Rocky Mountain Land Use Institute Conference
March 12 – 13, 2015

# Climate Smart Cities: Using GIS for Climate Resiliency and Scenario Planning

Breece Robertson
*National GIS Director*

THE TRUST for PUBLIC LAND
LAND FOR PEOPLE

# Our Mission

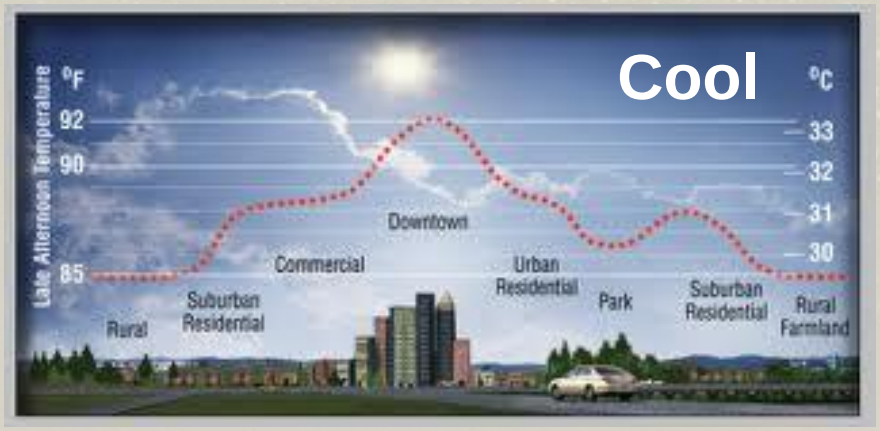
The Trust for Public Land conserves land for people to enjoy as parks, gardens, and other natural places, ensuring livable communities for generations to come.

