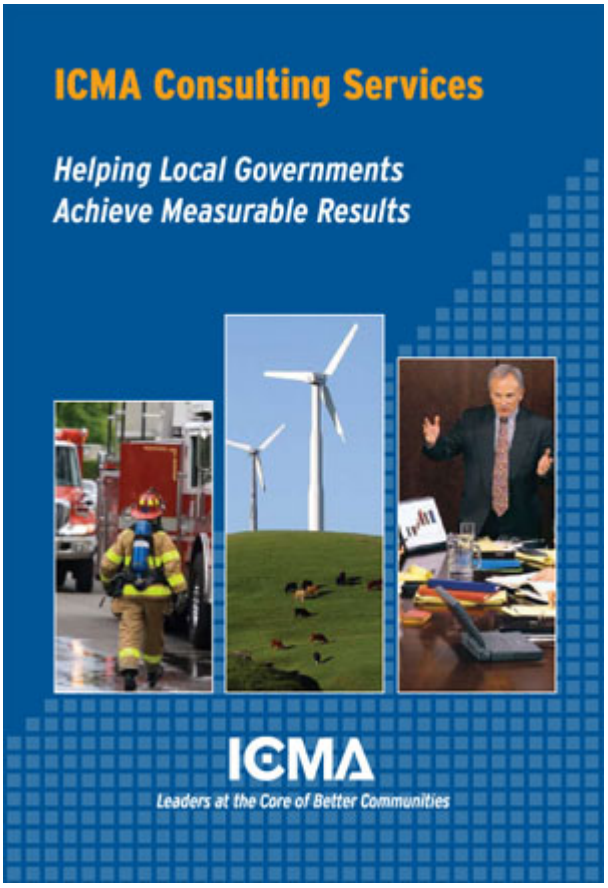
Leaders at the Core of Better Communities

Final Report
Fire/EMS Operations
Glenview, Illinois



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Fire/EMS Operations
Glenview, Illinois
Final Fire Report

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I. Introduction

This is the final report on fire operations for the Village of Glenview, Illinois, conducted by ICMA *Consulting Services*.

This report, and a similar report on police operations, was commissioned by the Village of Glenview to enable the village's elected officials and village manager to fully understand these operations and be able to determine whether opportunities exist to improve service levels and/or reduce the costs of operations.

The Glenview fire department provides both emergency medical service (EMS) and fire service to the village as well as to an adjacent fire district. This report initially addresses the entire scope of fire department operations. It then separates the workload within the village from that within the district.

In general, we found the fire department data to be well organized and comprehensive, which permitted the team to focus on the analysis of the information rather than on formatting the materials into understandable categories, as was the case with the police data. All analyses in this final report were developed directly from 12 months of dispatch records—September 1, 2006, through August 31, 2007—maintained in the department's dispatch center.

We particularly wish to thank Fire Chief Wayne Globerger and his staff for their assistance and cooperation while we conducted our research.

A. Description

Glenview, Illinois, is located in the northern Chicago metro area. The area is flat, with few hills or other topographical changes that affect response to fire or ambulance calls.

Demographic data show five distinct areas of the community. The focal point is an old military base that has undergone redevelopment and now forms a sort of golden triangle in the center of the community. The older downtown forms the second district, and the other three areas consist of large, demographically similar populations: the east side is all residential, with older and established residents; the south side comprises quarter-acre lot sizes, also with older, established residents; and the west side is occupied by hotels, corporate campuses, and multifamily dwellings. There is little heavy industry in the town, as most of the industrial base is made up of research and design/corporate headquarters.

This upper-middle-income community is largely landlocked, with future expansion being possible only by annexing unincorporated areas on the west side of the village. However, annexation of these areas may produce less-than-desired benefits to the remaining community as the demographic data show lower incomes, a higher need for infrastructure improvements, and a considerable likelihood that the area would be better served by total redevelopment. The community itself is undergoing significant redevelopment, however, as older, smaller homes constructed earlier in the 20th century are being purchased and torn down to make way for larger estates. These will pose opportunities as well as serving as missed opportunities if not dealt with.

As noted, many of the community's residents are older, which accounts for a significant number of cardiac response incidents each year. This situation should be evaluated to ensure that all response elements are tuned to produce positive outcomes when a call for service is initiated by this population base.

There are five fire stations in the community, two of which have been targeted for redevelopment:

1. Headquarters, Station 6, has a battalion chief and runs an engine and an ambulance. A backup ambulance is also stationed at the headquarters facility.
2. Station 13 has a three-person engine company, a reserve squad used for callback to any structure fires, and a canteen vehicle used in the region by volunteers.
3. Station 7 is being rebuilt, with its equipment temporarily housed at nearby structures. The assigned apparatus are an engine and an ambulance.
4. Station 8, like Station 7, was acquired when the agency took over the Glenbrook Fire Protection District. It houses an ambulance, an engine, a reserve engine, and the dive team equipment. As the old headquarters building for Glenbrook, it has ample meeting and training space, although much of it is in basement areas.
5. Station 14 is a new station that was built next to the Northeastern Illinois Public Safety Training Academy (NIPSTA). It houses a truck company.

A study by the Matrix group shows that with the five-station configuration, much of the community can be served within a four-minute initial response and eight-minute effective deployment time.

II. Workload Analysis

The department classifies calls for service into 174 classes. For analysis purposes, we have collapsed those classes into eight types, which are further grouped into three broad categories: EMS calls, fire calls, and service calls

The agency operates out of five stations. Four stations house an engine company; the fifth houses a truck company. There are three ambulances housed, one in each of three different stations.

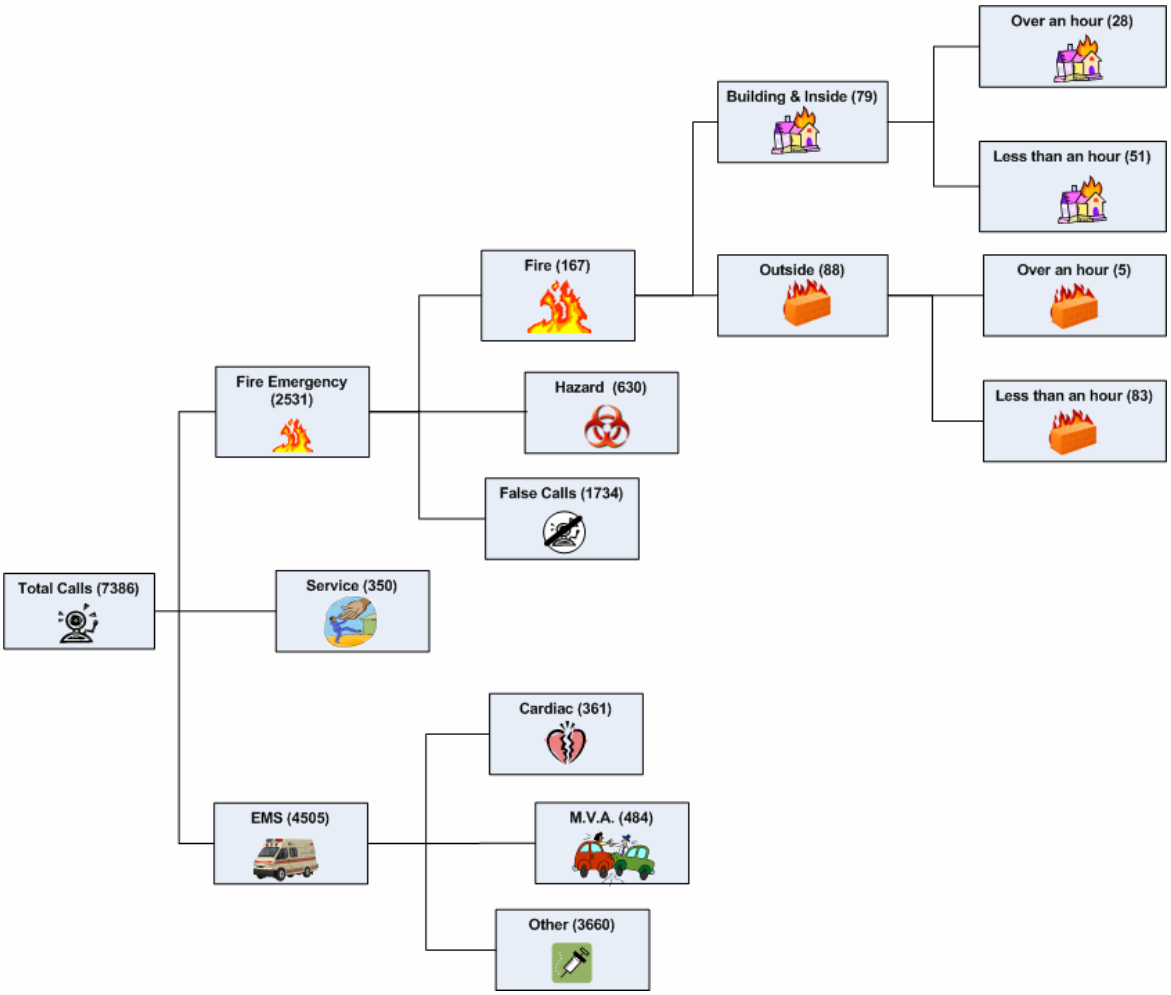
The department reports that it responded to a total of 7,386 calls over twelve months. Of these calls, 4,505 (61.10%) were EMS calls. Of the 2,531 total fire calls, including hazard, that the department responded to, 1,734 (68.5%) were false. The remaining 350 calls were service calls.

Table 1: Total Calls in Twelve Months

Call category	Category name	Total calls/year	Average calls/day	Percentage of total calls
EMS	Cardiac	361	1.0	4.9
	Motor vehicle accident	484	1.3	6.6
	EMS other*	3,660	10.0	49.6
EMS total		**4,505**	**12.3**	**61.0**
Fire	Building and inside	79	0.2	1.1
	Outside	88	0.2	1.2
	Hazard	630	1.7	8.5
	FALSE	1,734	4.8	23.5
Total fire calls		**2,531**	**6.9**	**34.3**
Total service calls	**Service**	**350**	**1.0**	**4.7**
TOTAL calls		**7,386**	**20.2**	**100.0**

*Includes strokes, seizures, pulmonary disease, trauma, etc.

Figure 1: Total Calls in Twelve Months



Observations:

- Of the total number of calls made, 23.5% were false. Appendix A provides a breakdown of these calls.
- Almost 50% of the total calls were classified as EMS other.
- Only 2.3% of calls were actual fires, either within a structure or outside of a structure.
- Of the 79 fires calls inside a building, 28 calls tied up fire units for more than one hour while 51 kept them busy for less than one hour.
- Of the 88 fire calls outside of a structure, 5 tied up fire units for more than an hour and 83 kept them busy for less than one hour.

