

# ***CRIME ANALYST TRAINING***

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King County Prosecutor's Office

Police-Prosecution Partnership (3PI)

August 2-4, 2017

# OVERVIEW OF CLASS – DAY 1

- **9:30 am – 12:30 pm**    *Training: CSU team and Crime Analysts*
- Introductions
  - Name, Agency, Experience with SNA, Experience with GIS
- Mapping techniques
- Importance of Analysis of Both People and Places (Julie)
- Overview of what we did in Jackson & Iowa (multi-jurisdictional value of the latter)
- 
- **12:30 - 1:30 pm**        *LUNCH*
- 
- **1:30 – 4:00 pm**        *Training: CSU team and Crime Analysts*
- Review of SNA Concepts/Techniques (Andrew)
  - Review of updated SNA and how to extract individual agencies
- What's already been done with SNA in King County (Andrew facilitate participants)
  - Each describe what they have done since the last training and the challenges they face
- King County data discussion
  - What do you currently have?
  - What else would be helpful?
  - Where do you go to get it?

# OVERVIEW OF CLASS – DAY 2 & 3

- **Day 2**

- **9:30 am – 12:30 pm**                      *Training: CSU team and Crime Analysts*

- Hands on learning
- Getting to know your data (updated SNA data through the end of July 2017)
- Creating networks

- 

- **12:30 - 1:30 pm**              *Lunch (on your own)*

- 

- **1:30 – 4:00 pm**              *Training: CSU team and Crime Analysts*

- Creating maps of the networks

- 

- **Day 3**

- **9:30 am – 1:00 pm**    *Training: CSU team and Crime Analysts*

- Presentations by each city

- Networks
- Maps
- Related future analysis

- Next Steps – where do you go from here (discussion after each city's presentation as well as regionally)

# GIS & CRIME MAPPING

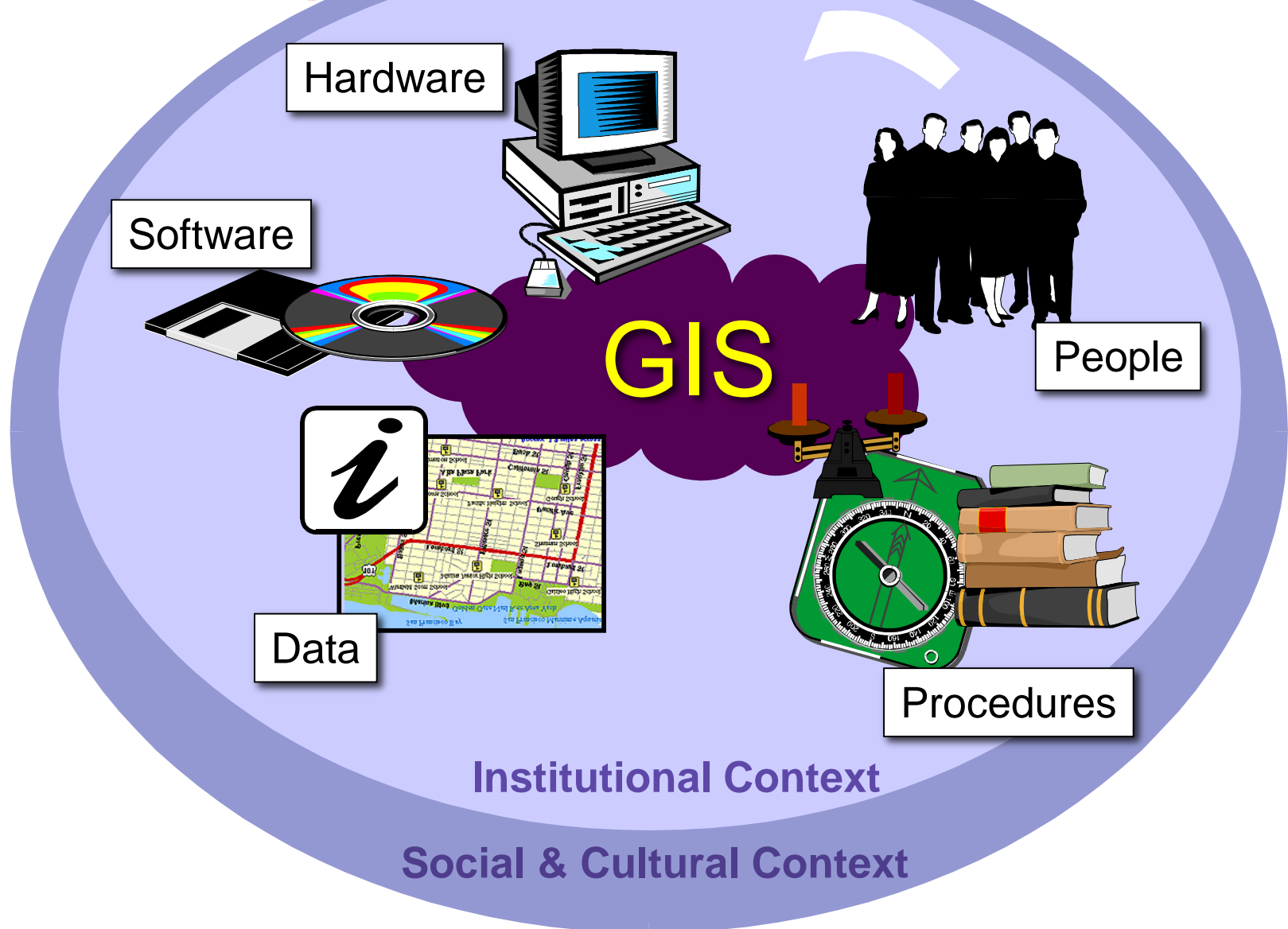
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# What is a GIS?

- Geographic Information System - special kind of computer information system
- Uses information about location that can be examined across space and time
- Combines a database and computerized mapping capability

Specifically: a set of computer tools and procedures used by people to collect, manage, analyze, and display information with a location

# GIS Components:



Offense/Arrest Report  
(RMS)

911 Call  
(CAD)

Prosecution  
(DA/Court System)

Parole/Probation

Community Context

Businesses

Schools

Parks

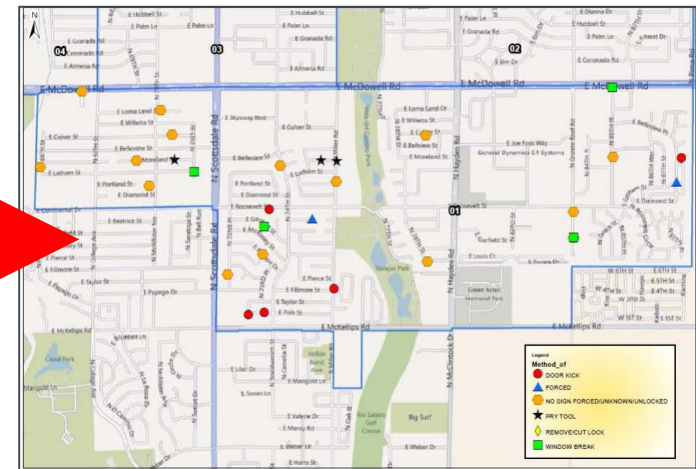
Alcohol

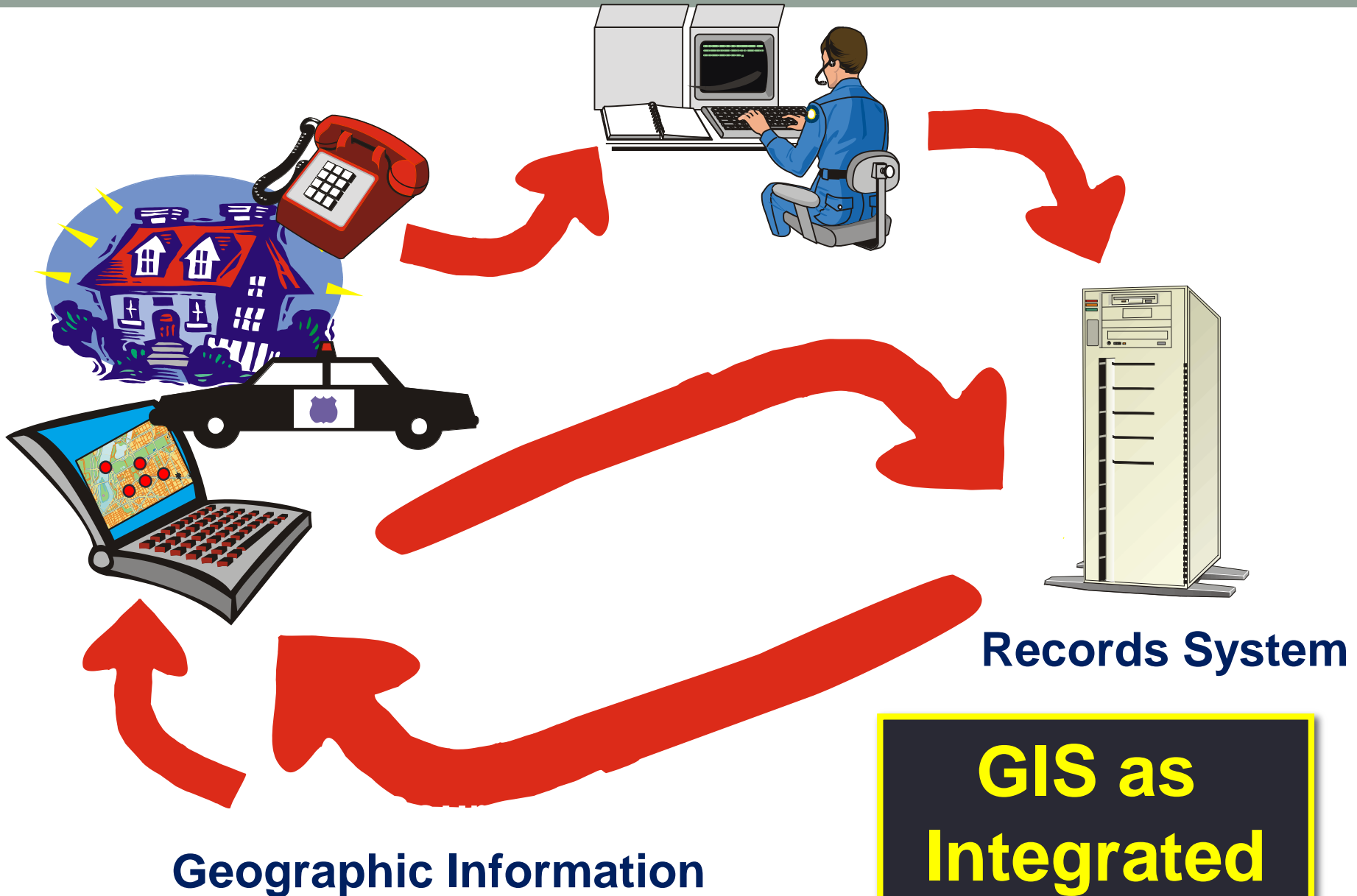
Establishments

Bus Stops/Routes

G  
I  
S

An Integrator  
for Effective  
Public Safety



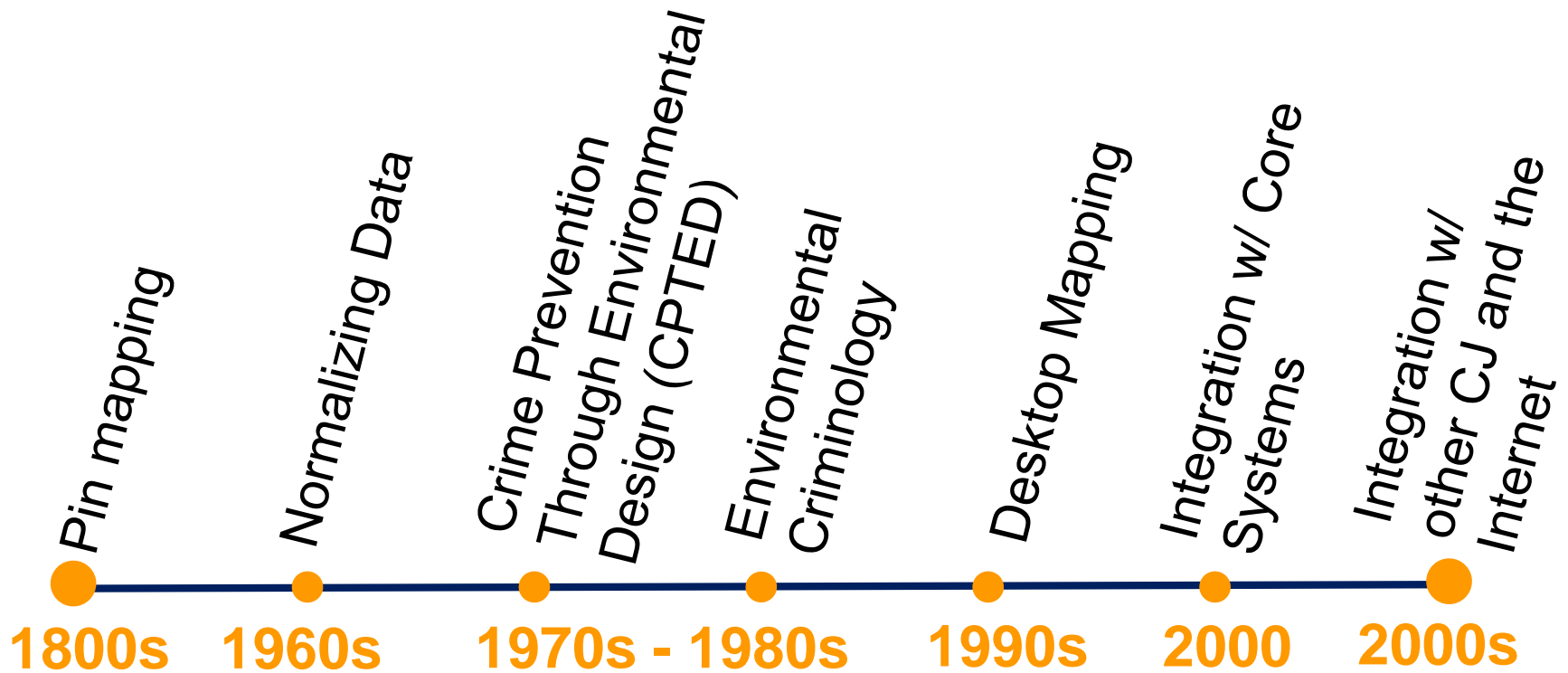


**GIS as  
Integrated  
Technology**



# Historical Overview

- Mapping has long history of use in law enforcement

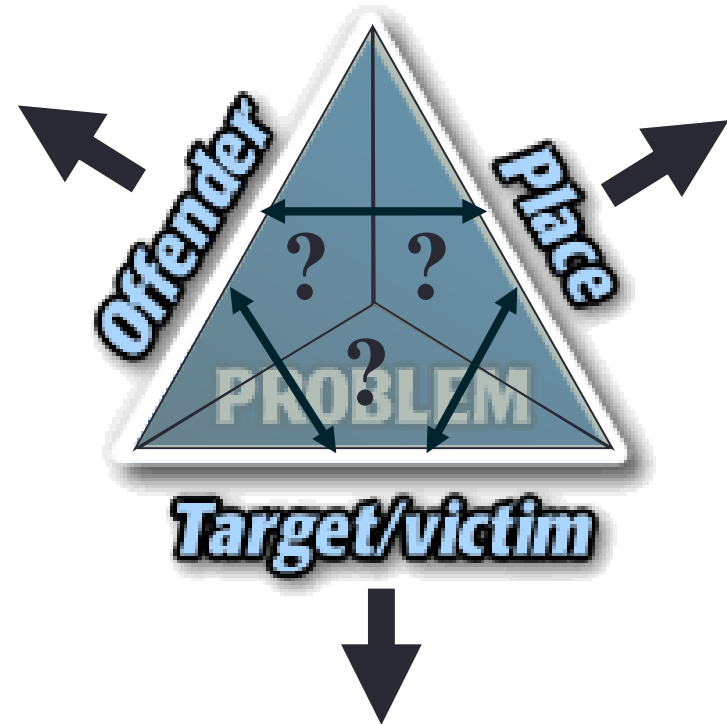


# IMPORTANCE OF GEOGRAPHY

- **The four dimensions of crime**

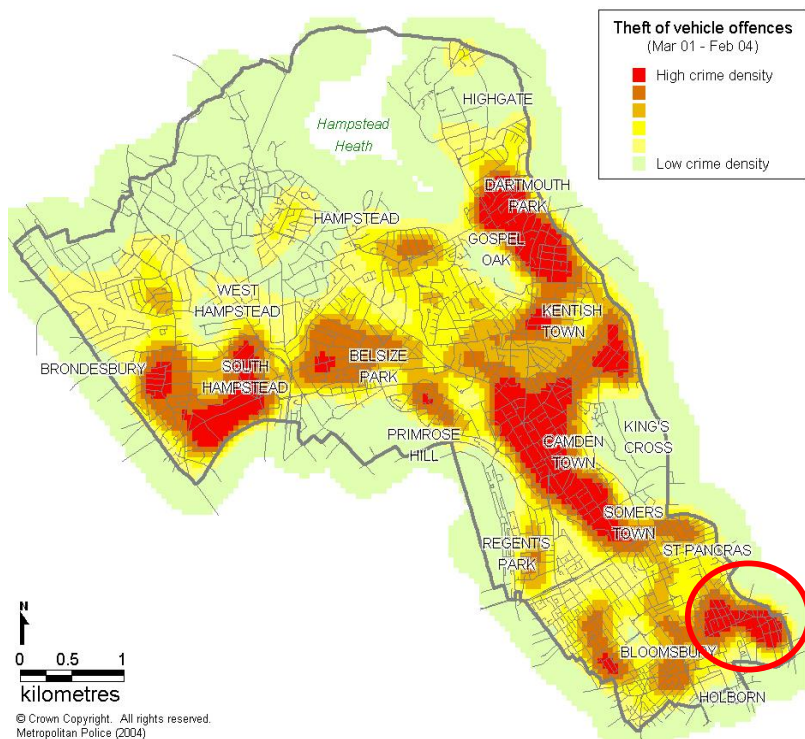
1. Legal (a law must be broken)
2. Victim (someone or something has to be targeted)
3. Offender (someone has to do the crime)
4. Spatial (it has to happen at a place - somewhere, in space and time)

