The author(s) shown below used Federal funds provided by the U.S. Department of Justice and prepared the following final report:

Document Title: **Managing Citizen Calls to the Police: An Assessment of Non-Emergency Call Systems.**

Author(s): **Lorraine Mazerolle; Dennis Rogan; James Frank; Christine Famega; John E. Eck**

Document No.: **199060**

Date Received: **February 14, 2003**

Award Number: **98-IJ-CX-0067**

This project was supported under award number 98-IJ-CX-0067 to the University of Cincinnati by the National Institute of Justice, with funds transferred from the Office of Community Oriented Policing Services, U.S. Department of Justice. This report has not been published by the U.S. Department of Justice. To provide better customer service, NCJRS has made this Federally-funded grant final report available electronically in addition to traditional paper copies.

Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

MANAGING CITIZEN CALLS TO THE POLICE: AN ASSESSMENT OF NON-EMERGENCY CALL SYSTEMS

A (Revised) Final Report Submitted to the
National Institute of Justice
Grant # 98-IJ-CX-0067

By

Lorraine Mazerolle, Ph.D.
School of Criminology and Criminal Justice
Griffith University

Dennis Rogan, Ph.D.
President, Statistical Analysis for Law Enforcement Strategies

James Frank, Ph.D.
Division of Criminal Justice
University of Cincinnati

Christine Famega M.S.
Center for Criminal Justice Research
University of Cincinnati

John E. Eck, Ph.D.
Division of Criminal Justice
University of Cincinnati

October, 2001

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

ACKNOWLEDGEMENTS

Our research was made possible by the full cooperation of people from a number of city agencies in each of the four study sites, Baltimore, Dallas, Phoenix, and Buffalo. In each city we were provided access to communications divisions, police departments, computer operations and city personnel associated with the emergency and non-emergency call systems. While many individuals provided us with assistance during the project, a number in each city deserve special mention.

In Baltimore, then-Police Commissioner Thomas C. Frazier fully supported our research efforts. Also, Gordon Witkin of U.S. News and World Reports, and John Cohen provided valuable historical information about the Baltimore call system.

We would especially like to thank Colonel Timothy Longo formerly of the Baltimore Police Department who, during the course of our research, gave us his support and provided us with access to all facets of Baltimore's police operations. Without his assistance we could not have accomplished our research objectives in Baltimore. Sector managers Lieutenant Vandermuellen, Lieutenant Baratta, and Lieutenant Owens and their staffs are worthy of special mention for helping to ensure that all of our observers were able to ride in the randomly assigned posts during the observation portion of our study in Baltimore. Our most important acknowledgements are to the many patrol officers and community officers who allowed us to accompany them and observe their work routines.

We also want to thank a number of people who helped gather, interpret and/or transfer electronic and other types of data associated with the Baltimore call systems. Specifically, Major John Reintzell, Major Dawn Jessa, Sergeant Nelson Hermann, Sergeant Womack and Sergeant Sloan, all of the Communications Division provided access to data, along with Lieutenant Wesley Wise (CAD Administrator); William Daniels (Interim 9-1-1 Administrator); Suzan Smith (Senior Program Analyst); Dave Alonge (LAN Administrative Consultant); and Dave Franquist (Tiburon Corporation).

The City of Dallas also provided unfettered access and assistance during the course of our research on their 3-1-1 call system. We owe a great deal of thanks to City Manager Mary Suhm and people from the Dallas Fire Department, Police Department and Communications and Information Services. Captain Raymond Sweeney, of the Dallas Fire Department acted as the Interim Manager of the Dallas call systems during the period of our research project. Captain Sweeney and Richard Taylor (Assistant Manager, Support Services) provided us with access to the Dallas non-emergency call system personnel and data. Armando Rodriquez (Public Safety Manager); Ron Zeigler (Senior Program Analyst); Corporal Eric Garrett (UCR Administrator); Chief Doug Kowalski (Communications Division); and Lieutenant Mark Stallo helped gather and transfer call system data in Dallas. Finally, Chief Holliday, Sergeant Rommel, and Sergeant Zihlman were especially helpful in ensuring that the research team had access to police officers throughout the city. These officers took the time to complete our surveys and answer our questions as we sought to gain a complete understanding of the impact of their city's call system on day-to-day police operations.

We also received tremendous assistance from the City of Phoenix during the course of our research project. Assistant Police Chief, Gerd J. Kurtenbach, of the Phoenix Police Department as well as Carol J. Campbell of the Phoenix Police Department Communications Bureau organized all of the interviews with police and communications personnel and supported our research efforts in their city. Mary K. Strickler (Lead Application Analyst/Program Project Leader) gave us access to all Phoenix data and provided information concerning operation of Phoenix's non-emergency call system.

During our work in Buffalo we were fully supported in our efforts to obtain and understand the Buffalo non-emergency call system. We would especially like to acknowledge the support of Paul Gajewski (9-1-1 Administrator), Captain Gerald Schoenle (Director of Communications) and Ken Kroft (System Administrator).

We wish also to acknowledge important contributions by members of our research team. The following individuals contributed to the production of this report; R. Cory Watkins (Dallas Officer Survey), William Terrill (Baltimore Citizen Survey), and Steve Holmes (Phoenix Stakeholder Interviews). Several individuals helped with research activities including Marty Floss (Buffalo Field Consultant), Timothy Godsey (Baltimore Observational Study), Maggie Palazzolo (Baltimore Observational Study) and the Evaluation Services Center of the University of Cincinnati particularly Jennifer Williams and Peggy Davis (Baltimore Citizen Survey).

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Claudia Scholz, who spent numerous hours on-site in Baltimore collecting data for the research team, deserves special mention.

Finally, we owe a great deal of thanks to the National Institute of Justice for their willingness to support this study and especially Steve Edwards, our project monitor.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

EXECUTIVE SUMMARY

- The University of Cincinnati Evaluation Team compared and contrasted four technological and operational approaches to handling non-emergency calls for police service. We also examined the impact of implementing non-emergency call systems on the quality and quantity of policing in Baltimore (Maryland) and Dallas (Texas).

- We compared and contrasted the technological approaches to handling non-emergency calls in four cities. Baltimore (introduced their 3-1-1 system on October 1, 1996); Dallas (introduced their 3-1-1 system in December, 1997); Buffalo (introduced their non-emergency number in October, 1996); and Phoenix (introduced their non-emergency number in April, 1992).

- We provided an in-depth analytic assessment of the Baltimore and Dallas 3-1-1 systems. We explored police and stakeholder perceptions, citizen satisfaction, and the changes in the nature and quantity of 3-1-1 and 9-1-1 calls over time.

- Our interrupted time series analysis of Baltimore CAD data revealed a large and statistically significant reduction of nearly 5,000 9-1-1 calls per week (25 percent reduction) that can be directly attributable to the introduction of the 3-1-1 call system.

- The large drop in 9-1-1 calls, however, was offset by the calls placed to the 3-1-1 call system. The 3-1-1 system adopted about 30 percent of the calls that had previously been placed to the 9-1-1 system. Indeed, our time series analysis reveals virtually no change in the number of calls per week being placed to the BPD as a result of introducing the 3-1-1 call system.

- Some categories of citizen complaints migrated in large numbers from the 9-1-1 system to the 3-1-1 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).

- The number of Priority One (High Priority) calls received by the Baltimore Police Department increased by about 25 percent following the implementation of the 3-1-1 system. The trend increase in Priority One calls began several months prior to the introduction of 3-1-1 and was most likely driven by an increase in reporting of several specific categories of serious crimes (particularly rape, robbery and burglary). We conclude that the observed increase in Priority One calls was most likely spuriously related to the implementation of the 3-1-1 non-emergency call system.

- About 12 percent of all Priority One calls were placed to the 3-1-1 non-emergency number system in Baltimore.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

- The number of Priority five calls decreased by 99 percent to the 9-1-1 system and by 54 percent overall (9-1-1 and 3-1-1 combined). We speculate that citizens were dissuaded from calling either the police 9-1-1 or 3-1-1 call systems about minor, low priority calls because the police department introduced a policy to cease dispatching priority five calls at the same time that they introduced the 3-1-1 call system technology.

- Over 97 percent of Priority One, Two, Three and Four calls continued to be routinely dispatched in Baltimore, regardless of whether they were received on the 9-1-1 or 3-1-1 call systems. Over a quarter of all calls that were dispatched originated from the 3-1-1 call system.

- There were about 89,000 fewer calls (counting both 9-1-1 and 3-1-1 calls) dispatched to police patrol units during the two years following the introduction of the 3-1-1 system. This translates into about 3,700 fewer dispatched calls per month.

- One-third of the surveyed patrol officers from Baltimore perceived a reduction in the number of calls to which they were dispatched after the introduction of the 3-1-1 system. These respondents believed that the number of low priority calls that were dispatched had decreased significantly. These findings are consistent with the CAD data analyzed.

- In total, about 6,000 3-1-1 calls per week (over half of all 3-1-1 calls) were routinely dispatched to the patrol division in Baltimore. 57 percent of all 3-1-1 calls that were received (including non-police matters) were typically dispatched and 88 percent of those 3-1-1 calls that were recorded in CAD (ie police matters only) were dispatched.

- Patrol units handled 9-1-1 calls marginally quicker than the mean time spent handling 9-1-1 calls before the introduction of the 3-1-1 system. Patrol units, however, generally handled 3-1-1 calls slower than 9-1-1 calls. Most of the overall increase in call handling time derived from the time it took from dispatch to arrival on the scene.

- The Neighborhood Service Centers in Baltimore were not utilized as an *alternate* response for 3-1-1 calls but rather as an additional response to a patrol dispatch. That is, NSC's responded to 3-1-1 calls after they had already been handled by the patrol division.

- About 460 alpha patrol units handled over 90 percent of all call responses. This number of primary units responding to calls remained consistent from before to after the intervention.

- The average time spent by alpha patrol units responding to all types of calls for service per shift *decreased* by 11 percent following the introduction of the 3-1-1 call system.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

- Our observational study of Baltimore patrol officers revealed that a large proportion of officer time was spent on self-initiated activities. Additionally, almost one-fifth (19.3%) of officer time in Baltimore was spent responding to 9-1-1 calls and an additional 3.2 percent of their time was consumed with responding to 3-1-1 calls. This is a low estimate of time spent handling 3-1-1 calls, possibly because officers (and thus our observers) were often unsure whether the call they were dispatched to originated from the 9-1-1 or 3-1-1 system.

- Our observational data showed that patrol officers responded to about 3 calls per shift, they spent nearly two hours per shift responding to dispatched calls and they had, perhaps, up to four blocks of time per shift, each of about one hour in duration, available for self-directed activity.

- The Baltimore CAD data reveals marginal increases in the number and duration of patrol unit "down time" following the introduction of the 3-1-1 call system. When these "gains" in down time are weighted to the daily average of alpha patrol units responding to calls, we show that there was only marginal gains in the number of down time blocks of time from before to after implementation of the 3-1-1 call system. Before 3-1-1 implementation alpha patrol units had an average of 2.62 "blocks" of down time lasting for about 109 minutes each. After 3-1-1 intervention, these alpha units had an average of 2.70 "blocks" of downtime lasting for about 112 minutes each.

- Consistent with these CAD data results, almost two-thirds of the officers responding to our survey did not perceive a change in the amount of discretionary time available during an average shift.

- In Baltimore, the routine dispatching of 3-1-1 calls compromised any "free" time gained from the reduction in 9-1-1 calls and the cessation of dispatching priority five calls. As such, we conclude that the 3-1-1 system in Baltimore was *under-utilized* as a technological tool to facilitate community policing.

- The 3-1-1 system in Baltimore receives about 4,500 calls per week that are not recorded into the CAD system. These calls include information requests and referrals to other government departments. The reception of such large numbers of non-recorded 3-1-1 calls represents an additional burden on the police to receive, redirect, and handle a much wider variety of citizen issues than they had centrally handled in the past.

- Our survey of Baltimore citizens who had called either 3-1-1 or 9-1-1 revealed an overall favorable view of 3-1-1 services. Citizens generally agreed that 3-1-1 improved city services, improved police-community relations, should be used for non-emergency calls only, and had lead to fewer non-emergency calls to 9-1-1. A significantly greater number of 3-1-1 respondents, as compared to 9-1-1 respondents, felt that 3-1-1 improved police-community relations and should be used for non-emergency calls only. Respondents were also generally pleased with services provided by 9-1-1 and 3-1-1 call-takers. Over 90 percent of

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

respondents felt that call-takers were both polite and helpful and they were overall satisfied with the service provided.

- Our analysis of the Dallas call handling system shows that the 3-1-1 non-emergency call system in Dallas had very little impact on Dallas police officers. Indeed, our results show that implementation of the 3-1-1 call center did not change, in any fundamental way, the manner in which police-related calls for service were dispatched to the police.

- The primary reason for the status-quo effect in Dallas following the introduction of the 3-1-1 system was that policies and procedures governing the call-handling and dispatching of police matters remained unchanged with the amalgamation of the various city department call centers into the 3-1-1 call center.

- Overall, we conclude that a "split-force" approach to handling non-emergency calls could be trialed in conjunction with the implementation of a 3-1-1 non-emergency call taking system. We recommend utilizing 3-1-1 systems to implement dual 9-1-1/3-1-1 call handling systems. Calls made to the 9-1-1 system should be treated differently to calls placed to the 3-1-1 system. Only the most obvious emergencies that are placed to the 3-1-1 call system should be dispatched. We suggest that 3-1-1 calls be diverted to patrol units that do not receive dispatched calls and are thus free to handle 3-1-1 calls using a problem-oriented policing approach.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

TABLE OF CONTENTS

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

LIST OF TABLES

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

LIST OF FIGURES

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

LIST OF APPENDICES

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

1 CHAPTER ONE: INTRODUCTION

1.1 Historical Context

"Calling the cops" using the emergency 9-1-1 number is what Bayley (1998) describes as the cornerstone of policing a democratic society (see also Sparrow, Moore and Kennedy 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 public as a method for getting police, fire, and medical personnel to emergencies fast, thereby improving services to people in need of help.[2] By the early 1980s it became clear that 9-1-1 could not reduce crime or increase arrests and the efficacy of 9-1-1 was called into question. 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 there are two human elements that impede 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 the offenders have contacts with victims, victims typically take several minutes to decide to call the police once the offender leaves. These minutes, during which offenders try to escape, are far more important than the seconds saved by having 9-1-1 available (Spelman and Brown 1981). In short, 9-1-1 is useful in too few cases for it to have a substantial impact on public safety from crime.

By the late 1970's police officials has 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 reports funded by the Law Enforcement 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) analysts reported on the problems posed by the increasing numbers of calls per officer coming in over police phone lines (Gay, Shack and Schell 1977). These analysts proposed a variety of management strategies for coping with

[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 percent of the 1.7 million calls for service are directed to the police. Police also respond to a significant number of medical and fire emergencies and frequently are the first public officials to arrive.

[2] It is beyond the scope of this report to examine its impact on fire and medical services.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

these problems including patrol shift scheduling by call volume rather than equal staffing around the clock. The idea was to reallocate existing resources in order to more effectively manage officer workloads.

In 1977, the LEAA funded the Police Executive Research Forum (PERF) to examine alternative ways of handling calls. The resulting PERF report described how non-emergency calls could be shifted away from requiring an immediate patrol response. The alternatives PERF considered were delaying responses 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 pro-actively suppress crime (Tien, Simon and Larson 1978). The second experiment looked at the impact of various call management strategies designed to free up officer time for working on crime problems (Cahn and Tien 1981). Another set of field trials of alternative call handing was conducted in Garden Grove (CA) and Toledo (OH) (McEwen, Connors and Cohen 1986). Collectively, these studies established that the public was accepting of delays in responding to calls and phone reporting of non-emergencies, 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. 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 identified with the proliferation of 9-1-1.

Beginning in the mid-1980s, as policing increasingly undertook 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

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

work. As community and problem-oriented policing requires 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 books published in the early 1990s made this point: The New Blue Line (Skolnick and Bayley 1986) and Beyond 9-1-1 (Moore, Sparrow and Kennedy 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, non-emergency calls to the police had been a major problem for local police for over 20 years. Police had attempted three strategies to addressing 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 that came into 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, far more common in Canada than in the United States, was to wean the public from using the telephone to report non-emergency concerns. In Edmonton (Alberta), for example, a major public information campaign was launched to have citizens report minor thefts, non-injury accidents, and other problems directly to local police substations established throughout the city (Hawkins 1996). Taking them in reverse order, these 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.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

1.2 The Development of a 3-1-1 Call System

On July 23, 1996 in Sacramento President Clinton called for a national *community policing* number to help alleviate the abundance of non-emergency calls flooding the 9-1-1 emergency system. 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 emergency 9-1-1 systems. San Jose, California, for example, implemented a 3-1-1 system[3] and a consortium of agencies in Southern California were studying implementation problems and alternative systems for reducing calls to 9-1-1.[4] Mayor Daley in Chicago established a 3-1-1 number system to access all city agencies in the fall of 1998.[5] The Seattle Times reported that King County was studying the addition of 3-1-1 to help siphon off a 43 percent increase in calls to 9-1-1 since 1991.[6] Similar efforts were also underway in Anchorage (Alaska), South Bend (Indiana), and Birmingham (Alabama).[7] The National Institute of Justice identified four study cities that represented a cross-section of jurisdictions leading the charge to find alternative effective and efficient ways for dealing with non-emergency requests for police service (Baltimore, Maryland; Buffalo, New York; Dallas, Texas; and Phoenix, Arizona). These cities comprised the study sites for our evaluation project. Table 1.1 below depicts selected characteristics of the four study sites.

---

[3] San Jose Police Department, 1997 http://www.sjpd.org/3-1-1.html 7.html; Pacific Bell Inc, 1997 http://biz.yahoo.com/bw/971114/pacific_bell_3-1-1_san_1.html.

[4] 9-1-1 Dispatch Services Inc. 1997; http://www.dispatch.com/web_story/stories_97/story-32-may97.html.

[5] City of Chicago, 1998, http://www.ci.chi.il.us/CommunityPolicing/WhatsNew/3-1-1Non Emergency.html.

[6] The Seattle Times, April 27, 1997; http://www.seattletimes.com/extra/browse/html97/ altcopsed_042797.html.

[7] These and other cities throughout the United States are examining the feasibility of the 3-1-1 alternative. In some instances pressure to reform the 9-1-1 system emanates from outside the law enforcement system. Richard D'oro, Anchorage Daily News, 1997; http://www.adn.com/ topstory/ t9712022.htm; Deanna Csomo Miccool, South Bend Tribune, 1998; http://www.sbtinfo.com /011298/local_ar/29134.htm; Karin Meadows, The Birmingham News, 1998; http://www.al.com/news/birmingham/1997-12-08/089-1-1.html.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 1.1 Characteristics of the Four Study Sites

	Baltimore	Buffalo	Dallas	Phoenix
Population (1996)[1]	716,446	313,238	1,060,585	1,139,793
Jurisdiction of PD (square miles)	86[2]		330.2[3]	469.4[4]
Number of full-time sworn officers (1996)	2,933[1]	940[5]	2,864[1]	2,433[1]
PD Total Calls	1,388,271 (1998)[6]	655,844 (1998)[7]	1,088,005 (1997)[8]	2,063,588 (1997)[4]
PD Non-emergency number calls	505,605 (1998)[9]	65,079 (1998)[10]	1,023,689 (1997)[8]	1,041,837 (1997)[11]
PD 9-1-1 calls	882,666 (1998)[6]	409,535 (1998)[12]	-	1,021,751 (1997)[4]
Total 9-1-1 requests for police	739,841 (1998)[6]	-	-	-
PD Dispatched Calls	833,118 (1998)[6]	-	657,234 (1997)[13]	719,669 (1997)[4]

[1] 1997. Sourcebook of Criminal Justice Statistics.
[2] Baltimore City Police Department. 1998. (http://cw.ci.baltimore.md.us/government/police/history.html)
[3] Dallas Police Department. 1997. (http://www.ci.dallas.tx.us/dpd/dpdinfo.html).
[4] Phoenix Police Department. 1997. 1997 Annual Summary.
[5] Buffalo Police Department. 1999.
[6] Baltimore Police Department. 1998 (Jan-Nov). 9-1-1/3-1-1 Systems Administrator (Sergeant Nelson A. Hermann).
[7] Includes: 9-1-1; non-emergency; administrative; and abandoned calls.
[8] Dallas Police Department. FY 1996-1997. "Call Volume Comparisons."
[9] Includes: Direct dialed 3-1-1 calls from citizens; calls transferred from 9-1-1 to 3-1-1 for handling; calls from police Centrex lines to 3-1-1; '685-Drug' calls; and '685-Guns' calls.
[10] Buffalo 853-2222.
[11] Phoenix 262-6151(Crime Stop).
[12] 9-1-1 Communications Coordinator (Paul J. Gajewski) "1998 Statistics - Erie County CPS/9-1-1Buffalo."
[13] Dallas Police Department, Communications Division (Deputy Chief Doug Kowalski). 1999. "Dispatched Call Summary 1988-1998."

As Table 1.1 shows, the study sites vary by population, by the number of sworn officers and the number of calls for service that they handle each year. For example, Dallas has over 1 million people residing in the city limits compared to Buffalo with slightly more than 300,000 people. Baltimore, Dallas and Phoenix each have over two thousand sworn officers, whereas Buffalo has not quite one thousand. As such, these four cities offer a comparison of call taking practices across different types of jurisdictions.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

1.3 The University of Cincinnati Evaluation

The University of Cincinnati Evaluation Team sought to answer two broad research questions: what were the processes for implementing alternative methods for dealing with non-emergency citizen calls for police service? And what is the impact of implementing alternative methods for handling non-emergency citizen calls for police service on the quality and quantity of policing?

Our process evaluation drew from two primary data collection efforts: first, in-depth interviews with key stakeholders (e.g. police chiefs, city agency managers, AT&T representatives, local Bell Company representatives, communications commanding officers, call takers, dispatchers, local government politicians, and community leaders) involved in the implementation of the alternative calls for service systems in each of the four participating cities; and second, a review of newspaper articles and web sites that depicted the unfolding story of the implementation of the non-emergency number to handle citizen calls for service.

Our impact evaluation (assessment strategy) drew from six primary data collection efforts: first, telephone interviews with a carefully selected sample of 9-1-1 and 3-1-1 callers in Baltimore; second, a survey among a sample of patrol officers who routinely respond to both emergency and non-emergency call systems in Baltimore and in Dallas; third, systematic ride-alongs with patrol officers in Baltimore; fourth, on-site observations of call takers and dispatchers in each of the study sites; fifth, data tapes of calls for service records (both 3-1-1 and 9-1-1) from the study cities; and sixth, police department "policies and procedures" manuals to help us understand the classification systems and rules governing the way that calls for service should be handled (e.g. priority codes, decisions to cross-reference calls, decisions to dispatch or not) in each of the study sites.

1.4 What Follows

This final project report comprises ten chapters and a multitude of supporting documentation in chapter appendices. Chapter Two provides a detailed description of the 3-1-1 non-emergency call system technologies in each of the four study sites. We compare and contrast the technologies and describe some of the 9-1-1 and 3-1-1 data limitations in each site. Chapter Three combines depth interviews with stakeholders, open-ended interviews with sector managers, and a survey of patrol officers from Baltimore City to ascertain police perceptions of the 3-1-1 call system in Baltimore. In Chapter Four we analyze the Baltimore 9-1-1 and 3-1-1 calls for police service data. We examine pre and post test data and we use interrupted time series models to

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

assess the impact of 3-1-1 on the volume and nature of calls for service.[8] In Chapter Five we examine the flow of 3-1-1 calls to the Neighborhood Service Centers (NSC) in Baltimore. These NSCs comprise the foundation of the Baltimore approach to community policing approach. The centers house police representatives as well as other city service agency representatives and are, in theory, the focal point for solving problems identified through the 3-1-1 non-emergency call system. Chapter Six presents the results of a two-week intense observational study of Baltimore police use of time. The purpose of the observational study was to identify police officer activities during regular shifts paying particular attention to comparing officer handling of 3-1-1 and 9-1-1 dispatches as well as identifying discretionary time during patrol shifts under the study condition of a fully implemented 3-1-1 system. In Chapter Seven we wrap up our analysis of Baltimore's 3-1-1 system. We present the results of a survey among Baltimore citizens who called either 3-1-1 or 9-1-1. The survey sought to compare and contrast citizen perceptions of the two call systems and their respective satisfaction levels with the alternate ways for reporting problems to the police. Chapter Eight presents an assessment of the Dallas 3-1-1 call system. In this chapter, we describe stakeholder, police and citizen perceptions of the 3-1-1 non-emergency call system. As with the Baltimore site, we conducted depth interviews with stakeholders as well as a survey of officers in Dallas to ascertain their perceptions of the 3-1-1 system. In Chapter Nine we analyze the Dallas 9-1-1 and 3-1-1 calls for police service data, and examine trends in the CAD data. We use a pre and post test analysis to assess the impact of 3-1-1 on the volume and nature of calls for service. The final, concluding chapter compares and contrasts elements of non-emergency number systems and highlights the positive and negative aspects of non-emergency number systems more generally. We discuss the contrasts among the study sites and draw conclusions about non-emergency call systems in the final chapter.

[8] The Dallas, Buffalo and Phoenix site data were inappropriate for time series analysis. The Dallas data could not be analyzed as a time series because the CAD data fails to differentiate between the origin of calls and whether they were initially received as 9-1-1 or 3-1-1 calls. Similarly, the Buffalo call recording system does not differentiate whether the call originated from either the 3-1-1 and 9-1-1 system. The Phoenix site, by contrast, could in fact differentiate the call origin. But since the non-emergency call number pre-dated the emergency call system (by nearly twenty years), the interruption point was the reverse of all other sites: that is, introduction of the 9-1-1 system is the point of interruption. Throughout this report, our assessments of the Dallas, Phoenix and Buffalo sites are considerably less extensive than the Baltimore site for one main reason. During our interviews with stakeholders in each of the four sites, it was readily apparent that the non-emergency call system in Baltimore involved the police far more than the non-emergency call systems in the other sites. In Dallas, for example, the 3-1-1 system receives and directs non-emergency calls for many city agencies including animal control, parking, and garbage pick up. Our preliminary analysis of the 3-1-1 system impact on the police in Dallas revealed very little change in activities as a result of introducing the system. By contrast, the Baltimore site implemented a non-emergency call system that was intrinsically linked to their community policing efforts.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

2 CHAPTER TWO: NON-EMERGENCY CALL SYSTEM TECHNOLOGIES

2.1 Introduction

In this chapter we examine the technological components of the four sites involved in our assessment as well as the existing calls for service data available to evaluate the effectiveness of the introduction of the Non-Emergency Call Systems (NECS). To some extent, an assessment of the technology involved in the delivery of 9-1-1 and NECS is common across the four jurisdictions and will be described in a general section on technology. Despite these commonalities among the four sites there are also differences which impact our research questions. Therefore, following our introductory comments we will address these site specific differences and describe the impact they will have on our assessment.

2.2 General Technological Considerations

Police departments employ technologies to enhance their ability to provide uninterrupted emergency 9-1-1 services and non-emergency call system services to their citizens. These technologies are largely the product of the telecommunication industry supported by increasingly sophisticated computer technology which allows for rapid examination of databases to aid in the tracking, prioritizing, and processing of calls requesting emergency and non-emergency services. In this section we first address emergency services and then non-emergency services. We leave our discussion of the specific technologies in each site to later sections and concentrate here on a more general description of the call taking process.

In layman's terms a 9-1-1 call is initiated when the caller places a call to a designated public safety attendant who determines the type of emergency and the names and locations of persons needing assistance. The attendant then initiates action which results in the dispatching of the appropriate police, fire or medical assistance needed. In some ways, calling 9-1-1 is not unlike calling a family member or friend for assistance in an emergency except that such persons are not contracted to provide assistance. There are other important and meaningful differences in this analogy: family and friends may or may not be home, their phone numbers may or may not have changed, after connecting the caller may or may not be able to provide the answering party with pertinent information with regard to their name and location. In some instances the phone system may fail, and in other instances pertinent information may not be gathered to help the caller. Even after ascertaining the emergency, family and friends may lack knowledge of the appropriate agency and telephone numbers to notify them. In short, the analogy between friends and 9-1-1 emergency services breaks down as a result of numerous unanticipated uncertainties which combine to make calls unpredictable in terms of their outcome.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

To a significant extent, 9-1-1 emergency services attempts to eliminate these uncertainties. 9-1-1 call systems provide a redundant emergency service on dedicated lines through advance tandem switching designed to provide trained attendants with significant amounts of information about the calling party and location of the call. The systems also provide rapid response technology to dispatch and monitor the delivery of the appropriate assistance.

A 9-1-1 call from an End-User (EU) requesting emergency service initiates a process through which an emergency call is routed through secure Emergency Service (ES) trunks from an End Office (EO) to an Emergency Service Central Office (ESCO) where it enters a Selective Routing (SR) switch and is directed to a predetermined Public Safety Answering Point (PSAP) based on the Emergency Service Number (ESN) assigned by the Number Plan Area (NPA) and Number Plan Digit (NPD) of the End User's telephone number.[1] These designations and assignments are based on the Selective Routing Data Base (SRDB) and ensure that the End User's Automatic Number Identification (ANI) is forwarded to the Customer Premises Equipment (CPE) when the call arrives. Once the call arrives at the PSAP, the call is processed through an Automatic Call Distributor (ACD) while simultaneously being routed through the CPE's Automatic Location Identification (ALI) Multiplexer to the ALI data base where records are searched for the End User's name, telephone number, address/location and supplementary emergency services information. In some instances the Central Office Selective Routing Switch Tandem sends a signal to ALI and in other instances it is retrieved by the PSAP's own ALI Multiplexer. The ACD automatically distributes incoming calls to available PSAP attendants in the order the calls are received or queues calls until an attendant (call taker) is available. The 9-1-1 and NECS status of calls is also provided in PSAP's where the duties of call taker's are combined.

The call then rings at the predetermined PSAP and is answered by a call taker who simultaneously receives the ANI/ALI information of the Caller on the Call Taker's computer screen. This system is generally backed up by a CPE including a computer system which provides security, redundancy, command and control functions for the local provider.

While this system is capable of using predetermined information such as the EU's number, name and address (ANI/ALI), this information may or may not be the caller's name and address nor necessarily correspond with the location at which assistance is needed. Thus, the Call Taker immediately attempts to

[1] Actually the call first travels to a mini trunk or hard wire switch and routed to the End Office where it enters secure trunks in route to the Central Office maintaining the Selective Routing switch.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

ascertain the nature of the problem, the address at which assistance is needed, and the name of the caller. If the caller is the telephone subscriber and assistance is needed at the subscriber's address, the Call Taker can hit one console button and enter the ANI/ALI information. If not, the Call Taker will enter the address where assistance is requested and the caller's name as well as the exact nature of the emergency. Depending on whether the emergency requires Police, Fire or Medical service the Call Taker can process the call with single button transfer to the appropriate emergency service dispatcher. To ensure that the closest available unit is dispatched the call is processed by the Computer-Aided Dispatch system (CAD) switch to the appropriate dispatcher based on the Master Street Address Guide (MSAG) for PSAP, thus ensuring the appropriate dispatcher whether it be Police, Fire or EMS.

This process is ensured by processing calls through the CAD system which identifies the appropriate Emergency Service Zone (EMZ) and Emergency Service Number (ESN) in the Master Street Address Guide (MSAG). For example, in the case of a police dispatch the CAD system would identify the appropriate district Dispatcher given the caller's address or, more correctly, the address where assistance is being requested and the call would be transferred to the appropriate dispatcher. Prior to transferring the call the Call Taker gathers information from the caller which provides the basis for call prioritization and comments which will assist emergency efforts. These calls, along with the ANI/ALI information, are then forwarded to the appropriate dispatcher through the Computer Aided Dispatch (CAD) system.

Upon arrival at the dispatcher's workstation, each call has generated a wealth of information. This information allows the Dispatcher, with the aid of the CAD software, to process the call. The call priority is established by the Call Taker based on a predetermined set of rules and its priority in the system is flagged for the Dispatcher. The CAD system also identifies the closest available units, given the emergency address, that can be dispatched to the call and also provides the Dispatcher with the call taker's comments which may assist the responding agency's personnel in handling the call in the most appropriate manner. Additionally, the Dispatcher's recall screen provides information on the unit (car) history, the CAD history, as well as access to important criminal justice databases such as NCIC, MVA records[2] and other state and local criminal justice information. The unit status is also displayed so that the Dispatcher has instant access to available and committed units. Obviously, dispatchers are also equipped with a radio frequency component or system which allows them to communicate with the appropriate units on specified radio frequencies. Generally these

[2] National Crime Information Center (NCIC), Motor Vehicle Administration (MVA).

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

frequencies are assigned to each police district as well as a city wide frequency and special frequencies for specific units such as internal affairs, narcotics and special units. There are also special radio frequencies which cannot be accessed by radio for special undercover operations.

Despite the commonality in this general call taking picture, there are variations across our four study sites which will be discussed below. These variations result from different technologies used by Service Providers and the Public Safety Answering Point. In short, the set of networks, tandem switches, databases and Customer Premises Equipment (CPE), which constitute a 9-1-1 System, reflect different technological approaches and end products.

At first glance, such variation appears to beg standardization. However, these variations, carefully examined, reflect slightly different concerns, goals, and objectives between jurisdictions. Moreover, the breadth of available components offers a wealth of hardware and software variation. This environment will most likely encourage competition and innovation to address future problems and advancements in 9-1-1 systems. For example, the current lack of reliable ANI/ALI information for cellular phones is being addressed by a number of telecommunication companies in their efforts to provide better service.

In the following sections we describe the 9-1-1/NECS in each of the four study sites. While some redundancy is inevitable in our discussion of these sites, we attempt to identify and describe differences in each of the sites and to specifically identify how the 3-1-1 or NECS was incorporated into their Communication Centers.

2.3 Baltimore City, Maryland

The existing 9-1-1/3-1-1 system was implemented on October 1, 1996 by Baltimore City Police Department and AT&T. AT&T was replaced by Bell Atlantic as the service provider on December 17, 1998. This change resulted from cost considerations to the city, but left the system virtually unchanged.

Unlike most Public Service Answering Points (PSAPs) the Baltimore City system purchases a 511 pin space on Bell Atlantic's Nortel DMS 100™ switch which is maintained by the Bell Atlantic. This eliminates the need for an Automatic Call Distributor (ACD) switch in the Customer Premises Equipment (CPE). In effect, the system is *transparent* to call takers and receives information directly from Bell Atlantic who also maintains the equipment. Despite the absence of an ACD, Customer Premises Equipment (CPE) calls are automatically distributed to available Public Safety Answering Point (PSAP) attendants or call takers or a queued for the next available call taker.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

The number and assignment of available trunks to carry information on Emergency Message (EM) Circuits from different Emergency Service Zones (EMZ) is controlled by Bell Atlantic and the PSAP's 9-1-1 Administrator. Trunks are allocated based on *peg counts* that are determined by assessments of "busy hours" and "average busy hours." These data provide the Service Provider (SP) and the PSAP with counts to establish chokes in the 9-1-1 system so that all lines are not tied up with call takers responding to the same emergency. These counts are set in accordance with the designated grade of service which is defined as the probability that one call out of one hundred will be blocked during the average busy hour. This probability (P.01) is the minimum recommended grade of service for 9-1-1 trunk groups. The number of trunks available to a PSAP from a specific calling area, therefore, is constantly monitored and adjusted to provide sufficient access in *quiet* and *active* areas.

The number of lines designated as 9-1-1 or 3-1-1 coming from the DMS 100™ is controlled by software at the PSAP and can be adjusted directly by the 9-1-1/3-1-1 System Administrator at Baltimore Police Department's Communication Center. While, theoretically, there could be 511 lines available, staffing and equipment limitations renders this number less than optimal for the needs of the system. Currently there are sixteen 9-1-1 and nine 3-1-1 lines available to the system. The distribution of these 25 lines is adjustable by the 9-1-1 Administrator from a CPE computer. Baltimore City employs 9-1-1 and 3-1-1 call takers or attendants. All 9-1-1 call takers receive several weeks of training and are certified 9-1-1 call takers. These call takers handle only 9-1-1 calls and do not process non-emergency, 3-1-1 calls except to transfer them to 3-1-1 call takers. Conversely, 3-1-1 call takers are specially assigned sworn police officers who are not certified 9-1-1 call takers and do not answer 9-1-1 calls.[3]

Work Stations for 9-1-1 call takers are connected to the Tiburon Computer Aided Dispatch (CAD) system through *dumb* terminals which are not connected to the LAN system. Telephonic communication capabilities are provided by Bell Atlantic and ANI/ALI information is transmitted to a terminal display when

[3] Emergency calls incorrectly made to 3-1-1 can be processed by 3-1-1 operators in a single button transfer to a designated dispatcher based on the address given the Call Taker by the calling party. This direct dispatch in emergency situations obviously saves time by more quickly processing the call to dispatch, however, since the number did not enter the system as a 9-1-1 call, ANI/ALI and other information available from the ALI database are not available to the dispatcher. Since there is no Calling Party Hold or Emergency Ring Back if the call is lost it is unavailable for re-ring. These limitations are presently under review by the Baltimore City Police Department in an effort to ascertain whether the advantages of ANI/ALI may surpass the advantages of anonymity of the caller.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

the call is answered.[4] The 9-1-1 call taker immediately ascertains the nature of the emergency by stating, "This is the 9-1-1 operator what is your emergency"? If the call is an emergency, the Call Taker can route the call to the appropriate agency through a single button transfer to Police, Fire, or EMS. If the caller requests fire or medical assistance the Call Taker will stay on the line until voice contact is made with the appropriate Fire/EMS dispatcher. The Call Taker will then acknowledge the connection and terminate participation unless the potential for a dual response exists. If the call appears to require a dual police response the call taker will stay on the line and open a CAD record which will be forwarded to the appropriate police district's dispatcher. In these instances, the caller's ANI/ALI will be routed to both dispatchers, although the 9-1-1 call taker's comments will only be routed to the Police Dispatcher since the caller has talked directly with Fire/EMS dispatchers. Emergencies requiring police dispatches will also be prioritized by the Call Taker prior to its being sent to the district Dispatcher in accordance with the existing operating procedures.

Each workstation is equipped with a Telecommunication Device for the Deaf (TDD) and Teletypwriter (TYY) to provide easy access to hearing impaired individuals. The system is also equipped with an instant playback recorded and a tape backup recorder. The system comprises a backup power supply in case of a major disruption.

Workstations for 3-1-1 call takers are also presently connected to the Tiburon Computer Aided Dispatch (CAD) system through *dumb* terminals connected to the mainframe CAD system. Additionally, 3-1-1 call takers also have access to a LAN network with a Hewlett Packard Server with a Lotus Notes Platform. Although this system remains only partially set-up -- the LAN and CAD computers cannot presently transfer information -- yet in its final stage of implementation the system will be integrated, eliminating the current need for dual entry of data (see below).

A 3-1-1 call enters the system as a non-emergency call and thus is not afforded the security and redundancy that a 9-1-1 call receives. 3-1-1 calls are not assigned ANI/ALI and arrive blind or without a caller ID number. Caller ID would obviously not be available for calls placed through an operator or from a public phone. The lack of ANI/ALI information is especially troublesome for those emergency calls that mistakenly enter the 3-1-1 system, since this system does not have Calling Party Hold which allows 9-1-1 operators to hold

[4] Calls placed through the operator or from a pay phone will not have ANI/ALI information since there is no emergency service number.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

open a 9-1-1 call even if the party hangs up nor affords call back or re-ring capabilities. This decision is presently under review to ascertain the benefits of anonymity versus these potentially life saving capabilities.

Upon answering a 3-1-1 call the Call Taker identifies themselves as a non-emergency operator and asks how they can be of service. Depending on the caller's problem a number of options are designated to resolve the call. First, in a case where the caller is reporting a life threatening emergency or a crime in progress, the 3-1-1 call takers (like their 9-1-1 counterparts) will send the call to dispatch. In the case of 3-1-1, however, the Call Taker will immediately attempt 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 Public Service Agency and Dispatcher. Once this information is entered into the CAD system it receives a CAD number and the CAD information is transferred directly to the Dispatcher. CAD automatically validates the address and the Call Taker is able to identify the correct Dispatcher by reference to the CAD database.

Second, if the calling party desires to fill out a police report for a crime that does not require dispatch, the Call Taker can complete the report over the phone through the CAD system. In effect the report is given a CAD number and the information becomes a permanent record in CAD. The report is also available through the CAD system to the District in which the offense occurred. This information is also presently entered into the Lotus Notes LAN database by the call taker or a back log entry operator. In any event, a record, with accountability, is provided to the district and sector in which the crime occurred.

Third, if the calling party reports a more general neighborhood problem which enhances the probability of unlawful or criminal behavior, a description of the problem is entered into the Lotus Notes database and e-mailed or faxed to the neighborhood service center's district sergeant. Similar to the CAD records above, a paper trail of accountability is established between the district, the sector commander, the NSC and the citizen's report (see Chapter Five). In an effort to ensure that citizen complaints concerning other city services are documented and referred to the appropriate city agency, such requests are also forwarded by e-mail or faxed to the NSC's sergeant who refers it to the appropriate agency within the NSC.

Fourth, in calls requiring urgent but not emergency response, the Call Taker provides the caller with the number of the appropriate city agency or service. For example, if a fire hydrant were opened by children and required a response to stop the water flow and perhaps lock the hydrant, a process which was initiated by sending an e-mail or fax to a NSC may not be appropriate. The situation simply requires more urgent attention than the normal 3-1-1 notification process allows. In the case of an opened fire hydrant, the 3-1-1 call taker will

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

provide the caller with the appropriate number to call. Unfortunately the record of accountability appears to break down on this category of calls. That is, these calls are not recorded in CAD nor the Lotus Notes database and, therefore, neither the call nor its outcome is presently tracked by the system. Furthermore, lacking a record, the call cannot be reconstructed other than a transcription of all or part of the tape backup recording of the call: A strategy which would likely prove prohibitively expensive.[5] In essence these are calls entering the system which are not currently tracked (but see Chapter Five).

As noted above, dispatched calls are automatically sent directly to the appropriate district dispatcher based on the incident location's address by the CAD system. The call arrives on the Dispatcher's CAD terminal with ANI/ALI information and any comments written by the Call Taker. The CAD terminal displays a wealth of information to assist the Dispatcher. The CAD system displays on a terminal the unit status of existing units, presently available units, calls pending which have not been dispatched which are ranked by priority and time in the system. A call recall screen is available to review call assignments. Additionally, the Dispatcher can use a recall window to review the Call Taker's CAD entry and comments or examine external databases such as NCIC, MVA, and MILES.[6] The Dispatcher communicates with officers with a Motorola Centracom Series Two Radio Console.

The introduction of 3-1-1 should have a pronounced effect on the number of calls placed to 9-1-1, at least to the extent that citizen's are aware of the new number and can adequately differentiate between urgency and an emergency. Additionally, it should have a pronounced effect on the number of dispatches since differing policing strategies, other than dispatch, may more effectively and efficiently identify and remove the causes of reported offenses. Such consideration may even appear more plausible as the number of calls and dispatches continues to increase.

There are several problems in analyzing the existing data available in Baltimore. First, as noted above, there are substantial numbers of calls, an estimated forty-five to sixty percent, entering the 3-1-1 system which are not recorded. While this may not affect our analysis of call volume available independently from CCMIS records, it will effectively prohibit the identification of the requested service and/or City agency involved.

---

[5] Since such calls represent between an estimated 45 and 60 percent of all calls we requested from the BPD to make a one month effort to identify this percentage accurately and identify the costs of automating the recording of such calls. We report on these calls in Chapter Five.

[6] The National Crime Information Center (NCIC), Motor Vehicle Administration (MVA), and Maryland Integrated Law Enforcement System (MILES).

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Second, little if anything is known about what caller's do with the information provided by the 3-1-1 call taker. For example, the caller may take the advice to call another city agency or simply ignore the advice and abandon efforts to correct the problem. Even in instances where the caller follows the advice and calls another city agency, that agency may have no record of the call or what was done about it. In these instances we could track the 3-1-1 call into the system and identify the call taker's suggestion to the caller but could not identify what processes occurred after the completion of the call. We at least partially addressed this limitation of the non-emergency call taking data through a one month modification to the call taking procedures in Baltimore. Chapter Five describes and reports the findings from this one month data collection effort.

2.4 Buffalo, New York

The existing 9-1-1/NECS in Buffalo was implemented on October 1, 1996 in an effort to relieve 9-1-1 call volume by diverting non-emergency calls to an alternative ten digit number (716) 853-2222 which requires only seven digits within the calling area. The 9-1-1 system is managed by Erie County, where call takers answer 9-1-1 calls for the entire county. Calls from outside the Buffalo area, however, are forwarded, by the Call Taker, on one of thirty-six speed dial numbers to the appropriate jurisdiction where they are processed by the jurisdiction's call takers and dispatchers.

Despite being Erie County employees, the call takers in Buffalo are housed in the Buffalo Police Department Communications Center and can transfer emergency calls for Buffalo with a single button Call Relay to the appropriate response agency such as Police, Fire and Medical. As noted above, this is completed through speed dialing for the rest of Erie County and by call relay in Buffalo.

The Buffalo 9-1-1 system receives calls from End Offices via dedicated and secure 9-1-1 trunks at Bell Atlantic's Central Office where information is routed through a Nortel DMS 100™ switch and sent to the appropriate PSAP in Buffalo. Simultaneously the call is routed by tandem to the ALI database to collect information on the subscriber's phone, name, address/location of phone and supplementary emergency service information. The call, upon reaching the PSAP is processed through the ACD which makes it available to a call taker or fixes its position in the queue based on the time it was received. This queue, showing the time the calls have been waiting are visually displayed for call takers.

Trunk assignments are managed by *peg counts* which are based on calls during the average busy hour and other call volume statistics available to the service provider, Bell Atlantic. As in other sites these data are shared with the 9-1-1 Administrator who may also have caller complaints about 9-1-1 service. The trunks are

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

made available to areas based on these *peg counts* and complaints to ensure that available trunks exist to process 9-1-1 calls in *quiet* and *busy* areas. This process of choking, as noted above, ensures that adequate lines exist and the system does not become overburdened with many people reporting the same incident.

Once calls are answered the Call Taker establishes the nature of the emergency. If the emergency requires Fire or Medical response a single button call relay transfers the call to the appropriate agency. In cases involving Police or dual assistance involving the Police, the Call Taker enters the CAD system by a single button which begins a CAD record by assigning a CAD number. The Call Taker then verifies if the ANI/ALI information which has been transferred to the CAD system is the correct name and location where assistance is required. If so, the information is entered directly into the name and location fields; if not, the Call Taker enters the name of the calling party as well as the location of the incident. The CAD system verifies that the address entered is a valid address and prompts the Call Taker with address possibilities if it is not. The Call Taker also attempts to gather useful information which will be helpful in responding to the call in a comments section of the CAD report. Once this is accomplished the Call Taker transfers the call through Call Relay to the previously identified Dispatcher who will assume responsibility for dispatching available units to the location in order of priority and length of time the call is in the system.

Non-emergency calls to (716) 853-2222 (NECS) are received by the same Erie County call takers who process 9-1-1 calls. Calls entering the system are prioritized by the ACD and made available in the order in which they are received with the exception that 9-1-1 calls always receive priority over non-emergency number calls. Thus, if calls are backed up in the queue, 9-1-1 calls would receive priority over 853-222 or NECS calls by bumping the NECS call to a lower position in the queue. All calls (both 9-1-1 and NECS) involving police matters are routed to the police dispatch center. Fire and medical emergencies are similarly routed for dispatch to their respective dispatch centers. Callers reporting non-emergency matters that are deemed to be non-police matters (or fire or medical matters) are provided the appropriate city agency number to call. As with the Baltimore site, these calls are not recorded in the system. The routing of the calls to the CAD system in Buffalo fails to differentiate whether the call originated from 9-1-1 or the non-emergency call number. As such, detailed analysis of these data are not possible for our project purposes.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

2.5 Dallas, Texas

The 3-1-1 non-emergency call system in Dallas was finally implemented on December 17, 1997 after many months of preparation and test runs. The 9-1-1/3-1-1 call center in the city of Dallas is the most expansive in terms of the delivery of *seamless* governmental services. Despite this emphasis in Dallas, the 9-1-1 system, which operates under specified rules, is not unlike the existing 9-1-1 systems in other jurisdictions. We will first address these similarities and then turn to differences which marginally impact the delivery of 9-1-1 calls and examine how Dallas has dealt with these problems.

Dallas maintains one hundred dedicated 9-1-1 trunks and forty dedicated 3-1-1 trunks to handle call volume in the city. The normal shift, however, usually has approximately 30 call takers with approximately eighteen answering 9-1-1 calls and twelve answering 3-1-1 calls. To facilitate this process the Meridian 81D switch creates queues to process 9-1-1 or 3-1-1 calls and the calls enter and are monitored separately within the two queues. The system is organized to keep these calls processed separately with both 9-1-1 and 3-1-1 call takers logged-in on different numbers. Nonetheless, a call arriving on a 3-1-1 designated line can request emergency services and a 9-1-1 call can request non-emergency services since the decision of which number to dial is left to the caller. In these instances, the effort of the Call Taker is to process the call rather than transfer it to the other system.[7] The Supervisor is in a position to both resize the queue or physically transfer operators to either 9-1-1 or 3-1-1 positions to handle call volume.

Call to 9-1-1 are initiated, as in other sites, by a caller placing a call to 9-1-1. The call travels through a hard wire box or mini-trunk to an End Office (EO) which are distributed throughout the City. At the EO the call is identified as a 9-1-1 call and is routed to the Central Office on dedicated and secure trunks. Upon arrival at the Central Office the call enters the selective routing switch which identifies its ANI and ESN which allows the selective routing switch to identify the appropriate Public Safety Answering Point and the location of the ALI database. The call is then routed through the tandem to the ALI database lookup and to the PSAP. Upon arrival at the Dallas PSAP Communication Center the call enters the Meridian 81D switch and is processed through the Automatic Call Distributor (ACD) which identifies the call as being from dedicated 9-1-1 trunks

[7] Since both 9-1-1 and 3-1-1 call takers are crossed trained, they are both capable of handling either type of call. In fact, the given distribution in the queue can be adjusted by the 9-1-1 Coordinator to alter the number of available operators responsible for each queue. However, if the caller has dialed the wrong number in error, the operator is instructed to process the call rather than transfer it based on site studies demonstrating that this is the quickest method for handling calls. If the 9-1-1 call taker is processing a 3-1-1 call they can put the call on hold to handle pending 9-1-1 calls.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

and places it into the 9-1-1 queue in the order it is received. The Meridian Switch also identifies the call as 9-1-1 and makes available to the Call Taker the appropriate screens and databases to process the call once it is answered.

As noted above, during this process of routing the call to the PSAP, the Central Office selective routing switch has simultaneously extracted the ANI information from the call and determined the Emergency Service Number and has routed this information to the ALI database to look up the subscriber's name, location and other pertinent data which is transferred along with the call to the Meridian 81D switch for processing by the Call Taker. Thus once the phone is answered, the 9-1-1 Call Taker has access to the ANI/ALI information of the caller. The 9-1-1 Call Taker then ascertains the nature of the emergency and can route the call with single button transfer to Fire/EMS if these services are required. In instances where police services are required, the 9-1-1 Call Taker can open a CAD record through the VESTA workstations LAN connection to the Rapid Entry (RE) CAD system through the CAD server which has been logged during login at the beginning of the Call Taker's shift.[8] The Meridian 81D switch and the VESTA intelligent work station, having already registered the call as entering on a dedicated 9-1-1 trunk will present the call taker with the appropriate 9-1-1 emergency screen to facilitate data collection on the particular call. Once the Call Taker has ascertained the nature of the emergency as a police matter and confirmed the name, number and location of the caller, the Call Taker can transfer the information contained in the ANI/ALI information directly with one button or can correct the information to reflect the true caller and the location of the incident manually and transfer this information into the CAD system.

Calls to 3-1-1 also enter on dedicated 3-1-1 trunks from the Central Office selective routing switch. However, these calls are not routed through the tandem to the ALI database and arrive at the 3-1-1 call station without ANI/ALI information. The Call Taker, after identifying the nature of the problem can access the appropriate database directly from the VESTA intelligent workstation, thereby providing specific information to the appropriate city agency holding responsibility. To assist the 3-1-1 call takers in identifying specific problems by code the system provides scripts which aid in the identification of over 600 different codes. The intelligent work stations are also equipped with Speed Dial Keys which can place the call taker or caller in immediate contact with other city agencies.

---

[8] Because 9-1-1/3-1-1 call takers are cross-trained the login procedure actually provides access to all available databases: Code Enforcement (CE), Centrex, Water Department (CIABS) and Rapid Entry (RE) or the CAD database. We will address this capability further when describing the 3-1-1 role of 9-1-1 call takers.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

The VESTA intelligent workstations possess TDD and TYY equipment for the deaf and hearing impaired for both 9-1-1 and 3-1-1 call takers. The system also has an instant Call Recorder which holds approximately 30 minutes of call and a permanent voice recorded tape back up of all calls entering the system.

Both 9-1-1 and 3-1-1 calls can be immediately transferred to the appropriate dispatcher in instances where police, fire or medical assistance are needed. The process is slightly different for the two types of calls since 3-1-1 calls do not have ANI/ALI information, calling party hold, emergency ring back and other common features of Enhanced 9-1-1 Systems.[9] The obvious distinction between the two is the amount of information which must be directly entered by the call taker in cases where the incident location and calling party match the ANI/ALI information already received. In either case, a request for police services will be prioritized according to standard procedures after the caller information and nature of the incident has been established. The call will then be transferred by a single button entry into the CAD system which will automatically assign it to the appropriate dispatcher based on the location of the incident which is looked up in the CAD database. The call will then be routed through Call Relay.

Once in the CAD system the CAD software will identify the location of the incident and look up the appropriate dispatcher for the Call Relay to which the call should be routed based on the address or location brought over from ALI or entered by the call taker.

Once entered into the CAD system by the call taker, CAD software looks up the appropriate dispatcher, given the location of the incident, prior to Call Relay which transfers the call from the call taker to the dispatcher. The call is then transferred to the appropriate dispatcher with the type of incident, call priority, incident location information as well as the call taker's comments and the original ANI/ALI information.[10] Once this process is complete there is little, if any, communications necessary between the call taker and the dispatcher although the call taker, as noted above, maintains a voice record of the caller's comments should further clarification become necessary.

---

[9] E9-1-1 is an emergency telephone system which includes network switching, database, and CPE elements capable of providing Selective Routing, Selective Transfer, Fixed Transfer, ANI and ALI.

[10] In Dallas, but not Baltimore, the original ANI/ALI information resulting from the ANI/ALI lookup is maintained in a Supplemental file available on IBM tapes.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

2.6 Phoenix, Arizona

The existing E9-1-1 system was implemented on April 25, 1992 in Phoenix, Arizona. The system's Meridian Digital Switch currently provides 47 lines which are divided between 9-1-1 and NECS operators. Currently 30 of the 47 lines, (64 percent) are dedicated 9-1-1 lines and the remaining 17 lines (36 percent) are dedicated to the non-emergency number. The NECS number in Phoenix is a ten digit number 602 262-6151 which requires the caller to dial seven digits within the calling area. This non-emergency number was in place some twenty years before the system upgrade on April 25, 1992 and is well known by the local community.

The existing E9-1-1 system in Phoenix, Arizona was implemented on April 25, 1992. Currently, Nortel's 61_C Meridian switch provides 47 lines to available call takers. Sixty-four percent, or 30 of the 47 lines, are dedicated to the emergency 9-1-1 number, while the remaining 17 lines (36 percent) are designated as 262-6151 or NECS lines.

The system provides ANI/ALI information for the 9-1-1 calls but does not provide this information for the non-emergency number. Once entering the system 9-1-1 calls are switched to one of three dispatch systems by the call taker with a single button transfer: (1) Police, (2) Emergency Medical Service, or (3) the Fire Department. For example, if a caller reports a fire, the call-taker enters a single button transfer which connects the caller with the Fire Department. The caller remains on the line in order to determine whether police assistance will be required and the call is forwarded to the respective Computer Aided Dispatch (CAD) systems for agencies handling the call.

The software for the CAD system is currently provided by Public Safety Systems Incorporated (PSSI) in Lanham, Maryland. The Response CAD System provided by PSSI is a fully integrated computer-aided dispatch system designed to assist public safety agencies in responding to calls for service.[11] Currently once the call is transferred to the Dispatcher the existing PSSI software assists the dispatcher in processing prioritized calls. A citizen's call to 9-1-1 is initially routed through an emergency service trunk (EM) to the caller's US West Local Office or end office.[12] The call is then routed with its ANI to the US West Central Office selective

[11] Presently there are plans for a new computer system around 2001 which will up-grade the current system to a 880 megahertz system. At that time it is anticipated that PRC Inc. a subsidiary of Litton Industries will provide the CAD software for the new system.

[12] Message trunks capable of providing Automatic Number Identification (ANI) information, based on the Number Area Plan (NAP) and Number Plan Digit (NPD), to the US West Central Office's selective routing switch which *hands off* the call to the appropriate PSAP and the ALI database in Denver to look up the Automatic Location Identification.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

routing switch which determines the appropriate Public Service Answering Point (PSAP) by referencing a predetermined database linking ANI information with the appropriate PSAP at Phoenix South. The call is then routed to the PSAP while simultaneously being *handed off* to US West in Denver, Colorado to look up the caller's Automatic Location Information (ALI).[13]

The thirty 9-1-1 lines are processed from thirty central trunks while the remaining 17 NECS lines are processed as single subscriber lines. As calls enter the system they are evaluated in relation to time and space (phone prefix) to prevent call duplication for single events and choked from entering the system by the number of available trunks based on predetermined peg counts of the number of calls.

Additionally, the service provider, US West, continually monitors the flow of calls through trunks assigned to specific PSAPs through a process called peg counts. Calls are also monitored by customer complaints to the PSAP. The number of trunks available to PSAPs from a specific calling area, therefore, can be adjusted in accordance with their volume of calls and number of complaints. In this manner the number of available trunks can be adjusted for *quiet* and *active* areas.

Phoenix uses a Nortel Meridian Max software to provide call centers (PSAP) with a management information system. The Meridian Max provides call takers with audio and visual display of the information provided by the ANI/ALI system and the information received and recorded by the call taker. Given the availability of multiple queue assignments (MQA) the total number of 9-1-1 calls in the system can exceed the thirty available 9-1-1 lines. The system also provides real-time information about time, date, calls and queues for analysis by the Call Center's Manager.

This information, in automated form, is less retrievable than CAD data which is retained in automated file on the mainframe. Such information is only retained in automated form by the Call Centers for approximately three months and its availability from the service providers in automated form, such as US West, is uncertain.

Our time series analysis of the Phoenix non-emergency number system cannot include an interruption point. The NECS number in Phoenix was a pre-existing number prior to the implementation of 9-1-1 and

---

[13] Thus, upon receiving the citizen's call, the call taker at the appropriate PSAP identified in Tempe, simultaneously receives ALI information from Denver within 4 to 5 milliseconds . This ANI/ALI information is downloaded to the computer terminal and subsequently transferred to the CAD system. The process described can be viewed as depicted by Ameritech at: http://www.ameritech.com/products/9-1-1/works.html note, those reading the document in an application can double click the above hyperlink to view this page. Those reading this in hard copy would have to enter the URL to reach the web site.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

E9-1-1. Thus, a before/after assessment is not possible and an independent impact of the effect of NECS in Phoenix is limited to a relatively minor advertisement campaign on one radio station (KEZ) encouraging citizens to use the non-emergency number in situations which do not require an immediate response. Since the dates of this campaign were between April and October of 1997 there appears little rationale for attempting to ascertain the effect on the 9-1-1/NECS system.

2.7 Comparing the Four Non-Emergency Call Systems

One of the goals of our assessment of the four non-emergency call systems was to compare and contrast the four technologies and the characteristics that define each of the systems. In Table 2.1 below, we summarize the four call systems, paying specific attention to the technologies, the impetus to adopt the non-emergency call system, and the manner in which the non-emergency call systems were communicated to police personnel.

Table 2.1 summarizes the four non-emergency call systems. As this table shows, the primary impetus of the Baltimore and Buffalo systems was to reduce the burden on 9-1-1 systems. In Dallas, by contrast, the goal of the NECS was to better manage city services. All four sites have used the web, T.V., billboards and brochures to advertise the non-emergency number. Interestingly, however, we were unable to locate the non-emergency number in three out of the four city's telephone directories.

Table 2.1 Summary of Department Call Systems

	Baltimore	Buffalo	Dallas	Phoenix
Non-emergency number	3-1-1	853-2222	3-1-1	262-6151 (CRIMESTOP)
Date non-emergency call system (NECS) implemented	10/02/96 (Implementation of Local-area-network system, LAN, began 02/98)	10/01/96	12/17/97	9/09/85: 9-1-1 implemented (previous police number became non-emergency number) 4/25/92 existing E9-1-1 system
Telephone Company	Bell Atlantic	Bell Atlantic as of 12/17/98	Southwestern Bell Telephone	US West

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

	Baltimore	Buffalo	Dallas	Phoenix
System Housed	Police Department Communications Division	Police Department Headquarters	Fire Department Communications Division	Police Department Communications Bureau
System maintained		Erie County: 9-1-1 Buffalo PD: 853-2222 Bell Atlantic	Dallas Communication and Information Services Division	
Impetus to adopt a NECS	Divert non-emergency calls from the 9-1-1 center	Reduce calls to 9-1-1	Better management of city services & customer service Relieve stress on 9-1-1	N/A
Focus of the NECS	Non-emergency police assistance	Non-emergency police assistance	Provide easy access to city services	Non-emergency police assistance
Types of calls handled on non-emergency number	Police-related calls for information, Low priority calls for police, Electronic incident reports	General information, Low priority calls for police, Telephone reports, Illegal parking	General information, Info about city government & Requests for city services from 8 city departments	Police-related calls for information, Low priority calls for police, Telephone reports
Department/ City advertising of the non-emergency number	Extensive & ongoing. Police attend community meetings, explain how the number works;	Extensive (initially) BPD hired advertising agency (Schutte Group): created a jingle; brochures; bumper stickers; telephone stickers; magnets; TV/radio commercials; street banners	Minimal. No major campaigns. Inform community groups at meetings	Substantial & ongoing. PD & radio station KEZ promote CRIMESTOP number for non-emergencies jingle, brochures, billboards, cars Police visit schools; call-takers participate in city-planned events;

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

	Baltimore	Buffalo	Dallas	Phoenix
Other advertising of the non-emergency number	Public service multi-media campaign (TV, radio spots); AT&T put ads on buses, printed magnets; Website information	Niagara Frontier Transit Authority donated ad space on buses; private agencies donated billboard space	Minimal TV & newspaper coverage; brochures; Website information	Ongoing radio/TV spots; billboards
Non-emergency number in telephone directory		No	No	Yes
Slogan	"When there's urgency but no emergency"	"For real emergencies call 9-1-1 and we'll quickly send someone. For non-emergencies it's 853-2222 and we'll tell you what to do!"	"3-1-1 your call to City Hall"	"26-26-151"
Technology				
Number of 9-1-1 lines	511 lines available 16 (service terminals are interchangeable)	15 (dedicated trunk lines)	100 (dedicated trunk lines) Normal shift 18	30 (central trunk lines)
Number of non-emergency lines	9 (service terminals are interchangeable)	3 line Hunt Group	40 (dedicated trunk lines) Normal shift 12	17 (single subscriber lines)
ANI/ALI	9-1-1	9-1-1	9-1-1	9-1-1
Caller ID	NO	853-2222	3-1-1	CRIMESTOP
Present call distribution switch	Bell Atlantic's Nortel DMS 100™ Intelligent Call Processing switch	Nortel DMS 100™	Nortel option 81c Smart switch	Nortel 61c Meridian MI Digital Switch
Automatic call director	N/A (Bell Atlantic)	BCS (Bell Atlantic)	Northern Telecom Meridian 81 (CPE)	Northern Telecom Meridian (CPE)

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

	Baltimore	Buffalo	Dallas	Phoenix
Other	Local-area-network system (LAN) computers, with Hewlett Packard Server & Lotus Notes Platform (AT&T & SEMCOR Inc.)	MAARS View 2, (Plant Equipment)	Link terminal system VESTA Intelligent work stations Scripting for 600 service codes	Electronic telephones Positron E9-1-1 equipment
Cost Estimates				
9-1-1	Upgrades- telephone systems, hardware, software programs	$0	Upgrade- switch & workstations $4,000,000	$3,500,000
Non-emergency number	& public education $1,300,000 Estimated LAN computer implementation $405,558	Advertising $30,000	Scripting $500,000	N/A
Funding for implementation	3-1-1 COPS office grant $349,787 AT&T Government Markets	853-2222 Police Foundation $30,000 Assistance from Schutte advertising group	3-1-1 General Fund	9-1-1 US West. Money that was not refunded to overcharged customers (could not be located)
Ongoing funding of call system		9-1-1 Buffalo, Central Police Services money generated by surcharge on phone bill for county residents	3-1-1 User departments & general obligation funds	9-1-1 State money generated by excise tax paid through phone bill by residents of Arizona CRIMESTOP lines- City of Phoenix
Time & Cost to train Call Takers	3-1-1 officers- One day orientation 3 day training program 2 wks on the job training	3-4 wks classroom 3-4 wks field work 3-4 wks on the job training (self-paced mentoring mode)	3-1-1- 5 wks classroom, 60 hrs of on the job training 9-1-1 10 wks classroom, 60 hrs on the job training Estimated cost $60,000	5 wk class for basic info 2-4 months on the job 9-1-1 training 4-6 months on the job radio training

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

	Baltimore	Buffalo	Dallas	Phoenix
Effects on Personnel				
Non-emergency call response options	1. Provide information or referral; 2. take telephone report; 3. take information to forward to NSC; 4. send to dispatch	1. Provide information or referral; 2. Transfer to appropriate police department 3. Send to dispatch for car response 4. Send to dispatch for telephone reporting unit	1. Send to dispatch; 2. provide information (incl. service order status & updates, research complaints) or referral; 3. take service request; 4. transfer to city agency dispatcher; 5. transfer to expediter	1. Provide information or referral; 2. take telephone report; ? 3. refer to hotline number; 4. send to dispatch
Call Takers	9-1-1/3-1-1 cross trained 9-1-1-civilians 3-1-1-predominantly limited duty police officers	9-1-1/non-emergency cross trained civilians	9-1-1/3-1-1 cross trained civilians	9-1-1 /CRIMESTOP & radio (dispatch) cross trained civilians
Police informed about NECS	Roll call training (over 2 wk period)	Memo to all commands	Announced at detail (once?); Received a memo; Saw media coverage of implementation ceremony	N/A
Change in officer routine (officer self-reports)	None	None	Have to complete service request sheets	N/A
Change in type of calls responding to (officer self-reports)	Maybe slight	Maybe slight	None	N/A

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

	Baltimore	Buffalo	Dallas	Phoenix
Department Reported Data				
Average wait time for call pick up	9-1-1: 2 seconds 3-1-1: NA (Oct 96-Sept 98)		9-1-1: 5 seconds 3-1-1: 21 seconds (June 98)	9-1-1: 86% answered within 10 seconds (1997 Summary)
Callers receiving a recorded message	78% reduction (Since implementation)			
9-1-1 calls for police service	30.1% decrease (Since implementation)	Approx. 20% decrease (1997)	Est. 5% increase (October 98)	
Non-emergency calls to 9-1-1			Est. 7% decrease (October 98)	
Calls dispatched	7.5% decrease (Since implementation)	Average 30% of calls to 853-2222 are dispatched Constitutes approx 25% of all calls dispatched		43% of all calls are dispatched
Time 9-1-1 operators are busy on calls	18% decrease (Since implementation)			

One difference among the systems was the roles and functions of call takers. Clearly, the Dallas system appears to be the most flexible in allowing call takers to deal with either 3-1-1 or 9-1-1 calls and cross-training them to take calls for multiple agencies. By contrast, the Baltimore call takers are either dedicated to 3-1-1 or 9-1-1. One of the primary differences among the four systems examined is the manner in which the non-emergency call systems are utilized. In Baltimore, for example, the system is integrated with the police department's community policing policy. By contrast, the Dallas 3-1-1 system is designed to handle citizen requests and is not an integral part of the police department organizational or operational agenda.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

3 CHAPTER THREE: POLICE PERCEPTIONS OF BALTIMORE'S 3-1-1 CALL SYSTEM

3.1 Introduction

Baltimore's 3-1-1 call system has received extensive media coverage over the last several years. In October 1997, the New York Times tabulated the "successes" of Baltimore's 3-1-1 system and reported that the "3-1-1 experiment has been so successful that more than 100 other jurisdictions, including Chicago and Philadelphia, are eager to try it" (New York Times, "Baltimore Cites Success With Alternative to 9-1-1," Thursday October 2, 1997, page A7). One year later, the Maryland Sun newspaper reported that "Baltimore's two year experiment with a non-emergency number has reduced 9-1-1 police calls by more than one-third, easing a strained system...and free[ing] officers to help prevent crime" (Maryland Sun, "Nonemergency line reduces calls to 9-1-1," October 2, 1998, page 1B). In this section we describe the background to the introduction and trial of the 3-1-1 non-emergency system in Baltimore. We draw from depth interviews with district and sector managers as well as an analysis of officer perceptions of 3-1-1.

3.2 Background

If the problem of non-emergency calls inhibiting effective police work has been around for a long time and in many jurisdictions, why was Baltimore selected for implementation of the national-non-emergency police number in 1996? How was it that, out of several alternatives considered over the last score years, a three digit number was selected to address this problem? The twenty year history of the call problem created conditions that were suitable for some type of solution, but they did not point to any particular approach as being superior to any other. To answer these questions we need to consider the people who were instrumental in developing 3-1-1 as a potential solution.

The three people who were at the center of the development of 3-1-1 had been officials in police departments in the San Francisco Bay area of California. Thomas Frazier, former chief of the Baltimore Police Department and current Director of the Office of Community-Oriented Policing Services (COPS), had risen through the ranks of the San Jose Police Department. In one of his assignments he spearheaded this agency's development of a communications center. Consequently, he was intimately familiar with the technology of police communications, probably more familiar than most chiefs of police.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

The second decision-maker was Joseph Brahn, former Director of the Office of Community-Oriented Policing Services (COPS) in the United States Department of Justice. While Chief of Police in Hayward, California he lead this agency's implementation of community policing. In 1993 he was selected to become the first director of the COPS office.

The third person involved in the development 3-1-1 was John Cohen. Cohen had been a police officer with a small agency in the San Francisco Bay area where he engaged in community problem-solving before he moved to the Washington DC area to take a job with the Office of National Drug Control Policy (ONDCP) in February 1994. At ONDCP, Cohen met with sheriffs and chiefs of police to develop approaches to drug problems consistent with community policing. In this position he met Frazier and Brahn. Cohen left the ONDCP in May 1995 to take a position with AT&T's division that markets its services to local governments.

Of these three people, Frazier is the most critical. It was Baltimore Police Department that implemented 3-1-1. On becoming Chief of Police in Baltimore he began implementing community policing. As part of his activities, Frazier routinely rode with police officers throughout the city. He was dismayed to find that his officers were besieged with non-emergency calls for service. This was a major concern to him because he had been promoting the idea of community policing throughout the city, but the workload of his officers, "threatened to make a liar out of me."

To address this problem he asked Colonel Longo (now retired) to head-up the communications section. Longo was given the assignment to look into ways of reducing the 9-1-1 calls. He discovered that the overwhelming volume of calls being sent to officers were about incidents that were not emergencies, and many of them were about difficulties the police were not able to handle. After a major rainstorm, for example, hundreds of residents called 9-1-1 to report flooded basements. Police dispatchers routinely sent patrol officers to these calls. Longo recalls asking communications personnel what they expected the officers to do at the call. "I don't know," responded one operator. "I do not know either," Longo recalls responding.

As troublesome as this was for officers, these calls also clogged the 9-1-1 system so that true emergency requests had difficulty getting through. Several Baltimore police officials explained it this way. Emergencies are actually easy and quick to handle. The caller usually can rapidly communicate the problem and the address. Non-emergency calls, on the other hand, often take longer for callers to describe. If the resident has been dealing with the problem for some time, the caller may be obstreperous and difficult to handle, thus taking up more time.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Longo and Sergeant Hermann (now retired), a long term police supervisor in the communications division, took several approaches to the non-emergency call problem. The first was to reorganize communications personnel from several non-essential specialized functions to handling 9-1-1 calls. This provided more operators and dispatchers available to handle calls. They also changed staffing procedures so that personnel available to handle calls were proportional to the call load, rather than have equal staffing around the clock. And they hired more Police Communications Assistants to answer calls and dispatch officers. This made it easier for callers to get through to the police, but it did not help reduce officers call loads.

