Foreclosures and Crime: A Geographical Perspective

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Crime changes with urban development patterns. Opportunities for crime emerge, disappear, or move as the urban landscape changes. The current housing foreclosure crisis is a pattern that has the potential to form a new geography. Current home foreclosures are not randomly scattered across a metropolitan area nor do they occur solely in neighborhoods that are already crime-prone and depressed. Rather, they are often clustered in middle-class or revitalized neighborhoods that were fueled by the housing boom of the last decade and not in socially disorganized or otherwise destitute neighborhoods.

Although neighborhood decline is normally a long, slow process occurring over a generation, the foreclosure crisis is expediting this decline, bringing with it the traditional outcomes of theft, drugs, vandalism, vagrancy, prostitution, and arson. Residents still living in these abandoned neighborhoods face an increasing risk of burglary and robbery. As neighborhoods fall further into disrepair, these crimes are only the immediate impact. Long-term trends could undo the significant progress that many metropolitan areas have made in the last few decades in both neighborhood quality of life and economic progress.

As other changes occur throughout a metropolitan area, those forces take advantage of clusters of abandoned houses. They change the urban fabric fundamentally—and usually not for the better. A new set of socially disorganized neighborhoods is instantly created just as others have been revitalized. Yet the geographic distribution of these rapidly declining areas is more dispersed than traditional patterns of crime and social disorganization, and may affect suburban areas as much as the inner city. This geographic shift can create disorganized neighborhoods and increase crime. It has an impact on city-level crime patterns, housing and land use patterns, public transportation, police practices, and other public policy issues.

What are the long-term outcomes from this trend? Will there be large-scale changes in future crime trends? Will adjacent neighborhoods decline to create suburban ghetto areas? What will the impact be on children growing up in these rapidly declining foreclosure neighborhoods? Will they be more likely to suffer academically and socially as they are forced to move from their established social fabric? Will abandoned neighborhoods be replenished with new residents anytime soon? When they are replenished, what sorts of demographic and social changes will the new residents bring?
Once a neighborhood falls into disarray it takes years and a lot of investment in time, money, and care to turn it around. Given this potentially bleak outcome, research and policy discussions are essential for stemming the tide of the foreclosure problem and planning ways to rebuild in its wake.

The emerging trend between foreclosures and crime has been well-documented in the news media; however, only one peer-reviewed study to date makes a statistical connection between the two. Researchers will need to work in conjunction with practitioners and policymakers to solve the problem.

The process by which home foreclosures lead to crime must be analyzed in the context of other trends and changes in a metropolitan area. In particular, analysts must strive to determine how demographic, ecological, and economic processes affect urban structures during this crisis. Understanding current trends and developing solutions will require applying geographic principles and using geographic visualization and analysis to paint a full picture of the problem.

In this issue of *Geography and Public Safety*, Michael Bess of the Charlotte-Mecklenburg Police Department describes a study his department conducted to examine foreclosures and their consequences in the Charlotte area. Erin Dalton, of the Department of Human Services in Pittsburgh, Pennsylvania, discusses how geographic information systems can be used to advise policy decisions related to the foreclosure crisis.

Several news stories in this issue provide an overview of how the foreclosure crisis has brought on problems in many cities across the nation. These stories highlight the difficulties that city governments have faced rebuilding neighborhoods in the wake of financial crises and describe the negative results of predatory lending.

The issue also uses the broken windows theory to demonstrate that cities experiencing blight and disorder as a result of foreclosures should react quickly, before the problem escalates. An article by Louis Tuthill of the National Institute of Justice describes the basics of what this theory entails, and a technical piece by Phil Mielke of the Redlands (California) Police Department demonstrates how to use geographic information systems to invigorate efforts to remove blight and graffiti in a city. Finally, Kurt Smith of the San Diego Sheriff’s Department provides a practitioners’ review of a new book that examines the theories of broken windows and collective efficacy from the vantage point of hardcore criminals.

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**Assessing the Impact of Home Foreclosures in Charlotte Neighborhoods**

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Residents in Charlotte are concerned with the high numbers of residential foreclosures. Although Charlotte is home to the Bank of America and several other major national banks, the city’s status as a major banking center has not helped shield the area from the nationwide foreclosure crisis.

To better understand the crime and disorder that Charlotte is experiencing as a result of these foreclosures, the Charlotte-Mecklenburg Police Department (CMPD) used applied geography. It combined a biannual quality-of-life study of neighborhoods with a homeownership and sales study commissioned by the local newspaper to assess the city’s foreclosure crisis, and used the department’s web-based mapping system to visualize the data. This allowed the department to develop a plan to avoid future foreclosures and support the local communities.
The Problem

Late in 2005, an officer working in CMPD’s suburban North Division observed that some of his assigned neighborhoods were changing. He began to notice more houses becoming vacant, many of which were becoming hangouts for juveniles. He saw increased juvenile delinquency, curfew violations, and vandalism. As he shared his observations, he learned that other officers in other neighborhoods were noticing similar occurrences.

The North Division made this emerging problem a priority and began checking all of its neighborhoods for similar activity patterns. The division commander concluded that a number of newer neighborhoods had an alarming number of houses that were boarded up, broken streetlights, and junk and trash accumulating on the sidewalks. Entire neighborhoods were beginning to show signs of disorder and blight and began to resemble former inner-city slums. The houses in these neighborhoods were empty because their owners had moved out as a result of foreclosure.

Studying Charlotte Foreclosures

The CMPD used several data sources to study the effects of residential foreclosures on Charlotte Neighborhoods:

Quality-of-life study. Every 2 years Charlotte’s Neighborhood Development Department commissions a study that evaluates the quality of life in 173 neighborhoods. The study covers the entire city and surrounding territories. It measures quality of life using 20 social, physical, crime, and economic indicators, and uses the resulting data to categorize each area as stable, transitioning, or challenged. A secondary score indicates if the area’s quality of life is increasing, decreasing, or not changing. The CMPD regularly uses the quality-of-life study to help understand why certain neighborhoods experience crime and disorder.

The Charlotte Observer’s study. The local newspaper, The Charlotte Observer, conducted an investigation into home sales and lending practices by a number of builders and mortgage companies in the area. Staff assembled ownership and sales information extracted from county public property records. The CMPD and The Charlotte Observer agreed to partner and participate in an investigative series on the foreclosure crisis.

