Crime Mapping Level 1

BCJI WEBINAR

FEBRUARY 23, 2015

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)

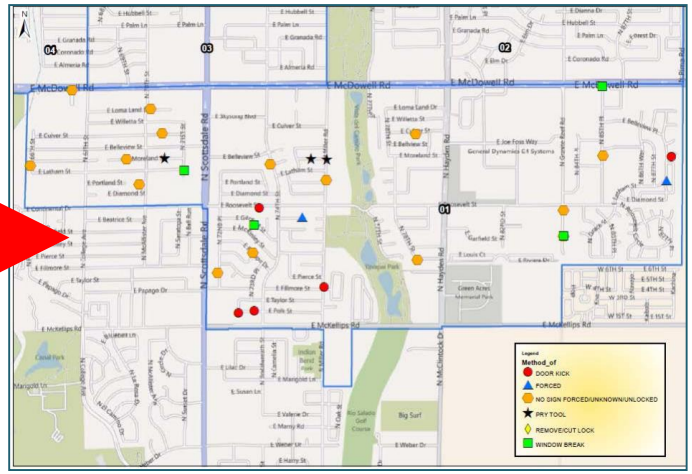
Prosecution (DA/Court System)

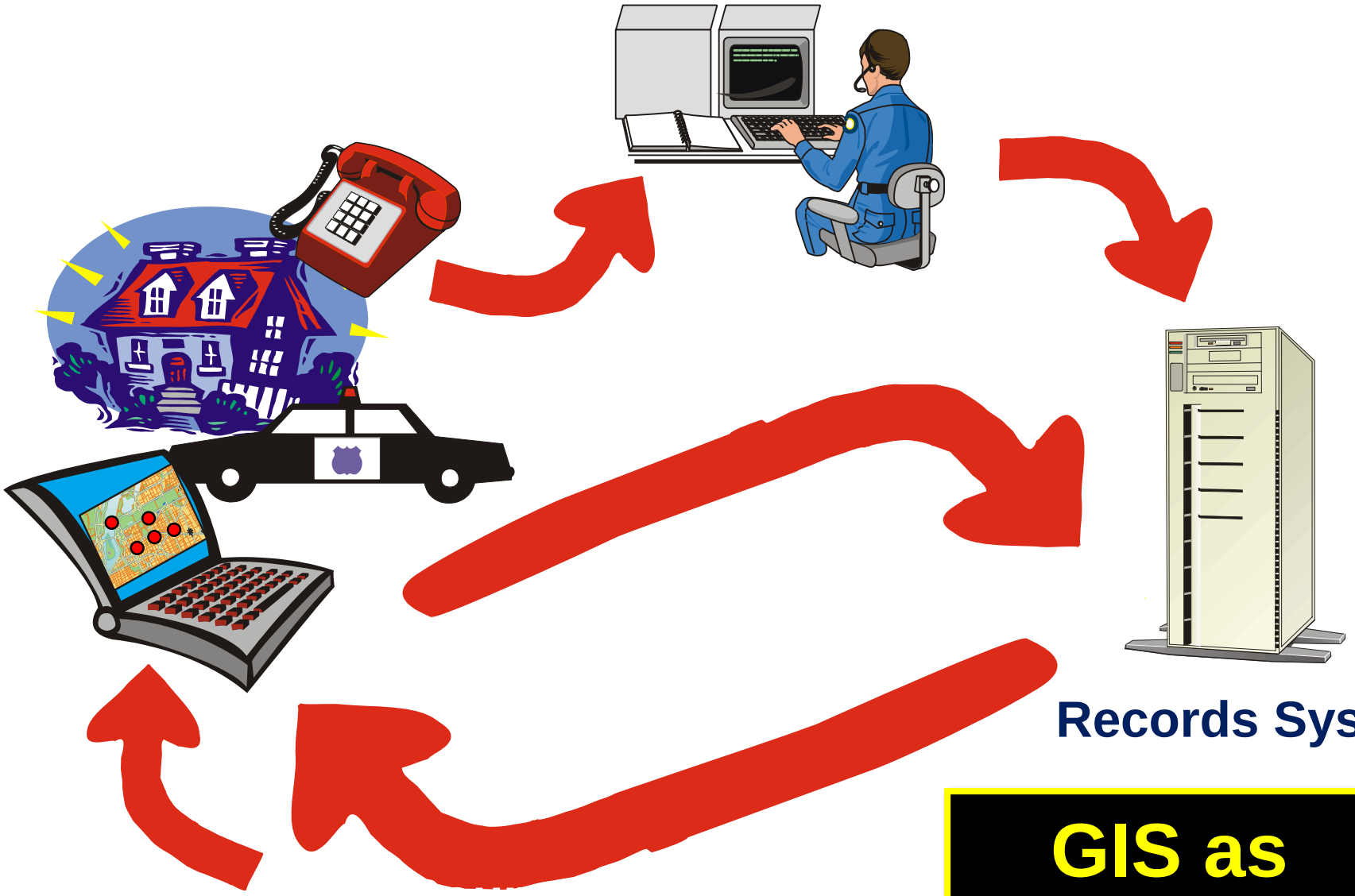
Parole/Probation

<u>Community Context</u>
Businesses
Schools
Parks
Alcohol Establishments
Bus Stops/Routes

G I S

An Integrator for Effective Public Safety





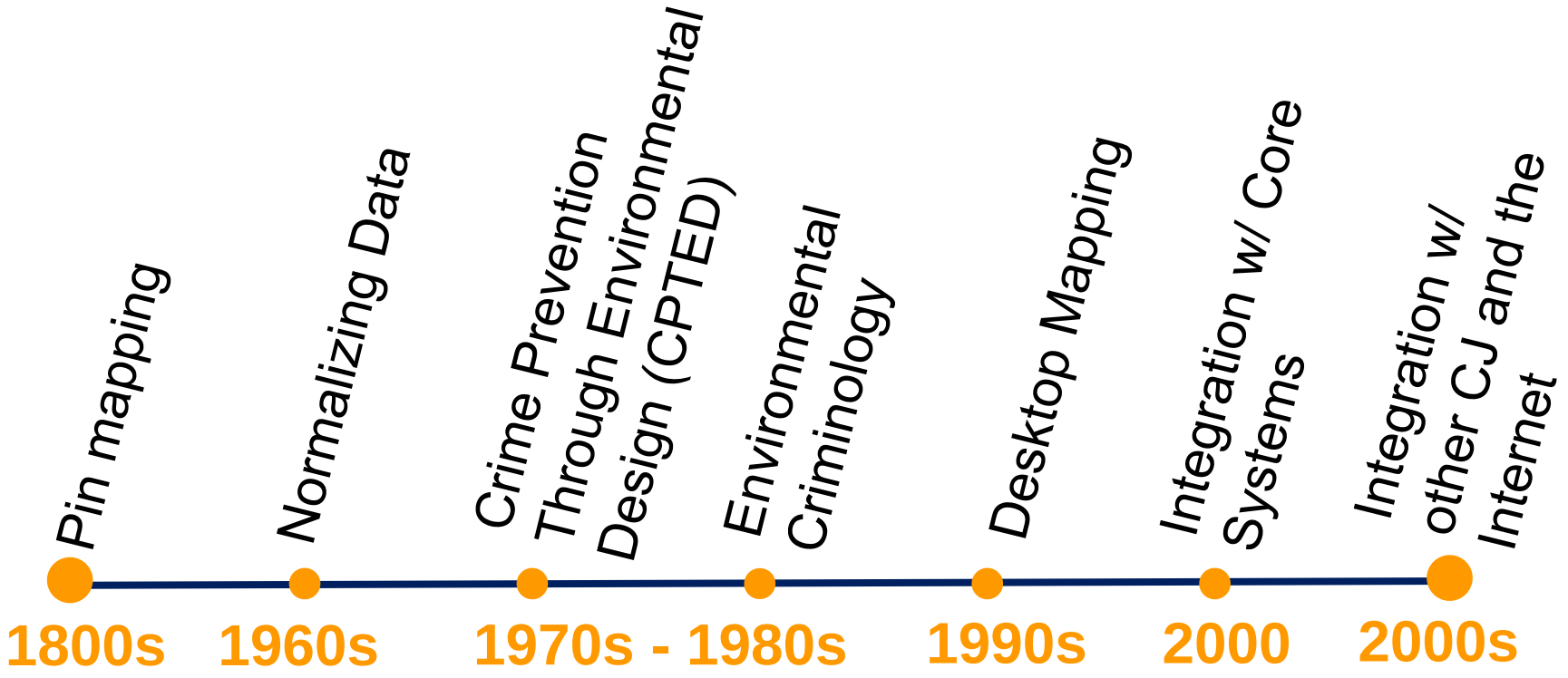
Records System

Geographic Information

GIS as Integrated Technology

Historical Overview

- Mapping has long history of use in law enforcement



IMPORTANCE OF GEOGRAPHY

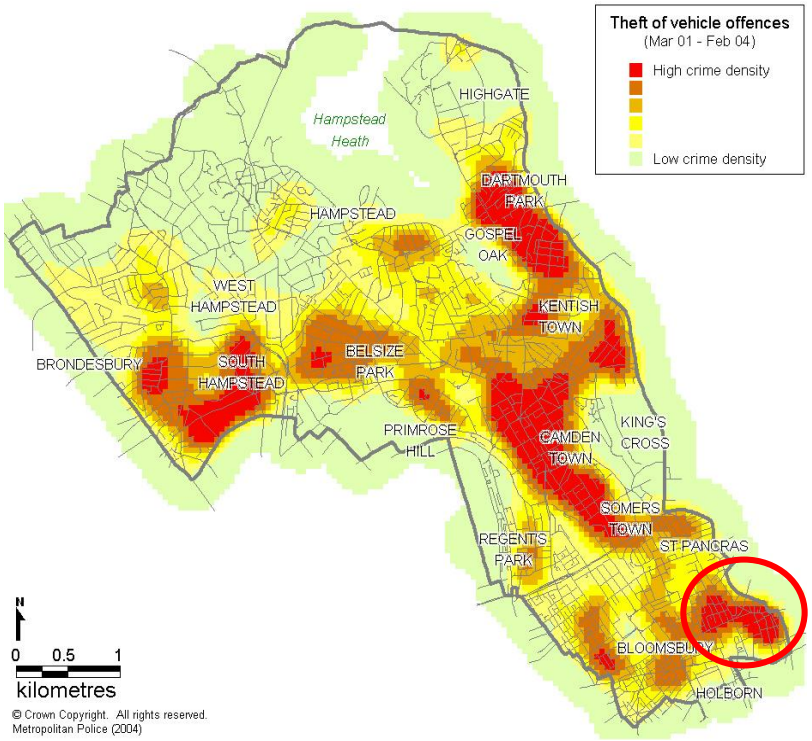
The four dimensions of crime

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

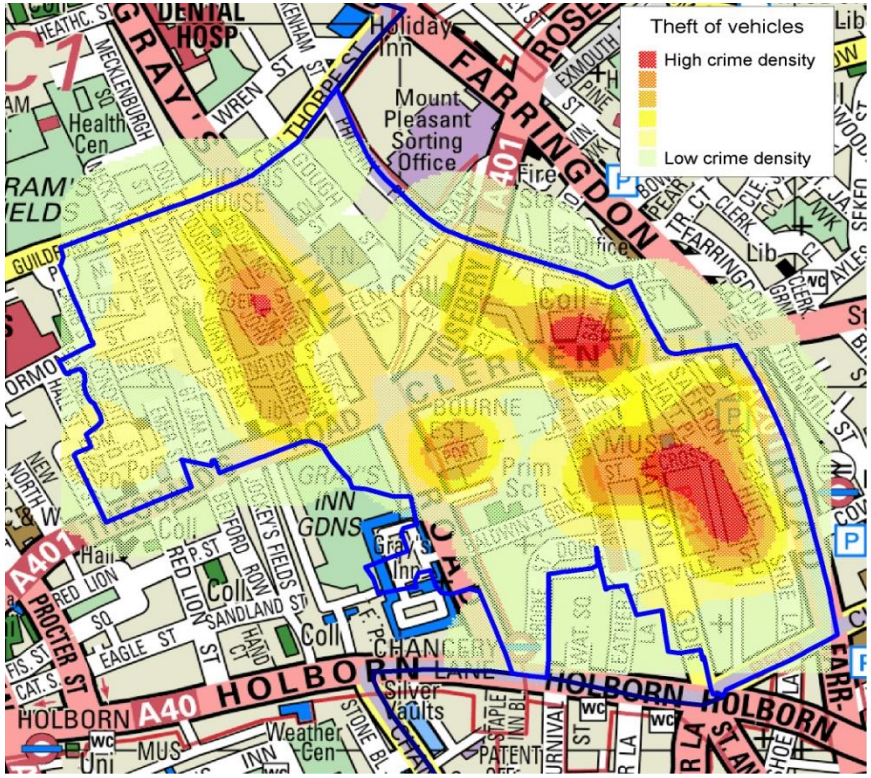
Future crime is *"six times more predictable by the address of the occurrence than by the identity of the offender. Why aren't we thinking more about whereduni*t, *rather than just whodunit?"* (Larry Sherman, 1995)

Clerkenwell Hotspot



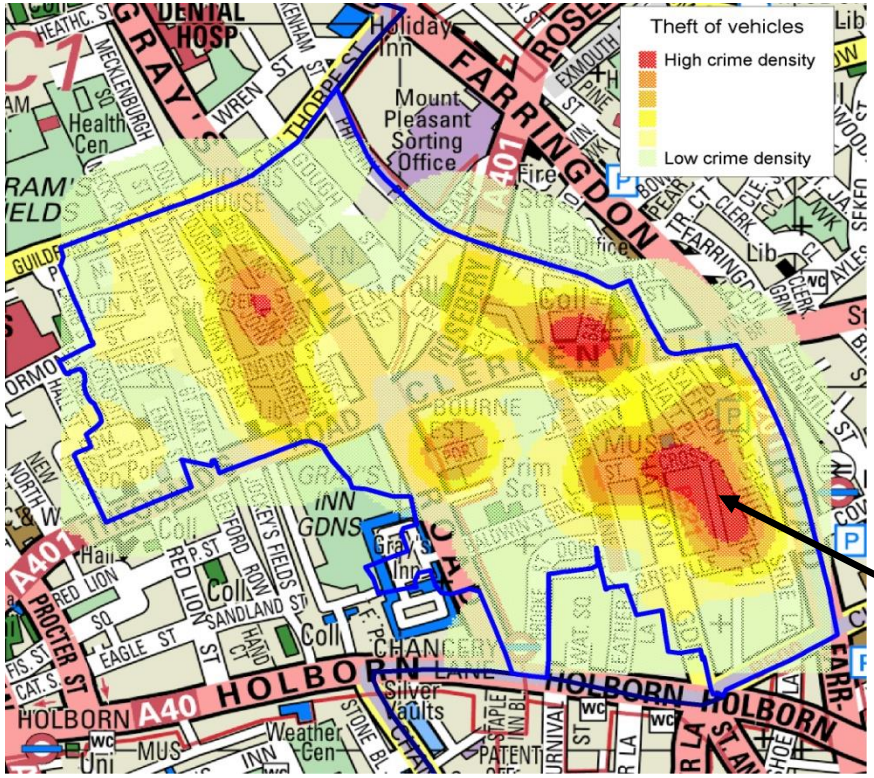
From whereunit to whodunnit

Clerkenwell Hotspot



From whereduni to whodunnit

Clerkenwell Hotspot

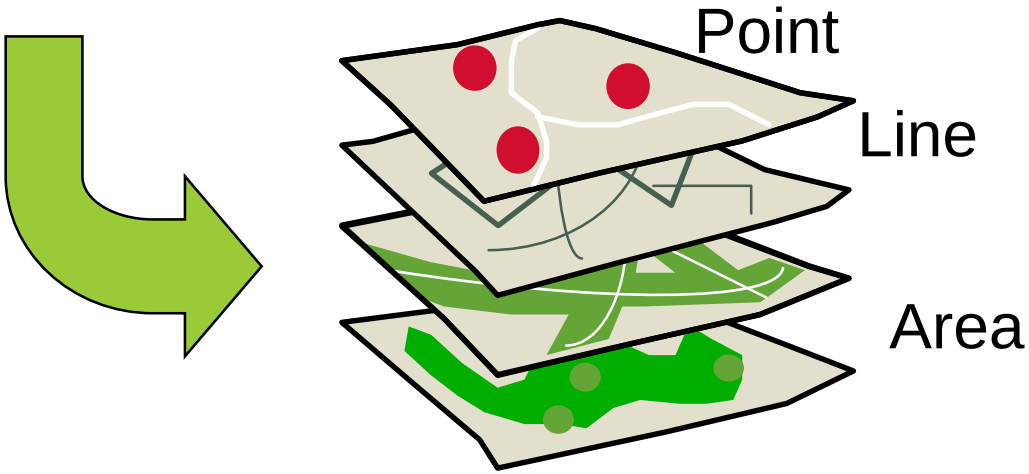


Vehicle type	Camden	Clerkenwell (n)	Clerkenwell(%)
Car	51%	41	18%
Sports or convertible	3%	5	2%
Scooter or moped	26%	95	42%
Motor cycle	13%	70	31%
Van	5%	3	1%
Other	2.0%	10	4%
Not known	0.5%	0	0%