To address this issue Longo realized he would have to address the 9-1-1 problem. In his words, "9-1-1 was sold well" and the citizens of Baltimore had grown used to police officers coming when they called. He decided an alternative to 9-1-1 was needed to handle the non-emergency requests. Of particular concern to Longo and Frazier was the fact that many residents of Baltimore had limited phone service so calls from pay phones were quite frequent. Any alternative phone number, therefore, needed to be free so that all citizens could have equal access. The most obvious answer was an 800 number, and in Fall 1995 Longo asked the local telephone provider (Bell Atlantic) to provide some preliminary cost estimates.

At about this time AT&T employees, including John Cohen, approached the Baltimore Police with a plan to test an 800 number for free. The number proposed was 1-800-379-COPS.

Frazier, Longo, and Hermann were having second thoughts about the feasibility of an 800 number. Would citizens be able to remember it? Maryland telephone customers had just been required to dial the area code for local calls, and concern was being raised about the difficulty citizens were having remembering all of these numbers. Would it be possible to use a three-digit number? Cohen looked into this and discovered that a three digit number could be used by programming switching computers to recognize it as an existing 800 number. The computer could remember the eleven digits, and citizens would only need to recall three digits. The hidden 800 number would route the calls to computers located in Colorado, check for address locations, and then shunt them back to police operators in Baltimore. Throughout February and March, 1996 the police department and AT&T negotiated the details of the agreement, including the ability to have operators log in as either 3-1-1 or 9-1-1 operators, and the ability of the Baltimore Police to renegotiate the contract once the test period was over, in two years.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Two problems had to be overcome; one national and the other local. The national problem was the three digit numbers ending in 11 (known as n11 numbers) are controlled by the FCC and local public service commissions. Local phone companies were likely to object to isolated police agencies requesting these numbers because the few n11 numbers available had high potential market values.

To gain access to 3-1-1, the FCC and the Maryland Public Service Commission needed to give authorization. The United States Justice Department engaged in discussions with the FCC to reserve 3-1-1 as a national non-emergency number, thereby precluding its use by other private and public entities. The Baltimore Police Department went to the Maryland Public Service commission for state authorization.

To Chief Frazier, diverting calls from 9-1-1 was only a part of the solution. Something had to be done with the calls that came into 3-1-1. The mayor of Baltimore was interesting in streamlining the delivery of city services to the local residents and had established offices throughout the city. Frazier pointed out that each city agency had different service boundaries within the city, making it extremely difficult for citizens to know who to call when they had problems. He suggested that all of the boundaries be made coterminous with police district lines and that Neighborhood Service Centers (NSCs) be established within each district (see Chapter Four). Representatives from the largest city agencies, including a police sergeant, would have offices in these centers. Linking the NSCs to 3-1-1 would provide a mechanism for handling many of the calls that were not dispatched to patrol officers.

In Spring, 1996 U.S. News and World Report had a lengthy cover article on the problems with 9-1-1 overuse. Cohen provided much of the information that went into the article. AT&T made sure that copies of the article were distributed to the annual Major City Chief's conference in Sun Valley, Idaho where Frazier discussed the problems of 9-1-1 and the possibility of 3-1-1 with his colleagues.

In June, 1996 President Clinton announced the establishment of 3-1-1 as the national non-emergency number. By July, the FCC had formalized its approval of the 3-1-1 for the sole purpose being this number. On October 2, at 8 a.m. the 3-1-1 system became operational in Baltimore. Police officials report that by the time of the 10 a.m. ceremony inaugurating its implementation, 125 calls had come into 3-1-1. By the end of the day, police records show that 9-1-1 calls had dropped by a third. These records showed that during the first year the chances of a caller getting a recorded message on 9-1-1 had dropped by 60 percent.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Baltimore requested funding from the COPS office to link the new 3-1-1 system to the neighborhood service centers through a local area network. Establishing the NSCs took longer than setting up 3-1-1. The last one was established in late 1998.

In summary, the answers to the questions posed at the beginning of this section are as follows. Baltimore was selected because three people with shared backgrounds happened to meet each other. All three were from the same part of the country. All three had strong and sustained interest in community policing. And all three were in the Washington DC area. Further, each of these people were in positions to make different things happen. Thomas Frazier had a police department with a major problem and he and his staff had the interest in implementing a phone based system. John Cohen was employed by a large phone company with the technology needed and the interest in establishing a new product for local government. Joseph Brahn was head of an important Federal government agency that could fund parts of the new system as well as mobilize support for 3-1-1 within the Justice Department, the FCC, and the White House.

The selection of 3-1-1 to address the glut of non-emergency calls came from an exploration of alternatives. The Baltimore Police Department implemented a number of changes in the communications division that improved the efficiency of this police operation. However, the search of a more comprehensive solution apparently was restricted to alternative ways for the public to call the police. The major choice was which free number to use, an 11 digit 800 number, or a three digit number.

3.3 Sector Manager Perceptions of the Baltimore Non-Emergency Call System

The Baltimore Police Department is operationally organized to facilitate community policing. There are nine policing districts covering 29 sectors. Each of the sectors are managed by a Lieutenant who is called "The Sector Manager," or "The Gold Badge." Each Sector Manager is responsible for crime and problems by reviewing 9-1-1 calls, 3-1-1 calls and any other "data" they deem necessary in their efforts to control problems in their Sectors. They supervise morning, afternoon and evening shifts of patrol teams (sergeants and patrol officers) and they direct the discretionary time of their patrol staff. For example, if the Sector Manager deems a particular place as having an inordinate number of 3-1-1 calls or 9-1-1 calls, or if the Neighborhood Service Center Sergeant calls the Sector Manager about a particular problem, the Sector Manager will direct his/her patrol staff to those specific problem places. The Sector Managers are ultimately responsible for problems in their sector 24 hours per day, setting up a system of accountability for reducing problems in their geographic

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

patrol area. Sector Managers from other sectors (but the same district) cover for each other when not on duty. But the "stand-in" Sector Manager carries out the desires of the host Sector Manager.

The Sector Managers are a key link in understanding the interface of the 3-1-1 system with community policing at the street level. We sought to interview all Sector Managers (N = 29) during our study period (see Appendix 3-A for our interview instrument). We asked the Sector Managers 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 intend to assign their personnel in the forthcoming week. We selectively explored three Sector Manager directives for patrol activity (CAD data, patrol officer rides, and patrol logs) to assess the congruence between Sector Manager directives regarding discretionary time and how patrol officers respond.

3.3.1 Sector Management

Over the past couple of years the Baltimore Police Department has moved toward a different district management approach called *sector management*. The implementation process began in 1996 on a trial basis in two of the city's nine districts. By February, 1999 it was formally implemented throughout all of the city's police districts.

Under sector management each of the Police Department's nine districts are divided into sectors (all districts have either 3 or 4 sectors) which are determined by both geographical boundaries and activity level (calls for service). The sector manager (at rank of Lieutenant) is held accountable for crime and policing within their sector 24 hours a day, seven days a week (in contrast to the traditional shift lieutenant position which required the lieutenant to be responsible for policing in the entire district, but only during a designated shift). The presumption is that the sector managers can then concentrate their efforts on developing crime control/prevention and policing strategies that are most applicable to their designated area, and that both lieutenants' and officers' responsibility for ongoing problems will increase.

3.3.2 Sector Managers and 3-1-1

One of the questions that our non-emergency call system assessment sought to answer was: How does the non-emergency call system interface with community policing and problem oriented policing at the street level? Specifically, we wanted to know if 3-1-1 had an impact on the amount of officer discretionary time (time not responding to 9-1-1 calls) that might be used for community policing and/or problem oriented policing, by

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

reducing the quantity of calls or changing the nature of calls that patrol officers had to respond to. Given our lack of information on police discretionary time before the implementation of 3-1-1 (but see Chapter Four), we sought to inquire as to whether there was a perceived effect of 3-1-1 on the amount of officer discretionary time.

One of the goals of sector management is to increase police responsibility for ongoing problems. We were interested in the effects 3-1-1 may have had on problem oriented policing (e.g. more discretionary time to engage in problem oriented policing) and whether this discretionary time was a function of the sector management structure of the Baltimore Police Department. To disentangle the effects of 3-1-1 and sector management, members of the UC research team conducted face-to-face interviews with all of the sector managers in each district (N = 29) during a two-week field observation period in Baltimore.

Using the data obtained from our interviews, this section explores the role of the sector manager, the perceived effect that 3-1-1 has had on sector managers, sector managers' perceptions of the effect of 3-1-1 on their patrol officers, the perceived effect of 3-1-1 on community and problem oriented policing, and perceptions regarding the effectiveness of the 3-1-1 call system.

3.3.3 Role of the Sector Manager

The sector managers we interviewed all agreed that much of their responsibility was to systematically identify on-going problems in their sector and address them. Most reported examining the daily crime reports and crime maps to identify patterns and trends each day, or at the very least weekly. Information from sector sergeants, other units (e.g. detective division, narcotics), citizens and informants, as well as call and arrest reports were also mentioned, though none of the sector managers reported using information from the neighborhood service center sergeant to identify persistent problems.

Once identified, sector managers devise an "initiative" (strategy) to target a specific problem. Depending on the nature of the problem a combination of high visibility or undercover surveillance and enforcement tactics may be employed. Sector managers leave the assignment of specific officers for an initiative to their sector supervisors (sergeants), who rarely use patrol/post officers, drawing resources from specialized units (flex, outreach, hotspots, neighborhood services) instead. Very few sector managers involve the neighborhood service center sergeant in their initiatives.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

3.3.4 Sector Manager Perceptions of the Effect of 3-1-1

There was consensus among the lieutenants that 3-1-1 has not had an impact on their job as supervisors and administrators. They reported to us that they supervise and manage officers and resources in much the same way as before the non-emergency call system was implemented. However, a few sector managers commented that they perceived 3-1-1 to have increased the amount of patrol officer discretionary time. These sector managers felt they had more officer discretionary time to manage.

When asked directly if 3-1-1 has changed the way problems are handled, the majority of lieutenants responded that it has not. The few lieutenants that did see changes in the way problems are handled made reference to the neighborhood service centers and the neighborhood service center sergeants. They noted that the problems that the neighborhood service sergeant addressed were problems that before 3-1-1, would have been dispatched to a unit as a citizen call for service of low priority. For these calls (at best) a patrol car would drive past the incident location within a couple of hours. More likely, the call would still be on the dispatch screen at the end of the shift. One lieutenant commented that before 3-1-1 "[there was] a lack of accountability for low priority calls - officers would forget about class 5 calls. 3-1-1 and the NSCs have been a good compromise for those class 5 calls." Another sector manager stated that the "NSCs actually give persistent calls attention. For calls regarding minor problems, e.g. trash in yard, [now the] person is cited."

In effect, it appears that the sector managers differentiated between types of problems when responding to our question. There are the problems that they are responsible for in their sector, "crime problems" (e.g. house burglaries, motor vehicle theft, gang crimes) which are identified using crime statistics and maps, 3-1-1 has not changed the way these problems are handled. Then there are the "neighborhood problems" (parking complaints, juveniles causing a disturbance), problems that before the implementation of 3-1-1 were not tracked, and were by necessity a low priority for police. When sector managers responded that they felt 3-1-1 had had an effect on the way problems were handled, they referred to the latter type of problems.

3.3.5 Sector Manager Perceptions of the Effect of 3-1-1 on Police Officers

The majority of sector managers believed that 3-1-1 has decreased the quantity of calls that their patrol officers respond to. A few sector managers commented that they noticed a reduction in "air traffic" when monitoring their radios. There was an increase in the dead air time over the radio compared to the constant voice dispatching to units before the implementation of 3-1-1. One lieutenant commented that his patrol officers' response time to calls had improved (that is, they perceived that response time had decreased since the

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

inception of 3-1-1). Other sector managers responded that they believed there was a decrease in the number of calls being dispatched, but their districts still received so many calls that only the officers who had been working the district for a long time before the implementation of 3-1-1 would notice the reduction.

Virtually all sector managers believed that 3-1-1 has influenced the nature of the calls that are being dispatched to units. They noted that their officers were responding to less "junk" or "low priority" calls such as "bats in houses, water in the basement, double parked cars," and that 3-1-1 had "relieved a lot of report [taking] calls." Although they acknowledged a reduction, many lieutenants argued that officers were still getting "too many" of these types of calls.

The lieutenants were split over whether they perceived 3-1-1 to have had an effect on how their patrol officers spend their shifts. Many sector managers responded that although the quantity of calls being dispatched had decreased, their officers were still very busy with calls, very 9-1-1 driven, and that the daily routine hadn't changed. Other sector managers responded that 3-1-1 had created more discretionary time for officers with the reduction in calls being dispatched, "[t]hey have time to do more than just chase calls." Less calls meant that officers spent less time writing reports, thus where officers spent their time may have changed (e.g. officers often wrote their reports in the car, less reports- less time in the car). A decrease in the number of report-taking calls being dispatched meant officers were spending more time on other types of calls, and as one sector manager stated, more time on "crime related stuff, [t]hey know the areas that need to be worked on."

3.3.6 Sector Manager Perceptions of the Effect of 3-1-1 on Community Policing and Problem Solving

More than half of the sector managers perceived 3-1-1 to have had a positive effect on community policing. Many believe that by increasing the discretionary time available to officers, 3-1-1 has enabled officers to spend more time out of their cars talking with citizens (other than those who have called for police assistance). "They have more time to be with a community, the number of contacts with citizens has to be up." While the majority of those lieutenants who did not perceive a positive effect of 3-1-1 on community policing simply felt that 3-1-1 has not had an effect, there was a dissenting opinion. Referring to the reduction in the dispatching of low priority calls to patrol officers with the implementation of 3-1-1, one sector manager argued that "before [3-1-1] that is how you got to know your community - answering the nuisance calls."

Very few lieutenants considered the effect of the neighborhood service centers and NSC sergeants on community policing, although one sector manager commented that with the neighborhood service center handling "neighborhood problems" citizens see that "there are people who care in the community" and

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

"persistent [neighborhood] problems may decrease. Instead of [a patrol car] responding 100 times to juvenile activity, [the neighborhood service center sergeant will go to the neighborhood and talk to the parents."

Approximately half of the sector managers perceived that there is more time for their officers to engage in problem oriented policing, however a few of these commented that they were unsure whether this was due to 3-1-1.

3.3.7 Perceived Effectiveness of 3-1-1

Overall, sector managers spoke positively about the 3-1-1 system. The majority responded that they think the system is working, that it has taken the burden off 9-1-1, and that it has reduced the number of calls that are dispatched to officers (especially "nuisance calls"). One lieutenant commented that "without it, we would be in trouble."

When asked "what changes to the 3-1-1 system would be needed for there to be an impact on the job of your patrol officers?" most lieutenants responded that they would like to see still more calls go to 3-1-1. Comments such as "they need to screen out more calls that are not really police matters" and "there are more types of reports that they could take" were common. One lieutenant noted "a lot [of calls] make it to radio that 3-1-1 could handle. We err on the side of service, but this is good because the police are service oriented."

Many lieutenants suggested that more 3-1-1 lines or call takers were needed because during high volume call times, calls to 3-1-1 would get bumped back to dispatch as low priority, "3-1-1 is getting overburdened like 9-1-1 was." They also noted that if citizens called 3-1-1 and the line was busy – they (citizens) would call 9-1-1 instead.

Without exception, when asked "what changes, if any would you like the Department to make to the 3-1-1 system?" lieutenants responded with reference to the 3-1-1 call takers at the communications center. They commented that the call takers needed better training and needed to have a better demeanor.

> "Call takers need more training on how to handle calls and what calls should be sent to dispatch."
>
> "We need better people as call takers. There are still ridiculous calls that get through."
>
> "[3-1-1 is a] good system, put in place for the right reasons, but it could be staffed with better people."
>
> "The employees down there put anything through dispatch to get rid of the calls. I have heard some complaints about the demeanor of the call takers. We do not have the best people working as operators."
>
> "We have a problem with the call takers. The 'problem children' are there."
>
> "Suspended, disgruntled call takers are the weak link."

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Lieutenants suggested that the Department employ retirees as 3-1-1 call takers, noting that they would know which calls to send to dispatch, and they would probably be more enthusiastic. It was also suggested that the Department hire civilians for the position, that civilians could take telephone reports if supervised by a sworn member, and it would cost the department less in salaries.

Lieutenants also commented that the neighborhood service center sergeant might be better equipped to address some of the 3-1-1 calls presently dispatched to the patrol division. They felt that the NSC sergeants could devote more time to talking to residents and reaching compromises, rather than sending an officer out to solve the problem "for the time being."

3.4 Police Officer Perceptions of the Baltimore Non-Emergency Call System

The majority of police officers in the Baltimore Police Department are assigned to patrol. Under the sector management system patrol officers are assigned a post (beat) within a sector of one of nine districts. Post officers work out of one-officer units and are responsible for responding to citizen calls for service and random patrol within their post. Post officers report to a sector sergeant and lieutenant (sector manager). In addition to post officers and sergeants, sector managers have a number of additional officers at their disposal. The number of officers varies by sector but ranges from approximately four to ten at any given time. Comprising a specialized unit, (variously referred to as a flex squad/team/unit; neighborhood unit etc.), these officers are not assigned to police a specific post and generally do not respond to citizen calls for service, rather they are available for deployment at the sector manager's discretion and are primarily used for initiatives.

3.4.1 Survey Method

To tap police officers' perceptions of the 3-1-1 system members of the UC research team developed a self-administered police survey (see Appendix 3-B). The survey comprised 36 close-ended multiple choice or fill in the blank questions, and one open-ended question requesting suggestions regarding the 3-1-1 non-emergency call system. The surveys were delivered to each district station house during the second week of the field observation period in Baltimore. Each district received between 100 and 150 surveys accompanied by a

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

letter addressed to the Major detailing instructions and requesting assistance in attaining responses.[1] Surveys were to be completed by sergeants and officers below the rank of sergeant (police agents, police officers, police officer trainees), both post officers and specialized unit officers.[2] During the week prior to delivering the surveys to the station houses, members of the research team explained the purpose of the survey to the Lieutenants (and Majors when available) during the face-to-face interviews that were conducted with the sector managers.

Using the data obtained from the police survey, this section explores police officers perceptions of whether the 3-1-1 system has had an impact on the quantity and nature of calls that they are dispatched to and the amount of discretionary time available to officers. In conclusion we examine police perceptions of the effectiveness of the 3-1-1 non-emergency call system.

3.4.2 Sample Characteristics

As anticipated, the response rate for the police survey was poor, thus our analyses are restricted to descriptive measures. Table 3.1 displays the number of survey respondents by district as compared to the number of BPD personnel by district. A total of 386 respondents completed the survey for a response rate equaling 20 percent.

---

[1] The research team had requested to administer the police survey during roll calls over the two - week observation period. Our request was denied due to the nature of shift changes in the department. The limited number of units available required that shift changes did not overlap. The units used by the 8 a.m.-4 p.m. shift were immediately handed off to the 4 p.m. - midnight shift, thus during shift changes there was minimum patrol presence in the district. By necessity roll calls were kept brief. The administration felt that the time required for officers to complete the survey during roll call would interfere with patrol operations. Subsequently a request was also made to administer the survey to officers coming off their shift. We were advised that compliance would be hard to attain and consequently would probably not achieve a significantly higher response rate than the method that was finally employed.

[2] The research team had requested to administer the police survey during roll calls over the two- week observation period. Our request was denied due to the nature of shift changes in the department. The limited number of units available required that shift changes did not overlap. The units used by the 8 a.m.-4 p.m. shift were immediately handed off to the 4 p.m. –midnight shift, thus during shift changes there was minimum patrol presence in the district. By necessity roll calls were kept brief. The administration felt that the time required for officers to complete the survey during roll call would interfere with patrol operations. Subsequently a request was also made to administer the survey to officers coming off their shift. We were advised that compliance would be hard to attain and consequently would probably not achieve a significantly higher response rate than the method that was finally employed.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 3.1 Police Officers by District

District	Percent of Survey Respondents	N	Percent of BPD Personnel*	N
Central	22	56	13.3	254
Southeast	38	68	9.4	179
Eastern	15	35	12.2	232
Northeast	15	29	10.0	191
Northern	4	10	12.2	233
Northwest	15	28	10.0	190
Western	25	49	10.4	199
Southwest	40	78	10.1	193
Southern	10	23	12.4	236
Missing	-	10	-	-
BPD Overall	20	386	100.0	1907

*Sworn personnel ranked Sergeant and below, calculated as of October 1999, MIS Division.

Ninety percent of the respondents were of the rank police officer (N=350). Only 5 percent of respondents were sergeants (N=20), and the remaining respondents indicated that they were police agents (N=5), Officer in Charge (OIC) (N=1), specialized unit officer (N=1), or did not provide their rank (N=16) (see Table 3.2). Officers were over-represented in our sample while agents and sergeants were under-represented

Table 3.2 Officers by Rank of Officer

Rank	Percent of Survey Respondents	N	Percent of BPD Personnel*	N
Police OfficerTrainee	0	0	<1	5
Officer	90.7	350	81.2	1549
Agent	1.3	5	7.6	144
Sergeant	5.2	20	11	209
Other	.5	2	-	-
Missing data	2.3	9	-	-
Total	100.0	386	100	1907

*Sworn personnel ranked Sergeant and below, calculated as of October 1999, MIS Division.

Table 3.3 displays the survey respondents by sex, as compared to the composition of the Baltimore Police Department (BPD). Male respondents constituted 82 percent of survey respondents (N=318) as compared to 87 percent of the BPD. Female respondents comprised 12 percent of female respondents (N=45) as opposed to 14 percent of the BPD. Thus the survey respondents over-represented male officers but only slightly under-represented female officers.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 3.3 Police Officers by Sex

Sex	Percent of Survey Respondents	N	Percent of BPD Personnel*	N
Male	82.4	318	86.5	1649
Female	11.7	45	13.5	258
Missing	6.0	23	-	-
Total	100.0	386	100.0	1907

*Sworn personnel ranked Sergeant and below, calculated as of October 1999, MIS Division.

When the ethnicity of survey respondents is compared to the ethnic composition of the BPD, white officers are over-represented (53 percent (N=204) compared to 48 percent respectively) while black officers are greatly under-represented (26 percent (N=102) as opposed to 35 percent respectively). (See Table 3.4). The numbers of Hispanic, Asian American/Pacific Islander and Native American/Alaska Native officers comprise too small a percentage of the BPD personnel for there to be meaningful differences.

Table 3.4 Police Officers by Ethnicity

Ethnicity / Police Officer Survey	Percent of Survey Respondents	N	Ethnicity / MIS Data	Percent of BPD Personnel*	N
African American	26.4	102	Black	34.7	661
Caucasian	52.8	204	White	47.6	908
Hispanic	1.8	7	Hispanic	1.4	26
Asian American	1.0	4	-	-	-
-	-	-	Asian American/ Pacific Islander	<1	10
-	-	-	American Indian/ Alaska Native	1.0	21
Other	4.7	18	-	-	-
Missing data	13.2	51	Missing data	14.7	281
Total	100.0	386	Total	100	1,907

*Sworn personnel ranked Sergeant and below, calculated as of October 1999, MIS Division.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 3.5 Police Officers by Years of Service

Years	Percent of Survey Respondents	N	Percent of BPD Personnel*	N
Less than 5	39.9	154	31.9	608
5-9	25.1	97	28.4	542
10-14	11.4	44	13.4	256
15-19	8.3	32	12.6	241
20-24	3.3	16	6.1	117
25-29	4.5	15	5.1	97
30 +	.9	9	2.4	46
Missing Data	4.9	19	-	-
Total	100	386	100	1907

*Sworn personnel ranked Sergeant and below, calculated as of October 1999, MIS Division.

Finally, Table 3.5 examines the years of service of the survey respondents as compared to the BPD generally. Officers with less than 5 years of service are over-represented among survey respondents, while officers in all other categories are slightly under-represented (by 5 percent or less across all categories).

Although completion of the police survey was in essence voluntary, the sample obtained is fairly representative of the target population in terms of sex and years of service. Respondent bias is evident by district (wide variation in number of respondents), rank (police officers are over-represented, police agents and sergeants are under-represented) and race (whites are over-represented, blacks are under-represented).

3.4.3 Calls for Service and Discretionary Time

In this section we briefly examine officers' use of time on a typical shift, including the proportion of time officers report spending on different call types and their estimates of discretionary time (time not responding to calls for service). The data obtained from all completed police surveys are employed (N=386).

Officers were asked to indicate what percent of calls for service fell into each of 4 categories, nuisance calls (calls that are not a police matter), quality of life calls (low-priority calls), non-emergency calls that require police response, and emergency/medical assistance (risk of injury) calls. Table 3.6 displays the descriptive statistics for officers' estimates for shifts 2 and 3 (day and evening respectively). For both shifts officers estimate that they respond primarily to nuisance calls, followed by non-emergency calls which require police response, quality of life calls, and emergency/medical assistance calls (respectively).

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 3.6 Officers' Estimates of Percent of Calls Per Shift by Type

	Mean	Std Deviation	Median	Mode	N*
Shift 2					
Nuisance	37	27	30	10	248
Non-Emergency	32	24	23	10	235
Quality of Life	28	23	20	10	238
Emergency/Medical Assistance	23	21	20	10	234
Shift 3					
Nuisance	37	27	30	20	238
Non-Emergency	33	25	25	20	225
Quality of Life	29	24	20	10	221
Emergency/Medical Assistance	27	23	20	10	224

*Number of officers reporting

On a typical day shift 60 percent of officers (N=230) estimate that they have less than 3 hours of discretionary time (see Table 3.7). Ten percent (N=39) report having less than 1 hour of discretionary time, 26 percent (N=99) report having more than 1 hour but less than 2 hours, and 24 percent of officers (N=92) replied that on average they have more than 2 hours but less than 3 hours of discretionary time. Only 7 percent of officers (N= 25) report having 4 or more hours of discretionary time on the average day shift.

Table 3.7 Officers' Estimates of Discretionary Time During Average Day Shift (Shift 2)

	Percent Responding	N
Less than 1 hour	10.1	39
1-2 hours (less than 2)	25.6	99
2-3 hours	23.8	92
3-4 hours	10.1	39
4-5 hours	3.9	15
5-6 hours	1.0	4
6 or more hours	1.6	6
Missing	23.8	92
Total	100.0	386

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 3.8 displays officers' perceptions of the amount of discretionary time available on the day shift (2) as compared to the evening shift (3). Approximately half of the respondents replied that they had either a little more (32 percent, N=123) or a lot more (20 percent, N=77) discretionary time on the day shift than the evening shift. Thirteen percent (N=63) of officers perceived the amount of discretionary time to be the same on both the day and evening shifts. Only 12 percent of officers (N=48) perceived there to be more discretionary time on the evening shift than the day shift.

Table 3.8 Officers' Estimates of Discretionary Time on Day Shift (2) as Compared to Evening Shift (3)

	Percent Responding	N
A little more time on day shift	31.9	123
A lot more time on day shift	19.9	77
Same amount on both shifts	13.3	63
A little more time on evening shift	10.4	40
A lot more time on evening shift	2.1	8
Missing data	19.4	75
Total	100.0	386

Regarding the management of discretionary time, survey respondents indicate that sector sergeants are slightly more likely than sector lieutenants (managers) to provide directives on the use of officer discretionary time (see Table 3.9). Although the nature of directives that are provided are consistent for sector sergeants and sector managers (see Table 3.10).

Table 3.9 Officers' Estimates of the Frequency with which Directives for Discretionary Time are Provided by Sector Sergeants and Sector Lieutenants

	Sector Sergeants		Sector Lieutenants (managers)	
Directives Provided	Percent	N	Percent	N
Never	13.5	52	16.8	65
Rarely	15.3	59	22.8	88
Maybe once a week	15.8	61	16.8	65
Very often (couple times a week)	29.3	113	29.8	115
Practically every day	23.3	90	11.7	45
Missing data	2.8	11	2.1	8
Total	100.0	386	100.0	386

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 3.10 Officer Accounts of the Type of Directives Provided by Sector Sergeants and Sector Lieutenants

	Directives Provided By			
	Sector Sergeants		Sector Lieutenants	
Description	Percent	N	Percent	N
Specific instructions regarding people and places to watch	36.0	139	31.1	120
General instructions on what to look for	30.3	117	33.4	129
Specific instructions about places to watch	16.8	65	14.2	55
Specific instructions about people to watch	4.1	16	4.7	18
Missing Data	12.7	49	16.6	64
Total	100.0	386	100.0	386

3.4.4 Perceived Changes in Calls for Service and Discretionary Time

One of the goals of our non-emergency call system assessment was to determine whether the implementation of 3-1-1 was perceived to have had an impact on the amount of officer discretionary time (time not responding to calls for service) that might be used for community policing and/or problem oriented policing, by reducing the quantity of dispatched calls[3] or changing the nature of calls to which officers had to respond. As the 3-1-1 non-emergency call system provides the option of an alternative response to citizen calls for service (response from a neighborhood service center sergeant as opposed to prioritized dispatch to a patrol unit), a possible outcome of the non-emergency call system implementation would be that some low priority calls, which prior to 3-1-1 were dispatched to a post unit, would be alternately routed to the neighborhood service center. It is plausible (we believed) that officers employed with the BPD before and after the 3-1-1 system implementation might notice a change in the average number of calls to which they were being dispatched (less calls because some were being routed to the neighborhood service center), or a change in the nature of these calls (less low priority calls because some were being routed to the neighborhood service center). Thus if the number of citizen calls for service requiring dispatch to a post unit remained relatively constant, but the number of low priority calls requiring dispatch decreased (due to routing to a neighborhood service center), it is possible that officers would have more discretionary time (time not responding to citizen calls for service) in which to pursue community and problem oriented policing.

[3] We use "9-1-1 calls" and "calls for service" interchangeably to refer to calls to which a post unit is dispatched. Officers have no way of knowing whether the call for service to which they are responding was called in by the citizen using 9-1-1 or 3-1-1 unless the call-taker relays this information to the dispatcher and the dispatcher in turn informs the officer.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

To measure officers' perceptions regarding these issues officers with less than five years of service with the BPD were omitted from the analysis.[4] This reduced the sample size by 40 percent (from 386 officers to 282 officers). Table 3.11 displays whether officers perceive 3-1-1 to have had an effect on the quantity of 9-1-1 calls that they are dispatched to and/or the nature of these calls.

Table 3.11 Officers' Perceptions Regarding Change in Quantity of 9-1-1 Calls and/or Type of Calls Since 3-1-1 Implementation

	Quantity of 9-1-1 Calls		Types of 9-1-1 Calls	
	Percent Responding	N	Percent Responding	N
No	55.6	129	56.5	131
Yes	40.5	94	39.7	92
N/A*	1.7	4	1.7	4
Missing Data	2.2	5	2.2	5
Total	100.0	232	100.0	232

* Began employment after implementation of 3-1-1

The majority of officers responded that they *did not* perceive 3-1-1 to have had an effect on either the quantity of 9-1-1 calls to which they are dispatched on a typical shift or the nature of these calls (56 percent [N=129] and 57 percent [N=131] respectively). For officers that thought 3-1-1 had an effect on call volume, 35 percent (N=80), replied that they are dispatched to fewer calls, and 11 percent (N=25) replied that they are dispatched to more calls (see Table 3.12).

Table 3.12 Officers' Perceptions of Change in Average Number of 9-1-1 Calls Since 3-1-1 Implementation

	Percent Responding	N
Respond to fewer 9-1-1 calls	34.5	80
Respond to same number of 9-1-1 calls	53.4	124
Respond to more 9-1-1 calls	10.8	25
Missing data	1.3	3
Total	100.0	232

Table 3.13 illustrates how officers perceive 3-1-1 to have influenced the nature of calls for service that they receive on a typical shift. Again, the majority of officers responded that they noticed no difference in the nature of calls to which they were dispatched (57 percent [N=133]). Six percent (N=14) of responding officers

[4] The 3-1-1 non-emergency call system became operational October 2, 1996. For officers to have worked a full year with the BPD before the implementation of 3-1-1 (in order to make before and after implementation comparisons) survey responses for the number of years of service must be five years or greater.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

perceived that they were responding to *very few* low priority or nuisance calls since the implementation of 3-1-1, while 28 percent (N=64) of officers acknowledged a lesser reduction in the number of low priority calls being dispatched. Only 3 percent of responding officers (N=7) believed the number of low priority calls to which they were being dispatched actually increased since the implementation of 3-1-1.

Table 3.13 Officers' Perceptions of Change in Type of Calls Since 3-1-1 Implementation

	Percent Responding	N
Very few nuisance or low priority calls	6.0	14
Fewer nuisance or low priority calls	27.6	64
About the same number of nuisance or low priority calls	57.3	133
More nuisance or low priority calls	3.0	7
Missing Data	6.0	14
Total	100.0	232

Table 3.14 illustrates officers' perceptions of the effect of the 3-1-1 system implementation on discretionary time (time not responding to calls for service). The majority of officers, 69 percent, (N=160) responded that they perceived no change (on a typical shift) in the amount of discretionary time attributable to the implementation of 3-1-1. Twenty-one percent of officers (N=49) responded that they perceived the implementation of 3-1-1 to have increased their discretionary time, while only five percent of officers (N=11) responded that they had less discretionary time since 3-1-1 was implemented. These results are not surprising when compared with those displayed in Tables 3.12 and 3.13. The majority of officers perceived no change in the quantity of 9-1-1 calls received, or in the nature of these calls. Rather they believed they were responding to the same number of 9-1-1 calls and approximately the same number of these calls were low priority, before and after the implementation of 3-1-1.

Table 3.14 Officers' Perceptions of the Effect of 3-1-1 Implementation on Discretionary Time

	Percent Responding	N
About the same amount of discretionary time	69.0	160
More discretionary time	21.1	49
Less discretionary time	4.7	11
N/A*	0.9	2
Missing Data	4.3	10
Total	100.0	232

*Began employment with BPD after implementation of 3-1-1

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Finally, officers with five or more years of service with the BPD were more likely to report that the implementation of 3-1-1 has not changed their general work routine in any way, than to have perceived an effect on their routine (see Table 3.15). Of these officers, 54 percent (N=126) perceived *no change* in work routine attributable to the implementation of 3-1-1, while 44 percent (N=103) responded that 3-1-1 *had changed* their general work routine.

Table 3.15 Officers' Perceptions Regarding Change in General Work Routine Since 3-1-1 Implementation

	Percent Responding	N
No	54.3	126
Yes	44.4	103
Missing data	1.3	3
Total	100.0	232

3.5 Summing Up

In summary, over half of the officers responding to our survey in Baltimore perceived that the implementation of the 3-1-1 non-emergency call system had no effect on the quantity of 9-1-1 calls to which they are dispatched, while approximately one-third of officers perceived a reduction in the number of calls to which they are required to respond. Similarly, over half of the survey respondents did not perceive a change in the nature of calls to which they are dispatched, while roughly one-third of respondents believed that the number of low priority calls that are dispatched had decreased. In contrast, the interviews conducted with the sector managers showed that the majority of sector managers perceived that 3-1-1 has decreased the quantity of calls that their patrol officers respond to, and virtually all sector managers perceived 3-1-1 to have influenced the nature of the calls that are being dispatched to units (less low-priority calls).

Almost two-thirds of the officers responding to the survey did not perceive a change in the amount of discretionary time available on the average shift. Slightly more than half of the respondents replied that the implementation of 3-1-1 had not changed their day-to-day work routine in any way, while the remaining officers reported that 3-1-1 had changed their work routine. Interviews with the sector managers revealed similar differences in opinion.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

4 CHAPTER FOUR: THE IMPACT OF 3-1-1 ON CALLS FOR SERVICE IN BALTIMORE

4.1 Introduction

The United States first implemented the emergency 9-1-1 direct dial system in 1968. Police leaders and policy makers then spent the next several years marketing the 9-1-1 system and encouraging people to embrace the new, technological approach to providing police services. At the heart of 9-1-1 marketing was the promise that the new system would reduce police response times to citizen calls for police service (Sparrow, Moore and Kennedy, 1990). Some thirty years after the initial implementation of 9-1-1, policy makers and police departments across the country suggest that the emergency 9-1-1 system has outgrown itself: an overwhelming number of calls to 9-1-1 request non-emergency services (national estimates range from forty to eighty percent); substantial overloading in the number of 9-1-1 emergency calls to the police threatens to dilute the effectiveness of the emergency response system; citizens express frustration with slow response times from the police when they call 9-1-1 (Spelman and Brown 1981); police complain about the demands of the 9-1-1 system (Bayley, 1998:2); and community policing proponents lament the inability of police to free themselves of the 9-1-1 system.

On July 23, 1996 in Sacramento President Clinton called for a national **community policing** number to help alleviate the abundance of non-emergency calls flooding the emergency system. The goal of the "community policing" number was to alleviate pressures on the 9-1-1 system and thus provide a technological infrastructure for police departments to free-up officer time to engage in community policing activities such as building working relationships with residents and local business leaders and solving local crime and disorder problems. Proponents of a non-emergency, community policing number argue that 3-1-1 technology can provide the impetus for police departments to deal effectively and efficiently with non-emergency requests for police service. In this chapter, we answer two critical questions: did the introduction of Baltimore's 3-1-1 change the quantity of calls to the police? And did the introduction of 3-1-1 change the nature of the calls to the police?

4.2 Baltimore 9-1-1 and 3-1-1 Data

The Computer Aided Dispatch (CAD) data (October 1, 1994 through December 31, 1999) for Baltimore includes both 3-1-1 and 9-1-1 citizen calls for service. These data were copied to IBM 3480 tapes and converted to a Foxpro database. The three CAD databases obtained from the Baltimore Police Department

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

included an incident based file, a geographic based file and a unit based file.[1] The incident based file provides sufficient data to track 9-1-1 and 3-1-1 calls that entered the CAD system by district, sector, post, reporting area, house number and street, etc[2]. The incident based file provided all calls entering CAD in the baseline and follow-up periods, demarcated with the introduction of 3-1-1 System on October 2, 1996. We examine the distributions of CAD data before and after the introduction of 3-1-1. These distributions are then cross-tabulated with priority, crime type, and response time.[3]

We identified several nuances with the Baltimore CAD. First, we were unable to gain a clear profile of 3-1-1 calls from October 2, 1996 through October 1998 because we could not distinguish between 3-1-1 calls to the 3-1-1 number and 3-1-1 calls that were initially made to 9-1-1 and transferred to 3-1-1 and then dispatched.[4] We used every means possible to find *flags* in the data that allowed separation of these call types in our effort to disentangle these calls. This means that we could distinguish 3-1-1 calls from 9-1-1 calls in the CAD data, but we could not track the source of the 3-1-1 call.

Second, a substantial number of calls placed to 3-1-1 are not documented. For example, when a 3-1-1 call is not a police matter (e.g. public works) the 3-1-1 call taker provides the caller with the appropriate telephone number. These data are not entered into the CAD system, they are not entered into any other database in a systematic manner and are thus "lost" from the system. In an effort to more adequately account for such calls we requested that all calls be entered into the CAD and LAN systems during a sample period

---

[1] The geographic and unit based file is only available for an eighteen month period and were used to examine agreement between reported geographical and unit breakdowns and the incident based file.

[2] Unlike Dallas, that maintains the original ANI/ALI information in a supplemental file, we could not go back to the original information to obtain details about the phone subscriber.

[3] Unfortunately, the Baltimore Police Department does not capture the entire CAD record on permanent back-up and our ability to calculate response times was limited to minutes rather than fractions of minutes.

[4] Although the 3-1-1 system now includes a "call origin" field that identifies the origin of the call (9-1-1 or 3-1-1), the 3-1-1 system did not include this field until October 1998. The problem was concentrated in low priority #4 and #5 calls. Sergeant Hermann and Don Wayson found that cross log-in from 3-1-1 and 9-1-1 operators renders it difficult or impossible to distinguish 3-1-1 and 9-1-1 call origins. Obviously, this condition seriously affected our ability to examine the impact that 3-1-1 had on 9-1-1, since call origin is uncertain. We explored alternative methods of distinguishing between these calls for the period before October 1998. One solution was to examine call taker's PCA number that allows identification of the call taker for a particular record. Since some call takers are not cross trained, PCA numbers and dates allowed differentiation at least for a portion of these calls. Additionally, we examined the CAD records in great detail once they were in a relational database in an effort to differentiate 3-1-1 calls beginning on October 2, 1996. In short, we used every means possible to find *flags* in the data that allowed separation of these call types in our effort to disentangle these calls.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

between May 17, 1999 and June 28, 1999 (see an analysis of these data in Chapter Five). In response to this request, the 3-1-1 unit entered all calls into the CAD system during this sample period. Such calls were classified as code '79' or other category which captures those calls entering CAD which lack an alternative signal classification. This procedure substantially increased the number of calls entering the CAD system during the sample dates. In fact, for the 3-1-1 system there was a 426 percent increase in type '79' calls during this sampling period.[5] Compared to the processing of other 3-1-1 unit calls, this increase is an artifact of the inclusion of additional type '79' calls, since the corresponding increase, after type '79' calls were removed, was only 5 percent over the average of the same period in the two preceding years.

We suggest that the most appropriate way to handle the analysis of these calls is to assess whether or not these calls would have entered the 9-1-1 system prior to the implementation of 3-1-1. If these calls would have been placed to 9-1-1 prior to the implementation, these omitted 3-1-1 calls should be incorporated into the call volume for 3-1-1 calls. Alternatively, if these calls resulted from the increased publicity to "call when there was urgency but no emergency," such calls would not previously have entered the 9-1-1 system. Given these considerations, we opted for a dual analysis: First, we increased the number of calls in our master database by increasing the Type '79' calls by a constant reflecting the number of calls during the experimental period between May 17, 1999 and June 28, 1999. Second, we removed the Type '79' calls entered during this sampling period from our analysis by removing a proportion of Type '79' calls in excess of the average number of these calls routinely entered by 3-1-1 operators. An analysis of these data suggest that the increased volume of Type '79' calls recorded during the sampling period represented an absolute increase in these types of calls rather than a simple diversion of such calls from 9-1-1 to 3-1-1 call takers. This conclusion is based on a number of observations of these data.

The observed increase in Type '79' calls reflected in the 426 percent increase in 3-1-1 calls during the sampling period is not represented in the previous number of 9-1-1 calls nor in the observed decline in these calls after the implementation of 3-1-1. Examining only Type '79' 9-1-1 calls in the post implementation period we note a marked decline (-54 percent) in the number of calls. Obviously, a major explanation of this decline is the extent to which the new 3-1-1 system began to process these calls. However, when the combined

[5] The average number of Type '79' calls between May 17, 1999 and June 28, 1999 was 537.7 calls per day. By comparison the average for the two proceeding May 17th to June 28th periods in 1997 and 1998 was 102.15. Thus the percent change ((102.15 - 537.7) / 102.15)*-100 of 426 percent is substantively a by product of the increased reporting.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

9-1-1 and 3-1-1 Type '79' calls are examined, the post implementation calls decline by 8 percent. When the supplemental calls, secured during the observation period, are excluded, these types of calls actually decline by 15 percent. Thus, it appears that the influx of Type '79' calls into the 3-1-1 system mark a new type of call being processed primarily for informational purposes or requests to alternative Governmental agencies. Nonetheless, this volume of calls must be handled by 3-1-1 call takers in addition to processing 3-1-1 calls which legitimately reflect police concerns. In order to assess the nature of these type '79' calls vis-à-vis those traditionally handled by 9-1-1 we examined the number of such calls requiring some police action. To assess this we first estimated the number of type '79' calls traditionally processed by 9-1-1 call takers. There were a total of 294,548 type '79' calls processed between October 1, 1994 and December 31, 1999. Of these, 94 percent (N = 277,857) resulted in dispatching a police unit. However, only 77 percent (N = 97,538 of 125,866) type '79' calls were dispatched by 3-1-1. This substantial difference between 9-1-1 and 3-1-1 decisions to dispatch could be accounted for by processing decisions made by 3-1-1 call takers such as referring such calls to Neighborhood Service Centers or completing a written report rather than dispatching an officer. Or, alternatively, such differences may reflect the nature of the calls that are not currently recorded by the 3-1-1 unit.

In fact, when we analyze the data excluding the sampling period when all calls were recorded (May 17, 1999 through June 28, 1999), the number of type '79' calls equals 102,745 of which 93,645 or 91 percent were dispatched. Thus, it appears that the type '79' calls recorded during the sampling period reflect non-police activities that do not reflect legitimate police matters. In fact, of the 23,121 type '79' calls recorded during this period, only 3,893 or roughly 16 percent were dispatched.

This suggests that the nature of the types of calls currently excluded from police record keeping may adequately reflect appropriate policing concerns with respect to efficient time management. While such a service no doubt serves the community it is questionable whether it is the most appropriate use of sworn officers who currently administer the 3-1-1 system. It is also suggestive that excluding the impact of these calls from an analysis of the dispatching and response time analysis more adequately reflects the true nature of the types of calls historically and currently processed by the Baltimore City Police Department.

Comparison of the sampling period between May 17, 1999 and June 28, 1999 with the same period in 1997 and 1998 further confirms our impression that the calls reported in the sampling period do not represent police processing decisions. For example the number of calls reported during this period in 1997 and 1998

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

respectively was 32,201 and 31,969. These are obviously more clearly associated with the 33,786 calls retained after excluding the non-police type '79' calls recorded for our purposes during the sampling period. Consequently, the non-police '79' calls are removed from the analyses presented in the remainder of this chapter.

Another nuance with the Baltimore data is that a number of 3-1-1 calls are double-handled by the Police Department in Baltimore. Each day, police-related 3-1-1 calls are printed out and given to data entry operator. If a 3-1-1 call is deemed suitable for referral to a Neighborhood Service Center, the 3-1-1 call is re-entered by a data entry operator into a Lotus Notes LAN system. We obtained copies of the Lotus Notes LAN database of 3-1-1 referrals which were easily converted into a Foxpro database and compared to the existing CAD records to identify cross referenced entries. We do not examine these double-handled 3-1-1 calls in this chapter but rather refer the reader to our analysis of these "referred" 3-1-1 calls in Chapter Five.

With these nuances in mind, this chapter provides a detailed analysis of the 9-1-1 and 3-1-1 data with a view to depict, describe, and assess the manner in which the quantity and quality of calls for service changed as a result of introducing the 3-1-1 non-emergency call system. In essence, this chapter serves as the most crucial and objective assessment of how the introduction of a non-emergency call system altered citizen requests for police service and how the new 3-1-1 system subsequently affected dispatching and responding to citizen calls for service.

4.3 Pre and Post Test Analysis

Our first step in analyzing the Baltimore CAD data was to explore the statistical differences in 9-1-1 calls before the introduction of the 3-1-1 system compared to 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 and we assess the impact of introducing the 3-1-1 system on the time taken to process calls as well as on the type of calls received by the Baltimore police call center.

Table 4.1 below reports the number and percent change for 9-1-1 calls received by the BPD by time period (pre and post intervention) and by the priority that the call was allocated.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 4.1 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 percent) in the total number of 9-1-1 citizen calls for police service received by the BPD following the introduction of the non-emergency call system in October 1996. As 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 percent decline). Apart from the priority one 9-1-1 calls that experienced a 12.6 percent 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 went from 2 to 5.

Table 4.2 depicts the number and dispatched proportion of 9-1-1 and 3-1-1 calls by time period (pre and post intervention) and by priority level.

Table 4.2 Number and Dispatched Proportion of 9-1-1, 3-1-1 and Total Calls by Time Period (pre and post- intervention) and By Priority Level

	Pre-Intervention		Post-Intervention					
Priority	N 9-1-1 Only	Percent Dispatch	N 9-1-1 Only	Percent Disp	N 3-1-1 Only	Percent Disp	N 3-1-1 + 9-1-1	Percent Disp
1	417,728	99.4	470,263	99.6	62,534	98.6	532,797	99.5
2	902,565	99.4	633,706	99.6	184,931	97.6	818,637	99.2
3	415,133	97.2	177,967	99.3	138,722	94.1	316,689	97.0
4	201,043	99.2	66,169	99.5	103,878	98.1	170,047	98.3
5	111,500	10.3	375	0.5	50,454	0.6	50,829	0.6
Total	2,047,969	81.1	1,348,480	79.7	540,519	77.8	1,888,999	78.9

Table 4.2 reveals some important findings. During the two years before the introduction of 3-1-1, there were just over 2 million 9-1-1 calls for service of which 81 percent were dispatched: 99 percent of the priority one through four calls were dispatched and 10.3 percent of priority five calls dispatched. During the

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

two years after the introduction of 3-1-1 there were a total of 1,888,999 calls for service received via both the 3-1-1 and 9-1-1 call systems and of these calls, 78.9 percent of all calls were dispatched: 98 percent of priority one through four calls were dispatched and less than one percent of priority five calls were dispatched.

Table 4.2 shows a total reduction in the number of calls received and dispatched following the introduction of 3-1-1 (from 2,047,969 calls before to 1,888,999 calls after representing a 7.7 percent decline in calls (see below for further discussion about this decline in calls). The table also shows that there was a large absolute reduction in the total number of priority five calls received (from 111,500 to 50,929 representing a 54.3 percent reduction in priority five calls) and that a large portion of priority two, three, four and five 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 one calls following the introduction of 3-1-1. As Table 4.2 shows, there was a 27.5 percent increase (from 417,728 priority one calls before to 532,797 priority one calls after) in the total number of priority one calls received and dispatched by the BPD following the introduction of the 3-1-1 system. More than any other category of call, the priority one calls are a major drain on police resources when the response time and complexity of the call is taken into account. Hence, we examined more closely the apparent increase in the priority one calls. Our analysis of the weekly averages of priority one calls reveals that there was a trend increase in priority one calls that began several months prior to the introduction of 3-1-1. Our data also suggest (see below) that the increase in priority one calls was most likely driven by an increase in reporting of several specific categories of serious crimes (particularly rape, robbery and burglary). We conclude that much of the observed increase in Priority One calls was spuriously related to the implementation of the 3-1-1 non-emergency call system.

Table 4.2 also shows that over a quarter (28.6 percent) of all calls that are dispatched to the police were calls made to the 3-1-1 system (see also Chapter Six). Indeed, the data in Table 4.3 reveals that, for the post-intervention period, 12 percent of all priority one calls were placed to 3-1-1, 23 percent of priority two calls came from 3-1-1, 44 percent of priority three calls were made to 3-1-1, 61 percent of priority four calls began with a 3-1-1 call and 99 percent of priority five calls were made to the 3-1-1 call system.

Overall, Table 4.2 suggests that there are five issues that characterize the before and after patterns of citizen reporting and police call handling following the introduction of 3-1-1. First, there was an absolute decline in the number of calls received and dispatched by the BPD following the introduction of the 3-1-1 system Second, there was a 54 percent reduction in the number of priority five calls received by the BPD across

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

both the 9-1-1 and 3-1-1 calls systems. Third, the police virtually ceased dispatching priority five calls after the introduction of 3-1-1, a factor that contributed to the absolute decline in priority five calls. We speculate that citizens may have become dissuaded from calling the police about low priority matters if they thought that the police would not respond with a patrol car to their call. Fourth, this reduction in priority five calls received and handled by the police was overshadowed by a 27.5 percent increase in the number of priority one calls received and handled by the police. Fifth, the police call handlers appear to be indifferent to whether the call was received via 3-1-1 or 9-1-1 in making a decision whether or not to dispatch a call from a citizen.

Our data suggest that much of the increase in priority one calls began prior to the introduction of the 3-1-1 system. However, we question why so many high priority calls were placed to 3-1-1. One could speculate that citizens are not very good at choosing the correct number to call and that a large number of calls placed to 3-1-1 should have been made to 9-1-1. Alternatively, one could question the logic behind police handling 3-1-1 calls in a similar manner as they handle 9-1-1 calls. Why do the police maintain similar prioritization and dispatch policies for both 9-1-1 and 3-1-1? Why don't the police develop alternative dispatch policies for calls received via 9-1-1 and calls received via 3-1-1 unless, of course, the incident clearly warrants a police dispatch? Our survey of citizens calling 3-1-1 and 9-1-1 suggests that citizens have different expectations of the police when they call 3-1-1 (see Chapter Seven). Alternate citizen expectations and referral to Neighborhood Service Centers (see Chapter Five) could considerably reduce the number of calls that the police handle via dispatch and thus substantially free-up officer time for community and problem-oriented policing activities. Indeed, the apparent gains made through significant reductions in 9-1-1 calls seem to be offset by the migration of calls to 3-1-1 and the police decision to dispatch these 3-1-1 calls in much the same way as how they would have dispatched the calls if they were received by 9-1-1. We return to answer these questions in our concluding chapter (Chapter Ten).

The total numbers 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 emerging story. Table 4.3 below reports the mean call processing times (in minutes) by priority code and by categories of call processing for the pre-intervention and post-intervention periods for 9-1-1 and 3-1-1 calls.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 4.3 Mean Call Processing Times (in minutes) for Dispatched 9-1-1 and 3-1-1 Calls by Priority and Categories of Call Processing for Before and After the Introduction of 3-1-1

Call Processing Category	Pre-Intervention Just 9-1-1	Post Intervention Just 3-1-1	Post Intervention Just 9-1-1	Post Intervention 3-1-1 + 9-1-1	Percent Change (pre 9-1-1 to post 9-1-1+ 3-1-1)
Priority 1					
Time to Dispatch[1]	2.95	5.72	3.02	4.37	+ 48%
Time to Arrive[2]	14.91	19.27	13.28	16.28	+ 9.19%
Time from dispatch to clear[3]	30.61	34.03	28.92	31.47	+ 3.79%
Total time to Clear[4]	30.61	34.03	28.92	31.47	+ 2.80%
Priority 2					
Time to Dispatch	4.73	5.60	4.77	5.19	+ 9.73%
Time to Arrive	14.84	15.69	14.08	14.88	+ 0.27%
Time from dispatch to clear	26.66	27.99	29.89	28.94	+ 8.55%
Total time to Clear	26.66	27.99	29.89	28.94	+ 8.55%
Priority 3					
Time to Dispatch	5.72	6.64	5.69	6.17	+ 7.87%
Time to Arrive	23.16	24.78	22.39	23.58	+ 1.81%
Time from dispatch to clear	38.91	43.26	45.68	44.47	+ 14.29%
Total time to Clear	38.91	43.26	45.68	44.47	+ 14.29%
Priority 4					
Time to Dispatch	9.48	9.33	8.96	9.15	- 3.48%
Time to Arrive	19.37	18.75	19.94	19.35	- 0.10%
Time from dispatch to clear	25.39	25.22	28.32	26.77	+ 5.44%
Total time to Clear	25.39	25.22	28.32	26.77	+ 5.43%
Priority 5					
Time to Dispatch	49.82	112.31	29.29	70.80	+ 42.0%
Time to Arrive	32.57	60.56	29.71	45.14	+ 38.59%
Time from dispatch to clear	51.76	102.48	38.69	70.59	+ 36.38%
Total time to Clear	51.76	102.48	38.69	70.59	+ 36.38%

[1] Time to dispatch is calculated from the time the call was received by the call center to the time the call was dispatched.

[2] Time to arrive is calculated from the time the call was dispatched through to the time the officer arrived on the scene.

[3] Time from dispatch to clear is calculated from the time the call was dispatched through to the time the call was cleared. We point out that calculation of the time cleared was based on the truncation of about 5 percent of the calls examined in this study (over 8 million records in total). When a call was not cleared (ie when the officer forgot to clear a call or a call was administratively cleared some days after the call was received, we truncated the call to "end" eight hours after the call was received. This decision to truncate these calls reduces the bias in the data towards longer cleared time lags as a result of officer error, but at the same time, somewhat inflates the time to clear category as we are sure that many of our truncated calls were most likely cleared well within the eight hour cut off period that we used.

[4] Total time to clear is calculated from the time the call was received by the call center to the time the call was cleared. We used the same definition for "call cleared" as detailed in note 3.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 4.3 shows some interesting patterns. The before to after comparisons of dispatch times, times to arrive on the scene, and times to clear/complete the call for priority one calls, show that in addition to the absolute increase in priority one calls, the high priority 9-1-1 calls were dispatched slightly slower in the post-intervention period compared to the pre-intervention period. The police, however, were quicker at handling 9-1-1 priority one calls than they were at handling 3-1-1 priority one calls, perhaps reflecting the more serious types of priority one calls received by the 9-1-1 call center compared to the priority one calls received by the 3-1-1 call center (as one would expect). Overall, the police handled most categories of 9-1-1 calls (dispatch, arrival and cleared) in much the same time after the implementation of 3-1-1 as what they had handled 9-1-1 calls before the introduction of 3-1-1. By contrast, the police were slower at handling 3-1-1 calls compared to 9-1-1 calls across all priority levels. Overall, our results in Table 4.3 tend to suggest that there were differences in the speed at which the police handled 3-1-1 and 9-1-1 calls. The police were generally slower to dispatch, arrive and clear 3-1-1 calls than their 9-1-1 counterparts.

One of our interests in assessing the introduction of the 3-1-1 system in Baltimore was to explore whether or not patrol officers had additional "down-time" available to engage in community policing activities following the implementation of the 3-1-1 system. We examine the issue of "down-time" several different ways. Our first analysis examines the number of patrol units available for call response in the pre-intervention to post-intervention period. 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[6]. 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 and/or 9-1-1 calls. This represents a mere 0.1 percent 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 percent of all 3-1-1 and 9-1-1 calls for service both before and after the introduction of the 3-1-1 call system.

---

[6] 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" is accurate and not inflated by nuances of overtime.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Our second analysis seeks 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. Using the data presented in Table 4.2 (number of dispatched 9-1-1 and 3-1-1 calls before and after) and Table 4.3 (average time spent from dispatch to cleared) as well as the average number of patrol units before and after (see above), we find that patrol units spent 189.88 minutes per unit per shift responding to 9-1-1 calls prior to the 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[7]. This represents an 11 percent *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, 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 percent 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. Overall, our analysis reveals that the BPD 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.

Another, and more sophisticated, way to examine these data 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. To calculate blocks of up time and down time, we examined all CAD data from October 1, 1994 through December 31, 1999 (N = 7,175,882 CAD records). Of these, 240,022 records were missing unit assignments and 859 cases lacked time stamps for the time of dispatch, arrival and clearance. This reduced the total number of cases suitable for down time and up time analysis to N = 6,935,001. Of the nearly 7 million cases examined, 58 percent of the calls originated from a 9-1-1 call, 11 percent came from a 3-1-1 call, 29 percent originated directly from one of the district dispatchers (i.e. there was no citizen call involved), and the other dispatch directives came from the housing

[7] We calculated the minutes per unit per shift in the following way: we used the number of dispatched calls over 730 days /730 days (to obtain a daily average); we then used the average time from dispatch to cleared across all call priority categories for the before and after periods and multiplied this average time spent per call by the daily average number of calls. We then divided this number by the average number of patrol units responding to calls per day (before versus after).

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

police, fire department, city wide administrator, police supervisor or public works. The vast 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." These alpha units were assigned to the nine police districts and handled 98 percent of all 3-1-1 and 9-1-1 calls for service. We note that 460 of these alpha units handled over 90 percent of all 9-1-1 and 3-1-1 calls for service.

For our uptime and down time analysis, we examine a 730 day period before the 3-1-1 implementation and a 730 day period following the implementation of the 3-1-1 system. N = 6,935,001 dispatched records was 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 between calls. These "run-on" calls were counted as one unique block of committed time (ie uptime). Calculation of up time and down time, however, was confounded by overlapping times and our need to estimate a shift start 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. All categories of call sequences were included to calculate the number of minutes in an uptime block.

Calculating down time 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 periodically re-sets the time stamp to account for inaccuracies in the "time" fields), the BPD uses a series of shift start and end times to account for busy time and day of week periods, 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 down time: 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

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

and hour. This half-hour criterion allowed us to eliminate all short bursts of "down time" that we believed were useless blocks of time for patrol units to engage in any type of meaningful problem-oriented policing or community policing. We point out, from the outset, that the average down time was not calculated as the inverse of committed time. As such, one does not expect that increases in uptime will necessarily translate into a decrease in down time. Thus, our analysis presented in Table 4.4 is more sophisticated than a simple subtraction from committed time. We also remind readers that short bursts of "down time" (less than half and hour) are excluded from our analysis. Table 4.4 presents the results of our uptime and down time analysis.

Table 4.4 Total and Average Uptime and Downtime Blocks (in minutes) for Before and After 3-1-1 (alpha units only; downtime block criteria greater than half and hour)

Period	Shift	Call Origin	Up Time	N of Cases	Down Time	N of Cases
1	1	9-1-1	26.74	343,817	114.95	258,112
1	2	9-1-1	31.43	601,875	111.58	328,566
1	3	9-1-1	25.90	873,204	102.54	350,996
Totals and Averages for Before Period	All shifts	9-1-1	28.02	1,818,896	109.69	937,674
2	1	3-1-1	25.17	75,639	116.96	252,376
		9-1-1	29.60	247,851		
2	2	3-1-1	35.72	163,952	115.30	340,021
		9-1-1	31.15	420,187		
2	3	3-1-1	26.55	203,457	105.93	369,822
		9-1-1	27.48	597,363		
Totals and Averages for After Period	All shifts	9-1-1 and 3-1-1	29.28	1,708,449	112.73	962,219

This table reveals some very important results. First, the table shows differences across shifts in the average minutes that alpha units had in committed (uptime) and uncommitted (downtime) blocks of time. On average, during the pre-intervention period, patrol units spent 28.02 minutes in a committed block 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.

To estimate how the blocks of committed and uncommitted time played out in any one patrol shifts we used the daily average of patrol units during the before (489.41) and after (488.93) to estimate how many

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

"slots" patrol units had during an average shift[8]. We estimate that before implementation of the 3-1-1 system, patrol units had 2.62 downtime slots available of about 109 minutes in duration during an average shift. In the post intervention period, patrol units had about 2.70 downtime slots available of about 112 minutes in duration. This represents a very marginal increase in the number and duration of time slots available.

We also calculated the ratio of uptime to downtime cases to assess whether there was any difference in the before to after time periods. We estimate that before the 3-1-1 intervention 66 percent of the time slots were classified as committed time and 34 percent of the 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 percent) and a slightly larger proportion of an average patrol shift was available as "downtime" (36 percent). This means that in the post intervention period, at least one in three blocks of time are downtime slots that will last for over an hour and a half. Overall, these results reveal that patrol officers have some degree of predictability as to the likelihood that a break in committed time will lead to substantial time to engage in problem solving.

An added complication to our analysis was our need to account for the amount of downtime remaining at the end of a shift. These cases could not be "rolled" into the downtime totals because it would have required inserting a "dummy" record at the end of each shift. Since we could not estimate whether this "dummy" record should be a committed time or uncommitted record, we calculate the average time remaining for those cases with at least half an hour of uncommitted time. In total, there were 214,386 cases with at least 30 minutes remaining at the end of the shift before the 3-1-1 intervention and 234,073 cases with at least 30 minutes remaining at the end of the shift after the 3-1-1 intervention. We estimate that for these cases, the average amount of time available at the end of the shift was 162.26 minutes before the intervention and 164.09 minutes after the intervention.

[8] 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 down time 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).

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Overall, these results suggest that patrol units in Baltimore have 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: they have marginally more time slots, on average, to engage in problem-solving activities, and these time slots are just slightly longer in duration.

In addition to assessing the quantity of time that might be available for community policing activities as a result of introducing the 3-1-1 system, we also wanted to assess any change in the nature of the calls stemming from the introduction of the new 3-1-1 call system. We also wanted to explore further the possibility that citizens called 3-1-1 when, in fact, they should have called 9-1-1. Table 4.5 below presents the average number of calls per week by selected crime types processed by call takers from October 2, 1994 through December 31, 1999. For the 9-1-1 calls, we use the average number of calls per week for a before period from October 1, 1994 through October 1, 1996 (N = 105 weeks) and for the after period we examine the average number of calls per week from October 2, 1996 through December 31, 1999 (N = 170 weeks). We show the 3-1-1 and 9-1-1 proportion of total calls in the post-intervention period and we sum the average number of calls per week for 3-1-1 and 9-1-1 calls in the post-intervention period in order to calculate a percentage change in calls by selected crime type.

As this table shows, the introduction of the 3-1-1 system fundamentally changed the patterns of citizen reporting of crime 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 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 percent decrease in 9-1-1 calls regarding family disturbances the police received. Overall, the police received 90 fewer calls per week about family disturbances (9-1-1 + 3-1-1 = 586 family disturbance calls per week) 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.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 4.5 Percent Change and Before/After Comparisons of 9-1-1 and 3-1-1 Calls for Service by Selected Crime Types (reported in averages per week)

Crime Type	Before 9-1-1 only[1]	After 9-1-1[2] N (%)	After 3-1-1[3] N (%)	After Total[4] (9-1-1+3-1-1)	Percent Change in 9-1-1 Calls[5]
Murder	1.83	0.20 (100%)	0.00 (0%)	0.20	- 89
Rape	5.61	7.52 (82%)	1.65 (18%)	9.17	+ 34
Robbery	87.25	100.71 (84%)	18.89 (16%)	119.60	+ 15
Aggravated Assault	117.40	109.26 (89%)	13.55 (11%)	122.81	- 7
Burglary	166.95	189.26 (70%)	83.04 (30%)	272.30	+ 13
Larceny	515.26	200.45 (30%)	464.79 (70%)	665.24	- 61
Motor Vehicle Theft	115.54	87.17 (57%)	65.81 (43%)	152.98	- 24
Parking	204.33	24.65 (18%)	109.17 (82%)	133.82	- 88
Juvenile Disturbance	446.70	206.24 (49%)	212.38 (51%)	418.62	- 54
Loud Noise	266.44	34.85 (12%)	246.39 (88%)	281.24	- 87
Destruction of Property	621.03	198.58 (43%)	259.66 (57%)	458.24	- 68
Narcotics	1219.29	705.97 (48%)	764.82 (52%)	1470.79	- 42
Gambling	44.17	15.99 (35%)	29.09 (65%)	45.08	- 64
Auto accident	514.19	309.54 (80%)	77.58 (20%)	387.12	- 40
Family disturbance	677.46	492.21 (84%)	94.53 (16%)	586.74	- 27
Suspicious Person	368.87	177.06 (68%)	85.23 (32%)	262.29	- 52
All Calls[6]	19,560.55	12,324.92 (70%)	5,320.00 (30%)	17,644.92	- 37

[1] The average number of 9-1-1 calls (for selected crime types) per week from October 1, 1994 through October 1, 1996.
[2] The average number of 9-1-1 calls (for selected crime types) per week from October 2, 1996 though December 31, 1999 including percent of all calls (9-1-1 + 3-1-1) from October 2, 1996 through December 31, 1999.
[3] The average number of 3-1-1 calls (for selected crime types) per week from October 2, 1996 though December 31, 1999 including percent of all calls (9-1-1 + 3-1-1) from October 2, 1996 through December 31, 1999.
[4] Total number of 9-1-1 and 3-1-1 calls per week from October 2, 1996 through December 31, 1999.
[5] Percent change of 9-1-1 calls only from before the intervention to after the intervention.
[6] Total number, percent and percent change of all calls per week (in addition to those presented in the table).

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

More intriguing is 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 an 87 percent 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 vast majority (88 percent) of these loud noise calls were received by the 3-1-1 system. Citizen reporting for narcotics, motor vehicle theft, gambling, larceny and aggravated assault followed similar patterns to those demonstrated in the reporting of loud noises.

Overall, it appears that the introduction of the 3-1-1 non-emergency call system reduced the total number of citizen calls per month (see Table 4.5) from about 19,560 calls per week down to about 17,644 calls per week, including a decline of 37 percent of calls to the 9-1-1 system. However, it appears that the 3-1-1 system "adopted" about 30 percent 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).

On face value, one could conclude that citizen migration away from calling 9-1-1 towards the non-emergency 3-1-1 system to report some categories of crime and disorder incidents would free-up officer time to engage in community policing or problem-oriented policing activities. One could reasonably assume that fewer 9-1-1 calls would lead to fewer dispatched calls. We refer readers, however, to our results in Table 4.3 and the discussions in Chapters Five and Six that demonstrate a major flaw in the manner in which the Baltimore Police Department utilized the 3-1-1 system. As these discussions point out, many of the 3-1-1 calls to the police were dispatched, much in the same manner as 9-1-1 calls were dispatched. Indeed, many patrol officers were indifferent to whether the call originated through the 9-1-1 or 3-1-1 system: from their point of view, the call was dispatched and they were expected to handle the call for service in same manner as they would handle a 9-1-1 originating call. As such, any gains on paper in officer time that are identified in our 9-1-1 and 3-1-1 analysis are compromised by the police department policy that required the vast majority of 3-1-1 calls to be dispatched in a manner mirroring the 9-1-1 dispatch policies.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

4.4 Time Series Analysis

Our second step in analyzing the Baltimore CAD data was to create two interrupted time series statistical models. The first model includes 275 observation points of 9-1-1 calls for police service from October 1, 1994 through March 31, 1999. The second model includes 275 observation points of both 9-1-1 only (pre-intervention) and 9-1-1 combined with 3-1-1 calls (post-intervention) from October 1, 1994 through March 31, 1999.

The time series analytic method allowed us to model the effect (i.e. form and magnitude) of introducing the 3-1-1 call system on patterns of 9-1-1 calls for service. As McDowell and his colleagues (1980) suggest, a test of the null hypothesis (e.g. that the introduction of the 3-1-1 call system would not change the quantity of 9-1-1 calls for service received by the Baltimore Police Department) was not in question. Alternatively, our analysis sought to ascertain the exact form and magnitude of the 3-1-1 intervention.

The general form of the univariate ARIMA model is (p,d,q) (P,D,Q); where: p= the order of the autoregressive process, d= the degree of nonseasonal differencing, q= the order of the moving average process, P= the order of the seasonal autoregressive process, D= the degree of seasonal differencing, Q= the order of the seasonal moving average process. One of the necessary conditions of an ARIMA model is that it be stationary in its variance. Inspection of a plot of the raw time series reveals whether or not a series is stationary in its variance. Fortunately, a series which is not stationary in its variance can be made so by performing a natural logarithm transformation of the series.

In brief, univariate model identification of a time series (which is stationary in its variance) is based upon the examination of the autocorrelation function (ACF) which is a measure of the correlation between observations of a series at time t and succeeding time lags, and the partial autocorrelation function (PACF) which is a measure of the correlation between time series observations k units apart after the correlation at intermediate lags has been controlled or partialed out. Inspection of the ACF and PACF indicates whether or not the series is stationary in its level (i.e., requires differencing) and/or is contaminated by autocorrelation (i.e., requires the specification of autoregressive or moving average parameters). For example, if the ACF at lag one is large, say greater than or equal to .7, and if the ACF at succeeding lags decays very slowly, the analyst can deduce that the series is nonstationary in its level and requires differencing or requires the specification of a

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

trend parameter (i.e., a constant).[9] However, if the ACF reveals a significant value (i.e., spike) at a given lag, but no spikes at succeeding lags and the PACF reveals a spike at that same given lag but slowly decaying values at succeeding lags, the analyst can deduce that a moving average process is present. Finally, if the ACF reveals a spike at a given lag, but slowly decaying values at succeeding lags and the PACF reveals a spike at the same given lag, but values that approach zero at succeeding lags, the analyst can deduce that an autoregressive process is present. Based upon the researcher's interpretations of the ACFs and PACFs, competing models are estimated. As noted above, a model is considered statistically adequate when there is no longer any systematic variation among the model residuals.[10]

An examination of Figure 4.1 reveals a number of interesting characteristics of the current series. First, it appears that the series is not stationary in the homogeneous sense. Second, the process appears to represent an integrated process rather than 'white noise'. Third, while there may be trend or drift throughout the series, there is also a profound effect on the level of the series in the 106th week corresponding with implementation of the 3-1-1 system. Finally, the variance of the series appears to have been affected by the rather dramatic change in level associated with the 106th week drop in the series. Collectively, these characteristics pose rather unique challenges in identifying and modeling the average weekly 9-1-1 calls. Obviously, a significant research question is whether the implementation of 3-1-1 resulted in the observed impact on the series and, even more importantly, the *form* and *magnitude* of this impact.[11]

---

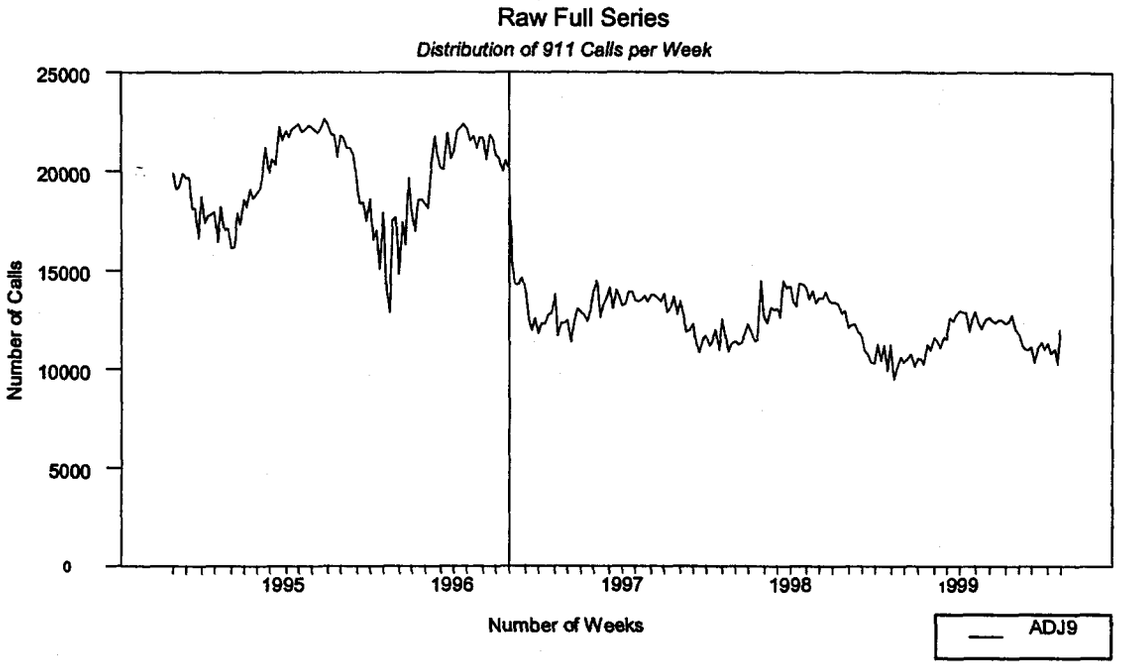
[9] The analyst can determine whether a nonstationary time-series reflects a random walk process (and thereby requires differencing) or a systematic change in the level of the series (and thereby requires the specification of a trend parameter) by testing the null hypothesis: $H_0 : \Theta_0 = 0$. If one can reject the null hypothesis, then the researcher must conclude that the time-series is drifting and must be differenced.

