The Patrol Route Monitor: a Modern Approach to Threshold Analysis

By Christopher W. Bruce, President, International Association of Crime Analysts

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In 2007, Don Chamberlayne, Principal Crime Analyst for the Worcester, Massachusetts Police Department, won the IACA/Corona Solutions "Innovations in Crime Analysis" award for the "Patrol Route Monitor." Corona Solutions of Fort Lupton, Colorado, paid for Don to attend the IACA 2007 Annual Training Conference and present on his innovation. The IACA is grateful to Corona (whose president is one of the founders, and the second president, of the IACA) for sponsoring this annual award.

WPD Patrol Route Monitor

14-Day Incident Flag Summary

City and 4 Sectors

	Cit. Calls	B&E	Larc M.V.	Vand	M.V. Theft	Robb	Aslt	Dis-Con.	Noise Dist
CITY	3202 *3203* (100%)	31 *55.5*	86 *85.9*	120 *106.4*	21 *43.4*	16 *17.7*	39 *34.5*	597 *497.0* *	260 *204.4* * (122%)
NE	804 *805* (100%)	9 *11.2*	23 *20.1*	29 *27.5*	6 *11.7*	5 *3.7*	7 *9.3*	153 *123.2* *	65 *40.6* * (133%)
SE	800 *823* (97%)	10 *16.8*	20 *22.9*	23 *27.5*	3 *9.8*	1 *4.2*	10 *8.4*	137 *112.0* *	69 *60.2* (120%)

Figure 1: it may not look like much visually, but bear with us: there's a lot of valuable math behind this HTML page.

In the summer of 2006, a gang of thieves from Boston began commuting to Worcester, Massachusetts (about 45 minutes to the west) and preying on vehicles parked near popular nightclubs. Within six days of the first incident, eighteen victims had lost wallets, purses, iPods, and even two laptop computers.

The series may have gone unnoticed. With only three crime analysts to cover New England's second largest city, thefts from vehicles ranked low on the priority list. Gang violence, street robberies, commercial and residential burglaries, and domestic assaults occupied as much time as the analysts—not to mention detectives and officers—could spend reading individual police reports and identifying emerging patterns.

Fortunately, the Worcester Police had a backup. On July 27, 2006, an automated system, published to all department members, warned that thefts from vehicles on one route were up to 17 from an average of about eight during the previous two weeks. On July 29, the 14-day figure increased to 23 over an average of seven. Two adjacent routes also showed high totals. The resultant flags made it apparent to everyone that something was going on.

The figures prompted the analysts to take a closer look at the incidents in the involved routes. They conveyed their findings at the next command staff briefing. Action followed: the Tactical Impact Team went to work and ultimately arrested the offenders. But this article is about the identification system—the automated process that “flagged” this crime as unusually high. Its concept is simple, and decades old. But its execution—using modern data querying and aggregation techniques—is quite new. And as Don has shown, it is within the grasp of the average crime analyst without access to special or expensive software.

Threshold Analysis

As a crime analyst for a small police agency, I have the comparative luxury of time. My agency records only 16,000–17,000 calls for service per year (about 45 per day), all of which I can review, and most of which I can directly compare to past incidents, identifying patterns as they emerge. This is true even with minor disorders, noise, and service calls.

Analysts in larger agencies often use a similar methodology but must confine their review to a limited selection of “target crimes.” Still others aren’t even that lucky. Under-staffed and over-tasked, they’ve long given up on reading reports—and, consequently, on identifying that burglary pattern on the second incident.

The earliest developers of crime analysis gave us a back-up plan known as “threshold analysis.” The reasoning went that we could use statistics to answer two vital questions:

1) What is the normal or expected volume for this type of incident, in this area, in this time frame?

2) How does current activity compare to what’s normal?

By answering these questions, analysts could look for incident types of exceptional volume—those that crossed the “threshold” from normal to abnormal. The extent of this deviation then helps the analyst triage his analysis. If robberies are unusually high in Sector 7 or thefts from vehicles are skyrocketing in area 9, the analyst takes a closer look at the individual incidents to see if patterns or series have emerged.