# Leadership in GIS and Planning Applications

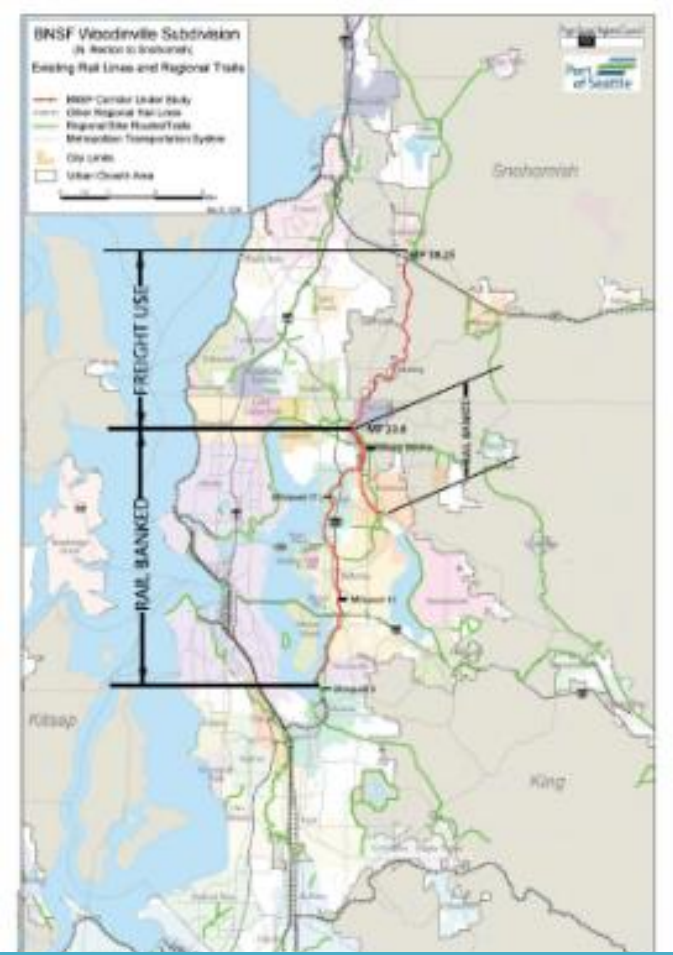
THE TRUST for OUR LAND

THE TRUST for PUBLIC LAND

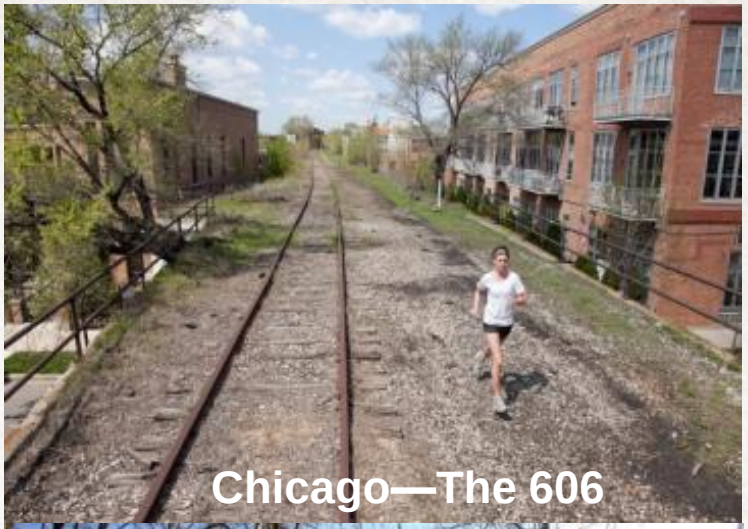
# Green Cities to Become Climate-Smart



# **Connect** – To Save ½ Lb. CO2 & 1.3 Cents Per Mile



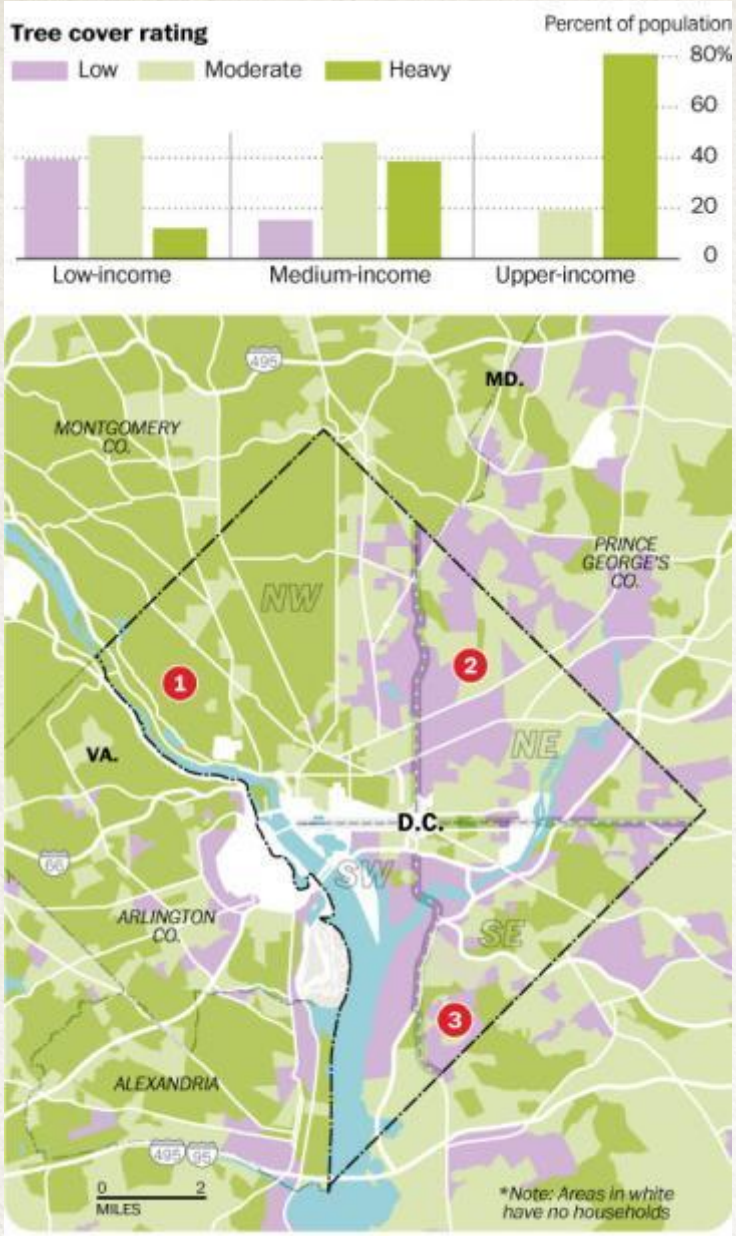

Seattle—Eastside Rail Corridor

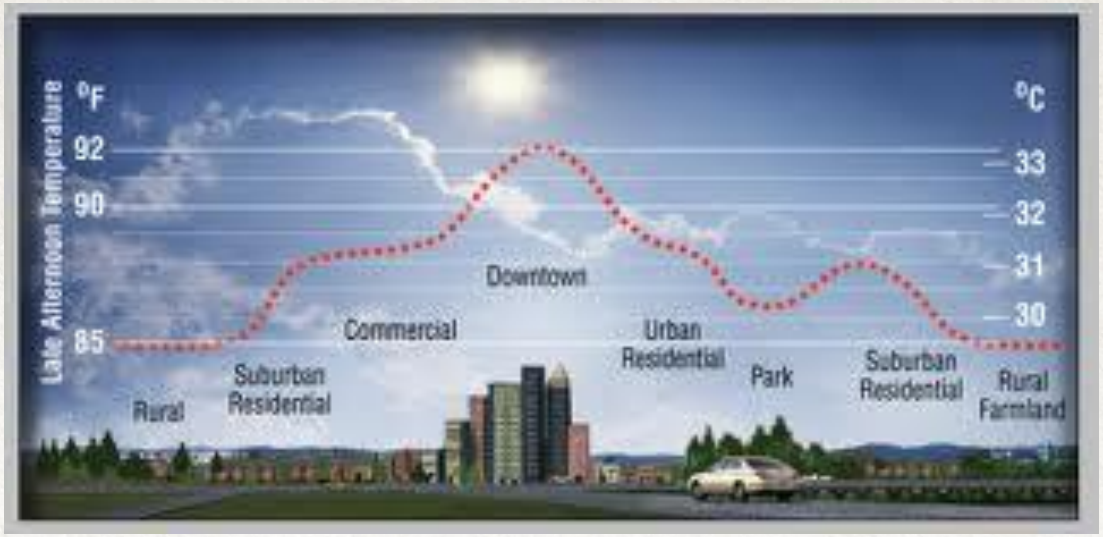


Chicago—The 606

NYC—The Queensway

# **Cool** – Add Green to Cool Air by 5-22 Degrees



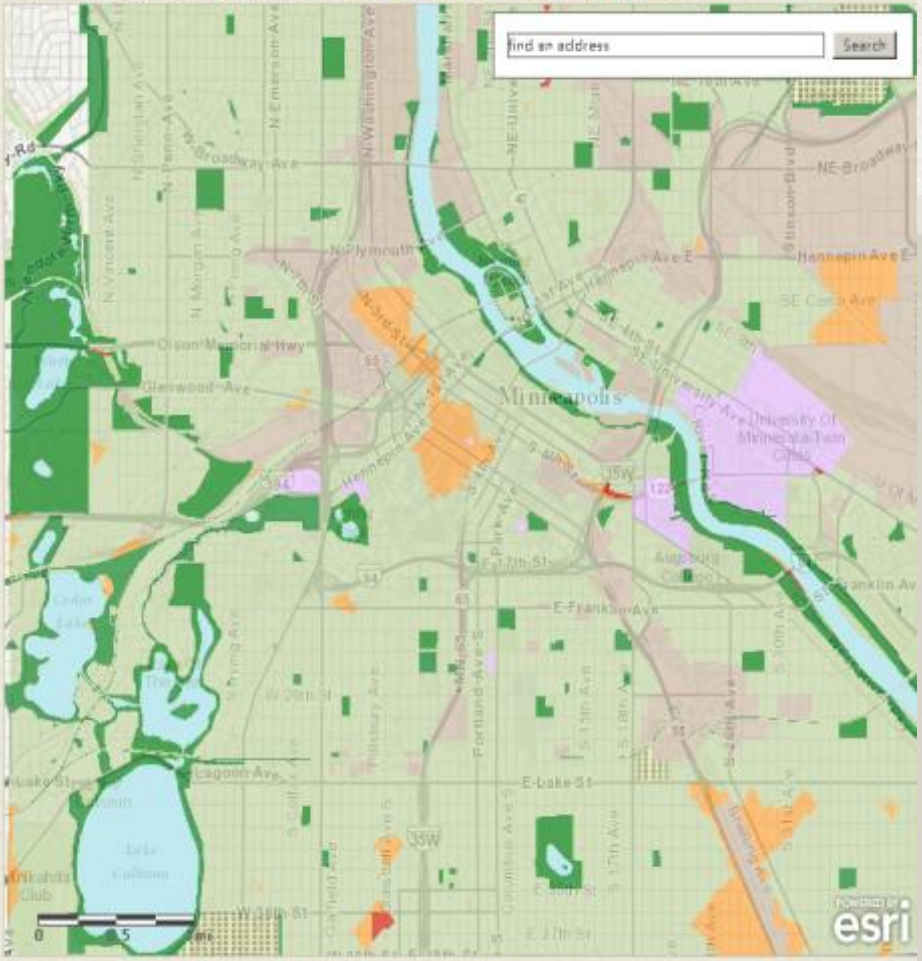
# **Absorb** – To Clean Urban Waters & Recharge Aquifers

