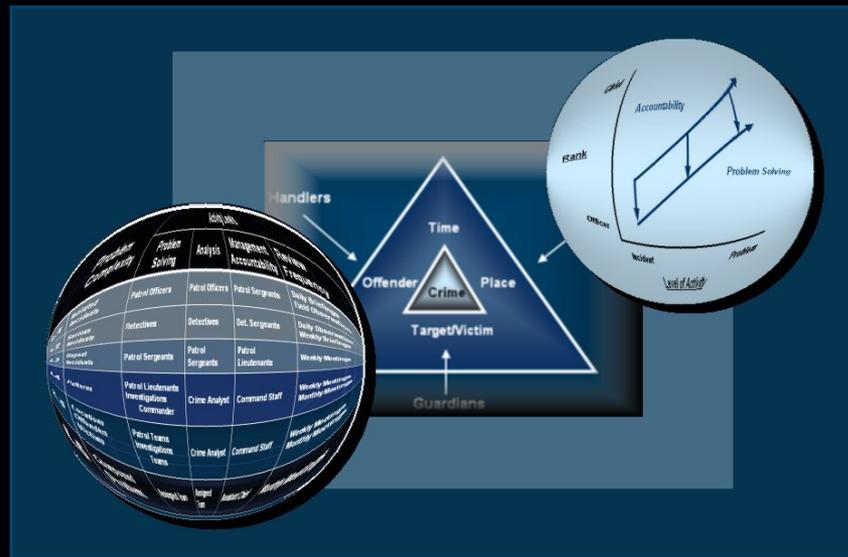


What You Need to Know About Crime Analysis to Do Problem-Solving



Dr. Rachel Boba
Florida Atlantic University

POP Conference 2008
Bellevue, WA

Outline

- Role of analysis in policing
- Levels of problem solving and analysis
- Short-term analysis and examples
- Long-term analysis and techniques

Role of Analysis in Policing

- Crime analysis plays a role in each police strategy from traditional model to problem-oriented policing
- In some a much greater role than in others
- The importance of crime analysis in policing can not be overstated
- Only recent incorporation of crime analysts into police agencies
- The discipline is still struggling with being recognized and being used in effective ways

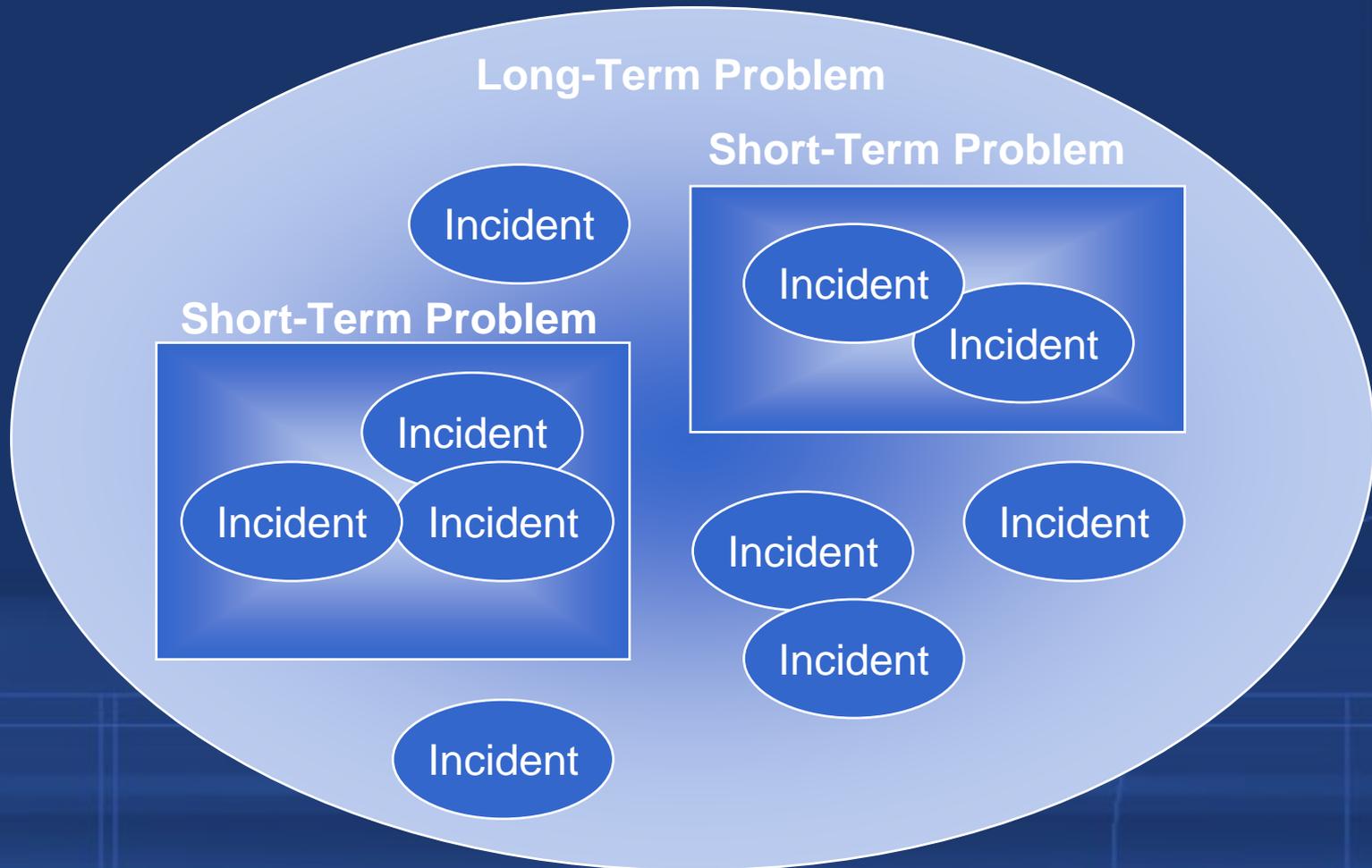
Levels of Problem Solving and Analysis

Important to distinguish among different types of activity that are addressed in policing so analysis can vary appropriately by level.

1. Immediate analysis and response
 - Isolated and serious incidents
2. Short-term analysis and response
 - Repeat incidents and patterns
3. Long-term analysis and response
 - Problems (e.g., locations, offenders, victims, property and compound problems)

Levels of Problem Solving and Analysis

Routine Activities and Situational Environments



Short-Term Analysis

Repeat Incidents

- Two or more non-criminal or interpersonal criminal incidents that are similar in nature and have happened at the same place (typically) or by the same person over a short period of time
- Problem solving focuses on immediate and creative responses
- Scanning occurs through a standardized report
- Analysis and response by sworn personnel
- Assessment through standardized report and documentation

Repeat Incident Analysis

- Data
 - Most up-to-date
 - Calls for service
- Routinized report(s) tailored by
 - Nature of activity in the community
 - Priorities of the agency
- Standardized parameters...

Repeat Incident Analysis

- Type of calls selected as proxy
 - Grouping of related types
 - Individual types (alarms)
- Data range and call threshold
 - Rolling time period
 - Length of time depends on activity and frequency of activity
 - Set threshold for number of calls based on agencies needs and resources
- Information in the report
 - Date, time, location, disposition
 - Short narrative of call

Example Report

Repeat calls include:

- Narcotics
- Neighbor trouble
- Juvenile trouble
- 911 hang ups
- Domestic trouble
- Fights
- Disturbances
- Mentally ill



Port St. Lucie Police Department



REPEAT CALLS FOR SERVICE BY ADDRESS

Dispatch Signals included in this report are: S8, S20, S22, S36, S37, S38, S39, S57, and S99
(Frequency of 3 or more in the last 28 Days; Hospitals, Public Schools, and the Police Station addresses has been removed)

Tuesday, August 22, 2006 - Monday, September 18, 2006

DISTRICT 1

10600 S U S HIGHWAY 1

CALL TYPE: S36 FIGHT

DATE	TIME	DOW	APT	DISPOSITION	INCIDENT #	CASE #	ZONE
9/16/2006	12:51:28 AM	SAT		10-50/10-8 VERBAL WARNING	62590026		14

CALL TYPE: S37 JUVENILE TROUBLE

DATE	TIME	DOW	APT	DISPOSITION	INCIDENT #	CASE #	ZONE
9/10/2006	12:30:10 PM	SUN		UNABLE TO LOCATE COMPL OR VERIFY	62530491		14
9/4/2006	4:12:30 PM	MON		UNABLE TO LOCATE COMPL OR VERIFY	62470658		14

10855 S U S HIGHWAY 1

CALL TYPE: S22 DISTURBANCE

DATE	TIME	DOW	APT	DISPOSITION	INCIDENT #	CASE #	ZONE
9/5/2006	4:18:53 PM	TUE		FI CARD MADE	62480838	306019358	14
9/1/2006	4:58:14 PM	FRI		FELONY ARREST	62440977	306019092	14