The CMPD’s web-based mapping system. Charlotte police officers use a custom web-based mapping system in their daily work to monitor levels of disorder and decide where to apply their enforcement and problem-solving skills. This system covers nearly 2,000 residential and 400 commercial neighborhoods.

Analyzing the Data

An exploratory data analysis found that between 2003 and 2007, more than 8,700 homes were foreclosed in Charlotte-Mecklenburg. After mapping foreclosure locations, a visual examination suggested that the foreclosures occurred most often in a portion of the county referred to as the Brookshire Corridor, which runs to the north and west from downtown (see Figure 1). Clusters of foreclosures were located in neighborhoods built within the past 5 to 7 years—many of the same neighborhoods where officers in the North Division observed increases in blight, crime, and disorder.

These high-foreclosure neighborhoods shared an additional characteristic: The market value of the houses in these neighborhoods was between $90,000 and $150,000. This price range was just below the average price for houses in the area, and is considered “affordable housing.” To test if all neighborhoods in this price range were experiencing a similar rate of foreclosure, the CMPD examined all other areas with “affordable housing” and found 13 neighborhoods that had the most significant clusters of foreclosure. As a comparison group for further analysis, the CMPD identified another 12 neighborhoods within the same price range that have not had the same magnitude of foreclosures.

The neighborhoods studied contained 5,355 housing units—54 percent of these units were part of the high-foreclosure group and 46 percent were in the low group. Six hundred and forty-seven homes were foreclosed; 96 percent of those foreclosures came from the high-foreclosure group (which constituted almost a fourth of the units in the group).

Foreclosed homes are often rentals. These neighborhoods are becoming primarily renter-occupied communities. One out of every four homes in high-foreclosure areas of neighborhoods is a rental property. This makes it difficult to organize residents and create strong neighborhood associations. Foreclosures lead to higher crime rates. The CMPD analyzed rates of violent crime, property crime, and 911 service calls in all neighborhoods in the study from 2003 to 2006. It found the following:

- Violent crime rose consistently during the 5-year period in the high-foreclosure neighborhoods, but remained significantly lower in the low-foreclosure neighborhoods, except in 2004 (see Figure 2).
- Property crime and related service calls spiked in 2004, fell sharply in 2005, and rose slightly in 2006, following a pattern similar to violent crime rates in low-foreclosure neighborhoods.
seems to correspond to a quick increase in housing units that year. A number of these neighborhoods were built in 2004, and many homes experienced appliance and building material thefts.

Some of the differences in the crime statistics observed may be due to when the houses were built. The high-foreclosure neighborhoods were built predominantly between 1999 and 2003 and the low-foreclosure neighborhoods from 2003 to 2006; therefore, the low-foreclosure group might simply be at an earlier stage of the foreclosure process, and may have not yet experienced the subsequent impact on crime and disorder.

**How the CMPD Has Responded to the Crisis**

The data gathered supply the CMPD with information that will help it provide timely intervention and stabilize neighborhoods with high foreclosure rates. The CMPD partners with Charlotte’s Neighborhood Development Department and others to reverse the decay and disorder these neighborhoods have experienced.

Neighborhood Development and the CMPD are actively engaged in neighborhood preservation activities in the high-foreclosure neighborhoods. These activities help stop the threat of crime and disorder, link property owners with financial counseling, and provide general foreclosure-prevention assistance. Other services have been provided by public, private, and nonprofit groups. For example, a private property management company has stepped in to provide free management services to one of the affected neighborhoods’ homeowners’ association. The association had completely collapsed and hadn’t been able to collect dues to maintain common community areas for more than a year. In another case, a landscaping contractor replaced landscaping in a troubled community. And Charlotte has created a foreclosure resource web site to help people with problem loans avoid foreclosure.

**Conclusion**

This study serves as an example of how applied geography can be leveraged to understand neighborhood problems. Data exploration, coupled with observations from field personnel, allowed the police to visualize and understand the actual foreclosure problem. Without the understanding provided by the applied geography, the problem might have been misinterpreted as a crime-and-disorder problem. By using data and geography, the officers could see that this was a neighborhood decay issue related to
foreclosures. The resulting awareness led to partnerships with The Charlotte Observer to help get the story in front of the public.

The CMPD is currently working to enhance its ability to monitor neighborhood data, looking for indicators of foreclosure and related disorder. This will enable it to warn officers earlier, so that neighborhoods can receive help before they deteriorate.

Notes
1. Quality-of-life scores are derived by examining four dimensions of variables. The dimensions include:
   1. Social. Average kindergarten test score, high school dropout rate, percentage of births versus the percentage of adolescents.
   2. Physical. Percentage of homeowners, percentage of people with access to public transportation, pedestrian friendliness index.
   4. Economic. Percentage change in housing values, percentage change in income, percentage of residents who receive food stamps.

2. Social, physical, criminal, and economic variables are used to label each area as stable, transitioning, or challenged:
   - Stable. An area has few neighborhood-scale problems and high scores on quality-of-life categories.
   - Transitioning. An area has average overall scores and weakness in one or more of the quality-of-life categories, signaling a change in a neighborhood’s quality-of-life.
   - Challenged. An area has low or moderate scores on quality of life dimensions, and is considered “at risk” in multiple categories.

3. This was confirmed using density calculation methods available in NIJ’s CrimeStat and other spatial analysis software.

4. Interestingly, none of the study’s neighborhoods was ranked as “challenged” in the quality-of-life study. One neighborhood in the high-foreclosure group was shown as trending upward, and the rest were not changing. The low-foreclosure group had exactly the same scoring pattern; all scored as not changing except one, which was trending upward.

Additionally, 8 of the 13 neighborhoods experiencing high foreclosure rates fall into the category of transitioning as defined by the quality-of-life study. The other five are classified as stable. The other comparison neighborhoods are split equally—six are considered transitioning and six are stable. The study will be updated in 2008, and foreclosures may affect the quality-of-life ratings.