# **Protect** – Green Shorelines to Buffer Cities

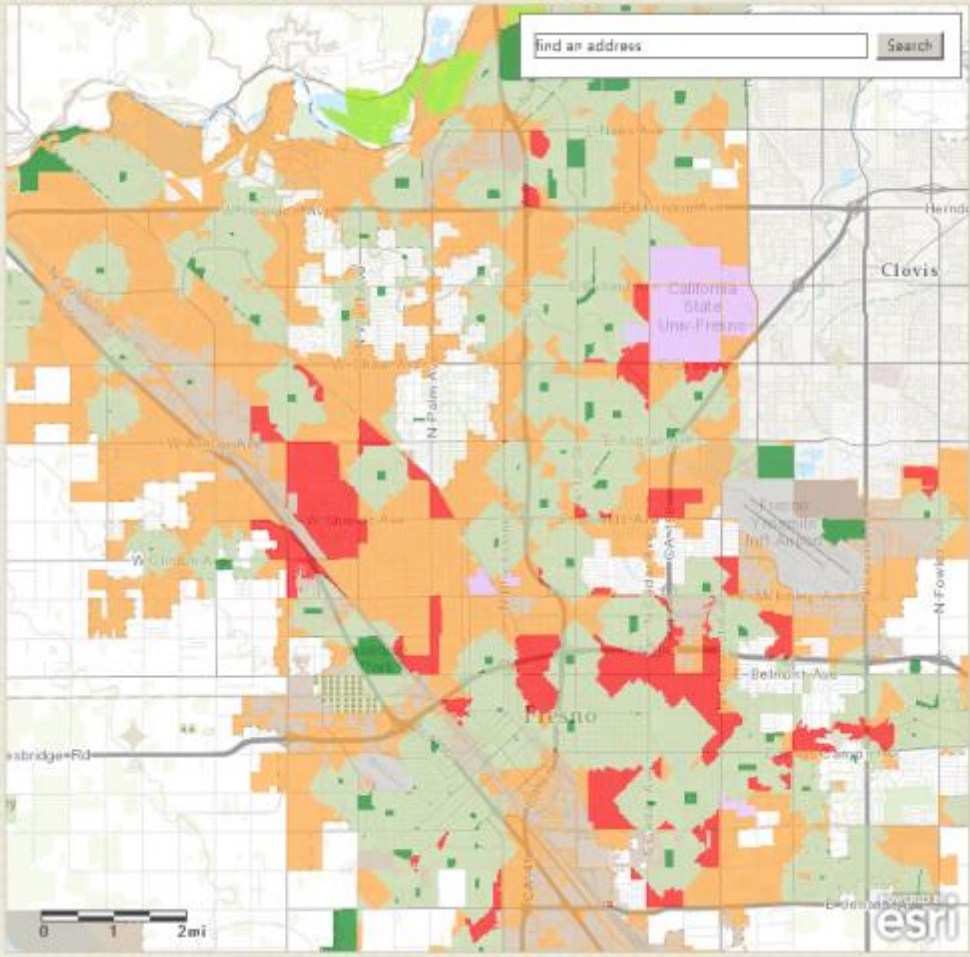
***North Shore Park, Staten Island***

***Old Place Creek, Staten Island***

## MINNEAPOLIS, MN = 81.0 ParkScore




## FRESNO, CA = 27.5 ParkScore




## MINNEAPOLIS, MN

DOWNLOAD MAP & TABLES

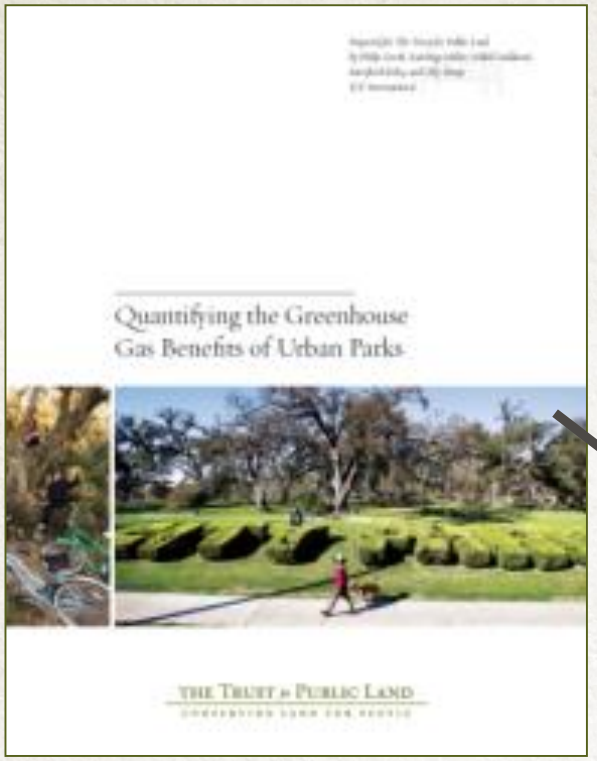
| Rank | Population | Acreage | | Services & Investment | | Access | Raw Score | ParkScore |
|---|---|---|---|---|---|---|---|---|
| 1 out of 50 | 379,969 | 27 MAX 40 | | 32 MAX 40 | | 38 MAX 40 | 97 MAX 120 | 81.0 MAX 100 |
| | | Median Park Size | Park Land as % of City Area | Spending per Resident | Playgrounds per 10,000 Residents | | | |
| | | 12 MAX 20 | 15 MAX 20 | 20 MAX 20 | 12 MAX 20 | | | |

## FRESNO, CA

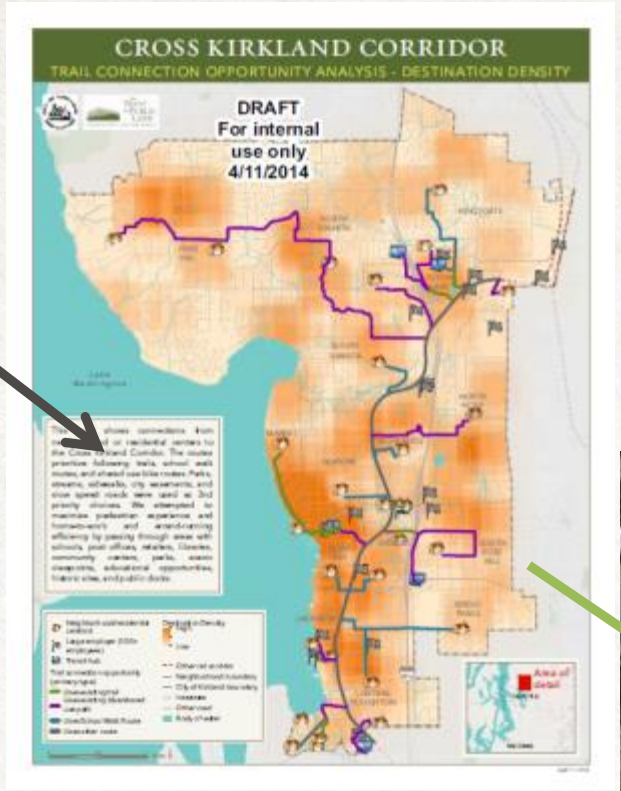
DOWNLOAD MAP & TABLES

| Rank | Population | Acreage | | Services & Investment | | Access | Raw Score | ParkScore |
|---|---|---|---|---|---|---|---|---|
| 50 out of 50 | 468,337 | 10 MAX 40 | | 7 MAX 40 | | 16 MAX 40 | 33 MAX 120 | 27.5 MAX 100 |
| | | Median Park Size | Park Land as % of City Area | Spending per Resident | Playgrounds per 10,000 Residents | | | |
| | | 9 MAX 20 | 1 MAX 20 | 5 MAX 20 | 2 MAX 20 | | | |