Figure 2: Calls by Type and Month

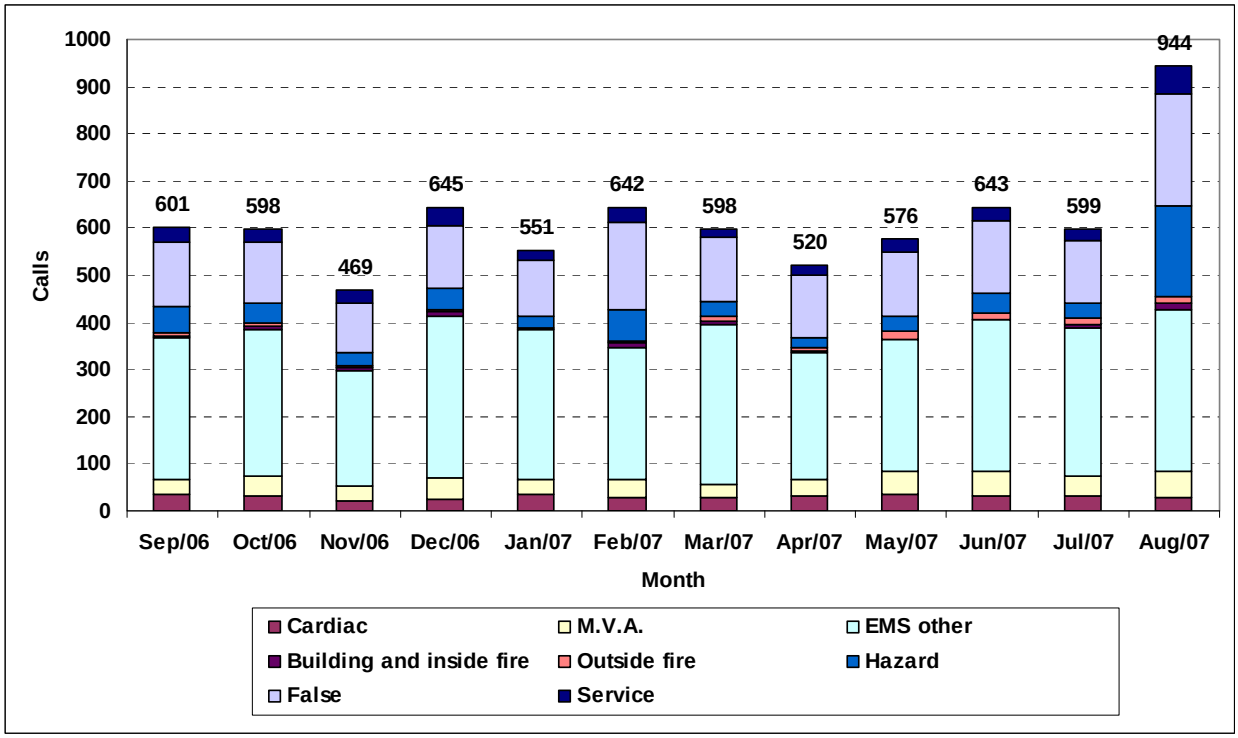


Table 2: Calls by Type and Month

Call type\month	Sep 06	Oct 06	Nov 06	Dec 06	Jan 07	Feb 07	Mar 07	Apr 07	May 07	Jun 07	Jul 07	Aug 07	Row total
Cardiac	36	30	20	26	34	28	27	31	36	32	33	28	361
M.V.A.	30	45	34	43	34	40	30	34	47	52	40	55	484
EMS other	300	311	243	344	315	279	339	270	281	320	314	344	3,660
Building and inside fire	6	6	6	9	4	11	7	5	1	3	9	12	79
Outside fire	4	8	3	3	1	1	9	6	16	11	12	14	88
Hazard	59	41	29	48	26	68	32	22	31	45	34	195	630
False	136	130	107	131	119	185	135	133	137	154	130	237	1,734
Service	30	27	27	41	18	30	19	19	27	26	27	59	350
Column total	601	598	469	645	551	642	598	520	576	643	599	944	7,386

Observations:

- August had a spike because of the major rainstorm that hit late in the month.
- November had the fewest calls.
- Outside fire calls peaked between May and August.
- Response times for fire calls outside the village are affected by canceled enroute times not distinguished in the computer-aided dispatch (CAD) system.

Figure 3: Average Calls Every Two Hours by Type and Time of Day

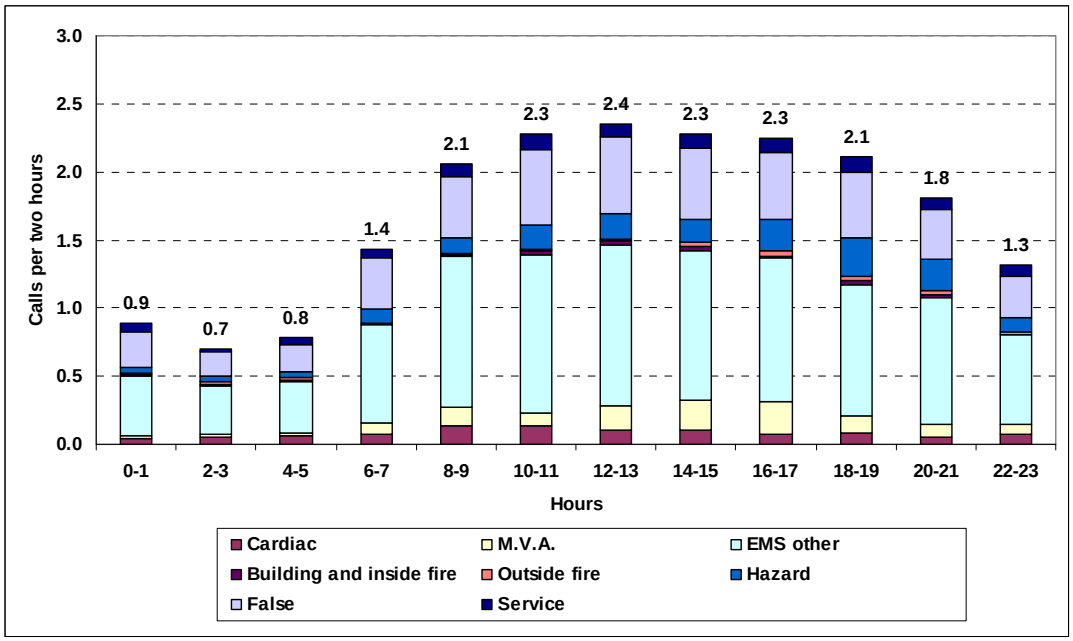


Table 3: Average Calls Every Two Hours by Type and Time of Day

	Two-Hour Time Blocks												
Call Type	**0–1**	**2–3**	**4–5**	**6–7**	**8–9**	**10-11**	**12–13**	**14–15**	**16–17**	**18–19**	**20–21**	**22–23**	Row total
Cardiac	0.04	0.05	0.07	0.07	0.13	0.13	0.11	0.10	0.07	0.08	0.05	0.07	1.0
M.V.A.	0.02	0.02	0.02	0.08	0.14	0.10	0.18	0.23	0.25	0.12	0.10	0.07	1.3
EMS other	0.43	0.36	0.38	0.72	1.10	1.16	1.18	1.09	1.05	0.97	0.93	0.66	10.0
Building and inside fire	0.01	0.01	0.01	0.01	0.01	0.03	0.03	0.03	0.02	0.03	0.02	0.01	0.2
Outside fire	0.02	0.01	0.01	0.00	0.01	0.02	0.01	0.04	0.04	0.03	0.03	0.02	0.2
Hazard	0.04	0.05	0.05	0.10	0.12	0.18	0.18	0.17	0.23	0.28	0.23	0.10	1.7
False	0.26	0.18	0.20	0.38	0.45	0.55	0.57	0.52	0.50	0.48	0.36	0.30	4.8
Service	0.05	0.02	0.05	0.06	0.10	0.12	0.09	0.10	0.11	0.11	0.08	0.08	1.0
Column total	0.9	0.7	0.8	1.4	2.1	2.3	2.4	2.3	2.3	2.1	1.8	1.3	20.2

Observations:

- From 0800 until 2000, the call rate was over two calls per two-hour interval, or slightly more than one call per hour.
- The call rate was less than half that number between midnight and 0600.

We analyzed the department's calls by location, determining whether they came from within village limits or within the service district.

Figure 4: Calls by Type and Location

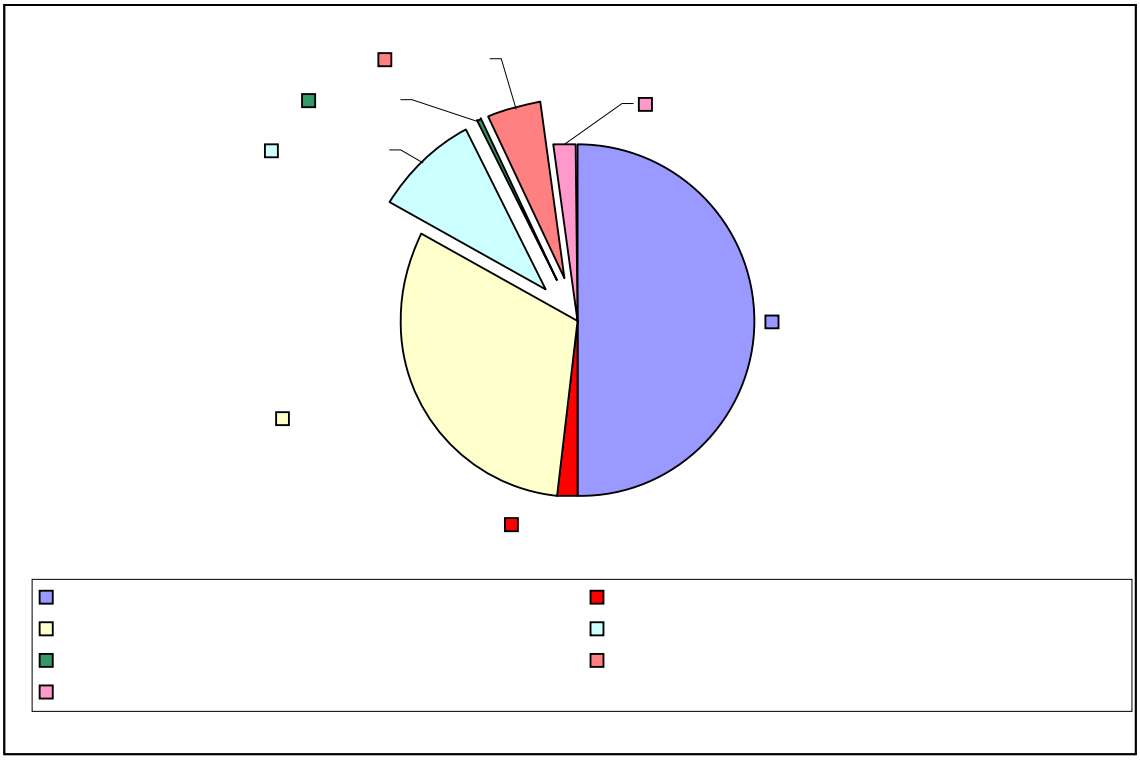


Table 4: Calls by Type and Location

Call category	Ambulance		Fire engine		Fire truck	
	In village	Out of village	In village	Out of village	In village	Out of village
Medical runs	3,382	672	2,857	670	655	12
Fire runs	43	8	138	28	48	7
Hazard, service, and	499	115	2,092	413	691	67
Total	3,924	795	5,087	1,111	1,394	86

Note: This table involves counting multiple units responding to the same call.

Observations:

- Seventeen percent of ambulance runs went outside the village.
- Eighteen percent of calls involving engines came from outside the village, compared with only 6% of the runs involving the truck.

Table 5: Response Time Based on Location of Calls

Call category	In village		Out of village	
	Avg. response time	Counts	Avg. response time	Counts
Medical	0:04:18	3,672	0:04:27	721
Fire	0:05:41	129	0:04:09	25

Note: To obtain the average response time for medical calls, we averaged the time for the first ambulance to arrive on scene with the time for the first other vehicle to arrive on scene. For fire calls, we averaged the response times for the first-arrived vehicle, whether fire engine or fire truck.

Observations:

- Response times for medicals calls within and outside the village show little variability.
- Response times for fire calls inside the village averaged 5 minutes and 41 seconds. There were two unusually long data points that, if excluded, decrease the average to 5 minutes and 5 seconds.

Ambulance Calls

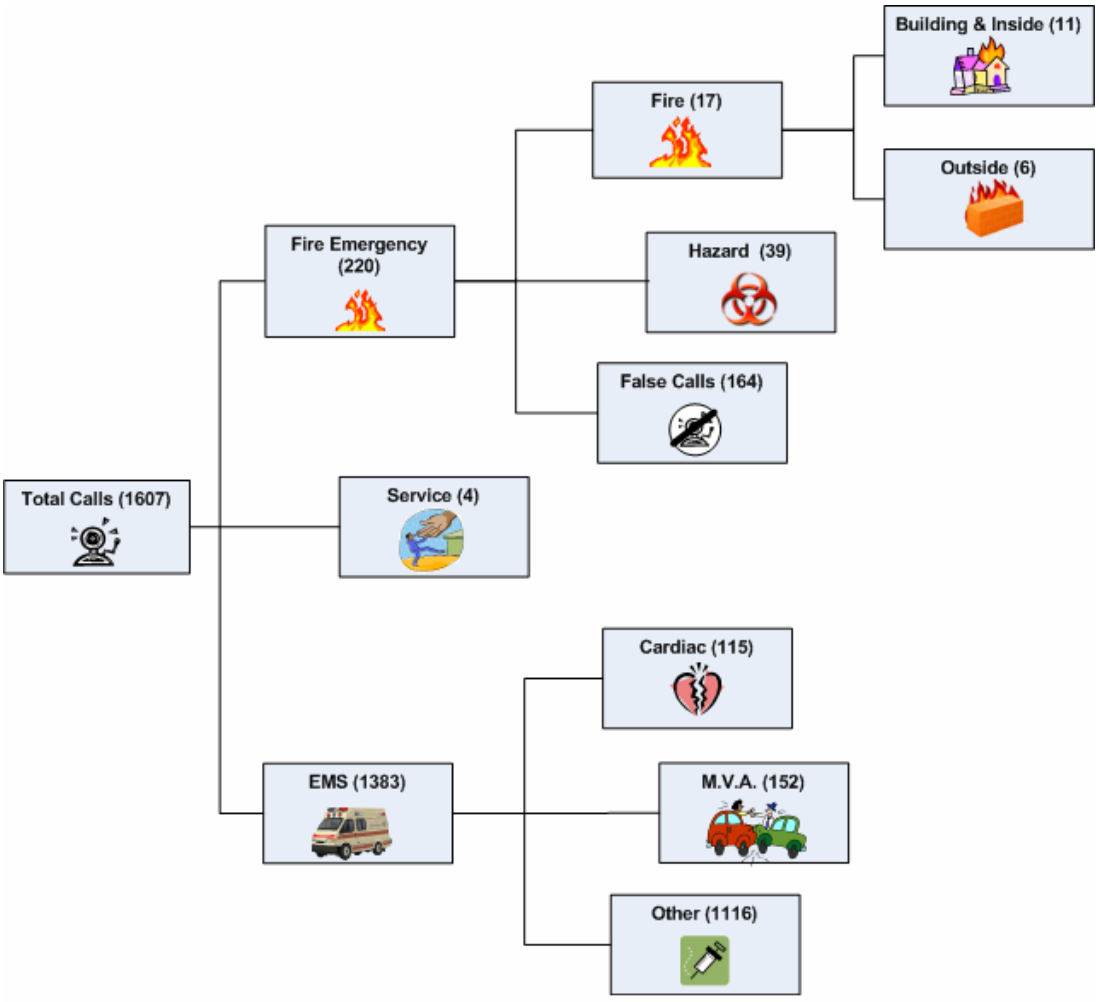
The study team analyzed the number of calls handled by the department's ambulances. On average, an ambulance handles 1,607 calls annually. However, there is significant variation among ambulances as to total workload and types of calls. For example, Ambulance 8 (A8) handles half of the number of cardiac calls as does A7 (see Table 6 and Figure 5).

