

***Proximity of Parks and Schools
Is Associated with
Physical Activity in
Adolescent Girls***

**An Ancillary Study to
The Trial of Activity in Adolescent Girls
(TAAG)**



RAND

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Office of Minority Health

Background and Methods

- **TAAG is a school-based, national randomized controlled intervention trial whose goal is to increase PA among adolescent girls.**
- **6th grade girls recruited from 36 schools in 6 cities across the US. (n= 1,603)**
- **Wore accelerometers for 1 week.**
- **Geocoded their address and studied their neighborhoods and the relationship of neighborhood features to PA, as measured by the accelerometer.**

Methods

To understand how different neighborhoods might be associated with PA, we analyzed the data hierarchically with girl as the center of her own neighborhood.

1) Sites

2) Schools

% free lunch (by school)

3) Girls

Controlled for:

Neighborhood SES,

Neighborhood % African American

Neighborhood % Hispanic

Girl's race/ethnicity

Neighborhood Size

We looked at neighborhoods using:

Census block group

Census tract

Traffic analysis zone (TAZ)

$\frac{1}{4}$ mile circular radius (girl's home as centroid)

$\frac{1}{2}$ mile

1 mile;

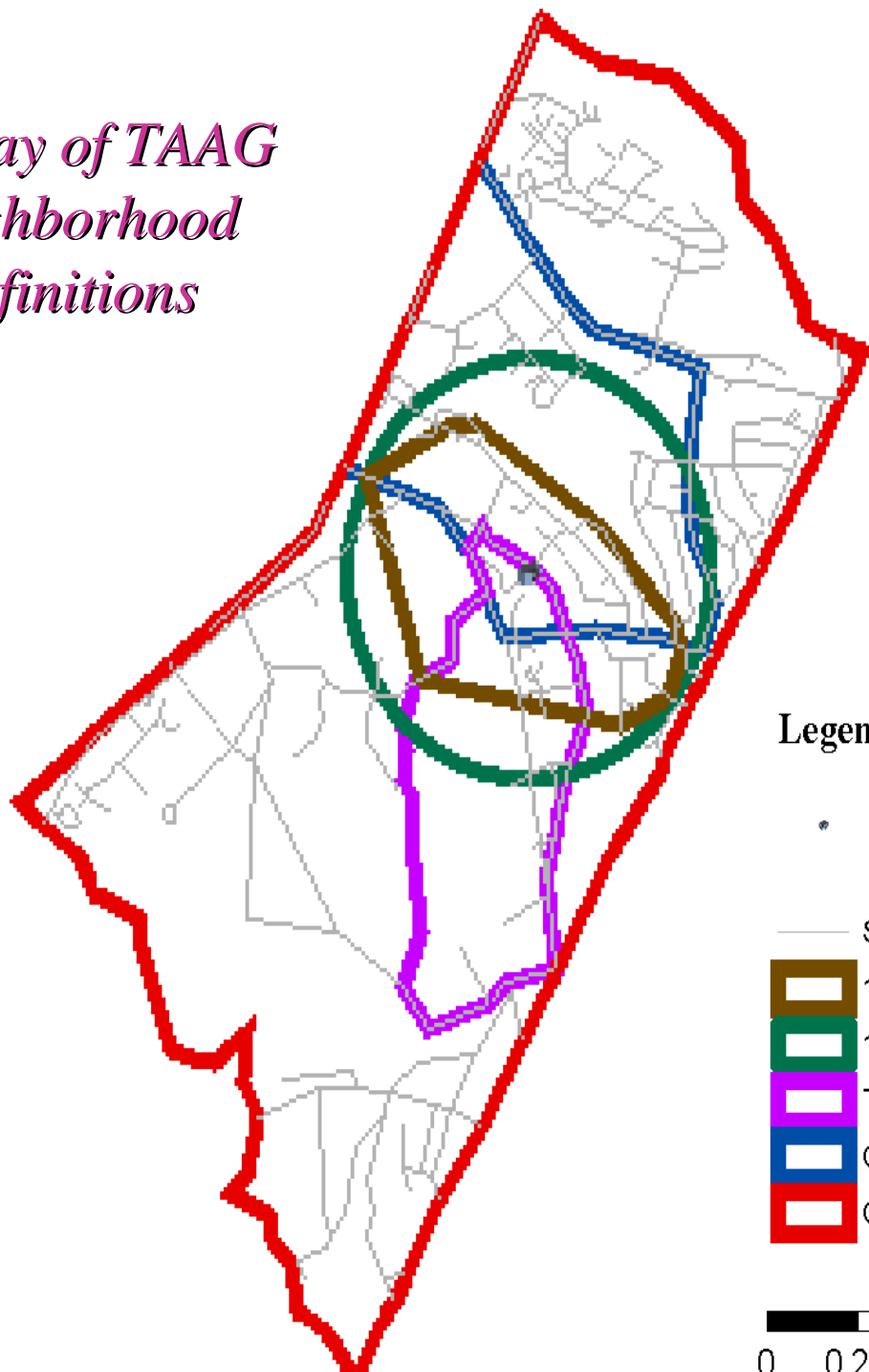
$\frac{1}{4}$ mile along street network

$\frac{1}{2}$ mile

1 mile

Results are based upon $\frac{1}{2}$ mile circular radius

Overlay of TAAG Neighborhood Definitions



Legend

* Residence Location

— Streets

1/2 Mile Network Neighborhood

1/2 Mile Circular Neighborhood

TAZ Neighborhood

Census Blockgroup Neighborhood

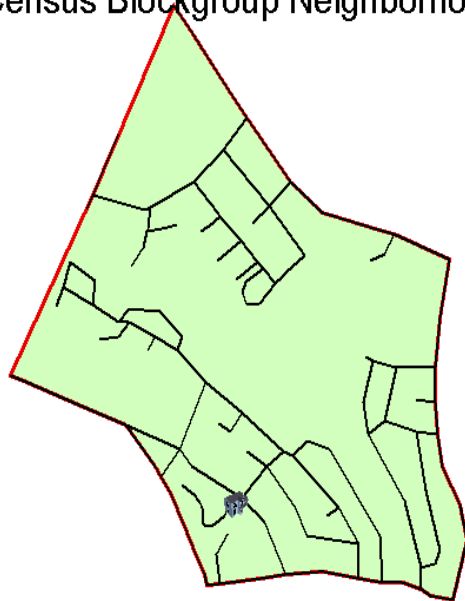
Census Tract Neighborhood

0 0.25 0.5 0.75 1 Miles

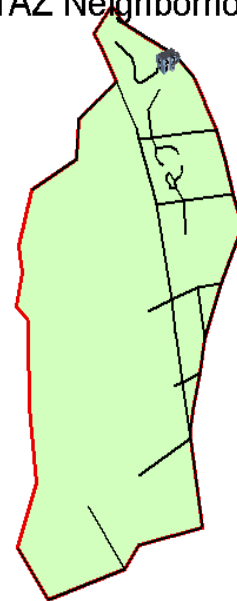
Census Tract Neighborhood



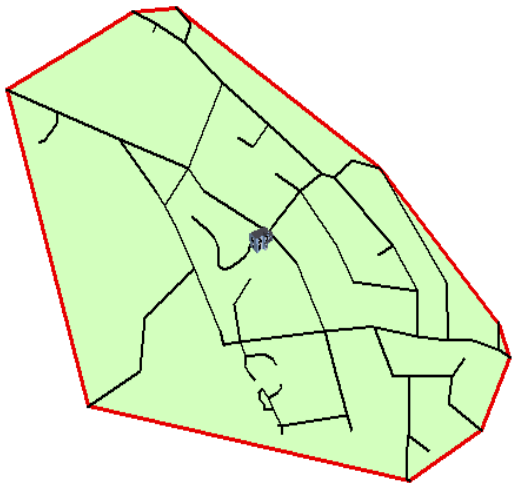
Census Blockgroup Neighborhood



TAZ Neighborhood



Street Network 1/2 -Mile Neighborhood



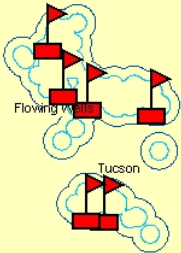
Circular 1/2-mile Neighborhood



Legend

- Residence Location
- Streets
- Neighborhood Area

Tucson, AZ

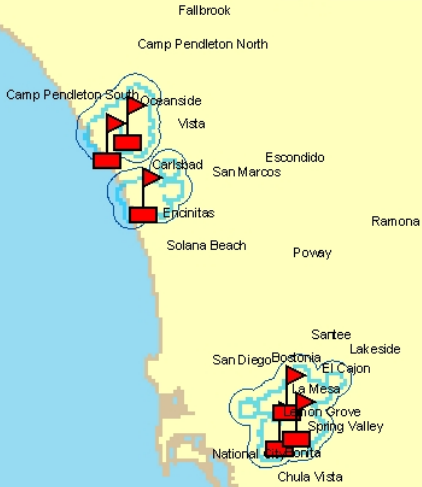


Flowing Wells

Tucson

Green Valley

San Diego, CA



Fallbrook

Camp Pendleton North

Camp Pendleton South

Vista

Carlsbad

San Marcos

Escondido

Eucalyptus

Ramona

Solana Beach

Poway

Santee

San Diego

Boonville

Lakeside

Yucca Valley

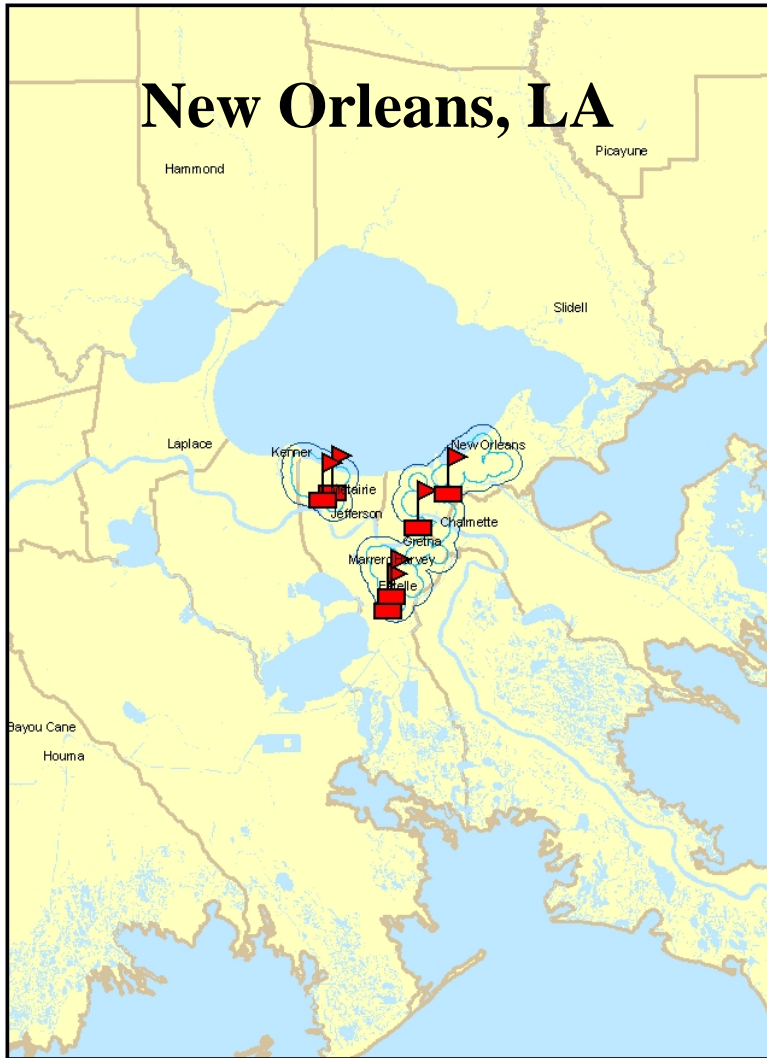