CALL TYPE: S36 FIGHT

DATE	TIME	DOW	APT	DISPOSITION	INCIDENT #	CASE #	ZONE
9/5/2006	3:36:09 PM	TUE		INCIDENT VERIFIED/GOA	62480785		14

1915 SE HILLMOOR DR

CALL TYPE: S38 DOMESTIC TROUBLE

DATE	TIME	DOW	APT	DISPOSITION	INCIDENT #	CASE #	ZONE
9/3/2006	10:26:45 PM	SUN	APT72	INCIDENT VERIFIED/GOA	62461066	306019244	14
8/29/2006	8:01:11 PM	TUE		ASSIST OFCR/DEPUTY ON SERVICE CALL	62411092		14
8/29/2006	10:54:55 AM	TUE		INCIDENT VERIFIED/GOA	62410459		14
8/29/2006	1:35:10 AM	TUE		ASSIST OFCR/DEPUTY ON SERVICE CALL	62410050		14

2802 SE MELALEUCA BLV

CALL TYPE: S22 DISTURBANCE

DATE	TIME	DOW	APT	DISPOSITION	INCIDENT #	CASE #	ZONE
9/10/2006	1:13:56 AM	SUN		PEACE RESTORED	62530053		11
9/4/2006	12:48:36 AM	MON		PEACE RESTORED	62470038		11
8/29/2006	10:25:19 PM	TUE		ASSIST OFCR/DEPUTY ON SERVICE CALL	62411218		11

DISTRICT 2

1187 SW HOGAN ST

CALL TYPE: S8 MISSING PERSON/RUNAWAY

DATE	TIME	DOW	APT	DISPOSITION	INCIDENT #	CASE #	ZONE
9/18/2006	1:25:21 PM	MON		INCIDENT VERIFIED/GOA	62610682		23
9/18/2006	6:02:54 AM	MON		INCIDENT VERIFIED/GOA	62610117	306020365	23
9/12/2006	9:22:53 PM	TUE		INCIDENT VERIFIED/GOA	62551197	306019944	23

Ft. Pierce, FL Example

- Assaults
- Shooting
- Fights
- Domestic Trouble
- Juvenile Trouble
- Trespassing
- Loitering
- Unwelcome Subject
- Beverage Violation
- Narcotics Case
- Disturbance
- Neighbor Trouble

Repeat Incident Report
112106 to 121806

Call #	Start Date	Start Time	Signal	Apt #	Call Disposition	Case Number	Day	Common Name	Emp 1
Zone 110									
3008 AVENUE D				7					
63401148	12/8/06	18:15	S37		CANCELLED BY COMPLAINANT	400000000	WED	LIBRARY ZORA NEAL HURSTON	0000008240
63401023	12/8/06	16:49	S37		MISD. ARREST	400000000	WED	LIBRARY ZORA NEAL HURSTON	0000008040
63321057	11/28/06	18:44	S37		SUSP CONTACTED/ADVISED CEASE/DESIST	400000000	TUE	LIBRARY ZORA NEAL HURSTON	0000002804
63321020	11/28/06	18:07	S37		INCIDENT VERIFIED/GOA	400000000	TUE	LIBRARY ZORA NEAL HURSTON	0000008240
63290469	11/25/06	12:29	S22		INCIDENT VERIFIED/GOA	400000000	SAT	LIBRARY ZORA NEAL HURSTON	0000008277
63250950	11/21/06	16:41	S84		ASSIST OFCR/DEPUTY ON SERVICE CALL	400000000	TUE	LIBRARY ZORA NEAL HURSTON	0000008240
63250931	11/21/06	16:22	S37		UNABLE TO LOCATE COMPL OR VERIFY	400000000	TUE	LIBRARY ZORA NEAL HURSTON	0000008240
1001 N 32ND ST				4					
63350065	12/1/06	01:00	S38	APT B	ASSIST OFCR/DEPUTY ON CRIMINAL CALL	400000000	FRI	GARDEN TER HOUSING AUTHORITY	0000004999
63350048	12/1/06	00:43	S22	APT B	NOT A LAW ENFORCEMENT PROBLEM	400000000	FRI	GARDEN TER HOUSING AUTHORITY	0000008060
63350008	12/1/06	00:09	S22	APT B	NOT A LAW ENFORCEMENT PROBLEM	400000000	FRI	GARDEN TER HOUSING AUTHORITY	0000008060
63341384	11/30/06	23:44	S84	APT B	PEACE RESTORED	400000000	THU	GARDEN TER HOUSING AUTHORITY	0000008058
2311 AVENUE D				3					
63501027	12/16/06	20:01	S57		INCIDENT VERIFIED/GOA	400000000	SAT		0000008060
63431135	12/9/06	21:23	S22		REPORT WILL BE WRITTEN	406017288	SAT		0000008060
63331228	11/29/06	20:39	S84		INCIDENT VERIFIED/GOA	400000000	WED		0000008060

Repeat Incident: Problem Solving Example

1010 Chipola Rd (Residence)

Summary

- Mentally ill daughter having dispute with neighbors. The daughter thought the neighbors were saying things about her and teasing her.

Response

- Daughter taken to mental facility but returned home. Victims Assistance counseled resident and neighbors and offered solutions.

Results

- No calls since Victims Assistance visit.



Patterns

- Two or more crimes or serious incidents that seem to be related by victim, offender, location, or property, occurring over a short period of time
- Most current crime data essential
- Scanning through crime type selection
- Analysis by crime analysts
- Limited number of responses
- Assessment /results (e.g., no further related activity)

Preparing for Pattern Analysis

- Crime analyst a funnel for all patterns
- Data collection imperative
- Common use of language pattern types
- Department selects certain crimes for routine analysis (i.e., prioritization)
- Establish consistent bulletin format

Types of Patterns

Series: a run of similar crimes committed by the same individual(s)

Spree: characterized by a high frequency of criminal activity to the extent that the activity appears almost continuous

Hot spot: a specific location or small area where an unusual amount of criminal activity occurs

Repeat victim: specific individuals or groups of individuals who have been repeatedly victimized over a short period of time

Repeat offender: specific individuals or groups of individuals who have repeatedly offended over a short period of time

Hot product: a specific type of property that is the target in the same or different types of crime

Hot target: a type of place that is frequently victimized

Pattern Responses by Police

- In order to develop meaningful patterns
- Important for analysts to understand police capabilities and potential responses to short-term problems
- There are a limited number of realistic responses at this level
- Some responses conducted at the time of the pattern
- Others during regular work/waking hours

Pattern Responses by Police

Responses in Area and during Times of Pattern

Directed patrol

- Police patrol in the areas and times of the pattern
- In cars, on bikes, or on foot
- Objective is to arrest offenders in the act or deter offenders (increasing perceived risk)

Field contacts

- Contacting people in the pattern area
- Objective to arrest offenders, deter offenders, and identify investigative leads

Pattern Responses by Police

Responses in Area and during Times of Pattern

Surveillance

- Police watch and wait in a particular area at a particular time for a crime to happen in order to make an arrest
- Technology used to conduct surveillance (e.g., mobile CCTV)

“Sting” or “bait” operations

- People or property that have been targeted in a particular pattern are put out as “bait” for offenders
- Police observe the “bait” or have electronic monitoring that allows them to arrest the offender or record offenders committing the crimes when the bait is taken

These are used only in the most specific patterns because of the limited effectiveness and high personnel costs

Pattern Responses by Police

Responses during Business/Waking Hours

Clearing cases

- Investigating crimes of a pattern together
- Debriefing suspects
- Arrest for one crime is used to clear others in the pattern

Contacting potential victims directly

- Crime prevention education targeted at specific victims, times, and areas
- In person, through a letter via postal mail, or through flyers left at homes or businesses

Pattern Responses by Police

Responses during Business/Waking Hours

Reverse 911

- Technology that allows the police to call residents and businesses in a pattern area and leave a recorded message about the crime pattern and crime prevention advice

Providing pattern information to the public

- Encourage the public to provide additional information (“tips”)
- Offenders might be deterred from continuing their offending
- Encourage individuals to protect themselves
- Media such as newspapers, radio, television, and the Internet are used to provide this information

Pattern Examples



Burglary Spree: Vehicle Burglaries at Neighboring Apartments & Condominiums

Number of Incidents: 6
 Date Range: August 26, 2007
 Time Range: Primarily in the late night/early morning hours (between 0001 hours and 1100 hours)

Target: Primarily unlocked vehicles and convertibles

Property Taken: Stereo face plates, music CDs, other miscellaneous items left in vehicle

MO: Suspects enter vehicle via unlocked door or cut rooftops of convertibles.

Possible Suspect Info: No Suspect Information.

Theft from Vehicle Spree at Apartments and Condos, Fort Pierce, Florida

Map #	Case Number	Method of Entry	Property Taken	Date	Time	Day	Location
1	2007-4-12130	CUT HOLE IN CONVERTIBLE ROOFTOP	STEREO FACE PLACE, CDs	8/26/2007	0001 - 0831	SUN	2040 COLONIAL ROAD, APT #5
2	2007-4-12135	UNLOCKED DOOR	DEBIT CARD, SOCIAL SECURITY CARD, DRIVER'S LICENSE	8/26/2007	0030 - 0900	SUN	2010 S. 10TH STREET, APT. B
3	2007-4-12136	UNLOCKED DOOR	STEREO FACE PLACE	8/26/2007	0001 - 0900	SUN	2050 OLEANDER AVE, APT 1-201
4	2007-4-12139	BROKE SUNROOF, NO ENTRY	NONE	8/26/2007	0001 - 1110	SUN	2090 COLONIAL ROAD, ATP #6
5	2007-4-12141	BROKEN SIDE & BACK WINDOW	CAR STERO/RADIO, GARAGE DOOR OPENER	8/26/2007	0001 - 1110	SUN	2070 COLONIAL ROAD , APT #6
6	2007-4-12144	UNLOCKED DOOR	STEREO FACE PLATE, MISC. CDs	8/26/2007	0001 - 0900	Sun	2014 S. 10TH STREET, APT. A

Courtesy of Ft. Pierce, FL Police

Theft from Vehicle Spree at Apartments and Condos, Fort Pierce, Florida

Map of Incident Locations



Courtesy of Ft. Pierce, FL Police

Theft from Vehicle Hot Product, Danvers, MA

Crime Analyst, Chris Bruce presenting at 1:30pm today.

