



Leaders at the Core of Better Communities

Data Analysis Report Police Operations East Providence, RI

Submitted by and reply to:
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ICMA Background

The International City/County Management Association (ICMA) is the premier local government leadership and management organization. Since 1914, ICMA's mission has been to create excellence in local governance by developing and advocating professional local government management worldwide. ICMA provides an information clearinghouse, technical assistance, training, and professional development to more than 9,000 city, town, and county experts and other individuals throughout the world.

ICMA Consulting Services

The ICMA Consulting Services team helps communities solve critical problems by providing management consulting support to local governments. One of ICMA Consulting Services' areas of expertise is public safety services, which encompasses the following areas and beyond: organizational development, leadership and ethics, training, assessment of calls for service workload, staffing requirements analysis, designing standards and hiring guidelines for police and fire chief recruitment, police/fire consolidation, community-oriented policing, and city/county/regional mergers.

Table of Contents

I.	Executive Summary	4
II.	Introduction	8
III.	Workload Analysis.....	9
IV.	Deployment	29
V.	Response Times.....	37

I. Executive Summary

This report was commissioned by the City Manager of East Providence, Richard Brown specifically to provide a detailed analysis of workload and staffing deployment in the East Providence Police Department.

The purpose of this report is to provide the city with an accurate depiction of police department activities so that the city can make unbiased, data driven decisions concerning the appropriate staffing levels within the agency as well as the most effective deployment schedules of department personnel. East Providence, like so many other communities in the country is facing significant fiscal challenges and is seeking ways to reduce operating costs while maintain service levels.

Based upon this data analysis there appears to be an opportunity to reduce departmental operating costs without sacrificing service delivery levels. We wish to bring to the reader's attention some specific information which will allow the reader to better understand the implications of what we have found in this analysis.

Workload

Note for example, table number two on page 9 which identifies that the department handles, on average 83 calls per day. Of these calls 25 or 38% are traffic related and only 11% involved crimes. When calls with zero on scene time are excluded, the average number of calls per day drops to 77 or approximately 7.2 calls per hour.

Figure 4 on page 13 shows that there is limited variability on workload by season. The busiest months, July and August had only 18% more

calls than the slowest months January and February. This limited variability has implications for deployment decisions which are discussed later in the report.

Figure 7 on page 18 describes a number of responding units, on average by type of category of call. We note that the average number of units responding to calls such as traffic and general are somewhat higher than we have seen in other agencies. This suggests that the department may want to focus on stronger command-and-control of field units to ensure that units remain within their assigned patrol zones and do not respond out of their assigned areas needlessly.

Deployment

The deployment data shows the implications of the current work schedule, eight hour shifts. The department deploys an average of 9.9 patrol officers during a 24-hour day both in August and February. When including additional units such as traffic enforcement and school resource officers that number increases to 10.3 and 10.9 officers respectively

Pages 27 through 32 contrast deployment versus workload reviewed by weekdays and weekends in August and in February. In all instances the numbers of officer deployed appear to be exceptionally high compared to the actual workload being handled.

For example figure 12 compares deployment versus workload on weekdays in August of 2007. Note for example that at 5 AM there are virtually no calls for service yet eight police officers are assigned to patrol. The significant difference between workload and employment

continues throughout the day. For example at 8 PM there are two man-hours of work and yet almost 12 officers are deployed.

Figure 15 and page 30 shows even greater discrepancy between deployment and workload for example during the daytime hours workload never exceeds three man-hours per hour and yet almost 14 officers are deployed. The pattern continues on weekends in February as well

We understand that some of the scheduling is required by the unfortunate existence of minimal manning clauses in the collective bargaining agreements which restrict management's ability to assign personnel resources based upon actual need. However it appears that the current deployment exceeds that which is required by the agreements.

While there are no standards or guidelines concerning the percentage of time officers should be tied up on calls for service a generally accepted practice is approximately 1/3 of on-duty time handling calls for service, one third of time spent completing administrative tasks such as court time, vehicle maintenance, meals, and other such tasks. The balance of officer's time typically would be spent on patrol, directed patrol, and so forth. As one can see by looking at the deployment versus workload graphs the patrol force rarely if ever is busy on calls for service one third of the time on duty. Accordingly we suggest that the city review deployment more closely since this appears to be an area where significant savings could occur with minimal or no impact on field operations.

Response Times

We also looked at response time both of nonemergency calls for service and high priority calls. Generally response times are favorable including dispatch delay times (time from receipt of calls to dispatch).

True emergency calls identified as priority one calls show a very low dispatch in travel time (2.3 minutes and 2.1 minutes respectively) with a total average response of 4.4 minutes. There were over 2000 calls in that category. We also specifically look at accidents with injuries as a way to test the accuracy of response Times reported to priority one calls. Here we find that those calls, which typically are all highest priority, had even a lower response time of four minutes on average.

These very low response times are indicative of a patrol force with a large number of officers available to immediately respond to a call for service and are consistent with our previous observations that the patrol force is busy a very small percentage of on-duty time.

Summary

There appears to be an opportunity to reduce staffing in the police department with minimal effect on service delivery. We suggest that the city consider reducing the number of officers assigned to patrol. Further opportunities exist to achieve even greater savings with a change in the current work schedule. We understand that this is a matter of collective bargaining, but one that we believe the city should explore.

We emphasize that this report and our conclusions are based upon data derived directly from the East Providence Police Department upon which we rely for their accuracy.

II. Introduction

This is the data analysis report on police operations for East Providence, Rhode Island, conducted by ICMA Consulting Services. This report focuses its analysis on three main areas: workload, deployment, and response times. These three areas are almost exclusively related to patrol operations, which constitute by far the bulk of the police department's personnel and financial commitment.

All information in this report was developed directly from data recorded in the department's dispatch center. The purpose of this report is to provide the city with findings and to allow the city to review any dispatch information that may be inconsistent with other internal records of the agency.

The first section of the report, concluding with Table 8, uses the call and activity data for the entire year. For the detailed workload analysis and the response time analysis, we have used two 4-week sample periods. The first period was the month of August 2007 (August 1 to August 28), or *summer*, and the second period was the month of February 2008 (February 1 to February 28), or *winter*.

III. Workload Analysis

We encountered a number of issues when analyzing the data supplied by the police department. We made assumptions and decisions to address them. We describe these issues, assumptions, and decisions below.

- A small but significant percentage of calls involving patrol units had zero time on scene (7.7%). Most of these were traffic-related calls or investigations (including building checks).
- The computer software generates a large number of call codes, which can be customized by the dispatchers. This led to 948 different call descriptions, which we reduced to 17 categories for our tables and 10 categories for our figures.
- There were 25 different action codes. There are codes for unfounded calls (e.g., NA = No Action Required), but it is not easy to determine whether calls were cancelled.
- A large number of unit records (20%) were missing arrival times. When focusing on calls rather than individual units, this left 13% of calls without a valid response time.
- The data set also included instances (approximately 1,300 units responding to 1,100 calls) where the same unit was recorded as being dispatched to, arriving at, and clearing a call location multiple times. These times were not identical and could not be explained. After consulting with the police department, we chose to use the record with the latest dispatch time and to remove the rest.

Our study team often has worked with many of these problems with call-for-service data previously. To identify calls that were canceled en

route, we assumed zero time on scene to account for a significant portion of them. Any call with an on-scene time of less than 30 seconds was labeled *zero on scene*. We also used the information stored within the dispatch records to distinguish between patrol-initiated and other-initiated calls.

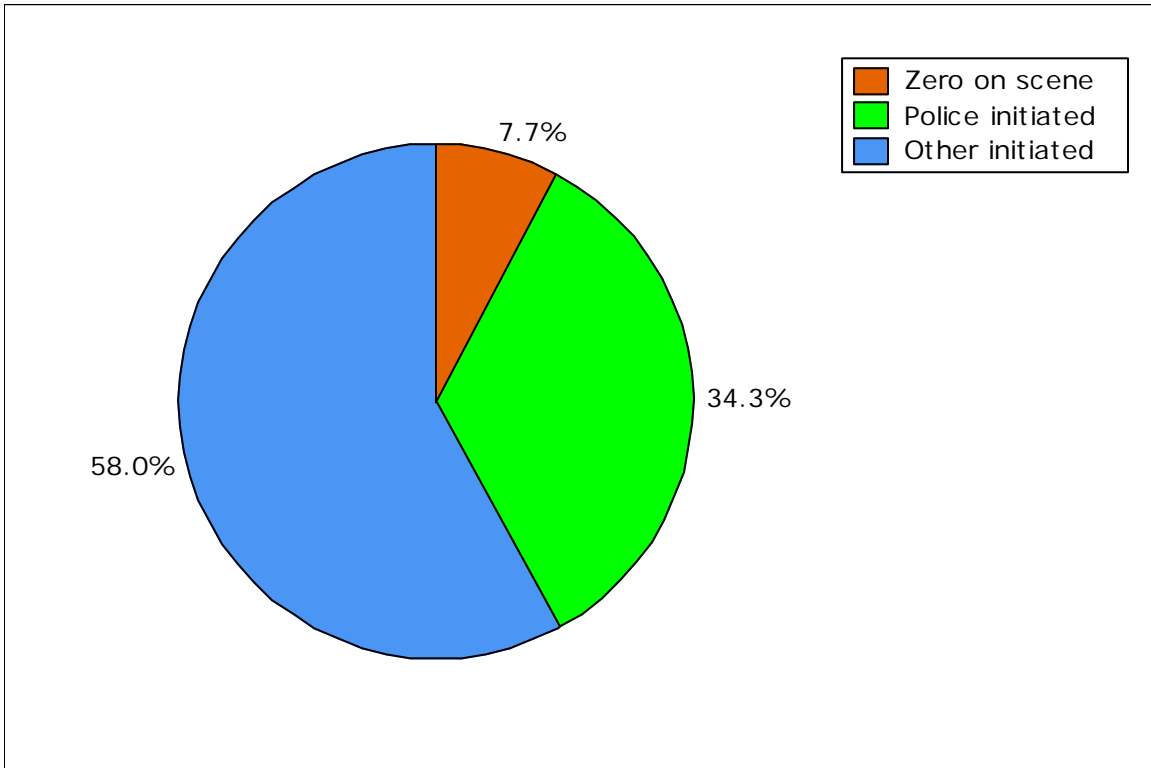
Before describing the workload analysis, we briefly review the data received. In the period from July 2007 to June 2008, there were approximately 30,900 calls for service. Of the total, approximately 30,300 included a patrol unit either as the primary responder or as a secondary unit. When focusing on our 4-week periods, we analyzed 2,492 calls in August and 2,156 calls in February. In addition, when analyzing workloads and response times, we ignored calls with incorrect or missing time data. The inaccuracies included elapsed times that either were negative or exceeded 8 hours. For the entire year, this excluded only 26 calls (less than 0.1%) from our analysis.

In July 2007 to June 2008, the police department reported 83 calls for service per day. As mentioned, about 7.7% of these calls show no officer time spent on the call.

In the following pages we show two types of data: activity and workload. The activity levels are measured by the average number of calls per day, broken down by the type and origin of the calls and categorized by the nature of the calls (e.g., crime, traffic). Workloads are measured in average work-hours per day. Activity levels show calls indicating when a patrol unit was out of service. The following tables use 17 call categories. For the graphs, some of these categories are consolidated to 10 distinct categories. We show our categories chart on the next page.

Table categories	Figure categories
Accidents	Traffic
Traffic enforcement	
Alarm	Investigations
Check/investigation	
Animal calls	General noncriminal
Miscellaneous	
Assist other agency	Assist other agency
Crime—persons	Crime
Crime—property	
Directed patrol	Directed patrol
Disturbance	Suspicious incident
Suspicious person/vehicle	
Juvenile	Juvenile
Out of service—administrative	Out of service
Out of service—personal	
Prisoner—arrest	Arrest
Prisoner—transport	

Figure 1. Percentage Calls per Day, by Initiator



Note. Percentages are based on a total of 30,322 calls.

