



# Using GIS to Create Healthy Cities

Breece Robertson  
National GIS Director

THE TRUST *for* PUBLIC LAND

LAND FOR PEOPLE

# Our Mission

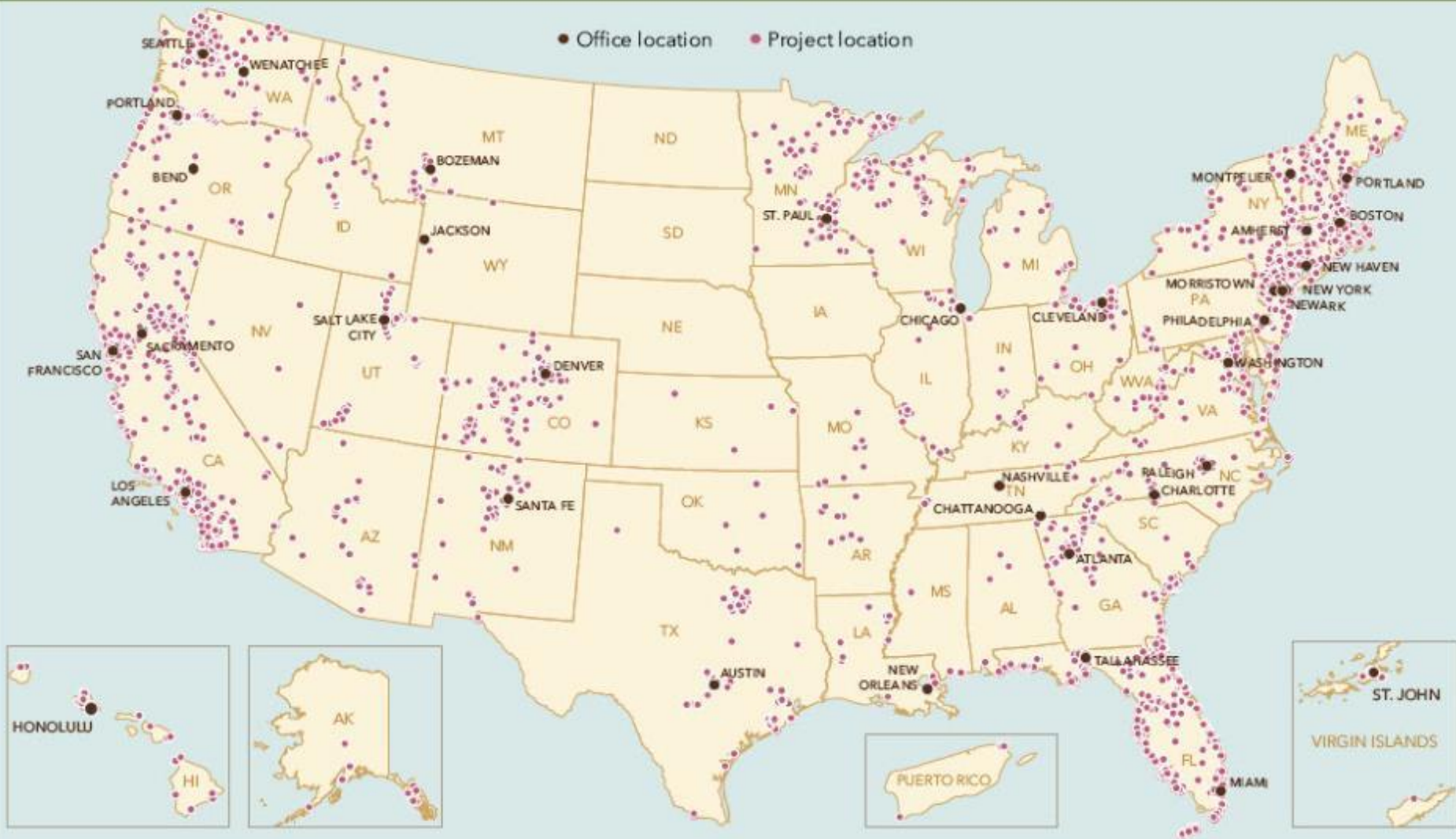
The Trust for Public Land conserves land for people to enjoy as parks, gardens, and other natural places, ensuring livable communities for generations to come.