The concept is simple; its execution is not. To be of real use, thresholds have to be calculated frequently—ideally every day, so as to catch each offense the minute it jumps the rails. The analyst has to have a certain flexibility in the length of his time frame. He must be able to look at the beat level as well as the jurisdiction level. But allowing for all of these factors in a manual system (all that was possible when the technique was introduced) would require maintaining a separate datasheet for each crime, time period, and geographic area. An analyst confining his studies to ten incident types and five geographic areas, looking at the thresholds once a week, would need 260 sheets, all of which would have to be recalculated each year. Threshold analysis was, in short, a technique that needed automation to be of value. And even then, it would be pretty hard.

The Worcester Project

A decade ago, Don Chamberlayne was over-tasked and under-staffed. As the (then) sole analyst for a city of 175,000, reporting 9,000–10,000 Part I crimes a year, detailed daily review of each crime report was a distant fantasy. However, Don came to the position with a statistical background, and he understood intuitively the need for threshold analysis even before he encountered the concept in crime analysis literature. In 2004, he unveiled to his department “The Patrol Route Monitor” (PRM), which calculated expected and actual volumes for nine categories among the city’s four patrol sectors and 20 routes.

“I had a data management process that was working pretty well,” Don recalls, “but we changed records management systems in 2004, and it forced me to rebuild everything. It was frustrating, but I decided to take the opportunity to implement [the PRM], which I had been designing mentally for a couple of years.”

Don programmed the PRM not only to automate the calculations, but to create printed reports in HTML format, automatically posted to the department’s intranet and squad room bulletin board. Different symbols indicated if the incident type, in that area, had 1) just crossed the “threshold,” or 2) had recently been hot but had fallen back to normal levels.

Don had originally hoped that individual sector sergeants would use the statistics to prompt some street-level problem solving, attacking emerging series as the flags were tripped. But instead, a more significant development occurred.

“[Current Worcester Police chief] Gary Gemme became chief in 2004,” Don says, “and the timing couldn’t have been better. We had these new ideas, including the PRM, coming out of crime analysis, and suddenly a new chief who was eager to use analysis to direct tactics and strategy on a regular basis. It was a perfect match.”

The Patrol Route Monitor became the cornerstone of the new chief’s weekly crime control meetings, called the “Captains’ Roundtables”—an informal COMPSTAT-style process.

Don notes that “while many of the crime patterns likely would be observed eventually anyway,” the PRM speeds up the identification. And since officers and commanders can easily see incident types that have tripped their thresholds in their patrol routes, the PRM prompts them to “take action more rapidly than is likely when information has to flow up and down the chain of command.” For instance, in March 2008, the PRM revealed a surge in motor vehicle break-ins in Patrol Route 8, with 16 reported over a two-week period in which only 4.9 were expected. When the Route 8 sergeant noted the increase, he immediately increased police patrols in the affected area. One of the additional officers made an arrest and the incidents stopped immediately.

The Program

Don would have no qualms offering the program code to the crime analysis community, but he wrote it in a now-obscure DOS programming language called Clipper, and it would therefore be of little use to most of us. (A migration to SQL Server is currently in the works.) Instead, the IACA has replicated his logic in a database you can download at **http://www.iaca.net/files/Threshold.zip**. Whether the analyst uses Clipper, Access, Excel, or some other program, the following logic applies. The steps are illustrated with a simple spreadsheet that calculates totals for an entire jurisdiction.

