Sycamore Township Police Staffing Study

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EXECUTIVE SUMMARY

Sycamore Township, (Sycamore) , Ohio contracted with the University of Cincinnati's Institute of Crime Science (ICS) to determine the police staffing needs for the township. Currently, Sycamore does not have its own police department and instead contracts with the Hamilton County Sheriff's Office (HCSO) to provide police patrol services. To prepare this report, ICS researchers analyzed calls for service data, crime data, and interviewed the township administrator to better understand Sycamore's current staffing situation. Following the data collection and analysis processes, ICS employed two different methodologies to examine the staffing needs of Sycamore. Generally, three different methodologies are used to determine staffing needs. However, due to data limitations discussed later, ICS only employed two of the three methodologies, peer comparison and citizen initiated calls for service workload. It is also important to note that most staffing analyses are conducted to determine staffing levels of an existing police agency. Staffing analyses generally look at patrol staffing as part of the overall staffing of a police agency, as well as deployment and organizational structure.

The peer comparison analysis compares jurisdictions that have their own police departments. There are no standards for comparison among jurisdictions that contract for police services. As mentioned above, Sycamore does not have its own police department, therefore comparisons among peer agencies may be informative if Sycamore would ever consider forming a police department or perhaps consider forming a joint police district with one or more other jurisdictions.

In the peer comparison model, ICS researchers first compared Sycamore with other comparable United States villages/cities that have a similar population size and crime level. *National analysis revealed that the average number of sworn police officers in the villages/cities most similar to Sycamore is 36.*

Next, ICS conducted a peer comparison looking only at Ohio cities in order to account for possible regional differences. In-state only comparisons provide a more robust estimation of staffing needs since each region has its own unique characteristics. *Based on the in-state comparison, ICS researchers found that the average number of sworn personnel in these Ohio departments is 31 which is slightly less than the national average of 36.*

Since Sycamore Township does not have its own police department and receives contracted police services from the HCSO, in the per capita approach we should look at the number of officers *assigned solely to uniformed patrol* instead of the total number of sworn officers in a police department. Using the International City/County Management Association's (ICMA) recommendation that 60% of total sworn personnel should be allocated to uniformed patrol functions, *the per-capita comparison method indicates that Sycamore should have 19 officers assigned to uniformed patrol functions if it operated its own police department.*

ICS researchers do not rely solely on the peer comparison staffing model because it does not consider the workload of police departments. Therefore, using 2017 Sycamore calls for service (CFS) data, ICS applied a workload-based calculation method to determine the number of officers needed to answer and clear calls for service.

The workload-based calculation method used only citizen initiated calls for service data. This approach strictly follows the International Association of Chiefs of Police (IACP)'s recommendation that patrol officers should spend one third of their time on citizen initiated calls for service, one third of their time on administrative tasks, and one third of their time on proactive policing. *This workload based calculation method suggests that 4 officers on day shift and 3 officers on night shift can clear all calls for service for that shift.* This could change if Sycamore desired, or had a comprehensive plan for proactive policing or self-initiated activity for officers as a percentage of their patrol time.

Three scenarios are presented as part of this staffing analysis. Scenario 1 presents staffing requirements for only reactive policing provided by HCSO (answering citizen calls for service with no proactive time) and indicates that 2 officers per shift can handle all calls for service. Scenario 2 presents staffing for minimal proactive time provided by HCSO and indicates that 4 officers on day shift and 3 officers on night shift can handle all calls for service, and Scenario 3 which presents a patrol staffing level if Sycamore Township had its own police department and its patrol force engaged in minimal proactive time indicates that 4 officers on day shift and 3 officers on night shift using a four squad deployment can handle all calls for service.

STAFFING ANALYSIS

One of the fundamental questions for police departments is how many sworn personnel are needed to efficiently and effectively perform policing functions in a given jurisdiction? Unfortunately, there is no single standard method for answering this question. There are different methods/approaches used to determine the staffing needs of police departments, such as the per capita approach, the minimum staffing approach, and a workload based approach. Each approach has certain advantages and disadvantages. In this report, the University of Cincinnati's Institute of Crime Science (ICS) combines both the per capita and the workload-based approach to calculate police staffing needs for Sycamore Township (Sycamore).

A unique aspect of this staffing analysis is that Sycamore does not operate its own police department. Previous staffing analyses conducted by ICS have been for jurisdictions with their own police departments. Many factors can influence agency staffing decisions. This report will only show the minimum number of patrol units needed to answer calls for service in 3 different scenarios. We make no recommendations on deployment and give no opinion on the percentage of time that Sycamore wants, or should dedicate to proactive policing. One of the reasons to point this out is because many of the functions and activities regularly performed by police agencies may not take place in a jurisdiction that contracts with an outside entity for its police services. Often these contracts are for a specific number of hours of police patrol services with only a few specific details included as to how precisely that service will be provided. Jurisdictions with their own police departments have far better control and influence over the activities of their police officers. A jurisdiction that contracts out police services has very limited influence over those same activities, unless the precise scope of work to be performed is clearly articulated in the Service Contract or Agreement. Consequently, a staffing analysis may not be able to include a recommendation of optimal agency staffing other than for responding to citizen initiated calls for service.

If no proactive activities are undertaken by the contracting entity (e.g., problem solving, formal community policing programs, targeted enforcement or patrols) there is no empirical methodology currently available to determine optimal staffing while also including those activities.