# PROTECTED PLACES

1973 - 2014



THE TRUST *for* PUBLIC LAND  
CONSERVING LAND FOR PEOPLE

# Leadership in GIS and Planning Applications





# THE TRUST FOR PUBLIC LAND

## GREENPRINTS AND OTHER CONSERVATION VISION ANALYSIS PROJECTS



Examples of TPL GIS Efforts at all Scales

# Parks are More than Play



## Environment

- Green Infrastructure
- Sustainability
- Resilience

## Beauty

- Public Art
- Creative Placemaking

## Community

- Social networks
- Engagement

## Health

- Physical
- Mental
- Spiritual
- Air & Water Quality

## Economy

- Investment in public land
- Real Estate Values





# Climate-Smart Cities

Helping Cities Create Urban Greenspace to Connect, Cool, Absorb, & Protect



**Climate-Smart Cities Partnerships—**  
*Linking Public, Private, and Academic Leaders within “Pilot Cities”*

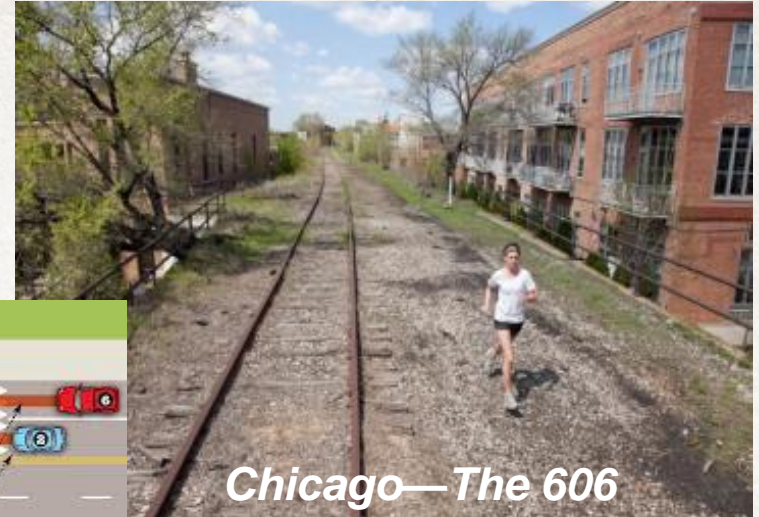
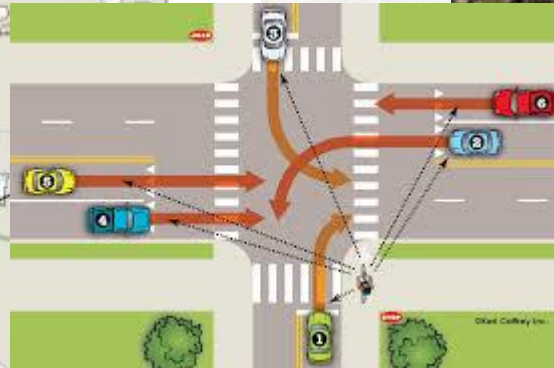
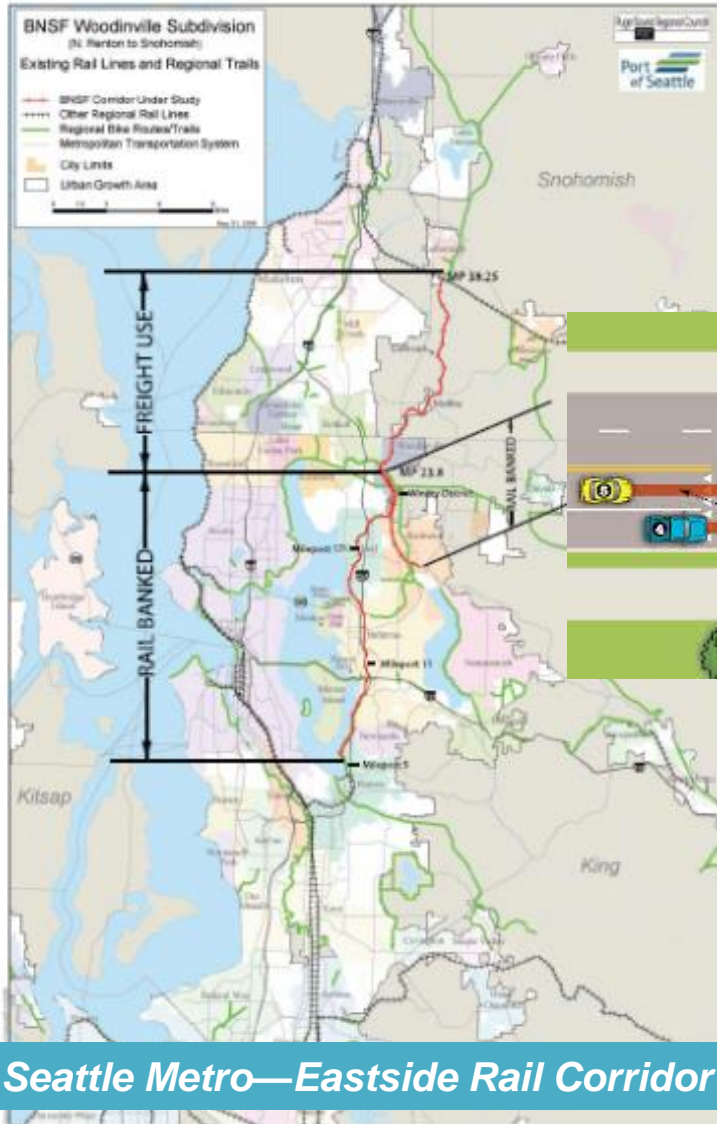
**Demonstration Projects—**  
*Creating Model Greenspace Designed for Climate Goals*

**Applied Research—**  
*How to Connect, Cool, Absorb, & Protect Your City?*

**GIS Data and Decision Support—**  
*Visualizing Climate Solutions and Prioritizing Project Areas*



# Connect—Remove Barriers to Walking and Biking

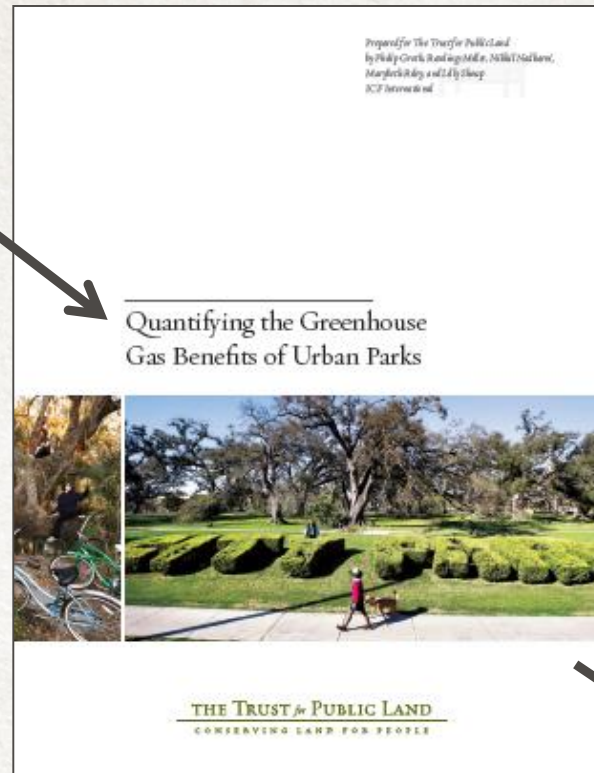




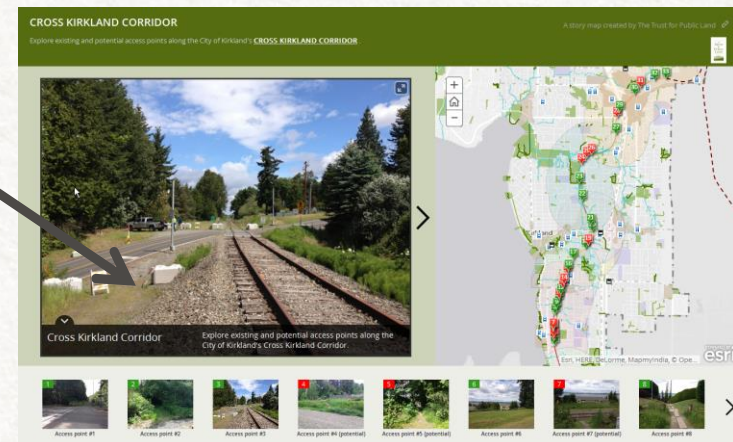
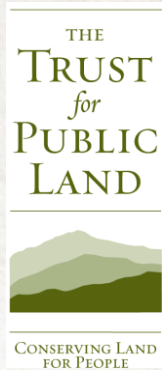
# Climate-Smart Cities Pilot: *Leverage Eastside Rail Corridor to **Connect** Seattle*