Imperial Valley

Spring Valley

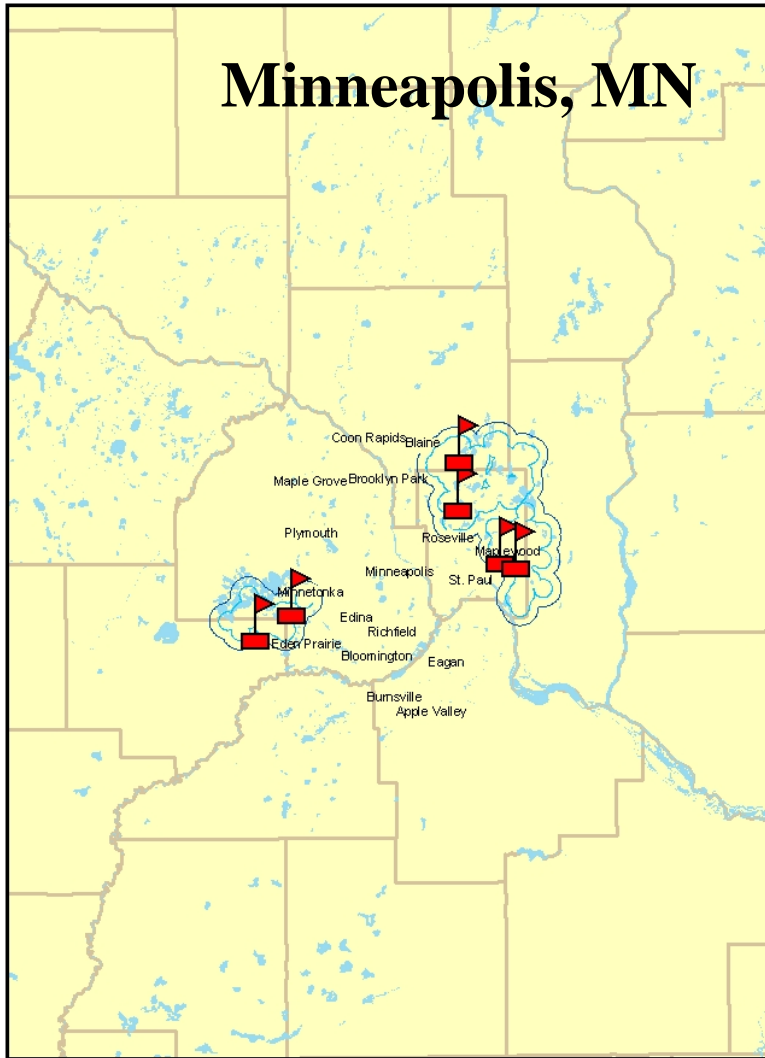
National City

San Marcos

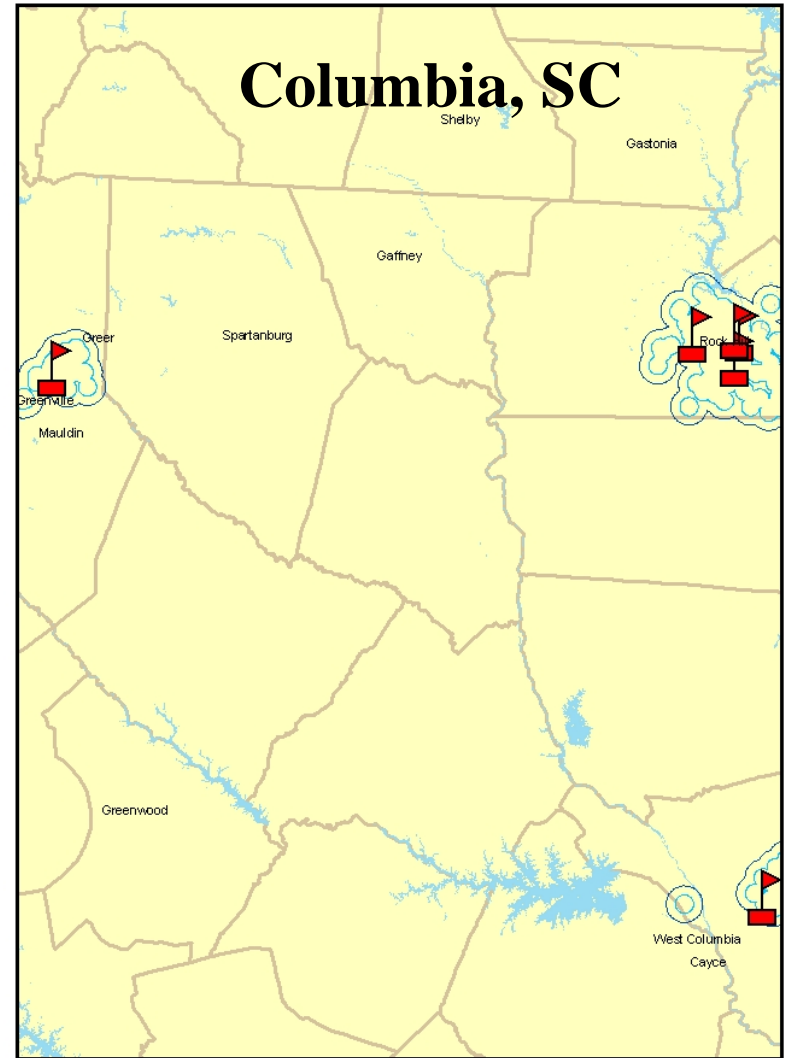
Chula Vista



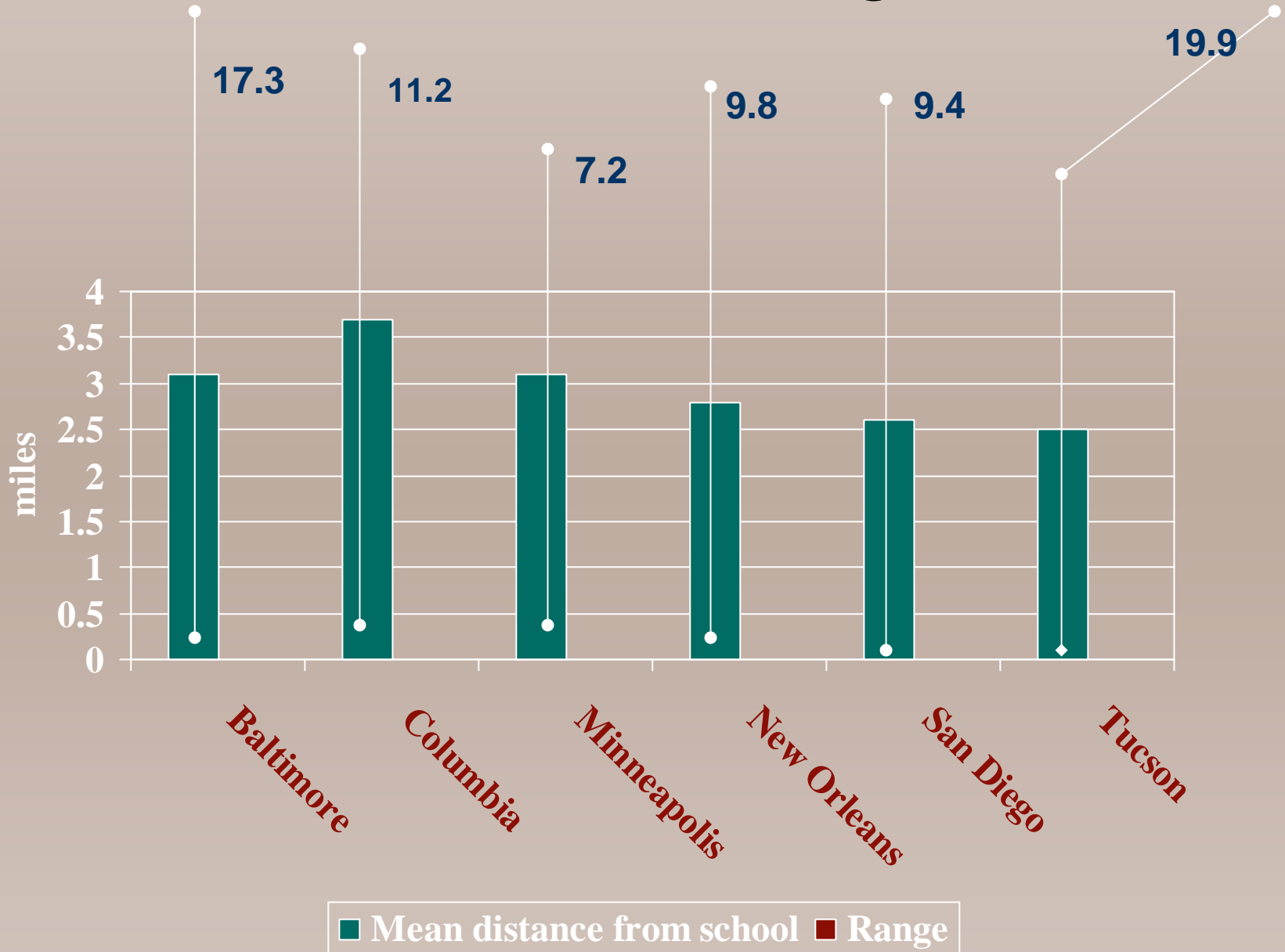
Minneapolis, MN



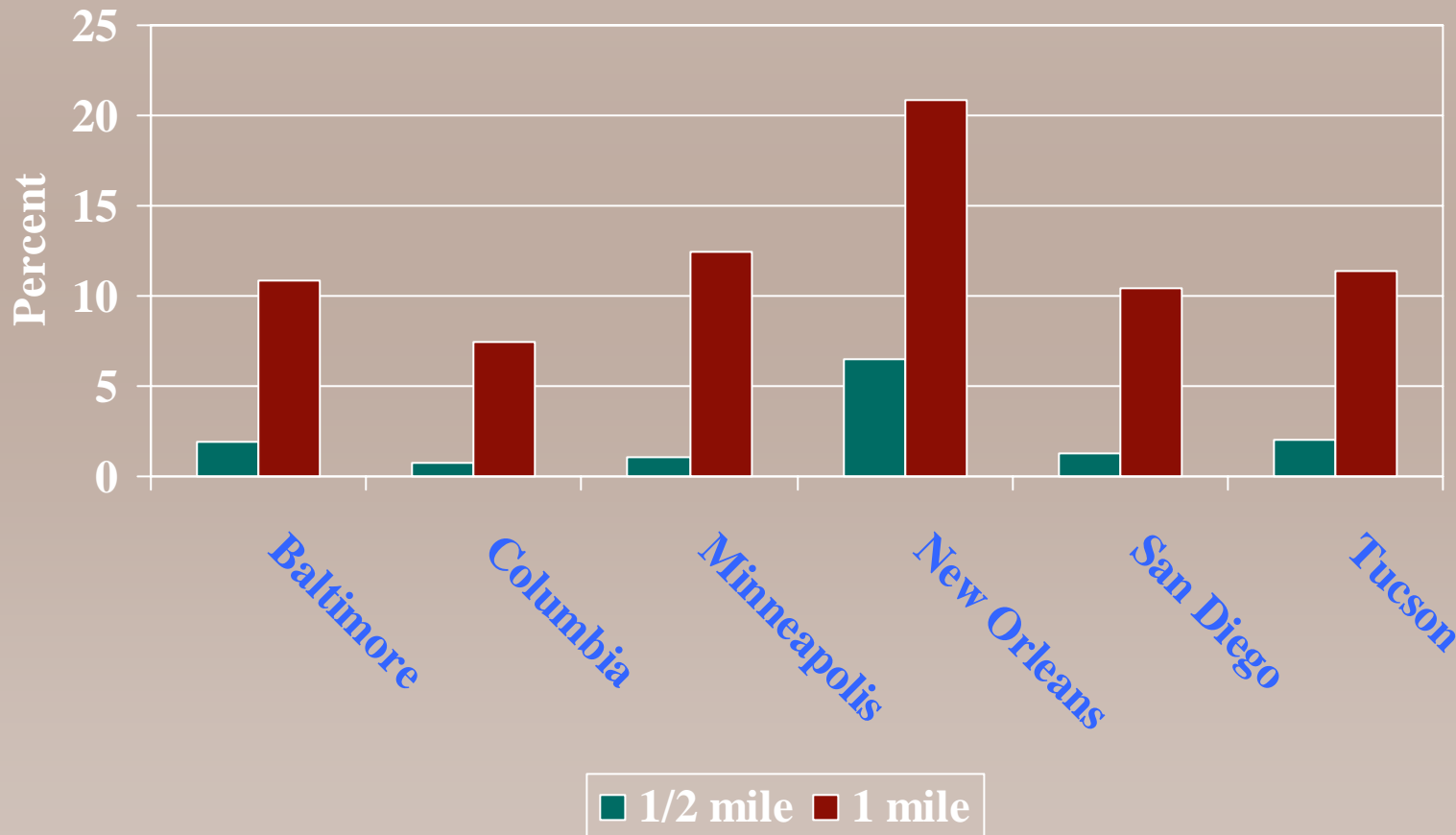
Columbia, SC



Mean Miles From School Along Street Network



% Girls living within 0.5 and 1 mile of school



Outcome: MET-Weighted MVPA

(moderate to vigorous physical activity)

- Differentiates slow from brisk walking (1500 cut point)
- Weights the intensity of exercise

(2+ .0017*accelerometer counts/30 seconds)

- Counted blocks of time after 3 pm Monday-Friday and all day Saturday and Sunday (Non school hours)
- Use minutes of MET-weighted MVPA per week.

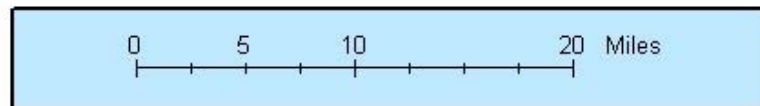
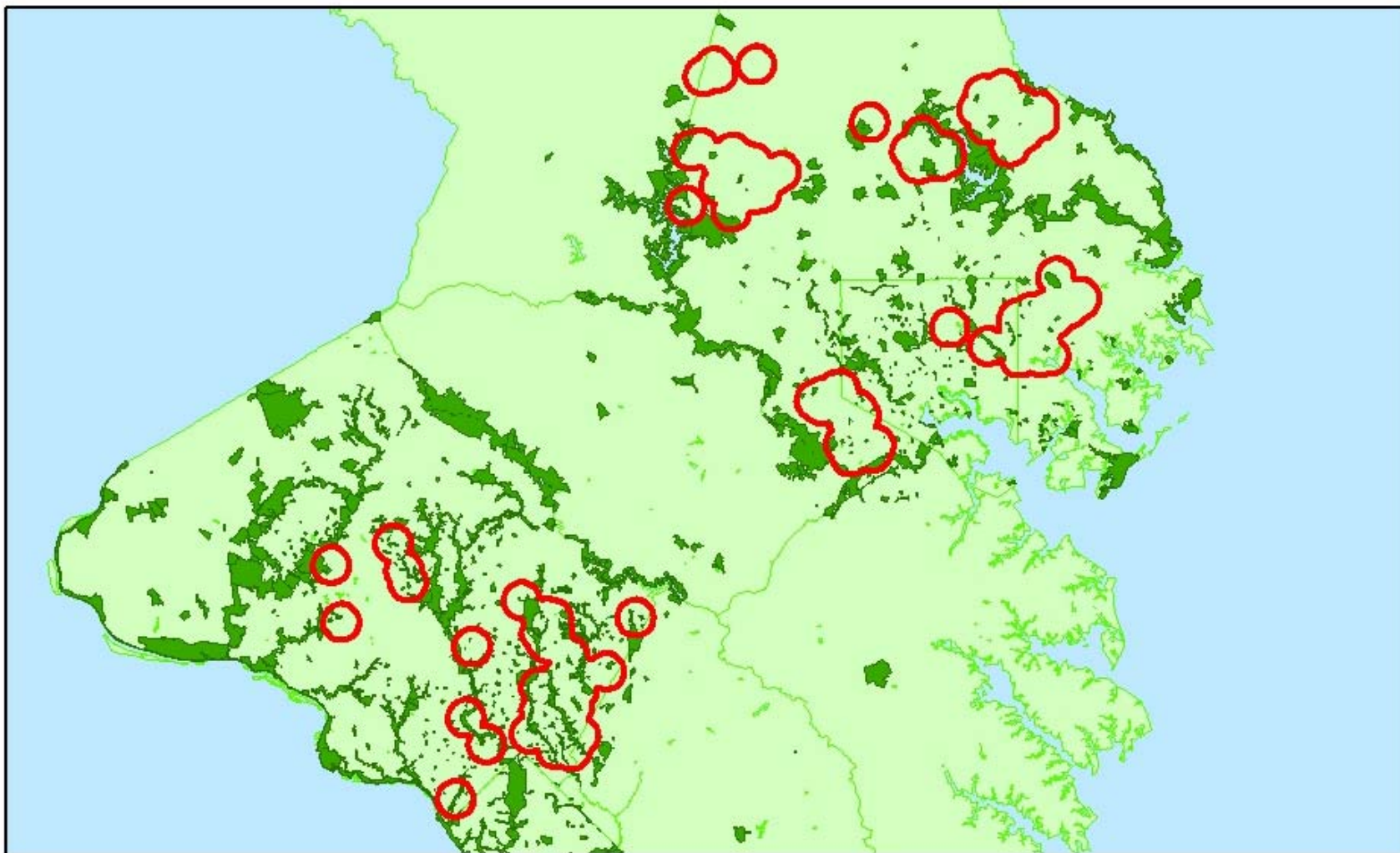
Greater Distance from School Related to Lower Physical Activity

Distance To School	Difference in MET-Weighted MVPA	95% C.I. (1/2 mi.radius)
0-1/2 mile	reference	
1/2-5 miles	-45 minutes/week	(-117, 38)
> 5 miles	-96 minutes/wk	(-170, -6)**

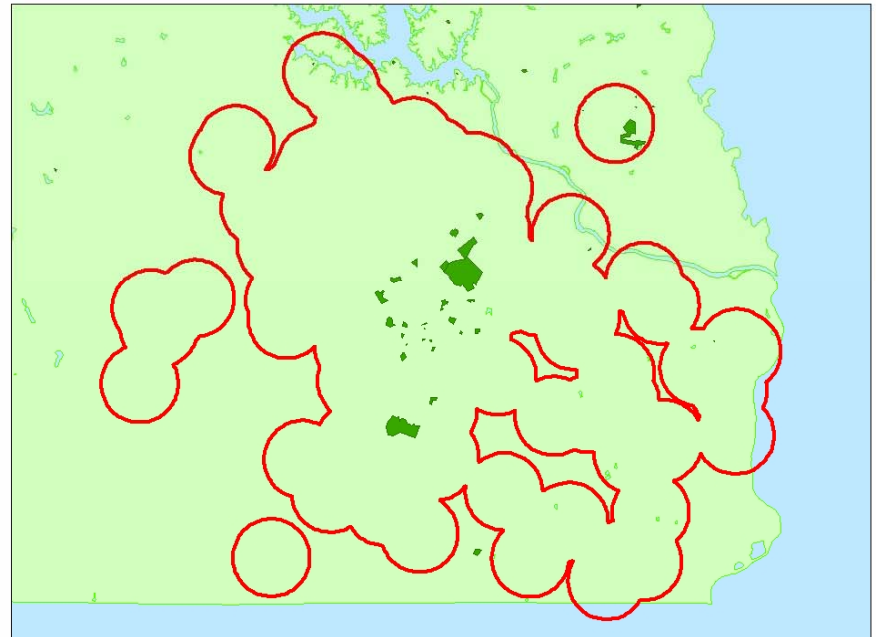
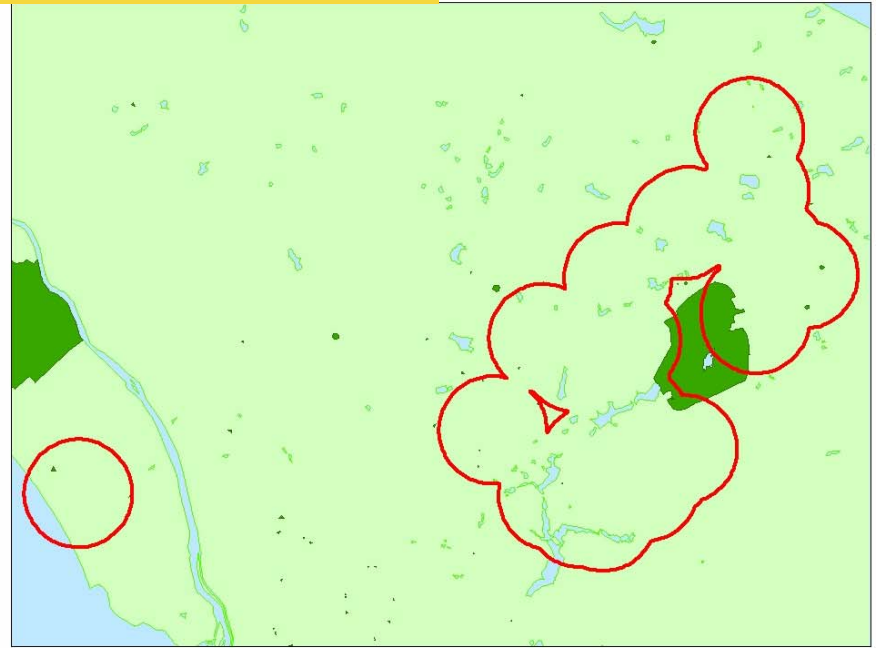
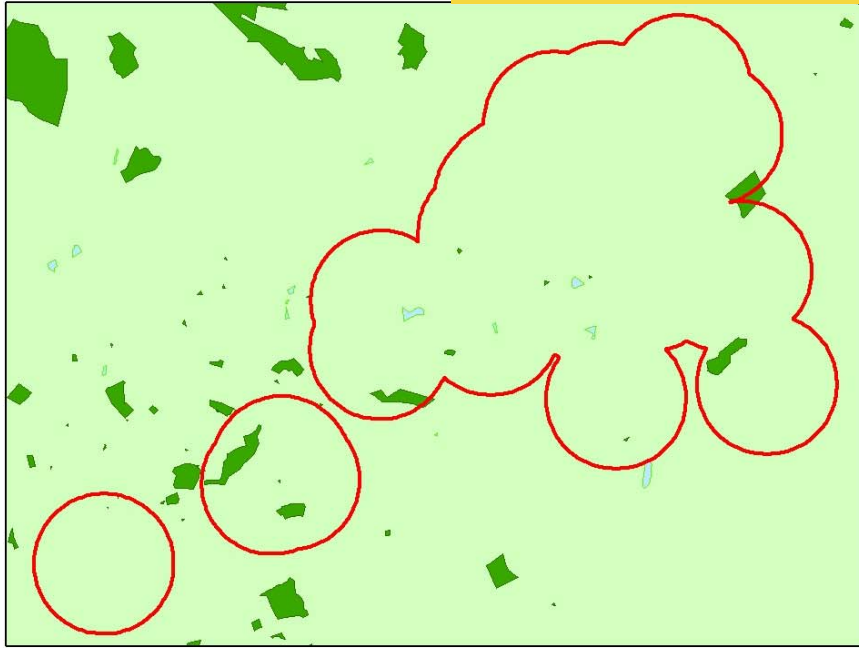
Potential Mechanism

