Green Values

Evaluating benefits of green stormwater infrastructure including real estate value.

Peter Haas
Center for Neighborhood Technology

AGENDA

- Project Overview and Summary

- Demonstration of Green Values Tool

- Research and Results

- Q and A

GSI & PROPERTY VALUES

- Project funded by Kresge Foundation to look at Green Stormwater Infrastructure (GSI) to:

  - Determine if and to what degree distributed GSI changes residential real estate value

  - Make the benefits and cost of GSI more transparent to developers, landscape designers, policy makers, advocates and residents, including:

    - Opportunities for GSI funding and financing

    - Actions to pre-empt displacement risk

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RESEARCH FINDINGS OVERVIEW

- What we found:

  - Doubling the square footage of rain gardens, swales, planters, or pervious pavement near a home is associated with a 0.28% to 0.78% higher home sale value, on average.

- What this means:

  - A homeowner with a $250,000 home could see an increase of $700 to $1,950 in home sales value with a doubling of nearby GSI.

- See report on CNT.org publications page or https://www.cnt.org/sites/default/files/publications/GSI-Impact-on-Property-Values.pdf

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APPLICATIONS

- Special Service Districts and other financing tools

- Investment without displacement:

  - Community Planning

  - Community Ownership

  - Renters Rights and Affordable Housing

  - Job Creation

- 2021 engagement in three cities

- Green Values Tool
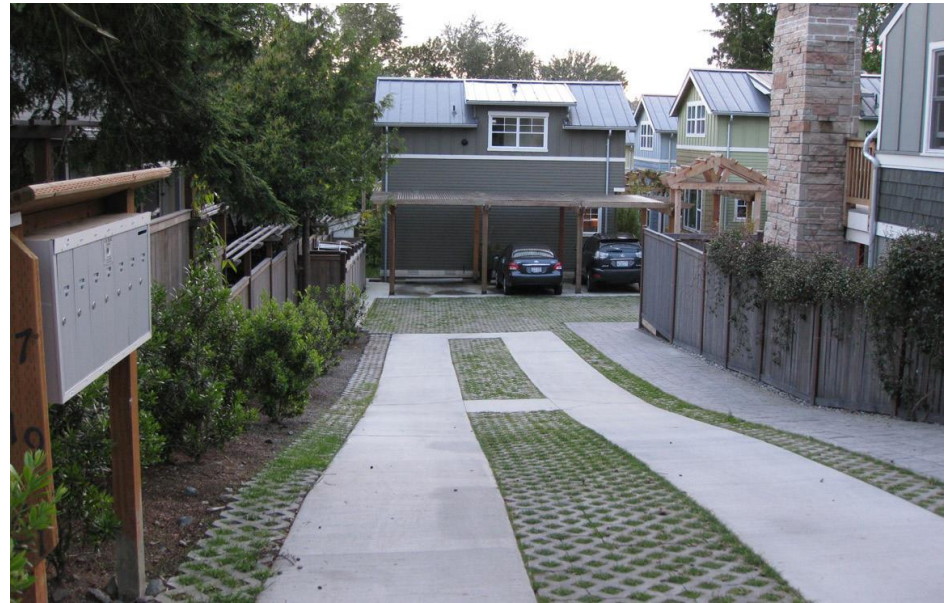
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GSI CALCULATOR DEMONSTRATION
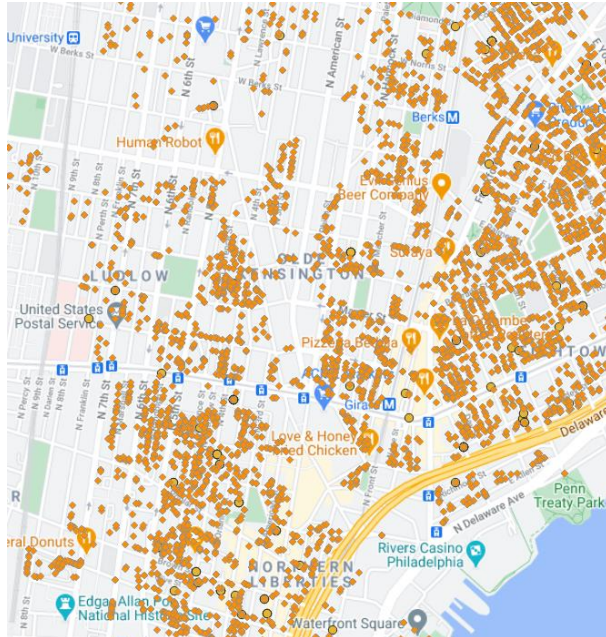