From whereunit to whodunnit

Basic GIS Concepts:

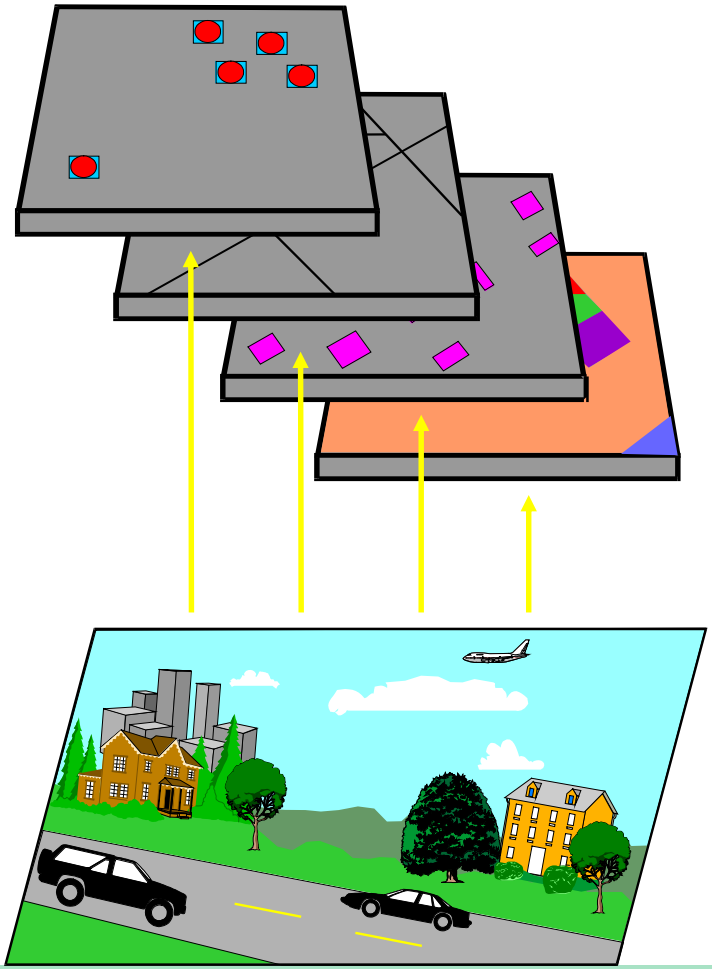
Points, Lines and Areas/Polygons



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

Basic GIS Concepts:

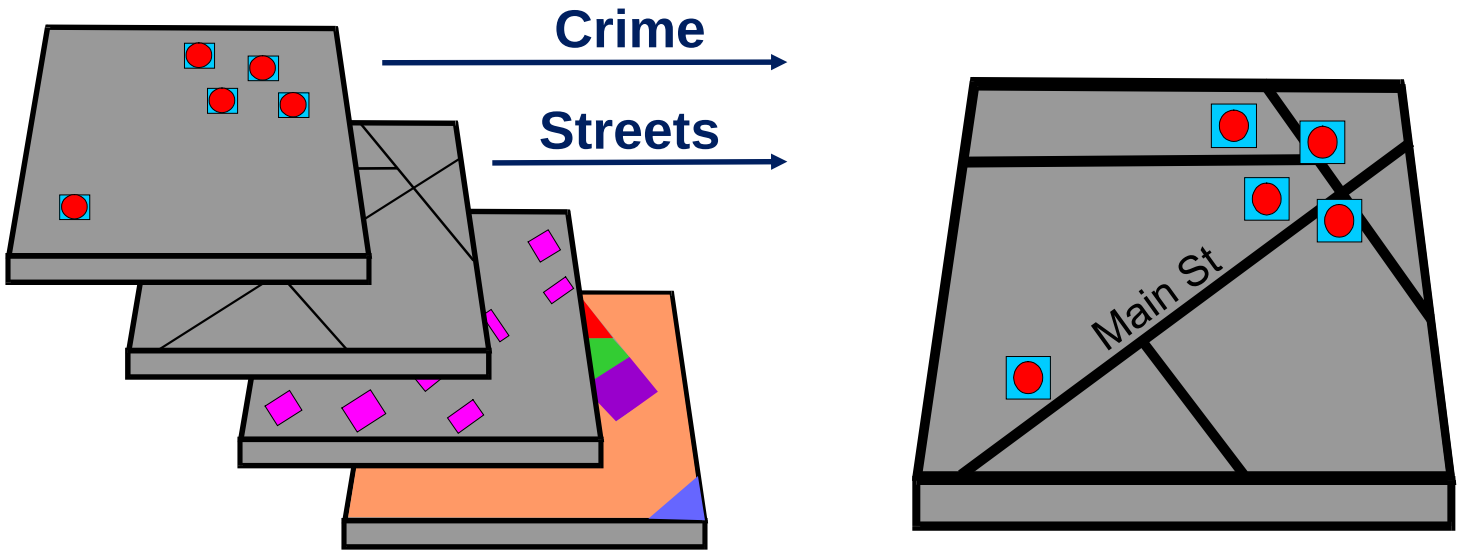
How does GIS work?



- 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:

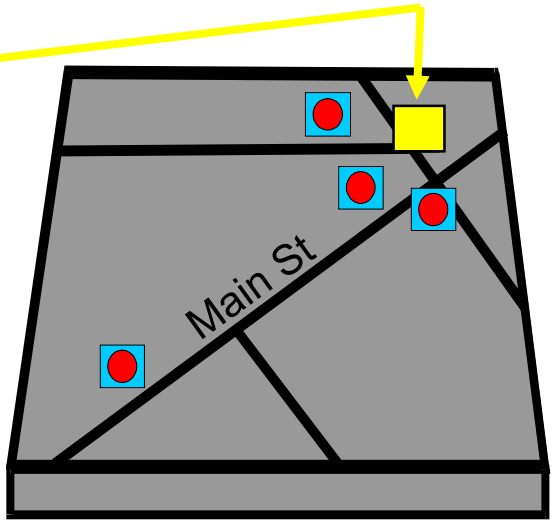


Any combination of these layers can then be analyzed and/or mapped.

Basic GIS Concepts:

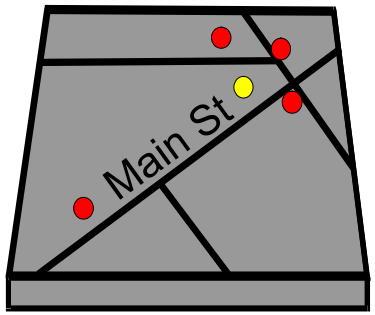
Attributes and Locations, Points

Crime Type	Address	Date	Time
Robbery	999-2nd St	May22, 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

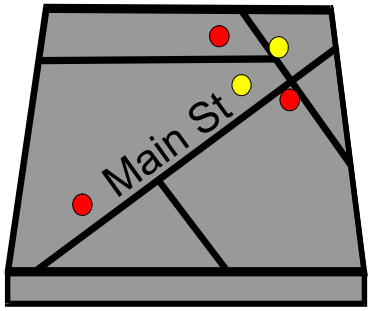


The database could be queried to find out where the robberies occurred on the map.