- More time commuting, less free time.
- The few students who live close probably do walk to school

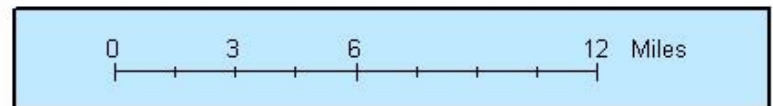
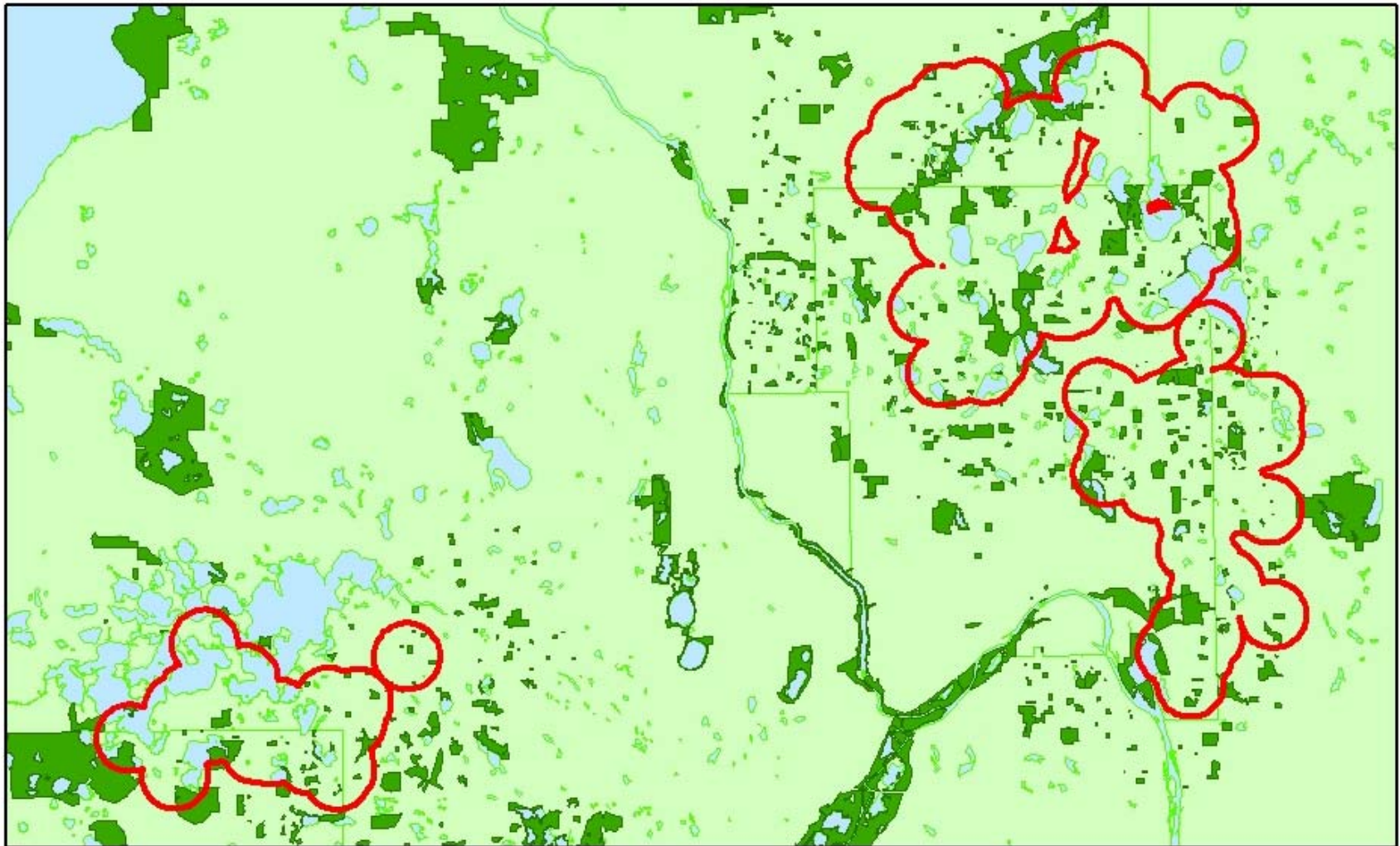
Baltimore/Wash. DC



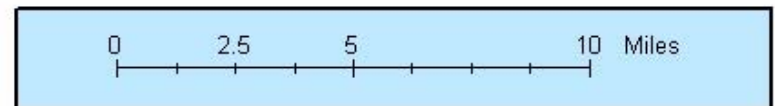
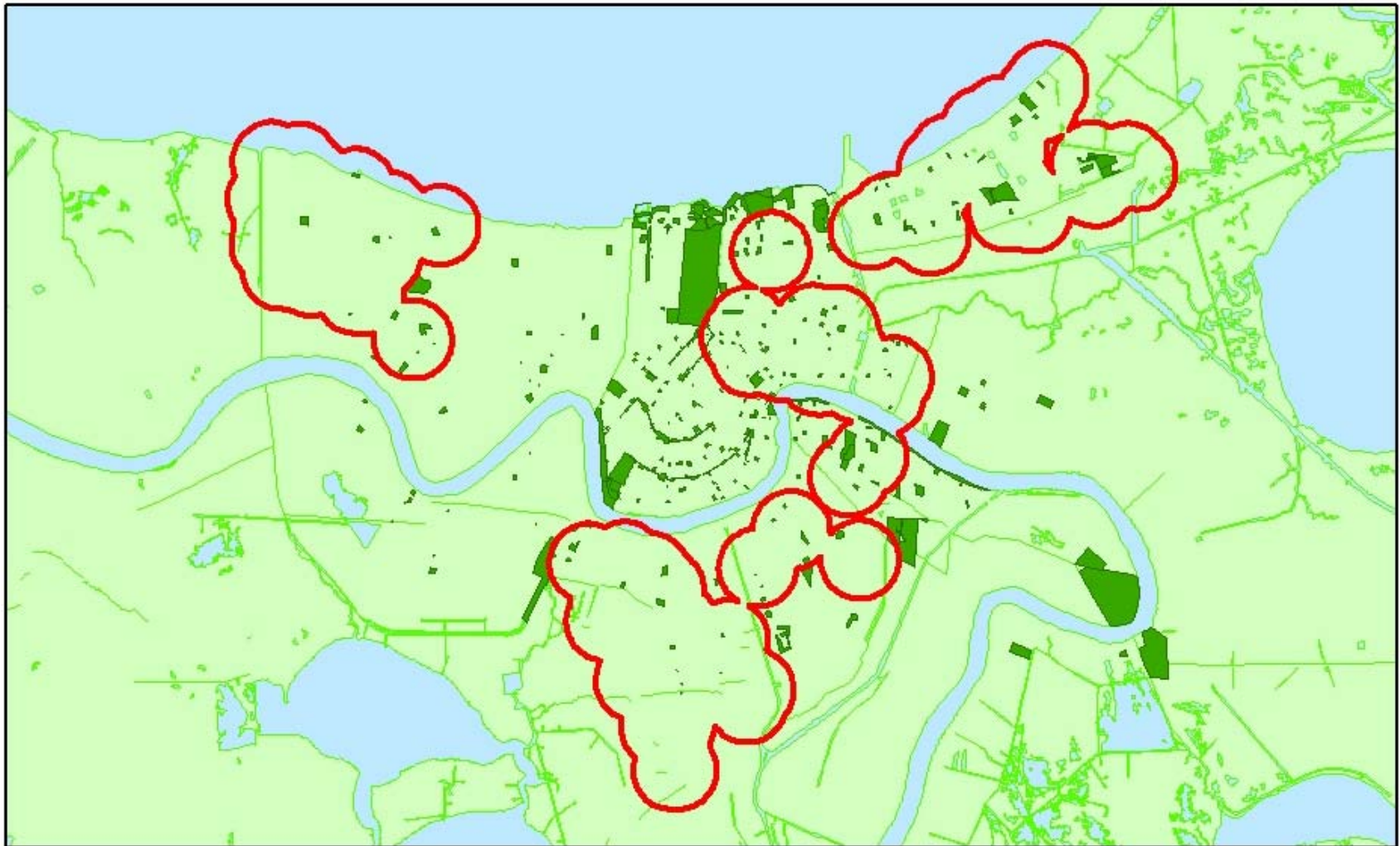
Columbia, S.C



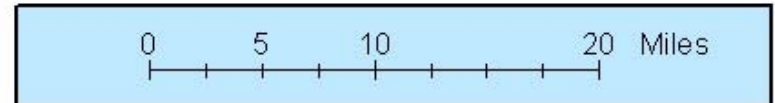
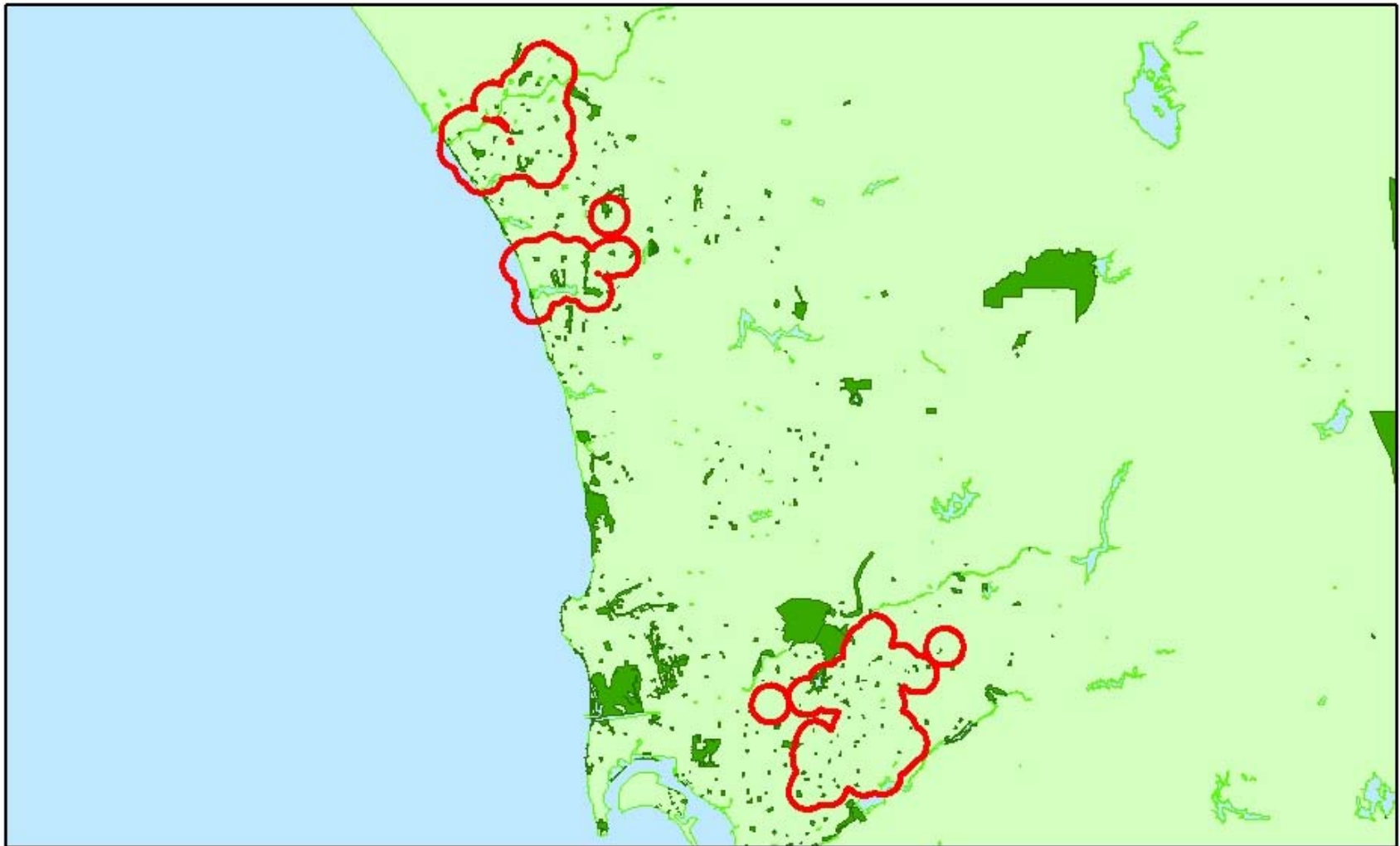
Minneapolis