Table 6: Average Annual Number of Calls Responded to per Ambulance (A)

Call category	A6	A7	A8	Average annual calls/ambulance
Cardiac	121	149	74	115
Motor vehicle accident	161	129	166	152
EMS other	1,349	1,130	870	1,116
Building and inside	14	11	7	11
Fire outside	7	6	6	6
Hazard	54	35	28	39
FALSE	210	127	155	164
Service	7	3	2	4
Total	1,923	1,590	1,308	1,607

Note: Some ambulance calls were counted twice because more than one ambulance responded to the call for service.

Figure 5: Calls Responded to by Ambulance



We then calculated the average time spent on calls per ambulance within a 24-hour period. The time “busy” for an individual call was calculated from the turnout time (time from receipt of the call to actual movement of the responding unit) until the vehicle was cleared and back into service, ready for another call. If a patient was transported to a hospital, this time was included. The total time busy on calls for 12 months was then divided by 365 days to determine a per-day average. The same calculations were also carried out for fire engines and fire trucks.

Figure 6: Average Busy Minutes on Calls per 24-Hour Shift per Ambulance (A)

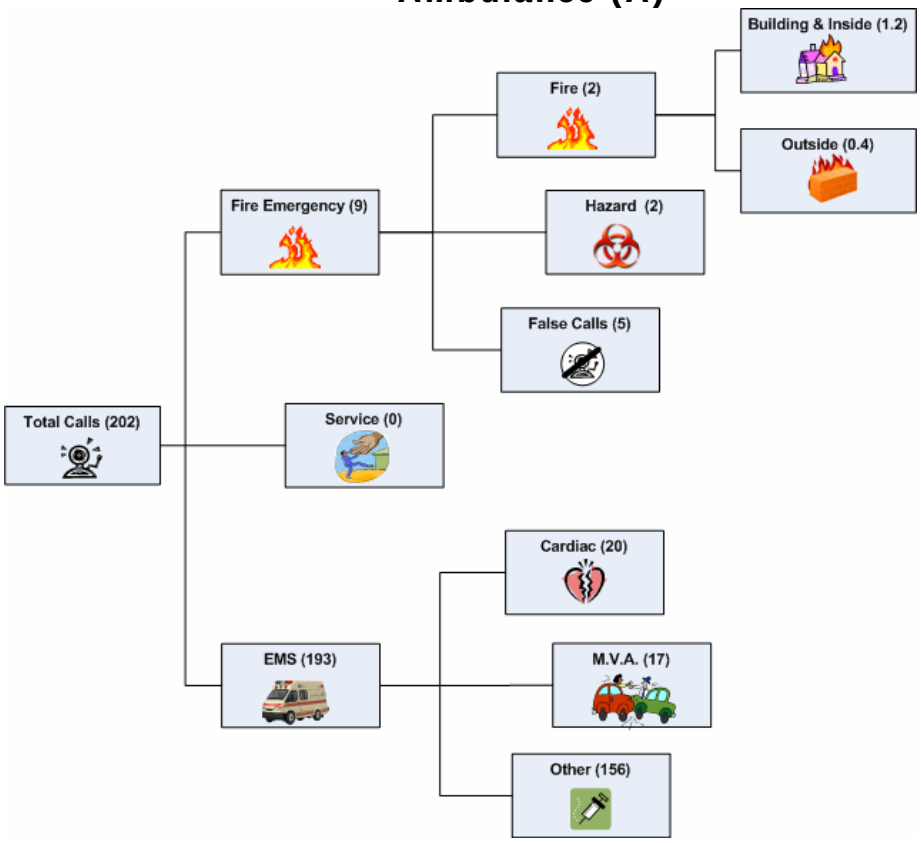


Table 7: Average Busy Minutes on Calls per 24-Hour Shift per Ambulance (A)

Call category	A6	A7	A8	Average busy minutes/ambulance
Cardiac	22.2	25.2	13.3	20.2
Motor vehicle accident	18.1	13.4	18.9	16.8
EMS other	193.4	152.4	122.5	156.1
Building and inside	1.3	1.0	1.3	1.2
Fire outside	0.4	0.3	0.3	0.3
Hazard	2.7	1.4	1.5	1.9
FALSE	6.6	3.9	4.7	5.1
Service	0.2	0.1	0.0	0.1
Total	244.9	197.7	162.5	201.7

Observations:

- On average, an ambulance was busy 201.7 minutes (3.4 hours) per 24-hour shift.
- Of this time, 20 minutes were spent serving cardiac calls, and 17 minutes were spent on motor vehicle accidents.

- Seventy-seven percent of the time (156 minutes) were spent serving EMS other calls.

Dual Response to Medical Calls

The department operates a dual-response system to medical calls: the closest engine or truck is dispatched along with the assigned ambulance. The study team was interested in learning if this practice provided a quicker response than just dispatching the ambulance.

Table 8: Analysis of First Arriving Units to Medical Calls

First arrived	Count	Percentage	Average. response time of ambulance	Average response time of fire engine/truck
Ambulance	2,540	65.2	0:03:55	0:04:02
Fire engine/truck	1,353	34.8	0:05:28	0:03:29
Total	3,893	100.0	0:04:27	0:03:50

Observations:

- In those cases when the ambulance arrived first (65.2% of cases), the average response time of the first arriving unit was 2:40 minutes.
- In those cases when the engine/truck arrived first (34.8% of cases), the average response time was 3:29 minutes.

We calculated the average number of calls handled by an engine company.

Figure 7: Average Annual Number of Calls Responded to per Fire Engine (E)

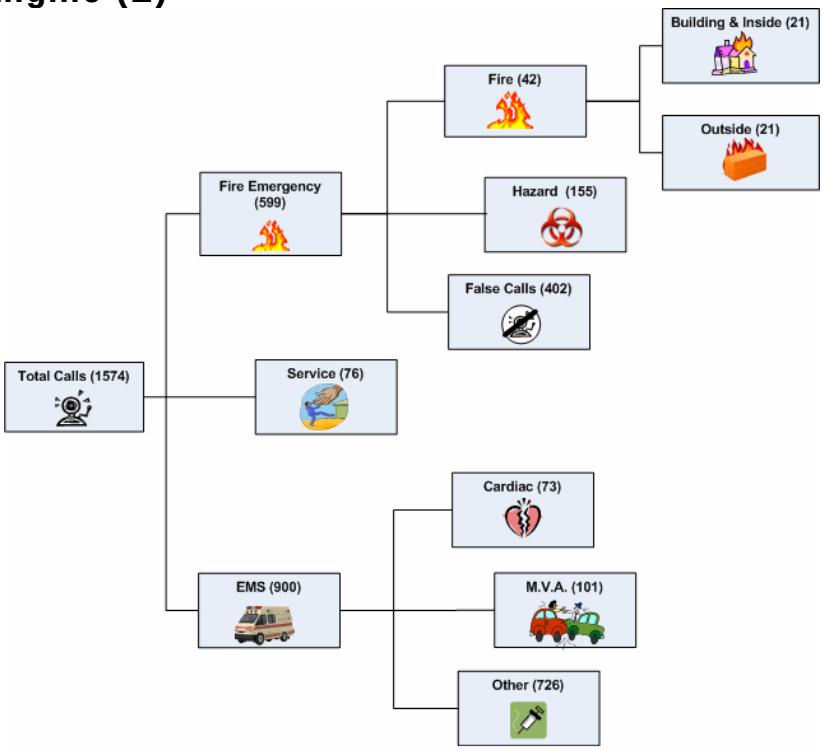


Table 9: Average Annual Number of Calls Responded to per Fire Engine (E)

Call category	E13	E6	E7	E8	Average annual calls
Cardiac	49	59	118	67	73
Motor vehicle accident	61	89	101	152	101
EMS other	458	801	914	730	726
Building and inside	21	26	21	15	21
Fire outside	12	25	27	21	21
Service	50	76	80	96	76
Hazard	132	195	178	113	154
FALSE	294	498	405	411	402
Total	1,077	1,769	1,844	1,605	1,574

Observations:

- There was significant variation in the workloads of engine companies. E7 handled 71% more total calls than did E13.
- The least busy company (E13) handled a total of 1,077 calls in 12 months, or slightly less than three calls per 24-hour period. The busiest (E7) handled five calls per 24-hour period.

Figure 8: Average Busy Minutes on Calls per 24-Hour Shift per Fire Engine (E)

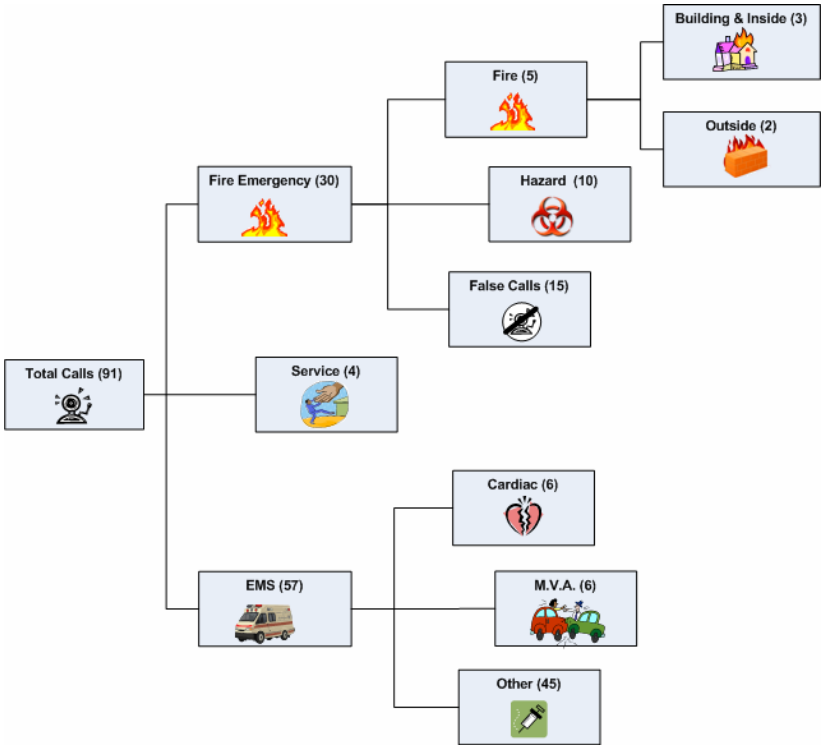


Table 10 Average Busy Minutes on Calls per 24-Hour Shift per Fire Engine (E)

Category	E13	E6	E7	E8	Average busy minutes/engine
Cardiac	3.7	4.6	9.2	5.5	5.8
Motor vehicle accident	3.9	5.1	5.3	9.6	6.0
EMS other	27.3	50.2	54.7	47.7	45.0
Building and inside	3.3	3.7	2.8	2.1	3.0
Fire outside	1.0	1.5	1.6	2.2	1.6
Service	2.6	3.4	3.5	4.5	3.5
Hazard	8.2	12.4	11.1	7.5	9.8
FALSE	11.1	20.3	14.3	16.1	15.5
Total	61.1	101.2	102.5	95.2	90.2

Observations:

- The average engine company is busy on calls for service 90 minutes out of a 24-hour work period.
- The busiest engine company (E7) is busy almost 103 minutes per 24-hour shift.