Sycamore Township currently contracts with the Hamilton County Sheriff's Office (HCSO) for their police patrol services. HCSO provides contract police patrol services to other jurisdictions as well. In this HCSO model, each jurisdiction contracts for a specific amount of daily police coverage. Usually, HCSO and the contracting jurisdiction jointly determine what coverage is needed to provide the police services. This may be the result of analyzing calls for service and crime data, or it may be coverage based on what a community can afford to pay. The cost of a contract or agreement is derived from the actual number of hours of police service provided. In a recent discussion with the Sycamore Township administrator, researchers learned that cost was a primary factor in determining their staffing levels. There was some discussion with HCSO about calls for service and other data to arrive at a final staffing determination.

Sycamore Township currently contracts for 4 officers per shift 7 days a week, 365 days per year plus one power shift car that works between the hours of 10:00 AM and 7:00 PM Monday through Friday. The power shift car has no replacement for off days or other days when the assigned officer is not available (sick, vacation, training etc.).

As part of the existing contractual agreement, HCSO provides, at no extra cost, a Lieutenant to oversee the officers assigned to Sycamore Township, and recently assigned 1 Sergeant to their east side patrol districts, including Sycamore, to handle HCSO cumulative administrative and support services as needed, including: criminal investigations, traffic crash investigation, bomb squad response and helicopter assistance. These positions are not included the ICS staffing analysis.

The Discussion section of this staffing analysis presents 3 scenarios for police patrol staffing to respond to Sycamore citizen calls for service. Scenario 1 presents staffing requirements for only reactive policing provided by HCSO (answering citizen calls for service with no proactive time); Scenario 2 presents staffing for minimal proactive time provided by HCSO, and Scenario 3 which presents a patrol staffing level if Sycamore Township had its own police department and its patrol force engaged in minimal proactive time (seeTable 9).

Calls for Service Data

The calls for service data used in this analysis came from the Hamilton County Communications Center (HCCC). ICS used 2017 calls for service (the last full year of data available when the analysis started). HCCC dispatches for almost all police agencies in Hamilton County. After cleaning the data, by removing duplicate calls, removing calls with no associated call times, and removing calls where no unit was dispatched, ICS researchers noticed that calls for service in Sycamore were not always answered by the contract cars assigned to Sycamore Twp. Sometimes calls were answered by other HCSO contract cars from neighboring communities or by an HCSO unit assigned to the east side district of Hamilton County that was not contracted by any specific jurisdiction. It is unknown why these calls were answered by units other than those assigned to Sycamore. However, in the final analysis, the number of calls answered by non-Sycamore units did not impact the required number of units to answer citizen calls for service.

This does raise the question, however of why Sycamore units are sometimes unavailable to answer calls for service and how is it determined which other unit(s) respond to and handle the call.

Per Capita Approach[1]

The per capita approach is fairly easy to understand and provides a rough and quick staffing estimate for a police department, based on similar law enforcement agencies in terms of their populations, crime rates, and geographic area (e.g., Southern states, Western states, etc.).
Although it does not rely on any scientific calculations, it still offers a good starting baseline to see how the rest of the nation handles their safety needs based on certain similar characteristics (e.g., population, crime rates). In this report, ICS did not use a traditional per capita approach, which principally uses citizen-officer ratios and the population size of cities, because there are many drawbacks to only using citizen-officer ratios to determine proper staffing levels. These drawbacks include: differential workload of cities (in terms of calls for service), varying crime levels, and topographical differences (including population density per square mile). For this reason, ICS researchers generally employ FBI Uniform Crime Report (UCR) data to better compare cities, based on their various types of crime levels (e.g., property crimes, violent crimes), with the matching cities.

The per-capita approach does have certain advantages, such as quickly identifying the basic level of appropriate police staffing for Sycamore Township. when compared to police departments in similarly sized United States cities[2].

The Population of Sycamore Township

The population of Sycamore Township, Ohio has been fairly stable over the years. The current population of Sycamore Township is 19,422. It is predicted that the population of Sycamore Township will rise to 19,660 in 2021 and 19,901 within six years. Therefore, ICS defines the population range of Sycamore Township as 20,000 for our comparisons with other US and Ohio cities.

Table 1 below shows that there are 818 US police departments[3] whose population falls within a range of 15,000 to 25,000 citizens. Sycamore Township specifically falls into this jurisdictional population range. When ICS researchers looked at the national staffing average for police departments in this population range, we found they have an average of 36 sworn officers.

[1] Revised as peer comparison in this study
[2] In our experience, using a peer comparison approach is safe and generates very similar results if it is done correctly. In statistics, we compare our results with the population (or hypothetical sampling distributions/populations) in order to determine whether the study outcome is rare or not. If the result/outcome substantially deviates from the norm (in this case, national average), then, we conclude that the outcome is very rare (high or low depending on the positional score on the population distribution). Given this context, we try to replicate statistical procedure with a peer comparison model in order to quickly identify the positional score of Sycamore when compared to the national average (in statistical terms: population).
[3] This number is based on the number of police departments reported to UCR.

In this context, Table 1 below suggests that the appropriate staffing level is 36 officers (this is the average of the two population range average number of sworn officers) for the entire Sycamore Township Police department (if one existed).

