Designing Healthy Communities with Maps

Matthew Baker

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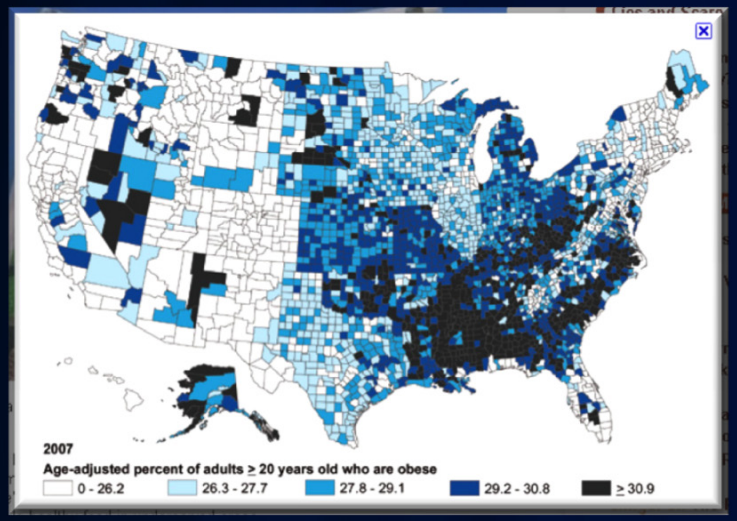
Presentation Overview

- Mapping Food Deserts
- Mapping Park Access
- Safe Routes to School Planning
  - Data collection
  - Planning
  - Communication

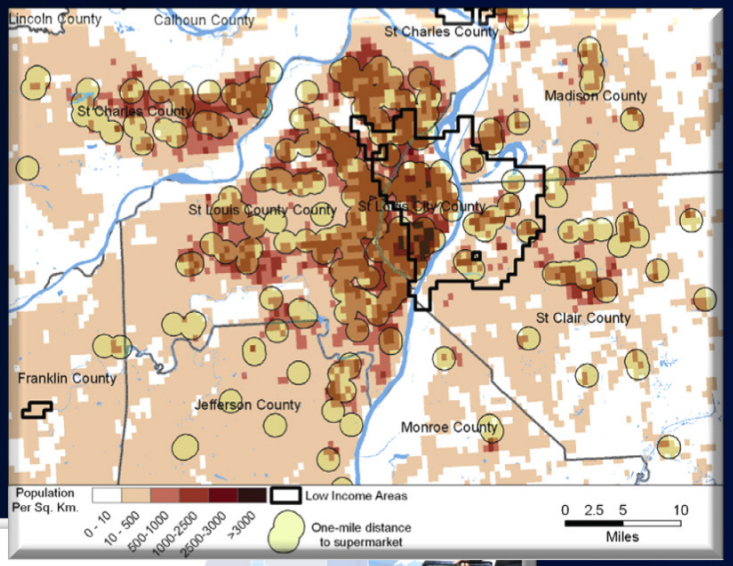
Mapping Food Deserts

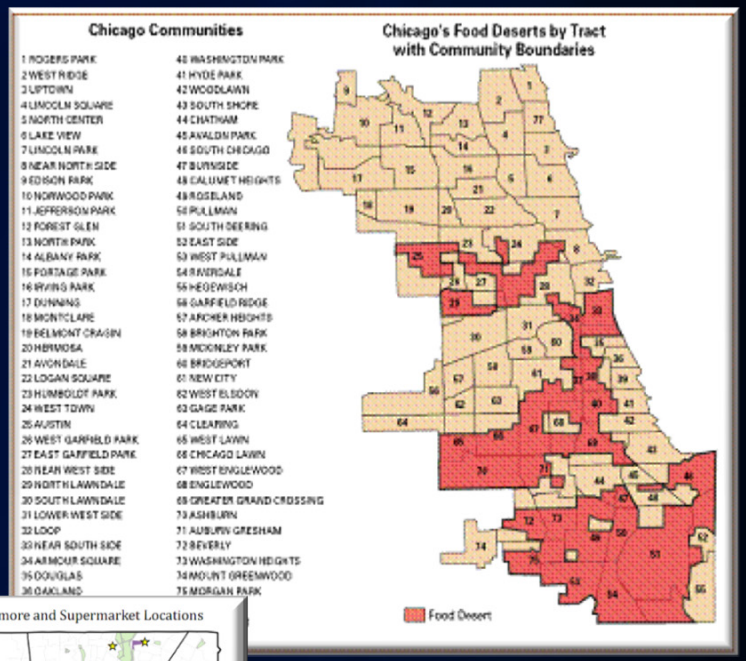
Comparing Current Applications and Analysis