[10] The Q statistic, which is distributed as chi square, tests whether or not there is any systematic variation among the model residuals (i.e., do the residuals as a whole differ from a white noise process).

[11] In fact there can be little doubt that the implementation of 3-1-1 had a profound impact on the series as is visually obvious from an inspection of Figure 4.1. Thus, one can anticipate that a test of the H_0 hypothesis of no effect will be rejected. Nevertheless, as McDowall, et al., note, the *form* and *magnitude* of the relationship remains in question (McDowall, et al., 1980, p. 74).

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Figure 4.1 Distribution of 9-1-1 Calls October 1, 1994 – December 31, 1999



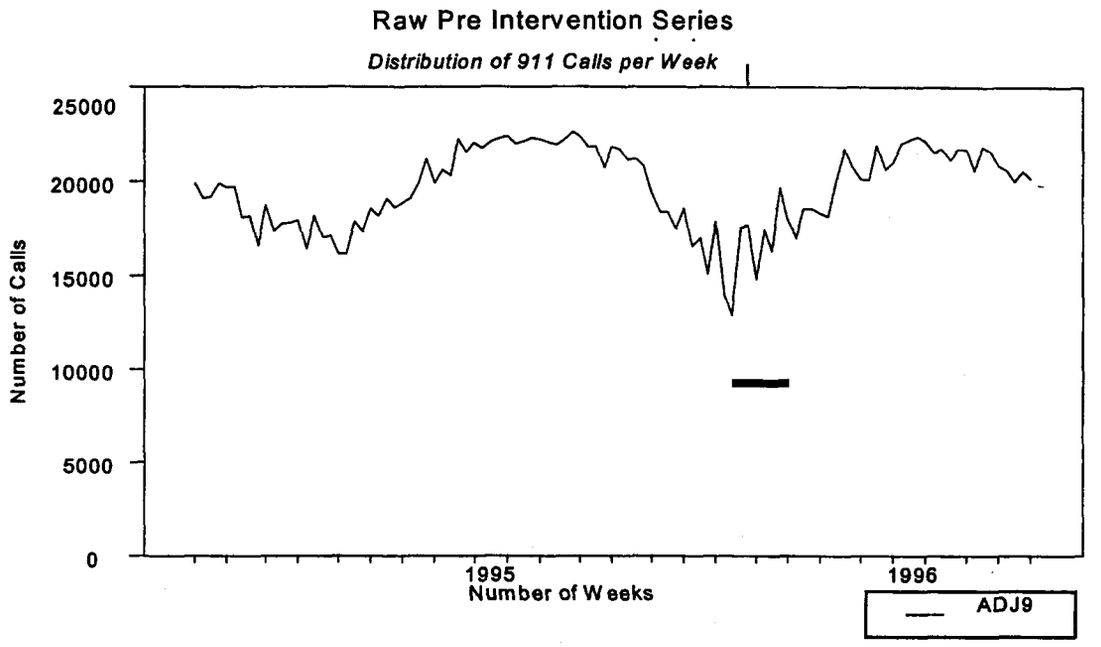
Identification of this model is restricted to the first 105 weeks in the series. This decision represents common modeling strategy and is based on the relatively dramatic drop in the series corresponding with the implementation of 3-1-1 beginning in the 106th week. This strategy is particularly compelling, since there is a corresponding drop in both level and variance following intervention. Obviously, it would prove beneficial to identify the noise component without these confounding influences (McCleary and Hay, 1980). [12]

Figure 4.2 depicts the raw pre-intervention realization of the average weekly number of 9-1-1 calls. Examination of this series suggests drifting or trending behavior within the series. It also appears that the series is oscillating between winter and summer months, which may reflect a seasonal component. In general, the variance appears relatively constant throughout the series, although there may be some irregularities between July and September of 1996. In any event, it appears that the series is nonstationary, at least in the homogeneous sense, and must be differenced. It also appears that both regular and seasonal differencing may be required.

[12] As McCleary and Hay indicate, impacts which have a profound effects on the level of the series tend to "overwhelm" the ACF and PACF and should be avoided. p. 152.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

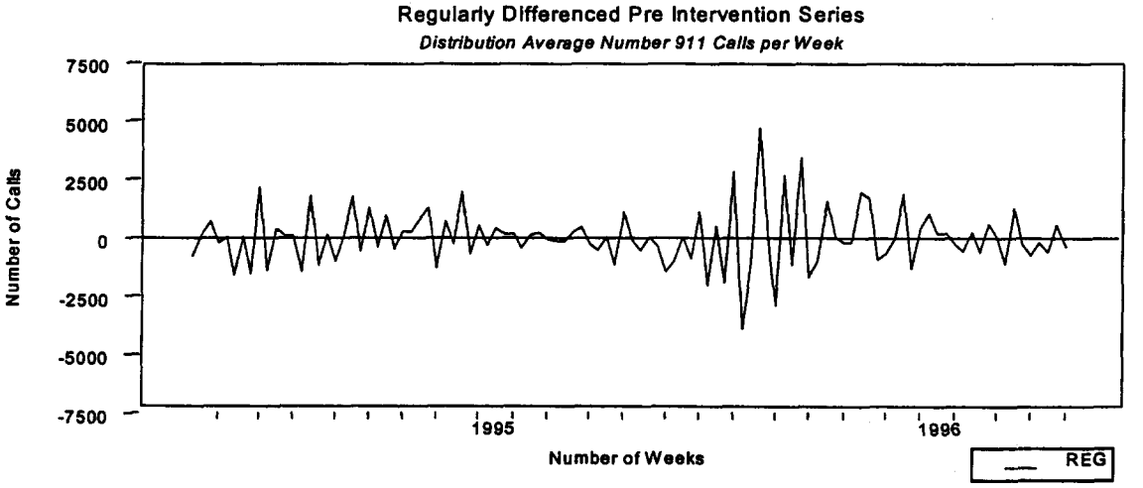
Figure 4.2 Pre -Intervention 9-1-1 Call Distribution



While questions concerning irregularities in the variance arise in both the pre and post-intervention segments, we delay our discussion of these until after we have examined the effect of differencing on the pre-intervention series.[13] Here, we merely direct attention to the underlined area in Figure 4.2 which may reflect irregular rather than constant variance in the pre-intervention level.

We begin with first order differencing of the pre-intervention series as depicted in Figure 4.3.

Figure 4.3 Regularly Differenced Pre-Intervention 9-1-1 Calls



[13] Interested readers are directed to Appendix 4-A for the Autocorrelation and Partial Autocorrelation distributions and corresponding significance tests associated with this discussion.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Examination of the regularly differenced series reveals that the differenced series now appears to fluctuate, albeit noisily, around a zero mean. While the variance appears relatively constant throughout its course, the series, as noted above, does show some unexplained variation between July and September of 1996. This observation, along with the relatively proportional decrease in the variance observable in Figure 4.1, suggests that the series may be nonstationary in the larger sense and represents a factor which must be taken into account prior to impact assessment (McCleary and Hay 1980).

While we will further explore the appearance of nonstationary variance in some detail momentarily, we postpone this discussion until after an analysis of the ACF and PACF for the pre-intervention series. During the course of our discussion of autocorrelation, we refer readers to the ACF and PACF distributions provided in Appendix 4-A.

The initial ACF and PACF for the raw series are presented in Table I, Appendix 4-A.[14] Analysis indicates that the pre-intervention series is a nonstationary process. The *damped sine wave* distribution in the ACF suggests that this distribution will require at least first order differencing to ensure stationarity (Dixon 1992: 473) and may require seasonal differencing as well.[15] The key to this conclusion is the slowly decaying and relatively high autocorrelation in the initial lags of the series. Both the standard errors for the initial ACF and the Ljung – Box Q statistics confirm this interpretation by leading to a rejection of the H_o ACF(k) = 0. We begin by positing an ARIMA(0,1,0) model and possibly an ARIMA(0,1,0)$(0,1,0)_{52}$ model.

The ACF and PACF for the regularly differenced series is presented in Table II (Appendix 4-A). The ACF, after regular differencing, shows a significant spike in the first lag, followed by relatively low correlation among the remaining lags. We note that lag 8 does reach statistical significance, suggesting that some unmodeled noise remains in this model. Examination of the PACF shows a rapidly and exponentially decaying series of spikes in the initial values which are followed by insignificant lags, although there is an aberrant spike in lag 5 reaching marginal significance. We conclude that an examination of the ACF and PACF suggests an ARIMA(0,1,1) process. This identification is based on the significant spike in ACF lag 1 and the rapidly decaying PACF. Thus, we begin by diagnostically checking this preliminary model.

The results of this analysis are reported in Table 4.6. Initially we tested this ARIMA(0,1,1) noise component with a trend parameter included in the model. However, failing to reject the $H_o : \Theta_0 = 0$, we

[14] Tables I through XIII are provided in Appendix 4-A.

4.1 - 4.10

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

dropped this parameter, concluding that the pre-intervention series does not require a trend parameter. We also note that drifting within the series is substantively reduced with first order differencing. The identified moving average parameter, Θ_1, is retained since it is statistically significant and within the bounds of invertibility.

An analysis of the residuals of the estimated model, however, are far from definitive (see Table III Appendix 4-A). In fact, the non-logged model of these residuals produces a Q value of 79 with k – 2 degrees of freedom representing the retained Θ_1 parameter and differencing. The x^2 value with .10 and .05 probability respectively is 63.17 and 67.5. These values indicate that the H_o ACF(k) = 0 cannot be rejected, providing evidence that the model is inadequate as specified and requires further identification. However, the re-estimated log transformed model is more consistent with a stationary process. The new estimate of Θ_1 is 0.4852 with a t-ratio of 5.65 and standard error of 0.0858. The Q statistic for the transformed series is 66 and the table values with k-2 degrees of freedom remain the same. Thus, the logged transformed series is very close to a white noise process and even meets the statistical criteria at the .05 level of significance. Even more importantly, the vast majority of autocorrelations (96 percent) are within 95 percent confidence intervals as shown in Table IV of Appendix 4-A.

Table 4.6 Pre-Intervention Series: Average Weekly Number of 9-1-1 Calls ARIMA(0,1,1) Model

Parameter	Coefficient	Standard Error	T-Ratio	Probability
Θ_1	0.4548	0.0875	5.20	> .001
Ln Θ_1	0.4852	0.0858	5.65	> .001

As a result, we tentatively accept this model and turn our attention to the full series. Although there is unmodeled noise in lags 4 and 8 that might be modeled directly, we remain more concerned with the possibility that the full model may require seasonal differencing and parameters. We base this belief on plot of the full series depicted in Figure 4.1, rather than the empirical results from our pre-intervention analysis.

[15] The ACF, PACF, and standard errors used in the identification process are provided in Appendix 4- for interested readers.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Given our examination of that series and the unmodeled noise in the ARIMA(0,1,1) model, we are led to believe that an ARIMA$(0,1,1)(0,1,0)_{52}$ model should be explored. This decision is especially appropriate since we lack sufficient observations, using only the pre-intervention series to examine the critical 52nd lag for seasonal effects. While this modeling strategy may appear somewhat arbitrary, we believe it is justified by the apparent seasonality in the raw series, the post-intervention reduction in variance and the lack of observations in the pre-intervention period. Should we be unable to identify significant contributions from seasonal components, we would be in a position to empirically restrict our analysis. Furthermore, while it is an error to introduce unwarranted seasonal components, it is a greater error to fail to introduce such parameters when warranted.[16]

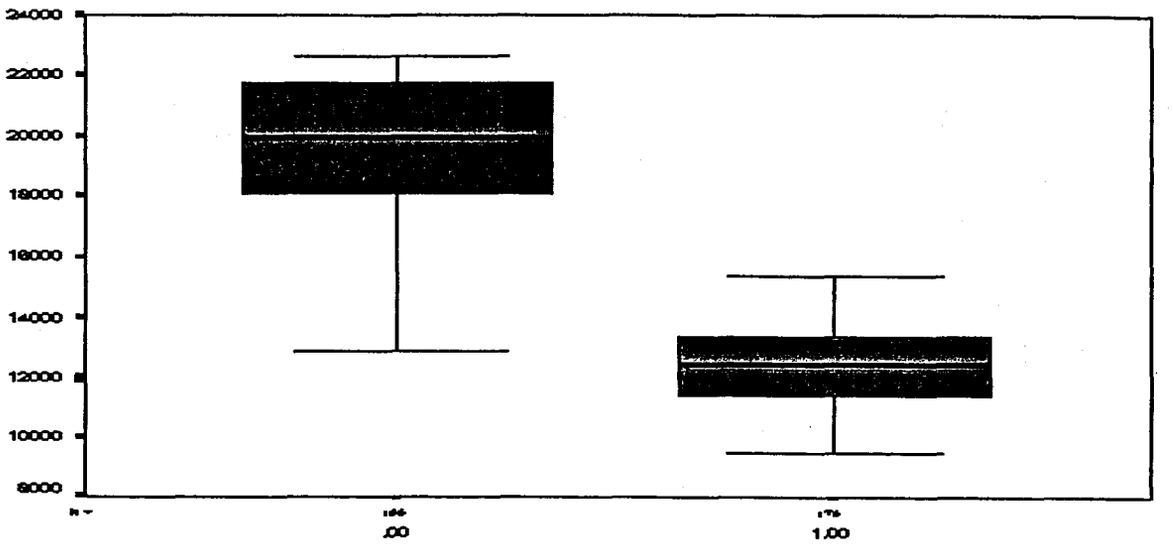
Thus we will estimated an ARIMA$(0,1,1)(0,1,0)_{52}$ for the full series. Should we fail to find significant seasonal effects, we will return to isolating the impact of Θ_4 and Θ_8 for analysis. Before turning to this analysis, however, we return to the issue of whether the series is homogeneous in its variance. We noted in our discussion of Figure 4.1 that the full series had several characteristics, including a substantial reduction in the number of calls corresponding with the introduction of the alternative 3-1-1 system. We also noted, that accompanying this reduction was a corresponding reduction in the variance of the series after the 106th week.

In Figure 4.4 we examine the variance of the pre and post-intervention series. It is visually apparent from the boxplots that the variance of the pre and post-intervention series is substantively different Thus, the variance is not constant over the course of the series and therefore not stationary in the larger sense. Although differencing provided a more stationary series in the homogeneous sense, it did not impact homogeneity in variance. In short, the pre-intervention model remains nonstationary in the larger sense and continues to demonstrate nonstationary components in the homogeneous sense.

[16] It is more problematic to fail to include a seasonal component which is warranted, than to include an unwarranted seasonal component. Furthermore, inclusion allows further avenues in identification and diagnostics to correct unwarranted inclusions. See, for example, the dispute between Deutsch and Alt and McCleary and Hay with special reference to p. 121 in McCleary and Hay, 1980.

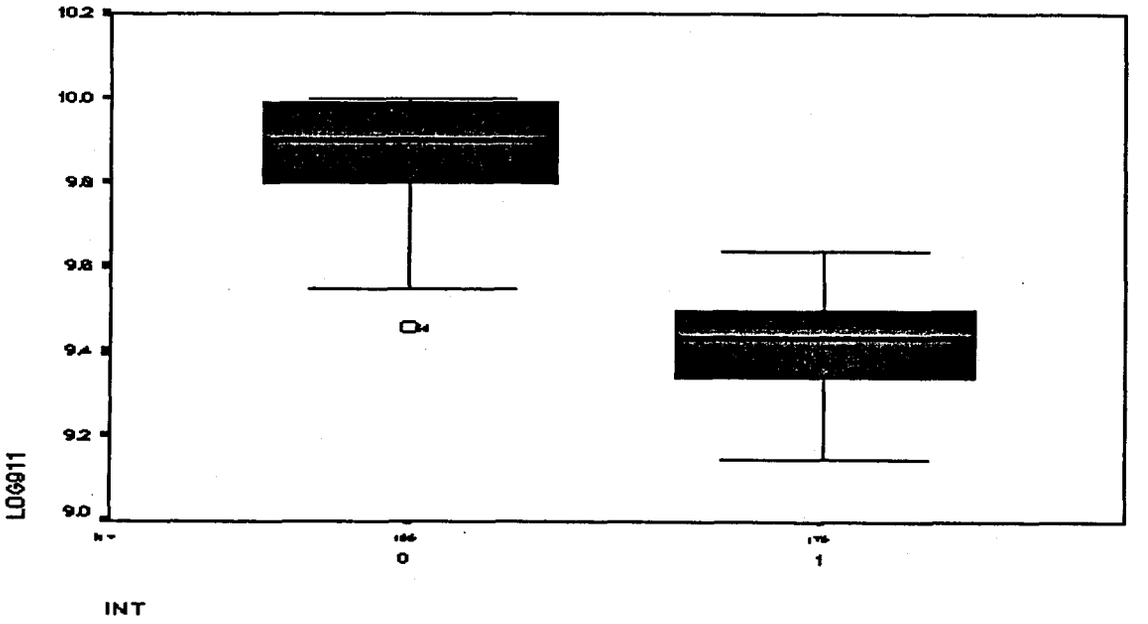
This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Figure 4.4 Non-transformed Series: Comparison of Pre and Post-Intervention Variance



Our initial identification, therefore, becomes even more problematic with the introduction of the remainder of the series. To account for this impact, we begin by taking the log of Y_t for the entire series.[17] This transformation, while not impacting the level of the series, serves to reduce the variance between the two series segments. This is visually apparent in Figure 4.5 where the boxplots reflect the logged transformed 9-1-1 calls.

Figure 4.5 Log Transformed Series: Comparison of Pre and Post-Intervention Variance



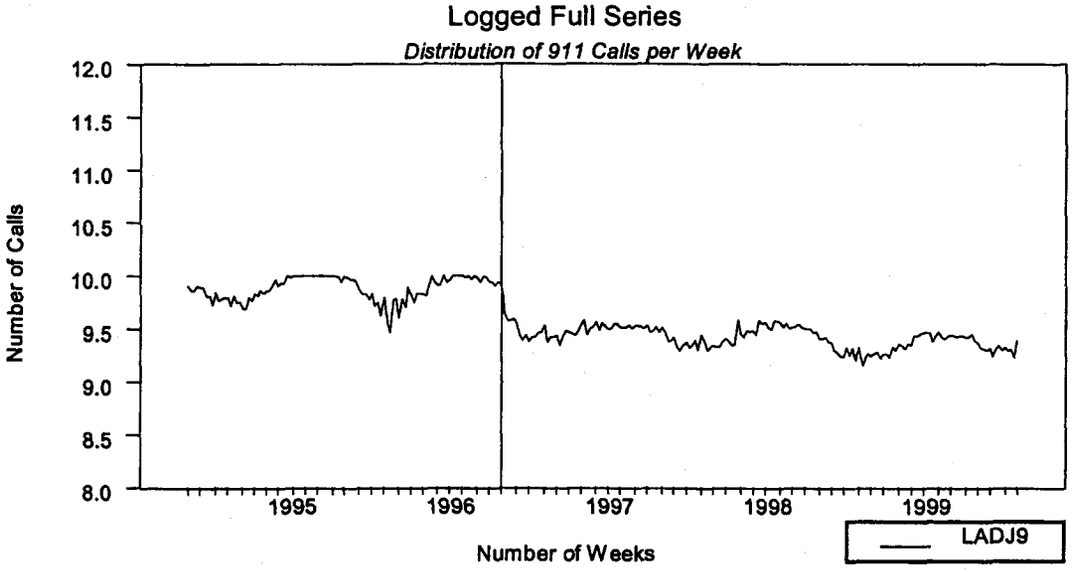
[17] As McCleary and Hay demonstrate, the log transformation is a relatively simple transformation which, while not impacting stationarity in the homogeneous sense, substantially reduces the fluctuations in variance between the series segments. (McCleary and Hay, 1980. pp. 48 – 53).

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

It is apparent that while the difference in series means has not been altered by the transformation, the sample variance between the two segments has been reduced.[18] To further explore the potential risks inherent in modeling the noise component without addressing this issue with variance, we plot the logged 9-1-1 calls and their residuals for the entire series.

As can be seen by reference to Figure 4.6, the logged transformed series is more constant in its variance than the distribution depicted in Figure 4.1. The variance is now more consistent throughout the course of the series, including the variance between July and September 1996.

Figure 4.6 Distribution of Logged 9-1-1 Calls October 1994 – December 1999



The impact of this transformation is even more striking examining the residuals from the regularly and seasonally differenced series depicted in Figure 4.7. This log transformation, however, has not altered the ratio between the pre and post-intervention levels.[19]

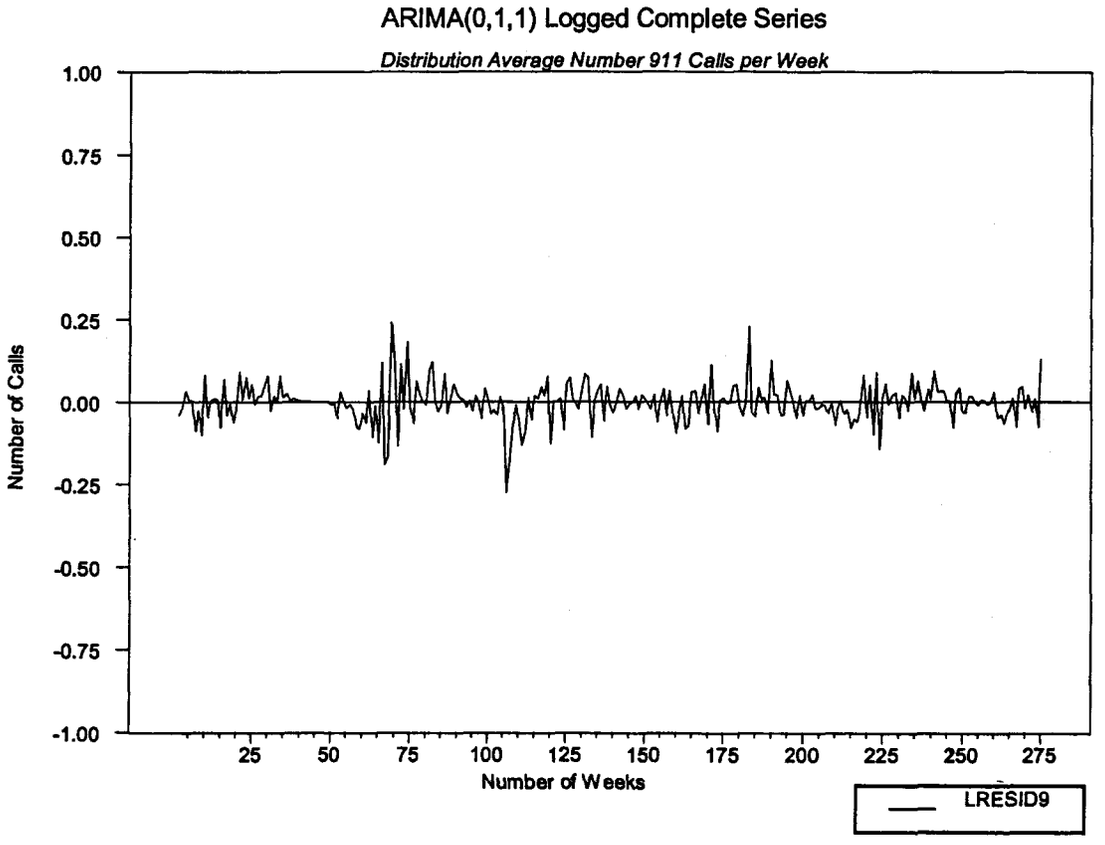
[18] See McCleary and Hay, 1980 and McDowall et al., 1980 for a full discussion of the logged transformed series. For more informative reference to this and other potential transformations, see McCleary and Musheno, 1980; Box and Cox, 1964.

[19] This is observable in a comparison of Table III and IV in Appendix 4 – A.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Given this smoothing of variance, we will use the logged transformed 9-1-1 calls for exploration of the full model and examination of the impact component. We begin by reexamining the noise component for the full series. As we noted above, it was impossible to test an ARIMA $(0,1,1)(0,1,0)_{52}$ pre-intervention model with only 105 observations in the pre-intervention series. Additionally, the issue of variance, which we have corrected by the previously described transformation, further confounded an identification of an adequate noise component. Given both of these issues, there is little to be gained by returning to the pre-intervention series in efforts to fit an adequate model. Instead we begin by fitting a noise component, albeit directed from our pre-intervention analysis, for the full model.[20]

Figure 4.7. Residuals for Regularly and Seasonally Differenced Logged 9-1-1 Series



[20] See McCleary and Hay for a detailed description for a similar solution p. 181

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

We first examine an ARIMA(0,1,1)(0,1,0)$_{52}$ model to assess the extent to which this model allows identification of a seasonal component. If seasonality is identified, we will further explore potential seasonal parameters suggested by the ACF and PACF. We begin with an analysis of the ACF and PACF of this model as depicted in Table V of Appendix 4-A. The ACF and PACF plots clearly suggest a seasonal component to this model. Additionally, after the log transformation and regular and seasonal differencing, the Θ_1 parameter remains statistically significant and within the bounds of invertibility. Furthermore, the model residuals now clearly depict a white noise process or series made stationary by differencing. The Q value of 29 is well below the table value for x^2. Finally, the plot of the ACF indicates that there may be a seasonal moving average parameter as well.

Thus, we next model an ARIMA(0,1,1)(0,1,1)$_{12}$ in an effort to identify the appropriate noise component prior to examining the impact of the 3-1-1 system on the series. The results of this analysis are reported in Table 4.7, and Table VI of Appendix 4-A. As can be seen in Table 4.7 both moving average parameters are statistically significant and within the bounds of invertibility. Furthermore, examination of the ACF and PACF of model residuals in Table IV indicates that the H_o ACF(k) = 0 cannot be rejected.

Table 4.7 Entire Series: Average Weekly Number of 9-1-1 Calls ARIMA(0,1,1)(0,1,1)$_{52}$ Model

Parameter	Coefficient	Standard Error	T-Ratio	Probability
Θ_1	0.5974	0.0504	11.86	> .001
Θ_{52}	0.8420	0.0240	35.15	> .001

Given this final ARIMA(0,1,1)(0,1,1)$_{52}$ model, we are in a position to examine the impact of the alternative 3-1-1 system on the number of 9-1-1 calls being processed through the Computer Aided Dispatch system. The model being tested, Ln($Y_t = \omega_o I_t$ + (0,1,1)(0,1,1)$_{52}$, has three pertinent parameters which are presented in Table 4.8.

Table 4.8 Entire Series With Intervention Component: Average Weekly Number of 9-1-1 Calls ARIMA(0,1,1)(0,1,1)$_{52}$ Model

Parameter	Coefficient	Standard Error	T-Ratio	Probability
Θ_1	0.7458	0.0422	17.68	> .001
Θ_{52}	0.8245	0.0242	34.06	> .001
ω_0	-0.2923	0.0343	-8.52	> .001

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

It is clear that all three parameter estimates are statistically significant. Both moving average parameters are within the bounds of invertibility and statistically adequate. Additionally, the intervention component, or zero order transfer function, is statistically adequate and represents the pre to post change in the natural logarithm of the series (Table VII Appendix 4-A).

To enhance understanding of this impact, we convert the natural log value of ω_0 back into its raw metric. By exponentiating the $e^{\omega 0}$ parameter, we can compute the pre to post percent reduction in the level of the series attributable to the a priori identified intervention. Thus we find a 25 percent reduction, $[(e^{-.2923} - 1)\ 100 = -25.35]$, in the pre to post level of the series. Given the preintervention level of 19,642 weekly calls, this represents a 25 percent reduction or a reduction of roughly 4,979 calls per week attributable to the intervention component. Obviously, this does not translate into a new series level of roughly 14,663 calls. Rather, this reduction is independent from the drifting behavior of the series which occurs independent of the implementation of 3-1-1. In fact, the overall level of the series during the postintervention period is roughly 12,365 per week, reflecting a total reduction in calls of 7,276 per week. Of these, a reduction of 2,297 calls is not explained by the intervention component specified in the current model, but result from the drifting behavior of the series.

These data may appear to support the hypothesis that patrol officers are afforded additional time when responding to calls for service as a consequence of fewer calls. These results, however, are limited to those calls that previously arose through the 9-1-1 system. Thus, it is only within this system that we observe a 25 percent reduction in the number of calls entering the CAD system. Should these calls be offset by an increase in the number of calls originating from another source, these apparent gains would be reduced.

In an effort to explore the extent to which the total number of citizen calls has been diverted from "dial a cop" to alternative policing strategies encompassing community and problem oriented policing, we explore the distribution of combined 9-1-1 and 3-1-1 calls.

We again begin with model identification for the combined model. Although we will again test the impact of the alternative 3-1-1 strategy in this model, we are not confronted with the same limitations experienced in our analysis of the 9-1-1 system. That is, examination of the raw combined series does not reflect an abrupt drop in the number of calls corresponding to the introduction of 3-1-1. It appears that calls which were traditionally handled by 9-1-1, while diverted to the 3-1-1 system, were handled in much the same

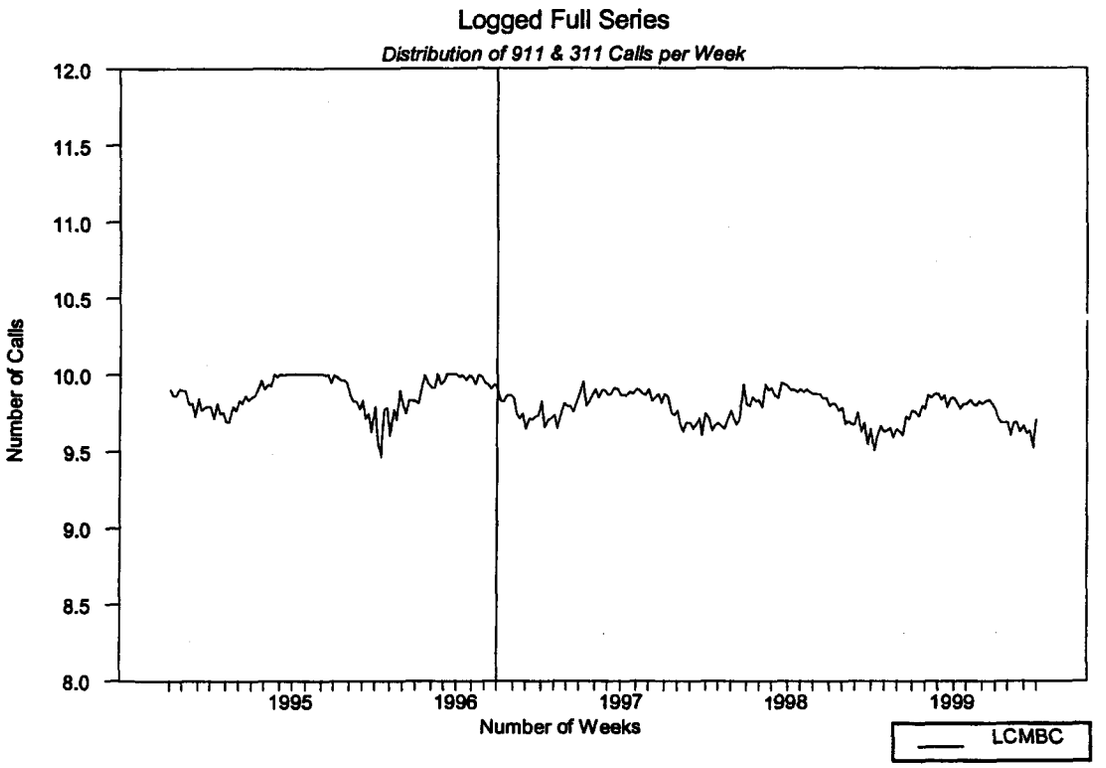
This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

manner with respect to being processed through the CAD system. Figure 4.8 depicts the realization of the combined series over the 275 weekly periods.

Unlike Figure 4.1, this series appears to maintain a more constant variance throughout its course. Obviously, departures from a constant variance, noted in Figure 4.1, are replicated here for the period between July and September of 1996. In general, however, modeling the current series should prove less challenging than our modeling of the 9-1-1 series. We begin the process of identification by examining the ACF and PACF of the raw series.

The initial ACF and PACF again suggest that the series is not stationary and differencing is required. This interpretation results from the slowly decaying damped sine wave. There is also a large number of high correlations in both the ACF and PACF and statistically significant Q statistics which result in the failure to reject the H_0 : Acf(k) = 0. The identified model is rejected and a regularly differenced ARIMA(0,1,0) is examined.

Figure 4.8 Distribution of 9-1-1 & 3-1-1 Calls October 1 1994 – December 31, 199



This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

The regularly differenced model continues to have relatively high correlations in both the ACF and PACF which are significantly different from white noise. Once again the H_0 : Acf(k) = 0 cannot be rejected and the model remains non stationary in the homogeneous sense. There is one significant spike in ACF 1 and the PACF shows a pattern of exponential decay indicating that and ARIMA(0,1,1) model may be appropriate.

An ARIMA(0,1,1) model continues to represent ACF which is different from white noise. The model, while improving, remains nonstationary in the homogeneous sense. Nonetheless, the moving average parameter is statistically significant and within the bounds of invertibility. Unfortunately, examination of the ACF and PACF, does not point to a specific model which might enhance the stationarity of the model. Nonetheless, Figures 4.1, 4.6 and 4.8 depict patterns that suggest that there is a seasonal component to this series. Although this model is not indicated by the ACF and PACF we believe that the seasonal pattern apparent in the 9-1-1 series and the seasonal indication of the plotted series warrant an examination of a seasonal moving average parameter.

Although the seasonal moving average parameter lies within the bonds of invertibility and is statistically significant, evaluation of the ACF and PACF residuals continue to indicate that the identification is not satisfactory. While the model may appear satisfactory in other dimensions, Q statistics for the estimated model require rejection of the null hypothesis H_0 : Acf(k) = 0. Before abandoning the potential seasonal component, however, we will reestimate the model after seasonally differencing the series. Thus the new model is an ARIMA $(0,1,1)(0,1,1)_{52}$. Here we have identified an ARIMA model similar to the model identified for the 9-1-1 series.

Both moving average parameters are significant and within the bounds of invertibility and the residual ACF now depicts a white noise process. The Q statistic of 33 is statistically significant with 34 degress of freedom and the mean of the model residuals is superior to a seasonally differenced model without the seasonal moving average parameter.

The estimates of the identified model are provided in Table 4.9 and meet the diagnostic criteria of statistical significance and bounds of invertibility. Since the model is now stationary, at least in the homogeneous sense, we again introduce the impact of the 3-1-1 intervention on this model.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 4.9 Entire Series: Average Weekly Number of 9-1-1 & 3-1-1 Calls ARIMA(0,1,1)(0,1,1)$_{52}$ Model

Parameter	Coefficient	Standard Error	T-Ratio	Probability
Θ_1	0.8273	0.0381	23.55	> .001
Θ_{52}	0.8192	0.0246	33.25	> .001

Unlike the 9-1-1 series, review of the plot of the raw combined series leaves us skeptical that an impact effect will be identified. Nonetheless, theoretically, the combined series will help us to determine if the combined number of calls has reached a new level following the implementation of 3-1-1. That is, to the extent that the 3-1-1 calls are being processed outside of the CAD system, the combined series should continue to reflect a downward trend following the implementation of 3-1-1. Alternatively, to the extent that the 3-1-1 calls are processed in a traditional manner, the level of the series should reflect this and there should not be a significant impact effect following implementation.[21]

While review of the plot of the raw combined series leaves us skeptical, it is possible that the combined series could also reflect an impact effect, provided that the processing of 3-1-1 calls is being conducted outside the CAD system.

With this caveat in mind, we provide the $Ln(Y_t = \omega_o I_t + (0,1,1)(0,1,1)_{52}$ impact assessment model for the combined series. The noise component is identified as an ARIMA$(0,1,1)(0,1,1)_{52}$ and the impact is again identified as an abrupt permanent impact reflecting a first order transfer function. The results of this model are presented in Table 4.10.

Table 4.10 Entire Series Intervention Component: Average Weekly Number of 9-1-1 & 3-1-1 Calls ARIMA $(0,1,1)(0,1,1)_{52}$ Model

Parameter	Coefficient	Standard Error	T-Ratio	Probability
Θ_1	0.8299	0.0351	23.65	
Θ_{52}	0.8183	0.0247	33.11	
ω_0	-0.0340	0.0294	-1.16	NS

[21] Of course, to the extent that the 3-1-1 calls do not enter the CAD system, there is some relief afforded previous processing of calls provided that these 3-1-1 calls reflect calls that traditionally entered the system and were processed. To the extent that they represent additional calls not previously entering the 9-1-1 system, they represent an additional workload being absorbed without further derailing the 9-1-1 system.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

As can be seen, by reference to this table, the moving average parameters are statistically significant and within the bounds of invertibility. However, the impact parameter is not statistically significant. Although 3-1-1 calls are diverted to a new group of call takers, they remain integrated within the CAD processing system. It appears that there is roughly the same number of calls entering the CAD system after the introduction of 3-1-1. While the pattern of these calls has shifted less serious calls into the alternative 3-1-1 system, as we report elsewhere in this report, the total number of calls entering the CAD system has not been substantially altered.

4.5 Summing Up

The introduction of the 3-1-1 system in Baltimore sought to provide a technological infrastructure to divert calls from the overburdened 9-1-1 system and thus free-up officer time for community and problem-oriented policing activities. This chapter provides an objective assessment of the impact of 3-1-1 on call patterns and police call handling patterns in Baltimore.

Our analysis of the Baltimore CAD data reveals several important findings: first, large numbers of 3-1-1 calls never get recorded into the CAD system. Indeed, there are about 4,500 calls per week that the Baltimore Police Department handle, but do not keep a record of. We conclude that a large portion of these calls comprises a new category of calls that the police previously did not receive and that they primarily represent information requests and referrals to other government agencies. Remembering that sworn officers handle these calls, we conclude that the 3-1-1 system has introduced an added function and burden on the police to receive, direct and handle information requests for a wide variety of matters from citizens. We question whether this additional service provided by the police makes the best use of sworn officer time.

Second, our time series analysis of the CAD data shows a large and statistically significant decline in 9-1-1 calls for police service following the introduction of the 3-1-1 system. There are about 5,000 less 9-1-1 calls per week, representing about a 25 percent decline in 9-1-1 calls for police service that can be directly attributed to the introduction of the 3-1-1 call system. Priority five calls are virtually obliterated from the 9-1-1 call system and there is an overall reduction in priority five calls that are somewhat offset by the increase in priority one calls. Our time series analysis of the trends in all calls (3-1-1 and 9-1-1 calls), however, reveal no change in the number of calls received by the BPD that can attributed to the introduction of the 3-1-1 call system. We also surmise that the increase in priority one calls are spuriously related to the introduction of the 3-1-1 call system as the trend increase in priority one calls began before the 3-1-1 call system was implemented.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

The police department dispatched 3-1-1 calls in much the same way that they dispatched 9-1-1 calls (in terms of the proportion of calls dispatched per priority level). We note, however, that the police were slower to dispatch, arrive and clear 3-1-1 calls compared to their time spent handling 9-1-1 calls. We also acknowledge that the BPD modified some of their operational approaches to handling calls for service following the introduction of the 3-1-1 call system (e.g. they ceased dispatching priority five calls; and they were faster at responding to 9-1-1 calls for service). At the same time, however, the number of alpha patrol units assigned to respond to calls for service remained steady from before to after the introduction of the 3-1-1 call system.

Our up time and downtime analysis showed that alpha patrol units had as much as 11 percent less committed time following the introduction of the 3-1-1 call system. When we examined committed and uncommitted time per unit per shift, our analysis shows that alpha units only had marginally longer downtime blocks of time (an average of about 3 minutes longer per downtime slot of more than half an hour) and they had marginally more down time slots (from 2.62 down time slots per shift to 2.70 downtime slots per shift) after the introduction of the 3-1-1 call system.

We conclude that the managerial and policy changes implemented by the BPD were the primary factors that influenced the way that patrol officers spent their operational time, rather than the 3-1-1 technology itself. We discuss the implications of these research findings in chapter ten.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

5 CHAPTER FIVE: 3-1-1 AND BALTIMORE'S NEIGHBORHOOD SERVICE CENTERS

5.1 Introduction

The city of Baltimore's Neighborhood Service Centers (NSCs) opened July 1, 1996, as a one-stop contact and referral point for all city services. The NSCs are federally funded and operate under the Department of Housing and Community Development.[1] The NSCs are housed in community centers and schools at nine locations throughout the city for which the boundaries correspond with police districts. They are staffed by representatives from city agencies including housing inspectors, health inspectors, forestry, department of public works coordinators, fire inspectors, section 8 community liaisons, human service workers, and police sergeants. The mission of the NSCs is to provide easily accessible community, public safety and health services to residents of Baltimore; receive and resolve concerns, and coordinate the efforts of City Departments to ensure an effective and timely response to neighborhood and citizen concerns.[2] Citizens may walk-in to the NSC in their neighborhood, call the main desk at the NSC, or call direct to an agency representative's office at the center.

5.2 The Relationship Between 3-1-1 and Neighborhood Service Centers

Our interest in the Baltimore neighborhood service centers stems from their link to the 3-1-1 non-emergency call system through *neighborhood service referrals*. Specifically, we were interested to examine the volume of calls referred to NSCs and the type of calls that were referred, what the differences were within and between calls referred to NSCs, and whether the characteristics of these calls revealed anything about the people who were calling or the places that they were calling about. Most importantly, we sought to understand whether neighborhood services referrals, as a component of the 3-1-1 system, have an effect on the quantity or quality of policing. Specifically, we asked: what are the differences in the way these calls are handled? Does this alternative police response help to reduce neighborhood problems? Finally, how are these 3-1-1 referrals integrated with other police operations?

This chapter describes the neighborhood service centers in Baltimore. We begin the chapter by explaining the Baltimore Police Department's involvement with the NSCs. We briefly examine the similarities

[1] Funding is obtained through Community Service Block Grant (CSBG) and Community Development Block Grant (CDBG) funds.

[2] Adapted from: Baltimore City. 1999. Southeast Neighborhood Service Center information pamphlet.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

and differences among the nine neighborhood service centers. We then discuss the 3-1-1 call handling process using the Computer Aided Dispatch system and the Local Access Network system. For a two-week period we examine all citizen calls placed to the 3-1-1 non-emergency number that were referred to a neighborhood service center. We examine how this sub-sample of calls were processed. We conclude by assessing the effect that the neighborhood service centers have on policing in Baltimore.

5.3 The Baltimore Police Department and Neighborhood Service Centers

There are nine neighborhood service centers in Baltimore. A police neighborhood service sergeant[3] is assigned to each of the neighborhood service centers. Their role includes handling 3-1-1 complaints, and providing assistance to employees of other city agencies in the Center. (E.g. accompanying housing or health inspectors into neighborhoods, locating property owners, conducting safety presentations for businesses and community meetings). Neighborhood service sergeants handle problems and complaints that are brought to the sergeants' attention via walk-ins from citizens and telephone calls directly to the neighborhood service center. The neighborhood service sergeants also receive complaints as *neighborhood services referrals* from the police communications center through a Local Access Network (LAN) system.

5.4 Neighborhood Service Centers and the Neighborhood Service Sergeants

Members of the UC research team visited the neighborhood service centers and interviewed the neighborhood service sergeants over a period of 4 months during site visits to Baltimore. Interviews focused on the role of the neighborhood service sergeant, record keeping at the NSCs, and the volume and type of 3-1-1 referrals common to each NSC.

Three of the nine neighborhood service centers (A, C, and H) opened July 1, 1996. Neighborhood service center -F opened in January 1997, NSC-I in January 1998, and the remaining three -- NSCs- D, E, and G – opened shortly thereafter. Five of the NSCs (B,C,D,F,G) are in sector 2 of their districts. The other four NSCs (A,E,H, and I) are in sector 3 of their districts.

There was wide variation in the time that the NSC sergeants had been in their positions. Of the nine neighborhood service sergeants, one retired during our field observation period, one retired shortly after our observation period, and one retired shortly after our field research concluded (late 1999). Two of the sergeants had been at their NSCs for more than 6 months, and two sergeants had been at their NSCs for 6 months. One of

[3] At the time of this study, the Northeast District NSC was staffed by a Police CSW (Contractual Specialist Worker).

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

the sergeants had just started at a neighborhood service center, and the last sergeant (whom we were unable to interview) was on extended medical leave. With one exception, all the NSC sergeants were male.

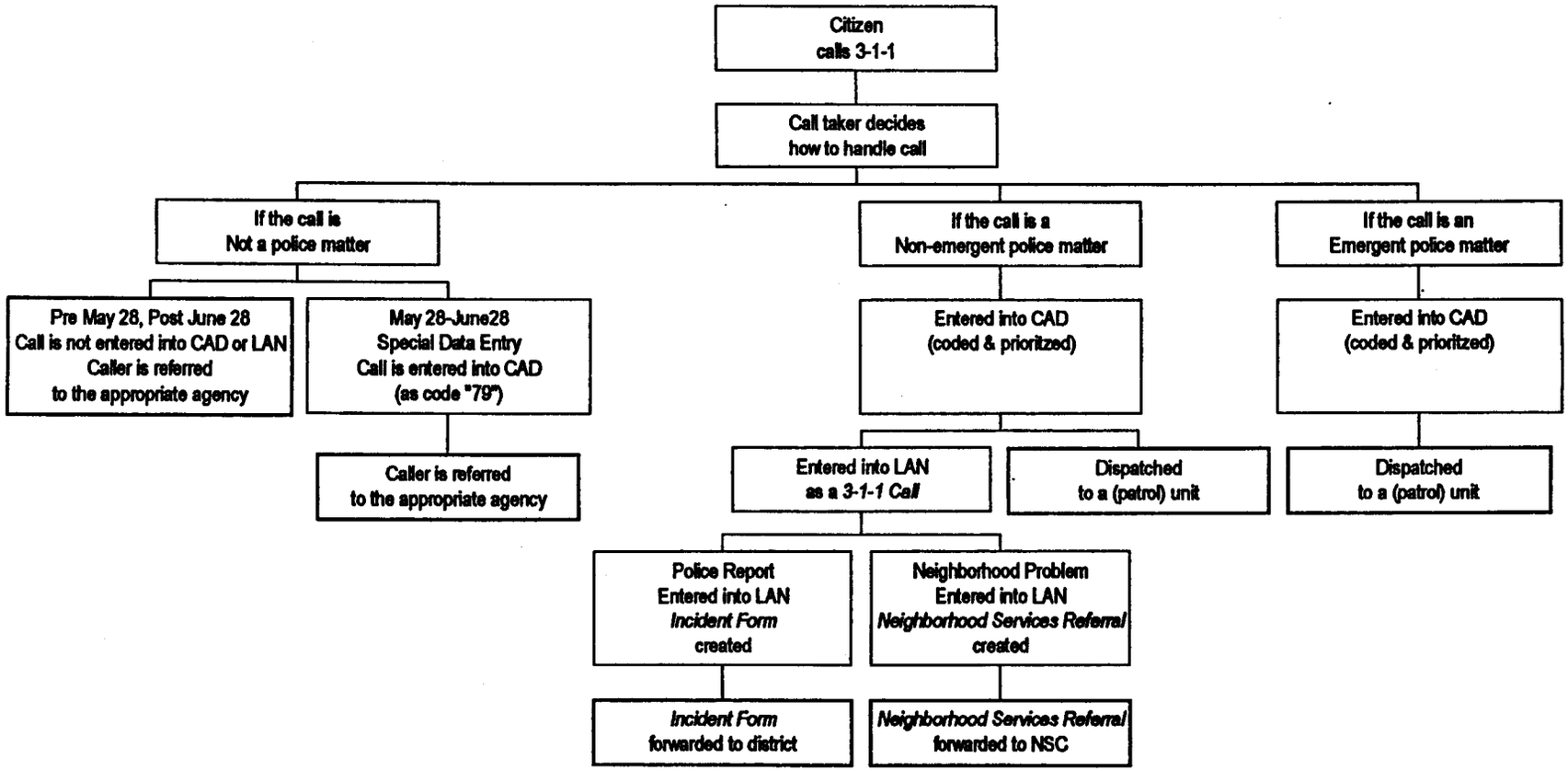
Four of the neighborhood service sergeants seemed to be very community oriented. They said that they liked to spend their shift out of the office and deal with the NSC referrals themselves. These four community-oriented sergeants were highly organized, but their main focus wasn't administration such as keeping track of their problem-solving efforts. Alternately, two of the sergeants were much more management and administratively oriented: They kept extensive records and follow-up information but, by their own admission, didn't spend much time in the community. They felt that their role was to forward the information to the district sergeants and ensure that these sergeants dealt with the issues. The anomaly was the sergeant who was strictly community oriented and tended to be adverse to any type of paperwork. After bringing up the NSC referrals on the computer terminal, this community-oriented sergeant would print them and then throw them out after they had been handled, keeping no records.

5.5 3-1-1 Call Process

Figure 5.1 describes the case flow and decision points of 3-1-1 call handling. When a 3-1-1 call is answered at the communications center the call taker requests from the caller the reason for the call. Under normal circumstances, if the call-taker decides the call is not a police matter, they will immediately refer the caller to the correct number to call. In these cases, there is no record made whatsoever of the call to the police: the call is not entered into the CAD system nor is it recorded into the LAN system. This is a major shortcoming from our research perspective as it meant that we had no means to quantify the volume of 3-1-1 calls received by the 3-1-1 call center without record of these non-police matter calls. Therefore, for the purpose of our research, we requested that the Baltimore Police Department keep a record of these non-police matter calls made to the 3-1-1 system. In compliance with this request, the BPD created CAD records for these non-police matter calls for the period May 28 through June 28, 1999.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Figure 5.1 3-1-1 Call Processing Chart



This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

If the call taker decides the police can be of assistance, information is entered into the Computer Aided Dispatch (CAD) system and a CAD number (call tracking number) is generated for that call. From the caller's description of the incident/problem a numeric code is assigned to the incident (e.g. caller reports a loud noise, the incident is coded 68). The call is then prioritized from 1 to 5 (e.g. depending upon the circumstances, a 68 might be assigned a priority of 4). Calls with a priority of 1 (emergency) through 4 (non-emergencies requiring police response) are sent to dispatch for a unit to respond. Priority 5 calls are classified as "true 3-1-1" calls and may or may not be dispatched depending upon the circumstances and the nature of the call. "True 3-1-1" calls are generally police reports, and calls that can best be classified as "other" (information requests and low priority calls for which there is no numeric code). Information requests range from inquires about whether/how to find out if an arrested friend/family member has been booked yet, to - who to call to report a street pothole, to - what temperature to cook a turkey at. Similarly low priority calls include: car blocking an alley; disorderly people loitering; and juveniles playing on pay phones.

For calls to report a crime, the CAD number and call information is immediately re-entered into the LAN, a separate computer terminal at the 3-1-1 call takers' workstation, to create a *3-1-1 Call Record.* (The LAN and CAD computers cannot presently transfer information. In future planned upgrades to the system, CAD and LAN entries will be integrated eliminating the current need for dual entry of data). The LAN record, like the CAD record, lists general call information and complainant/victim information (see Appendix 5-A). From the 3-1-1 Call Record an *Incident Form* is generated on the LAN, which is a more detailed record of the incident and includes crime scene information; reporting person, witness, and suspect information; and if applicable vehicle information, along with a brief narrative of the incident being reported. This record is provided to the district and sector in which the incident occurred. Incident forms are commonly completed for calls reporting: burglary, auto accident, larceny from auto, lost property, destruction of property, as well as family disturbance, disorderly person, narcotics, animal disturbance, missing person, or sick person.

A 3-1-1 Call Record may also be entered if the call taker determines that the call is one regarding a "neighborhood problem" or if the caller reports a problem of a persistent nature. These 3-1-1 Call Records are reviewed daily by a back log entry operator at the police communications center who then generates a *Neighborhood Services Referral* on the LAN. Neighborhood Services Referrals are sent via the LAN to a computer terminal at the appropriate neighborhood service center. The neighborhood service center sergeant can access these referrals and print them off as computer-generated forms which provide the CAD information

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

about the call (date and time the call was taken, date of the incident, location of the incident), information about the caller/complainant, a description of the incident that prompted the call to the police, and the number of prior calls for police service to the incident location (see Appendix 5-B).

The NSC sergeant handling the referral may choose to address the referral in a number of ways. If the complainant left a call back telephone number, the sergeant might call the complainant and inquire as to whether the problem has been resolved. If the problem remains unresolved or there is no information to contact the complainant, the sergeant makes a decision as to the appropriate action to be taken. This may include: providing information to the complainant, personally responding to the complainant or incident location, forwarding the referral to the police district's lieutenant, sergeant, or a specific post officer/neighborhood services officer to address the issue, and/or forwarding the referral to a special unit or team (e.g. narcotics, vice, outreach).

Depending on the NSC sergeant, referrals that are forwarded to a third party (e.g. narcotics unit) may or may not have a date by which an action must be taken and written documentation returned to the NSC sergeant. Some sergeants prefer to handle all neighborhood services referrals individually, forwarding a copy to the district sector manager for their information only.

5.6 Citizen Calls Received by 3-1-1

In this section we examine all of the calls placed to the 3-1-1 non-emergency number during a two-week study period. We examine the distribution of calls by outcome, specifically, were the calls dispatched to a police unit? Were the calls forwarded to a neighborhood service center, or was there no further action taken by the police department after speaking with the caller? We then explore in more detail the characteristics and dispositions of those calls that were later referred to a neighborhood service center.

5.6.1 Data

Data were obtained from the Baltimore Police Department Communications Center and included data tapes of calls for service from the Tiburon Computer Aided Dispatch system (CAD) from January 1998 through December 1999, and the Local Access Network system (LAN), which is a record of all 3-1-1 calls assigned a CAD number and entered into a Lotus Notes program, from January 1998, through December 1999. We specifically examined a two-week population of police department computerized records (LAN and CAD data) a period coinciding with field observations conducted in Baltimore from June 14 through June 28, 1999. (See Chapter 6).

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

5.6.2 Method

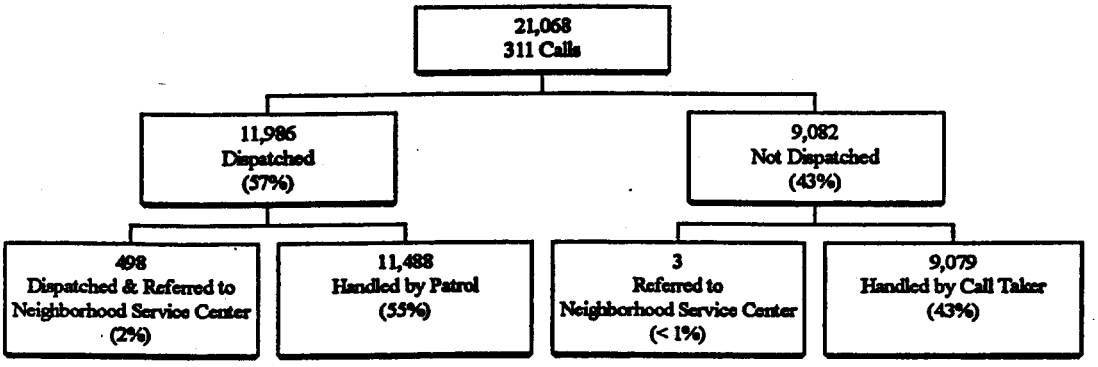
3-1-1 call takers at the communications center were asked to enter every call received between May 28 and June 28 into the CAD system. Calls that are routinely not entered were, for a one-month period, assigned the numeric code '79' referring to the miscellaneous "other" category. Calls receiving a '79' code include those calls that are identified as non-police matters or those calls when the call-taker provides information directly on the phone and is not required to make a CAD record of the call (e.g. directions to the Orioles game, referral to another agency, temperature at which to cook a turkey). Both the CAD data and the 3-1-1 LAN data were transferred, downloaded and converted into a foxpro data base. We examine all data for June 14 through June 28 to coincide with our two weeks of field data collection on-site in Baltimore

5.6.3 Analysis of all 3-1-1 Calls

There were a total of 21,060 calls placed to 3-1-1 for the period June 14 to June 28, 1999 (see Figure 5.2). These 3-1-1 calls are first divided into those that were dispatched (N=11,978, 57 percent) and those that were not dispatched (N=9,082, 43 percent). Of the calls that were dispatched, 498 were handled by patrol and *also* referred to a neighborhood service center (2.4 percent of all 3-1-1 calls). The remainder (N=11,488) were dispatched and handled by patrol only. Of the calls that were *not* dispatched to a patrol unit, three 3-1-1 calls (less than one percent) were referred directly to a neighborhood service center. The remaining 9,079 non-dispatched calls (43 percent of all 3-1-1 calls) were handled directly by the 3-1-1 call taker. In these cases the call taker either provided the requested information or transferred the call to the telephone reporting unit. For example, if a citizen called about the time of an Orioles baseball game, to ask for directions to a place or to request information that was deemed outside the span of police responsibility, then the call-taker would provide this information directly and then hang-up. Under normal circumstances, the caller would not create a CAD record for these calls. However, for the purpose of our research, the BPD created a special code for these calls and instructed call-takers to record these non-police matter calls into CAD for a one-month period (May 28 through June 28). As such, while we have this information about non-CAD record 3-1-1 calls for a one month period, we do not have extensive detail or longitudinal data for these types of calls.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Figure 5.2 311 Call Distribution June 14-28, 1999



This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

These data tell an important story. First, we were surprised to find out that so many 3-1-1 calls were dispatched to the patrol division. Indeed, in Chapter Four we report that an average of 5,320 calls are generally recorded by the 3-1-1 call center per week (see Table 4.2, average is over a three year time period from October 1996 through December 31, 1999). These recorded 3-1-1 calls do not include those additional 3-1-1 calls that are handled directly on the phone by the call taker (about an additional 4,500 calls per week). In this chapter, we reveal that during our two week study period (June 1999), there was an average of nearly 6,000 3-1-1 calls per week (N = 11978 calls for the two week period) that were dispatched to the patrol division. This represents a higher than average number of 3-1-1 calls per week, reflecting the busier summer months. Thus, we can be reasonably certain, that the vast majority of 3-1-1 calls are dispatched to the patrol division on a routine basis. This finding begs the question: how much time is freed up for patrol officers with the introduction of the 3-1-1 system if patrol officers continue to receive dispatched calls that originate from the 3-1-1 system? We would expect that any "free" time gained from reduced dispatches from 9-1-1 (see Table 4.1, Table 4.2) could be lost to calls dispatched via 3-1-1. In this scenario, patrol officers could be unaware of any reduction in 9-1-1 dispatched calls when the dispatching of 3-1-1 calls mirrors the number and types of calls dispatched prior to the introduction of 3-1-1 (but see Chapter Four, Table 4.3). Either way, if police–related calls received by 3-1-1 call-takers are also being dispatched to the patrol division, then we question the overarching function of the 3-1-1 system as a "community policing" number and as a technological means to facilitate community policing.

The second part of the story returns to the theme of the neighborhood service centers being the organizational unit in which to solve community problems identified via 3-1-1 citizen calls. We remind readers that these "referred" 3-1-1 calls constituted only 2.4 percent (N=498) of all 3-1-1 calls received. Nonetheless, our analysis shows that of these 3-1-1 calls referred to NSCs, 98 percent (N=490) were *first* dispatched to a patrol unit to respond to the call. This suggests that the NSCs may not be an *alternate* response to citizen non-emergency calls for service but rather an *additional* response. This finding counters the argument that NSCs constitute the front-line for community policing: from the outset, it was our understanding that non-emergency number systems were intended to divert calls away from 9-1-1 and free up officer time to involve themselves in community policing activities. It was our understanding that the 3-1-1 system was intended to divert calls away from the patrol division and handle calls that were deemed police matters in an alternative manner. Of all calls referred to Neighborhood Services Centers (N = 501), 99 percent were dispatched to the patrol division as well as being referred to the NSC. This very much appears to be double handling and we question the utility of

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

dispatching a non-emergency call placed to 3-1-1 that is also referred to the NSC. Indeed, the double handling of these calls could, in fact, be a barrier to optimizing patrol officer time and freeing up patrol officer time to engage in community or problem-oriented policing activities.

5.6.4 Analysis of 3-1-1 Calls Referred to Neighborhood Services Centers

We put aside for one moment the double-handling and dispatch nature of the vast majority of 3-1-1 calls. In this section we ignore the patrol division response to 3-1-1 and assess the nature of 3-1-1 referrals as well as the manner in which 3-1-1 calls were handled by NSCs. We point out that, from the outset, we expected many more 3-1-1 calls to be referred to the NSCs. Indeed, we expected the vast majority of 3-1-1 calls to be referred to the NSCs and not dispatched to the patrol division directly via the 3-1-1 call center.

Table 5.1 displays the incident description entered by the 3-1-1 call taker for those calls that were later referred to one of the neighborhood service centers. Only six types of incidents were referred to the NSCs during the two week period (juvenile disturbance, disorderly behavior, narcotics violation, parking complaint, vehicle disturbance, animal disturbance). Approximately half of these incidents were described as a juvenile disturbance.

Table 5.1 Calls Referred to Neighborhood Service Centers

Description	Percent	N
Juvenile Disturbance	49.5	244
Other, Disorderly	17.8	88
Other, Narcotics Violation	15.4	76
Parking Complaint	8.7	43
Vehicle Disturbance	5.9	29
Animal Disturbance	2.6	13
Total	100.0	493

"Juvenile disturbance" encompasses such juvenile behavior as: disorderly juveniles, juveniles drinking, juveniles inside vacant homes, loitering, opening fire hydrants, playing ball in the street, setting off fireworks, throwing bottles, throwing rocks, and juveniles playing on coin phones. "Disorderly behavior" includes: disorderly people loitering, people causing a disturbance, people fighting dogs, setting off fireworks, harassing customers, and females soliciting for prostitution. "Narcotics" usually refers to people selling drugs. "Parking complaint" includes calls regarding: vehicles illegally parked, blocking alley, blocking garage. "Vehicle Disturbance" predominantly refers to incidents of disorderly people on dirt bikes (in our data). Finally the majority of "animal disturbance" calls are regarding disorderly people fighting dogs (pit bulls).

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 5.2 illustrates the 3-1-1 calls received during the study period that were referred to neighborhood service centers, by day of the week and date. Calls are evenly distributed by day of the week with the exception of Thursdays, which had the lowest number of referrals to NSCs (only 24 calls were referred to a NSC on Thursday for both weeks).

Table 5.2 3-1-1 Calls Referred to Neighborhood Service Centers by Study Period

Day and Date Calls Received	Percent	N
Monday 06/14/99	9.5	47
Tuesday 06/15/99	9.7	48
Wednesday 06/16/99	9.7	48
Thursday 06/17/99	4.9	24
Friday 06/18/99	9.7	48
Saturday 06/19/99	9.7	48
Sunday 06/20/99	9.5	47
Monday 06/21/99	9.7	48
Tuesday 06/22/99	9.5	47
Wednesday 06/23/99	7.3	36
Thursday 06/24/99	4.9	24
Friday 06/25/99	0	0
Saturday 06/26/99	0	0
Sunday 06/27/99	0	0
Monday 06/28/99	5.7	28
Total	100.0	493

Table 5.3 shows the distribution of 3-1-1 calls later forwarded to a neighborhood service center by the time the call was received at the communications center. The greatest number of calls, 41 percent, were received in the evening hours between 6:01 p.m. and 12:00 a.m. (N=202). This period was followed by the afternoon hours from 12:01 p.m. to 6:00 p.m., during which time 31 percent of the total calls forwarded to a NSC were received (N=154). For the two week period, 17 percent (N=83) of calls that were received between midnight and 6:00 a.m. were later forwarded to a neighborhood service center, and very few calls that were received in the morning hours between 6:01 a.m. and 12:00 p.m. were later forwarded to a NSC, 11 percent (N=54).

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 5.3 3-1-1 Calls Later Referred to a NSC by Time Received at the Communications Center

	Received	Percent	N
Morning	6:01 am - 12:00 pm	11.0	54
Afternoon	12:01 pm – 6:00 pm	31.2	154
Evening	6:01 pm – 12:00 am	41.0	202
Midnight	12:00 am – 6:00 am	16.8	83
Total	-	100.0	493

The distribution of calls referred to the nine neighborhood service centers during the study period, is displayed in Table 5.4.[4] With the exception of NSC-I (which does not have a LAN terminal) the referrals are fairly evenly distributed.

Table 5.4 Distribution of 3-1-1 Calls Referred to the Neighborhood Service Centers

Neighborhood Service Center	Percent	N
A	12.8	63
B	11.8	58
C	12.4	61
D	12.6	62
E	13.0	64
F	13.0	64
G	12.8	63
H	11.8	58
I	0	0
Total	100.0	493

Table 5.5 illustrates the characteristics of 3-1-1 callers whose complaints were later referred to a neighborhood service center. Only 5 percent (N=26) of the calls referred to a NSC (N=493) were incidents reported by a female caller. Callers left a name (first and/or last) in 13 percent of calls (N=63), and a call back number in 17 percent (N=86) of calls that were later referred to a NSC (some callers left a contact number but no name).

[4] Pseudonyms A-I are used for the 9 neighborhood service centers.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 5.5 Characteristics of 3-1-1 Callers

	Percent	N
Caller gave call back number	17.4	86
Caller gave name	12.8	63
Female Caller	5.3	26

Table 5.6 shows the information that the caller provided to the dispatcher for those 3-1-1 calls that were later referred to a neighborhood service center. Females were more likely to leave their name and/or a call back number than men (88 percent of women versus 8 percent of men). Likewise, women were more likely themselves to leave contact information than not (24 of 26 female callers left contact information), while men typically did not leave contact information (63 of 404 male callers left some type of contact information).

Table 5.6 Information Provided by 3-1-1 Callers by Sex

	Female		Male		Total	
	Percent	N	Percent	N	Percent	N
Contact name & Call back number	88	23	8	39	12.6	62
Contact name, No Call back number	0	0	<1	1	0.2	1
No Contact Name, Call back number	4	1	5	23	4.9	24
No Contact Name, No Call back number	8	2	87	404	82.3	406
Total	100	26	100	467	100	493

5.7 Handling 3-1-1 Calls for Service

In this section we examine the manner in which 3-1-1 referrals were handled for a subsample of the neighborhood service centers.

5.7.1 Data

We examine the neighborhood services referrals received at the neighborhood service centers via the LAN system and printed off as computer generated forms (here forth referral forms) for our two week observation period. We also draw from the Police Department computerized LAN and CAD records for this same time period.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

5.7.2 Method

Copies of the referral forms that were downloaded from the LAN terminals at the NSCs between June 14 and June 28, 1999, were obtained from the NSC sergeants at five of the nine NSCs (B, C, D, F, and G). The sample was reduced to five for various reasons. NSC-I did not have a LAN terminal, therefore there were no neighborhood services referrals.[5] NSC-A did not keep records consistent with those of the other neighborhood service centers. The neighborhood services referrals were not printed off the LAN as referral forms, rather a contract specialist worker transferred information from the LAN computer screen onto a *Police Department Complaint Referral* form by hand. The CAD numbers (which were necessary for our analysis) were not copied onto these forms. Both NSC-E and NSC-H experienced technical difficulties with their LAN terminals during our study period. The NSC Sergeants were unable to access the neighborhood services referrals on their terminals or print the referral forms.

Neighborhood service center sergeants at the five study NSCs were asked to copy all 3-1-1 referrals that they received over the LAN for incidents that were reported between June 14 and June 28 inclusive. Members of the UC research team collected these forms from the NSC sergeants during the two-week observation period.

The neighborhood services referral forms obtained from the five NSC sergeants were matched to the LAN data base using the CAD number documented both on the referral forms and in the data base. A variable field "Hardcopy" was added to the data base and a value of "1" was entered if a referral form had been obtained from the NSC Sergeant for each neighborhood services referral in the data base.

5.7.3 Results

The distribution of 3-1-1 calls referred to the five study neighborhood service centers is illustrated in Table 5.7.

Table 5.7 Distribution of 3-1-1 Calls Referred to the Study Neighborhood Service Centers

Neighborhood Service Center	Percent	N
F	20.8	64
G	20.5	63
D	20.1	62
C	19.8	61
B	18.8	58
Total	100.0	308

[5] It is believed that the computer was allocated for other use.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

As a check on the reliability of the LAN system, the referral forms collected from the NSCs were matched to the computerized LAN neighborhood services referrals data. Table 5.8 shows the number of referral forms that were not retrieved from the five study NSCs.

Table 5.8 Crosstabulation - Referral Forms Unaccounted For

	Hard Copy		
NSC	No	Yes	Total
G	1	62	63
D	1	61	62
F	1	63	64
C	0	61	61
B	0	58	58
Total	3	305	308

In total, one percent (N=3) of the 308 sample referral forms are unaccounted for. One each from NSC-D, NSC-F and NSC-G. All of the neighborhood services referrals from the other neighborhood service centers were matched to a hard copy referral form collected from the neighborhood services sergeant. Possible reasons for the missing referral forms were human error (sergeant oversight) in copying the referral forms for the dates requested, and / or neighborhood services sergeants also periodically had problems accessing the referrals on the LAN, or printing the forms for these referrals.

Using information recorded by the CAD system (date and time call was received at the call center, date and time of the incident-as reported by the caller,); the LAN system (date action was taken at the NSC); and the referral forms (sergeant close date), the call processing time for our study sample was calculated (see Table 5.9).

Table 5.9 3-1-1 Call Processing Time

	Mean	Median	Mode	Minimum	Maximum
Number of days from date incident occurred to date call received (N=308)	.12	.00	0	0	4
Number of days from date call received to date action taken (N=308)	2.53	2.00	2	0	6
Number of days from date call received to Sergeant close date (N=168)	4.61	4.50	6	1	9

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 5.9 indicates that on average, 3-1-1 callers reported incidents on the same day that they occurred (x = .12). The maximum number of days 3-1-1 callers waited before reporting an incident was 4. On average, it took 2.5 days from the date the call was received until action was taken by the NSC, though some incidents were handled within the same day, while others were not addressed for up to 6 days. The average call processing time from start to finish (date call received to date sergeant closed the report) was 4.5 days, with a minimum of 1 day and a maximum of 9 days. However, it must be noted that these figures are for 168 of the 3-1-1 calls, not the total sample, for approximately half of the 3-1-1 calls sampled sergeants did not record a close date.

Table 5.10 illustrates the dispositions of the 308 calls as entered into the CAD system. As mentioned earlier, of those 3-1-1 calls referred to neighborhood service centers, 99 percent were first dispatched to a unit to respond, (see figure 5.2). These are the dispositions reported by the responding units.

Table 5.10 CAD Call Dispositions

		Percent	N
A	Unfounded	4.2	13
B	Unable to locate complainant	0.6	2
D	No police service necessary	6.5	20
E	Gone on arrival	15.3	47
F	Complaint abated	20.8	64
X	Report written	1.0	3
DUP	Duplicate Call	2.3	7
Missing		49.4	152
Total		100.0	308

From Tiburon Complaint History Summarys

For almost 50 percent of the calls sampled, no disposition was entered into the CAD system. Of the remaining calls, the majority of calls were either abated (21 percent) or the person/s involved in the incident reported were no longer present/gone on arrival (15 percent). Reports were only written in one percent of the calls studied, and very few calls were considered to be situations for which no police service was necessary (7 percent) or the call was unfounded (4 percent).