Table 1. Average Number of Law Enforcement Employees Based on Population

Number of Cities	Population Range	Average Sworn Officers	Average Civilians	Average Total Employees
497	15,000 - 19,999	33	8	40
336	20,000 - 25,000	39	9	48

Using the above formula, our next analysis only looks at Ohio cities, in order to account for regional differences, and because in-state comparisons provide a more robust estimation since each region has its own unique characteristics. Table 2 below shows there are 31 police departments in Ohio jurisdictions that have a population between 15,000 and 20,000 people. *The average number of sworn personnel in these departments is 31, which is slightly less than the national average.*

Table 2. Average Number of Law Enforcement Employees in Select Ohio Cities, Based on 2017 UCR Data

Cities	Population	# of Violent Crimes	# of Property Crimes	# of Sworn Personnel	# of Civilians	Total Employees	Officer Ratio Per 1000 Citizens
Alliance	21838	75	800	38	12	**50**	**2.29**
Ashland	20485	25	375	29	7	**36**	**1.76**
Aurora	15932	3	187	28	7	**35**	**2.20**
Avon Lake	23839	8	124	29	5	**34**	**1.43**
Bay Village	15327	--	--	23	4	**27**	**1.76**
Berea	18871	8	140	26	2	**28**	**1.48**
Centerville	23782	14	373	39	15	**54**	**2.27**
Clearcreek Township	15531	11	74	15	1	**16**	**1.03**
Copley Township	17280	15	163	22	1	**23**	**1.33**
Defiance	16594	26	464	30	3	**33**	**1.99**
Eastlake	18056	14	330	21	11	**32**	**1.77**
Fairfield Township	22524	26	758	19	1	**20**	**0.89**
Forest Park	18665	50	435	36	6	**42**	**2.25**
Miamisburg	19928	14	257	37	2	**39**	**1.96**
Monroe	16002	19	406	31	8	**39**	**2.44**
Mount Vernon	16553	22	621	29	3	**32**	**1.93**
Niles	18334	--	--	34	5	**39**	**2.13**
Norwalk	16811	--	--	23	7	**30**	**1.78**
Piqua	20973	54	819	35	3	**38**	**1.81**

Sandusky	24861	70	995	47	2	**49**	**1.97**
Sidney	20466	42	822	35	10	**45**	**2.20**
Solon	23023	13	182	47	17	**64**	**2.78**
Springboro	18632	10	122	26	4	**30**	**1.61**
Steubenville	17979	49	1132	38	5	**43**	**2.39**
Streetsboro	16308	11	343	28	8	**36**	**2.21**
Sylvania	18908	6	86	35	7	**42**	**2.22**
Sycamore Twp.*	**19422**	**30**	**565**				
Tallmadge	17529	--	--	24	3	**27**	**1.54**
Tiffin	17481	--	--	31	9	**40**	**2.29**
Vandalia	15022	26	310	28	9	**37**	**2.46**
Wadsworth	23388	24	333	30	9	**39**	**1.67**
Whitehall	18835	125	1269	47	15	**62**	**3.29**
Averages	**19024**	**29**	**458**	**31**	**6**	**37**	**2**

*Numbers for Sycamore Twp. not included in Averages

Summary of Per Capita Comparison Approach

The International Association of Chiefs of Police (IACP) advises that it is inappropriate to use a per capita approach when calculating the staffing needs of police departments because staffing allocation should be made as a result of more complex analysis, such as workload-based calculations. For this reason, per capita comparisons should be interpreted with a caveat.

As stated earlier, Sycamore Township does not have its own police department and receives contracted police services from the HCSO, therefore, in the per capita approach we should look at the number of officers *assigned solely to uniformed patrol* instead of the total number of sworn officers in a police department. To approximate the number of patrol officers that would be in a Sycamore Township Police Department, if one existed, we use the International City/County Management Association (ICMA) recommendation that 60% of total sworn personnel should be allocated to uniformed patrol functions. Using this recommendation, the average number of sworn police officers in comparable Ohio jurisdictions is 31 as seen in Table 2 above, and 60% of this number is 18.6 which is rounded up to 19 sworn officers. *Using this analysis, the per-capita comparison method indicates that Sycamore should have 19 officers assigned to uniformed patrol functions if it operated its own police department.*

Workload-based Approach

A workload-based approach requires a thorough data cleaning process and additional calculations, using available calls for service data, to calculate staffing. The idea behind a workload-based approach is that the police maintain order for the public; therefore, public service requests (e.g., responding to citizen calls for service, investigating a crime, etc.) should determine the staffing size of a police department. While this approach generally has a valid base, researchers should always keep certain rules in mind about a workload-based approach before applying it to any police

department. Using 12 months of calls for service data is a widely accepted data set to conduct a workload based staffing analysis as it provides actual numbers of calls for service, response times, and time spent on calls for that time period.

The first rule is that researchers need to know whether the police department currently applies any problem-oriented policing strategy to reduce calls for service in their jurisdiction. Failing to consider ongoing crime prevention efforts may yield underestimated staffing needs. Note that like responding to calls for service, conducting proactive policing takes either a similar or an increased amount of time and resources for a police department. For this reason, researchers should conduct interviews with police departments to better learn the nature of their calls for service data *prior* to workload-based calculations being performed.

The second rule is that many calls for service data points are highly complex. Researchers should investigate the data for errors, missing cases, duplicate entries, and logical errors (e.g., the closing time of a call for service is earlier than dispatch time) *prior* to performing calculations. Any data error can lead to a fatal calculation error –thereby creating more or less staffing needs– since a workload-based approach uses every single source of information to determine the staffing needs of a police department.

Third, in certain cases, relying solely on agency data to calculate the staffing needs of a police department can be a harmful error for a police department because of the possible mistakes/additions/omissions in the police data/database. For this reason, the calculated results should be discussed with the police department in order to confirm whether their suggested staffing numbers accurately match with the realities of the police department's workload.