Using Maps of Home Foreclosures to Understand National and Local Problems

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The mortgage foreclosure crisis has affected millions of Americans directly, but uncounted members of their communities have also felt the impact of foreclosures through depressed property values or criminal activity that follows from vacant housing. In 2007 alone, there were 2.2 million foreclosures nationwide, up 75 percent from 2006; and a 2001 study by Temple University concluded that an abandoned house on a block reduced the value of other properties on the block by an average of $6,720.2

The crisis has been noted by national leaders. In his September 2007 testimony before the House Committee on Financial Services, Federal Reserve Chairman Ben Bernanke said, “The consequences of default may be severe for homeowners, who face the possibility of foreclosure, the loss of accumulated home equity, and reduced access to credit. In addition, clusters of foreclosures can lead to declines in the values of nearby properties and do great damage to neighborhoods.”3

Despite the significant media focus on foreclosures in middle- and upper-income communities, low- and moderate-income communities are likely to bear most of the burden of this crisis because they are disproportionately exposed to foreclosures and are the least equipped to respond. This article will discuss local communities’ capacity to use geographic information systems (GIS) to influence crime control and other emerging problems and to advise policy-making around these pressing social issues.

How Foreclosures Can Lead to Crime

News reports suggest that communities with high densities of mortgage foreclosures become communities with high densities of vacant houses, which attract squatters, looters, drug dealers, prostitutes, and arsonists. In Ohio, Mark Wiseman of the Cleveland-based Cuyahoga County Foreclosure Prevention Program observed that once owners move out of foreclosed homes, looters steal whatever they can (including appliances, copper piping, and wire) and squatters move in to escape the weather, often setting indoor fires that get out of control.4

Much more research is needed to describe and specify the relationships among
mortgage foreclosures, vacant housing, and crime. Research conducted by Immergluck and Smith in Chicago showed that a 1 percent increase in the foreclosure rate led to a 2.3 percent increase in crime rates. Furthermore, decades of research show that vacant housing increases crime. Researchers in Austin, Texas, examined abandoned residential buildings in a low-income neighborhood and found that these sites attracted crime—83 percent showed evidence of illegal activities such as prostitution and drug use. This study further revealed that blocks with vacant buildings had three times as many drug calls to police and twice the calls for theft and violence compared to blocks that had no vacant buildings.

**Local Data Can Be Used to Affect Policy**

For nearly 3 decades, national groups have been helping local organizations, particularly in low-income communities, amass and utilize quantitative information to provide programming that better serves their constituencies. Their use of GIS to understand community problems is becoming increasingly common. The National Neighborhood Indicators Project (NNIP), for example, connects the Urban Institute with local partners in 29 cities, helping to drive community change using neighborhood information systems. Similarly, the Local Initiatives Support Corporation (LISC) has 30 urban offices that provide capacity-building support to community organizations that wish to develop and build information stores. LISC offers economic support, educational opportunities, and information, helping community organizations use data more effectively in their work in distressed communities. Another national coalition, Social Compact, uses GIS to examine economic variables in different neighborhoods and create investment opportunities in struggling communities. These programs have begun to yield promising results.

Today, hundreds of communities are building the information they need to address community challenges. Some uncover opportunities by becoming affiliated sites and recognized partners, and others embrace the principles set forth by these leading organizations. Most sites have amassed significant data stores. A recent inventory of NNIP site data finds that the communities collect demographic, crime, youth, health, housing, land use, and economic information. Many of these organizations have expanded their data collections to include information that furthers their understanding of mortgage foreclosures. The Pittsburgh Neighborhood and Community Information System (PNCIS) has compiled a wealth of data to identify possible indicators of foreclosures and vacancy. The system has information on tax delinquency, vacancy, building code violations, and more. In addition, it has collected detailed crime-incident data, allowing researchers to see how specific neighborhoods are affected by foreclosures.

**Figure 1.** The Arlington Neighborhood of Pittsburgh, Pennsylvania. This figure shows address-level data on home foreclosures. © Allegheny County Department of Human Services

Similarly, the University of Memphis’s Center for Community Building and Neighborhood Action has completed ZIP Code mapping and analysis on foreclosure data from 2000 to 2007. It has incorporated Census and Home Mortgage Disclosure Act data and plans to add data from the Internal Revenue Service and Social Compact’s inner-city market analyses, known as DrillDowns.

This sort of community-level information is critical because national data sources often do not adequately represent low- and middle-income communities. G. Thomas Kingsley, the director of NNIP, testified before a joint House hearing in May 2008. He said, “Housing markets are complicated, and how neighborhood spillover effects are likely to work
themselves out in different metropolitan settings is certainly not well understood at this point. Richer data sets than those available nationally (including data on the capacities of local service providers) need to be assembled and examined.”

Furthermore, national data on home foreclosures may not be useful unless they are:
- Combined with local data (from code enforcement, police, housing, etc.).
- Directed at specific audiences. Data should be organized by council district for an audience of city council members, by beat for police officers, or by street for community groups.

Maps are crucial to presenting this information in a usable way. Mortgage foreclosure maps are being produced at every geographic scale (see Figure 1 for an example of a neighborhood-level map.) They help groups target their community outreach efforts.

Although amassing community-level data is a significant accomplishment and a necessary first step toward understanding mortgage foreclosure trends, it is not sufficient to effect change. Any data-driven approach to the mortgage foreclosure crisis must be supplemented with strong community partnerships among housing counseling agencies, financial institutions, and government agencies. Nonetheless, these data can help communities improve their neighborhoods and influence policy.

**Using GIS to Inform Mortgage Foreclosure Policy and Practice**

Geographic analysis can be used to craft, implement, and monitor policy interventions throughout the nation. Examples of successful uses of GIS to inform policy and practice are discussed below.

**The Neighborhood Stabilization Act of 2008.** Representatives from NNIP, LISC, and Social Compact took center stage at a May 2008 hearing on the Neighborhood Stabilization Act of 2008 (H.R. 5818), presenting their analyses on the legislation’s impact. The act would make housing stimulus grants and loans available to qualified states, urban counties, and cities through the Department of Housing and Urban Development.

The witnesses used maps of foreclosures, vacancies, and problem properties to make the case that foreclosures affect not just homeowners but also neighbors and the surrounding community. They discussed the importance of using relevant, accurate data and taking individual community characteristics into account when creating a formula that governs foreclosure aid allocations.

**Cleveland’s early warning system.** At Case Western University, the Center for Urban Poverty and Community Development is using GIS to develop a foreclosure “early warning system” for Cleveland (see Figure 2). The system will identify variables that may indicate foreclosure, including tax delinquency, low water usage, and vacancy. Armed with this information, community development groups and local government can target their efforts to prevent foreclosure.

**Boston’s coordinated intervention efforts.** The City of Boston’s foreclosure intervention team uses GIS to coordinate the activities of agencies, including the police, inspection services, and neighborhood development groups. The team focuses intervention efforts on streets with high foreclosure activity.