# Climate-Smart Cities Pilot:
## *Eastside Rail Conversion to Connect Seattle*




***RESEARCH: Quantify CO2 Reductions***




***GIS: Design Connected Network***

***DEMONSTRATION: Connect + Absorb***

CITY OF KIRKLAND WASHINGTON

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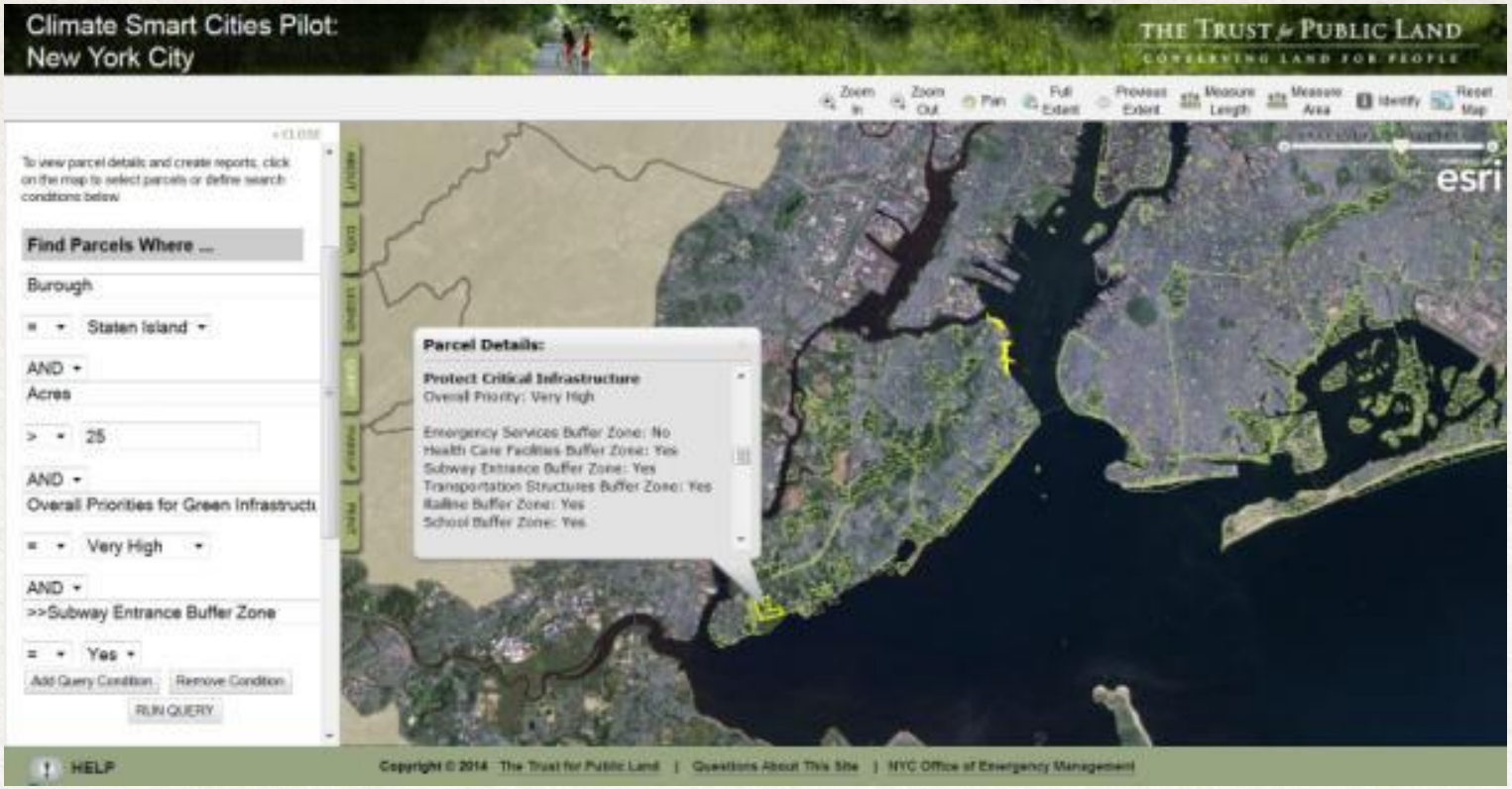
# Climate-Smart Cities Pilot:
## *Green Shorelines to Protect NYC Waterfront*



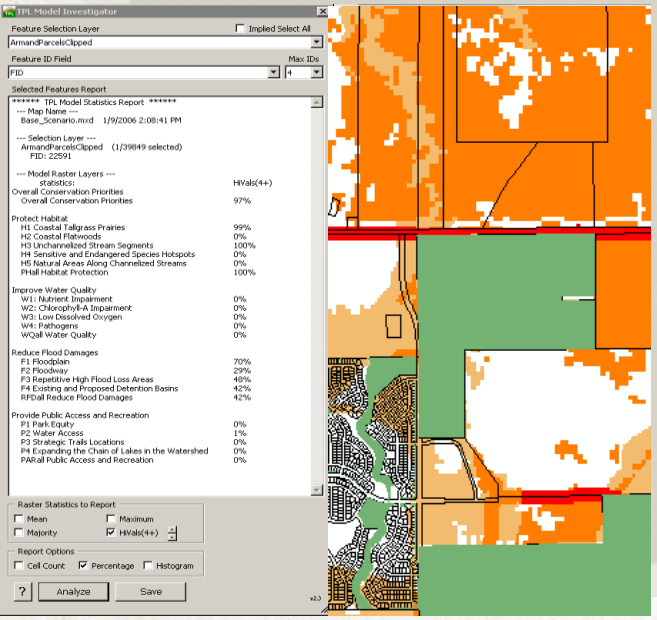

**RESEARCH:** Assess Past Performance of Green Buffers

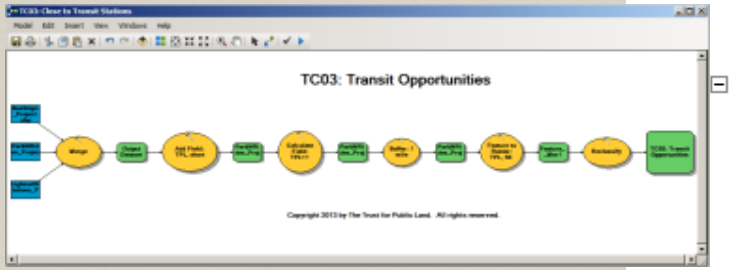
**GIS MAPPING:** Target Highest Value Sites

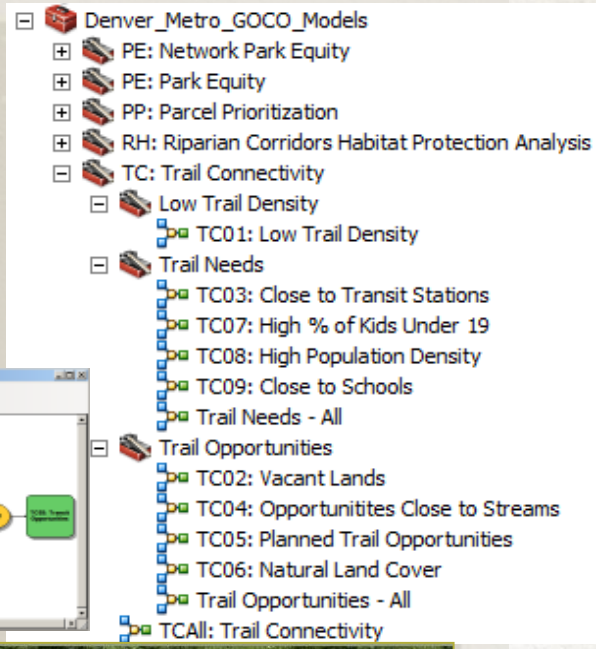
**DEMONSTRATION:** Innovative Designs on Priority Sites