Calculating Patrol Unit Size of Sycamore Township

The uniformed patrol force of a police department has three main duties in any given jurisdiction: (1) responding to calls for service, (2) administrative tasks, and (3) proactive policing to support public order and build community relationships. IACP suggests that police officers working in a patrol assignment need to divide their time into three equal parts:

- one third of their time is allocated for responding to calls for service,
- one third of their time is allocated for administrative tasks, and
- one third of their time is allocated for proactive policing.

There are two different widely used formulas to calculate the uniformed patrol size of a police department based on calls for service data. The first formula was developed by Dr. Alexander Weiss, Ph.D. and takes into account only citizen-initiated calls for service time. In addition to this, Weiss's formula also requires calculation of the shift relief factor by considering officers' off days, vacation time, in-service training times, and sick time usage in determining overall agency staffing needs. This formula also suggests that the police officers working in a patrol function should spend one third of their time responding to citizen initiated calls for service, considering the shift relief factor.

The second formula was developed by the International City/County Management Association (ICMA) and takes into account all calls for service data (both citizen initiated and officer initiated) for calculations. ICMA calls this formula the 60% rule. The formula essentially states that a police officer working on patrol should spend a maximum 60% of his/her time on all types of calls for service, after considering off days, vacation, in-service training and sick time.

The two formulas are very close in their calculation methods. Dr. Weiss's formula considers only citizen-initiated calls for service; whereas the ICMA formula takes into account all calls (both citizen initiated calls[4] and police initiated calls[5]). ICS researchers generally employ both formulas in a staffing study to confirm the results from the two different calculation methods. However, in this analysis we will only use Dr. Weiss's formula using citizen generated calls for service. Using the data provided by HCSO, ICS was unable to determine, with precise certainty, the number of self-initiated calls for service and officer proactive activity needed to include the ICMA formula in this analysis.

Regardless of which formula is being used, they both require calculating the number of calls for service by hour, day of the week, month, and season because both approaches suggest that the optimum number of officers assigned to patrol duties should be calculated based on the highest month or season's activity in order to maintain the IACP standard of at least 33% of an officer's time be available for proactive policing over the course of the entire year.

Due to the data limitations explained above, this study will only employ Dr. Weiss's formula for the Sycamore Township staffing calculation.

Sycamore Township Patrol Unit Calculation based on Weiss's Formula

Table 3 below shows the 2017 citizen-initiated calls for service (CFS) for Sycamore Township (the last full year of available data). The total number of Sycamore citizen-initiated CFS was 11,838. As mentioned earlier, calls for service in Sycamore were not always answered by the contract units assigned to Sycamore. Sometimes calls were answered by other HCSO contract units from neighboring communities or by an HCSO unit assigned to the east side district of Hamilton County that was not contracted by any specific jurisdiction. It is unknown why these calls were answered by units other than those assigned to Sycamore township. ICS found 390 calls for service in Sycamore that were answered by units other than those specifically assigned to Sycamore. The analysis shown in Table 3 below was run and included the calls answered by other non-Sycamore based HCSO units. Including those calls did not change the required number of units to answer Sycamore's citizen calls for service.

As the heat map colors of Table 3 below suggest, Sycamore Township showed a higher volume of CFS between the hours of 10 am and 9 pm. On average, 13.71 hours were spent to clear Sycamore's CFS in a given day.

[4] For instance, a call to report a crime or a situation that requires police assistance to resolve
[5] For instance, a traffic stop or investigative contact

That is, if we considered the patrol officers like a robot, 1.71 officers would need to work non-stop (8 hours a day) just to clear daily citizen initiated calls for service (13.71 hours / 8 hours = 1.71 officers).

Table 3. Citizen Initiated Calls for Service (January 1, 2017 - December 31, 2017)

Hour	Number of CFS	Total Service Hours	Average Number of CFS in a Day	Total Daily Service Hours to Clear Daily CFS
0	323	153.73	0.9	0.43
1	258	125.97	0.71	0.35
2	202	138.27	0.57	0.39
3	160	68.31	0.44	0.19
4	174	102.42	0.48	0.28
5	180	75.29	0.49	0.21
6	196	66.86	0.55	0.19
7	335	127.09	0.93	0.35
8	445	164	1.23	0.45
9	528	181.23	1.46	0.5
10	579	209.72	1.6	0.58
11	621	232.89	1.71	0.64
12	659	272.77	1.82	0.75
13	671	289.58	1.85	0.8
14	663	267.51	1.82	0.73
15	743	320.69	2.06	0.89
16	797	339.13	2.19	0.93
17	790	338.51	2.18	0.93
18	744	304.87	2.06	0.84
19	723	276.39	1.99	0.76
20	589	239.59	1.63	0.66
21	533	301.74	1.46	0.83
22	512	197.21	1.41	0.54
23	413	176.86	1.14	0.49
Total	**11838**	**4970.63**	**32.68**	**13.71**

Table 3a below includes the calls for service in Sycamore that were answered by units other than the Sycamore contract cars. In this analysis, on average, 15.98 officer hours were spent to clear CFS in a given day. Using the same formula from above, 1.99 officers would need to work non-stop (8 hours a day) just to clear daily citizen initiated calls for service (15.98 hours / 8 hours = 1.99 officers). So, in both analyses, 2 officers would be able to handle all of Sycamore's CFS in a given day.