**The Association of Community Organizations for Reform Now (ACORN).** ACORN helps ensure social and economic justice in low- and moderate-income communities nationwide. The organization uses GIS to prepare papers on the costs of foreclosures, tailored to nearly 100 metropolitan areas, for homeowners, their neighbors, lenders, investors, and local governments. Additionally, it uses GIS to map census tracts that have a high number of subprime loans and estimated future foreclosures. This helps stakeholders target outreach and advocacy efforts.

ACORN’s papers are being used to create policy recommendations on key issues like foreclosure prevention, affordable housing, municipal maintenance for vacant properties, and lending regulation.

**Figure 2.** Sample Map Used by Case Western University to Develop an Early-Warning System for Cleveland, Ohio, Neighborhoods. © Allegheny County Department of Human Services
Law enforcement use GIS maps to target foreclosed homes. In Virginia’s Loudoun and Fairfax Counties, law enforcement officers are “targeting vacant houses on regular patrols, using maps of foreclosed properties as guides, while working with community watch groups to identify trouble spots.”

Conclusion

The use of GIS to identify and address major public policy issues has increased significantly in the last decade. Today, communities throughout the country have data repositories, new data sets, and analysis to help them respond to critical problems. Many communities display this information on the Internet so that police departments and citizens alike can use the information to respond. Easily accessible maps bring diverse parties together to create community-wide solutions.

Policymakers have recognized the need for information, and many state and local governments now require the private sector to provide critical data to regulatory agencies for mapping. They have also engaged key community stakeholders who provide maps and analysis.

The use of GIS to target home foreclosure-prevention efforts demonstrates how well GIS can be employed to understand and respond to community problems.

Notes


7The National Neighborhood Indicators Partnership (NNIP) is a collaborative effort of the Urban Institute and local partners to further the development and use of neighborhood-level information systems in local policy-making and community building. For more information, see www2.urban.org/nnip/about.html.

8The Urban Institute is a nonpartisan economic and social policy research organization that gathers data, conducts research, evaluates programs, offers technical assistance, and educates Americans on social and economic issues. For more information, see www.urban.org/about/index.cfm.

9For more information about the Local Initiatives Support Corporation (LISC), see www.lisc.org/section/aboutus.

10For more information, see “Pittsburgh Neighborhood and Community Information Systems.” www.pghnis.pitt.edu.

11The Home Mortgage Disclosure Act (HMDA) was enacted by Congress in 1975 and implemented by the Federal Reserve Board’s Regulation C. It requires lending institutions to report public loan data. For more information, see www.ffiec.gov/hmda.

12For more information about Social Compact’s DrillDowns, see www.socialcompact.org/section/aboutus.


14For more information on the Neighborhood Stabilization Act of 2008, see thomas.loc.gov/cgi-bin/bdquery/z?d110:h.r.05818:

15For more information, see blog.case.edu/msass/2007/09/24/pov


Breaking New Windows—Examining the Subprime Mortgage Crisis Using the Broken Windows Theory

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The subprime mortgage crisis¹ has had a large impact on the economy of the United States and the world. These economic and residential changes will lead to increases in crime at the local level.

The crime and justice community needs to understand what kind of crime changes may occur in order to create programs and policies to counter these new sorts of crimes. The broken windows theory has had one of the largest public policy impacts on issues involving location and crime.

This article briefly reviews the broken windows theory, empirical research that examines the application of the theory, and the counterarguments from alternative theoretical positions. It then discusses how criminological theories of place and crime can be applied to the current housing crisis, and the effects that the crisis may have in the extended future.

Broken Windows Theory and Research

In 1982, James Q. Wilson and George L. Kelling created the broken windows theory when they wrote Broken Windows: The Police and Neighborhood Safety. The premise of their theory is that neighborhood physical and social disorder is a precursor to serious crime. Wilson and Kelling argue that physical signs of disorder (such as broken windows, graffiti, or abandoned buildings) and social signs of disorder (such as homelessness or panhandlers) give rise to apathy and fear among residents. When residents experience fear and apathy, they become unwilling to work together to improve their neighborhood. Wilson and Kelling, therefore, contend that to avoid serious crimes, law enforcement should police these minor crimes and disorder (Wilson and Kelling, 1982).

During the last 20 years, the broken windows theory has had a significant effect on public policy regarding place and crime. One reason for this success has been the support of current Los Angeles Police Chief (and former New York Police Commissioner) William Bratton.

Bratton has maintained that the implementation of innovations derived from the broken windows theory allowed for the decrease in crime in both New York and Los Angeles. These innovations include broken windows policing, hot spot policing, CompStat, and zero-tolerance policing. Research evaluating the impact of these innovations and public policy changes has shown mixed results (Messner et al., 2007).

Opposing Theories

Some researchers argue that physical and social disorder are the result of criminal behavior rather than the cause, and that crime arises because of community residents’ inability to assert informal social controls within their neighborhood. This theoretical model, better known as collective efficacy, suggests that increases in crime arise out of weak social ties and the unwillingness of residents to act for the social good of the community ( Sampson and Raudenbush, 1999).

Another line of research argues that even socially and physically disorganized neighborhoods have informal social controls, business, and community cohesion—although these factors exist as a part of the illicit activity and violence in the community ( Venkatesh, 2006). This criminal behavior occurs as a result of the interaction of social conditions (such as poverty, single-parent households, or residential instability), informal organizations (such as gangs or mafia), and illegal activities (such as prostitution or drug sales) that maintain social order and stimulate the local economy.

Using the Theories to Combat Crime and Social Disorder

Public and policing policies resulting from the broken windows theory are not a panacea for crime and social disorder. Such policies are more effective when residents work to strengthen their community through local involvement in politics; schools; their neighborhood; and programs such as neighborhood watch, the parent-teacher association, and service-based clubs (Sharon et al., 2004).

But efforts to create public policy, policing policy, and intervention need coordinating with efforts to build community strengths. Community strength-building efforts may include improving community cohesion, enhancing local economies, providing evidence-based intervention and prevention programs, and reducing physical disorder. Strengthening communities can support police efforts and provide law enforcement with additional resources.

The Broken Windows Theory as Applied to the Subprime Loan Crisis

Economists are still debating the factors that led to the recent subprime mortgage crisis, global financial crisis, and bursting of the U.S. housing bubble.² Nearly 1.3 million houses were subject to foreclosure in 2007, and banks around the world have lost $391 billion (Bernanke, 2008). Subprime mortgages were often given to higher risk customers who did not have the credit track record to receive prime loans. A risky track record might include customers with low incomes, a short job history, or low credit scores. Such loans...
disproportionately occurred in neighborhoods with high levels of poverty and ethnic diversity (Squires, 2004). These low-income neighborhoods will be hardest hit from this economic crisis.