FLAGS.PRG - Notepad

File Edit Format View Help

```
    DO WHILE D_OCC <= ISTOP .AND. .NOT. EOF()

        IF D_OCC<ISTOP .OR. (D_OCC=ISTOP .AND. T_OCC < '07:00')
            STORE 0 TO N1,N2
            IF ROUTE <> SPACE(3)
                DO GET_ROUTE WITH SUBSTR(ROUTE,2,2)
              ELSE
                N1 = 25
            ENDIF

            IF .NOT. ORIGIN $ 'DEP PKW' .AND. .NOT. TYPE $ 'CAN DUP AAA 111'
                DO ADD_ONE WITH 1
                IS_INCID = .T.
                IF ORIGIN $ '911 CFS DBP DBW PHO WAL'
                    DO ADD_ONE WITH 2
                ENDIF
              ELSE
                IS_INCID = .F.
            ENDIF

            IF DISP $ 'ARIS'
                ARIS = .T.
              ELSE
                ARIS = .F.
            ENDIF

            IF IS_INCID
                IF .NOT. ABUSE
                    IF SUBSTR(NIBRS,1,1) $ NSTRING .OR. ;   && agg assault &
                        SUBSTR(NIBRS,2,1) $ NSTRING .OR. ;  && murder
                        (TYPE $ 'ADW MUR MUA' .AND. ARIS)
                         DO ADD_ONE WITH 3
                    ENDIF
                    IF SUBSTR(NIBRS,3,1) $ NSTRING .OR.  ;
                        (TYPE = 'ASB' .AND. ARIS)
                       DO ADD_ONE WITH 4
                    ENDIF
                    IF SUBSTR(NIBRS,6,1) $ NSTRING .OR.  ;
                        (TYPE $ 'ARI ARC URI URC CAR' .AND. ARIS)
                       DO ADD_ONE WITH 5
                    ENDIF
                    IF SUBSTR(NIBRS,7,1) $ NSTRING .OR.  ;
                        (TYPE $ 'BED BEC' .AND. ARIS)
                       DO ADD_ONE WITH 6
                    ENDIF
                    IF SUBSTR(NIBRS,9,1) $ NSTRING .OR.  ;
                        (TYPE $ 'LAV STP' .AND. ARIS)
```

Figure 2: Don's Clipper code. Because it would be difficult for most analysts to implement this, the IACA created an Access database that replicates the logic of the system.

1. **Manage and clean the dataset.**

Threshold analysis requires an accurate historical database of at least three years plus the current year. This means that analysts must have effective, systematic data management, querying, and cleaning processes in place before attempting to apply these calculations.

The old saw about "garbage in, garbage out" rings loudly in threshold analysis. Miscoded offense types result in incorrect totals in both the expected and actual categories. Incorrect dates or geographic areas will throw off all the calculations. The Worcester Crime Analysis Unit does not run the Patrol Route Monitor until the most recent incidents have been reviewed and the records properly cleaned.

Don also notes that when using threshold analysis for short time periods, for the purpose of identifying immediate patterns, it's important "to consider what we might call the 'contagiousness' of crimes—that is, their likelihood of being repeated on other victims. In the case of robbery and property crimes, we exclude incidents deemed to have had a domestic basis on the grounds that they are not 'contagious.'"

In short, analysts should spend a fair amount of time determining what incident types to include in the calculations, what parameters to apply to those reports, and how they might organize the data ahead of time to get something meaningful from the statistics. Not all types of crime, disorder, and calls for service lend themselves to threshold analysis, and even with those that do, some manipulation of the data may be necessary ahead of time.