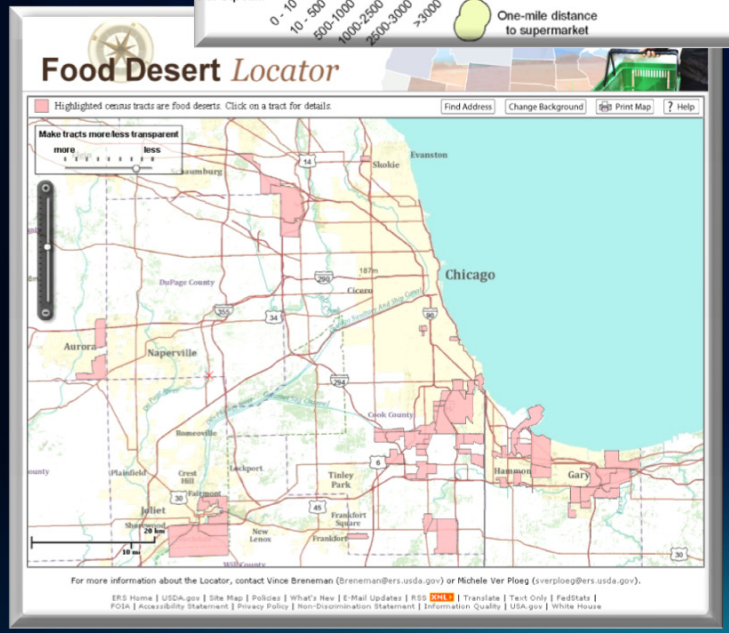
Small Scale Examples

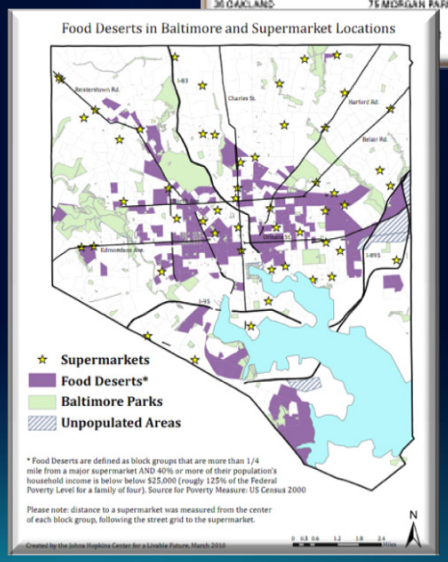


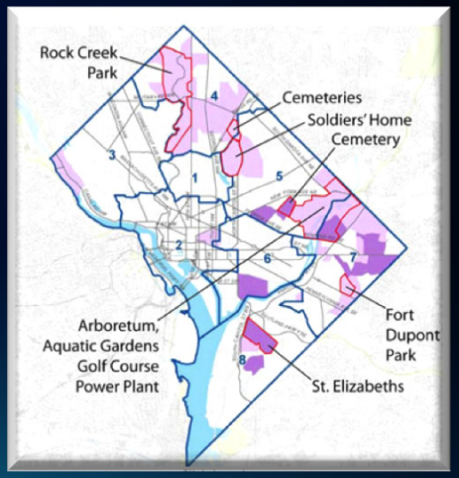
Medium Scale





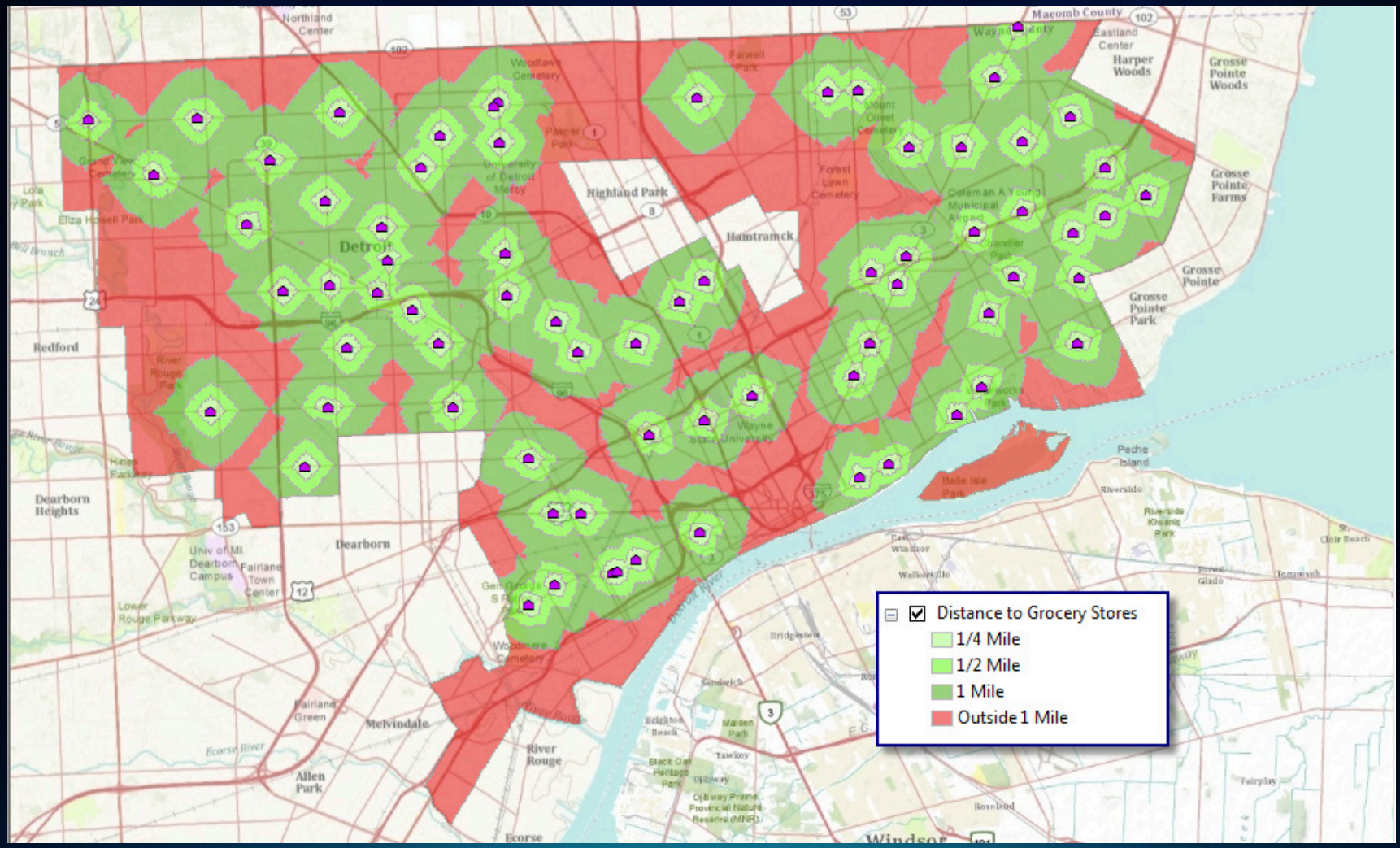


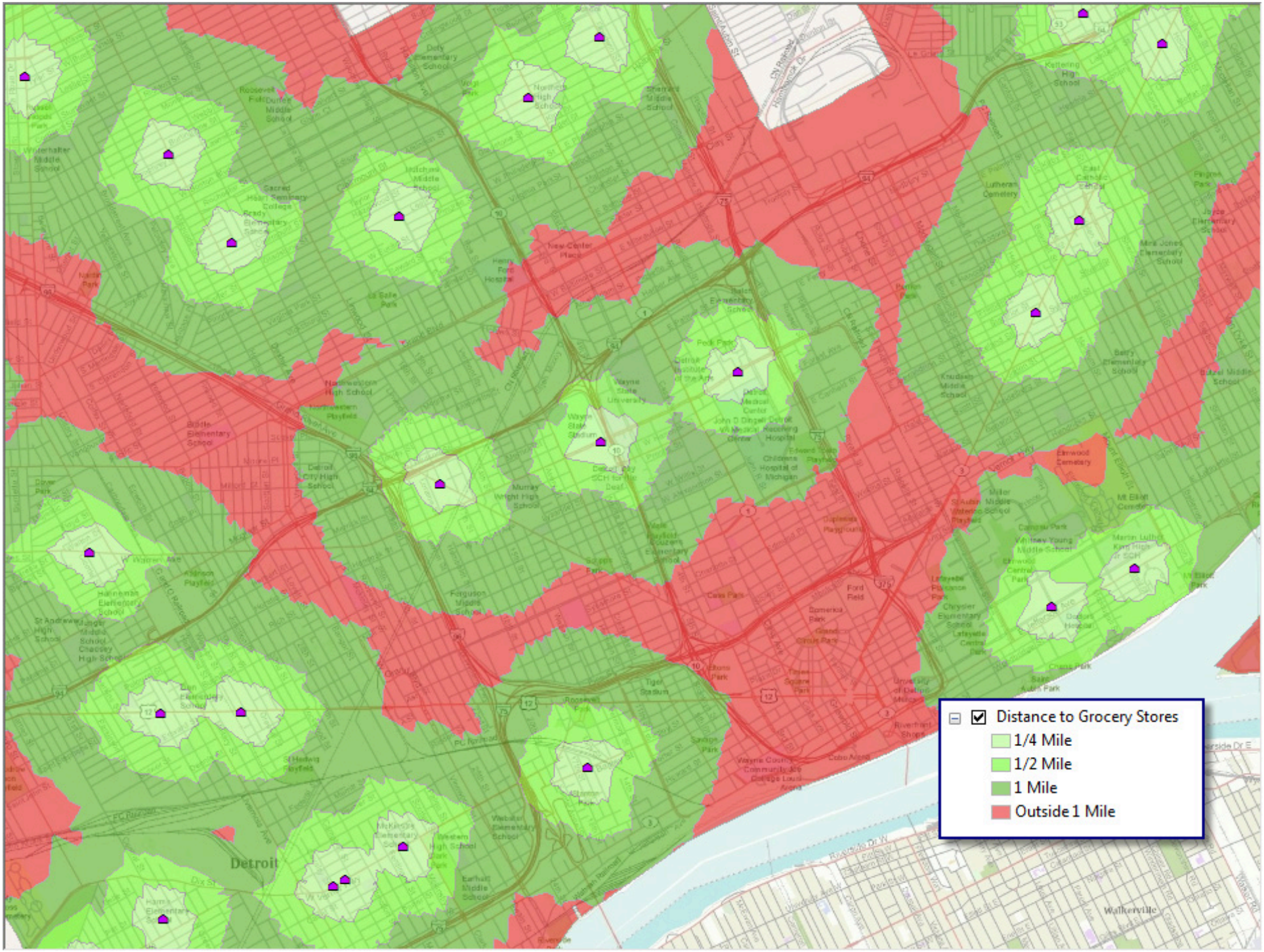




Detroit Food Access

Simple distance-only example

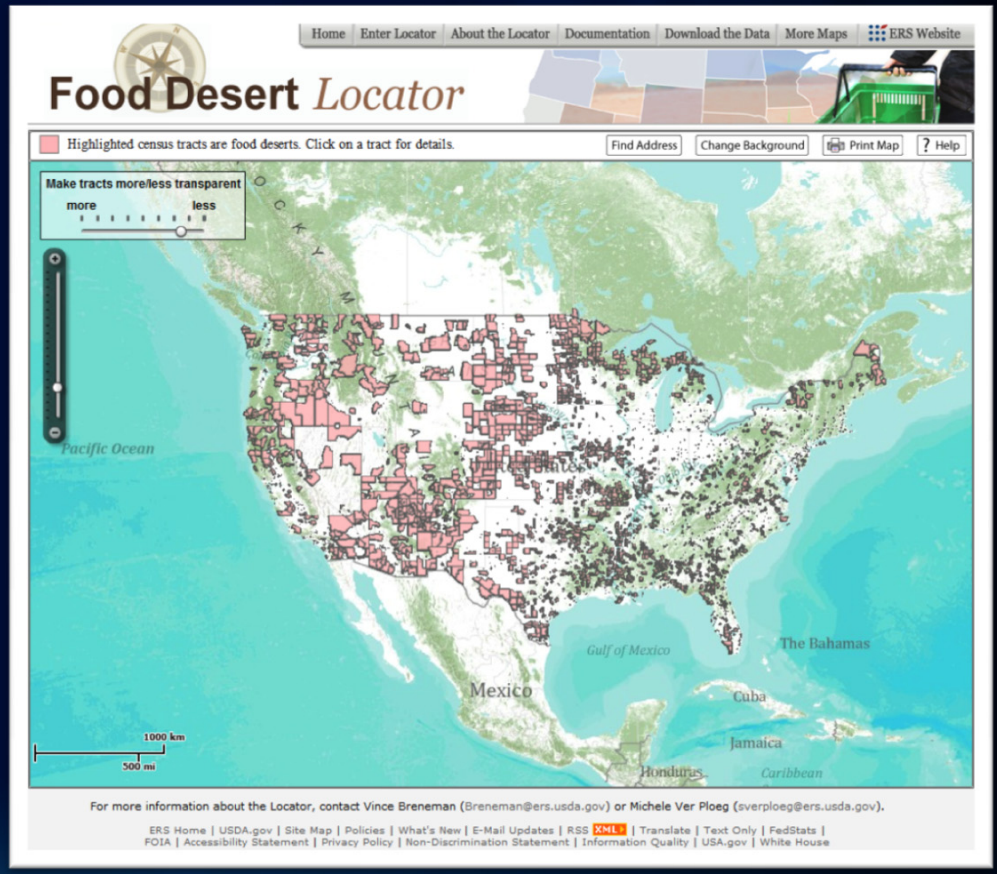



Distance to Grocery Stores
1/4 Mile
1/2 Mile
1 Mile
Outside 1 Mile
Detroit
Walkerville

USDA Application

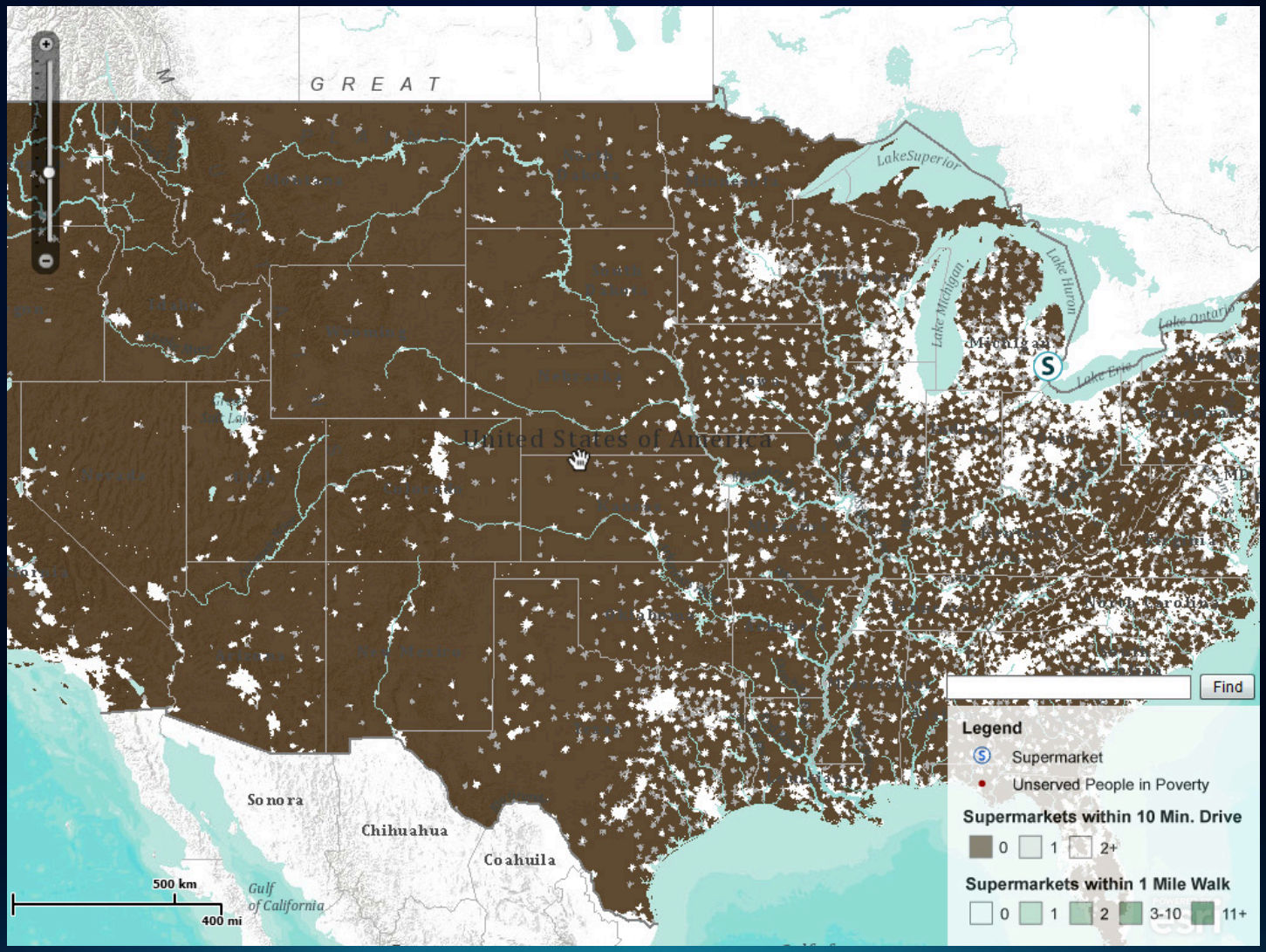
http://www.ers.usda.gov/data/fooddesert/fooddesert.html

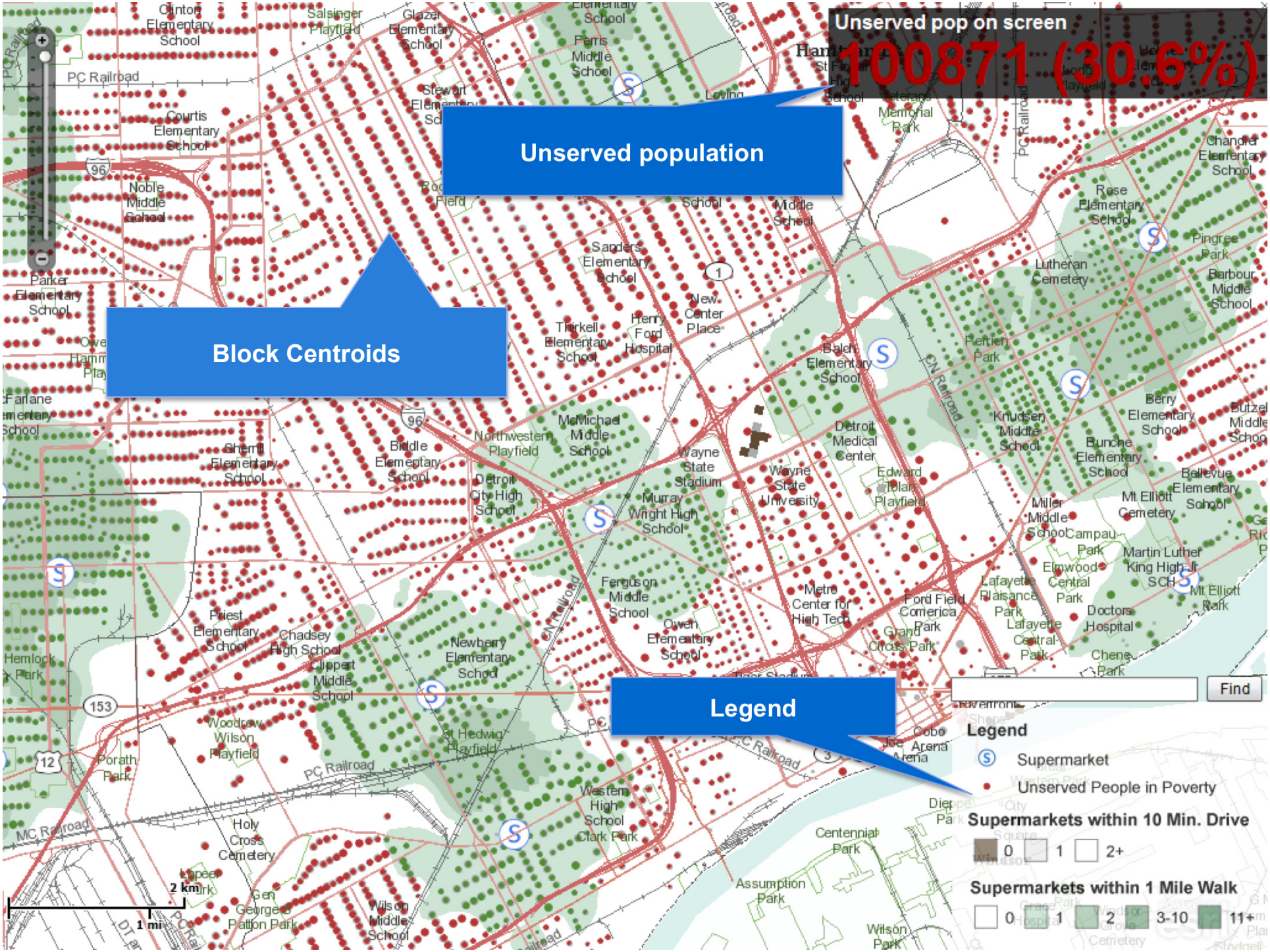
- **Food Desert Defined:**
  - ***low-income census tract*** **where a substantial number or share of residents has *low access* to a supermarket or large grocery store:**
- **National data**
  - **Census Tract**
- **Built on ArcGIS Server**
  - **Flex API**
  - **Interactive web map**