Grouping/Categorizing

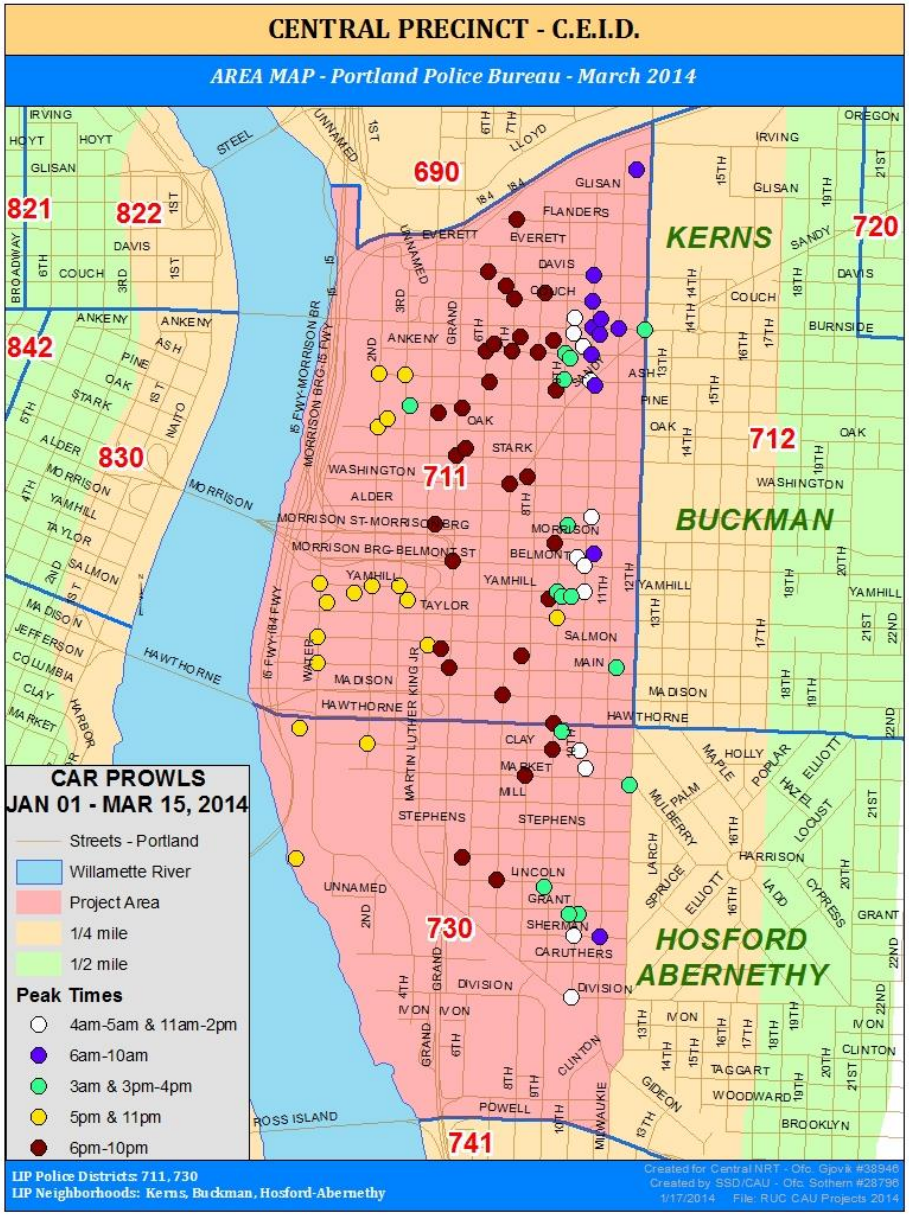


- Robbery
- Auto Theft

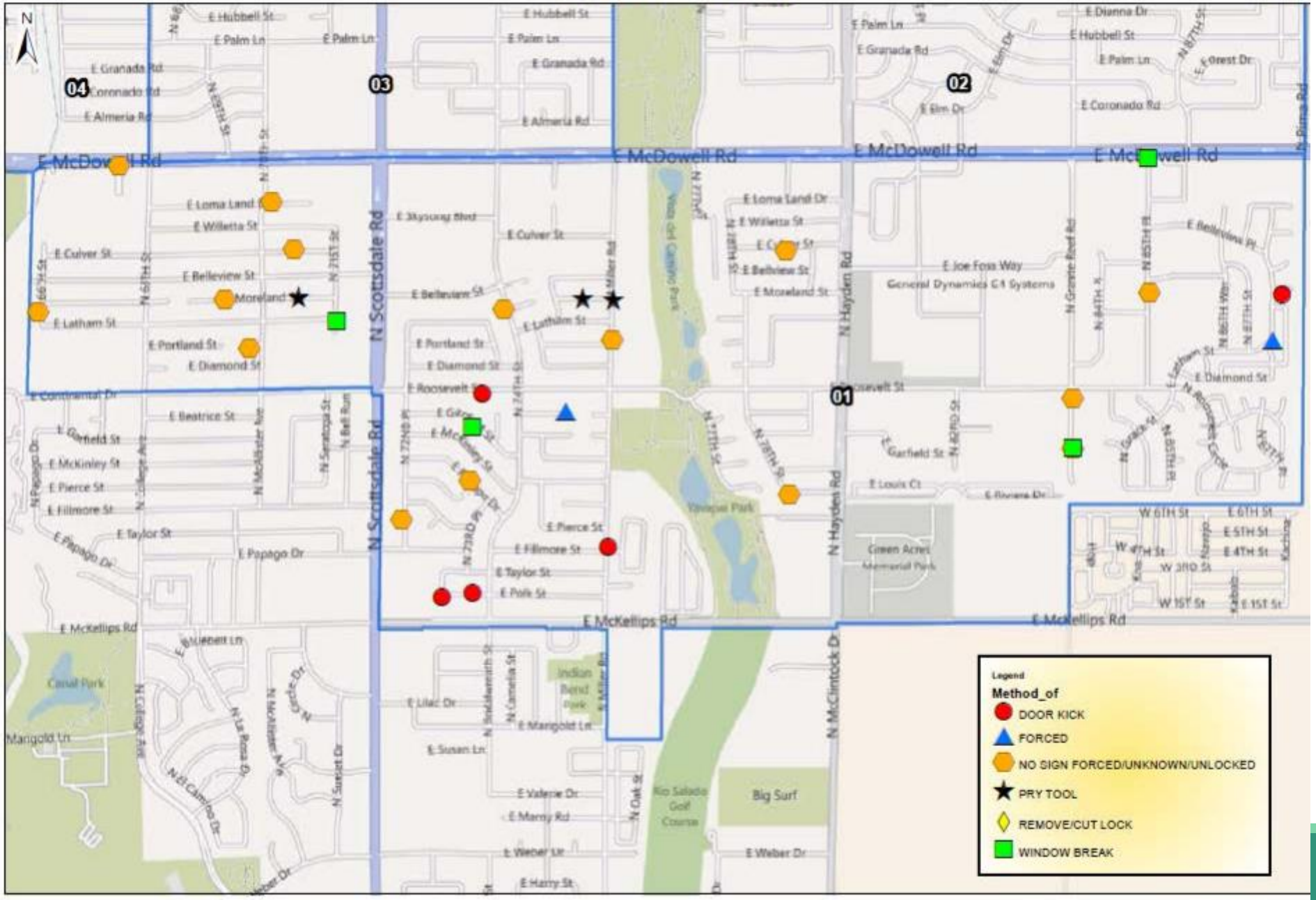


- May
- June

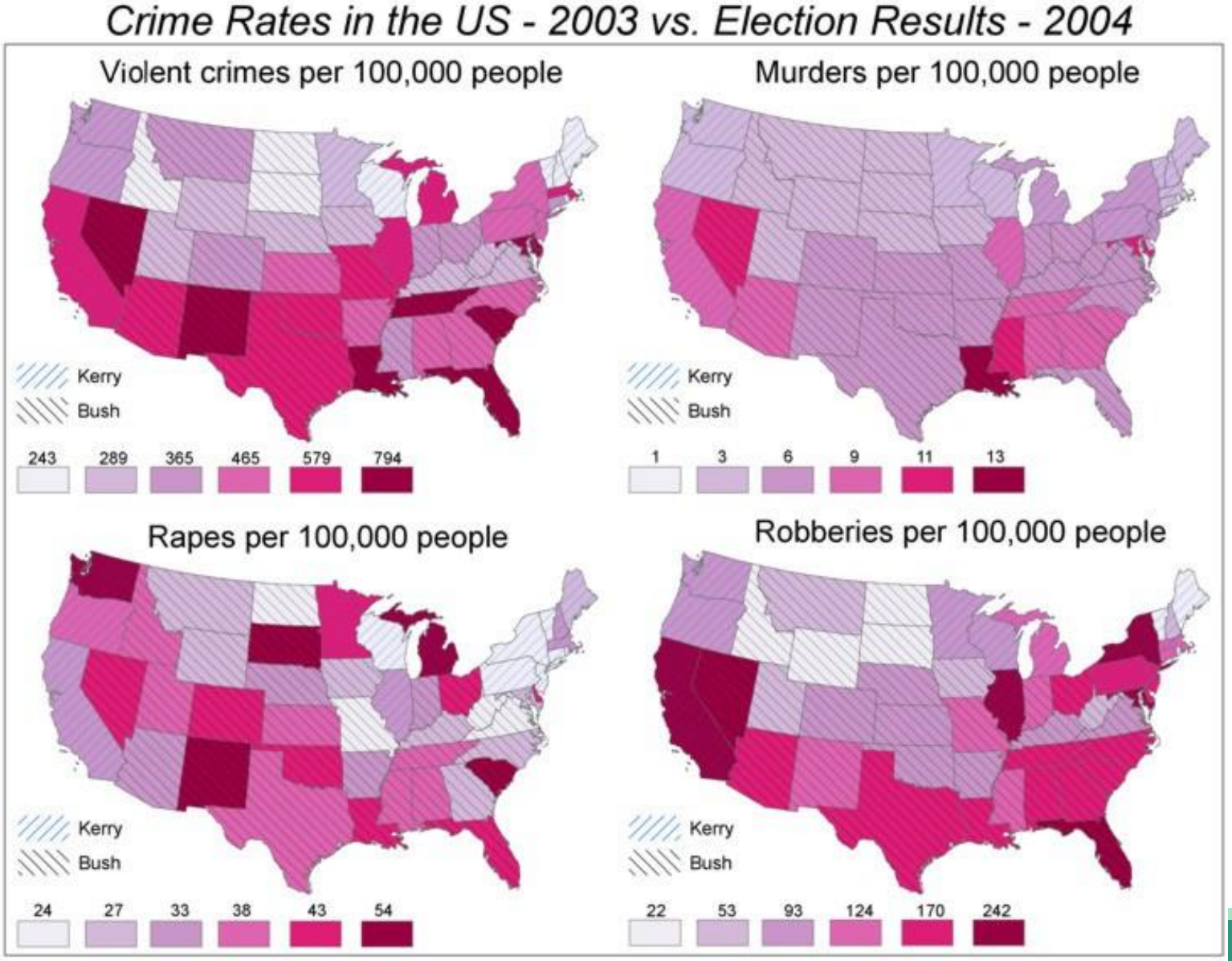
The data could be mapped by type of crime, date, time or MO.



SCOTTSDALE POLICE DEPARTMENT
Residential Burglaries in Beat 1
09/12/2011 - 11/13/2011