Courtesy of Danvers, MA Police

DPD



Neil F. Ouellette
Chief of Police

PATTERN REVIEW Thefts of GPS Devices February 9, 2007

For more information, contact the Office of Public Safety Analysis
978-774-1213 ext. 119 • cbruce@mail.danvers-ma.org

Thefts Return to Route 1

Two new GPS thefts this week on Route 1 give concern that the Newbury/Andover hot spot, which has otherwise been quiet since the CID arrests of Racca and Neuner, may be returning.

The thefts were at the Residence Inn (238 Andover St) and Hardcover (15 Newbury St). There were half a dozen others at Hardcover in November and December. The recent thefts are concentrated in the late evening, 20:00-23:40.

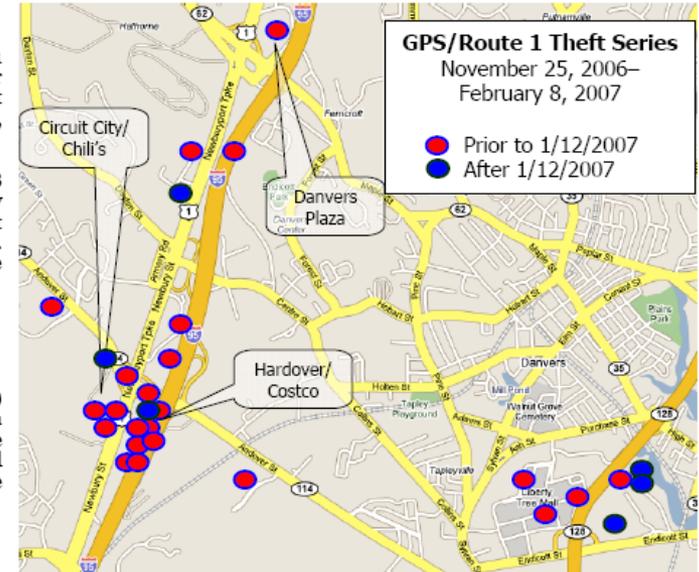
Hollywood Hits Quiet

Hollywood Hits (7 Hutchinson Drive) was the site of three thefts between December 27 and January 17, with the concentration between 20:00 and 22:00. There have been none there in the past three weeks.

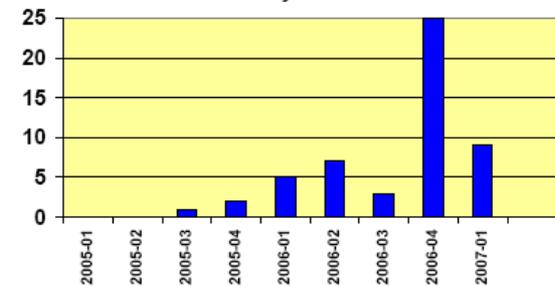
Anatomy of the Pattern

The recent pattern encompasses 32 incidents with the following characteristics:

- Several potential suspects have been identified and/or arrested. Most of them are **boyfriend/ girlfriend teams**, with **drug dependency**, from the local area.
- The focus on **GPS devices** (with the occasional **laptop** or other electronic) suggests the thieves **peer into multiple cars on foot** before selecting the targets. They then return to their cars, drive quickly up to the target car, **smash the window**, and take the device.
- The cars are parked in **commercial lots just off the highway**. The **Hardcover/ Costco** lot (11-15 Newbury St) in Danvers has been hit seven times; **Circuit City/Chili's** (4-10 Newbury St) has been hit three times; and **Hollywood Hits** (7 Hutchinson Dr) has been hit three times.



GPS Thefts in Danvers by Quarter



Long-Term Analysis

Crime vs. Problem Analysis

Problem: A set of related activity that stems from systematic opportunities created by everyday behavior and environment occurring over a longer period of time

Crime Analysis

- Descriptive
- Official data
- Patterns and counts

Problem Analysis

- Explanatory
- Primary data
- Themes and logical conclusions

Key Analysis Questions

- What is the nature of problem?
- How frequently is the problem occurring?
- Has the problem increased or decreased?
- When is the problem occurring?
- Where is the problem occurring?
- Who are the victims/targets and does repeat victimization exist?
- Who are the offenders and does repeat offending exist?
- Why is the problem occurring?

What is the nature of the problem?

- Problem locations (individuals and types)
- Problem victims (individuals and types)
- Problem offenders (individuals and types)
- Problem property (types)
- Compound problems

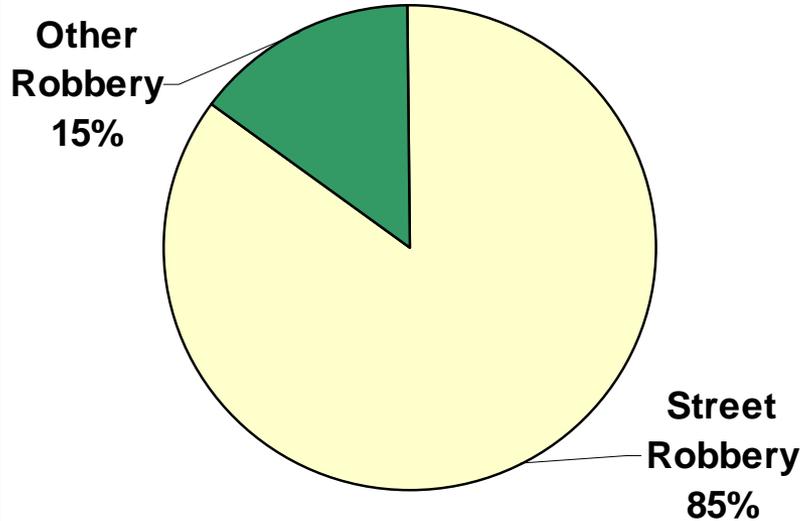
How frequently is the
problem occurring?

Frequency and Percentage of Street Robbery Comparison

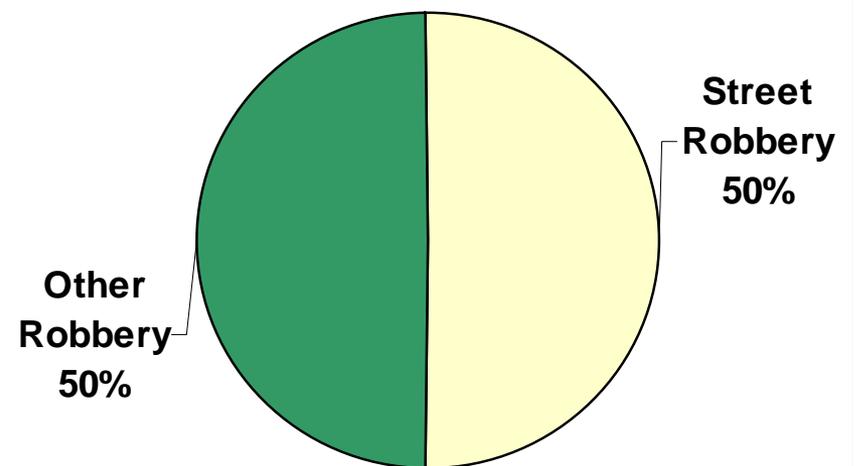
Pie Chart: Percentage of Street Robbery

	Street Robbery	All Robbery	Percent of Total
Year 1	210	247	85%
Year 2	200	400	50%