Table 1. Calls per Day by, Initiator

Initiator	Total calls	Calls per day
Zero on scene	2,335	6.4
Police initiated	10,403	28.5
Other initiated	17,584	48.2
Total	30,322	83.1

Note. Table excludes 1 call with missing time data.

Observations:

- About 7.7% of the calls reported involved zero on-scene time and are included in these numbers as well as the next figure and table. Later, we will exclude calls with zero on-scene time.
- The data records include a large number of patrol-initiated activities: 29 per day, or about 34% of all activities.
- There were a total of 83 calls per day, or 3.5 per hour.

Figure 2. Percentage Calls per Day, by Category

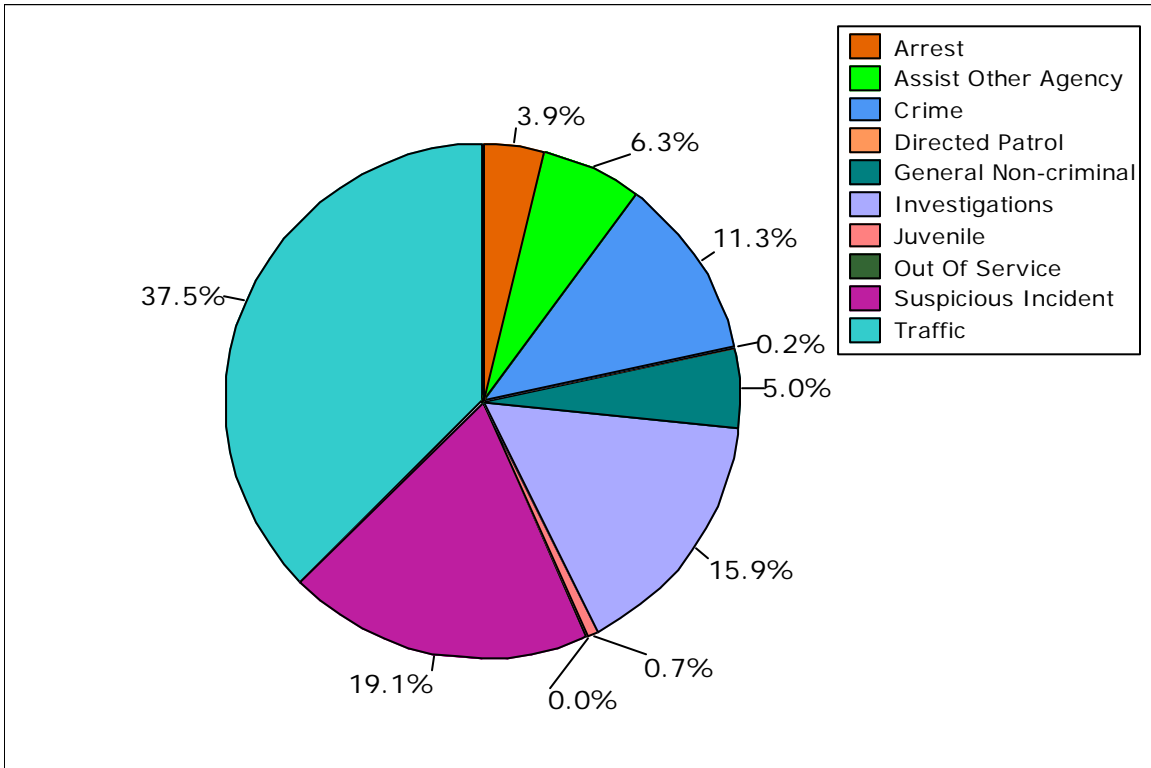


Table 2. Calls per Day, by Category

Category	Total calls	Calls per day
Accidents	2,368	6.5
Alarm	2,553	7.0
Animal calls	359	1.0
Assist other agency	1,921	5.2
Check/investigation	2,278	6.2
Crime—persons	1,310	3.6
Crime—property	2,123	5.8
Directed patrol	67	0.2
Disturbance	2,722	7.4
Juvenile	222	0.6
Miscellaneous	1,146	3.1
Out of service—administrative	12	0.0
Out of service—personal	2	0.0
Prisoner—arrest	249	0.7
Prisoner—transport	924	2.5
Suspicious person/vehicle	3,072	8.4
Traffic enforcement	8,994	24.6
Total	30,322	82.8

Observations:

- Four categories (traffic, suspicious incident, investigations, and crime) accounted for 84% of activities.
- 38% of calls were traffic related.
- 16% were investigations.
- 11% of calls involved crimes.
- 19% involved suspicious activities, including general disturbances.
- Few out-of-service activities, such as breaks, were recorded in the dispatch data.

Figure 3. Percentage Nonzero Calls per Day, by Category

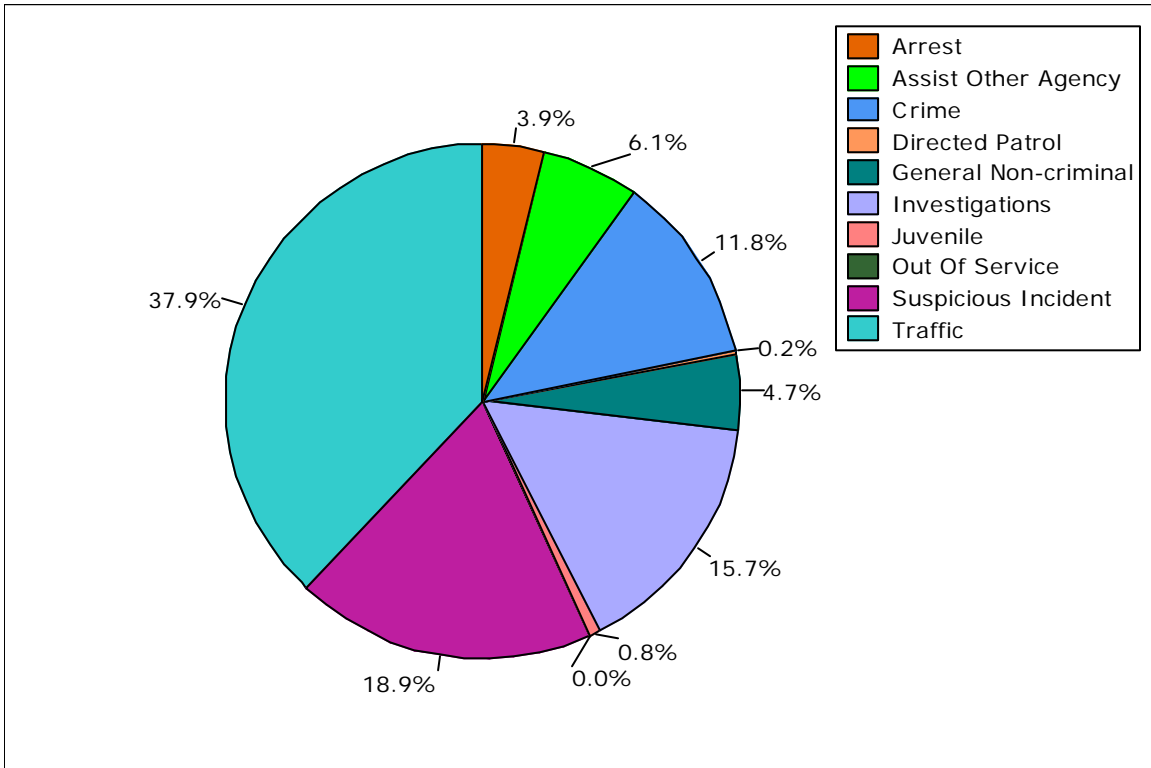


Table 3. Nonzero Calls per Day, by Category

Category	Total calls	Calls per day
Accidents	2,297	6.3
Alarm	2,322	6.3
Animal calls	311	0.8
Assist other agency	1,718	4.7
Check/investigation	2,063	5.6
Crime—persons	1,271	3.5
Crime—property	2,030	5.5
Directed patrol	66	0.2
Disturbance	2,454	6.7
Juvenile	211	0.6
Miscellaneous	1,013	2.8
Out of service—administrative	10	0.0
Out of service—personal	2	0.0
Prisoner—arrest	236	0.6
Prisoner—transport	846	2.3
Suspicious person/vehicle	2,823	7.7
Traffic enforcement	8,314	22.7
Total	27,987	76.5

Observations:

- When zero-on-scene calls and out-of-service calls are excluded, there are only 77 calls per day, or 7.2 per hour.
- The top four categories and their percentages remain essentially unchanged.

Figure 4. Calls per Day, by Initiator and by Months

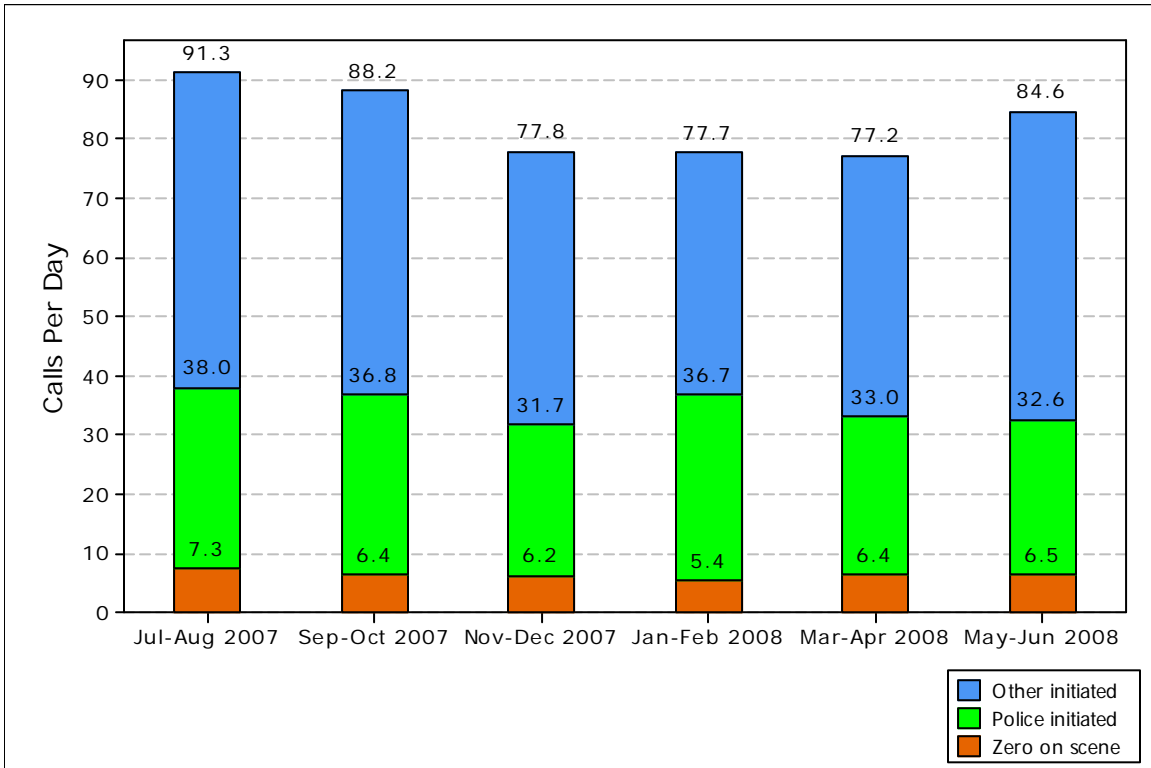


Table 4. Calls per Day, by Initiator and by Months (July 2007 to June 2008)

Initiator	Jul-Aug	Sep-Oct	Nov-Dec	Jan-Feb	Mar-Apr	May-Jun
Zero on scene	7.3	6.4	6.2	5.4	6.4	6.5
Police initiated	30.6	30.4	25.4	31.3	26.6	26.1
Other initiated	53.3	51.4	46.1	41.0	44.2	52.0
Total	91.3	88.2	77.8	77.7	77.2	84.6

Observations:

- The number of calls was largest from July to August.
- The number of calls was technically the smallest from March to April but essentially the same from November through April.
- The largest months had 18% more calls than the smallest.