Table 3a. Citizen Initiated Calls for Service (January 1, 2017 - December 31, 2017)

Hour	Number of CFS	Total Service Hours	Average Number of CFS in a Day	Total Daily Service Hours to Clear Daily CFS
0	336	200.09	0.92	0.55
1	270	145.45	0.74	0.4
2	210	183.14	0.59	0.52
3	164	75.86	0.45	0.21
4	175	110.24	0.48	0.3
5	181	80.21	0.5	0.22
6	207	75.97	0.58	0.21
7	353	139.84	0.98	0.39
8	469	194.59	1.29	0.54
9	536	206.54	1.48	0.57
10	593	232.51	1.63	0.64
11	636	259.62	1.75	0.72
12	680	311.03	1.87	0.86
13	697	337.06	1.93	0.93
14	686	308.37	1.88	0.85
15	759	368.41	2.11	1.02
16	823	381.54	2.26	1.05
17	816	397.42	2.25	1.09
18	792	396.71	2.19	1.1
19	753	324.12	2.07	0.89
20	600	264.98	1.66	0.73
21	546	373.15	1.5	1.03
22	522	221.82	1.44	0.61
23	424	200.73	1.17	0.55
Total	**12228**	**5789.4**	**33.72**	**15.98**

Table 4 below displays more detailed information for citizen initiated calls for service. Analyses show that the average response time to citizen initiated calls for service is 6.53 minutes and average total service time to clear the call is 26.38 minutes. Further analyses suggest that 66.5% of citizen initiated calls were responded to and handled by one officer (7873 / 11838 = .665). That is, no back up unit was needed for 66.5% of the citizen initiated calls for service. Table 4 also shows that two officers together responded on 25.04% of citizen- initiated calls. It is a rare situation where three or more officers together respond to a citizen initiated call (4.72%). It is important to calculate backup unit involvement to correctly calculate the total amount of service time required for citizen-initiated calls. Failing to consider backup units for citizen-initiated calls might yield significantly underestimated staffing levels for a police department. For this reason, we carefully cleaned the data and calculated multiple patrol officers' involvement for all of Sycamore's citizen-initiated calls.

Table 4. Total Service Hours by Backup Units for Citizen Initiated CFS Data

	One Officer		Two Officers		Three Officers		Four Officers		Five and More Officers	
Hour	**# of CFS**	**Avg Service Minutes**	**# of CFS**	**Avg Service Minutes**	**# of CFS**	**Avg Service Minutes**	**# of CFS**	**Avg Service Minutes**	**# of CFS**	**Avg Service Minutes**
0	187	15.59	103	14.75	29	25.37	4	77.34	--	--
1	150	13.38	73	15.53	29	26.39	3	37.23	3	48.66
2	108	18.40	73	23.87	17	39.75	4	59.43	--	--
3	90	15.02	46	16.85	21	16.78	3	29.94	--	--
4	92	14.62	54	18.02	22	25.63	4	52.58	2	51.93
5	98	16.62	70	16.49	11	20.02	2	13.42	1	18.84
6	120	11.95	59	13.07	15	28.42	--	--	--	--
7	214	15.83	83	13.48	31	18.63	7	17.36	--	--
8	312	16.80	105	15.31	25	17.37	2	12.88	1	87.55
9	384	15.08	122	15.47	19	18.30	2	35.21	1	66.50
10	443	16.35	103	17.87	29	22.22	3	6.43	1	8.71
11	472	15.99	117	18.88	25	21.05	7	37.31	--	--
12	453	16.01	160	17.06	38	27.81	5	22.13	3	39.70
13	454	16.95	156	17.57	52	25.47	6	26.70	3	34.98
14	451	15.89	166	17.01	38	23.85	5	24.84	3	50.61
15	528	16.96	161	17.45	44	21.53	7	58.30	3	61.08
16	561	16.49	172	19.64	52	21.46	8	26.21	4	43.96
17	479	15.23	230	16.77	63	19.23	13	22.31	5	49.09
18	464	14.93	203	15.73	58	22.99	15	17.82	4	24.88
19	488	14.26	177	16.13	47	20.39	8	27.42	3	34.39
20	400	16.28	137	18.13	41	19.97	8	17.97	3	25.94
21	339	15.87	140	22.03	48	33.95	2	117.72	4	61.53
22	332	15.14	134	16.46	41	19.91	4	21.95	1	6.54
23	254	15.72	121	18.55	32	22.83	5	20.69	1	23.49
	7,873	**375.34**	**2965**	**412.14**	**827**	**559.33**	**127**	**783.16**	**46**	**738.40**

Table 5 below shows the percentage distribution for CFS by call type for 2017. Medical related calls for service comprise the highest percentage of dispatched CFS in Sycamore. Traffic related calls come in second (does not include self-initiated traffic stops or enforcement), and the third highest percentage is public service related calls for service. When looking at the table, it is also important to note the total hours spent per year on the various calls for service. For example, even though Crimes in Progress make up only 3.52% of calls, the time spent servicing those calls ranks fourth in overall hours per year. And, while traffic related calls ranks second in percentage of calls for service, they take up the most officer time servicing those calls. Appendix A at the end of this report is a complete list of call types responded to in 2017 and the total time spent servicing the calls. This table was included for reference and to stimulate further discussion with HCSO on calls for service and workload in Sycamore.