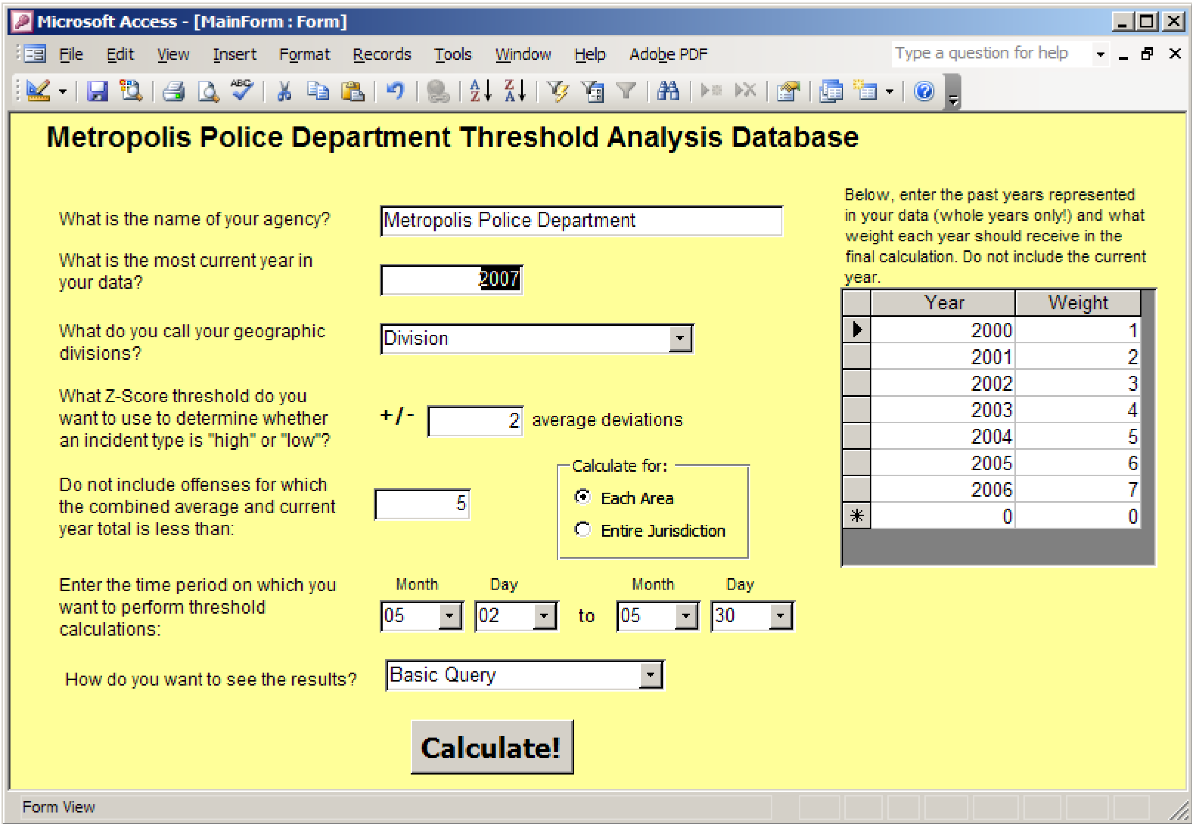

Figure 3: the IACA's Threshold Analysis Database, which replicates the results of Don's Patrol Route Monitor

2. **Set the date range.**

Both the PRM and the IACA database allow for any data range except one that crosses from December into January (we haven't figured out how to effectively program that yet); you can calculate thresholds for a single day or an entire year. However, Don stresses the importance of using date ranges divisible by seven to yield the same number of weekends and weekdays in both the past and current data. "Otherwise," he warns, "active weekend days [and nights] will sometimes be counted more than other days, and sometimes not, thus yielding an unnecessary inconsistency." The flexibility in the date range allows the analyst to search for both short-term series-based activity and long-term trends.

	A	B	C	D	E	F
1	**Incidents Between March 1 and March 29 in Metropolis**					
2						
3		**2003**	**2004**	**2005**	**2006**	**2007**
4	Shootings	4	17	14	19	18
5	Robbery	250	194	200	183	166
6	Residential Burglary	308	392	257	363	315
7	Commercial Burglary	275	265	289	304	318
8	Thefts from Vehicles	418	450	394	377	352
9	Noise & Disorder	617	610	624	608	630
10	Traffic Accidents	890	1078	784	1030	815

Figure 4: the process begins by counting up various categories, by year, within a specified month-day range. Please note that this is a fictional jurisdiction and for illustration purposes some figures are unrealistically high.

3. **Determine "what's normal" for the date range specified.**

Don's PRM actually stores the values in a separate table, while the IACA file dynamically calculates them each time the user runs the query. Rather than store the "normal" value for every possible combination of time periods, the PRM stores the values by month—for instance, 166 might be the normal "disorder" total for the Northeast District for the month of November, and 189 might be the total in December. If the user queries November 23 to December 7, the program takes one week's proportion of the November total (166/30*7) and one week from the December total (189/31*7). The IACA database, by contrast, calculates the total for the specific time range entered.

What calculations go in to this "normal" figure? Essentially, it's an average. Analysts can choose a straight average of the last X years. Don recommends somewhere between five and seven. "I'm fortunate to have seven years of past data," Don says. "Most analysts won't have that much—and remember, it has to be *good* data. You can do [threshold analysis] with three years, but I wouldn't go lower than that. Anything more than seven years, and you're probably including data from a period when the physical and demographic characteristics of your city were quite different."