Figure 5. Calls per Day, by Category and by Months

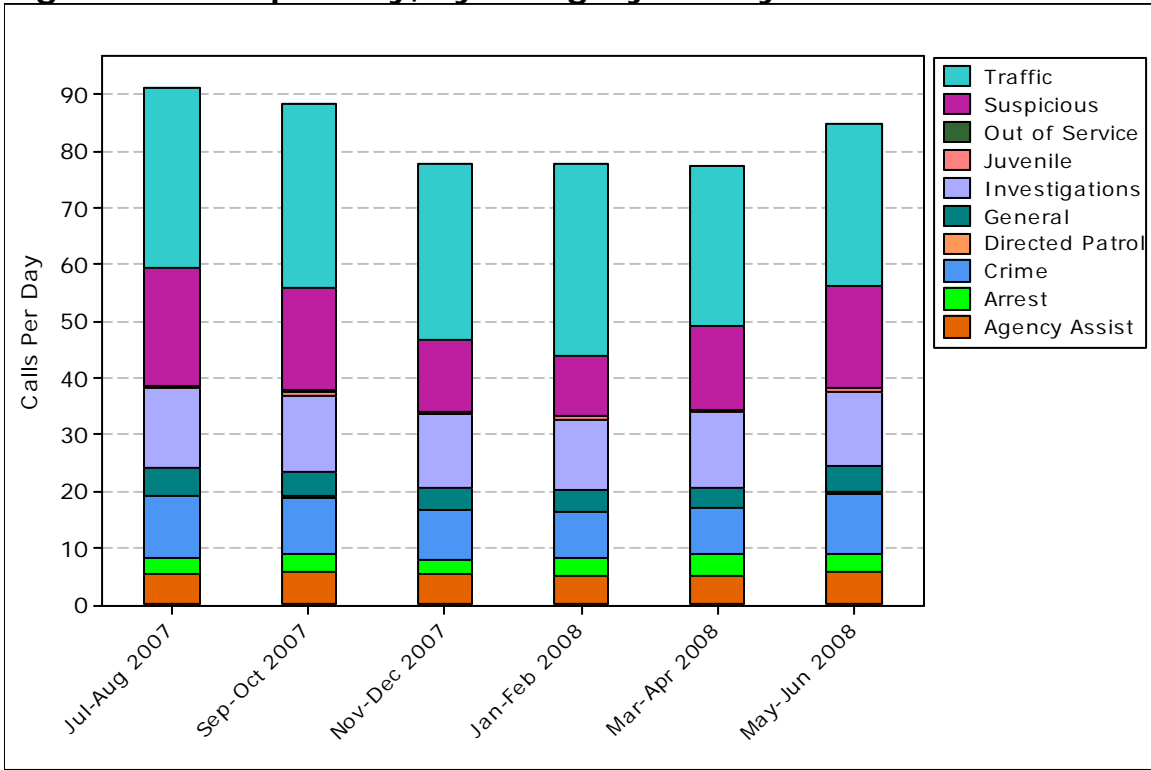


Table 5. Calls per Day, by Category and by Months

Category	Jul-Aug	Sep-Oct	Nov-Dec	Jan-Feb	Mar-Apr	May-Jun
Accidents	6.0	6.8	7.2	6.4	5.9	6.4
Alarm	7.0	6.8	7.3	6.8	6.8	7.1
Animal calls	1.4	1.1	0.7	0.7	0.9	1.1
Assist other agency	5.2	5.5	5.1	5.0	5.1	5.5
Check/investigation	7.1	6.7	5.7	5.5	6.3	6.0
Crime—persons	3.6	4.0	3.3	3.2	3.4	4.0
Crime—property	7.1	5.9	5.4	4.9	4.8	6.7
Directed patrol	0.2	0.1	0.1	0.1	0.2	0.3
Disturbance	10.1	8.7	5.6	4.9	6.3	9.0
Juvenile	0.5	1.0	0.3	0.6	0.5	0.7
Miscellaneous	3.5	3.1	3.1	3.3	2.7	3.3
Out of service—administrative	0.0	0.1	0.0	0.1	0.1	0.0
Out of service—personal	0.0	0.0	0.0	0.0	0.0	0.0
Prisoner—arrest	0.8	0.8	0.6	0.4	0.8	0.7
Prisoner—transport	2.2	2.7	2.0	2.6	2.8	2.7
Suspicious person/vehicle	10.6	9.4	7.2	5.9	8.4	8.9
Traffic enforcement	25.9	25.7	24.1	27.4	22.3	22.1
Total	91.3	88.2	77.8	77.7	77.2	84.6

Observations:

- Traffic-related calls were the most common type of call throughout the year.
- In combination, traffic-related calls (enforcement and accidents) and suspicious incidents (persons and disturbances) per day were consistently more than 55% of all calls.
- Crime calls vary between 8 (Jan-Apr) and 11 (May-Aug) per day throughout the year.
- Investigations (checks and disturbances) vary from 12 (Jan-Feb) to 14 (Jul-Aug) calls per day throughout the year.

Figure 6. Average Busy Times, by Category and Initiator

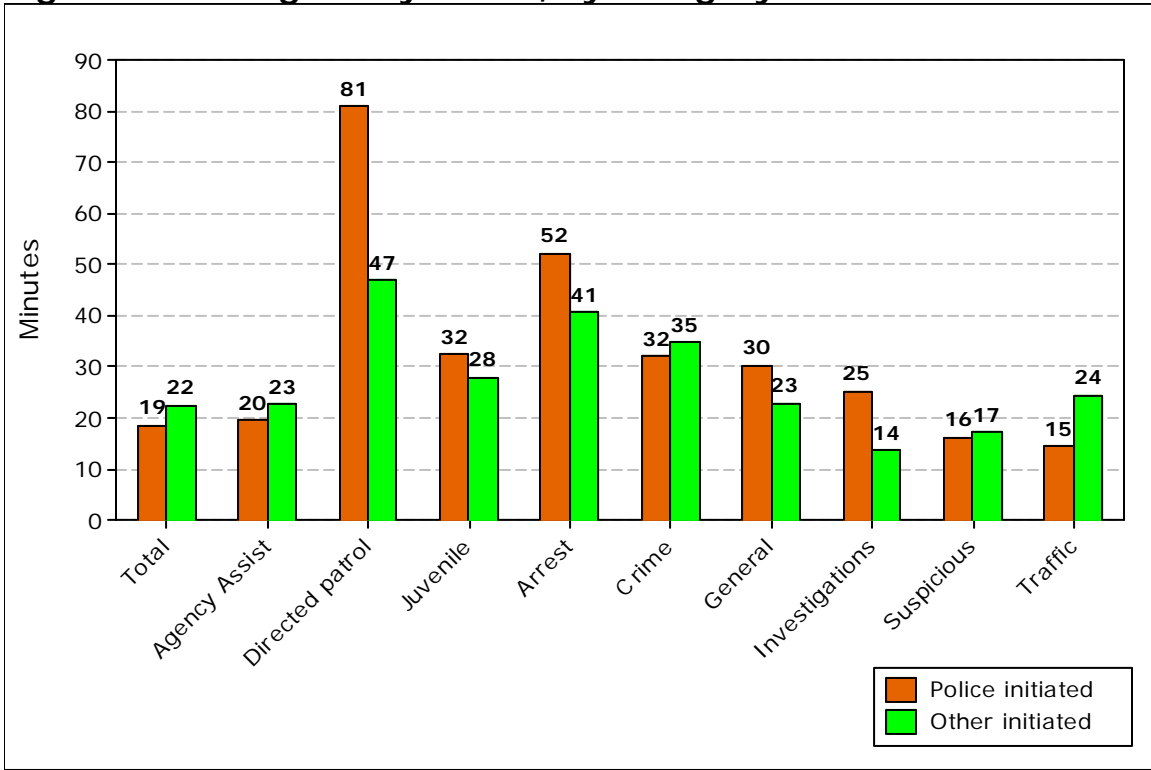


Table 6. Average Busy Times, by Category and Initiator

Category	Police initiated		Other initiated	
	Total calls	Minutes	Total calls	Minutes
Accidents	287	29.0	2,006	30.1
Alarm	51	5.9	2,271	8.1
Animal calls	30	18.9	281	16.3
Assist other agency	317	19.5	1,401	22.6
Check/investigation	435	27.5	1,628	21.5
Crime—persons	30	28.7	1,241	34.9
Crime—property	66	33.4	1,964	34.8
Directed patrol	52	80.9	13	46.8
Disturbance	161	19.9	2,293	16.8
Juvenile	12	32.3	199	28.0
Miscellaneous	127	33.0	886	24.8
Prisoner—arrest	160	32.7	76	44.1
Prisoner—transport	493	58.4	353	39.8
Suspicious person/vehicle	1,083	15.5	1,739	17.6
Traffic enforcement	7,086	13.9	1,228	15.1
Total	10,401	18.5	17,580	22.5

Note. Figure 6 and Table 6 exclude zero-on-scene calls.

Observations:

- Average time spent on a call was between 6 and 81 minutes overall, with significant variation by call type.
- The longest average times spent were 81 minutes on police-initiated directed patrols.
- Police-initiated traffic-related calls averaged 15 minutes per call, whereas other-initiated traffic calls averaged 24 minutes.
- Crime calls averaged 32 minutes for police-initiated calls and 35 minutes for other-initiated calls.

Figure 7. Number of Responding Units, by Initiator and Category

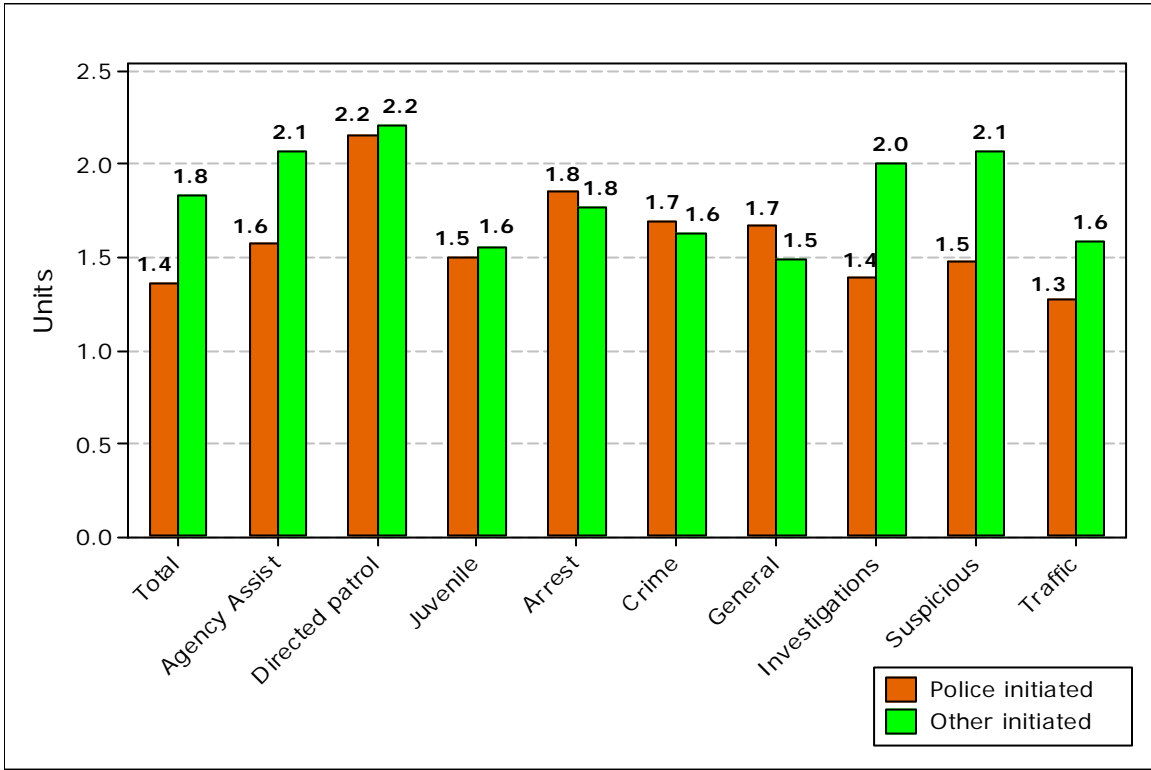


Table 7. Number of Responding Units, by Initiator and Category

Category	Police initiated		Other initiated	
	Average	Total calls	Average	Total calls
Accidents	1.8	288	1.7	2,008
Alarm	1.6	51	2.2	2,271
Animal calls	1.3	30	1.2	281
Assist other agency	1.6	317	2.1	1,392
Check/investigation	1.4	435	1.8	1,628
Crime—persons	2.2	30	1.9	1,241
Crime—property	1.5	66	1.4	1,964
Directed patrol	2.2	52	2.2	14
Disturbance	1.7	161	2.2	2,292
Juvenile	1.5	12	1.6	199
Miscellaneous	1.8	127	1.6	886
Prisoner—arrest	1.8	160	2.3	76
Prisoner—transport	1.9	493	1.7	353
Suspicious person/vehicle	1.4	1,084	1.9	1,739
Traffic enforcement	1.2	7,085	1.3	1,228
Total	1.4	10,402	1.8	17,573