The team analyzed the number of calls handled by the truck company in 12 months. The truck company handled 1,518 calls, or slightly more than 4 calls per 24-hour day.

Figure 9: Average Annual Number of Calls Responded to per Fire Truck

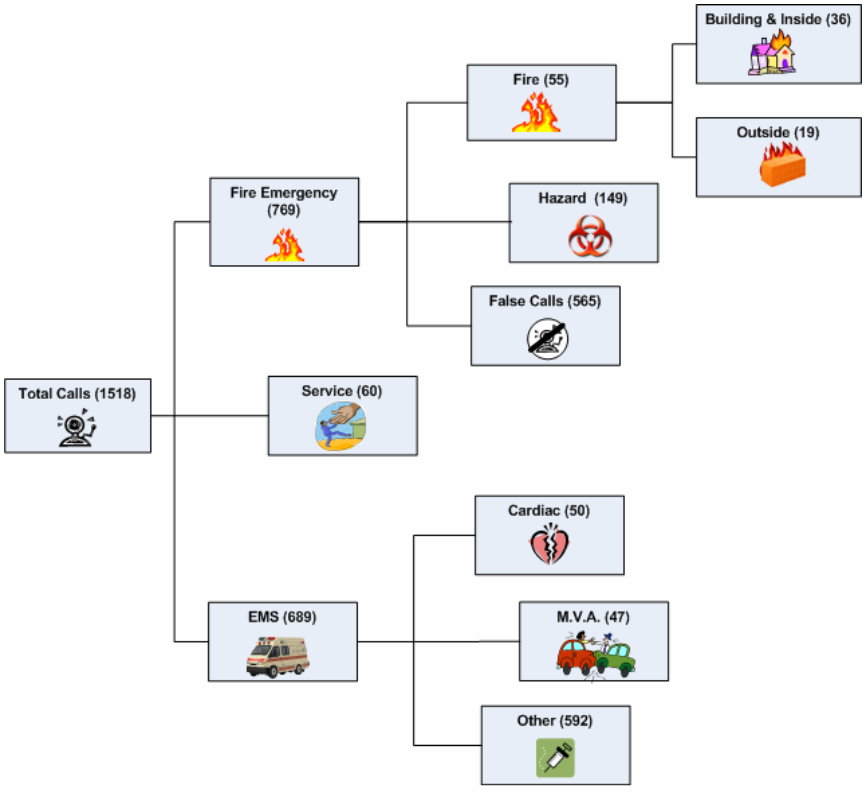


Table 11: Average Annual Number of Calls Responded to per Fire Truck

Call category	Annual calls T14
Cardiac	50
Motor vehicle accident	47
EMS other	592
Building and inside	36
Fire outside	19
Service	60
Hazard	149
FALSE	565
Total	1,518

Figure 10: Average Busy Minutes on Calls per 24-Hour Shift per Fire Truck

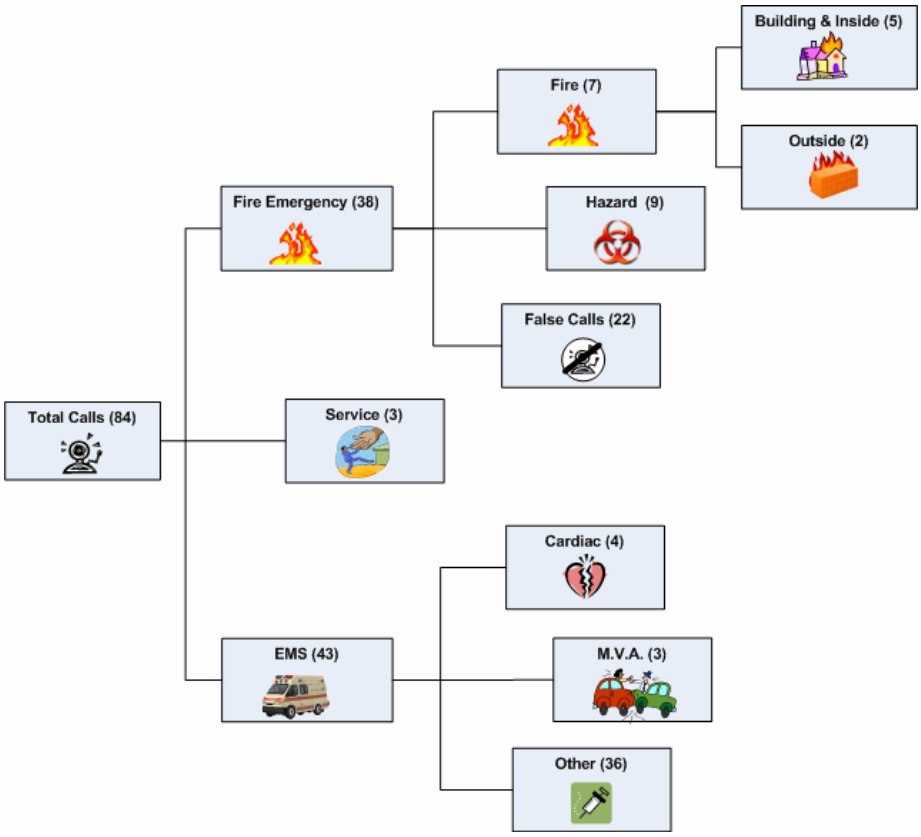


Table 12: Average Busy Minutes on Calls per 24-Hour Shift per Fire Truck

Call category	Average busy minutes T14
Cardiac	3.6
Motor vehicle accident	2.5
EMS other	36.3
Building and inside	5.4
Fire outside	1.5
Service	3.4
Hazard	8.6
FALSE	21.9
Total	83.2

Observation:

- The truck company is busy on calls an average of 83 minutes in a 24-hour period.

Multiple-Unit Responses

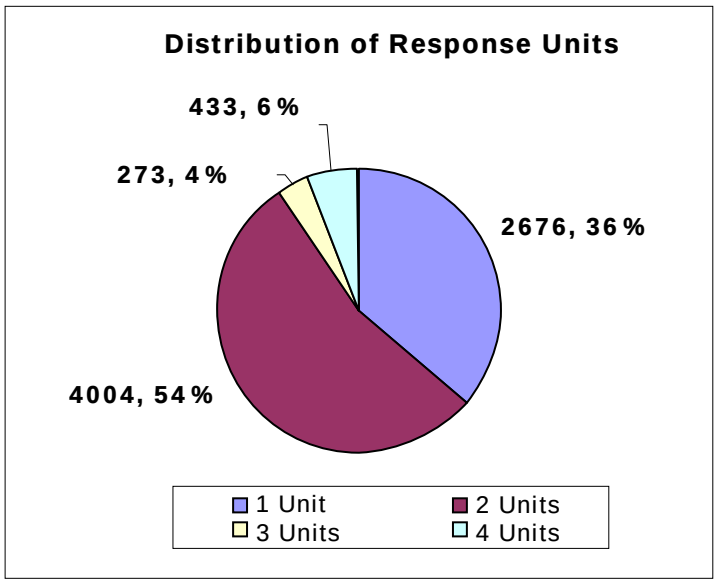
The team analyzed multiple-unit responses to various types of calls.

Table 13: Distribution of Response Types

Call category	1 unit		2 units		3 units		4 units	
	Count	%	Count	%	Count	%	Count	%
Cardiac	34	1.3	320	8.0	7	2.6	0	0.0
Motor vehicle accident	82	3.1	339	8.5	38	13.9	25	5.8
EMS other	476	17.8	3,119	77.9	59	21.6	6	1.4
Building and inside	40	1.5	8	0.2	3	1.1	28	6.5
Fire outside	62	2.3	10	0.2	3	1.1	13	3.0
Service	335	12.5	5	0.1	2	0.7	8	1.8
Hazard	486	18.2	28	0.7	23	8.4	93	21.5
FALSE	1,161	43.4	175	4.4	138	50.5	260	60.0
Total	2,676	100.0	4,004	100.0	273	100.0	433	100.0

Notes: The units include all types of responding units: ambulance, fire truck, and fire engine. Percentages may not total 100% because of rounding.

Figure 11: Distribution of Response Types



Observations:

- For 54% of the calls, exactly two units were dispatched. Most of these two-unit responses fell into the category EMS other.
- For 36% of the calls, only one unit was sent.

Figure 12: Distribution of Multiple Unit Responses by Call Type

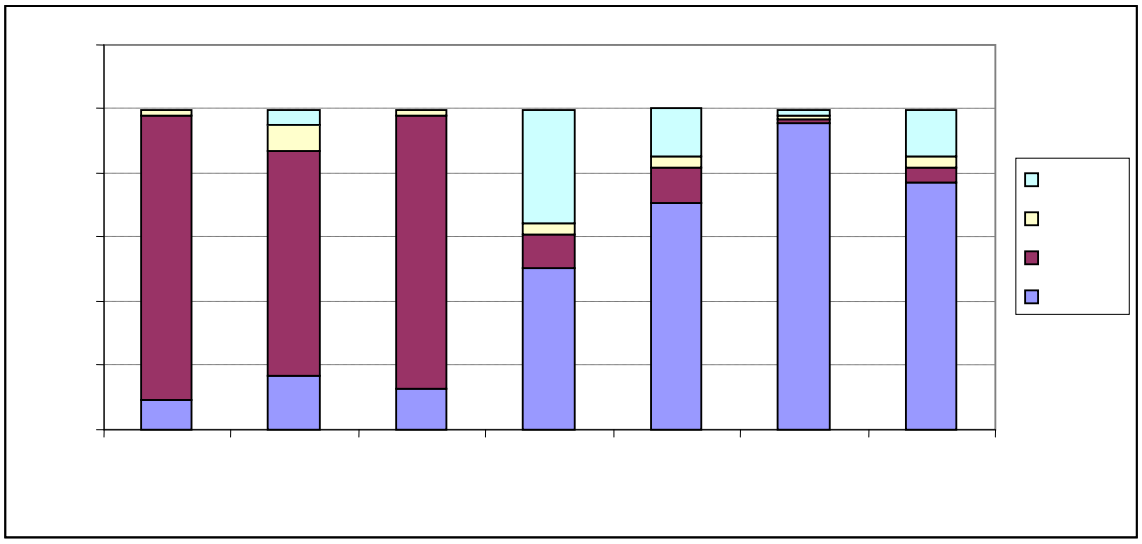


Table 14: Distribution of Multiple Unit Responses by Call Type

Call category	1 unit, %	2 units, %	3 units, %	4 units, %	Total, %
Cardiac	9.4	88.6	1.9	0.0	99.9
Motor vehicle accident	16.9	70.0	7.9	5.2	100.0
EMS other	13.0	85.2	1.6	0.2	100.0
Fire: Building and inside	50.6	10.1	3.8	35.4	99.9
Fire outside	70.5	11.4	3.4	14.8	100.1
Service	95.7	1.4	0.6	2.3	100.0
Hazard	77.1	4.4	3.7	14.8	100.0
FALSE	67.0	10.1	8.0	15.0	100.0

Note: Percentages may not total 100% because of rounding.

Observations:

- For most cardiac and EMS other calls, two units were dispatched.
- In 50.6% of building fire calls, only one unit was required.
- In 70.5% of outside fire calls, only one unit was required.

III. Response Times

Since calls were not prioritized, we analyzed the response times to several types of calls to determine whether response times varied by call type. We calculated both the turnout time and the total response time. To better understand the response time issue, the study team calculated the cumulative distribution function (CDF) of response time for seven types of calls. We present here just the cardiac and building fire data. Cities often use response times and outcomes for cardiac calls as a measure of performance. For cardiac calls, we report just the ambulance times. For building fire calls, we report both engine and truck times. Data for the rest of the calls appear in the appendix at the back of the report.

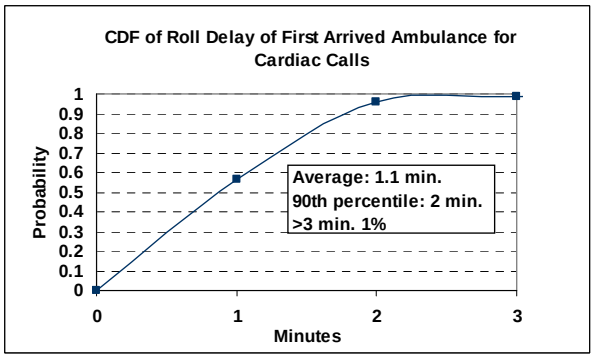
Reading the CDF Charts

In Figures 13 to 15, the vertical axis is the probability or percentage of calls. The horizontal axis is time: either turnout time or total response time. With regard to cardiac calls, for example, the 0.9 probability line intersects the graph at a time mark of less than 2 minutes. This means that 90% of the cardiac calls experienced a turnout time under two minutes. The corresponding 90th percentile for total response time was 5 minutes.