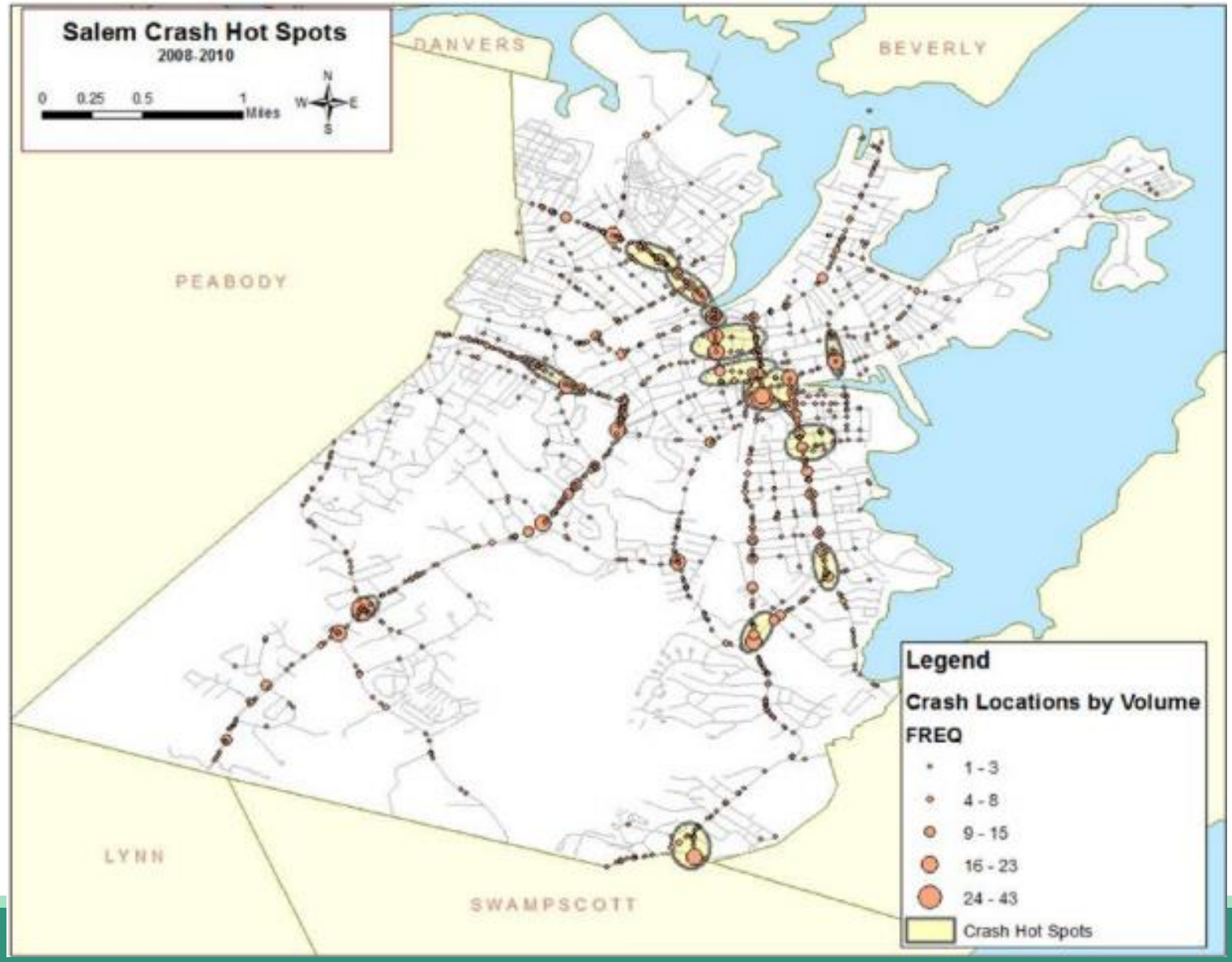


Area/Choropleth Map

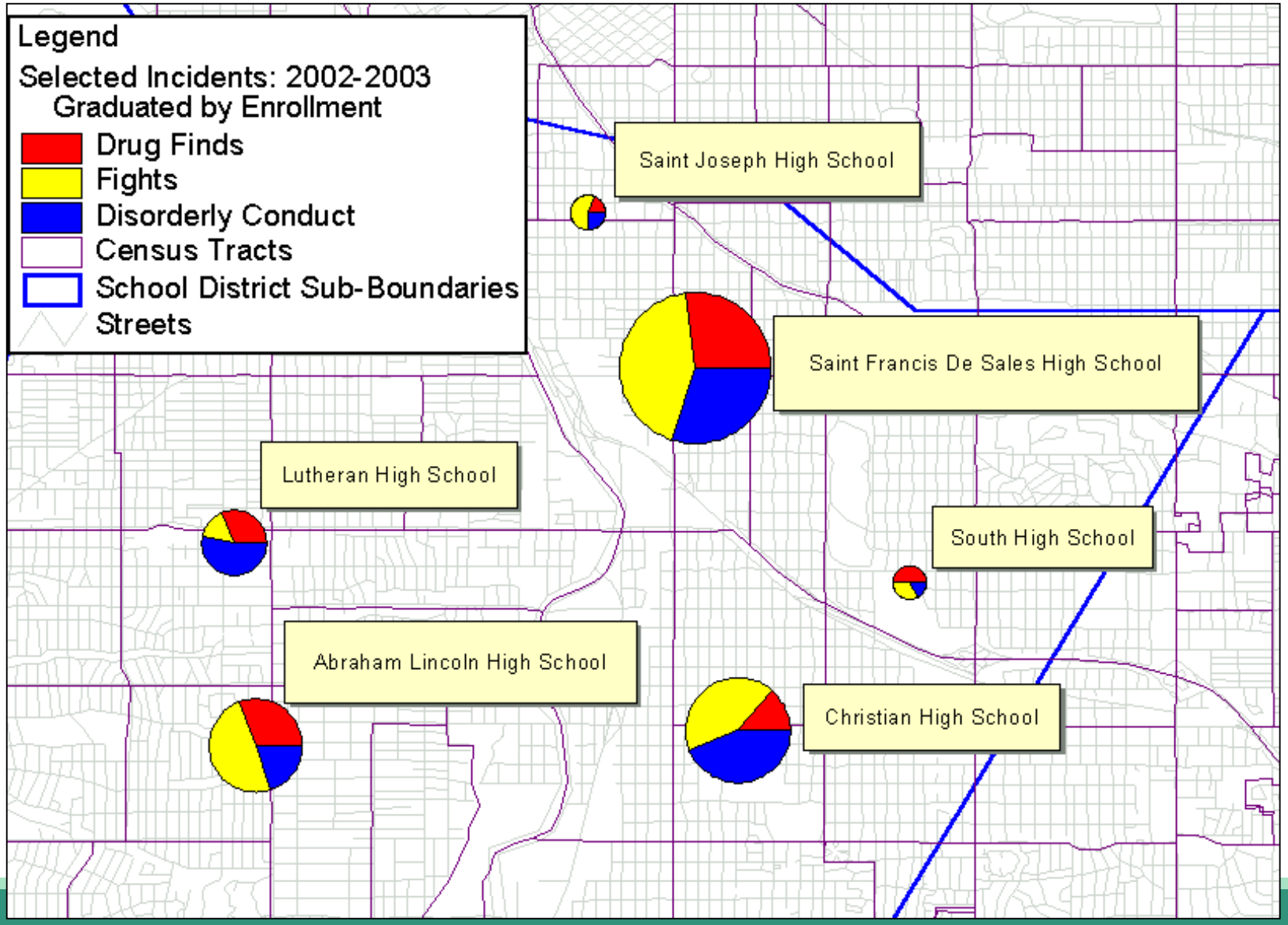


Source: Crime in the United States, 2003, FBI, Uniform Crime Reports

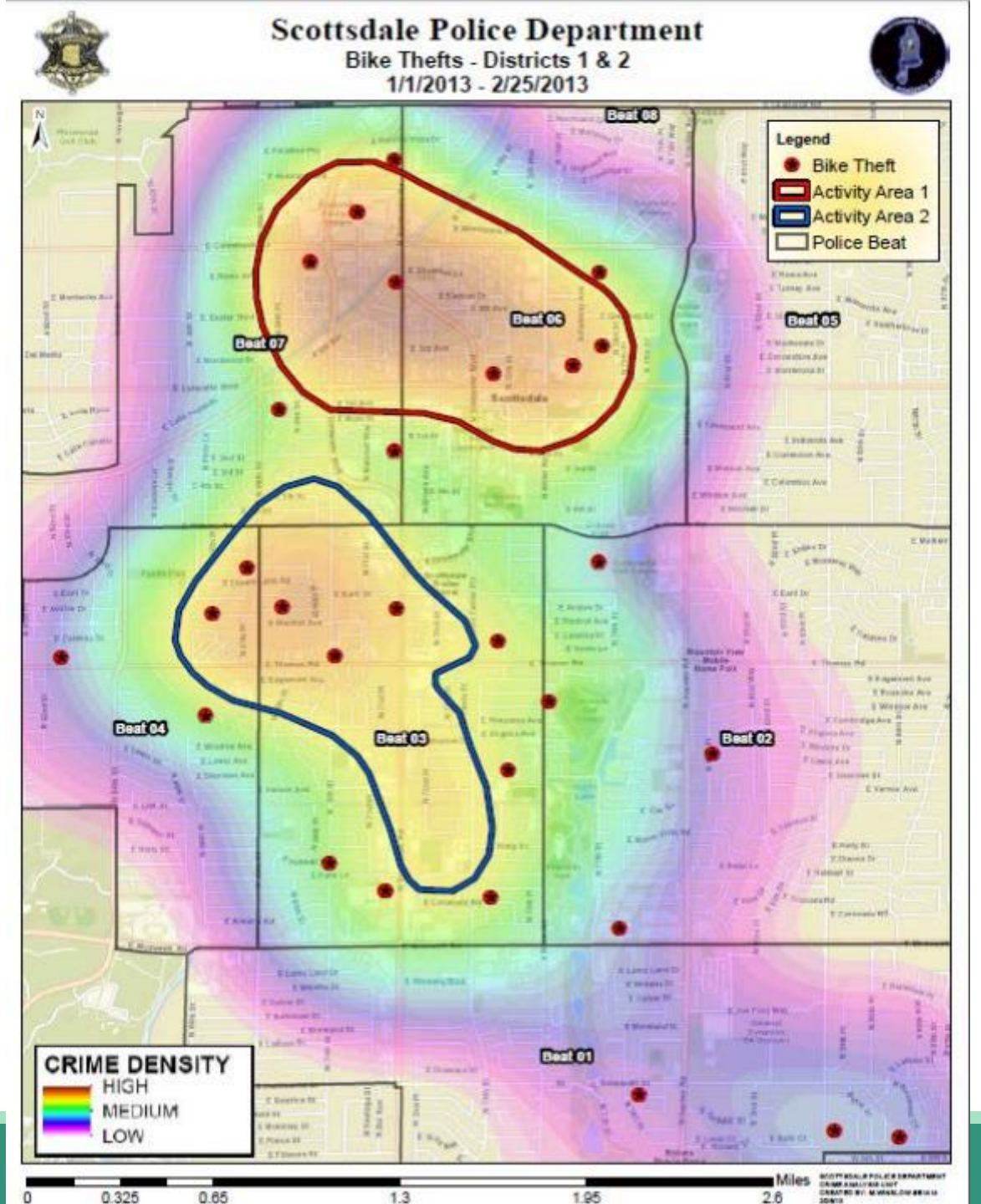
Graduated Symbol Map



Graduated Symbols + Chart

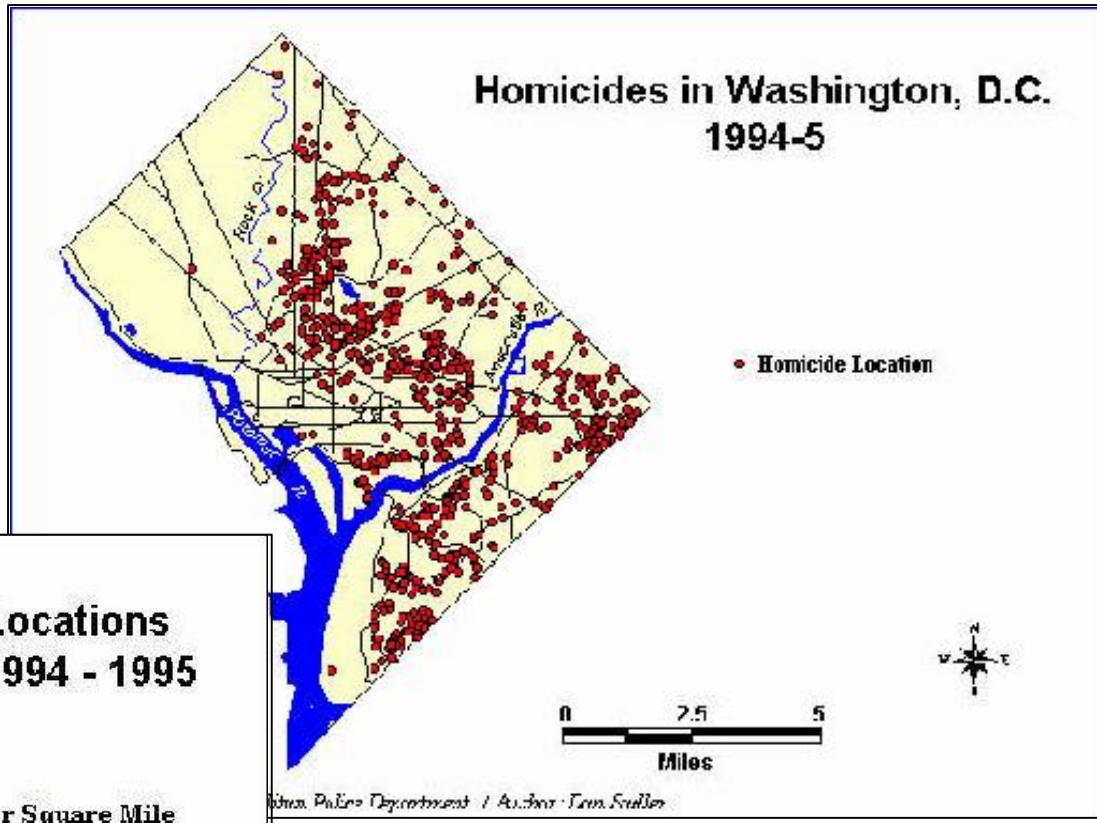


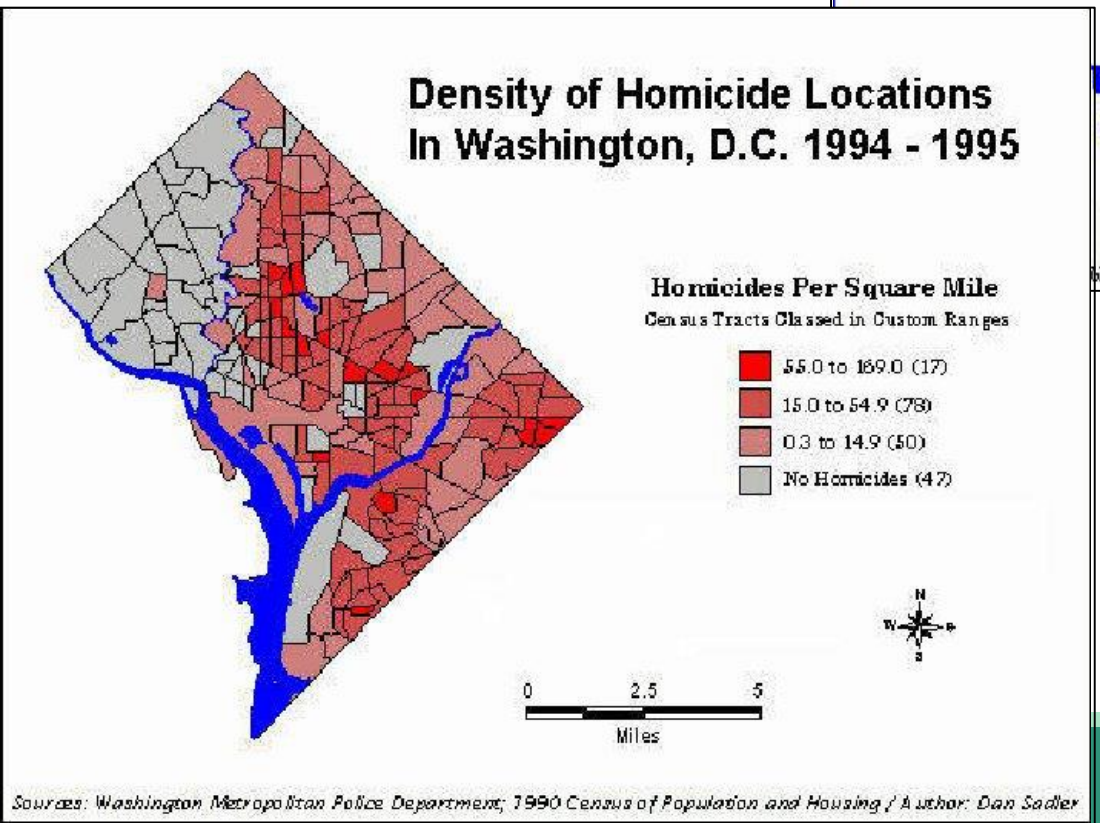
(Kernel) Density Map



Things to consider when mapping crime…

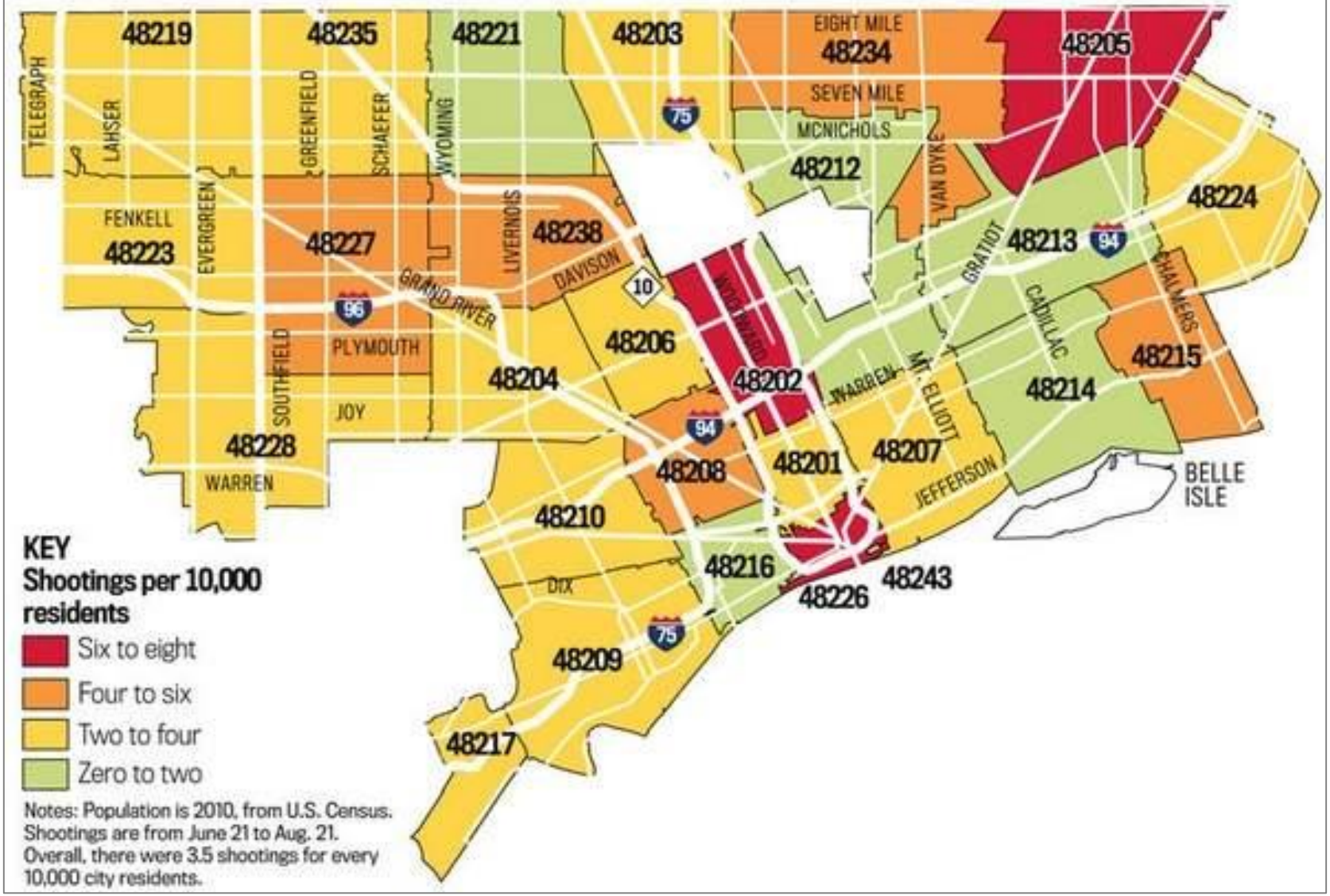
Points vs. Rates





Detroit's hardest hit

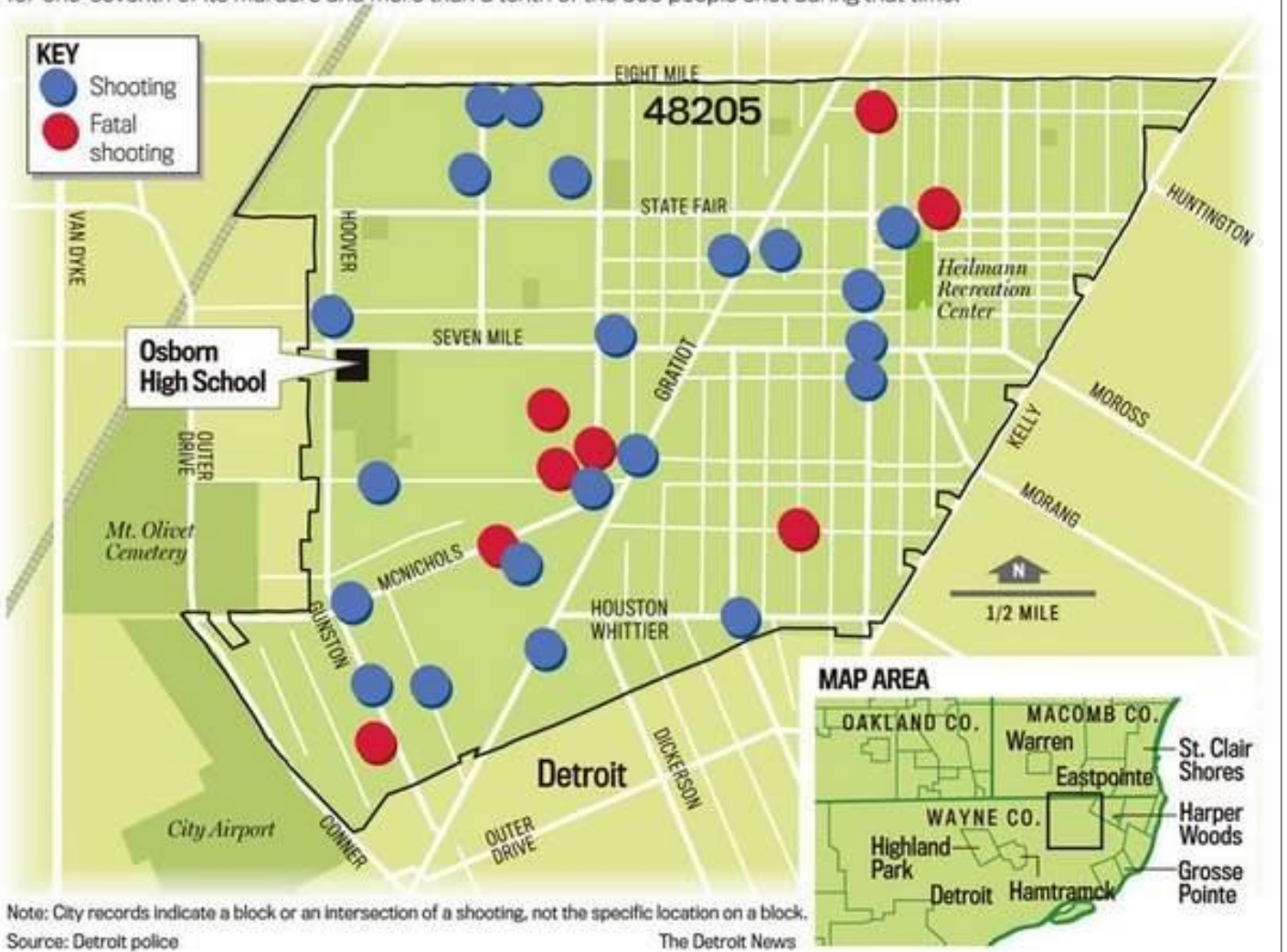
Shootings over a two-month period this summer in Detroit varied dramatically by neighborhood & zip code.



Notes: Population is 2010, from U.S. Census. Shootings are from June 21 to Aug. 21. Overall, there were 3.5 shootings for every 10,000 city residents.

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.