Figure 8. Number of Units Responding, by Category

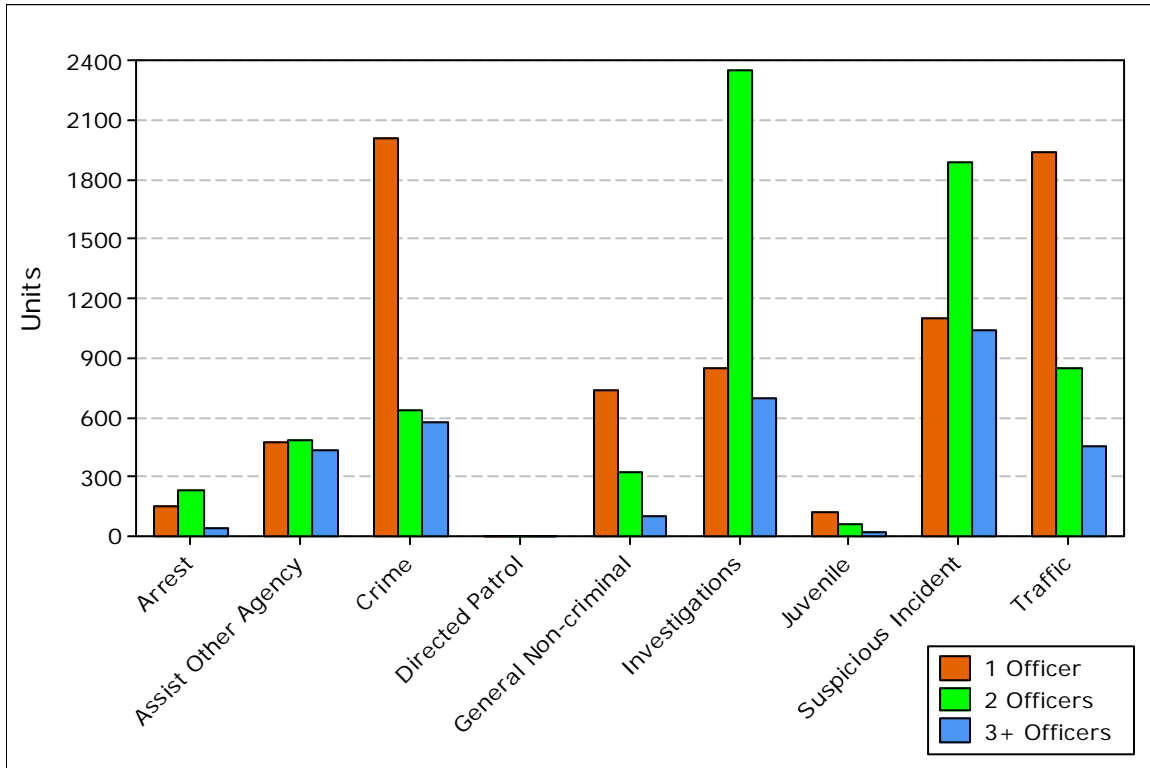


Table 8. Number of Units Responding, by Category

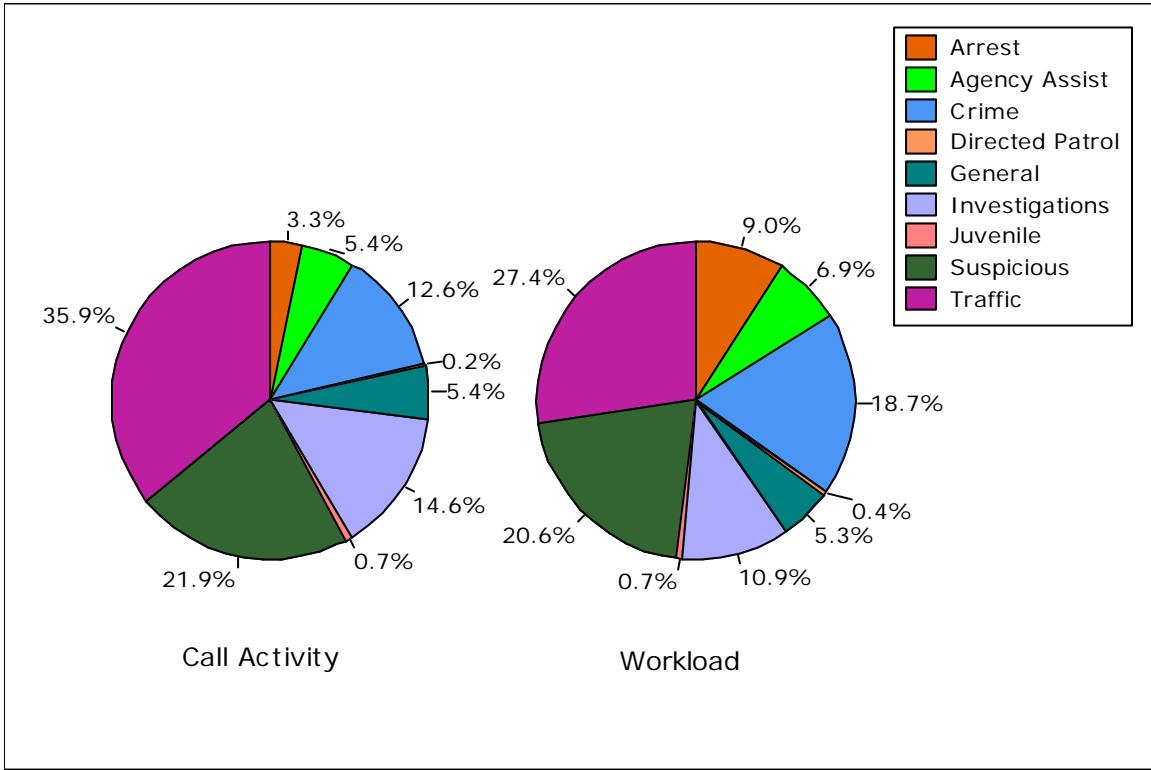
Category	Responding units		
	One	Two	Three or more
Accidents	1,065	555	388
Alarm	145	1,720	406
Animal calls	228	44	9
Assist other agency	477	483	432
Check/investigation	707	631	290
Crime—persons	610	276	355
Crime—property	1,392	355	217
Directed patrol	5	4	5
Disturbance	521	1,091	680
Juvenile	117	59	23
Miscellaneous	509	282	95
Prisoner—arrest	7	48	21
Prisoner—transport	149	181	23
Suspicious person/vehicle	583	798	358
Traffic enforcement	875	291	62
Total	7,390	6,819	3,364

Note. Figure 8 and Table 8 include other-initiated calls.

Observations:

- The overall mean number of responding units was 1.4 for police-initiated calls and 1.8 for other-initiated calls.
- The mean number of responding units is always between 1.2 and 2.3, with a maximum for other-initiated arrests.
- The number of responding units was also high for calls involving crimes against persons, with an average 2.2 units per call for police-initiated calls and 1.9 units for other-initiated calls.
- About an equal number of calls involved one responding unit (42%) or two responding units (39%).
- Overall, more calls involved multiple units (58%) than a single unit.
- The largest group of calls with three or more responding units involved suspicious incidents.

Figure 9. Percentage Calls and Work-hours, by Category, in August 2007



Note. Calculations include only nonzero on-scene calls.

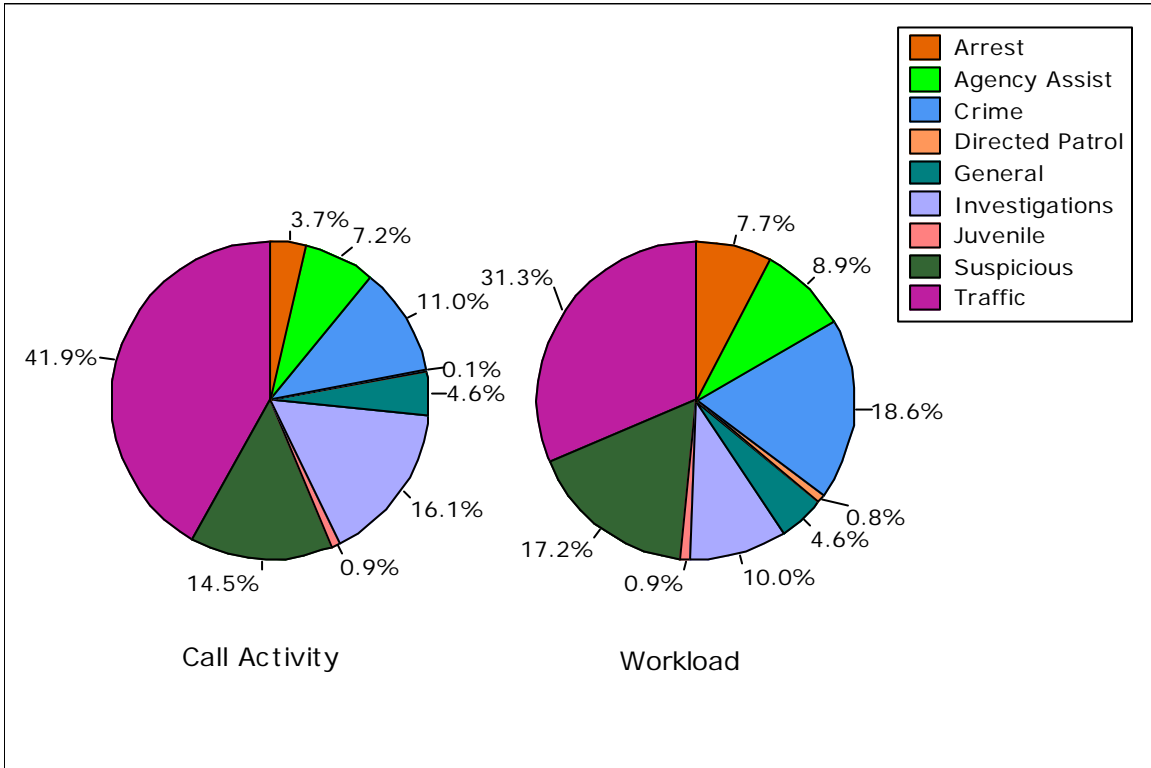
Table 9. Calls and Work-hours per Day, by Category, in August 2007

Category	Per day	
	Calls	Work-hours
Arrest	2.7	4.0
Assist other agency	4.4	3.0
Crime	10.3	8.3
Directed patrol	0.2	0.2
General Noncriminal	4.4	2.3
Investigations	11.9	4.8
Juvenile	0.6	0.3
Suspicious incident	18.0	9.1
Traffic	29.4	12.1
Total	81.9	44.1

Observations:

- Total calls were 81.9 per day, or 3.4 per hour.
- Total workload was 44.1 work-hours per day, or 1.8 personnel per hour.
- Traffic-related events constituted 36% of calls but only 27% of workload.
- Crimes constituted 13% of calls but 19% of workload.
- Investigations, including premise checks, were 15% of calls and 11% of workload.
- Suspicious incidents were 22% of calls and 21% of workload.

Figure 10. Percentage Calls and Work-hours, by Category, in February 2008



Note. Calculations includes only nonzero on-scene calls.