The current economic crisis has had quite a few effects at the local level:

- Resources for law enforcement, after-school programs, intervention and prevention programs, and other supports that mitigate criminal behavior will be reduced.

- Residents will leave economically disadvantaged communities and homes in these communities will foreclose. These residential changes will weaken social ties within the community.

- After residents leave the community, service-based businesses in the community will close. This can also be followed by bank decisions to stop investing in neighborhoods that are seen as too risky (Li et al., 2001). These changes create a negative feedback loop—the decrease in businesses and bank investments will further reduce the resources for programs that mitigate crime.

The new neighborhoods that form in times of economic distress will have weakened social ties, lack the resources to address the social and physical disorder, and become enclaves where illicit forms of economy and organization could prosper.

Recent research examining the link between housing foreclosures and increased crime has shown a positive correlation between the two, but more research is needed (Immergluck and Smith, 2006). Crime-reduction efforts must address this economic crisis at the local level and work to alleviate the community problems that it has created. The effects of this crisis will have a much larger impact on community resources as time passes.

References


Notes

1In 2006, an economic crisis began that was caused by global investors’ inability to move their assets because of an increased home foreclosure rate in the United States. This triggered a global economic crisis in 2007, which made it more difficult for Americans to refinance their homes. This global economic crisis is known as the subprime mortgage crisis.

2Many factors led to the subprime mortgage crisis, including borrowers taking loans they were not capable of paying, lenders lending to high-risk borrowers, a downturn in the housing market, and government policies that may have forced lenders to make higher risk loans.
The subprime mortgage crisis and the effect it has had on the nation cannot be understated. High numbers of home foreclosures affect both the people directly displaced and residents in surrounding neighborhoods because they debase the property values of the homes in neighboring areas. Furthermore, home foreclosures have been associated with increased rates of crime and public disorder.

Policymakers and analysts nationwide are currently trying to measure the effects of the foreclosure crisis and decide how to distribute resources properly. The National Neighborhood Indicators Partnership (NNIP) has been forthcoming in assisting with this task. The NNIP was created to assist policymakers and researchers in solving problems, helping distressed neighborhoods like those affected by the foreclosure dilemma.

On May 21–22, 2008, three NNIP representatives testified in congressional hearings about the effects of subprime lending at the neighborhood level. The representatives discussed the new federal legislation, H.R. 5818, which will create loans and grants for states to help them buy back foreclosed housing. The representatives focused on how foreclosure affects surrounding neighborhoods and what other solutions might be employed to resolve the crisis.

NNIP partner Phyllis Betts testified at the first hearing, which focused on the debilitating effect the foreclosure dilemma has on local neighborhoods and how it causes blight to spread. Her testimony supported H.R. 5818, referencing foreclosure problems in Memphis and Shelby County, Tennessee. In particular, she addressed the 61,590 foreclosures that occurred in the county between 2000 and 2007, which accounted for 25 percent of the county’s single-family residences.

Another NNIP partner, Vicky Been, testified at the same hearing. Her research, which focused on the effects that foreclosures have on the value of neighboring properties in New York, showed that properties in the vicinity of foreclosures have significantly lowered values, accompanied by an increase in crime and neighborhood blight.

Tom Kingsley, director of the NNIP, testified at the second hearing, which focused on recognizing and allocating federal aid to the neighborhoods most affected by the subprime mortgage crisis. He spoke about how the funding formula should be based on certain indicators, datasets, and principles.

The current national foreclosure crisis may seem dire, but the work and data that the NNIP produces are steps toward a solution. The NNIP’s partners help to quantitatively measure the effects that subprime lending has on cities at the local and neighborhood levels and describe how this affects a city as a whole. Their research has the power to influence policy change and help alleviate the negative effects of foreclosures.

Notes
1 The funding formula (a part of H.R. 5818) calculates a state’s outstanding loan and grant allocations based on the state’s number of 90-day delinquent subprime loans and foreclosures.
2 The full testimonies of the NNIP partners and staff can be found on the web at www2.urban.org/nnip/subprime.html.
3 Indicator projects are local data systems created and maintained by each partnership. These systems track and record indications of changing neighborhood conditions in a city.
Using Geographic Information Systems to Support Broken Windows Policing

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When New York City police began targeting graffiti crews and turnstile jumpers instead of the city’s rampant violence and crack use, many critics objected. But when their strategy gave way to success, police began seriously considering broken windows policing as an excellent crime-reduction policy. Today, police can use geographic information system tools to reduce blight and graffiti in a city and enhance broken windows policing strategies.

Broken windows policing is a theory developed by George Kelling and James Wilson. It suggests that if minor crimes and disorders are targeted, major crime will be prevented. In other words, an environmental context sets norms of acceptable behavior—if one window is broken, vandals will think that breaking windows is an acceptable behavior. Journalist Malcolm Gladwell highlights these ideas in his book, *The Tipping Point*, illustrating that many relatively benign factors can combine to produce a “tip” in forces at play. Criminal behavior or public disorder grows exponentially rather than following a straight linear path; thus, targeting small crimes and blight can have an outstanding effect on city crime prevention.

Crime analysts can respond to blight and graffiti issues within a city in many different ways. Maps using different data sources help analysts consider the environmental factors at play and make crime prevention a major factor in a city’s planning and development. When creating a plan for citywide crime prevention, geographic information system (GIS) analysts must combine officers’ observations of neighborhood crime and disorder with external data and policing initiatives.

**Riverside’s Graffiti Abatement Partnership**

Many forces can lead to a breakdown of the social fabric of neighborhoods and commercial establishments. Vandalism and graffiti are primary indicators of this kind of degradation; however, these crimes often go unreported. Crime analysts using graffiti and vandalism reports to support a picture of the city’s overall problem find the public’s reluctance to report minor crimes challenging. Public relations efforts can help people learn why and how they should report such crimes. Cities need this kind of proactive effort to document and clean public and private property.