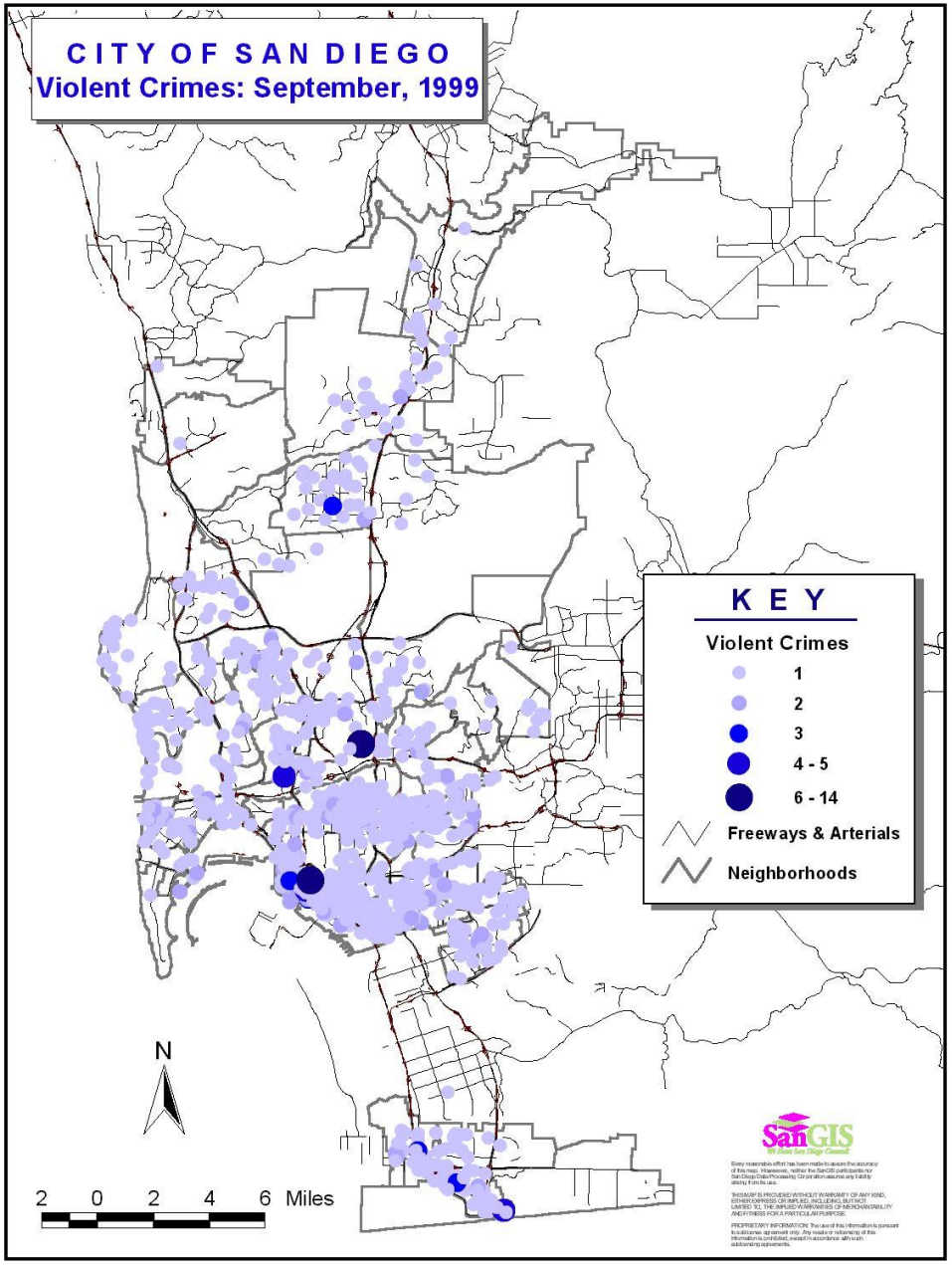


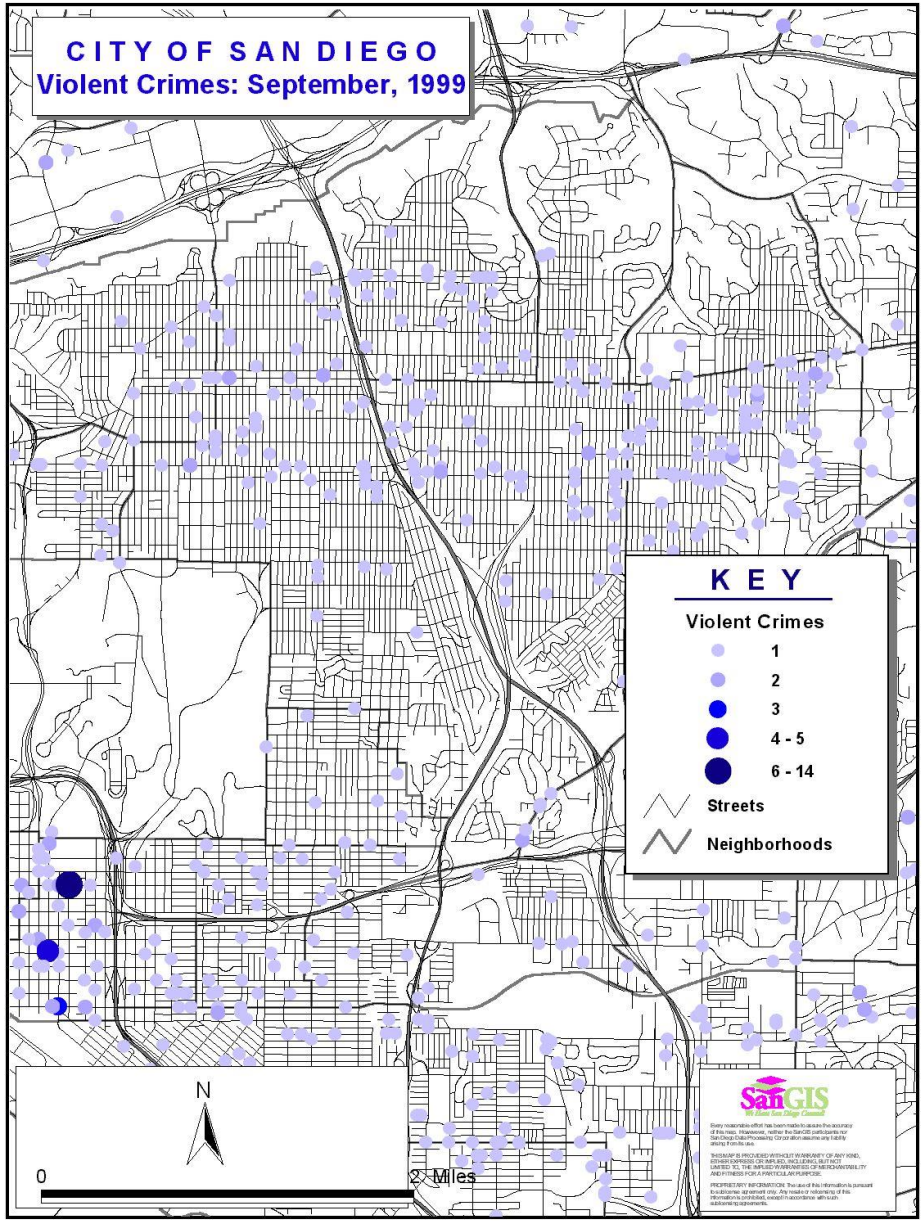
Note: City records indicate a block or an intersection of a shooting, not the specific location on a block.

Source: Detroit police

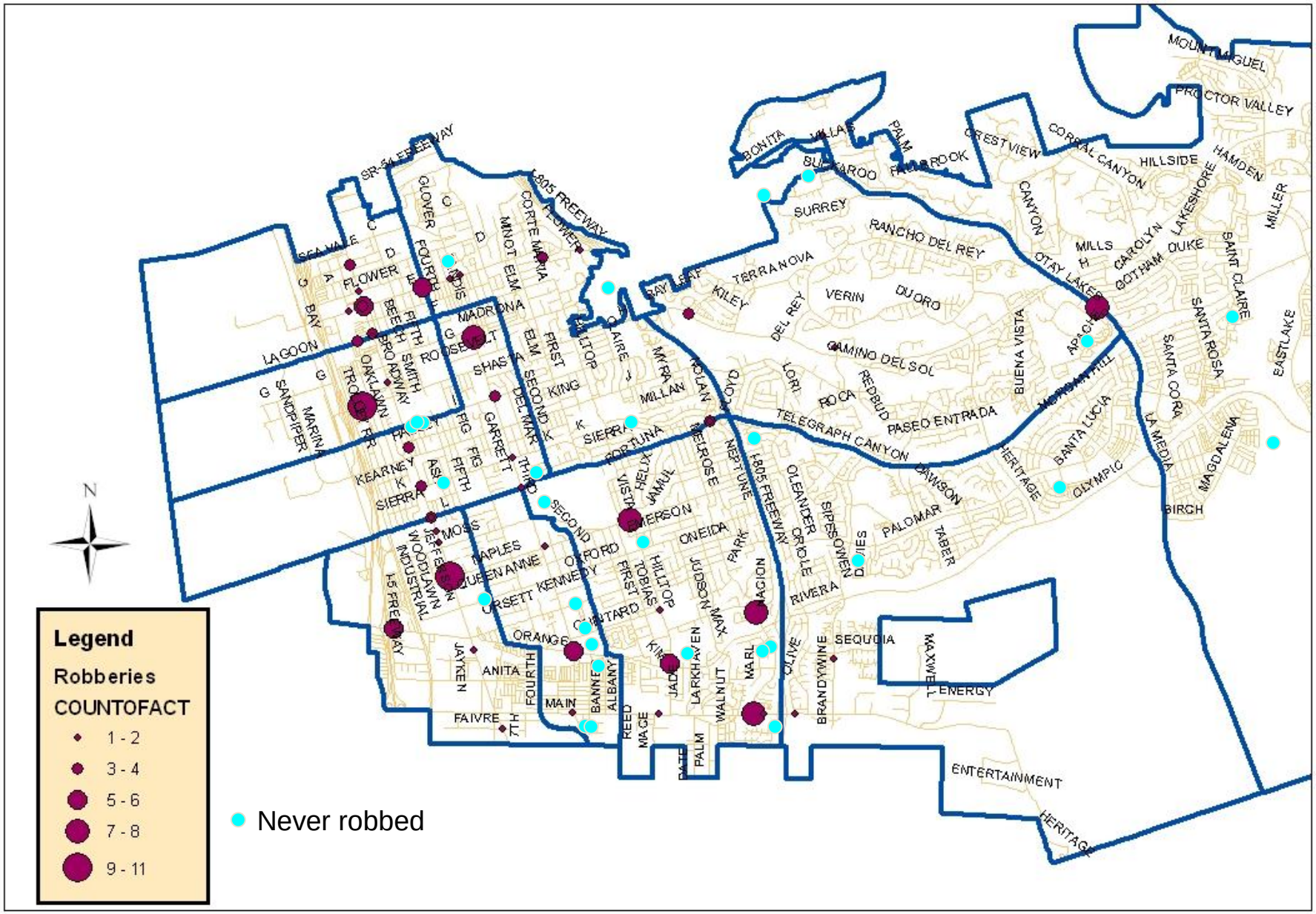
The Detroit News

Scale Matters





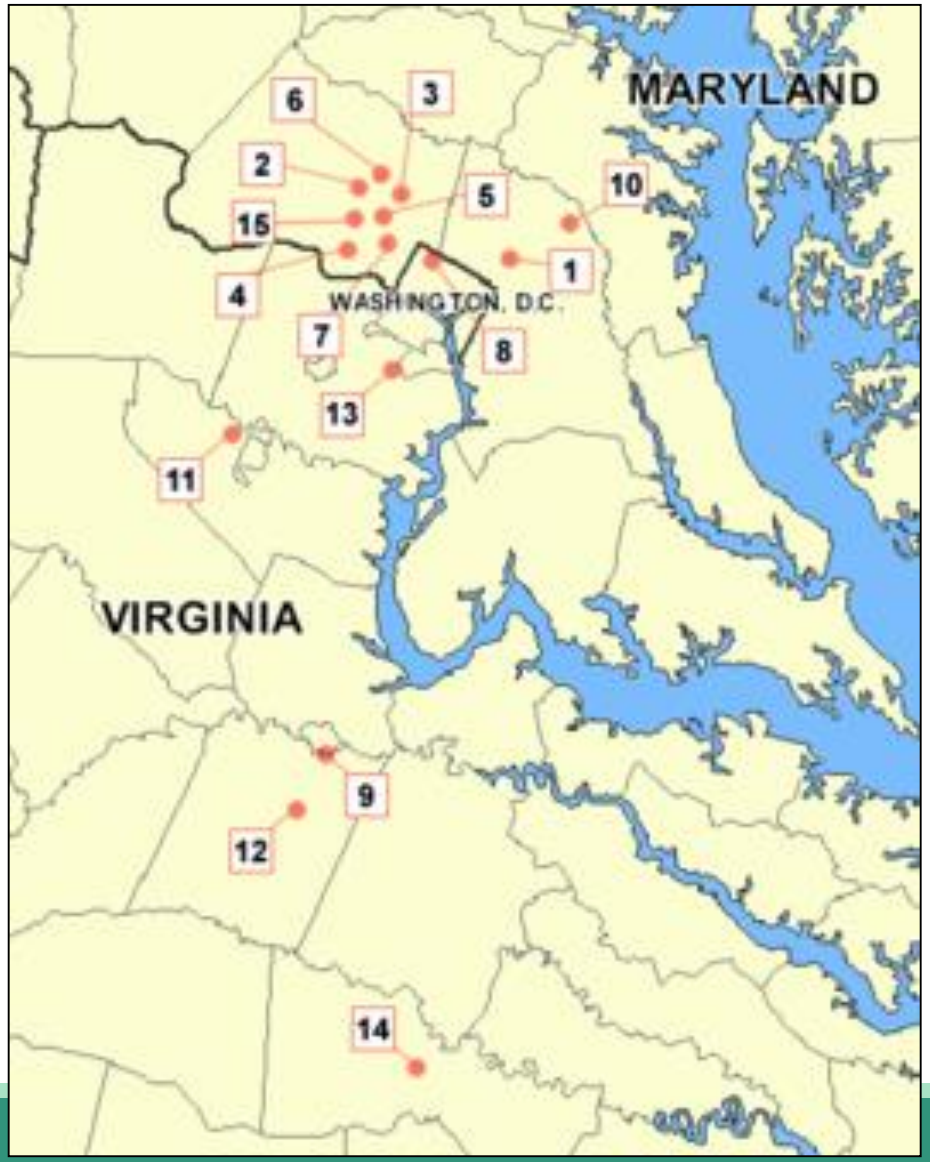
Convenience Store Robberies in Chula Vista 2002-2006 (through 5/19/2006)