Table 10. Calls and Work-hours per Day, by Category, in February 2008

Category	Per day	
	Calls	Work-hours
Arrest	2.6	2.7
Assist other agency	5.1	3.1
Crime	7.9	6.4
Directed patrol	0.1	0.3
General Noncriminal	3.3	1.6
Investigations	11.5	3.5
Juvenile	0.6	0.3
Suspicious incident	10.4	6.0
Traffic	29.9	10.8
Total	71.3	34.7

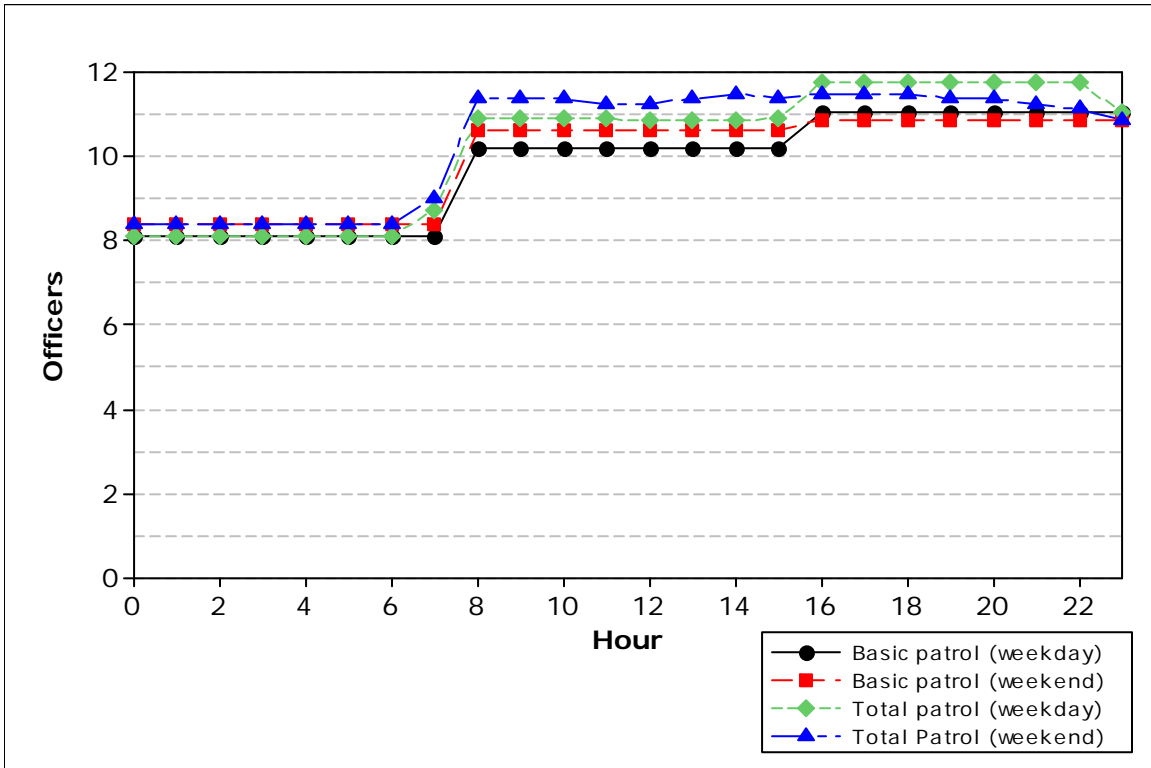
Observations:

- In February, the total calls and workload were lower than in August.
- Total calls were 71 per day, or 3.0 per hour. This was 13% lower than in August.
- Total workload was 34.7 work-hours per day, or 1.4 personnel per hour. This was 21% lower than in August.
- Traffic-related events constituted 42% of calls but only 31% of workload.
- Crimes constituted 11% of calls but 19% of workload.
- Investigations, including premise checks, were 16% of calls and 10% of workload.
- Suspicious incidents, including disturbances, were 15% of calls and 17% of workload.

IV. Deployment

The department operates with three 8-hour shifts starting at 7:45 AM (morning shift), 3:45 PM (afternoon shift), and 11:45 PM (night shift). Along with regular patrol officers, the department had additional officers performing patrol-related duties. These include units assigned to traffic enforcement and school resource officers. The patrol unit included officers and supervisors. We included all officers and supervisors from the rank of sergeant and below within our analysis. The department deployed an average of 9.9 patrol officers during the 24 hour day in both August 2007 and February 2008. When including the additional units, the department deployed an average of 10.3 and 10.9 officers during the 24-hour day in August 2007 and February 2008, respectively. The deployment varied slightly by season and slightly between weekends and weekdays. It varied much more by time of day.

Figure 11. Deployed Officers, by Day of Week, in August 2007



Observations:

- The average patrol deployment was approximately 10 patrol officers during the week and on weekends.
- During the day, deployment reached as high as 11 officers and dropped as low as 8 officers.
- When additional units (e.g., traffic) were added, the deployment rose slightly both on weekends and weekdays.
- Average total deployed officers rose as high as 12 officers both during the week and on weekends.

Figure 12. Deployment versus Workload on Weekdays in August 2007

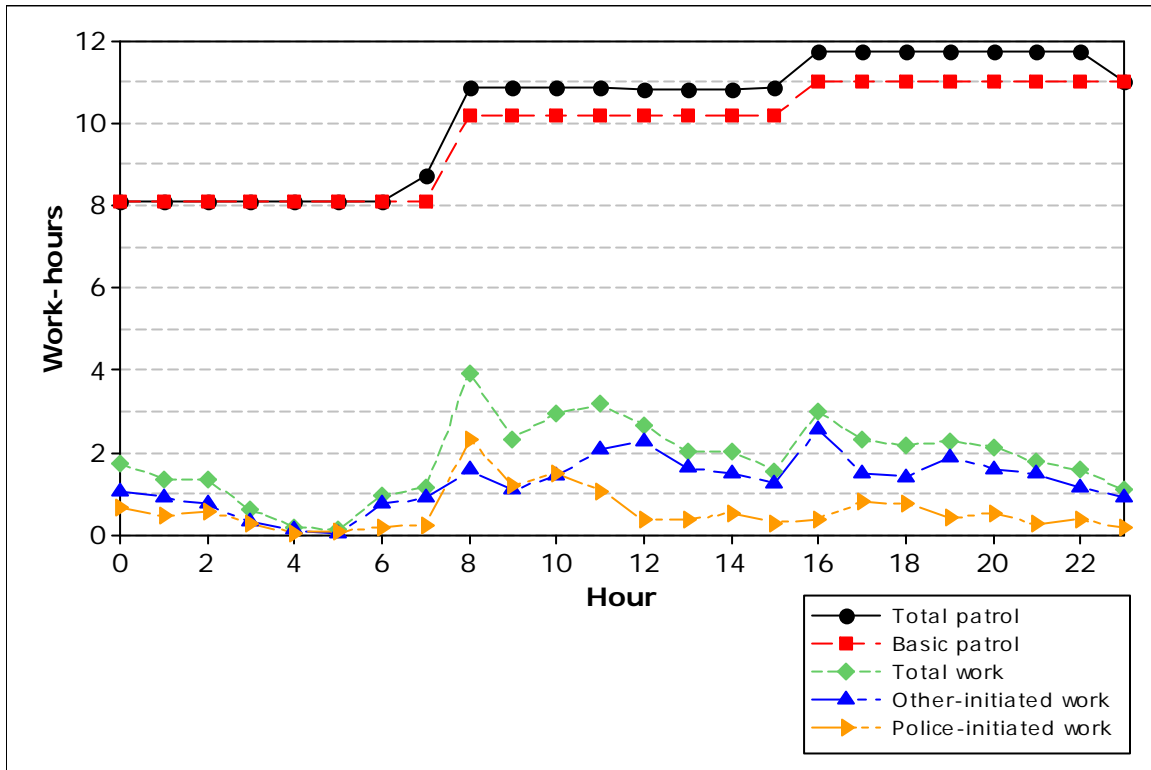
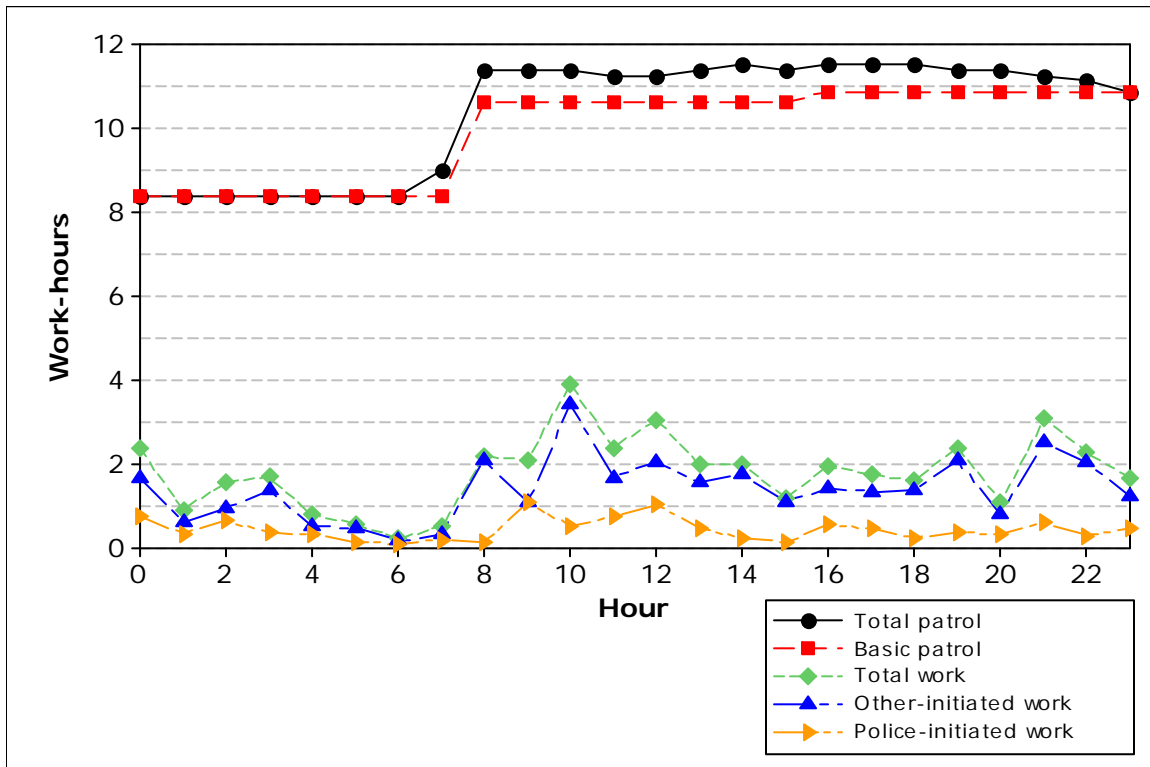