## GIS: Design for Hyper-Connectivity

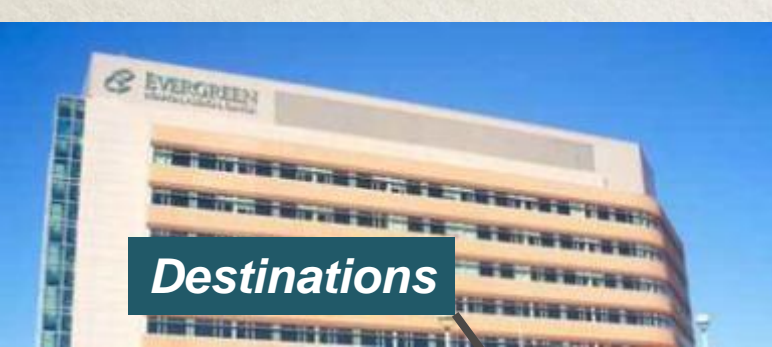


## RESEARCH: Show Potential CO2 Savings



## DEMONSTRATION: Optimize Access

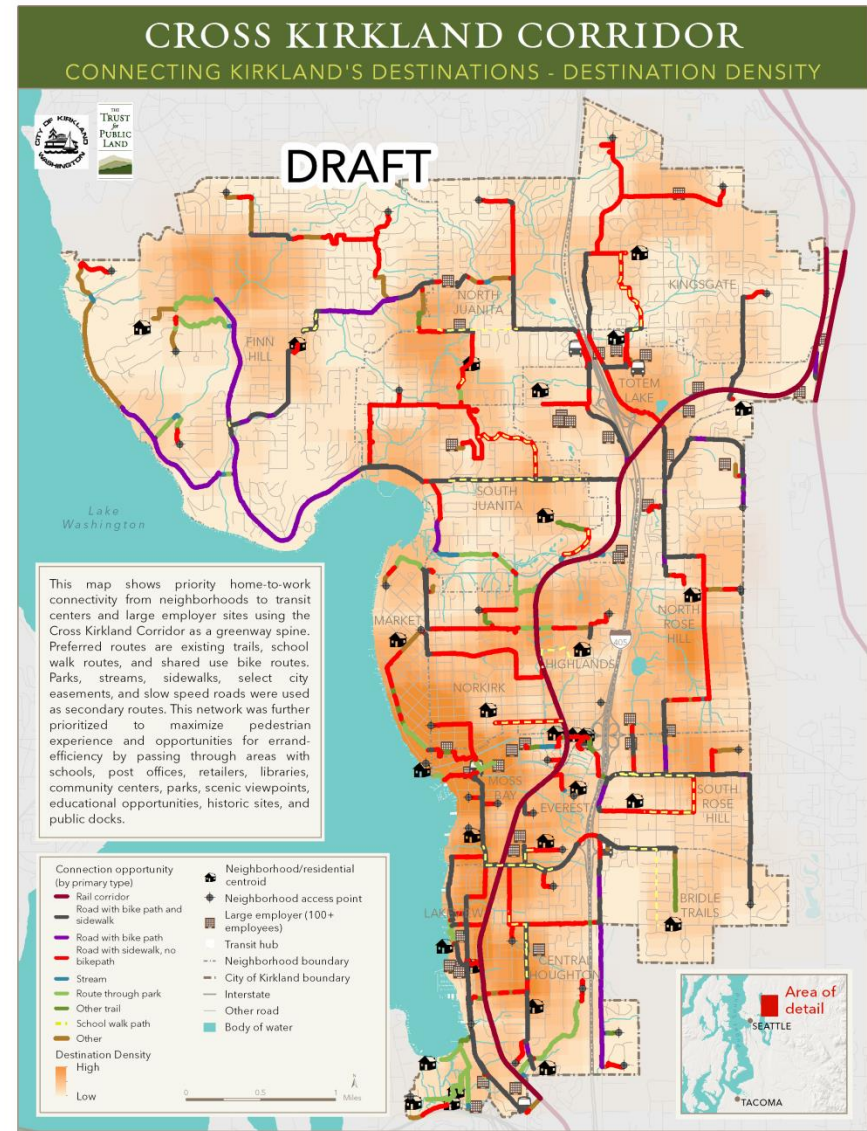
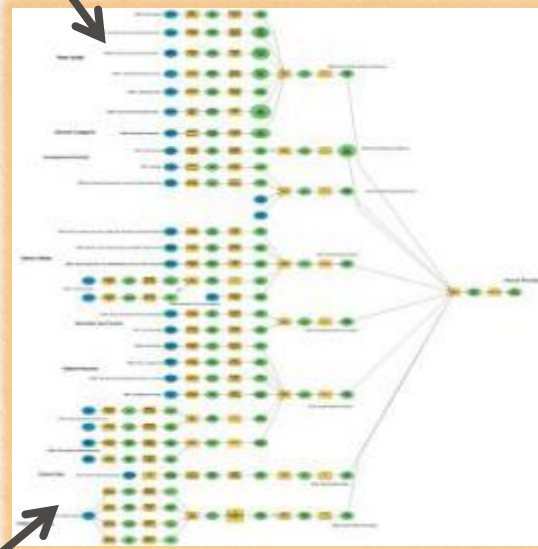




**Destinations**



**Users**



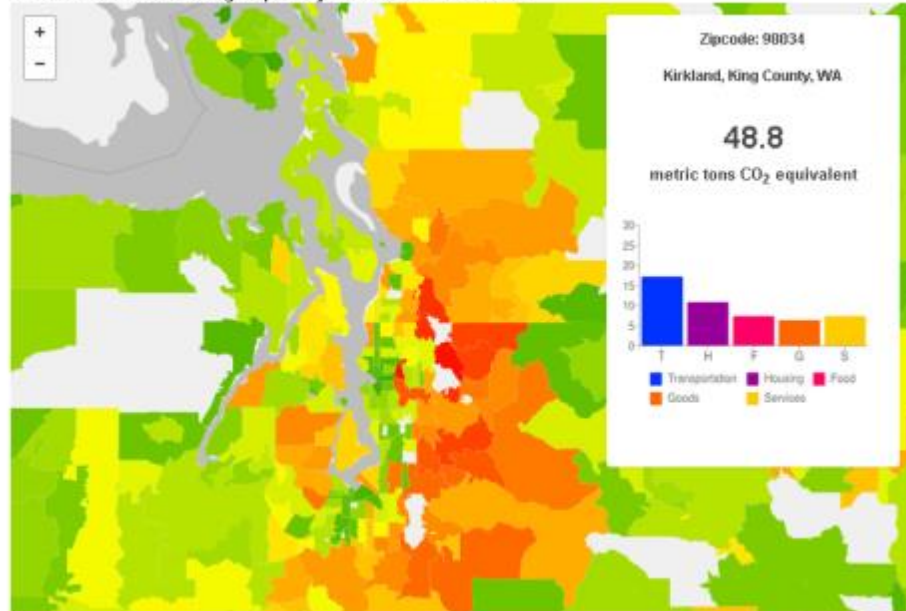
Innovative Computer Modeling for “Hyper-Connectivity”





### Average Annual Household Carbon Footprint by Zip Code

Double click to zoom or drag map to any location. Hover for details.



Finn Hill neighborhood to Google, Inc.	0.38% Mode Shift	2.07% Mode Shift	Units
Days <sup>1</sup>	215	215	days of use/year
Average length of bicycle trips <sup>2</sup>	5.8	5.8	miles
Annual average daily traffic <sup>3</sup>	650	650	trips per day
Mode shift from driving to biking	0.0038	0.0207	
Credit for activity centers near the project <sup>4</sup>	0.002	0.002	
Annual Auto Trips Reduced	810.55	3172.33	trips/year
Annual Auto VMT Reduced	4701.19	18399.49	miles/year
Annual Emission Reductions	4280.09	16751.38	lbs CO <sub>2</sub> /year
CO <sub>2</sub> saving per VMT reduced	0.91	0.91	lbs CO <sub>2</sub> /mile

