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REACTION ESSAY

NO EASY ANSWERS: PUBLIC POLICY, CRIMINAL JUSTICE, AND DOMESTIC VIOLENCE

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Mandatory and presumptive arrest policies have been among the most important initiatives in the field of domestic violence in the last three decades. They have done well in forcing police departments to take domestic violence seriously. As a result, they have also shifted the terrain to the benefit of victims confronted by abusive partners. Change has not come easily, however. It has taken considerable work to implement these policies, and even now research shows that the job is incomplete, an observation that should give pause to policymakers who would restructure the way the criminal justice system responds to domestic violence.

A number of questions have been raised about the arrest policies currently in effect. One set of concerns focuses on the unintended consequences of mandatory responses, in particular, on the problem of dual arrest. Despite guidelines to the contrary, reports show that police officers do arrest both parties in domestic violence incidents. Poor police training may explain the practice, but policymakers should recognize that it is unlikely to persist without the pressures created by mandated arrest. In one study, a third of the domestic violence incidents involved dual arrest. Such practices cause problems, especially for victims. Dual arrests have been used to impeach the testimony of victims in felony trials. An arrest may trigger actions against a victim in areas of child custody, housing, and employment. Immigrant women may face deportation as a result of dual arrest.

Additionally, policies that mechanically turn arrest decisions over to the police raise questions, because they deprive victims of control just when they need to take charge of their lives. Policymakers should recognize that victim control is a core policy issue, which originates from the unique character of intimate violence. Batterers have ongoing, private access to intimate partners, and they use fear and intimidation to keep partners in the relationship. It stands to reason, then, that women's experiences with violence would make their assessments of danger more accurate than would the automatic responses of a police officer. On this question, victim-preferred responses should be included in field experiments that test the impact of police responses on victim safety and re-offending.

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Racial disparities always raise questions, although in the arena of domestic violence, they exemplify the dangers of adopting policies without looking beyond immediate effects. If policymakers wish to reduce racial disparities in reporting or offending, programs that also take into account forces underlying race differences ought to be considered. If white victims are overexposed to domestic violence because they do not call the police, then programs that encourage victims to report should be evaluated for their impact on reducing racial disparities as well as on victim safety and re-offending. Other disparities illustrate deeper tensions. African-American men, who are young, have prior records, and who may also have drug or alcohol problems are the men most likely to be arrested for domestic violence. As a first step, policymakers would do well to determine whether these data reflect differential offending, differential response, or something more complex.

Other questions about mandatory arrest can be traced to confusion about the purposes of arrest. Safety and support are watchwords for programs that marshal social services, civil remedies, and criminal justice resources for the protection of victims. Mandatory arrest has a role to play in integrated approaches to domestic violence, but one should not confound strategies that affect suspects with those that protect victims. Policymakers ought to recognize that whatever effect arrest policy may have on deterring offenders, the question of victim safety continues to be problematic for victims and those who counsel them.

Considering these questions, we can easily recognize that victim preference should play a greater role in the way police respond to domestic violence. In making a decision about arrest, the victim is in a good position to assess potential danger and to take into account the impact of arrest or dual arrest on her life and the well being of her children. Attention should be paid to a broader range of mandated options that would also specify the conditions under which police officers would take victim preferences into account.

Moreover, arrest policies that would address differential offending are different from equal protection initiatives that differential responses to suspects would require. In the former instance, we might be able to justify arrest plus a broader range of options and require officers to take severity of injury or other objective indicators into account. In the latter case, however, increased discretion would likely intensify tendencies for officers to respond in a discriminatory manner. For this reason, high-risk abusers pose an extraordinary challenge to policy makers.

Arrest, however, is the first step in bringing chronic abusers into the system where new and controversial tools have emerged. One tool, "no-drop prosecution," brings batterers into court; although policymakers should be aware that no-drop polices have uncertain consequences for

victims. In Pennsylvania, domestic violence victims will be forced to testify against their batterers, even if they decide not to pursue charges. The impact of such policies on victim safety, victim reporting behavior, and the conviction of batterers has yet to be evaluated. But in being forced to testify, victims may be able to shift the blame to the state, and, thus, prevent abusers from pressuring them into silence. On the other hand, shifting the blame to the state may endanger the victim, and furthermore, fear of retaliation may discourage her from reporting abuse in the first place.

Hybrid or problem-solving courts have emerged as a model for addressing complex problems, like domestic violence, that involve issues in addition to criminality. Ideally, judicially supervised probation, case management, mandated treatment, and ancillary services are sufficient to protect victims and to enable batterers to remain in the community where they can support their families. The experience in drug court, another kind of hybrid court, is indicative of the problems domestic violence courts may face. Whether treatment is voluntary or coercive is less important for recovery than is the duration of exposure to drug and alcohol treatment. The quality of treatment services, however, is uncertain. Staff turnover, low pay, and minimal training undermine the quality, as do fiscal pressures to deliver affordable or low-cost services.

Policymakers face difficult choices when it comes to sentencing because chronic abusers pose significant danger to their intimate partners and because severe sentences enjoy widespread political support. A Pennsylvania judge was recently praised for having seen the "big picture," after he imposed a 12-year sentence on a man who had been convicted of 12 counts of misdemeanor assault. Permanent imprisonment, i.e., incapacitation, is available should prosecutors charge repeat abusers under special offender or "three strikes and you're out" laws. Many states, including New Jersey, allow for misdemeanor offenders to be charged with third-degree felonies. Our reliance on incarceration for drug offenders has produced our current re-entry crisis: Felons return to their communities, find scant support services, and re-offend. There are, however, benefits to maintaining violent batterers in the community, in halfway houses, and on intensive supervision probation. An employed batterer who provides for his family and pays taxes ought to appeal to policymakers trying to make the most of limited resources.

Shifting focus, we can see the value of committing greater resources to support social services for victims. Temporary shelters, victim advocates, legal clinics, transitional housing, childcare, job training, mental health services, alcohol and drug counseling, and employment counseling are vital elements in any social service package. In addition, legal assistance in negotiating the process of obtaining protection orders and resolving

custody issues is as basic a requirement as municipal, state, and federal subsidies for women left without support. Although these services carry a considerable price tag, the benefits have to be measured in terms of physical safety, in the viability of families, and in the productivity of survivors.

Several measures that policymakers could adopt may effect further reductions in domestic violence. The first measure would be a suggestion that funding agencies make a commitment to develop and evaluate pilot programs that experiment with system-wide approaches to domestic violence. Single reform (e.g., mandatory arrest) and coordinated responses (the Duluth project) have been the model. It is time to test the utility of different system-wide combinations, which might include team responses, follow-up responses for victims, no-drop and other prosecution policies, problem-solving courts, with and without mandated treatment, and sentencing options. Justice responses have not always been coordinated with social services, or with family or civil courts: These too ought to be included in a system-wide mix. Pilot experiments would enable practitioners and administrators to gain experience and to understand how different combinations fit local circumstances and respond to special problems. With the sophisticated techniques currently used for evaluation, experimental programs could be tested for their impact on reducing both domestic violence and underlying problems like racial disparities in victim reports and in offending. Policy makers could, then, expect reliable answers as to which combinations are effective under which set of circumstances.

A second measure, funding for education, would address some of the problems associated with current practices and policies. Training in specialized topics like domestic violence is not widely available to police departments. A few slots a year may be allocated, but they are never enough to provide the educational support necessary for a modern department. In this regard, dual arrest practices are a dramatic illustration of the need for adequate police training. Competent, well-trained personnel increase the likelihood that policy changes will be successfully implemented. Other benefits comprise greater insight into the problem, increased knowledge of procedures, greater acceptance of change, and less cynicism about victims and offenders.

Permit me a few observations. Fairness seems to matter. Batterers who believe that they are treated fairly may respond better, or less violently, than those who feel the effects of police discrimination. Secondly, high-risk, chronic batterers are generally violent; that is, they attack other people in addition to their own partners. I point this out for two reasons. Conduct is what the criminal justice system is designed to address, and we know that the police and courts process violent conduct more efficiently

than other types of crime. So on this basis alone, the most dangerous offenders are likely to make their way into system. Moreover, "high risk" is a status, not a crime, and we know "status" cannot be the basis for arrest no matter how great the temptation to profile and arrest suspects on the basis of a demographic profile. Risk assessments, however, are useful in making sentencing recommendations or in setting the conditions of probation, although questions of reliability and validity of the instruments call for caution.