Observations:

- Overall, average roll delay for all types of calls ranged from 1.1 to 1.2 minutes.
- For 90% of each type of call, the roll delay was less than 2 minutes.
- The average response time for all units ranged from 4 to 6 minutes.
- The 90th percentile for response time ranged from 6 to 8 minutes depending on the call type.

Figure 13: Cardiac Calls – Ambulance



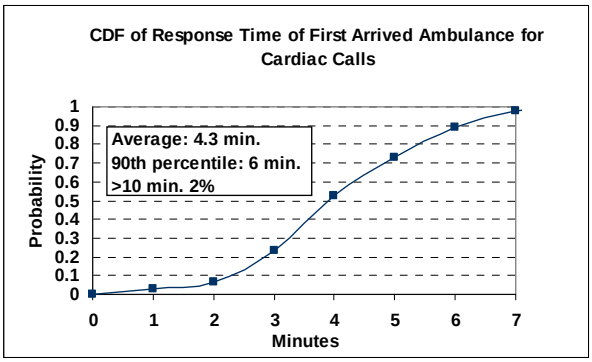
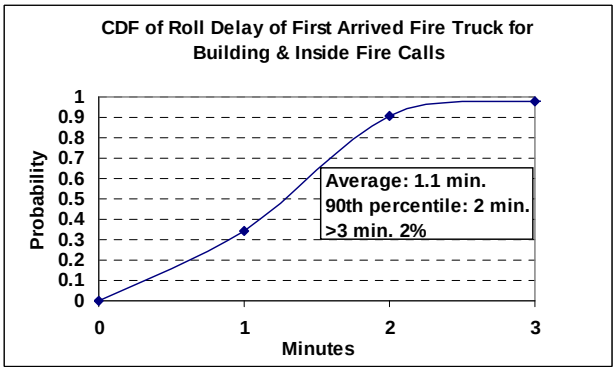


Figure 14: Building and Inside Building Fire Calls – Fire Truck



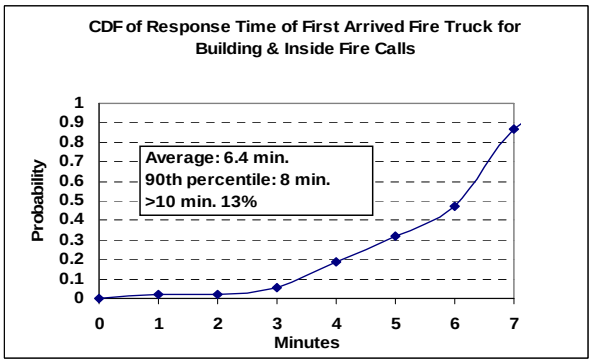
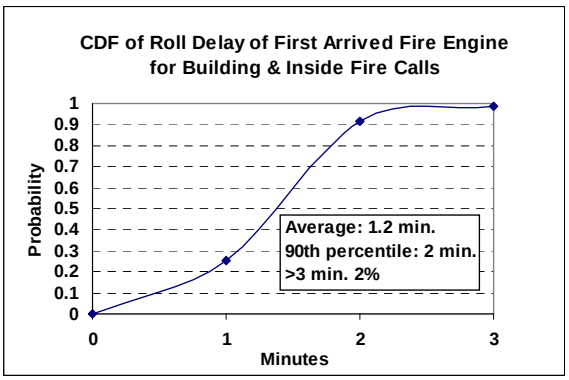


Figure 15: Building and Inside Building Fire Calls – Fire Engine



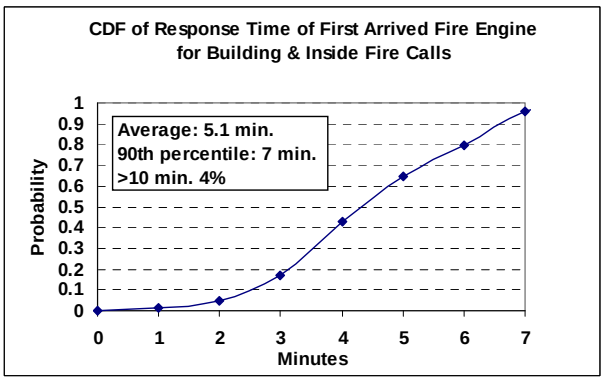
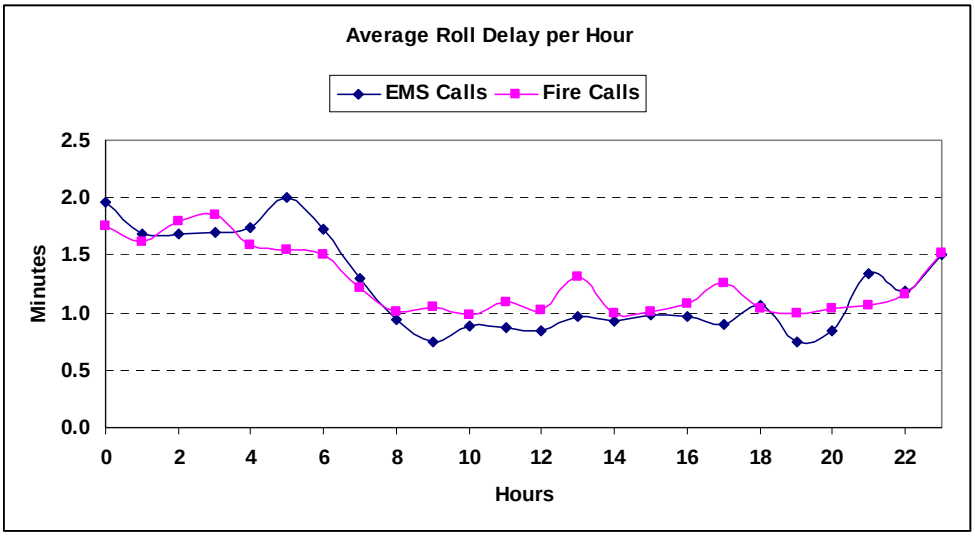


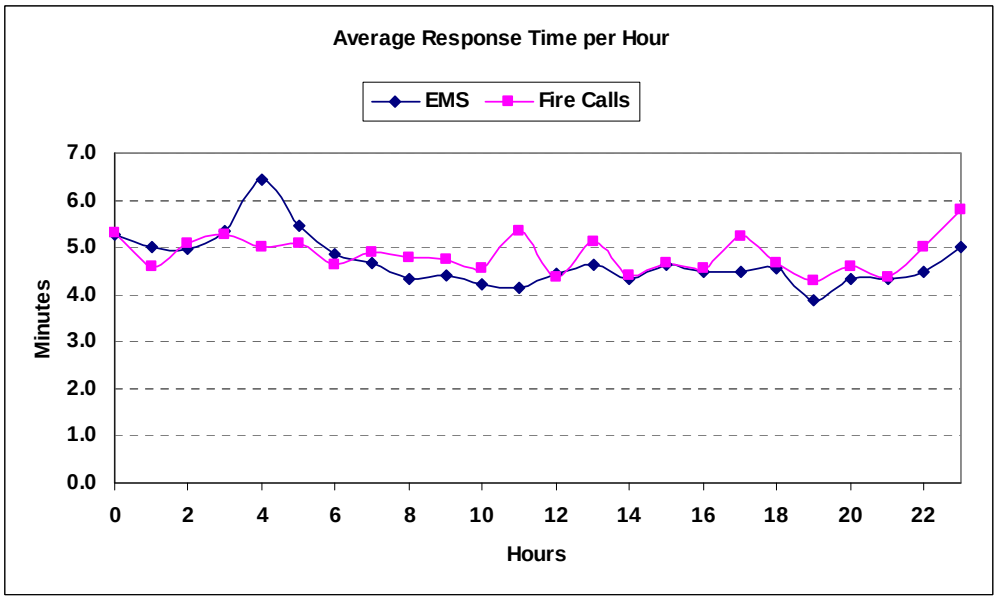
Figure 16: Comparison of Turnout Time by Hour of Day—EMS vs. Fire, Rollout and Response Time Averages



Observations:

- There was a half minute to a minute more roll delay in the early morning, from about midnight to 600, than during the rest of the day.
- The peak delay was greatest for EMS calls.

Figure 17: Average Response Time by Hour of Day



Observations:

- In most cases, the average response time for fire calls was slightly longer than that for EMS calls.

Table 15: Response Times for Building Fire Calls

Description	Number of building and inside building fires			
	1st unit	2nd unit	3rd unit	4th unit
<1 minute	0	0	0	0
1–2 minutes	1	1	0	2
2–3 minutes	6	3	0	3
3–4 minutes	11	4	8	4
4–5 minutes	18	6	4	7
5–6 minutes	9	2	7	2
6–10 minutes	18	8	10	6
>10 minutes	9	1	0	1
Total	72	25	29	25

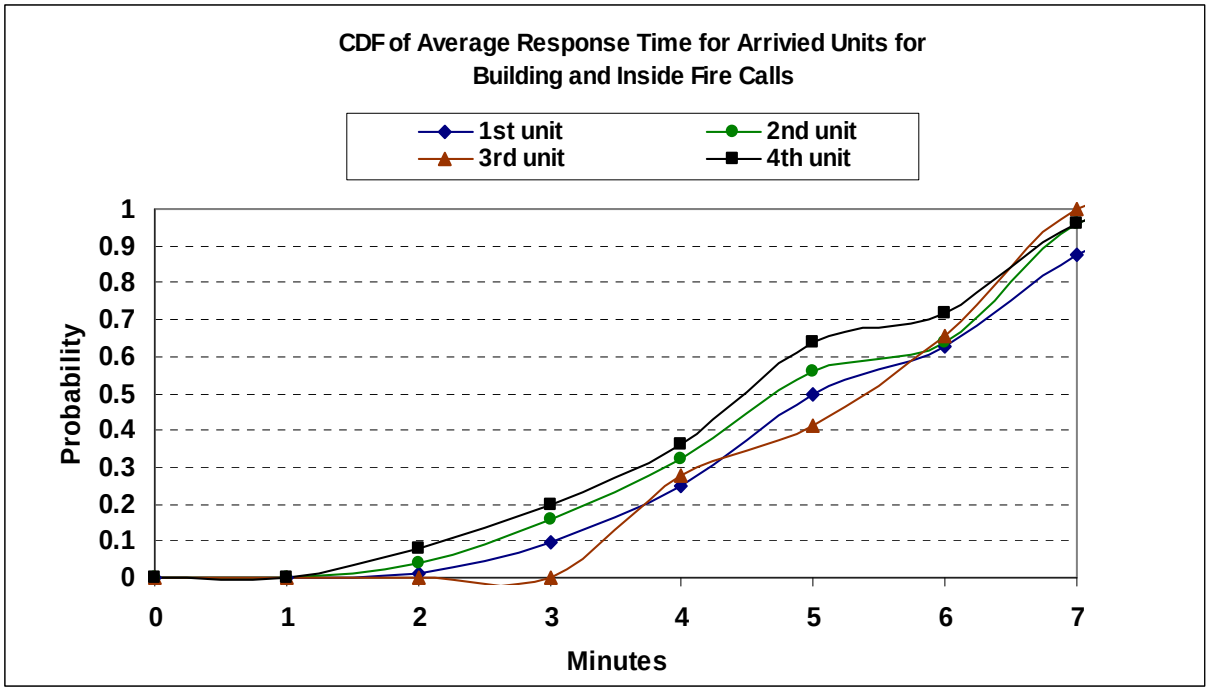
Note: Calls are double counted.

Table 16: Cumulative Distribution of Response Times for Building and Inside Building Fire Calls

Description	Cumulative percentages: Building and inside calls			
	1st unit	2nd unit	3rd unit	4th unit
<1 minute	0	0	0	0
< 2 minutes	1	4	0	8
< 3 minutes	10	16	0	20
< 4 minutes	25	32	28	36
< 5 minutes	50	56	41	64
< 6 minutes	63	64	66	72
< 10 minutes	88	96	100	96
>10 minutes	100	100	100	100

Note: The designations of 1st, 2nd, 3rd, and 4th units are the way the data were recorded. They do not represent the order in which the units arrived on the scene.