Year 1



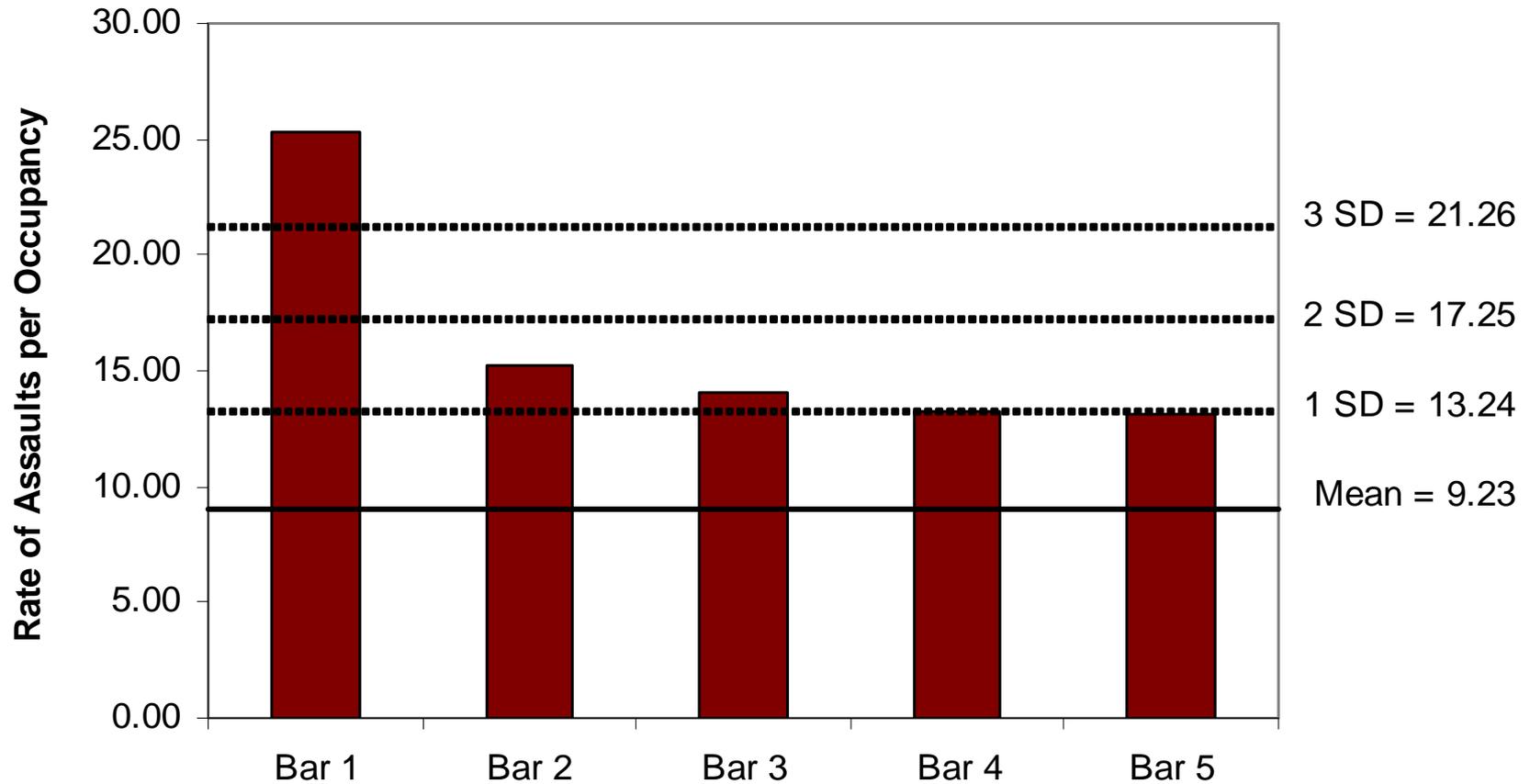
Year 2



Frequency and Rate of Burglaries per Target

Beat	Frequency of Burglaries	Number of Targets	Burglaries per 100 Targets
Beat 1	164	131	125.01
Beat 2	82	75	109.17
Beat 3	174	130	134.18
Beat 4	299	348	85.93
Beat 5	43	84	50.86
Beat 6	68	286	23.65
Beat 7	135	212	63.81
Total	965	1266	76.21

Rates of Assaults at Bars, Mean and Standard Deviations



Has the problem
increased or decreased?

Chart Comparing City and State Robbery Rates

Robbery Rate per 100,000 Persons

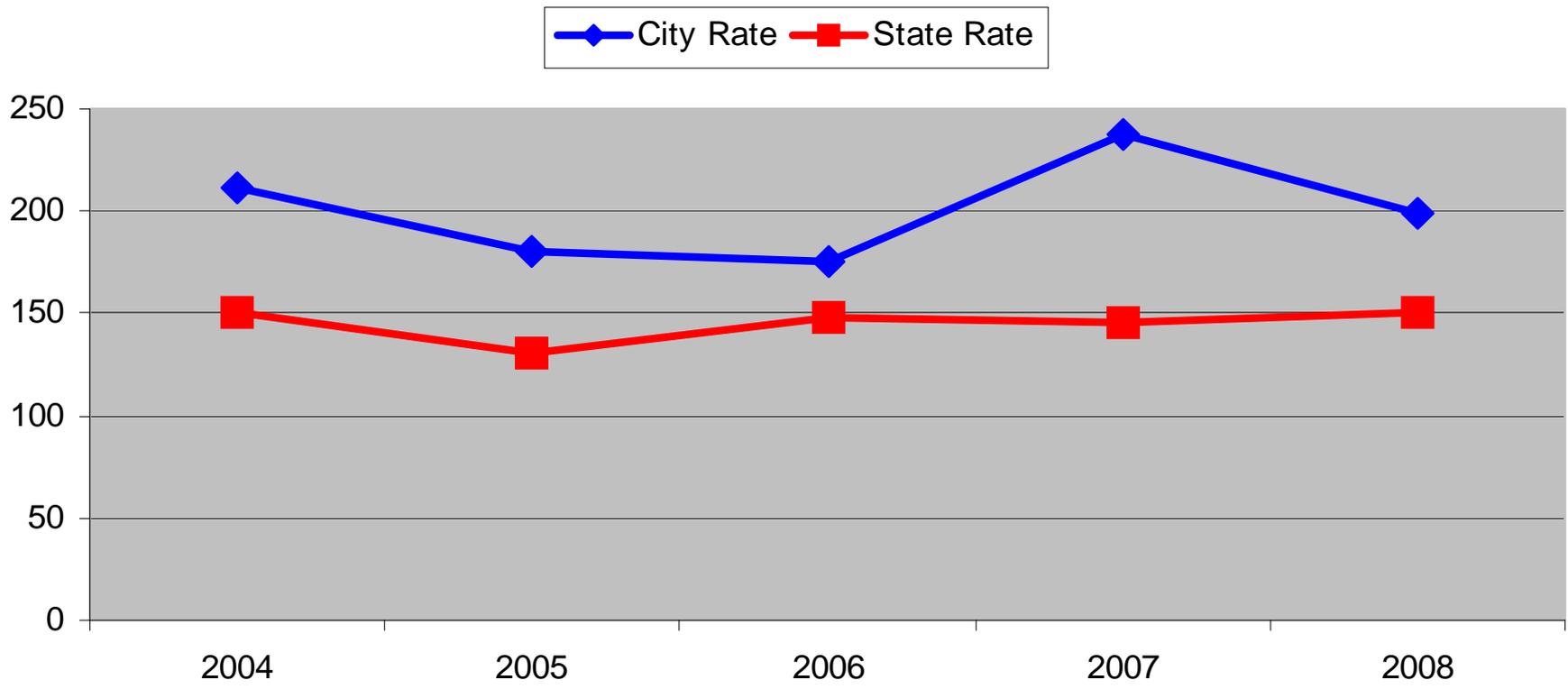
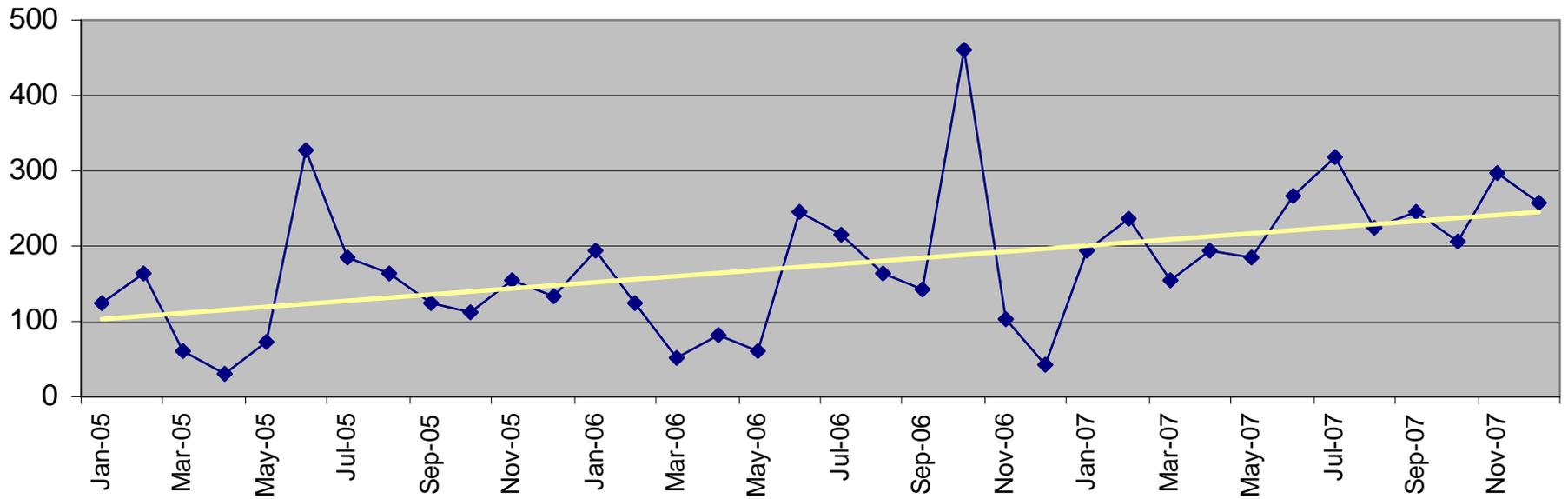


Chart of Loud Party Calls at Apartment Complexes, Three Years (Linear Trend Line)

Number of Loud Party Calls at Apartment Complexes



Actual and Percentage Change in Stranger Rape by Beat From 2006 to 2007

Beat	2006	2007	Change	Percent Change
Beat 1	20	46	26	130%
Beat 2	36	23	-13	-36%
Beat 3	15	49	34	227%
Beat 4	56	84	28	50%
Beat 5	0	12	12	N/A
Beat 6	3	19	16	533%
Beat 7	29	38	9	31%
Total	159	271	112	70%

When is the problem
happening?