# Carbon Analysis Makes Case for New Connections

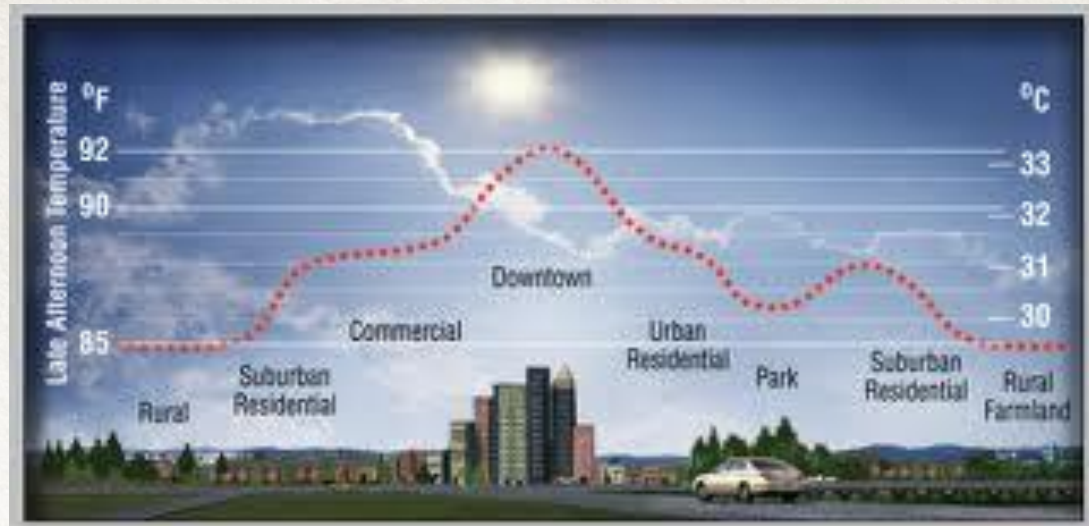
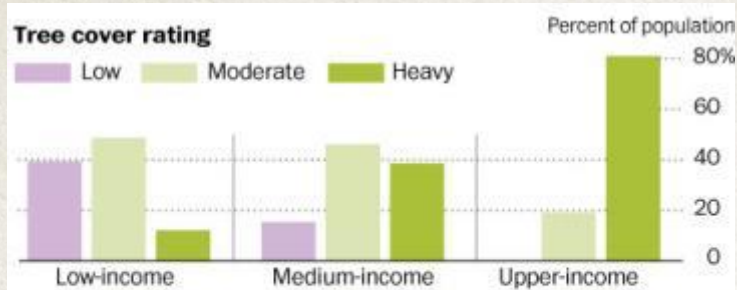
# Health Benefits of Walk-Bike Connected Corridors

- Increasing median daily walking and bicycling from 4 to 22 minutes reduced the burden of cardiovascular disease and diabetes by 14% (*American Journal of Public Health*)
- Cycling has a positive effect on emotional health, improving levels of well-being, self-confidence and tolerance to stress while reducing tiredness, difficulties with sleep and a range of medical symptoms.
- A study commissioned in Denmark found that every 6 miles traveled by bicycle avoids 2.8 lbs. of CO<sub>2</sub> emissions and avoids 9 cents of health care costs.