- **Crime Analysis Triangle**



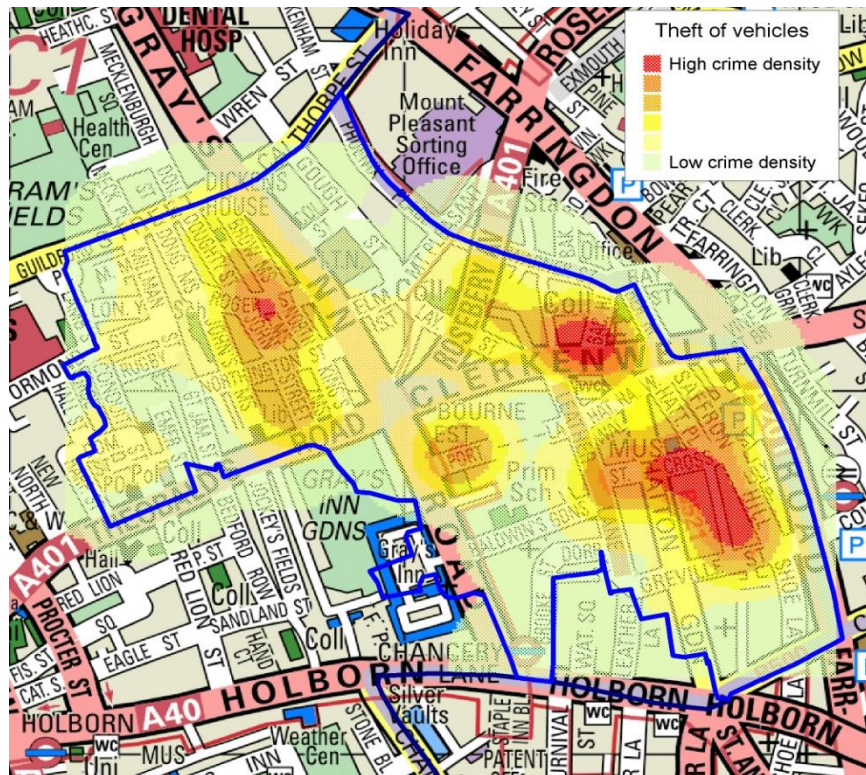
Future crime is “*six times more predictable by the address of the occurrence than by the identity of the offender. Why aren’t we thinking more about wheredunit, rather than just whodunit?*” (Larry Sherman, 1995)

# Clerkenwell Hotspot



From wheredunit to whodunnit

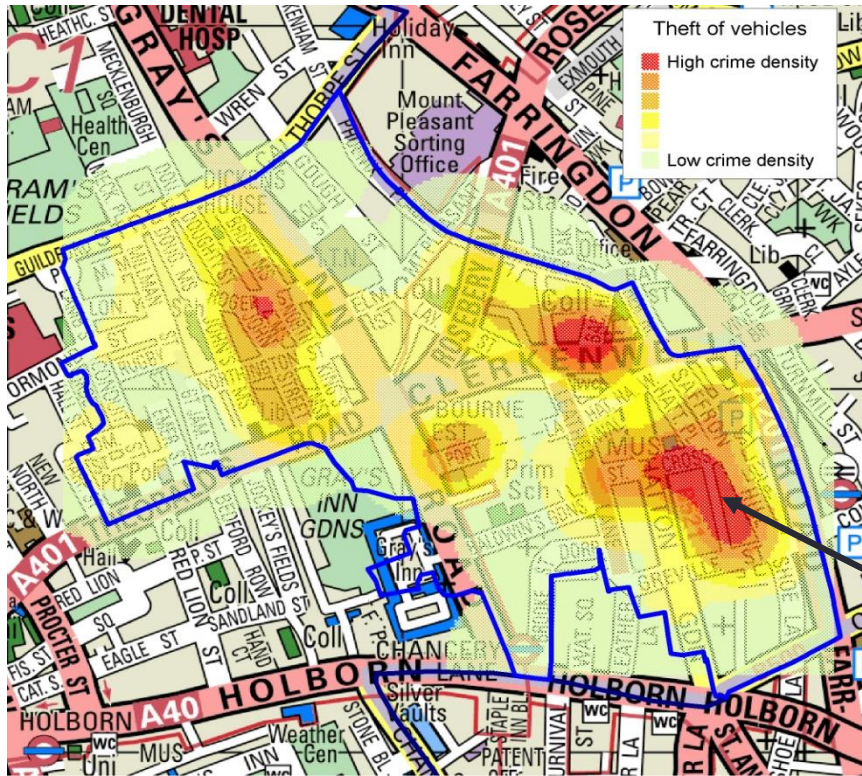
# Clerkenwell Hotspot



From wheredunit to whodunnit



# Clerkenwell Hotspot



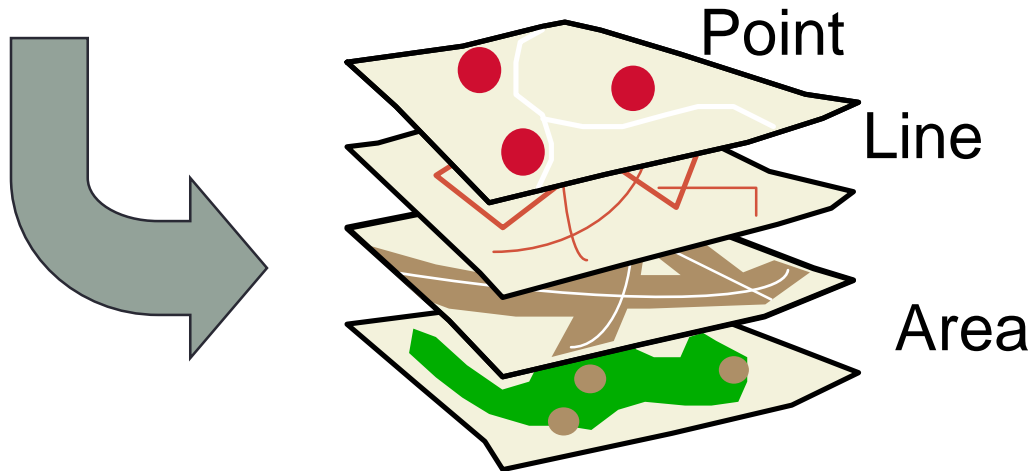
Vehicle type	Camden	Clerkenwell (n)	Clerkenwell(%)
Car	51%	41	18%
Sports or convertible	3%	5	2%
Scooter or moped	26%	95	42%
Motor cycle	13%	70	31%
Van	5%	3	1%
Other	2.0%	10	4%
Not known	0.5%	0	0%



From wheredunit to whodunnit

## Basic GIS Concepts:

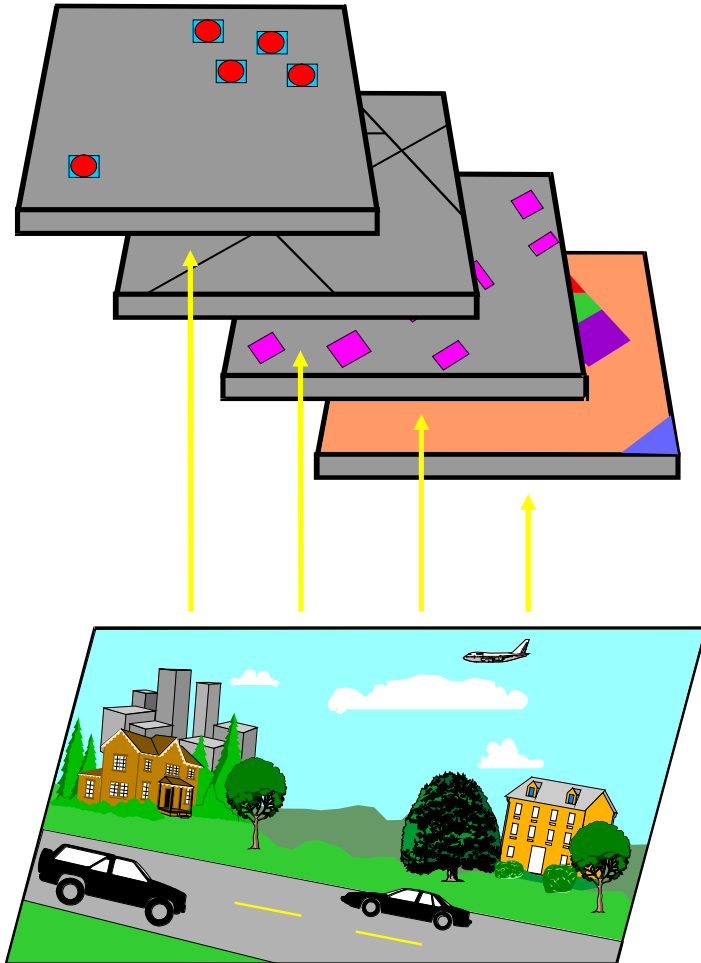
# Points, Lines and Areas/Polygons



- Point
  - Street Light
  - Bus Stop
- Line
  - Street
  - River
- Polygon/Area
  - Neighborhood
  - Police Beat

## Basic GIS Concepts:

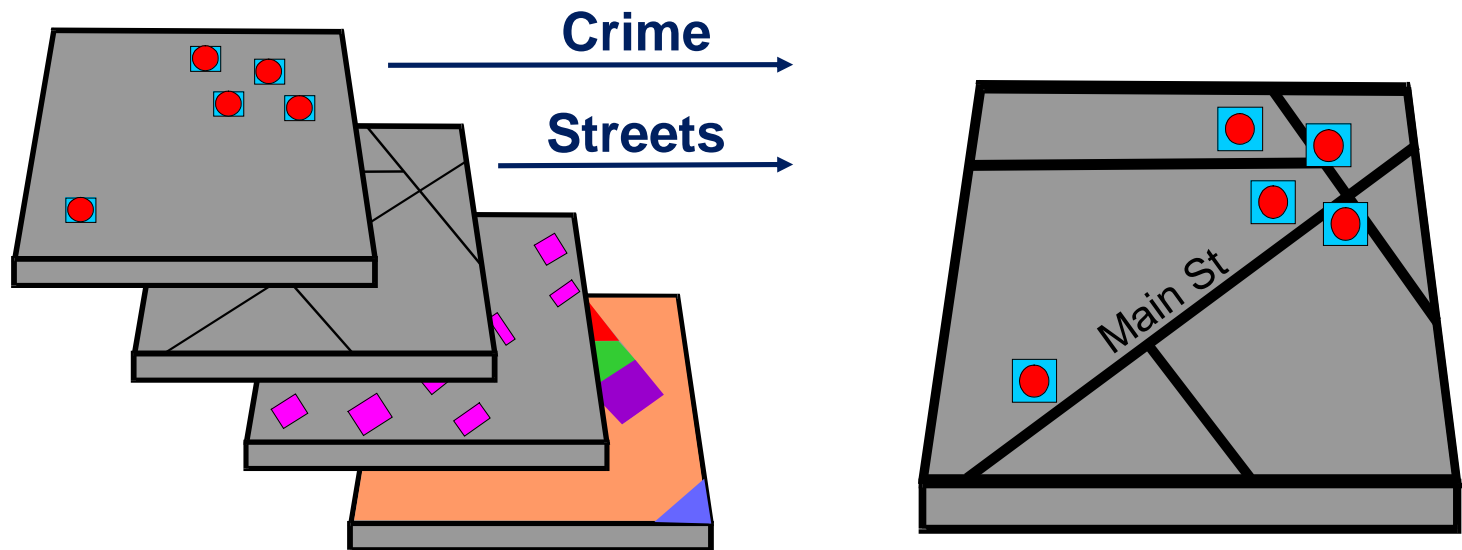
# How does GIS work?



- Information about your community is entered into a GIS as “layers”
- Each layer represents data of a similar type
- All the data attributes for each feature are stored in the GIS

Basic GIS Concepts:

# Overlaying Data:



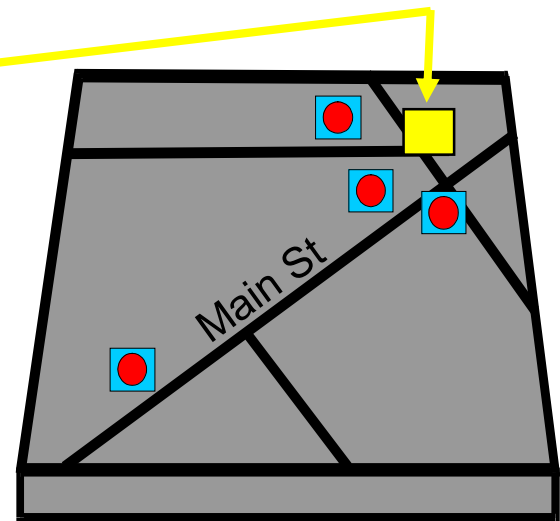
Any combination of these layers can then be analyzed and/or mapped.



## Basic GIS Concepts:

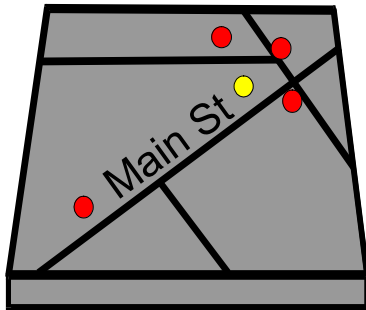
# Attributes and Locations, Points

Crime Type	Address	Date	Time
Robbery	999-2 <sup>nd</sup> St	May 22, 1997	22:00
Robbery	830 Main St	May 15, 1997	20:30
Robbery	100 Cross St	May 29, 1997	15:00
Robbery	1000 Main St	June 13, 1997	22:45
Auto Theft	997 Main St	June 3, 1997	23:00

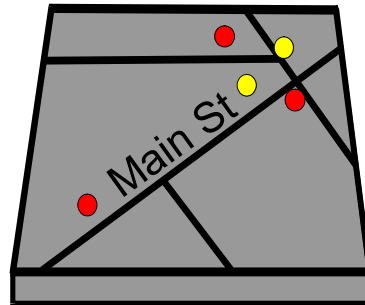


The database could be queried to find out where the robberies occurred on the map.