Figure 18: CDF of Response Time for Building and Inside Building Fires



APPENDIX

Table 17: False alarms

Description	Code	Counts
Other good-intent call	600	42
Dispatched and canceled en route	611	16
Unspecified	622	4
Other steam, other gas mistaken for smoke	650	4
Smoke scare, odor of smoke	651	36
Steam, vapor, fog, or dust thought to be smoke	652	11
Barbecue, tar kettle	653	3
Hazardous material (hazmat) release investigation w/no hazmat	671	17
Other false alarm or false call	700	224
Other false alarm	710	21
False alarm: box	711	3
False alarm: master box	712	5
False alarm: central station	714	2
False alarm: local alarm system	715	1
Other system malfunction	730	137
Sprinkler activation due to malfunction	731	6
Extinguishing system activation due to malfunction	732	1
Smoke detector activation due to malfunction	733	103
Heat detector activation due to malfunction	734	2
Alarm system sounded activation due to malfunction	735	47
Co-detector activation due to malfunction	736	30
Other unintentional transmission of alarm	740	91
Sprinkler activation, no fire unintentional	741	10
Extinguishing system activation, no fire, unintentional	742	1
Smoke detector activation, no fire, unintentional	743	263
Heat detector activation, no fire, unintentional	744	70
Alarm system sounded, no fire, unintentional	745	100
Carbon monoxide detector activation: none found	746	28
Lightning strike (no fire)	814	1
Trouble alarms	5,001	455
Total		1,734

Figure 19: Motor Vehicle Accident (MVA) Calls

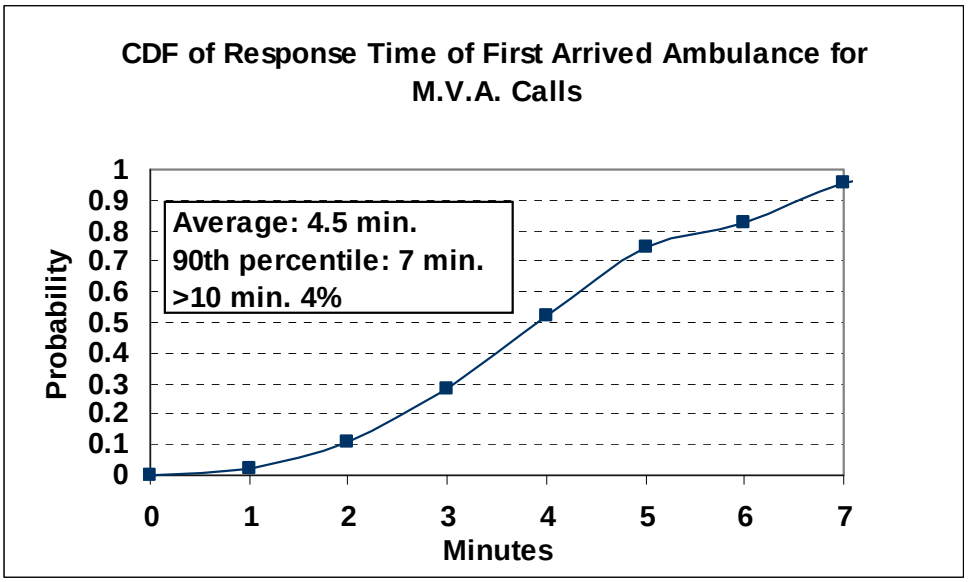


Figure 20: EMS Other

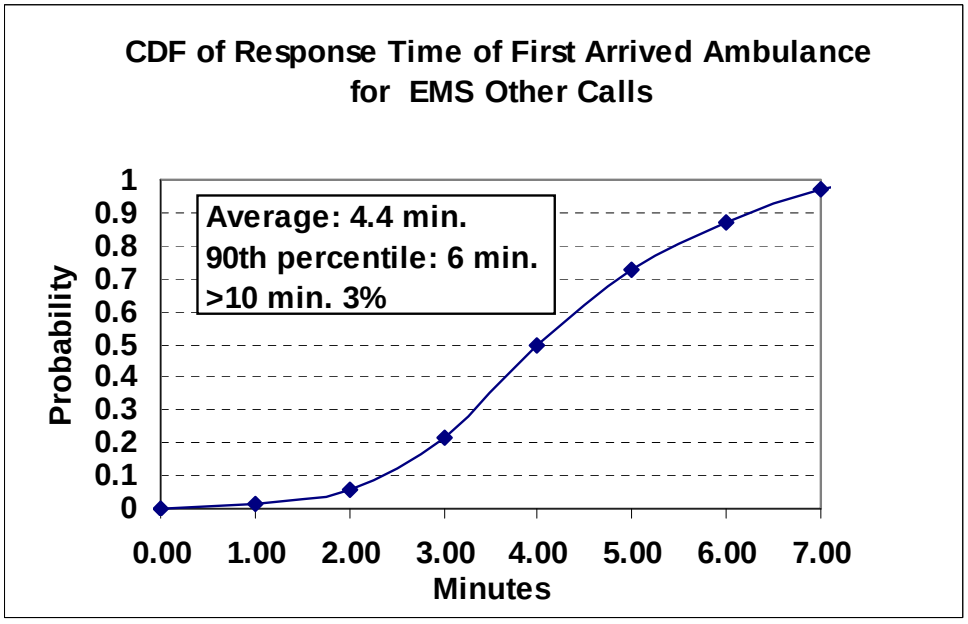
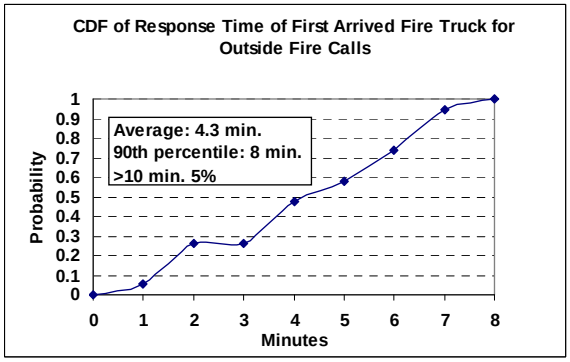


Figure 21: Fire Outside

Fire truck



Fire engine

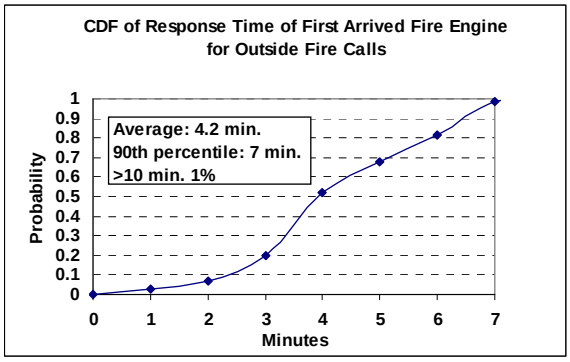
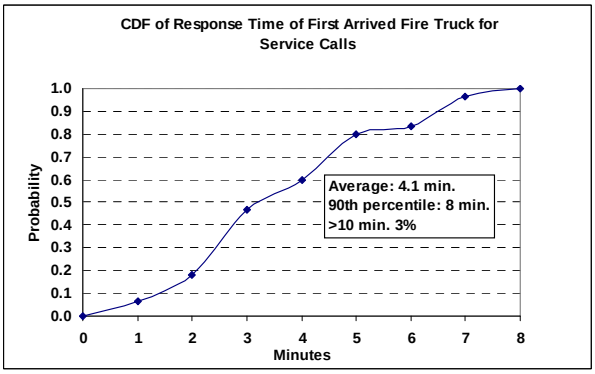
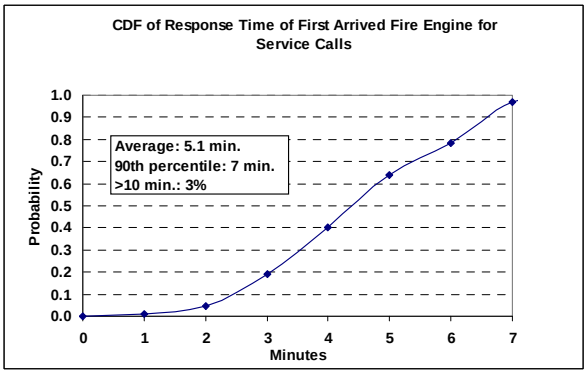


Figure 22: Service Calls

Fire truck

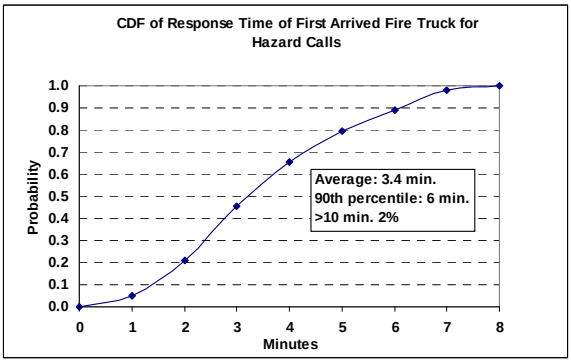


Fire engine

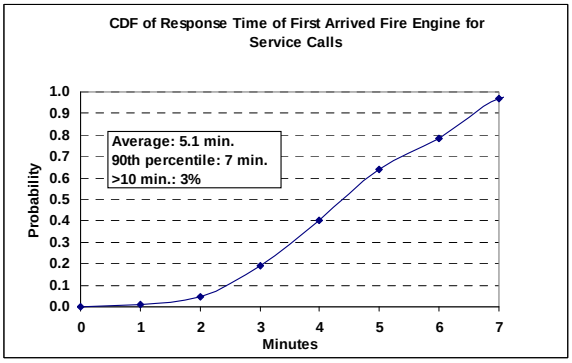


Figures 23: Hazard Calls

Fire truck



Fire engine



EXECUTIVE SUMMARY

1. **Conduct an All-Hazards Risk Assessment for the Community**

   Goal: Identify hazards and corresponding risks, and pre-plan for events that may occur; prevent what can be prevented; improve safety for citizen and responders

   Time: Day one to one year

2. **Begin Community Building Inspection Program**

   Goal: Prevent incidents before they occur

   Time: Day one and ongoing

3. **Merge Building Department into Fire Department**

   Goal: Ensure coordinated plans with fire prevention and safety

   Time: Six months to one year

4. **Conduct Strategic Planning Program**

   Goal: Match community expectations with service delivery

   Time: Day one to three months

5. **Review and Expand Preventive Approaches for EMS**

   Goal: Build a systematic approach to EMS delivery with a focus on preventive efforts

   Time: Day one and ongoing

6. **Quality Controls within Dispatch**

   Goal: If you can't measure it, you cannot improve it!

   Note: The data contained in this report were difficult to extract from the existing record management system. Pieces of the data remain suspect and cannot be corrected until changes within the system are completed. Measuring and evaluating performance in an ongoing quality control mode require accurate data.

   Time: Day one to two months

7. **Hydrant Care**

   Goal: Ensure that all tools for firefighting are operative

8. **Water System Efforts**

   Goal: Make sure that sufficient resources are available.

   Time: Day one to one year

9. **Use Geographic Information System Technology in the Fire Service**

   Goal: Deliver the right resources at the right time to the right locations

   Time: Day one and ongoing

10. **Public and Department Education Improvements**

    Goal: Test to evaluate if the message is being delivered and received

    Time: Three months to one year

11. **Risk Management**

    Goal: Eliminate risks that affect the health and safety of employees (similar to goal for #1)

    Time: Ongoing

12. **Succession Planning**

    Goal: Provide for a seamless transition during changes in the organization

    Time: Ongoing

13. **Diversity Recruitment**

    Goal: Make sure that the department and community are reflective of each other.