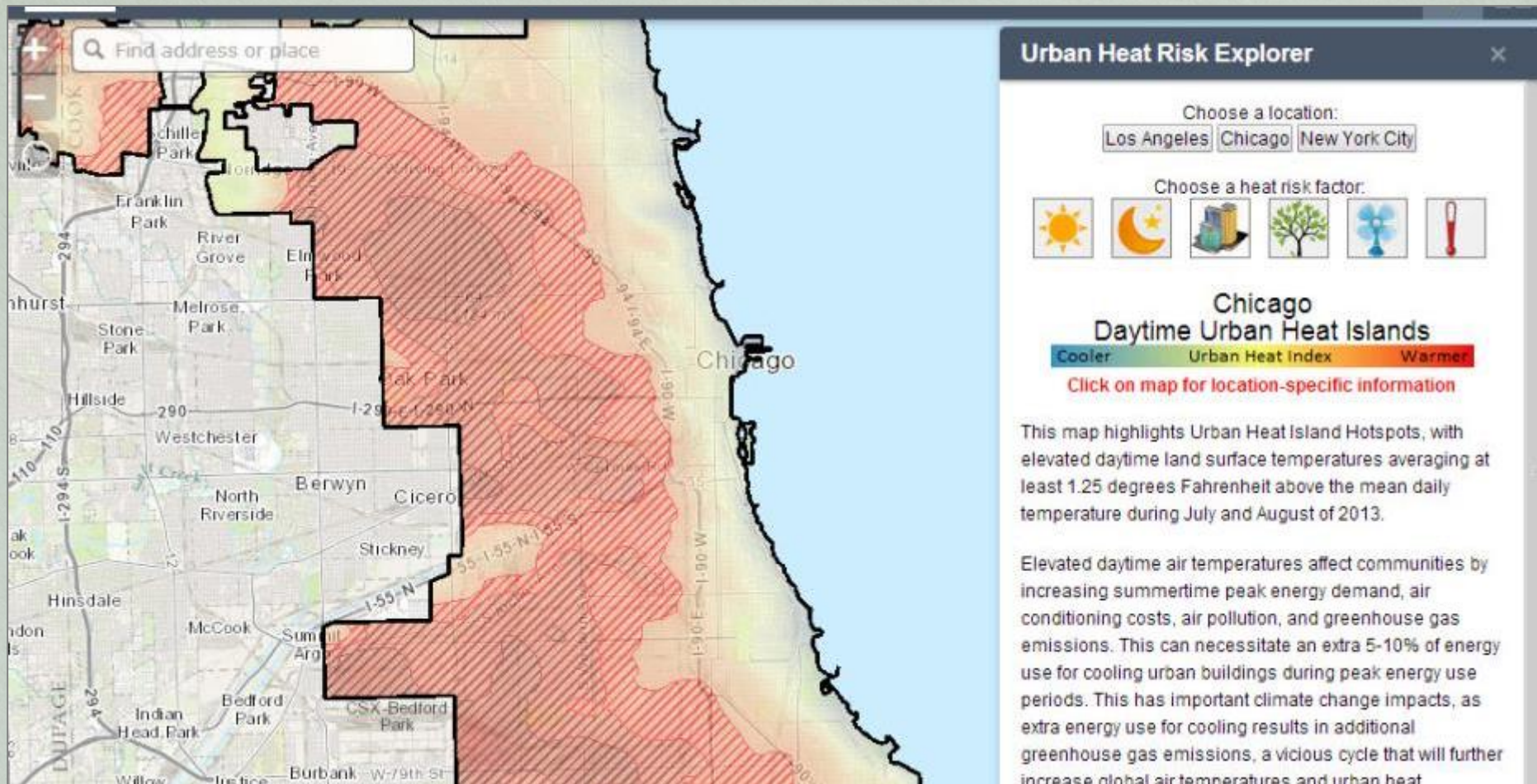


# Cool – Add Green to Cool Air by 5-22 Degrees



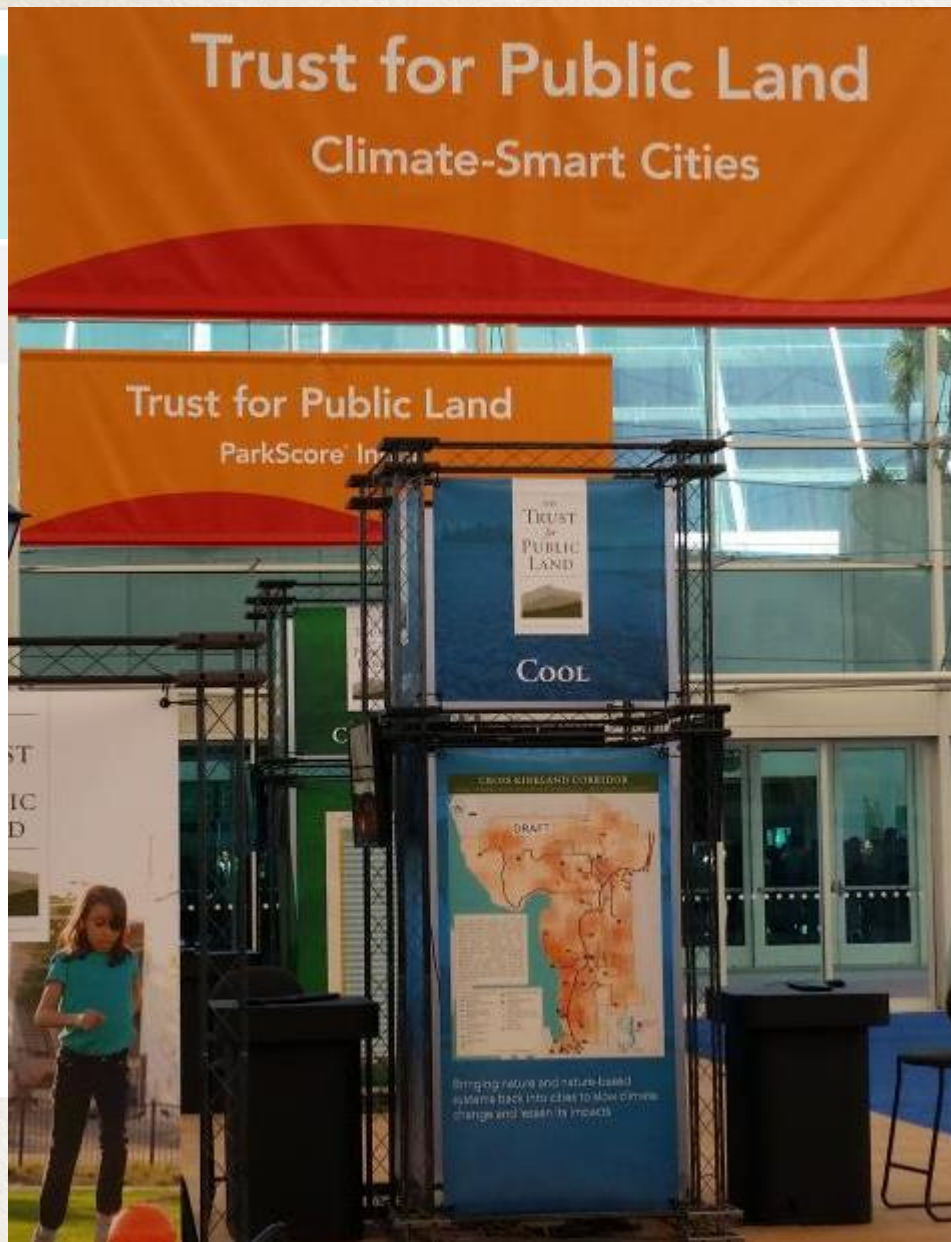


# Urban Heat Risk Explorer





# Our Climate-Smart Cities Pilots Are National Model



energy efficiency building potential at the parcel level.

- **Trust for Public Land:** The Trust for Public Land will commit new organizational resources through the use of Geographic Information Systems (GIS) technology to help America's cities lessen their vulnerability to climate-related heat events. Specifically, over the next two years the Trust for Public Land will help fill national gaps in heat-risk spatial data and modeling for cities, expand its [Urban Heat Risk Explorer App](#) to new cities, and develop a heat risk reduction GIS toolkit to help cities strategically target green infrastructure for heat resilience.

For more information about steps the Obama Administration is taking to act on climate change, please visit [www.whitehouse.gov/climate-change](http://www.whitehouse.gov/climate-change).



# THE TRUST *for* PUBLIC LAND

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## *ParkScore*®

Rates park systems in the 60 largest U.S. cities

### METHODOLOGY





# ParkScore® - A Standardized Approach for Assessing City Park Systems

## CITY RANKINGS

We analyzed the 50 largest U.S. cities.

Using mapping technology and demographic data, we determined how well each city is meeting the need for parks.

See the full ranking analysis.

You can learn more with in-depth city profiles ... or compare multiple cities.

We scored cities in three categories. Learn more about the ParkScore methodology.



Minneapolis



New York



San Francisco



Sacramento



## CITY PROFILES

CHOOSE A CITY



Explore interactive map

**City Stats**  
 City area: 85,217 acres  
 Median park size: 2.05 acres  
 Park land as % of city area: 5.8 %  
 Spending per resident: \$96.22  
 Playgrounds per 10,000: 2.6  
 Population density: 4.8 per acre

**Park Facts**  
 Park acreage: 4,737 acres  
 People served per park acre: 56  
 Oldest park: Oakland Cemetery, est. 1880  
 Largest park: Chastain, 268 acres  
 Most-visited park: Piedmont Park

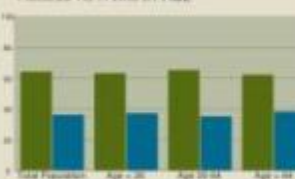
## ATLANTA, GA



COMPARE MAP & TABLES

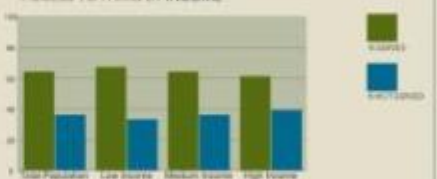
Rank	Population	Average	Services & Investment	Access	Park Score	ParkScore
31 out of 50	416,920	10 MAX: 40	20 MAX: 40	24 MAX: 40	54 MAX: 100	45.0 MAX: 100
		Median Park Size	Park Land as % of City Area	Spending per Resident	Playgrounds per 10,000 Residents	
		5 MAX: 30	5 MAX: 30	10 MAX: 30	10 MAX: 30	

## ACCESS TO PARKS BY AGE








Park access analyzed by age for Atlanta, GA  
 POPULATION within a ten-minute walk of a public park

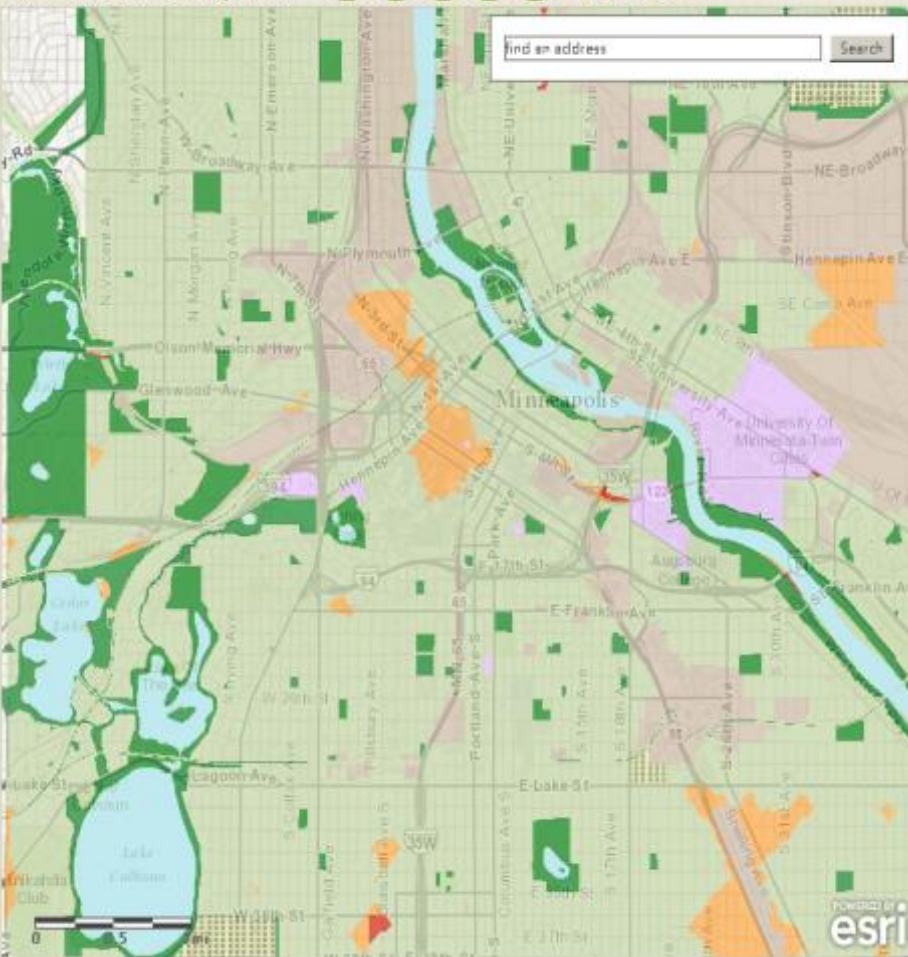
## ACCESS TO PARKS BY INCOME



Park access analyzed by the median income of Atlanta, GA  
 POPULATION within a ten-minute walk of a public park  
 LOW INCOME: Households earning less than 75% of the city median income  
 MEDIUM INCOME: Households earning between 75%-125% of the city median income  
 HIGH INCOME: Households earning more than 125% of the city median income