The PRM and the IACA database both allow for something more complex than a simple mean: a weighted average in which more recent years count more. The PRM weighs the past seven years through a basic formula in which the earliest year is counted once, the next twice, and so on. The IACA database allows the user to specify the number of years and the weight each year receives. This slight addition provides what Don calls a "built-in trend reckoning."

H4 fx =(B4+C4*2+D4*3+E4*4+F4*5)/15

	A	B	C	D	E	F	G	H
1	**Incidents Between March 1 and March 29 in Metropolis**							
2								
3		**2003**	**2004**	**2005**	**2006**	**2007**	**Avg**	**Wtd. Avg**
4	Shootings	4	17	14	19	18	14.4	16.4
5	Robbery	250	194	200	183	166	198.6	186.7
6	Residential Burglary	308	392	257	363	315	327.0	326.0
7	Commercial Burglary	275	265	289	304	318	290.2	298.5
8	Thefts from Vehicles	418	450	394	377	352	398.2	384.5
9	Noise & Disorder	617	610	624	608	630	617.8	619.4
10	Traffic Accidents	890	1078	784	1030	815	919.4	906.2

Figure 5: The "Average" counts each year equally; the "weighted average" counts more recent years more. Remember that the goal is not necessarily to calculate the mathematical mean but rather to produce an "expected" value for the current year. To that end, the four shootings in 2003 seem to be an abnormality and should not "count" as much as the higher levels during the past four years. Similarly, the 250 robberies in 2003 would seem a bad predictor of current volume.

4. **Determine current volumes**.

This is a simple matter of applying the date range above to the same time period in the current year.

N4 *fx*

	A	B	C	D	E	F	G	H
1	**Incidents Between March 1 and March 29 in Metropolis**							
2								
3		**2003**	**2004**	**2005**	**2006**	**2007**	**Wtd. Avg**	**2008**
4	Shootings	4	17	14	19	18	16.4	15
5	Robbery	250	194	200	183	166	186.7	201
6	Residential Burglary	308	392	257	363	315	326.0	315
7	Commercial Burglary	275	265	289	304	318	298.5	349
8	Thefts from Vehicles	418	450	394	377	352	384.5	323
9	Noise & Disorder	617	610	624	608	630	619.4	660
10	Traffic Accidents	890	1078	784	1030	815	906.2	1007

Figure 6: the growing threshold sheet with the current year's total

5. **Compare the current volume to the normal (or "expected") volume**.

If the expected burglary total is 50 and the current volume is 60, how do we determine if the deviation (10) is significant? Both the PRM and the IACA database use the average deviation to make the comparison. The z-score* then tells you how many average deviations from the average the current value is.

J4 *fx* =(H4-G4)/I4

	A	B	C	D	E	F	G	H	I	J
1	**Incidents Between March 1 and March 29 in Metropolis**									
2										
3		**2003**	**2004**	**2005**	**2006**	**2007**	**Wtd. Avg**	**2008**	**Wtd. Avg. Dev.**	**Z-Score**
4	Shootings	4	17	14	19	18	16.4	15	2.61	-0.54
5	Robbery	250	194	200	183	166	186.7	201	15.73	0.91
6	Residential Burglary	308	392	257	363	315	326.0	315	37.33	-0.29
7	Commercial Burglary	275	265	289	304	318	298.5	349	15.89	3.18
8	Thefts from Vehicles	418	450	394	377	352	384.5	323	25.71	-2.39
9	Noise & Disorder	617	610	624	608	630	619.4	660	8.91	4.56
10	Traffic Accidents	890	1078	784	1030	815	906.2	1007	111.84	0.90

Figure 7: the z-score provides us with an indication whether a crime has "crossed the threshold."

The analyst can determine at what point the z-score "trips the threshold." Don's standard value is 1.5. Anything above +1.5, it's usually a good sign that a pattern, series, or some other kind of influencing phenomenon is at work. Anything below -1.5 is unusually low, or a sign that something is having a suppressive affect on the incident category.

A simpler way might be to use the percentage change (between the average and the current year), and there are plenty of times where the percentage change will work fine. But it fails to consider the normal amount of variation within the usual scores for the crime.

* Properly, the z-score is each score's number of *standard* deviations from the average. However, we couldn't find the analogous term for average deviations, so we're using it here anyway.