    Time: Ongoing

14. **Print Shop**

    Goal: Produce materials for the village cost-effectively

    Time: Ongoing

15. **Shift Schedules**

    Goal: Have the right staffing for the right times

    Time: Ongoing

RECOMMENDATIONS

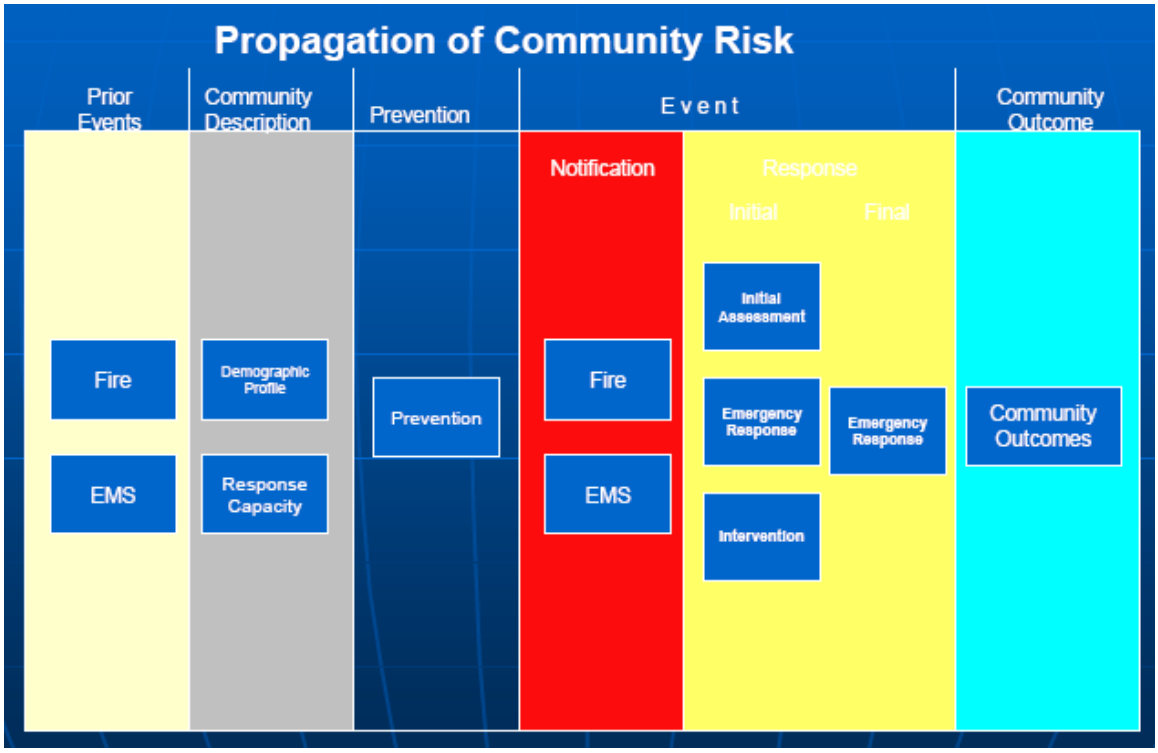
TIME: Day one to one year

1. *Conduct a complete risk assessment of the community.* Unread by most and buried deep within NFPA standards 1710 and 1720 is the requirement that communities conduct a risk assessment. For application to federal grant programs, communities will be required to show that they have conducted a risk assessment and that the application is supported by the risk assessment.

The risk assessment should use the following model, which focuses on *outcomes* and not *outputs.* Often fire agencies concentrate on outputs, such as the times stipulated in NFPA 1710 and 1720, equipment, manpower, hose, nozzles, foam, etc. Each of these is critical to achieving a successful outcome, but without a comprehensive application and systematic development, departments that try to buy their way to success normally fail—as happened, for example, with the Charleston, South Carolina fire, in which nine firefighters were killed despite the community having a Class 1 ISO rating. While outputs or tactical components were present in Charleston, no outcome-driven process had been developed to use the individual pieces in a systematic approach.

With redevelopment ongoing in Glenview, a risk assessment should look at the needs of the agency as redevelopment occurs. In many cases, 1,200-square-foot structures are being replaced by 3,000- and 4,000-square-foot (or greater) buildings. Normally when a new house is being constructed, developers and builders present lists of add-ons that the homeowner may select, such as higher-end countertops, underground sprinklers, decorative touches, etc. Glenview should encourage the use of

residential sprinklers as one of the options; they are about the same or less in price than an underground sprinkler that ensures that the lawn does not burn up in hot summer months. An interior sprinkler system and automated alarm confines fires to points/rooms of origin and ensures that the occupants do not burn up in fire incidents.



Absent sprinkler systems on these larger developments, there may come a need for more staffing to handle the increasingly larger square footages when an incident occurs.

The risk assessment should also be all-hazards, meaning that all hazards—fire, EMS, hazardous materials, technical rescue, marine, aircraft (if applicable), and homeland security—should be looked at and deployment scenarios created. Homeland security can be further divided into human-made and natural trigger incidents.

The current system deployment is based on specific criteria and is contained on “run cards” established at dispatch. During the course of the risk assessment, this system can be reviewed. The review should include establishing models for the deployment of sufficient resources to handle the demands of the location, with CASTing (Critical Attendance Standards) for each function that must be performed in each incident at each location.

The risk assessment should lead to adopted “Standards of Response Coverage.” Simply put: “What will be the response to any incident occurring in Glenview?” The standard of response tells the elected officials and citizens what equipment and staffing will be required for an all-hazards response matrix in order to ensure that the right equipment is deployed at the right time and in the right amount.

TIME: Day one and ongoing

2. As the risk assessment is being conducted, it can serve as an excellent opportunity to conduct a complete community building inspection program. Such a program can be advertised and promoted as an additional service to seniors, who are usually concerned about being trapped in burning buildings and generally welcome and participate in such programs in large numbers. A complete community building inspection program could go far to eliminating risks that necessitate responses.

Many communities have used similar inspection programs to affect the outcomes of incidents that would have otherwise had larger impacts on the community. For example, Scottsdale, Arizona, which has a large older population, has identified “falls” as a significant factor in patient

outcomes. The falls led to hip fractures, a serious injury that affects longevity as well as quality of life. The city's inspection program tries to eliminate fall hazards, ultimately reducing hip fractures suffered by citizens and calls for service occasioned by them. Other departments have targeted specific areas according to frequent calls for service. By reviewing calls and classifying them by injury and cause, a department may be able to identify areas to specifically target.

Prevention of incidents before they occur is often minimized by departments and communities. It is difficult to report how many incidents did not occur because of prevention activities; it is much easier to report incidents that occurred and resulted in losses. Key to improving the outcome of an event is the elimination any risk that can be eliminated before an incident occurs.

The task of conducting such a community building inspection program will have to be carefully coordinated, but it should provide data on the 20,000 or more buildings served by the Glenview fire department, and it can be used in the risk assessment as well as the standard of cover report.

TIME: Six months to one year

3. Consider merging the building department with the fire department under a unified command.

The building department and fire department currently operate well together, with the fire department receiving information on projects, making comments, and incorporated those comments into final planning decisions. However, a more effective approach to long-term success is to

have a team of firefighters and inspectors that would be familiar with unique situations in the neighborhoods served by the individual stations.

By combining their efforts, the departments could increase the number of inspections performed for residential as well as commercial/industrial buildings. Firefighters would be intimately involved in mitigating risk before any incidents occurred, and they could gain a level of knowledge on building inspection that would raise their ability to handle any incidents that did occur at inspected locations. A primary failure highlighted by the Charleston fire was the responders' lack of knowledge about the roof and building design/construction. By combining their efforts and educating all personnel on the risks present in their district, Glenview's building and fire departments could significantly reduce the chances that this kind of tragedy will occur.

The bureau was at one time in the fire department. The focus has shifted to new construction, with the existing facilities' inspection functions pretty much stopped. Much of this was because of the large volume of new construction that has taken place in the community, particularly on the former military base.

Building inspections on commercial and industrial facilities can also generate additional revenues for the fire department to offset future improvements and service requests, as well as the costs of the comprehensive residential inspection program.

There are approximately 2,900 occupancies that should be inspected each year; consideration has been given to move that to once every 18 months because the yearly goal cannot be achieved. The department is looking at merging and coordinating these functions; that effort should continue.

TIME: Day one to three months

4. Conduct a strategic planning program. The department mentioned that it would like to consider becoming an accredited department through the Center for Public Safety's Commission on Fire Accreditation International. That program, developed around performance measurements developed by ICMA and the International Association of Fire Chiefs (IAFC), seeks to guide departments on developing the level of service that is expected by the Authority Having Jurisdiction (village board) and the community.

By conducting a strategic planning program, the department can get input from the community's elected officials and citizens to ensure that the level of service applied will meet community expectations. This is critical because there will be ill will or bad feelings if the citizens expect one level of service and, because of ineffective deployments, another is

delivered The program is available from various groups and can be conducted using in-house facilitators.

TIME: Day one and ongoing

5. During station inspections, it was noted that firefighters on duty were taking citizens' blood pressures and assisting them with other preemergency care. Expansion of these services can be funded through the application of fees for ambulance response.

The use of on-duty firefighters to provide regular care, such as blood pressure, blood sugar, and other such screenings before incidents occur, is critical to the pre-response deployment. The agency should continue this preventive approach and review call records to determine if other pre-call screenings could be conducted at stations, which could thereby prevent emergency calls for service.

The agency should also create and deploy a comprehensive community education program, with a target of training all citizens in CPR and the use of AED devices within five years. The goal of the program is to provide immediate intervention when a cardiac or other emergency event occurs—prior to the arrival of emergency responders, which can take up to six minutes under the best of circumstances. Cities such as Houston, Atlanta, and Seattle have seen success rates for defibrillation rise to levels above 40% when targeting such strategies.

Any program created should include a pre-test as well as a post-test to determine if the training and education is achieving a level of success. If the department is simply providing information that does not improve the skill level of the community, the money and efforts might be better

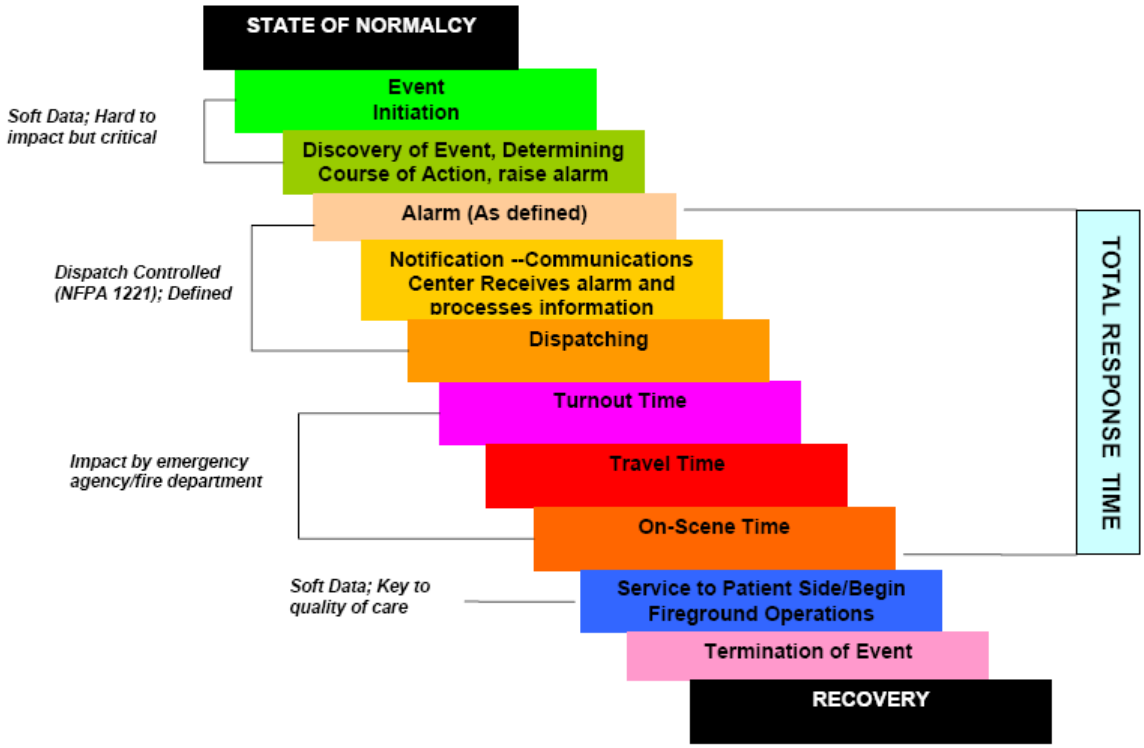
applied. A similar recommendation is made in the public education area of this report.

The last part of a successful system is the department's relationship with the medical care providers to which patients are delivered. Glenview uses nurse ride-a-longs, regular meetings with the project medical director for region X, and monthly continuing education that satisfies training requirements.

Meetings with medical control, quality managers, and fire department officials should be held regularly to review incidents for outcomes. Outcome information is the most difficult piece of data to obtain because of patient confidentiality. Few departments review the outcome of intervention, but such information is key to making quality improvements.

TIME: Day one to two months

6. Quality control on dispatch. A new dispatch center has been created in the new police department building that allows Glenview the opportunity to grow and offer quality service. Although key performance measurement has not yet been implemented, it should be implemented as soon as possible to ensure that there are not breakdowns or shortcomings in the levels of service.



Key measurements include how much time it takes for a phone to be answered (NFPA 1221 indicates 15 seconds 95% of the time), for the call taker to take information (NFPA 1221 identifies 30 seconds if the call has to be switched from call taker to a dispatcher, and then 1 minute to acquire sufficient data to dispatch units), for units to be dispatched (included in the 1-minute time above), for turnout (1 minute, although study data indicate that this may not be enough time and that it should be closer to 1.5 minutes), for travel and arrival at patient's side (or initiation of service at a fire call), and for the total incident. If one does not measure times, there is no way to improve them, or to even establish existing baselines of service or benchmark an agency's response times against those of other agencies of similar demographics or size.