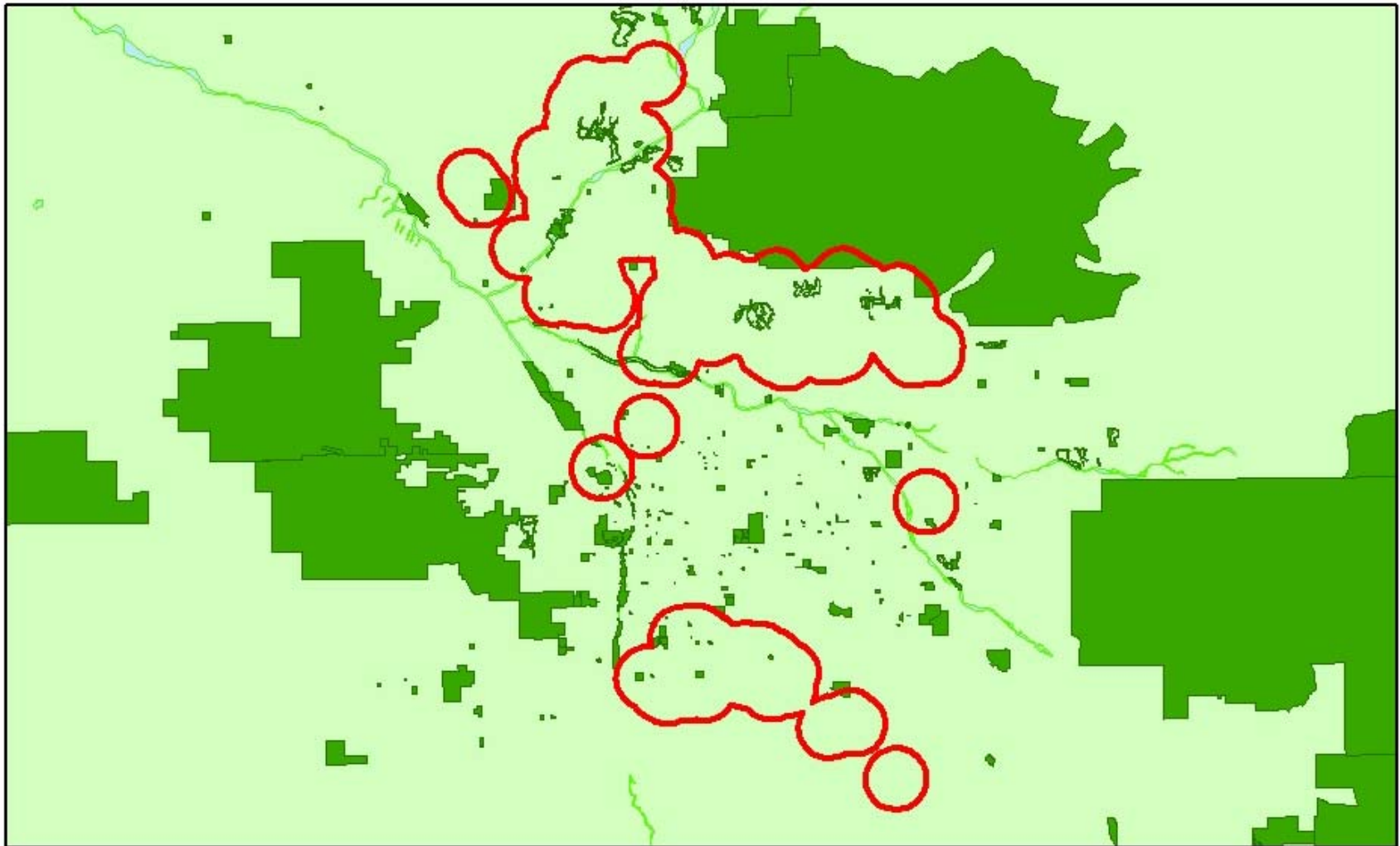
New Orleans



San Diego



Tucson, AZ



1-Mile Buffers



Parks



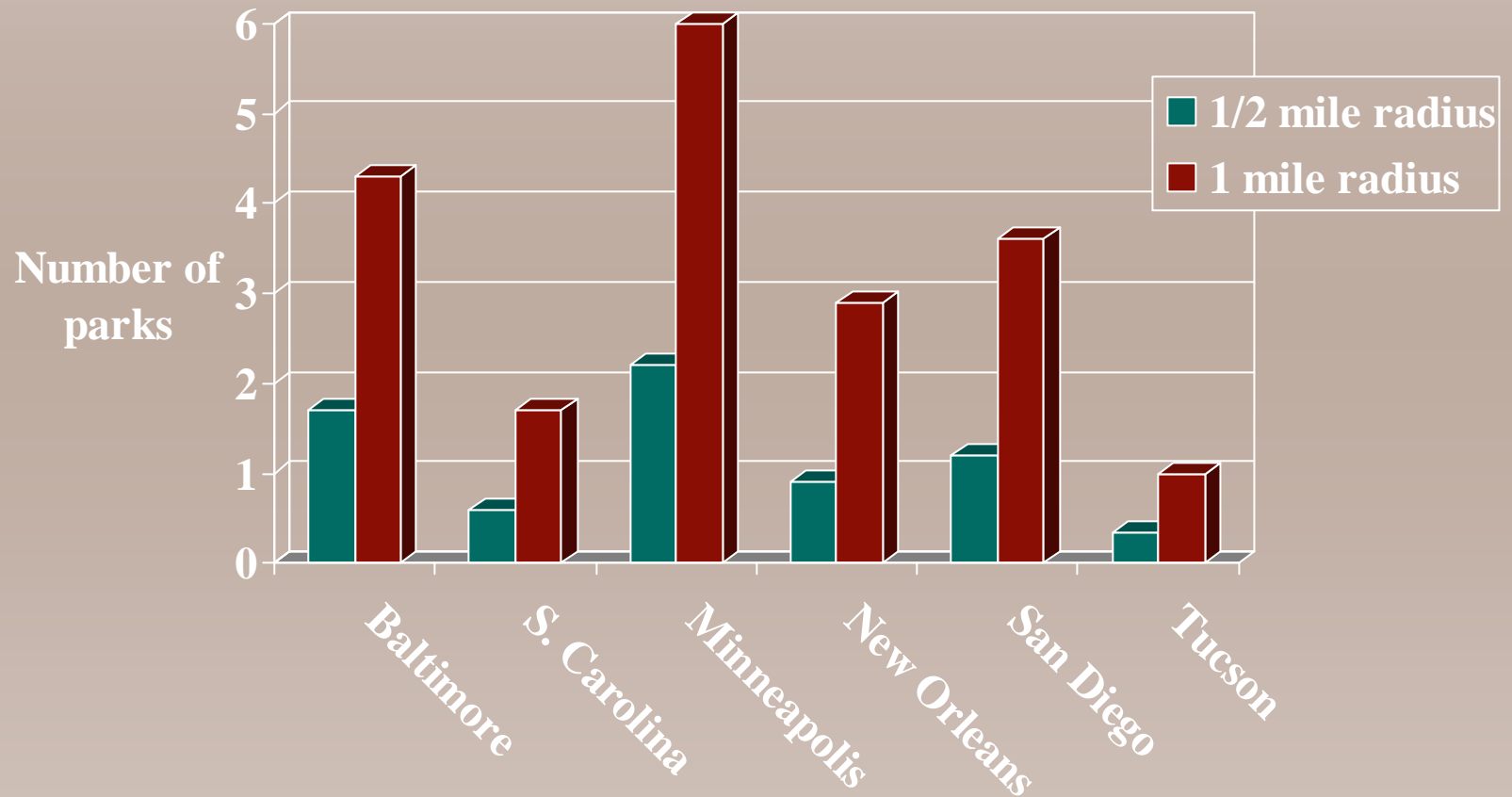
0 4 8 16 Miles

Types of Parks Visited

(definition from Mertes & Hall, 1996, NRPA)

97	Mini parks
234	Neighborhood parks
139	Community parks
24	Large urban parks
25	Sports complexes
136	Natural resource areas
<u>52</u>	<u>Special use facilities</u>
707	Total
+710	Schools/schoolyards