Dispositions of the 3-1-1 calls taken from the referral forms indicate the actions taken by the neighborhood service center sergeants upon receiving the referral via the LAN system (subsequent to the patrol unit response). As with the CAD data, these data are incomplete as sergeants did not record dispositions for every referral. Indeed, 62 percent of referral forms have no comment (N=192) (see Table 5.11).

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

In 17 percent of cases (N=51) neighborhood service sergeants reported only that "patrol responded." For 11 percent of the referrals sergeants wrote "area to be given special attention" on the referral form. Sergeants indicated that 7 percent (N=22) of the referral forms they received were forwarded to the sector manager in which the incident occurred, 5 percent (N=16) of the referral forms were given to the drug unit, and for 1 percent (N=4) of the referrals the NSC sergeant contacted animal control. In less than 1 percent of the referrals the sergeants contacted either Housing or Parking. For 2 percent of the referrals (N=6), sergeants indicated that they could not contact the complainant. This number is probably much larger and reflected in the 192 referral forms for which no disposition is recorded (recall Table 5.6, only 17 percent of our total sample of 3-1-1 callers (N=493) left a call back number).

Table 5.11 NSC Referral Form Dispositions

	Percent	N
Patrol responded	16.56	51
Area to be given special attention	10.71	33
Forwarded to Sector Manager	7.14	22
Given to Drug Unit	5.19	16
Couldn't contact complainant	1.95	6
Animal Control notified	1.30	4
Advised	1.30	4
Forwarded to Housing	.65	2
Parking notified	.32	1
Comments –Total	-	139
No comment	62.34	192
Total*	107.46	331

* Totals are greater than 100 percent as some Neighborhood Service Referral sheets may have had multiple comments, e.g. "Patrol responded, area to be given special attention".

5.8 Assessing the Effect of Neighborhood Service Centers on Policing

One of the questions our research team sought to answer was how does the non-emergency call system interface with community policing and problem oriented policing at the street level? In answering this question we explored whether or not the NSC police response (referral of calls to neighborhood service centers) impacted on the quality of policing or helped to reduce neighborhood problems.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

5.8.1 Data

The neighborhood services referrals received from June 14th to June 28th comprised from our subsample of neighborhood service centers were used in conjunction with the Police Department computerized records (LAN and CAD data) from January 1998 to December 1999. We used the population of referral forms collected from the subsample of neighborhood service centers when the incident locations were recorded (N=308 referral forms). For these cases, the street block for the address of each incident was determined. A database consisting of all the street blocks on which incidents occurred was compiled (N=275)[6]. The number of calls for service placed to 3-1-1 for 6 months (186 days) preceding our observation period were obtained from the CAD data for each of the 275 blocks in our sample.

5.8.2 Method

We examined the 3-1-1 calls for service by block for 27 types of offenses (as reported by the caller). These included the six types of incidents which were referred to neighborhood service centers: juvenile disturbance, disorderly, narcotics violation, parking complaint, vehicle disturbance, animal disturbance; the seven index offenses: murder, rape, robbery, aggravated assault, burglary, larceny, motor vehicle theft; and 12 additional offenses which were perceived (by the research team) to be ambiguous as to whether they should be reported to 3-1-1 or 9-1-1 (see Table 5.12). This procedure was repeated using the calls for service placed to 9-1-1 from the 275 blocks, and repeated again for both 3-1-1 and 9-1-1 calls for service during the 6 months after our observation period.

A random sample of 100 Baltimore street blocks was drawn from the Baltimore street file.[7] The above procedure was again repeated for these 100 blocks, constructing a "control group" for analytic purposes. [8]

The means for the "treatment" or NSC treated group compared to the control group across offenses were examined for the pre-neighborhood service center intervention period (6 months) to determine whether the samples were significantly different (See Tables 5.12 and 5.13). Pre and post NSC intervention comparison of means for the 6 offense types referred to the NSCs were conducted for both the treatment and control groups,

---

[6] The number of street blocks is less than the number of referrals because some blocks had more than one incident.

[7] The 275 blocks were excluded from the street file.

[8] While not a true control group, there were no neighborhood services referrals received from these blocks during our observation period. If we examine the handling of the 3-1-1 referrals by the neighborhood service center as an "intervention" or "treatment" the control group did not receive the treatment.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

to determine if there was a significant difference or not in the number of calls for service for these 6 types of offenses in the treatment group (the blocks which had the NSC intervention).

Table 5.12 Independent Samples T test: Average Calls Per Block Placed to 3-1-1 During 6 Months Prior to NSC Intervention (January – June 1999) by Incident Type

	Treatment (N=275 blocks)	Control (N=100 blocks)	
Incident	X	X	t
Offenses referred to NSCs			
Juvenile Disturbance	1.81	.28	-8.85**
Disorderly	2.93	.53	-9.39**
Narcotics Violation	5.21	2.33	-1.87
Parking Complaint	.49	.09	-5.00**
Vehicle Disturbance	.29	.04	-5.32**
Animal Disturbance	.28	.07	-3.91**
Part 1 Offenses			
Murder	.00	.00	-
Rape	.01	.01	.24
Robbery	.07	.02	-2.43
Aggravated Assault	.07	.03	-1.74
Burglary	.45	.11	-.57**
Larceny	1.67	.57	-6.13**
Motor Vehicle Theft	.28	.17	-1.78
Other Offenses			
Loud Noise	2.09	.40	-4.62**
Common Assault	.95	.13	-9.29**
Destruction of Property	.79	.29	-5.71**
Drug Free Zone	.70	.25	-2.56*
Family Disturbance	.45	.05	-7.93**
Suspicious Person	.25	.06	-4.36**
Auto Accident	.18	.09	-2.03*
Gambling	.14	.00	-2.49*
Lost Property	.13	.07	-1.39
Recovered Property	.10	.03	-2.87*
Sanitation Complaint	.03	.02	-.50
Street Obstruction	.01	.01	-.37

*Significant at p< =.05
** Significant at p<=.001

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

5.8.3 Results

Table 5.13 Independent Samples T test: Average Calls Per Block Placed to 9-1-1 During 6 Months Prior to NSC Intervention (January – June 1999) by Incident Type

	Treatment (N=275 blocks)	Control (N=100 blocks)	
Incident	X	X	t
Offenses referred to NSCs			
Juvenile Disturbance	2.47	.33	-6.39**
Disorderly	6.56	1.08	-10.21**
Narcotics Violation	3.81	1.33	-3.13*
Parking Complaint	.05	.02	-1.6
Vehicle Disturbance	.19	.05	-2.84*
Animal Disturbance	.15	.01	-4.81**
Part 1 Offenses			
Murder	.00	.00	-
Rape	.04	.01	-1.94*
Robbery	.60	.09	-6.12**
Aggravated Assault	1.21	.30	-6.50**
Burglary	1.57	.41	-8.06**
Larceny	2.11	.23	-3.35**
Motor Vehicle Theft	.44	.11	-5.84**
Other Offenses			
Loud Noise	.13	.08	-.87
Common Assault	5.26	1.34	-9.44*
Destruction of Property	.71	.17	-6.89**
Drug Free Zone	2.17	.52	-3.50**
Family Disturbance	2.00	.56	-7.23**
Suspicious Person	.54	.25	-3.24**
Auto Accident	1.01	.54	-2.02*
Gambling	.09	.02	-2.26*
Lost Property	.00	.00	-1.42
Recovered Property	.07	.00	-4.51**
Sanitation Complaint	.01	.00	-1.74
Street Obstruction	.00	.01	1.00

*Significant at p< =.05
** Significant at p<=.001

The independent samples t-test revealed that the treatment (NSC referrals) and control groups did not significantly differ in the average number of calls to *3-1-1 or 9-1-1* during the 6 months prior to the NSC intervention period for the following offenses: murder, lost property, sanitation complaint, or street obstruction (see Tables 5.13 and 5.14). Table 5.13 indicates that during the 6 months prior to the NSC intervention period, our treatment and control groups did not have a significantly different average number of calls to *3-1-1* for the following offenses: narcotics, rape, robbery, aggravated assault, or motor vehicle theft. Table 5.13 indicates

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

that during the 6 months prior to the NSC intervention period, our treatment and control groups did not have a significantly different average number of calls to *9-1-1* for parking complaints, or loud noise. As the two groups differ on the number of calls placed to the police for the majority of offenses, it is evident that our treatment group that was composed of 275 blocks for which 3-1-1 calls were referred to neighborhood service centers is significantly different from our control group consisting of a random sample of Baltimore street blocks. While this is not ideal to assess the effectiveness of 3-1-1 call handling by the neighborhood service centers it does suggest that 3-1-1 is called more often where 9-1-1 calls are also made on a frequent basis.

Table 5.14 shows the t-values for the before and after comparison of means for the number of calls to 3-1-1 and the number of calls to 9-1-1 for both the treatment and control groups (mean number of calls per block during 6 months before NSC call handling and mean number of calls per block during 6 months after NSC call handling). The average number of calls per block to 9-1-1 for juvenile disturbances significantly increased for the treatment group (i.e. for the 275 blocks that received the NSC call handling). There were no other significant differences in calls for service for those blocks which had 3-1-1 referrals sent to the NSC, and those blocks which did not have 3-1-1 calls referred to the NSC.

Table 5.14 Paired Samples T-test: Change in Mean Calls for Service Per Block Before and After Neighborhood Service Center 3-1-1 Call Handling

	3-1-1		9-1-1	
Offense	Experimental [1] t	Control[2] t	Experimental [1] t	Control[2] t
Juvenile Disturbance	-1.131	-1.204	2.686*	.506
Other, Disorderly	-.873	-1.332	-1.258	-.878
Other, Narcotics Violation	.754	.732	-.365	.359
Parking Complaint	.669	-.729	-.928	-.445
Vehicle Disturbance	.635	-1.421	-.373	.332
Animal Disturbance	.889	.276	-1.252	-1.0

*Significant at p< =.05
[1] df = 274
[2] df = 99

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

5.9 Summing Up

Many technological innovations in policing are notorious for allowing the tail to wag the dog. That is, the police adopt the technology, yet fail to capitalize on the potential of the technology to facilitate operational reform. So far, in our analysis of the 3-1-1 system in Baltimore, our research is pointing to evidence that suggests that non-emergency call system technology failed to free-up officer time and was under-utilized as a facilitator for the adoption of community policing. It is not that the technology is flawed, bad, or inappropriate. Quite the opposite. The technology led to significant reductions in 9-1-1 calls, especially for the lower priority calls. As such, it is our view that the 3-1-1 technology has the potential to revolutionize the manner in which police receive and handle citizen calls for service. Indeed, our analysis has shown that the 3-1-1 technology has the potential to free up officer time and substantially reduce the number of calls that patrol officers respond to. But this optimization of 3-1-1 technology requires policy decisions as to the handling of 3-1-1 calls.

Our research, particularly in Chapters Four and Five, shows that the introduction of the 3-1-1 call system significantly reduced the number of 9-1-1 calls for service (particularly low priority calls) and that officers spent more time at the scene of 9-1-1 low priority calls following the introduction of 3-1-1. Nonetheless, our research also shows that 3-1-1 calls that were deemed "police matters" were dispatched to the patrol division. We ask: Why were these calls dispatched? Was it necessary to dispatch these 3-1-1 calls? Why wasn't more use made of the NSC referral system to handle these 3-1-1 calls? The answers to these questions lie in the policies adopted that guide the utilization of 3-1-1 technology. Clearly the technology offers citizens the opportunity to classify and more appropriately direct their calls (see Chapter Seven). At the same time, the technology offers the police the opportunity to focus their emergency and patrol response capacity on high priority incidents (9-1-1 response) and use their more long-term, problem-solving capacity for lower priority, less emergent incidents. The neighborhood service centers seem well-placed to receive more referrals from the 3-1-1 system than what they currently receive (they currently receive only about 2.4 percent of 3-1-1 calls deemed "police matters"). We explore some recommendations for future use of the 3-1-1 system in Baltimore in Chapter Ten.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

6 CHAPTER SIX: OBSERVATIONS OF BALTIMORE PATROL OFFICER ACTIVITIES

6.1 Introduction

One important component of our project was to assess the role and influence of non-emergency call systems on street-level policing efforts. So far we have analyzed calls for service (Chapter Four), documented the flow of 9-1-1 and 3-1-1 calls to Neighborhood Service Centers (Chapter Five) and interviewed Baltimore Police Department patrol officers and administrators including District Commanders and Sector Managers (Chapter Three) to assess how the 3-1-1 non-emergency call system had influenced policing in their districts, both organizationally and at the street level. Our analysis thus far shows that despite some flaws in the police department policy allowing 3-1-1 calls to be dispatched, police officers generally believed that the introduction of Baltimore's 3-1-1 system had reduced the quantity of emergency calls being dispatched, that there were fewer non-emergency calls forwarded to officers for immediate action, and that officers had more discretionary time. Police administrators believed that the non-emergency call system had created opportunities for patrol officers to concentrate their efforts in trouble locations and solve crime and disorder problems within their communities.

In this chapter, we report the results of a two-week observational study in Baltimore that sought to assess the role and influence of 3-1-1 at the street-level. Observational research is one technique that is used to document, quantify and understand police officer behavior. Specifically, observational studies have examined officer time (e.g. time spent engaging in routine patrols, time spent making arrests, self-initiated time, time spent responding to calls for service), officer operational styles, department styles, police-citizen interactions and the outcomes of these encounters, and the behavior of detectives, narcotics officers, and patrol officers, in general. This chapter follows in the tradition of quantitative field observation studies and explores, in a somewhat limited way, street-level patrol officer behavior and their nexus with both the 9-1-1 and 3-1-1 call systems in Baltimore.

6.2 Method

Overall, the goal of our observational study was to describe, quantify and understand the manner in which the 9-1-1 and 3-1-1 systems impacted officer time. Given that Baltimore's 3-1-1 system is a fully operational, national model for non-emergency call systems, we sought to document how much time officers spent engaged in community policing activities at the street level. Given our cost limitations, our observational study in Baltimore can best be described as pilot research. Nonetheless, our pilot, exploratory study of street-

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

level policing under a fully implemented 3-1-1 system provides an important foundation for future research.

We selected a two week study period in June, 1999 (June 14 through June 28) to conduct the observations. This time period was selected because we had limited resources for the observational study and a two-week time period was within our budget constraints. Moreover, as with other observational studies (see Mastrofski et al. 1998), we used students whom were available for this type of research during the summer months.

Sites in which to conduct our observations were selected by first interviewing most district commanders and sector managers concerning their perceptions of the non-emergency call system's impact on policing in their district, both organizationally and at the street-level, and by examining the distribution of calls for service throughout Baltimore. This process led us to select three study sectors, with each sector located in a different district (Central District Sector 4, Southeast District Sector 1, and Southern District Sector 3). We selected these three Sectors from a total of 29 sectors in the city.

Participant observers (riders) were selected from universities in the Baltimore area. More specifically, faculty members at the University of Maryland, Johns Hopkins, University of Baltimore, University of Maryland at Baltimore County and Towson State were contacted and asked to recommend students for participation in the project. Recommended individuals were contacted by members of the research team and asked to attend an introductory meeting one-week prior to their potential participation in the project. At this meeting the observers were screened for suitability as participant observers and provided a packet of information on the history of the project, a National Institute of Justice publication on conducting systematic social observations, and a copy of the confidentiality agreement that all potential observers were asked to sign.

Approximately one week later all observers selected to participate in the study were required to attend a compulsory five-hour training session. Observers were trained in how to observe and record officers' actions, how to debrief officers, appropriate conduct and dress while conducting ride-alongs, and the logistics of completing the data coding instruments. Observers were told to report to roll call which began 21 minutes prior to the official start of the shift, to record instructions given to officers at roll call, and to conduct their eight hour observations only in the randomly selected project posts in each district. To facilitate the assignment of observers to the proper posts, each participating sector lieutenant and sector sergeant was provided a copy of the schedule for their district.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Observers were requested to complete two types of data collection instruments at the conclusion of each ride. For each ride-along the observer was to complete one "ride instrument"(see Appendix 6-A). This coding instrument was designed to collect demographic data relative to the observed officer and information about any directives the officer may have received concerning activities to be undertaken during the ride-along. The second type of coding instrument was an "activity instrument" (see Appendix 6-B). This coding instrument was designed to collect data on each distinct activity (from responding to calls and doing random patrol to eating lunch or conducting personal business) undertaken by the officer. Specifically, for each activity, the observer was to record the time the activity began and ended, the location of the activity, the type of action taken by the officer, and the nature of the problem that was the catalyst for the mobilization. For all acts except those pertaining to shift preparation (e.g., car maintenance, checking equipment), personal activities and transporting offenders observers were to question the officer about the reasons for engaging in the specific behavior and whether there was a feasible alternative to an immediate mobile response.

We assigned riders (university students) to a random sample of day and early evening patrol "posts" for the three selected sectors. We also interviewed the three Sector Managers every day to ask them questions about their assignment of patrol personnel and their use of 3-1-1 and 9-1-1 data to assign their officers during their discretionary time periods.

The random sample of "posts" was drawn from the population of posts in the three sectors, for a fourteen-day study period, for the day and early evening posts. We generated a stratified random sample of fifty percent of all possible posts per sector that met our study criteria. More specifically, the number of posts for each sector was determined for the second (7 a.m. - 3 p.m.) and third shifts (3 p.m. - 11 p.m.). The first shift (11 p.m. – 7 a.m.) was not selected in an effort to maximize the observation of a police response to a 3-1-1 call. A random sample of 251 observation periods was derived using a computer generated random sampling procedure. This represented fifty percent of all possible observation periods during the scheduled study period, where an observation period represented the assignment of a patrol car to each of the posts in the three selected sectors. This produced an observation schedule for 67 ride-alongs in Central District, 101 observations in Southeast District, and 83 observations in Southern District. Our assignments thus covered approximately 20 posts per day generating about 280 rides over our 14 day study period (about 2,240 hours of observation).

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

We also wanted to document the street-level policing activities of the officers assigned to the role of "Community Officer." Each Sector employed one patrol officer that was designated as the "Community Officer." Since we knew that these officers interfaced with both the Neighborhood Service Sergeants (see Chapter Five) as well as the patrol officers in each Sector, we wanted to assess their time spent responding to 3-1-1 calls and solving crime and disorder problems. As such, we scheduled 9 ride-alongs with the Community Officers in each of the study sectors (N = 27 scheduled rides), representing the population of all posts for Community Officers during our two week study period.

During each eight-hour ride, the rider noted the nature of every dispatched call (including both voice/radio and Mobile Data Terminal (MDT) calls) to the sampled patrol vehicle, they recorded the manner in which the dispatched call was handled, use of discretionary time, patrol activity at Sector Manager designated locations, and citizen encounters. We adapted Professor James Frank's observational instrument that he used in two prior NIJ studies (see Frank 1996, and 1998) and generated a unique observational instrument that captured information pertaining to the nexus between officer behavior and the 9-1-1 and 3-1-1 systems (see Appendix 6-B). At the end of each ride, the officers were interviewed in a short, 10 minute debriefing regarding their general views of the 3-1-1 system and whether the non-emergency call system has enhanced their community policing efforts or not (Appendix 6-A). We also collected photocopies of patrol officer activity logs for each ride over our two week study period. These patrol logs summarized the officers daily activity and served to cross-check the observers documentation of officer time. Observations of post officers sought to quantify and understand the amount of time officers spend responding to 3-1-1 and 9-1-1 calls, the amount of time consumed by these calls in relation to other police activities, the contextual characteristics of both types of calls for service, whether officers receive directives from other police personnel and, if so, whether they have discretionary time to conduct proactive activities. Our observations also enabled us to debrief the officers after each call about whether or not there was an alternative response by the police department that could have been as efficient as an immediate response.

6.3 Sample

Of the 251 scheduled observation periods, twenty-seven were with community officers (nine in each study sector) while the remaining ride-alongs were to be conducted with post officers (see Table 6.1). Specifically, a total of 58 observations were to be conducted with post officers in the four posts that comprise Sector 4 of the Central District, 92 rides with post officers in the seven posts in the Southeast District sector,

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

and 74 with officers that work the five posts in the Sector 3 of the Southern District. In total (including community policing officers as well as patrol officers), ninety-six percent (N = 241) of the scheduled observations were completed in accordance with the ride schedule (26 of the 27 community officers, 55 of the 58 rides in Central District, 88 of 92 in Southeast District and 72 of 74 in the Southern District). Three of the observations were not completed because of the failure of the scheduled officer to appear for work due to personal reasons, while two additional rides did not occur because the police department did not have an available post car to cover the selected post during the shift. The remaining four scheduled observations were not completed due to research error (e.g. failure of rider to turn-up to the scheduled posting, miscommunication regarding who was assigned to particular rides).

Table 6.1 Number of Observations Scheduled and Observations Completed by District

	Scheduled			Completed			
District	Day Post	Evening Post	Total	Day Post	Evening Post	Total	Percent Completed
Central	32	26	58	31	24	55	94.8
Southeast	45	47	92	42	46	88	95.7
Southern	37	37	74	36	36	72	97.3
Total	114	110	224	109	106	215	96.0

Table 6.2 Demographic Characteristics of Observed Officers

Variable	Percent	N
Gender		
Male	84.8	201
Female	15.2	36
Race		
White	67.5	160
Black	31.2	74
Hispanic	1.3	3
Education Level		
High School /GED	27.3	63
Some College	45.5	105
Associates Degree	12.1	28
Baccalaureate Degree	12.6	29
Post Graduate Work	2.6	5
Unit Assignment		
Post Officer	88.1	207
Community Outreach	10.6	25
Flex Unit	1.3	4
Age	Mean = 32.13	S.D. = 7.23
Service with BPD	Mean = 8.66	S.D. = 5.91

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 6.2 presents the demographic characteristics of the officers that were observed. Most of the officers were males (84.8 percent) and white (67.5 percent). Almost half of the officers (45.5 percent) had attended college, while 27.3 percent had completed at least an Associates degree. The average age of the observed officers was slightly over 32 years old and they had served 8.66 years with the Baltimore Police Department.

6.4 Results

6.4.1 Mobilization of Patrol Officers

Typically systematic social observations of police officers have been used to describe the work routine of street-level police officers and account for the time spent on each distinct activity. Observations of officers also permits the debriefing of officers to examine the sources of officer mobilizations. Our observers were trained to query officers as to the reasons for their decisions to undertake each unique activity.[1] As such, we were able to collect information on the proportion of the typical shift that was spent responding to 9-1-1 calls, 3-1-1 calls, activities initiated by the officer and those actions undertaken at the request of supervisors and citizens.

Table 6.3 displays the different sources that can mobilize the police to conduct police activities. The second column in the table reports the number of activities undertaken by each type of mobilization (Why did the officer engage in the act?), while column three contains the total minutes spent on activities undertaken by mobilization source. The first column represents the proportion of total observed time consumed by activities undertaken due to each type of mobilization.

As can be seen in table 6.3, officers spent the greatest proportion of their time (42.2 percent of the average shift) engaged in activities that were self-initiated. Approximately two-thirds (66.2 percent) of the self-initiated activities involved performance of general random motorized patrol. In fact, patrol consumed 78.8 percent (36,421 minutes or 607 hours) of the time spent on officer initiated activities. Officers responded to 1,083 calls that were dispatched as 9-1-1 calls for service. These call responses consumed approximately 19.3 percent of observed time or slightly over one and a half hours per shift. Calls dispatched as 3-1-1 calls (N=174) consumed on average around 3.2 percent of observed time or about fifteen minutes per shift.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 6.3 Time Performing Activities by Reason for Officer Mobilization

	Percent*	N	Time**
Response to 9-1-1 Call	19.3	1,083	21,062
Response to 3-1-1 Call	3.2	174	3,433
Solely on Initiative of Officer	42.4	1,547	46,210
Initiative of Officer & Citizen Information	0.9	52	946
Directive of Officer's Supervisor	2.3	80	2,489
General Instructions of Supervisor	0.4	14	432
Instructions and Initiative of Officer	0.4	19	475
Other***	31.1	1,176	33,827
Total	100.0	4,145	108,874

* Percent of total observed time.
** Time represents total minutes engaged for activity.
*** The "Other" category includes activities such as attending roll call, preparing for shift work, transporting evidence and other police, meeting with a prosecutor or judge, personal business, and debriefing project participants.

Table 6.4 provides the number and percent of all mobilizations for selected categories of mobilization by district as well as the total and proportion of time spent on these selected mobilizations by district. The percentages exclude activities in the "other category" (see Table 6.3).

Table 6.4 Percent and Number of Mobilizations by District (Number and Time Spent per Selected Mobilizations)

	Central				Southeast				Southern			
	Number		Time		Number		Time		Number		Time	
	%[1]	N	%[2]	mins[3]	%	N	%	mins	%	N	%	mins
9-1-1 Call	35.0	240	29.7	5,410	41.7	499	31.8	10,241	31.6	344	22.0	5,411
3-1-1 Call	2.9	20	2.2	409	7.6	91	6.0	1,946	5.8	63	4.4	1,078
Self-Initiated Or Directed	62.1	426	68.1	12,399	50.7	606	62.1	19,994	62.6	680	73.6	18,159
Total	100.0	686	100.0	18,218	100.0	1,196	100.0	32,181	100.0	1,087	100.0	24,648

[1] Percent of all mobilizations within the district.
[2] Percent of total time within district consumed with each type of mobilization.
[3] Total time in minutes.

[1] Questions pertaining to the reasons for undertaking the activity were asked for all but the following activities: meetings with other police, roll call, report writing, automobile maintenance, calibrating equipment, processing evidence, meeting with a prosecutor or judge, appearing in court, personal business such as meals, errands, meeting with other officers on non-police business.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Overall, the reasons for officer mobilizations and the proportion of time spent by type of mobilization varied significantly across the three sectors ($F = 17.251$, $p = .000$). Officers in the Central District were much less likely to mobilized by a 3-1-1 call (2.9 percent) than officers in either the Southeast (7.6 percent) or Southern (5.8 percent) district. As such, officers in the Central District spent a smaller proportion of their observed time on 3-1-1 mobilized activities than officers in the other two districts (2.2 percent versus 6.0 percent and 4.4 percent of observed time). Self-initiated and directed calls consumed the largest proportion of time in the Southern District (73.6 percent), while 9-1-1 calls consumed the least amount of officer time in this same district. This resulted from the fact that 9-1-1 calls in the Southern District only took on average 15.7 minutes to handle, while in the Southeast District each 9-1-1 mobilization took approximately 20.5 minutes to deal with and about 22.5 minutes to work with in the Central District.

6.4.2 Situational Characteristics of 3-1-1 Calls, 9-1-1 Calls and Self-Initiated Activities

Our activity instrument required observers to collect situational data for each activity in an effort to document the contextual nature of police activities. As such we provide a description of the characteristics surrounding each type of police response, and also a comparison of the characteristics across the activity types. Table 6.5 presents the contextual characteristics of 3-1-1, 9-1-1, and self-initiated activities.

Table 6.5 Percents and P-Values for Selected Contextual Characteristics for 9-1-1, 3-1-1 and Self-Initiated Mobilizations

	9-1-1 Response		3-1-1 Response		Self-initiated		9-1-1 v 3-1-1	Self v All Calls
	No	Yes	No	Yes	No	Yes	P value	P value
Prior Knowledge	80.0	20.0	86.7	13.3	61.1	38.9	.037	.000
Citizen Encounter	31.1	68.9	28.1	71.9	61.2	38.8	.430	.000
Public Property	39.8	60.2	40.4	59.6	6.8	93.2	.885	.000
Org. Rep. Present	91.4	08.6	97.1	02.9	97.5	2.5	.010	.000
Number of Officers[1]	-	-	-	-	-	-	.000	.000

[1] T-tests were performed with number of officers because it is interval level data.

The contextual characteristics reported in Table 6.5 were designed to elucidate the factors that distinguish one activity from another. For example, we were interested to know whether officers had prior knowledge of the location they were either dispatched to or where they initiated activity. We were also interested to know whether the activity culminated in a citizen encounter or not, whether the location was a public or private place, and whether or not there were members of other city agencies present at the scene of the activity.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

As Table 6.5 shows, the situational characteristics of 9-1-1 and 3-1-1 calls follow similar patterns although there are differences in the extent to which certain characteristics are present. For both 9-1-1 and 3-1-1 calls officers are not very likely to have prior knowledge of the location to which they are directed by the dispatcher (13.3 percent and 20.0 percent respectively) and officer activities resulting from these calls are not likely to involve encounters with representatives of social service organizations. Normally citizens are present when the police arrive at both 9-1-1 calls (68.9 percent) and 3-1-1 calls (71.9 percent) and the calls normally involve responses to public locations (60.2 percent and 59.6 percent).

In order to assess whether there were significant differences between the contextual characteristics of 3-1-1 and 9-1-1 calls a series of chi-square tests of differences were conducted.[2] As shown in Table 6.4, there were statistically significant differences between 3-1-1 and 9-1-1 calls for three of the contextual characteristics. Specifically, 3-1-1 and 9-1-1 calls differed as to the number of officers that appeared at the scene, with, as expected, more officers usually appearing at 9-1-1 calls. Also, officers were more likely to have prior knowledge of the target location for 9-1-1 mobilizations than for 3-1-1 mobilizations although in only 20 percent of 9-1-1 dispatched call responses they knew something about the target site before they responded to the call. Finally, officers responding to 9-1-1 calls were more likely to communicate with representatives of other organizations that provide services to the public than were officers handling 3-1-1 requests.

Situational characteristics of self initiated activities appear to be somewhat different than activities that result from dispatched 9-1-1 or 3-1-1 calls (see Table 6.5). Specifically, police are much less likely to have contact with citizens (38.8 percent of these activities) when they are engaged in self-initiated activities. At the same time, officers are much more likely to have prior knowledge of the locations where self initiated activities occur and are also much more likely to act in the public domain (93.2 percent) than when mobilized by dispatchers. Similar to 3-1-1 call responses, self-initiated activities rarely involved contact with organizational representatives. Again a series of chi-square and t-tests were computed to assess whether there were significant differences between self-initiated and dispatcher directed call activities on the contextual characteristics. The significance tests indicated there were significant differences on all of the contextual dimensions.

[2] Chi-square test comparisons were made for prior knowledge, citizen encounters, public property, and organizations present. T-test comparisons were made for the number of officers at the scene because it was an interval level variable.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

We also wanted to be able to assess the relative influences of selected situational characteristics on whether the outcome was a 9-1-1, 3-1-1 or self-initiated activity. As such, we estimated two logistic regression equations where the dependent variable was defined as a dichotomous variable receiving a value of 1 when the police responded to a 3-1-1 call and a 0 for a 9-1-1 call (Model 1) and where the dependent variable was defined as a dichotomous variable receiving a value of 0 when the police responded to a call (3-1-1 + 9-1-1) and a 1 if the activity was self-initiated (Model 2). This dependent variable was regressed on the contextual variables as well as for the district where the mobilization occurred (Southern District being the reference category). Table 6.6 portrays the effects of each variable by the regression coefficient, standard error and significance level.

As Table 6.6 shows, prior knowledge, contact with organizational representatives, number of officers and Central District were all significant factors pertaining to distinguishing 9-1-1 to 3-1-1 calls as well as all calls to self-initiated activities. In essence, police responding to 9-1-1 calls are more likely to have some prior knowledge of the target location than when they respond to 3-1-1 calls, organizational representatives are more likely to be present during 9-1-1 calls than 3-1-1 calls and the Central District officers handle more 9-1-1 calls relative to 3-1-1 calls than their counterparts in Southern and Southeast Districts. The presence of citizens and the location of the activity (public versus private) were not significant in differentiating 9-1-1 from 3-1-1 calls. This means that 3-1-1 calls are no more likely to occur at a public or a private location than 9-1-1 calls and they are no more or less likely to involve citizens.

Table 6.6 Logistic Regression Estimates for 3-1-1 v 9-1-1 Calls and All Calls v Self-Initiated Activities

	9-1-1 v. 3-1-1			All Calls v. Self-Initiated		
Variable	B	SE	P Value	B	S.E.	P Value
Prior Knowledge	-.533	.258	.039	.913	.105	.000
Org. Rep. Present	-1.075	.526	.041	-.880	.218	.000
Citizen Encounter	.348	.197	.075	-.812	.094	.000
Public Property	.051	.178	.773	1.713	.117	.000
Number of Officers	-.478	.094	.000	-.283	.034	.000
Central Dist.	-.845	.293	.004	-.173	.121	.155
Southeast Dist.	-.019	.189	.918	-.648	.104	.000
Constant	.216	.780	-	-1.032	.370	-

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Also reported in Table 6.6 are the estimates from a second logistic regression equation where the dependent variable was call directed (0) versus self-initiated (1) activities. Consistent with the findings from the chi-square tests of significance all the contextual characteristics were significant, suggesting that the contextual characteristics of self-initiated activities differ considerably to the characteristics of calls (9-1-1 and 3-1-1) that police are dispatched to.

Specifically, officers were more likely to have prior knowledge of places when they initiated their own activity compared to when they were dispatched to the location (via 9-1-1 or 3-1-1), there were fewer organizational representatives present during self-initiated activities than call mobilizations, there were fewer citizen encounters during self-initiated activities and self-initiated activities were more likely to occur at public places than activities mobilized via the call dispatching system. All of these variables were statistically significant predictors that differentiated call mobilized versus self-initiated activities.

6.4.3 Committed and Uncommitted Time

The nexus between call-mobilized and self-initiated activities provides one way to assess how patrol officers spend their time. Our observational data also offers the opportunity to explore whether or not officers had time in Baltimore to engage in problem-oriented policing or other community policing activities. Table 6.7 presents the distribution of the number of dispatched calls per observed shift (including 9-1-1 and 3-1-1 calls).

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 6.7 Distribution of Dispatched Calls per Observed Shift

Number of Calls	All Observed Officers (including Community Service Officers)	Percent	Observed Post Officers	Percent
0	17	7.4	1	.5
1	10	4.4	5	2.5
2	19	8.3	17	8.4
3	32	14.0	30	14.8
4	25	10.9	25	12.3
5	28	12.2	27	13.3
6	21	9.2	21	10.3
7	19	8.3	19	9.4
8	17	7.4	17	8.4
9	12	5.2	12	5.9
10	8	3.5	8	3.9
11	6	2.6	6	3.0
12	3	1.3	3	1.5
13	3	1.3	3	1.5
14	0	---	0	---
15	4	1.7	4	2.0
16	2	.9	2	1.0
17	1	.4	1	.5
18	0	---	0	---
19	0	---	0	---
20	2	.9	2	1.0
Mean	5.49		6.09	
Median	5.00		5.00	
Std. Deviation	3.80		3.58	
Std. Error of Mean	.25		.25	

As this table shows, on average Baltimore officers answered about five or six calls per shift. As one would expect, some officers are much busier than others: some officers answered more than ten calls per shift and others answered just one or two calls per shift. Those responding to more calls per shift typically were on evening shifts and those responding to fewer calls per shift were typically on day shift hours.

Table 6.8 Time Spent (In Minutes) Responding to Calls Per Observed Shift

	All Observed Officers	Observed Post Officers
Mean	106.97	119.08
Median	96.00	105.00
Standard Deviation	77.08	73.09
Standard Error of Mean	5.09	5.13
Range	0-420	0-420
N	229	203

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 6.8 shows the mean and median time that officers spent responding to all calls dispatched to them during their observed shift. As this table shows, officers spent over an hour and a half and less than two hours responding to calls for service during any one shift. In effect, our observational data reveals that no more than about a quarter of a patrol shift is spent responding to calls for service.

While the total amount of time spent responding to calls for service is important to quantify, these statistics potentially hide one of the issues that police often complain about: that they do not have sufficient "blocks" of down time available to engage in any meaningful community policing activities or problem-solving (see also Chapter Four). In the following tables we explore the issue of how many "blocks of time" Baltimore officers potentially had to engage in problem-solving or community policing activities.

Table 6.9 Number of Shifts on Which Consecutive Calls Occurred by Number of Times Officer Had Consecutive Calls on an Observed Shift

Number of Shifts with Consecutive Calls	All Observed Officers	Percent of Shifts	Observed Post Officers**	Percent of Shifts
No Consecutive Calls By Shifts	97	42.36	71	34.98
One Set of Consecutive Calls*	69	30.13	69	33.99
Two Sets	43	18.78	43	21.18
Three Sets	12	5.24	12	5.91
Four or More Sets	8	3.49	8	3.94

* At least two or more consecutive calls without available free time
** Not a single community officer (non-post officers) had a shift that included consecutive calls

Table 6.9 shows the number of shifts where officers had consecutive calls. "Consecutive calls" are defined as calls that essentially run immediately one after the other. These are the calls where the police have no down time in-between. As this table shows, about one third of the shifts we observed (during the height of the summer vacation period), did not involve any consecutive calls. An additional one third of the shifts included just one set of consecutive calls. We note that our observations were conducted on just the day time and evening shifts. Excluding the night shift from our sample provides, we believe, a more reliable picture of how police spend their time.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 6.10 Maximum Number of Consecutive Calls Per Shift By Number of Shifts

Maximum Number of Consecutive Calls	Number of Observed Post Officer Shifts**	Percent of Shifts With Consecutive Calls
2	68	51.52
3	30	22.73
4	20	15.15
5	8	6.07
6	1	.78
7	0	-----
8	0	-----
9 or more	4	3.03

** Not a single community officer (non-post officers) worked a shift that included consecutive calls

Table 6.10 shows the number of calls included in a single block of what we are calling "consecutive calls." As this table shows, over half of the "blocks of consecutive calls" included no more than two calls in quick succession and about another quarter of the "blocks of consecutive calls" included no more than three calls in the block. These tables together reveal how officer time is committed within the "average shift." We do not, in these analyses, suggest that officers do not have shifts where they are literally run off their feet. Indeed, our data show that in a very small minority of shifts, officers might have a block of more than nine consecutive calls and that they might have more than four blocks of calls. But our data suggest that these very busy shifts are clearly the exception and not the rule.

Measuring officer uptime is important for understanding how much time per shift can be designated as "committed time." Our results in Chapter Four, however, suggest that an analysis of officer "down time" is equally important. Measuring officer down time, however, is much harder than measuring "up time." Observational data, however, provide an opportunity to explore the how much, as well as the nature of, uncommitted time. We were not so much interested in the aggregate amount of "down time" but rather we were interested to explore how many blocks of down time that officers might have in their shift that could reasonably translate into enough time to engage in community policing or problem-solving activities. We explore this issue of down time in the following tables (see also Chapter Four).

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 6.11 Number of Uncommitted Time Slots Per Observation by Number of Observed Shifts

Number of Time Slots	All Observed Officers	Percent of Shifts	Observed Post Officers	Percent of Shifts
1	22	9.6	4	2.0
2	17	7.4	13	6.4
3	29	12.7	26	12.8
4	50	21.8	49	24.1
5	41	17.9	41	20.2
6	26	11.4	26	12.8
7	19	8.3	19	9.4
8	13	5.7	13	6.4
9	6	2.6	6	3.0
10	5	2.2	5	2.5
11	0	----	0	----
12	0	----	0	----
13	1	.4	1	.5
Mean	4.62		5.02	
Median	4.00		5.00	
Std. Deviation.	2.24		2.04	
Std. Error Of Mean	.15		.14	

Table 6.11 reveals the number of uncommitted time slots per shift. Time slots are defined as the number of periods per shift that an officer was not responding to dispatched 9-1-1 or 3-1-1 calls for service. As this table shows, over two thirds of the shifts (68 percent) had between three and six time slots available. Table 6.12 shows how many minutes were available per time slot.

Table 6.12 Average Number of Available Minutes Per Uncommitted Time Slot By Observed Shift

	All Observed Officers	Observed Post Officers
Mean	118.17	88.52
Median	82.67	76.80
Std. Deviation	111.64	61.48
Std. Error of Mean	7.38	4.32
Range	0-540	0-540
N	229	203

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

As this table shows, the officers had between and hour and an hour and a half of down time between blocks of time that they spent responding to calls. While averages are an important way to communicate the amount of down time for typical shifts, these averages conceal how down time is distributed across a range of patrol shifts. In table 6.13 we explore the amount of down time for those shifts with one, two, three and more blocks of uncommitted time.

Table 6.13 Average Available Time (in minutes) by Number of Uncommitted Slots Per Observation

Number of "Free" Time Slots	All Officers			Only Post Officers		
	Mean	Median	Mode	Mean	Median	Mode
1	403.32	446.00	465.00*	270.75	276.00	**
2	194.85	207.50	**	195.85	215.50	**
3	128.24	137.33	**	126.94	135.67	**
4	98.06	99.88	114.50*	97.71	99.75	114.50*
5	71.56	75.20	84.80*	***		
6	56.52	58.50	55.17	***		
7	47.19	45.71	*	***		
8	41.97	42.50	*	***		
9	36.81	36.56	*	***		
10	33.48	37.10	*	***		

*mode = 2 observations
** all average times available were different so mode = 1 observation across all times
*** all observed officers with 5 or more available time slots were post officers so means and medians for post officers (all observed) are presented under all officers (figures were the same)

As we expected, Table 6.13 shows that those shifts with fewer committed time slots had the longest blocks of down time available to them to engage in problem-oriented policing. For example, a shift that includes one long free time slot (includes those officers who responded to none or just one block of calls) had the longest amount of down time available (e.g. 270 minutes or four and a half hours in a "block" of down time). Obviously, when an officer has four-and-a-half hours available, then there is plenty of time available to engage in problem-solving activities. The most common type of shift (i.e: those shifts with between 3 and 6 time slots available) had about two hours of uncommitted time per slot. This result is the best benchmark statistic to assess the amount of available time for problem-solving.

Our results presented in Table 6.13 also reveal that those officers working on shifts with up to 10 blocks of time "free" have more than thirty minutes of "free time" during their blocks of down time. This is an important result: contrary to the notion that officers are run off their feet and have little blocks of time available for problem-solving, our results suggest something different. We suggest that officers do, in fact, have

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

sufficient time to pro-actively engage in problem-solving activities. Indeed, our results show that for even the busiest shifts, officers have blocks of at least thirty minutes available to engage in problem-solving.

6.4.4 Feasible Alternative Responses

One presumed benefit of non-emergency call systems is that, in theory, the systems are designed to divert calls that do not require an immediate response out of the dispatch system, reducing the number of emergency responses and freeing up officer time that can be spent on other directives. For this objective to be achieved call-takers must be in a position to divert calls away from the dispatch process for those calls that do not require an immediate response. For these diverted calls, the department needs clear and concise policy guidelines as to what and how alternatives can be utilized to handle these non-emergent citizen requests. Obviously, some 3-1-1 calls may need to be dispatched. However, as we reported in Chapter Four, it is clear that the vast majority of 3-1-1 calls are low priority calls. Therefore, it is reasonable to assume that an appropriate departmental policy should be a presumption to not dispatch a low priority 3-1-1 call rather than to dispatch the call. As we have pointed out, however, the current practice in Baltimore is to dispatch the 3-1-1 calls (see Chapters Four and Five).

Four questions were used to gather data on office perceptions of whether 3-1-1 dispatched calls could have received alternative responses. First, observers asked officers whether at the time the call was "initially dispatched or when the officer first heard about the problem" it could have been handled by "some alternative method other than the officer responding." If answered in the affirmative, officers were queried about the possible alternative. Two additional questions asked the officer if at the end of the activity it was a problem that could have been handled by some means other than through dispatch, and if so, the feasible alternative.

Table 6.14 presents the findings concerning 3-1-1 calls that were dispatched to officers. Officers believed that at the time the call was dispatched, 11 of the 174 3-1-1 calls dispatched and observed during our two week observational study could have been handled by alternative means. This represents 6.3 percent of the 3-1-1 calls dispatched and handled by the patrol division during our sample of observed ride-alongs.

When asked at the end of handling the 3-1-1 request, officers replied that 25 (14.4 percent) of these dispatched 3-1-1 calls could have been handled by an alternative response. Table 6.14 reports that using an alternative would have saved 484 minutes (approximately one eight hour shift) of post officer time that could have been used performing other street-level activities.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 6.14 Officer Perceptions of Feasible Alternatives for 3-1-1 Dispatched Calls by Total Time Engaged in Activities

	When initially received 3-1-1		At end of handling	
Alternative	N	Minutes	N	Minutes
3-1-1 and gone to NSC Sergeant	1	45	1	45
3-1-1 and set for a delayed response	3	61	4	28
3-1-1 and referred to another police unit	1	27	4	122
3-1-1 and referred to another city agency	3	79	3	79
3-1-1 and written report taken by phone	2	40	5	130
Other	1	25	8	80
Total	11	277	25	484

Table 6.15 uses the same format and provides the findings for the handling of 9-1-1 calls. This table indicates that officers felt that 70 of the 1,083 9-1-1 calls (6.5 percent) calls that were dispatched to observed officers could have been handled by some different response. According to officers, almost one-half (45.7 percent) of these calls should have been 3-1-1 calls and set for a delayed response. Officer responses after handling the call indicated that 147 (13.5 percent of the 9-1-1 calls) calls could have been effectively handled using some other means and that 2,479 minutes of patrol time was spent responding to these requests for service. In other words, 41.3 hours of officer time (during 5 eight-hour officer shifts) were spent responding to 9-1-1 requests for service that officers believed could have been handled by some other police action.

Table 6.15 Officer Perceptions of Feasible Alternatives for 9-1-1 Dispatched Calls by Time Engaged in Activities

	When initially received 9-1-1		At end of handling	
Alternative	N	Minutes	N	Minutes
3-1-1 and gone to NSC Sergeant	3	75	5	117
3-1-1 and set for a delayed response	32	430	46	655
3-1-1 and referred to another police unit	11	196	11	229
3-1-1 and referred to another city agency	7	209	9	211
3-1-1 and written report taken by phone	3	106	22	426
Other	14	187	54	871
Total	70	1203	147	2,479

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

6.4.5 Directing Officer Behavior

During interviews with members of the research team, several BPD sector lieutenants and district commanders stated that the non-emergency call system had reduced the quantity and quality of dispatched calls. As such, they believed that officers had more discretionary time and administrative personnel had more opportunities to direct officer behavior. One way we sought to collect information on this issue was to ask observed officers a series of questions that focused on whether the officer had been commanded or requested to perform specified activities during their shift by district personnel.

Observers asked officers prior to beginning their observation period whether "At roll call or some time prior to going out on patrol" the officer received "directives from a supervisor" about places that should receive attention. If answered in the affirmative, this question was followed by an inquiry concerning the officers' beliefs as to the "reason for the directive" and also questions about the specifics of the directive. Subsequent questions followed this same format and asked about directives received during the ride from supervisory personnel, instructions from supervisors at roll call on how to use their discretionary time, and instructions received during the ride on how to use discretionary time. Two additional questions asked officers whether they received information from other officers and whether the officer had contact with the Neighborhood Service Center Sergeant during the ride.

Table 6.16 provides the officer responses concerning directives and instructions received before and during each ride by the personnel providing the direction and the officers perceptions as to the basis for the supervisory input.

Officers were much more likely to note that they received directives prior to going out on patrol (N=37) than during the ride (N=13) and that directives were more than twice as likely than instructions on how to use their discretionary time (N=15 and N=6). Further, slightly more than two-thirds (67.6 percent) of all requests were the result of communication from the sector sergeant, the immediate supervisor of post officers and slightly less than one-half (45.1 percent) were believed to be based on existing crime data. On 48 different rides officers received directives or instructions from supervisory personnel, while 23 officers received information both prior to and during their rides.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 6.16 Source of Directives Provided by Perceived Basis for the Directive

	Perceived Basis for Directive						
	9-1-1	3-1-1	Citizen Info	Discretion of Person	Crime Data	Missing	N
Directives prior to ride by:							
Sector Sgt	3	0	5	4	11		23
Sector Lt.	1	1	0	2	6		10
Dist. Commander	0	0	0	2	0		2
Community Officer	0	0	0	1	0		1
Other							1
Directives during the ride by:							
Sector Sgt.	1	0	0	2	6		9
Sector Lt.	0	0	0	2	0		2
Dist. Commander	0	0	0	2	1		1
Community Officer.	0	0	0	0	0		0
Other							1
Instructions at roll call on how to spend discretionary time by:							
Sector Sgt.	1	0	1	3	4	1	10
Sector Lt	0	0	1	2	1		4
Dist. Commander	0	0	0	0	0		0
Community Officer.	0	0	0	0	0	1	1
Other							0
Instructions during ride on how to spend discretionary time by:							
Sector Sgt.	1	0	0	2	3		6
Sector Lt	0	0	0	0	0		0
Dist. Commander	0	0	0	0	0		0
Community Officer	0	0	0	0	0		0
Other							0
Total	7	1	7	22	32	2	71

As noted two additional questions asked about contact officers had with other officers and their Neighborhood Service Center Sergeant. Only three officers reported that they had contact with the NSC Sergeant. Sixteen officers said during their shift they received "instructions from another police officer about places" in their area that should receive attention. When responses to these two questions are included a total of 60 different officers received information from another source during their work shift.

When use of directives is examined across study districts, they were most likely to occur in the Central District (22.4 percent of rides), then Southern District (18.1 percent) and finally Southeast (17.8 percent). However, when information from other officers is included, Southern District becomes the most common likely

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

area (27.7 percent) in which officers will receive information from a secondary source. Eight officers that did not receive directions or instruction from supervisory personnel did communicate with other officers in their sector or post.

6.5 Summing Up

This chapter sought to describe the nature and manner in which patrol officers in Baltimore spend their time. The goal of the observational study was to quantify the time officers spent responding to 3-1-1 calls and how the presence of a 3-1-1 non-emergency number system shapes the nature of patrol work in Baltimore.

Our research reveals some interesting patterns: first of all, a large proportion of officer time was spent on self-initiated activities. While this varies from the common assumption that police work is primarily reactive, it is consistent with findings reported for the POPN project in St. Petersburg and Indianapolis (Mastrofksi et al. 1998: 25-26 in Systematic Observation of Public Police: Applying Field Research Methods to Policy Issues, NIJ Research Report). Almost one-fifth (19.3 percent) of officer time in Baltimore was spent responding to 9-1-1 calls and an additional 3.2 percent of their time was consumed by 3-1-1 calls. These numbers increase to approximately 30 percent of officer patrol time when only officer mobilizations are considered. Further, close to one-third (31.3 percent) of officer activities in Baltimore were classified as administrative, involving personal business or shift preparation.

The extent to which officer mobilizations occurred from 3-1-1, 9-1-1, and self-initiated activities varied across the three study sectors, although each followed the same pattern. Officer activities were most likely to be self-initiated or directed, less likely to be due to 9-1-1 calls and least often the result of 3-1-1 requests for service.

Our results also shed light on the nexus between officer up time and down time. Our results show that officers respond to about five calls per shift, they have about 4 or 5 time slots available per shift to engage in problem-oriented policing activities and that the "free" time slots available are of sufficient time (about 2 hours) for officers to pro-actively engage in problem-solving.

Not only did officers in Baltimore have ample down time to engage in problem-solving, but they also believed that they were being dispatched to calls that could have been handled by some other means than an immediate response. Specifically, officers at the end of handling twenty-five 3-1-1 calls believed that an alternative would have been proper. Likewise, officers felt that 147 calls dispatched as 9-1-1 requests could have received an alternative response. These calls accounted for 2,963 minutes of officer time.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

The number of calls that officers thought should not have been dispatched doubled over the course of handling the call (81 to 172). This likely occurred because officers had more information after responding to the citizen request than they had when the call was initially dispatched.

On approximately one-fourth of all rides officers received some form of instructions from other police personnel about the activities they were to perform while on duty. Information was most likely to come from sector sergeants.

These results, when examined in the context of our findings from Chapters Four and Five, suggest that the Baltimore Police Department has the capacity to gain additional benefits from the 3-1-1 non-emergency call system infrastructure. Reducing the number of 3-1-1 dispatched calls, reducing the number of 9-1-1 dispatched calls, encouraging more non-emergency calls that are presently placed to the 9-1-1 system to be diverted to the 3-1-1 system, and making greater operational linkages with the Neighborhood Services Center (if these centers were elevated to take on a more pro-active, problem-oriented policing responsibility). We explore these policy implications in the final, concluding chapter (Chapter Ten).

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

7 CHAPTER SEVEN: CITIZEN PERCEPTIONS OF BALTIMORE'S 3-1-1 CALL SYSTEM

7.1 Introduction

In the fall of 1999 we conducted a survey to gauge citizen attitudes and satisfaction with 9-1-1 and 3-1-1 services. This chapter describes the sampling methodology, provides a description of the respondents and their characteristics, and presents main findings from the survey. Numerous areas are explored including: citizen behaviors over the past year (e.g., use of 9-1-1 and 3-1-1 services); general citizen perceptions of the 3-1-1 system (e.g., does 3-1-1 lead to fewer 9-1-1 calls for service?); and citizen satisfaction with 9-1-1 and 3-1-1 call-takers, police, and city agencies (e.g., was the call-taker helpful, was the citizen satisfied with the police and agency response?).

7.2 Method

A sample of 9-1-1 and 3-1-1 calls made to the Baltimore City Police Department between May 28, 1999 and June 28, 1999 were selected for the survey. This thirty-two day period represented a time frame in which a more extensive recording of 3-1-1 calls were made by call takers.[1] A sample of 330 cases representing 125, 9-1-1 calls; 125, 3-1-1 calls; and 80, 3-1-1 calls that led to Incident Reports or neighborhood service center reports entering the LAN system. Thus, the calls represented a diversity of types of calls entering the Computer Aided Dispatch System (CAD).

In total there were 147,169 CAD entries during the study period. Since these data existed on a real time system and included on-scene requests for CAD numbers as well as 9-1-1 and 3-1-1 calls a sampling strategy was designed to ensure that the designated number of 9-1-1 and 3-1-1 calls entering the CAD system could randomly be drawn from the population of 147,169 calls. An optimum strategy would have downloaded all calls and sorted them by type of call dividing the categories into 9-1-1, 3-1-1 and on-scene requests. Then a random sample of 9-1-1 and 3-1-1 calls could have been selected from the population after excluding those calls with CAD numbers which entered the LAN system. This strategy, however, was not possible since the real time system lacked the capacity to download such a periodic sample. Consequently, these data had to be scrutinized on the CAD screens to ensure that sufficient samples of 9-1-1 and 3-1-1 calls not entering the LAN system could be randomly drawn.

---

[1] During this period, *all* calls received by the 3-1-1 system were entered into the CAD system providing a complete record of all calls. This represents a more extensive recording of 3-1-1 calls since informational calls requesting directions or other Government services are generally not recorded within this system.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Since time was considered a critical component in contacting sample respondents it was impossible to access, in real time, each of the 147,160 CAD records to isolate and remove the on scene officer requests for CAD numbers. To resolve this dilemma, we first identified the total number of calls per day entering the CAD system during the thirty-two day period.[2] Since the CAD system assigns CAD numbers based on the four digit sequence plus the year and the day of the year we were able to reconstruct the CAD sequence for each of the thirty-two days. For example, the first record on May 28, 1999 would be designated as 991480001 and subsequent records would increment sequentially using the year and day until the last record was identified.

We drew a series of random samples of 463 cases each in an effort to identify valid 9-1-1 and 3-1-1 calls by requesting the CAD record screen and examining the call to ensure that it was not an on-scene request. Since we were conducting a telephone survey, the sample was also screened for other important information to determine whether the call represented a valid call from a citizen. The conditions in determining whether a call was valid were dictated by necessity and practical concerns inherent in the types of calls entering the system. For example, if the call was operator assisted or was placed from a third party business address the call was deemed invalid as the likelihood of contacting the caller was extremely improbable if not nil. Calls were also screened for sexual assaults and domestic violence to ensure both citizen privacy and safety.[3]

Samples of 463 were continuously drawn in an effort to identify 375 9-1-1 and 3-1-1 calls which were not entered into the LAN system. The 240 cases of 3-1-1 calls entering the LAN system, where an automated database existed, were randomly drawn from the total number of LAN entries during the opportunity window specified above. The CAD numbers were then cross-checked against the 147,160 records to exclude 3-1-1 calls which entered the LAN system. The 375 valid 9-1-1 cases were obtained after drawing ten samples of 463 cases and the 375 valid 3-1-1 calls after twenty samples of 463 cases.[4]

Once the selection of 375 cases for the CAD 9-1-1 and 3-1-1 calls and the 240 cases for the LAN system were drawn, we randomly assigned cases to one of three groupings. The rationale for this strategy was to provide three names for each of the cases. Efforts were then undertaken to contact each case in its specified

---

[2] This information was available from the CAD summary sheets which provided the total number of records per day beginning with 0001 and continuing through to the last request for a CAD number

[3] For example, it was determined that in instances of domestic violence the non-calling party could be contacted resulting in enhanced opportunity for violence. Similarly, citizens who requested anonymity and not to be contacted by officers were excluded from the sample.

[4] The second sample consisted of only 460 cases based on an error when drawing a random selection of cases. This sample was utilized rather than drawing another random sample.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

order following a three call back rule. If the caller could not be contacted in three attempts the interviewer would select the next case for the sample number and again follow the three call back rule.[5]

The 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 and then randomly assigned to a sequence and call order number. Obviously, each additional sample of 463 cases was drawn without replacement since respondents were to be contacted only once in the survey.

Thus, although the base sample consisted of 990 telephone numbers, with 375 9-1-1; 375 3-1-1 and 240 LAN calls, the sample consisted of 125 9-1-1 calls; 125 non LAN 3-1-1 calls and 80 LAN 3-1-1 calls.[6]

Sampling was in part directed by our review of the number of calls in 1998. During the same time period in 1998 there were 126,035 calls. Of these, 21 percent or 27,059 calls were to 3-1-1 and 51 percent, 63,749 were to 9-1-1. The remaining 28 percent or 35,227 CAD entries were on-scene requests by officers for CAD numbers. Thus, during our sampling strategy we assumed that our method would produce a complete 9-1-1 sample faster than a 3-1-1 sample since the 3-1-1 calls represented approximately one third of citizen calls. While this was in fact the case, there were slightly more 3-1-1 calls projected in 1999 representing almost 40 percent of citizen calls. This is most likely the result of the added attention afforded entering all calls including informational calls into the CAD system during the sampling period.

The results of the sampling strategy are reported in Table 7.1 and Table 7.2.

Table 7.1 Number of Survey Respondents by Sample

Sample	9-1-1	3-1-1	3-1-1 LAN	Total
Sample A (n=330)	41	31	21	93 (28.1)
Sample B (n=330)	22	24	19	65 (19.7)
Sample C (n=330)	18	23	15	56 (16.9)

Table 7.1 provides a breakdown of the number of citizens in each sample that participated. Of the 330 potential respondents identified in Sample A, 28.1 percent (n = 93) participated; of the 330 potential respondents identified in Sample B, 19.7 percent (n = 65) participated; and of the 330 potential respondents identified in Sample C, 16.9 percent (n = 56) participated.

[5] Despite efforts to ensure that we had valid cases which could be called within a reasonable time frame some of those sampled had moved or no longer had working telephones. Thus, despite efforts to contact the first party on each assignment alternately assigned cases could be used if contact was impossible.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 7.2 provides a breakdown of 9-1-1, 3-1-1, and 3-1-1 LAN callers. As shown, 37.9 percent of the respondents were 9-1-1 callers while the remaining 62.1 percent were either 3-1-1 or 3-1-1 LAN entrants. In total, 214 of 330 citizens agreed to participate, a 64.8 percent response rate.

Table 7.2 Number of Survey Respondents by Final Sample (Percentages in Parentheses)

	9-1-1	3-1-1	3-1-1 LAN
Sample A	41	31	21
Sample B	22	24	19
Sample C	18	23	15
Total	81 (379)	78 (36.4)	55 (25.7)

7.3 Sample Characteristics

Table 7.3 below presents demographic characteristics of survey participants. Approximately 60 percent of the respondents were female, with a higher percentage found in the 9-1-1 (65.3 percent) group as opposed to the 3-1-1 group (56.2 percent). With respect to race, nonwhites represented 61.5 percent of survey respondents. When comparing 9-1-1 to 3-1-1 respondents, race was the only factor that demonstrated a statistically significant difference. While whites made up 50 percent of all 3-1-1 calls, they comprised less than 20 percent of 9-1-1 calls.

The age and income levels of respondents varied widely. The 30-39 age group held the largest number of respondents (28.1 percent) while close to half (45.5 percent) of all respondents earned between $20,000 and $45,000. The most common level of educational achievement was a high school diploma (32.6 percent). Slightly less than half (48.2 percent) of all respondents attended college. In addition, 9-1-1 callers were less likely to have attended college (32.3 percent) compared to 3-1-1 callers (57.9 percent). Finally, a majority of respondents were homeowners (55.6 percent).

[6] Since our interview requested both information on the Call Taker and the Police Department's response to the problem we have kept the Incident Reports and Neighborhood Service Centers separate from the more general 3-1-1 calls including those which ended in dispatch.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 7.3 Characteristics of Survey Respondents

	9-1-1		3-1-1		Total	
Variable	Percent	N	Percent	N	Percent	N
Gender[1]						
Male	34.7	26	43.8	57	40.5	83
Female	65.3	49	56.2	73	59.5	122
Race[2]						
White	18.4	14	50.0	66	38.5	80
Black	75.0	57	39.4	52	52.4	109
Other	6.6	5	10.6	14	9.1	19
Age[3]						
<18	2.7	2	3.1	4	3.0	6
18-21	6.8	5	1.6	2	3.4	7
22-29	14.9	11	20.2	26	18.2	37
30-39	31.1	23	26.4	34	28.1	57
40-49	17.6	13	25.6	33	22.7	46
50-64	21.6	16	17.1	22	18.7	38
>64	5.4	4	6.2	8	5.9	12
Income[4]						
<10,000	12.8	6	10.4	10	11.2	16
10-20,000	19.1	9	9.4	9	12.6	18
20-30,000	25.5	12	21.9	21	23.1	33
30-45,000	21.3	10	22.9	22	22.4	32
45-65,000	14.9	7	20.8	20	18.9	27
65-100,000	6.4	3	8.3	8	7.7	11
>100,000		-	6.3	6	4.2	6
Education[5]						
Some HS	26.2	17	15.0	16	19.2	33
HS Grad	41.5	27	27.1	29	32.6	56
GED		-	2.8	3	1.7	3
Some College	9.2	6	18.7	20	15.1	26
2-yr College	3.1	2	5.6	6	4.7	8
4-yr Grad	13.8	9	21.5	23	18.6	32
Masters Grad	3.1	2	4.7	5	4.1	7
Other	3.1	2	4.7	5	4.1	7
Housing[6]						
Owner	54.7	35	56.1	60	55.6	95
Renter	42.2	27	40.2	43	40.9	70
Relative	3.1	2	3.7	4	3.5	6

[1] Chi Sq. = 1.663 p =.197 df =1
[2] Chi Sq. = 25.030 p =.000 df =2
[3] Chi Sq. = 6.725 p =.347 df =6
[4] Chi Sq. = 6.454 p =.374 df =6
[5] Chi Sq. = 11.783 p =.108 df =7
[6] Chi Sq. = 0.096 p =.953 df =2

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

7.4 Results

Table 7.4 Survey Question Description

Item	Description:	
Citizen Behaviors over past year:		
Number of times citizen called 9-1-1?	Interval variable	
Number of times citizen called 3-1-1?	Interval variable	
Number of times citizen spoke with neighborhood officer?	Interval variable	
Citizen perceptions of 3-1-1		
3-1-1 improves city services?	Ordinal variable,	1 =strongly disagree, 2 = somewhat disagree; 3 =neither; 4 = somewhat agree; 5 = strongly agree
3-1-1 should be used for non-emergency calls only?	Ordinal variable,	1 =strongly disagree; 2 = somewhat disagree; 3 =neither; 4 = somewhat agree;5 = strongly agree
3-1-1 improves police-community relations?	Ordinal variable,	1 =strongly disagree, 2 = somewhat disagree,3 =neither; 4 = somewhat agree; 5 = strongly agree
3-1-1 has led to fewer non-emergency calls to 9-1-1?	Ordinal variable,	1 =strongly disagree, 2 = somewhat disagree, 3 =neither; 4= somewhat agree, 5 = strongly agree
Citizen Satisfaction with Call-Taker:		
Was the police department call-taker polite?	Ordinal variable,	1 =strongly disagree; 2 = somewhat disagree; 3 =neither; 4 = somewhat agree; 5 = strongly agree
Was the police call-taker helpful?	Ordinal variable,	1 =strongly disagree; 2 = somewhat disagree; 3 =neither; 4 = somewhat agree, 5 = strongly agree
Overall, were you satisfied with the way the police department call-taker handled your call ?	Ordinal variable,	1 =very dissatisfied; 2=somewhat dissatisfied,3=neither; 4=somewhat satisfied, 5=very satisfied
Citizen Satisfaction with Police:		
Were the police dispatched to handle your call?	Dummy variable,	1=yes; 2=no
How long did it take the police to respond to your call?	Interval variable,	Number of Minutes
Overall, how satisfied were you with the police response?	Ordinal variable,	1 =very dissatisfied, 2=somewhat dissatisfied, 3=neither; 4=somewhat satisfied, 5=very satisfied
Citizen Satisfaction with City:		
Did a city employee or city inspector respond to your call?	Dummy variable,	1=yes, 2=no
Were you satisfied with the city agency=s response?	Ordinal variable,	1 =very dissatisfied, 2=somewhat dissatisfied, 3=neither; 4=somewhat satisfied, 5=very satisfied
Citizen perception of original problem:		
Do you think the original problem (identified in the call) is currently a problem?	Ordinal Variable	1=big problem, 2=small problem; 3=no problem

The survey contained a variety of items intended to measure citizen attitudes and levels of satisfaction with 3-1-1 and 9-1-1 services (see Appendix 7-A for complete survey instrument).

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

For purposes here, the instrument is broken down into six primary areas of inquiry: citizen behaviors over the past year, general citizen perceptions of 3-1-1 services, citizen satisfaction with the call-taker, citizen satisfaction with the police, citizen satisfaction with city agencies, and the citizen's current perception of the problem which prompted the original call. As such, findings are presented within each of these six areas. Table 7.4 provides a description of selected variables in original form stemming from survey questions. Responses to some questions are re-coded in the following sections by collapsing multiple categories for comparative purposes. The intent is to provide a more intuitive comparative base (e.g., agreeing or disagreeing with whether 3-1-1 reduces emergency calls to 9-1-1).[7] For complete cross comparison between 3-1-1 and 9-1-1 for re-coded variables, please see Appendix 7-B.

Table 7.5 Descriptive Statistics

	Min	Max	Mean	StdDev
Citizen Behaviors over past year:				
Number of times called 9-1-1?	0	480	8.78	46.29
Number of times called 3-1-1?	0	960	10.93	71.87
Number of times spoke with neighborhood officer?	0	365	14.40	59.96
Citizen perceptions of 3-1-1:				
Does 3-1-1 improve city services?	1	5	4.01	1.20
Should 3-1-1 be used for non-emergency calls on	1	5	4.38	1.09
Does 3-1-1 improve police-community relations?	1	5	3.83	1.28
Does 3-1-1 lead to fewer non-emergency calls to 9-1-1?	1	5	4.11	1.05
Citizen Satisfaction with Call-Taker:				
Was call-taker polite?	1	5	4.52	.79
Was call-taker helpful?	1	5	4.39	.99
Overall satisfaction with way call- taker handled call	1	5	4.38	.94
Citizen Satisfaction with Police:				
Was police officer dispatched to call?	1	2	1.21	.41
Response Time?	0	120	18.72	18.83
Overall satisfaction with police response?	1	5	3.83	1.45
Citizen Satisfaction with City:				
Did city employee or inspector respond to call?	1	2	1.95	.21
Satisfaction with city response?	1	5	4.00	1.50
Citizen perception of original problem:				
Is original problem still a problem?	1	3	1.73	.84

[7] In addition, recoding offered the benefit of dealing with extreme outliers. For example, by examining the number of citizens calling 3-1-1 and 9-1-1 in the past year, as well as how many called more than one time, the fact that someone claims to have called 3-1-1 960 times is not provided so much weight as to skew the contact percentage.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

7.4.1 Citizen Behaviors in Past Year

Citizens were asked how many times in the past year they have a) called 9-1-1, b) called 3-1-1, and c) spoken to their neighborhood police officer? In Table 7.6, each of these three behaviors are broken down into the number of citizens engaged in such behaviors, as well as how many citizens participated in each behavior on multiple occasions. These figures are further divided into 9-1-1 and 3-1-1 groups (e.g., based on whether they were included into the sample as a result of calling 3-1-1 or 9-1-1), which is done throughout the remainder of the chapter.

Table 7.6 Citizen Behavior Patterns over Past Year

	9-1-1		3-1-1		Total	
Item	Percent	N	Percent	N	Percent	N
Did Citizen call 9-1-1 in past year?[1]						
No	31.2	24	12.1	16	19.1	40
Yes	68.8	53	87.9	116	80.9	169
Number of Citizens calling more than once? [2]	44.1	34	46.2	61	45.5	95
Did Citizen call 3-1-1 in past year? [3]						
No	8.8	7	38.6	51	27.4	58
Yes	91.2	73	61.4	81	72.6	154
Number of Citizens calling more than once? [4]	66.2	53	32.6	43	45.2	96
Did Citizen speak with Neighborhood Police Officer in past year? [5]						
No	32.9	26	33.8	44	33.5	70
Yes	67.1	53	66.2	86	66.5	139
Number of Citizens speaking with Neighborhood Officer more than once? [6]	54.4	43	44.6	58	48.3	101

[1] Chi Sq = 11.401 p =.001 df=1
[2] Chi Sq. = 0.083 p =.773 df=1
[3] Chi Sq. = 22.387 p =.000 df=1
[4] Chi Sq. = 22.796 p =.000 df=1
[5] Chi Sq. = 0.019 p =.890 df=1
[6] Chi Sq. = 1.896 p =.169 df=1

In total, approximately four out of five citizens (80.9 percent) had called 9-1-1 at some point in the past year, while 45.5 percent had called more than one time. Interestingly, those in the 3-1-1 group were significantly more likely to have used 9-1-1 previously (87.9 percent) compared to those who had originally called 9-1-1 (68.8 percent) about a problem. Following a similar pattern, 91.2 percent of 9-1-1 callers had called 3-1-1 at some point in the past year, compared to only 61.4 percent of original 3-1-1 callers. Further, 9-1-1 callers were significantly more likely than 3-1-1 callers to call the 3-1-1 system on multiple occasions. Apparently, a substantial majority of callers to both the 9-1-1 and 3-1-1 systems were consumers of both systems (e.g., 3-1-1 callers tend to use 9-1-1, and 9-1-1 callers often use 3-1-1). When examining the number

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

of citizens who have spoken to their neighborhood officer in the past year, 66.5 percent of the respondents had done so. However, there was no statistically significant difference between the 9-1-1 and 3-1-1 group in this regard.

7.4.2 General Citizen Perceptions of 3-1-1

Four questions concerning citizen perceptions toward 3-1-1 were analyzed: a) does 3-1-1 improve city services, b) should 3-1-1 be used for non-emergency calls only, c) does 3-1-1 improve police-community relations, and d) does 3-1-1 lead to fewer non-emergency calls to 9-1-1? Table 7.7 presents results from each of these questions.

Table 7.7 Citizen Perceptions of 3-1-1

	9-1-1		3-1-1		Total	
Item	Percent	N	Percent	N	Percent	N
3-1-1 improves city services?[1]						
Strongly or somewhat:						
Agree	79.0	64	81.2	108	80.4	172
Disagree	17.0	17	18.8	25	19.6	42
3-1-1 should be used for Non-Emergency calls only? [2]						
Strongly or Somewhat:						
Agree	80.0	64	91.7	122	87.3	186
Disagree	20.0	16	8.3	11	12.7	27
3-1-1 improves Police-Community relations?[3]						
Agree	62.5	50	75.2	100	70.4	150
Disagree	37.5	30	24.8	33	29.6	63
3-1-1 has led to fewer Non-Emergency calls to 9-1-1?[4]						
Strongly or Somewhat:						
Agree	68.8	55	80.3	106	75.9	161
Disagree	31.3	25	19.7	26	24.1	51

[1] Chi Sq. = 0.153 p =.696 df=1
[2] Chi Sq. = 6.209 p =.013 df=1
[3] Chi Sq. = 3.861 p =.049 df=1
[4] Chi Sq. = 3.639 p =.056 df=1

Overall, citizens view 3-1-1 favorably as seen in the overall agreement for each question. Slightly more than 80 percent of respondents felt that 3-1-1 improves city services, while nearly nine in ten (87.3 percent) believe 3-1-1 should be used for non-emergency calls only. The least amount of agreement was found in the question concerning whether 3-1-1 improves police community relations, but this still resulted in 70.4 percent agreeing with this assessment. Perhaps most importantly, three of every four interviewed agreed that 3-1-1 leads to fewer non-emergency calls to the 9-1-1 system.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

There were statistically significant differences between the 9-1-1 and 3-1-1 group on two of the four questions. Over 90 percent of 3-1-1 respondents felt that 3-1-1 should be used for non-emergency calls as opposed to 80 percent of 9-1-1 callers. Additionally, 3-1-1 callers were also more likely to feel that 3-1-1 improves police-community relations (75.2 percent versus 62.5 percent). Despite these differences, there is still a high amount of agreement in both groups.