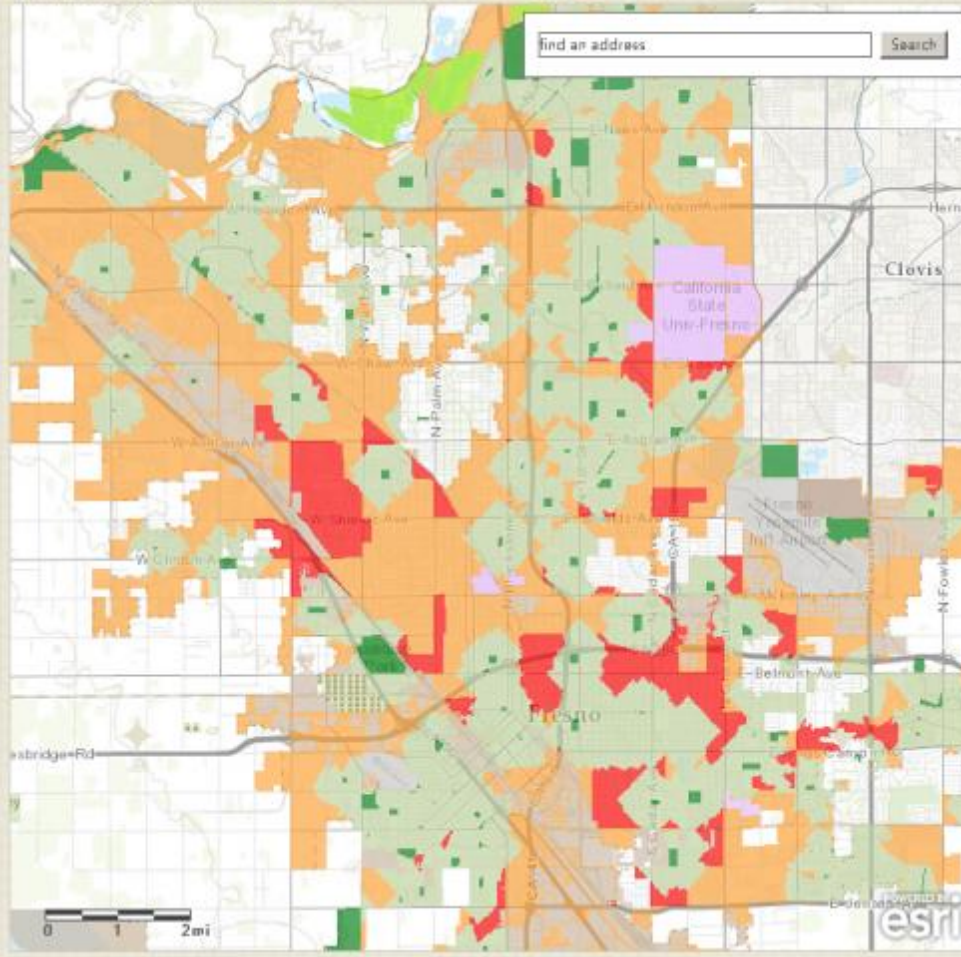
# MINNEAPOLIS, MN

     = **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			

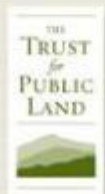
## FRESNO, CA



[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			





ParkScore™

- > GO TO TPL.ORG
- > FAQ
- > LOG OUT

[DONATE](#)[RANKINGS](#)[CITY PROFILES](#)[EXPLORE](#)[COMPARE](#)[METHODOLOGY](#)[ABOUT](#)

## PARK EVALUATOR

[Help](#)

1

Zoom to an area of high park need

2

Add proposed park boundary and access points

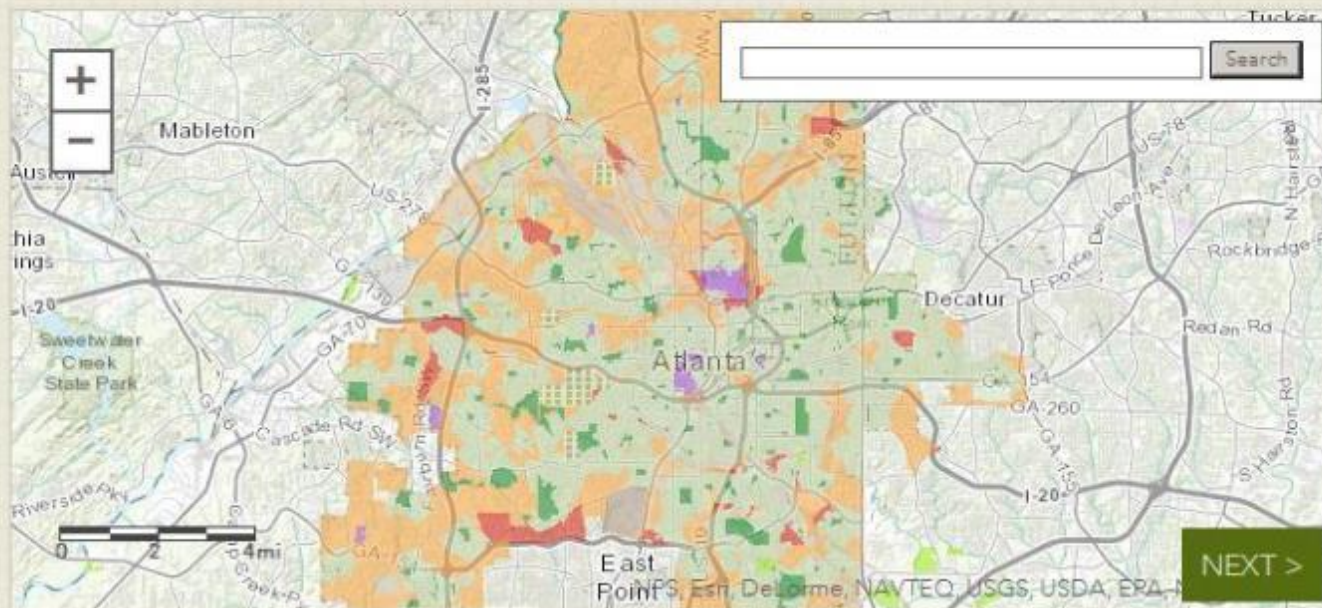
3

Enter information about playgrounds and spending

4

View results and create a report

Explore the map to find areas of high park need. Orange indicates a high need for parks, and red indicates a very high need.



## CHOOSE MAP FEATURES

See where parks are needed most.