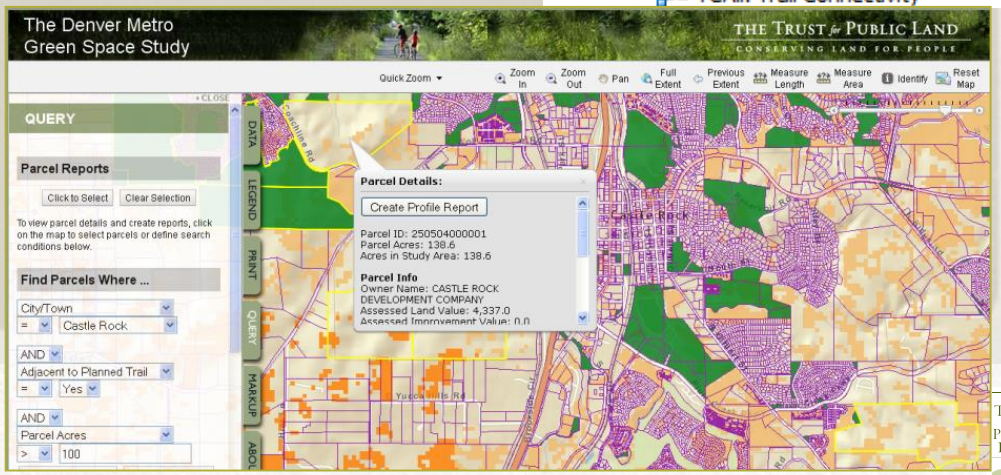
# TPL Uses ESRI Software + Custom TPL Tools

- **ArcGIS Desktop**
- **Modelbuilder**
- **Spatial Analyst and Network Analyst**
- **Custom TPL Interactive mapping site (ArcGIS Server, Javascript API)**
- **Custom TPL parcel reporting tools**