7.4.3 Citizen Satisfaction with Call-Taker

Three questions concerning citizen satisfaction with the call-taker were examined: a) was the call-taker polite, b) was the call-taker helpful, and c) overall satisfaction with the way the call-taker handled the call? Table 7.8 presents findings from each of these questions.

On the whole, citizens were pleased with the service provided by call-takers. Nearly 95 percent of the respondents felt that the call-taker was polite, while 90.7 percent felt the call-taker was helpful. Overall, 91 percent of those surveyed were either strongly or somewhat satisfied with the way the call-taker handled the call. Callers to the 9-1-1, as well as the 3-1-1, system were similarly satisfied with the service provided by the call-taker. Very little difference was found between the two groups of callers on any of the three questions posed, none of which produced a statistically significance difference.

Table 7.8 Citizen Satisfaction with Call-Taker

	9-1-1		3-1-1		Total	
Question	Percent	N	Percent	N	Percent	N
Was Call-Taker polite? [1]						
Strongly or somewhat:						
Polite	92.5	74	95.5	127	94.4	201
Impolite	7.5	6	4.5	6	5.6	12
Was Call-Taker helpful? [2]						
Strongly or Somewhat:						
Helpful	90.1	73	91.0	121	90.7	194
Not Helpful	9.9	8	9.0	12	9.3	20
Overall satisfaction with the way Call-Taker handled call? [3]						
Strongly or Somewhat:						
Satisfied	91.1	72	91.0	121	91.0	193
Dissatisfied	8.9	7	9.0	12	9.0	19

[1] Chi Sq. = .839 p =.360 df=1
[2] Chi Sq. = .043 p =.835 df=1
[3] Chi Sq. = .002 p =.968 df=1

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

7.4.4 Citizen Satisfaction with Police Response

Three questions concerning citizen satisfaction with the police response were analyzed: a) was a police officer dispatched to the call, b) what was the average response time, and c) overall satisfaction with the police response? Results from each of these questions are presented in Table 7.9.

Table 7.9 Police Response and Citizen Satisfaction

	9-1-1		3-1-1		Total	
Question	Percent	N	Percent	N	Percent	N
Was a Police Officer dispatched to call? [1]						
Yes	92.1	70	70.5	91	78.5	161
No	7.9	6	29.5	38	21.5	44
Average response time? (in minutes) [2]	-	16.34	-	20.44	-	18.72
Overall satisfaction with Police response? [3]						
Strongly or Somewhat:						
Satisfied	72.0	54	80.0	100	77.0	154
Dissatisfied	28.0	21	20.0	25	23.0	46

[1] Chi Sq. = 13.191 p = .000 df=1
[2] t = -1.429 p = .155
[3] Chi Sq. = 1.694 p = .193 df=1

Over three-quarters (78.5 percent) of all calls made by respondents to 9-1-1 and 3-1-1 resulted in an officer being dispatched to the scene. As expected, a greater percentage of 9-1-1 calls resulted in a dispatched officer., 92.1 percent of those respondents calling 9-1-1 resulted in a dispatched officer compared to 70.5 percent of those calling 3-1-1, producing a statistically significant difference. The average overall response time was reported to be just over 18 minutes. As expected, the average response was reported to be quicker for 9-1-1 calls (16 minutes) than 3-1-1 calls (20 minutes). The median reported response time was 10 minutes for 9-1-1 calls, 15 minutes for 3-1-1 calls, and 12 minutes overall. Moreover, overall citizen satisfaction with the police response was favorable. Seventy-seven (77) percent of the respondents were either strongly or somewhat satisfied with the police response. Further, although satisfaction levels varied somewhat between the 9-1-1 (72 percent satisfied) and 3-1-1 groups (80 percent satisfied), this did not produce a statistically significant difference.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

7.4.5 Citizen Satisfaction with City Response

Citizens were also asked about the city's response to requests for service via the 9-1-1 and 3-1-1 systems. More specifically, two questions were analyzed: a) did a city employee or inspector respond to the call, and b) overall satisfaction with the city's response? Table 7.10 presents findings from these questions.

Table 7.10 City Response and Citizen Satisfaction

	9-1-1		3-1-1		Total	
Question	Percent	N	Percent	N	Percent	N
Did a city employee or inspector respond to call? [1]						
Yes	2.6	2	5.6	7	4.5	9
No	97.4	74	64.4	117	95.5	191
Overall satisfaction with City response? [2]						
Strongly or Somewhat:						
Satisfied	50.0	1	85.7	6	77.8	7
Dissatisfied	50.0	1	14.3	1	22.2	2

[1] Chi Sq. = .996 p = .318 df=1
[2] Chi Sq. = 1.148 p = .284 df=1

As shown, only 9 callers (4.5 percent) reported a city response beyond or in place of a police response. Seven of the nine stemmed from a call to 3-1-1 while the remaining two were the result of calls to 9-1-1. Seven of the citizens receiving a city response were strongly or somewhat satisfied with the service provided, six of which were 3-1-1 callers. With respect to response time by city agencies (not shown in Table 7.10), 3 callers received a response within a day, 3 within a week, one within a month, one over a month, and one never came to the scene. Among the agencies responding to citizen concerns were: court system services, the city crime lab, an insurance official, the Maryland Stadium Authority, Metric Maid, city council, and the water department.

7.4.6 Current Status of Problem

Finally, citizens were asked about the current status of the problem they originally called either 9-1-1 or 3-1-1 about. Interviewers asked respondents whether they perceived the problem at the current time as either a big problem, small problem, or no longer a problem. Table 7.11 shows the results from this question.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 7.11 Current Status of Problem

	9-1-1		3-1-1		Total	
Question	Percent	N	Percent	N	Percent	N
Is the original problem still a problem? [1]						
Big Problem	56.6	43	49.6	66	59.2	109
Small Problem	17.1	13	25.6	34	22.5	47
No Problem	26.3	20	24.8	33	25.4	53

[1] Chi Sq. = 2.030 p = 0.362 df = 2

As shown, a majority of those surveyed still feel that the original problem exists. Nearly three of every four (74.7 percent) interviewed stated that the problem was currently still a big or small problem. Over half (52.2 percent) felt the problem was still a big problem. Further, although slightly more 9-1-1 callers (56.6 percent) felt the original problem was still currently a big problem compared to 3-1-1 callers (49.6 percent), this difference was not statistically significant. Hence, it appears that despite a clear majority of citizens being satisfied with the call-taker, as well as the police and city response, they still perceive the existence of a problem.

7.5 Summary

In sum, when examining citizen behaviors of 9-1-1 and 3-1-1 use over the past year it was found that a majority of citizens have used each of these systems (about three-quarters) while just under half have done so on multiple occasions. It also appears that respondents using one system (e.g., 3-1-1) often use the other as well (e.g., 9-1-1). With respect to citizens speaking with a neighborhood officer, two of three respondents have spoken to a neighborhood officer in the past year, with about half doing so on more than one occasion.

Citizens had an overall favorable view of 3-1-1 services. Citizens generally agreed that 3-1-1 improves city services, improves police-community relations, should be used for non-emergency calls only, and leads to fewer non-emergency calls to 9-1-1. A significantly greater number of 3-1-1 respondents, as compared to 9-1-1 respondents, felt that 3-1-1 improves police-community relations and should be used for non-emergency calls only.

Respondents were also generally pleased with services provided by 9-1-1 and 3-1-1 call-takers. Over 90 percent of respondents felt that call-takers were both polite and helpful and were overall satisfied with the service provided. Further, citizen respondents were generally satisfied with police and city agency services, although not to the same extent as they were with call-takers. About three-quarters of the respondents were

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

either very or somewhat satisfied with the police and city's response to their call. Moreover, both 9-1-1 and 3-1-1 callers were similarly satisfied with police and city service. As expected, 9-1-1 calls yielded a quicker response time by the police compared to 3-1-1 calls.

Finally, somewhat surprisingly, three of four citizens surveyed felt the problem they originally called about still currently remained a problem. Further, over half of these citizens believed this was actually a "big" problem. Thus, it appears that responding to citizen concerns is as important, if not more important, than actually rectifying the problem called about, at least in the long term.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

8 CHAPTER EIGHT: PERCEPTIONS OF THE DALLAS 3-1-1 SYSTEM

8.1 Introduction

In December 1997, the City of Dallas implemented a holistic non-emergency call system where twenty-eight city customer service numbers and seven call-taking centers were amalgamated under the Fire Department to accept citizen requests for the vast majority of city services. Unlike the Baltimore non-emergency call system, the Dallas 3-1-1 system was not designed to specifically reduce non-emergency calls to the police. Rather the Dallas non-emergency call system was implemented to provide citizens with easier and more efficient access to a wide range of city services. City service call centers were consolidated into the one 3-1-1 non-emergency call center and allowed citizens to call 3-1-1 to reach the following city services: animal control (e.g. animal cruelty, unrestrained animal, noisy animal), sanitation (e.g. missed garbage, illegal dumping), streets (e.g. street and shoulder repair, drainage repair, storm drain cleaning), public works and transportation (e.g. illegal parking, street lighting, traffic signals), code compliance (e.g. junk auto, high weeds, property damage, litter, graffiti), economic development (e.g. building permits, motor repairs), parks (e.g. tree trimming, park maintenance), environmental and health services (e.g. noise pollution, air pollution), city controller (e.g. cable T.V., electric), housing (e.g. human services, housing programs), and water (e.g. main break, sewer leak, burst pipe).

At a minimum, the Dallas non-emergency call system sought to provide citizens with accurate information about city services 24 hours a day/7 days a week. The overarching goal of the Dallas system, however, was much more: From the outset, the Dallas non-emergency number system sought to cut through bureaucratic red-tape and provide citizens with the city services they need in a timely and efficient manner.

This chapter explores stakeholder, police officer and citizen perceptions of the 3-1-1 system in Dallas. We begin the chapter with a summary of stakeholder accounts of the factors precipitating introduction of the 3-1-1 system. We then draw from a systematic survey of police officers in Dallas to assess their perceptions of the 3-1-1 non-emergency call system. We complete the chapter with a summary of a citizen survey of 3-1-1 callers.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

8.2 Stakeholder Perceptions of the Dallas 3-1-1 Non-Emergency Call System

During several site visits to the City of Dallas, members of the University of Cincinnati Evaluation Team interviewed a range of personnel identified in a snowball sampling manner as having a role in the development, implementation and management of the 3-1-1 non-emergency call system. Drawing from lists of open-ended questions (see Appendix 8-A), personnel were interviewed from the fire department, police department, the call-taking center, various city agencies, the City Manager's office, city politicians and representatives from private companies involved in the provision of 3-1-1 technologies.

Several critical factors played roles in the development and implementation of the Dallas 3-1-1 call system. First, the former City Manager, John Ware, in early 1990s began to explore the feasibility of consolidating 28 non-emergency telephone numbers available to Dallas residents for requesting city services. Specifically, the intention was to consolidate all of the existing city communication personnel who were employed by the various municipal agencies (Animal Control, Public Works and Transportation, Sanitation, Streets, Code Compliance, etc.) under one unit. Several interviewees suggested that the idea of consolidating the handling of non-emergency requests for city services would not have evolved as it did without the political leadership of John Ware.

Second, at the time the 3-1-1 proposal was being explored the City of Dallas had an existing department, the Action Center, which handled non-emergency requests of citizens. This department's primary role was to receive calls from disgruntled citizens and help in securing the requested services. By the late 1980s the Action Center monitored some of the city responses to these citizen requests, although the agency's primary responsibility remained directing the service request to the proper agency. The 3-1-1 concept was premised on the roles and responsibilities of the Action Center that at one time was under the control of John Ware prior to his becoming the city manager.

Third, stakeholders reported that Dallas's 9-1-1 system was not overburdened to the extent that similar systems are in other cities. Stakeholders believed that while there were delays in handling calls in Dallas, these delays were not compromising the 9-1-1 system and they did not feel the delays were as lengthy as in other locations.

Fourth, some stakeholders stated that the decision to implement the 3-1-1 system in Dallas (hardware, software etc.) was influenced by the fact that the City of Dallas needed to purchase new hardware as the old system was already outdated. Because of the existing need to purchase equipment, coupled with the plan to

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

consolidate the handling of non-emergency calls, a decision was made by the city's communications division to purchase a "switch" that could be used for a combined 9-1-1 and 3-1-1 system.

Fifth, stakeholders recalled that once the decision was made to consolidate the communication personnel, stakeholders report that it took approximately three years to implement because of state and federal bureaucratic issues that had to be resolved.

The initial goal of the 3-1-1 system was to reduce citizen complaints concerning their inability to contact city personnel about general service-related issues. The system was not intended to be police specific, and in fact, even now the emphasis is on the provision of a range of municipal services. Along with reducing the number of complaints, the intent was to increase citizen satisfaction by providing Dallas residents with a single number that could be contacted around the clock, and where the call would be personally answered.

One 3-1-1 Coordinator noted that "3-1-1 is an information and referral system and the system has been pretty successful in providing citizens information about a variety of city service topics." (personal communication). This person suggested that only recently the emphasis has shifted to also ensure that the requested service is actually provided, something that is now being done by tracking agency response to service requests.

The Interactive Community Policing (ICP) Sergeants commented that the goal of 3-1-1 is to also to allow the city to track calls concerning city services so that the appropriate agencies may be held responsible for providing the requested services. This was noted as an area that the city needs to especially work on, as there is a fear that the expectations of citizens may not be met when it comes to delivery of the service.

The 3-1-1 non-emergency call system in Dallas was not implemented with the specific purpose of influencing the work routine of Dallas police officers. Stakeholders interviewed for this project consistently noted that job of Dallas Police Department officers has not changed with the implementation of the 3-1-1 system. One stakeholder noted that existing DPD dispatch and response policies were translated verbatim into the 3-1-1 system dispatch and response policies (as were a number of other departmental policies relating to dispatch and response) and thus there have been only "minimal, if any, changes in how we handle police business" (personal communication). This point is worth elaborating upon: in essence, the 3-1-1 call center in Dallas adopted the policies and procedures relating to dispatch and response from each of the participating departments. Amalgamation of the call centers thus consolidated the personnel receiving calls from citizens into one physical location but did not affect the manner in which the calls were subsequently handled.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

According to our stakeholder interviewees, the 3-1-1 call center call-takers were explicitly trained to handle the calls in the manner in which each department directed. The call center architects did not want to alienate the participating departments and they did not want to dictate to the departments how best the calls should be treated. In order to gain cooperation from the participating departments, existing policies and procedures remained stable and intact with the implementation of the 3-1-1 call center. With this in mind, it is clear why stakeholders (including the police) believe that the roles, responsibilities and workloads of police in Dallas have not been affected in any meaningful way with the introduction of the 3-1-1 system.

Presently, the 9-1-1/3-1-1 system is housed within the Fire Department's Communications Division. All system hardware is maintained and operated by Dallas Communication and Information Services Division. Cross-trained call takers receive and handle all 9-1-1 and 3-1-1 calls. As in the past, DPD officers work as police dispatchers.

In addition to problems associated with bringing the system on-line, stakeholders reported that there were a number of personnel issues that initially plagued the system. These human resource management issues arose because the call takers were now under the control and policies of the Fire Department, and not a variety of city agencies. Unfortunately, city policies that regulated work conditions (salaries, seniority, and appropriate dress) were not consistent throughout the city and these issues had to be reconciled.

Furthermore, stakeholders commented that there is a continuing concern that the generalist approach to the 3-1-1 call center is fundamentally flawed. Stakeholders complained that call takers who originated from the various city agencies are unable to properly handle calls about non-home agency matters because of a lack of familiarity with unique, department-specific problems. For example, stakeholder commented that call takers originally employed by the Sanitation Department call center are ill-equipped to handle calls regarding public works concerns such as illegal parking, traffic signals, and street construction. The City of Dallas has attempted to eliminate this concern by "scripting" responses that will allow the call takers to collect the necessary information from the citizen and by providing training to all call takers. Nonetheless, the sentiment remains among a critical mass of stakeholders that specialist as opposed to generalist call-takers provide better information to citizens and lead to more appropriate handling of the problem reported.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

8.3 Police Officer Perceptions of the Dallas 3-1-1 Non-Emergency Call System

In August, 1999 we conducted a survey of patrol officers in Dallas to ascertain their attitudes and perceptions of the 3-1-1 call system. This section presents the results of the survey and examines officers' perceptions of the impact that the 3-1-1 non-emergency call system had on officer workloads as well as the nature, quality and quantity of policing.

8.3.1 Survey Method

The Dallas Police Department employs approximately 1,200 sworn personnel and is comprised of six patrol operations divisions: Northwest Operations Division, Northeast Operations Division, North Central Division, Central Operations Division, Southwest Operations Division, and Southeast Operations Division. Our survey data were collected from all six patrol divisions over the course of one week during second and third shift roll calls.[1] The second shift roll calls range from 6:00 a.m. to 8:00 a.m. between the six patrol divisions. The third shift roll calls range from 3:00 p.m. to 9:00 p.m. between the six patrol divisions. It is important to note that extensive discussions with call takers, dispatchers, patrol officers, and police executive personnel indicated that the majority of 3-1-1 calls for service occurred during these two shifts. It is in the morning, afternoon, and early evenings when citizens are most likely to use the 3-1-1 system.[2] Thus it was decided that surveys of all officers at second and third shift roll calls for a one week period would yield sufficient data to assess the impact that the 3-1-1 non-emergency call system had on officers' workloads.

The six patrol divisions were divided between two project personnel (3 patrol divisions each). Detail rosters, or roll call rosters, were obtained prior to each shift. Project personnel used these rosters to establish divisional response rates and an overall response rate. Once the detail rosters were secured, project personnel attended selected roll calls, presented a brief overview of the project and purpose of the survey, and then distributed the surveys to all officers attending roll call who either responded, or had the potential to respond, to 3-1-1 calls for service. Officers filled the surveys out at the end of roll call prior to starting their shift. Upon completion, the survey instruments were placed in a box in the back of each detail room.

---

[1] Data were also collected from community policing officers. As many of these individuals establish their own schedules and do not attend roll calls, it was difficult to get their input using our data collection procedure. Consequently, surveys for these individuals were left with COP team supervisors at each division early in the week and then retrieved at the end of the week.

[2] First watch shift starting times range from 11:00 p.m. to 12:00 a.m.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

8.3.2 Sample Characteristics

Table 8.1 presents the overall study response rate. From this table, it can be seen that there are 874 officers that comprise second and third watches with the Dallas Police Department. Of these 874 officers, 544 (58 percent) were present at details during our study week and were given a survey form. There are a number of reasons as to why officers were not present at detail during our study week. For instance, some officers were on vacation during the study period. Other officers were working special assignments and thus did not attend roll calls during the study period. Furthermore, a number of officers were on sick leave, some were in court, and still other officers simply missed roll calls (but were working) the week that the survey data were collected. Close examination of Table 8.1 shows that of the 544 officers that were present at detail, 507 completed surveys. This represents an overall response rate of 93 percent. In other words, of those officers that attended roll calls, 93 percent completed the officer survey.

Table 8.1 Dallas Police Department Overall Response Rate (2nd & 3rd Watches)

	N
Number of Dallas Police Officers on Detail Rosters	874
Number of Dallas Police Officers Present at Detail	544
Number of Dallas Police Officer Surveys Received	507
Overall Response Rate for Surveys Administered	93%
Percent of Watch (officers) surveyed at Detail	58%

It is clear from Table 8.1 that the majority of respondents who attended roll calls completed the survey. Specifically, Table 8.2 shows response rates by police operations division. That is, no less than 88 percent of the respondents completed the survey across all divisions. Moreover, we surveyed over 50 percent of all officers at each detail in each division with the exceptions of the North Central Operations Division (47 percent), and the Central Operations Division (49 percent). We cannot be sure, however, of the biases in the survey sample created by not sampling those officers absent at roll call (e.g. those on vacation, those on sick leave, those in court etc).

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 8.2 Dallas Police Department Response Rate by Division (2nd & 3rd Watches)

Division	N
Northwest Division	
Number of Dallas Police Officers on Detail Rosters	157
Number of Dallas Police Officers Present at Detail	93
Number of Dallas Police Officer Surveys Received	90
Overall Response Rate for Surveys Administered	97%
Percent of Watch (officers) surveyed at Detail	57%
North Central Division	
Number of Dallas Police Officers on Detail Rosters	109
Number of Dallas Police Officers Present at Detail	53
Number of Dallas Police Officer Surveys Received	51
Overall Response Rate for Surveys Administered	96%
Percent of Watch (officers) surveyed at Detail	47%
Northeast Division	
Number of Dallas Police Officers on Detail Rosters	178
Number of Dallas Police Officers Present at Detail	105
Number of Dallas Police Officer Surveys Received	96
Overall Response Rate for Surveys Administered	91%
Percent of Watch (officers) surveyed at Detail	54%
Southwest Division	
Number of Dallas Police Officers on Detail Rosters	168
Number of Dallas Police Officers Present at Detail	132
Number of Dallas Police Officer Surveys Received	124
Overall Response Rate for Surveys Administered	94%
Percent of Watch (officers) surveyed at Detail	74%
Central Division	
Number of Dallas Police Officers on Detail Rosters	84
Number of Dallas Police Officers Present at Detail	41
Number of Dallas Police Officer Surveys Received	41
Overall Response Rate for Surveys Administered	100%
Percent of Watch (officers) surveyed at Detail	49%
Southeast Division	
Number of Dallas Police Officers on Detail Rosters	178
Number of Dallas Police Officers Present at Detail	120
Number of Dallas Police Officer Surveys Received	105
Overall Response Rate for Surveys Administered	88%
Percent of Watch (officers) surveyed at Detail	59%

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 8.3 provides basic demographic information about the officers who comprised the sample. Specifically, this table provides a breakdown of the number of officers surveyed per watch, the units to which they are assigned, the rank structure, and amount of time spent with the Dallas Police Department. It also provides a description of the sex, education, and ethnic composition of the sample.

This table indicates that 65 percent of the sample was comprised of third shift personnel, while the remaining 35 percent of the sample is comprised of second watch officers. This distribution is not unexpected as third shift receives the largest number of citizen calls for service. Accordingly, the Dallas Police Department allocates the largest proportion of its patrol officer resources to this shift. Furthermore, 3-1-1 and 9-1-1 calls are predominately handled by patrol officers and corporals whose primary duties consist of responding to citizen calls for service. During peak call times, sergeants are sometimes required to answer calls, however this is not the norm. On rare occasions, community policing officers (ICP) might get dispatched to a citizen call for service and so we also included these officers in our sample.

We attempted to survey those officers who responded to non-emergency calls for service. The information in Table 8.3 reflects this sampling strategy. Over two thirds of the sample (67 percent) were patrol officers while the remaining third were either corporals (29 percent) or sergeants (4 percent). Furthermore, 93 percent of the officers in this study were assigned to patrol while the remaining 7 percent were community policing officers (ICP).

Table 8.3 also indicates that nearly 60 percent of officers responding to this survey had ten years or less experience with the Dallas Police Department. Alternatively just over one quarter (26 percent) of the respondents had sixteen or more years of experience. Our sample was also comprised primarily of male officers with at least some college experience. These figures reflect the overall breakdown of the Dallas Police Department. Specifically, over seventy-five percent of sworn personnel are male officers and the department now requires new recruits to possess at least an Associate's Degree (personal communication Dallas Police Department, 5/2/00).

Finally, Table 8.3 indicates that 57 percent of the officers were Caucasian, 24 percent were African American, and 18 percent were of Hispanic descent. These numbers tend to reflect the larger Dallas population at large. 1990 U.S. Census estimates indicates that the population of the Dallas Metropolitan Area is 47 percent Caucasian, 24 percent African American, and 17 percent Hispanic (U.S. Census Bureau, 1990).

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 8.3 Dallas Police Department Demographic Data

Variable	Percent	N
Watches		
Officers Surveyed Second Watch (0600, 0700, 0800)	35	178
Officers Surveyed Third Watch (1400, 1500, 1600, 1700, 1800,1900)	65	329
Total	100	507
Unit Assignment		
ICP (Community Policing Unit)	7	32
Patrol (Beat Officers)	93	430
Total	100	462
Officer Rank		
Patrol Officer	67	274
Senior Corporal	29	121
Sergeant	4	16
Total	100	411
Amount of Time Spent with Dallas Police Department		
0 - 5 years	32	160
6 - 10 years	28	143
11 – 15 years	16	81
16 + years	26	133
Total	100	517
Officer Sex		
Male	86	394
Female	14	66
Total	100	460
Officer Education		
High School/GED	2	10
Some College/Trade School	25	112
Associates Degree (AA or AS)	23	106
Bachelor Degree (BA or BS)	43	195
Some Graduate Coursework/ Advanced Degree	7	32
Total	100	455
Officer Ethnicity		
Caucasian	57	255
African American	24	108
Hispanic	18	81
Asian American	1	6
Total	100	459

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

8.3.3 Officer Perceptions of the Purpose and Use of the 3-1-1 Non-Emergency Call System

One purpose of our research was to identify the extent that the 3-1-1 non-emergency call system in Dallas freed up officer time to enable law enforcement to more efficiently and effectively handle emergency calls (9-1-1) for service. To explore this issue we asked officers a series of questions regarding their perceptions about the purpose behind the 3-1-1 system, their perceived use of the system, and how they perceived citizen's to view the system. Table 8.4 indicates that most officers believed that the purpose of the system fulfilled two fundamental needs. Specifically, 74 percent of the officers perceived that the purpose of the 3-1-1 non-emergency call system was to both reduce police responses to non-emergency calls for service and provide callers with the appropriate city service number that would provide them with the answers they needed.

Table 8.4 Officers' Perceptions of Purpose and Use of the 3-1-1 Non-Emergency Call System

Item	Percent Responding	N
Purpose of 3-1-1 Non-Emergency Call System		
Reduce Police Responses to Non-Emergency Calls	16	79
Provide # for City Service Information	5	24
Both Reduce Police Responses to Non-Emergency Calls and Provide # for City Service Information	74	369
Unsure of the Purpose of the 3-1-1 Non-Emergency Call System	6	28
Total	100	500
Who Handles 3-1-1 Calls Routed to Each Division		
Patrol Officers	28	142
ICP Officers (Community Policing Unit Officers)	10	51
PSO (Public Service Officers)	13	64
Unsure of Who Handles 3-1-1 Calls for Service	39	196
Other	9	47
Total	100	500

Numerous discussions with patrol officers and administrative personnel suggested that, at least in theory, officers and police executives had a clear understanding of the alternative call system. However, these discussions also revealed that there was likely to be considerable uncertainty as to how the system actually worked. We identified these uncertainties in our survey. For instance, when officers were asked to identify who received and subsequently responded to 3-1-1 calls routed to the six patrol operations divisions, officers were quite unclear on this issue. Nearly 40 percent of the officers stated that they were unsure who handled 3-

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

1-1 calls routed to each division. Further, 38 percent believed that either patrol officers (28 percent) or ICP officers (10 percent) were the ones responding to non-emergency calls for service.

8.3.4 Officers Perceptions of Citizen Use of 3-1-1

In order to use the 3-1-1 non-emergency system to its fullest extent, the public must be educated about what the 3-1-1 system is and how it works. Law enforcement will unavoidably play a part in spreading this message through their daily interaction with the citizens of Dallas. Moreover, they can also be used as a gauge to measure system usage and citizen knowledge levels and satisfaction levels with the system. When we asked officers how often they actually referred citizens to the 3-1-1 system, half responded only once in a while. An additional 26 percent stated that they never referred citizens to 3-1-1. Alternatively, 24 percent of the officers indicated that they referred citizens to 3-1-1 quite frequently (See Table 8.5)

Table 8.5 Officers' Perceptions of Citizens' Views of the 3-1-1 System

Question	Percent Responding	N
How often do you refer citizens to 3-1-1?		
Never	26	118
Only every once in a while	50	232
Often	24	112
Total	100	462
Considering the people you deal with in your beat, do you think that most of them:		
Know about the 3-1-1 Call System and use it in appropriate situations?	7	33
Know about the 3-1-1 Call System but still choose to use 9-1-1 for non-police matters?	19	88
Are confused about when to use 3-1-1 or 9-1-1?	38	174
Don't even know about 3-1-1?	35	161
Total	100	456
Have you ever had citizen's complain about the 3-1-1 System?		
No	78	359
Yes, but only once in a while	16	74
Yes, often	6	30
Total	100	463
Have you ever had citizen's complain about other city agency's responses to 3-1-1 calls?		
No	73	337
Yes, but only once in a while	18	84
Yes, often	9	40
Total	100	461

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Based on officers' experiences interacting with Dallas residents, we asked our survey respondents about what they thought about citizens' knowledge levels and satisfaction levels with the 3-1-1 non-emergency call system. Table 8.5 shows that 73 percent of the officers felt the citizens either were confused about when to use 3-1-1 or 9-1-1 or did not even know that the system existed. These results are not surprising as patrol officers and police administrators informally complained that they felt there was minimal effort expended to explain the 3-1-1 non-emergency call system to the police or to market the system to citizens. Police felt that the lack of marketing was the primary reason why so few residents either complain about the 3-1-1 system (78 percent) or complain about other city agency's responses to 3-1-1 calls (73 percent). It could be that the citizens have no knowledge of the system and therefore do not express feelings of satisfaction or dissatisfaction in their interactions with the police.

8.3.5 Perceived Impact of the 3-1-1 Non-Emergency Call System on Officer Workloads

One of our research interests was to assess the impact of the 3-1-1 non-emergency call system on officer workloads. To explore this issue, we examined the impact that the 3-1-1 non-emergency call system had on the type of calls officers receive, the types of activities they are involved in, as well as a general overall assessment of the impact that this system has had on their work routines.

Research indicates that law enforcement handles a very diverse range of calls on a daily basis (American Bar Association 1973; Frank, Brandl and Watkins 1997; Greene and Klockars 1991; Mastrofski 1983; Moore, Trojanowicz and Kelling 1988). Discussions and interviews with patrol officers, call takers, dispatchers, and executive administrators provided us with an overview of the types of calls that could be affected by the implementation of a non-emergency call system. Thus we asked officers whether they thought whether the 3-1-1 system had increased, decreased, or generally left unchanged a select number of different calls that could be classified as crime related calls, service related calls, and traffic related calls.

Table 8.6 shows that officers perceive the 3-1-1 system has had little impact (if at all) on a variety of crime related calls for service such as shots fired, family violence, drug dealing, youth gang activity, and burglar alarms. In fact, 100 percent of the officers indicated that the number of aforementioned crime related calls have remained about the same since the implementation of the 3-1-1 system. This might be expected however, as these types of calls are commonly seen as "police matters," and are appropriately handled through the 9-1-1 system anyway.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

It might be expected that the real benefit to law enforcement would be the impact that the 3-1-1 system could have on redirecting more service related or traffic related calls to the appropriate city agency. Table 8.6 indicates that some service related calls appeared to remain unchanged as a result of implementing the 3-1-1 system. Specifically, the number of times officers responded to water main break calls, and unrestrained animal calls were perceived to be unaffected by implementation of the non-emergency call system

Table 8.6 Impact of 3-1-1 on Officer Workload by Call Type

Call Type	Percent of Officers Responding			
Crime Related Calls	Less	About the Same	More	Unsure
Shots fired (N=335)	0	100	0	0
Family Violence (N=310)	0	100	0	0
Drug Dealing (N=292)	0	100	0	0
Youth Gangs (N=304)	0	100	0	0
Burglar Alarm (N=310)	0	100	0	0
Service Related Calls				
Meet Complainant (N = 300)	0	100	0	0
H_2O Main Break (N = 68)	0	100	0	0
Unrestrained Animal (N = 215)	0	100	0	0
Dead Animal (N = 356)	57	0	3	40
Missed Garbage (N = 391)	55	0	3	42
Tall Weeds (N = 382)	58	0	3	48
Litter (N = 376)	58	0	4	38
Traffic Related Calls				
Parking Violations (N=253)	58	0	21	21
Traffic Signal Out (N = 344)	65	0	3	62

Table 8.6 also indicates that the number of "meet the complainant" calls was not reduced. Our anecdotal information suggests that citizen's are unaware of 3-1-1 or the city agency that could best resolve their issue. As a result, they continue to call 9-1-1 for assistance. The perceived unchanged number of "meet the complainant" calls may also stem from the department's belief that it is important to maintain communication with the community and these types of calls provide a good opportunity to have contact with Dallas residents in situations that are not necessarily law enforcement related.

Apart from "meet the complainant" calls, officers perceived that other service related calls were reduced as a result of introducing the 3-1-1 system. Specifically, officers perceive that the number of dead animal calls, missed garbage calls, tall weed calls, and litter calls were reduced after the implementation of the 3-1-1 system. In fact, nearly 60 percent of the responding officers thought that these basic type service calls

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

had decreased. This could be explained by the fact that these calls have distinct departments for the calls to be re-directed away from the police department.

One other area that we thought may be affected by the 3-1-1 system was traffic related calls for service. We asked officers if they had noticed any differences in calls about parking violations or malfunctioning traffic signals: two types of calls that are routinely handled by the police through the 9-1-1 system but are more appropriately suited for the non-emergency system. From Table 8.6 it can be seen that 58 percent of the officers perceived a reduction in the number of parking violation calls. In addition, 65 percent of the officers felt that there had been a decrease in the number of malfunctioning traffic signal calls for service. These data seem to reflect that officers feel that the non-emergency system is at least having somewhat of an expected impact on certain types of calls for service. While police do not feel that 3-1-1 is reducing crime related calls, officers indicated that the system seems to be relieving some of the burden from the 9-1-1 call system. Specifically, officers feel that this system is reducing some of the call load generated by basic service and traffic related calls.

We also asked officers what impact they perceived the 3-1-1 system has had on the types of activities they routinely perform. Table 8.7 shows the categorical breakdowns and the responses by activity type. When asked whether the 3-1-1 system impacted different law enforcement related activities, the majority of officers indicated that it did not. Specifically, two-thirds of the officers indicated that the 3-1-1 system has not impacted the level of random patrol (66 percent) or the patrol practices in high activity areas (67 percent). When asked whether the 3-1-1 call system impacted the investigation of crime problems, again the majority of officers (69 percent) perceived that the amount of time and energy devoted to the investigation of crime problems remained unchanged.

It is not surprising that the majority of officers felt that the 3-1-1 system has had little (if any) impact on their levels of patrol. Random patrol and the allocation of more patrol units to more dangerous locations or places that generate more calls have been a standard in law enforcement for decades. Random preventive patrol after all is the backbone to policing both historically and even today. From an investigative standpoint, it is arguable that the 3-1-1 system could perhaps increase the amount of time officers have to investigate crime problems if they were indeed being freed-up from service related or traffic related calls. However, it could also be the case that lack of officer and citizen knowledge about the system decreases the chances that it will be

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

promoted or used. Consequently, officers may not perceive the 3-1-1 system to be freeing them up and thus feel they have no more or less time to investigate crime problems.

Table 8.7 Impact of 3-1-1 on Officer Workload by Activity Type

Activity Type	Percent Responding		
Law Enforcement Related Activities	Less	About the Same	More
Random Patrol (N = 461)	14	67	19
Patrol High Activity Places (N = 461)	12	66	22
Investigate Crime Problems (N = 292)	16	69	15
Community Oriented Activities			
Talk with Law-Abiding Citizens (N = 462)	19	68	12
Solve Community Problems (N = 455)	26	65	9
Attend Community Meetings (N = 441)	31	62	7

Officers were also asked whether they felt the 3-1-1 has impacted community-oriented activities. Table 8.7 indicates that the majority of officers did not feel that the non-emergency call system either freed them up or restricted them from engaging in community policing activities. Specifically, 68 percent of the respondents indicated that they had about the same amount of time to talk to law-abiding citizens, 65 percent stated that they had about the same amount of time to solve community problems, and 62 percent indicated that they had about the same amount of time to attend community meetings.

Some officers indicated that implementation of the 3-1-1 system has actually reduced the amount of time they have to devote to community-oriented activities. Table 8.7 indicates that over one quarter (26 percent) of the officers felt that since the implementation of the 3-1-1 system, they had less time to engage in community problem solving activities. Furthermore, roughly one third (31 percent) of the officers believed that they had less time to attend community meetings.

These data seem to suggest that the police became distanced from the community as a result of the 3-1-1 system in Dallas. It could be argued that while the system is, at least as officers perceive it, reducing some basic service related and traffic related calls for service, it does not appear to be having any significant impact on the overall call load. Consequently, officers continue to feel that they are racing from call to call and do not actually have time to solve community problems much less attend community meetings.[3]

[3] Communication with officers in roll calls and between shifts supports the notion that although the 3-1-1 system is in place they are still feel like they are "radio slaves." They admit that some calls seem to be less frequent such as litter problems, tall weeds, and animal calls, however, they further indicated that the reduction has no impact on the overall number of calls coming into the department and being routed to each patrol division (Personal communication, August 1999).

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

We asked officers to provide us with a general overview of how they felt the 3-1-1 system has impacted their work routines. Specifically, we asked them to compare the amount of time spent on 3-1-1 calls versus 9-1-1 calls, and the amount of paperwork associated with 3-1-1 calls as compared to 9-1-1 calls. We also asked them how often they responded to 3-1-1 calls that they knew were initially routed to other agencies, and how many 3-1-1 calls for service they handled since the system was implemented. Finally, we asked them what they perceived to be the overall impact of the 3-1-1 system on the number of police calls for service that they handle, whether they believed that the system has changed their daily work routine and whether the 3-1-1 system has helped officers perform their jobs.

Table 8.8 shows that 60 percent or more of the surveyed officers believe that it takes about the same amount of time to dispose of 3-1-1 calls as it does 9-1-1 calls, and that the amount of paperwork associated with both types of calls is similar. One quarter of the sample felt, however, that 3-1-1 calls take longer to dispose of than 9-1-1 calls. It would appear from these data that there is not a great deal of difference between the time spent on 3-1-1 calls and 9-1-1 calls or the amount of paperwork associated with both types of call.

From a workload assessment standpoint, it is important to determine how often officers respond to 3-1-1 calls that were initially routed to other city agencies. Over three fourths of the officers indicated that they infrequently responded to 3-1-1 calls that were originally routed to other city agencies. Specifically, 50 percent of the officers indicated that they responded to these calls only once in a while. An additional 26 percent indicated that they never responded to 3-1-1 calls originally routed to the police department. These results could indicate that calls routed to other city agencies are being adequately handled by the contact agency and thus require no police follow up or activity.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 8.8 Overall Impact of 3-1-1 Non-Emergency Call System on Officer Workloads

Question	Officers Responding	
	Percent	N
Time to Dispose of a 3-1-1 Call as Compared to a 9-1-1 Call		
3-1-1 calls take less time than 9-1-1 calls	15	56
3-1-1 calls take same amount of time as 9-1-1 calls	60	220
3-1-1 calls take more time than 9-1-1 calls	24	88
Total	100	364
Amount of Paperwork Associated with 3-1-1 Calls as Compared to 9-1-1 Calls		
3-1-1 calls require less paperwork than 9-1-1 calls	20	67
3-1-1 calls require the same amount of paperwork as 9-1-1 calls	64	217
3-1-1 calls require more paperwork than 9-1-1 calls	16	53
Total	100	337
How often do you respond to a 3-1-1 call that you know was initially routed to another city agency		
Never	26	118
Only every once in a while	50	232
Often	24	112
Total	100	462
How often are you dispatched to a call that you know came in as a 3-1-1 call?		
Never	22	102
One time per month	10	49
A couple of times per month	24	113
Once every few days	44	206
Total	100	470
Overall Effect of 3-1-1 on Number of Police Calls for Service		
Respond to Fewer Calls since 3-1-1 Implementation	29	132
Same Number of Calls since 3-1-1 Implementation	63	284
Respond to More Calls since 3-1-1 Implementation	7	33
Total	100	449
Has the Implementation of the 3-1-1 Call System Changed Officer Daily Work Routines		
Yes it has	23	103
No it has not	77	343
Total	100	446
Is the 3-1-1 Call System Overall Helping Officers Perform their Jobs		
Strongly Agree	4	16
Agree	41	180
Disagree	46	203
Strongly Disagree	10	43
Total	100	442

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

When asked about the number of times officers were dispatched to calls that were known to have come in as 3-1-1 calls, respondents indicated that being dispatched to 3-1-1 calls was not an uncommon thing. Specifically, 44 percent of the officers revealed that they were dispatched to 3-1-1 designated calls once every few days. An additional 24 percent of the officers suggested that they were dispatched on 3-1-1 calls a couple of times per month.

Finally, we presented officers with an opportunity to provide an overall assessment of the impact of 3-1-1 on the number of police calls for service, its impact on daily work routines, and whether they believe that it helps officers perform their jobs. The majority of officers (63 percent) indicated that the non-emergency call system has had no impact on the number of calls for service dispatched to patrol units. Twenty-nine percent of the officers believed, however, that the 3-1-1 system has resulted in fewer calls being dispatched to patrol elements. Table 8.8 also indicates that 77 percent of Dallas police officers believe that implementation of the 3-1-1 call system has not changed officers' daily work routines.

Although most officers indicated that they feel the 3-1-1 system has not reduced the overall number of calls for service or significantly changed their daily work routines, officers were less critical as to how helpful the system was in performing their jobs. Table 8.8 shows that 56 percent of the officers either disagreed (46 percent) or strongly disagreed (10 percent) with the statement, "Overall the 3-1-1 system is helping officers perform their jobs." On the other hand, 45 percent agreed (41 percent) or strongly agreed (4 percent) with this particular statement.

These data seem to suggest that the majority of officers do not feel the system has done what it was designed to do, namely reduce non-emergency and non-police related calls for service and free up police resources. However, there is a small group of officers that feel the 3-1-1 system reduced the number of calls being dispatched to patrol units and subsequently changed officer daily work routines. It could be that the reduction in traffic related calls and some service related calls resulting from the 3-1-1 system has noticeably altered the work routines of a small proportion of Dallas police officers. However, these data also indicate that the majority of Dallas police officers are skeptical about the ability of the alternative call system to positively impact what it is that they do.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

8.4 Citizen Perceptions of the Dallas 3-1-1 Non-Emergency Call System

To tap citizens' perceptions of the 3-1-1 system the City of Dallas conducted callbacks to citizens who had used the 3-1-1 non-emergency call service. These citizens were asked an open-ended question about their experience with the Dallas 3-1-1 system. A member of the UC research team examined the comments collected during the callback process to determine the outcome of the problem, citizen satisfaction with city services, and citizen satisfaction with the 3-1-1 service. These citizen comments were matched with existing city data regarding the problem in question and the city department that handled the citizens' requests.

8.4.1 Survey Population

Table 8.9 illustrates the number of callbacks made to citizens who had used the 3-1-1 non-emergency call system for three months during 1998 and 1999, and the number of citizens actually questioned about their experience with 3-1-1. In November 1998, Dallas city personnel attempted to call back 325 citizens who had called 3-1-1 regarding a problem with city services. For 57 percent of these calls (N=185) citizens provided comments about their 3-1-1 experience. In January 1999, city personnel were able to question 55 percent (N=167) of citizens that they called back, and in February 1999, 54 percent (N=59) of citizens were questioned.

Table 8.9 Number of Survey Respondents by Month

	Citizens Called Back by City of Dallas	Citizens Surveyed by City of Dallas	
	N	Percent	N
November 1998	325	57	185
January 1999	302	55	167
February 1999	109	54	59
Total	736	56	411

As the number of citizens that Dallas city personnel were able to question is rather small (N=411) we examine the population of callbacks (N=736), using the problems for which citizens requested city services as the unit of analysis.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

8.4.2 Results

Table 8.10 displays a list of city departments by the number of problems in our sample. As this table shows, four city departments handled over ninety percent (93.5 percent, N=688) of the problems in our sample. These four departments included Sanitation (31.8 percent, N=234), Animal Control (27.2 percent, N=200), Water (20.8 percent, N=153), and Streets (13.7 percent, N=101)..

Table 8.10 Problems by Department

Department	Percent	N
Sanitation	31.8	234
Animals	27.2	200
Water	20.8	153
Streets	13.7	101
Parking	2.4	18
Complaints	1.9	14
Housing	1.9	14
E-mail/Send Message	0.1	1
Other Departments	0.1	1
Total	100.0	736

Table 8.11 examines the most prevalent types of problems handled by each of the top four city departments generating 3-1-1 calls. Over half of the problems in our sample handled by the Sanitation Department were missed garbage (52.6 percent, N=123). Over two-thirds (70 percent, N=140) of the problems in our sample handled by the Animal Control Department were about loose animals (42 percent, N=84) and confined/trapped animals (28 percent, N=56). Over half (58.1 percent, N=89) of the problems in our sample that were handled by the Water Department were water leaking (34.6 percent, N=53) and stopped services (23.5 percent, N=36). Nearly half of the problems in our sample handled by the Streets Department were potholes on public property (44.6 percent, N=45).

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 8.11 Most Prevalent Problems By Department

Departments and Problems	Percent	N (688)
Sanitation		
Missed Garbage	52.6	123
Garbage Schedule Information	8.5	20
Missed Brush	8.1	19
Other	30.8	72
Total	100.0	234
Animals		
Loose Animal	42.0	84
Confined/Trapped Animal	28.0	56
Dead Animal	14.0	28
Other	16.0	32
Total	100.0	200
Water		
Water Leaking	34.6	53
Stopped Up	23.5	36
Water Meter Problems	10.5	16
Other	31.4	48
Total	100.0	153
Streets		
Potholes-Public Property	44.6	45
Cuts	14.9	15
Other Signal Problems	4.9	5
Other	35.6	36
Total	100.0	101

Table 8.12 below displays the range of known outcomes for our callback sample. As this table shows, citizens reported that some type of service was provided for over one-third (35.9 percent, N=264) of the problems in our sample. Citizens stated that a city service was not provided for 12.5 percent (N=92) of the problems in our sample. We point out that nearly one-half (44.4 percent, N=327) of the cases in our sample (N=736) had missing values for the outcome variable. This means that the citizen was not contacted by city personnel in the callback attempt.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 8.12 Problem Outcome

Outcome	Percent	N
Service Provided	35.9	264
Service Not Provided	12.5	92
Unsure	7.2	53
Missing	44.4	327
Total	100.0	736

Table 8.13 illustrates the problem outcomes for each of the four city departments discussed above. The Streets Department had the highest number of problems where citizens stated that no service was provided (49 percent, N=25) followed by the Water Department (25 percent, N=22).

Table 8.13 Crosstab: Outcome by Department

	Departments							
	Sanitation		Animals		Water		Streets	
Outcome	Percent	N	Percent	N	Percent	N	Percent	N
Service Provided	65.6	86	71.9	82	62.5	55	39.2	20
Service not Provided	15.3	20	18.4	21	25.0	22	49.0	25
Unsure	19.1	25	9.6	11	12.5	11	11.8	6
Total (N=384)	100.0	131	100.0	114	100	88	100.0	51

Table 8.14 displays citizen satisfaction with city services and perceived problem outcomes. As expected most respondents (83.3 percent, N=10) who stated they were unhappy with city services were cases in which service had not been provided. Most responses (95 percent, N=38) that were pleased with city services were cases where service had been provided.

Table 8.14 Crosstab: Outcome by Service Satisfaction

	Service Satisfaction					
	Unhappy/Upset with Service/City		Pleased With Service		N/A	
Outcome	Percent	N	Percent	N	Percent	N
Service Provided	16.7	2	95.0	38	62.7	224
Service Not Provided	83.3	10	0.0	0	23.0	82
Unsure	0.0	0	5.0	2	14.3	51
Total (N=409)	100.0	12	100.0	40	100.0	357

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 8.15 displays citizen satisfaction with the 3-1-1 number by how the problem was handled.

Table 8.15 Crosstab: Outcome by 3-1-1-Number Satisfaction

	3-1-1-Number Satisfaction					
	Like 3-1-1		Mixed Feelings About 3-1-1		N/A, Not Stated	
Outcome	Percent	N	Percent	N	Percent	N
Service Provided	75.0	15	50.0	1	22.7	248
Service Not Provided	15	3	50.0	1	64.1	88
Unsure	10.0	2	0.0	0	13.2	51
Total (N=409)	100.0	20	100.0	2	100.0	387

8.5 Summing Up

This chapter has presented results from stakeholder interviews, a survey of police officers and a review of a citizen callback survey. Overall, our results show that the 3-1-1 non-emergency call system in Dallas has had very little impact on Dallas police officers. Indeed, our results show that implementation of the 3-1-1 call center did not change, in any fundamental way, the manner in which police-related calls for service were dispatched to the police. Respondents reported that those 3-1-1 calls designated as police matters were dispatched in the same way post implementation of 3-1-1 as they had been dispatched pre-implementation of 3-1-1. Police officers perceived that implementation of the 3-1-1 system had led to no change in the number of dispatched 9-1-1 crime calls, animal control calls, or traffic problem calls, and that the new system had resulted in minimal changes, if any, in the manner and levels of routine patrols or their community policing efforts. The primary reason for this status-quo is that policies and procedures governing the call-handling and dispatch of police matters remained unchanged with the amalgamation of the various city department call centers.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

9 CHAPTER NINE: THE IMPACT OF 3-1-1 ON CALLS FOR SERVICE IN DALLAS

9.1 Introduction

On December 1, 1997 the City of Dallas implemented a holistic non-emergency call system. The Dallas non-emergency call system uses the 3-1-1 call number and consolidated twenty-eight city customer service numbers and seven call-taking centers into one call center under the management of the Fire Department to accept citizen requests for the vast majority of city services. Our initial review of the Dallas model suggests that the non-emergency number system has had a minimal effect on the police (see Chapter Eight). Indeed, unlike the Baltimore non-emergency call system, the Dallas 3-1-1 system was not designed to specifically reduce non-emergency calls to the police. Rather the Dallas non-emergency call system was implemented to provide citizens with easier and more efficient access to city services.

In this chapter we explore the patterns in citizen calls to the police and depict the influence of the 3-1-1 system on the volume and nature of 9-1-1 calls. Further, we explore the patterns of handling calls for police service as a result of introducing the city-wide 3-1-1 system.

9.2 Dallas 9-1-1 and 3-1-1 Data

The 3-1-1 system was implemented on 1st December 1997 (although apparently not fully implemented without bugs until 1st May 1998). We obtained Dallas CAD data from December 1995 through December 31, 1999. These data provide substantial information to create a base period and a lengthy follow-up period from before to after the implementation of 3-1-1. The CAD records provide call taker's ID, date and time of the call, dispatch time, response time, time call cleared, number of units responding, priority, and the nature of the call. The CAD supplemental file provides ANI/ALI information.[1]

[1] The City of Dallas maintains five "legacy" data systems: Code Enforcement (CE), Response System (includes streets and sanitation), Rapid Entry (essentially the city's CAD system), Fire and Ambulance, and CIABS (Water). The 3-1-1 data are copied and appended (what they call "pasted") into these legacy data systems. For example, if the 3-1-1 call taker receives a call about a water problem, the information from that 3-1-1 call is maintained in the 3-1-1 database but also copied and appended to the CIABS legacy database. This feedback loop thus enables the legacy systems to maintain up-to-date information on demands for city services across a range of city departments. The 3-1-1 calls made to the Call Center are stored in a database entered via a visual basic screen. These data are stored and backed up on CD's. As in Baltimore, those 3-1-1 calls that resulted in call-takers providing telephone numbers for direct city agency help, do not get entered into the 3-1-1 data system and are lost for analysis purposes.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

9.3 Trends in the CAD Data

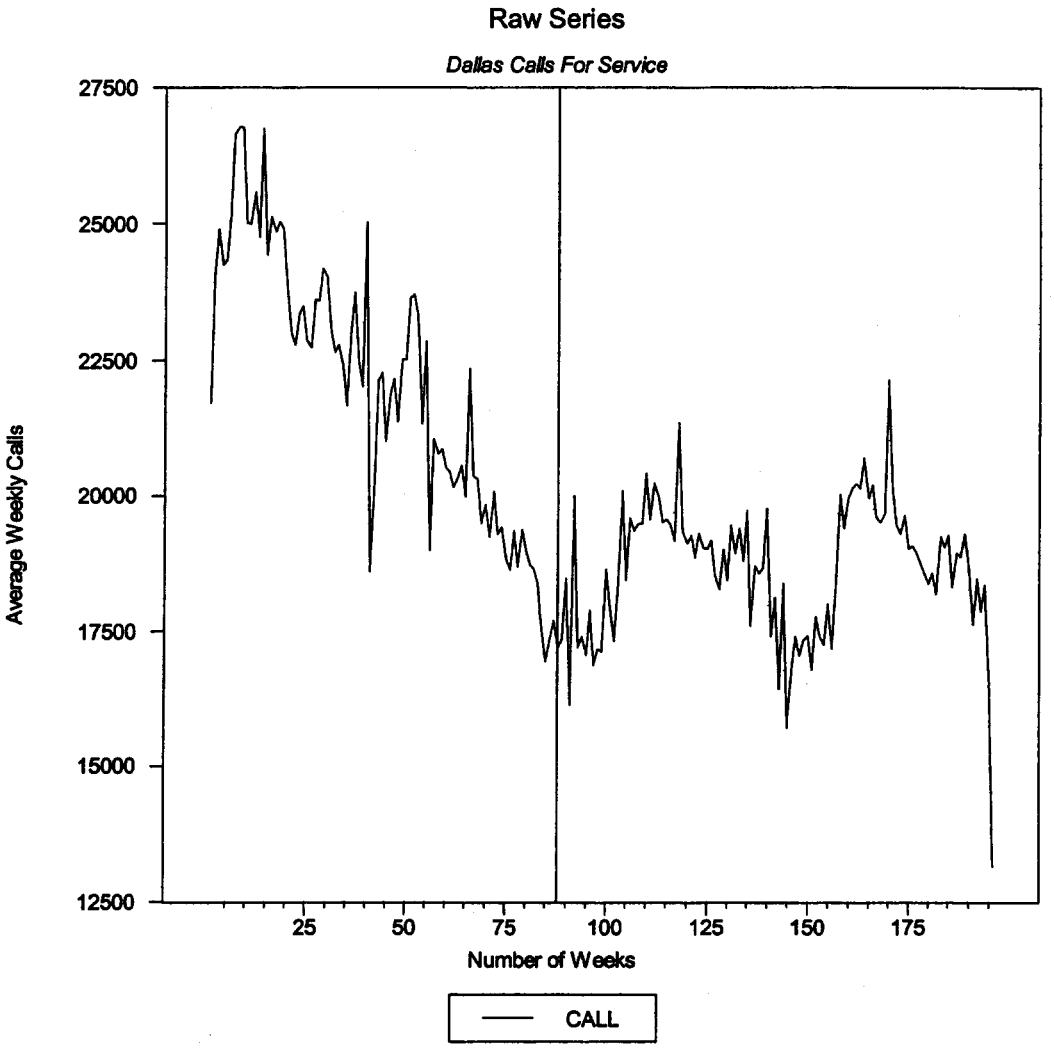
We analyzed over four million CAD records from April 1996 through December 1999 (176 weeks). The monthly average of CAD calls during this time period was about 22,500 calls. Our primary interest was to examine the trends in the CAD data both before and after implementation of the 3-1-1 non-emergency number system. We examine two intervention dates: first, we assess the impact of introducing the 3-1-1 system using December 1, 1997 as the intervention date. This was the official "kick-off" date for taking 3-1-1 calls via the central call system. Second, we assess the impact of the 3-1-1 system when we use May, 1st 1998 as the intervention date. By May, 1998, stakeholders suggest that the system was working without any bugs and initiation problems.

Figure 9.1 depicts the time series of CAD calls using the December 1st, 1997 intervention date. In effect, the intervention comes in at week 88. As this figure shows, there had been a steady decline in calls for police service since just after the beginning of the series (week 15, about June, 1996). Over the summer of 1996, there was an average of about 26,000 calls for service per week, this weekly average in calls for police service dropped in a systematic way leading up to the introduction of the 3-1-1 call system. For instance, by January, 1997, the weekly average was about 21,000 calls, a decline of about 5,000 calls per month since the summer of 1996. By the summer of 1997 (six months prior to the intervention date), there were about 19,000 calls per week, an overall decline of about a quarter since the previous summer.

Interestingly, Figure 9.1 depicts an increase in calls for police service in the nine months after the implementation of the 3-1-1 system. From thereafter, the time series suggests a possible cyclical pattern of citizen calls for police service: during the winter months there appears to be somewhat of a drop in the weekly average of calls down to about 17,500 calls per week and in the summer months, there appears to be a weekly average of about 19,000 calls. Importantly, however, it appears that the introduction of the 3-1-1 call system did not impact, in any way, the trends in citizen calls for police service.

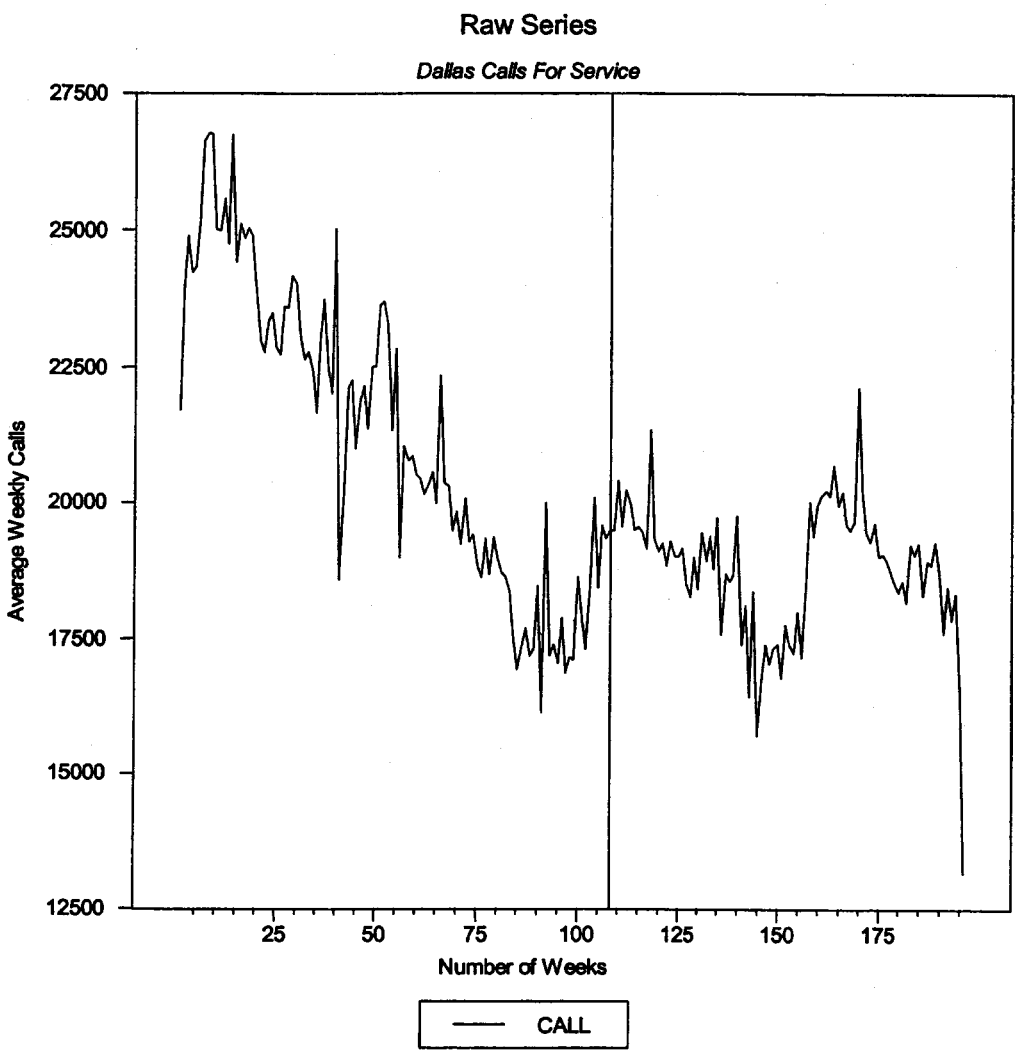
This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Figure 9.1



This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Figure 9.2



This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Figure 9.2 depicts the weekly trends in calls for police service and identifies May, 1998 as the implementation date of the 3-1-1 number system. While one could possibly argue that there was a drop in calls over the nine months following introduction of the 3-1-1 system, we suggest that the overarching declines in calls for police service began some two years prior to the introduction of 3-1-1 and that the drop in calls following the May, 1998 intervention date was part of a seasonal cycling of calls for service.

9.4 Pre and Post Test Analysis

We analyzed the Dallas CAD data by exploring the statistical differences in 9-1-1 calls before the introduction of the 3-1-1 system compared to after the 3-1-1 intervention. We define two intervention dates: 1st December, 1997 and the 1st May, 1998. We assess the before to after differences with these two intervention date because, by all accounts, the 3-1-1 system was first implemented in December 1997, but stakeholders report that the system was not fully operational until May 1998. Thus, to provide parsimony in our analysis, we report the data for both intervention dates.

The pre-intervention period for the 1st December intervention date includes all CAD information for 87 weeks before and for 87 weeks after. In effect, the before period runs from April, 1996 through November, 1997 and the after period runs from December, 1997 through August, 1999. When we use 1st May, 1998 as our intervention date, we include from September 1996 through April, 1998 as our pre-intervention period and from May, 1998 through December, 1999 as our post-intervention period (88 weeks before and 88 weeks after the intervention). We examine the differences in the absolute number of 9-1-1 calls, pre to post intervention and we assess the impact of introducing the 3-1-1 system by the time taken to process calls as well as by the type of calls received by the Dallas call center.

Table 9.1 below reports the number and percent change for 9-1-1 calls by time period (pre and post intervention) by the priority that the call was allocated for the December 1st 1997 intervention date.

As this table shows, there were small declines in calls for service across priority one, two and three calls for police service. The priority one call category reveals the largest decrease in calls from before to after implementation of 3-1-1 (2.63 percent decrease). Interestingly, however, our data reveal a 2.24 percent increase in priority four (low priority) calls for police service directed to the 9-1-1 call system following the introduction of the 3-1-1 call system. This is in the reverse direction to what we would have expected: we would expect that the 3-1-1 system would siphon calls away from 9-1-1 and provide an alternative avenue for citizens to call about non-emergency situations. We suggest that this result might be because citizens steadfastly insist that the

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

problem is a police matter and that they want police assistance to solve the problem rather than assistance from another city agency. Alternatively, there could have been an overall rise in low level problems in Dallas during our study time period and that the increase in low priority calls reflect this actual increase. Since the increase is not excessively large (from 234,256 calls to 239,513 calls), we suggest that speculation that the 3-1-1 system negatively influenced the police is premature. We point out, however, that the perceptions of police officers and stakeholders that introduction of the Dallas 3-1-1 system had absolutely no impact on the police appear well founded. These results are reported in Chapter Eight.

Table 9.1 Number and Percent Change for 9-1-1 Calls by Time Period (pre and post-intervention) by Priority for December 1st Intervention Date

Priority	Pre-Intervention[1]	Post-Intervention[2]	Percent Change
Priority 1	27,695	26,967	- 2.63
Priority 2	388,944	387,194	- 0.45
Priority 3	340,274	336,576	- 1.09
Priority 4	234,256	239,513	+ 2.24
Total	998,837	999,468	+ 0.06

[1] Pre-intervention period is from April 1996 through November, 1997
[2] Post-intervention period is from December, 1997 through August, 1999

Table 9.2 below reports the number and percent change for 9-1-1 calls by time period (pre and post intervention) by the priority that the call was allocated for the May 1st 1998 intervention date.

Table 9.2 Number and Percent Change for 9-1-1 Calls by Time Period (pre and post intervention) by Priority for May 1st Intervention Date

Call Priority Code	Pre-Intervention[1]	Post-Intervention[2]	Percent Change
Priority 1	26,824	27,531	+ 2.64
Priority 2	382,879	396,741	+ 3.62
Priority 3	337,327	339,879	+ 0.75
Priority 4	234,941	244,305	+ 3.99
Total	989,435	1,017,942	+ 2.80

[1] Pre-intervention period is from September, 1996 through April, 1998
[2] Post-intervention period is from May, 1998 through December, 1999

As this table shows, using the May 1st, 1998 intervention date masks any possible positive impact of introducing the 3-1-1 system. Indeed, Table 9.2 reiterates our earlier statement that the decline in calls for police service began several years prior to the introduction of the 3-1-1 system and that the trends in calls for service tends to follow a seasonal pattern.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 9.3 below reports the mean call processing times (in minutes) by priority code and by categories of call processing for the pre-intervention and post-intervention periods for 9-1-1 calls for the December 1st, 1997 intervention date.

Table 9.3 Mean Call Processing Times by Priority and Categories of Call Processing for Before and After the Introduction of 3-1-1 in December, 1997

Call Processing Category	Pre-Intervention Mean Processing Time (in minutes)	Post-Intervention Mean Processing Time (in minutes)
Priority 1		
Time to Dispatch	1.36	1.37
Time to Arrive	5.99	6.36
Time to Clear	52.78	55.01
Priority 2		
Time to Dispatch	5.71	6.26*
Time to Arrive	7.84	8.31*
Time to Clear	35.24	36.24
Priority 3		
Time to Dispatch	15.14	17.10*
Time to Arrive	8.28	8.83*
Time to Clear	31.60	33.38
Priority 4		
Time to Dispatch	29.04	35.29*
Time to Arrive	8.59	9.00
Time to Clear	33.20	24.63

* Denotes statistical significance where $p < .000$

Table 9.3, when read in conjunction with Table 9.1, shows an interesting pattern. The before to after comparisons of dispatch times, times to arrive on the scene, and times to clear/complete the call show that while there were some reductions in the number of calls for service (priority one through three), there was an increase in the time taken to handle calls for service following the introduction of the 3-1-1 system. Indeed, across all priority levels, there was an increase in time taken to dispatch the calls and time taken to arrive on the scene. Time taken to dispatch was statistically significant for priority two, priority three, as well as priority four calls. Time taken to arrive on the scene showed a statistically significant increase for priority two and priority three calls. The only category of call handling that was reduced following introduction of the 3-1-1 system was time taken to clear calls for priority four incidents. Considering the increase in priority four calls (see Table 9.1), we suggest that officers spent very little time on priority four calls following the introduction of the 3-1-1 system.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 9.4 below reports the mean call processing times (in minutes) by priority code and by categories of call processing for the pre-intervention and post-intervention periods for 9-1-1 calls for the May 1st intervention date.

Table 9.4 Mean Call Processing Times (in minutes) by Priority and Categories of Call Processing for Before and After the Introduction of 3-1-1 in May, 1998

Call Processing Category	Pre-Intervention Mean Processing Time (in minutes)	Post-Intervention Mean Processing Time (in minutes)
Priority 1		
Time to Dispatch	1.33	1.42
Time to Arrive	6.02	6.45
Time to Clear	52.96	56.49
Priority 2		
Time to Dispatch	5.33	6.88
Time to Arrive	7.86	8.50*
Time to Clear	35.54	37.06
Priority 3		
Time to Dispatch	14.01	18.69
Time to Arrive	8.31	9.04*
Time to Clear	32.21	34.42*
Priority 4		
Time to Dispatch	26.44	38.48*
Time to Arrive	8.65	9.22*
Time to Clear	33.76	35.76

* Denotes statistical significance where $p < .000$

Table 9.4, when read in conjunction with Table 9.2, shows an interesting pattern. The before to after comparisons of dispatch times, times to arrive on the scene, and times to clear/complete the call show that for every call priority level and for every method for measuring the time taken to handle calls for service, there were increases not only in the absolute number of calls for service, but also in the time taken to handle the calls following the introduction of the 3-1-1 system in Dallas. This result tells an important story: that, consistent with the information provided to us from police officers and stakeholders, the 3-1-1 system in Dallas was not designed to impact on the police, it was not designed to divert non-emergency police matter calls away from the police and, true to the benign influence that the 3-1-1 system was expected to have on the police, our data reveal at best status quo as a result of introducing the 3-1-1 system and at worst, an increase in workloads as a result of introducing the 3-1-1 system (see also Chapter Eight).

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

In addition to assessing the quantity of time that might be available for community policing activities as a result of introducing the 3-1-1 system, we also wanted to assess any change in the nature of the calls. Table 9.5 below presents the average number of calls per week by time period by selected crime types. In this table we use the December, 1997 intervention date and we report the average number of calls per week for a before period from April, 1996 through November, 1997 (N = 87 weeks) and the average number of calls per week for an after period from December, 1997 through August, 1999 (87 weeks).

Table 9.5 Percent Change and Before/After Comparisons of 9-1-1 Calls for Service by Selected Crime Types (reported in averages per week) for December, 1997 Intervention Date

Crime Type	Before[1]	After[2]	Percent Change[3]
Disturbance	82,338	84,588	+2.73
Larceny/Theft	96,967	100,723	+3.87
Burglary	77,600	82,994	+6.95
Prowler	8,776	7,195	-18.02
Shooting	2,894	2,640	- 8.78
Robbery	9,457	9,801	+3.64
Animal Complaint.	1.013	1,306	+28.92
Criminal Assault	2,357	2,216	- 5.98
Suspicious Person	49,017	45,045	- 8.10
Felony in progress	23,726	23,196	-2.23
Random Gunfire	20,228	19,796	- 2.14
Violent Disturbance	291,568	294,552	+ 1.02
Drug House	8,875	10,636	+19.84
Drunk	7,303	5,165	-29.28

[1] The average number of 9-1-1 calls (for selected crime types) per week from April, 1996 through November, 1997

[2] The average number of 9-1-1 calls (for selected crime types) per week from December, 1997 though August, 1999

[3] Percent change of 9-1-1 calls only from before the intervention to after the intervention.

As this table shows, following the introduction of the 3-1-1 system there were some changes in the nature of calls received by the 9-1-1 call system. Prowler calls, calls about drunk people, shootings and suspicious person calls all went down. Alternatively, there were significant increases in animal complaints and drug houses. For the most part, these results continue to suggest that introduction of the 3-1-1 system in Dallas had very little to do with citizen call patterns and that there is very little that one can make of the introduction of the 3-1-1 system either in terms of the quantity of calls nor the nature of the calls made to the police.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table 9.6 below presents the average number of calls per week by time period by selected crime types. In this table we use the May, 1998 intervention date and we report the average number of calls per week for a before period from September, 1996 through April, 1998 (N = 88 weeks) and the average number of calls per week for an after period from May, 1998 through December, 1999 (88 weeks).

Table 9.6 Percent Change and Before/After Comparisons of 9-1-1 Calls for Service by Selected Crime Types (reported in averages per week) for May, 1998 Intervention Date

Crime Type	Before[1]	After[2]	Percent Change[3]
Disturbance	79,505	86,835	9.22
Larceny/Theft	97,138	105,200	8.30
Burglary	78,069	87,570	12.17
Prowler	8,465	7,370	-12.94
Shooting	2,696	2,619	-2.86
Robbery	9,072	10,523	15.99
Animal Complaint.	961	1,563	62.64
Criminal Assault	2,319	2,303	-0.69
Suspicious Person	47,417	46,423	-2.10
Felony in progress	23,128	23,706	2.50
Random Gunfire	21,384	18,965	-11.31
Violent Disturbance	283,185	303,362	7.13
Drug House	8,546	11,041	29.19
Drunk	6,475	5,134	-20.71

[1] The average number of 9-1-1 calls (for selected crime types) per week from September, 1996 through April, 1998
[2] The average number of 9-1-1 calls (for selected crime types) per week from May, 1998 though December, 1999
[3] Percent change of 9-1-1 calls only from before the intervention to after the intervention

Table 9.6 merely exacerbates the results found in Table 9.5 and is further confirmation that the implementation of the 3-1-1 system was neither designed to affect the police nor did it end up freeing-up officer time to engage in community policing. Indeed, the reductions in calls for service via 9-1-1 had begun several years prior to the introduction of the 3-1-1 system.

9.5 Summing Up

Our analysis of the Dallas computer-aided dispatch data suggest that the introduction of the 3-1-1 system in Dallas had very little to do with any trends or patterns or changes in the number or nature of calls for police service. These results are consistent with our findings from Chapter Eight and reiterate the fact that the 3-1-1 system in Dallas was not intended to materially impact on the police nor provide a technological infrastructure to enhance community policing in the city.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

The Dallas 3-1-1 system is an interesting contrast to the 3-1-1 system implemented in Baltimore. In Baltimore, the system was designed to siphon calls away from the 9-1-1 system and create opportunities for the department to free-up officer time to engage in community-oriented and problem-oriented policing activities. Whilst the system in Baltimore has some implementation flaws, mainly in the policy adaptations of the system, the Dallas system stands in stark contrast as it didn't even attempt to provide an infrastructure to support community policing efforts.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

10 CHAPTER TEN: SUMMARY AND CONCLUSIONS

On July 23, 1996 in Sacramento, California President Clinton called for a national community policing number to help alleviate the abundance of non-emergency calls flooding the 9-1-1 emergency system. 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 emergency 9-1-1 systems. In March, 1998, the National Institute of Justice identified four study cities that represented a cross-section of jurisdictions leading the charge to find alternative, technological ways to deal more effectively and efficiently with non-emergency requests for police service (Baltimore, Maryland; Buffalo, New York; Dallas, Texas; and Phoenix, Arizona). NIJ subsequently released a solicitation requesting proposals to assess the impact of introducing non-emergency call systems on the quantity and quality of police work. The University of Cincinnati Evaluation Team was awarded the grant to assess these non-emergency call systems. We sought to answer two broad research questions: what were the processes for implementing alternative methods for dealing with non-emergency citizen calls for police service? And what was the impact of implementing alternative methods for handling non-emergency citizen calls for police service on the quality and quantity of policing?