Analyzing public safety issues goes beyond mapping crime data

Putting the crime in context

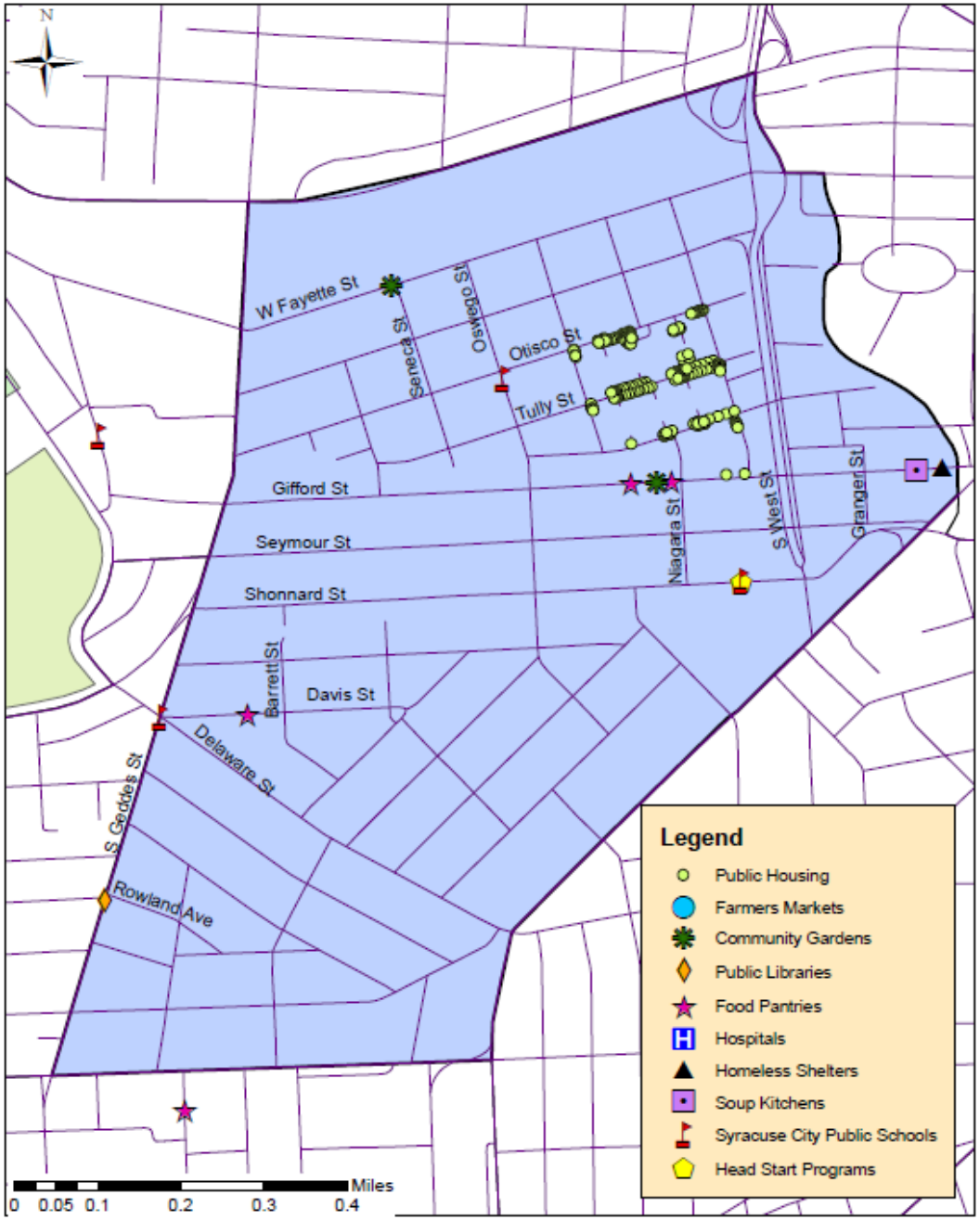
- What's near the incidents in my crime pattern?
  - Highways/major routes
  - Methadone clinics
  - Public transportation
  - Budget motels
  - Public housing
  - Schools
  - Gang territories



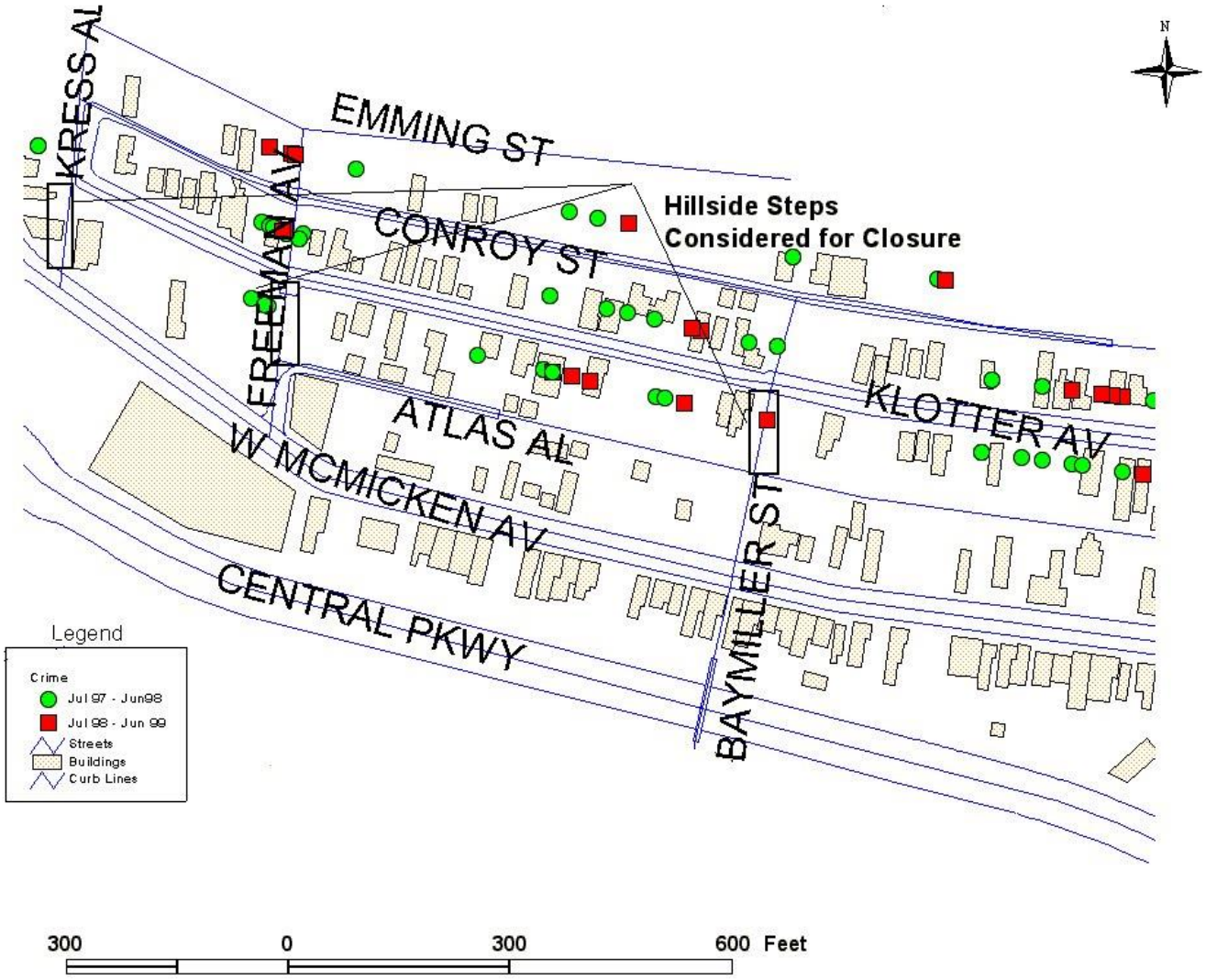
Syracuse BCJI

Westside Neighborhood

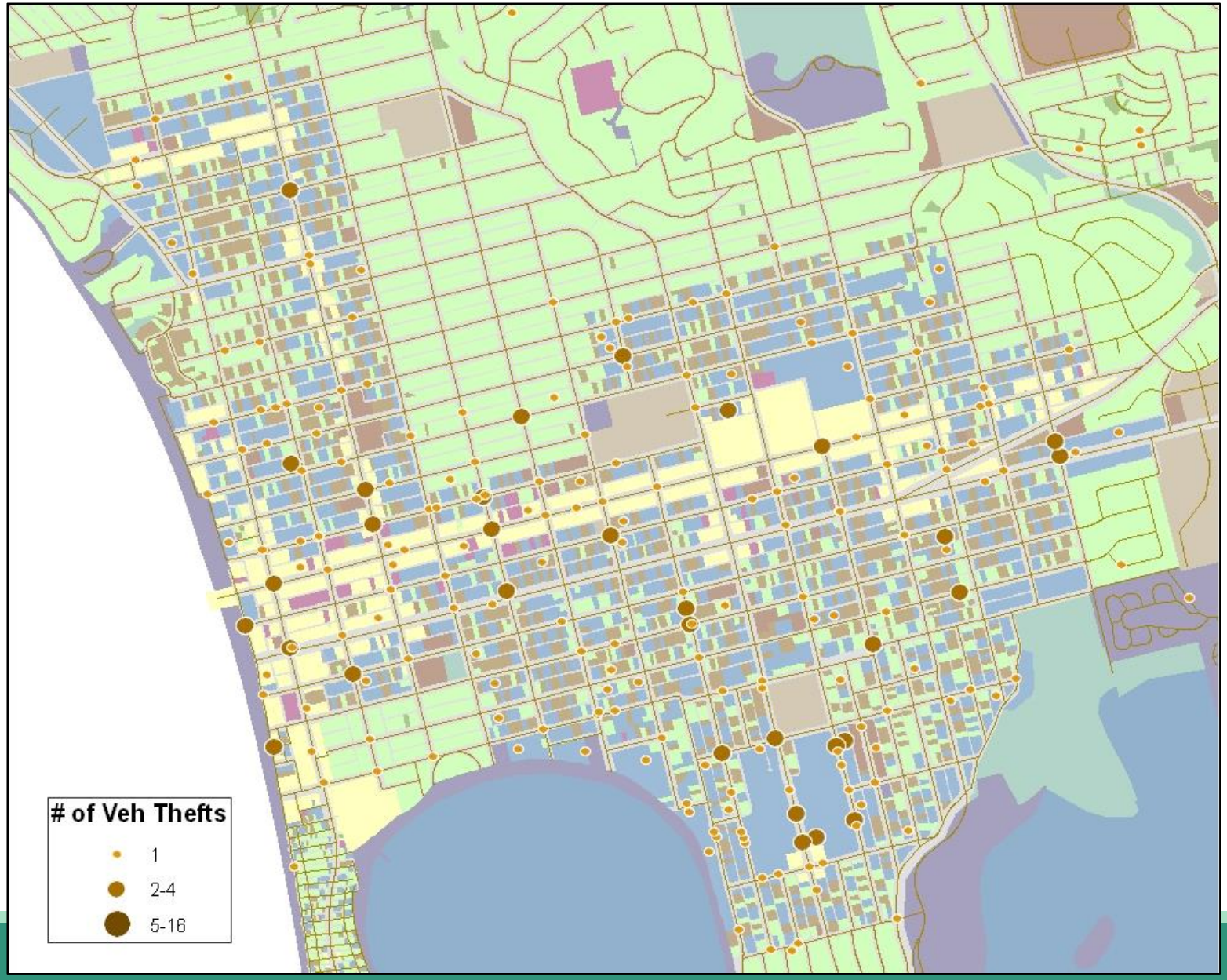
Public Housing & Community Assets



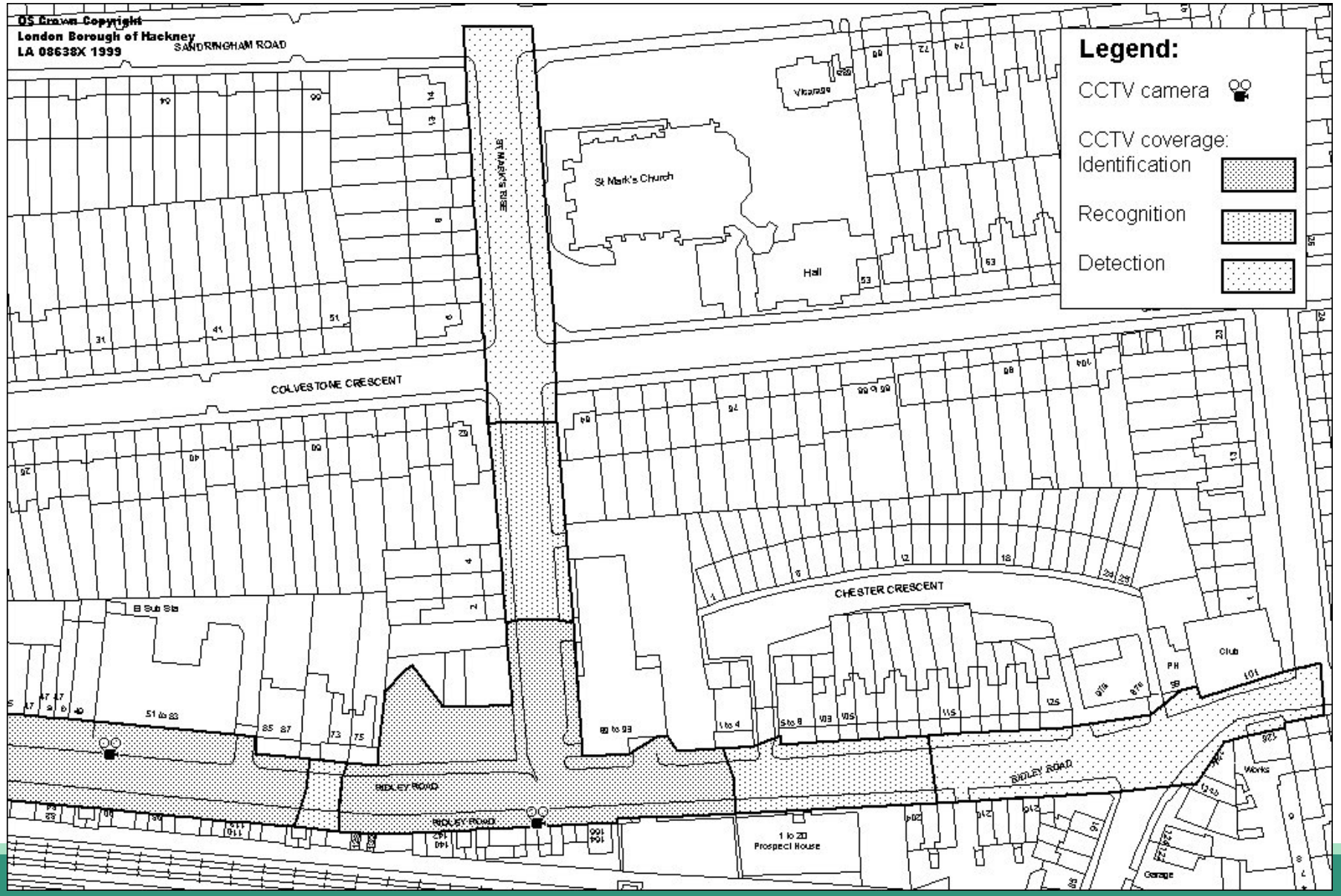
Using CPTED for Neighborhood Problem Solving in Cincinnati, OH