As a final consideration, we all realize that the relationship between research and policy is complex. The history of this relationship in the arena of domestic violence suggests that policy leads and research follows, research being important in validating initiatives and in pointing out or in eliminating potential problems. Escalation effects were attributed, erroneously, to mandatory arrest. Priority ought to be given to multisite field studies designed to test the effects of system-wide experiments on victim safety and recidivism and to assess the impact of training on performance of key personnel. Other initiatives that justify study would address racial disparities, greater discretion, and victim preferences. Potential escalation effects for no-drop prosecution and court-ordered treatment would also require attention.

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MANAGING CITIZEN CALLS TO THE POLICE: THE IMPACT OF BALTIMORE'S 3-1-1 CALL SYSTEM*

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Research Summary:

Our paper explores the impact of implementing a nonemergency 3-1-1 call system in Baltimore, Maryland. We found a large (34.2%) reduction in 9-1-1 calls following the introduction of the 3-1-1 nonemergency call system. Many, but not all, of these calls simply migrated over to the 3-1-1 call system. Overall, we identified a 7.7% reduction in recorded citizen calls to the police post 3-1-1 intervention. This recorded reduction in citizen calls was confounded by an increase in high priority calls to the 9-1-1 system (27.5%), a large overall reduction in low priority calls (54.3%), and an estimated increase (perhaps 8%) in unrecorded calls to the police. We also note a small increase in response times to high priority 9-1-1 calls following the implementation of the 3-1-1 call system and virtually no change in the amount of officer time available for community policing or problem-oriented policing activities.

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Policy Implications:

Our findings suggest that nonemergency call systems, such as 3-1-1, can greatly facilitate police efforts to better handle citizen calls for police service. However, the intrinsic value of nonemergency call systems is tightly woven with a police department's willingness to change dispatch policies (especially for those calls received via the 3-1-1 system), reallocate patrol resources, and adopt organizational reforms to support alternative methods (apart from dispatch) for handling nonemergency calls for service.

KEYWORDS: Police Workloads, Non-emergency Calls, Emergency Calls, Community Policing, Police Management, Police Organizations

"Calling the cops" using the emergency 9-1-1 number is what Bayley (1998) describes as the cornerstone of policing in modern democratic countries (see also Sparrow et al., 1990). Any citizen from any city, suburb, or town across the United States can mobilize police resources by simply picking up the phone and placing a direct call to the police. To a citizen of the United States this may seem a trivial entitlement; yet to millions of people from less democratized countries, the ability of a private citizen to call, expect, and receive police services by simply dialing 9-1-1 is seen as an outstanding privilege.[1]

The national emergency number, 9-1-1, was sold originally to the U.S. public as a method for getting police, fire, and medical personnel to emergencies fast, thereby improving services to people in need of help. By the early 1980s, however, numerous deficits with the 9-1-1 call system became clear: An overwhelming number of calls to 9-1-1 requested nonemergency services (national estimates range from 40% to 80% percent); 9-1-1 was not a magic pill that could reduce crime or increase arrests (Sherman, 1997; Spelman and Brown, 1981); citizens expressed frustration with police handling of 9-1-1 calls (Spelman and Brown, 1981); and the police consistently complained about the demands placed on them by the 9-1-1 call system (Bayley, 1998). Indeed, Malcolm Sparrow and his Harvard colleagues (1990) identified the late 1980s as a period when "thoughtful police executives [began] to doubt the wisdom of policing's marriage to 9-1-1" (P. 105). Indeed, one participant at Harvard's Executive Session on Community Policing in 1985 declared to Sparrow and his colleagues that "we have created a monster" (Sparrow et al., 1990:105).

1. Although the 9-1-1 system is designed to handle emergency medical, fire, and police calls, the overwhelming number of callers request police services. For example, in Baltimore, Maryland about 70% of the 1.7 million 9-1-1 calls for service per year are directed to the police.

In July 1996, President Clinton called for a national community policing number to help alleviate the abundance of nonemergency calls flooding the 9-1-1 emergency system (July 23, 1996, Sacramento, California). The U.S. Department of Justice, Office of the Community-Oriented Policing Services responded by submitting a request to the Federal Communications Commission (FCC) that a 3 digit phone number be reserved for nonemergency use. By 1997, the FCC had approved this request. At this time, many police departments across the United States of America were in the process of reviewing or implementing technological approaches, as opposed to management approaches, to relieve the overburdened emergency 9-1-1 systems. Some cities (e.g., Dallas) opted for a 3-1-1 call system that integrated city call centers to better handle nonemergency calls for a wide range of city service problems (including nonemergency police matters). Some police agencies (e.g., Buffalo) chose to simply increase the advertising of a departmental nonemergency phone number. Baltimore, by contrast, implemented a police managed and operated 3-1-1 call system that changed the call routing and management system of citizen calls for police service.

Our paper explores the impact of implementing a nonemergency 3-1-1 call system in Baltimore, Maryland. In particular, we explore whether the technological call handling system (ie 3-1-1) reduces the number of emergency 9-1-1 calls for police service. We also examine whether the 3-1-1 call system helped the police to better manage citizen calls for service, free-up officer time, and improve response times for high priority emergency calls. We begin the paper with a review of past research on police handling of citizen calls for service. We then identify the characteristics of the City of Baltimore and Baltimore's calls for service system, and we describe our research methodologies. Next, we present our research findings and then conclude with a discussion of the strengths and weaknesses of the 3-1-1 call system and the policy implications of our research.

PAST RESEARCH

Emergency 9-1-1 call systems comprise the single most important technological innovation that has shaped and defined police practices over the last three decades. The 9-1-1 emergency call system is a call handling systems that was originally sold as a technological solution for reducing response times and increasing police effectiveness. The proliferation of 9-1-1 call systems revolutionized the manner in which police handled citizen demands for police service and underpinned demand management during the reform era of policing (see Kelling and Moore, 1988).

In the early days, the 9-1-1 emergency call system was hailed as a huge success (Sparrow et al., 1990). By the late 1970s, however, police officials

had become concerned with the volume of calls their officers were handling. This concern was not universal, but neither was it isolated. In a pair of influential reports, which were funded by the Law Enforcement Assistance Administration,[2] analysts identified problems posed by the increasing number of calls per officer coming in over police phone lines (Gay et al., 1977). These analysts proposed a variety of management strategies for coping with these problems, including patrol shift scheduling by call volume rather than equal staffing around the clock. The wisdom at this time was that increases in 9-1-1 calls could be better handled by reallocating existing resources to more effectively manage officer workloads.

Subsequent studies in Kansas City (MO) (Kansas City Police Department, 1977), Peoria (IL), Rochester (NY), Jacksonville (FL), and San Diego (CA) (Spelman and Brown, 1981) demonstrated that two human elements impeded the technology of 9-1-1. First, most crimes are discovered long after the offender has left the scene of the crime. Second, even when offenders have contact with victims, victims typically take several minutes to decide to call the police once the offender leaves. This time lapse, during which time offenders try to escape, was found to be far more important than the seconds saved by having 9-1-1 available (Spelman and Brown, 1981). In short, scholars started to show that 9-1-1 was useful in too few cases for it to have a substantial impact on public safety from crime.

In 1977, the LEAA funded the Police Executive Research Forum (PERF) to examine alternative ways for the police to handle citizen calls for service. The resulting PERF report described how nonemergency calls could be shifted away from requiring an immediate patrol response. The alternatives PERF considered were delaying dispatches until officers were free to respond, taking reports over the phone, asking that callers mail in reports, or asking callers to come to a police station to file reports (Farmer, 1981). Based on this and other research, the National Institute of Justice (NIJ) developed and field tested the nationwide Managing Patrol Operations programs, consisting of regional seminars, manuals, and other materials (Cawley and Miron, 1977).