When is the problem happening?

- Seasonality
- Time of day/day of week
- Time span analysis/weighted method (aoristic analysis)

Loud Party Calls at Apartment Complexes: Seasonal Comparison

Number of Loud Party Calls at Apartment Complexes

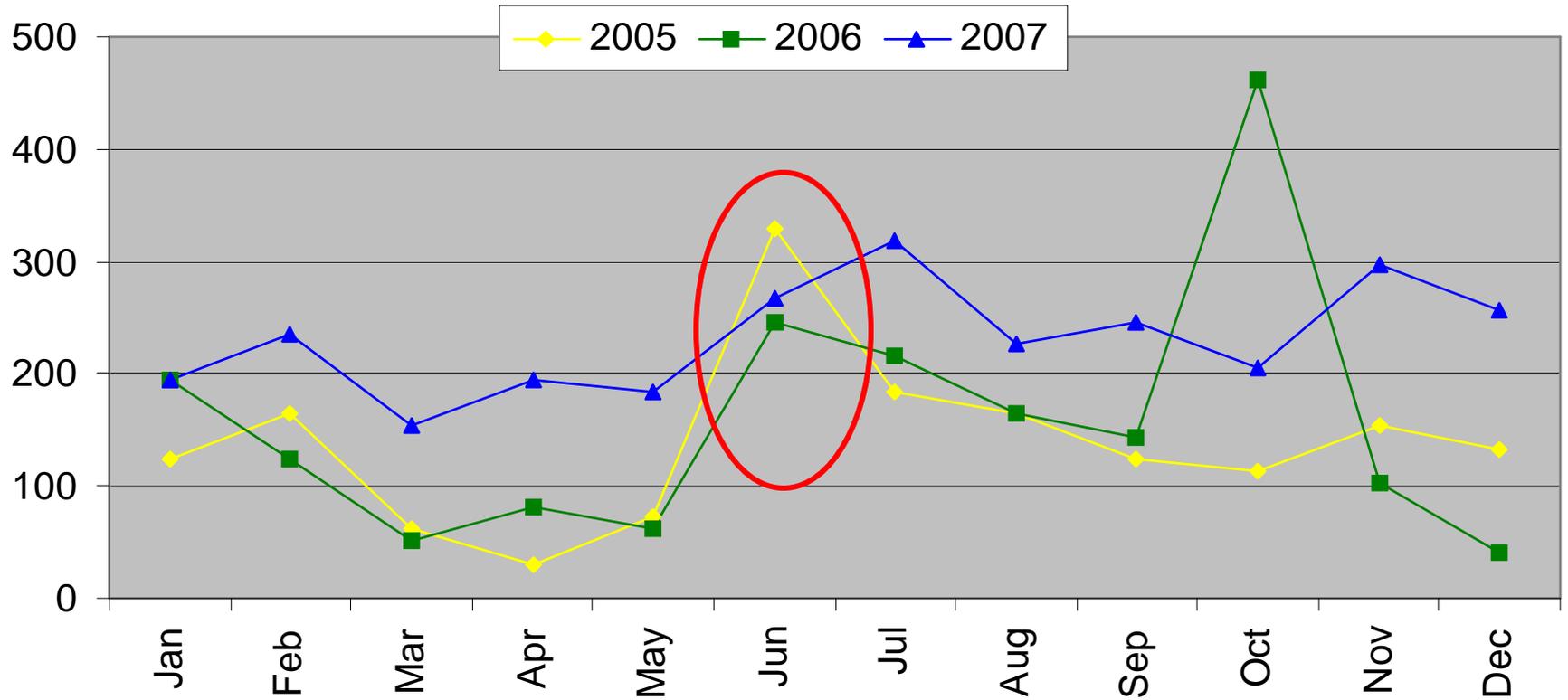
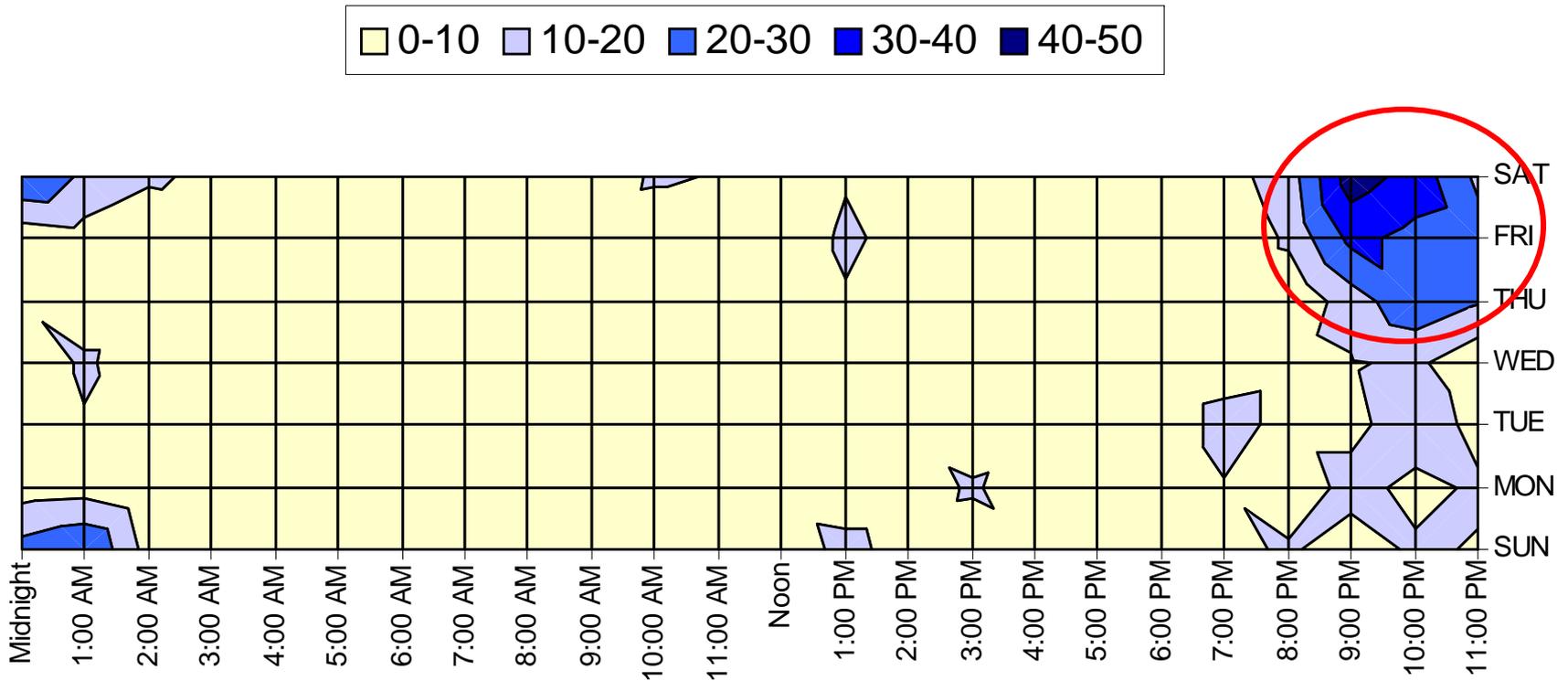
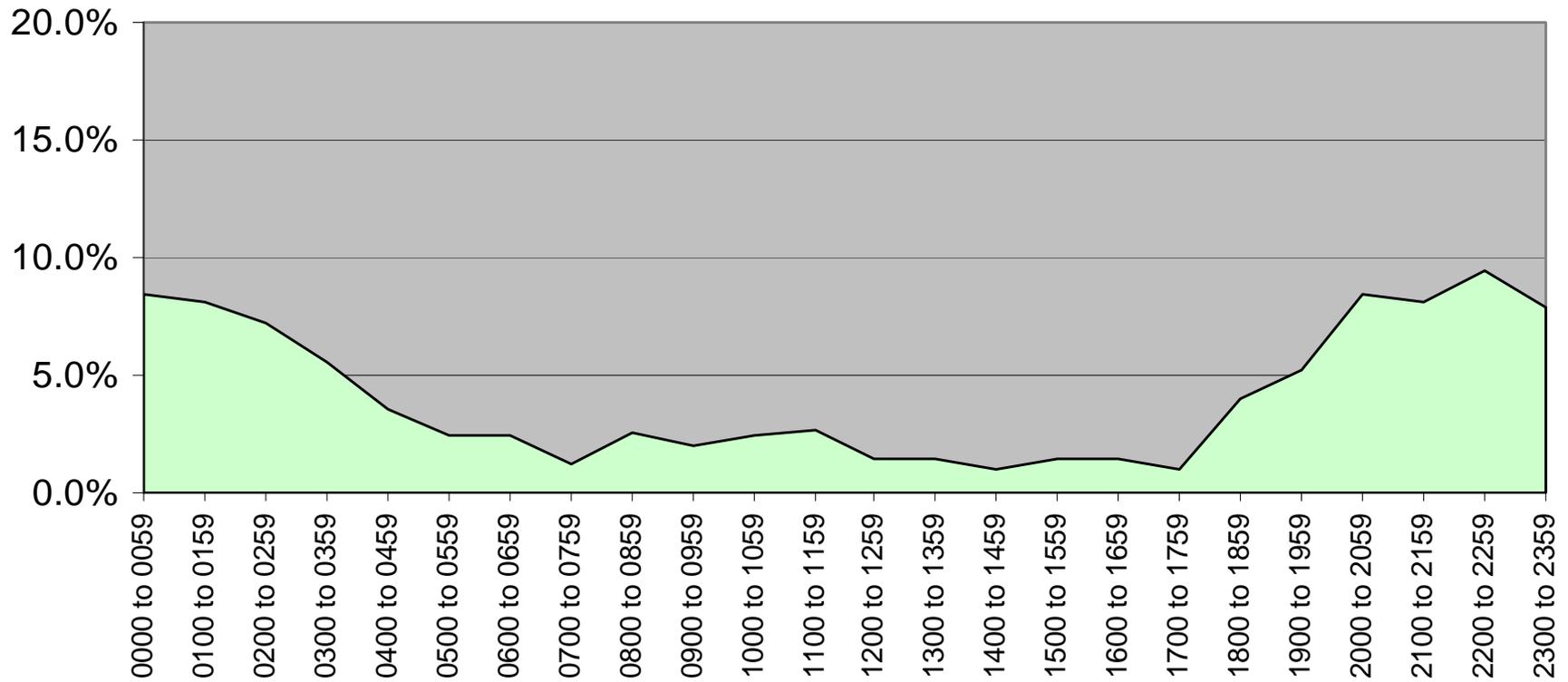