K4 =(H4-G4)/G4

	A	B	C	D	E	F	G	H	I	J	K
1	**Incidents Between March 1 and March 29 in Metropolis**										
2											
3		**2003**	**2004**	**2005**	**2006**	**2007**	**Wtd. Avg**	**2008**	**Wtd. Avg. Dev.**	**Z-Score**	**% Change**
4	Shootings	4	17	14	19	18	16.4	15	2.61	-0.54	-9%
5	Robbery	250	194	200	183	166	186.7	201	15.73	0.91	8%
6	Residential Burglary	308	392	257	363	315	326.0	315	37.33	-0.29	-3%
7	Commercial Burglary	275	265	289	304	318	298.5	349	15.89	3.18	17%
8	Thefts from Vehicles	418	450	394	377	352	384.5	323	25.71	-2.39	-16%
9	Noise & Disorder	617	610	624	608	630	619.4	660	8.91	4.56	7%
10	Traffic Accidents	890	1078	784	1030	815	906.2	1007	111.84	0.90	11%
11											

Figure 8: although percent change may be more familiar to analysts and their audiences, it's inferior to the z-score because it does not consider the normal rate of variance in the category.

We see here that while the percent change squares pretty well with the z-score values for the first five categories, it breaks down when we get to "Noise and Disorder." The percent change shows an increase of only seven percent—hardly worth going into crisis mode. But look at the actual values for the category: it never varies from a tight range of 608–630. This means that noise and disorder volume is usually highly predictable. That it shot out of this range, up to 660, in 2008 is remarkable. The z-score informs of us this fact where the percentage change does not.

Conversely, the 11 percent increase in traffic accidents might normally be a cause for concern. But the scores show that traffic accidents are highly variable from year to year, so the 2008 total of 1007 is not out-of-the-ordinary. Again, the z-score accounts for this usual variance.

6. **Investigate Abnormalities**

Remember, threshold analysis is intended to help you triage or prioritize your analysis—not take the place of it. Knowing that robberies are unusually high in Beat 4 hardly improves upon knowing nothing at all; we still have to figure out the qualities and characteristics of those robberies. Do we truly have a pattern or series? Or just high volume? Does the high z-score "mean" anything, or is it just a statistical fluke? Only a careful review of the crimes will we know these answers for sure.

"The mathematics are getting all the attention here," Don says, "but they're not really the point. The point is the qualitative analysis that follows—finding the patterns within the numbers."

Reporting or Not Reporting

The Worcester Patrol Route Monitor automatically generates a series of HTML reports, by sector and route, showing the expected values (weighted averages) and actual values. Categories that have "tripped the threshold" are flagged with an asterisk (*).

Don generally sets the threshold at 1.5 average deviations, but he nudges this figure upward if too many flags start to appear in any given period. "If there are asterisks all over the page, it defeats the purpose of triaging."

A double asterisk (**) indicates that the category just crossed the threshold today. Finally, hollow dots (o) indicate that the category was recently high, but has just receded back within the threshold.

14-Day Incident Flag Summary

North West Sector

	Cit.	Noise & Disorder				Property Crimes			
	Calls	Dis	Noise	Arrest	Robb	B&E	L/MV	Vand	MVT
R16	208	40	25	3.1%	2	4	7	1	3
	182	*46.9*	*14.9*	*6.0%*	*0.6*	*2.2*	*3.4*	*4.2*	*2.8*
			*				**		
	114%	105%							
R17	118	22	26	4.2%	1	2	6	1	2
	123	*23.1*	*13.4*	*7.2%*	*0.8*	*3.0*	*4.0*	*3.3*	*1.6*
			*						
	96%	132%							
R18	155	14	9	4.3%	0	4	7	3	0
	147	*17.1*	*10.4*	*2.3%*	*0.6*	*2.8*	*4.7*	*5.5*	*0.8*
						o	*		
	106%	84%							
R19	102	11	8	0.0%	0	1	2	0	0
	105	*8.1*	*4.6*	*2.4%*	*0.5*	*2.0*	*3.3*	*2.5*	*1.5*
		*	*						
	98%	149%							
R20	133	16	2	22.2%	1	1	1	2	0
	[illegible]	[illegible]	*7.1*	[illegible]	[illegible]	[illegible]	*2.8*	[illegible]	[illegible]

Figure 9: the Patrol Route Monitor report. Figures on the top line are current totals; italicized figures on the bottom line are expected totals. Don likes to have at least once decimal place to continually remind readers that they're looking at averages.