In addition to model programs, the NIJ also sponsored evaluations of call handling strategies throughout the 1980s. The Wilmington Police Department was the site for two evaluations. The first examined the utility of splitting the patrol service into two groups—one to handle calls and the other to proactively suppress crime (Tien et al., 1977). The second experiment looked at the impact of various call-management strategies designed

2. The Law Enforcement and Assistance Administration (LEAA) was the forerunner of the National Institute of Justice, the Bureau of Justice Statistics, the Bureau of Justice Assistance, and the Office of Justice Programs.

to free up officer time for working on crime problems (Cahn and Tien, 1981). Another set of field trials that assessed alternative call handling strategies was conducted in Garden Grove (CA) and Toledo (OH) (McEwen et al., 1986). A third line of inquiry, more popular in Canada than in the United States, was to explore ways to wean the public away from placing nonemergency calls to the emergency call system. In Edmonton (Alberta), for example, a major public information campaign was launched to have citizens report minor thefts, noninjury accidents, and other problems directly to local police substations established throughout the city (Hawkins, 1996). Collectively, these studies established that the public was accepting of delays in responding to calls and phone reporting of nonemergencies, if police call takers clearly described how the call would be handled and did not imply officers would soon arrive.

The national emergency number, 9-1-1, remained in the background of these studies and public information campaigns. At first, there were many urban and suburban police agencies that did not have 9-1-1. However, as 9-1-1 became increasingly universal, the growing problem of call saturation became synonymous with the proliferation of 9-1-1.

Beginning in the mid-1980s, as policing increasingly undertook reform programs to implement community and problem-oriented policing strategies, officials found themselves confronting a common complaint from their officers: "We are too busy handling 9-1-1 calls to address the problems that give rise to these calls." This was particularly the case on busy evenings. Some of the officer's concerns may have been more perceptual than real, as audits of time availability usually uncovered more discretionary time than officers claimed (Eck and Spelman, 1987; Skolnick and Bayley, 1986). One thing had become clear, however: Even if officers had time, the seemingly random nature of calls gave officers a sense of chaos and the perception that they could not accomplish preventive work. As community and problem-oriented policing require officers to engage in self-directed activities, these perceptions had to be addressed.

It became accepted wisdom within policing that to undertake community and problem-oriented policing, police managers would have to address the volume of calls. At least two widely read published books made this point: *The New Blue Line* (Skolnick and Bayley, 1986) and *Beyond 9-1-1* (Sparrow et al., 1990). By 1996, the problem had become so well known within policing that it spilled out into the popular press with a cover story in *U.S. News and World Report* on the "tyranny of 9-1-1" (Witkin and Guttman, 1996).

In summary, nonemergency calls to the police had been a major problem for local police for over 20 years. Police had attempted three strategies to address the problem. The first was to reallocate internal resources to

equalize officer workloads and free up time for proactive work. The second approach was to divert calls placed to the police so they did not immediately go to officers and so that some other calls could be handled without a patrol response. The third approach was to wean the public from using the telephone to report nonemergency concerns. Taking them in reverse order, these call management strategies sought to (1) keep calls from coming in, (2) separate calls by their need for quick response and assign them to appropriate services, and (3) adjust patrol resources to handle more calls with the resources available.

Police departments collectively spend billions of dollars each year managing and upgrading their Computer Aided Dispatch (CAD) systems. Much time, effort, and resources has been channelled into developing enhanced 9-1-1 systems that have made call routing procedures even more efficient than in the past. Moreover, most police agencies spend considerable energies appropriating resources to improve CAD-vehicle communications and enhance their ability to better manage and respond to citizen calls for police service. Most jurisdictions have also grappled with the problem of overburdened emergency call systems and implemented a variety of management approaches for handling the burden.

During the mid-1990s, many police agencies throughout the United States began looking for technological options, as opposed to management approaches, to solve their overburdened 9-1-1 call system problems. One family of technological solutions was nonemergency call systems that routed nonemergency calls away from the 9-1-1 system. The goals of nonemergency call systems typically were to relieve 9-1-1 call systems of nonemergency calls, to improve the management of all citizen calls to the police (both emergency and nonemergency), to improve response times for high priority calls, to increase citizen satisfaction with the police handling of calls for service, and to free-up patrol officer time to provide more opportunities for problem-oriented and community-policing activities.

In early 1998, the National Institute of Justice identified four cities that represented a cross section of jurisdictions leading the charge to implement technological solutions for dealing with nonemergency requests for police service (Baltimore, Maryland; Buffalo, New York; Dallas, Texas; and Phoenix, Arizona). These cities agreed to participate in a comprehensive assessment of their nonemergency number systems. The University of Cincinnati was subsequently awarded a competitive grant to explore the processes these four cities adopted for implementing alternative methods for dealing with nonemergency citizen calls for police service. The evaluation also sought to determine the impact of implementing alternative methods for handling nonemergency citizen calls for police service on the quality and quantity of policing. The remainder of this paper draws on the results from the Baltimore site to assess the impact of implementing a 3-1-

1 nonemergency call system on police practice.[3]

BALTIMORE AS THE RESEARCH SITE

At the time of our study, The City of Baltimore has a population of 716,446 people covering 86 square miles. The police department comprises nearly 3,000 sworn officers that handle about 1.4 million calls for police service each year. The existing 3-1-1 system was implemented on October 1, 1996 by the Baltimore City Police Department and AT&T funded in part by a 1996 grant by the Office of Community Oriented Policing. AT&T was replaced by Bell Atlantic as the service provider on December 17, 1998.[4] This change resulted from cost considerations to the city, but left the system virtually unchanged.

Baltimore's 3-1-1 nonemergency call system comprises nine telephone lines and uses a Nortel DMS 100 Intelligent Call Processing distribution switch. The City estimates the 3-1-1 system cost approximately $1.3 million to implement, including the cost of public education campaigns, hardware, software, and training. Incoming 3-1-1 calls are handled by limited duty sworn officers who undergo a one-day orientation, three-day training program, and two weeks on-the-job training.

At the time the evaluation was conducted, 3-1-1 calls entered the system as nonemergency calls and thus were not afforded the security that 9-1-1 calls received. These 3-1-1 calls were not assigned ANI/ALI[5] and arrived "blind" or without a caller-identification number. Upon answering 3-1-1 calls, call takers identified themselves as nonemergency call operators and asked how they could be of service. Depending on the caller's problem, a number of options were designated to resolve the call. First, in a case where the caller was reporting a life-threatening emergency or a crime in progress, the 3-1-1 call takers (like their 9-1-1 counterparts) sent the call directly to dispatch. In the case of 3-1-1, however, the call taker immediately attempted to ascertain the telephone number, name, and location of the calling party while simultaneously transferring the call through a single button transfer to the appropriate dispatcher. The information gleaned by the call taker was entered into the CAD system, it received a CAD number, and the CAD information was transferred directly to the dispatcher. CAD automatically validated the address.

3. Our examination of the Dallas, Phoenix, and Buffalo nonemergency call systems revealed unique system shortcomings and challenges that subsequently led to our decision to reduce our impact analysis efforts in these three cities (for a full description and discussion of these issues, please refer to Mazerolle et al., 2001).

4. Bell Atlantic has subsequently merged with GTE and now trades as "Verizon."

5. Automatic Number Identification (ANI) and Automatic Location Identification (ALI).

Second, if the calling party desired to fill out a police report for a crime that did not require dispatch, the call taker completed the report over the phone through the CAD system. The report was given a CAD number, and the information became a permanent record in CAD. The report was also available for review and analysis through the CAD system to the District in which the offense occurred. Third, if the calling party reported a more general neighborhood problem, a description of the problem was entered into a Lotus Notes database and e-mailed or faxed to a Neighborhood Service Center (NSC). A paper trail of accountability was established among the district, the sector commander, the NSC, and the citizen's report (see Mazerolle et al., 2001). Fourth, for calls that did not require police, fire, or ambulance response, the call takers provided the caller with the number of the appropriate city agency or service (in Baltimore, these calls are called type "79" calls). These "type 79" calls were generally not recorded in the CAD system.

The Baltimore nonemergency call-taking system is now somewhat different than the original system implemented in 1996. The biggest change in the Baltimore system has been the implementation of a voice recognition system. Today callers to the 3-1-1 call system in Baltimore select "1" for a police emergency, "2" for a police concern that is not an emergency, or "3" if they want to contact a non-police city service. This voice recognition system is a technological enhancement to the 3-1-1 call system that seeks to reduce further the number of calls made to and handled by the police.