We concentrated the vast majority of our research effort on assessing the Baltimore and Dallas 3-1-1 systems. After fieldwork trips, interviews with stakeholders, and assessments of CAD data in each of the four study sites, we concluded that our research efforts were best served documenting the impact of the 3-1-1 systems in Dallas and Baltimore. The Buffalo system was deemed inappropriate for substantive analysis because the vast majority of non-emergency calls to the call center were not recorded. Moreover, those 3-1-1 calls that were deemed police matters became treated as 9-1-1 calls and were indecipherable from 9-1-1 calls recorded in the CAD system. The Phoenix system posed a different dilemma: the non-emergency number system in Phoenix pre-dated the 9-1-1 system. As such, the Phoenix site was not appropriate to assess the quantitative and qualitative impact of a non-emergency system on 9-1-1 calls for police service because the so-called non-emergency number system "intervention" preceded the introduction of the 9-1-1 system.

Our analysis of the Dallas and Baltimore 3-1-1 systems revealed some fundamental differences in the two systems: the Baltimore 3-1-1 system was a non-emergency call system designed to receive and handle calls that were relevant to the police. By contrast, the Dallas 3-1-1 system was designed to receive calls from citizens requesting a wide range of city services, including animal control, public works, sanitation, and water.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Calls about police matters to 3-1-1 in Dallas comprised just one of many categories of calls made to the 3-1-1 call center. The fundamental differences in the basic infrastructure of the Dallas and Baltimore 3-1-1 systems was expected to produce two very different outcomes as far as the police were concerned. In Baltimore, the 3-1-1 system was hailed as a technological solution to relieve the over-burdened 9-1-1 system, reduce the number of dispatched calls to the police and thus free-up officer time to engage in community and problem-oriented policing. In Dallas, by contrast, the 3-1-1 was not designed to impact on the police in any material way. As such, we were not surprised to learn that the introduction of the 3-1-1 system in Dallas virtually had no impact whatsoever on the police. Since the Baltimore 3-1-1 system was intended to change the quality and quantity of policing we concentrated most of our research efforts on this site. In effect, the Baltimore system provides the most interesting example of how a technological innovation that changes police communication systems might advance a department's community policing agenda. As such, our summary and concluding comments concentrate primarily on the results derived from our Baltimore fieldwork.

One-third of surveyed patrol officers from Baltimore perceived a reduction in the number of calls to which they were dispatched after the introduction of the 3-1-1 system. These respondents believed that the number of low priority calls that were dispatched had decreased. However, almost two-thirds of the officers responding to the survey did not perceive a change in the amount of discretionary time available on the average shift. Our analysis of CAD 9-1-1 and 3-1-1 calls in Baltimore supports the general perceptions of officers in Baltimore. Indeed, our analysis shows about a 25 percent reduction in 9-1-1 calls representing about 5,000 less 9-1-1 calls per week that were directly attributable to the introduction of the 3-1-1 call system.

The reduction in 9-1-1 calls is fairly impressive. However, on further exploration we found that this drop in 9-1-1 calls did not translate into significantly more discretionary time for community or problem-oriented policing activities. The drop in 9-1-1 calls was off-set by two main things: first, our analysis revealed that the 3-1-1 system "adopted" about 30 percent of the calls that had previously been routed via the 9-1-1 system; second, a large proportion of these 3-1-1 calls were dispatched to the patrol division in much the same way that 9-1-1 calls were dispatched to them. Indeed, before the 3-1-1 intervention, about 94 percent of all 9-1-1 calls were dispatched. In the post-intervention period, about 96 percent of all calls (9-1-1 + 3-1-1) were dispatched. We note that the vast majority of 3-1-1 calls were dispatched: In fact 88 percent of 3-1-1 calls that were recorded in CAD were dispatched and 57 percent of all 3-1-1 calls that were received (includes those 3-1-1 calls that were handled on the phone and did not enter the CAD system) were typically dispatched. From an

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

officer's vantage point, our study suggests that somewhere between one fifth (see Chapter Six) and one third (see Chapter Four) of all calls dispatched to the patrol division originated from the 3-1-1 system.

Our analysis also revealed that the department virtually ceased dispatching priority five calls. Indeed, less than one percent of 9-1-1 and 3-1-1 priority five calls were dispatched following the implementation of the 3-1-1 call system compared to about 10 percent of 9-1-1, priority five calls were dispatched before the introduction of 3-1-1. 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).

One of the interesting aspects of the Baltimore Police Department's effort to introduce community policing was the introduction of nine Neighborhood Service Centers (NSCs). A police neighborhood service sergeant was assigned to each of the neighborhood service centers. Their role included handling 3-1-1 complaints, and providing assistance to employees of other city agencies in the Center. (E.g. accompanying housing or health inspectors into neighborhoods, locating property owners, conducting safety presentations for businesses and community meetings). However, our analysis of the NSC's shows two shortcomings in the manner in which NSCs were utilized in Baltimore: first, just 2.3 percent of 3-1-1 calls received in Baltimore were handed over to the NSCs and second, 98 percent of the 3-1-1 calls referred to NSCs were *first* dispatched to a patrol unit to respond to the call. Unfortunately, this suggests that the NSCs are under-utilized and, even when they are used as a resource to handle 3-1-1 calls, they are not an *alternate* response to citizen non-emergency calls for service but rather an additional response.

Overall, we found that about 6,000 3-1-1 calls per week (over half of all 3-1-1 calls) were routinely dispatched to the patrol division. This finding begs the question: how much time is freed up for patrol officers with the introduction of the 3-1-1 system if patrol officers continue to receive dispatched calls that originate from the 3-1-1 system? In Chapter Four, we suggested that any "free" time gained from the reduction in calls and dispatches from 9-1-1 were lost to calls dispatched via 3-1-1. Further, our analysis of committed and uncommitted time in patrol unit shifts reveals only marginal gains in uncommitted time that are most likely attributable to the introduction of the 3-1-1 call system. With these results in mind, we ask: If police-related calls received by 3-1-1 call-takers are also being dispatched to the patrol division in much the same way as 9-1-1 calls, then what is the function of a non-emergency number system? The corollary is*: **how can a 3-1-1 system***

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

be better utilized as a technological tool to facilitate community policing? This question is at the heart of our assessment of non-emergency number systems and we seek to provide an answer to this question in the remainder of this chapter discussion.

It is our belief that a 3-1-1 non-emergency number system could, with some policy and organizational reform, be an effective way to facilitate the adoption of community policing. We argue this point as follows. Non-emergency number system technology offers citizens the opportunity to classify and more appropriately direct their calls. Our survey of Baltimore citizens who had called either 3-1-1 or 9-1-1 revealed an overall favorable view of 3-1-1 services. Citizens generally agreed that 3-1-1 improves city services, improves police-community relations, should be used for non-emergency calls only, and leads to fewer non-emergency calls to 9-1-1. A significantly greater number of 3-1-1 respondents, as compared to 9-1-1 respondents, felt that 3-1-1 improves police-community relations and should be used for non-emergency calls only. Respondents were also generally pleased with services provided by 9-1-1 and 3-1-1 call-takers. Over 90 percent of respondents felt that call-takers were both polite and helpful and they were overall satisfied with the service provided. These results suggest that, from a citizen reporting perspective, 3-1-1 is a positive alternative and they do not feel they are getting a second rate response if they call 3-1-1 rather than 9-1-1. In effect, this means that citizens will most likely restrict their use of the 9-1-1 system if they are given the opportunity to call an alternate number.

It is important for police policy makers to know that citizens are likely to utilize the 9-1-1 with more reserve when they are given an alternative number to call for non-emergency situations. This means that the police do not need to go to great lengths to discourage citizen calls to the 9-1-1 system if they adopt a 3-1-1 system. Moreover, if the police "trust" citizen assessments of reported incidents, and if they trust citizen decisions to call either 3-1-1 or 9-1-1, then it could make the job of deciding whether or not to dispatch an officer to a call a lot easier: in effect, the citizens themselves can "screen" their calls, make on-the-scene decisions as to the emergent nature of the incident, and thus take into their own hands how, what type and under what circumstances they expect a police response. We point out, however, that the large number of 3-1-1 calls that the police subsequently classify as high priority calls makes it somewhat dubious to assume that citizens place their calls to 3-1-1 appropriately.

The non-emergency call system in Baltimore provides some interesting insights as to how the police might best handle calls for service. As we identified in our discussion in Chapter One, up until the introduction of the 3-1-1 system, the police had three alternatives available to them to better manage calls for police service:

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

they could (1) stop 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 (see Chapter One). A tremendous amount of research over the last two decades has attempted to identify ways to best handle and manage calls, each study addressing one of these three issues. The 3-1-1 technology, coupled with appropriate departmental policy and organizational infrastructures, provides yet another solution.

The 3-1-1 technology offers the police the opportunity to focus their emergency and patrol response capacity on high priority incidents and use their more long-term, problem-solving capacity for calls that citizens consider do not require an emergency response. In effect, the 3-1-1 technology could be the answer to one of the most basic and fundamental problems that plague the wholesale adoption of community policing principles. One of the central dilemmas faced by patrol officers is gaining enough time during a regular shift to engage in problem-solving and building working relationships with community members and business leaders. Clearly research shows that it is not so much that officers do not have the time. Indeed, Frank (1996) and Parks and colleagues (1999) show that their observed beat officers have approximately 25 percent of their shift time engaged in "uncommitted" work (see Mastrofksi et al. 1994, and Frank 1996,1998). This fact is born out in the mini-observational study conducted by our UC research team in Baltimore as well as from our analysis of the 9-1-1 and 3-1-1 CAD data from Baltimore. Our observational study of Baltimore patrol officers reveals that a large proportion of officer time was spent on self-initiated activities and that about one-third of their time was spent on various "administrative" work.

Even though research shows that large chunks of officer time is already "available" for problem-oriented policing activities, the chief complaint of officers is that the chaotic nature of dispatched calls for service creates the perception that there is limited time to engage in meaningful problem-solving. And one can empathize with this view: A typical scenario unfolds as follows: Officers Alpha and Beta in Patrol Unit 1, with the best of intentions begin the process of analyzing the cause of high levels of drug dealing from a street corner. Unit 1 decides to talk to some of the business owners on the street corner to talk about the problem. They have a casual conversation with two of the five business owners and they are starting to get a "feel" for the factors contributing to the problem. Just as they are ready to interview the third business owner, they receive a dispatched call for service. They take a look at their watches and know that they need another couple of hours to complete their business owner interviews, so they decide to respond to the call and clear it off their backlog of calls so they can get back to the business of solving the drug dealing problem. Unit 1 responds to the call and

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

as then returns to the drug dealing corner. By the time they get back there, the regular store owner has taken a lunch break and his elderly mother-in-law, who knows very little about the drug dealing problem, is minding the store for him. The Unit 1 officers go to the next store, but half-way through the interview, they are called out again on another call. They decide to complete the interview, but they have has lost their train of thought and the momentum of the interview is compromised.

The implementation of 3-1-1 technology, coupled with organizational reform and careful policy change, could greatly facilitate the adoption of community policing. Indeed, 3-1-1 technology, if adopted at the same time as a split-force model of policing (Tien et al. 1978), could provide the technological infrastructure to manage calls for service, more efficiently use scare patrol response and more effectively engage in problem-oriented policing. We have been down this path, perhaps only partway down the path, before. Indeed, the NIJ sponsored several 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 pro-actively suppress crime (Tien et al. 1978). The second experiment looked at the impact of various call management strategies designed to free up officer time for working on crime problems (Cahn and Tien 1981). Another set of field trials of alternative call handing was conducted in Garden Grove (CA) and Toledo (OH) (McEwen, Connors and Cohen 1986).

What is new, with the adoption of 3-1-1, is that we now have available a technological component to call-handling strategies that could, if properly implemented and managed, revolutionize the manner in which police handle and respond to citizen calls. In many ways, Baltimore has gone the furthest towards implementing an ideal-type model for integrating non-emergency call system technology with community policing. The Baltimore Police Department got many things right: 3-1-1 is an 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 that they do not expect an emergency response, and citizens are generally satisfied with the manner in which the police handled their call. The NSCs provide a perfect place for 3-1-1 non-emergency calls to be referred to: the NSCs have a range of other city agencies housed in the NSC and the police can draw on their expertise to solve problems (see Mazerolle and Roehl, 1999). 3-1-1 referrals to NSC's could be integrated with many of Baltimore's organizational components (e.g. flex teams, hot spot teams) that are equally well-positioned to advance the principles of community policing. Accountability at the sector level and the geographic nature of the Sector Management system provide a perfect backdrop for wholesale adoption of community policing.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Moreover, the policy decision to cease dispatching low priority calls along with the decision to reduce the number of patrol units responding to calls for service creates a pre-cursor to utilizing the 3-1-1 system as a technological tool to further divide (or split) the patrol division into two parts: those that respond to 9-1-1 dispatched calls and those that solve community problems.

There are three basic problems with Baltimore's current community policing organizational structure and their model for handling non-emergency calls for service: First, over half of all 3-1-1 calls are currently dispatched to patrol. We expect that citizens do not expect the police to respond to these 3-1-1 calls in the same way as they respond to 9-1-1 calls. However, the Baltimore Police Department dispatches 9-1-1 and 3-1-1 calls in much the same manner, depending on the nature of the call. The police department seems indifferent to the call origin in dispatching so many 3-1-1 calls. The police may argue that there are good reasons to dispatch calls regardless of whether they were received by 9-1-1 or 3-1-1. We, however, beg to differ and suggest that dual dispatch policies should be developed depending on whether the call is received by 3-1-1 or 9-1-1, except in situations where the citizen has clearly made a mistake in calling 3-1-1 and there truly is an emergency (e.g. armed robbery in progress). Second, very few 3-1-1 calls are referred to the NSC's and those that are referred to the NSCs are typically handled already by the patrol division under dispatched conditions. Third, there is insufficient emphasis placed on the NSC's in terms of resources, status and responsibility.

If one accepts these shortcomings of the Baltimore 3-1-1 system, there are some straightforward solutions that could be implemented to facilitate the integration of the 3-1-1 system with community policing in Baltimore. First, the Baltimore Police Department could adopt dual dispatch policies for those calls received via 3-1-1 versus those calls received via 9-1-1. We assume that citizens calling 3-1-1 are less intent on officers being dispatched to the incident. Therefore, we suggest that the Baltimore Police Department trust the citizen expectation and thus reduce the dispatches for certain categories of calls (especially for those 3-1-1 calls categorized as priority three and four calls). Second, the police department could more fully integrate the NSCs with the Sector Management infrastructure. Third, the department could increase personnel resources around the NSC infrastructure. The department could re-allocate patrol resources to NSCs and have officers assigned to the NSCs off the radio such that calls would not be dispatched to them. These NSC patrol officers would then receive and handle 3-1-1 calls within a problem-solving framework. That is, all 3-1-1 calls (except those deemed "true emergencies" that are clearly mistakes made by citizens that should have been, in the first instance, referred to the 9-1-1 system) would be referred to the NSCs and retrieved from the email system,

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

much in the same manner as it is currently transmitted to the NSCs. Fourth, police dispatch policies should be changed such that they scrutinize, review and reduce the 3-1-1 calls that are dispatched to the patrol division

In essence, the model being proposed is akin to the split force model of policing. On the one hand, the NSC patrol officers handle 3-1-1 calls and solve neighborhood problems, drawing on the expertise of other city agency representatives assigned to the NSCs as well as the special units (e.g. flex and hot spot units) that are at the disposal of the Sector Managers. On the other hand, the patrol officers continue to handle 9-1-1 calls dispatched to them much in the same manner as they handle these calls now.

There are a number of assumptions that underlie the model outlined above. First and foremost, the system relies upon the citizens to use the 3-1-1 for non-emergencies and the 9-1-1 for emergencies. In effect the citizens are the ones deciding as to how they want the police to handle their call. Citizens have one of two choices. On the one hand, their choice is to call 3-1-1 and expect a problem-solving officer to look at the underlying causes of the problem and begin efforts to reduce or eliminate the problem over time. On the other hand, citizens can choose to call 9-1-1 and expect an officer to respond when they can and disperse the immediacy of the problem.

Second, the model for handling calls for service outlined above relies upon the skill base for effective problem-solving being shifted to the NSC infrastructure. At present, the NSC system is not regarded as a dynamic hub of problem-oriented policing. Rather, the locus of problem-oriented policing skill currently rests with officers under the direct command of the Sector Managers. The challenge would be to maintain the accountability role of Sector Managers and merge that structure with the NSCs that are divided up on the basis of Districts rather than Sectors.

Third, our proposed model for implementing 3-1-1 within a community-policing model relies upon the idea that 9-1-1 calls and 3-1-1 calls tend to derive roughly from similar places (see Chapter Five). If the spatial distribution of 9-1-1 and 3-1-1 calls were fundamentally different (and they seem not to be), then our proposed model would bias problem-oriented policing efforts toward reducing less intractable problems. However, since 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 these intractable places.

In sum, our research sought to uncover the impact of non-emergency number systems on the quality and quantity of policing. Since the Baltimore 3-1-1 system provided the best model to assess the impact of 3-1-1 on policing, we relied principally on our results from Baltimore to generalize and speculate how an ideal-type

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

system might look for handling and managing calls for police service, given the adoption of the technology that underpins the 3-1-1 non-emergency call system.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

11 CHAPTER ELEVEN: RECOMMENDATIONS

Based on our evaluation of the non-emergency calls systems -- principally the systems in operation in Baltimore, Maryland and Dallas, Texas – we propose the following ten broad recommendations that police agencies may want to consider during their deliberations to implement a non-emergency number system.

Recommendation One: Police agencies should clearly articulate the goals and objectives of their communications systems and consider a variety of non-emergency call system options.

Our assessment of police communication systems has revealed a number of options available to police to better handle their non-emergency calls. The options, as we see them, include:

(a) Do nothing from a technological perspective and continue to utilize the existing call-taking system. Additionally, *improve call-taking practices* by training call-takers to gather more useful information (from a problem-oriented policing perspective) from callers, encourage call-takers to better communicate alternatives for citizens to call non-emergency police numbers or other government departments, and informing callers about what to expect from a police response;

(b) Do nothing from a technological perspective and continue to utilize the existing call-taking system. In addition, embark on an *intensive advertising campaign* to market an easy-to-remember non-emergency number. We expect a marketing campaign would be likely to reduce the number of inappropriate, non-emergency calls to 9-1-1. Most police departments already have easy-to-remember, recurring phone numbers. For these departments, it might be overkill to implement a costly series of phone switches and communications systems to simply reduce the number of calls to 9-1-1.

(c) Consider a police-only non-emergency number system. A police agency that aims to re-structure their communications systems and police operations to facilitate the implementation of community policing and problem-oriented policing, might well be advised to consider implementing a 3-1-1 non-emergency call system. The technological approach taken by the Baltimore Police Department (but not necessarily the operational approach adopted by Baltimore) would serve as an example of a non-emergency number system that, in theory, could greatly facilitate the implementation of community policing (but see Recommendations 7, 8 and 9 below).

(d) Consider a city government approach to handling non-emergency calls. A holistic, integrated, city government approach seeks to better coordinate the delivery of city services. The Dallas model serves as a good technological example of this type of holistic approach. Police agencies, however, are advised that without specific changes in police policies, the implementation of a city-wide 3-1-1 system is unlikely to have any impact on the police at all (see Chapters 8 and 9).

Recommendation Two: Police agencies require adequate technological and human resources to successfully implement a 3-1-1 non-emergency system.

Police departments need to decide how many "pin spaces" might be required to adequately service their system; they need to ensure that an adequate number of trunks will be available at any one time to receive and process the expected number of 3-1-1 and 9-1-1 calls; they need to carefully choose the software that controls the number of 3-1-1 and 9-1-1 lines; and they need to consider whether the 3-1-1 system will collect ANI and ALI information.

Additionally, police agencies need to consider some "hidden" costs and resources that are required to successfully implement a 3-1-1 non-emergency number system. Some hidden costs include networking the main 3-1-1 communications system with local police districts (so that 3-1-1 calls can be directly handled and tracked by local police districts), creating phone links with other government communications systems when it is appropriate (so that callers do not have to hang up and re-dial to reach the correct city agency), insuring adequate backup systems are in place to handle emergency and roll-over situations, re-examining, modifying and updating emergency call systems (especially the dispatching and priority systems) to ensure they are

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

consistent with the goals and policies of the non-emergency number system, staffing call-taking centers, and consider staffing options to potentially handle an aggregate increase in Priority One calls for service. We note, however, that the increase in Priority One calls observed in the Baltimore data following the implementation of 3-1-1 actually began several months prior to the introduction of the 3-1-1 system. Thus, the relationship between implementation of 3-1-1 and the increase in Priority One calls is most likely spurious (see Chapter Four).

Recommendation Three: The goals and operations of a new 3-1-1 system need to be effectively communicated to all police and staff members.

Police agencies need to work hard to insure that all police personnel understand the goals and objectives of a 3-1-1 non-emergency number system. Call-takers need to be trained in the new technology as well as in the interface between the 3-1-1 system and the existing 9-1-1 system; call-takers need to clearly communicate to callers the anticipated police response, if any; dispatchers need to clearly understand the important differences between calls received on 9-1-1 and calls received on 9-1-1 (our evaluation suggests that the Baltimore dispatchers were sometimes unaware as to the source of the call and treated all calls equally); dispatchers need to provide police with more information about the call, even in non-emergency situations; police need to understand the departmental expectations of police responses to 9-1-1 calls and those calls made to the 3-1-1 system; and police need to better utilize their downtime, by identifying and solving clusters of 3-1-1 and 9-1-1 calls (see Recommendations 7, 8 and 9).

Effective communication of the goals and objectives of the 3-1-1 system to police personnel assumes that police management can clearly identify the goals and objectives of a non-emergency number system (see Recommendation 1), they can modify organizational structures to support the dual communications system, and they can successfully implement policies and procedures that are consistent with the goals and objectives of the non-emergency number system (see Recommendations below).

Recommendation Four: The goals and operations of a new 3-1-1 system need to be effectively communicated to the community.

In Chapters Four and Seven of our report, we explore the manner in which citizens used the Baltimore 3-1-1 system and how these calls were translated into operational responses. Our research reveals that from the outset, citizens knew of the 3-1-1 number and used it instantly as an alternative number to 9-1-1. Nonetheless, our analysis suggests that citizens did not appear to correctly utilize the 3-1-1 system. For example, they called 3-1-1 over 62,000 times during our study period to report what the police classified as priority 1 calls.

We suspect five reasons for this large number of "priority one" calls made to the 3-1-1 system: (1) an overall increase in serious crime (especially rape, robbery and burglary), (2) citizen desire for greater anonymity in reporting crime (ANI and ALI information is not recorded in the 3-1-1 system), (3) citizen assessments (or misjudgments) that the incident does not require an emergency response, (4) citizen error and confusion regarding the most appropriate number to call the police; and (5) call-taker error in classifying the call.

We recommend that the goals and operations of a 3-1-1 be effectively communicated to citizens. A two-pronged effort is needed: first, police agencies need to engage in marketing campaigns to more extensive communicate the types of incidents that should be reported to 3-1-1 and the types of incidents that should be reported to 9-1-1. Second, not only do police departments need to better communicate to citizens how to place a call to the police, but they also need to clearly articulate to callers what they should expect as follow-up to their call. For example, if the police adopt a split force model, the citizens should be provided with the name and number of the Neighborhood Services Officer from their local district to track their logged call (see also Recommendation 9). If the police modify their policies regarding the dispatching of 3-1-1 calls (see Recommendation 7), then call-takers should clearly communicate to callers that a patrol car will not respond to the call and that, alternatively, the call will be handled within the context of a problem-oriented policing response.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Recommendation Five: Police agencies must adequately staff call-taking centers.

We recommend that police agencies carefully select the people they assign to receive and handle 3-1-1 calls. Civilian staffing of non-emergency call taking centers is recommended. The 3-1-1 call itself should be seen as an important, initial data gathering exercise to facilitate more effective problem-oriented policing. Indeed, the contact with citizens calling 3-1-1 could potentially serve as a crucial foundation point in the operational activities that are subsequently set in motion to solve recurring problems. If the initial 3-1-1 call is seen in a more strategic way, we would expect citizens to be more satisfied (see Recommendation 6) and less time wasted by the police in trying to back-track and gather analytic information about ongoing problems.

Recommendation Six: Police agencies should carefully monitor caller satisfaction with police response under a 3-1-1/9-1-1 communications system.

Organizational reforms that are necessary to accommodate properly the implementation of a non-emergency number system (see also Recommendations 5, 9 and 10) will fundamentally alter the manner in which police deal with citizen complaints. As such, we recommend that the police develop systematic mechanisms (e.g. routine call backs, surveys) to carefully monitor citizens attitudes and perceptions toward the altered way that the police handle and respond to their calls for service.

Recommendation Seven: Police agencies need to review and modify the priorities and dispatch policies for non-emergency 3-1-1 calls.

One of the most important results identified in the review of the Baltimore 3-1-1 system was the similarity of dispatch decisions for both the 9-1-1 and 3-1-1 calls. In Chapter Four of our report (see especially Table 4.3), we reveal that nearly 90 percent of all 3-1-1 calls were dispatched much in the same manner that 9-1-1 calls were dispatched. Overall, we conclude that the police department was somewhat indifferent, at least from a dispatch perspective, as to whether the call originated on 9-1-1 or 3-1-1.

We suggest that the police department could greatly facilitate community policing and problem-oriented policing (see Recommendation 8) by re-considering the treatment of 3-1-1 calls. In particular, we recommend that police agencies review their policies and procedures for handling 3-1-1 calls. We suggest that police departments with 3-1-1 non-emergency call systems trial a dual call handling system. Under this field trial 3-1-1 calls would be handled within a problem-solving context rather than through a dispatched, patrol response unless, of course, the 3-1-1 call was clearly an emergency (see Recommendation 4).

In Baltimore, for example, the role of the Neighborhood Service Centers should be elevated in status (see Recommendation 8) and 3-1-1 calls should be routed directly to these centers and handled in a comprehensive, integrated and problem-oriented policing manner. Under this type of "split-force" model, 3-1-1 calls should not be dispatched at all, unless they are clearly emergency situations.

Recommendation Eight: Police agencies need to carefully consider the interface between 3-1-1, problem-oriented and community policing.

One of the promises of 3-1-1 non-emergency number systems was that the system could facilitate the implementation of community and problem-oriented policing. The 3-1-1 system was hailed as a technological approach to reducing 9-1-1 call burdens and freeing up officer time to engage in problem-oriented policing activities.

We assume, at least within this recommendation (but see Recommendation 9) that a goal of a non-emergency number system, like 3-1-1, is to free-up officer time to engage in community and problem-oriented policing activity. We further assume that fewer dispatched calls will (a) increase the amount of down time (b) provide adequate "blocks" of time for officers to engage in problem-solving activities and (c) that the police agency will put in place organizational structures such that the increase in "down time" can in fact be translated into problem-oriented and community-policing activities (see Chapter Four and Recommendation 9).

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Our research in Dallas suggests that the implementation of the city-wide approach to handling non-emergency calls (including police matters) did not translate into additional down time for the police to engage in problem or community policing activities.

In Baltimore, by contrast, our research shows that the policy decision to *not dispatch priority five calls* was most likely the critical factor that led to a reduction in the amount of time officers spent on handling calls for service. We doubt, however, that the 3-1-1 system in Baltimore was the crucial intervening factor that led to any increases in down time. Indeed, our research in Baltimore shows that patrol officers handled the vast majority of 3-1-1 calls, much in the same way that they handled 9-1-1 calls. Just 2.4 percent of all 3-1-1 calls were referred to the Neighborhood Services Center (see Chapter 5) and these referred calls received a dual response both from the a dispatched patrol car as well as the NSC, somewhat defeating the purpose of an NSC referral.

Overall, our research suggests that the 3-1-1 technology in Baltimore was *under-utilized* as a method for enhancing community and problem-oriented policing. With this in mind, we recommend that police agencies carefully consider the interface between 3-1-1, problem-oriented policing and community policing.

We suggest a dual approach to insure that the implementation of a 3-1-1 system interfaces effectively with problem-oriented policing and community policing. First, we recommend that police agencies change their dispatch policies and procedures such that 3-1-1 calls are only dispatched in extreme emergency situations (see Recommendation 7). With an absolute reduction in calls being dispatched for patrol officers to handle in a one-off, ad-hoc manner, we would expect patrol officers to have more of their shift time to engage in problem-oriented policing. During their shift, patrol officers could systematically scan for problems (including scanning 3-1-1 and 9-1-1 calls), analyze the nature of scanned problems, respond to ongoing problems using innovative techniques, and then assess the impact of their responses. Second, in addition to patrol officers engaged in problem-oriented policing, we suggest that existing community policing infrastructures need to be better utilized to handle 3-1-1 call information (see also Recommendation 9). For example, the Neighborhood Services Centers in Baltimore provide an ideal infrastructure for police to systematically handle 3-1-1 calls (see Chapter 5). Neighborhood Service Centers (if they were networked with the 3-1-1 calls system, as they are intended to be, and if they were adequately staffed to collate, scan, analyze and respond to recurring problems) could be well positioned to engage in problem-oriented policing. Moreover, the Neighborhood Services Centers could be the point of accountability and follow-up for 3-1-1 callers (see Recommendation Four).

Recommendation Nine: Police agencies need to change their operational infrastructures when they implement a non-emergency number call system.

One of the most noteworthy goals of a non-emergency number system is to facilitate the implementation of community policing. However, as discussed in Recommendation 8 (and Chapter Ten), we suggest that the 3-1-1 technology has been under-utilized as a catalyst for organizational and operational reform to cement the adoption of community policing. In Chapter Ten, we discussed the possibilities of police agencies considering a split force approach to handling 3-1-1 calls. We reiterate this suggestion in this recommendation. Indeed, we suggest that police agencies that implement 3-1-1 call systems might want to trial a split-force approach to policing. Under this model, 9-1-1 calls would be dispatched (with some policy review) to patrol officers. Patrol officers would continue to engage in problem-oriented policing during their "down time." Additionally, 3-1-1 calls (except clear emergencies) would be routinely diverted to networked police "districts" (e.g. Neighborhood Service Centers). The police districts would become accountable for handling 3-1-1 calls within a problem-oriented policing environment.

Recommendation Ten: Monitor and evaluate 3-1-1 systems.

Ongoing monitoring and evaluation of 3-1-1 call systems is necessary. First, we recommend that police agencies, at a minimum, set up tracking systems to clearly identify and demarcate 9-1-1 and 3-1-1 calls as they move through CAD and records management systems.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Second, we suggest that police agencies collect "baseline" (or pre-intervention) data on measures such as officer "down time" (or rather how officers spend their time prior to the introduction of the 3-1-1 call system) and citizen satisfaction with call handling.

Third, we recommend police agencies implement their non-emergency call systems in such a way to enable analysts to isolate the impact of implementing non-emergency call systems. Post-facto assessments of non-emergency call systems can be confounded by (a) changing call taking policies (b) changing dispatch policies (c) changing call classification systems (d) changing organizational structures and (e) advertising. Any (or all) of these factors confound post-facto evaluations that are designed to isolate the impact of implementing a 3-1-1 system. Our research in Baltimore, for example, was confounded by a number of factors: (a) the decision in Baltimore to stop dispatching priority five calls for service coincided with the implementation of 3-1-1 (b) the post-facto increase in Priority One calls in Baltimore (c) our limited ability to establish a "true" baseline of "down time" prior to implementation of the 3-1-1 system.

Overall, we recommend that any future evaluation of non-emergency number system be designed with the following in mind:

1. Design call systems to adequately track 9-1-1 and 3-1-1 originating calls;

2. Capture baseline information on the qualitative and quantitative manner in which calls are dispatched;

3. Collect field data on the amount of officer "down time" prior to implementation of a non-emergency number system;

4. Understand the qualitative nature of the calls that police respond to prior to implementation of the non-emergency number system;

5. Gather information on citizen satisfaction with police responses to calls prior to implementation of the non-emergency number system.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

REFERENCES

American Bar Association. 1973. The Urban Police Function.

Bayley, D.H. 1994. Police for the Future. New York: Oxford University Press.

Bayley, D.H. 1998. What Works in Policing. New York: Oxford University Press.

Box, G.E.P. and D.R. Cox. 1964. "An Analysis of Transformations." Journal of Royal Statistical Society, B, 26.

Cahn, M.F. and J.M. Tien. 1981. An Alternative Approach in Police Response: Wilmington Management of Demand Program. Washington, DC: United States Government Printing Office.

Cawley, D.F. and H.J. Miron. 1977. Managing Patrol Operations Manual. Washington, DC: United States Government Printing Office.

Cook, T.D. and D.T. Campbell. 1979. Quasi-Experimentation Design and Analysis Issues for Field Studies. Boston, MA: Houghton Mifflin Company.

Cordner, G. 1979. "Police Patrol Work Load Studies: A Review and Critique." Police Studies, 2: 55-60.

Cumming, E., I. Coming and L. Edell. 1965. "Policeman as a Philosopher, Friend, and Guide." Social Problems, 12: 276-86.

Dixon, W.J. 1992. "BMDP Statistical Software Manual Volume 1," in BMPD Release 7. Chief Editor. Berkeley, CA: University of California Press.

Eck, J.E. and W. Spelman. 1987. Solving Problems: Problem-Oriented Policing In Newport News. Washington, DC: Police Executive Research Forum.

Farmer, M.F. 1981. Differential Police Patrol Strategies. Washington, DC: Police Executive Research Forum.

Frank, J. 1996. "Street-Level Policing in Cincinnati: The Content of Community and Traditional Policing and the Perceptions of Policing Audiences." GRANT 96IJ-CX-0075. Washinton, DC: National Insitute of Justice.

Frank, J. 1998. "Policing in a Community Context: An Observational Study of Suburban, Rural and Urban Policing." GRANT 95-IJ-CX-0071. Washington, DC: National Institute of Justice.

Frank, J., S. Brandl and R.C. Watkins. 1997. "The Content of Community Policing: A Comparison of the Daily Activities of Community and 'Beat' Officers." Policing: An International Journal of Police Strategies and Management, 20 (4): 716-28.

Gay, W.G., T.H. Schell and S. Schack. 1977. Prescriptive Package: Improving Patrol Productivity Volume I Routine Patrol. Washington, DC: Office of Technology Transfer, Law Enforcement Assistance Administration.

Green, J. and C. Klockars. 1991. "What Police Do," in Thinking About Police 2nd ed. edited by C. Klockars, and S.D. Mastrofski. New York: McGraw-Hill.

Hawkins, C.W. Jr. 1996. "Ready, Fire, Aim: A Look at Community Policing in Edmonton, Alberta, Canada," in Themes and Variations in Community Policing: Case Studies in Community Policing. Washington, DC: Police Executive Research Forum.

Mastrofski, S.D. 1983. "The Police and Non-Crime Services," in Evaluating Performance of Criminal Justice Agencies, edited by G. Whitaker and C. Phillips. Beverly Hills, CA: Sage.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Mastrofski, S.D., R.B. Parks, A.J. Reiss and R.E. Worden. 1994. "Community Policing at the Street-Level." GRANT 95-IJ-CX-0071. Washington, DC: National Institute of Justice.

Mastrofski, S.D., R.B. Parks, A.J. Reiss Jr., R.E. Worden, C. DeJong, J.B. Snipes, and W. Terril. 1998. Systematic Observation of Public Police: Applying Field Research Methods to Policy Issues. Washington, DC: National Institute of Justice.

Mazerolle, L. and J. Roehl. 1999. Controlling Drug and Disorder Problems: Oakland's Beat Health Program. Washinton, DC: National Insitute of Justice.

McCleary, R. and M.C. Musheno. 1980. "Floor Effect in the Time Series Quasi-Experiment." Political Methodology, 7 (2).

McCleary, R. and R.A. Hay Jr. 1980. Applied Time Series Analysis for the Social Sciences. Beverly Hills, CA: Sage.

McDowall, D., R. McCleary, E.E. Meidinger and R.A. Hay Jr. 1980. Interrupted Time Series Analysis; Quantitative Applications in the Social Sciences. Beverly Hills, CA: Sage.

McEwen, T., E.F. Connors and M.I. Cohen. 1986. Evaluation of the Differential Police Response Field Test. Washington, DC: United States Government Printing Office.

Moore, M., Trojanowicz, R. and G. Kelling. 1988. Crime and Policing. Washington, D.C: U.S Department of Justice.

Parks, R.B., S.D. Mastrofski, C. DeJong, and M.K. Gray. 1999. "How Officers Spend Their Time With the Community." Justice Quarterly 16: 483-518.

Reiss, A. 1971. The Police and the Public. New Haven, CT: Yale University Press.

Skolnick, J. and D. Bayley. 1986. The New Blue Line. New York: The Free Press.

Sparrow, M.K., M. Moore and D.M. Kennedy. 1990. Beyond 9-1-1. A New Era for Policing. New York: Basic Books.

Spelman, W. and D.K. Brown. 1981. Calling the Police: Citizen Reporting of Serious Crime. Washington, DC: Police Executive Research Forum.

Tien, J.M., J.W., Simon and R.C. Larson. 1977. An Evaluation Report of an Alternative Approach to Police Patrol. The Wilmington Split Force Experiment. Cambridge, MA: Public Systems Evaluation, Inc.

United Census Bureau. 1990. 1990 Census Estimates: General Profile for Dallas City, Texas.

Webster, J. 1970. "Police Task and Time Study." Journal of Criminal Law, Criminology, and Police Science, 61: 94-100.

Witkin, G. and M. Guttman. 1996. Cover Story: 'This is 9-1-1 ... please hold'. U.S. News and World Report. (June): Page 30-34, 36, 38.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Sector Manager Interview

Sector Manager _____

Date _____

District _____

Sector _____

1. What do you perceive to be your role as a sector manager? What are your typical job duties as a sector manager?

2. Do you on a regular basis systematically identify on-going problems in your sector?
   Note: On-going Problem is one that has generated two or more incidents over consecutive months

IF YES

2A. How often do you systematically identify on-going problems in your sector?

2B. How and using what information do you systematically identify on-going problems in your sector? (probe—daily crime print outs, pin map, types of 3-1-1 calls and 9-1-1 calls, officer logs, etc).

3. When an on-going problem in your sector has been identified, what are the various strategies you typically use to address the problem?

4. When you decide on a specific initiative, what types of officers are you likely to use in carrying out the initiative?

5. Who is likely to assign the officers to the initiative? (Probe -- yourself, sector sergeant, unit sergeant or lieutenant, major, etc)

NOW I WOULD LIKE TO ASK YOU SOME QUESTIONS ABOUT 3-1-1 AND YOUR JOB AS A SECTOR MANAGER

6. What are your perceptions of the 3-1-1 System? How do you think the system is working?

7. What effect if any do you believe that the 3-1-1 system has had on the performance of YOUR JOB? Do you think that it has changed how you manage and supervise your officers?

   Do you do anything different now that 3-1-1 has been implemented?

NOW I WOULD LIKE TO ASK YOU SOME SPECIFIC QUESTIONS ABOUT 311 AND THE IMPACT IT MAY HAVE HAD ON YOUR OFFICERS

8. Do you believe that the 3-1-1 system has influenced the quantity of calls YOUR beat officers must respond to? (fewer calls, more calls?)

9. Has 3-1-1 influenced the nature of the calls that YOUR beat officers respond to? (fewer nuisance calls, garbage calls, low priority calls).

10. Has the call system influenced how YOUR officers spend their work shift? (directed to areas, etc)

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

11. What changes would need to be made to the existing 3-1-1 system for there to be an impact on your job and the job of your officers?

    11A. What changes, if any would you like the Department to make to the 3-1-1 system. (ie., change call priorities, response policies, etc.)

12. The COPS office is very interested in community policing issues. Do you think the 3-1-1 system has had an impact on community policing efforts in your sector?

13. Has the system influenced the amount and type of contact your officers have with citizens? Has it freed up officer time to engage in Problem Oriented Policing?

    13A. Has it changed the police department structure in any way?

    13B. Has it changed the ways problems are handled?

14. Is there anything else we need to know about how the 3-1-1 system may have influenced your work routine?

NOW A FEW QUESTIONS ABOUT THE DISTRICT'S NEIGHBORHOOD SERVICE CENTER SERGEANT.

15. Describe your relationship with the District's Neighborhood Service Center Sergeant?

16. Does the NSC sergeant provide you with information on 3-1-1 calls that apply to your sector?

    16A. How often does this occur? What are the typical types of calls that are brought to your attention? What role do you have in the handling of calls forwarded to the NSC?

    16B. How does the Neighborhood Service Sergeant bring this information to your attention?

NOW A FEW QUESTIONS ABOUT YOURSELF

17. How long have you been with the Baltimore Police Department?

18. What is your present rank?

19. How long have you been employed in law enforcement?
    Years months

20. How long have you been employed by the Baltimore Police Department
    Years months

21. How long have you been in your present position?
    Years months

22. How old are you? years

23. What is the highest year of school you have completed?

24. When was the sector manager system implemented in this District?
    Month year

25. Sex: male female

26. Ethnic Origin:

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

APPENDIX 3-B

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

BALTIMORE POLICE DEPARTMENT
OFFICER SURVEY

This survey is being conducted by the University of Cincinnati Center for Criminal Justice Research, as part of a project funded by the National Institute of Justice to study non-emergency call systems. It is designed to find out your opinions concerning responding to calls for service, the implementation of Baltimore's 3-1-1 call system, and the impact of 3-1-1 on your work. The survey should take approximately 10 to 15 minutes to complete. Your opinions are important to us.

The information you provide in your completed survey will only be used in combination with information from other surveys. Answers will be grouped for analysis. No attempt will be made to single out any individual officer. Only the researchers will see your completed survey. All information will be held in strictest confidence.

Your participation is voluntary. Thank you for taking the time to complete the survey. Again, we are concerned about your opinions of the non-emergency response to calls for service in Baltimore.

If you have any questions, you may contact:

Dr. Lorraine Green Mazerolle
or Dr. James Frank
University of Cincinnati
Center for Criminal Justice Research
(513) 556-5880

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Date:_____

WE WOULD LIKE TO ASK YOU SOME GENERAL QUESTIONS ABOUT THE 3-1-1 CALL SYSTEM.

1. Do you believe the 3-1-1 call system has affected how you perform your job?
   1. No
   2. Yes

2. Has the 3-1-1 call system influenced the quantity of calls you handle on your typical shift?
   1. No
   2. Yes
   3. employed with Baltimore PD after the implementation of 311 (go to Q-4)

3. On a typical shift, would you say that you respond to fewer, the same number, or more calls now than you did prior to the implementation of the 3-1-1 system.
   1. respond to fewer calls
   2. respond to same number of calls
   3. respond to more calls

4. Has the 3-1-1 call system influenced the nature of the calls (types of calls) you handle on your typical shift (compared to the nature of calls handled prior to 3-1-1)?
   1. No (go to Q-6)
   2. Yes
   3. employed with Baltimore PD after the implementation of 311 (go to Q-6)

5. How has the 3-1-1 system influenced the types of calls you now respond to? Do you now respond to:
   1. very few nuisance or low priority calls, mainly emergency or high priority calls
   2. fewer nuisance or low priority calls
   3. about the same number of nuisance or low priority calls
   4. more nuisance or low priority calls

6. On average, approximately what percentage of the calls that you respond to per day do you consider:
   1. Nuisance calls/not a police matter (shift 2) ____%
   2. Nuisance calls/not a police matter (shift 3) ____%
   3. Quality of life calls/low priority(shift 2) ____%
   4. Quality of life calls/low priority (shift 3) ____%
   5. Non-emergency calls that require police response (shift 2) ____%
   6. Non-emergency calls that require police response (shift 3) ____%
   7. Emergency/medical assistance/risk of injury calls (shift 2) ____%
   8. Emergency/medical assistance/risk of injury calls (shift 2) ____%

7. About how frequently are you dispatched to a call that the dispatcher indicates came in on a 3-1-1 line?
   1. never
   2. once a month
   3. a couple of times a month
   4. once every few days

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

8. On average, how much discretionary time (time when not responding to citizen calls) do you have during a typical day shift (shift 2)?
_____hours

9. Do you have more, less or the same amount of discretionary time on the morning shift (2) as the evening shift (3)?
   1. less discretionary time on the morning shift
   2. the same amount of discretionary time on both shifts
   3. a little more discretionary time on the morning shift
   4. a little more discretionary time on the evening shift
   5. a lot more discretionary time on the morning shift
   6. a lot more discretionary time on the evening shift

10. Has the 3-1-1 system influenced the amount of discretionary time you have on a typical shift?
   1. No -- I have the same amount of discretionary time
   2. Yes -- I now have more discretionary time
   3. Yes -- I now have less discretionary time
   4. employed with Baltimore PD after the implementation of 311

11. On a typical shift, does your **Sector Lieutenant** give you directives on how to use your discretionary time?
   1. No
   2. Yes

12. How often does your Sector Lieutenant give you directives on how to use your discretionary time?
   1. never (go to Q-12)
   2. rarely
   3. maybe once a week
   4. very often (a couple times a week)
   5. practically every day

13. When your Sector Lieutenant does give you directives, are they more likely to be general comments about what to look for on your shift or are they specific instructions about people and places to watch?
   1. general instructions on what to look for on my shift
   2. specific instructions about people to watch on my shift
   3. specific instructions about places to watch on my shift
   4. specific instructions about people and places to watch on my shift

14. On a typical shift, does your **Sector Sergeant** give you directives on how to use your discretionary time?
   1. No
   2. Yes

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

15. How often does your Sector Sergeant give you directives on how to use your discretionary time?
    1. never (go to Q-15)
    2. rarely
    3. maybe once a week
    4. very often (a couple times a week)
    5. practically every day

16. When your Sector Sergeant does give you directives, are they more likely to be general comments about what to look for on your shift or are they specific instructions about people and places to watch?
    1. general instructions on what to look for on my shift
    2. specific instructions about people to watch on my shift
    3. specific instructions about places to watch on my shift
    4. specific instructions about people and places to watch on my shift

17. How likely are you to receive information from the **Neighborhood Service Center** in your district about a 3-1-1 call?
    1. I never receive any information
    2. I receive information maybe once a month at most.
    3. I receive information a couple of times a month.
    4. I receive information approximately once a week.
    5. I receive information a couple of times a week.

18. How likely are you to receive information from the **Neighborhood Services Sergeant/Unit or Community Outreach Sergeant/Unit** in your sector about a 3-1-1 call?
    1. I never receive any information
    2. I receive information maybe once a month at most.
    3. I receive information a couple of times a month.
    4. I receive information approximately once a week.
    5. I receive information a couple of times a week.

19. It is not unusual for me to have to respond to calls that could have been handled by taking a written report over the telephone.
    1. True
    2. False

20. I still receive calls that could have been handled without an immediate response.
    1. True
    2. False

21. There are calls that go to 311 that I think should receive an immediate response instead.
    1. True
    2. False

22. Even if the 3-1-1 system diverted all of the non-emergency calls so that they were not dispatched to units, I still would not have any discretionary time because of the volume of emergency calls.
    1. True
    2. False

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

23. Considering the people you deal with in your sector, do you think that most of them
    1. know about 311 and use it if an appropriate situation arises
    2. know about 311 but still call 911 for non-emergencies
    3. know about 311 but still call 911 for non-emergencies because they are confused about when to use 311 or 911
    4. don't even know about 311

24. How would you respond to the statement " Overall, 311 is working well" ?
    1. strongly agree
    2. agree
    3. disagree
    4. strongly disagree

25. Is there anything that could be done or changed to improve the 311 call system and/or the impact that it has on your job?

26. District of Assignment:

1. Central	4. Northeastern	7. Western
2. Southeastern	5. Northern	8. Southwestern
3. Eastern	6. Northwestern	9. Southern

27. What is your present rank:
    1. Officer
    2. Specialist (please specify) _____
    3. Sergeant
    4. Captain
    5. Lieutenant
    6. Major
    7. Other (please specify) _____

28. How long have you been employed in law enforcement?
    _____Years _____ Months

29. How long have you been employed by the Baltimore Police Department?
    _____Years _____ Months

30. How long have you been assigned to your present District?
    _____Years _____ Months

31. Age _____ years

32. 1. Male
    2. Female

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

33. What is the highest year of school you have completed?

1._____ 11 years or less
2._____ High school graduate or GED
3._____ Some college
4._____ Associate's Degree (AA or AS)
5._____ Bachelor's Degree (BA or B.S.)
6._____ Some Graduate course work
7._____ Advanced Degree (specify) _____

34. What is your ethnic origin?

1. _____ African American
2. _____ Caucasian
3. _____ Hispanic
4. _____ Asian American
5. _____ Other (specify)_____

35. Is there anything else you think we should know about the non-emergency call system (3-1-1)?

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

APPENDIX 4-A

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

```
#****************************** TABLE I *********************************#

BLOCK           RANGE = 1,105.
ACF             VAR = cnt9. MAXLAG = 52.  LBQ.

FIRST CASE NUMBER TO BE USED      =              1
LAST CASE NUMBER TO BE USED       =            105
NO. OF OBS. AFTER DIFFERENCING    =            105
MEAN OF THE (DIFFERENCED) SERIES  =       19641.7520
STANDARD ERROR OF THE MEAN        =         211.0432
T-VALUE OF MEAN (AGAINST ZERO)    =          93.0698
AUTOCORRELATIONS
  1- 12     .84  .82  .79  .77  .69  .61  .54  .51  .39  .28  .19  .12
  ST.E.     .10  .15  .19  .22  .24  .26  .27  .28  .29  .30  .30  .30
L.-B. Q    77.  149  218  284  337  379  412  442  460  469  473  475
 13- 24     .02 -.11 -.18 -.24 -.31 -.39 -.45 -.49 -.56 -.59 -.63 -.64
  ST.E.     .30  .30  .30  .30  .30  .31  .31  .32  .33  .33  .34  .36
L.-B. Q    475  476  480  487  500  519  546  579  620  667  722  778
 25- 36    -.65 -.63 -.63 -.62 -.61 -.55 -.54 -.48 -.43 -.37 -.30 -.25
  ST.E.     .37  .38  .39  .40  .41  .41  .42  .43  .43  .44  .44  .44
L.-B. Q    837  894  952  1E3  1E3  1E3  1E3  1E3  1E3  1E3  1E3  1E3
 37- 48    -.20 -.13 -.06  .01  .06  .11  .18  .23  .27  .30  .33  .37
  ST.E.     .44  .44  .44  .44  .44  .44  .45  .45  .45  .45  .45  .45
L.-B. Q    1E3  1E3  1E3  1E3  1E3  1E3  1E3  1E3  1E3  1E3  1E3  1E3
 49- 52     .38  .39  .39  .41
  ST.E.     .46  .46  .46  .46
L.-B. Q    1E3  1E3  1E3  2E3
PLOT OF AUTOCORRELATIONS
          -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
LAG   CORR. +----+----+----+----+----+----+----+----+----+----+
                                     I
  1   0.843                      +    IXXXX+XXXXXXXXXXXXXXX
  2   0.815                     +     IXXXXXX+XXXXXXXXXXXXX
  3   0.793                   +       IXXXXXXXX+XXXXXXXXXXX
  4   0.766                  +        IXXXXXXXXXX+XXXXXXXX
  5   0.692                 +         IXXXXXXXXXXX+XXXXX
  6   0.605                +          IXXXXXXXXXXXX+XX
  7   0.539                +          IXXXXXXXXXXXX
  8   0.506               +           IXXXXXXXXXXXX+
  9   0.390               +           IXXXXXXXXXX   +
 10   0.275              +            IXXXXXXX       +
 11   0.185              +            IXXXXX         +
 12   0.117              +            IXXX           +
 13   0.022              +            IX             +
 14  -0.107              +          XXXI             +
 15  -0.180              +         XXXXXI            +
 16  -0.241              +        XXXXXXI            +
 17  -0.309              +      XXXXXXXXI            +
 18  -0.392              +    XXXXXXXXXXI            +
 19  -0.452              +   XXXXXXXXXXXI           +
 20  -0.495              +  XXXXXXXXXXXXI            +
 21  -0.558              + XXXXXXXXXXXXXXI           +
 22  -0.589              +XXXXXXXXXXXXXXXI           +
 23  -0.633             +XXXXXXXXXXXXXXXXI            +
 24  -0.636             +XXXXXXXXXXXXXXXXI            +
 25  -0.647            + XXXXXXXXXXXXXXXXI             +
 26  -0.635            + XXXXXXXXXXXXXXXXI             +
 27  -0.634           +  XXXXXXXXXXXXXXXXI              +
 28  -0.623           +  XXXXXXXXXXXXXXXXI              +
 29  -0.614          +    XXXXXXXXXXXXXXXXI               +
 30  -0.551          +    XXXXXXXXXXXXXXXXI               +
 31  -0.539        +       XXXXXXXXXXXXXXXI                +
 32  -0.483        +       XXXXXXXXXXXXXXI                 +
 33  -0.434        +       XXXXXXXXXXXXXI                  +
 34  -0.374        +         XXXXXXXXXXI                   +
 35  -0.303      +           XXXXXXXXXI                     +
 36  -0.252      +           XXXXXXXI                       +
 37  -0.199      +           XXXXXI                         +
 38  -0.129      +             XXXI                         +
 39  -0.057      +              XI                          +
 40   0.010      +               I                          +
```


This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

```
 41   0.062    +                    IXX                  +
 42   0.113    +                    IXXX                 +
 43   0.181    +                    IXXXXX               +
 44   0.225    +                    IXXXXXX              +
 45   0.266    +                    IXXXXXXX             +
 46   0.299    +                    IXXXXXXX             +
 47   0.330    +                    IXXXXXXXX            +
 48   0.372    +                    IXXXXXXXXX           +
 49   0.382    +                    IXXXXXXXXXX          +
 50   0.387    +                    IXXXXXXXXXX          +
 51   0.392   +                     IXXXXXXXXXX           +
 52   0.406   +                     IXXXXXXXXXX           +

PACF            VAR = cnt9. MAXLAG = 52.
FIRST CASE NUMBER TO BE USED     =              1
LAST CASE NUMBER TO BE USED      =            105
NO. OF OBS. AFTER DIFFERENCING   =            105
MEAN OF THE (DIFFERENCED) SERIES =       19641.7520
STANDARD ERROR OF THE MEAN       =         211.0432
T-VALUE OF MEAN (AGAINST ZERO)   =          93.0698
PARTIAL AUTOCORRELATIONS
  1- 12      .84  .36  .20  .09 -.16 -.26 -.18  .06 -.19 -.26 -.19 -.05
  ST.E.      .10  .10  .10  .10  .10  .10  .10  .10  .10  .10  .10  .10
 13- 24     -.02 -.16 -.02  .01  .07  .06  .02 -.06 -.20  .03 -.07 -.02
  ST.E.      .10  .10  .10  .10  .10  .10  .10  .10  .10  .10  .10  .10
 25- 36     -.07  .07  .01 -.09 -.11  .09 -.04  .04  .04 -.03  0.0 -.01
  ST.E.      .10  .10  .10  .10  .10  .10  .10  .10  .10  .10  .10  .10
 37- 48     -.04 -.10  0.0  .10  .03 -.12 -.09 -.03  0.0 -.01 -.03  .03
  ST.E.      .10  .10  .10  .10  .10  .10  .10  .10  .10  .10  .10  .10
 49- 52      0.0 -.02 -.03 -.08
  ST.E.      .10  .10  .10  .10
PLOT OF PARTIAL AUTOCORRELATIONS
          -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
LAG   CORR. +----+----+----+----+----+----+----+----+----+----+----+
                                      I
  1   0.843                        +    IXXXX+XXXXXXXXXXXXXXXX
  2   0.363                        +    IXXXX+XXXX
  3   0.196                        +    IXXXXX
  4   0.091                        +    IXX  +
  5  -0.161                         +XXXXI    +
  6  -0.264                       XX+XXXXI    +
  7  -0.177                         +XXXXI    +
  8   0.059                        +    IX   +
  9  -0.191                        XXXXXI    +
 10  -0.255                       X+XXXXI    +
 11  -0.189                        XXXXXI    +
 12  -0.053                        +   XI    +
 13  -0.017                        +    I    +
 14  -0.160                        +XXXXI    +
 15  -0.022                        +   XI    +
 16   0.006                        +    I    +
 17   0.069                        +    IXX  +
 18   0.058                        +    IX   +
 19   0.024                        +    IX   +
 20  -0.057                        +   XI    +
 21  -0.202                        XXXXXI    +
 22   0.031                        +    IX   +
 23  -0.067                        +  XXI    +
 24  -0.021                        +   XI    +
 25  -0.067                        +  XXI    +
 26   0.069                        +    IXX  +
 27   0.010                        +    I    +
 28  -0.087                        +  XXI    +
 29  -0.110                        + XXXI    +
 30   0.092                        +    IXX  +
 31  -0.044                        +   XI    +
 32   0.038                        +    IX   +
 33   0.045                        +    IX   +
 34  -0.030                        +   XI    +
 35  -0.003                        +    I    +
 36  -0.008                        +    I    +
```


This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

37	-0.039	+ XI +
38	-0.095	+ XXI +
39	-0.002	+ I +
40	0.105	+ IXXX +
41	0.029	+ IX +
42	-0.124	+ XXXI +
43	-0.086	+ XXI +
44	-0.029	+ XI +
45	-0.004	+ I +
46	-0.013	+ I +
47	-0.033	+ XI +
48	0.031	+ IX +
49	-0.001	+ I +
50	-0.020	+ I +
51	-0.034	+ XI +
52	-0.075	+ XXI +

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

```
#****************************** TABLE II ******************************#

BLOCK           RANGE = 1,105.
DIFF            OLD = cnt9. NEW = dcnt9. DFORD = 1.
ACF             VAR = dcnt9. MAXLAG = 52.  LBQ.

FIRST CASE NUMBER TO BE USED      =              2
LAST CASE NUMBER TO BE USED       =            105
NO. OF OBS. AFTER DIFFERENCING    =            104
MEAN OF THE (DIFFERENCED) SERIES  =         2.5769
STANDARD ERROR OF THE MEAN        =       119.4574
T-VALUE OF MEAN (AGAINST ZERO)    =         0.0216
AUTOCORRELATIONS
  1- 12    -.41 -.01  .01  .15  .04 -.06 -.10  .26 -.01 -.07 -.07  .08
  ST.E.     .10  .11  .11  .11  .12  .12  .12  .12  .12  .12  .12  .12
L.-B. Q     18.  18.  18.  21.  21.  22.  23.  31.  31.  31.  32.  33.
 13- 24     .11 -.18 -.04  .03  .05 -.07 -.06  .07 -.10  .04 -.13  .03
  ST.E.     .12  .12  .13  .13  .13  .13  .13  .13  .13  .13  .13  .13
L.-B. Q     34.  38.  38.  38.  39.  39.  40.  40.  42.  42.  44.  44.
 25- 36    -.07  .04 -.04  .01 -.17  .16 -.14  .03 -.04 -.02  .05 -.01
  ST.E.     .13  .13  .13  .13  .13  .13  .14  .14  .14  .14  .14  .14
L.-B. Q     45.  45.  45.  45.  50.  53.  56.  56.  57.  57.  57.  57.
 37- 48    -.04 -.01  0.0  .06  0.0 -.05  .07  .02  .02  0.0 -.03  .10
  ST.E.     .14  .14  .14  .14  .14  .14  .14  .14  .14  .14  .14  .14
L.-B. Q     57.  58.  58.  58.  58.  59.  59.  59.  60.  60.  60.  62.
 49- 52     .01  0.0 -.03  .09
  ST.E.     .14  .14  .14  .14
L.-B. Q     62.  62.  62.  64.
PLOT OF AUTOCORRELATIONS
          -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
LAG   CORR. +----+----+----+----+----+----+----+----+----+----+----+
                                     I
  1  -0.414                 XXXXX+XXXXI    +
  2  -0.014                      +    I    +
  3   0.009                      +    I    +
  4   0.153                      +    IXXXX+
  5   0.036                      +    IX   +
  6  -0.063                      +   XXI   +
  7  -0.101                      +  XXXI   +
  8   0.262                      +    IXXXXX+X
  9  -0.008                      +    I    +
 10  -0.074                      +   XXI   +
 11  -0.073                      +   XXI   +
 12   0.084                      +    IXX  +
 13   0.109                      +    IXXX +
 14  -0.178                      + XXXXI   +
 15  -0.043                      +   XI    +
 16   0.029                      +    IX   +
 17   0.046                      +    IX   +
 18  -0.067                      +   XXI   +
 19  -0.060                      +   XXI   +
 20   0.069                      +    IXX  +
 21  -0.104                      +  XXXI   +
 22   0.036                      +    IX   +
 23  -0.129                      +  XXXI   +
 24   0.026                      +    IX   +
 25  -0.066                      +   XXI   +
 26   0.038                      +    IX   +
 27  -0.038                      +   XI    +
 28   0.009                      +    I    +
 29  -0.170                      + XXXXI   +
 30   0.157                     +     IXXXX +
 31  -0.143                     +  XXXXI    +
 32   0.035                     +     IX    +
 33  -0.044                     +    XI     +
 34  -0.022                     +    XI     +
 35   0.051                     +     IX    +
 36  -0.007                     +     I     +
 37  -0.036                     +    XI     +
 38  -0.011                     +     I     +
 39   0.002                     +     I     +
```


This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

```
 40   0.060                  +      IX     +
 41  -0.005                  +      I      +
 42  -0.052                  +     XI      +
 43   0.067                  +      IXX    +
 44   0.018                  +      I      +
 45   0.020                  +      I      +
 46   0.004                  +      I      +
 47  -0.035                  +     XI      +
 48   0.095                  +      IXX    +
 49   0.015                  +      I      +
 50  -0.001                  +      I      +
 51  -0.029                  +     XI      +
 52   0.092                  +      IXX    +

PACF           VAR = dcnt9. MAXLAG = 52.
FIRST CASE NUMBER TO BE USED     =              2
LAST CASE NUMBER TO BE USED      =            105
NO. OF OBS. AFTER DIFFERENCING   =            104
MEAN OF THE (DIFFERENCED) SERIES =          2.5769
STANDARD ERROR OF THE MEAN       =        119.4574
T-VALUE OF MEAN (AGAINST ZERO)   =          0.0216
PARTIAL AUTOCORRELATIONS
  1- 12    -.41 -.22 -.12  .14  .23  .12 -.11  .14  .17  .07 -.08 -.11
  ST.E.     .10  .10  .10  .10  .10  .10  .10  .10  .10  .10  .10  .10
 13- 24     .02 -.12 -.14 -.18 -.14 -.08 -.01  .12 -.11 -.02 -.07 -.02
  ST.E.     .10  .10  .10  .10  .10  .10  .10  .10  .10  .10  .10  .10
 25- 36    -.14 -.08  .02  .04 -.17 -.03 -.10 -.08 -.02 -.04 -.04 -.01
  ST.E.     .10  .10  .10  .10  .10  .10  .10  .10  .10  .10  .10  .10
 37- 48     .06 -.03 -.14 -.07  .08  .03 -.04 -.06 -.06 -.02 -.08 -.04
  ST.E.     .10  .10  .10  .10  .10  .10  .10  .10  .10  .10  .10  .10
 49- 52    -.02 -.01  .04  .01
  ST.E.     .10  .10  .10  .10
PLOT OF PARTIAL AUTOCORRELATIONS
          -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
LAG   CORR. +----+----+----+----+----+----+----+----+----+----+----+
                                     I
  1  -0.414                XXXXX+XXXXI    +
  2  -0.223                    X+XXXXI    +
  3  -0.115                     + XXXI    +
  4   0.136                     +    IXXX +
  5   0.226                     +    IXXXX+X
  6   0.124                     +    IXXX +
  7  -0.107                     + XXXI    +
  8   0.142                     +    IXXXX+
  9   0.174                     +    IXXXX+
 10   0.072                     +    IXX  +
 11  -0.085                     +  XXI    +
 12  -0.112                     + XXXI    +
 13   0.025                     +    IX   +
 14  -0.119                     + XXXI    +
 15  -0.139                     + XXXI    +
 16  -0.178                     +XXXXI    +
 17  -0.136                     + XXXI    +
 18  -0.082                     +  XXI    +
 19  -0.006                     +    I    +
 20   0.125                     +    IXXX +
 21  -0.113                     + XXXI    +
 22  -0.019                     +    I    +
 23  -0.071                     +  XXI    +
 24  -0.023                     +   XI    +
 25  -0.143                     +XXXXI    +
 26  -0.076                     +  XXI    +
 27   0.022                     +    IX   +
 28   0.035                     +    IX   +
 29  -0.166                     +XXXXI    +
 30  -0.025                     +   XI    +
 31  -0.105                     + XXXI    +
 32  -0.081                     +  XXI    +
 33  -0.019                     +    I    +
 34  -0.038                     +   XI    +
 35  -0.038                     +   XI    +
```


This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

36	-0.012	+ I +
37	0.059	+ IX +
38	-0.034	+ XI +
39	-0.145	+XXXXI +
40	-0.065	+ XXI +
41	0.078	+ IXX +
42	0.027	+ IX +
43	-0.038	+ XI +
44	-0.059	+ XI +
45	-0.056	+ XI +
46	-0.025	+ XI +
47	-0.079	+ XXI +
48	-0.042	+ XI +
49	-0.022	+ XI +
50	-0.007	+ I +
51	0.043	+ IX +
52	0.013	+ I +

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

```
#****************************** TABLE III ******************************#

BLOCK           RANGE = 1,105.
ARIMA           VAR = cnt9.
                DFORder = 1.
                MAORder = '(1)'.
ESTIMATION BY BACKCASTING METHOD
SUMMARY OF THE MODEL
OUTPUT VARIABLE -- cnt9
INPUT VARIABLES -- NOISE
VARIABLE  VAR. TYPE  MEAN      TIME      DIFFERENCES
                                            1
cnt9       RANDOM              1- 105  (1-B  )
PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE        ST. ERR.  T-RATIO
      1  cnt9          MA      1      1     0.4548         0.0875      5.20
RESIDUAL SUM OF SQUARES  = 121757144.000000
DEGREES OF FREEDOM       =              103
RESIDUAL MEAN SQUARE     =   1182108.250000
ACF         VAR  = rcnt9. MAXLAG = 52. LBQ.

FIRST CASE NUMBER TO BE USED     =              2
LAST CASE NUMBER TO BE USED      =            105
NO. OF OBS. AFTER DIFFERENCING   =            104
MEAN OF THE (DIFFERENCED) SERIES =         9.5293
STANDARD ERROR OF THE MEAN       =       106.6093
T-VALUE OF MEAN (AGAINST ZERO)   =         0.0894
AUTOCORRELATIONS
  1- 12    -.05  .01  .10  .24  .12 -.02  0.0  .30  .08 -.07 -.07  .08
  ST.E.     .10  .10  .10  .10  .10  .11  .11  .11  .11  .11  .12  .12
L.-B. Q     .30  .30  1.4  7.8  9.4  9.4  9.4  20.  21.  21.  22.  23.
 13- 24     .06 -.21 -.13 -.02  0.0 -.11 -.12 -.03 -.16 -.10 -.21 -.09
  ST.E.     .12  .12  .12  .12  .12  .12  .12  .12  .12  .13  .13  .13
L.-B. Q     23.  29.  31.  31.  31.  33.  34.  34.  38.  39.  45.  46.
 25- 36    -.12 -.04 -.09 -.10 -.20  .03 -.16 -.05 -.08 -.04  .03 -.01
  ST.E.     .13  .13  .13  .13  .13  .14  .14  .14  .14  .14  .14  .14
L.-B. Q     48.  48.  49.  51.  57.  57.  61.  61.  62.  63.  63.  63.
 37- 48    -.05 -.02  .02  .08  .02 -.01  .09  .08  .07  .04  .03  .14
  ST.E.     .14  .14  .14  .14  .14  .14  .14  .14  .14  .14  .14  .14
L.-B. Q     63.  63.  63.  64.  64.  64.  66.  67.  68.  68.  68.  72.
 49- 52     .09  .05  .04  .15
  ST.E.     .14  .14  .14  .14
L.-B. Q     74.  74.  75.  79.

PLOT OF AUTOCORRELATIONS
          -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
LAG   CORR. +----+----+----+----+----+----+----+----+----+----+
                                     I
  1  -0.052                      +   XI    +
  2   0.005                      +    I    +
  3   0.101                      +    IXXX +
  4   0.241                      +    IXXXX+X
  5   0.119                      +    IXXX +
  6  -0.020                      +   XI    +
  7   0.001                      +    I    +
  8   0.302                      +    IXXXX+XXX
  9   0.077                     +     IXX   +
 10  -0.074                     +   XXI     +
 11  -0.072                     +   XXI     +
 12   0.085                     +     IXX   +
 13   0.064                     +     IXX   +
 14  -0.210                     +XXXXXI     +
 15  -0.132                     +  XXXI     +
 16  -0.020                     +    XI     +
 17  -0.003                     +     I     +
 18  -0.114                     +  XXXI     +
 19  -0.116                     +  XXXI     +
 20  -0.029                     +    XI     +
 21  -0.155                     + XXXXI     +
 22  -0.100                     +  XXXI     +
 23  -0.208                     +XXXXXI     +
 24  -0.094                     +   XXI     +
```


This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

```
 25  -0.116                    +  XXXI     +
 26  -0.039                    +    XI     +
 27  -0.091                    +   XXI     +
 28  -0.100                    +  XXXI     +
 29  -0.204                    +XXXXXI     +
 30   0.026                   +      IX     +
 31  -0.160                   +  XXXXI      +
 32  -0.050                   +     XI      +
 33  -0.080                   +    XXI      +
 34  -0.038                   +     XI      +
 35   0.031                   +      IX     +
 36  -0.012                   +      I      +
 37  -0.046                   +     XI      +
 38  -0.022                   +     XI      +
 39   0.019                   +      I      +
 40   0.080                   +      IXX    +
 41   0.020                   +      I      +
 42  -0.011                   +      I      +
 43   0.094                   +      IXX    +
 44   0.080                   +      IXX    +
 45   0.066                   +      IXX    +
 46   0.042                   +      IX     +
 47   0.032                   +      IX     +
 48   0.142                   +      IXXXX  +
 49   0.087                   +      IXX    +
 50   0.048                   +      IX     +
 51   0.044                   +      IX     +
 52   0.147                   +      IXXXX  +

PACF            VAR  = rcnt9. MAXLAG = 52.

FIRST CASE NUMBER TO BE USED      =              2
LAST CASE NUMBER TO BE USED       =            105
NO. OF OBS. AFTER DIFFERENCING    =            104
MEAN OF THE (DIFFERENCED) SERIES  =         9.5293
STANDARD ERROR OF THE MEAN        =       106.6093
T-VALUE OF MEAN (AGAINST ZERO)    =         0.0894

PARTIAL AUTOCORRELATIONS

  1- 12    -.05  0.0  .10  .26  .16 -.01 -.06  .22  .08 -.08 -.15 -.08
  ST.E.     .10  .10  .10  .10  .10  .10  .10  .10  .10  .10  .10  .10

 13- 24    -.01 -.19 -.15 -.14 -.05  .01  .05  .05 -.17 -.01 -.08 -.05
  ST.E.     .10  .10  .10  .10  .10  .10  .10  .10  .10  .10  .10  .10

 25- 36    -.13  0.0  .03 -.06 -.19  0.0 -.11 -.03  0.0 -.03 -.02  .01
  ST.E.     .10  .10  .10  .10  .10  .10  .10  .10  .10  .10  .10  .10

 37- 48     .02 -.11 -.11  .04  .08 -.05 -.08 -.06 -.05 -.03 -.06  0.0
  ST.E.     .10  .10  .10  .10  .10  .10  .10  .10  .10  .10  .10  .10

 49- 52     .01  .02  .03 -.03
  ST.E.     .10  .10  .10  .10

PLOT OF PARTIAL AUTOCORRELATIONS

          -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
LAG   CORR. +----+----+----+----+----+----+----+----+----+----+----+
                                     I
  1  -0.052                    +   XI    +
  2   0.002                    +    I    +
  3   0.102                    +    IXXX +
  4   0.255                    +    IXXXX+X
  5   0.162                    +    IXXXX+
  6  -0.009                    +    I    +
  7  -0.063                    +  XXI    +
  8   0.225                    +    IXXXX+X
  9   0.079                    +    IXX  +
 10  -0.075                    +  XXI    +
```