This notion of proactively combating graffiti made the community of Riverside, California, consider how the public works and police departments could work together effectively to create an information technology project that would serve both their needs:

- The public works department needed to document the location, time, materials, and equipment associated with graffiti cleanup. They needed to keep track of work done in the field and supervise their field workers.
- The police department needed to analyze data and track individuals’ and crews’ tags in an attempt in court to tie individuals or tagging crews to other acts of vandalism.
- As a result of its partnership with the public works department, the police department could use the costs tracked by the public works department to assess damages in the offenders’ trials.

**Riverside’s System**

The Riverside system can best be discussed in relation to its components. This article examines Riverside’s field equipment, server architecture, and software application design.

**Field equipment.** Riverside cleans up graffiti either proactively or using a work order system. Each cleanup crew member has a combination Ricoh GPS-enabled camera with a customized entry screen. The GPS-enabled camera stores location data in the image tag.
Ten to twelve crew members work in the field each day, and the camera and crew members’ IDs are specific to each picture and camera. The crew member arrives on the scene and takes multiple pictures of the graffiti incident. The crew member proceeds to clean or cover up the graffiti. A camera records the method and duration of the cleaning. For jobs larger than a permanent marker tag, different crew members arrive with appropriate equipment (such as a pressure washer, sandblaster, or paint). An image tag stores date, time, latitude, longitude, crew ID, time spent, cleanup type, and work order number.

Crew members spend 50 percent of their time recording and cleaning proactively. They walk down targeted streets and systematically capture data and clean up graffiti on public and private property. This method allows them to capture data in areas that are not typically reported. Moreover, proactively cleaning graffiti by targeted streets reduces travel costs and is more efficient. Approximately 64,000 graffiti incidents have been captured and cleaned up in the 9 months that the program has been in place.

**Server architecture.** The server architecture is split into six components to allow the police department to maintain security. These components include the following:

1. A public works ArcSDE (Spatial Data Engine) database that stores spatial information linked to graffiti images so that an analyst can review image information on a map.
2. A mirrored police ArcSDE database that stores feature classes, making them accessible from the firewall-protected police network.
3. A public works Oracle server, with data that list work time, cost, and equipment used in cleanup. These data are joined to spatial information so that users can review the data by location.
4. A police Oracle database that houses police-specific data (such as moniker or tag crew) and joins these data to feature classes.
5. An application server for the ArcGIS Server, for reporting and editing.
6. An application server for the SQL Server 2005, for reporting and editing.

When crew members return at the end of the day, crew managers retrieve the data from their instruments. Analysts process images, giving each tag spatial attributes, and adding them into an ArcSDE feature class. Each feature class entry references image files, which allows analysts to link them to different Internet applications.

Once the imagery and data are processed, the public works department tallies costs for each crew member, noting the time and type of cleanup required. Proactive and work-order-generated graffiti cleanups are collected and summed, and tools help analysts edit material, equipment, and labor costs.

SQL Server 2005 customized intranet reports also provide the public works department with statistics of daily operating costs and individual crew member productivity. An ArcGIS Server intranet application maps the cleanup locations and allows analysts to query locations to learn the date and extent of each cleanup. Analysts report that geocoding or zooming into specific locales is intuitive. A “map tips” tool brings the graffiti image and pertinent data to the screen for review.

**Software application design.** The Riverside Police Department uses the mirrored ArcSDE database, which stores spatial data. It combines this database with an Oracle database that stores data about each collected graffiti instance.

One full-time graffiti analyst enters moniker (i.e., tag) information into a customized interface. This information often can be connected with related incidents and these data can be entered into a separate field. If an analyst cannot connect the moniker with other tags, he or she can search and review possible previous tags by text and image.

Additionally, proactive cleanup and data collection allows analysts to cluster sections geographically, which often helps them link individuals’ tags or tags created by the same crew of offenders. Since a majority of crews claim geographic origin in their tag (such as Eden Street or 14th Street), analysts can review the migration of tag crew activity.

![Figure 1](image-url) - The ArcGIS Server Application allows police to review graffiti locations. Users can query moniker information, tagging crews, and dates. © Philip Mielke.
The ArcGIS Server, an internet mapping application, allows police analysts to search data by date, case number, moniker, crew name, or address.

**Conclusion**

To eliminate graffiti and blight effectively, crime analysis units must partner with their city’s or region’s GIS department and/or public works department to develop a data-sharing relationship. Cities maintain a wealth of data that allow them to better understand the geographic circumstances behind many crime problems. These partnerships can help defray costs of GIS data, software, and project development. In return, crime analysis data helps city officials realign and assess the city’s priorities. This, helps them find efficient and cost-effective ways to target graffiti and blight and reduce citywide crime.

**Notes**

1. Individuals or crews who create graffiti often deface an area by painting their “tag,” meaning their nickname or moniker, on public property. Each tag is unique, and by identifying and connecting similar tags, police can link incidents committed by the same person or crew.

2. The police department kept monikers and data pertaining to their crime reports in a separate system that is secure by Department of Justice standards.

3. Often, individuals write their tags on public property in permanent marker. This kind of tagging is the most common type observed.

4. A feature class is a point, line, or polygon layer that is added to a geographic map. Collections of points can link to images of graffiti.

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**A New Model for Institutionalizing Problem Analysis in Police Agencies**

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**Introduction**

A Community Oriented Policing Services (the COPS Office)-funded project in 2003, “Institutionalizing Problem Analysis: Case Studies of Problem Analysis in Five Police Agencies,” worked to institutionalize problem analysis in five research sites (Weisel et al., 2008). One of these agencies, the Port St. Lucie (Florida) Police Department (PSLPD), implemented the “Integrated Model of Problem Solving, Analysis, and Accountability.” The integrated model reconsiders how to define and analyze problems and how problem-solving accountability should be distributed throughout the entire police organization.

The model has shown initial success during the last 4 years, so in 2007, the COPS Office provided additional funding to lead researcher Rachel Boba to do the following:

- Complete a thorough evaluation of the model's development and impact on crime
- Bring problem-solving scholars and practitioners together to review the evaluation findings and identify best practices and considerations of the model’s implementation
- Develop a guidebook based on the evaluation and forum results.
- Create problem-solving literature to facilitate other agencies’ learning about and implementing the model
- Develop training curricula and product examples that law enforcement agencies can use to implement this model within their own organizations.

As part of this project, in May 2008 the COPS Office hosted a focus group of practitioners (crime analysts and sworn commanders) at Florida Atlantic University. Dr. Boba facilitated
a session in which participants discussed the pros and cons of implementing the model in different agencies. This article is a brief summary of the model and the comments and suggestions made at the forum.