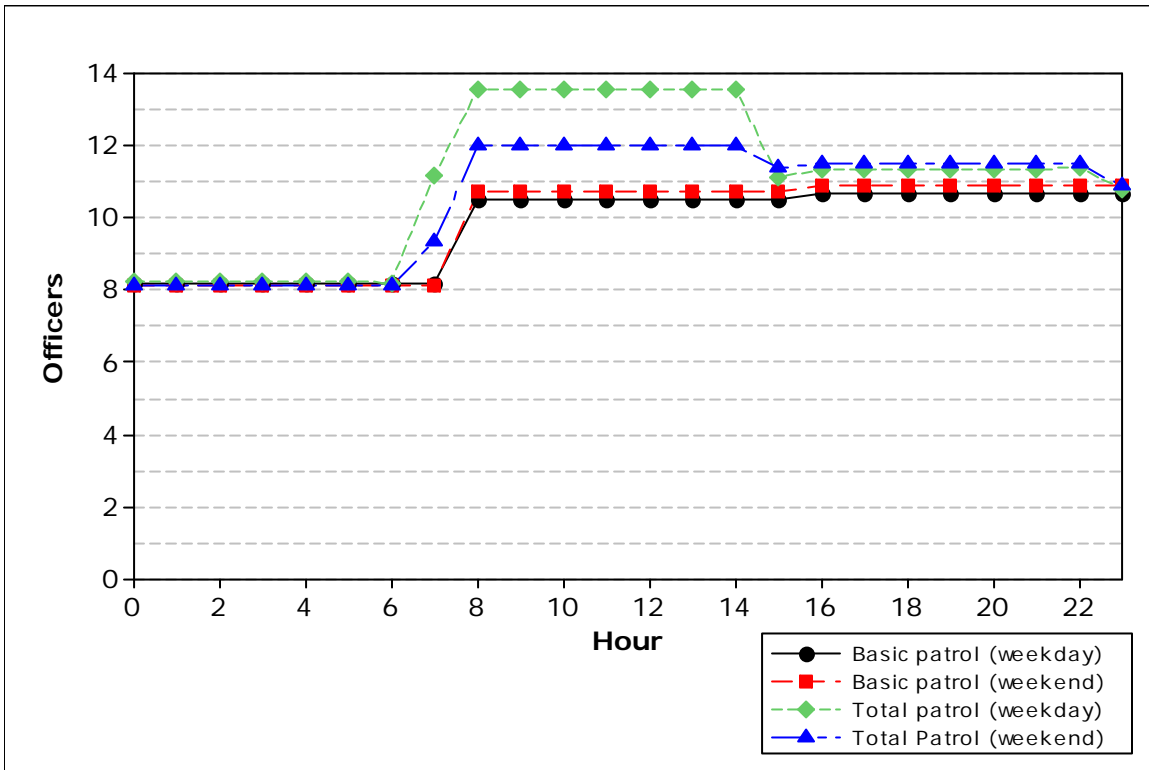
Figure 13. Deployment vs. Workload on Weekends in Aug. 2007



Observations:

- During the week, patrol workload averaged 1.9 personnel per hour.
- This was 19% of basic deployment and 18% of total deployment. This means that patrol officers spent 18–19% of their time on patrol-related activities.
- During the week, patrol workload dropped as low as 2% of total deployment between 5 AM and 6 AM and as high as 36% of total deployment between 8 AM and 9 AM.
- On the weekends, patrol workload averaged 1.8 personnel per hour (18% of basic deployment and 17% of total deployment).
- On the weekends, the patrol workload dropped as low as 2% of total deployment between 6 AM and 7 AM and rose as high as 34% of total deployment between 10 AM and 11 AM.

Figure 14. Deployed Officers, by Day of Week, in February 2008



Observations:

- The number of officers deployed was higher in February than in August.
- There was an average of 10 officers deployed both during the week and on weekends.
- Basic deployment varied between 8 and 11 officers both during the week and on weekends.
- When additional units (traffic and school resource officers) were added, the deployment rose more than in August.
- Total deployment reached a maximum of 14 officers during the week and 12 officers on weekends.
- The average total deployment was 11 officers both during the week and on weekends.

Figure 15. Deployment versus Workload on Weekdays in February 2008

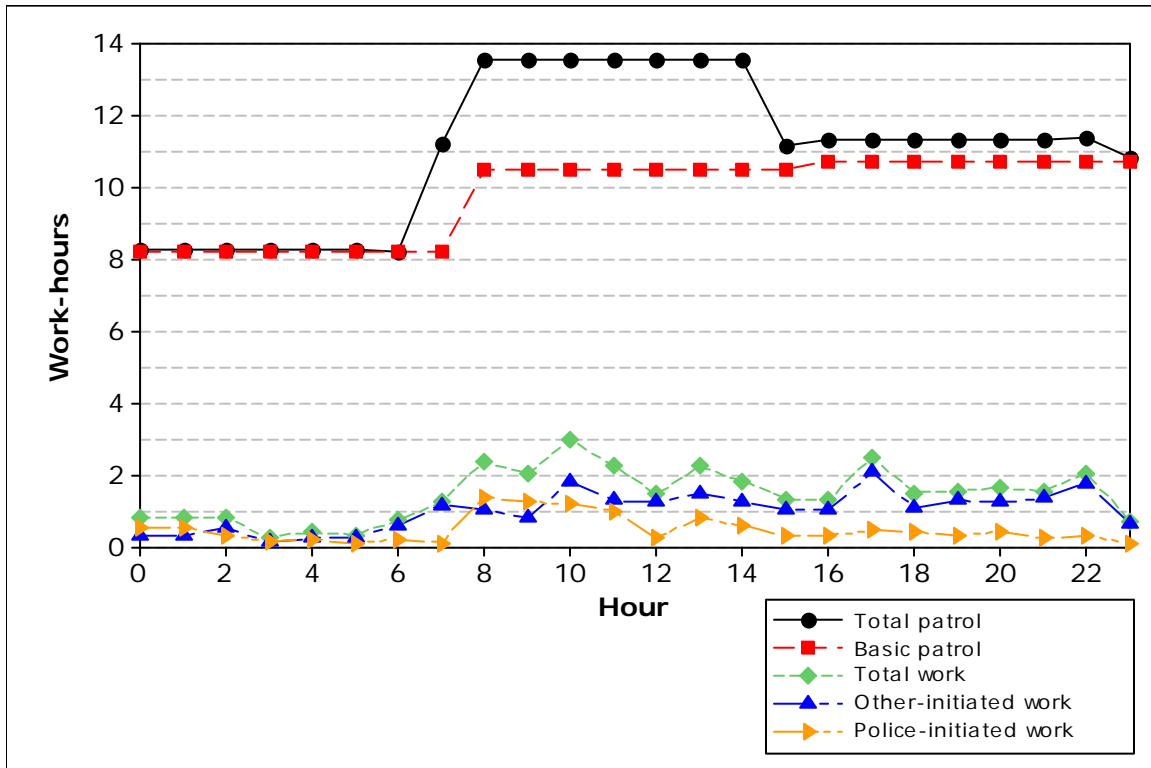
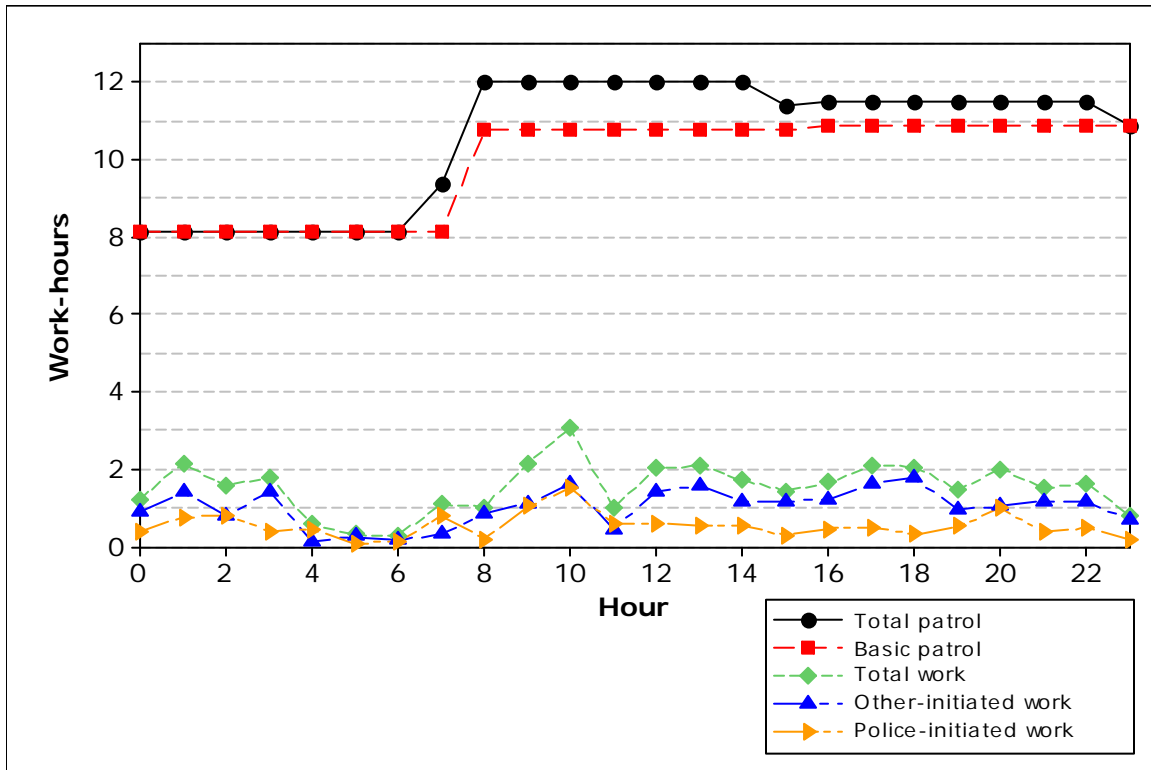


Figure 16. Deployment versus Workload on Weekends in February 2008



Observations:

- When out-of-service calls are included, during the week, the total nearly matches deployment between 1 PM and 2 PM.
- During the week, patrol workload averaged 1.4 personnel per hour.
- This was 14% of basic deployment and 13% of total deployment. This means that patrol officers spent 13–14% of their time on patrol-related activities.
- During the week, patrol workload dropped as low as 3% of total deployment between 5 AM and 6 AM and rose as high as 22% of total deployment between 10 AM and 11 AM and between 5 PM and 6 PM.

- On the weekends, patrol workload averaged 1.5 personnel per hour.
- This was 15% of basic deployment and 14% of total deployment.
- On the weekends, the patrol workload dropped as low as 3% of total deployment at between 6 AM and 7 AM and rose as high as 26% of total deployment between 1 AM and 2 AM and between 10 AM and 11 AM.

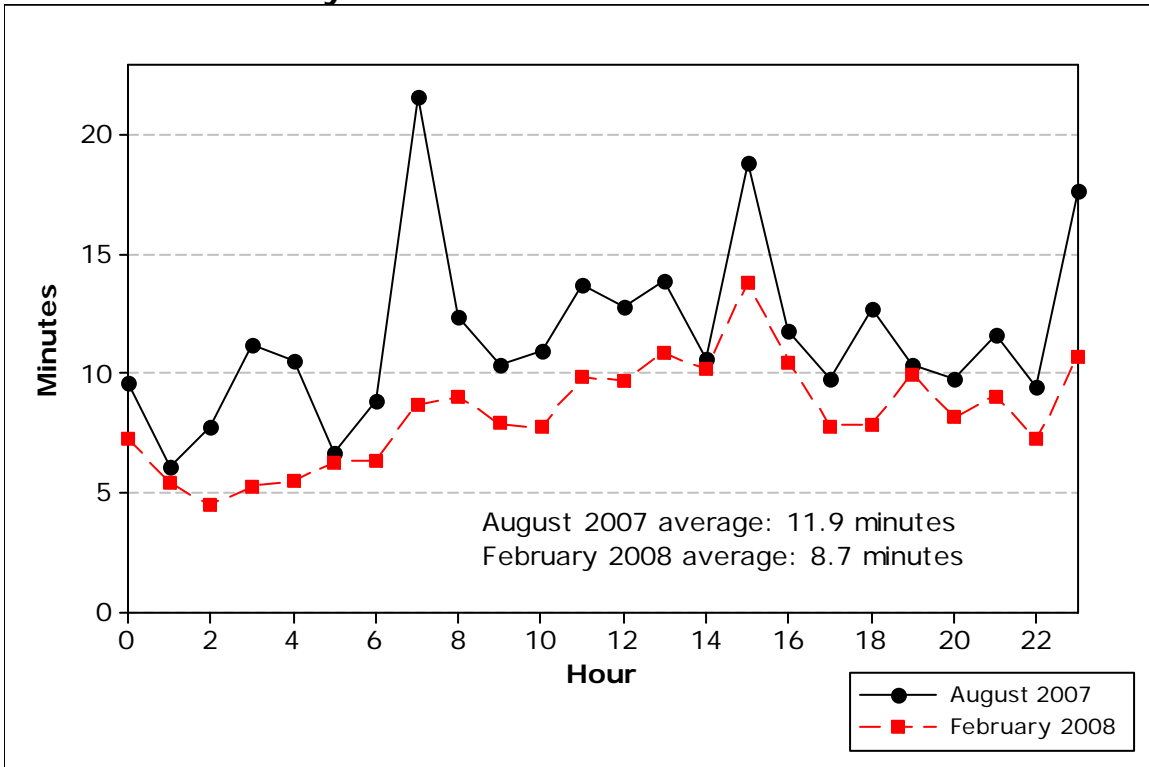
V. Response Times

We analyzed the response times to various types of calls, separating the duration into dispatch and travel times. We begin the discussion with statistics that include all calls combined. Later, we report on the much lower response times for high-priority calls. We analyzed several types of calls to determine whether response times varied by call type. To better understand the response time issue, the study team calculated the cumulative distribution function (CDF) of response time for three types of calls. We calculated the dispatch delay, travel time, and the total response time.