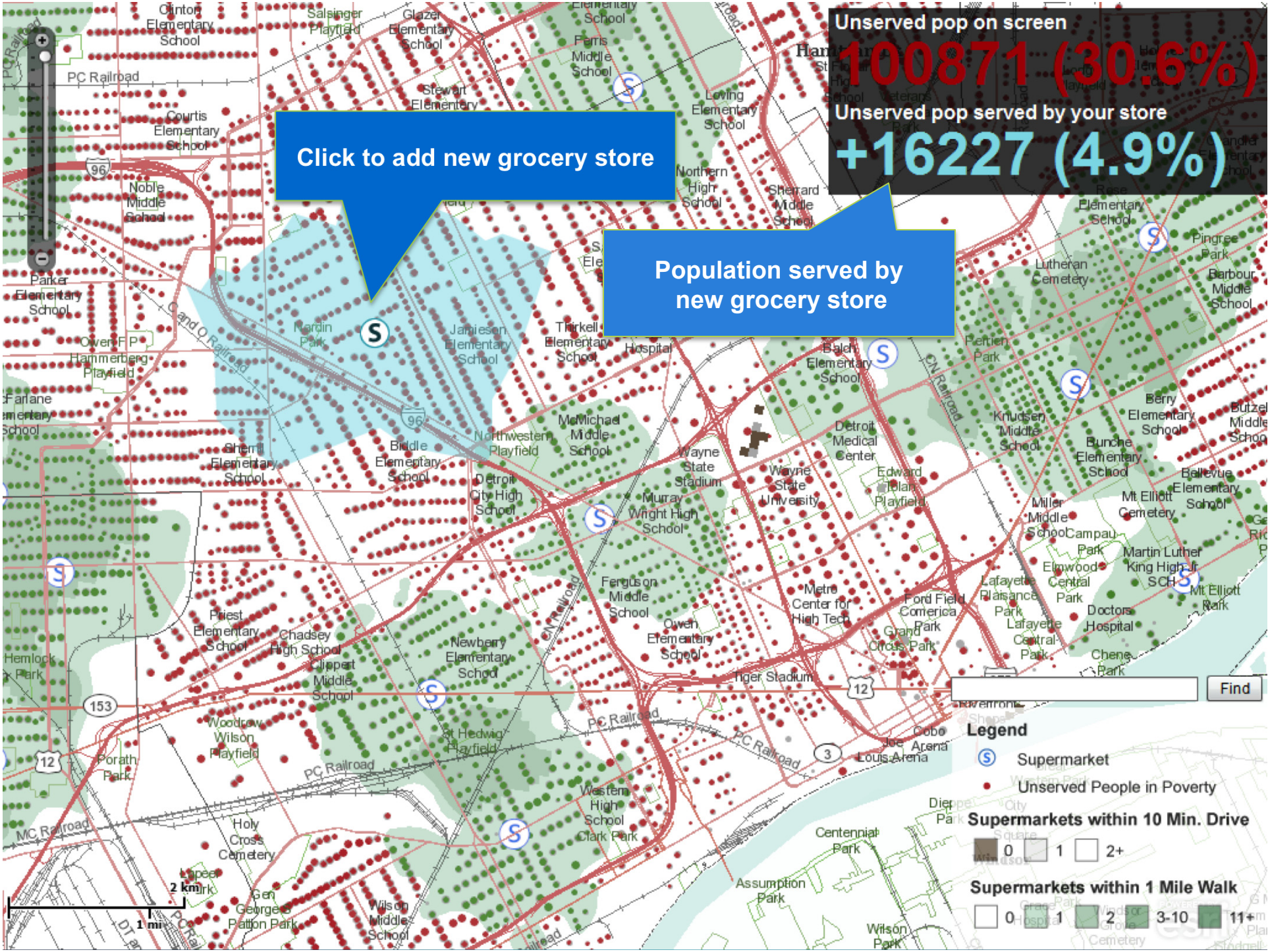


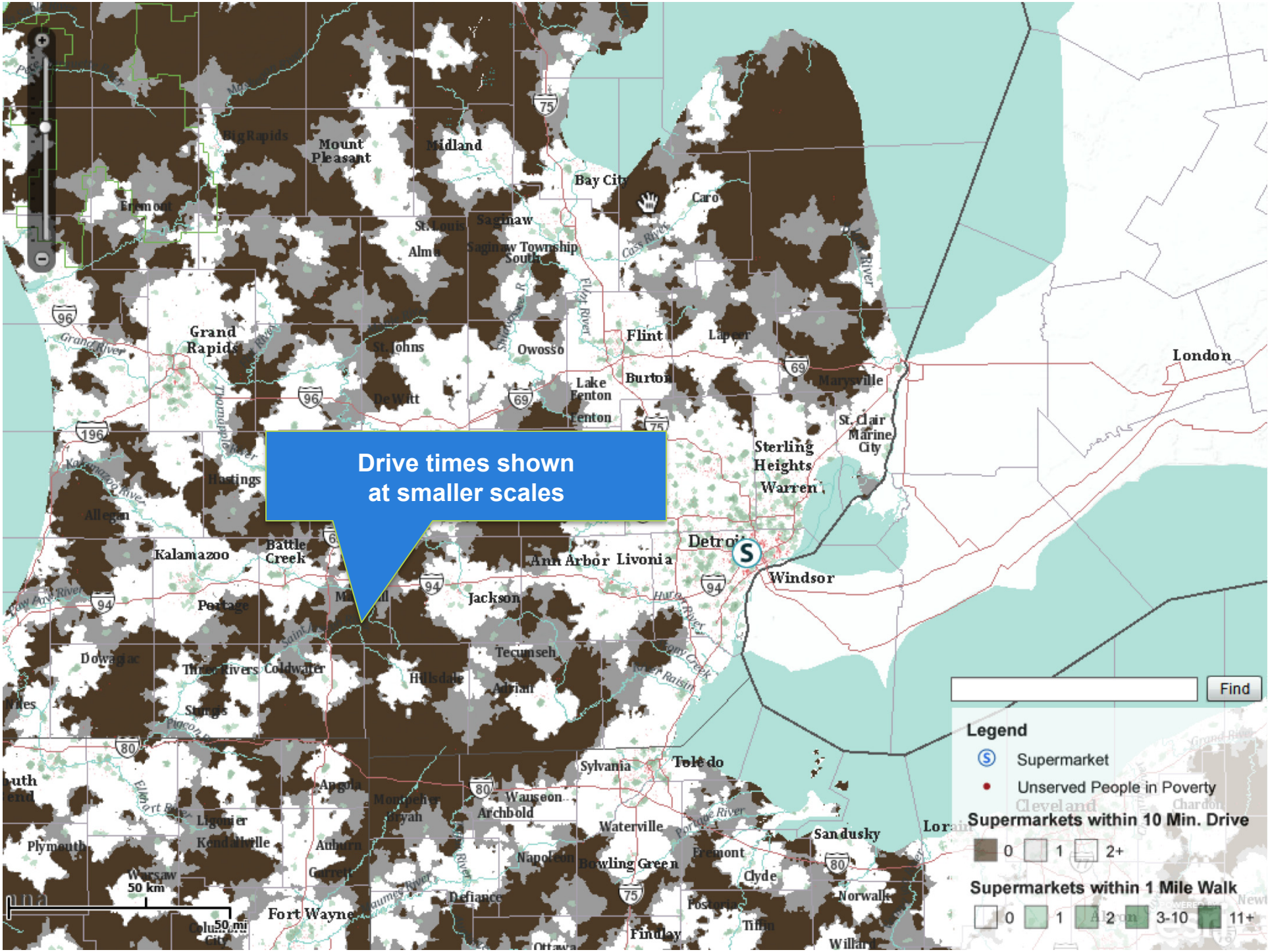
ESRI Food Desert Finder

http://megacity.esri.com/fooddeserts




Unserved pop on screen
100871 (30.6%)
Unserved population
Block Centroids
Legend
Find
Legend
Supermarket
Unserved People in Poverty
Supermarkets within 10 Min. Drive
0
1
2+
Supermarkets within 1 Mile Walk
0
1
2
3-10
11+
2 km
1 mi


Unserved pop on screen
100871 (30.6%)
Unserved pop served by your store
+16227 (4.9%)
Click to add new grocery store
Population served by new grocery store
Find
Legend
Supermarket
Unserved People in Poverty
Supermarkets within 10 Min. Drive
0
1
2+
Supermarkets within 1 Mile Walk
0
1
2
3-10
11+
2 km
1 mi


Drive times shown
at smaller scales
Find
Legend
Supermarket
Unserved People in Poverty
Supermarkets within 10 Min. Drive
0
1
2+
Supermarkets within 1 Mile Walk
0
1
2
3-10
11+
50 km
50 mi
Big Rapids
Mount Pleasant
Midland
Bay City
Caro
Saginaw
Saginaw Township South
Alma
St. Louis
Grand Rapids
St. Johns
Owosso
Flint
Lapeer
Burton
Lake Fenton
Fenton
DeWitt
Marysville
London
St. Clair
Marine City
Sterling Heights
Warren
Detroit
Windsor
Hastings
Allegan
Kalamazoo
Battle Creek
Ann Arbor
Livonia
Jackson
Portage
Dowagiac
Three Rivers
Coldwater
Tecumseh
Hillsdale
Adrian
Sturgis
Sylvania
Toledo
Wauseon
Archbold
Waterville
Sandusky
Fremont
Clyde
Bowling Green
Napoleon
Defiance
Fort Wayne
Findlay
Tiffin
Norwalk
Plymouth
Ligonier
Kendallville
Auburn
Garrett
Warsaw