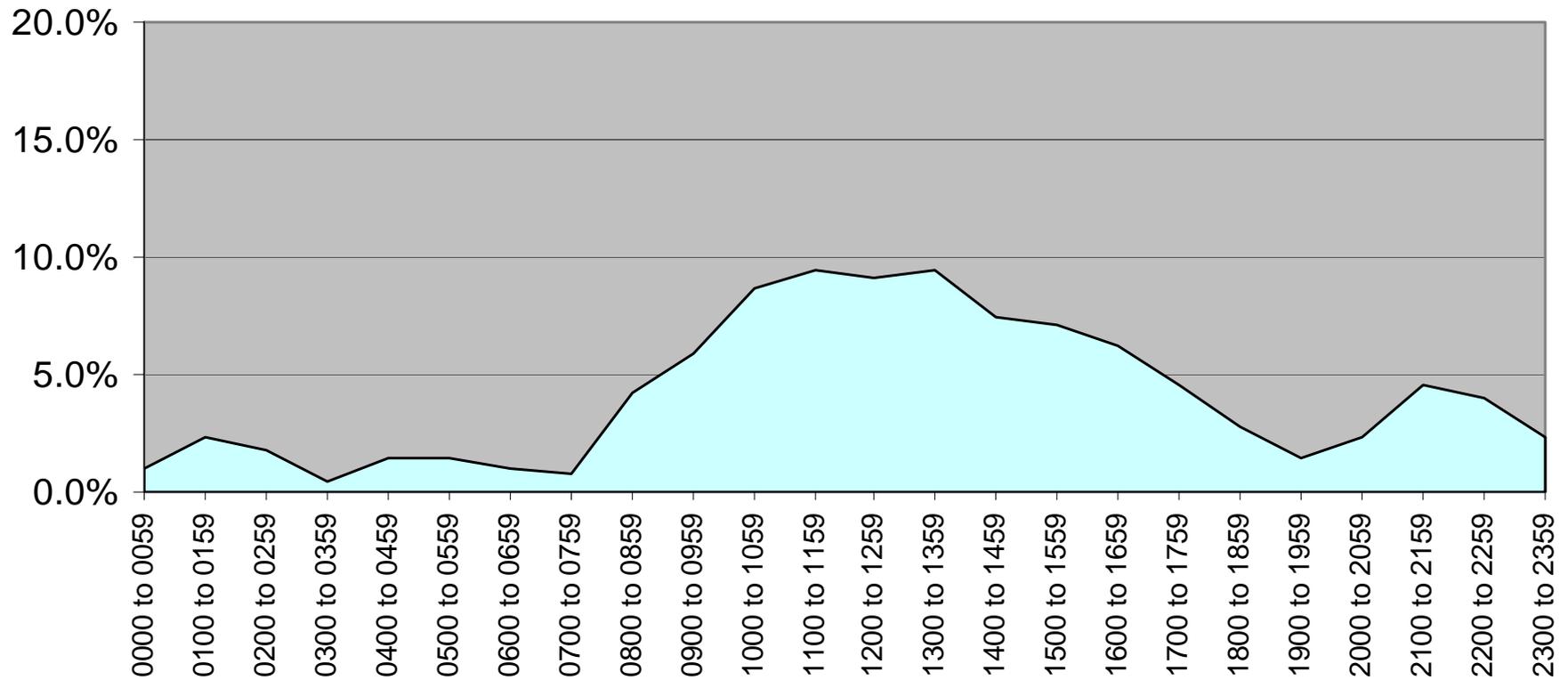
Chart: Convenience Store Robberies by Time of Day and Day of Week



Weighted Time Span Chart: Commercial Burglaries



Weighted Time Span Chart: Residential Burglaries

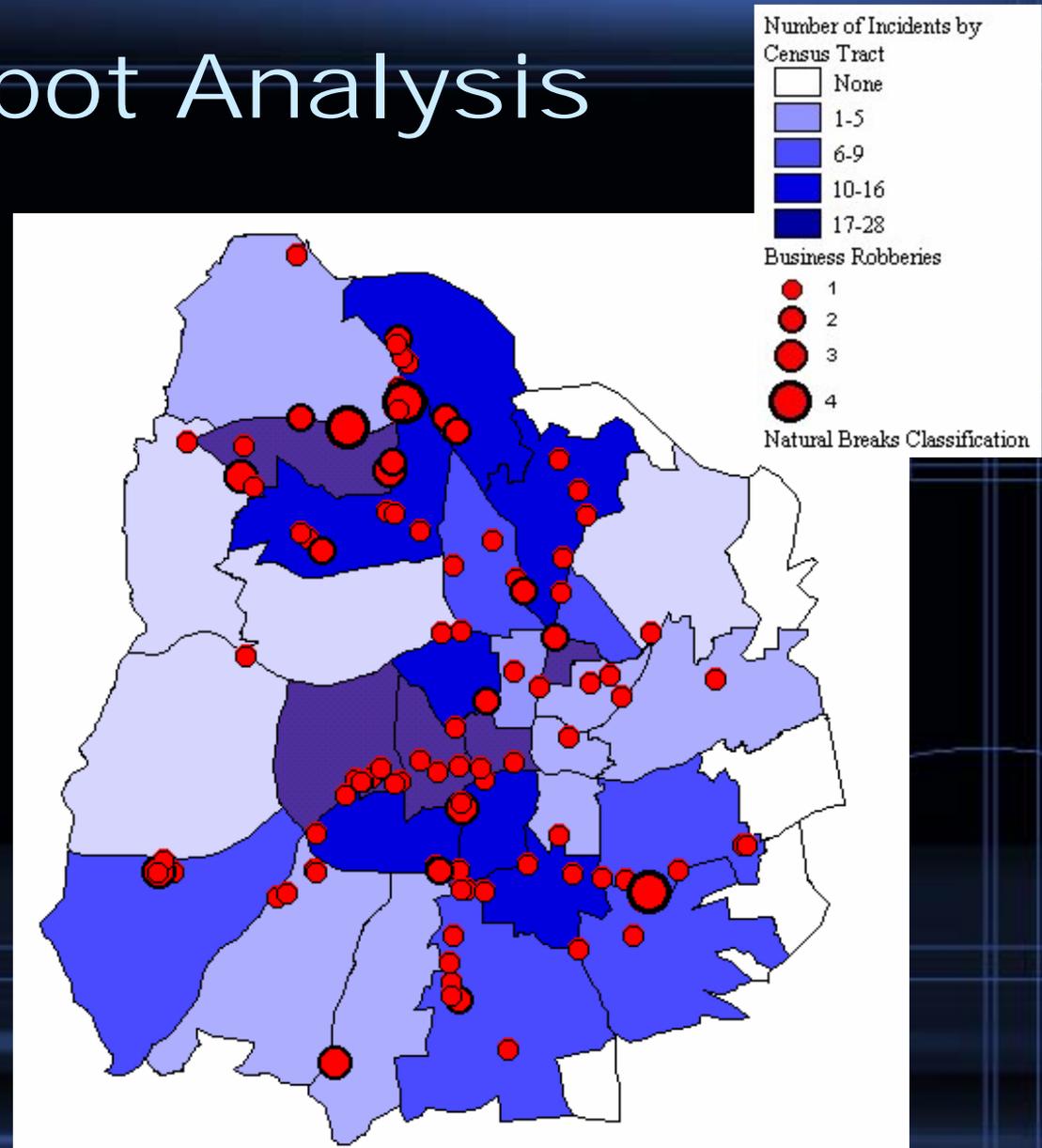


Where is the problem
occurring?