DATA AND METHODS

The primary goals of nonemergency call systems are to relieve 9-1-1 call systems of nonemergency calls, to improve the management of all citizen calls to the police (both emergency and nonemergency), to improve response times for high priority calls, to increase citizen satisfaction with the police handling of calls for service, and to free-up patrol officer time to provide more opportunities for problem-oriented and community-policing activities. Our research methods sought to assess the efficiency and effectiveness of the Baltimore 3-1-1 call handling system in achieving these goals.

Our main source of data was gathered from Baltimore's CAD system (October 1, 1994 through December 31, 1999) and included both 3-1-1 and 9-1-1 citizen calls for service. We also interviewed primary stakeholders; we conducted a survey of patrol officers, line supervisors, and sector managers; we conducted a telephone survey of callers to both the 3-1-1 and 9-

1-1 call systems; and we conducted a series of systematic observations during ride-alongs with patrol officers over a two-week study period (see Mazerolle et al., 2001 for a detailed discussion of our data and methods).

We examined a total of 3.4 million 9-1-1 calls for the pre-intervention period (October 1, 1994 through October 1, 1996) and the post-intervention period (October 2, 1996 through October 1, 1998) as well as 540,519 3-1-1 calls entering the CAD system in the post-intervention period. We also examined the CAD data for what were labeled as "type 79" calls for service and were deemed non-police matters. To further explore the presence (or absence) of CAD records for these "type 79" calls, we collected data over a one-month period to document all calls (i.e., all type 79 calls) whether they were recorded in CAD or not. These type 79 calls were generally calls that were not police, fire, or ambulance matters, and call takers referred the callers to the appropriate city agency without making any record of the call to the police.

We interviewed all Sector Managers ($n = 29$), asking them about their perceptions of 3-1-1, what types of data they review to decide what problems they have in their Sector (when and how much), how they identify patrol officer discretionary time, how they typically use patrol officer discretionary time, how they interface with the Neighborhood Service Center Sergeant, where they have directed their patrol staff over the last week, and where they intended to assign their personnel in the forthcoming week. To tap police officers' perceptions of the 3-1-1 system, we developed a self-administered police officer survey. A total of 386 respondents completed the survey for a response rate equalling 20%.

The sample for the citizen caller survey was drawn from the population of all 9-1-1 and 3-1-1 calls made to the Baltimore City Police Department between May 28, 1999 and June 28, 1999. This 32-day period represented a time frame in which a more extensive recording of 3-1-1 calls was made by call takers.[6] Our final sample consisted of 330 cases with 125 9-1-1 callers, 125 3-1-1 callers, and 80 3-1-1 LAN callers. Each case was randomly drawn from the population of 147,160 cases identified during our 32-day study period and then randomly assigned to a sequence and call order number.

Our observational study sought to assess the role and influence of 3-1-1 at the street-level, albeit in a limited way. In total, 96% ($N = 241$) of the scheduled observations were completed in accordance with the ride schedule (see Mazerolle et al., 2001).

6. During this period, all calls (including type 79 calls) received by the 3-1-1 system were documented providing a complete record of all calls. This represents a more extensive recording of 3-1-1 calls because informational calls requesting directions or other governmental services are generally not recorded within this system.

RESULTS

THE IMPACT OF 3-1-1 ON 9-1-1 CALLS

Our first step in analyzing the Baltimore CAD data was to explore the differences in 9-1-1 calls before the introduction of the 3-1-1 system compared with after the 3-1-1 intervention. We define the pre-intervention period as being from October 1, 1994 through October 1, 1996 (two years) and the post-intervention period as being from October 2, 1996 through October 1, 1998 (two years). We examine the differences in the absolute number of 9-1-1 calls, pre- to post-intervention. Table 1 reports the number and percent change for 9-1-1 calls received by the Baltimore Police Department by time period (pre- and post-intervention) and by the priority that the call was allocated.

TABLE 1. NUMBER AND PERCENT CHANGE FOR 9-1-1 CALLS RECEIVED BY TIME PERIOD (PRE- AND POST-INTERVENTION) BY CALL PRIORITY

	Pre-intervention[1]	Post-intervention[2]	Percent change
Priority 1	417,728	470,263	+12.6
Priority 2	902,565	633,706	–29.8
Priority 3	415,133	177,967	–57.1
Priority 4	201,043	66,169	–67.1
Priority 5	111,500	375	–99.7
Total	**2,047,969**	**1,348,480**	**–34.2**

[1] Pre-intervention period includes 730 days from October 1, 1994 through October 1, 1996, excluding February 29, 1996 (leap year).
[2] Post-intervention period includes 730 days from October 2, 1996 through October 1, 1998.

As this table shows, there was a dramatic decline of about one-third (34.2%) in the total number of 9-1-1 citizen calls for police service received by the police following the introduction of the nonemergency call system in October 1996 (see also *Maryland Sun*, 1998; *New York Times*, 1997). As the police department had hoped and expected, the most dramatic decline came from priority 5 (low priority) calls: from 111,500 calls during the pre-intervention period down to just 375 calls in the post-intervention period (99.7%). Apart from the priority 1 9-1-1 calls that experienced a 12.6% increase (see below for more discussion on this issue), there were significant declines in the number of calls across all priority levels, and the declines got larger as the priority levels decreased.

Our time series analysis of these CAD data confirm these pre- and post-comparisons and show large and statistically significant declines in 9-1-1 calls for police service following the introduction of the 3-1-1 system (see

Mazerolle et al., 2001). In real terms, the Baltimore Police Department received about 5,000 fewer 9-1-1 calls per week, representing about a 25% decline in 9-1-1 calls for police service that could be directly attributed to the introduction of the 3-1-1call system.

THE IMPACT OF 3-1-1 ON ALL CALLS TO THE POLICE

The impact of the 3-1-1 system on the quantity of 9-1-1 calls received by the police clearly demonstrates that the system achieved one of its primary goals: to reduce the burden of calls on the 9-1-1 system. However, our analysis of the CAD data sought to explore whether, and to what extent, the calls previously made to the 9-1-1 simply migrated to the 3-1-1 call system. Table 2 depicts the number of calls broken down by 3-1-1 and 9-1-1 call type pre and post the 3-1-1 intervention.

TABLE 2. THE NUMBER OF 9-1-1 AND 3-1-1 CALLS BY TIME PERIOD

	Pre-Intervention		Post Intervention	
Priority	Pre 9-1-1 Only	Post 9-1-1 Only	Post 3-1-1 Only	Post 3-1-1 + 9-1-1
1	417,728	470,263	62,534	532,797
2	902,565	633,706	184,931	818,637
3	415,133	177,967	138,722	316,689
4	201,043	66,169	103,878	170,047
5	111,500	375	50,454	50,829
Total	**2,047,969**	**1,348,480**	**540,519**	**1,888,999**

Table 2 shows a reduction in the total number of calls received following the introduction of 3-1-1 (from 2,047,969 calls before to 1,888,999 calls after) representing a 7.7% absolute decline in calls. Table 2 also reveals a large, absolute reduction in the total number of priority five calls received (from 111,500 to 50,929 representing a 54.3% reduction in priority five calls). Clearly our results show that a large proportion (about one in three) of priority 2, 3, 4, and 5 calls that used to be placed to 9-1-1 simply migrated over to 3-1-1.

Of major interest is the absolute increase in priority 1 calls following the introduction of 3-1-1. As Table 2 shows, there was a 27.5% increase (from 417,728 priority 1 calls before to 532,797 priority 1 calls after) in the total number of priority 1 calls received by the police department via 9-1-1 and 3-1-1 following the introduction of the 3-1-1 system. More than any other category of call, the priority 1 calls are a major drain on police resources, particularly when the response time and complexity of the call is taken into account. Hence, we examined more closely the apparent increase in

the priority 1 calls. Our data suggest (see below) that the increase in priority 1 calls was most likely driven by an increase in reporting of several specific categories of serious crimes (particularly rape, robbery, and burglary). Moreover, our analysis of the weekly averages of priority 1 calls reveals that there was a trend increase in priority 1 calls that began several months prior to the introduction of 3-1-1 (see Mazerolle et al., 2001). We conclude that much of the observed increase in priority 1 calls was probably spuriously related to the implementation of the 3-1-1 nonemergency call system.