Average number of parks near girls' homes

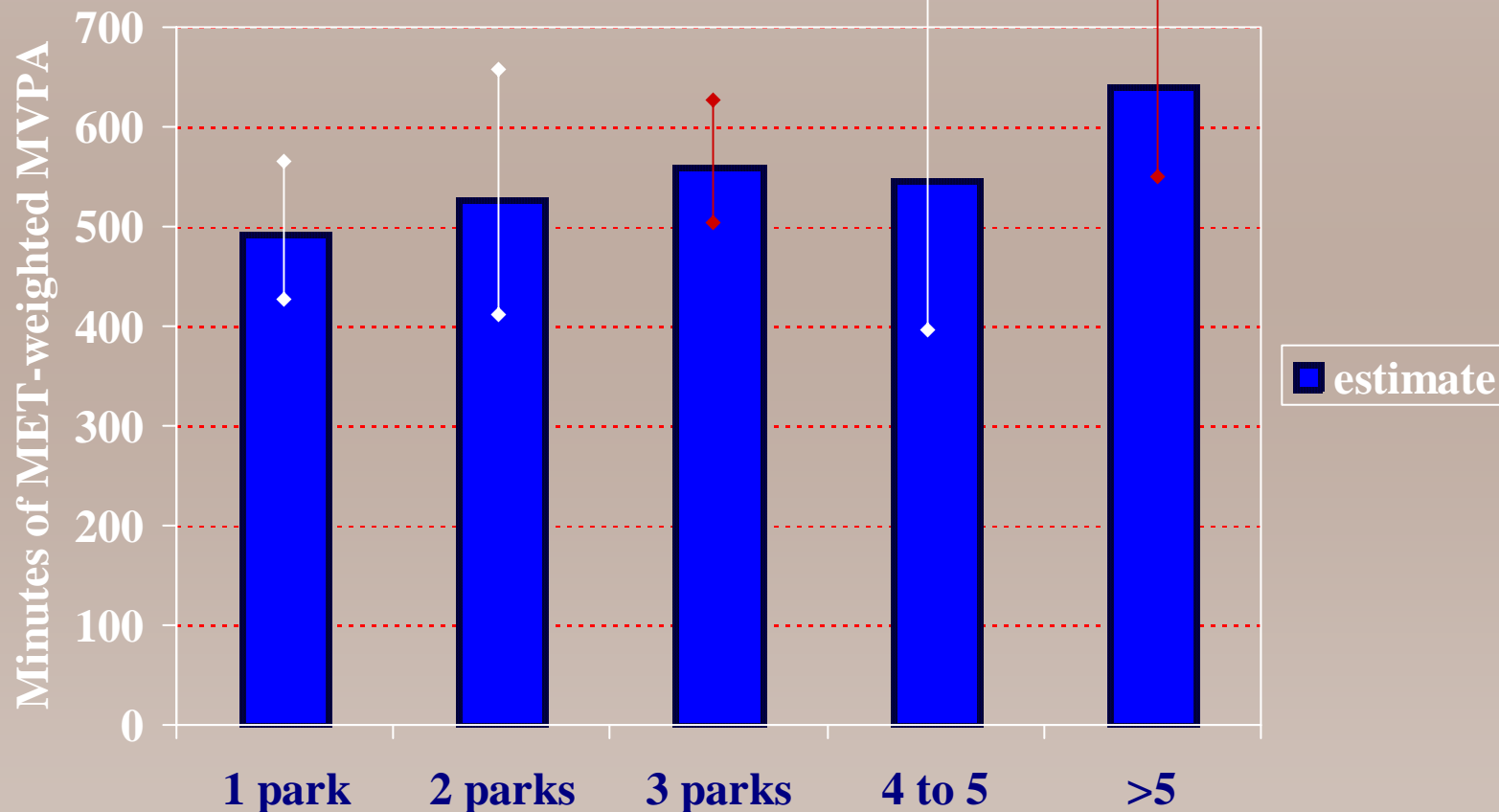


Total Parks Associated with MET-Weighted MVPA

	Coefficient	Effect Size
1 mile radius	1.68**	10.2 min
0.5 mile radius	3.13**	18.8 min
0.25 mile radius	3.24**	19.5 min

Proximity to More Parks

Associated with MET-weighted MVPA

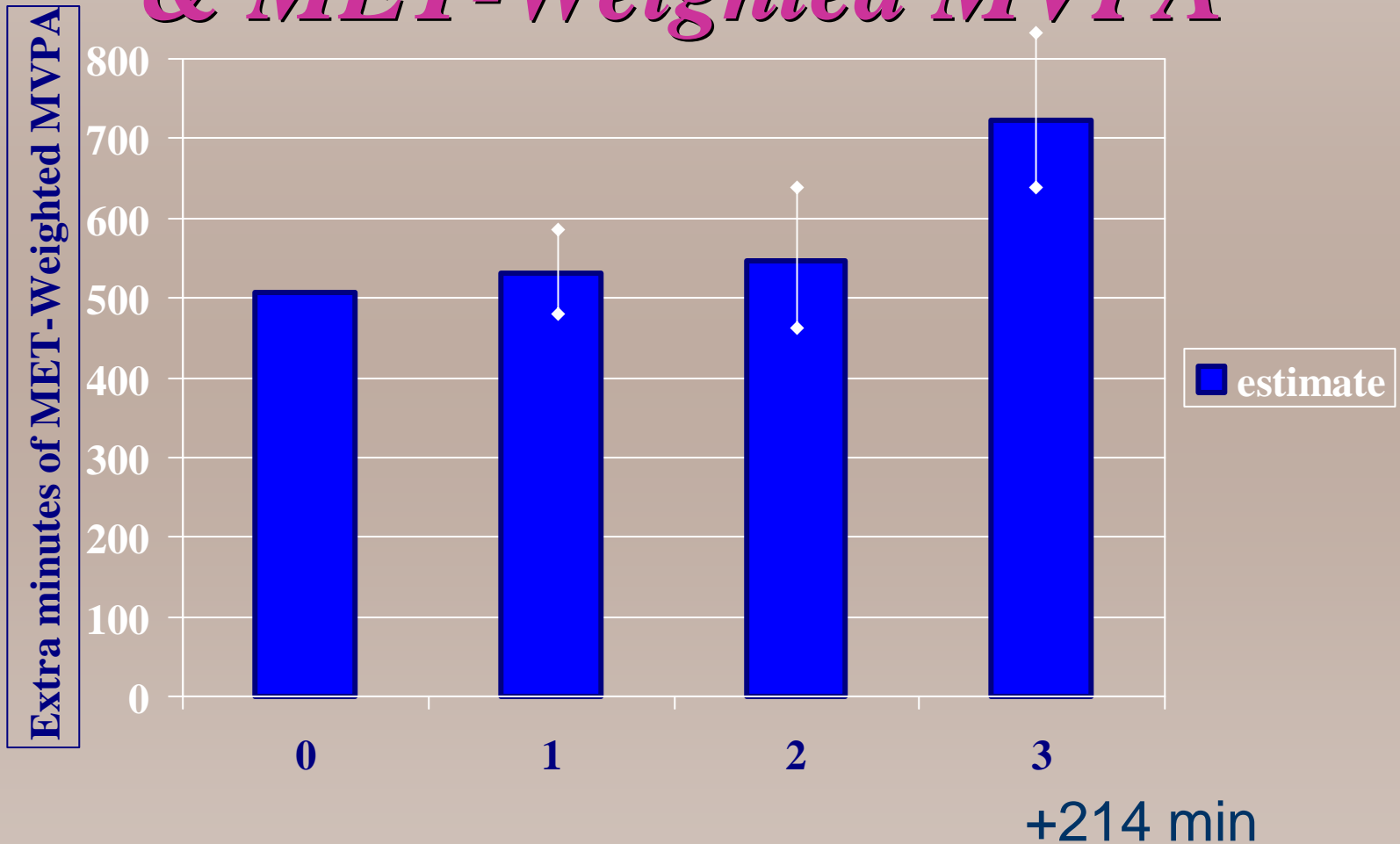


Neighborhood Parks Contribute More to PA

Compared to other parks:

	Coefficient	Effect Size
Community Parks	3.46	20.8 minutes
Neighborhood Park	6.38**	37.8 minutes

Neighborhood Parks (5-10 acres) & MET-Weighted MVPA

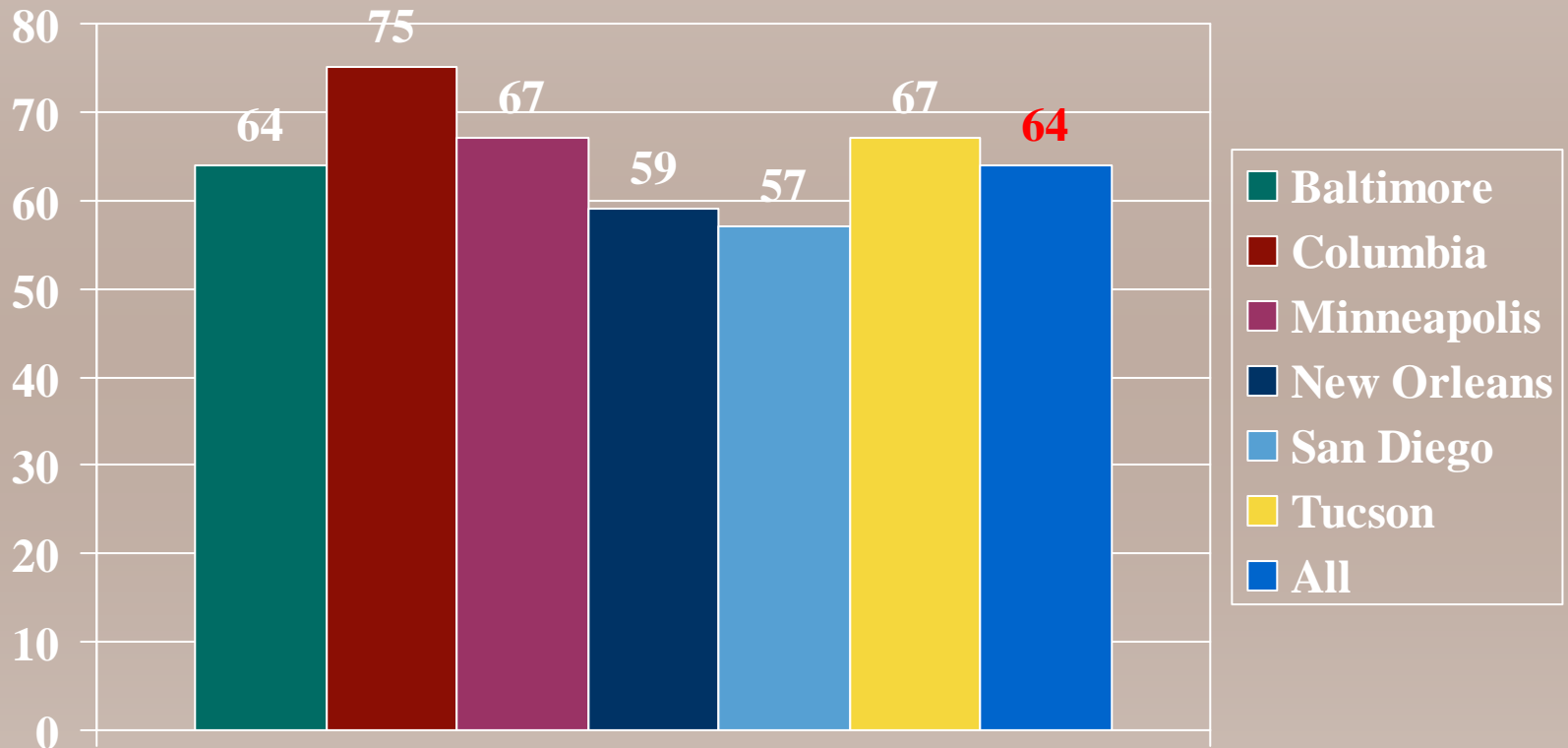


Park Facilities

We visited all parks (n=707) within a 1 mile radius of girls homes and documented the existence of a variety of facilities, including