greenvalues.cnt.org

GSI VALUATION

- Assessed sales data from 3 different cities

- Spatially joined with available green infrastructure data

- Ran regression model to determine impacts on property values
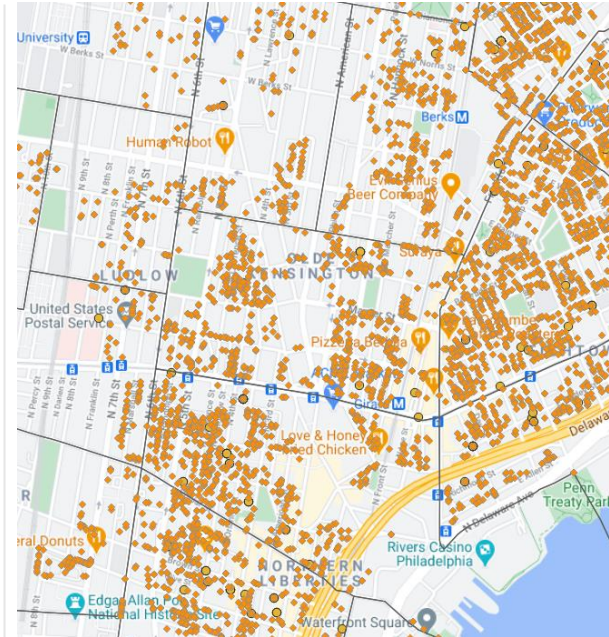

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METHODOLOGY – PROPERTY CHARACTERISTICS
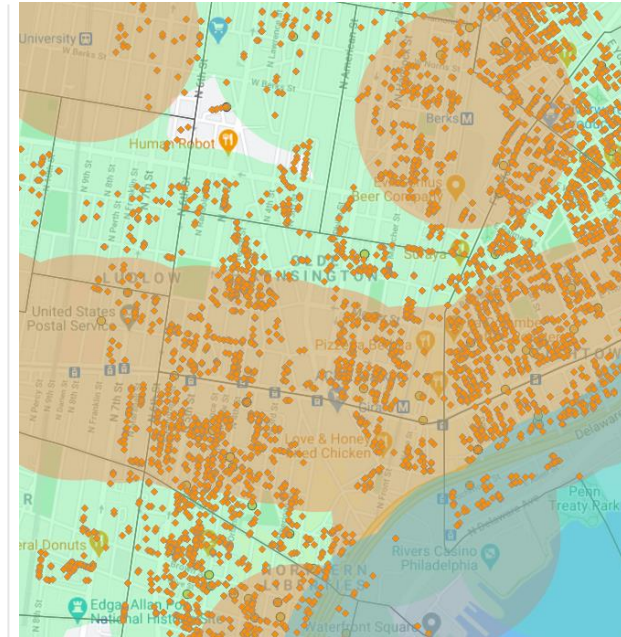
Property Characteristics

- Residential Unit Type
- Number of Bedrooms/Bathrooms
- Living area square footage
- Presence/absence of fireplace
- Presence/absence of garage
- Sale date