Boba’s Integrated Model

The integrated model developed by Dr. Boba (see Boba and Crank, 2008, for the complete description) seeks to develop structures and practices within a police agency to institutionalize problem solving, problem analysis, and accountability. It overcomes the barriers of earlier models, such as the inadequate definition of a “problem,” the use of weak and underdeveloped problem analysis, and a lack of accountability for problem solving at all levels (Scott, 2000; Goldstein, 2003; Braga and Weisburd, 2006).

The model allows for a varied and integrated response at all levels of problem solving—from small, incident-centered activity to broad patterns of routine behavior. Problems are assigned to specific levels within the police organization according to their complexity. Problem-solving responsibility is distributed across the rank structure, instead of being assigned to line officers. Problems that require more work (or activity) to solve must be analyzed by officers with more resources available to them.

The model provides direction for appropriate officer supervision during problem-solving efforts. It employs the command structure of a traditional police organization; for example, sergeants monitor officers’ problem solving and lieutenants monitor sergeants’ problem solving. This ensures that managers and commanders are involved in the problem-solving effort. Figure 1 illustrates how higher ranking officers must be involved and held accountable as problems increase in complexity.

Focus Group Recommendations

The focus group reviewed the implementation and maintenance of the integrated model in the PSLPD. They asked participants to offer feedback on the model and provide suggestions for how the model might be implemented in other agencies.

The following is a list of some of the key comments and suggestions that came out of the 2-day meeting:

- The continuity of leadership and the readiness of an organization to embrace change (such as the implementation of the integrated model) are important when trying to modify police culture and current police practices.
- The model can adapt to a variety of different types and sizes of agencies, and the participants felt it could be implemented in their agencies. Large departments with high crime rates, however, may have a difficult time implementing the model in its entirety.
so the department might be better able to focus its efforts on adopting a piece of the model.

- The model helps to overcome the communication barriers among different divisions (e.g., patrol, criminal investigations) within a police agency by providing specific guidelines for problem solving, analysis, and responses.
- The support for the model must come from the agency’s chief and from supervisors who can facilitate personnel under their command and hold them accountable.
- Standard crime analysis products must be developed. The problem-solving and accountability model should be based on the use of these products. These products may share qualities across police agencies, but can be tailored to suit each agency’s needs. They must be standardized, so that problem solving and accountability can be conducted routinely.
- Training is the key to success. All levels of the agency need training on how to use the model and on the concepts that helped create it (such as crime opportunity theory, problem solving, and crime analysis.)

The members of the focus group also made recommendations for the guidebook and training that will be produced. These recommendations will make the materials relevant to various types and sizes of organizations. The guidebook and training will contain examples of analysis products, problem-solving responses, and mechanisms of accountability. It will also contain an extensive literature review and the recommendations from a focus group of police researchers (available in 2009.)

References


Notes

1To institutionalize means to establish as normal or to make something a customary and accepted part of the organization.

2The inadequacies of problem definition (that have emerged from practice) lie in how to view the relationship between incidents and problems. Conceptual definitions (Clarke and Eck, 2005; Goldstein, 1990), unfortunately, have been difficult to apply in practice. Problems are typically under-specified and defined much too narrowly. When officers are assigned to address problems, they are invariably asked to do so as part of their regular patrol or investigative duties. Officers often say that they have difficulty balancing problem solving with answering calls and investigating cases (Cordner and Biebel, 2005). This point is underscored by Scott (2000, p. 13), “Line-level officers lack the requisite resources in most instances to conduct the sort of analysis and effect the sort of responses necessary to bring about substantial improvements in community-wide problems.”

3For example, larger scaled problems require a strategic response at the middle and upper ranks in the organization, where budget and strategy are integrated for long-term planning.

4The focus group included crime analysts and police commanders from the Charlotte-Mecklenburg Police Department in North Carolina, the Fairfax County Police Department in Virginia, the Gainesville Police Department in Florida, the Fort Pierce Police Department in Florida, and the Port St. Lucie Police Department in Florida.
Pockets of Crime: Broken Windows, Collective Efficacy, and the Criminal Point of View

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Peter K.B. St. Jean’s latest book, Pockets of Crime, examines the theories of broken windows and collective efficacy, looking at them through the eyes of some hardcore crooks on the streets of Chicago’s Grand Boulevard neighborhood. He unites police data, a street-level survey, and his own observations to test these theories’ strengths and show how they interrelate when applied to crimes like narcotics, robbery, and battery. St. Jean’s innovative analysis challenges crook and resident alike, moving beyond tables and maps to provide a refreshing look at criminal motivation.

Working forward from existing research, St. Jean finds that physical disorder is more directly linked to crime when viewed through the eyes of a crook than when viewed through the eyes of residents. When planning criminal actions, crooks look for social disorder and low collective efficacy, attempting to minimize their risk of being caught.

But does physical disorder yield crime on every block? No. Observations demonstrate a stronger interplay of social disorder and collective efficacy where the tapestry of development brings together certain businesses and behaviors that crooks see as both low risk and high opportunity. The mix of these factors and their relative proximity to one another, which St. Jean calls “ecological disadvantage,” holds the key to why crime occurs where it does.

St. Jean explores the concept of ecological disadvantage through the eyes and words of an opportunistic street thug. The crook’s view enables the reader to understand why disorder or efficacy account for both “hot” and “cold” blocks of crime.

This information holds implications for policymakers and police practitioners because crooks target areas with elements of disorder that indicate a lack of adequate government commitment, rather than areas where the residents are trying their best to maintain their homes and neighborhoods in the face of poverty. This critical component deserves further investigation.

Pockets of Crime begins strong and delivers throughout, finishing with comprehensive appendixes on relevant research. Through St. Jean’s street work, you’ll delve into the minds of some tough crooks, as they explain how broken windows and collective efficacy affect their lives. With chapters on hot spots; disorder; and a crook’s view of narcotics, robbery, and battery, this book is a must-read for any practitioner interested in applying broken windows and collective efficacy theories to daily practice.

Reference

High Rates of Foreclosures Lead to Crime Increases Nationwide

Ariel Whitworth
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The nationwide crisis in home foreclosures has police on their toes. As foreclosure rates skyrocket, residents move out of neighborhoods and crime moves in.