# Grouping/Categorizing

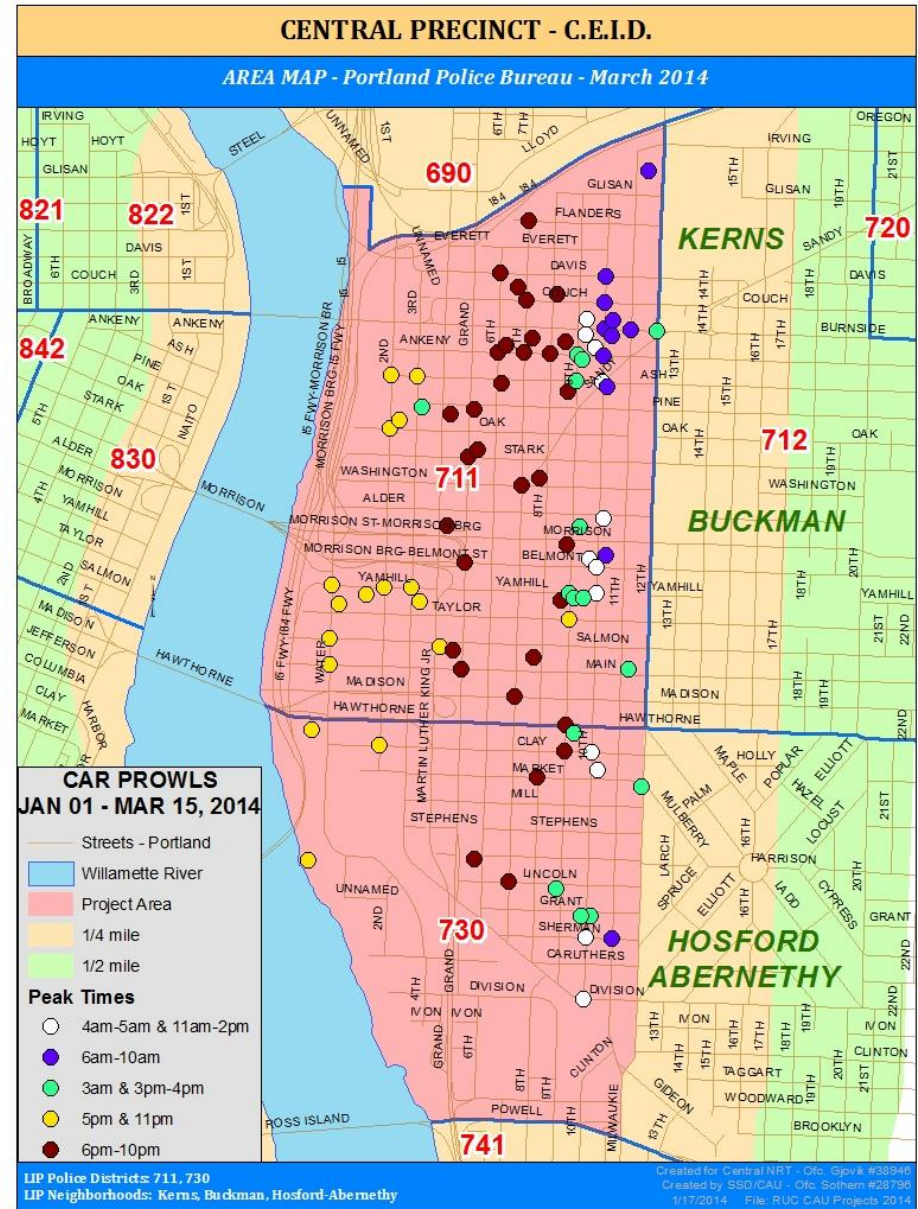


- Robbery
- Auto Theft



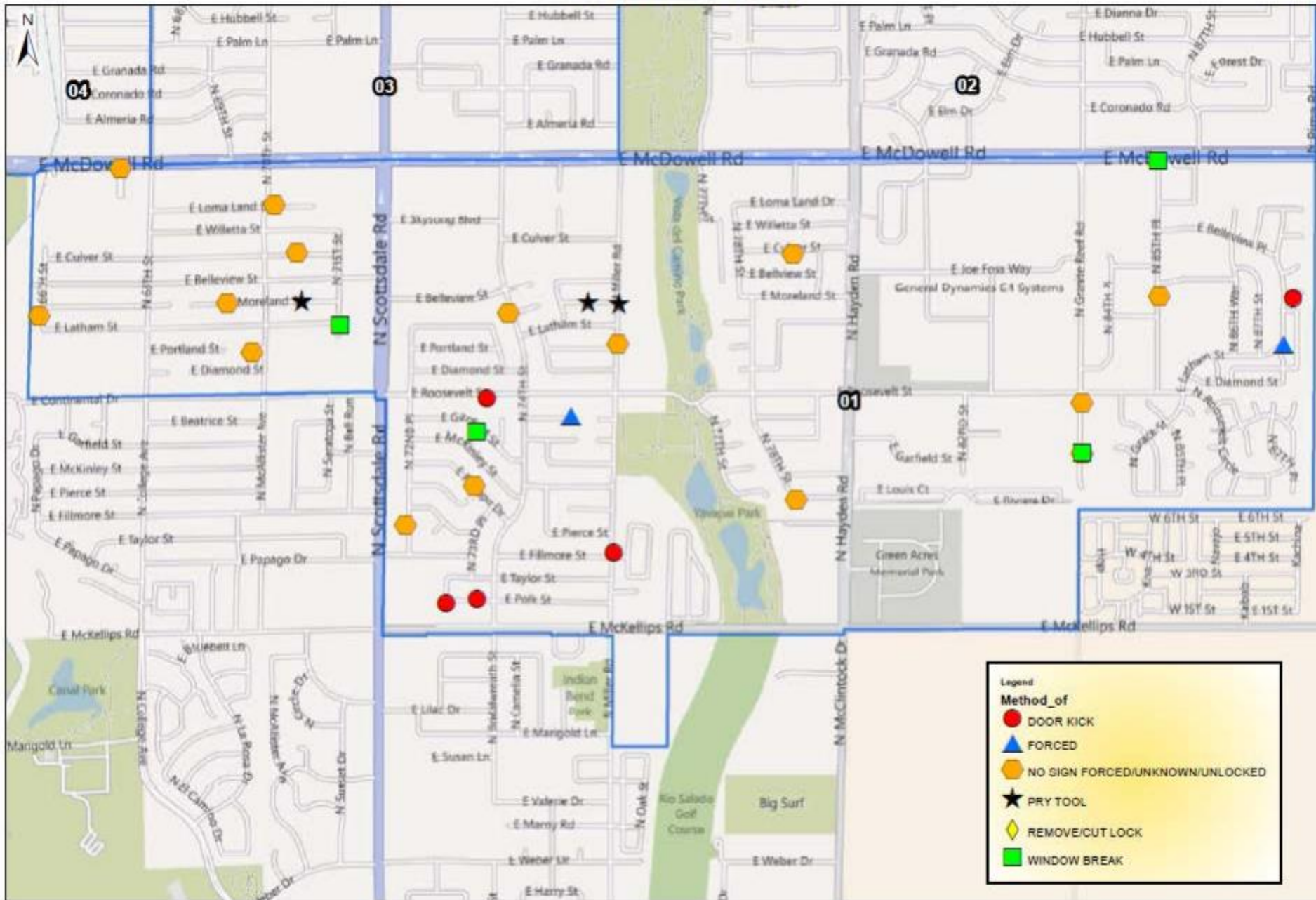
- May
- June

The data could be mapped by type of crime, date, time or MO.