OVERLAY OPACITY

DARK



LIGHT

BASE MAP TYPE

☒ TOPOGRAPHIC☐ SATELLITE IMAGERY

PARK ACCESS

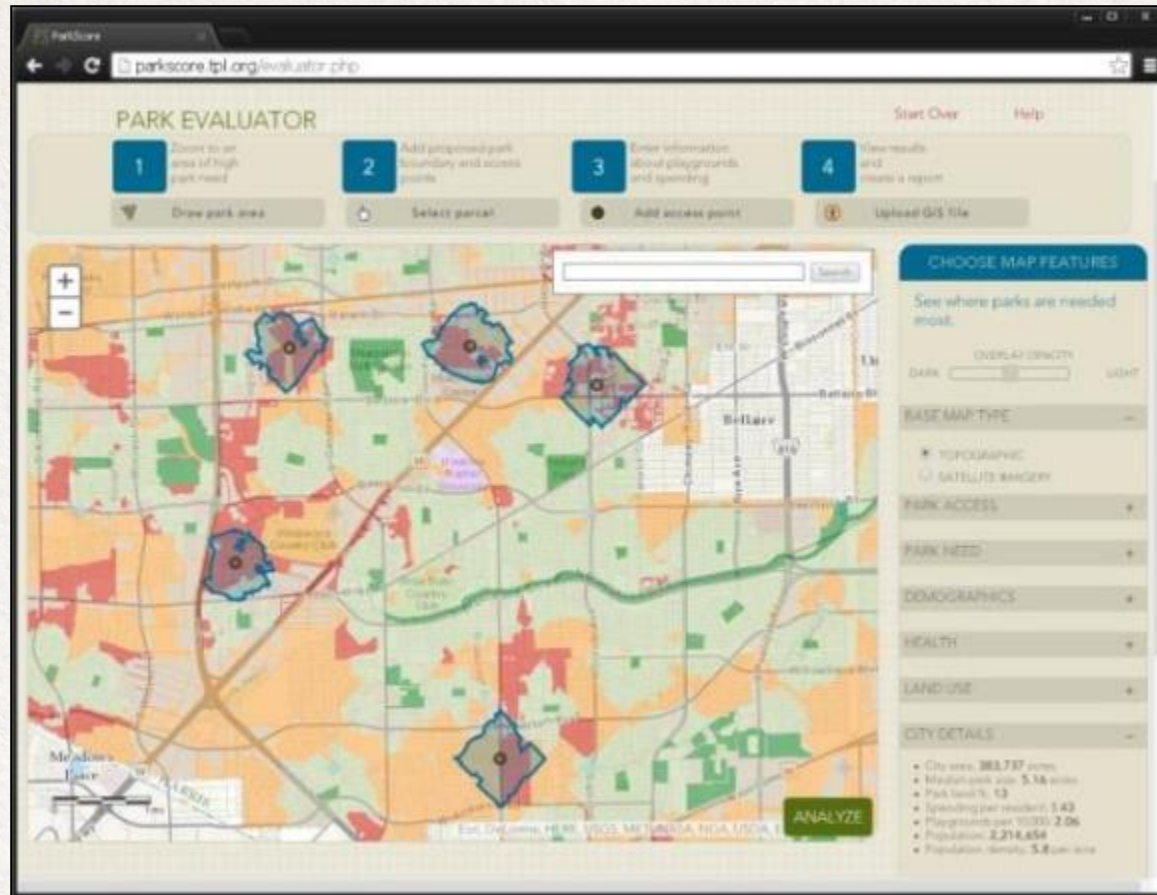
+

PARK NEED

+

# Potential “Optimized” New Parks – Points created using TPL’s “Park Optimizer™” model

5 New Parks in these locations would serve approximately 33,988 new residents



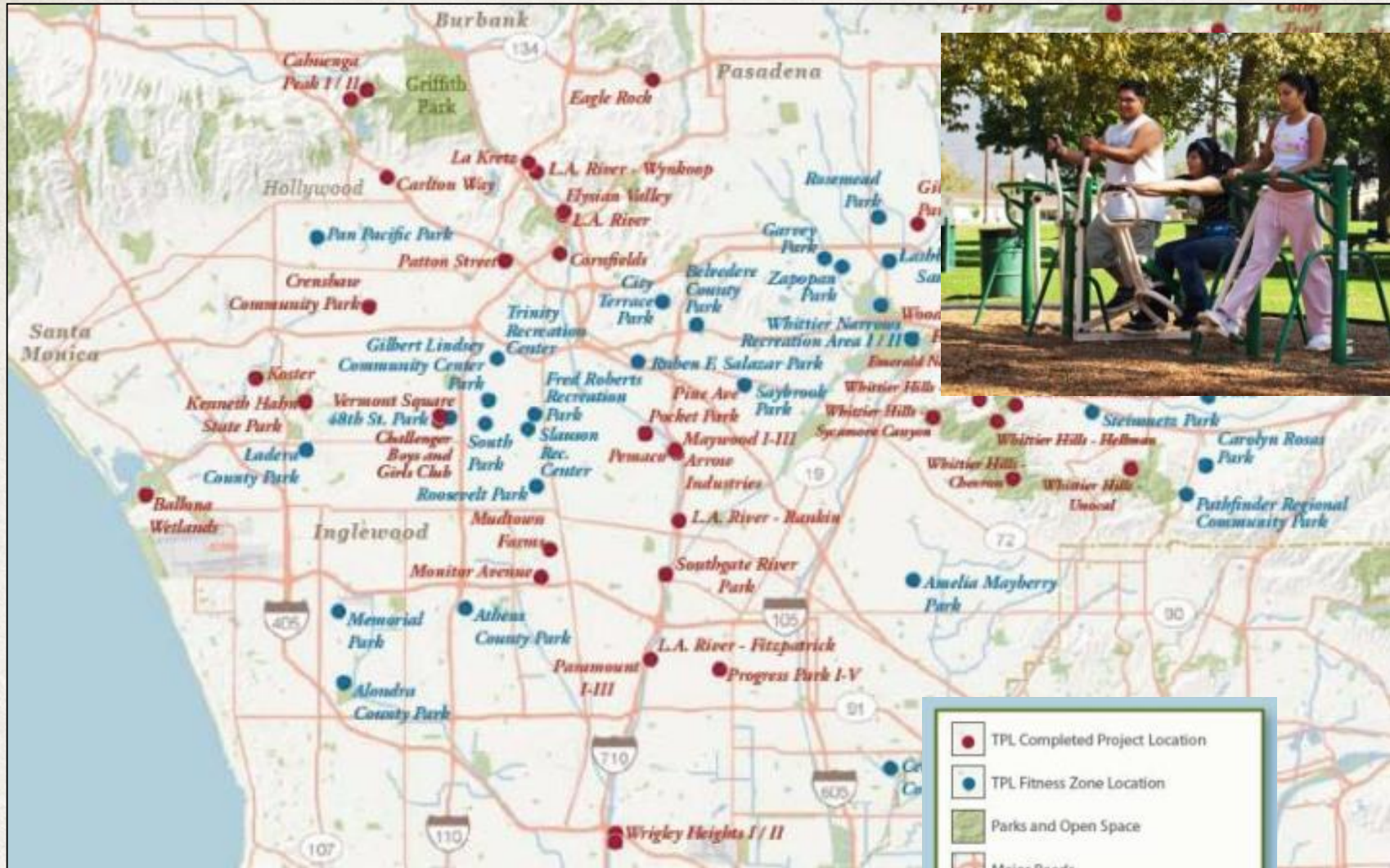


# Parks and Health: Evaluation





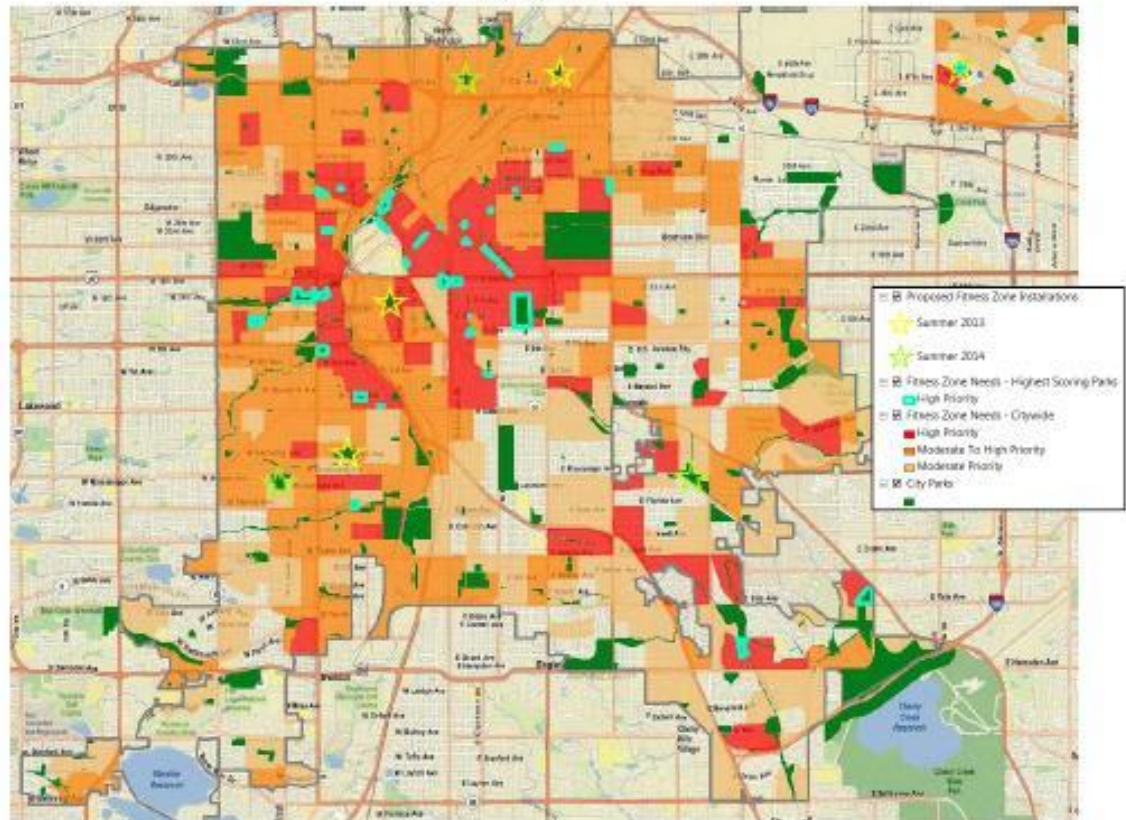
# Fitness Zone Mapping





3/18/2013

# Fitness Zone Siting Analysis



\* Highest Scoring Parks based on analysis within 1/2 mile walkable service area of each park.

## Analysis Components for Map Above

### Demographic Profiling

Population Density

% Kids 19 and under

### Economic Profiling

% Low Income Households

### Health Indicators

% Obese Children ages 10-17

Heart Disease Mortality Rates