Auto Thefts and Land Use in San Diego

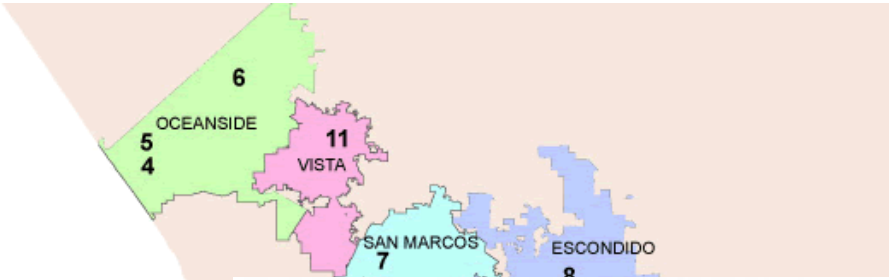


Closed Circuit TV Coverage Areas



Making maps with data that doesn’t yet exist

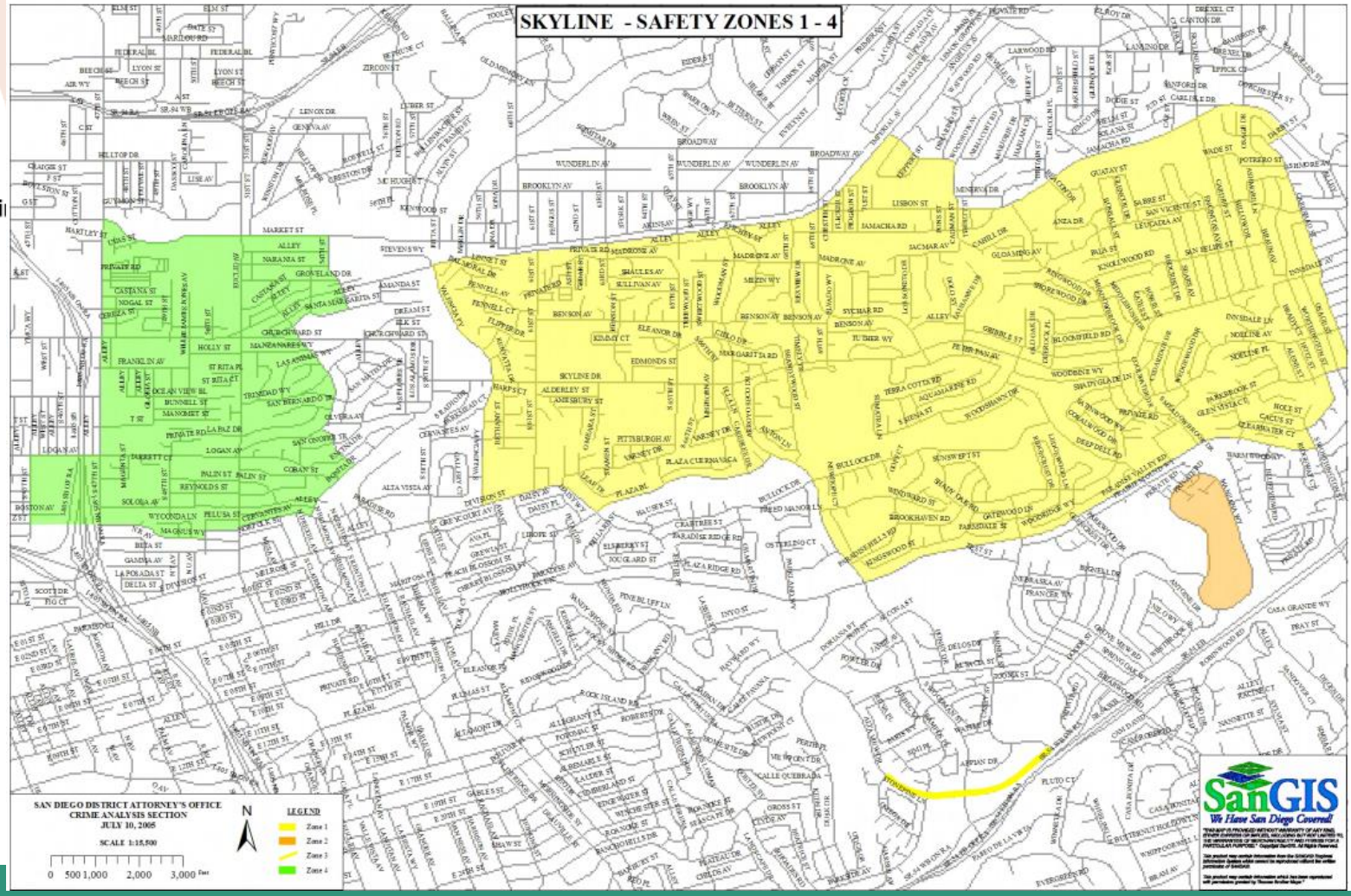
Digitizing Data: Gang Zones



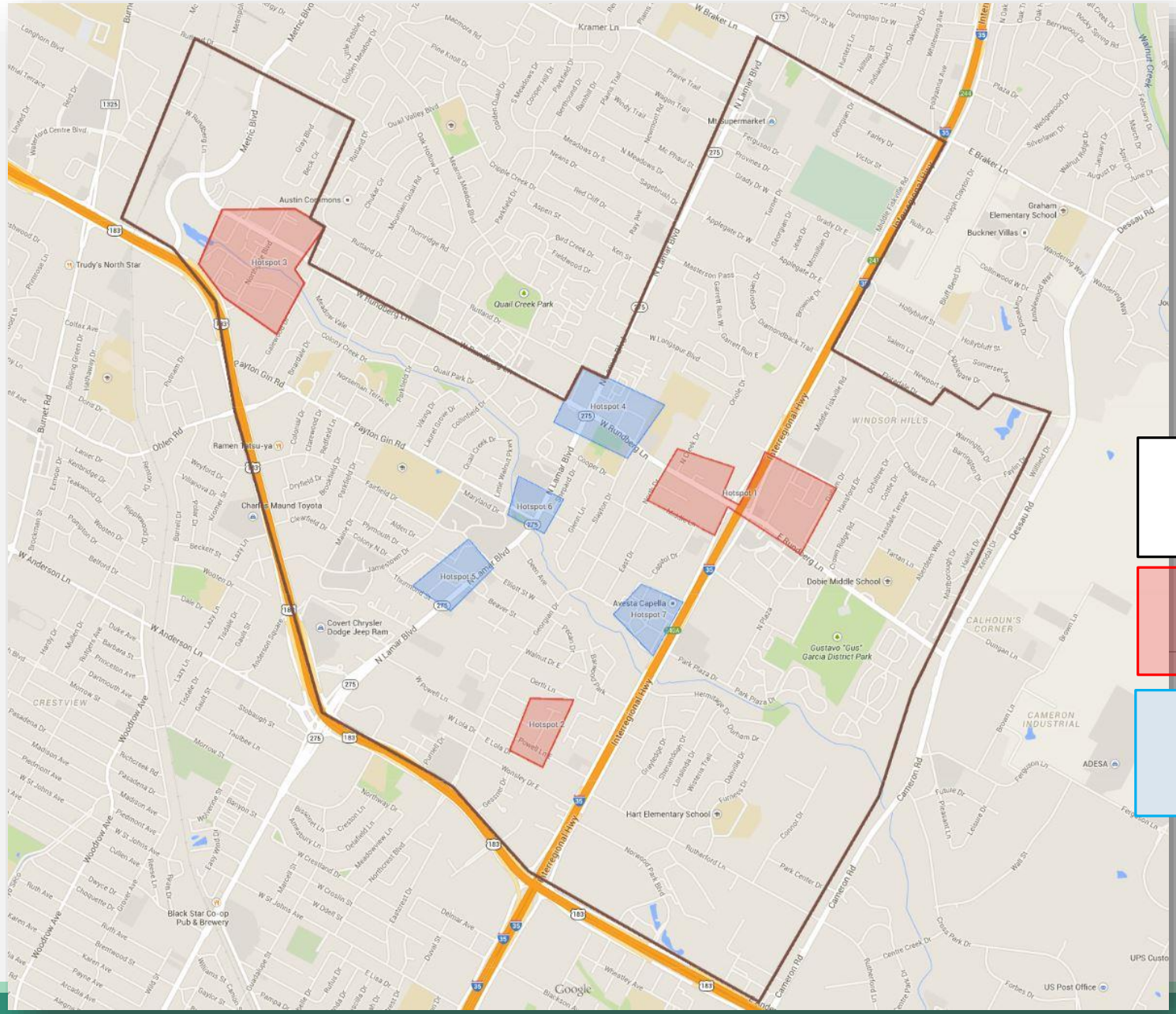
Gang Injunctions withi
San Diego County

Non-injunction area

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
8 Diablos - 2010
9 Westside - 2007
9 Westside - 2010
10 Nestor
11 Vista Home Boys
12 OTNC