09/12/2011 - 11/13/2011

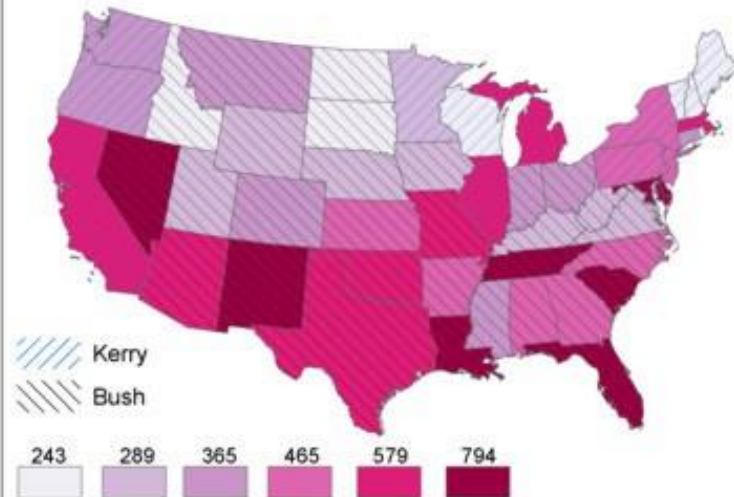




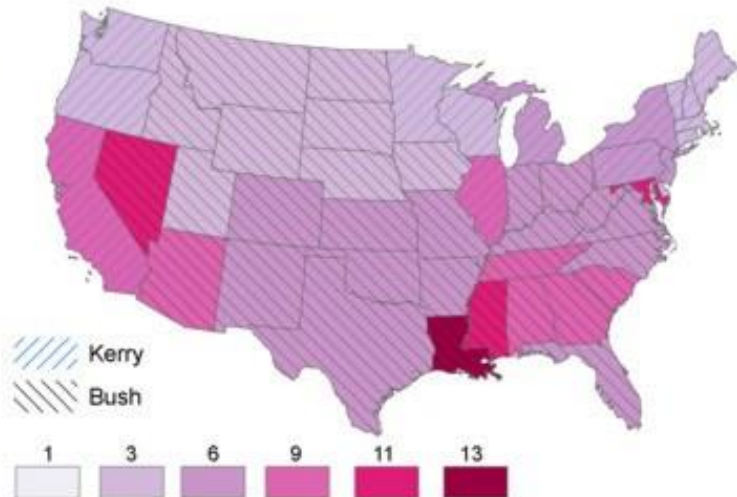
# Area/Choropleth Map

## Crime Rates in the US - 2003 vs. Election Results - 2004

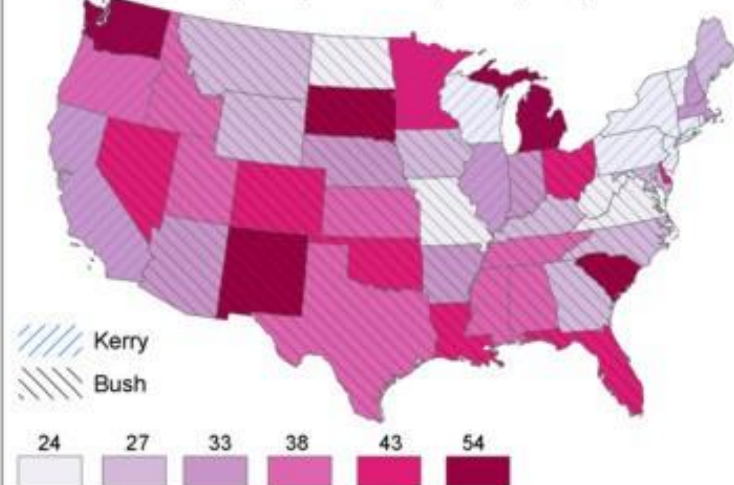
Violent crimes per 100,000 people



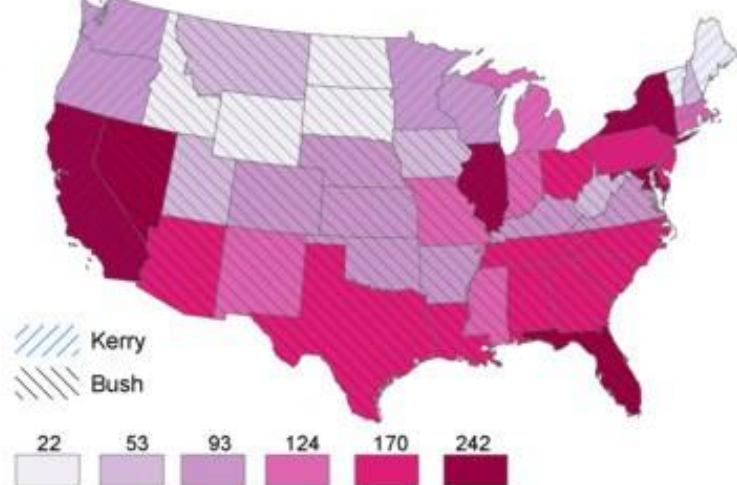
Murders per 100,000 people



Rapes per 100,000 people

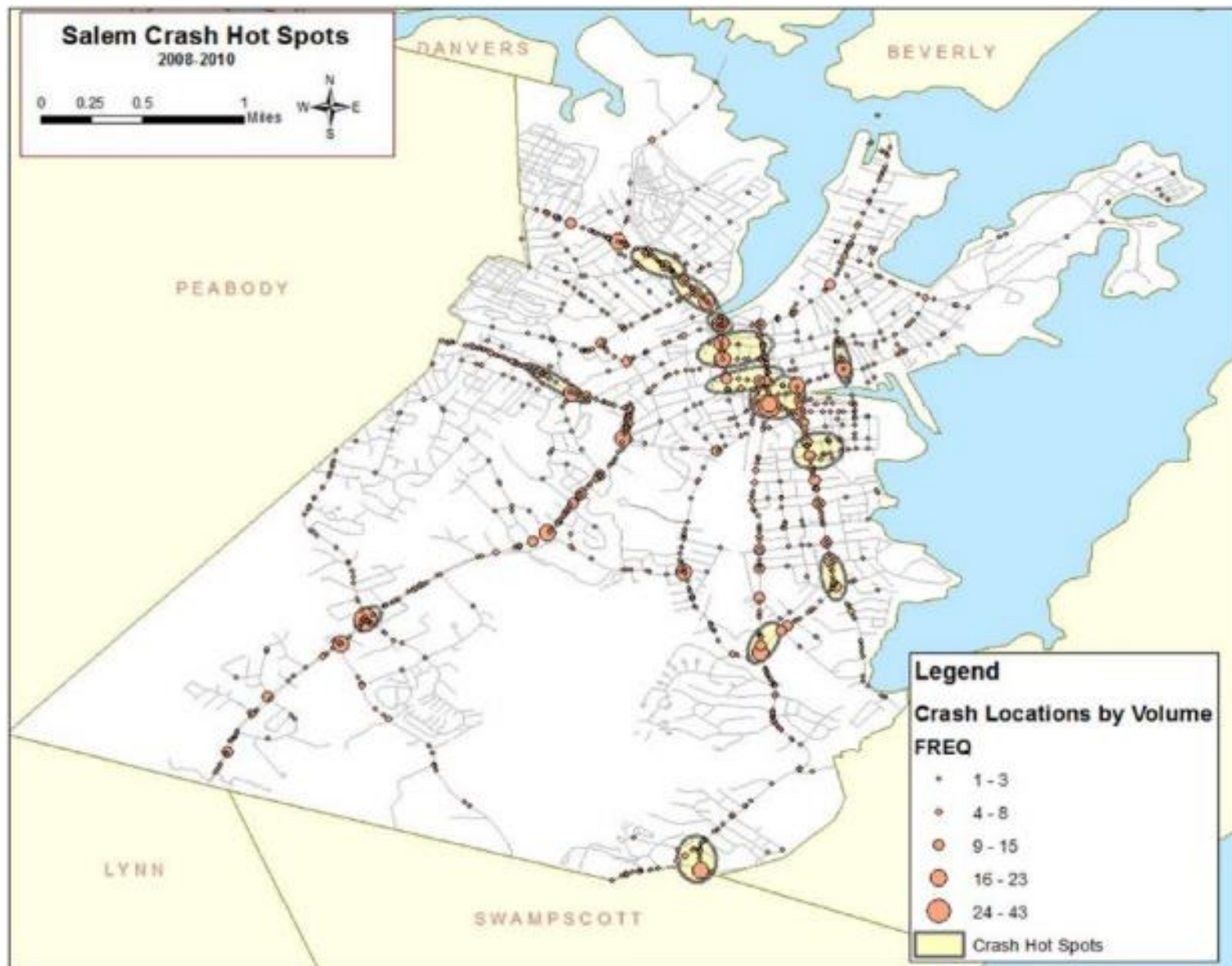


Robberies per 100,000 people

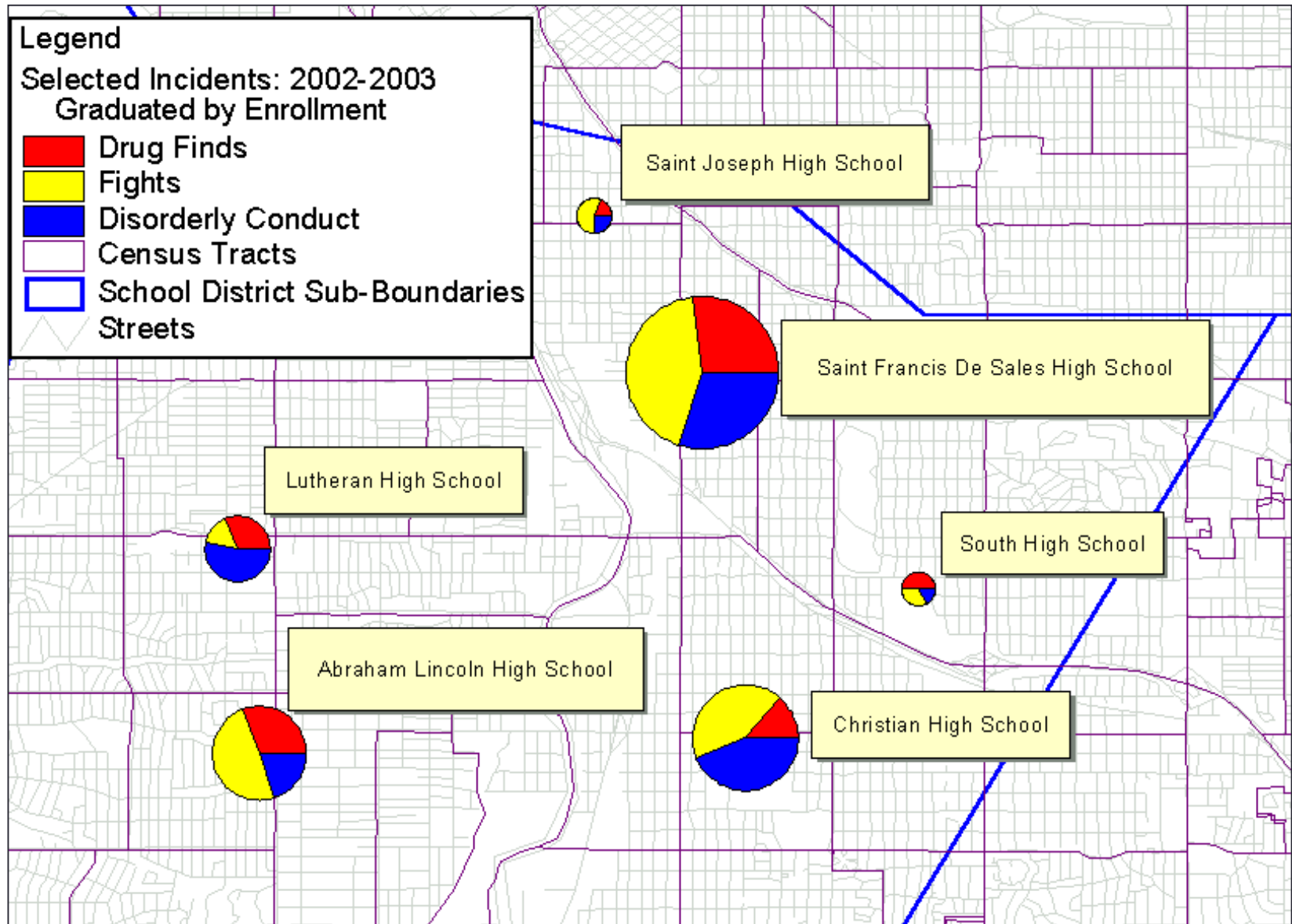


Source: *Crime in the United States, 2003, FBI, Uniform Crime Reports*

# Graduated Symbol Map

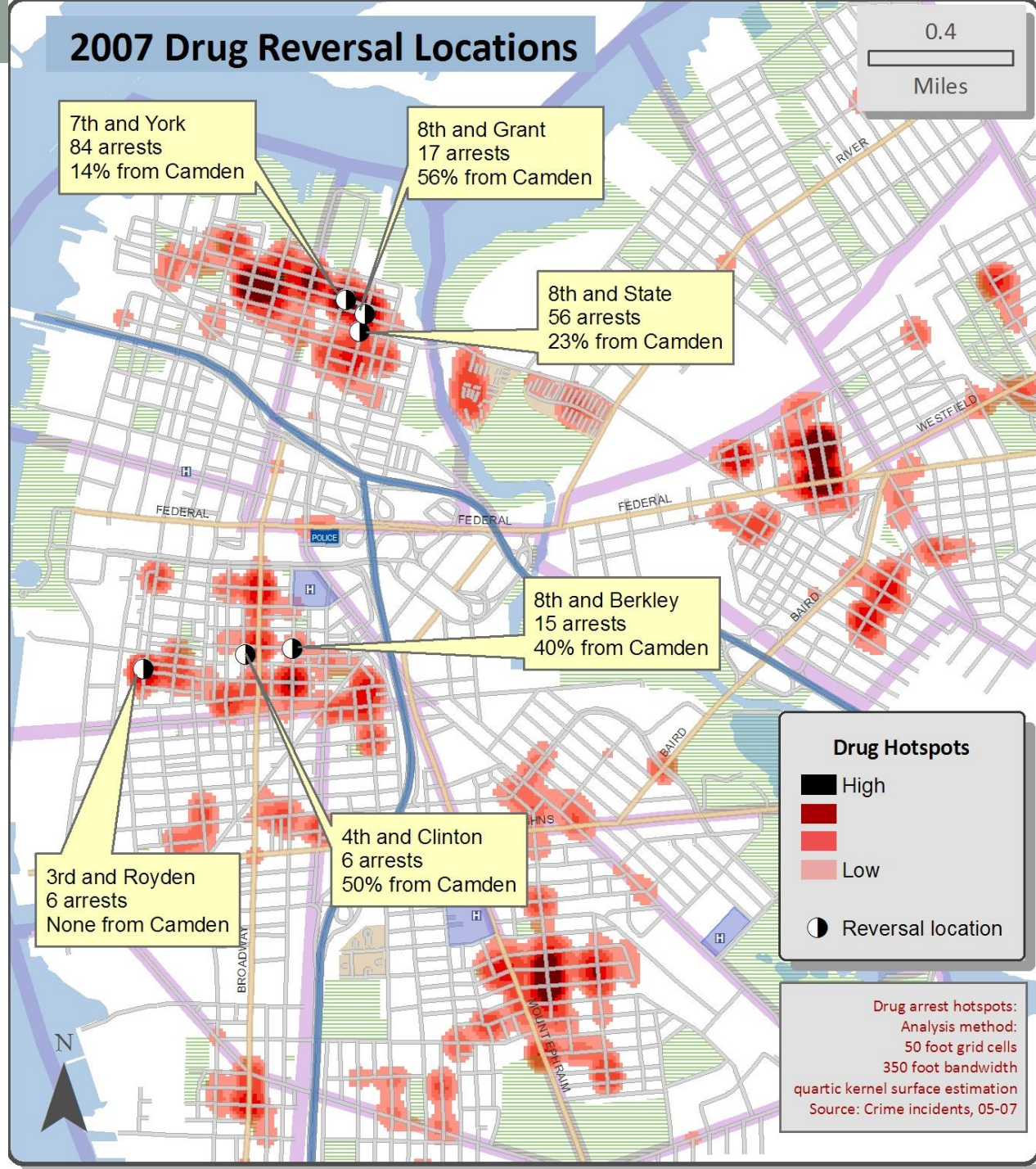


# Graduated Symbols + Chart

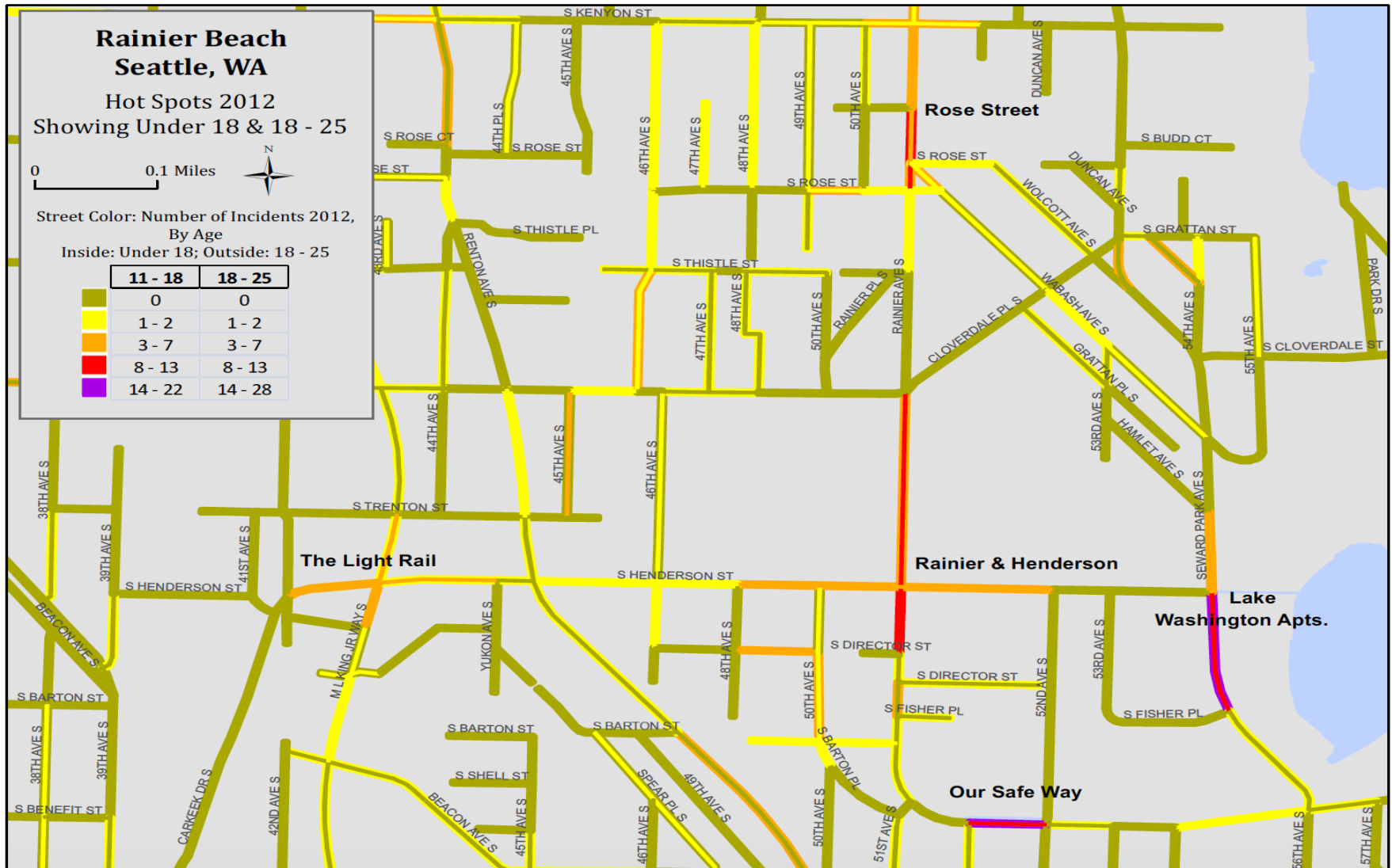




- Kernel Density (KDE)
- Temple University working with Camden Prosecutor's Intelligence Analysis Section
- Using Drug Hotspots to target resources

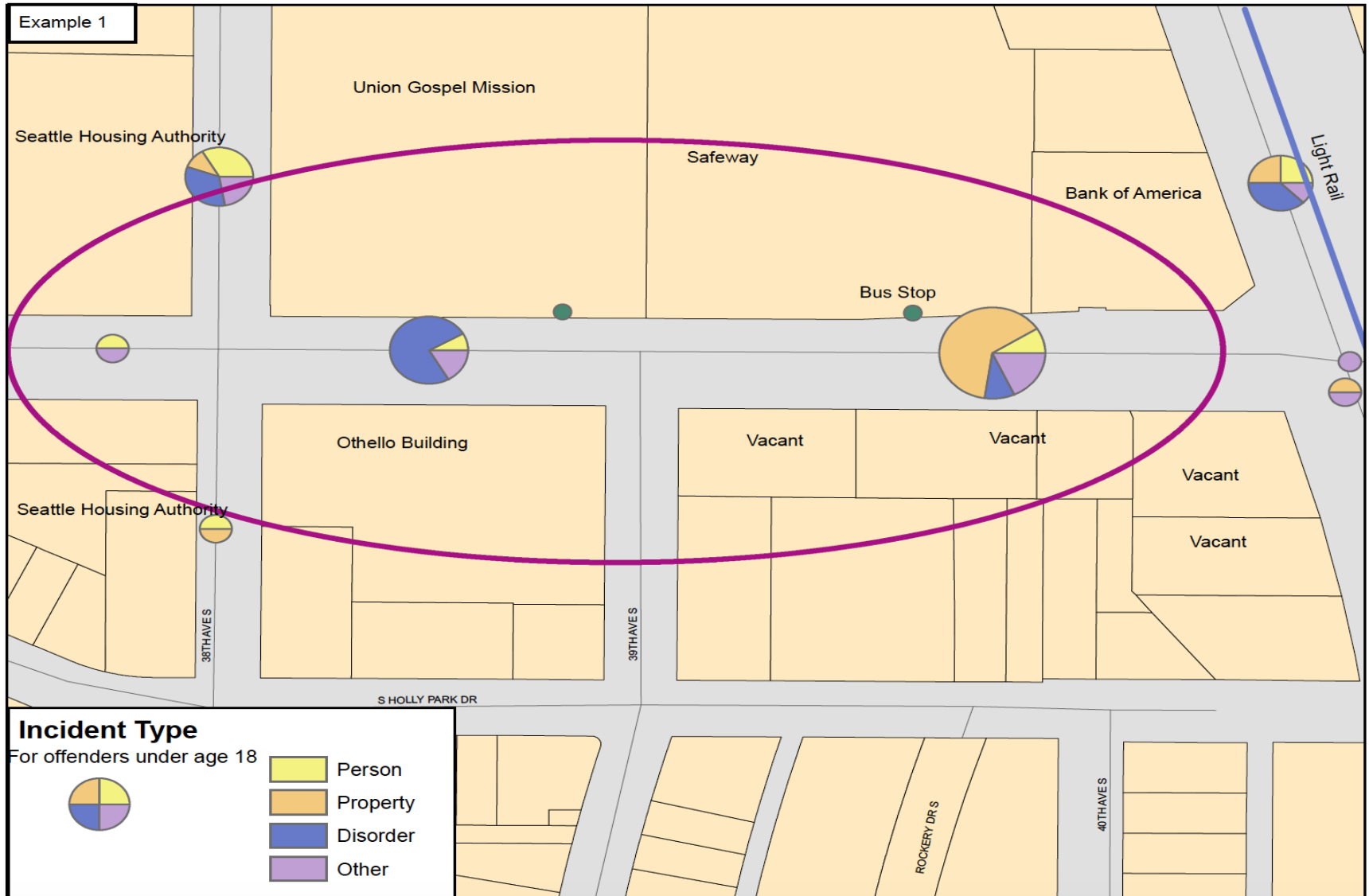


# Analyzing “hot” places





# Analyzing “hot” places



# ANALYZING “HOT” PLACES

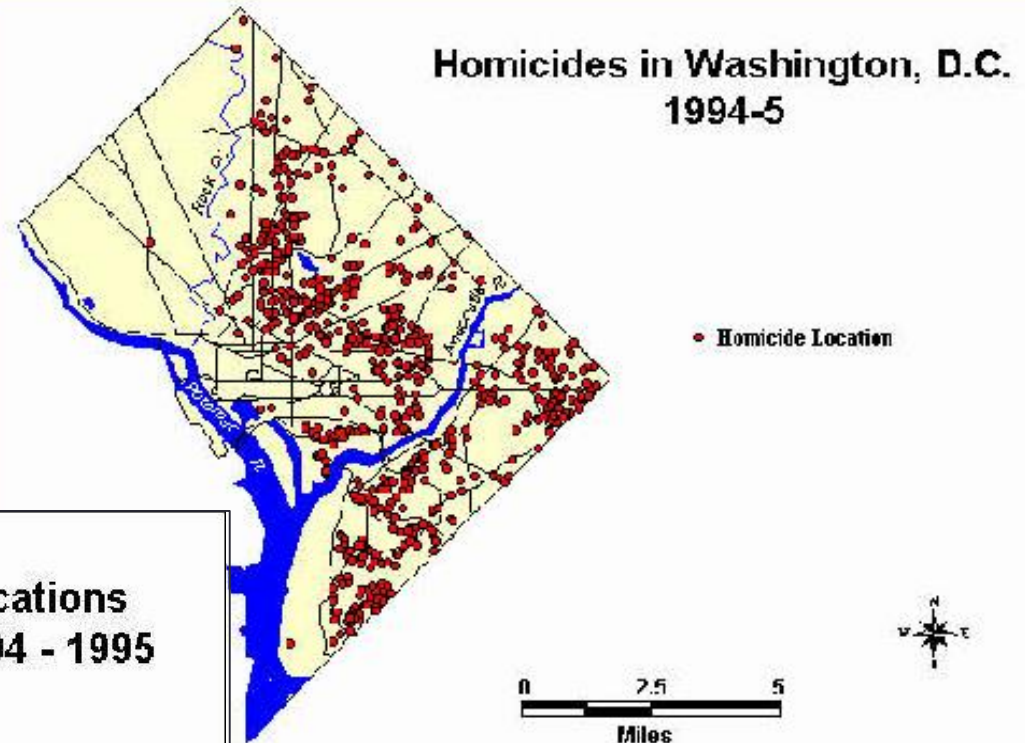


# THINGS TO CONSIDER WHEN MAPPING CRIME...

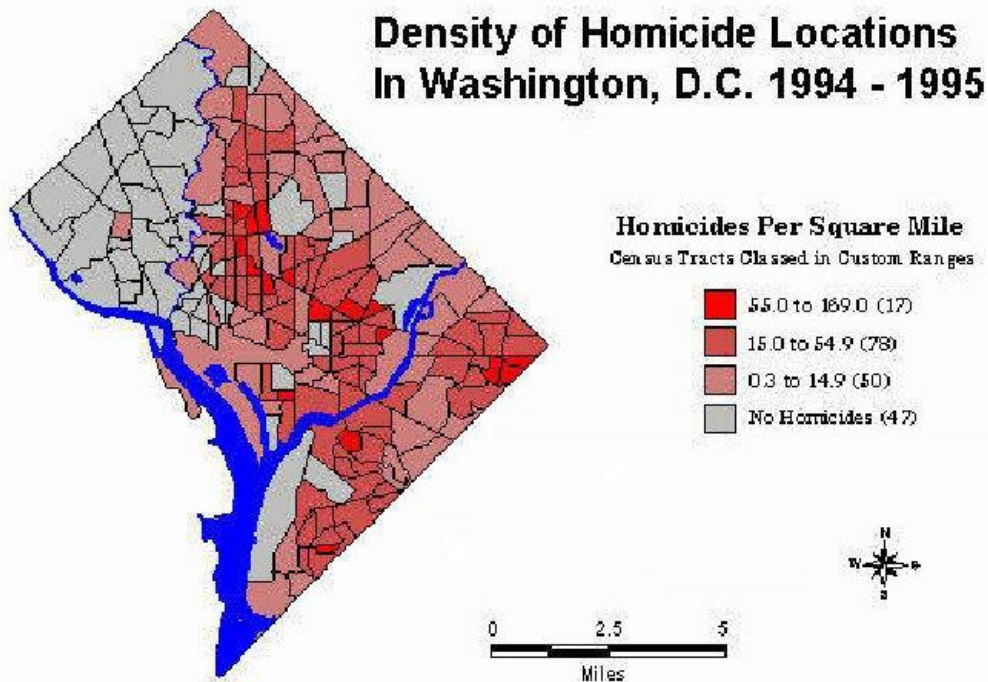
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# Points vs. Rates