This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

11	-0.153	+XXXXI +
12	-0.080	+ XXI +
13	-0.013	+ I +
14	-0.193	XXXXXI +
15	-0.149	+XXXXI +
16	-0.143	+XXXXI +
17	-0.055	+ XI +
18	0.005	+ I +
19	0.055	+ IX +
20	0.051	+ IX +
21	-0.171	+XXXXI +
22	-0.008	+ I +
23	-0.085	+ XXI +
24	-0.048	+ XI +
25	-0.127	+ XXXI +
26	0.004	+ I +
27	0.030	+ IX +
28	-0.059	+ XI +
29	-0.185	XXXXXI +
30	-0.004	+ I +
31	-0.110	+ XXXI +
32	-0.027	+ XI +
33	0.003	+ I +
34	-0.033	+ XI +
35	-0.015	+ I +
36	0.012	+ I +
37	0.019	+ I +
38	-0.109	+ XXXI +
39	-0.114	+ XXXI +
40	0.037	+ IX +
41	0.083	+ IXX +
42	-0.048	+ XI +
43	-0.082	+ XXI +
44	-0.065	+ XXI +
45	-0.048	+ XI +
46	-0.028	+ XI +
47	-0.064	+ XXI +
48	0.000	+ I +
49	0.007	+ I +
50	0.017	+ I +
51	0.034	+ IX +
52	-0.030	+ XI +

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

```
#****************************** TABLE IV ******************************#

ESTIMATION BY BACKCASTING METHOD
□
SUMMARY OF THE MODEL
□

□
OUTPUT VARIABLE -- lncnt9
□
INPUT VARIABLES -- NOISE
□

□
VARIABLE  VAR. TYPE  MEAN      TIME      DIFFERENCES
                                          1
lncnt9      RANDOM             1- 105   (1-B  )

PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE        ST. ERR.  T-RATIO
      1  lncnt9       MA      1      1     0.4852         0.0858      5.65

RESIDUAL SUM OF SQUARES  =          0.397063
DEGREES OF FREEDOM       =               103
RESIDUAL MEAN SQUARE     =          0.003855
ACF              VAR  = rlncnt9. MAXLAG = 52. LBQ.                      /

FIRST CASE NUMBER TO BE USED     =               2
LAST CASE NUMBER TO BE USED      =             105
NO. OF OBS. AFTER DIFFERENCING   =             104
MEAN OF THE (DIFFERENCED) SERIES =          0.0005
STANDARD ERROR OF THE MEAN       =          0.0061
T-VALUE OF MEAN (AGAINST ZERO)   =          0.0788
AUTOCORRELATIONS
  1- 12    -.06 -.02  .15  .22  .11 -.04 -.01  .28  .03 -.07 -.06  .10
  ST.E.     .10  .10  .10  .10  .11  .11  .11  .11  .11  .11  .11  .11
L.-B. Q     .40  .40  3.0  8.4  9.7  9.9  9.9  19.  19.  20.  20.  21.
 13- 24     .03 -.22 -.13 -.01 -.01 -.14 -.08  0.0 -.15 -.11 -.16 -.07
  ST.E.     .12  .12  .12  .12  .12  .12  .12  .12  .12  .12  .13  .13
L.-B. Q     22.  27.  29.  29.  29.  32.  33.  33.  36.  37.  41.  41.
 25- 36    -.09 -.07 -.08 -.08 -.16  .02 -.12 -.05 -.07 -.05  .01 -.01
  ST.E.     .13  .13  .13  .13  .13  .13  .13  .13  .13  .13  .13  .13
L.-B. Q     42.  43.  44.  45.  49.  49.  51.  51.  52.  53.  53.  53.
 37- 48    -.03 -.04  .03  .07  .03 -.02  .05  .06  .08  .04  .03  .14
  ST.E.     .13  .13  .13  .13  .13  .13  .13  .13  .13  .13  .13  .13
L.-B. Q     53.  53.  53.  54.  54.  54.  55.  55.  57.  57.  57.  61.
 49- 52     .09  .05  .04  .11
  ST.E.     .14  .14  .14  .14
L.-B. Q     63.  63.  64.  66.

PLOT OF AUTOCORRELATIONS
          -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
LAG   CORR. +----+----+----+----+----+----+----+----+----+----+----+
                                     I
  1  -0.059                       +   XI    +
  2  -0.020                       +   XI    +
  3   0.154                       +    IXXXX+
  4   0.222                       +    IXXXX+X
  5   0.109                       +    IXXX +
  6  -0.037                       +   XI    +
  7  -0.013                       +    I    +
  8   0.284                       +    IXXXX+XX
  9   0.031                      +     IX    +
 10  -0.073                      +   XXI     +
 11  -0.058                      +    XI     +
 12   0.095                      +     IXX   +
 13   0.032                      +     IX    +
 14  -0.217                      +XXXXXI     +
 15  -0.129                      +  XXXI     +
 16  -0.012                      +     I     +
 17  -0.015                      +     I     +
```


This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

```
 18  -0.136                    +  XXXI      +
 19  -0.082                    +    XXI     +
 20  -0.001                    +      I     +
 21  -0.150                    +  XXXXI     +
 22  -0.105                    +  XXXI      +
 23  -0.158                    +  XXXXI     +
 24  -0.070                    +    XXI     +
 25  -0.089                    +    XXI     +
 26  -0.068                    +    XXI     +
 27  -0.076                    +    XXI     +
 28  -0.075                    +    XXI     +
 29  -0.164                    +  XXXXI     +
 30   0.015                    +      I     +
 31  -0.125                    +  XXXI      +
 32  -0.050                    +     XI     +
 33  -0.071                    +    XXI     +
 34  -0.054                    +     XI      +
 35   0.013                    +      I      +
 36  -0.007                    +      I      +
 37  -0.032                    +     XI      +
 38  -0.042                    +     XI      +
 39   0.025                    +      IX     +
 40   0.072                    +      IXX    +
 41   0.026                    +      IX     +
 42  -0.020                    +      I      +
 43   0.052                    +      IX     +
 44   0.060                    +      IX     +
 45   0.077                    +      IXX    +
 46   0.044                    +      IX     +
 47   0.030                    +      IX     +
 48   0.143                    +      IXXXX  +
 49   0.091                    +      IXX    +
 50   0.048                    +      IX     +
 51   0.043                    +      IX     +
 52   0.113                    +      IXXX   +

PACF            VAR  = rlncnt9. MAXLAG = 52.                              /
FIRST CASE NUMBER TO BE USED      =              2
LAST CASE NUMBER TO BE USED       =            105
NO. OF OBS. AFTER DIFFERENCING    =            104
MEAN OF THE (DIFFERENCED) SERIES  =         0.0005
STANDARD ERROR OF THE MEAN        =         0.0061
T-VALUE OF MEAN (AGAINST ZERO)    =         0.0788
PARTIAL AUTOCORRELATIONS
  1- 12    -.06 -.02  .15  .25  .16 -.03 -.10  .19  .04 -.05 -.14 -.04
  ST.E.     .10  .10  .10  .10  .10  .10  .10  .10  .10  .10  .10  .10
 13- 24    -.01 -.18 -.14 -.13 -.01  0.0  .07  .05 -.16 -.03 -.09 -.03
  ST.E.     .10  .10  .10  .10  .10  .10  .10  .10  .10  .10  .10  .10
 25- 36    -.09  .01  .01 -.07 -.18 -.03 -.09 -.04 -.01 -.04 -.02 -.01
  ST.E.     .10  .10  .10  .10  .10  .10  .10  .10  .10  .10  .10  .10
 37- 48     0.0 -.14 -.09  .04  .11 -.03 -.12 -.12 -.05  .02 -.03  .05
  ST.E.     .10  .10  .10  .10  .10  .10  .10  .10  .10  .10  .10  .10
 49- 52     .01  .02  0.0 -.07
  ST.E.     .10  .10  .10  .10

PLOT OF PARTIAL AUTOCORRELATIONS

          -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
LAG   CORR. +----+----+----+----+----+----+----+----+----+----+----+
                                     I
  1  -0.059                    +    XI    +
  2  -0.024                    +    XI    +
  3   0.152                    +     IXXXX+
  4   0.245                    +     IXXXX+X
  5   0.163                    +     IXXXX+
  6  -0.028                    +    XI     +
  7  -0.102                    + XXXI     +
  8   0.190                    +     IXXXXX
  9   0.040                    +     IX   +
 10  -0.050                    +    XI    +
 11  -0.142                    +XXXXI     +
```


This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

```
12  -0.042                    +   XI    +
13  -0.010                    +    I    +
14  -0.177                    +XXXXI    +
15  -0.143                    +XXXXI    +
16  -0.133                    + XXXI    +
17  -0.011                    +    I    +
18  -0.002                    +    I    +
19   0.074                    +    IXX  +
20   0.047                    +    IX-  +
21  -0.164                    +XXXXI    +
22  -0.033                    +   XI    +
23  -0.087                    +  XXI    +
24  -0.031                    +   XI`   +
25  -0.093                    +  XXI    +
26   0.011                    +    I    +
27   0.008                    +    I    +
28  -0.074                    +  XXI    +
29  -0.177                    +XXXXI    +
30  -0.029                    +   XI    +
31  -0.089                    +  XXI    +
32  -0.037                    +   XI    +
33  -0.014                    +    I    +
34  -0.036                    +   XI    +
35  -0.021                    +   XI    +
36  -0.014                    +    I    +
37  -0.002                    +    I    +
38  -0.137                    + XXXI    +
39  -0.090                    +  XXI    +
40   0.043                    +    IX   +
41   0.109                    +    IXXX +
42  -0.028                    +   XI    +
43  -0.119                    + XXXI    +
44  -0.120                    + XXXI    +
45  -0.047                    +   XI    +
46   0.021                    +    IX   +
47  -0.031                    +   XI    +
48   0.050                    +    IX   +
49   0.014                    +    I    +
50   0.016                    +    I    +
51   0.005                    +    I    +
52  -0.067                    +  XXI    +
```


This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

```
#************************* TABLE V ****************************#

BLOCK           RANGE = 1,275.
ACF             VAR = lncnt9. DFORDER = 1, 52. MAXLAG = 52.

FIRST CASE NUMBER TO BE USED      =              1
LAST CASE NUMBER TO BE USED       =            275
NO. OF OBS. AFTER DIFFERENCING    =            222
MEAN OF THE (DIFFERENCED) SERIES  =        -0.0001
STANDARD ERROR OF THE MEAN        =         0.0060
T-VALUE OF MEAN (AGAINST ZERO)    =        -0.0224
AUTOCORRELATIONS
  1- 12    -.42 -.10  .12  .01  0.0 -.04 -.03  .11 -.04 -.02 -.04  .04
  ST.E.     .07  .08  .08  .08  .08  .08  .08  .08  .08  .08  .08  .08
 13- 24     .03 -.07  .02  .03  .01 -.06  .02  .07 -.05 -.03  .06 -.01
  ST.E.     .08  .08  .08  .08  .08  .08  .08  .08  .08  .08  .08  .08
 25- 36    -.08 -.02  .13  0.0 -.14  .13  0.0 -.09  .08 -.03 -.02  .03
  ST.E.     .08  .08  .08  .08  .08  .08  .09  .09  .09  .09  .09  .09
 37- 48    -.06 -.01  .03  .01  .05 -.11  .13 -.06  .01  .02  .03 -.06
  ST.E.     .09  .09  .09  .09  .09  .09  .09  .09  .09  .09  .09  .09
 49- 52     .09 -.04  .12 -.41
  ST.E.     .09  .09  .09  .09
PLOT OF AUTOCORRELATIONS
          -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
LAG   CORR. +----+----+----+----+----+----+----+----+----+----+----+
                                     I
  1  -0.417                  XXXXXXX+XXI  +
  2  -0.096                        + XXI   +
  3   0.117                        +   IXXX+
  4   0.008                        +   I   +
  5   0.000                        +   I   +
  6  -0.045                        +  XI   +
  7  -0.032                        +  XI   +
  8   0.110                        +   IXXX+
  9  -0.044                        +  XI   +
 10  -0.023                        +  XI   +
 11  -0.039                        +  XI   +
 12   0.041                        +   IX  +
 13   0.034                        +   IX  +
 14  -0.068                        + XXI   +
 15   0.019                        +   I   +
 16   0.035                        +   IX  +
 17   0.006                        +   I   +
 18  -0.059                        +  XI   +
 19   0.019                        +   I   +
 20   0.069                        +   IXX +
 21  -0.050                        +  XI   +
 22  -0.032                        +  XI   +
 23   0.065                        +   IXX +
 24  -0.012                        +   I   +
 25  -0.084                        + XXI   +
 26  -0.022                        +  XI   +
 27   0.128                        +   IXXX+
 28   0.004                        +   I   +
 29  -0.138                        +XXXI   +
 30   0.133                        +   IXXX+
 31  -0.004                        +   I   +
 32  -0.087                        + XXI   +
 33   0.084                        +   IXX +
 34  -0.034                        +  XI   +
 35  -0.017                        +   I   +
 36   0.033                        +   IX  +
 37  -0.056                        +  XI   +
 38  -0.014                        +   I   +
 39   0.027                        +   IX  +
 40   0.013                        +   I   +
 41   0.055                        +   IX  +
 42  -0.111                        +XXXI   +
 43   0.125                        +   IXXX+
 44  -0.062                        + XXI   +
 45   0.007                        +   I   +
```


This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

```
 46   0.017                        +   I   +
 47   0.032                        +   IX  +
 48  -0.063                        + XXI   +
 49   0.088                        +   IXX +
 50  -0.039                        +  XI   +
 51   0.124                        +   IXXX+
 52  -0.410                   XXXXXX+XXXI   +

PACF            VAR = lncnt9. DFORDER = 1, 52. MAXLAG = 52.
FIRST CASE NUMBER TO BE USED     =              1
LAST CASE NUMBER TO BE USED      =            275
NO. OF OBS. AFTER DIFFERENCING   =            222
MEAN OF THE (DIFFERENCED) SERIES =        -0.0001
STANDARD ERROR OF THE MEAN       =         0.0060
T-VALUE OF MEAN (AGAINST ZERO)   =        -0.0224


PARTIAL AUTOCORRELATIONS
  1- 12    -.42 -.33 -.10  0.0  .05 -.01 -.08  .05  .03  .02 -.07 -.04
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
 13- 24     .02 -.02  0.0  .01  .04 -.03 -.02  .06  .01 -.03  .03  .02
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
 25- 36    -.09 -.14  .04  .11 -.05  .07  .06 -.06  .04  .04 -.03 -.05
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
 37- 48    -.05 -.06 -.05  0.0  .14  0.0  .07  0.0  .05  .02  .05 -.03
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
 49- 52     .06 -.01  .20 -.37
  ST.E.     .07  .07  .07  .07
PLOT OF PARTIAL AUTOCORRELATIONS
          -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
LAG   CORR. +----+----+----+----+----+----+----+----+----+----+----+
                                     I
  1  -0.417                  XXXXXXX+XXI  +
  2  -0.327                    XXXXX+XXI  +
  3  -0.098                         +XXI  +
  4  -0.002                         +  I  +
  5   0.054                         +  IX +
  6  -0.009                         +  I  +
  7  -0.082                         +XXI  +
  8   0.046                         +  IX +
  9   0.033                         +  IX +
 10   0.022                         +  IX +
 11  -0.074                         +XXI  +
 12  -0.045                         + XI  +
 13   0.021                         +  IX +
 14  -0.017                         +  I  +
 15   0.000                         +  I  +
 16   0.014                         +  I  +
 17   0.039                         +  IX +
 18  -0.032                         + XI  +
 19  -0.015                         +  I  +
 20   0.059                         +  IX +
 21   0.014                         +  I  +
 22  -0.027                         + XI  +
 23   0.028                         +  IX +
 24   0.023                         +  IX +
 25  -0.091                         +XXI  +
 26  -0.136                         XXXI  +
 27   0.043                         +  IX +
 28   0.111                         +  IXXX
 29  -0.047                         + XI  +
 30   0.071                         +  IXX+
 31   0.057                         +  IX +
 32  -0.060                         + XI  +
 33   0.036                         +  IX +
 34   0.037                         +  IX +
 35  -0.034                         + XI  +
 36  -0.048                         + XI  +
 37  -0.053                         + XI  +
 38  -0.063                         +XXI  +
 39  -0.048                         + XI  +
```


This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

```
 40  -0.003                        +  I  +
 41   0.142                        +  IXX+X
 42  -0.004                        +  I  +
 43   0.071                        +  IXX+
 44  -0.002                        +  I  +
 45   0.049                        +  IX +
 46   0.021                        +  IX +
 47   0.049                        +  IX +
 48  -0.034                        + XI  +
 49   0.059                        +  IX +
 50  -0.008                        +  I  +
 51   0.196                        +  IXX+XX
 52  -0.374                   XXXXXX+XXI  +

ARIMA           VAR = lncnt9.
                DFORder = 1, 52.
                MAORder = '(1)'.


CHECK   MODEL.
ESTIMATION      RESIduals = rlncnt9.   PCORrelation.
ESTIMATION BY BACKCASTING METHOD
SUMMARY OF THE MODEL
OUTPUT VARIABLE -- lncnt9
INPUT VARIABLES -- NOISE
VARIABLE  VAR. TYPE  MEAN      TIME      DIFFERENCES
                                            1      52
lncnt9      RANDOM             1- 275  (1-B  ) (1-B  )
PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE        ST. ERR.  T-RATIO
      1  lncnt9       MA      1      1     0.5634         0.0553    10.20

RESIDUAL SUM OF SQUARES  =         1.328375
DEGREES OF FREEDOM       =              221
RESIDUAL MEAN SQUARE     =         0.006011

ACF             VAR  = rlncnt9. MAXLAG = 36. LBQ.

FIRST CASE NUMBER TO BE USED     =              54
LAST CASE NUMBER TO BE USED      =             275
NO. OF OBS. AFTER DIFFERENCING   =             222
MEAN OF THE (DIFFERENCED) SERIES =         -0.0005
STANDARD ERROR OF THE MEAN       =          0.0052
T-VALUE OF MEAN (AGAINST ZERO)   =         -0.1029
AUTOCORRELATIONS
  1- 12    -.02 -.05  .12  .06  .01 -.05 -.01  .09 -.03 -.06 -.05  .03
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
L.-B. Q     .10  .70  4.2  5.2  5.2  5.7  5.8  7.7  7.9  8.8  9.4  9.6
 13- 24     .03 -.05  .02  .04  0.0 -.05  .03  .07 -.04 -.03  .03 -.04
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
L.-B. Q     9.8  10.  11.  11.  11.  12.  12.  13.  13.  13.  14.  14.
 25- 36    -.11 -.01  .14  .03 -.08  .11  .01 -.06  .05 -.03 -.04 -.02
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
L.-B. Q     17.  17.  22.  22.  24.  27.  27.  28.  28.  29.  29.  29.
PLOT OF AUTOCORRELATIONS
          -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
LAG   CORR. +----+----+----+----+----+----+----+----+----+----+
                                     I
  1  -0.020                        + XI  +
  2  -0.054                        + XI  +
  3   0.124                        +  IXXX
  4   0.064                        +  IXX+
  5   0.008                        +  I  +
  6  -0.047                        + XI  +
  7  -0.014                        +  I  +
  8   0.092                        +  IXX+
  9  -0.030                        + XI  +
 10  -0.059                        + XI  +
 11  -0.052                        + XI  +
 12   0.032                        +  IX +
 13   0.027                        +  IX +
 14  -0.051                        + XI  +
```


This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

```
 15   0.017                        +  I  +
 16   0.044                        +  IX +
 17   0.004                        +  I  +
 18  -0.047                        + XI  +
 19   0.027                        +  IX +
 20   0.065                        +  IXX+
 21  -0.037                        + XI  +
 22  -0.034                        + XI  +
 23   0.032                        +  IX +
 24  -0.045                        + XI  +
 25  -0.107                        XXXI  +
 26  -0.009                       +   I   +
 27   0.138                       +   IXXX+
 28   0.028                       +   IX  +
 29  -0.081                       + XXI   +
 30   0.107                       +   IXXX+
 31   0.014                       +   I   +
 32  -0.063                       + XXI   +
 33   0.045                       +   IX  +
 34  -0.030                       +  XI   +
 35  -0.038                       +  XI   +
 36  -0.015                       +   I   +

PACF            VAR  = rlncnt9. MAXLAG = 36.                          /
FIRST CASE NUMBER TO BE USED     =              54
LAST CASE NUMBER TO BE USED      =             275
NO. OF OBS. AFTER DIFFERENCING   =             222
MEAN OF THE (DIFFERENCED) SERIES =         -0.0005
STANDARD ERROR OF THE MEAN       =          0.0052
T-VALUE OF MEAN (AGAINST ZERO)   =         -0.1029
PARTIAL AUTOCORRELATIONS
  1- 12    -.02 -.05  .12  .07  .02 -.06 -.03  .08 -.02 -.04 -.08  .02
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
 13- 24     .04 -.02  .02  .02  .01 -.04  .03  .05 -.03 -.03  .01 -.05
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
 25- 36    -.10  0.0  .15  .05 -.06  .09 -.02 -.06  .05 -.03 -.08 -.05
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07

PLOT OF PARTIAL AUTOCORRELATIONS
          -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
LAG   CORR. +----+----+----+----+----+----+----+----+----+----+----+
                                      I
  1  -0.020                        + XI  +
  2  -0.054                        + XI  +
  3   0.122                        +  IXXX
  4   0.067                        +  IXX+
  5   0.024                        +  IX +
  6  -0.056                        + XI  +
  7  -0.032                        + XI  +
  8   0.080                        +  IXX+
  9  -0.017                        +  I  +
 10  -0.041                        + XI  +
 11  -0.077                        +XXI  +
 12   0.018                        +  I  +
 13   0.037                        +  IX +
 14  -0.016                        +  I  +
 15   0.022                        +  IX +
 16   0.019                        +  I  +
 17   0.010                        +  I  +
 18  -0.039                        + XI  +
 19   0.029                        +  IX +
 20   0.047                        +  IX +
 21  -0.035                        + XI  +
 22  -0.027                        + XI  +
 23   0.014                        +  I  +
 24  -0.052                        + XI  +
 25  -0.105                        XXXI  +
 26  -0.001                        +  I  +
 27   0.149                        +  IXX+X
 28   0.054                        +  IX +
 29  -0.057                        + XI  +
```


This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

```
30   0.089                    +  IXX+
31  -0.019                    +  I  +
32  -0.065                    +XXI  +
33   0.051                    +  IX +
34  -0.028                    + XI  +
35  -0.082                    +XXI  +
36  -0.047                    + XI  +
```


This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

```
#************************ Table VI ****************************#

BLOCK           RANGE = 1,275.
ACF             VAR = lncnt9. DFORDER = 1, 52. MAXLAG = 52.
FIRST CASE NUMBER TO BE USED     =              1
LAST CASE NUMBER TO BE USED      =            275
NO. OF OBS. AFTER DIFFERENCING   =            222
MEAN OF THE (DIFFERENCED) SERIES =        -0.0001
STANDARD ERROR OF THE MEAN       =         0.0060
T-VALUE OF MEAN (AGAINST ZERO)   =        -0.0224
AUTOCORRELATIONS
  1- 12    -.42 -.10  .12  .01  0.0 -.04 -.03  .11 -.04 -.02 -.04  .04
  ST.E.      .07  .08  .08  .08  .08  .08  .08  .08  .08  .08  .08  .08
 13- 24      .03 -.07  .02  .03  .01 -.06  .02  .07 -.05 -.03  .06 -.01
  ST.E.      .08  .08  .08  .08  .08  .08  .08  .08  .08  .08  .08  .08
 25- 36    -.08 -.02  .13  0.0 -.14  .13  0.0 -.09  .08 -.03 -.02  .03
  ST.E.      .08  .08  .08  .08  .08  .08  .09  .09  .09  .09  .09  .09
 37- 48    -.06 -.01  .03  .01  .05 -.11  .13 -.06  .01  .02  .03 -.06
  ST.E.      .09  .09  .09  .09  .09  .09  .09  .09  .09  .09  .09  .09
 49- 52      .09 -.04  .12 -.41
  ST.E.      .09  .09  .09  .09
PLOT OF AUTOCORRELATIONS
          -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
LAG   CORR. +----+----+----+----+----+----+----+----+----+----+----+
                                      I
  1  -0.417                  XXXXXXX+XXI  +
  2  -0.096                        + XXI   +
  3   0.117                        +   IXXX+
  4   0.008                        +   I   +
  5   0.000                        +   I   +
  6  -0.045                        +  XI   +
  7  -0.032                        +  XI   +
  8   0.110                        +   IXXX+
  9  -0.044                        +  XI   +
 10  -0.023                        +  XI   +
 11  -0.039                        +  XI   +
 12   0.041                        +   IX  +
 13   0.034                        +   IX  +
 14  -0.068                        + XXI   +
 15   0.019                        +   I   +
 16   0.035                        +   IX  +
 17   0.006                        +   I   +
 18  -0.059                        +  XI   +
 19   0.019                        +   I   +
 20   0.069                        +   IXX +
 21  -0.050                        +  XI   +
 22  -0.032                        +  XI   +
 23   0.065                        +   IXX +
 24  -0.012                        +   I   +
 25  -0.084                        + XXI   +
 26  -0.022                        +  XI   +
 27   0.128                        +   IXXX+
 28   0.004                        +   I   +
 29  -0.138                        +XXXI   +
 30   0.133                        +   IXXX+
 31  -0.004                        +   I   +
 32  -0.087                        + XXI   +
 33   0.084                        +   IXX +
 34  -0.034                        +  XI   +
 35  -0.017                        +   I   +
 36   0.033                        +   IX  +
 37  -0.056                        +  XI   +
 38  -0.014                        +   I   +
 39   0.027                        +   IX  +
 40   0.013                        +   I   +
 41   0.055                        +   IX  +
 42  -0.111                        +XXXI   +
 43   0.125                        +   IXXX+
 44  -0.062                        + XXI   +
 45   0.007                        +   I   +
 46   0.017                        +   I   +
```


This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

```
 47   0.032                        +   IX  +
 48  -0.063                        + XXI   +
 49   0.088                        +   IXX +
 50  -0.039                        +  XI   +
 51   0.124                        +   IXXX+
 52  -0.410                    XXXXXX+XXXI   +

PACF            VAR = lncnt9. DFORDER = 1, 52. MAXLAG = 52.          /
FIRST CASE NUMBER TO BE USED      =                1
LAST CASE NUMBER TO BE USED       =              275
NO. OF OBS. AFTER DIFFERENCING    =              222
MEAN OF THE (DIFFERENCED) SERIES  =          -0.0001
STANDARD ERROR OF THE MEAN        =           0.0060
T-VALUE OF MEAN (AGAINST ZERO)    =          -0.0224
PARTIAL AUTOCORRELATIONS
  1- 12    -.42 -.33 -.10  0.0  .05 -.01 -.08  .05  .03  .02 -.07 -.04
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
 13- 24     .02 -.02  0.0  .01  .04 -.03 -.02  .06  .01 -.03  .03  .02
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
 25- 36    -.09 -.14  .04  .11 -.05  .07  .06 -.06  .04  .04 -.03 -.05
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
 37- 48    -.05 -.06 -.05  0.0  .14  0.0  .07  0.0  .05  .02  .05 -.03
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
 49- 52     .06 -.01  .20 -.37
  ST.E.     .07  .07  .07  .07

PLOT OF PARTIAL AUTOCORRELATIONS
          -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
LAG   CORR. +----+----+----+----+----+----+----+----+----+----+----+
                                     I
  1  -0.417                  XXXXXXX+XXI  +
  2  -0.327                    XXXXX+XXI  +
  3  -0.098                         +XXI  +
  4  -0.002                         +  I  +
  5   0.054                         +  IX +
  6  -0.009                         +  I  +
  7  -0.082                         +XXI  +
  8   0.046                         +  IX +
  9   0.033                         +  IX +
 10   0.022                         +  IX +
 11  -0.074                         +XXI  +
 12  -0.045                         + XI  +
 13   0.021                         +  IX +
 14  -0.017                         +  I  +
 15   0.000                         +  I  +
 16   0.014                         +  I  +
 17   0.039                         +  IX +
 18  -0.032                         + XI  +
 19  -0.015                         +  I  +
 20   0.059                         +  IX +
 21   0.014                         +  I  +
 22  -0.027                         + XI  +
 23   0.028                         +  IX +
 24   0.023                         +  IX +
 25  -0.091                         +XXI  +
 26  -0.136                         XXXI  +
 27   0.043                         +  IX +
 28   0.111                         +  IXXX
 29  -0.047                         + XI  +
 30   0.071                         +  IXX+
 31   0.057                         +  IX +
 32  -0.060                         + XI  +
 33   0.036                         +  IX +
 34   0.037                         +  IX +
 35  -0.034                         + XI  +
 36  -0.048                         + XI  +
 37  -0.053                         + XI  +
 38  -0.063                         +XXI  +
 39  -0.048                         + XI  +
 40  -0.003                         +  I  +
 41   0.142                         +  IXX+X
```


This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

```
 42  -0.004                        +  I  +
 43   0.071                        +  IXX+
 44  -0.002                        +  I  +
 45   0.049                        +  IX +
 46   0.021                        +  IX +
 47   0.049                        +  IX +
 48  -0.034                        + XI  +
 49   0.059                        +  IX +
 50  -0.008                        +  I  +
 51   0.196                        +  IXX+XX
 52  -0.374                  XXXXXX+XXI  +

ARIMA           VAR = lncnt9.
                DFORder = 1, 52.
                MAORder = '(1), (52)'.

CHECK   MODEL.
SUMMARY OF THE MODEL
OUTPUT VARIABLE -- lncnt9
INPUT VARIABLES -- NOISE
ESTIMATION BY BACKCASTING METHOD
VARIABLE  VAR. TYPE  MEAN      TIME      DIFFERENCES
                                            1      52
lncnt9      RANDOM             1- 275  (1-B  ) (1-B  )
PARAMETER VARIABLE    TYPE  FACTOR  ORDER ESTIMATE        ST. ERR.  T-RATIO
      1  lncnt9        MA      1      1     0.5974         0.0504     11.86
      2  lncnt9        MA      2     52     0.8420         0.0240     35.15
RESIDUAL SUM OF SQUARES  =          0.687959
DEGREES OF FREEDOM       =               220
RESIDUAL MEAN SQUARE     =          0.003127
ACF             VAR  = rlncnt9. MAXLAG = 36. LBQ.
FIRST CASE NUMBER TO BE USED     =              54
LAST CASE NUMBER TO BE USED      =             275
NO. OF OBS. AFTER DIFFERENCING   =             222
MEAN OF THE (DIFFERENCED) SERIES =         -0.0025
STANDARD ERROR OF THE MEAN       =          0.0037
T-VALUE OF MEAN (AGAINST ZERO)   =         -0.6691
AUTOCORRELATIONS
  1- 12    -.01 -.04  .10  .14  .02 -.06 -.02  .14 -.03 -.09 -.11  .06
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
L.-B. Q     0.0  .30  2.5  7.0  7.1  7.9  8.1  12.  13.  15.  18.  18.
 13- 24     .04 -.05  .01  .03  0.0 -.03 -.03  .07 -.02  .01 -.01 -.04
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
L.-B. Q     19.  19.  19.  20.  20.  20.  20.  21.  21.  21.  21.  22.
 25- 36    -.04 -.01  .13  .03 -.07  .06  .01 -.05  .02 -.05 -.04  .02
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .08  .08
L.-B. Q     22.  22.  26.  26.  28.  29.  29.  29.  29.  30.  30.  30.
PLOT OF AUTOCORRELATIONS
          -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
LAG   CORR. +----+----+----+----+----+----+----+----+----+----+----+
                                      I
  1  -0.009                         +  I  +
  2  -0.038                         + XI  +
  3   0.097                         +  IXX+
  4   0.141                         +  IXX+X
  5   0.022                         +  IX +
  6  -0.058                         + XI  +
  7  -0.024                         + XI  +
  8   0.137                         +  IXXX
  9  -0.026                         + XI  +
 10  -0.094                         +XXI  +
 11  -0.111                         XXXI  +
 12   0.057                        +   IX  +
 13   0.040                        +   IX  +
 14  -0.055                        +  XI   +
 15   0.006                        +   I   +
 16   0.032                        +   IX  +
 17   0.001                        +   I   +
 18  -0.027                        +  XI   +
 19  -0.029                        +  XI   +
 20   0.066                        +   IXX +
```


This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

```
 21  -0.025                    +  XI   +
 22   0.013                    +   I   +
 23  -0.006                    +   I   +
 24  -0.036                    +  XI   +
 25  -0.041                    +  XI   +
 26  -0.005                    +   I   +
 27   0.126                    +   IXXX+
 28   0.028                    +   IX  +
 29  -0.072                    + XXI   +
 30   0.057                    +   IX  +
 31   0.006                    +   I   +
 32  -0.051                    +  XI   +
 33   0.015                    +   I   +
 34  -0.047                    +  XI   +
 35  -0.036                    +  XI   +
 36   0.018                    +   I   +

PACF            VAR  = rlncnt9. MAXLAG = 36.                          /
FIRST CASE NUMBER TO BE USED     =              54
LAST CASE NUMBER TO BE USED      =             275
NO. OF OBS. AFTER DIFFERENCING   =             222
MEAN OF THE (DIFFERENCED) SERIES =         -0.0025
STANDARD ERROR OF THE MEAN       =          0.0037
T-VALUE OF MEAN (AGAINST ZERO)   =         -0.6691
PARTIAL AUTOCORRELATIONS
  1- 12     -.01 -.04  .10  .14  .03 -.06 -.05  .11 -.02 -.07 -.13  .02
  ST.E.      .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
 13- 24      .06  .01  .04 -.01 -.02 -.01  0.0  .04 -.05  .02  0.0 -.04
  ST.E.      .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
 25- 36     -.05  0.0  .15  .04 -.06  .02 -.03 -.05  .04 -.05 -.10  .01
  ST.E.      .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
PLOT OF PARTIAL AUTOCORRELATIONS
          -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
LAG   CORR. +----+----+----+----+----+----+----+----+----+----+----+
                                      I
  1  -0.009                    +   I   +
  2  -0.038                    +  XI   +
  3   0.097                    +   IXX+
  4   0.142                    +   IXX+X
  5   0.034                    +   IX  +
  6  -0.059                    +  XI   +
  7  -0.055                    +  XI   +
  8   0.111                    +   IXXX
  9  -0.019                    +   I   +
 10  -0.069                    +XXI   +
 11  -0.135                    XXXI   +
 12   0.020                    +   I   +
 13   0.056                    +   IX  +
 14   0.010                    +   I   +
 15   0.039                    +   IX  +
 16  -0.010                    +   I   +
 17  -0.017                    +   I   +
 18  -0.010                    +   I   +
 19  -0.005                    +   I   +
 20   0.044                    +   IX  +
 21  -0.051                    +  XI   +
 22   0.023                    +   IX  +
 23  -0.003                    +   I   +
 24  -0.038                    +  XI   +
 25  -0.049                    +  XI   +
 26   0.001                    +   I   +
 27   0.153                    +   IXX+X
 28   0.038                    +   IX  +
 29  -0.056                    +  XI   +
 30   0.017                    +   I   +
 31  -0.031                    +  XI   +
 32  -0.050                    +  XI   +
 33   0.043                    +   IX  +
 34  -0.053                    +  XI   +
 35  -0.097                    +XXI   +
 36   0.014                    +   I   +
```


This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

#************************** TABLE VII ****************************#

BLOCK RANGE = 1,275.
ACF VAR = lncnt9. DFORDER = 1, 52. MAXLAG = 52.

FIRST CASE NUMBER TO BE USED	1
LAST CASE NUMBER TO BE USED	275
NO. OF OBS. AFTER DIFFERENCING	222
MEAN OF THE (DIFFERENCED) SERIES	-0.0001
STANDARD ERROR OF THE MEAN	0.0060
T-VALUE OF MEAN (AGAINST ZERO)	-0.0224

AUTOCORRELATIONS

1- 12	-.42	-.10	.12	.01	0.0	-.04	-.03	.11	-.04	-.02	-.04	.04
ST.E.	.07	.08	.08	.08	.08	.08	.08	.08	.08	.08	.08	.08
13- 24	.03	-.07	.02	.03	.01	-.06	.02	.07	-.05	-.03	.06	-.01
ST.E.	.08	.08	.08	.08	.08	.08	.08	.08	.08	.08	.08	.08
25- 36	-.08	-.02	.13	0.0	-.14	.13	0.0	-.09	.08	-.03	-.02	.03
ST.E.	.08	.08	.08	.08	.08	.08	.09	.09	.09	.09	.09	.09
37- 48	-.06	-.01	.03	.01	.05	-.11	.13	-.06	.01	.02	.03	-.06
ST.E.	.09	.09	.09	.09	.09	.09	.09	.09	.09	.09	.09	.09
49- 52	.09	-.04	.12	-.41								
ST.E.	.09	.09	.09	.09								

PLOT OF AUTOCORRELATIONS

LAG	CORR.	-1.0 -0.8 -0.6 -0.4 -0.2 0.0 0.2 0.4 0.6 0.8 1.0
1	-0.417	XXXXXXX+XXI +
2	-0.096	+ XXI +
3	0.117	+ IXXX+
4	0.008	+ I +
5	0.000	+ I +
6	-0.045	+ XI +
7	-0.032	+ XI +
8	0.110	+ IXXX+
9	-0.044	+ XI +
10	-0.023	+ XI +
11	-0.039	+ XI +
12	0.041	+ IX +
13	0.034	+ IX +
14	-0.068	+ XXI +
15	0.019	+ I +
16	0.035	+ IX +
17	0.006	+ I +
18	-0.059	+ XI +
19	0.019	+ I +
20	0.069	+ IXX +
21	-0.050	+ XI +
22	-0.032	+ XI +
23	0.065	+ IXX +
24	-0.012	+ I +
25	-0.084	+ XXI +
26	-0.022	+ XI +
27	0.128	+ IXXX+
28	0.004	+ I +
29	-0.138	+XXXI +
30	0.133	+ IXXX+
31	-0.004	+ I +
32	-0.087	+ XXI +
33	0.084	+ IXX +
34	-0.034	+ XI +
35	-0.017	+ I +
36	0.033	+ IX +
37	-0.056	+ XI +
38	-0.014	+ I +
39	0.027	+ IX +
40	0.013	+ I +
41	0.055	+ IX +
42	-0.111	+XXXI +
43	0.125	+ IXXX+
44	-0.062	+ XXI +

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

```
 45   0.007                        +   I   +
 46   0.017                        +   I   +
 47   0.032                        +   IX  +
 48  -0.063                        + XXI   +
 49   0.088                        +   IXX +
 50  -0.039                        +  XI   +
 51   0.124                        +   IXXX+
 52  -0.410                    XXXXXX+XXXI   +

PACF            VAR = lncnt9. DFORDER = 1, 52. MAXLAG = 52.
FIRST CASE NUMBER TO BE USED      =              1
LAST CASE NUMBER TO BE USED       =            275
NO. OF OBS. AFTER DIFFERENCING    =            222
MEAN OF THE (DIFFERENCED) SERIES  =        -0.0001
STANDARD ERROR OF THE MEAN        =         0.0060
T-VALUE OF MEAN (AGAINST ZERO)    =        -0.0224
PARTIAL AUTOCORRELATIONS
  1- 12    -.42 -.33 -.10  0.0  .05 -.01 -.08  .05  .03  .02 -.07 -.04
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
 13- 24     .02 -.02  0.0  .01  .04 -.03 -.02  .06  .01 -.03  .03  .02
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
 25- 36    -.09 -.14  .04  .11 -.05  .07  .06 -.06  .04  .04 -.03 -.05
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
 37- 48    -.05 -.06 -.05  0.0  .14  0.0  .07  0.0  .05  .02  .05 -.03
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
 49- 52     .06 -.01  .20 -.37
  ST.E.     .07  .07  .07  .07

PLOT OF PARTIAL AUTOCORRELATIONS
          -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
LAG   CORR. +----+----+----+----+----+----+----+----+----+----+----+
                                     I
  1  -0.417                  XXXXXXX+XXI  +
  2  -0.327                    XXXXX+XXI  +
  3  -0.098                       +XXI  +
  4  -0.002                       +  I  +
  5   0.054                       +  IX +
  6  -0.009                       +  I  +
  7  -0.082                       +XXI  +
  8   0.046                       +  IX +
  9   0.033                       +  IX +
 10   0.022                       +  IX +
 11  -0.074                       +XXI  +
 12  -0.045                       + XI  +
 13   0.021                       +  IX +
 14  -0.017                       +  I  +
 15   0.000                       +  I  +
 16   0.014                       +  I  +
 17   0.039                       +  IX +
 18  -0.032                       + XI  +
 19  -0.015                       +  I  +
 20   0.059                       +  IX +
 21   0.014                       +  I  +
 22  -0.027                       + XI  +
 23   0.028                       +  IX +
 24   0.023                       +  IX +
 25  -0.091                       +XXI  +
 26  -0.136                       XXXI  +
 27   0.043                       +  IX +
 28   0.111                       +  IXXX
 29  -0.047                       + XI  +
 30   0.071                       +  IXX+
 31   0.057                       +  IX +
 32  -0.060                       + XI  +
 33   0.036                       +  IX +
 34   0.037                       +  IX +
 35  -0.034                       + XI  +
 36  -0.048                       + XI  +
 37  -0.053                       + XI  +
 38  -0.063                       +XXI  +
 39  -0.048                       + XI  +
```


This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

```
 40  -0.003                        +  I  +
 41   0.142                        +  IXX+X
 42  -0.004                        +  I  +
 43   0.071                        +  IXX+
 44  -0.002                        +  I  +
 45   0.049                        +  IX +
 46   0.021                        +  IX +
 47   0.049                        +  IX +
 48  -0.034                        + XI  +
 49   0.059                        +  IX +
 50  -0.008                        +  I  +
 51  -0.196                        +  IXX+XX
 52  -0.374                    XXXXXX+XXI  +

ARIMA           VAR = lncnt9.
                DFORder = 1, 52.
                MAORder = '(1), (52)'.
INDEP           VAR = int.
                TYPE = BINARY.
                DFORder = 1, 52.
                UPORder = '(0)'.
CHECK   MODEL.


SUMMARY OF THE MODEL

OUTPUT VARIABLE -- lncnt9
INPUT VARIABLES -- NOISE    int
VARIABLE  VAR. TYPE  MEAN      TIME      DIFFERENCES
                                            1      52
lncnt9      RANDOM             1- 275  (1-B  ) (1-B  )
                                           1      52
int         BINARY             1- 275  (1-B  ) (1-B  )

ESTIMATION      RESIduals = rlncnt9.   PCORrelation.
FIRST CASE NUMBER TO BE USED     =              1
LAST CASE NUMBER TO BE USED      =            275
ESTIMATION BY BACKCASTING METHOD

SUMMARY OF MODEL
OUTPUT VARIABLE -- lncnt9
INPUT VARIABLES -- NOISE    int
VARIABLE  VAR. TYPE  MEAN      TIME      DIFFERENCES
                                            1      52
lncnt9      RANDOM             1- 275  (1-B  ) (1-B  )
                                           1      52
int         BINARY             1- 275  (1-B  ) (1-B  )
PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE        ST. ERR.  T-RATIO
      1  lncnt9       MA      1      1     0.7458         0.0422    17.68
      2  lncnt9       MA      2     52     0.8245         0.0242    34.06
      3  int          UP      1      0    -0.2923         0.0343    -8.52
RESIDUAL SUM OF SQUARES  =         0.564820
DEGREES OF FREEDOM       =              219
RESIDUAL MEAN SQUARE     =         0.002579

ACF             VAR  = rlncnt9. MAXLAG = 36. LBQ.

FIRST CASE NUMBER TO BE USED     =             54
LAST CASE NUMBER TO BE USED      =            275
NO. OF OBS. AFTER DIFFERENCING   =            222
MEAN OF THE (DIFFERENCED) SERIES =        -0.0028
STANDARD ERROR OF THE MEAN       =         0.0034
T-VALUE OF MEAN (AGAINST ZERO)   =        -0.8219


AUTOCORRELATIONS

  1- 12    -.01 -.03  .10  .11 -.05 -.11 -.03  .10 -.02 -.08 -.09  .09
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
L.-B. Q     0.0  .20  2.3  5.1  5.5  8.1  8.3  11.  11.  12.  14.  16.
```


This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

```
 13- 24     .05 -.09 -.02  .02  .02 -.06 -.03  .07 -.05 -.02 -.03  0.0
   ST.E.    .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
L.-B. Q    17.  19.  19.  19.  19.  20.  20.  22.  22.  22.  23.  23.

 25- 36     .03  .01  .05 -.01 -.06  .03 -.07 -.03  0.0 -.02 -.04  .08
   ST.E.    .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
L.-B. Q    23.  23.  24.  24.  25.  25.  26.  26.  26.  26.  27.  28.

PLOT OF AUTOCORRELATIONS

          -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
LAG   CORR. +----+----+----+----+----+----+----+----+----+----+
                                     I
  1  -0.013                        +  I  +
  2  -0.030                        + XI  +
  3   0.095                        +  IXX+
  4   0.111                        +  IXXX
  5  -0.045                        + XI  +
  6  -0.106                        XXXI  +
  7  -0.027                        + XI  +
  8   0.103                        +  IXXX
  9  -0.022                        + XI  +
 10  -0.080                        +XXI  +
 11  -0.092                        +XXI  +
 12   0.090                        +  IXX+
 13   0.045                        +   IX  +
 14  -0.094                        + XXI   +
 15  -0.020                        +  XI   +
 16   0.019                        +   I   +
 17   0.019                        +   I   +
 18  -0.063                        + XXI   +
 19  -0.034                        +  XI   +
 20   0.070                        +   IXX +
 21  -0.049                        +  XI   +
 22  -0.020                        +   I   +
 23  -0.032                        +  XI   +
 24   0.003                        +   I   +
 25   0.029                        +   IX  +
 26   0.006                        +   I   +
 27   0.052                        +   IX  +
 28  -0.008                        +   I   +
 29  -0.062                        + XXI   +
 30   0.034                        +   IX  +
 31  -0.068                        + XXI   +
 32  -0.032                        +  XI   +
 33  -0.001                        +   I   +
 34  -0.015                        +   I   +
 35  -0.044                        +  XI   +
 36   0.076                        +   IXX +

PACF            VAR  = rlncnt9. MAXLAG = 36.
FIRST CASE NUMBER TO BE USED      =          54
LAST CASE NUMBER TO BE USED       =         275
NO. OF OBS. AFTER DIFFERENCING    =         222
MEAN OF THE (DIFFERENCED) SERIES  =     -0.0028
STANDARD ERROR OF THE MEAN        =      0.0034
T-VALUE OF MEAN (AGAINST ZERO)    =     -0.8219
PARTIAL AUTOCORRELATIONS
  1- 12    -.01 -.03  .09  .11 -.04 -.11 -.06  .10  .01 -.05 -.12  .05
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
 13- 24     .07 -.04 -.02 -.05  .01 -.02  0.0  .03 -.08  0.0 -.02  0.0
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
 25- 36     .02  .02  .07 -.03 -.09  .02 -.05 -.02  0.0 -.02 -.05  .10
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07

PLOT OF PARTIAL AUTOCORRELATIONS
          -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
LAG   CORR. +----+----+----+----+----+----+----+----+----+----+
                                     I
  1  -0.013                        +  I  +
  2  -0.030                        + XI  +
```


This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

3	0.094	+ IXX+
4	0.113	+ IXXX
5	-0.037	+ XI +
6	-0.114	XXXI +
7	-0.056	+ XI +
8	0.096	+ IXX+
9	0.014	+ I +
10	-0.050	+ XI +
11	-0.124	XXXI +
12	0.052	+ IX +
13	0.072	+ IXX+
14	-0.036	+ XI +
15	-0.025	+ XI +
16	-0.049	+ XI +
17	0.009	+ I +
18	-0.015	+ I +
19	-0.001	+ I +
20	0.035	+ IX +
21	-0.080	+XXI +
22	0.000	+ I +
23	-0.017	+ I +
24	0.000	+ I +
25	0.015	+ I +
26	0.023	+ IX +
27	0.065	+ IXX+
28	-0.033	+ XI +
29	-0.085	+XXI +
30	0.021	+ IX +
31	-0.051	+ XI +
32	-0.025	+ XI +
33	0.003	+ I +
34	-0.015	+ I +
35	-0.052	+ XI +
36	0.097	+ IXX+

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

```
#*****************************Table VIII ******************************#

BLOCK           RANGE = 1,275.
ACF             VAR = cntc.  MAXLAG = 52.
FIRST CASE NUMBER TO BE USED      =              1
LAST CASE NUMBER TO BE USED       =            275
NO. OF OBS. AFTER DIFFERENCING    =            275
MEAN OF THE (DIFFERENCED) SERIES  =      18374.1992
STANDARD ERROR OF THE MEAN        =        129.4443
T-VALUE OF MEAN (AGAINST ZERO)    =        141.9468

AUTOCORRELATIONS
  1- 12     .87  .83  .81  .78  .71  .65  .60  .55  .47  .38  .30  .24
  ST.E.     .06  .10  .12  .14  .15  .16  .17  .18  .19  .19  .19  .20
 13- 24     .17  .07  .01 -.04 -.10 -.16 -.22 -.26 -.31 -.33 -.36 -.38
  ST.E.     .20  .20  .20  .20  .20  .20  .20  .20  .20  .20  .20  .21
 25- 36    -.40 -.39 -.38 -.37 -.36 -.32 -.29 -.25 -.20 -.14 -.08 -.02
  ST.E.     .21  .21  .21  .22  .22  .22  .22  .22  .22  .23  .23  .23
 37- 48     .03  .08  .16  .23  .28  .32  .39  .43  .47  .50  .54  .57
  ST.E.     .23  .23  .23  .23  .23  .23  .23  .23  .24  .24  .24  .25
 49- 52     .59  .58  .58  .58
  ST.E.     .25  .26  .26  .27
PLOT OF AUTOCORRELATIONS
          -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
LAG   CORR. +----+----+----+----+----+----+----+----+----+----+----+
                                     I
  1   0.865                        +  IXX+XXXXXXXXXXXXXXXXXXX
  2   0.832                      +    IXXXX+XXXXXXXXXXXXXXXX
  3   0.807                     +     IXXXXX+XXXXXXXXXXXXXX
  4   0.778                    +      IXXXXXX+XXXXXXXXXXXX
  5   0.714                    +      IXXXXXX+XXXXXXXXXX
  6   0.648                   +       IXXXXXXX+XXXXXXX
  7   0.602                   +       IXXXXXXX+XXXXXX
  8   0.547                  +        IXXXXXXXX+XXXXX
  9   0.469                  +        IXXXXXXXX+XXX
 10   0.378                  +        IXXXXXXXXX
 11   0.303                  +        IXXXXXXXX+
 12   0.240                 +         IXXXXXX   +
 13   0.168                 +         IXXXX     +
 14   0.072                 +         IXX       +
 15   0.010                 +         I         +
 16  -0.042                 +        XI         +
 17  -0.097                 +       XXI         +
 18  -0.164                 +     XXXXI         +
 19  -0.219                 +    XXXXXI         +
 20  -0.260                 +  XXXXXXXI         +
 21  -0.306                 + XXXXXXXI          +
 22  -0.334                 + XXXXXXXXI         +
 23  -0.363                 +XXXXXXXXXI         +
 24  -0.379                 +XXXXXXXXXI         +
 25  -0.399                 XXXXXXXXXXI         +
 26  -0.390                 XXXXXXXXXXI         +
 27  -0.375                 +XXXXXXXXXI         +
 28  -0.374                + XXXXXXXXXI          +
 29  -0.365                + XXXXXXXXXI          +
 30  -0.317                +  XXXXXXXXI          +
 31  -0.293                +   XXXXXXXI          +
 32  -0.255                +    XXXXXXI          +
 33  -0.195                +     XXXXXI          +
 34  -0.142                +      XXXXI          +
 35  -0.078                +        XXI          +
 36  -0.021                +         XI          +
 37   0.027                +          IX         +
 38   0.081                +          IXX        +
 39   0.157                +          IXXXX      +
 40   0.230                +          IXXXXXX    +
 41   0.276                +          IXXXXXXX   +
 42   0.322                +          IXXXXXXXX  +
 43   0.390                +          IXXXXXXXXXX+
 44   0.432                +          IXXXXXXXXXXX
 45   0.471               +           IXXXXXXXXXXXX
```


This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

```
 46   0.504              +            IXXXXXXXXXXX+X
 47   0.538              +            IXXXXXXXXXXX+X
 48   0.569              +            IXXXXXXXXXXX+XX
 49   0.586              +            IXXXXXXXXXXX+XXX
 50   0.584             +             IXXXXXXXXXXX+XX
 51   0.578             +             IXXXXXXXXXXX+X
 52   0.583             +             IXXXXXXXXXXX+XX

PACF            VAR = cntc.  MAXLAG = 52.                              /
FIRST CASE NUMBER TO BE USED     =              1
LAST CASE NUMBER TO BE USED      =            275
NO. OF OBS. AFTER DIFFERENCING   =            275
MEAN OF THE (DIFFERENCED) SERIES =      18374.1992
STANDARD ERROR OF THE MEAN       =        129.4443
T-VALUE OF MEAN (AGAINST ZERO)   =        141.9468

PARTIAL AUTOCORRELATIONS
  1- 12     .87  .33  .17  .07 -.14 -.17 -.05 -.05 -.12 -.19 -.13 -.02
  ST.E.     .06  .06  .06  .06  .06  .06  .06  .06  .06  .06  .06  .06
 13- 24    0.0 -.12 -.01  .04  .05  0.0 -.03 -.04 -.05  .06  .02 -.01
  ST.E.     .06  .06  .06  .06  .06  .06  .06  .06  .06  .06  .06  .06
 25- 36   -.06  .09  .14  0.0 -.05  .12  .02  .06  .14  .03  .05  .07
  ST.E.     .06  .06  .06  .06  .06  .06  .06  .06  .06  .06  .06  .06
 37- 48   -.02 -.04  .06  .13  .03 -.06  .03  0.0  .05  .03  .02  .02
  ST.E.     .06  .06  .06  .06  .06  .06  .06  .06  .06  .06  .06  .06
 49- 52     .04 -.03 -.06 -.01
  ST.E.     .06  .06  .06  .06
PLOT OF PARTIAL AUTOCORRELATIONS
          -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
LAG   CORR. +----+----+----+----+----+----+----+----+----+----+----+
                                      I
  1   0.865                        +  IXX+XXXXXXXXXXXXXXXXXX
  2   0.332                        +  IXX+XXXXX
  3   0.170                        +  IXX+X
  4   0.071                        +  IXX+
  5  -0.136                       XXXI  +
  6  -0.169                      X+XXI  +
  7  -0.054                       + XI  +
  8  -0.051                       + XI  +
  9  -0.124                       XXXI  +
 10  -0.193                      XX+XXI  +
 11  -0.128                       XXXI  +
 12  -0.018                       +  I  +
 13   0.001                       +  I  +
 14  -0.118                       XXXI  +
 15  -0.010                       +  I  +
 16   0.044                       +  IX +
 17   0.052                       +  IX +
 18  -0.001                       +  I  +
 19  -0.033                       + XI  +
 20  -0.039                       + XI  +
 21  -0.051                       + XI  +
 22   0.058                       +  IX +
 23   0.021                       +  IX +
 24  -0.005                       +  I  +
 25  -0.059                       + XI  +
 26   0.090                       +  IXX+
 27   0.138                       +  IXXX
 28   0.001                       +  I  +
 29  -0.051                       + XI  +
 30   0.115                       +  IXXX
 31   0.016                       +  I  +
 32   0.061                       +  IXX+
 33   0.144                       +  IXX+X
 34   0.032                       +  IX +
 35   0.047                       +  IX +
 36   0.066                       +  IXX+
 37  -0.016                       +  I  +
 38  -0.037                       + XI  +
 39   0.057                       +  IX +
 40   0.130                       +  IXXX
```


This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

41	0.035	+ IX +
42	-0.058	+ XI +
43	0.027	+ IX +
44	0.003	+ I +
45	0.053	+ IX +
46	0.027	+ IX +
47	0.016	+ I +
48	0.023	+ IX +
49	0.038	+ IX +
50	-0.032	+ XI +
51	-0.059	+ XI +
52	-0.014	+ I +

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

#*****************************Table IX *****************************#

```
ACF              VAR = cntc. DFORDER = 1. MAXLAG = 52.                  /
FIRST CASE NUMBER TO BE USED      =                1
LAST CASE NUMBER TO BE USED       =              275
NO. OF OBS. AFTER DIFFERENCING    =              274
MEAN OF THE (DIFFERENCED) SERIES  =         -13.3321
STANDARD ERROR OF THE MEAN        =          66.7071
T-VALUE OF MEAN (AGAINST ZERO)    =          -0.1999
AUTOCORRELATIONS
  1- 12    -.40 -.02  .01  .14  .01 -.06  .03  .08  .05 -.06 -.05  .04
  ST.E.     .06  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
 13- 24     .10 -.12 -.05  .02  .04 -.04 -.05  .01 -.06  0.0 -.05  .01
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
 25- 36    -.11 -.02  .05 -.04 -.14  .09 -.05 -.08  .01 -.04  .01  .04
  ST.E.     .07  .07  .07  .07  .07  .08  .08  .08  .08  .08  .08  .08
 37- 48    -.03 -.08  .01  .10  0.0 -.10  .10  .01  .02  0.0  .01  .05
  ST.E.     .08  .08  .08  .08  .08  .08  .08  .08  .08  .08  .08  .08
 49- 52     .08  0.0 -.04  .09
  ST.E.     .08  .08  .08  .08
PLOT OF AUTOCORRELATIONS
          -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
LAG   CORR. +----+----+----+----+----+----+----+----+----+----+----+
                                     I
  1  -0.399                 XXXXXXX+XXI  +
  2  -0.018                        +  I  +
  3   0.006                        +  I  +
  4   0.138                        +  IXXX
  5   0.006                        +  I  +
  6  -0.063                        +XXI  +
  7   0.034                        +  IX +
  8   0.084                        +  IXX+
  9   0.052                        +  IX +
 10  -0.056                        + XI  +
 11  -0.050                        + XI  +
 12   0.040                        +  IX +
 13   0.097                        +   IXX +
 14  -0.119                        +XXXI   +
 15  -0.046                        +  XI   +
 16   0.021                        +   IX  +
 17   0.039                        +   IX  +
 18  -0.039                        +  XI   +
 19  -0.053                        +  XI   +
 20   0.009                        +   I   +
 21  -0.063                        + XXI   +
 22  -0.003                        +   I   +
 23  -0.048                        +  XI   +
 24   0.007                        +   I   +
 25  -0.105                        +XXXI   +
 26  -0.016                        +   I   +
 27   0.048                        +   IX  +
 28  -0.039                        +  XI   +
 29  -0.143                        XXXXI   +
 30   0.090                        +   IXX +
 31  -0.050                        +  XI   +
 32  -0.082                        + XXI   +
 33   0.014                        +   I   +
 34  -0.036                        +  XI   +
 35   0.011                        +   I   +
 36   0.039                        +   IX  +
 37  -0.030                        +  XI   +
 38  -0.084                        + XXI   +
 39   0.011                        +   I   +
 40   0.100                        +   IXXX+
 41   0.001                        +   I   +
 42  -0.099                        + XXI   +
 43   0.102                        +   IXXX+
 44   0.010                        +   I   +
 45   0.023                        +   IX  +
 46  -0.003                        +   I   +
```


This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

```
 47   0.011                      +   I   +
 48   0.049                      +   IX  +
 49   0.083                      +   IXX +
 50   0.004                      +   I   +
 51  -0.044                      +  XI   +
 52   0.088                      +   IXX +

PACF            VAR = cntc. DFORDER = 1. MAXLAG = 52.                /
FIRST CASE NUMBER TO BE USED     =              1
LAST CASE NUMBER TO BE USED      =            275
NO. OF OBS. AFTER DIFFERENCING   =            274
MEAN OF THE (DIFFERENCED) SERIES =       -13.3321
STANDARD ERROR OF THE MEAN       =        66.7071
T-VALUE OF MEAN (AGAINST ZERO)   =        -0.1999

PARTIAL AUTOCORRELATIONS
  1- 12    -.40 -.21 -.11  .12  .15  .05  .03  .09  .15  .07 -.06 -.09
  ST.E.     .06  .06  .06  .06  .06  .06  .06  .06  .06  .06  .06  .06
 13- 24     .04 -.06 -.13 -.13 -.08 -.03 -.02 -.01 -.12 -.09 -.06  0.0
  ST.E.     .06  .06  .06  .06  .06  .06  .06  .06  .06  .06  .06  .06
 25- 36    -.13 -.18 -.03  .03 -.13 -.03 -.07 -.15 -.05 -.07 -.11 -.01
  ST.E.     .06  .06  .06  .06  .06  .06  .06  .06  .06  .06  .06  .06
 37- 48     .02 -.07 -.15 -.06  .05 -.04 -.02 -.07 -.04 -.02 -.04 -.07
  ST.E.     .06  .06  .06  .06  .06  .06  .06  .06  .06  .06  .06  .06
 49- 52     0.0  .05  0.0  0.0
  ST.E.     .06  .06  .06  .06
PLOT OF PARTIAL AUTOCORRELATIONS
          -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
LAG   CORR. +----+----+----+----+----+----+----+----+----+----+----+
                                     I
  1  -0.399                 XXXXXXX+XXI  +
  2  -0.210                      XX+XXI  +
  3  -0.107                        XXXI  +
  4   0.118                        +  IXXX
  5   0.155                        +  IXX+X
  6   0.047                        +  IX +
  7   0.033                        +  IX +
  8   0.094                        +  IXX+
  9   0.149                        +  IXX+X
 10   0.072                        +  IXX+
 11  -0.060                        +XXI  +
 12  -0.087                        +XXI  +
 13   0.037                        +  IX +
 14  -0.063                        +XXI  +
 15  -0.126                        XXXI  +
 16  -0.129                        XXXI  +
 17  -0.078                        +XXI  +
 18  -0.030                        + XI  +
 19  -0.020                        +  I  +
 20  -0.013                        +  I  +
 21  -0.118                        XXXI  +
 22  -0.095                        +XXI  +
 23  -0.060                        + XI  +
 24   0.001                        +  I  +
 25  -0.134                        XXXI  +
 26  -0.181                       XX+XXI  +
 27  -0.032                        + XI  +
 28   0.031                        +  IX +
 29  -0.129                        XXXI  +
 30  -0.033                        + XI  +
 31  -0.066                        +XXI  +
 32  -0.147                       X+XXI  +
 33  -0.054                        + XI  +
 34  -0.070                        +XXI  +
 35  -0.105                        XXXI  +
 36  -0.014                        +  I  +
 37   0.019                        +  I  +
 38  -0.068                        +XXI  +
 39  -0.148                       X+XXI  +
 40  -0.062                        +XXI  +
 41   0.054                        +  IX +
```


This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

42	-0.037	+ XI +
43	-0.023	+ XI +
44	-0.068	+XXI +
45	-0.044	+ XI +
46	-0.017	+ I +
47	-0.036	+ XI +
48	-0.069	+XXI +
49	0.004	+ I +
50	0.047	+ IX +
51	0.000	+ I +
52	0.004	+ I +

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

```
#***************************** Table X ******************************#

ACF            VAR = cntc. DFORDER = 1, 52. MAXLAG = 52.            /
FIRST CASE NUMBER TO BE USED      =              1
LAST CASE NUMBER TO BE USED       =            275
NO. OF OBS. AFTER DIFFERENCING    =            222
MEAN OF THE (DIFFERENCED) SERIES  =         -4.9505
STANDARD ERROR OF THE MEAN        =        103.7393
T-VALUE OF MEAN (AGAINST ZERO)    =         -0.0477
AUTOCORRELATIONS
  1- 12    -.47 -.09  .10  .01 -.01 -.10  .05  .06 -.01 -.01 -.02  0.0
  ST.E.     .07  .08  .08  .08  .08  .08  .08  .08  .08  .08  .08  .08
 13- 24     .08 -.10  .01  0.0  .05 -.08  0.0  .08 -.03 -.04  .04  .02
  ST.E.     .08  .08  .08  .08  .08  .08  .08  .08  .08  .08  .08  .08
 25- 36    -.11 -.01  .13  0.0 -.12  .14 -.05 -.08  .08 -.01 -.06  .07
  ST.E.     .08  .09  .09  .09  .09  .09  .09  .09  .09  .09  .09  .09
 37- 48    -.03  .01 -.02  .04  .02 -.09  .11 -.08 -.03  .05  .04 -.08
  ST.E.     .09  .09  .09  .09  .09  .09  .09  .09  .09  .09  .09  .09
 49- 52     .08 -.03  .16 -.42
  ST.E.     .09  .09  .09  .09
PLOT OF AUTOCORRELATIONS
          -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
LAG   CORR. +----+----+----+----+----+----+----+----+----+----+----+
                                     I
  1  -0.467                XXXXXXXXX+XXI  +
  2  -0.086                        + XXI   +
  3   0.103                        +   IXXX+
  4   0.007                        +   I   +
  5  -0.005                        +   I   +
  6  -0.102                        +XXXI   +
  7   0.046                        +   IX  +
  8   0.060                        +   IX  +
  9  -0.012                        +   I   +
 10  -0.013                        +   I   +
 11  -0.024                        +  XI   +
 12   0.000                        +   I   +
 13   0.083                        +   IXX +
 14  -0.098                        + XXI   +
 15   0.007                        +   I   +
 16   0.004                        +   I   +
 17   0.051                        +   IX  +
 18  -0.077                        + XXI   +
 19   0.004                        +   I   +
 20   0.083                        +   IXX +
 21  -0.034                        +  XI   +
 22  -0.039                        +  XI   +
 23   0.041                        +   IX  +
 24   0.022                        +   IX  +
 25  -0.113                        +XXXI   +
 26  -0.012                        +   I   +
 27   0.128                        +   IXXX+
 28  -0.003                        +   I   +
 29  -0.123                        +XXXI   +
 30   0.143                        +   IXXXX
 31  -0.047                        +  XI   +
 32  -0.080                        + XXI   +
 33   0.075                        +   IXX +
 34  -0.006                        +   I   +
 35  -0.057                        +  XI   +
 36   0.069                        +   IXX +
 37  -0.028                        +  XI   +
 38   0.008                        +   I   +
 39  -0.015                        +   I   +
 40   0.045                        +   IX  +
 41   0.019                        +   I   +
 42  -0.092                        + XXI   +
 43   0.114                        +   IXXX+
 44  -0.077                        + XXI   +
 45  -0.030                        +  XI   +
 46   0.052                        +   IX  +
```


This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

```
 47   0.039                          +    IX  +
 48  -0.081                          + XXI    +
 49   0.084                          +    IXX +
 50  -0.030                          +  XI    +
 51   0.158                          +    IXXXX
 52  -0.417                    XXXXX+XXXXI     +

PACF            VAR = cntc. DFORDER = 1, 52. MAXLAG = 52.                /
FIRST CASE NUMBER TO BE USED     =                1
LAST CASE NUMBER TO BE USED      =              275
NO. OF OBS. AFTER DIFFERENCING   =              222
MEAN OF THE (DIFFERENCED) SERIES =          -4.9505
STANDARD ERROR OF THE MEAN       =         103.7393
T-VALUE OF MEAN (AGAINST ZERO)   =          -0.0477

PARTIAL AUTOCORRELATIONS
  1- 12    -.47 -.39 -.20 -.09 -.01 -.14 -.14 -.05  .03  .05  0.0 -.07
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
 13- 24     .06  0.0 -.01 -.07 -.01 -.08 -.07  .02  .02 -.02  .02  .06
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
 25- 36    -.09 -.19 -.04  .07 -.05  .06  .02 -.11 -.03  .04 -.05 -.01
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
 37- 48    -.04  .01 -.01  .02  .08  .01  .09  .01 -.03  0.0  .07 -.01
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
 49- 52     .10  .01  .29 -.26
  ST.E.     .07  .07  .07  .07
PLOT OF PARTIAL AUTOCORRELATIONS
          -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
LAG   CORR. +----+----+----+----+----+----+----+----+----+----+----+
                                     I
  1  -0.467                XXXXXXXXX+XXI  +
  2  -0.389                  XXXXXXX+XXI  +
  3  -0.202                       XX+XXI  +
  4  -0.090                         +XXI  +
  5  -0.011                         +  I  +
  6  -0.138                        XXXI   +
  7  -0.140                        XXXI   +
  8  -0.053                        + XI   +
  9   0.025                        +  IX  +
 10   0.054                        +  IX  +
 11  -0.004                        +  I   +
 12  -0.065                        +XXI   +
 13   0.055                        +  IX  +
 14   0.000                        +  I   +
 15  -0.014                        +  I   +
 16  -0.074                        +XXI   +
 17  -0.010                        +  I   +
 18  -0.078                        +XXI   +
 19  -0.071                        +XXI   +
 20   0.016                        +  I   +
 21   0.023                        +  IX  +
 22  -0.020                        +  I   +
 23   0.016                        +  I   +
 24   0.058                        +  IX  +
 25  -0.090                        +XXI   +
 26  -0.192                       XX+XXI   +
 27  -0.043                         + XI   +
 28   0.070                         +  IXX+
 29  -0.050                         + XI   +
 30   0.060                         +  IXX+
 31   0.019                         +  I   +
 32  -0.107                        XXXI   +
 33  -0.027                        + XI   +
 34   0.042                        +  IX  +
 35  -0.053                        + XI   +
 36  -0.013                        +  I   +
 37  -0.038                        + XI   +
 38   0.008                        +  I   +
 39  -0.011                        +  I   +
 40   0.021                        +  IX  +
 41   0.084                        +  IXX+
```

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

```
42   0.010                    +  I  +
43   0.087                    +  IXX+
44   0.014                    +  I  +
45  -0.028                    + XI  +
46  -0.001                    +  I  +
47   0.070                    +  IXX+
48  -0.010                    +  I  +
49   0.096                    +  IXX+
50   0.012                    +  I  +
51   0.291                    +  IXX+XXXX
52  -0.256                 XXX+XXI  +
```


This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

```
        #****************************** Table XI ******************************#
BLOCK           RANGE = 1,275.                                          /

ARIMA           VAR = cntc.
                DFORder = 1.
                MAORder = '(1)'.                                        /
CHECK   MODEL.                                                          /
SUMMARY OF THE MODEL
OUTPUT VARIABLE -- cntc
INPUT VARIABLES -- NOISE
VARIABLE  VAR. TYPE  MEAN      TIME      DIFFERENCES
                                              1
cntc       RANDOM              1- 275  (1-B  )

PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
      1  cntc         MA      1      1     0.1000
ESTIMATION      RESIduals = rcntc1.   PCORrelation.                     /
FIRST CASE NUMBER TO BE USED     =              1
LAST CASE NUMBER TO BE USED      =            275
ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD
SUMMARY OF THE MODEL
OUTPUT VARIABLE -- cntc
INPUT VARIABLES -- NOISE
VARIABLE  VAR. TYPE  MEAN      TIME      DIFFERENCES
                                              1
cntc       RANDOM              1- 275  (1-B  )

PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE        ST. ERR.  T-RATIO
      1  cntc         MA      1      1     0.4504         0.0541     8.32

RESIDUAL SUM OF SQUARES  = 268883232.000000
DEGREES OF FREEDOM       =            273
RESIDUAL MEAN SQUARE     =   984920.250000
ESTIMATION BY BACKCASTING METHOD
RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES LESS THAN 0.5000E-04
SUMMARY OF THE MODEL
OUTPUT VARIABLE -- cntc
INPUT VARIABLES -- NOISE

VARIABLE  VAR. TYPE  MEAN      TIME      DIFFERENCES
                                              1
cntc       RANDOM              1- 275  (1-B  )

PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE        ST. ERR.  T-RATIO
      1  cntc         MA      1      1     0.4505         0.0540     8.35

RESIDUAL SUM OF SQUARES  = 268680256.000000
DEGREES OF FREEDOM       =            273
RESIDUAL MEAN SQUARE     =   984176.750000

ACF             VAR  = rcntc1. MAXLAG = 52. LBQ.                        /

FIRST CASE NUMBER TO BE USED     =              2
LAST CASE NUMBER TO BE USED      =            275
NO. OF OBS. AFTER DIFFERENCING   =            274
MEAN OF THE (DIFFERENCED) SERIES =       -29.1709
STANDARD ERROR OF THE MEAN       =        59.9063
T-VALUE OF MEAN (AGAINST ZERO)   =        -0.4869
AUTOCORRELATIONS
  1- 12    -.04  0.0  .08  .21  .08  0.0  .09  .16  .10 -.04 -.05  .05
  ST.E.     .06  .06  .06  .06  .06  .06  .06  .06  .07  .07  .07  .07
L.-B. Q     .50  .50  2.5  14.  16.  16.  19.  26.  29.  29.  30.  31.
 13- 24     .07 -.13 -.10 -.02  0.0 -.08 -.12 -.08 -.13 -.10 -.13 -.11
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
L.-B. Q     32.  37.  40.  40.  40.  42.  46.  48.  54.  57.  62.  66.
 25- 36    -.19 -.10 -.04 -.13 -.20 -.03 -.12 -.16 -.07 -.07 -.01  .01
  ST.E.     .07  .07  .08  .08  .08  .08  .08  .08  .08  .08  .08  .08
L.-B. Q     76.  79.  80.  85.  98.  98.  103  110  112  113  113  113
 37- 48    -.07 -.11  .02  .12  .02 -.05  .12  .08  .08  .06  .09  .15
  ST.E.     .08  .08  .08  .08  .08  .08  .08  .08  .08  .08  .08  .08
L.-B. Q     115  119  119  123  123  124  129  131  133  134  137  144
```