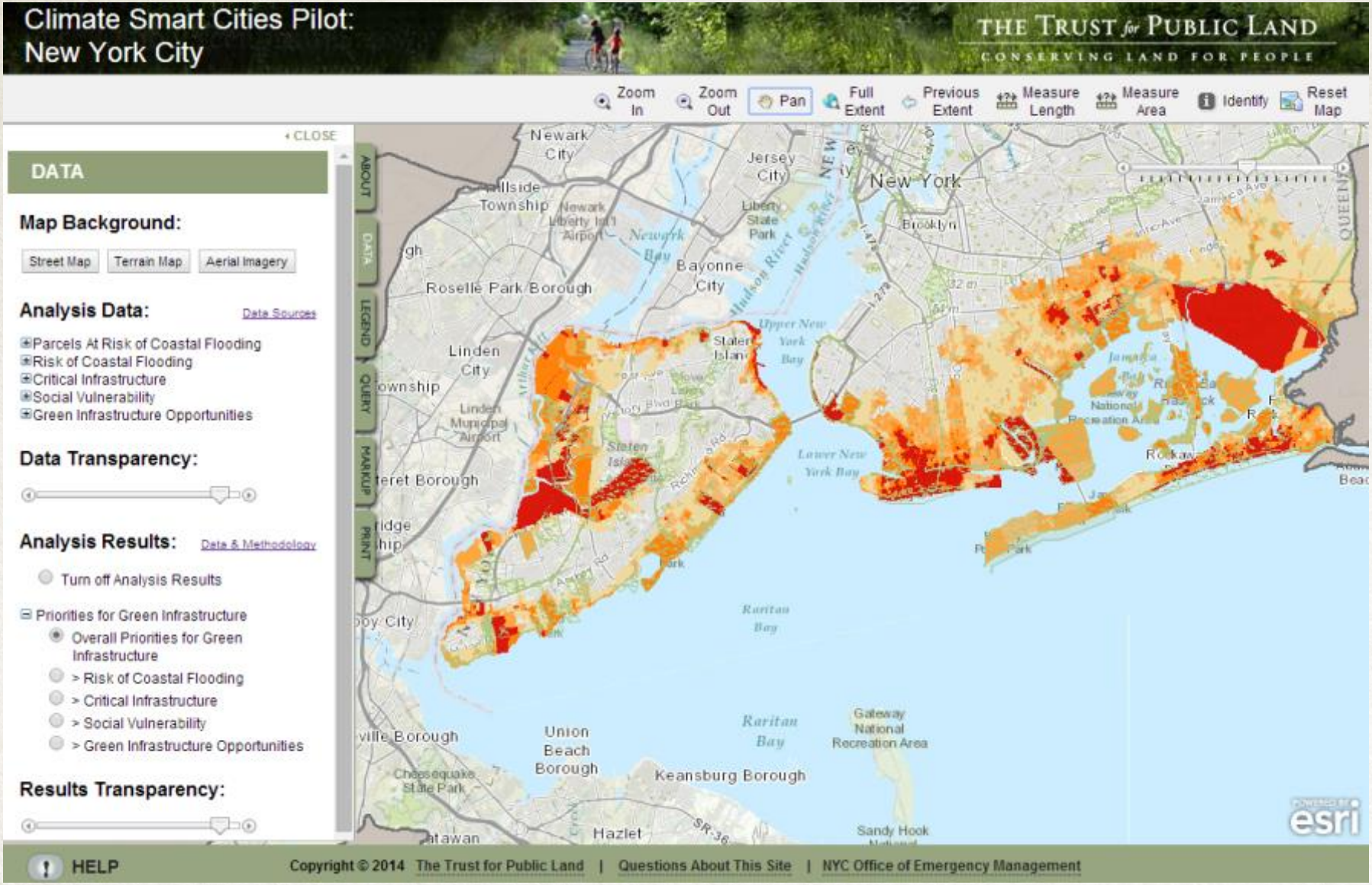


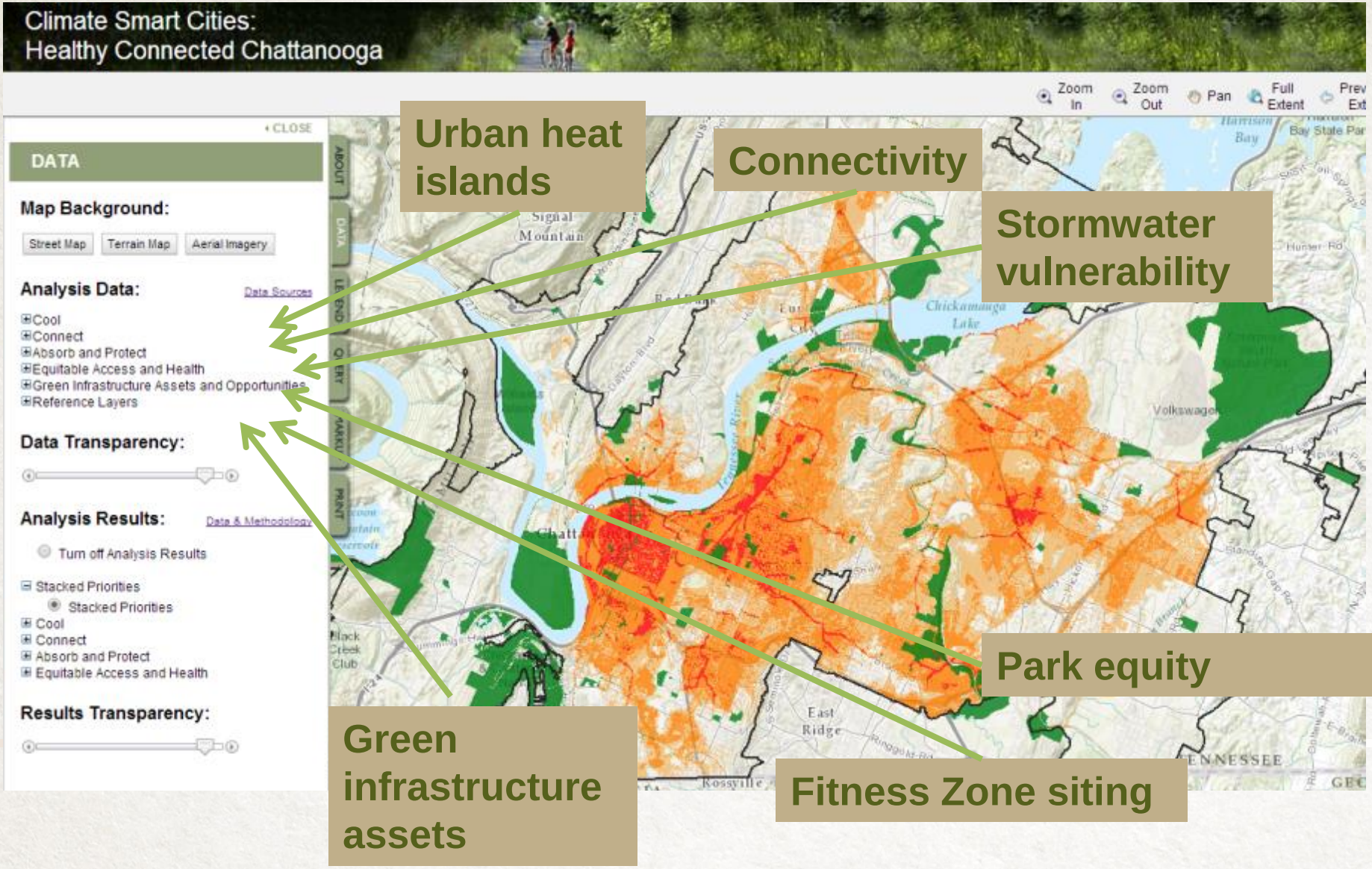



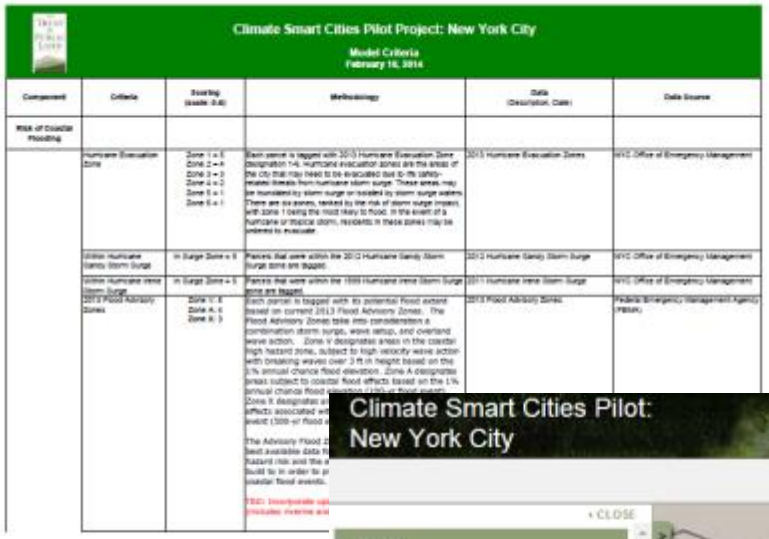

THE TRUST for OUR LAND

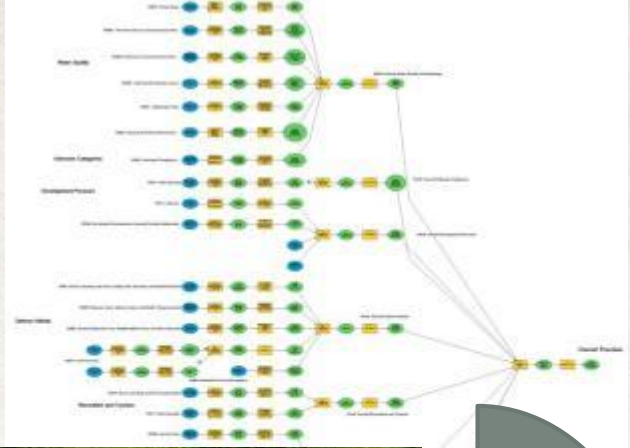


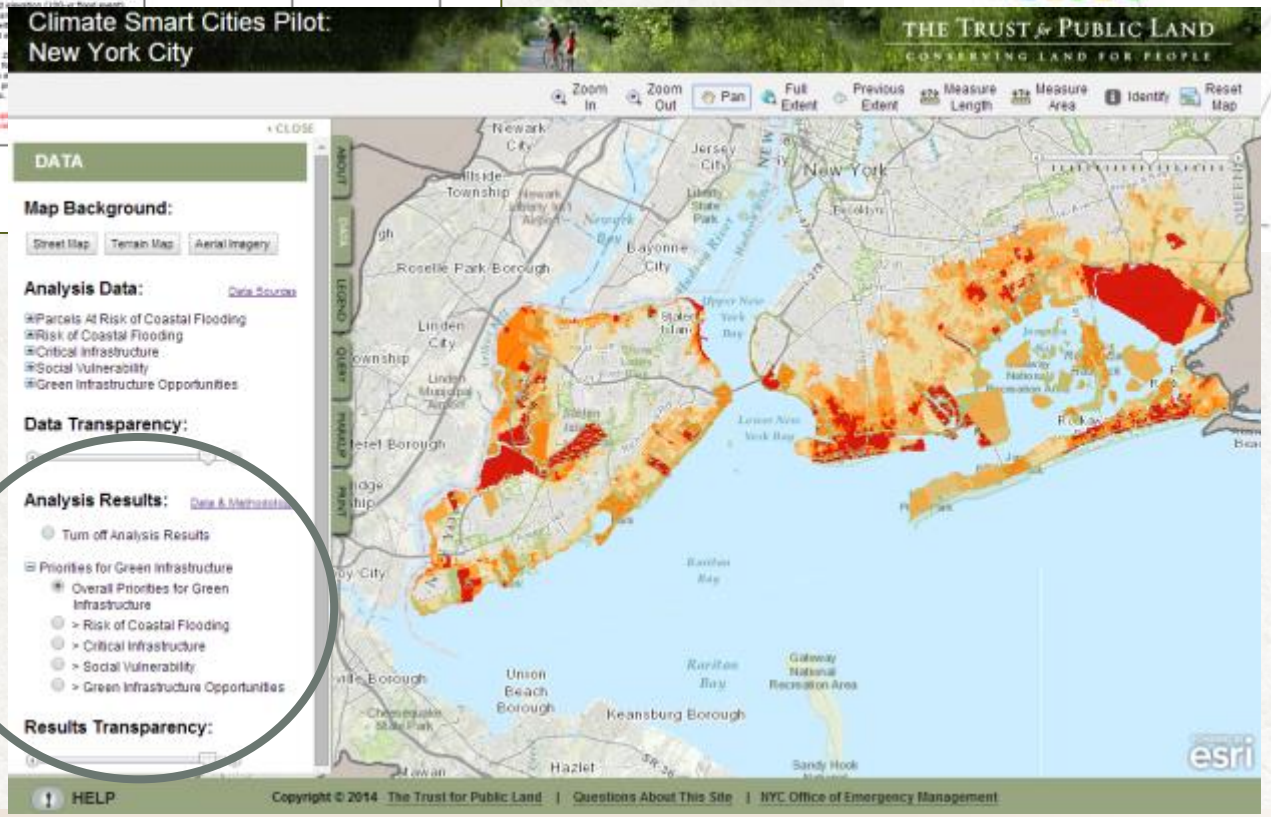

# TPL's Custom Online GIS Platform (Portal) Applies Data and Planning to Specific Locations for Analysis

# The Online Decision Support Tool Integrates All Relevant Data and Completed Modeling

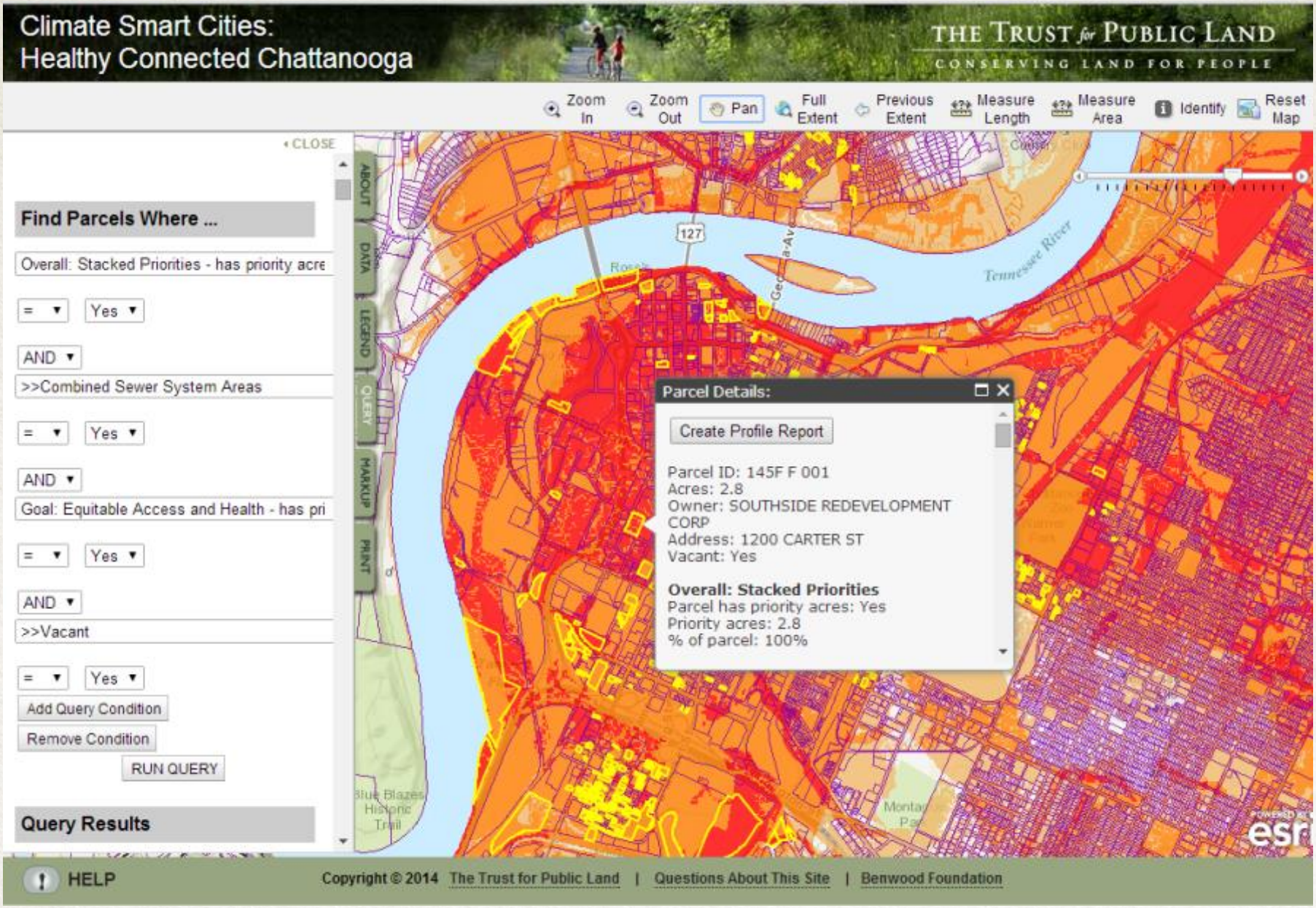







# The Data in the Portal Can Be Combined to Model Priorities at the City-Scale


Climate Smart Cities:
Healthy Connected Chattanooga
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Zoom In
Zoom Out
Pan
Full Extent
Previous Extent
Measure Length
Measure Area
Identify
Reset Map
CLOSE
ABOUT
DATA
LEGEND
QUERY
MARKUP
PRINT
Find Parcels Where ...
Overall: Stacked Priorities - has priority acre
= Yes
AND
>>Combined Sewer System Areas
= Yes
AND
Goal: Equitable Access and Health - has pri
= Yes
AND
>>Vacant
= Yes
Add Query Condition
Remove Condition
RUN QUERY
Query Results
Parcel Details:
Create Profile Report
Parcel ID: 145F F 001
Acres: 2.8