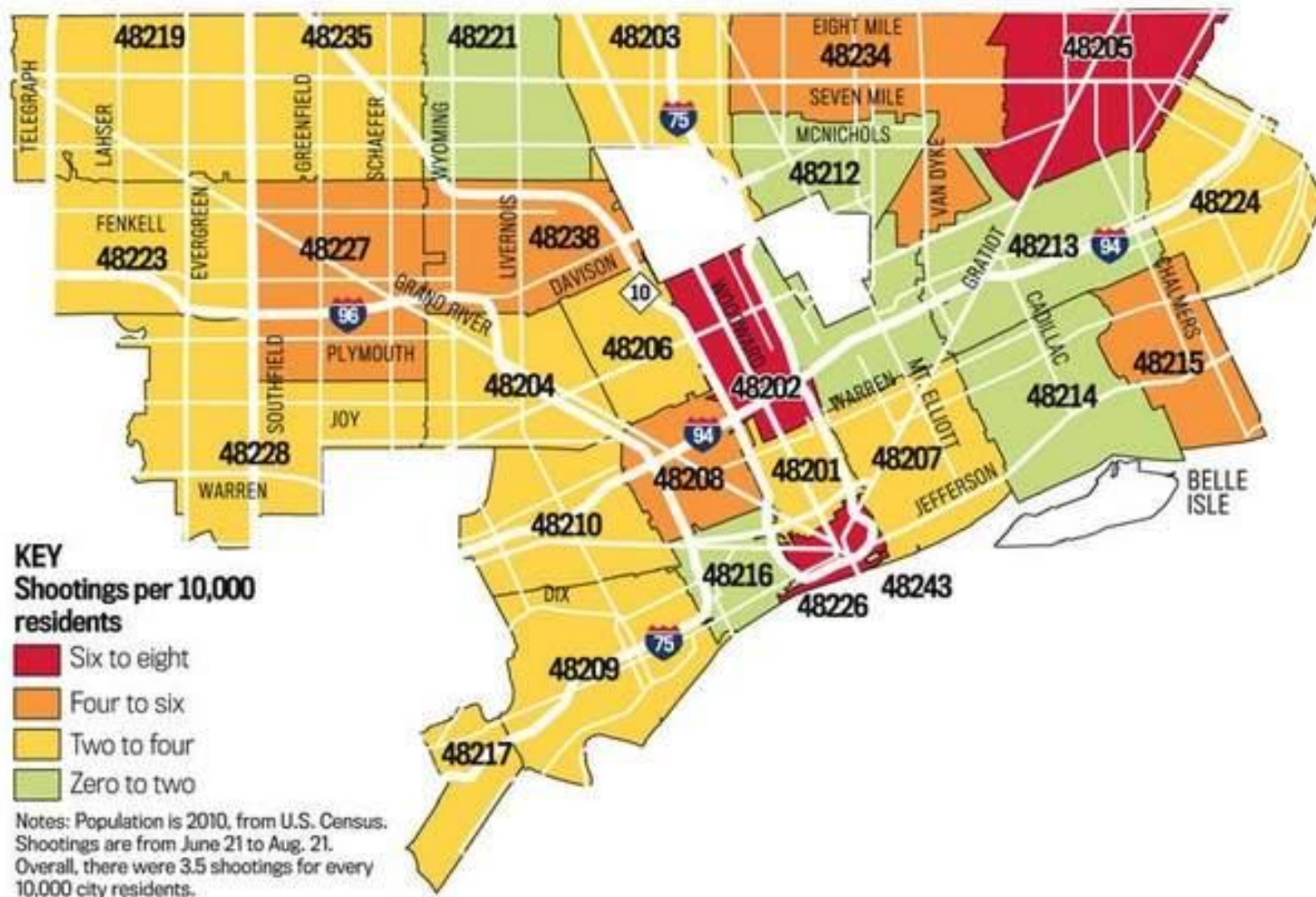
Source: Police Department / Author: Tom Sculler



Sources: Washington Metropolitan Police Department; 1990 Census of Population and Housing / Author: Dan Sadler

## Detroit's hardest hit

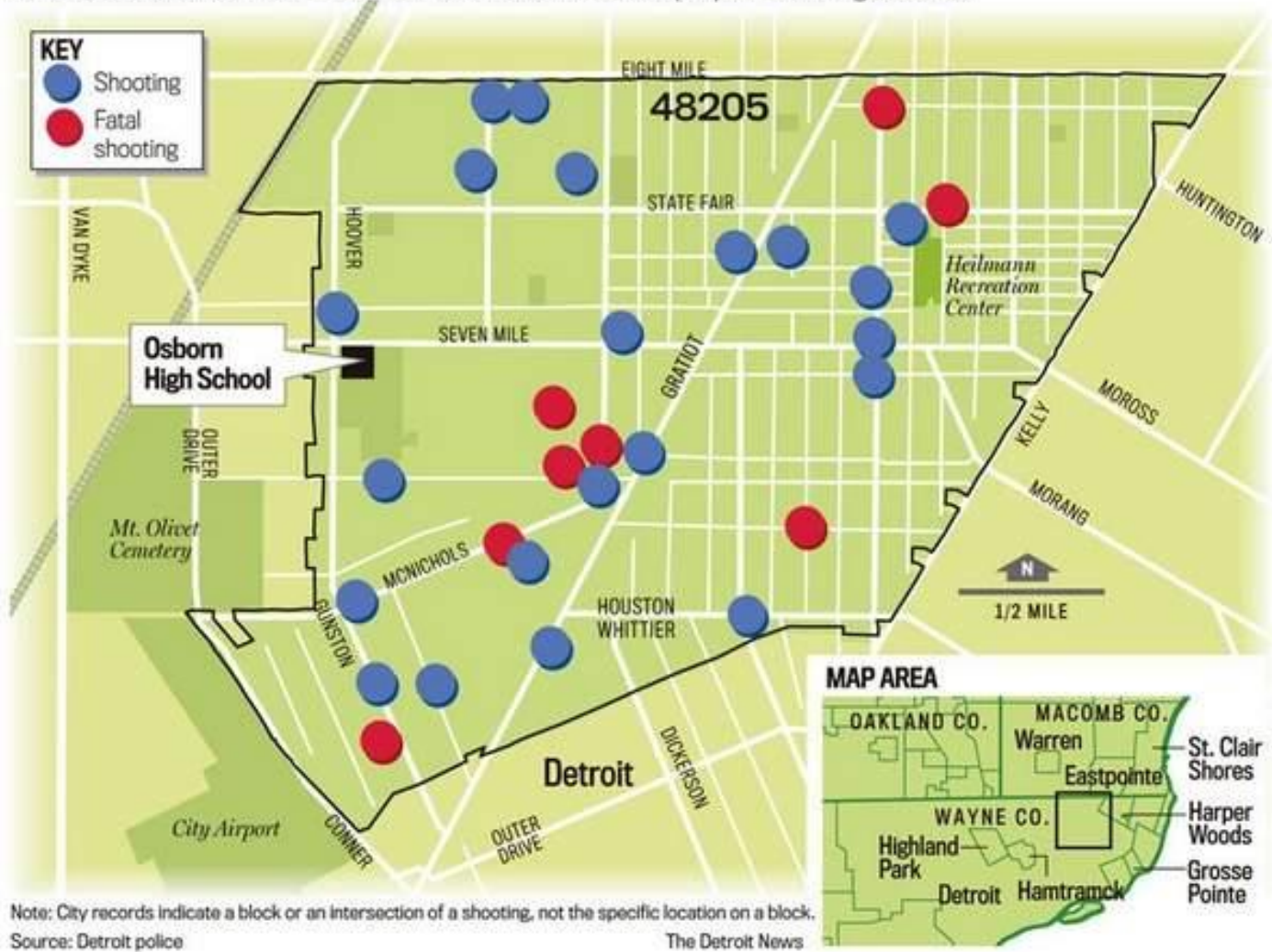
Shootings over a two-month period this summer in Detroit varied dramatically by neighborhood & zip code.





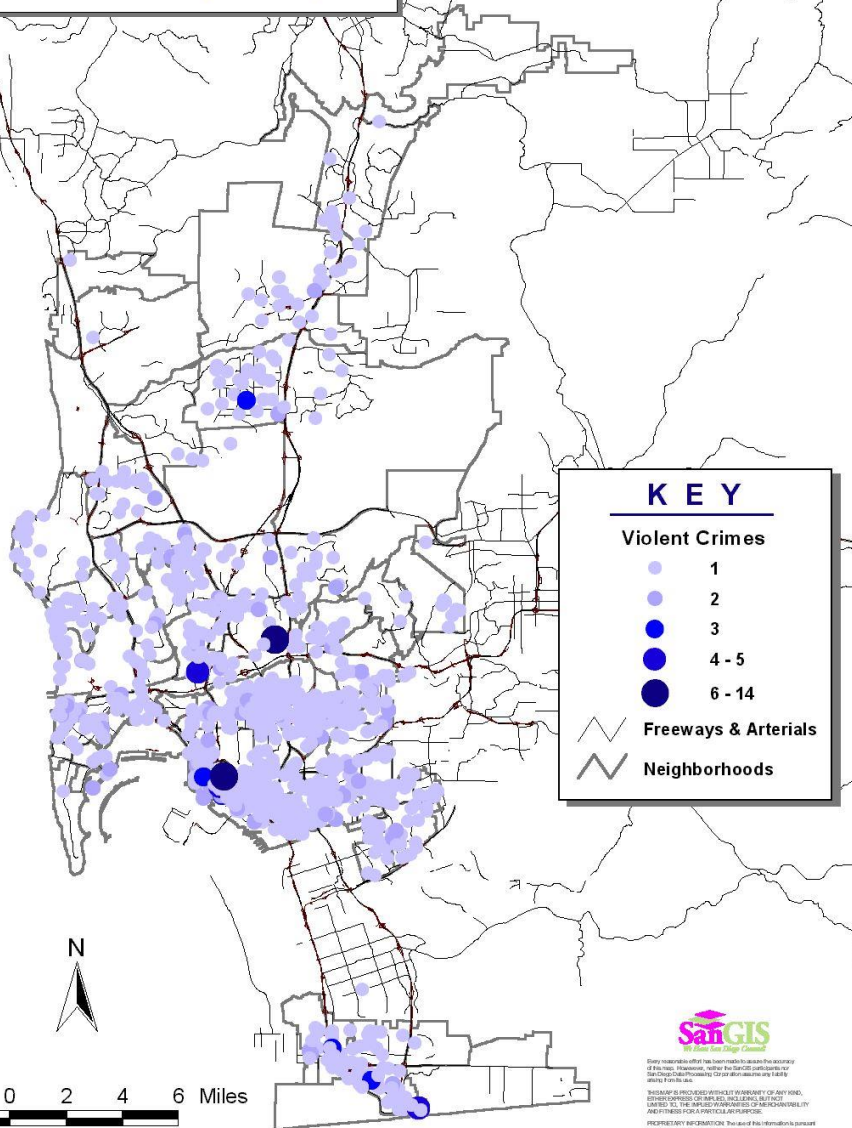
## Long, cruel summer

From June 21 to Aug. 21, 38 people were shot and eight died in the northeast corner of Detroit – which saw the most shootings of any ZIP code in the city. Although the 48205 ZIP code has just 6 percent of the city's residents, it accounted for one-seventh of its murders and more than a tenth of the 303 people shot during that time.

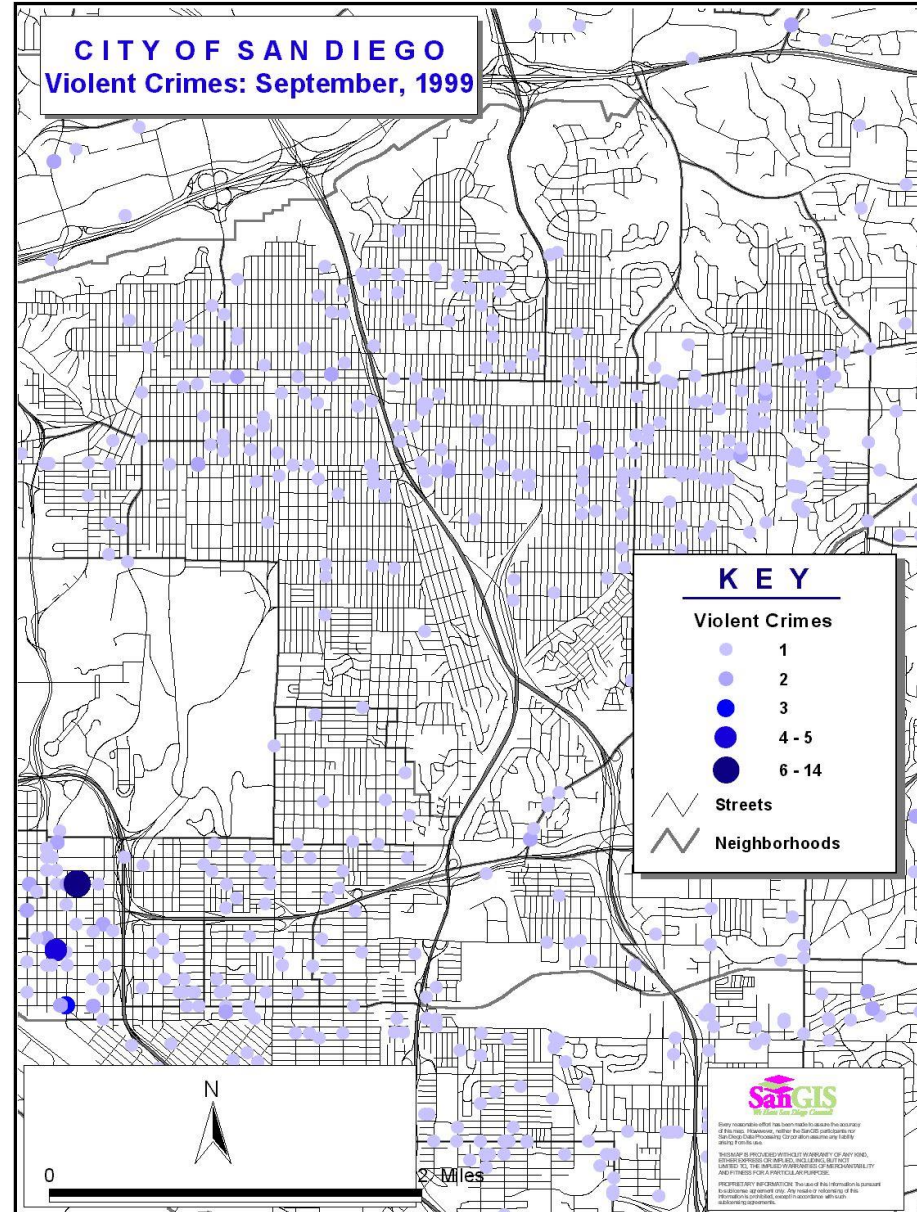


# Scale Matters

## CITY OF SAN DIEGO Violent Crimes: September, 1999



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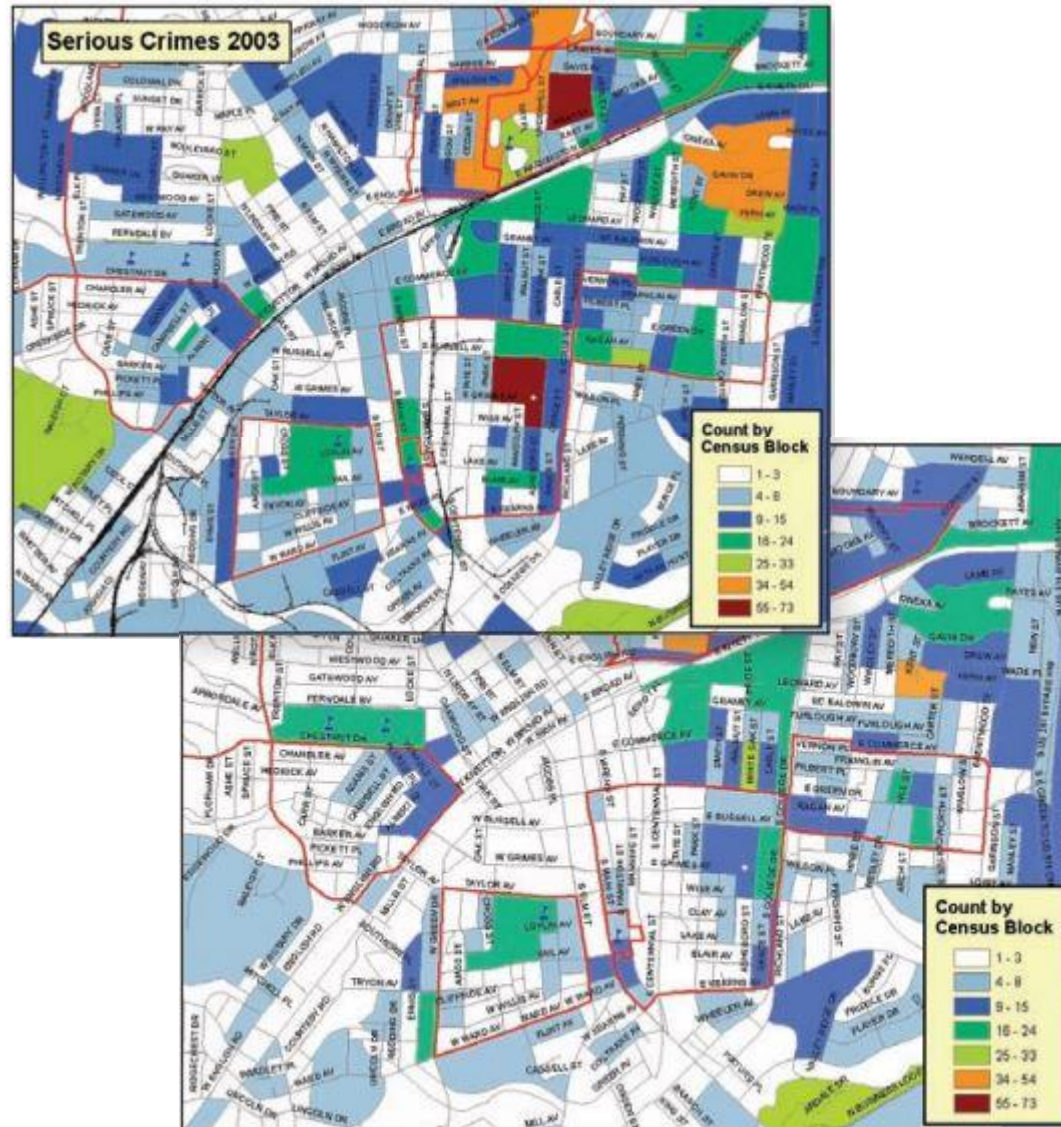