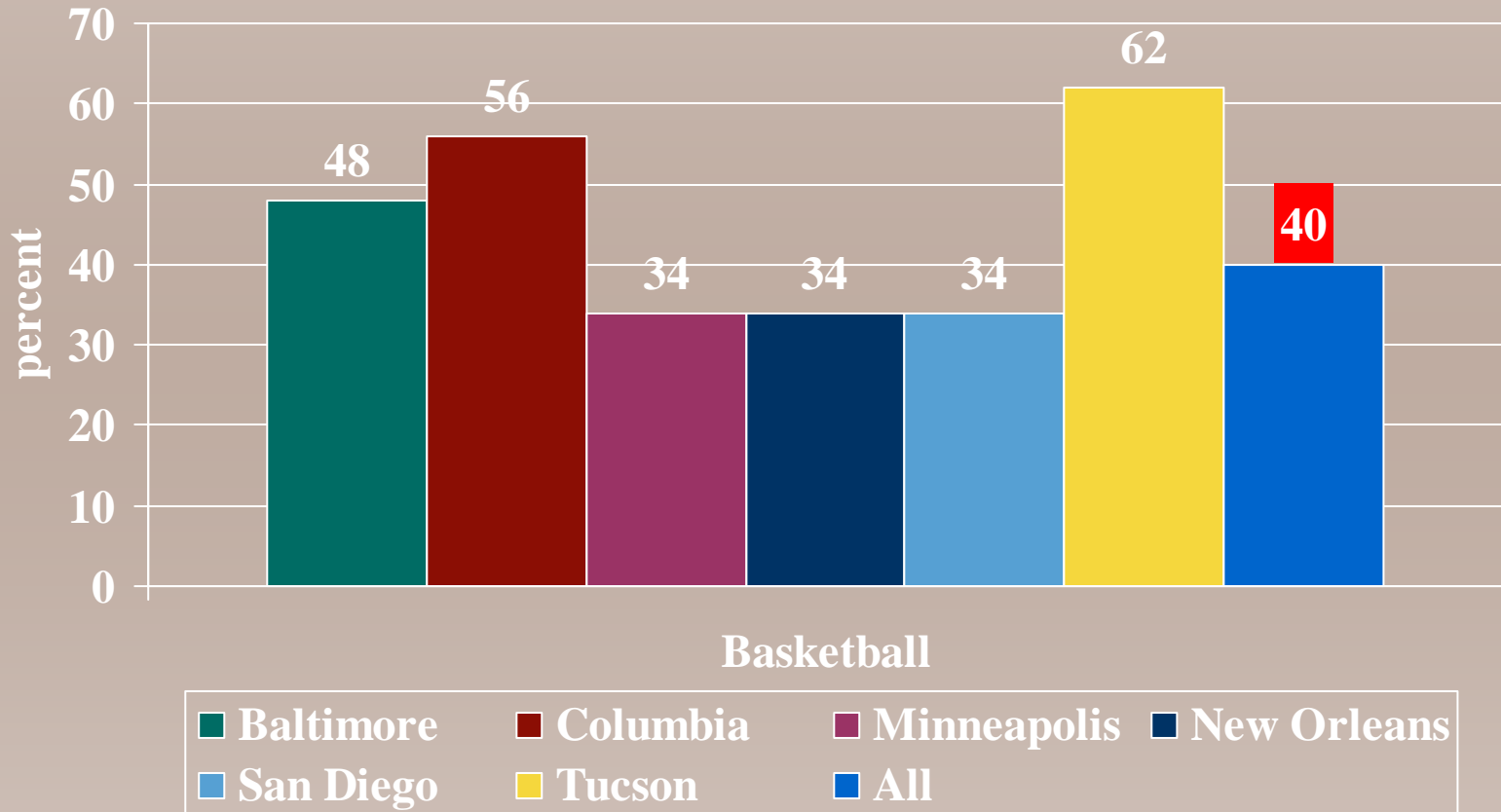
- playgrounds, (play equipment for Children < 10 yrs)
- basketball courts,
- tracks,
- fields,
- and other features.

Playgrounds



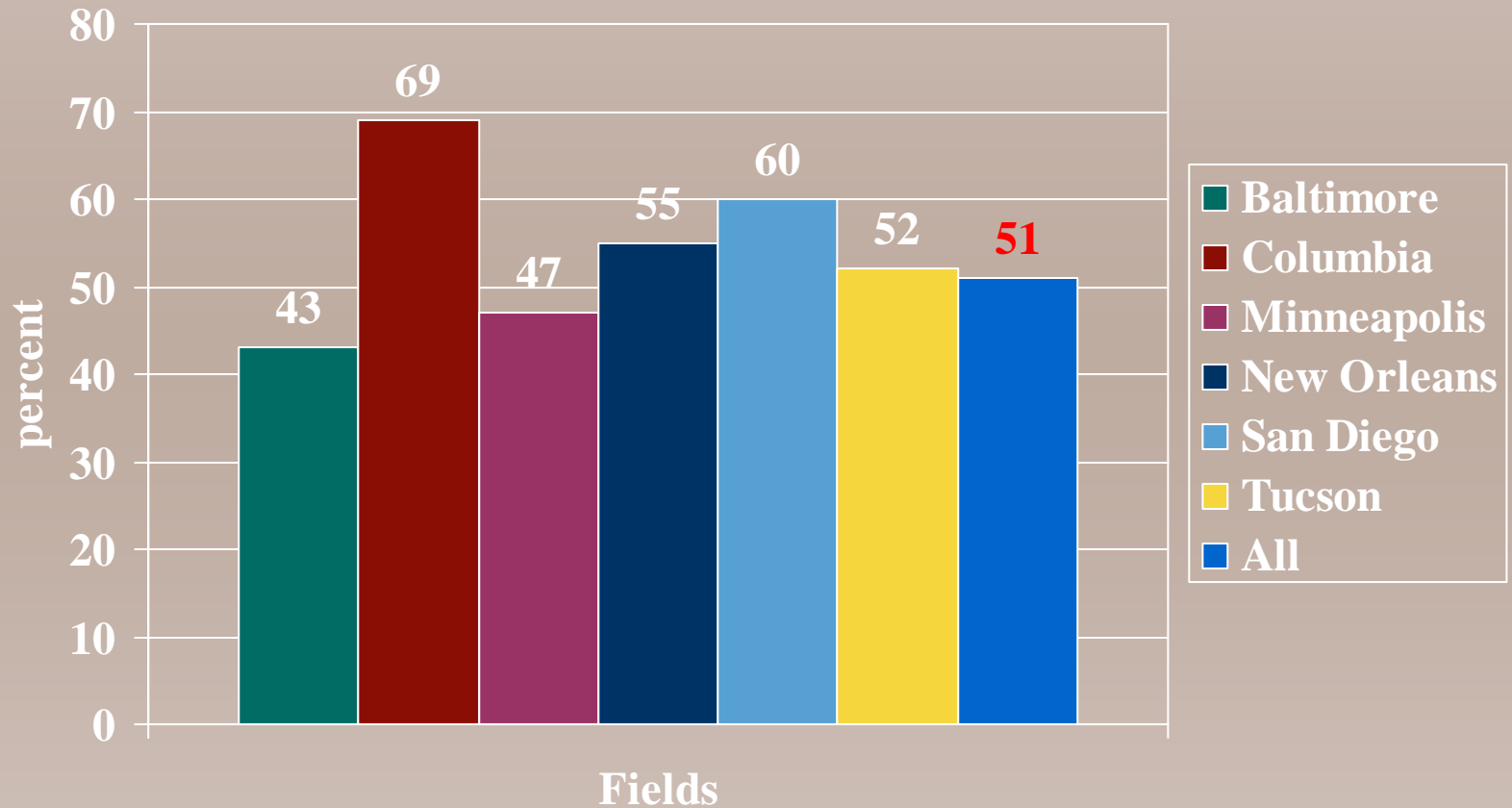
Playgrounds
% of girls who have a playground within 0.5 miles of their home

Basketball



% of girls who have a basketball court in a park within 1/2 mile of their home

Fields

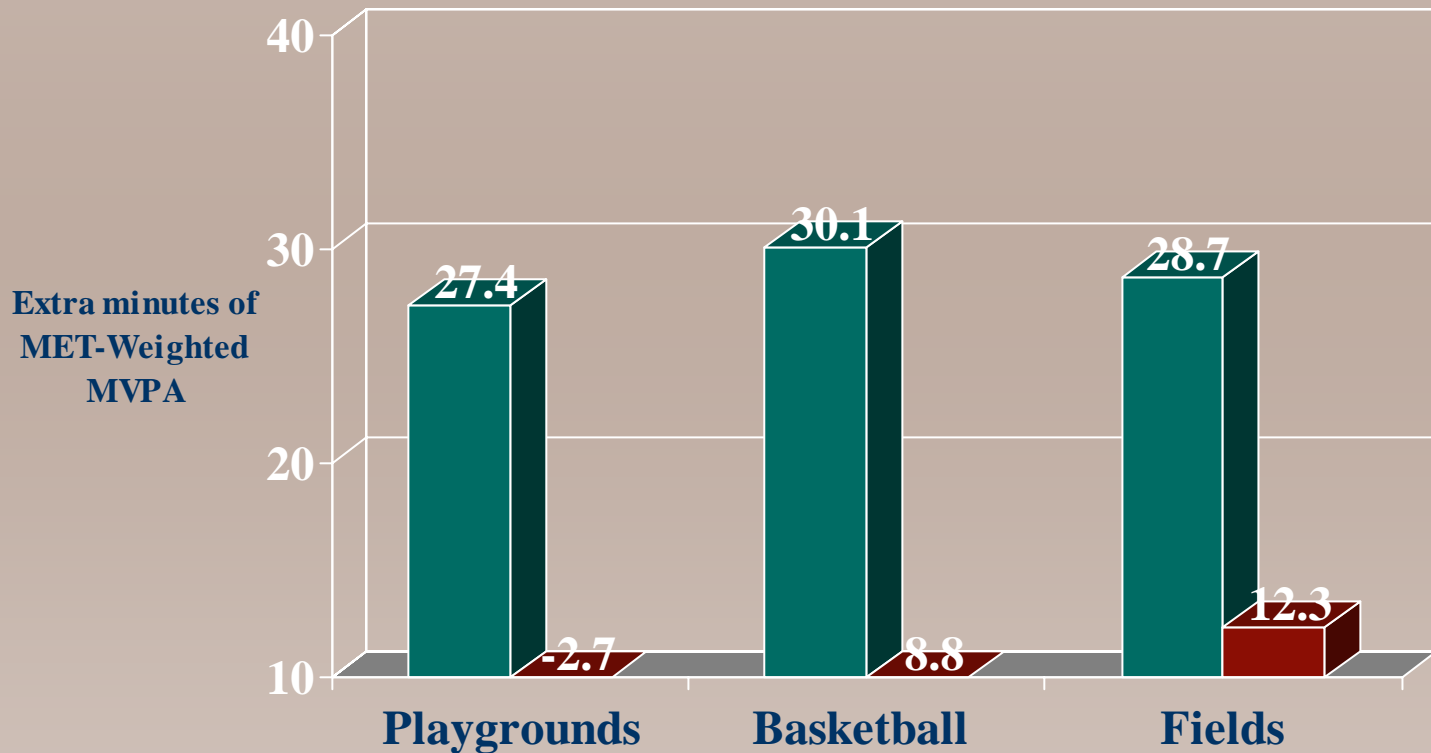


% of girls who have a multi-purpose field within 1/2 mile of their home

Parks and facilities

Parks with only basketball	8 (2%)
Parks with only fields	28 (6%)
Parks with only playgrounds	59 (12%)
Parks with none of above 3 facilities	133 (26%)
Parks with 2 or more of above	277 (55%)