ESRI Food Desert Finder

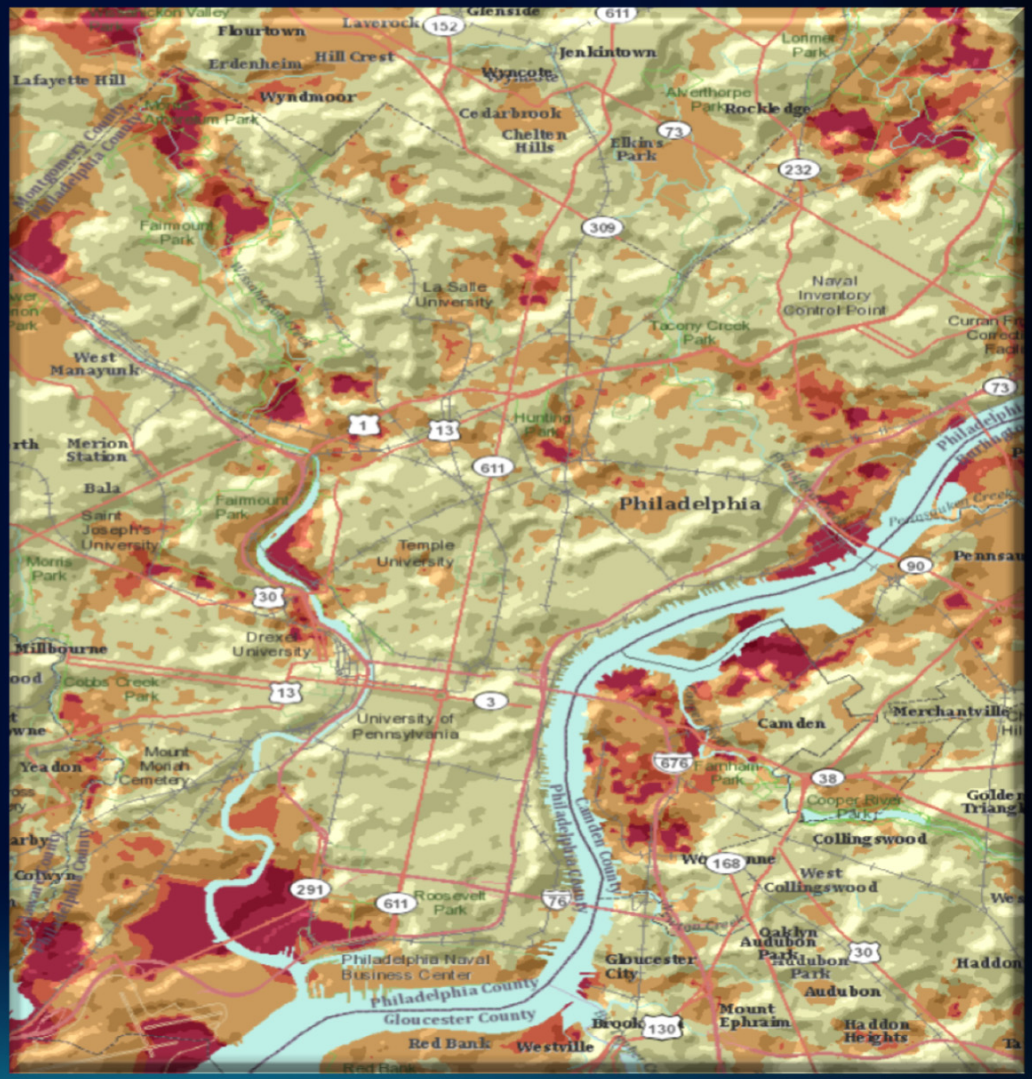
Data sources

- Built on ArcGIS Server
- Data sources
  - Block centroids
  - Census population
- Goals
  - Which blocks have walkable access to a supermarket?
  - Visualize measurements in full view
  - Partial view of how people access food

ESRI Food Desert Finder

Updates for 2011

- New data
  - Census 2010
  - socioeconomic status
  - significant differences in access
- Visualization
  - ‘hillshade’ effect

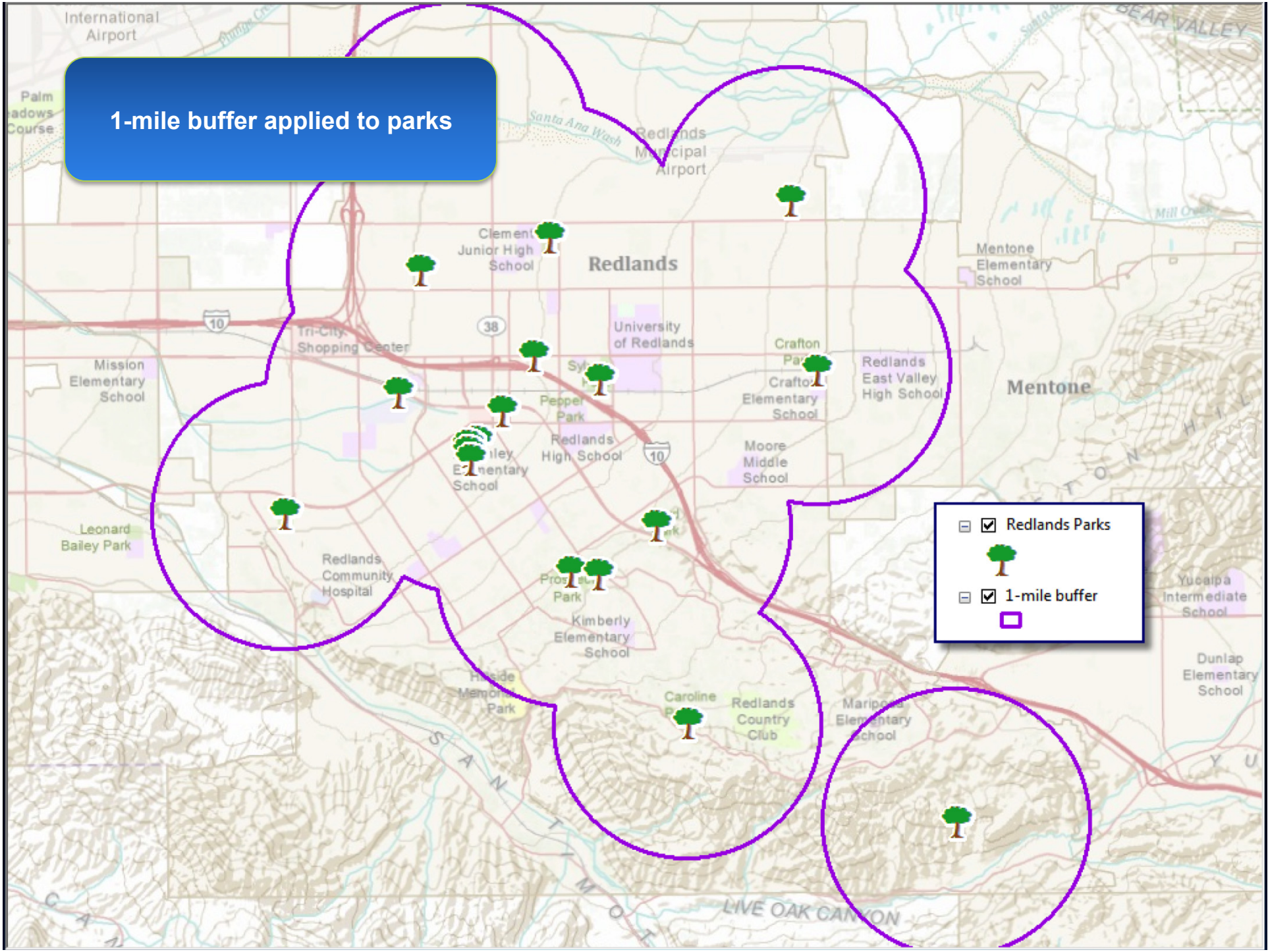


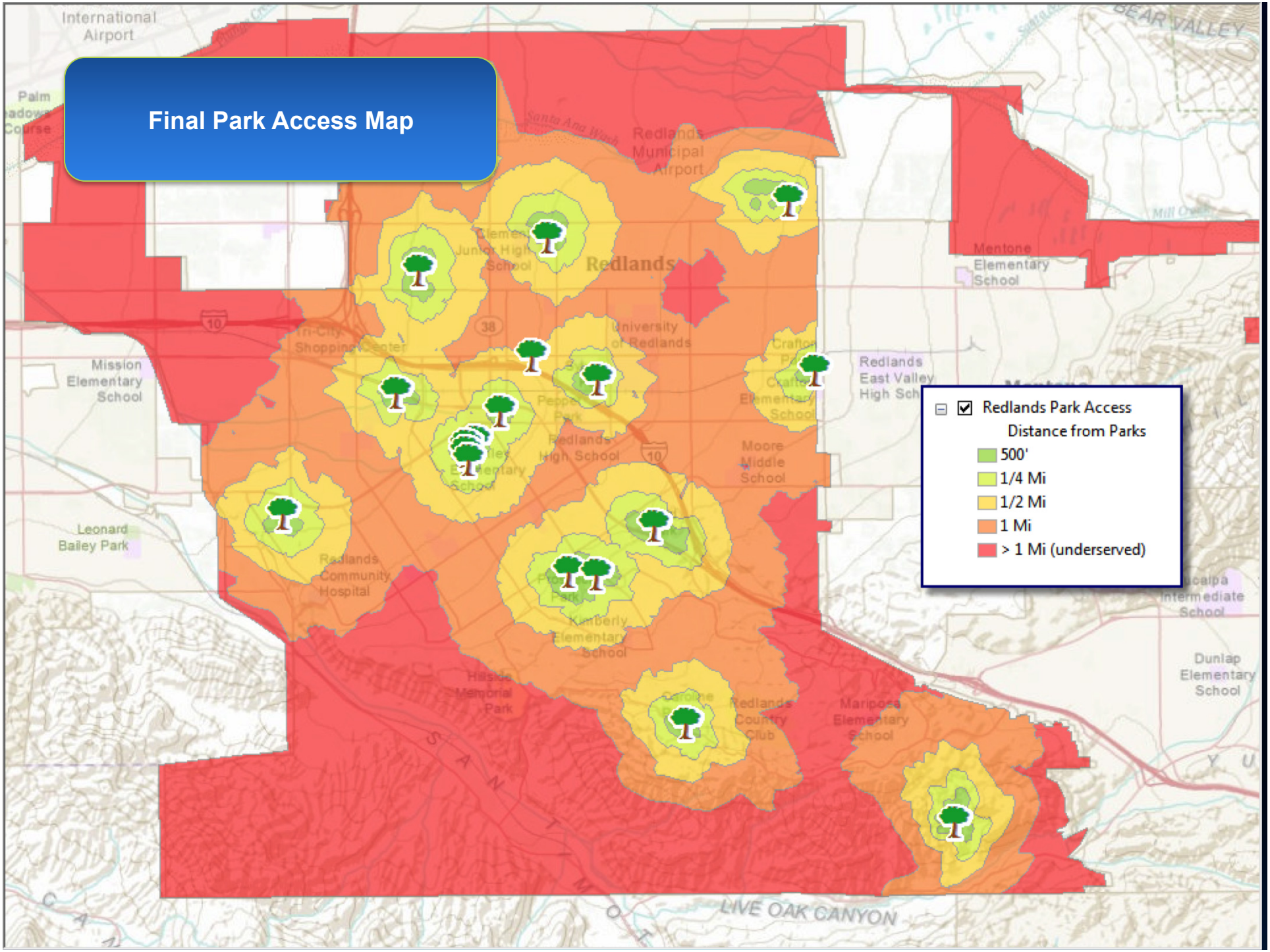
ESRI Food Desert Finder

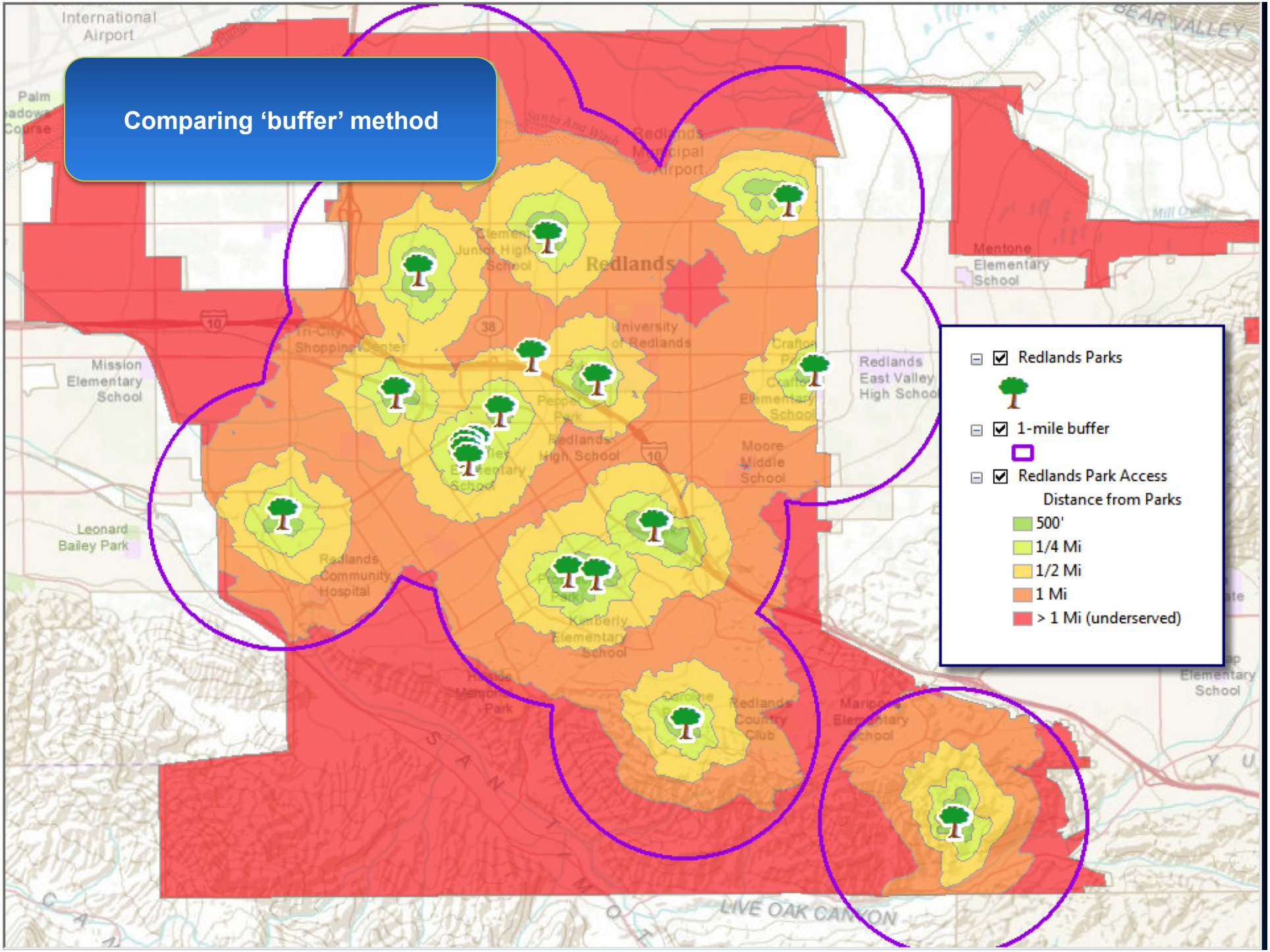
Updates for 2011

- Create a single, relatable measure of the food environment
- Distance is only a part of the story
- Assess areas based on multiple criteria
  - Poverty
  - Car ownership
  - % of income spent on food at home
  - Crime
  - Rural population
  - Distance to and number of restaurants and farmers' markets
  - Distance to and number of supermarkets
- **Data and methods available upon request