Respiratory Disease Mortality Rates

Diabetes Mortality Rates

Suicide Mortality Rates

## Other Variables For Consideration

### Demographic Profiling

% Seniors 65 and older

### Walkable Jobs and Amenities

Neighborhood WalkScore®

### Access to Fitness Facilities

Proximity to Recreation Centers

Existing or Planned Fitness Zone

### Local Momentum

Agency Support

Potential Partnerships

Community Interest

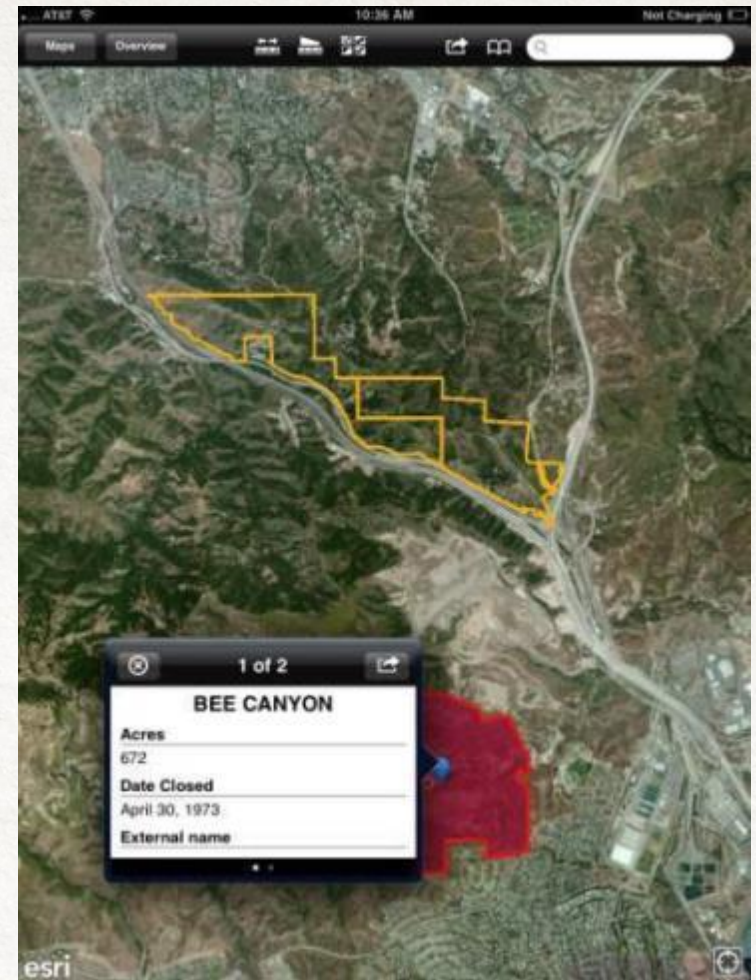
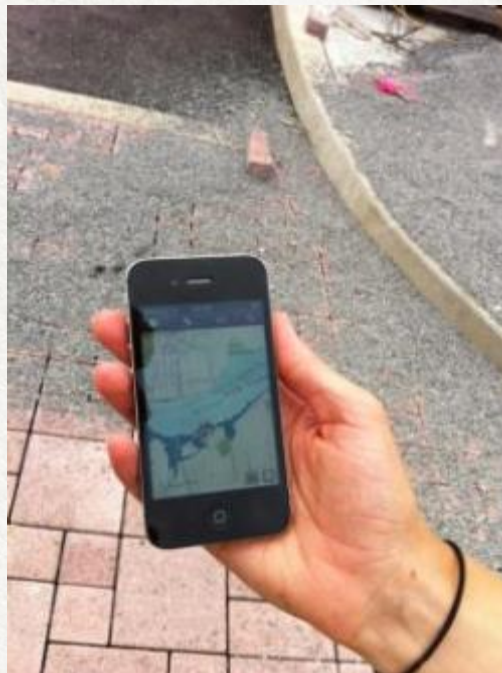
Funding Opportunities



# Mobile Applications Take GIS to the Field: Project Manager Use Case

Becky Nielsen – California

*"I can not tell you how important and critical this tool is to my work!!!!  
Incredible. Printed maps are nice, but my toolbox dramatically changed with this mobile technology."*







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





THANK YOU.