# Convenience Store Robberies in Chula Vista 2002-2006 (through 5/19/2006)

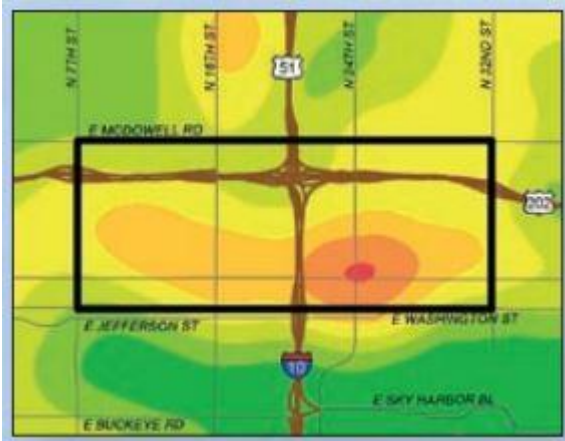




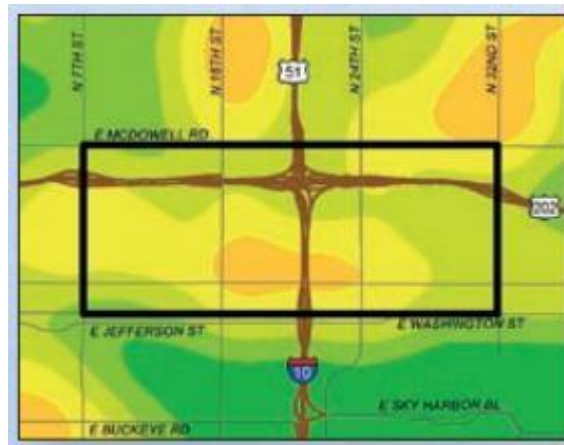
# Hot Spots: Choropleth



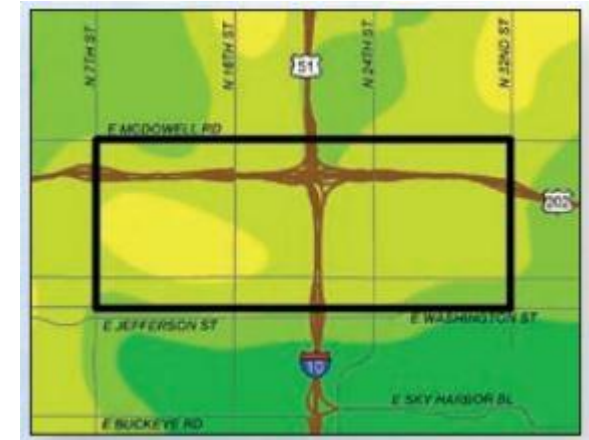
# Hot Spots: Kernel Density



Hot Spot



1 year later



2 years later

*Don't forget to use the same  
algorithm & criteria!*

# ANALYZING PUBLIC SAFETY ISSUES GOES BEYOND MAPPING CRIME DATA

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# Crime Mapping

## Sources of Data

- Criminal Justice
- Other Government
- Community
  - residents
  - businesses

# Putting the crime in context

- What's near the incidents in my crime pattern?
  - Highways/major routes
  - Methadone clinics
  - Public transportation
  - Budget motels
  - Public housing
  - Schools
  - Gang territories