Owner: SOUTHSIDE REDEVELOPMENT CORP
Address: 1200 CARTER ST
Vacant: Yes
Overall: Stacked Priorities
Parcel has priority acres: Yes
Priority acres: 2.8
% of parcel: 100%
127
Tennessee River
HELP
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## Climate Smart Cities: Healthy Connected Chattanooga
## Parcel Report

Parcel ID: 136C B 001 | Owner: CINCINNATI NEW ORLEANS & TEXAS | Acres: 26.0

LEGEND

Reference Data
- City Limits
- Parcels
- Parks
- Vacant Parcels

Analysis Results
Stacked Priorities
- High Priority
- Moderate To High Priority
- Moderate Priority

### Overall: Stacked Priorities

PARCEL HAS PRIORITY ACRES: Yes
PRIORITY ACRES: 17.4
PERCENT OF PARCEL: 100%

### Goal: Cool

PARCEL HAS PRIORITY ACRES: Yes
PRIORITY ACRES: 17.4
PERCENT OF PARCEL: 100%

| | PARCEL HAS PRIORITY ACRES | PRIORITY ACRES | PERCENT OF PARCEL |
|---|---|---|---|
| Daytime Heat Island Hot Spots | Yes | 17.4 | 100% |
| Nighttime Heat Island Hot Spots | Yes | 17.4 | 100% |
| Areas of High Impervious Surface | Yes | 17.4 | 100% |

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## Climate Smart Cities: Healthy Connected Chattanooga
## Parcel Report