Hotspot Analysis

Graduated Color and Size Maps

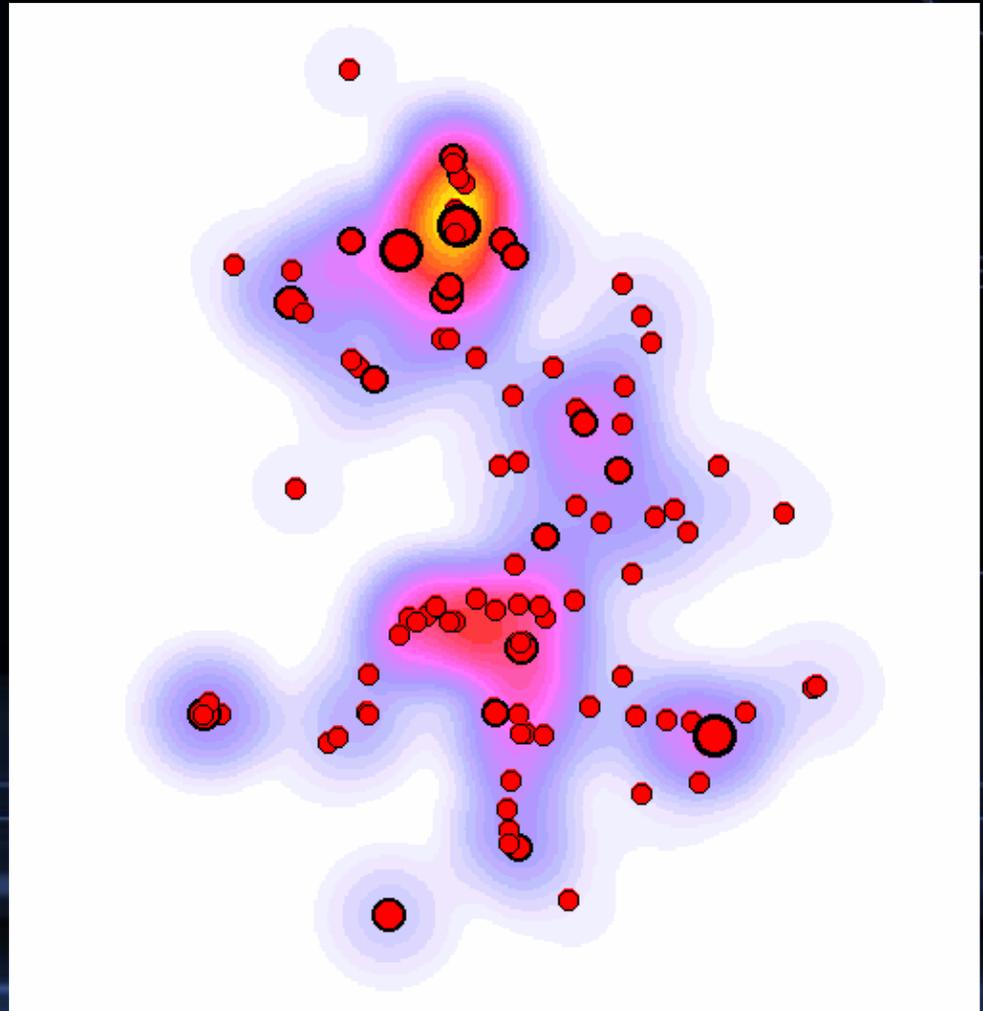
- Point, line, or polygon features are shaded or sized according to a statistical formula, custom setting, or unique value.



Hotspot Analysis

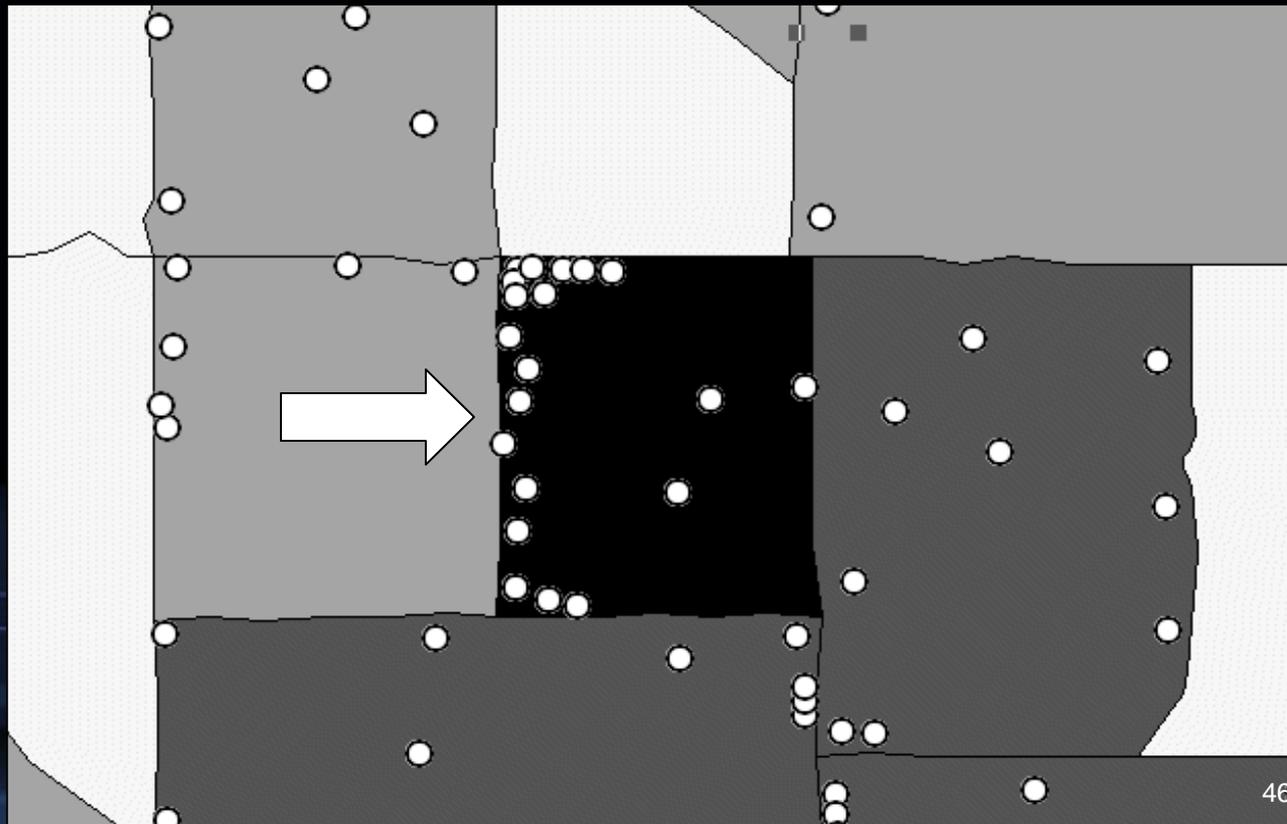
Kernel Density Method

- A grid is applied to the map, and a “score” is derived based on the number of incidents within each grid cell as well as the distance to other incidents.
- Cell size and search radius can be dictated by the user.



Issues with Graduated Color Maps

- Hides actual pattern of activity.
- Assumes equal distribution of points.
- Unnatural borders (e.g., arbitrary or along major roads).



Density Method

- Legend indicate number of incidents in the search area of that grid cell divided by the area (e.g., .3894 incidents per square mile).



Who are the
victims/offenders
and does repeat
victimization/offending
exist?

80%/20% Calculation for Robberies by Address

1	2	3	4	5	6	7
Rank	Address	Frequency of Robberies	Percent Robberies	Cumulative Percent Robberies	Percent of Addresses (N=106)	Cumulative Percent Addresses
1	134 E Main St	25	9.23%	9.23%	0.94%	0.94%
2	254 S Clover Av	17	6.27%	15.50%	0.94%	1.89%
3	8012 N Grand Blvd	15	5.54%	21.03%	0.94%	2.83%
4	8210 N Grand Blvd	10	3.69%	24.72%	0.94%	3.77%
5	1430 E Main St	9	3.32%	28.04%	0.94%	4.72%
6	365 W Haverty Rd	9	3.32%	31.37%	0.94%	5.66%
7	3401 N Staple Dr	8	2.95%	34.32%	0.94%	6.60%
8	210 S Daisy Rd	7	2.58%	36.90%	0.94%	7.55%
9	4598 N Roan Rd	5	1.85%	38.75%	0.94%	8.49%
10	132 E Main St	5	1.85%	40.59%	0.94%	9.43%
	Addresses with 4 (N=5)	20	7.38%	47.97%	4.72%	14.15%
	Addresses with 3 (N=15)	45	16.61%	64.58%	14.15%	28.30%
	Addresses with 2 (N=20)	40	14.76%	79.34%	18.87%	47.17%
	Addresses with 1 (N=56)	56	20.66%	100.00%	52.83%	100.00%
	Total	271	100.00%		100.00%	

Why is the problem occurring?