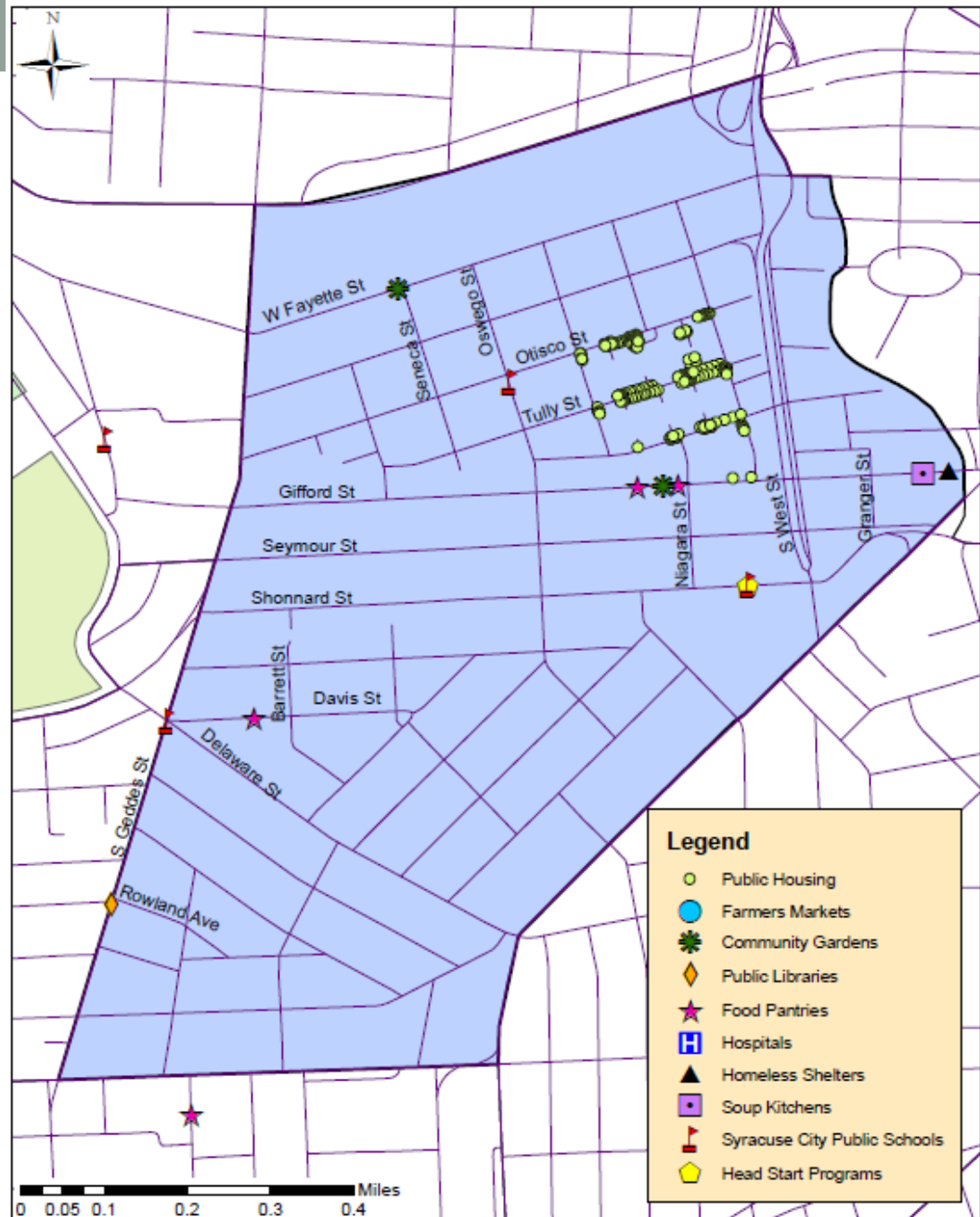




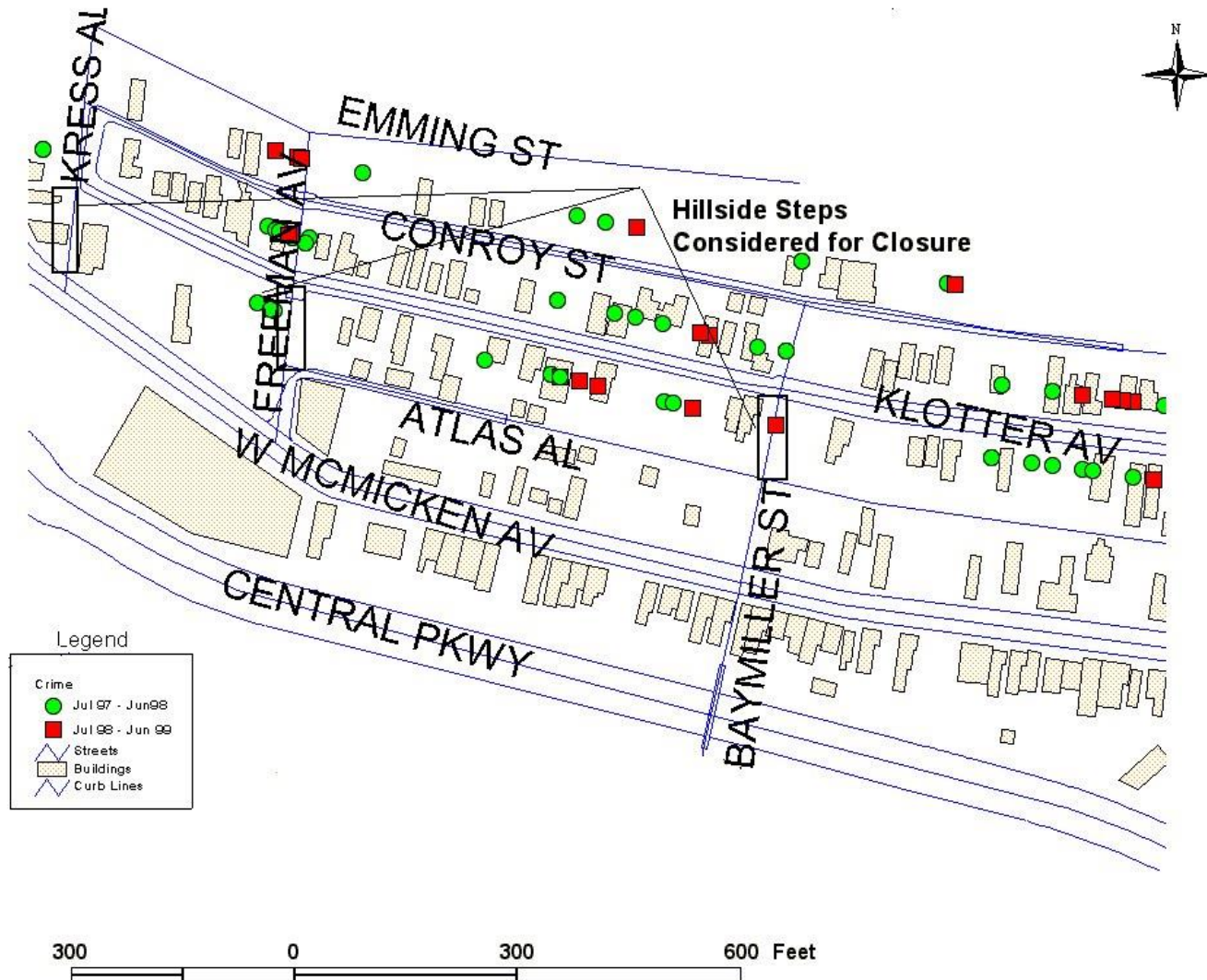
# Syracuse BCJI

## Westside Neighborhood

### Public Housing & Community Assets

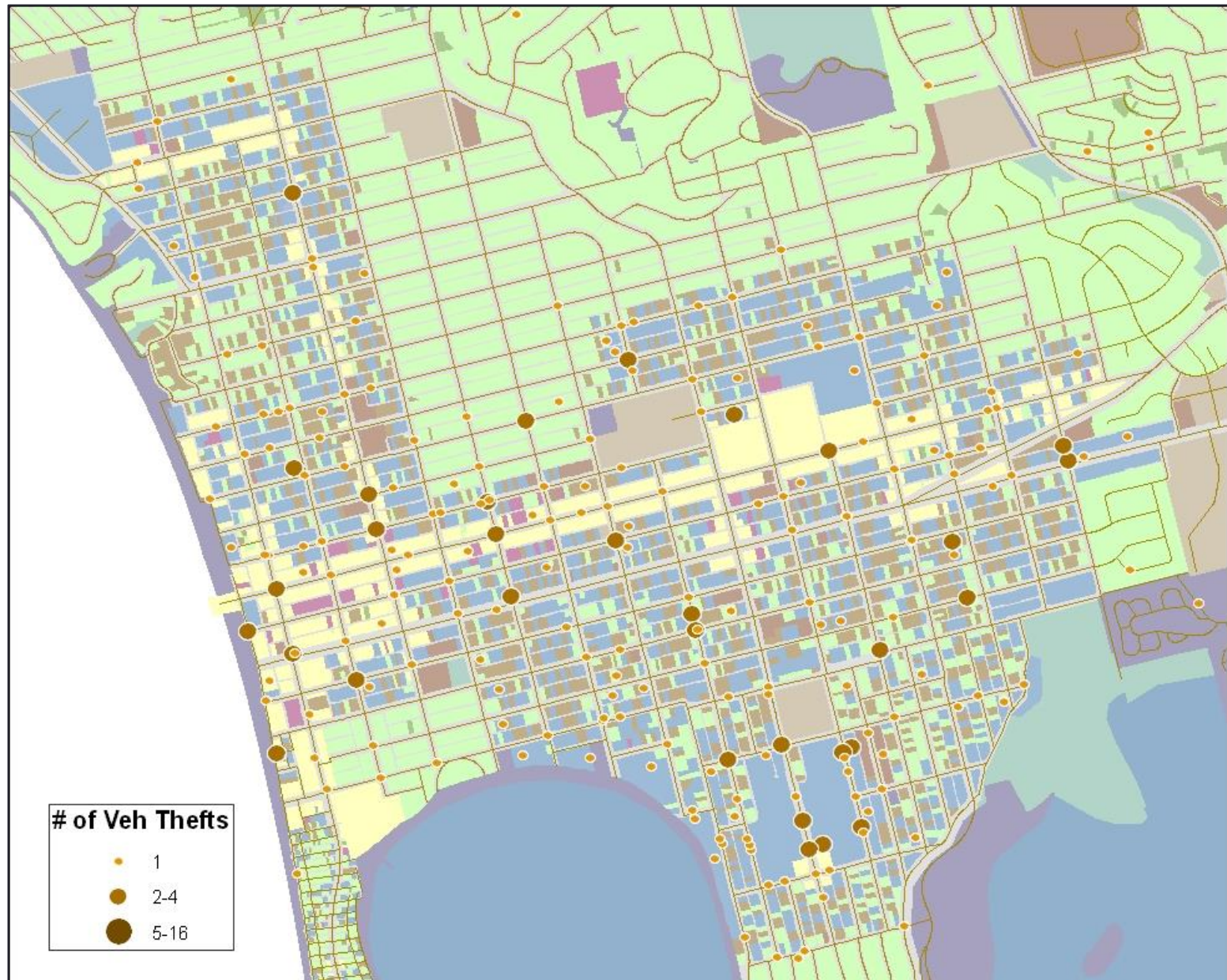


# Using CPTED for Neighborhood Problem Solving in Cincinnati, OH



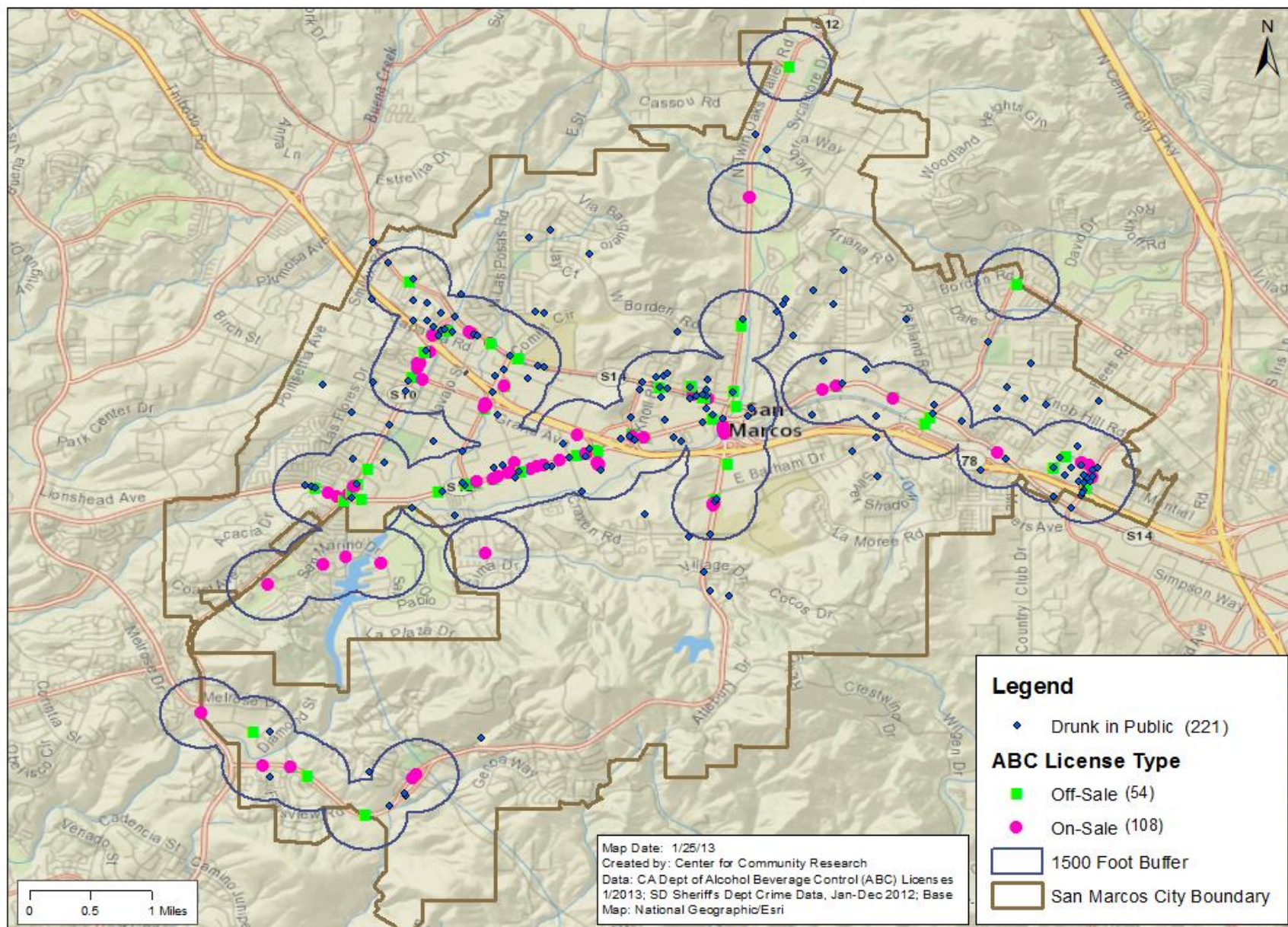


# Auto Thefts and Land Use in San Diego



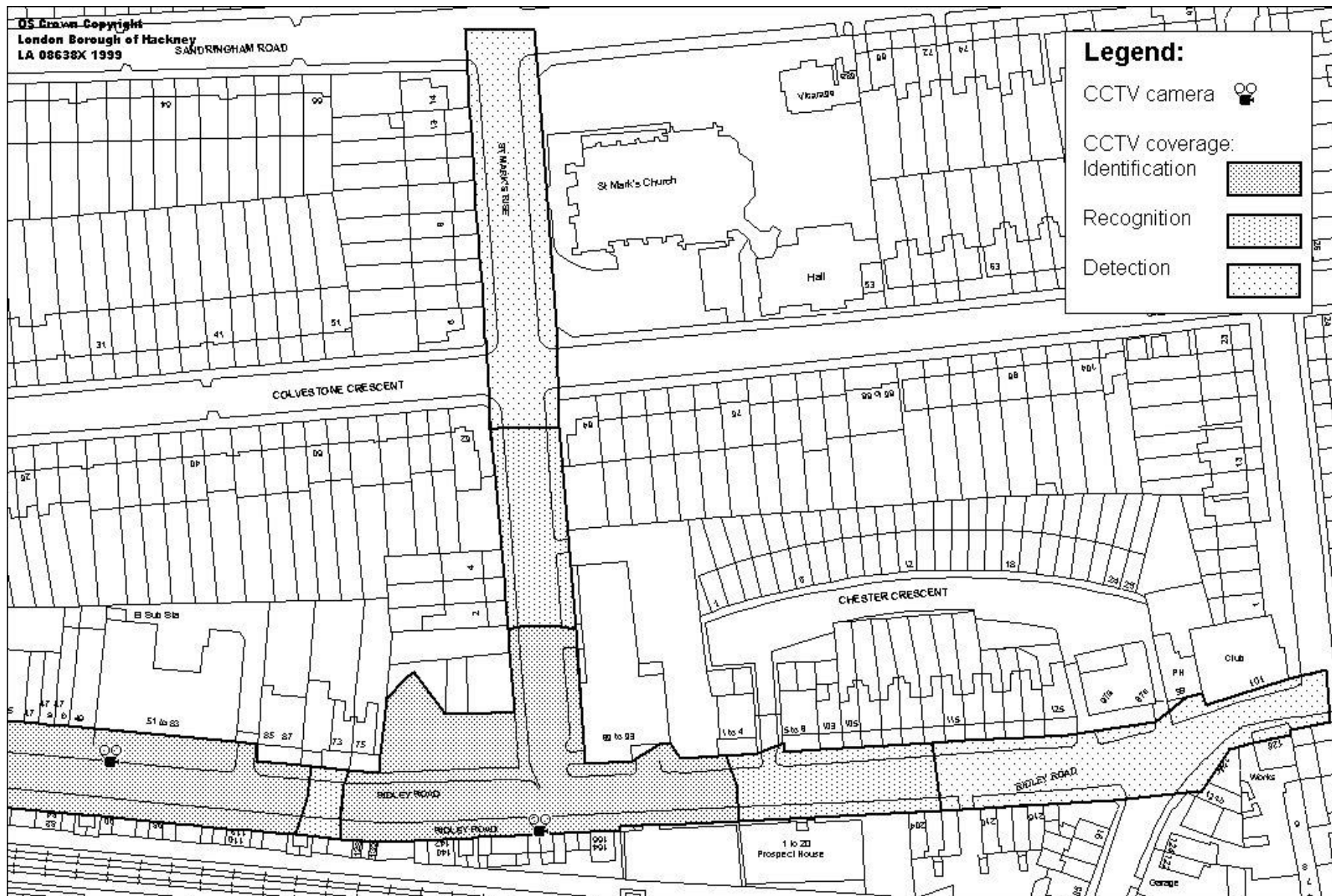


# City of San Marcos - Alcohol Establishments & Drunk in Public Incidents, 2012



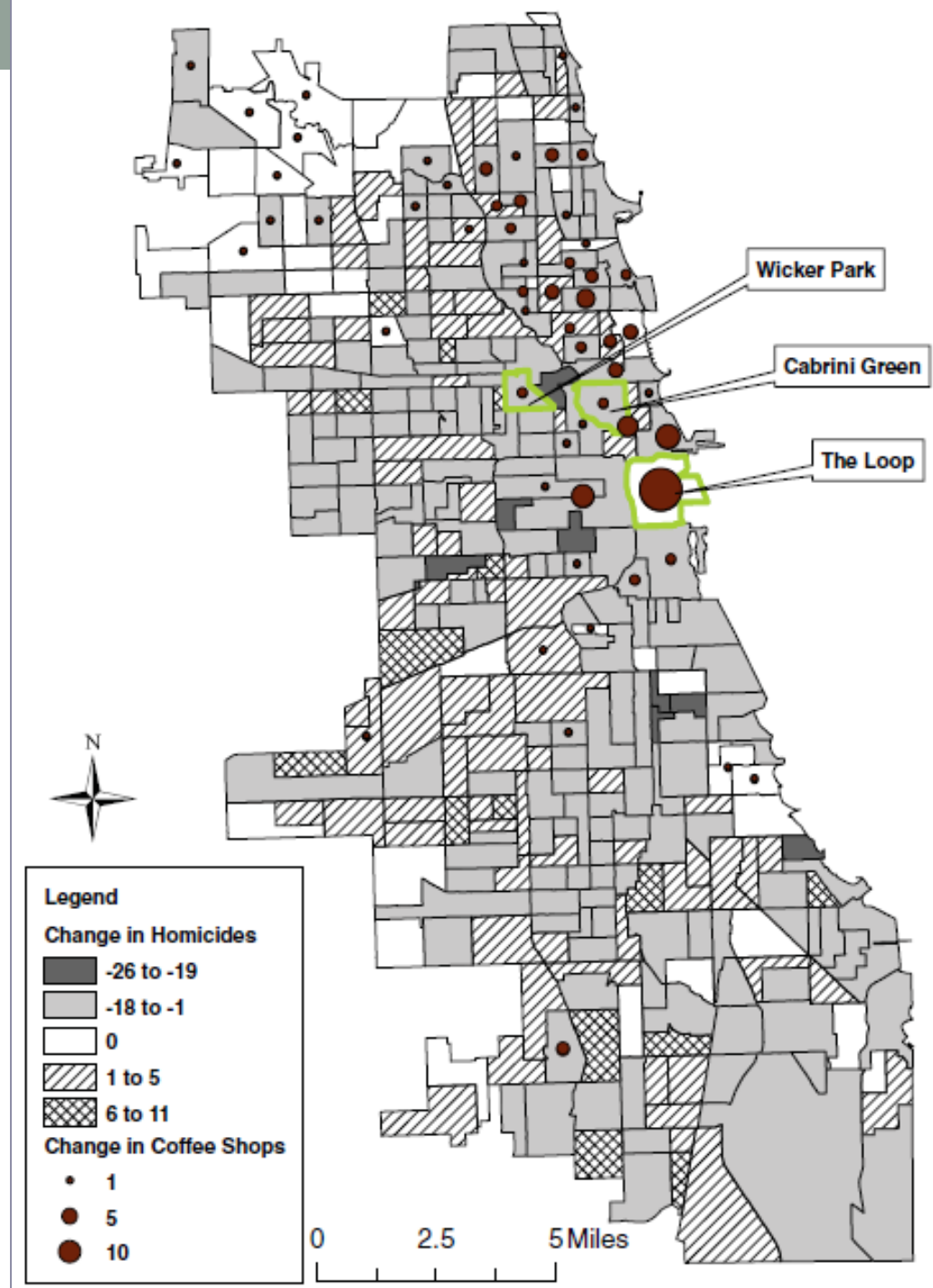


# Closed Circuit TV Coverage Areas



# Chicago neighborhood change in homicides and coffee shops, 1991 - 2005

“More Coffee, Less Crime?”  
Papachristos, et al.  
*City & Community*, Sept. 2011



# MAKING MAPS WITH DATA THAT DOESN'T YET EXIST

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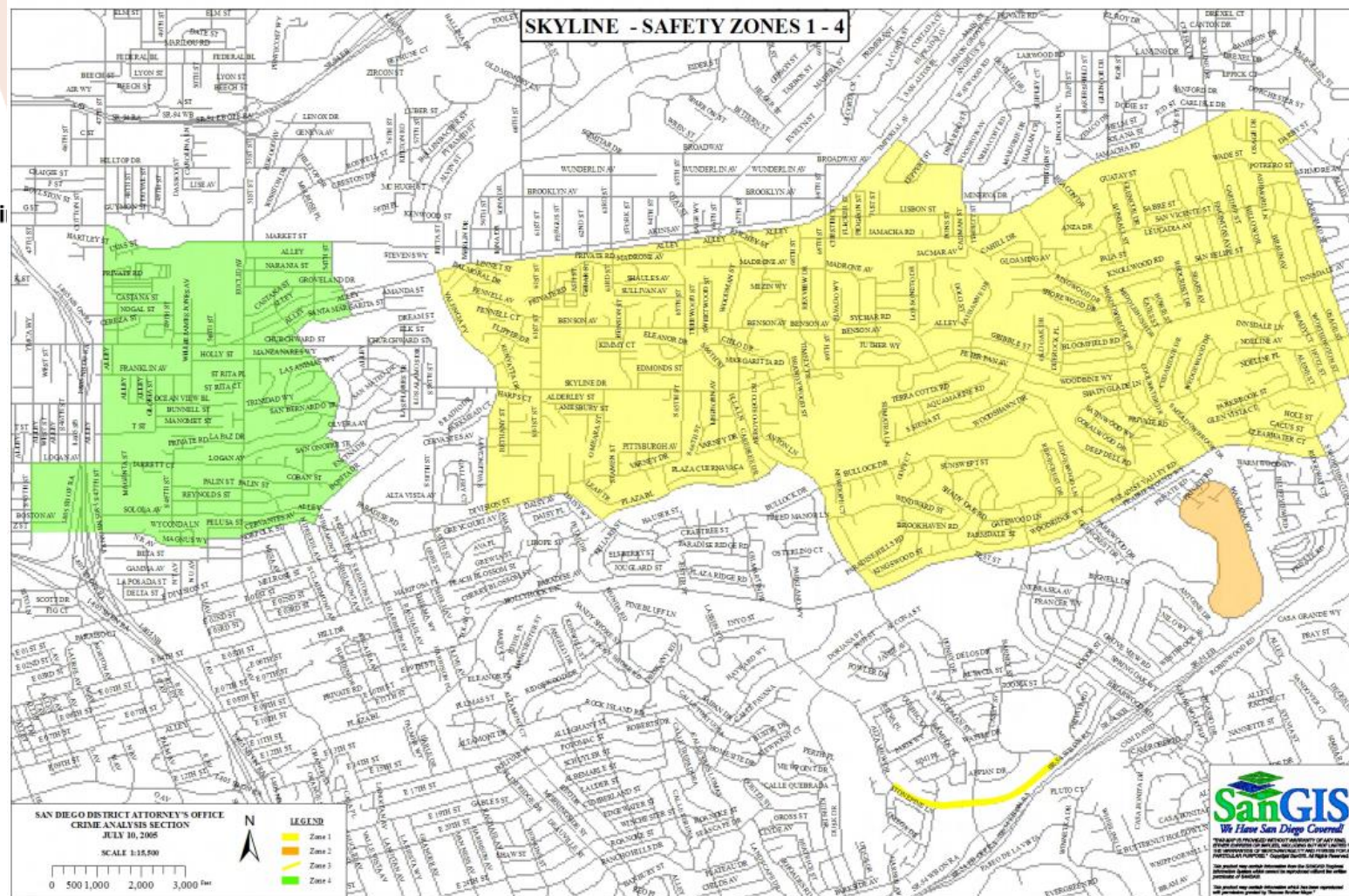


# Digitizing Data: Gang Zones

## Gang Injunctions with San Diego County

- 1 Logan Red Steps
- 2 Skyline
- 3 Linda Vista 13
- 4 Center Street
- 5 Varrio Posole Locos
- 6 Varrio Mesa Locos
- 7 Varrio San Marcos
- 8 Diablos - 2007
- 9 Diablos - 2010
- 10 Westside - 2007
- 11 Westside - 2010
- 12 Nestor
- 13 Vista Home Boys
- 14 OTNC