At the other end of the call priority spectrum, our analysis of the CAD and "type 79" data reveals some important nuances of the impact of the 3-1-1 call handling system on the pattern of citizen calls to the police for what the police believe to be non-police matters (i.e., nonspecific provision of information, information requests of the police, reporting of other city agency matters, etc.). As mentioned earlier, large proportions of the "type 79" calls are not recorded in the CAD system. In order to analyze these cases, we systematically recorded all "type 79" calls for a one-month study period. Our analysis of these "type 79" calls shows that the police handle an average of about 538 "type 79" calls per day, of which less than one-third get recorded into CAD. That is, the police call takers receive the call; provide information, advice, or a referral to the caller; and then simply hang up. Our estimates of police handling of "type 79" calls suggests that this category of calls increased by about 8% following the introduction of the 3-1-1 call system, offsetting to some degree the reduction in priority five calls received and recorded in the CAD system. We suggest that although citizens called the police less following the introduction of the 3-1-1 call system, we suspect that 3-1-1 call operators were more willing than were their 9-1-1 call taker counterparts to treat non-police calls coming into the 3-1-1 system as "type 79" calls and not record them into the CAD system. Baltimore's new voice recognition system and telephone link directly to the city agency call center more effectively siphons these "type 79" calls away from the police. Indeed, police call takers no longer even need to handle the call and re-direct the caller, perhaps reducing the workload of the 3-1-1 call takers by as much as 500 calls per day.

THE IMPACT OF 3-1-1 ON DISPATCH PRACTICES

One of the principle factors that dictate patrol officer workloads is the nature of dispatch policies. The Baltimore Police Department made a crucial policy change at the same time that they adopted the 3-1-1 call handling system in that they decided to cease dispatching low priority (priority 5) calls for service. This dispatch policy change is a confounding, yet crucial factor that needs to be examined within the context of our impact analysis of the 3-1-1 system in Baltimore. Table 3 depicts the dispatched

proportions of 9-1-1 and 3-1-1 calls by time period (pre- and post-intervention) and by priority level.

TABLE 3. PERCENT OF 9-1-1, 3-1-1, AND TOTAL CALLS DISPATCHED BY TIME PERIOD (PRE- AND POST-INTERVENTION) AND BY CALL PRIORITY

	Percent of Calls Dispatched			
Priority	9-1-1 – Pre	9-1-1 – Post	3-1-1 – Post	9-1-1 + 3-1-1 – Post
1	99.4	99.6	98.6	99.5
2	99.4	99.6	97.6	99.2
3	97.2	99.3	94.1	97.0
4	99.2	99.5	98.1	98.3
5	10.3	0.5	0.6	0.6
Total	**81.1**	**79.7**	**77.8**	**78.9**

Table 3 reveals some important findings. As expected, Table 3 shows that the Baltimore Police Department virtually stopped dispatching all priority 5 calls following the implementation of the 3-1-1 call system regardless of whether they were received by the 9-1-1 system or the 3-1-1 system[7]. The similar dispatch patterns observed for both the 3-1-1 and 9-1-1 calls is because the police department utilized just one dispatch policy that governed both 3-1-1 and 9-1-1 calls alike. Table 3 also shows that during the two years before the introduction of 3-1-1, 81.1% of all 9-1-1 calls were dispatched: over 97% of the priority 1 through 4 calls were dispatched and 10.3% of priority 5 calls were dispatched. During the two years after the introduction of 3-1-1, 78.9% of all calls were dispatched. This represents a marginal 2.7% decline in the total number of calls dispatched to the patrol division comparing before to after implementation of the 3-1-1 call system.

THE IMPACT OF 3-1-1 ON THE TYPES OF CALLS HANDLED

One way to explore the qualitative changes in calls before to after the implementation of the 3-1-1 call system is to examine changes in the types of calls placed to the 9-1-1 and 3-1-1 call systems (see Mazerolle et al., 2001). Our analysis reveals that the introduction of the 3-1-1 system fundamentally changed the patterns of citizen reporting of some crimes and disorder incidents to the police. For example, before the introduction of 3-1-1, the police received an average of nearly 700 calls per week ($N = 677$) for

7. We note, however, that recent changes to call handling practices in Baltimore suggest that more low priority calls are now being dispatched than in the two-year post-intervention period that we examined for our evaluation.

family disturbance problems via the 9-1-1 system. After the introduction of the 3-1-1 system, the police received nearly 200 fewer calls via the 9-1-1 system for family disturbance complaints. This represents a 27% decrease in 9-1-1 calls regarding family disturbances. Overall, the police received 90 fewer calls per week about family disturbances (9-1-1 + 3-1-1) after the introduction of 3-1-1. Citizen reporting of juvenile disturbances, parking, suspicious persons, auto accidents, and destruction of property followed similar declines as those demonstrated in reporting family disturbances.

Also intriguing was the change in citizen calling patterns regarding loud noise complaints: Before the introduction of 3-1-1, the Baltimore Police Department received about 266 calls for service per week about loud noises via 9-1-1. After the introduction of 3-1-1, the police only received about 34 calls per week about loud noises via the 9-1-1 system, representing a 87% decline in the number of loud noise complaint calls to 9-1-1. Interestingly, however, the total number of loud noise complaints per week increased (from 266 before to 281 after) when we examine the sum of loud noise complaints to both the 9-1-1 and 3-1-1 systems. The majority (88%) of these loud noise calls were received by the 3-1-1 system. Citizen reporting of narcotics, motor vehicle theft, gambling, larceny, and aggravated assault followed similar patterns to those demonstrated in the reporting of loud noises.

Overall, following the introduction of the 3-1-1 nonemergency call system, there was a reduction in the total number of citizen calls from about 19,560 calls per week down to about 17,644 calls per week. However, it appears that the 3-1-1 system "adopted" about 30% of the calls that had previously been routed via the 9-1-1 system. As one would expect, some categories of complaints migrated in large numbers from the 9-1-1 system (e.g., larceny, parking, loud noise, destruction of property, gambling, and suspicious persons). In some cases, however, the introduction of the 3-1-1 system coincided with an absolute increase in citizen complaints for some categories of crime and disorder (e.g., loud noise complaints).

RESPONSE TIME ANALYSIS

The total numbers and types of calls to 3-1-1 and 9-1-1 reveal part of the story about the impact of the 3-1-1 call system. How the police handled calls (both 9-1-1 and 3-1-1) provides additional insight into the implementation story of Baltimore's 3-1-1 call system. From the outset, we expected that the reduction in calls to the 9-1-1 call system would lead to faster response times, especially to the more serious, priority 1 calls for police service. Our analysis of the Baltimore CAD data included a detailed examination of the before to after comparisons of dispatch times, times to arrive on the scene, and times to clear/complete the call for priority 1 calls. In contrast to our expectations, we found that the high priority 9-1-1 calls

(priority 1 calls) were dispatched slightly slower in the post-intervention period compared with the pre-intervention period. We remind readers that following the introduction of the 3-1-1 call system, there was an increase in priority 1 calls. We suspect that this increase in priority 1 calls was the underlying factor that slowed police response to these calls. We note, however, that the police were quicker at handling 9-1-1 priority 1 calls than they were at handling 3-1-1 priority 1 calls, perhaps reflecting the more serious types of priority 1 calls received by the 9-1-1 call center compared with the priority 1 calls received by the 3-1-1 call center (as one would expect).

Apart from slower dispatch times for priority 1 calls in the post-intervention period, our analysis reveals that the police handled most categories of 9-1-1 calls (arrival and cleared) slightly faster after the implementation of 3-1-1 than before the introduction of 3-1-1. By contrast, the police were slower at handling 3-1-1 calls compared with 9-1-1 calls across all priority levels. In short, our analysis tends to suggest that there were subtle differences in the speed at which the police handled 3-1-1 and to 9-1-1 calls. We suspect that these subtle differences reflect more the distribution of seriousness of the call within each priority category than conscious officer decision making to respond slower to 3-1-1 than 9-1-1 received calls. That is, we know that officers rarely knew whether the call they were dispatched to was received on either 3-1-1 or 9-1-1 (see Mazerolle et al., 2001). As such, it is likely that 3-1-1 calls were the least serious types of calls within each priority category of calls.