Table 5. Classification of Calls for Service By Percentage of Calls 2017 and Time Spent

Call Type 2017	Number of Calls for Service	Total Min per Year	Total Hrs per Year	% of CFS
Traffic Related	1945	77747.4	1295.8	15.91%
Medical Response	2760	56481.8	941.4	22.57%
Reports	1134	38255	637.6	9.27%
Crimes in Progress	430	37471.5	624.5	3.52%
Trouble	541	25505.35	425.1	4.42%
Alarm	1497	23506.8	391.8	12.24%
Investigation	369	18799.2	313.3	3.02%
Suspicious Activity	663	16756.8	297.3	5.42%
Domestic	237	16840.9	280.7	1.94%
Public Service	1531	16243.9	270.7	12.52%
Information	724	7973.6	132.9	5.92%
Fire Related	180	7570.8	126.2	1.47%
Disorderly/Noise	192	3214.6	53.6	1.57%
Miscellaneous	25	996.4	16.6	0.20%
TOTAL	**12228**	**347364.1**	**5807.5**	**100.00%**

Table 6 below displays citizen-initiated CFS by hour and day of the week. Even though throughout the year the number of CFS substantially varies across the hours of the day, it is fairly stable for the days of the week except for Sundays. On average, each weekday generated approximately 1,691 citizen-initiated CFS in 2017.

Table 6. Citizen Initiated Calls for Service by Weekdays (January 1, 2017 - December 31, 2017)

Hour	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total
0	30	45	28	54	56	64	46	323
1	36	26	30	37	33	35	61	258
2	28	22	20	27	31	37	37	202
3	20	20	25	32	15	20	28	160
4	21	15	25	27	27	36	23	174
5	26	32	19	21	29	26	27	180
6	26	32	27	36	23	32	20	196
7	39	51	69	60	48	35	33	335
8	73	59	73	71	80	47	42	445
9	95	78	90	77	84	65	39	528
10	87	97	82	94	87	68	64	579
11	93	93	95	88	110	85	57	621
12	98	89	100	104	118	80	70	659
13	83	96	102	106	106	107	71	671

14	105	83	104	91	115	80	85	663
15	94	106	104	124	125	102	88	743
16	128	136	122	105	118	91	97	797
17	108	123	142	102	136	92	87	790
18	103	110	109	125	114	96	87	744
19	108	101	107	104	113	108	82	723
20	73	94	88	82	86	95	71	589
21	65	78	75	85	85	90	55	533
22	61	73	69	64	100	90	55	512
23	44	51	70	51	68	79	50	413
Total	**1644**	**1710**	**1775**	**1767**	**1907**	**1660**	**1375**	**11838**

Table 7 below shows that the highest number of citizen initiated calls for service was recorded in May of 2017. The lowest number of CFS occurred in November. Current research shows most US police departments report their highest level of calls for service numbers in August and their lowest level of calls for service in February. *Table 7 suggests that there is a seasonal trend and the spring and summer months receive a higher volume of calls for police services in Sycamore Township. ICS analysis also reveals that we need to take into account seasonal differences when calculating the optimum number of personnel. Existing studies suggest if there are seasonal differences, the required staffing numbers should be calculated by considering the month that generates higher number of calls. The reasoning behind this is to keep the personnel number at the optimum level regardless of the fluctuations of individual seasons and months.*

Table 7. Citizen Initiated Calls for Service by Month & Season (January 1, 2017 - December 31, 2017)

	Winter			Spring			Summer			Fall		
Hour	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**
0	21	31	24	27	25	33	27	43	25	26	24	17
1	22	28	18	22	18	35	25	19	23	16	16	16
2	7	9	10	18	18	18	15	28	22	25	22	10
3	11	17	13	13	16	16	9	15	15	14	10	11
4	16	10	12	11	12	23	20	15	12	13	15	15
5	16	16	13	13	15	14	16	16	9	9	29	14
6	18	18	15	15	15	16	10	16	20	17	23	13
7	18	27	24	29	31	33	38	30	27	27	32	19
8	24	41	36	40	30	44	37	34	37	46	42	34
9	24	41	33	46	46	47	55	45	54	59	50	28
10	35	48	57	39	52	59	45	46	56	63	50	29
11	52	50	51	58	52	62	51	47	62	58	39	39
12	46	56	39	63	49	64	53	64	58	67	63	37
13	43	49	56	53	54	64	61	66	77	55	58	35
14	41	60	37	74	62	53	59	62	67	56	50	42
15	47	52	63	62	70	74	82	65	81	62	42	43
16	49	62	56	74	77	77	81	75	74	67	55	50

17	58	66	62	62	63	92	81	72	64	63	66	41
18	46	64	47	70	68	76	74	58	75	63	62	41
19	51	56	65	56	64	58	61	67	70	62	66	47
20	49	46	38	40	52	58	53	55	49	67	42	40
21	41	40	51	30	43	61	63	44	51	39	43	27
22	35	32	32	39	56	37	62	51	53	40	42	33
23	37	28	33	32	27	31	49	34	35	33	45	29
Total	**807**	**947**	**885**	**986**	**1015**	**1145**	**1127**	**1067**	**1116**	**1047**	**986**	**710**
Seasonal Totals	**2,639**			**3,146**			**3,310**			**2,743**		

Shift Relief Factor

Dr. Weiss's formula requires the calculation of a shift relief factor in order to compensate for officers' time off including: regularly scheduled off days, training, vacation, and sick times. Because Sycamore has no police department, we do not have the historical personnel data needed to calculate their precise shift relief factor. Based on ICS researcher's experiences with different police departments' staffing analyses, the average shift relief factor is 0.36.Therefore , we will use this common finding as the shift relief factor for Sycamore Township.