Non-Injunction area



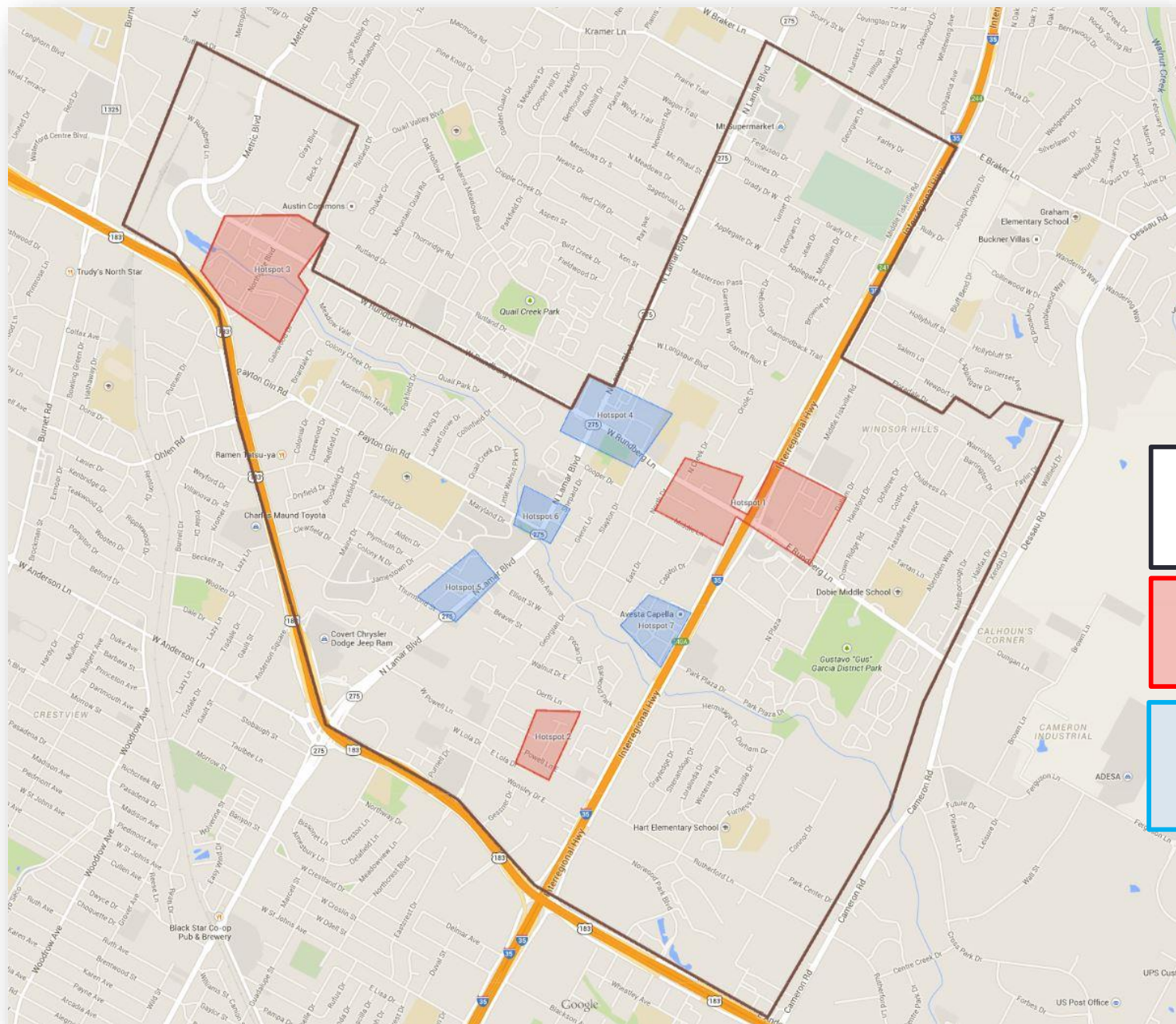


# AUSTIN BCJI

Grant Area

MWB Hotspots

Comparison  
Hotspots



**Figure 1: Temple University Police Department  
Assaults  
1997-1998**

- Temple University
- Outside Assaults
- Victim Survey
- High-definition GIS





**Figure 3: Temple University Police Department  
Assaults  
1998-1999**

## A Large Reduction in Campus Crimes





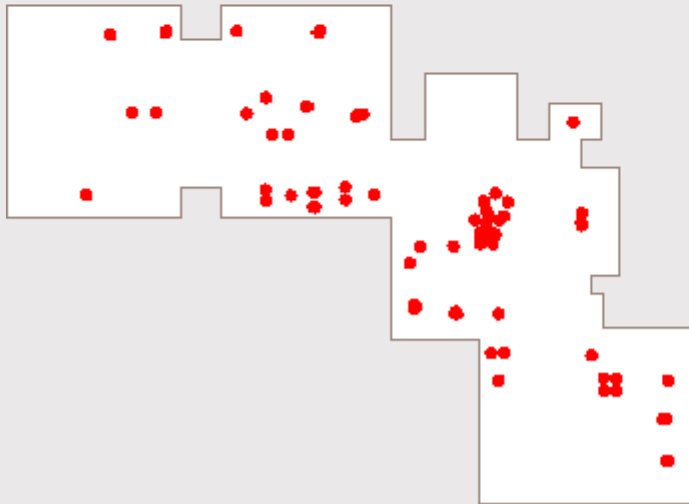
# THREE DIMENSIONAL MAPPING

**Gladfelter Hall**

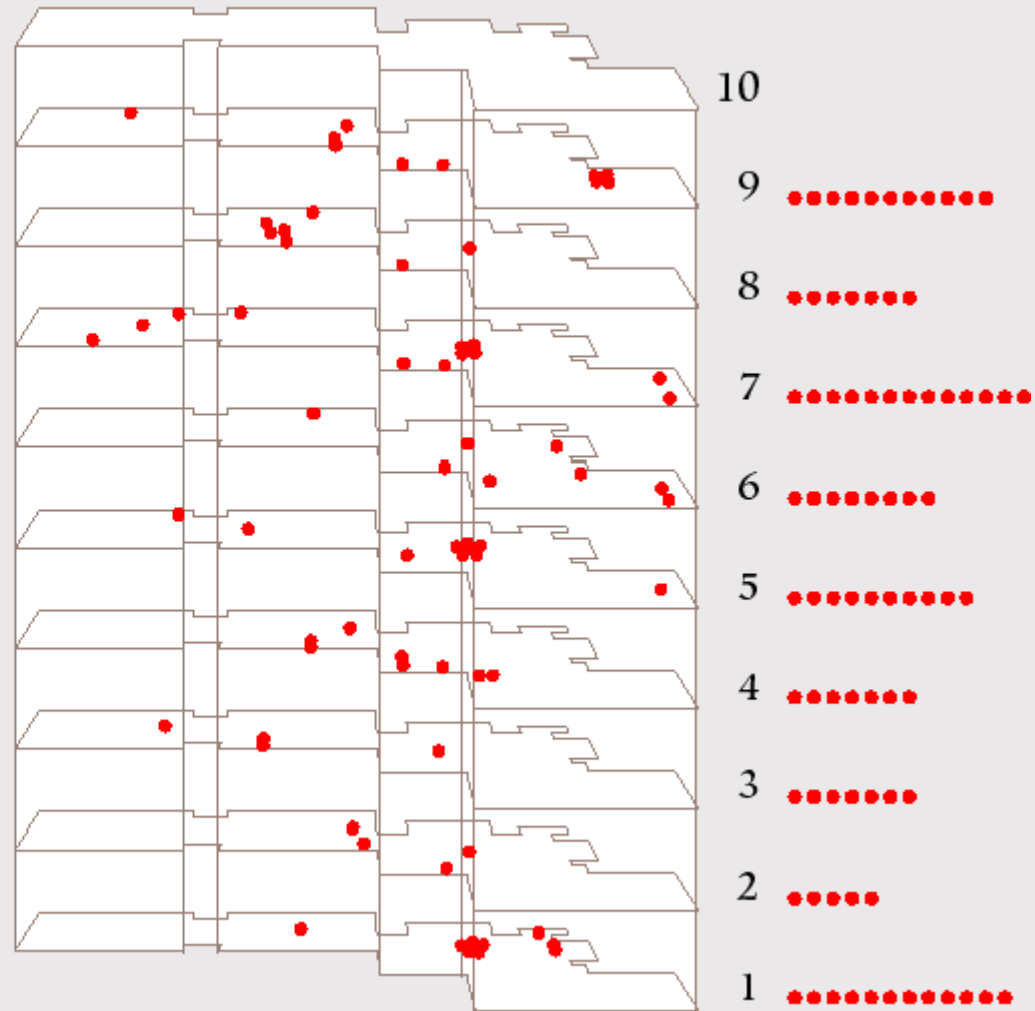


# VERTICAL AND HORIZONTAL PATTERN DETECTION

Crime Projected on  
Building Footprint



Crime on Building Floors



# Using GIS to Analyze Population and Housing

## POPULATION AND HOUSING ESTIMATES (2007) 2007 Wildfire Evacuation Areas



The following population and housing unit data are based on parcel-level housing counts from the San Diego County Assessor's Office, the U.S. Census Bureau, and SANDAG's Regional Information System.

### POPULATION (January 1, 2007)

	Persons
Total Population	515,077
Household Population	507,976
Group Quarters Population	7,101

### HOUSING (January 1, 2007)

	Units
Housing Units	187,785
Single Family - Detached	127,101
Single Family - Multi-Unit	14,340
Multiple Family	39,672
Mobile Home and Other	6,672

It is not possible to reliably estimate detailed demographic characteristics for this area. The following information provides the characteristics of a larger geographic area that includes the study area. While not a precise representation of the study area, it does provide an indication of its general demographic and economic characteristics.

### HOUSING TENURE (January 1, 2007)

	Occupied Units	Vacancy Rate	Persons per Household
Occupied Housing Units	177,776	5.3%	2.86
Single Family - Detached	68%	—	—
Single Family - Multi-Unit	8%	—	—
Multiple Family	20%	—	—
Mobile Home and Other	4%	—	—

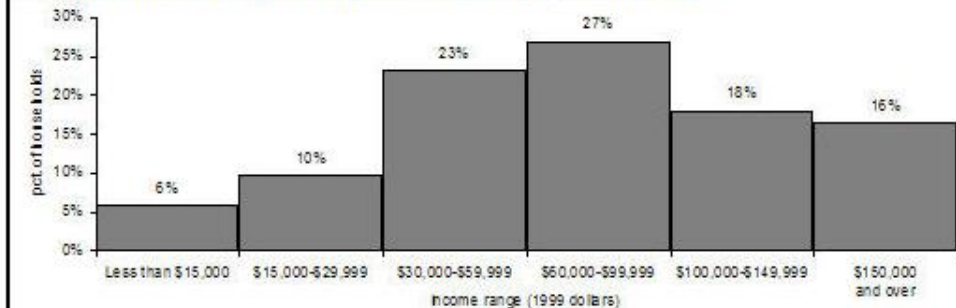
### GENDER AND AGE (January 1, 2007)

	Male	Female
0 to 17	12%	12%
18 to 34	11%	9%
35 to 64	21%	22%
65 and older	6%	7%
Total Population	50%	50%

### RACE AND ETHNICITY (January 1, 2007)

	Percent
Hispanic	18%
Non-Hispanic	82%
White	67%
Black	3%
American Indian	1%
Asian & Pacific Islander	9%
Other	3%

### HOUSEHOLD INCOME DISTRIBUTION (real 1999 dollars, adjusted for inflation)



### Median Household Income

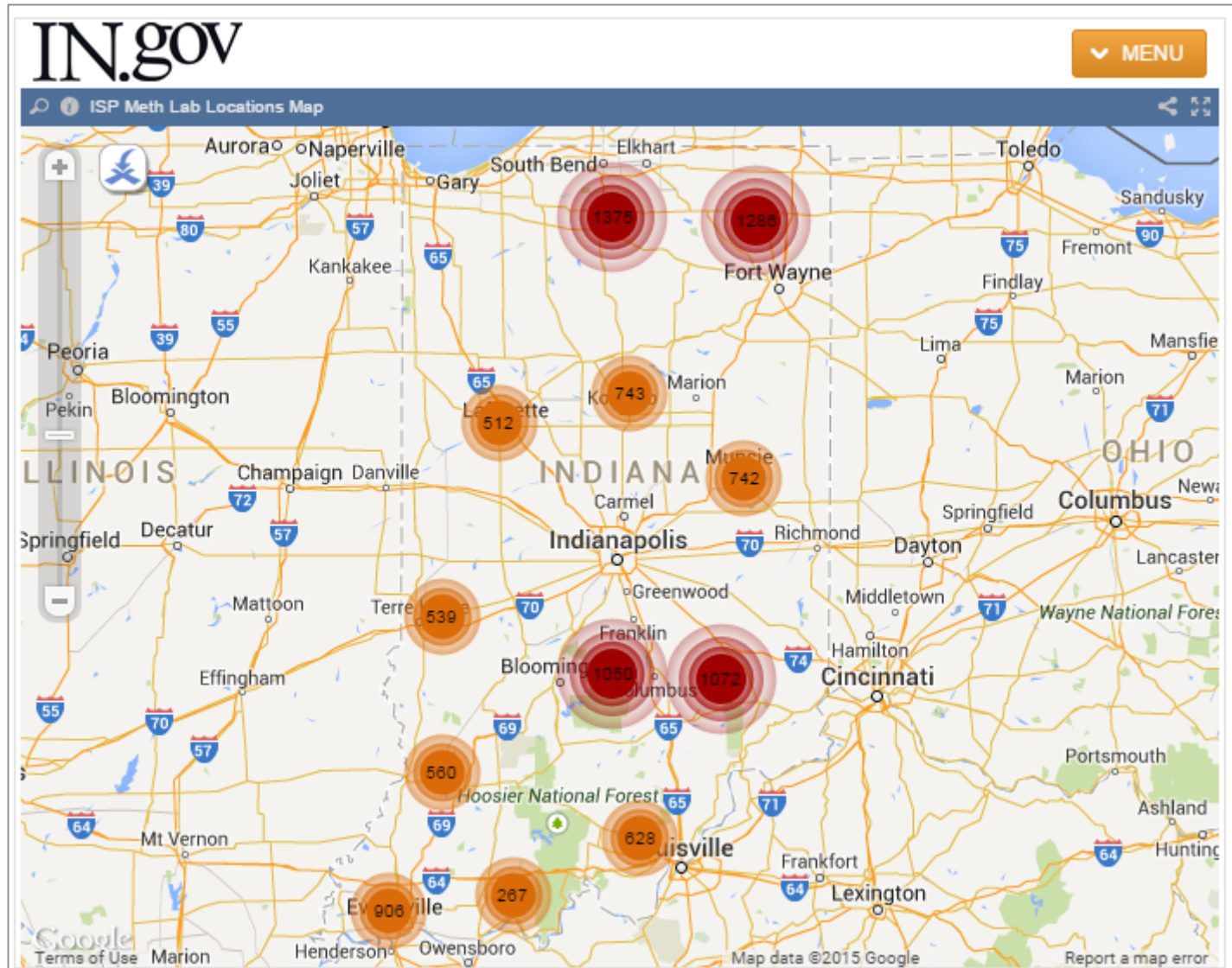
Adjusted for inflation (1999 \$)	\$74,498
Not adjusted for inflation (current \$)	\$98,339

Source: SANDAG, Current Estimates (2007)

October 2007



# Sharing maps with the public

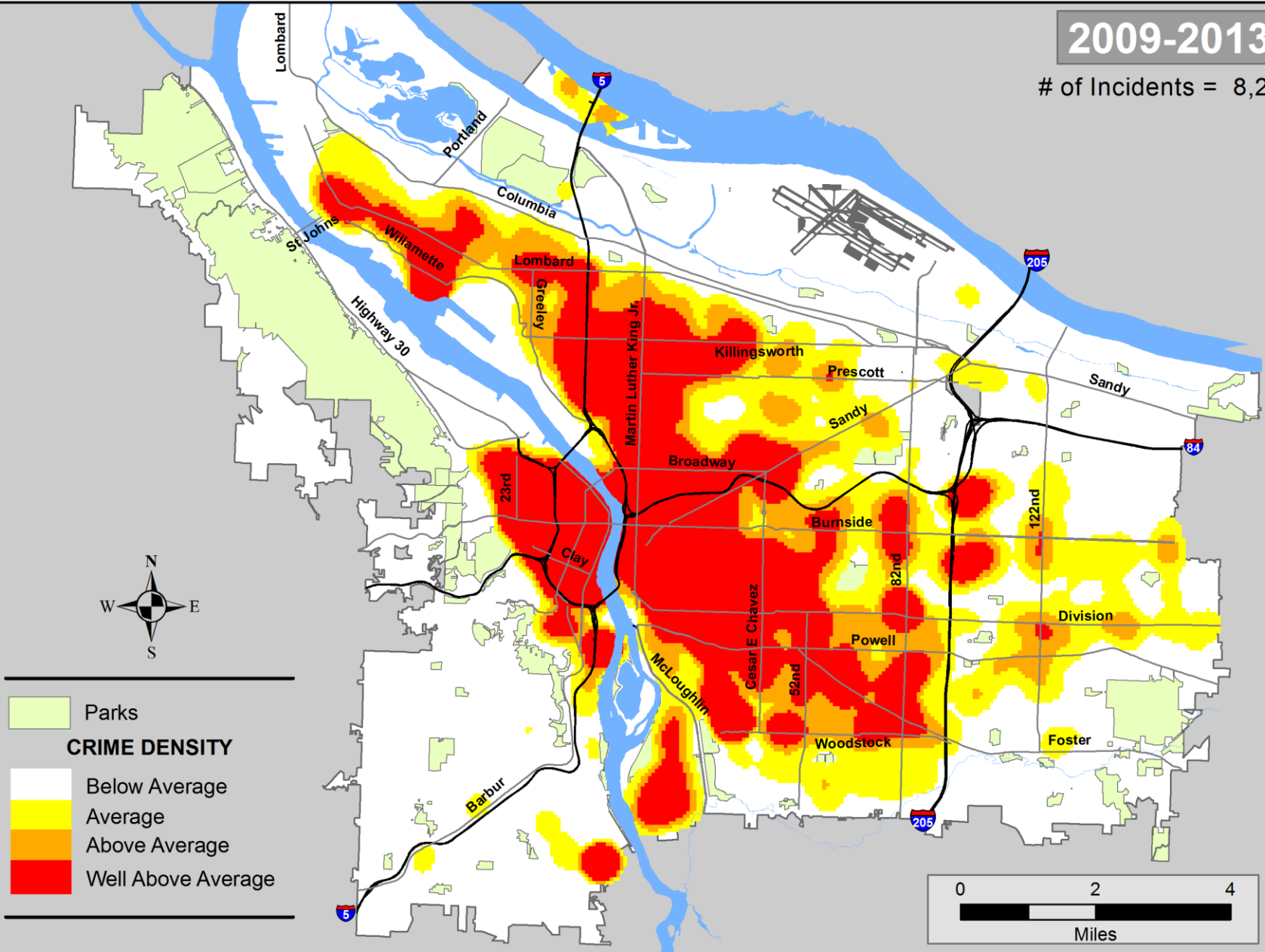




# Bicycle Theft

2009-2013

# of Incidents = 8,206



# GIS Resources

## DATA

- <http://www.census.gov/geo/maps-data/data/tiger.html>
- <http://freegisdata.rtwilson.com/>
- <http://www.google.com/publicdata/directory>
- Don't forget your local Council of Governments, City/County GIS, local or transportation agencies

## OTHER

- <http://www.google.com/earth/explore/products/desktop.html>
- <http://www.socialexplorer.com/>
- <https://www.ncjrs.gov/pdffiles1/nij/178919.pdf> (Mapping Crime book - free!)
- <http://www.amazon.com/Tutorial-Crime-Analysis-Wilpen-Gorr/dp/158948214X> (Crime Analysis GIS Tutorial – not free!)