Measuring Park Access

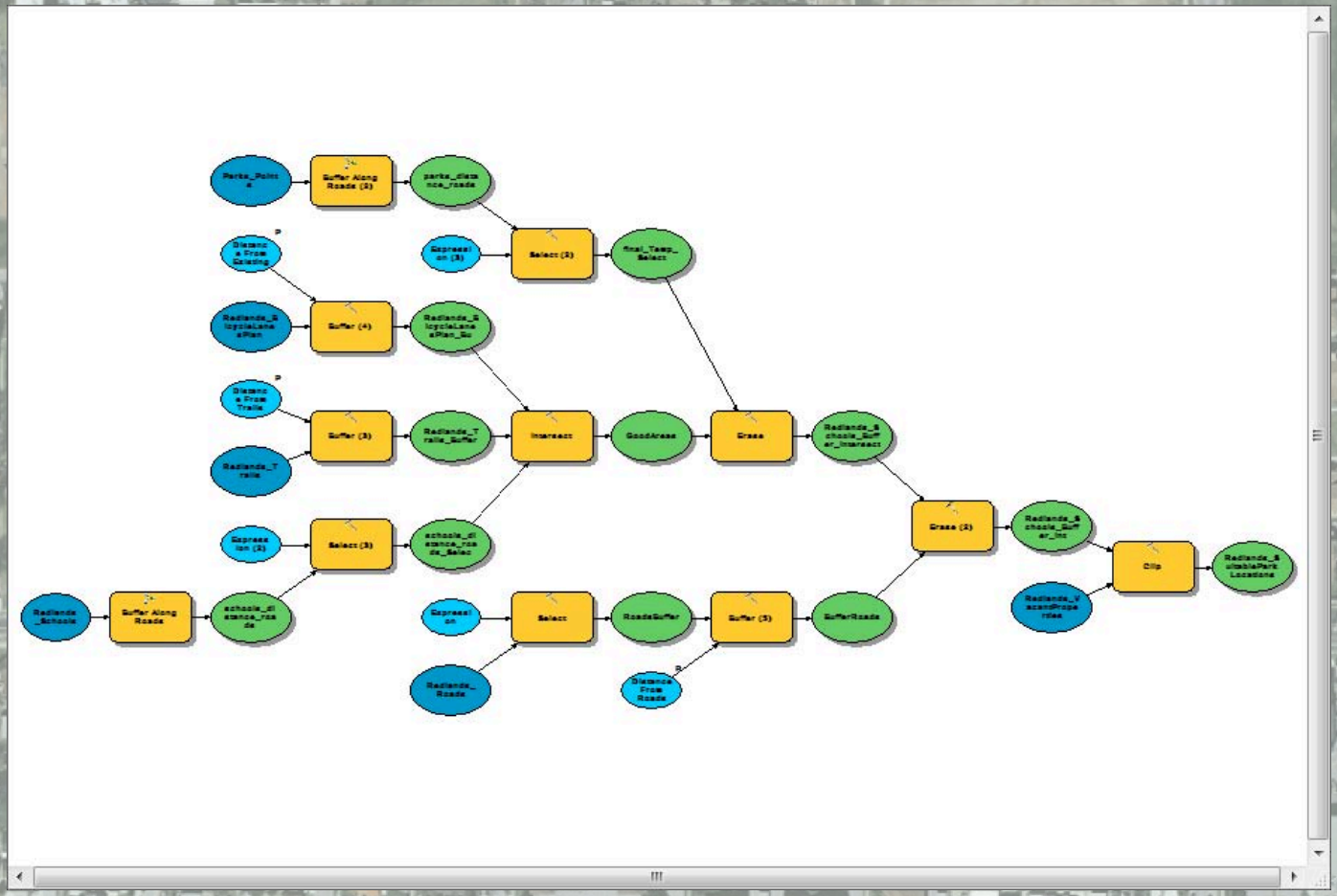

1-mile buffer applied to parks
Redlands Parks
1-mile buffer
Redlands
Mentone
International Airport
Redlands Municipal Airport
Clement Junior High School
Mentone Elementary School
Tri-City Shopping Center
University of Redlands
Mission Elementary School
Pepper Park
Redlands High School
Crafton Elementary School
Redlands East Valley High School
Moore Middle School
Leonard Bailey Park
Redlands Community Hospital
Kimberly Elementary School
Redlands Country Club
Yucaipa Intermediate School
Dunlap Elementary School
LIVE OAK CANYON


Final Park Access Map
Redlands Park Access
Distance from Parks
500'
1/4 Mi
1/2 Mi
1 Mi
> 1 Mi (underserved)
Redlands
Redlands Municipal Airport
International Airport
Mentone Elementary School
Redlands East Valley High Sch
Mission Elementary School
University of Redlands
Redlands High School
Moore Middle School
Leonard Bailey Park
Redlands Community Hospital
Kimberly Elementary School
Hillside Memorial Park
Redlands Country Club
Mariposa Elementary School
Dunlap Elementary School
LIVE OAK CANYON
BEAR VALLEY


Comparing 'buffer' method
Redlands Parks
1-mile buffer
Redlands Park Access
Distance from Parks
500'
1/4 Mi
1/2 Mi
1 Mi
> 1 Mi (underserved)
International Airport
Redlands Municipal Airport
Redlands
University of Redlands
Mission Elementary School
Leonard Bailey Park
Redlands Community Hospital
Redlands High School
Moore Middle School
Redlands East Valley High School
Mentone Elementary School
Kimberly Elementary School
Redlands Country Club
LIVE OAK CANYON
BEAR VALLEY

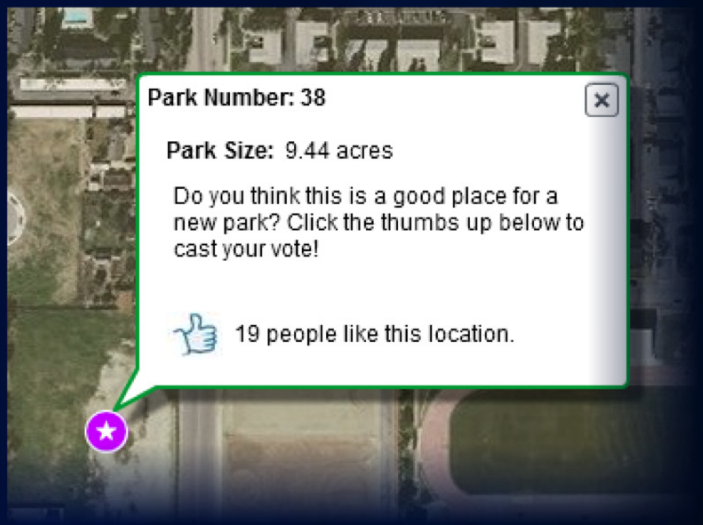
Determining new park location

Determining new park location



Park Location Voting Application

Built on ArcGIS Server, Flex API



Voting Results

A New Park for Redlands

Park ID	Number of Votes Tallied
38	19
25	7
13	5
27	5

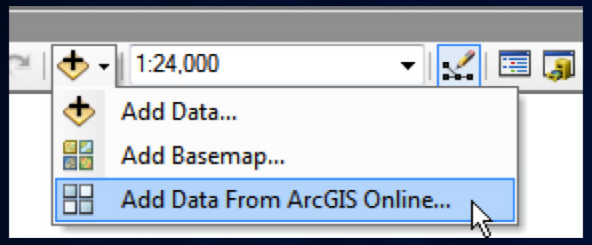
Table

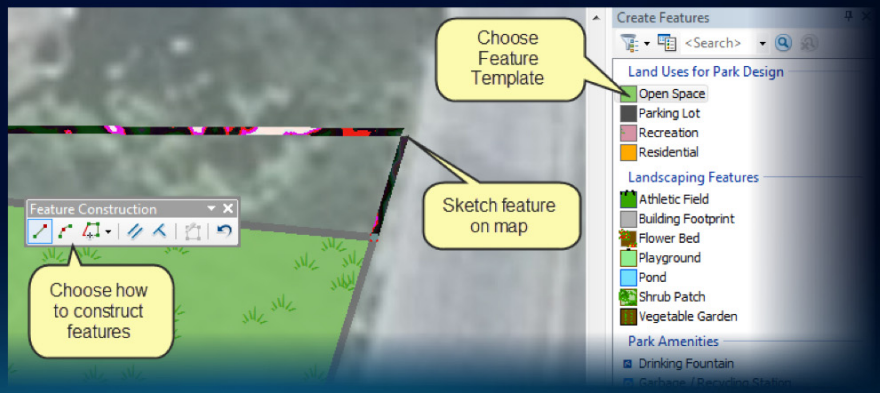
ParkAnalysisDesign.DBO.ParkVotingResults

ParkIDVoted *	AgreeWithPark	datetime
13	True	6/21/2011 12:50:06 AM
13	True	6/21/2011 12:50:07 AM
13	True	6/21/2011 12:50:08 AM
38	True	6/21/2011 12:50:13 AM
38	True	6/21/2011 12:50:14 AM