TIME: Six months to one year

7. Hydrant care. Glenview has an effective hydrant care and maintenance process in place through its public works department. Fire hydrants are critical to successful response efforts, and some fire departments have developed contractual relationships with the water service to flush hydrants, record pressures, do routine types of maintenance (painting, greasing fittings, etc), and report problems. Because the fire department is the end user of fire hydrants, it should be intimately involved with such issues.

On-duty personnel, when not responding to calls for service, could begin a comprehensive inspection program of fire hydrants in the village with the goal of improving efficiency, effectiveness, and safety for the community as well as for the responders. Such a program might entail using new hires or other lower-paid individuals to flush the system, given that hydrants normally have to flow for a given period of time, and using on-duty personnel to perform the function might be a problem if they get called off for responses in the district. This would present one opportunity to assist the public works department with staffing challenges.

In winter months, it would be beneficial to have some type of lightweight snowblower to clear snow piled around hydrants so that the hydrants can be found if needed during an incident. Before winter comes, hydrants normally need to be pumped dry to prevent winter freeze-ups and loss of their use.

TIME: Six months to one year

8. Water system coordination and development. The village has a trailer park that operates its own water system, but the system is not sufficient for incidents that occur within the development. SOP 210.00,

"Emergency Water Supply 2450 Waukegan Road (Sunset Village)" was developed to address this problem. The village should look at supporting Illinois state legislation that deals with trailer parks as it otherwise lacks legal standing to address this situation.

Should an incident occur at the trailer park, a large commitment of manpower will have to be made available in order to lay sufficient supply line into the park area. The citizens have been made aware of the shortcomings, which should be noted when developing the "Standard of Response Coverage" document.

TIME: Day one and ongoing

9. Development of geographic information system (GIS) technology. Because the fire department has periods with lower call volumes but not downtime in large, planned blocks, firefighters should be encouraged to learn about GIS and ways to expand the village's GIS system. Normally cities use people who have taken classes in GIS or have an information technology background. However, these people often lack the ability to match the technology to the demands required by the community.

Lot sizes, building types, building anomalies, water main sizes, hydrant locations, the presence of hazardous materials, exposure issues, demographics: often these are not the concern of one agency. In the case of fire, agencies have concerns that span across all these issues, as well as road systems, road closures, and building construction.

The International Association of Fire Fighters, through the National Alliance for Public Safety GIS, has indicated a support of efforts to educate firefighters at all levels on the uses of GIS.

GIS begins with the technician inputting data that can be used for analysis or response by all disciplines. The technician's work is usually time-consuming and requires sitting at a PC and coordinating geographic positioning system (GPS) and "points" with underlying maps. Templates are being created through the International Fire Marshall's Association and the Environmental Systems Research Institute (ESRI), together with IAFC and the National Alliance, to ensure that during emergency events, data created by one agency is compatible with all other data for key decision making. During Hurricane Katrina, for example, it was found that none of the data in the individual locales could be used in general decision making because they were not compatible.

Existing businesses and industries with GIS capabilities could furnish comprehensive data for inclusion in the village's GIS system, and all new construction should be required to input data into the system according to GIS standards established by the village. Fire department teams could be trained to input the data and build the underlying framework for key decision making in the community for many years to come. This would also lessen one of the hurdles that must be overcome by communities: funding the creation of a GIS system.

Classes for training firefighters in GIS technology will be available in the summer of 2008 through ESRI. One class is scheduled for Phoenix in December; two other classes are available for sponsorship, and the agency should consider sponsoring one at the Northeastern Illinois Public Safety Training Academy (NIPSTA).

TIME: Three months to one year

10. Review the public and department education programs for performance-based results.

The department is currently conducting education for the public using programs developed by and through the NFPA. However, such programs usually do not incorporate any methodology for evaluating their effectiveness—that is, whether the information taught was successfully received.

Through pre- and post-testing, the agency can demonstrate that goals and objectives are being achieved at the same time that it evaluates the instructor's ability to effectively communicate the message of change. Such testing can also ensure that the limited dollars being spent on public

education are producing an outcome and at what level. It is also a good way to gauge the efficiency and effectiveness of the prevention program.

For the department members, pre- and post-testing should be included in all programs as part of an ongoing risk-management strategy. The department should be commended for conducting monthly competency testing; the only issue is that there is no corresponding corrective model should a member fail. Failure to perform or to correctly use equipment provided by the village is not an option as it can have life or death consequences. Police officers cannot carry a gun if they cannot perform with it; firefighters are no less dangerous if they are unable to perform with the equipment necessary to control situations.

A yearly competency test should be developed to cover all the skills expected of members for the jobs that they are being paid to perform. A process should be agreed upon and negotiated to provide remedial instruction if it is needed, but the final responsibility rests with the individual to remain competent in his or her particular skill sets. While this can be difficult, given the number of skills demanded of individuals, it is critical to ensure the safety of both the responder and the other responders and the public.

Documentation of the results of the competency testing, as well as of any pre- and post-testing for programs given to employees, ensures that the same training is not provided 26 times to the same employee over a 26-year-career but, instead, that the training has been effective in improving or maintaining the skills and knowledge of the individual.

TIME: Ongoing

11. Risk management – physical. The department requires a physical training program, CPAT testing, and pre-testing of individuals prior to hire. The baseline cardiac and physical tests should be recorded, and a comprehensive training matrix that identifies areas of weakness should be implemented. Studies have shown that the shift work and stress of responses has an adverse impact on firefighters' health, particularly the heart.

By instituting regular physical evaluations and targeting critical issues, the village can minimize future liabilities to employees. A program of this nature, as well as training for minimizing injuries that show patterns of presentation, such as hernias, burns, and injuries to back and legs, could be expanded to cover all village employees. Managing risks and eliminating causes for injuries before they occur is always less expensive than managing the costs of injured employees, up to disability or death.

The light-duty program is currently medical specific; such duties could be expanded to painting fire hydrants; recording fire hydrant data; assisting in GIS development; and conducting building inspections, routine maintenance tasks, and public/department education. This may require coordination with the risk manager for the village.

TIME: Ongoing

12. Succession planning. The department is young, with an average age of 40. It recently went outside to hire a deputy chief, who will provide new skills and knowledge to the existing agency. However, because some groups were hired in 1971 and others in 1992, when the Glenbrook

district (formerly unincorporated Cook County) was annexed, many will soon be retiring.

The department should continue to develop a succession planning program for dealing with the vacancies that will occur when longtime employees retire, as well as for filling key administrative staff positions. Concepts have been initiated to deal with vacancies and provide for a seamless transition; this work should continue.

TIME: Ongoing

13 Diversity recruitment. The department has not had a great amount of success in diversifying its worker base because of the proximity to larger agencies and locales. It has taken steps to attempt to recruit women and minorities, but with limited success. These efforts should continue.

TIME: Ongoing

14. Print shop – The department has access to a print room that was used to produce village material. However, the existing equipment is dated. A review is needed to determine what materials are being printed by departments and in what quantity. It may not be a matter of simply upgrading the existing equipment; it may require a completely new copier. Persons on light duty could be assigned to the print shop, which would enable existing staff to handle calls without interrupting large copy runs. The needs inventory should be conducted because many materials may have been converted to electronic-access formats. Printing equipment is expensive and documents that require actual printing are probably more inexpensively produced by commercial printers.

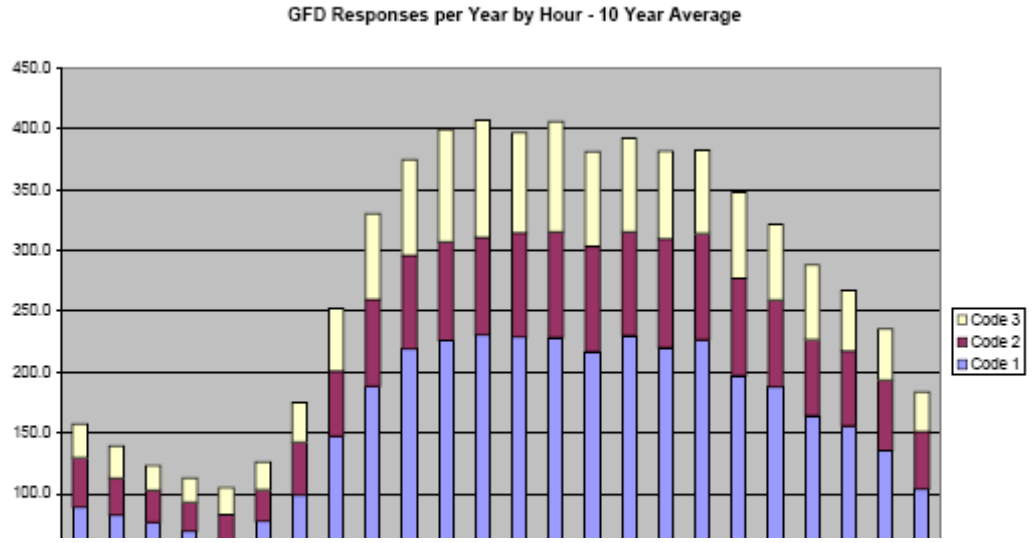
TIME: Ongoing

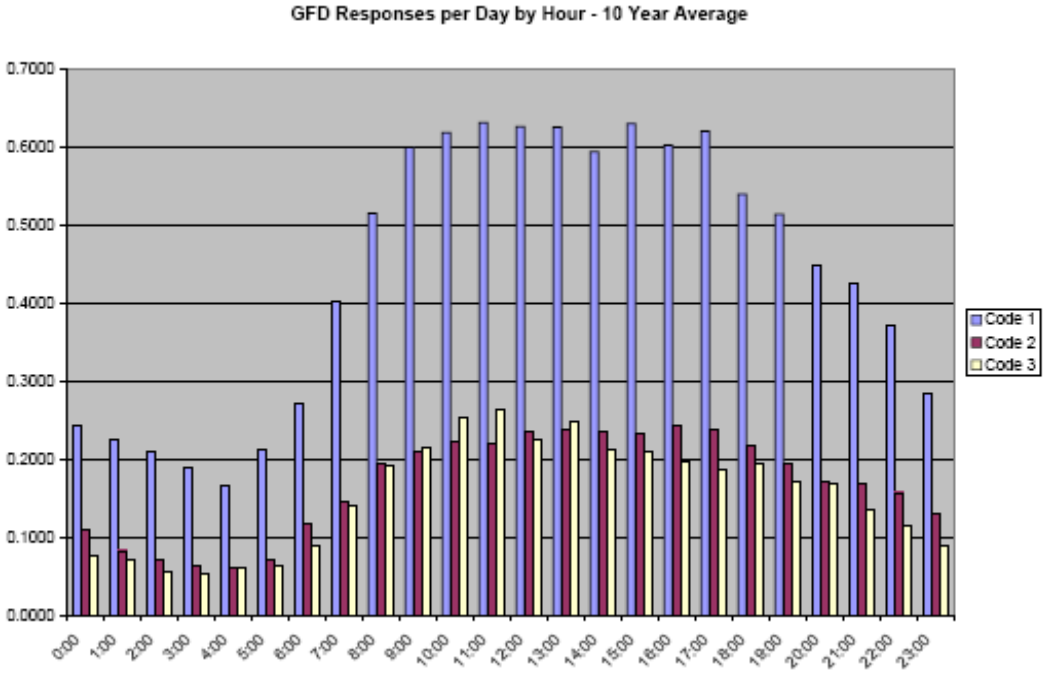
15. Shift schedules and hiring. A long-term project should be evaluating the shift schedule and time worked by the agency. While the tradition in fire departments is 24-hour shifts, Glenview has peak times in which more personnel are used. Having the flexibility to schedule personnel for less than 24 hours would allow additional staffing during the peak periods when it is needed, and the department could revert to the normal staffing at other times. The result is delivering service at the right levels and at the right times

Additionally, the village should look at the existing baselines for staffing. Currently there are 27 individuals on each shift, but with vacation and other paid leave time, the normal staffing is more closely 22. This allows for dispatch to a structure fire of low hazard and low occupancy, such as sending 16 firefighters to a house, and keeps in reserve enough personnel for an ambulance response. Fortunately the community is part of the excellent MABAS (mutual aid box alarm system) system found in the Chicago/Illinois area, which provides additional responders should they be necessary.

With the baseline staffing, if calls for service increase at periods of the day, the village should look at negotiating the ability to use nontraditional hours of employment blocks such as 4-hour shifts, etc., to provide sufficient manpower in those peak periods. The manpower is not needed 24 hours per day but rather at targeted times, and by having the ability to schedule flexibly, the department can minimize future costs while still achieving the outcome sought by the agency, elected officials, and the public.

The following charts are specific to Glenview fire department. For Glenview, the peak hours of usage on the system occur during daytime hours. Staffing should be viewed for covering the peak hours that stress the system; this may not include 24-hour work schedules but something of a combination.





Leaders at the Core of Better Communities

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