Note the absence of the specific calculations, including the weighted average deviation and the z-score, from the report. Although these calculations happen behind the scenes—and determine whether the category gets an asterisk—Don felt that including them in the report itself would befuddle lay audiences and complicate the report.

Other crime analysts may choose not to report on their threshold analyses at all. The technique is, after all, primarily for the *analyst*. Audiences easily confused by simple statistics like percent changes might balk at these more complicated concepts. Nonetheless, Don reports that his Patrol Route Monitor reports are well-received by the command staff and officers. "Once people get used to [the reports], they're fairly easy to read," he says. "They're very popular at our command staff meetings."

For most of my statistical reports, I compare the current year to both the weighted average and the "normal range," which represents one average deviation to either side of the average. The "normal range" is a fairly easy concept to explain ("if the current year is within the normal range, it's okay; if it's outside, it's abnormal") without having to introduce the specific weighted average, average deviation, and z-score concepts. But I still offer the familiar percentage change, which people grasp easily.

4 Danvers Police Department

2007 CRIME AND INCIDENT STATISTICS

The following table summarizes crime and other incidents in 2007 compared to previous years. The notes provide a few words of explanation or point to other sections of this report that elaborate. The ↑ and ↓ symbols indicate incidents that are unusually high or low (based on the usual range).

Incident Type	*1998-2007 Wtd. Avg.*	Usual Range	2006	2007	Change from Avg.	Notes
VIOLENT/PERSONAL CRIME						
Murder	*0*	0–1	1	**0**	**None**	No murders in 2007. See page 34 for past incidents.
Rape	*5*	2–7	8	**7**	**+40%**	Trend with teenaged girls as victims. See page 34.
↑Indecent Assault	*8*	6–10	6	**11**	**+38%**	High throughout the year, but incidents unrelated.
Aggravated Assault	*34*	27–41	37	**33**	**-3%**	About normal. Domestic assaults were up in the fall. See page 37.
Simple Assault	*151*	128–175	167	**173**	**+15%**	Domestic assaults were unusually high in the fall. See pages 28 & 37.
Robbery	*11*	6–15	7	**11**	**0%**	High in first half of the year; low in second. See page 35.
Kidnapping	*1*	0–2	0	**0**	**-100%**	Last incident was in the summer of 2004.
Threats/Intimidation	*96*	74–118	100	**96**	**0%**	Many domestic and acquaintance situations.
Bomb Threats	*5*	3–8	7	**5**	**0%**	Two at the high school in May. Otherwise, no patterns.
Violation of a Restraining Order	*41*	30–51	28	**30**	**-27%**	Has been continually low since 2005.
PROPERTY CRIME						

Figure 10: a page from the Danvers Police 2007 Annual Crime Report. It uses standard deviations and z-scores for its underlying calculations, but these are not reported to the reader.

Conclusions

In days of yore, it was not uncommon for crime analysts to complain that they were simply "numbers crunchers," turning out pages and pages of statistics and charts, with little time for qualitative analysis. Those days should be swiftly waning. With modern database querying and automation techniques, analysts should be able to spend the preponderance of their time on qualitative methods.

Don Chamberlayne's approach to threshold analysis shows this process in action. He has taken an old technique that once took hours and automated it to take minutes. At the same time, he introduced innovations such as the weighting and flagging systems that make the entire process more valuable to analysts and their agencies. The IACA congratulates him on his contribution to the field, and we hope that analysts everywhere are able to use these techniques to their advantage.

Download the IACA Threshold Analysis Database at http://www.iaca.net/files/Threshold.zip.

Do you think you have an innovation to top the Patrol Route Monitor? Do you want a free trip to the IACA conference in Florida in 2008? Apply for the 2008 IACA/Corona Solutions "Innovations in Crime Analysis" Award; details are at http://www.iaca.net/Conference2008.asp.