Sketching a new park

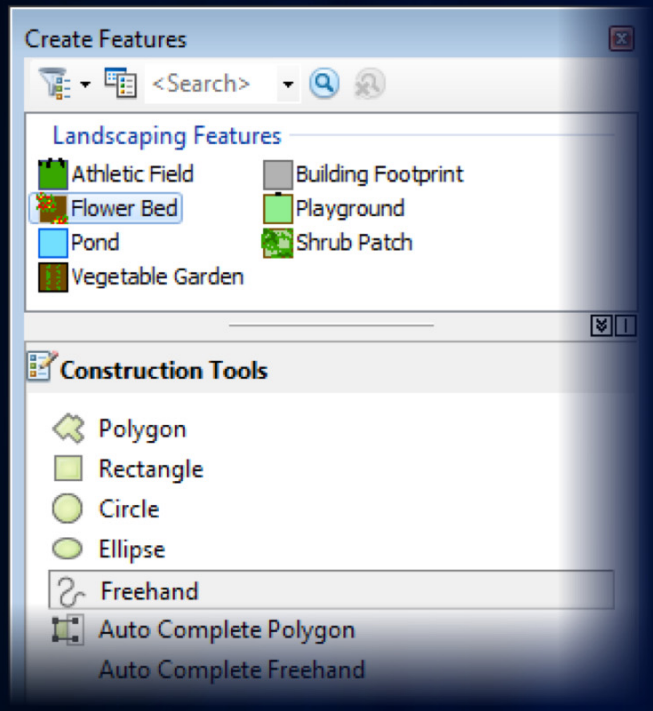
Park Design Template

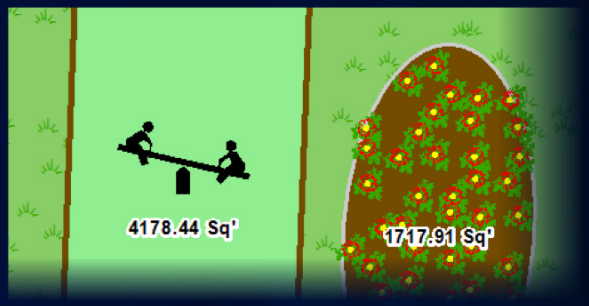


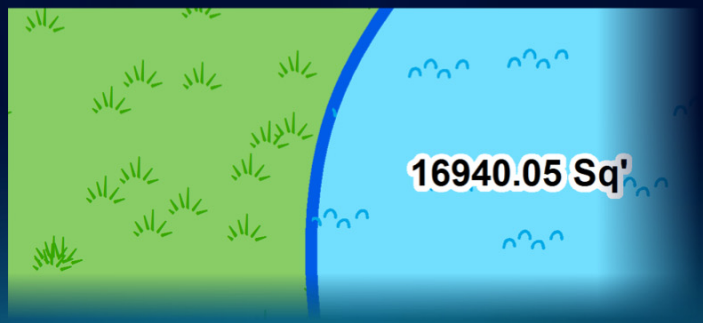


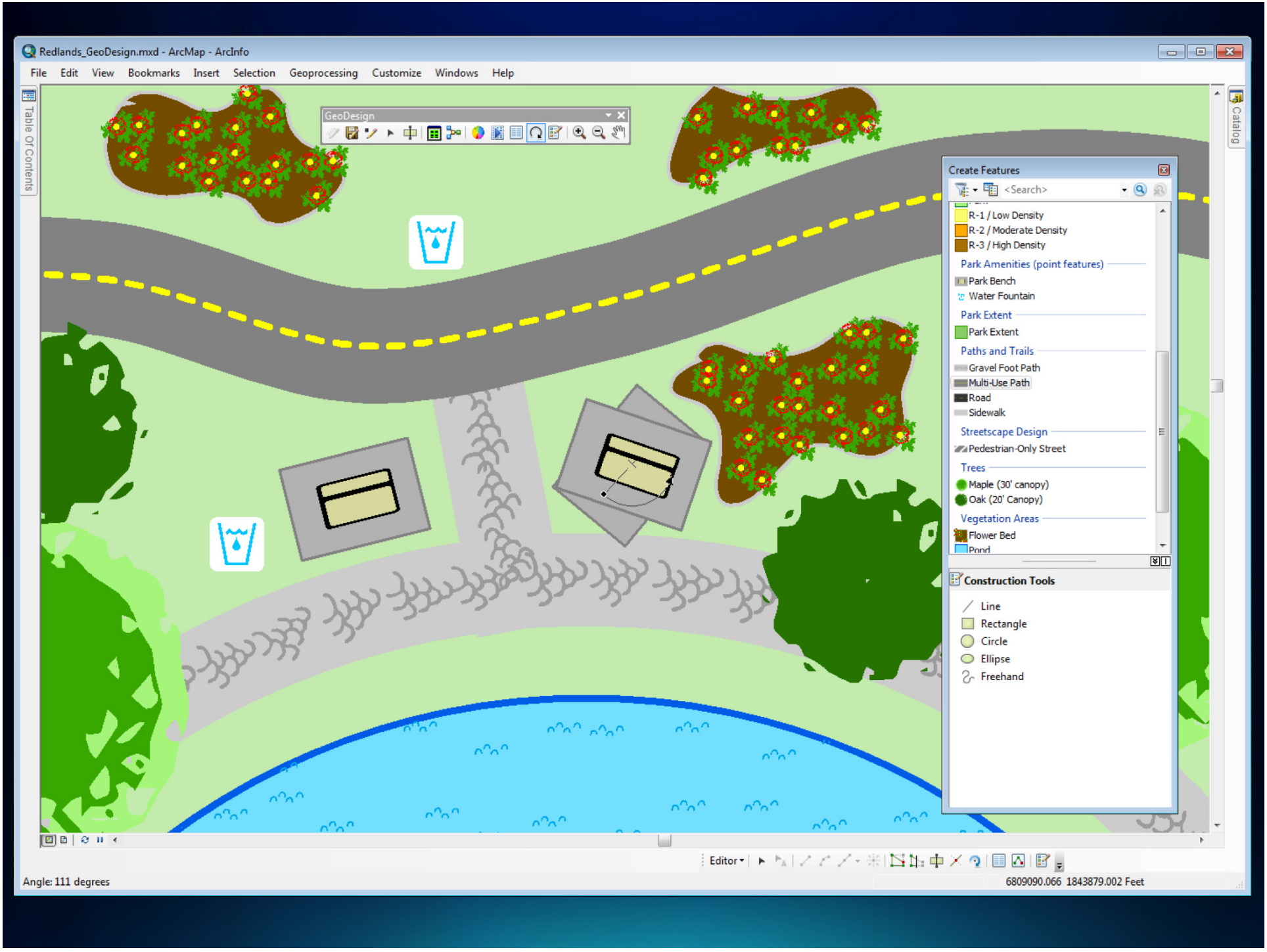
Sketching a new park

Park Design Template








Redlands_GeoDesign.mxd - ArcMap - ArcInfo
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
GeoDesign
Table Of Contents
Catalog
Create Features
<Search>
R-1 / Low Density
R-2 / Moderate Density
R-3 / High Density
Park Amenities (point features)
Park Bench
Water Fountain
Park Extent
Park Extent
Paths and Trails
Gravel Foot Path
Multi-Use Path
Road
Sidewalk
Streetscape Design
Pedestrian-Only Street
Trees
Maple (30' canopy)
Oak (20' Canopy)
Vegetation Areas
Flower Bed
Pond
Construction Tools
Line
Rectangle
Circle
Ellipse
Freehand
Editor
Angle: 111 degrees
6809090.066 1843879.002 Feet

Blog Post Series – Park Analysis and Design

ArcGIS Desktop Blog - http://blogs.esri.com/Dev/blogs/arcgisdesktop/

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Recent Posts

- Sketching the design of a new park
- Voting on a new park location
- ArcGIS Desktop 10.1 Beta 1
- Patch - ArcGIS Desktop and Engine Internet Tiled Layers
- Great info if you are going to the User Conference

Tags

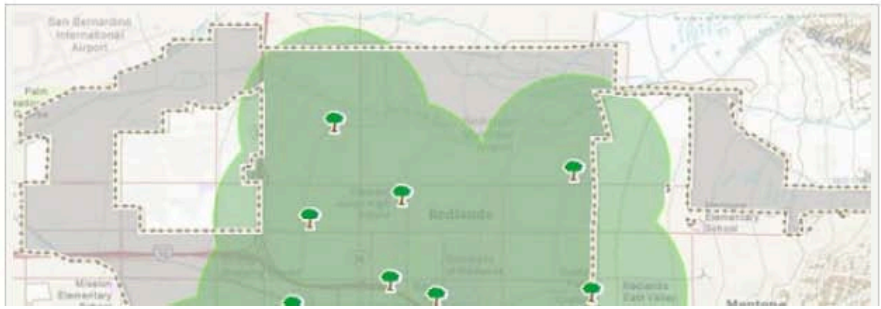
Measuring access to parks

Park analysis and design - Measuring access to parks (part 1)
Have you ever wondered how far you are from a park? In this post, I'll examine the placement of parks in Redlands, California, and determine which areas are best and worst served by a park. In future posts, I'll discuss siting a new park using binary suitability analysis, web-based tools for evaluating and increasing park access, and the design of a new park using ArcMap and feature template-based editing.

Over the last year, I've been attending various urban planning conferences and have discussed with several urban planners the need to design healthier communities, and I have heard this notion echoing throughout the planning community.

One concern is to figure out how well areas are served by parks. In my analysis, I want to determine which areas are within one mile of a park and visualize the results in a way that is easy to understand. I chose one mile, assuming most people can visualize how long it would take them to walk a mile, but this analysis could certainly be easily altered to measure any distance and present the results in a similar manner.

To do this, I could use a simple one-mile buffer around the parks, as the first map shows. However, a map created that way does not consider modes of travel. I want to measure pedestrian access to parks, so the best route is to travel along a road, preferably on the sidewalk.



ESRI Rideshare Application

Managing commuter information

Esri Rideshare

Commuting Map | Add Your Route | Other Redlands Data | About | Sign Up

Topo Map | Streets | Imagery

Welcome!

Welcome to the Esri Rideshare application. Here you will find data from Esri, The City of Redlands, and volunteered data from Esri Commuters of all types. Explore the data, add your own, and keep in touch to see how the data is analysed and used in the future at Esri and The City of Redlands.

ESRI Bicycle Infrastructure

Bicycle Racks

- ESRI
- City

Entrance Points to ESRI Campus

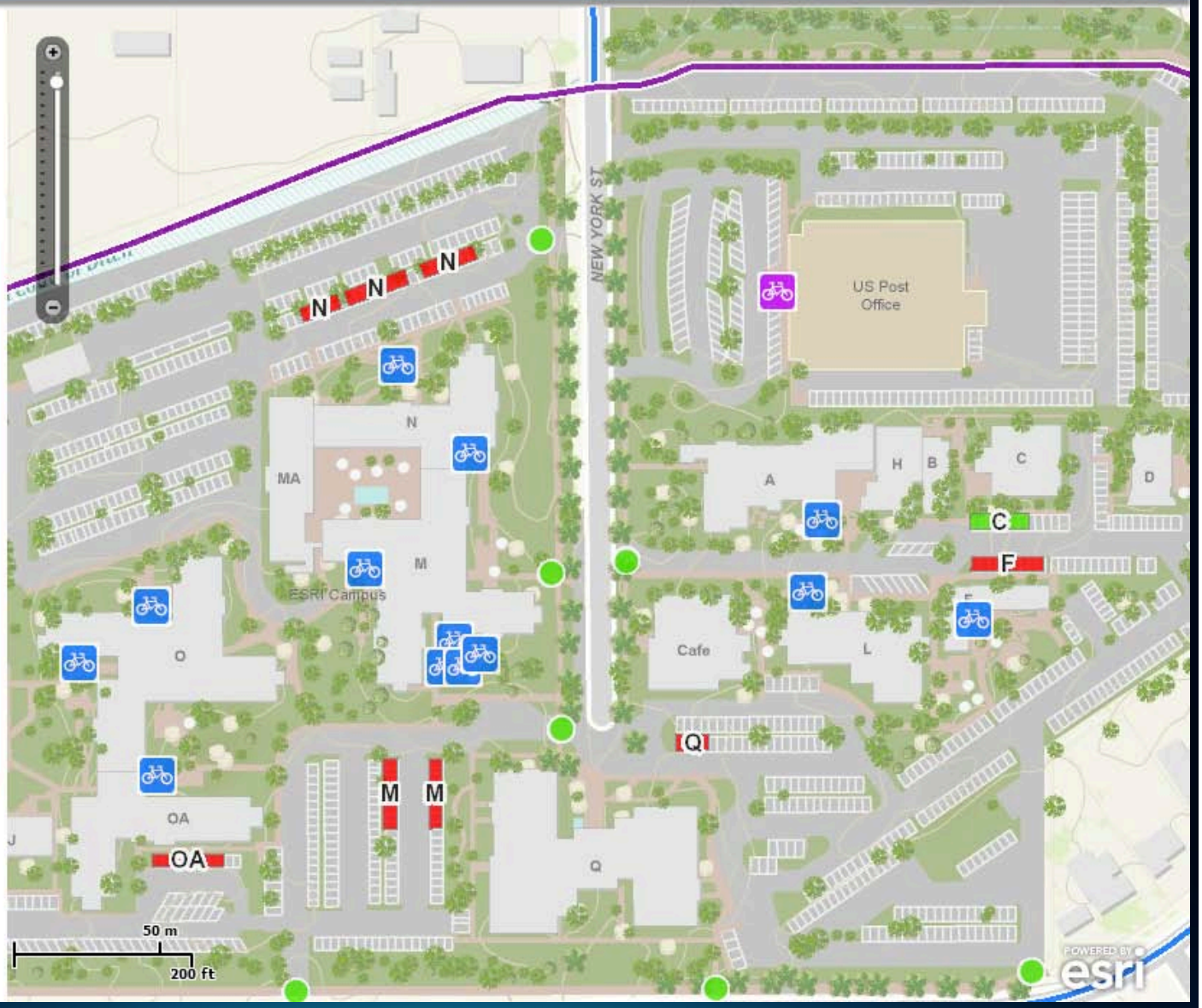
Redlands Proposed Bicycle Lanes

From City of Redlands

- Class I: Multi-use Bike Path
- Class II: Bike Lane
- Class II or Class III
- Class III: Signed Bike Route

Show Commuting Map

Map Transparency



Esri Rideshare

Commuting Map | Add Your Route | Other Redlands Data | About | Sign Up

Topo Map | Streets | Imagery

Add Your Route

Use the templates below to trace your route on the map. Do you have a favourite ride? Do you think there should be more infrastructure in the City? Add your ideas!