CITIZEN SATISFACTION WITH BALTIMORE'S CALL HANDLING SYSTEMS

One of the goals of the 3-1-1 call system in Baltimore was to increase citizen satisfaction of police handling of citizen calls for service. Our evaluation was not implemented until after the 3-1-1 system was operational; hence, we have no pre-intervention measures of citizen satisfaction with the police handling of calls for service. We did, however, conduct a small survey of 9-1-1 and 3-1-1 callers to ascertain their levels of satisfaction with the way the police handled their calls. Our results show that citizens had a favorable view of 3-1-1 services. Citizens generally agreed that 3-1-1 improved city services, improved police-community relations, they felt that the 3-1-1 call system should be used for nonemergency calls only, and they expected the new system to result in fewer nonemergency calls to 9-1-1. Over 90% of respondents felt that call takers were both polite and helpful and about three-quarters were either very or somewhat satisfied with the police and city's response to their call.

UPTIME AND DOWNTIME ANALYSIS

One of the goals of the 3-1-1 nonemergency call system was to increase the amount of uncommitted time for patrol officers. The expectation was that the 3-1-1 technology could be an important vehicle by which the police could implement problem-oriented and community-oriented policing activities. In this section, we examine the issue of "down-time" for patrol officers.

Our patrol officer survey revealed that the majority of responding officers stated that they did not perceive 3-1-1 to have had an effect on either the quantity of calls to which they were dispatched on a typical shift or the nature of these calls. Indeed, the majority of patrol officers responding to our survey perceived no change (on a typical shift) in the amount of discretionary time attributable to the implementation of 3-1-1.[8]

We also analyzed the CAD data to examine the number of patrol units available for call response in the pre-intervention to post-intervention period. We found that during the 730 days (two years) prior to the introduction of the 3-1-1 system, there was a daily average of 489.41 units responding to 9-1-1 calls for service.[9] In the 730 days (two years) following the implementation of the 3-1-1 system, we identified a daily average of 488.93 units responding to 3-1-1 or 9-1-1 calls. This represents a mere 0.1% decrease in the number of units responding to calls following the introduction of the 3-1-1 system. Indeed, there was virtually no change in the number of patrol units handling calls for service from before to after the introduction of the 3-1-1 call system. Further, our analysis of the patrol units responding to 9-1-1 and 3-1-1 calls shows that about 460 of the patrol units handled over 90% of all 3-1-1 and 9-1-1 dispatched calls for service both before and after the introduction of the 3-1-1 call system.

We also sought to calculate the total number of minutes that patrol units spent responding to calls for service ("uptime") before and after the implementation of the 3-1-1 call system. We found that patrol units spent 189.88 minutes per unit per shift responding to 9-1-1 calls prior to the

8. Our observational study suggests that officers rarely knew the origin of a call to which they were dispatched. That is, dispatchers did not inform patrol officers whether the call was a 9-1-1 call or a 3-1-1 call. As such, for the majority of calls, patrol officers were indifferent to whether the call was actually a 9-1-1 or 3-1-1 call.

9. We calculated the daily average number of units responding to calls for service by aggregating the number of unique "alpha" (or patrol) units per shift per day. If a unit did not respond to either a 9-1-1 or 3-1-1 call, they were not included in the analysis. If a unit "carried over" a call from one shift to another, we counted the unit to the originating shift. This was a crucial decision as we did not want to inflate the number of available units simply because a unit claimed several minutes of overtime running into a new shift. As such, we believe that our count of "units responding to calls" approximates the real number of available units and is not inflated by nuances of overtime.

implementation of the 3-1-1 system, and they spent a total of 168.91 minutes per unit per shift responding to all calls (3-1-1 + 9-1-1 calls combined) after the implementation of the 3-1-1 system. This represents an 11% decrease in the total time spent per unit responding to calls for service following the implementation of the 3-1-1 system. Of the 168.91 minutes spent dealing with calls post 3-1-1, patrol units spent two-thirds of this time responding to 9-1-1 calls (111 minutes) and one-third of this time responding to 3-1-1 calls. This represents a reduction of 41.5% in the number of minutes per unit per shift responding to 9-1-1 calls from before to after the introduction of the 3-1-1 call system.

In sum, our analysis of the CAD data reveals that the police department maintained the pre-3-1-1 levels of patrol response units following the introduction of the 3-1-1 system, that the patrol units spent considerably less time responding to 9-1-1 calls, and overall they spent less time handling calls for service after the introduction of the 3-1-1 call system, even when the time spent on 3-1-1 calls was taken into account.

TIME AVAILABLE FOR PROBLEM-ORIENTED AND COMMUNITY POLICING ACTIVITIES

One way to ascertain whether the 3-1-1 call system created increased opportunities for patrol officers to engage in problem-oriented and community-policing activities is to calculate true "blocks" of uptime and downtime available to patrol units during any one shift. By "blocks" of uptime, we mean blocks of calls that can be linked together by time to show that a patrol unit is "occupied" and thus not available for community-policing activities. By "blocks" of downtime, we mean substantial blocks of time (more than 30 minutes in duration) where patrol units are "uncommitted" to any type of recorded task.

The majority of the calls originating as 3-1-1 or 9-1-1 calls (if dispatched) were handled by what the Baltimore Police called "Alpha Units." About 488 alpha units were assigned to the nine police districts and they handled 98% of all 3-1-1 and 9-1-1 calls for service. As such, we examined the block sequencing patterns for these alpha patrol units and we used a 730-day period before the 3-1-1 implementation and a 730-day period following the implementation of the 3-1-1 system.[10] We point out, from the outset, that the average downtime was not calculated as the inverse of

10. N = 6,935,001 dispatched records were used in our analysis. The cases were sorted and ordered by unit responding and by time. Sequential cases were examined and categorized into "blocks." Simple "blocks" of uptime calls included, for example, three or four dispatched calls that started and finished in sequence with short time breaks (e.g., five minutes) between calls. These "run-on" calls were counted as one unique block of committed time (i.e. uptime). Calculation of uptime and downtime, however, was confounded by overlapping times and our need to estimate a shift start

committed time (or "uptime"). As such, one does not expect that increases in uptime will necessarily translate into a decrease in downtime. We also remind readers that short bursts of "downtime" (less than half an hour) were excluded from our analysis.

Our analysis reveals that during the pre-intervention period, patrol units spent on average 28.02 minutes in committed blocks of time and they had about 109 minutes (over an hour and a half) available to them in any one block of down time. During the post-intervention period, alpha units spent an average of slightly longer (29.28) minutes during any one committed time slot and they had slightly more minutes (112.73) in any one block of downtime. As expected, there were differences across shifts in the average minutes that alpha units had in committed (uptime) and uncommitted (downtime) blocks of time.

To estimate how the blocks of committed and uncommitted time played out in any one patrol shift, we used the daily average of patrol units during the before (489.41) and after (488.93) to estimate how many "slots" patrol units had during an average shift.[11] We estimate that before implementation of the 3-1-1 system, patrol units had 2.62 downtime slots available of

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and end time. To deal with these confounding problems, we calculated the "true" shift start time and used this time as our shift "starting" point. We truncated blocks of committed time that ran into the next shift. We examined each and every sequencing of calls and developed programs to handle all combinations and permutations of complicated call sequences. A simple example of a call sequence is thus: A call is received, a unit is on route and then diverted to another call that was received after the initiating call, the unit responds to the second call first, leaves the clearance time open, handles the first call, and then simultaneously clears the first and second call. We identified dozens of call sequences, some involving just two calls, but some involving up to four or five "run-on" calls. Together these calls would equal a block of committed time. All categories of call sequences were included to calculate the number of minutes in an uptime block.