This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

```
 49- 52      .17   .09   .05   .19
  ST.E.      .08   .09   .09   .09
L.-B. Q      154   157   158   170
PLOT OF AUTOCORRELATIONS
          -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
LAG   CORR. +----+----+----+----+----+----+----+----+----+----+----+
                                      I
  1  -0.043                         + XI  +
  2   0.001                         +  I  +
  3   0.083                         +  IXX+
  4   0.206                         +  IXX+XX
  5   0.082                         +  IXX+
  6  -0.004                         +  I  +
  7   0.094                         +  IXX+
  8   0.157                         +  IXX+X
  9   0.101                         +  IXXX
 10  -0.037                         + XI  +
 11  -0.046                         + XI  +
 12   0.052                         +  IX +
 13   0.073                         +  IXX+
 14  -0.131                         XXXI  +
 15  -0.102                         XXXI  +
 16  -0.016                         +  I  +
 17   0.002                         +  I  +
 18  -0.082                         +XXI  +
 19  -0.117                         XXXI  +
 20  -0.084                         +XXI  +
 21  -0.133                         XXXI  +
 22  -0.103                         XXXI  +
 23  -0.131                         XXXI  +
 24  -0.113                        +XXXI   +
 25  -0.186                        X+XXI   +
 26  -0.098                         + XXI  +
 27  -0.036                         +  XI  +
 28  -0.133                         +XXXI  +
 29  -0.205                        X+XXXI  +
 30  -0.030                         +  XI  +
 31  -0.119                         +XXXI  +
 32  -0.155                         XXXXI  +
 33  -0.071                         + XXI  +
 34  -0.068                         + XXI  +
 35  -0.015                         +   I  +
 36   0.010                         +   I  +
 37  -0.070                         + XXI  +
 38  -0.106                         +XXXI  +
 39   0.016                         +   I  +
 40   0.116                         +   IXXX+
 41   0.024                         +   IX  +
 42  -0.055                         +  XI   +
 43   0.117                         +   IXXX+
 44   0.083                         +   IXX +
 45   0.076                         +   IXX +
 46   0.062                         +   IXX +
 47   0.089                         +   IXX +
 48   0.148                         +   IXXXX
 49   0.174                         +   IXXXX
 50   0.086                         +   IXX +
 51   0.054                         +   IX  +
 52   0.187                         +   IXXX+X

PACF            VAR  = rcntc1. MAXLAG = 52.
FIRST CASE NUMBER TO BE USED     =              2
LAST CASE NUMBER TO BE USED      =            275
NO. OF OBS. AFTER DIFFERENCING   =            274
MEAN OF THE (DIFFERENCED) SERIES =       -29.1709
STANDARD ERROR OF THE MEAN       =        59.9063
T-VALUE OF MEAN (AGAINST ZERO)   =        -0.4869

PARTIAL AUTOCORRELATIONS
  1- 12    -.04  0.0  .08  .21  .11  .01  .06  .12  .09 -.04 -.12 -.05
  ST.E.     .06  .06  .06  .06  .06  .06  .06  .06  .06  .06  .06  .06
```


This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

```
 13- 24     .02 -.13 -.14 -.09 -.03 -.02 -.04 -.07 -.14 -.07 -.04 -.05
  ST.E.     .06  .06  .06  .06  .06  .06  .06  .06  .06  .06  .06  .06
 25- 36    -.17 -.10  .05 -.02 -.14 -.02 -.10 -.12 -.02 -.07 -.07  .02
  ST.E.     .06  .06  .06  .06  .06  .06  .06  .06  .06  .06  .06  .06
 37- 48    -.03 -.12 -.10  .03  .06 -.08 -.03 -.05 -.01  0.0 -.03 -.02
  ST.E.     .06  .06  .06  .06  .06  .06  .06  .06  .06  .06  .06  .06
 49- 52     .06  .05 -.01  .03
  ST.E.     .06  .06  .06  .06
PLOT OF PARTIAL AUTOCORRELATIONS
          -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
LAG   CORR. +----+----+----+----+----+----+----+----+----+----+
                                     I
  1  -0.043                        + XI  +
  2  -0.001                        +  I  +
  3   0.083                        +  IXX+
  4   0.215                        +  IXX+XX
  5   0.110                        +  IXXX
  6   0.010                        +  I  +
  7   0.062                        +  IXX+
  8   0.116                        +  IXXX
  9   0.092                        +  IXX+
 10  -0.045                        + XI  +
 11  -0.116                        XXXI  +
 12  -0.052                        + XI  +
 13   0.018                        +  I  +
 14  -0.134                        XXXI  +
 15  -0.136                        XXXI  +
 16  -0.090                        +XXI  +
 17  -0.034                        + XI  +
 18  -0.017                        +  I  +
 19  -0.040                        + XI  +
 20  -0.069                        +XXI  +
 21  -0.141                       X+XXI  +
 22  -0.067                        +XXI  +
 23  -0.042                        + XI  +
 24  -0.051                        + XI  +
 25  -0.175                       X+XXI  +
 26  -0.101                        XXXI  +
 27   0.046                        +  IX +
 28  -0.016                        +  I  +
 29  -0.144                       X+XXI  +
 30  -0.019                        +  I  +
 31  -0.100                        XXXI  +
 32  -0.123                        XXXI  +
 33  -0.022                        + XI  +
 34  -0.073                        +XXI  +
 35  -0.067                        +XXI  +
 36   0.019                        +  I  +
 37  -0.031                        + XI  +
 38  -0.121                        XXXI  +
 39  -0.104                        XXXI  +
 40   0.029                        +  IX +
 41   0.056                        +  IX +
 42  -0.076                        +XXI  +
 43  -0.030                        + XI  +
 44  -0.055                        + XI  +
 45  -0.009                        +  I  +
 46   0.002                        +  I  +
 47  -0.028                        + XI  +
 48  -0.018                        +  I  +
 49   0.063                        +  IXX+
 50   0.046                        +  IX +
 51  -0.010                        +  I  +
 52   0.027                        +  IX +
```


This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

```
#****************************** Table XII ******************************#

□
BLOCK           RANGE = 1,275.
□
ARIMA           VAR = cntc.
□
                DFORder = 1, 52.
□
                MAORder = '(1), (52)'.
CHECK   MODEL.
ESTIMATION BY BACKCASTING METHOD
SUMMARY OF THE MODEL
OUTPUT VARIABLE -- cntc
INPUT VARIABLES -- NOISE
VARIABLE  VAR. TYPE  MEAN      TIME      DIFFERENCES
                                          1      52
cntc       RANDOM             1- 275  (1-B  ) (1-B  )

PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE        ST. ERR.  T-RATIO
      1  cntc         MA      1      1     0.7864         0.0383    20.53
      2  cntc         MA      2     52     0.8252         0.0242    34.10

RESIDUAL SUM OF SQUARES  = 172820720.000000
DEGREES OF FREEDOM       =          220
RESIDUAL MEAN SQUARE     =    785548.750000

ACF             VAR  = rcntc2. MAXLAG = 52. LBQ.
FIRST CASE NUMBER TO BE USED     =          54
LAST CASE NUMBER TO BE USED      =         275
NO. OF OBS. AFTER DIFFERENCING   =         222
MEAN OF THE (DIFFERENCED) SERIES =      -58.4207
STANDARD ERROR OF THE MEAN       =       59.2204
T-VALUE OF MEAN (AGAINST ZERO)   =       -0.9865
AUTOCORRELATIONS
  1- 12     0.0 -.04  .07  .08 -.05 -.12  .01  .12 -.01 -.06 -.11  .02
  ST.E.      .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
L.-B. Q      0.0  .30 1.3  2.8  3.4  6.6  6.6  10.  10.  11.  14.  14.
 13- 24      .01 -.11 -.05  0.0  .01 -.05 -.04  .07 -.06 -.04 -.04 -.04
  ST.E.      .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
L.-B. Q      14.  17.  18.  18.  18.  18.  19.  20.  21.  21.  21.  22.
 25- 36    -.07 -.02  .12  .01 -.09  .04 -.05 -.07  .01 -.01 -.02  .09
  ST.E.      .07  .07  .07  .07  .07  .07  .07  .07  .08  .08  .08  .08
L.-B. Q      23.  23.  27.  27.  29.  29.  30.  31.  31.  31.  31.  33.
 37- 48      .03 -.04  .02  .09  .05 -.03  .05  .03 -.01  .02  0.0  0.0
  ST.E.      .08  .08  .08  .08  .08  .08  .08  .08  .08  .08  .08  .08
L.-B. Q      34.  34.  34.  36.  37.  37.  38.  38.  38.  38.  38.  38.
 49- 52      .08 -.05 -.06 -.14
  ST.E.      .08  .08  .08  .08
L.-B. Q      40.  41.  42.  48.

PLOT OF AUTOCORRELATIONS
          -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
LAG   CORR. +----+----+----+----+----+----+----+----+----+----+
                                     I
  1  -0.001                        +  I  +
  2  -0.038                        + XI  +
  3   0.067                        +  IXX+
  4   0.080                        +  IXX+
  5  -0.051                        + XI  +
  6  -0.118                        XXXI  +
  7   0.006                        +  I  +
  8   0.125                        +  IXXX
  9  -0.011                        +  I  +
 10  -0.058                        + XI  +
 11  -0.111                        XXXI  +
 12   0.017                        +  I  +
 13   0.015                        +  I  +
 14  -0.114                        XXXI  +
 15  -0.047                       +  XI   +
 16   0.000                       +   I   +
```


This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

```
 17   0.015                        +    I   +
 18  -0.045                        +   XI   +
 19  -0.042                        +   XI   +
 20   0.069                        +    IXX +
 21  -0.055                        +   XI   +
 22  -0.041                        +   XI   +
 23  -0.036                        +   XI   +
 24  -0.041                        +   XI   +
 25  -0.068                        +  XXI   +
 26  -0.016                        +    I   +
 27   0.118                        +    IXXX+
 28   0.014                        +    I   +
 29  -0.088                        +  XXI   +
 30   0.038                        +    IX  +
 31  -0.045                        +   XI   +
 32  -0.073                        +  XXI   +
 33   0.009                        +    I   +
 34  -0.008                        +    I   +
 35  -0.015                        +    I   +
 36   0.093                        +    IXX +
 37   0.030                        +    IX  +
 38  -0.038                        +   XI   +
 39   0.024                        +    IX  +
 40   0.092                        +    IXX +
 41   0.046                        +    IX  +
 42  -0.029                        +   XI   +
 43   0.049                        +    IX  +
 44   0.028                        +    IX  +
 45  -0.008                        +    I   +
 46   0.019                        +    I   +
 47   0.002                        +    I   +
 48  -0.003                        +    I   +
 49   0.085                        +    IXX +
 50  -0.047                        +   XI   +
 51  -0.055                        +   XI   +
 52  -0.141                        XXXXI    +

PACF            VAR  = rcntc2. MAXLAG = 52.
FIRST CASE NUMBER TO BE USED     =              54
LAST CASE NUMBER TO BE USED      =             275
NO. OF OBS. AFTER DIFFERENCING   =             222
MEAN OF THE (DIFFERENCED) SERIES =         -58.4207
STANDARD ERROR OF THE MEAN       =          59.2204
T-VALUE OF MEAN (AGAINST ZERO)   =          -0.9865
PARTIAL AUTOCORRELATIONS
  1- 12     0.0 -.04  .07  .08 -.05 -.12 -.01  .12  .01 -.04 -.15 -.02
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
 13- 24     .04 -.06 -.04 -.06  0.0 -.01 -.01  .04 -.09 -.04 -.03 -.05
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
 25- 36    -.09 -.02  .12  .01 -.10 -.01 -.07 -.06  .04 -.02 -.09  .07
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
 37- 48     .04 -.03  0.0  .04  .07 -.01  .02 -.03 -.02  .04  0.0 -.02
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
 49- 52     .07 -.04 -.02 -.14
  ST.E.     .07  .07  .07  .07

PLOT OF PARTIAL AUTOCORRELATIONS
          -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
LAG   CORR. +----+----+----+----+----+----+----+----+----+----+----+
                                      I
  1  -0.001                         +  I  +
  2  -0.038                         + XI  +
  3   0.067                         +  IXX+
  4   0.079                         +  IXX+
  5  -0.046                         + XI  +
  6  -0.119                         XXXI  +
  7  -0.009                         +  I  +
  8   0.122                         +  IXXX
  9   0.015                         +  I  +
 10  -0.040                         + XI  +
 11  -0.149                        X+XXI  +
```


This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

12	-0.020	+ XI +
13	0.037	+ IX +
14	-0.058	+ XI +
15	-0.041	+ XI +
16	-0.055	+ XI +
17	-0.004	+ I +
18	-0.009	+ I +
19	-0.007	+ I +
20	0.042	+ IX +
21	-0.089	+XXI +
22	-0.036	+ XI +
23	-0.035	+ XI +
24	-0.046	+ XI +
25	-0.089	+XXI +
26	-0.020	+ I +
27	0.121	+ IXXX
28	0.006	+ I +
29	-0.100	XXXI +
30	-0.011	+ I +
31	-0.071	+XXI +
32	-0.061	+XXI +
33	0.042	+ IX +
34	-0.020	+ XI +
35	-0.088	+XXI +
36	0.068	+ IXX+
37	0.037	+ IX +
38	-0.026	+ XI +
39	0.000	+ I +
40	0.041	+ IX +
41	0.072	+ IXX+
42	-0.010	+ I +
43	0.015	+ I +
44	-0.027	+ XI +
45	-0.022	+ XI +
46	0.039	+ IX +
47	0.004	+ I +
48	-0.024	+ XI +
49	0.070	+ IXX+
50	-0.040	+ XI +
51	-0.015	+ I +
52	-0.141	X+XXI +

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

```
        #****************************** TABLE XIII ******************************#

BLOCK           RANGE = 1,275.

ARIMA           VAR = cntc.

                DFORder = 1, 52.

                MAORder = '(1), (52)'.

INDEP           VAR = int.
                TYPE = BINARY.
                DFORder = 1, 52.
SUMMARY OF THE MODEL
ESTIMATION BY BACKCASTING METHOD
VARIABLE  VAR. TYPE  MEAN      TIME      DIFFERENCES
                                            1      52
cntc       RANDOM              1- 275  (1-B  ) (1-B  )
                                            1      52
int        BINARY              1- 275  (1-B  ) (1-B  )
PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE        ST. ERR.  T-RATIO
      1  cntc          MA      1      1     0.7864         0.0383     20.53
      2  cntc          MA      2     52     0.8252         0.0242     34.10

RESIDUAL SUM OF SQUARES  = 172824480.000000
DEGREES OF FREEDOM       =             220
RESIDUAL MEAN SQUARE     =    785565.813000
ACF             VAR  = rcntc3. MAXLAG = 52. LBQ.

FIRST CASE NUMBER TO BE USED     =              54
LAST CASE NUMBER TO BE USED      =             275
NO. OF OBS. AFTER DIFFERENCING   =             222
MEAN OF THE (DIFFERENCED) SERIES =         -58.4192
STANDARD ERROR OF THE MEAN       =          59.2210
T-VALUE OF MEAN (AGAINST ZERO)   =          -0.9865
AUTOCORRELATIONS
  1- 12     0.0 -.04  .07  .08 -.05 -.12  .01  .12 -.01 -.06 -.11  .02
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
L.-B. Q     0.0  .30 1.3  2.8  3.4  6.6  6.6  10.  10.  11.  14.  14.
 13- 24     .01 -.11 -.05  0.0  .01 -.05 -.04  .07 -.06 -.04 -.04 -.04
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
L.-B. Q     14.  17.  18.  18.  18.  18.  19.  20.  21.  21.  21.  22.
 25- 36    -.07 -.02  .12  .01 -.09  .04 -.05 -.07  .01 -.01 -.02  .09
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .08  .08  .08  .08
L.-B. Q     23.  23.  27.  27.  29.  29.  30.  31.  31.  31.  31.  33.
 37- 48     .03 -.04  .02  .09  .05 -.03  .05  .03 -.01  .02  0.0  0.0
  ST.E.     .08  .08  .08  .08  .08  .08  .08  .08  .08  .08  .08  .08
L.-B. Q     34.  34.  34.  36.  37.  37.  38.  38.  38.  38.  38.  38.
 49- 52     .08 -.05 -.06 -.14
  ST.E.     .08  .08  .08  .08
L.-B. Q     40.  41.  42.  48.
PLOT OF AUTOCORRELATIONS
          -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
LAG   CORR. +----+----+----+----+----+----+----+----+----+----+----+
                                      I
  1  -0.001                         +  I  +
  2  -0.038                         + XI  +
  3   0.067                         +  IXX+
  4   0.080                         +  IXX+
  5  -0.051                         + XI  +
  6  -0.118                         XXXI  +
  7   0.006                         +  I  +
  8   0.125                         +  IXXX
```


This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

```
  9  -0.011                          +  I  +
 10  -0.058                          + XI  +
 11  -0.111                          XXXI  +
 12   0.017                          +  I  +
 13   0.015                          +  I  +
 14  -0.114                          XXXI  +
 15  -0.047                         +  XI   +
 16   0.000                         +   I   +
 17   0.015                         +   I   +
 18  -0.045                         +  XI   +
 19  -0.042                         +  XI   +
 20   0.069                         +   IXX +
 21  -0.055                         +  XI   +
 22  -0.041                         +  XI   +
 23  -0.036                         +  XI   +
 24  -0.041                         +  XI   +
 25  -0.068                         + XXI   +
 26  -0.016                         +   I   +
 27   0.118                         +   IXXX+
 28   0.014                         +   I   +
 29  -0.088                         + XXI   +
 30   0.038                         +   IX  +
 31  -0.045                         +  XI   +
 32  -0.073                         + XXI   +
 33   0.009                         +   I   +
 34  -0.008                         +   I   +
 35  -0.015                         +   I   +
 36   0.093                         +   IXX +
 37   0.030                         +   IX  +
 38  -0.038                         +  XI   +
 39   0.024                         +   IX  +
 40   0.092                         +   IXX +
 41   0.046                         +   IX  +
 42  -0.029                         +  XI   +
 43   0.049                         +   IX  +
 44   0.028                         +   IX  +
 45  -0.008                         +   I   +
 46   0.019                         +   I   +
 47   0.002                         +   I   +
 48  -0.003                         +   I   +
 49   0.085                         +   IXX +
 50  -0.047                         +  XI   +
 51  -0.055                         +  XI   +
 52  -0.141                         XXXXI   +

PACF            VAR  = rcntc3. MAXLAG = 52.
FIRST CASE NUMBER TO BE USED     =              54
LAST CASE NUMBER TO BE USED      =             275
NO. OF OBS. AFTER DIFFERENCING   =             222
MEAN OF THE (DIFFERENCED) SERIES =        -58.4192
STANDARD ERROR OF THE MEAN       =         59.2210
T-VALUE OF MEAN (AGAINST ZERO)   =          -0.9865
PARTIAL AUTOCORRELATIONS
  1- 12     0.0 -.04  .07  .08 -.05 -.12 -.01  .12  .01 -.04 -.15 -.02
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
 13- 24     .04 -.06 -.04 -.06  0.0 -.01 -.01  .04 -.09 -.04 -.03 -.05
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
 25- 36    -.09 -.02  .12  .01 -.10 -.01 -.07 -.06  .04 -.02 -.09  .07
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
 37- 48     .04 -.03  0.0  .04  .07 -.01  .02 -.03 -.02  .04  0.0 -.02
  ST.E.     .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07  .07
 49- 52     .07 -.04 -.02 -.14
  ST.E.     .07  .07  .07  .07
PLOT OF PARTIAL AUTOCORRELATIONS
          -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
LAG   CORR. +----+----+----+----+----+----+----+----+----+----+
                                     I
  1  -0.001                         +  I  +
  2  -0.038                         + XI  +
  3   0.067                         +  IXX+
  4   0.079                         +  IXX+
```


This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

5	-0.046	+ XI +
6	-0.119	XXXI +
7	-0.009	+ I +
8	0.122	+ IXXX
9	0.015	+ I +
10	-0.040	+ XI +
11	-0.149	X+XXI +
12	-0.020	+ XI +
13	0.037	+ IX +
14	-0.058	+ XI +
15	-0.041	+ XI +
16	-0.055	+ XI +
17	-0.004	+ I +
18	-0.009	+ I +
19	-0.007	+ I +
20	0.042	+ IX +
21	-0.089	+XXI +
22	-0.036	+ XI +
23	-0.035	+ XI +
24	-0.046	+ XI +
25	-0.089	+XXI +
26	-0.020	+ I +
27	0.121	+ IXXX
28	0.006	+ I +
29	-0.100	XXXI +
30	-0.011	+ I +
31	-0.071	+XXI +
32	-0.061	+XXI +
33	0.042	+ IX +
34	-0.020	+ XI +
35	-0.088	+XXI +
36	0.068	+ IXX+
37	0.037	+ IX +
38	-0.026	+ XI +
39	0.000	+ I +
40	0.041	+ IX +
41	0.072	+ IXX+
42	-0.010	+ I +
43	0.015	+ I +
44	-0.027	+ XI +
45	-0.022	+ XI +
46	0.039	+ IX +
47	0.004	+ I +
48	-0.024	+ XI +
49	0.070	+ IXX+
50	-0.040	+ XI +
51	-0.015	+ I +
52	-0.141	X+XXI +

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

APPENDIX 5-A

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

311-HQ00001796I

Neighborhood Services Referral

Baltimore Police Department

General Information

District Commander:	Nd	**CAD # of Call:**	4186
Date of Call:	06/18/99	**Time of Call:**	2211
Date of Incident:	06/18/99	**Time of Incident:**	2209
District:	ND	**Post:**	523
Location:	721 Woodbourne AV	**NSC Phone # Given:**	○ Yes ● No
Center Location:	NSC N	**Unit Assigned:**	nsc nd

Caller / Complainant

Block Watcher #:			
Name (Last, First Mid):	Anon,	**Address:**	Anon
Race:		**Sex:**	● Male ○ Female
Call Back Phone:	anon	**Best Time to Call:**	n/a

Incident Information

Action Taken:	call sent to nsc
Date Action Taken:	06/21/99
Time Action Taken:	0732
Agency Involved:	BPD Only
Referral Incident Type:	Juvenile Disturbance

Remarks:

disorderly juv's refusing to leave the play ground, 10 prior calls there.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

APPENDIX 6-A

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

RIDE INSTRUMENT

1. Ride number. _____(sector/post/shift/project day)

2. Your observer number _____

3. Enter date of ride._____ (year/month/day)

4. Official start time of observed officer's shift?_____(military time)

5. Did your observation of the assigned officer begin later than the official beginning time of this shift?

1 no [Skip to Question 7]
2 yes

6. Why did your observation of the assigned officer begin late?

1 observer was not present when officer started work
2 officer not present; on duty elsewhere (include in the building)
3 officer not present; on personal business elsewhere
4 officer not present; don't know what he/she was doing
5 other

7. What was the official end time of assigned officer's shift? _____(Military time)

8. Did your observation of the assigned officer end earlier than the official ending time of this shift?

1 no [skip to Question 10]
2 yes

9. Why did your observation of the assigned officer end early?

1 observer requested it for personal reasons
2 officer had other official duties requiring transfer to other unit serving the assigned area
3 officer had permission to leave early for personal business
4 officer left early for personal reasons without permission
5 officer left work early for personal business and status of permission unknown
6 officer left work early for reasons unknown
7 other

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

10. To what type of unit was the observed officer(s) assigned?

1 Post officer
2 Community Outreach Officer
3 Foot Patrol
4 Flex Unit
5 Neighborhood Services Unit officer
6 Neighborhood Services Center Sergeant
7 other specialist _____ (state unit of regular assignment)

Officer Information

11. Officer's ID number. _____(Use Officer Badge Number)

12. Officer's name. _____

13. How long has officer been regularly assigned to this post/area of responsibility?

_____ENTER TIME--IN MONTHS.

14. Officer's level of education.

1 Less than High School
2 High School graduate or GED
3 Some college or trade school
4 Associates Degree (AA or AB)
5 College graduate (BA or BS)
6 Some post graduate education
7 Advanced degree

15. Officer's sex: 1 Male 2 Female

16. Officer's race:

1 White
2 Black
3 Hispanic
4 Asian
5 Other or mixed race

17. Age of officer. _____ (YEARS)

18. Length of service with the Baltimore police department? _____(YEARS)

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

19. Length of total law enforcement/police service? _____(YEARS).

19A. If different than length of service with this police department where did the officer work prior to joining the Baltimore Police Department?

_____

20. Officer's rank:

1 Police officer
2 Specialist
3 Sergeant
4 Lieutenant
5 Major
6 Other _____

21. What was the average temperature during the ride?_____degrees

22. Did the weather, in your opinion, affect how the officer acted or conducted her/his shift?

1 No
2 Yes - it diminished their activity
3 Yes - it increased their activity

22A. Was there precipitation during this ride?

1 no
2 light rain
3 heavy rain
4 combination of 2 and 3

23. If you were assigned to an automobile, did the police vehicle have a MDT (data terminal)?

1 No (go to Question 25)
2 Yes

24. If the car had a MDT, how many times did the officer use the MDT? _____

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

25. At **roll call, or some time prior to going out on patrol,** did the officer receive **directives** from a supervisor about **places** in the officer's assigned post/area that should receive **attention**?

1 No (Go to Question 30)
2 Yes -- officer's Sector Sergeant
3 Yes -- another Sector Sergeant
4 Yes -- officer's Sector Manager/Lieutenant
5 Yes -- another Sector Manager/Lieutenant
6 Yes -- Community Outreach Sergeant
7 Yes -- Neighborhood Services Unit Sergeant
8 Yes -- Neighborhood Services Center Sergeant
9 Yes -- the officer's District Major/Commander
10 Yes -- Some other supervisor _____(state person's position)

26. What was stated or perceived by the observed officer to be the reason for the directive?

1 a lot of 9-1-1 calls about this location
2 a lot of 3-1-1 calls about this location
3 a lot of citizen complaints about this location
4 done at the discretion of the supervisor
5 existing crime data/criminal reports
6 officer is unsure of the reason for the directive

27. Where was the officer directed to go to? Give address and complete Part A, check all that apply.

_____(address)

27A. _____ residence address
_____ street corner, street block
_____ privately owned business
_____ public space such as a park
_____ Other (please specify)

28. Did the officer have discretionary/free time and the opportunity to follow the directive?

1 No
2 Yes

29. During the shift you observed did the officer follow the directives?

1 No
2 Yes

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

30. **During the shift,** did the officer receive **directives** from a supervisor about **places** in the officer's assigned post/area that should receive **attention**? (Do not include dispatched calls the officer receives)

1 No (go to Question 35)
2 Yes -- officer's Sector Sergeant
3 Yes -- another Sector Sergeant
4 Yes -- officer's Sector Manager/Lieutenant
5 Yes -- another Sector Manager/Lieutenant
6 Yes -- Community Outreach Sergeant
7 Yes -- Neighborhood Services Unit Sergeant
8 Yes -- Neighborhood Services Center Sergeant
9 Yes -- the officer's District Major/Commander
10 Yes -- Some other supervisor _____(state person's position)

31. What was stated or perceived by the observed officer to be the reason for the directive?

1 a lot of 9-1-1 calls about this location
2 a lot of 3-1-1 calls about this location
3 a lot of citizen complaints about this location
4 done at the discretion of the supervisor
5 existing crime data/criminal reports
6 officer is unsure of the reason for the directive

32. Where was the officer directed to go to? Give address and complete Part A, check all that apply.

_____(address)

32A. _____ residence address
_____ street corner, street block
_____ privately owned business
_____ public space such as a park
_____ Other (please specify)

33. Did the officer have discretionary/free time and the opportunity to follow the directive?

1 No
2 Yes

34. During the shift you observed did the officer follow the directives?

1 No
2 Yes

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

35. At **roll call, or some time prior to going out on patrol**, did the officer receive instructions from a supervisor about **how the officer** should spend his **discretionary/free time** during the officer's shift?

1. No (go to Question 40)
2. Yes -- officer's Sector Sergeant
3 Yes -- another Sector Sergeant
4 Yes -- officer's Sector Manager/Lieutenant
5 Yes -- another Sector Manager/Lieutenant
6 Yes -- Community Outreach Sergeant
7 Yes -- Neighborhood Services Unit Sergeant
8 Yes -- Neighborhood Services Center Sergeant
9 Yes -- the officer's District Major/Commander
10 Yes -- Some other supervisor _____(state person's position)

36. What was stated or perceived by the observed officer to be the reason for the directive?

1 a lot of 9-1-1 calls about this location
2 a lot of 3-1-1 calls about this location
3 a lot of citizen complaints about this location
4 done at the discretion of the supervisor
5 existing crime data/criminal reports
6 officer is unsure of the reason for the directive

37. Where was the officer directed to go to? Give address and complete Part A, check all that apply.

_____(address)

37A. _____ residence address
_____ street corner, street block
_____ privately owned business
_____ public space such as a park
_____ Other (please specify)

38. Did the officer have discretionary/free time and the opportunity to follow the instructions?
1 No
2 Yes

39. During the shift you observed did the officer follow the directives?

1 No
2 Yes

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

40. **During the shift,** did the officer receive instructions from a supervisor about **how the officer** should spend **discretionary/free time** during the officer's shift? (Do not include dispatched calls the officer receives)

1. No (go to Question 45)
2. Yes -- officer's Sector Sergeant
3 Yes -- another Sector Sergeant
4 Yes -- officer's Sector Manager/Lieutenant
5 Yes -- another Sector Manager/Lieutenant
6 Yes -- Community Outreach Sergeant
7 Yes -- Neighborhood Officers Unit Sergeant
8 Yes -- Neighborhood Services Center Sergeant
9 Yes -- the officer's District Major/Commander
10 Yes -- Some other supervisor _____(state person's position)

41. What was stated or perceived by the observed officer to be the reason for the directive?

1 a lot of 9-1-1 calls about this location
2 a lot of 3-1-1 calls about this location
3 a lot of citizen complaints about this location
4 done at the discretion of the supervisor
5 existing crime data/criminal reports
6 officer is unsure of the reason for the directive

42. Where was the officer directed to go to? Give address and complete Part A, check all that apply.

_____(address)

42A _____ residence address
_____ street corner, street block
_____ privately owned business
_____ public space such as a park
_____ Other (please specify)

43. Did the officer have discretionary/free time and the opportunity to follow the directive?
1 No
2 Yes

44. During the shift you observed did the officer follow the directives?

1 No
2 Yes

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

45. During the shift, did the officer receive **instructions** from **another police officer** about places in the officer's assigned post/beat/area that should receive attention?

1 No
2 Yes

46. If yes, what place was the officer told about by this other officer?
(Give address and complete Part A)
_____(address)

46A. _____ residence address
_____ street corner, street block
_____ privately owned business
_____ public space such as a park
_____ Other (please specify)

47. During the ride did the officer have any contact (face to face, written memo,or other contact) with the district's **Neighborhood Service Center Sergeant**?

1 No (go to Question 51)
2 Yes

48. What was stated or perceived by the observed officer to be the reason for the contact with Neighborhood Service Center Sergeant?

1 3-1-1 calls about this location
2 citizen complaints about this location (though not 3-1-1 calls)
3 both 3-1-1 calls and citizen complaints
4 officer is unsure of the reason for the contact
5 other _____
(please specify the reason for the contact)

49. Was the contact concerning a specific problem?

1 No (skip to Question 51)
2 Yes

50. Describe the problem that was the reason for the contact.

_____

51. Were there any initiatives (other police department projects) going on in the officer's post that required more than the usual number of assigned officers to be present in that post (surveilance team, auto theft team, etc.)

1 No
2 Yes

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

52. At the beginning of the ride (first 1/2 hour), what was the observed officer's attitude about having an observer present?

1 very negative
2 negative
3 neutral
4 positive
5 very positive

53. At the end of the ride (last half hour), what was observed officer's attitude about having an observer present?

1 very negative
2 negative
3 neutral
4 positive
5 very positive

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

APPENDIX 6-B

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

ACTIVITY INSTRUMENT

1. Ride number. _____(sector/post/shift/project day)

2. Your observer number. _____

3. Activity number _____ (run consecutively throughout the shift)

4. Time activity began? _____(military time)

5. Time activity ended? _____(military time)

6. In what district, sector and post did this activity occur?

district _____ sector _____ post_____ district headquarters_____

7. Exact Geographic location/address of this activity (or if general patrol, state "general patrol" and give the post number where this patrol activity occurred).

_____

8. Brief description of activity/encounter?

_____

9. Type of activity? _____PUT IN THE ACTIVITY CODE

IF THE ACTIVITY CODE IS NUMBER 610, 611,612, 700, 701, 702, 703, 704, 705, 706, 708,708, 709, 710, 800, 801, 802, 803, OR 990 **YOU DO NOT NEED TO CODE ANY FURTHER. PROCEED TO YOUR NEXT ACTIVITY ON A NEW FORM.**

10. Why did the officer engage in this activity? Was the activity undertaken....

1 in response to a 9-1-1 call? If so, what is the CAD number _____
2 in response to a 3-1-1 call? If so, what is the CAD number _____
3 solely on the **initiative** of the observed officer (self-initiated while viewing a situation)
4 solely on the **initiative** of the observed officer while on discretionary/free time (self-initiated activity undertaken while officer on free time)
5 solely on the **initiative** of the observed officer based on information acquired by the officer from a citizen while on the street
6 in response to a **specific directive** from the officer's supervisor (officer told by another to perform some act involving a specific place and/or person)
7 in response to **general instructions** from the officer's supervisor (told to be watchful for certain behavior in an area; such as thefts from cars have been taking place here)
8 in response to **general instructions and on the initiative** of the observed officer (officer was told to watch an area/person, but not directed to do it at a certain time or in a specific way which was determined by the officer)

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

11. Who gave the **directive** to engage in this activity

1 no other authority appeared to give instructions (totally self initiated)
2 dispatcher--voice/radio
3 dispatcher--over the Mobile Data Terminal (MDT)
4 officer's own Sector Manager/Lieutenant
5 another Sector Manager/Lieutenant
6 officer's Sector Sergeant
7 another Sector Sergeant
8 Community Outreach Unit Sergeant
9 Neighborhood Officers Unit Sergeant
10 Neighborhood Services Center Sergeant
11 District Commander/Major
12 another officer requested the observed officer to undertake the activity
13 citizen (on-scene)
14 citizen (by direct telephone contact)
15 a local politician wanted this activity performed
16 other _____(please specify)

12. Was the officer directed to carry out the activity **at a specific location or locations**?

1 No
2 Yes

13. Give address and complete Part A (check all that apply).
_____(address)

13A. _____ residence address
_____ street corner, street block
_____ privately owned business
_____ public space such as a park
_____ Other (please specify)

14. Did the directive for this activity specify **when** the officer was to engage in this activity?

1 No
2 Yes -- during a specific time frame (at certain hours)
3 Yes -- generally, officer was told to do the activity "sometime today"

15. Did the directive specify **what** the officer was to do while carrying out this activity?

1 No
2 Yes -- officer was told to engage in certain specific activities
3 Yes -- officer received general instructions

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

16. Who conducted this activity?

1 observed officer only
2 observed officer and other post officers in the sector
3 observed officer and the Neighborhood Services Center Sergeant
4 observed officer and Neighborhood Services officer(s)
5 observed officer and Community Outreach officer(s)
6 observed officer and Flex Unit officer(s)
7 observed officer and another Baltimore Police Department officer (only include if the other officer is not on a Post that evening)
8 other (please specify)_____

17. How many police (including the observed officer) were engaged in this activity/encounter?

NUMBER OF OFFICERS_____

18. How did officer proceed to the scene of this encounter/activity?

1 motor vehicle: within posted speed; no lights/siren
2 motor vehicle: within posted speed; lights/siren
3 motor vehicle: above posted speed; no lights/siren
4 motor vehicle: above posted speed; lights/siren
5 foot: walking/normal speed
6 foot: running/above normal speed
7 not applicable: officer at scene at beginning of encounter

19 Nature of initial location of encounter/activity?

1 public property, outdoors (e.g., road, sidewalk, park)
2 public property, indoors (e.g., government building)
3 police facility, outdoors (e.g., police parking lot)
4 police facility, indoors (e.g., police station)
5 private property, outdoors (e.g., yard, front porch)
6 private property, indoors (e.g., home)
9 other

20. At any time during this ride did the police indicate that they had prior knowledge of this location?

1 no
2 yes, received information at roll call
3 yes, heard about it from department or other officers (not roll call)
4 yes, direct knowledge from prior visits
5 yes, police showed prior knowledge of location, but basis of knowledge not clear

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

21. Before the activity began, was there any indication of anticipated violence at the scene?

1 no
2 yes, officer indicated possible violence
3 yes, from other source (who _____)
4 yes, from both officer and other source (who _____)

22. Did this activity involve communicating with representatives of other organizations that provide services to the public?

1 no
2 yes, face-to-face meeting
3 yes, telephone discussion

23. What type of organization was involved?

_____USE AGENCY CODES

24. Did you observe this entire activity?

1 no
2 yes

25. Did this encounter/activity involve a face to face interaction with a citizen?

1 no
2 yes

26. When the officer **began the activity,** at what type of problem was this activity directed?

_____USE PROBLEM CODES

27. At the **end of the activity,** what type of problem was this activity directed at?

_____USE PROBLEM CODES

28. Did the police indicate that the problem in this encounter is part of a larger problem than just the circumstances of this event?

1 no (skip to Question 30)
2 yes

29. What was the nature of the larger problem identified by the police?

_____PROBLEM CODE FOR THE LARGER PROBLEM.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

30. As **initially dispatched, or when the officer first heard** about the problem, did the officer believe this was a problem that could be handled by some alternative method other than the officer responding?

1 no (skip to Question 32)
2 yes

31. What alternative response did the officer believe would have been appropriate?

1 call should have been a 3-1-1 call and gone to the Neighborhood Service Center Sergeant
2 call should have been a 3-1-1 call and set for a delayed response
3 call should have been a 3-1-1 call and referred to another police unit (such as Community Outreach, a Flex Unit, Neighborhood Services Unit)
4 call should have been a 3-1-1 call and referred to another city agency
5 call should have been a 3-1-1 call and a written report should have been taken over the phone
6 other _____(explain)

32. **At the end of the encounter** did the officer believe this was a problem that could have been handled by some alternative method other than the officer responding?

1 no (skip to Question 34)
2 yes

33. What alternative response did the officer tell you would have been appropriate?

1 call should have been a 3-1-1 call and gone to the Neighborhood Service Center sergeant
2 call should have been a 3-1-1 call and set for a delayed response
3 call should have been a 3-1-1 call and referred to another police unit (such as Community Outreach, a Flex Unit, Neighborhood Services Unit)
4 call should have been a 3-1-1 call and referred to another city agency
5 call should have been a 3-1-1 call and a written report should have been taken over the phone
6 other _____(explain)

34. Was this activity part of a long-term initiative to deal with this problem?

1 no (skip to Question 36)
2 yes, the initiative focused on specific people or location
3 yes, the initiative focused on this kind of problem in general
4 yes, unable to determine nature of the long-term initiative

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

35. Who created the long-term initiative that this activity was a part of?

1 observed officer--or officer with other officers
2 other police officers only
3 the observed officer's own Sector Manager/Lieutenant
4 another Sector Manager/Lieutenant
5 officer's Sector Sergeant
6 another Sector Sergeant
7 Community Outreach Sergeant
8 Neighborhood Officers Unit Sergeant
9 Neighborhood Services Center Sergeant
10 District Commander/Major
11 a local politician wanted this activity performed
12 other _____(please specify)
13 unable to determine

36. Did the officer request input from her/his **sector manager** during this activity?

1 no
2 yes, offered advice/suggestion only
3 yes, ordered/instructed by sector manager what to do
4 yes, unable to determine whether 2 or 3

37. At any time during the ride did the officer discuss this activity with a **sector manager**? [INCLUDE RADIO/MDT/TELEPHONE]

1 no (skip to Question 39)
2 yes, before activity only
3 yes, during activity only
4 yes, after activity only
5 yes, before and during activity
6 yes, before and after activity
7 yes, during and after activity
8 yes, before, during, and after activity

38. Did the **sector manager** tell the officer what to do regarding this activity?

1 no
2 yes, offered advice/suggestion only
3 yes, ordered/instructed officer
4 yes, could not determine whether 2 or 3

39. Did the officer request input from **another supervisor** during this activity?

1 no
2 yes, offered advice/suggestion only
3 yes, ordered/instructed by sector manager what to do
4 yes, unable to determine whether 2 or 3

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

40. At any time during the ride did the officer discuss this activity with **another supervisor?** [INCLUDE RADIO/MDT/TELEPHONE]

1 no (skip to Question 42)
2 yes, before activity only
3 yes, during activity only
4 yes, after activity only
5 yes, before and during activity
6 yes, before and after activity
7 yes, during and after activity
8 yes, before, during, and after activity

41. Did the supervisor tell the officer what to do regarding this activity?

1 no
2 yes, offered advice/suggestion only
3 yes, ordered/instructed officer
4 yes, could not determine whether 2 or 3

42. At any time during the ride did the officer discuss this activity with **the Neighborhood Services Center Sergeant?** [INCLUDE RADIO/MDT/TELEPHONE]

1 no (skip to Question 44)
2 yes, before activity only
3 yes, during activity only
4 yes, after activity only
5 yes, before and during activity
6 yes, before and after activity
7 yes, during and after activity
8 yes, before, during, and after activity

43. Did the **Neighborhood Services Center Sergeant** tell the officer what to do regarding this activity?

1 no
2 yes, offered advice/suggestion only
3 yes, ordered/instructed officer
4 yes, could not determine whether 2 or 3

44. For what percentage of the elapsed time did this activity occur within theboundaries of your assigned post and sector?

post _____percent sector_____ percent

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

45. Did the police change their behavior because of your or other observer presence?

1 no significant change (skip to Question 48)
2 yes, a little change
3 yes, a substantial change

46. In what way did the police change their behavior during this encounter because of observer presence?

1 police more inclined to get involved
2 police less inclined to get involved
3 police more inclined to arrest or cite
4 police less inclined to arrest or cite
5 police more inclined to use force
6 police less inclined to use force
7 other: explain in narrative

47. What is the basis of your judgment that police changed their behavior because of observer presence?

1 police stated that their behavior changed
2 observer inferred it from behavior or manner of police
3 other: explain in narrative

48. Did you perform any police tasks during this activity?

1 no
2 yes, offered police information, advice, or an opinion
3 yes, performed some physical aspect of police work
4 yes, had more than casual communication with citizens
5 yes, two or more of the above

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

APPENDIX 7-A

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Baltimore 311 Telephone Survey

INTRODUCTION:
"Hello. My name is _____ and I am calling from the University of Cincinnati. May I speak with ***(title & name on sample sheet)?"***

- **NOT AVAILABLE** –> "When would be a better time to reach her / him?"
RECORD TIME / DATE ON SAMPLE SHEET

- **MOVED / NOT LIVE HERE** -> "Is there a different # where I can reach her/him?"
RECORD ON SAMPLE SHEET

YES / RESPONDENT IS ON THE LINE– "My name is and I'm working with the Baltimore Police Department to evaluate Baltimore's new 311 system. We have randomly selected your phone number from a list of people who called either 3-1-1 or 9-1-1 in may or June of this year. We want to know how satisfied you were with the police (or city) response."

"This interview is voluntary and confidential. It should only take about 10 minutes to complete."

[Please enter 00 for none; enter 88 if the respondent requests not to answer the question; enter 99 if the respondent does not know.]

IMMEDIATELY ASK QUESTION #1.
If Respondent says they can't talk now, say....

"When would be a better time to call you back?"

RECORD TIME & DATE ON SAMPLE CARD.
THANK RESPONDENT. DIAL NEXT NUMBER.

Section 1: General Questions about Contact with Police

1. "Do you know that the City of Baltimore has a 3-1-1 call system?, or not"

2. "How many times in the last 12 months have you called 9-1-1?" [#] _____

3. "How many times in the last 12 months have you called 3-1-1?" [#] _____

4. "How many times in the last 12 months have you spoken with a police officer in your neighborhood?" [#] _____

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

5. "For the next few questions, I 'd like for you to tell me how much you agree or disagree with each of the following statements: **BRANCH. RECORD ON ANSWER SHEET.**

"Do you agree or disagree that...."
5a. "3-1-1 improves city services?"
5b. "3-1-1 should be used for non-emergency calls only?"
5c. "3-1-1 improves police-community relations?"
5d. "3-1-1 has led to fewer non-emergency calls to 9-1-1?"

Section 2: Citizen Decision Making

"I understand that you called [311 or 911] on [date] at [time] regarding [problem identified in call]."

6. "Had you called **311** about the problem before [date], or not?"

7. "Had you called **911** about the problem before _____[date], or not?"

8. "Have you called **911** about this same problem **since** _____[date], or not?"

9. "Have you called **311** about this same problem **since** _____[date], or not?"

Section 3: "My next few questions are about the call was handled."

10. "Did you have to wait more than five rings before your call was answered?, or not"

11. "Was your call put on hold?, or not"

12. "Was the police department call-taker polite or impolite?" **BRANCH**

13. "Was the police department call-taker helpful or not helpful?" **BRANCH**

14. "Did the police department call taker refer you to another city agency, or not?"
IF "NO", "NK" or "CAN'T REMEMBER", SKIP TO QUESTION 16.

15a. "Which agency were you told to call?" **[RECORD ON ANSWER SHEET]**
15b. "Did you call that agency, or not?"

16. "Overall, were you satisfied or dissatisfied with way the police department call taker handled your call?" **BRANCH.**

IF RESPONDENT ENDS INTERVIEW HERE, INTERVIEW IS CONSIDERED COMPLETE

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Section 4: Satisfaction with the Police Response

17. "Were the police dispatched to handle your call, or not?" **IF "NK, NA", FLEX WITH:**
"Did the police come out to your house or business following your call, or not?"
IF "NO, NK, NA", SKIP TO QUESTION 20

18a. "Did any police arrive by car, or not?"

18b. "Did any police arrive by foot, or not?"

18c. "And just to check, did any police arrive by bicycle, or not?"

18d. "Were the police in uniform, or not?"

18e. "Was the Neighborhood Services Officer present?, or not"
IF "NK, NA", FLEX WITH:
"The Neighborhood Services Officer is like your beat officer or your local police officer. Did your Neighborhood Services Officer show up, or not?"

19. "How long did it take the police to respond to your call?" **IF "NK, NA", PROBE** "Just roughly?"
INITIALLY ASK AS AN OPEN ENDED QUESTION. RECORD VERBATIM

IF NECESSARY, BRANCH WITH: "Was it more or less than one hour later?"

IF LESS THAN 1 HR. LATER	**IF MORE THAN 1 HR LATER**
"Less than 10 minutes later?"	"More than 1 hour later?"
"From 10 to 20 minutes later?"	"About a day later?"
"About 30 minutes later?"	"About 1 week later?"
"About 1 hour later?"	"About 1 month later?"
	"The police did not respond?"

20. "Overall, were you satisfied or dissatisfied with the police response?" **BRANCH**

Section 5: Satisfaction with the City's Response

21. "Did a city employee or city inspector respond to your call, or not?"

IF "NO, NK, NA", SKIP TO QUESTION 25, SECTION 6

22. "From which city agency?" **RECORD ON ANSWER SHEET.**

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

23. "How soon after you called did this agency representative respond?"
INITIALLY ASK AS AN OPEN ENDED QUESTION. RECORD VERBATIM

IF NECESSARY, BRANCH WITH: "Was it more or less than six hour later?"
IF LESS THAN 6 HRS. LATER..... IF MORE THAN 6 HRS. LATER.....

"Between 2-6 hrs. later?"	"Between 6-12 hrs. later?"
"About 1 hour later?"	"About 1 day later?"
"About 30 minutes later?"	"Between 1-7 days later?"
"From 10 to 20 minutes later?"	"More than a week later?"
"Less than 10 minutes later?"	"The agency did not respond?"

24. "Were you satisfied or dissatisfied with the city agency's response?" **BRANCH**

Section 6: General Perceptions Of Crime

25. "Do you think that the [problem identified in the call] that we have been talking about is currently...a big problem, somewhat of a problem, or not a problem at all anymore?"

26."I am now going to read you a list of crime and disorder problems. Please tell me whether each of them is currently a big problem, a small problem or no problem at all on your street block...

REPEAT AS OFTEN AS NECESSARY... "Big Problem, Small Problem, or No Problem?"

26a. People hanging out	26g. Drinking in public
26b. Drug dealing	26h. Nuisances — like noise, barking dogs
26c. Drug use	26i. Fights, arguments
26d. Trash, junk, graffiti	26j. Violence — like shootings, assaults
26e. Abandoned autos	26k. Prostitution
26f. Abandoned buildings	

Section 7: Demographics

"My last few questions are used only to divide our interviews into groups."

IF NECESSARY, SAY "All of your answers will be kept strictly confidential."

RECORD WHETHER THIS RESPONDENT IS MALE OR FEMALE.

"May I have your age, please?" **FLEX** - "Are you under 35, 35-50, or over 50?"

29. "What is your race or ethnic background?" **READ LIST, IF NEEDED. RECORD ONE.**

a. African American or Black
b. Asian American
c. White Hispanic or Latino
d. Native American
e. Bi-Racial
f. Other

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

"Have I reached a business or a residence?" **IF RESIDENCE, SKIP TO QUESTION 32.**

"What type of business is this?" **RECORD ANSWER AND CLOSE INTERVIEW.**

"How long have you lived at this residence?" **RECORD**

33. "How would you define your living arrangements, that is..." **READ LIST. RECORD ONLY 1**

Do you own this home?
Do you rent this home?
Are you living with a relative?
Is this a group home?

"How long have you lived in Baltimore City?" **RECORD**

35. "What is your total yearly household income?" **FLEX WITH** "That is, is it over or under $30,000? **BRANCH. RECORD CONSERVATIVELY.**

Less than $10,000 per year
Between $10,000 and $20,000
Between $20,000 and $30,000
Between $30,000 and $45,000
Between $45,000 and $65,000
Between $65,000 and $100,000
Over $100,000

36. "What is your primary source of income? Is it a....."
READ LIST. RECORD ONLY ONE RESPONSE ON ANSWER SHEET.

a. Full Time Job
b. Part Time Job
c. Public Assistance
d. Student Scholarship or Loan
e. Investments

37. "What is the highest grade of school you completed?" **RECORD ONLY ONE**

a. Did not finish high school
b. High school graduate
c. GED
d. Some college
e. 2 year college or technical school graduate
f. 4 year college graduate
g. Masters degree or higher
h. Other _____

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

CLOSING

"Those are all of my questions. If you have any questions about this interview, please call Baltimore Police Department's 311 phone number and ask for the 311 Supervisor on Duty.

Thank you and have a good day / night / evening!"

CHECK THE ANSWER SHEET AND SAMPLE PAGE TO MAKE SURE YOU HAVE RECORDED ALL INFORMATION PROPERLY.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

APPENDIX 7-B

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table B-1: Number of Times Citizen called 911 in Past Year

Number	911	311	Total
0	24 (31.2)	16 (12.1)	40 (19.1)
1	19 (24.7)	55 (41.7)	74 (35.4)
2	5 (6.5)	17 (12.9)	22 (10.5)
3	8 (10.4)	14 (10.6)	22 (10.5)
4	3 (3.9)	7 (5.3)	10 (4.8)
5	4 (5.2)	4 (3.0)	8 (3.8)
6	1 (1.3)	2 (1.5)	3 (1.4)
8	1 (1.3)	2 (1.5)	3 (1.4)
10	3 (3.9)	7 (5.3)	10 (4.8)
12	3 (3.9)	4 (3.0)	7 (3.3)
15	1 (1.3)	1 (.8)	2 (1.0)
20	-	3 (2.3)	3 (1.4)
23	1 (1.3)	-	1 (.5)
100	1 (1.3)	-	1 (.5)
288	1 (1.3)	-	1 (.5)
365	1 (1.3)	-	1 (.5)
480	1 (1.3)	-	1 (.5)
Total	77 (100.0)	132 (100.0)	209 (100.0)

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table B-2: Number of Times Citizen called 311 in Past Year

Number	911	311	Total
0	7 (8.8)	51 (38.6)	58 (27.4)
1	20 (25.0)	38 (28.8)	58 (27.4)
2	16 (20.0)	19 (14.4)	35 (16.5)
3	6 (7.5)	1 (0.8)	7 (3.3)
4	8 (10.0)	4 (3.0)	12 (5.7)
5	8 (10.0)	4 (3.0)	12 (5.7)
6	3 (3.8)	3 (2.3)	6 (2.8)
7	-	2 (1.5)	2 (0.9)
8	-	2 (1.5)	2 (0.9)
10	2 (2.5)	2 (1.5)	4 (1.9)
11	1 (1.3)	-	1 (0.5)
15	1 (1.3)	1 (0.8)	2 (0.9)
16	1 (1.3)	-	1 (0.5)
20	-	1 (0.8)	1 (0.5)
24	1 (1.3)	-	1 (0.5)
30	2 (2.5)	-	2 (0.9)
35	-	1 (0.8)	1 (0.5)
40	-	1 (0.8)	1 (0.5)
50	1 (1.3)	-	1 (0.5)
100	1 (1.3)	1 (0.8)	2 (0.9)
125	-	1 (0.8)	1 (0.5)
384	1 (1.3)	-	1 (0.5)
960	1 (1.3)	-	1 (0.5)
Total	80 (100.0)	132 (100.0)	212 (100.0)

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table B-3: Number of Times Citizen Spoken with Neighborhood Officer in Past Year

Number	911	311	Total
0	26 (33.3)	44 (34.1)	70 (33.8)
1	10 (12.8)	28 (21.7)	38 (18.4)
2	8 (10.3)	14 (10.9)	22 (10.6)
3	7 (9.0)	11 (8.5)	18 (8.7)
4	3 (3.8)	5 (3.9)	8 (3.9)
5	3 (3.8)	8 (6.2)	11 (5.3)
6	2 (2.6)	4 (3.1)	6 (2.9)
7	-	2 (1.6)	2 (1.0)
8	2 (2.6)	-	2 (1.0)
9	1 (1.3)	-	1 (0.5)
10	-	4 (3.1)	4 (1.9)
11	1 (1.3)	-	1 (0.5)
12	3 (3.8)	2 (1.6)	5 (2.4)
15	2 (2.6)	-	2 (1.0)
20	3 (3.8)	1 (0.8)	4 (1.9)
25	-	1 (0.8)	1 (0.5)
30	2 (2.6)	1 (0.8)	4 (1.9)
50	1 (1.3)	-	1 (0.5)
52	-	1 (0.8)	1 (0.5)
120	-	1 (0.8)	1 (0.5)
300	-	1 (0.8)	1 (0.5)
365	4 (5.1)	1 (0.8)	5 (2.4)
Total	78 (100.0)	129 (100.0)	207 (100.0)

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table B-4: 311 Improves City Services

	911	311	Total
Strongly Disagree	10 (12.3)	8 (6.0)	18 (8.4)
Somewhat Disagree	3 (3.7)	7 (5.3)	10 (4.7)
Neither	4 (4.9)	10 (7.5)	14 (6.5)
Somewhat Agree	33 (40.7)	48 (36.1)	81 (37.9)
Strongly Agree	31 (38.3)	60 (45.1)	91 (42.5)
Total	81 (100.0)	133 (100.0)	214 (100.0)

Table B-5: 311 should be used for Non-Emergency Calls Only

	911	311	Total
Strongly Disagree	5 (6.3)	5 (3.8)	10 (4.7)
Somewhat Disagree	9 (11.3)	3 (2.3)	12 (5.6)
Neither	2 (2.5)	3 (2.3)	5 (2.3)
Somewhat Agree	11 (13.8)	36 (27.1)	47 (22.1)
Strongly Agree	53 (66.3)	86 (64.7)	139 (65.3)
Total	80 (100.0)	133 (100.0)	213 (100.0)

Table B-6: 311 Improves Police-Community Relations

	911	311	Total
Strongly Disagree	11 (13.8)	8 (6.0)	19 (8.9)
Somewhat Disagree	8 (10.0)	11 (8.3)	19 (8.9)
Neither	11 (13.8)	14 (10.5)	25 (11.7)
Somewhat Agree	16 (20.0)	50 (37.6)	66 (31.0)
Strongly Agree	34 (42.5)	50 (37.6)	84 (39.4)
Total	80 (100.0)	133 (100.0)	213 (100.0)

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table B-7: 311 Reduces Non-Emergency Calls to 911

	911	311	Total
Strongly Disagree	3 (3.8)	2 (1.5)	5 (2.4)
Somewhat Disagree	9 (11.3)	6 (4.5)	15 (7.1)
Neither	13 (16.3)	18 (13.6)	31 (14.6)
Somewhat Agree	15 (18.8)	46 (34.8)	61 (28.8)
Strongly Agree	40 (50.0)	60 (45.5)	100 (47.2)
Total	80 (100.0)	132 (100.0)	212 (100.0)

Table B-8: Was Call-Taker Polite

	911	311	Total
Very Impolite	2 (2.5)	1 (0.8)	3 (1.4)
Somewhat Impolite	2 (2.5)	4 (3.0)	6 (2.8)
Neither	2 (2.5)	1 (0.8)	3 (1.4)
Somewhat Polite	22 (27.5)	44 (33.1)	66 (31.0)
Very Polite	52 (65.0)	83 (62.4)	135 (63.4)
Total	80 (100.0)	133 (100.0)	213 (100.0)

Table B-9: Was Call-Taker Helpful

	911	311	Total
Very Unhelpful	4 (4.9)	4 (3.0)	8 (3.7)
Somewhat Unhelpful	2 (2.5)	7 (5.3)	9 (4.2)
Neither	2 (2.5)	1 (0.8)	3 (1.4)
Somewhat Helpful	19 (23.5)	46 (34.6)	65 (30.4)
Very Helpful	54 (66.7)	75 (56.4)	129 (60.3)
Total	81 (100.0)	133 (100.0)	214 (100.0)

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Table B-10: Overall Citizen Satisfaction with Call-Taker

	911	311	Total
Very Dissatisfied	2 (2.5)	4 (3.0)	6 (2.8)
Somewhat Dissatisfied	4 (5.1)	6 (4.5)	10 (4.7)
Neither	1 (1.3)	2 (1.5)	3 (1.4)
Somewhat Satisfied	23 (29.1)	49 (36.8)	72 (34.0)
Strongly Satisfied	49 (62.0)	72 (54.1)	121 (57.1)
Total	79 (100.0)	133 (100.0)	212 (100.0)

Table B-11: Overall Citizen Satisfaction with Police Response

	911	311	Total
Very Dissatisfied	14 (18.7)	17 (13.6)	31 (15.5)
Somewhat Dissatisfied	7 (9.3)	7 (5.6)	14 (7.0)
Neither	-	1 (0.8)	1 (0.5)
Somewhat Satisfied	21 (28.0)	45 (36.0)	66 (33.0)
Strongly Satisfied	33 (44.0)	55 (44.0)	88 (44.0)
Total	75 (100.0)	125 (100.0)	200 (100.0)

Table B-12: Overall Citizen Satisfaction with City Response

	911	311	Total
Very Dissatisfied	-	1 (14.3)	1 (11.1)
Somewhat Dissatisfied	1 (50.0)	-	1 (11.1)
Neither	-	-	-
Somewhat Satisfied	1 (50.0)	1 (14.3)	2 (22.2)
Strongly Satisfied	-	5 (71.4)	5 (55.6)
Total	2 (100.0)	7 (100.0)	9 (100.0)

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

APPENDIX 8-A

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

INTERVIEW 1

Communications Supervisor, Chief of Support Services, System Administrator

I would like to ask you some questions about *your perspective* on the 311 system in order to understand how 311 was adopted and how you think it is currently working.

1. *What would you describe as the underlying factors that most likely caused the adoption of the 3-1-1 system?*

   Do you think that there was inappropriate use of the 911 emergency system by citizens in non-emergency situations?

   Do you think that there were technical inefficiencies with the 911 system?

   Do you think that the system was overburdened or no longer responsive to public expectations (busy signals, put on hold, recorded messages)?

   Do you think that police officers were overburdened?

   Was there a desire to implement community policing?

2. *What would you describe as the direct precipitating incidents giving rise to the 3-1-1 system?*

   Do you know of any incidents that received substantial publicity, resulting in public outrage?

3. *Could you please describe the reform process*

   What governmental agencies and private sector organizations were involved in the reform effort?

   Who put pressure on to adopt 311?

   What other types of technological alternatives were considered?
   Radio channels, AT&T Smart Switch, Meridian Automatic Call Directory?

   What compromises do you think led to the final solution?

   How would you describe the relationship between the police and other city agencies before 311?
   Do you think that there was intra / inter-agency cooperation or conflict?

   What partnerships do you think were forged in the process of implementing 311?

4. *What are your perceptions of the 311 system?*

   What are your thoughts regarding community acceptance?

   What are your thoughts regarding Police Department acceptance? City - agency acceptance?

   Relieving the 9-1-1 system

   How is the 311 system being used? By whom?

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Freeing time for community policing

Do you think 311 has changed the demand for police services?

Do you think 311 has had an impact on the allocation of police officer committed/uncommitted time?

The COPS office is very interested in community policing issues. Do you think 311 has had an impact on community policing efforts? How?

Operational issues with 311

How were the calls that now go to 311 handled before the system was implemented?

When a call comes in now how is it handled?

To what extent can calls be differentiated before and after 311 in terms of emergency / non-emergency? Simply, could we generate a count of emergency/non-emergency calls by type of call before & after 311 ?

Have any unforeseen problems surfaced?

How do you think 311 will impact call management systems within police agencies?

Relationship changes with other city agencies

How would you describe the relationship between the police and other city agencies now?

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

INTERVIEW 3

Call-takers / Dispatchers

I would like to ask you some questions about *your perspective* on the 311 system in order to understand how 311 was adopted and how you think it is currently working.

1. *What would you describe as the underlying factors that most likely caused the adoption of the 3-1-1 system?*

   Do you think that there was inappropriate use of the 911 emergency system by citizens in non-emergency situations?

   Do you think that there were technical inefficiencies with the 911 system?

   Do you think that the system was overburdened or no longer responsive to public expectations (busy signals, put on hold, recorded messages)?

   Do you think that police officers were overburdened?

2. *What would you describe as the direct precipitating incidents giving rise to the 3-1-1 system?*

   Do you know of any incidents that received substantial publicity, resulting in public outrage?

4. *What are your perceptions of the 311 system?*

   What are your thoughts regarding community acceptance?

   What are your thoughts regarding Police Department acceptance? City agency acceptance?

   Relieving the 911 system

   How is the 311 system being used? By whom?

   Freeing time for community policing

   Do you think 311 has changed the demand for police services?

   Do you think 311 has had an impact on the allocation of police officer committed/uncommitted time?

   The COPS office is very interested in community policing issues. Do you think 311 has had an impact on community policing efforts? How?

   Operational issues with 311

   How were the calls that now go to 311 handled before the system was implemented?
   When a call comes in now how is it handled?

   To what extent can calls be differentiated before and after 311 in terms of emergency/non-emergency?
   Simply, could we generate a count of emergency/311 by type of call before & after 311?
   Have any unforeseen problems surfaced?

   How do you think 311 will impact call management systems within police agencies?

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

INTERVIEW 4

Financial Administrator

I would like to ask you some questions about *your perspective* on the 311 system in order to understand how 311 was adopted and how you think it is currently working.

3. *Could you please describe the reform process*

Was a needs-assessment or cost-benefit analysis conducted?

What other types of technological alternatives were considered?
Radio channels, AT&T Smart Switch, Meridian Automatic Call Directory?

What compromises do you think led to the final solution?

How did the city develop resources to implement the system?

How would you describe the relationship between the police and other city agencies before 311?
Do you think that there was intra / inter-agency cooperation or conflict?

What partnerships do you think were forged in the process of implementing 311?

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

INTERVIEW 7

Telephone Service Provider

I would like to ask you some questions about *your perspective* on the 311 system in order to understand how 311 was adopted and how you think it is currently working.

How long has your company provided service to the police/fire department?

What does the telephone company provide?
Lines, networks, customer provided equipment, telephone equipment?

3. *Could you please describe the reform process*

What was the original 911 system?

What system is in operation now?

Was a needs-assessment or cost-benefit analysis conducted?

What other types of technological alternatives were considered?
Radio channels, AT&T Smart Switch, Meridian Automatic Call Directory?

What compromises do you think led to the final solution?

How did the city develop resources to implement the system?

4. *What are your perceptions of the 311 system?*

Operational Issues with 311

What data bases do you maintain to support front end software technology?
Call Center Management Information System, MAGIC System?

Have any unforeseen problems surfaced?

What reservations do you see in the future with regard to cellular phones and other technologies?

What, if any, are the long-term implications for local police agencies and police agencies throughout the state?

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

INTERVIEW 8

Communications & Information Services

I would like to ask you some questions about *your perspective* on the 311 system in order to understand how 311 was adopted and how you think it is currently working.

1. *What would you describe as the underlying factors that most likely caused the adoption of the 3-1-1 system?*

   Do you think that there was inappropriate use of the 911 emergency system by citizens in non-emergency situations?

   Do you think that there were technical inefficiencies with the 911 system?

   Do you think that the system was overburdened or no longer responsive to public expectations (busy signals, put on hold, recorded messages)?

2. *What would you describe as the direct precipitating incidents giving rise to the 3-1-1 system?*

   Do you know of any incidents that received substantial publicity, resulting in public outrage?

3. *Could you please describe the reform process*

   What governmental agencies and private sector organizations were involved in the reform effort?

   Who put pressure on to adopt 311?

   What was the original 911 system? (technology manufacturer)

   What system is in operation now?

   What other types of technological alternatives were considered?
   Radio channels, AT&T Smart Switch, Meridian Automatic Call Directory?

   What compromises do you think led to the final solution?

   Was a needs-assessment or cost-benefit analysis conducted?

   How did the city develop resources to implement the system?

   How long has Southwest Bell provided service to the police/fire department?

   What does the telephone company provide?
   Lines, networks, customer provided equipment, telephone equipment?

4. *What are your perceptions of the 311 system?*

   Have any unforeseen problems surfaced?

   Operational Issues with 311

   To what extent can calls be differentiated before and after 311 in terms of emergency / non-emergency?

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Simply, could we generate a count of emergency/non-emergency calls by type of call before & after 311 ?

What data bases do you maintain to support front end software technology?
Call Center Management Information System, MAGIC System?

What reservations do you see in the future with regard to cellular phones and other technologies?

What, if any, are the long-term implications for local police agencies and police agencies throughout the state?

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

ANIMAL CONTROL & PARKING ENFORCEMENT

What did the agency do before the 311 system?

How long were people waiting for service before 311?

How do officers get dispatched from 311?

What are the routine reporting practices?

Do they keep citizen request logs?

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Date _____ Hours that you are working today _____

We would like to ask you some general questions about the Dallas 3-1-1 call system.

1. What do you believe is the purpose of the 3-1-1call system?
   a. Reduce the number of police responses to non-emergency calls for service
   b. Provide citizens with a number to call for city service information
   c. Both a. & b.
   d. Unsure of the purpose of the 3-1-1 non-emergency call system
   e. Other _____

2. Generally, who handles the 3-1-1 calls that come in to your division by computer?
   a. Patrol officers b. ICP officers c. PSO d. Don't know e. other _____

3. On average, approximately what percent of the calls that you respond to per day are:
   a. Not a police matter _____%
   b. "Meet the complainant"/call that requires some police response _____%
   c. Non-emergency calls (lower priority) that require police response _____%
   d. Emergency/crime in progress calls (high priority) _____%

4. Since the introduction of 3-1-1 do you think that you receive: less (L) of the following types of calls; about the same (S) number of the following types of calls; more (M) of the following types of calls; unsure (U).

parking violations	____	water main break	____	missed garbage	____
meet complainant	____	family violence	____	dead animal	____
traffic signal out	____	unrestrained animal	____	tall weeds	____
burglar alarms	____	shots fired	____	litter	____
drug dealing	____	youth gang	____		

5. On a typical shift, do you think that 3-1-1 has had an effect on the overall number of calls dispatched to elements?
   a. I began employment with the Dallas Police Department after the implementation of 3-1-1
   b. Yes, elements respond to fewer calls
   c. No, elements respond to the same number of calls
   d. Yes, elements respond to more calls

6. About how often are you dispatched to a call that you know came in as a 3-1-1 call?
   a. Never b. Once a month c. A couple of times a month d. Once every few days

7. I think there are calls that go to 3-1-1 that should receive an immediate police response.
   a. Agree b. Disagree c. Unsure

8. I think there are calls that are dispatched to elements that should go to 3-1-1.
   a. Agree b. Disagree c. Unsure

9. Has the 3-1-1 system influenced the amount of down time (time not answering calls) that you have on a typical shift?
   a. I began employment with the Dallas Police Department after the implementation of 3-1-1
   b. No, I have about the same amount of down time
   c. Yes, I now have more down time
   d. Yes, I now have less down time

10. Since the introduction of 3-1-1, do you do more (M), less (L), or about the same (S) of the following activities:

General random patrol	___	Patrol high activity places	____	Solve community problems	____
Talk with law-abiding citizens	___	Investigate crime problems	____	Attend community meetings	____

11. I now spend more time dealing with police matters: a. Agree b. Disagree

12. The amount of time it takes to dispose of a 3-1-1 call is
   a. the same as when the call is handled as a 9-1-1 call
   b. greater than when the call is handled as a 9-1-1 call
   c. less than when the call is handled as a 9-1-1 call

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

13. The amount of paperwork I must complete to handle a 3-1-1 call is
    a. the same as when the call was handled as a 9-1-1 call
    b. greater than when the call was handled as a 9-1-1 call
    c. less than when the call was handled as a 9-1-1 call
    d. I don't handle 3-1-1 calls

14. Considering the people that you deal with in your beat, do you think that most of them:
    a. Know about 3-1-1 and use it if an appropriate situation arises
    b. Know about 3-1-1 but still choose to call 9-1-1 for non-police matters
    c. Are confused about when to use 3-1-1 or 9-1-1
    d. Don't even know about 3-1-1

15. Have you ever had a citizen complain to you about 3-1-1?
    a. No b. Yes, but only every once in a while c. Yes, often

16. Have you ever had a citizen complain to you about the response of another city agency to a 3-1-1 call?
    a. No b. Yes, but only every once in a while c. Yes, often

17. How often do you respond to a 3-1-1 call that you know was initially routed to another city agency?
    a. Never b. Only every once in a while c. Often

18. How often do you refer citizens to 3-1-1?
    a. Never b. Only every once in a while c. Often

19. The introduction of the 3-1-1 call system has changed my day-to-day work routine.
    a. Agree b. Disagree

20. How would you respond to the statement " Overall, 3-1-1 is helping me perform my job".
    a. Strongly agree b. Agree c. Disagree d. Strongly disagree

Demographic Section

21. How long have you been employed in law enforcement? _____Years _____Months

22. How long have you been employed by the Dallas Police Department? _____Years _____Months

23. How long have you been assigned to your present Division? _____Years _____Months

24. To what Division are you presently assigned?
    a. Southwest b. North Central c. Northwest d. Southeast e. Central f. Northeast

25. To what unit are you presently assigned? a. ICP b. Patrol

26. To what shift are you presently assigned? a. First Watch b. Second Watch c. Third Watch

27. How long have you been assigned to your present watch? _____Years _____Months

28. What is your present rank? _____

29. Age: _____Years

30. Sex: a. Male b. Female

31. What is the highest year of school you have completed?
    a. High school graduate or GED
    b. Some College/Trade School
    c. Associate's Degree (AA or AS)
    d. Bachelor's Degree (BA or B.S.)
    e. Some Graduate course work
    f. Advanced Degree (specify) _____

32. What is your ethnic origin?
    a. African American b. Hispanic c. Caucasian d. Asian American e. Other (specify)_____

33. Approximately how many 3-1-1 calls have you handled since the system was introduced? _____

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.