Commuting Routes

Cycling

Walking

Driving

Other

Recommended Route

Commuting Amenities

Bike Rack (existing)

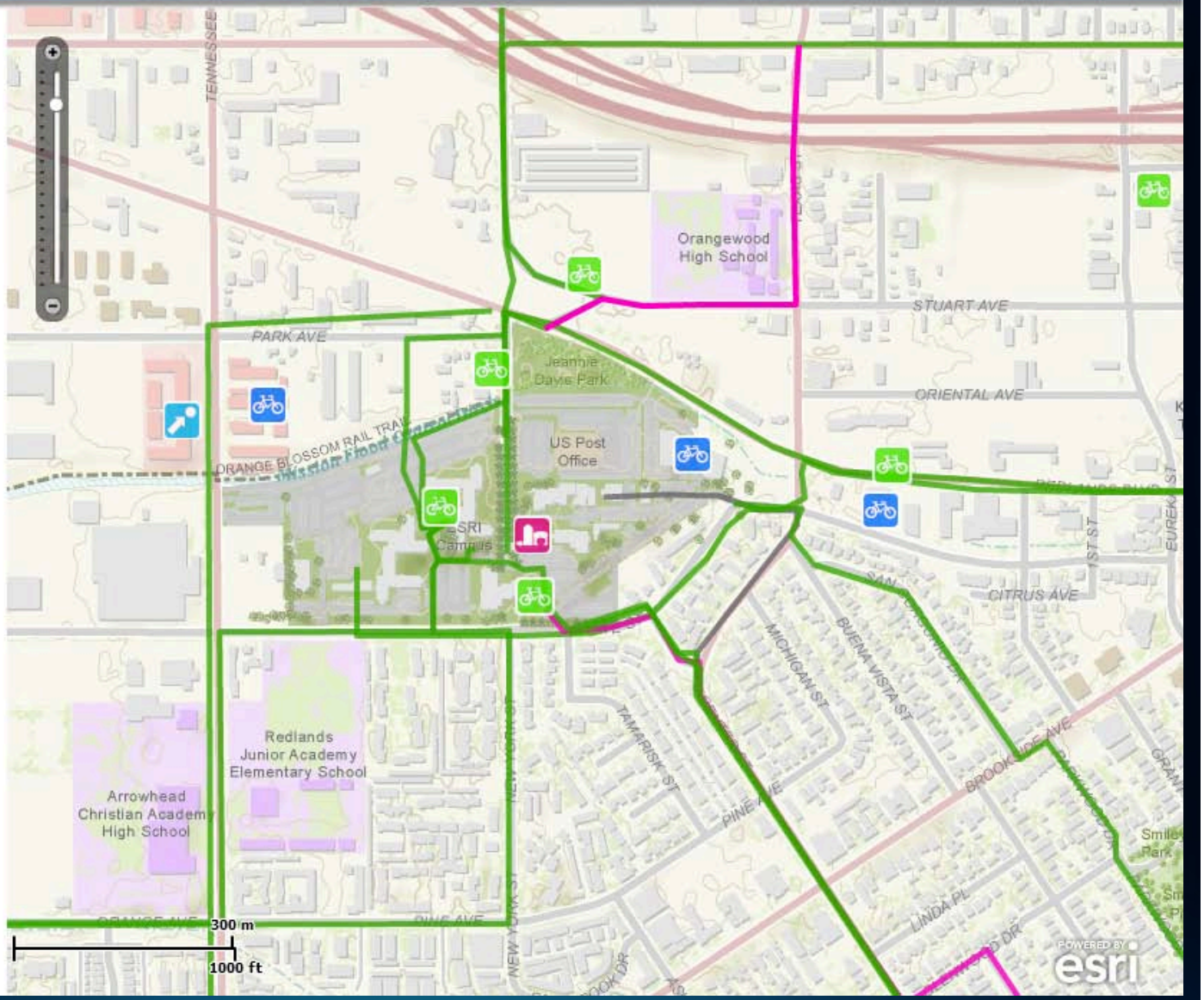
Bike Rack (proposed)