Calculating downtime was even more complicated than calculating the number of uptime minutes. The primary complicating factor in the Baltimore CAD data was the difficulties we encountered in assigning a start and end time to a shift. For example, the time stamp in the CAD data was not always accurate (e.g., off-line periods did not always end in correct times being assigned to cases; indeed, the CAD system in Baltimore periodically resets the time stamp to account for inaccuracies in the "time" fields). The police department also uses a series of shift start and end times to account for busy time and day-of-week periods. Finally, and most obviously, patrol units rarely start their shift with a call dispatch that coincides with their shift starting time. With these nuances in mind, we decided to restrict our calculation of downtime: We include the data for the alpha units only in our analysis, and we restricted the analysis to count only those blocks of uncommitted time that were equal to or greater than half an hour. This half-hour criterion allowed us to eliminate all short bursts of "downtime" that we believed were useless blocks of time for patrol units to engage in any type of meaningful problem-oriented policing or community policing.

11. To calculate the number of downtime slots per unit shift for the before period, we multiplied the daily average of available patrol units (489.41) with the number of days in the analysis (730 days) = 357,269.3. We divided the total number of downtime

about 109 minutes in duration during an average shift (about 4.8 hours). In the post-intervention period, patrol units had about 2.70 downtime slots available of about 112 minutes in duration (about five hours). This represents a very marginal increase in the number and duration of downtime slots available following implementation of the 3-1-1 call system.

Conversely, we estimated the average number and duration of uptime slots before and after 3-1-1 implementation. We found that there was an average of 5.09 uptime slots of about 28.02 minutes duration before 3-1-1 implementation (about 2.4 hours) and an average of 4.79 uptime slots of about 29.28 minutes duration in the post-intervention period (about 2.3 hours). This represents a marginal decrease in committed time from pre- to post-implementation.

We also calculated the ratio of uptime to downtime time slots to assess whether there was any difference in the before to after time periods. We estimate that before the 3-1-1 intervention, 66% of the time slots that we identified in the data were classified as committed time and 34% of the identified blocks of time were classified as downtime. Following the implementation of the 3-1-1 call system, a slightly smaller proportion of a patrol shift was dedicated to a block of "uptime" (64%) and a slightly larger proportion of an average patrol shift was available as "downtime" (36%). This means that in the post-intervention period, at least one in three identified blocks of time are downtime slots that will last for nearly two hours. These results reveal that following the implementation of the 3-1-1 system, patrol officers had slightly more blocks of downtime that were slightly longer in duration, suggesting that patrol units in Baltimore had slightly more time available to them to engage in problem-oriented policing and community-policing activities following the implementation of the 3-1-1 system.

We also examined the patterns of uptime and downtime by day of week and by shift. As expected, the "night" shift (shift 1 from midnight to 8am) showed the greatest amount of fluctuation in downtime between weekday nights and weekend nights (about 120 minutes of downtime during weekday nights and about 102 minutes of downtime on the weekend nights). The morning shift (shift 2; 8am to 4pm) both before and after 3-1-1 implementation revealed a tremendous degree of stability with an average of about 112 minutes of downtime per shift (slightly less per shift in the post

cases (937,674) by the total number of available patrol units (357,269.3) to identify 2.62 blocks of downtime per shift for the before period. We repeated the analysis for the after period using the daily average of patrol units after (488.93) and the total number of downtime cases after (N = 962,219). The average number of uptime slots was calculated using the same method: 1,818,896 uptime cases divided by 357,269.3 patrol units gives 5.09 uptime slots before and 1,708,449 divided by 356,918.9 patrol units gives 4.79 uptime slots after.

3-1-1 period) recorded on both weekdays and weekends. The afternoon shift (shift 3; 4pm to midnight) showed slightly more downtime midweek (about 108 minutes before and 104 minutes after 3-1-1 implementation) and less downtime over the weekends (about 101 minutes before and about 97 minutes of downtime after).

Like the downtime patterns, there were similarities in the patterns of uptime before and after implementation of the 3-1-1 call system. There was, however, even more consistency and predictability in the amount of uptime across the days of the week. For example, night shifts had an average of 27 minutes of uptime per shift (slightly less, surprisingly, on weekend "nights," i.e., the early hours of the night time shift). The afternoon shift (shift 2) clearly had the greatest amount of uptime (about 32 minutes both before and after 3-1-1 implementation), peaking earlier in the week before 3-1-1 implementation (Mondays and Tuesdays) and fairly consistently around 33 minutes on all weekdays in the post-3-1-1 period. Of interest is that the weekends show the lowest scores both for the number of uptime as well as for the number of downtime minutes. This apparent paradox can be explained as follows: First, we remind readers that the uptime and downtime estimates are not mirror images of one another, but calculated independently of one another and reflecting "blocks" of uptime and downtime, not absolute numbers of minutes uncommitted or committed; second, the low scores for uptime and downtime on the weekends is most likely the result of two things: (1) They have less blocks of downtime on weekends because they have a consistent flow of calls to respond to on those nights and (2) patrol officers spend less time responding to individual calls on what they perceive to be "busy nights" (i.e., weekends) because they expect to have a consistent flow of calls (which they probably have).

Overall, our analysis of the uptime and downtime patterns by shift and by day-of-week reveal very little influence of the 3-1-1 call system on time slots available for patrol officers to engage in problem-oriented and community-policing activities. Indeed, the only real pattern that emerges from the day-of-week comparison is that the 3-1-1 call system might have equalized calls for service across the days of the week, changing somewhat the pattern in which citizens report crime. That is, it appears that citizens tend to report crime to the 3-1-1 system in a steadier manner than what they used to report to the 9-1-1 system.

DISCUSSION AND CONCLUSION

In general terms, nonemergency call systems aim to relieve 9-1-1 call systems of nonemergency calls, improve the management of all citizen calls to the police (both emergency and nonemergency), improve response times for high priority calls, increase citizen satisfaction with the police

handling of calls for service, and free-up patrol officer time to provide more opportunities for problem-oriented and community-policing activities. Our analysis of the impact of the Baltimore 3-1-1 system reveals four main findings. First, the implementation of the 3-1-1 call system resulted in a large reduction in 9-1-1 calls (34.2%). Second, there was an absolute decline of 7.7% in the total number of calls (including 9-1-1 and 3-1-1 calls) recorded into the CAD system. This overall reduction in calls, however, was confounded by a number of factors. There was a 27.5% increase in priority 1 calls, of which a substantial number of these calls were placed to the 3-1-1 call system. We speculate that at least some of these high priority calls were placed to the 3-1-1 system because of the lack of ALI and ANI identifiers within the 3-1-1 system, thus, offering a degree of anonymity for a 3-1-1 caller that is not afforded to a 9-1-1 caller. Further confounding the reduction in calls to the police was the large reduction in priority five calls. Although some of this reduction in priority 5 calls was offset by an estimated 8% increase in nonrecorded "type 79" calls, we can only offer some suggestions as to why there was such a large reduction in low-level, quality-of-life calls for police service following the introduction of the 3-1-1 system in Baltimore. One explanation is that there was a true reduction in quality-of-life problems and that the reduction in these calls was spuriously related to the implementation of the 3-1-1 system. Another explanation is that citizens redirected their calls from the police to non-police city agency call centers following the advertising campaign launched by the Baltimore Police Department when they introduced the 3-1-1 call system. Yet another explanation is that citizens became dissuaded to call the police regarding quality-of-life problems because the Baltimore Police Department adopted a no-dispatch policy for priority 5 calls.

Our analysis of the 3-1-1 call system in Baltimore was confounded by the accompanying policy change where priority 5 calls ceased being dispatched. This no-dispatch policy for priority 5 calls was possibly a factor that dissuaded citizens to call the police about low-level neighborhood problems. Some scholars might argue that reducing the number of calls to the police is a step in the right direction in terms of improving police handling of emergency calls for service. Indeed, we note initiatives in Canadian policing where a core call management strategy has been to dissuade citizens from calling the police when they can call a local police station or report an incident in person (see Hawkins, 1996). Other scholars are more prone to argue the opposite: that one of the core principles of community and problem-oriented policing is encouraging citizen reporting of crime and neighborhood problems and enabling the police to depict a more accurate picture of the spatial distribution of crime and quality-of-life

problems.[12] Recent changes to the way the Baltimore police handle low priority calls tends to suggest that the Baltimore police department has reconsidered their no-dispatch policy for priority 5 calls. Their most recent dispatch policies tend to suggest that police departments should not unilaterally dissuade citizens from reporting low level neighborhood problems and that the police need to be a little more responsive to citizens about how they have handled their call.