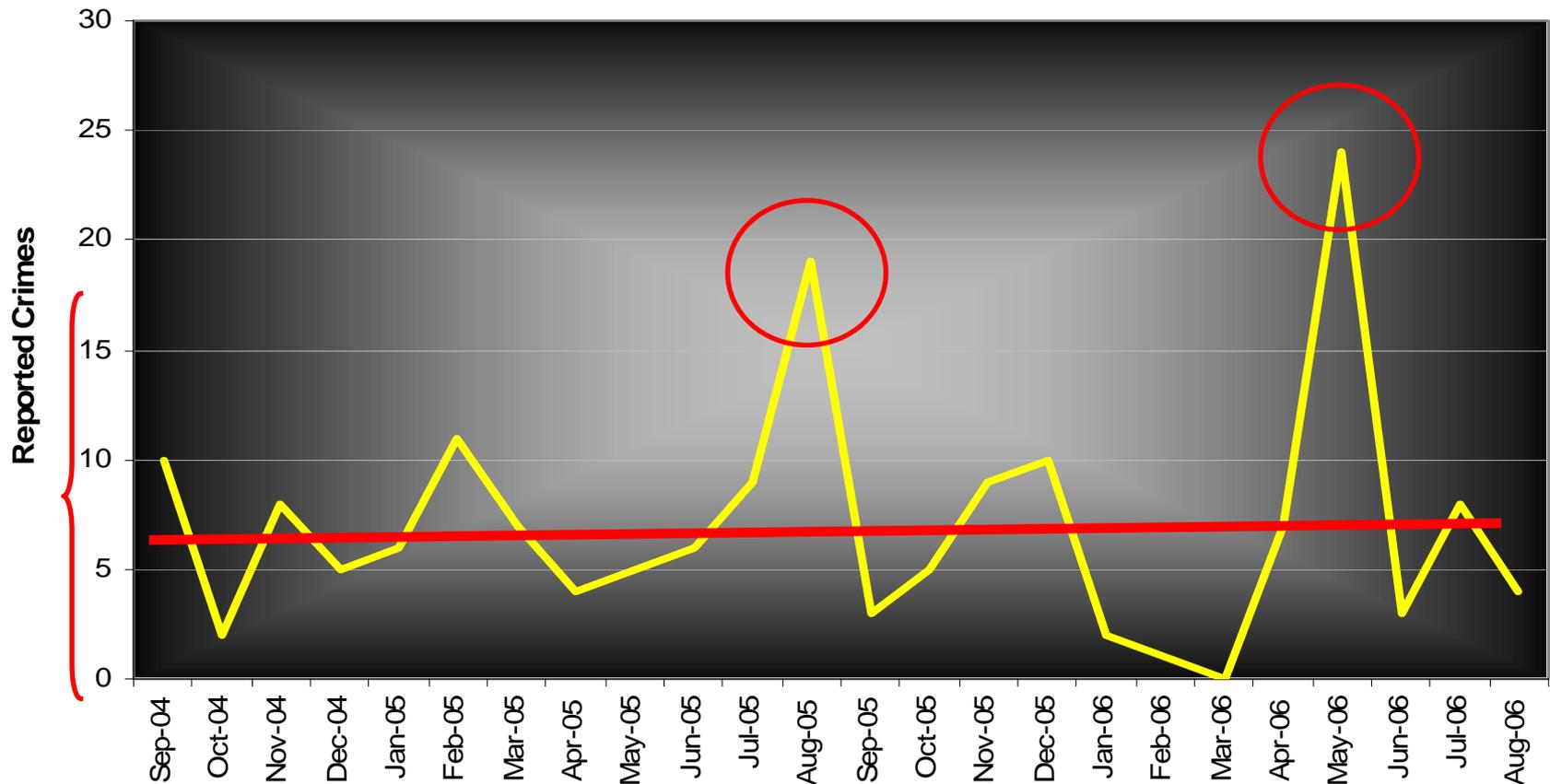
- Conclusions about hypotheses based on analysis results
- Results may not be clear cut
- Focus on results with practical responses
- Also consider additional facilitating factors:
 - Physical facilitators:
 - Augment offenders' behavior or help overcome prevention measures (e.g., trucks for moving stolen goods, telephones for obscene phone calls)
 - Also, can be part of the physical environment (e.g., a one stall bathroom)
 - Social facilitators:
 - Beliefs or behavior that enhances rewards, legitimates excuses, or encourages offending (e.g., Group of young men—rowdy behavior at sporting events)
 - Chemical facilitators:
 - Increase offenders' abilities to ignore risks or moral prohibitions (e.g., alcohol and drugs)

Long-Term Trend Analysis

- Review statistics every six months
- Last two years of data (at least)
- Compare to other crimes and jurisdictions
- Understand in the context of short-term analysis
- Use to identify long-term problem types
- Evaluates both short and long-term efforts

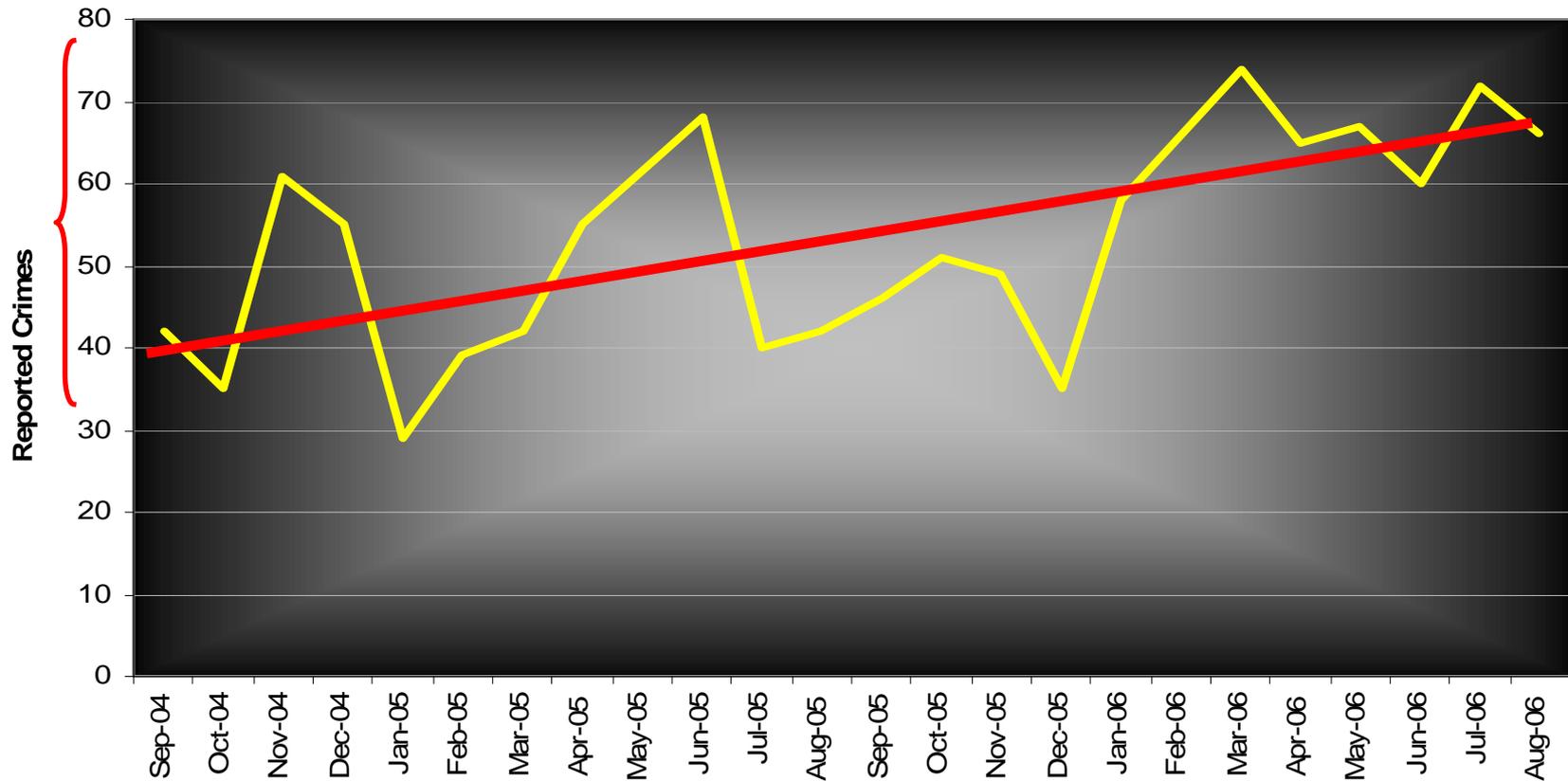
Robbery Example

- Crime is not dramatically increasing
- Two patterns in August '05 and May '06 explain the peaks
- Overall counts very low; Continue addressing at pattern level



Residential Burglary Example

- Although crime is going up and down month to month, the trend line indicates overall increase
- Counts high enough to be confident in increases
- May select as problem to address beyond pattern analysis



For more information...

- Email: rboba@fau.edu
- Book: Crime Analysis with Crime Mapping
 - Published November 2008
 - Sage Publications