Parcel ID: 136C B 001 | Owner: CINCINNATI NEW ORLEANS & TEXAS | Acres: 26.0

### Goal: Priority Connections and Adjacent Properties

PARCEL HAS PRIORITY ACRES: No
PRIORITY ACRES:
PERCENT OF PARCEL:

| | PARCEL HAS PRIORITY ACRES | PRIORITY ACRES | PERCENT OF PARCEL |
|---|---|---|---|

### Goal: Absorb and Protect

PARCEL HAS PRIORITY ACRES: Yes
PRIORITY ACRES: 17.4
PERCENT OF PARCEL: 100%

| | PARCEL HAS PRIORITY ACRES | PRIORITY ACRES | PERCENT OF PARCEL |
|---|---|---|---|
| Estimated Runoff Volume | No | | |
| Wetness Index | Yes | 17.4 | 100% |
| Floodways and Flood Zones | Yes | 17.4 | 100% |
| Stream Corridor Evaluation (SCORE) for Riparian Buffers | No | | |
| Wetland and Pond Buffers | No | | |
| Combined Sewer System Areas | No | | |
| Illicit Discharge Potential (IDP) Scores by Subbasin | Yes | 17.4 | 100% |

### Goal: Equitable Access and Health

PARCEL HAS PRIORITY ACRES: Yes
PRIORITY ACRES: 17.4
PERCENT OF PARCEL: 100%

| | PARCEL HAS PRIORITY ACRES | PRIORITY ACRES | PERCENT OF PARCEL |
|---|---|---|---|
| % Obese Teens | Yes | 17.4 | 100% |
| Likelihood of Obese or OverWeight Adults | Yes | 17.4 | 100% |
| Likelihood of Adults not meeting Physical Activity Recommendations | Yes | 17.4 | 100% |
| Likelihood of Heart Disease | Yes | 17.4 | 100% |
| Likelihood of Diabetes | Yes | 17.4 | 100% |
| Likelihood of Suicide | No | | |
| Likelihood of Respiratory Disease | Yes | 17.4 | 100% |
| Likelihood of Stroke | Yes | 17.4 | 100% |
| Population Density | No | | |
| % Kids 19 and under | Yes | 17.4 | 100% |
| % Seniors 65 and older | Yes | 17.4 | 100% |
| % Low Income households | No | | |
| Access to Recreation Facilities | Yes | 17.4 | 100% |

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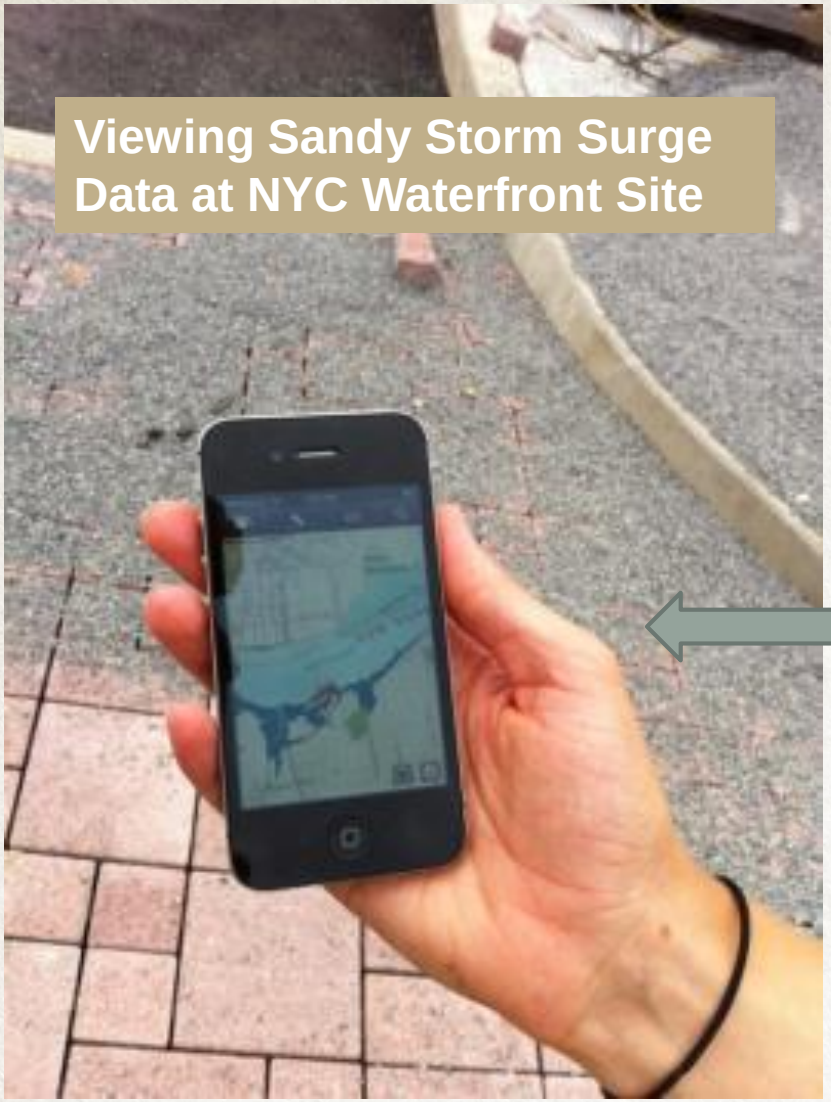
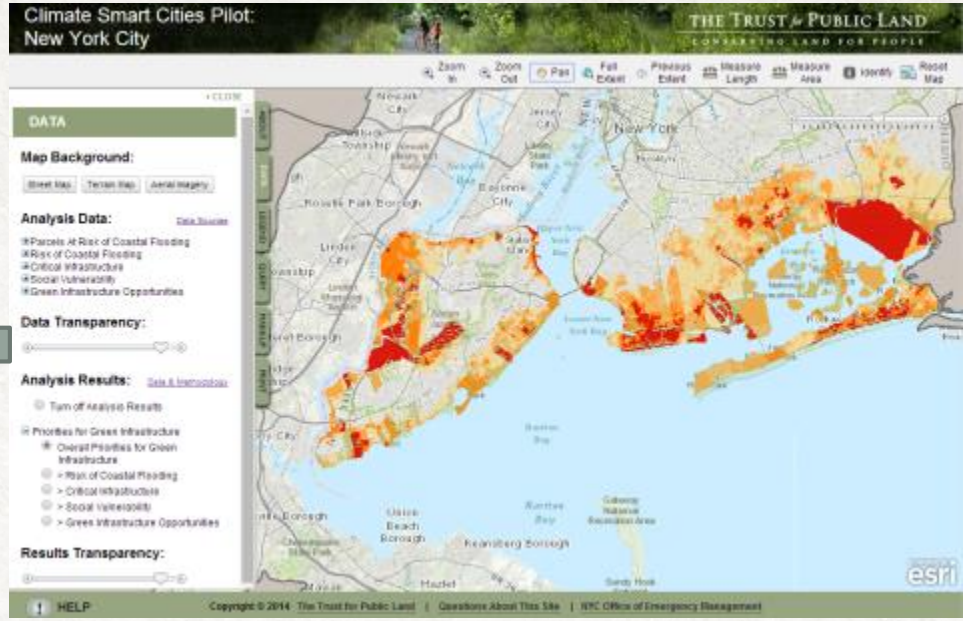
# Funding: Show Rationale for Projects w/ 1-Click Parcel Reports




# Being Online Means Users Can Take Data to the Field

**Green Infrastructure Playground**
**P.S. 261, Brooklyn**