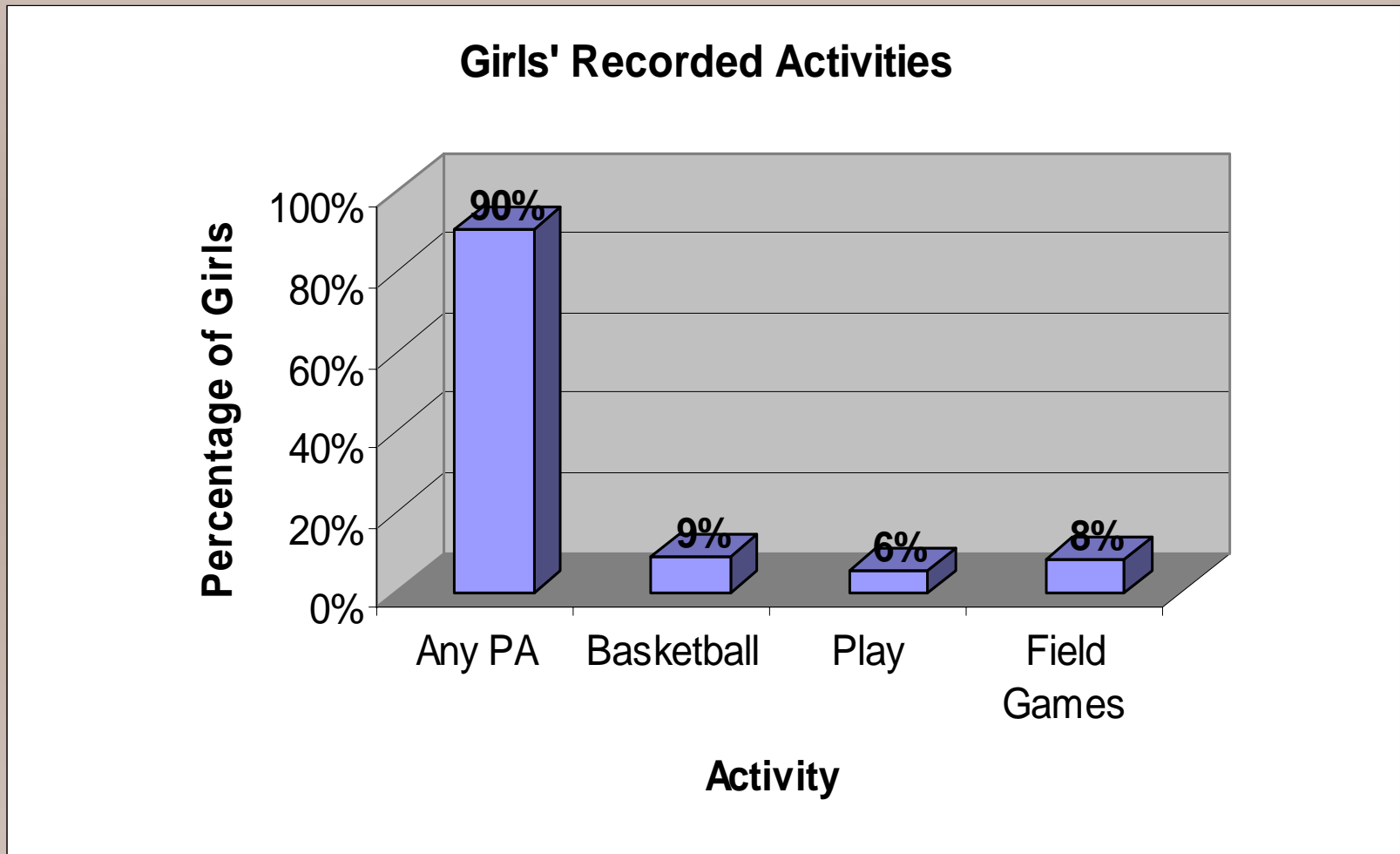
Effect Sizes for Parks With Specific Facilities



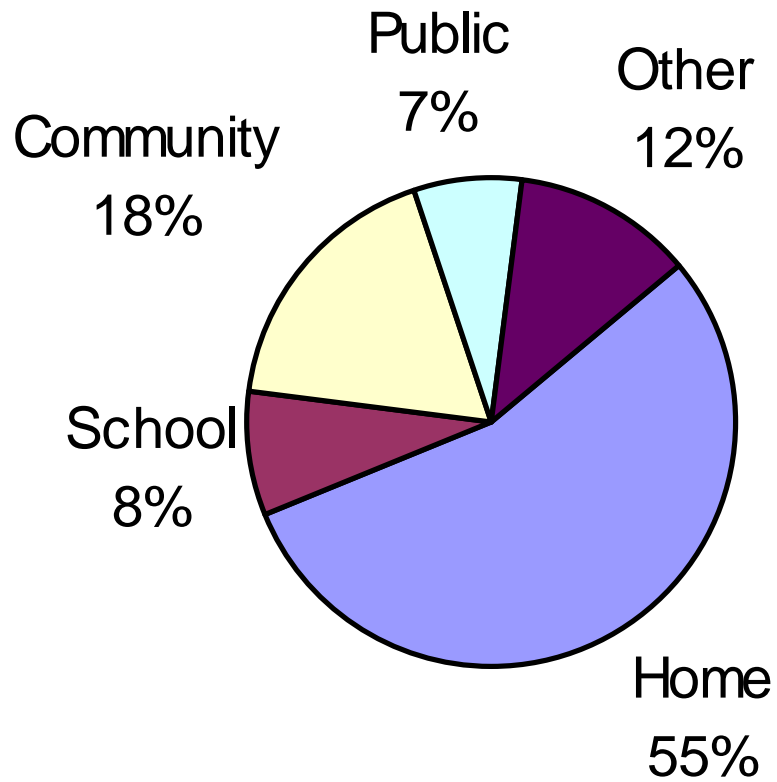
Validating findings: 3D PAR

During the last 3 days of wearing the CSA monitor, girls completed a 3-D PAR, reporting when and where they engaged in various activities.

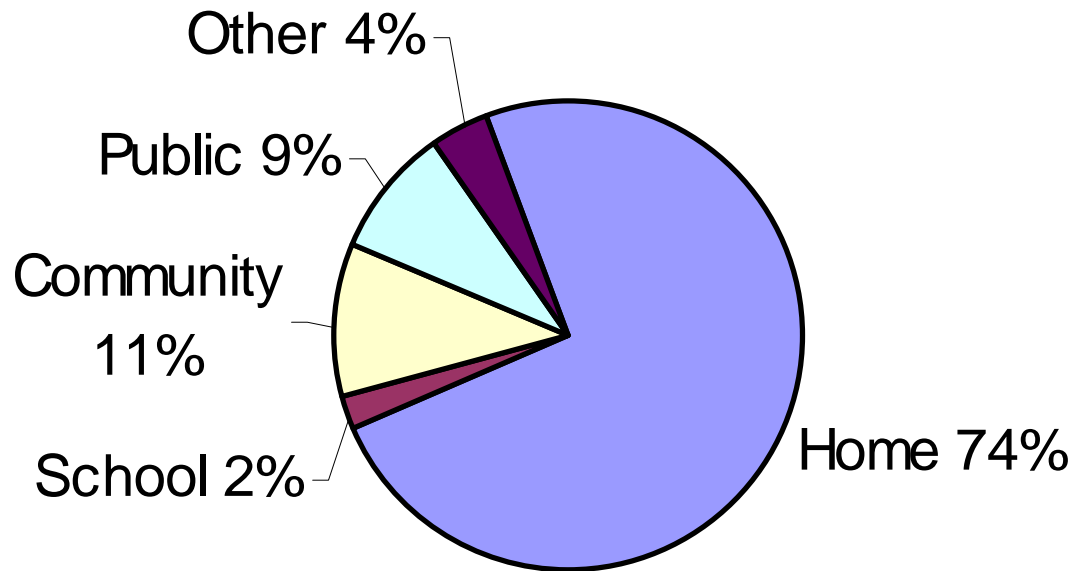
What Kind of Physical Activity?



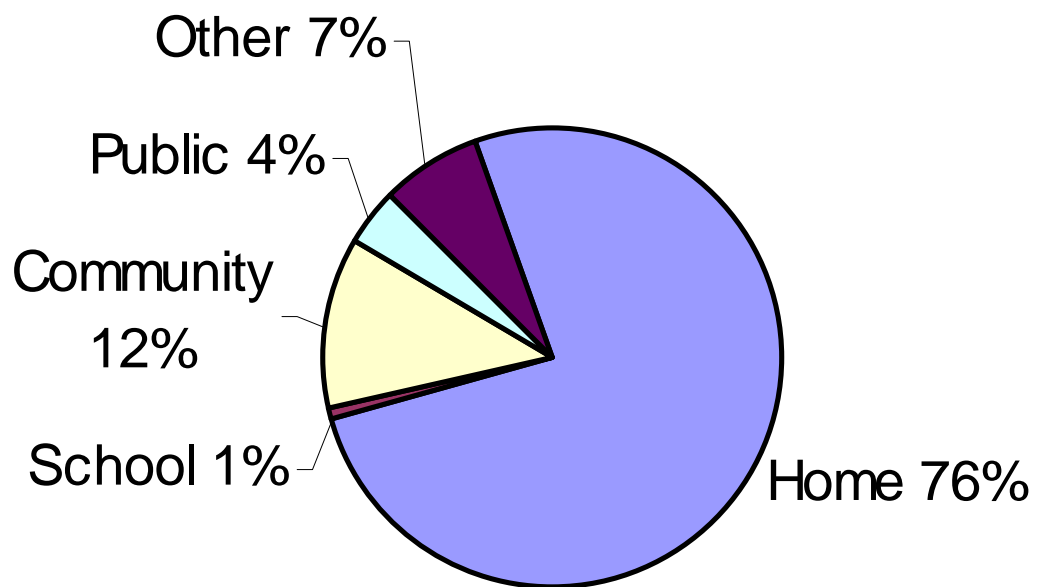
All Physical Activity



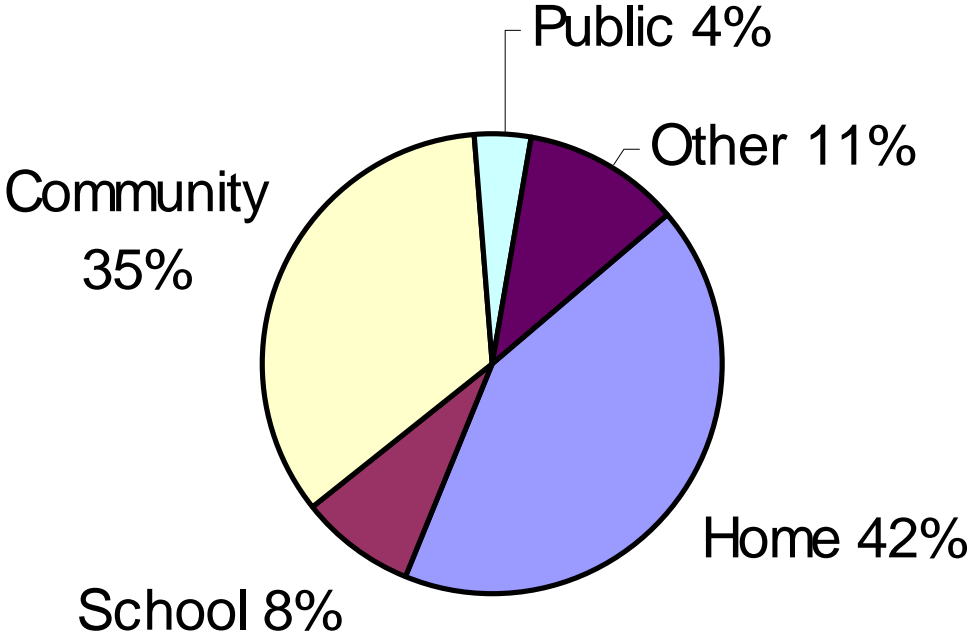
Basketball



Playing with Younger Children



Field Games



More Work to be Done...

1. Only a small portion of girls are active in community settings
2. Community settings can explain a small portion of total MET-weighted MVPA.
3. Still need to connect individual girls who are active to community settings. – Appears that it could explain the observed variation.
 - Are parks a venue for girls' physical activity?
 - Or, or do they help make PA more normative?

Summary

- Greater distance from school associated with less MVPA
- Greater density of parks associated with more MVPA
- Park relationship appears to be specific to neighborhood playgrounds
- Park facilities (basketball, fields, playgrounds) appear important to MVPA

Limitations

- Cannot rule out selection bias—
Active families may choose to live near parks and schools.
- Only one age and gender group
- We don't have consistent findings across all geographies— some associations at one level, are absent at others.

Prevention Paradox

“A preventive measure that brings large benefits to the community offers little to each participating individual.”

-Geoffrey Rose

Effect sizes of parks on PA are relatively small, but potentially influence everyone in the neighborhood.

Conclusion

- **Proximity to school and proximity to neighborhood parks are associated with physical activity in middle school-aged girls**
- **This study provides support for specific community/neighborhood structural features as an intervention to increase physical activity and improve health**