Neighborhood Characteristics

- Percentage of residents with a bachelor's degree or higher
- Percentage of households with income below the poverty threshold
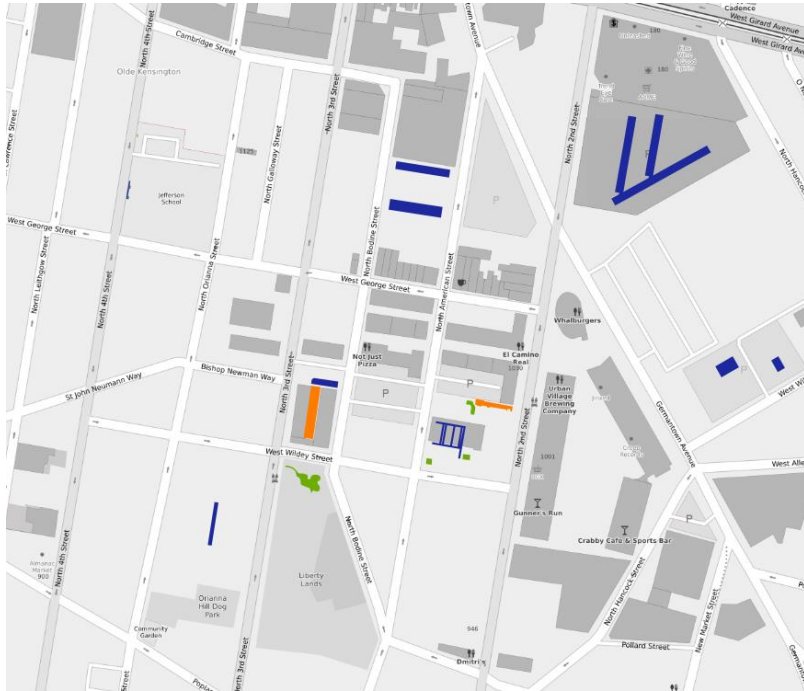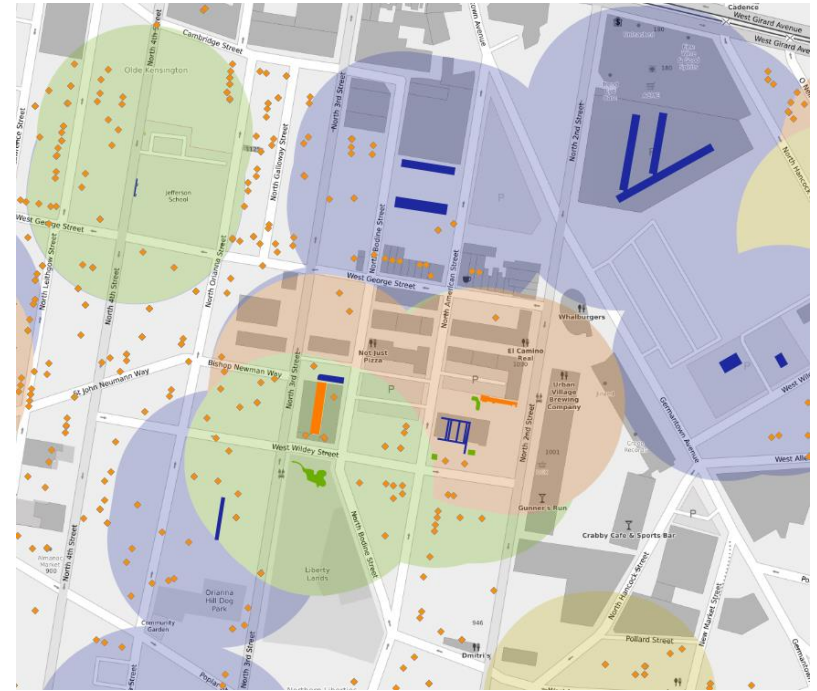- Owner-occupancy percentage

Spatial Amenities

- Property within half- or quarter-mile buffer of:
  - Fixed guideway transit station
  - Water feature
  - Public park

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METHODOLOGY – GSI CHARACTERISTICS

GSI Data

GSI Types	Group
Rain Garden	1
Swale	1
Bumpout	1
Planter	1
Basin	2
Trench	2
Wetland	2
Pervious Pavement	3
Green Roof	4
Cistern	4
Tree Trench	0

250' Buffer

- Matched properties within 250 feet of a GSI by type
- Indicated if GSIs were located within parks
- Aggregated GSI data (count, size, year installed) in cases where properties intersected multiple buffers

METHODOLOGY – MODEL STRUCTURE

- Multiple regression model

- Home value = F(Property characteristics, Neighborhood characteristics, Spatial amenities, GSI characteristics)

- Statistical tests:

  - **Model fit:** how much variation in sales prices is explained with these variables?

  - **Significance of GSI variable:** is the variation in sales price reliably corelated with GSI variables (e.g. size)?

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RESULTS:
EFFECT PER HUNDRED PERCENT INCREASE IN GSI SQUARE FOOTAGE ON SALE PRICE

Census Tract Control Variable	Philadelphia			Seattle		
	Education	Poverty	Homeowner	Education	Poverty	Homeowner
Group 1: Rain gardens, swales, planters	0.69% **	0.50% *	0.63% **	0.40%***	0.38%***	0.39%***
Group 2: wetland, basins, trenches	--	--	0.23% '	--	--	--
Group 3: pervious pavement	0.52% **	0.78% ***	0.53% **	0.30%***	0.28%***	0.29%***
Group 4: green roofs, cisterns	-0.61% *	-1.5% ***	-0.69% **	--	!	--
Conditional R^2 (LMM)	0.96	0.95	0.91	0.86	0.93	0.86
Number of unique SF estimates	1,356			6,849		
Average and Standard Deviation of GSI SF	115 (2,037)			117 (921)		

Significance levels: " ' " = .10, " * " = .05, " ** " = .01, " *** " = .001

"--" indicates no significant relationship. "!" indicates that the parameter was too similar to the spatial control to create a reliable estimate.

- **Internal validity of results:**
    - The relationship between GSI size and sale prices are consistent in direction and size of effect
    - The overall model predicts sales prices very close to what we observe (high R^2)

- **External validity of results - results should hold for other cities and GSI installations based on:**
    - Number and range of unique square footage estimates included in the model
    - Random effects included via Census tracts
    - Consistent results for both cities (exception: group 4)

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THANK YOU

Peter Haas

pmh@cnt.org

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