The latest nationwide homeowner vacancy rate rose to a record high in 2007, a number unparalleled since the Federal Government began tracking such vacancies in the 1960s. The crisis has hit many communities hard; one home in every 196 is foreclosed. For each percentage point that this rate increases, neighborhood violent crime correspondingly rises 2.33 percent. And although foreclosure crises in the past have commonly occurred in inner-city or low-income neighborhoods, current foreclosures have also affected suburban, middle-income neighborhoods—institigating a need for extensive police patrols.

When a neighborhood experiences numerous foreclosures, thefts often occur. Burglars loot abandoned houses, taking electrical appliances and copper wiring or scrap metal. Sometimes, squatters begin living in the houses and, in a few cases, homes have turned into drug farms. A real estate agent in Elk Grove, California, described the momentum of the crisis as “…descending into a feeling of chaos.”

To deter crime, police must work extra patrols and cities must invest large amounts of money in cleanup. But many departments have not received budget increases or extra staff, and cities often cannot fund the vast amount of cleanup needed. Neighborhood revitalization efforts must be made to clean up unkempt
and abandoned houses, so that they can be resold and neighborhoods do not experience crime.

Although the Federal Government has offered to help cities identify sources of funding and will provide billions of dollars in block grants, many cities have begun to research creative investments to aid their response to the crisis. For instance, some have begun demolishing houses and selling lots to adjacent homeowners as added yard space. Others use the funds from reselling properties to pay for further cleanup. Federal assistance, and efforts such as these, may mean that cities can prevent criminal activity from developing in widespread areas.


Foreclosure Crisis Creates Deficits in Local Economies

The mortgage foreclosure crisis has left numerous homeowners stranded in almost abandoned neighborhoods — unable to sell because of the resulting rapid decrease in property values. Their financial losses have a trickle-down effect, leading to local economic difficulties.

For cities, these same foreclosures decrease tax and sales revenues, increase homelessness, and increase demand for emergency housing and for city assistance to clean up abandoned houses. Unfortunately, lowered revenues leave many cities less able to respond to such needs.

In Riverside, California, the foreclosure crisis has led to a $12 million deficit this year. The region’s economy is declining, and the government has been unable to fund needed positions and home revitalization efforts. Although the city has passed an ordinance that requires the upkeep of homes, financially stricken families are not supporting the local economy — plunging the city further into deficit.


Predatory Lending: Cleveland’s Worst Nightmare

The murders of Cookie Thomas and Joe Krasucki should never have happened. They occurred because, when high numbers of houses in Cookie and Joe’s Cleveland, Ohio, neighborhood foreclosed, criminals moved in.

Cleveland has experienced high levels of foreclosures in the past few years. When owners move out, houses aren’t kept clean. Vandals strip them of valuable scrap materials and obscure the area with graffiti. And criminals begin to live or conduct business in the vacant houses.

Why have so many people been forced to vacate? Because in the late 1990s, the Cleveland real estate industry indulged in predatory lending.

Predatory lending is a practice that often involves “no-money-down” or “no-questions-asked” lending. Lenders give money to clients with weak credit or no credit. When these new homeowners, predictably, cannot pay their bills, they are forced to vacate their houses.

Cleveland passed antipredatory-lending laws in 2001 and 2002, but the response was too late. Home foreclosures currently overwhelm many neighborhoods in the city, and decreased spending — caused by a loss of tax revenues and the country’s current economic crisis — means that the city does not have the funds to help neighborhoods in need.

Cleveland isn’t the only city in a crunch. Numerous federal bills have attempted to provide solutions, such as restricting high-priced loans or prohibiting loans to buyers without proof that they can pay. But these bills aren’t enough; cities need financial assistance and emergency funds from the Federal Government. They cannot recover alone.

For more information, see www.washingtonpost.com/wp-dyn/content/article/2007/09/28/AR2007092801331.html.
Dealing with crime problems in a local law enforcement agency sometimes means reaching out to other local agencies to come up with a solution. The events listed here are good opportunities to learn what mapping professionals and those in related areas are doing, get new ideas, and present your work.

**2008 National States Geographic Information Council (NSGIC) Annual Conference**
September 7–11, 2008 in Keystone, Colorado
www.nsgic.org/events/2008_conference.cfm

**NEMA 2008 Annual Conference**
September 8–11, 2008 in Portland, Oregon
www.nemaweb.org/?2068

**2008 California Crime and Intelligence Analysts Association (CCIAA) Annual Training Conference**
September 23–26, 2008 in Pleasanton, California

**24th Annual New York State GIS Conference**
October 5–7, 2008 in Liverpool, New York
www.esf.edu/nysgisconf

**Urban and Regional Information Systems Association (URISA) 46th Annual Conference**
October 7–10, 2008 in New Orleans, Louisiana
www.urisa.org/conferences/aboutannual

**2008 IACA/FCIAA Conference**
October 13–16, 2008 in St. Pete Beach, Florida
www.iaca.net/Conference2008.asp

**Applied Geography Conference**
October 15–18, 2008 in Wilmington, Delaware
appliedgeog.binghamton.edu

**2008 ESRI Homeland Security GIS Summit**
October 20–23, 2008 in Scottsdale, Arizona
www.esri.com/events/homeland/index.html

**ISCPP Crime Prevention Symposium**
October 22–25, 2008 in Denver, Colorado
www.iscpp.org/Symposium2008.htm

**Texas GIS Forum**
October 27–31, 2008 in Austin, Texas
www.tnris.org/forum/default.aspx?id=494#links

**10th Annual Technologies for Critical Incident Preparedness (TCIP) Conference and Exposition**
guest.cvent.com/EVENTS/Info/Summary.aspx?e=b97398ef-b188-42f7-8a01-0ee5f1006962

**2008 American Society of Criminology Annual Meeting**
November 12–15, 2008 in St. Louis, Missouri
www.asc41.com/annualmeeting.htm

**2009 North Carolina GIS Conference**
February 19–20, 2009 in Raleigh, North Carolina

**2009 National States Geographic Information Council (NSGIC) Mid-Year Conference**
February 22–25, 2009 in Annapolis, Maryland
www.nsgic.org/events/future.cfm

**NEMA 2009 Mid-Year Conference & 35th Anniversary Celebration**
March 6–10, 2009 in Alexandria, Virginia
www.nemaweb.org/?2068

**Association of American Geographers (AAG) 2009 Annual Meeting**
March 22–27, 2009 in Las Vegas, Nevada

**Tenth Crime Mapping Research Conference**
August 2009 in New Orleans, Louisiana
www.ojp.usdoj.gov/nij/maps