Calculating Staffing of Sycamore Township

Using the average shift relief factor of .36, we then calculated the required number of patrol officers using Dr. Weiss's formula. The calculations in Table 8 below are dependent on the citizen initiated calls (N=11,838) for service that occurred between January 1, 2017 and December 31, 2017. According to Table 8 below, Sycamore Township requires 13.71 hours on average to clear all CFS that occur in a single day. The same table suggests that the average required time to clear the call varies according to time of the day. For instance, the average service hours needed to clear calls for service during the midnight hour is 0.43 hours.

For the next step, ICS added the shift relief factor as explained above. Continuing the midnight hour example, if we added a shift relief factor of 0.36 to 0.43, the required hours will increase to 0.58 ([0.43*0.36]+0.43 = 0.58). IACP suggests that a patrol officer spend one third of their time on citizen-initiated calls, and the remaining two thirds of their time should be equally split between proactive policing and administrative tasks. Given this context, the ideal patrol officer obligated time for citizen initiated calls is 33%. In this scenario, Sycamore Township needs 2 patrol officers during the midnight hour to appropriately clear citizen calls for service as well as maintaining 66% of their time available for proactive policing and administrative tasks.

The numbers displayed in Table 8 below, under the title of '50% obligated with shift relief', are absolute numbers which represent the precise number of personnel required to exclusively handle citizen calls for service during the listed hours and perform no other police functions (no administrative tasks, proactive patrol or self-initiated activities). In our example: Sycamore Township requires 0.15 officers dedicated strictly to handling citizen calls for service during the

midnight hour. In order to convert these absolute numbers to the number of required personnel per shift, ICS multiplied by 8 hours because our math is based on 8 hour shifts[6].

Table 8. Sycamore Required Patrol Officers Based on Citizen Initiated CFS

Shifts	Hour	Number of CFS	Total Service Hours	Average Number of CFS in a Day	Total Service Hours Needed To Clear Daily CFS	Adding Shift Relief Factor	Staffing Need with 50% Obligated	Staffing Need with 33% Obligated	Min - Max Staffing Per Shift
Night Shift	0	323	153.73	0.9	0.43	0.58	0.15	0.22	1 - 2
	1	258	125.97	0.71	0.35	0.48	0.12	0.18	1 - 1
	2	202	138.27	0.57	0.39	0.53	0.13	0.20	**1 - 2**
	3	160	68.31	0.44	0.19	0.26	0.06	0.10	1 - 1
	4	174	102.42	0.48	0.28	0.38	0.10	0.14	1 - 1
	5	180	75.29	0.49	0.21	0.29	0.07	0.11	1 - 1
Day Shift	6	196	66.86	0.55	0.19	0.26	0.06	0.10	1 - 1
	7	335	127.09	0.93	0.35	0.48	0.12	0.18	1 - 1
	8	445	164	1.23	0.45	0.61	0.15	0.23	1 - 2
	9	528	181.23	1.46	0.5	0.68	0.17	0.26	1 - 2
	10	579	209.72	1.6	0.58	0.79	0.20	0.30	2 - 2
	11	621	232.89	1.71	0.64	0.87	0.22	0.33	2 - 3
	12	659	272.77	1.82	0.75	1.02	0.26	0.39	2 - 3
	13	671	289.58	1.85	0.8	1.09	0.27	0.41	2 - 3
	14	663	267.51	1.82	0.73	0.99	0.25	0.38	2 - 3
	15	743	320.69	2.06	0.89	1.21	0.30	0.46	**2 - 4**
	16	797	339.13	2.19	0.93	1.26	0.32	0.48	**3 - 4**
	17	790	338.51	2.18	0.93	1.26	0.32	0.48	**3 - 4**
Night Shift	18	744	304.87	2.06	0.84	1.14	0.29	0.43	2 - 3
	19	723	276.39	1.99	0.76	1.03	0.26	0.39	**2 - 3**
	20	589	239.59	1.63	0.66	0.90	0.22	0.34	**2 - 3**
	21	533	301.74	1.46	0.83	1.13	0.28	0.43	2 - 3
	22	512	197.21	1.41	0.54	0.73	0.18	0.28	1 - 2
	23	413	176.86	1.14	0.49	0.67	0.17	0.25	1 - 2
	Total	**11838**	**4970.63**	**32.68**	**13.71**	**18.65**	**4.66**	**56.50**	**--**

[6] Even though HCSO generally uses 12 hours shifts in Sycamore, ICS's calculation is based on 8 hours shifts. The math is the same for both. With 8 hours shifts, police officers work 5 days a week and get two days off, and with 12 hours shifts, police officers work either three days for 12 hours or 4 days for 12 hours and take 2 day regular off days. Note that sleeping/rest time does not count as regular off days. Regular off days are weekends (2 days) in most governmental jobs. The same rule is valid for a police department with a rotating off days schedule (regular off days are not required to be weekends only).