One way to improve citizen satisfaction with a no-dispatch policy to low priority calls is to systematically call back those callers who offer their return phone number and who want the police to get back to them about actions they have taken following their call to the police. We note, however, that the citizens included in our survey of Baltimore callers to 311 and 911 did not reveal dissatisfaction with the police response to their 3-1-1 call, even when the police did not dispatch a patrol unit to the call.

The third major finding of our study was that the absolute reduction in 9-1-1 calls, coupled with the overall reduction in calls to the Baltimore Police Department failed to reduce response times for priority 1 calls. Indeed, with the increase in priority 1 calls, our data revealed an increase in the time taken to dispatch and respond to priority 1 calls following the implementation of the 3-1-1 call system.

Finally, our research shows that implementation of the 3-1-1 call system resulted in marginal gains in uncommitted blocks of time experienced by "alpha" patrol units. The introduction of the 3-1-1 call system left patrol units with slightly more time slots and longer time slots available for problem-solving and community-policing activities. But the marginal gains in uncommitted time observed in our data went unnoticed by the patrol officers responding to our survey.

Our analysis of the 3-1-1 call system in Baltimore leads us to ask two basic questions: First, what is the value of implementing a 3-1-1 call system and could a police department achieve the same results (i.e., reducing non-emergency calls to the 9-1-1 system) using other, perhaps less costly approaches to better handle their calls for police service? Second, how can a 3-1-1 system be better utilized as a technological tool to facilitate community policing?

Our research suggests that the implementation of a 3-1-1 call system reduces the number of calls made to a police department. It is not clear, however, whether the observed reduction calls in Baltimore was a function of a successful marketing campaign to reduce calls to the police (especially the 9-1-1 system), the result of citizen dissatisfaction with the police

12. We point out that the 3-1-1 system does not collect ANI and ALI information, thus, hampering the police department's ability to map out crime and quality-of-life problems reported by citizens to the police via the 3-1-1 system.

department's no-dispatch policy for priority 5 calls, the result of citizens redirecting their calls to other city call centers, a true reduction in low-level crime problems, or an artifact of call recording practices. Further research is needed to disentangle these rival hypotheses.

Police departments need to think very carefully about whether they want an absolute reduction in calls. When police departments encourage citizens to call the police, they arguably have better information about the spatial distribution of crime and quality-of-life problems and thus a more accurate picture of the locations of ongoing problems. These data are crucial for effective scanning and analysis within the problem-oriented approach to reducing neighborhood problems. We note, however, that the 3-1-1 system adopted in Baltimore did not have ANI and ALI, thus, reducing the utility of these 3-1-1 call data for problem-solving purposes.

Our research suggests that 3-1-1 call systems have the potential to help police efforts to better manage citizen calls and more aptly determine appropriate police responses. Indeed, with the adoption of a 3-1-1 call system, citizens take on some of the responsibility for determining the type of police response required in police handling of their call. That is, by calling 3-1-1, citizens are stating to the police that their problem does not require immediate patrol response or perhaps any patrol response. In essence, this self-screening process embodied by 3-1-1 challenges the value of the universal dispatch policy used by the Baltimore Police Department to handle citizen calls. Adoption of a 3-1-1 system should motivate police departments to adopt dual dispatch policies that acknowledge and capitalize on citizen decisions to call either 9-1-1 or 3-1-1.

From a citizen perspective, 3-1-1 technology provides several distinct advantages over more low tech approaches (e.g., hotlines and easy-to-remember seven-digit phone numbers) for more effectively and efficiently sorting out calls for police service. First, 3-1-1 call systems are superior to decentralized phone number systems because the 3-1-1 number is a universally easy to remember number (especially for out-of-town visitors), calls can be centrally tracked and analyzed, and the switch over to the 9-1-1 system is seamless in emergency situations. A 3-1-1 call system also appears to be a superior call handling system than simply adding more switches, call takers and phone lines to the 9-1-1 call system because the 3-1-1 system gives citizens an anonymous route to report crime incidents, it gives citizens some decision making power as to whether they want or require a patrol car to be dispatched, and it reinstates, to some degree, the purity of the 9-1-1 call system. The disadvantages, however, with 3-1-1 calls systems include the cost (about $1.3 million in Baltimore) and the potential lack of location identifiers attached to 3-1-1 calls that could be used to scan for neighborhood problems.

Our second question asks how police departments, if they were to

implement 3-1-1 technology, might better utilize the technology than what was evident in Baltimore. We recall that the Baltimore Police Department dispatched 3-1-1 and 9-1-1 calls in the same way, and they adopted a no-dispatch policy for priority 5 calls. The Baltimore Police department made no changes in the number of patrol units allocated to respond to calls. We suggest that the implementation of 3-1-1 technology, coupled with organizational reform and careful policy change, could greatly facilitate the adoption of community-policing and problem-oriented policing activities. Indeed, 3-1-1 technology, if adopted at the same time as a split-force model of policing (see Tien et al., 1977), could provide the technological infrastructure to better manage calls for service, more efficiently use scare patrol response, and more effectively engage in problem-oriented policing. This obviously would require police departments to adopt different dispatch policies for calls made to 3-1-1 compared with calls made to the 9-1-1 system.

The Baltimore Police Department got many things right: 3-1-1 is a universal and easily recognizable number; citizens are, for the most part, using the 9-1-1 system less and using the 3-1-1 system to identify incidents when they do not expect an emergency response. Moreover, the policy decision to cease dispatching low priority calls is a precursor to utilizing the 3-1-1 system as a technological tool to further divide (or split) the patrol response into two parts: those officers that respond to 9-1-1 dispatched calls and those officers that respond, in a problem-oriented policing capacity, to the 3-1-1 calls.

There are a number of assumptions, however, that underlie the successful implementation of a 3-1-1 call system. First and foremost, police departments should make sure they adequately advertise their nonemergency call systems to increase the probability that citizens use 3-1-1 for nonemergencies and 9-1-1 for emergencies. In effect, the citizens are the ones deciding as to how they want the police to handle their call. If they are ill-informed and make poor calling decisions, then it reduces the technological advantages of adopting a 3-1-1 call system. As such, marketing and effective citizen education on when and how to use the 311 system is as important to its effectiveness as the technology itself.

Second, the suggested dual policy model for handling calls for service relies on the skill base for effective problem-solving being organizationally allocated efficiently and effectively. Further, it assumes that police department personnel have effective problem-solving skills.

Third, effective implementation of 3-1-1 within a problem-oriented and community-policing model relies on the notion that 9-1-1 calls and 3-1-1 calls tend to derive roughly from similar places. If the spatial distribution of 9-1-1 and 3-1-1 calls were fundamentally different (and they seem not to

be; see Mazerolle et al, 2001), then our proposed model would bias problem-oriented policing efforts toward reducing less intractable problems. However, because we know that, for the most part, the street blocks with 3-1-1 problems tend also to be the street blocks with 9-1-1 problems, then we can be reasonably sure that problem-solving will occur at both crime prone as well as disorderly places.

In sum, our research sought to uncover the impact of nonemergency number systems on the quality and quantity of policing. We used the Baltimore 3-1-1 system to assess the impact of nonemergency number systems on policing, and we relied principally on our results from Baltimore to generalize and speculate how an ideal-type system might look for handling and managing calls for police service, given the adoption of the technology that underpins the 3-1-1 nonemergency call system. Our findings suggest that nonemergency call systems, such as 3-1-1, can greatly facilitate police efforts to better handle citizen calls for police service. However, the intrinsic value of nonemergency call systems is tightly woven with a police department's willingness to change dispatch policies (especially for those calls received via the 3-1-1 system), reallocate patrol resources, and adopt organizational reforms to support alternative methods (apart from dispatch) for handling nonemergency calls for service. Our research has, perhaps, raised more questions than we have been able to answer. Most notably, our research was unable to disentangle the relative factors that appear to have discouraged citizens from calling the police about low-level neighborhood problems. An answer to this, and other remaining questions, will greatly enhance our capacity to make informed policy decisions and justify the expenditures that 3-1-1 technology requires.

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