Before presenting the specific figures and tables, we summarize all of the observations. We started with 2,492 and 2,156 calls for August 2007 and February 2008, respectively. We limited our analysis to calls that were other-initiated with nonzero on-scene times. We also encountered a number of calls without arrival times that we were forced to exclude from our analysis due to lack of information. This left 1,352 calls in August 2007 and 1,062 calls in February 2008.

After the overall statistics, we present an analysis based on the priority codes provided within the data. We focus on high-priority calls for the entire year. The response times for these are significantly shorter.

Figure 17. Average Response Time, by Hour of Day, for August 2007 and February 2008



Observations:

- Average response times vary significantly by hour of day.
- The overall average is 3 minutes shorter in February than in August.
- In August, the longest response times are between 7 AM and 8 AM, with an average of 21.6 minutes, primarily due to large dispatch delays. Similar long response times are found at every hour when a shift changes, including 3 PM and 11 PM.
- In August, the shortest response times are between 1 AM and 2 AM, with an average of 6.1 minutes.
- In February, the longest response times are between 3 PM and 4 PM, with an average of 13.8 minutes, and the shortest response times are between 2 AM and 3 AM, with an average of 4.5 minutes.

A. Reading the Cumulative Distribution Function (CDF) Chart

The vertical axis is the probability or percentage of calls. The horizontal axis is time of dispatch delay, travel time, or total response time. For example, approximately 80% of February's calls experienced a dispatch delay of 6 minutes or less. (The 80% line intersects the red curve at the 6-minute mark.) A similar percentage of August calls experienced a dispatch delay of 10 minutes or less. When comparing different CDF lines, a higher graph represents a larger percentage of low values. Figures 18 through 20 show that the dispatch delay, travel time, and response time graphs are consistently higher for February 2008 than for August 2007. This indicates that times are consistently shorter February than in August.