Grocery Store

Point of Interest

Show Commuting Map

Map Transparency

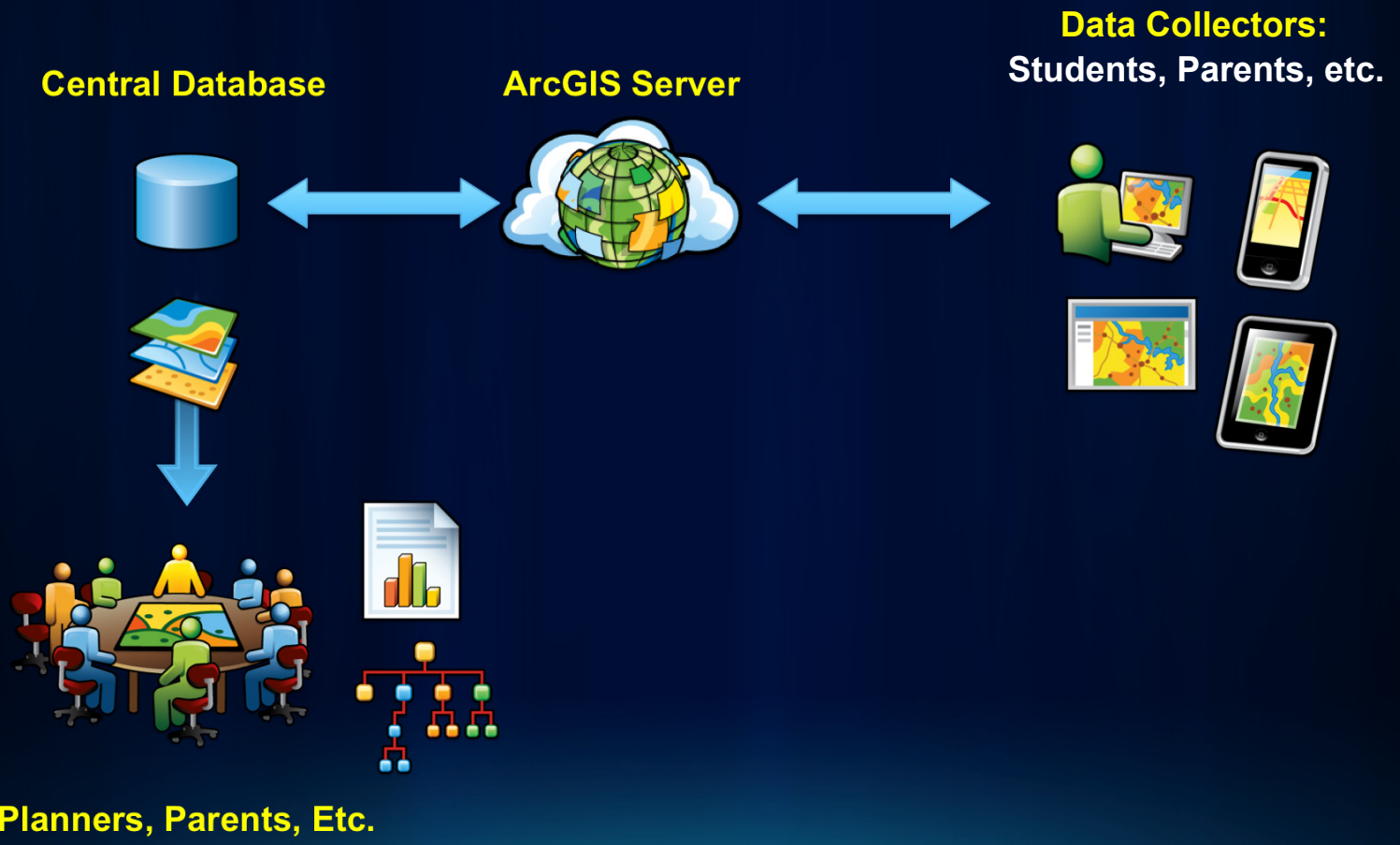


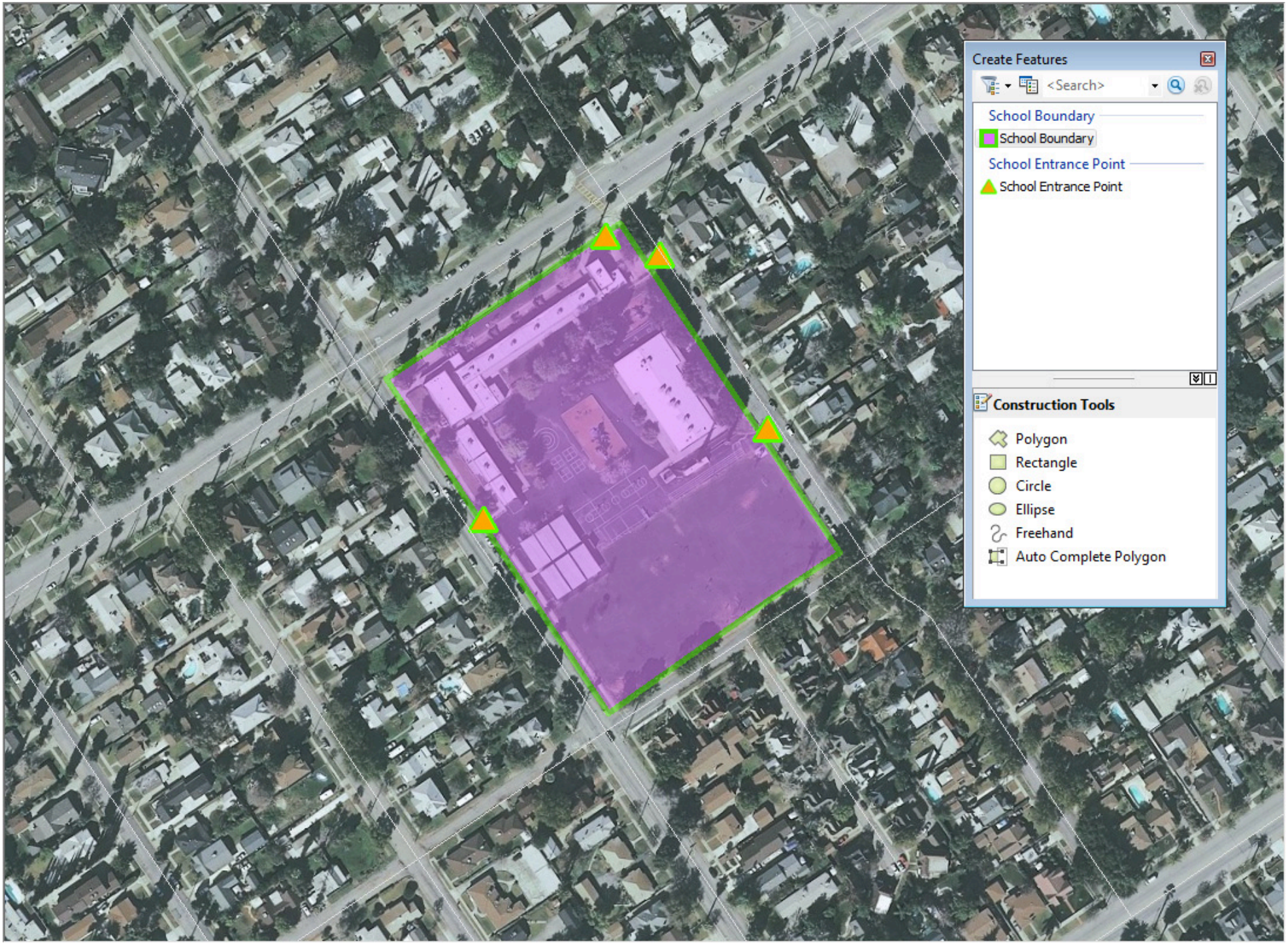
Safe Routes to School Planning

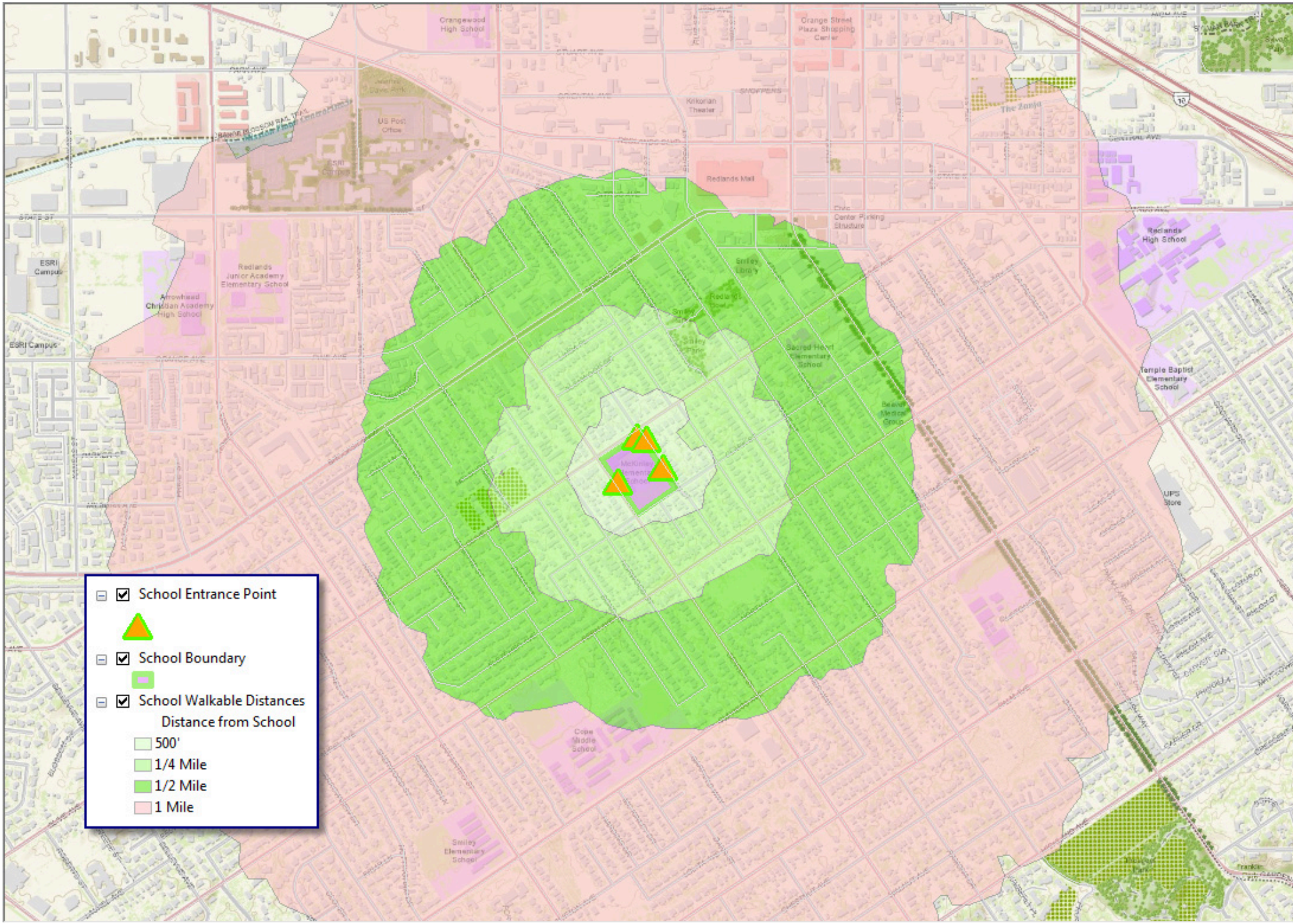
Data Collection, Site Design, Visualization

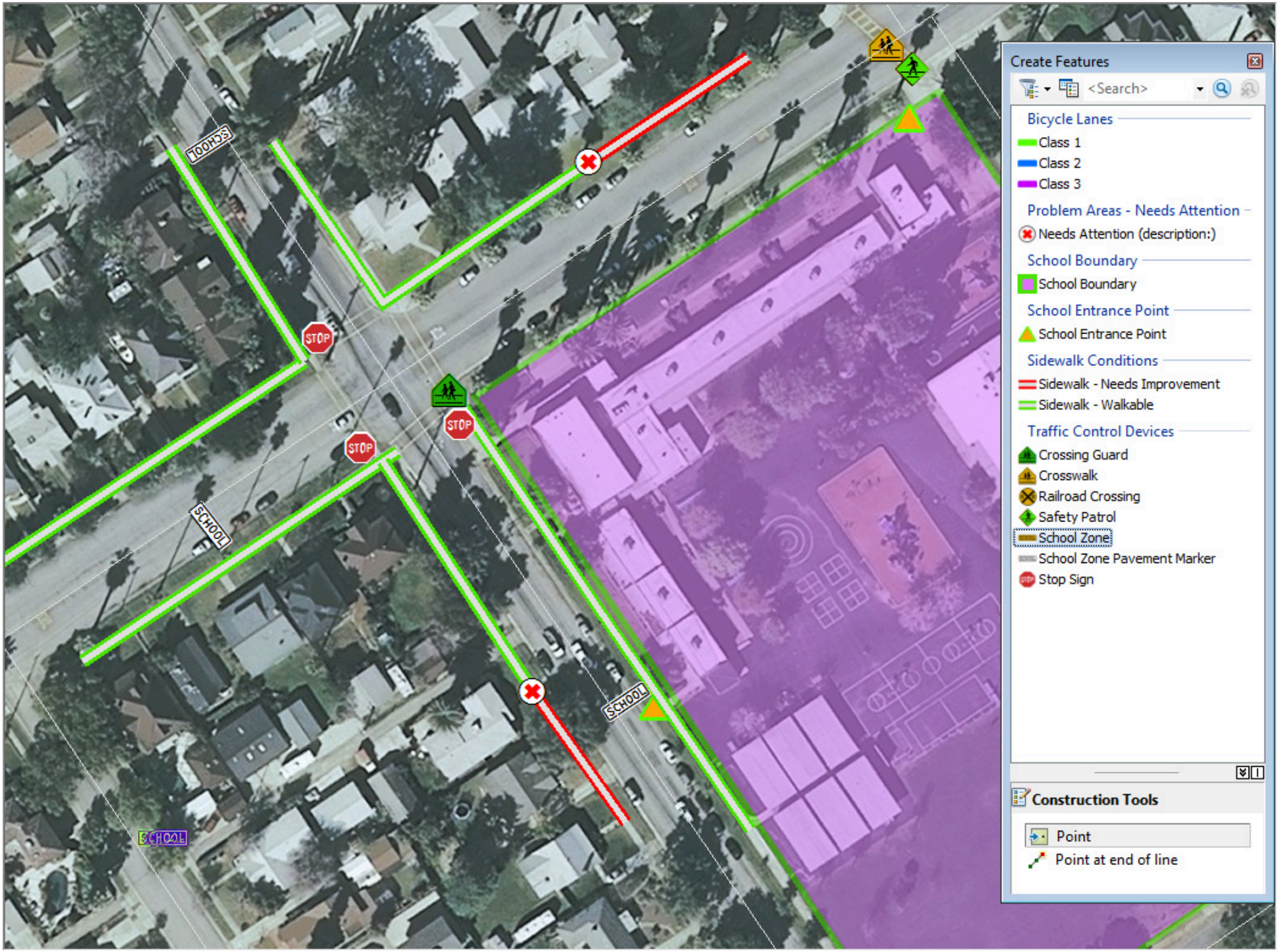
Collecting Data

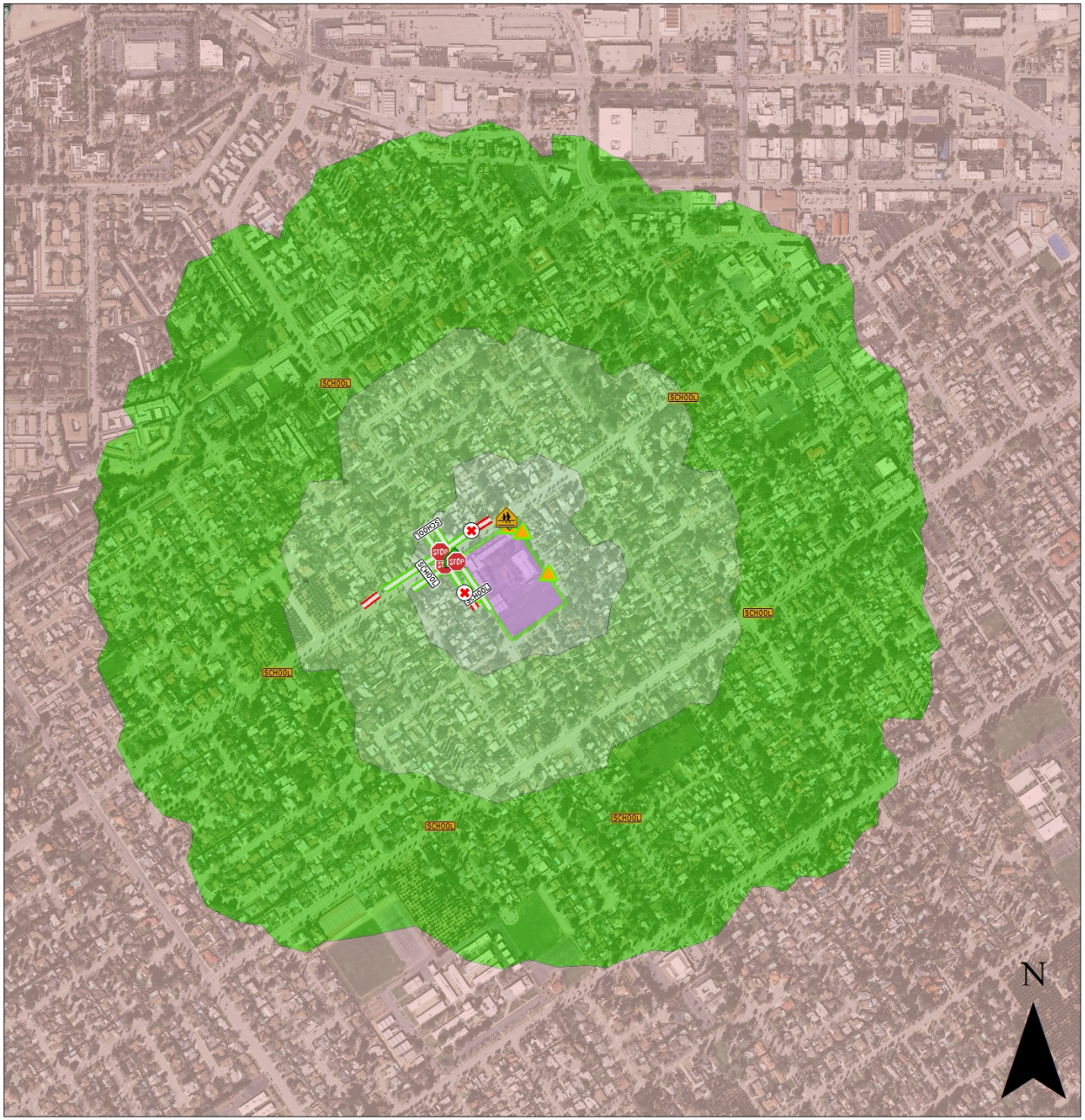
Park Locations, Grocery Stores, Walkable Sidewalks, etc…




Create Features
<Search>
School Boundary
School Boundary
School Entrance Point
School Entrance Point
Construction Tools
Polygon
Rectangle
Circle
Ellipse
Freehand
Auto Complete Polygon


School Entrance Point
School Boundary
School Walkable Distances
Distance from School
500'
1/4 Mile
1/2 Mile
1 Mile
Orangewood High School
Orange Street Plaza Shopping Center
Redlands Mall
Civic Center Parking Structure
Redlands High School
ESRI Campus
Redlands Junior Academy Elementary School
Arrowhead Christian Academy High School
Sacred Heart Elementary School
Temple Baptist Elementary School
Cope Middle School
Smiley Elementary School
UPS Store


Create Features
<Search>
Bicycle Lanes
Class 1
Class 2
Class 3
Problem Areas - Needs Attention
Needs Attention (description:)
School Boundary
School Boundary
School Entrance Point
School Entrance Point
Sidewalk Conditions
Sidewalk - Needs Improvement
Sidewalk - Walkable
Traffic Control Devices
Crossing Guard
Crosswalk
Railroad Crossing
Safety Patrol
School Zone
School Zone Pavement Marker
Stop Sign
Construction Tools
Point
Point at end of line
SCHOOL
STOP



Safe Routes to School Map

McKinleyville Elementary School

Legend

- Needs Attention
- Sidewalk - Needs Improvement
- Sidewalk - Walkable

Traffic Control Devices

Type

- 15mph Speed Zone
- Crossing Guard
- Crosswalk
- Railroad Crossing
- Safety Patrol
- School Zone
- School Zone Pavement Marker
- Stop Sign

Bicycle Lanes

Class of Bike Lane

- Class 1
- Class 2
- Class 3
- School Entrance Point
- School Boundary

School Walkable Distances

Distance from School

- 500'
- 1/4 Mile
- 1/2 Mile
- 1 Mile

0 250 500 1,000 1,500 2,000 2,500 Feet

Thank you!

Matthew Baker

matt_baker@esri.com