AUSTIN BCJI



Grant Area

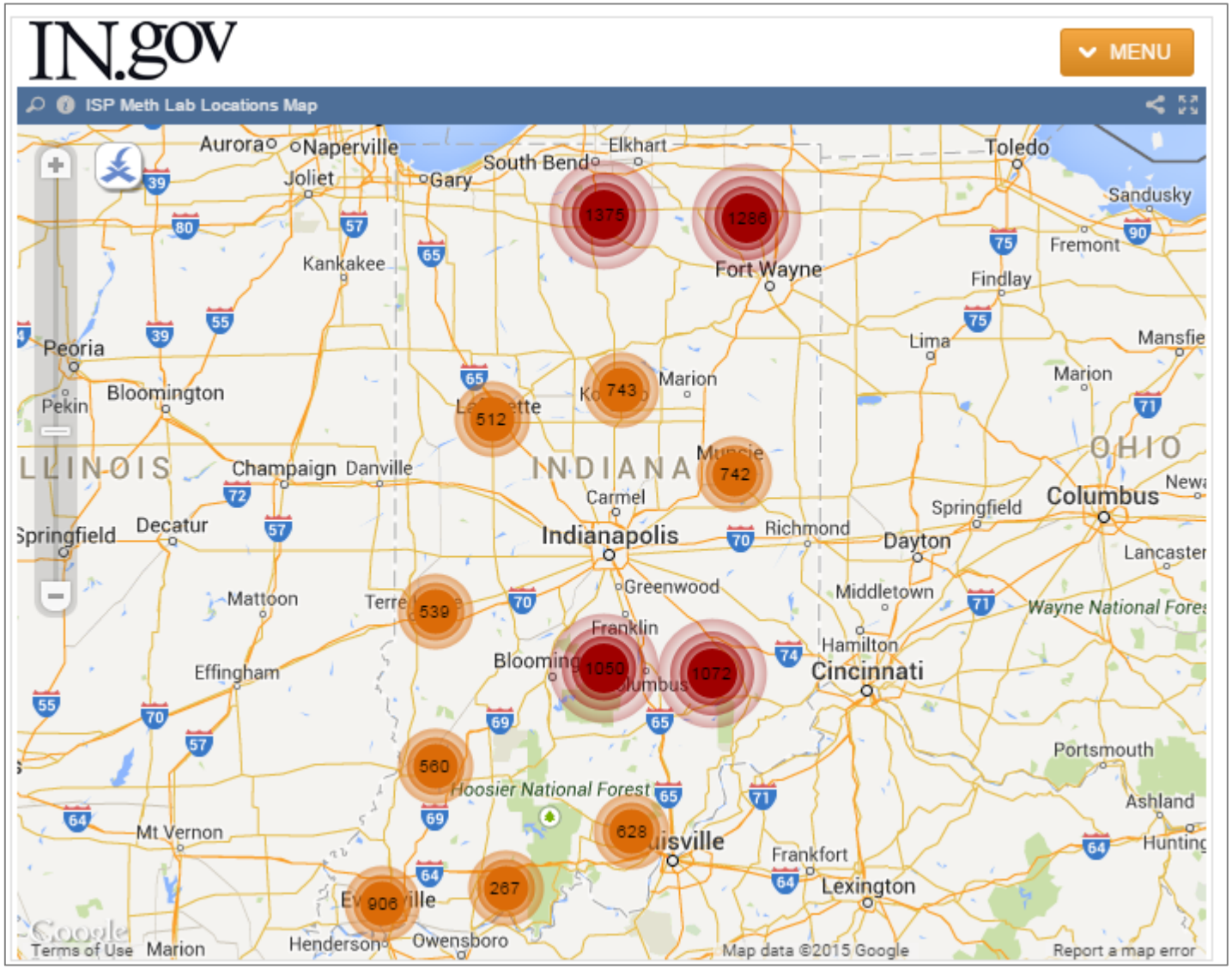
MWB Hotspots

Comparison Hotspots

Crime Mapping Sources of Data

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

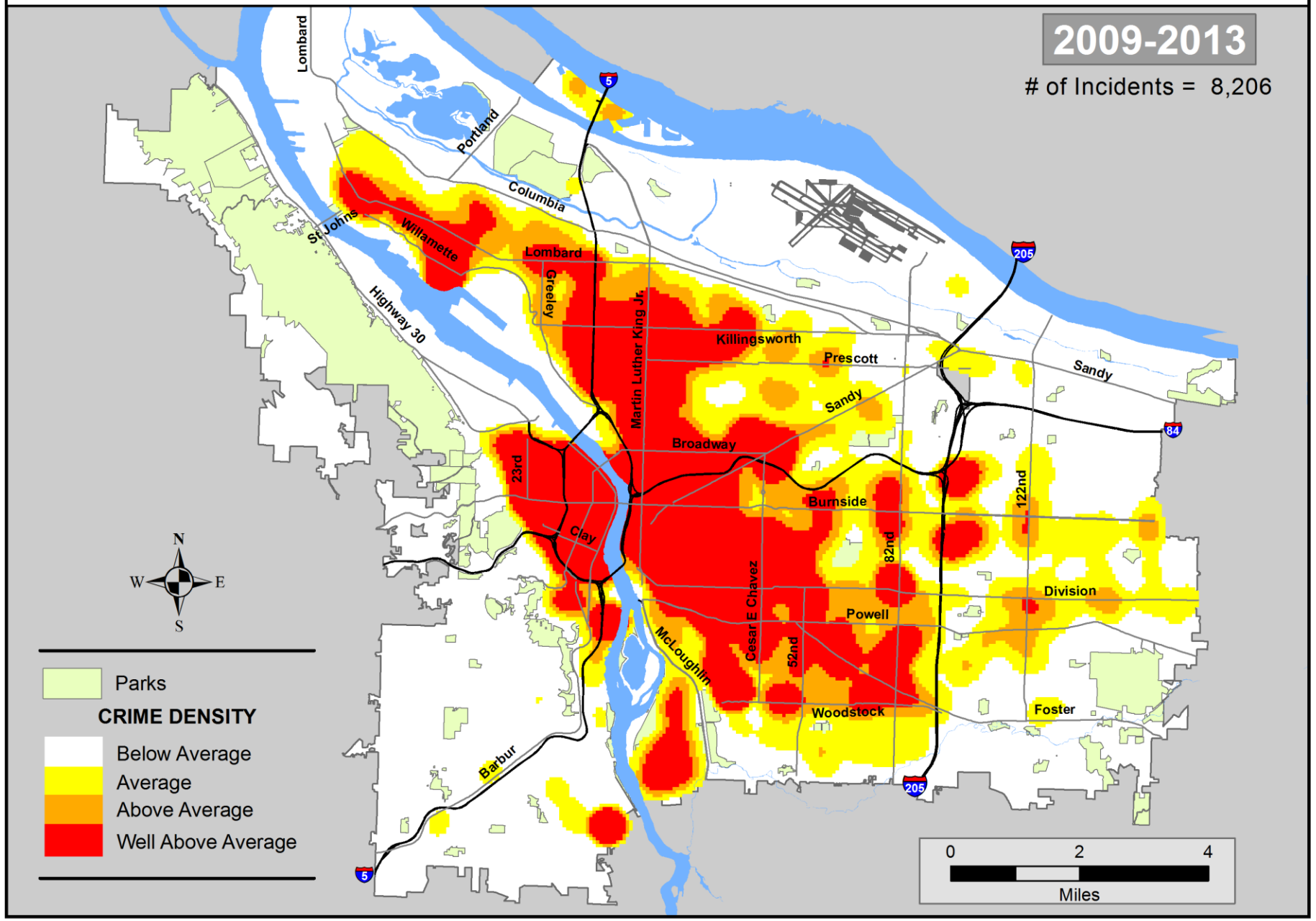
Sharing maps with the public



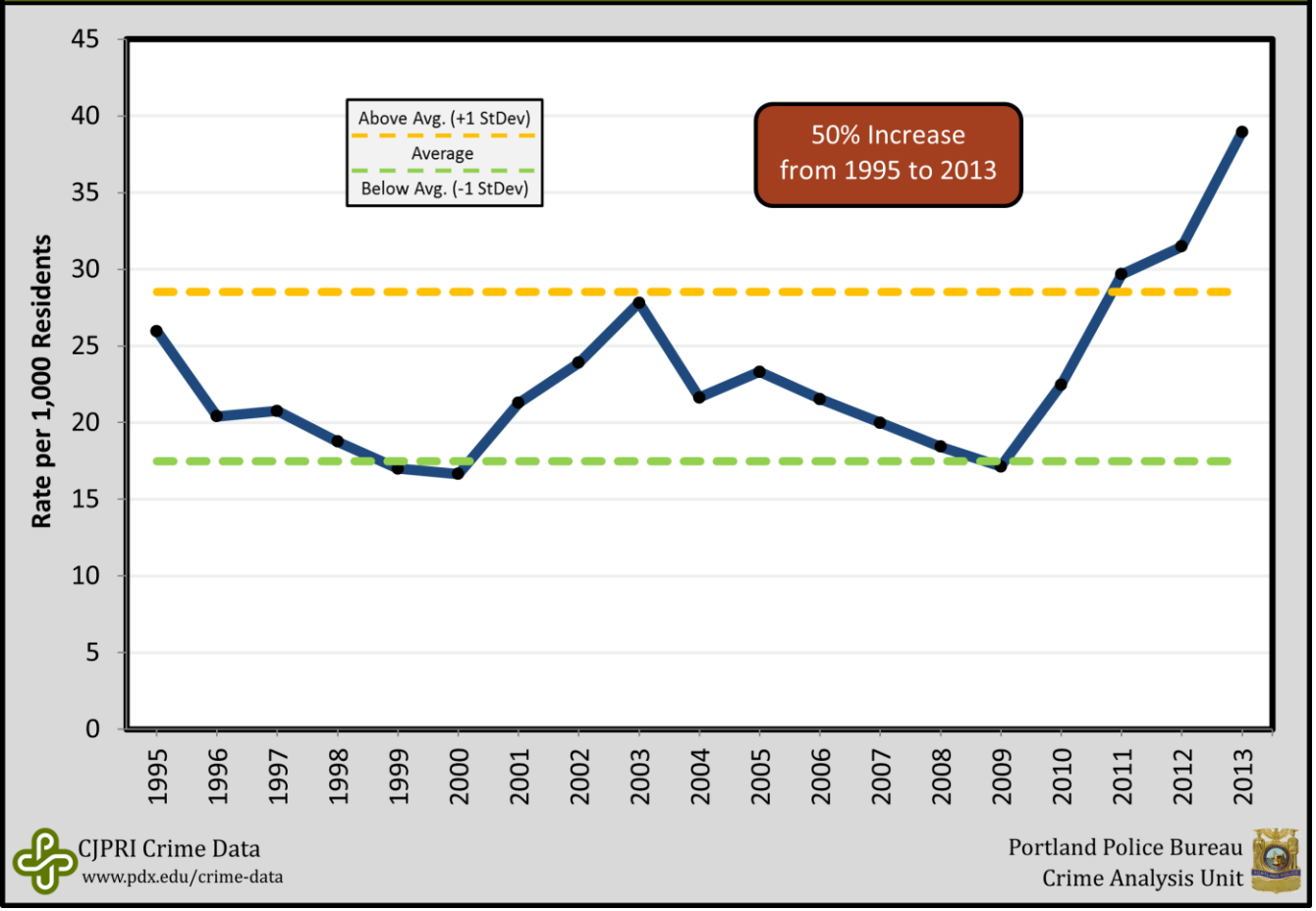
CJPRI Crime Data
www.pdx.edu/crime-data

Bicycle Theft

Portland Police Bureau
Crime Analysis Unit



Bike Theft Rate per 1,000 (Portland, OR)



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Portland Police Bureau
Crime Analysis Unit

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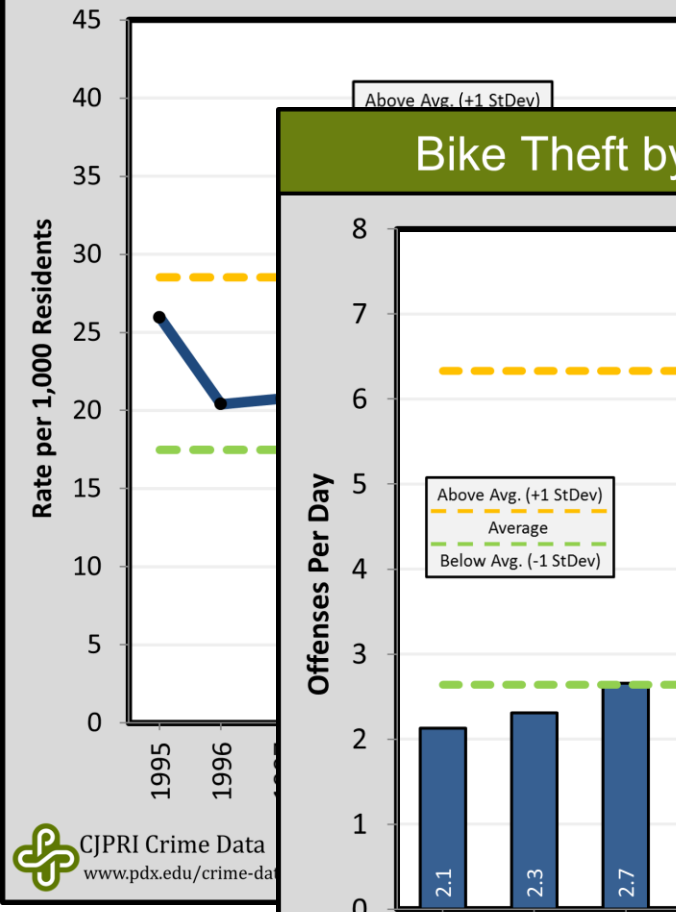
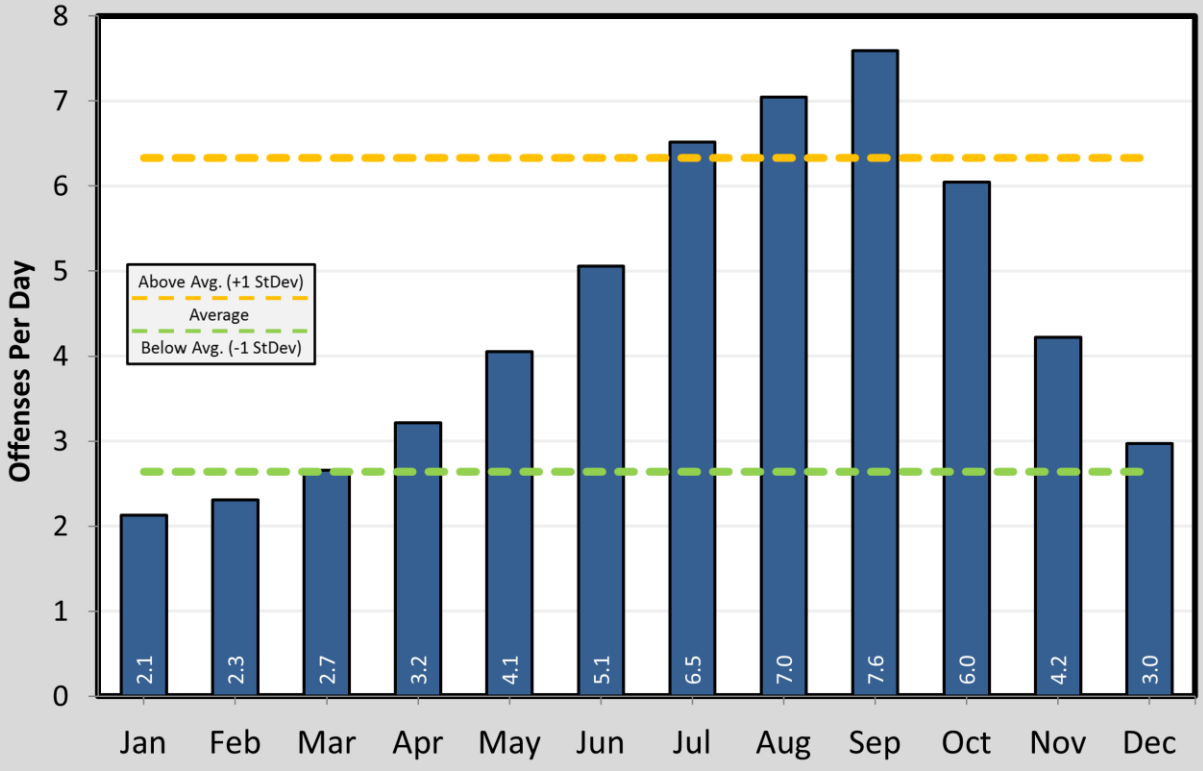


CJPRI Crime Data
www.pdx.edu/crime-dat

Bike Theft by Month (Portland, OR 2009-2013)



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Crime Analysis Unit

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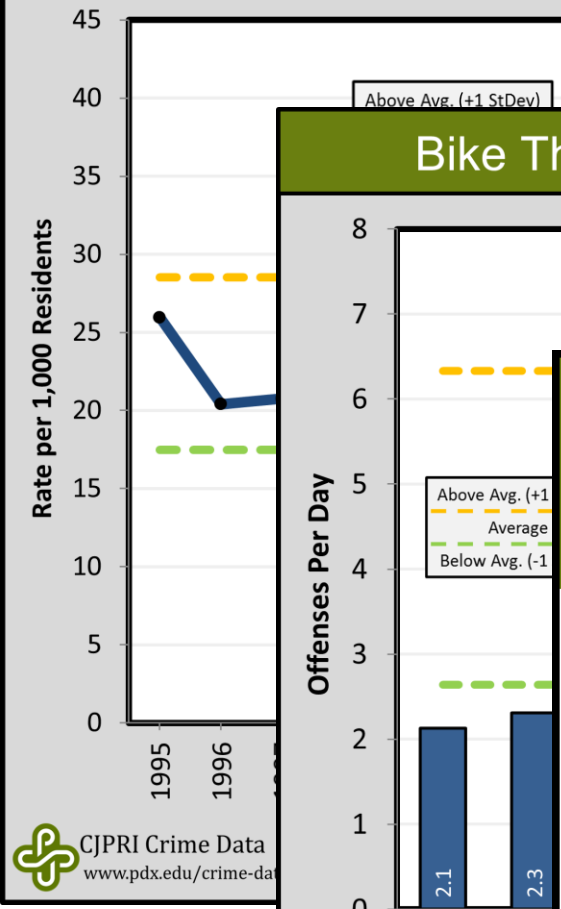

CJPRI Crime Data
www.pdx.edu/crime-dat

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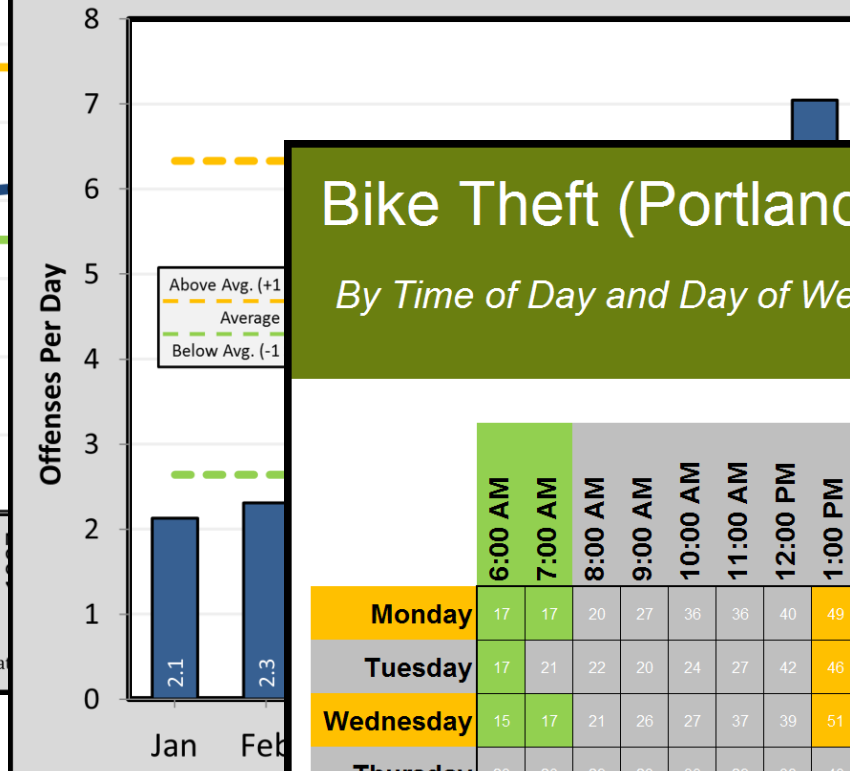

CJPRI Crime Data
www.pdx.edu/crime-data

Bike Theft (Portland, OR)

By Time of Day and Day of Week (2009 - 2013)

- **Below Avg.** (-1 StDev or more)
- **Average**
- **Above Avg.** (+1 StDev)
- **Well Above Avg.** (+2 StDev or more)

	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM
Monday	17	17	20	27	36	36	40	49	49	50	57	54	56	43	39	37	28	21	22	20	23	18	23	19
Tuesday	17	21	22	20	24	27	42	46	47	41	49	51	52	52	44	31	27	22	19	25	22	22	19	23
Wednesday	15	17	21	26	27	37	39	51	46	61	47	60	54	44	52	40	33	27	20	19	17	15	17	15
Thursday	23	20	29	23	30	29	38	40	46	53	50	44	50	43	33	33	40	22	22	18	21	19	17	19
Friday	16	17	19	30	35	34	39	38	47	47	42	42	41	41	41	40	31	33	23	23	24	19	16	18
Saturday	13	12	16	22	26	37	43	42	37	41	45	49	40	35	33	35	39	39	29	20	23	22	17	13
Sunday	16	13	16	20	23	24	38	37	47	42	55	58	41	45	37	34	28	31	29	26	23	21	16	18

Note: The number listed in the time/day cells above indicates the estimated number of offenses using a weighted time-span for incidents with a range rather than a specific hour (e.g., "It happened between 8:00am and 11:00am").

CJPRI Crime Data
www.pdx.edu/crime-data

Portland Police Bureau
Crime Analysis Unit

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!)

Thank You.

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