Figure 18. Dispatch Delay Cumulative Distribution Function

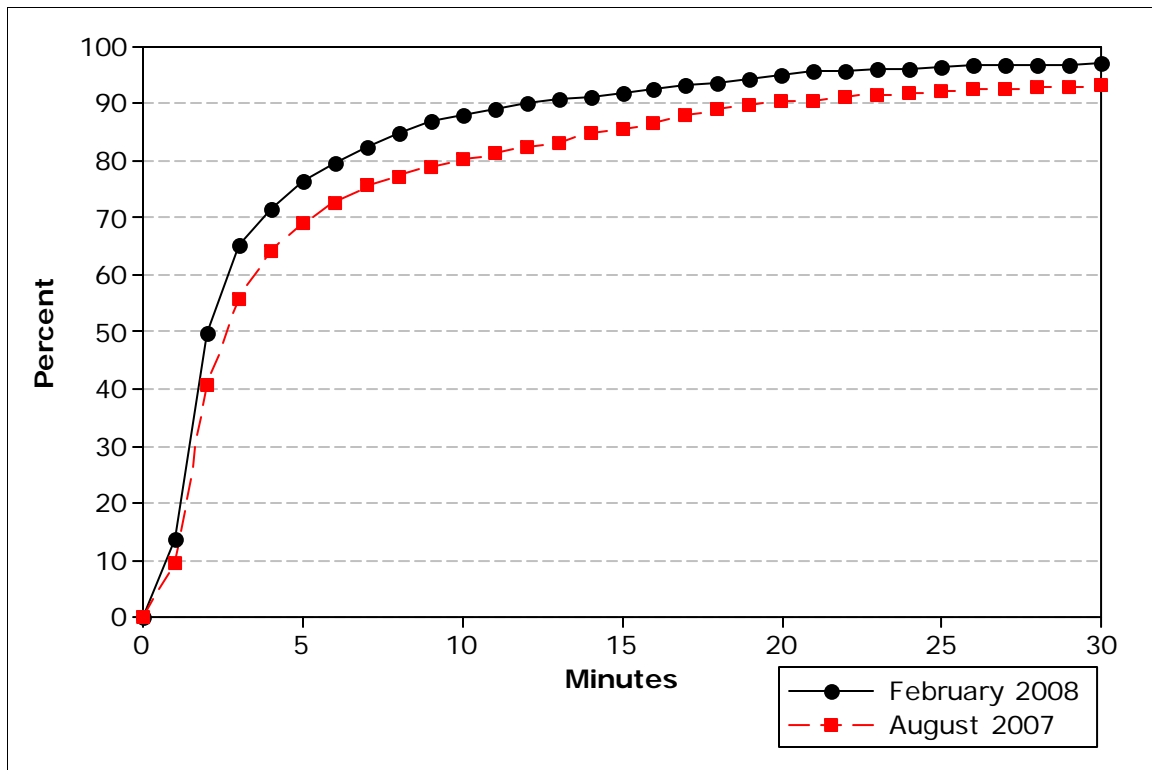


Figure 19. Travel Time Cumulative Distribution Function

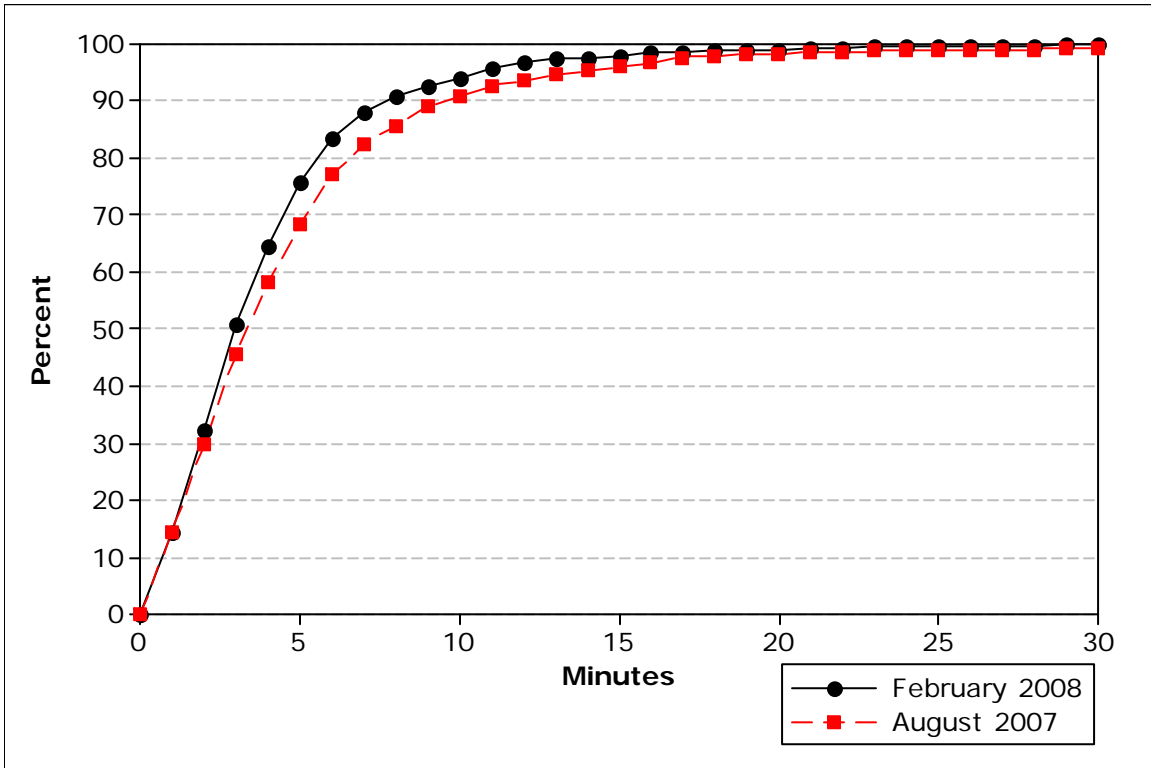


Figure 20. Response Time Cumulative Distribution Function

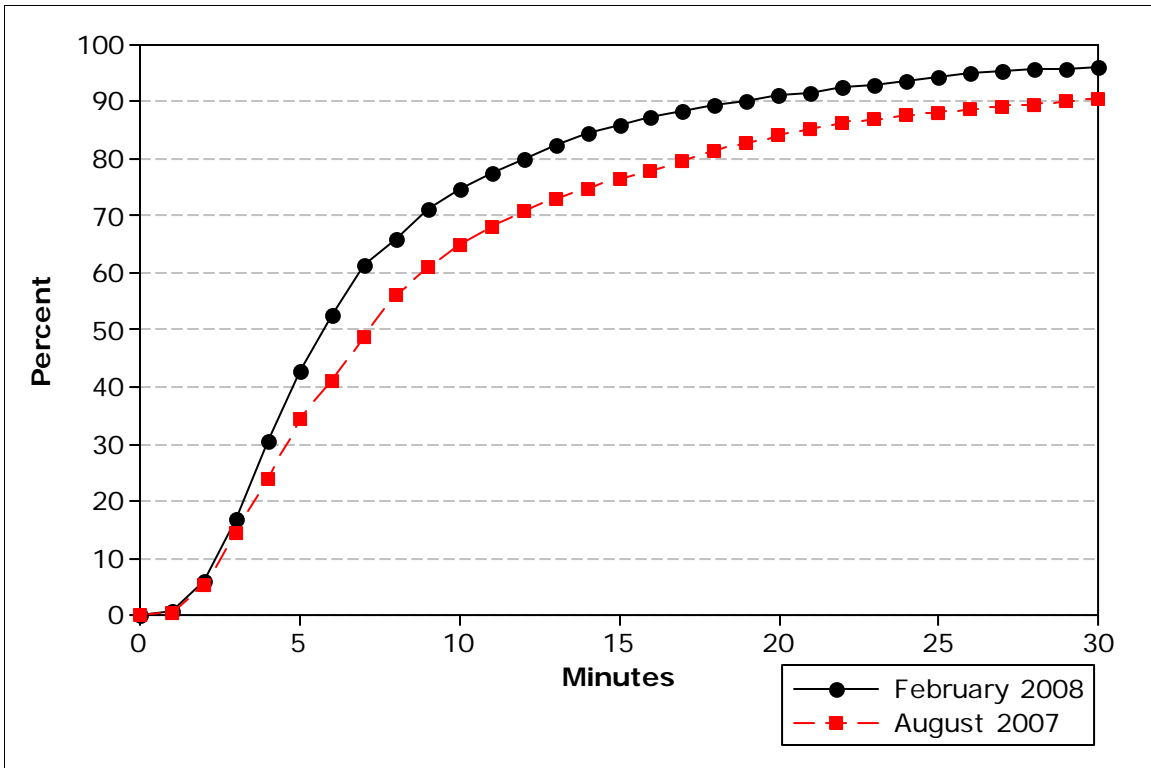


Figure 21. Average Dispatch, Travel, and Response Times in August 2007

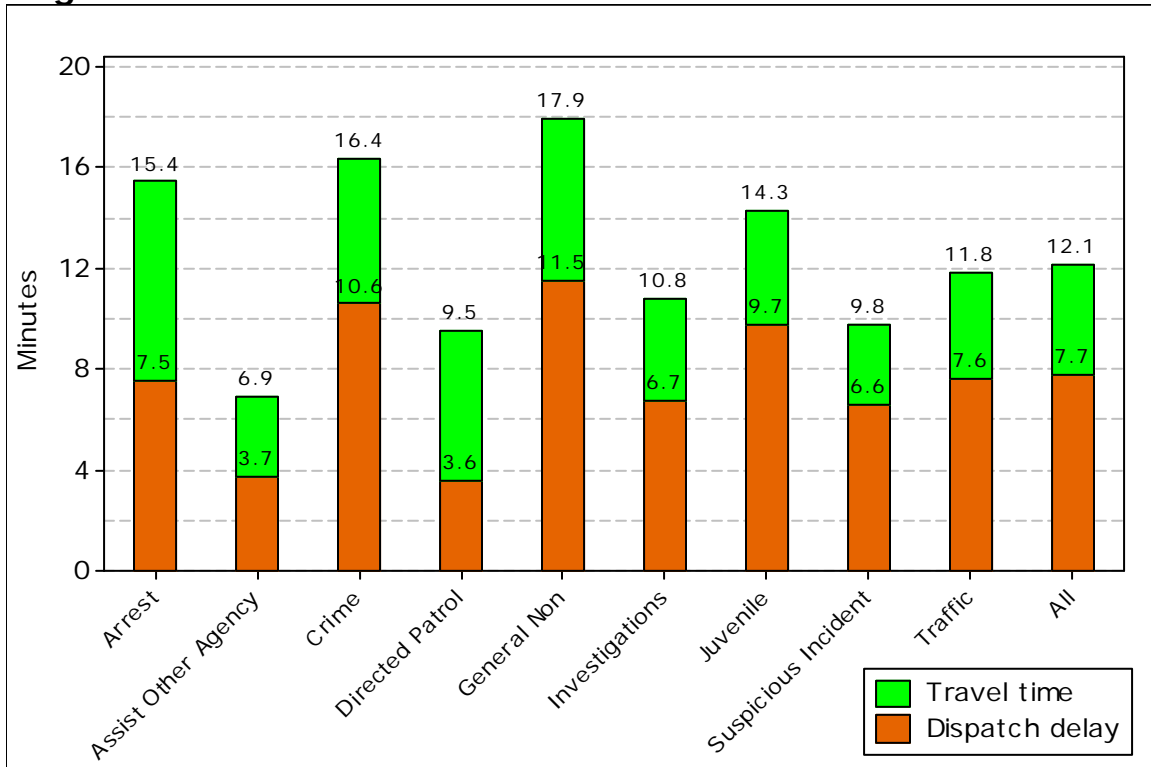


Figure 22. Average Dispatch, Travel, and Response Times in February 2008

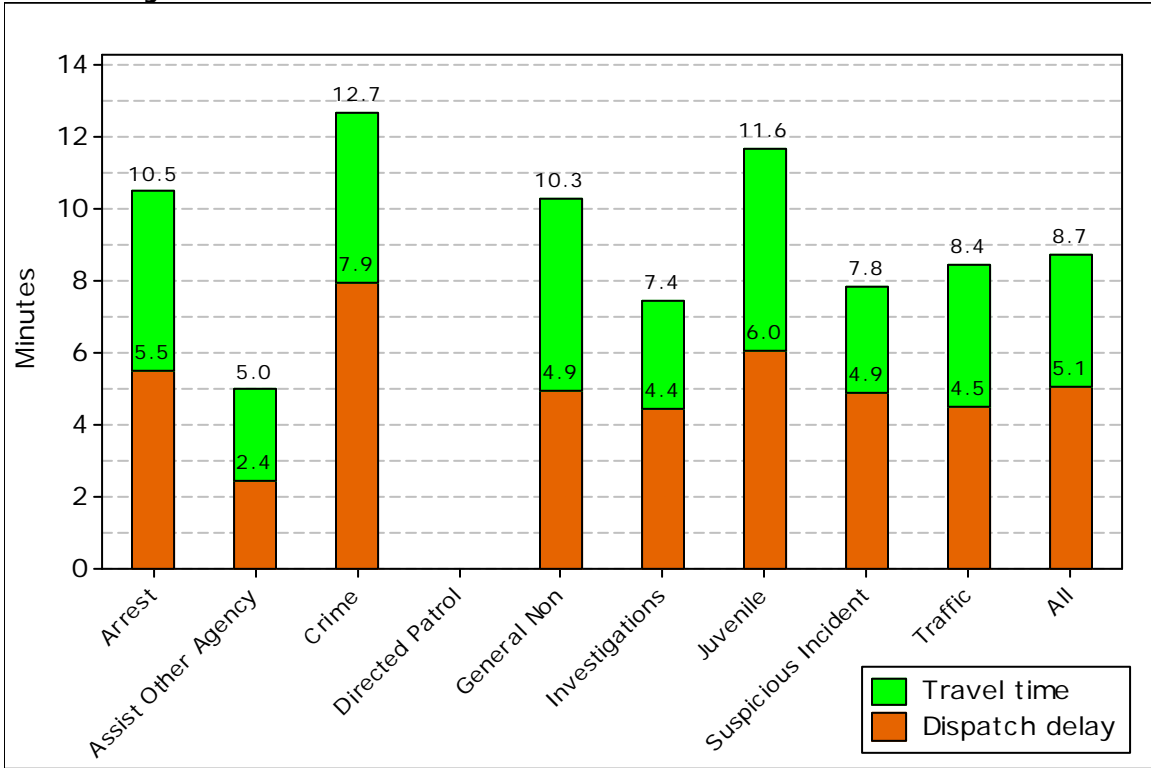


Table 11. Average Dispatch, Travel, and Response Times, by Category

Category	August 2007			February 2008		
	Dispatch	Travel	Response	Dispatch	Travel	Response
Arrest	7.5	7.9	15.4	5.5	5.0	10.5
Agency assist	3.7	3.1	6.9	2.4	2.5	5.0
Crime	10.6	5.8	16.0	7.9	4.7	12.7
Directed patrol	3.6	6.0	9.5	N/A	N/A	N/A
General	11.5	6.4	17.2	4.9	5.3	10.3
Investigations	6.7	4.0	10.8	4.4	3.0	7.4
Juvenile	9.7	4.6	13.8	6.0	5.6	11.6
Suspicious	6.6	3.2	9.7	4.9	3.0	7.8
Traffic	7.6	4.2	11.6	4.5	3.9	8.4
Total	7.7	4.4	11.9	5.1	3.7	8.7

Table 12. 90th Percentile Dispatch, Travel, and Response Times, by Category

Category	August 2007			February 2008		
	Dispatch	Travel	Response	Dispatch	Travel	Response
Arrest	24.7	16.8	40.6	17.1	14.6	25.0
Agency assist	7.3	7.9	16.1	4.4	5.3	9.2
Crime	34.4	12.2	41.3	22.2	10.3	30.1
Directed patrol	5.6	7.3	13.0	N/A	N/A	N/A
General	40.0	10.2	44.5	11.5	11.7	19.1
Investigations	16.7	8.2	22.4	9.3	5.5	14.3
Juvenile	33.9	10.5	39.0	27.5	12.3	35.8
Suspicious	16.9	6.5	22.1	13.1	6.2	19.5
Traffic	19.7	8.8	27.2	11.1	7.7	17.6
Total	20.2	9.1	28.9	12.1	7.5	18.6

Observations:

- Response times varied significantly by call category.
- Average response times were as short as 7 minutes (for agency assists) and as long as 17 minutes (for general noncriminal calls) in August, and as short as 5 minutes (for agency assists) and as long as 13 minutes (for crimes) in February.
- Average response times decreased from August 2007 to February 2008 for all categories.
- Average dispatch delays varied between 4 minutes (for agency assists) and 12 minutes (for general non-criminal calls) in August and between 2 minutes (for agency assists) and 8 minutes (for crimes) in February.
- 90th percentile values for response times for different call categories were as short as 13 minutes and as long as 45 minutes in August and as short as 9 minutes and as high as 36 minutes in February.
- Travel times for arrests in August were longer than for all other calls averaging 8 minutes.

B. High-Priority Calls

A priority code from 1 through 3 was assigned to each call by the dispatch center. Table 13 shows that average response times varied by priority. A separate category for accidents with injuries is also included. These averages included all nonzero on-scene other-initiated calls throughout the entire year (July 2007 to June 2008).

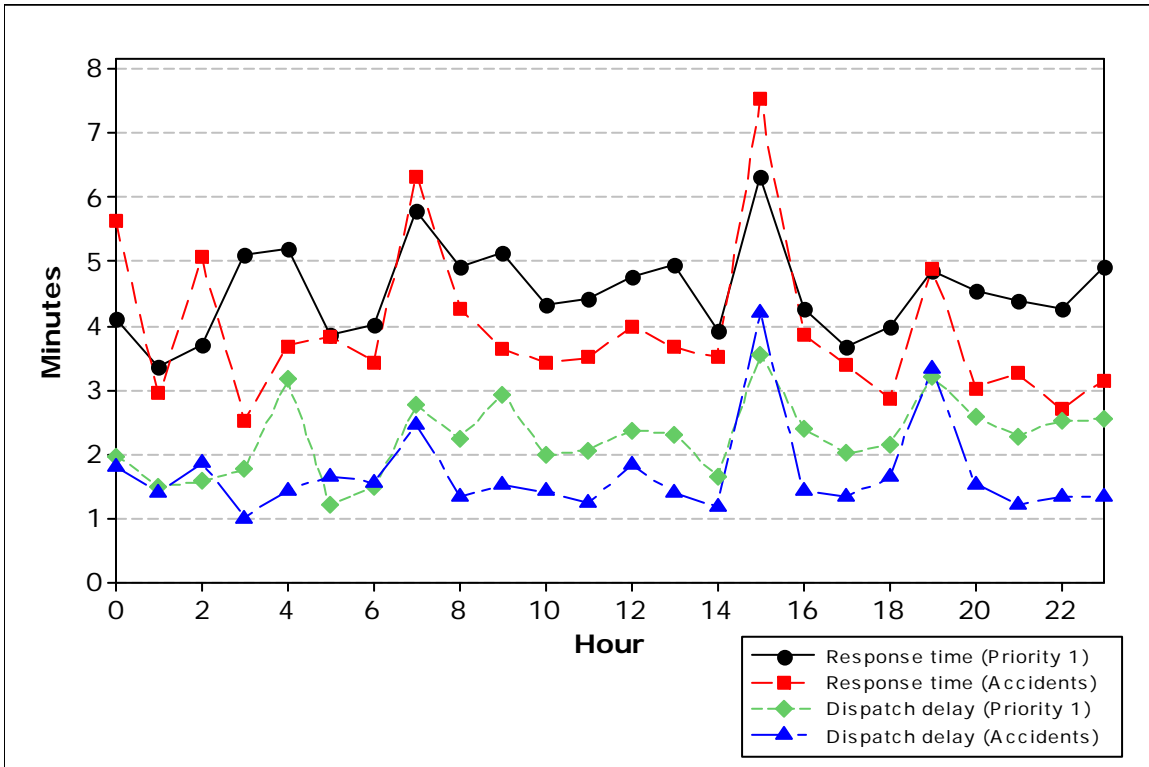
Table 13. Average Dispatch, Travel, and Response Times, by Priority

Priority	Dispatch	Travel	Response	Total calls
1	2.3	2.1	4.4	2,087
2	6.5	0.7	11.1	13,432
3	6.9	5.8	12.6	531
Total	6.0	1.1	10.3	16,050
Accident with Injuries	1.8	2.2	4.0	329

Observations:

- Response times varied significantly by call priority.
- Priority 1 calls and accidents had a much shorter response time of 4.4 and 4.0 minutes, respectively, in comparison with the overall average of 10.3 minutes.

Figure 23. Average Response Times by Hour for High-Priority Calls



Observations:

- Average response time for Priority 1 calls varied by time of day, from 3.4 minutes between 1 AM and 2 AM to 6.3 minutes between 3 PM and 4 PM.
- Average response time for accidents varied by time of day, from 2.5 minutes between 3 AM and 4 AM to 7.5 minutes between 3 PM and 4 PM.
- All shift changes negatively affect response times to motor vehicle accidents with injuries. The daytime shift changes at 7:45 AM and 3:45 PM negatively affect response times to Priority 1 calls.