The last column of Table 8 above reports the required number of patrol officers by both shift and hour. Our rule of thumb is not to exceed 50% obligated time for citizen calls during any hour of the day. For this reason, we would normally take the average of the minimum and maximum number of required personnel to efficiently perform the daily patrol tasks. *In this context, ICS recommends 2 patrol officers for the day shift and 2 patrol officers for the night shift, excluding supervisors.*

However, as explained above, Sycamore Township has seasonality variances in its calls for service requests. Therefore, we calculated the required personnel based on the month of May which generated the highest volume of CFS as shown in Table 8a below. *In this context, we recommend 4 patrol officers for the day shift and 3 patrol officers for the night shift. This is the average of the minimum and maximum number of officers needed to clear calls for service which is based on the 50% and 33% obligated time for answering calls for service and includes some proactive policing time.*

Table 8a. Sycamore Required Patrol Officers Based on the Highest Citizen Initiated CFS in a Month

Shifts	Hour	Number of CFS	Total Service Hours	Average Number of CFS in a Day	Total Service Hours Needed To Clear Daily CFS	Adding Shift Relief Factor	Staffing Need with 50% Obligated	Staffing Need with 33% Obligated	Min - Max Staffing Per Shift
Night Shift	0	33	15.36	27.93	0.55	0.75	0.19	0.28	1 - 2
	1	35	22.22	38.1	0.77	1.05	0.26	0.40	**2 - 3**
	2	18	9.19	30.64	0.33	0.45	0.11	0.17	1 - 1
	3	16	10.01	37.53	0.33	0.45	0.11	0.17	1 - 1
	4	23	12.01	31.34	0.41	0.56	0.14	0.21	1 - 2
	5	14	4.23	18.15	0.19	0.26	0.06	0.10	1 - 1
Day Shift	6	16	15.27	57.26	0.51	0.69	0.17	0.26	1 - 2
	7	33	16.13	29.34	0.54	0.73	0.18	0.28	1 - 2
	8	44	11.46	15.63	0.4	0.54	0.14	0.21	1 - 2
	9	47	13.14	16.78	0.45	0.61	0.15	0.23	1 - 2
	10	59	18.45	18.76	0.61	0.83	0.21	0.31	2 - 3
	11	62	26.39	25.54	0.94	1.28	0.32	0.48	3 - 4
	12	64	24.01	22.51	0.8	1.09	0.27	0.41	2 - 3
	13	64	26.68	25.01	0.89	1.21	0.30	0.46	2 - 4
	14	53	21.75	24.63	0.73	0.99	0.25	0.38	2 - 3
	15	74	29.64	24.03	1.02	1.39	0.35	0.53	3 - 4
	16	77	34.96	27.24	1.17	1.59	0.40	0.60	**3 - 5**
	17	92	46.88	30.58	1.56	2.12	0.53	0.80	**4 - 6**
Night Shift	18	76	25.17	19.87	0.84	1.14	0.29	0.43	2 - 3
	19	58	22.3	23.07	0.74	1.01	0.25	0.38	2 - 3

	20	58	21.74	22.49	0.75	1.02	0.26	0.39	2 - 3
	21	61	34.64	34.07	1.15	1.56	0.39	0.59	3 - 5
	22	37	18.63	30.21	0.62	0.84	0.21	0.32	2 - 3
	23	31	8.98	17.38	0.3	0.41	0.10	0.15	1 - 1
	Total	**1145**	**489.24**	**648.09**	**16.6**	**22.58**	**5.64**	**8.54**	**--**

Discussing Sycamore Township Staffing Needs

Sycamore Township currently contracts for 4 officers per shift 7 days a week, 365 days per year plus one power shift car that works between the hours of 10:00 AM and 7:00 PM Monday through Friday. The power shift car has no replacement for off days or other days when the assigned officer is not available (sick, vacation, training etc.). This staffing level allows Sycamore to have 4 cars working per shift 7 days per week and 5 cars between the hours of 10:00 am and 7:00 pm 5 days per week. From the analysis shown above, Sycamore currently staffs at the higher level to simply answer citizen calls for service.

Scenario 1:

In this scenario, ICS researchers calculated the staffing needs of Sycamore assuming they continue to contract for policing services from HCSO and the officers only answer citizen calls for service. From Table 8a above, we calculate the reactive policing needs of Sycamore Township. The total time required to clear calls for service for the midnight hour is 0.75 hours (including shift relief factor). That means a police officer can handle and clear all calls for service received at the midnight hour in less than one hour. This number/hour is an absolute number and we need to convert this absolute number in order to reflect how many officers would be needed to clear calls for service for the entire shift. The night shift is 12 hours (from 6 pm to 6 am), and the total required time is 9.49 hours (the sum of all absolute numbers in Table 8a from 6 pm to 6 am). Given this context, the required personnel for the night shift should be 9.49 / 8 = 1.19 officers. In addition to this number, we add an additional 33% time block to account for the many administrative tasks of police officers. Thus, the required personnel for the night shift becomes (1.19 * 0.33) + 1.19 = 1.58. In other words, two police officers will be enough to clear calls for service during the night shift for Sycamore with no other proactive or undedicated time. Using the same formula for the day shift (6 am to 6 pm), the total required time is 13.07 hours. The required personnel for the day shift should be 13.07 / 8 = 1.63 officers. Again, we add an additional 33% time block to account for the administrative tasks. Thus, the required personnel for the day shift becomes (1.63 * 0.33) + 1.63 = 2.16. In other words, two police officers will be enough to clear calls for service for Sycamore for the day shift with no other proactive or undedicated time.

So, if Sycamore Township, contracted for 2 officers per shift, those officers could clear all citizen calls for service during the shift. This does not take into account how multiple officer calls are handled nor do we make any inference or recommendation on how HCSO determines the number of officers they need to provide this level of service or how that cost is calculated.

Scenario 2:

If Sycamore Township continued to contract with the HCSO for policing services and determined it wanted some proactive policing time, 4 patrol officers for the day shift and 3 patrol officers for the night shift (the average of the minimum and maximum number of officers need to clear calls for service based on the 50% and 33% obligated time for answering calls for service) could answer all calls for service. This only provides a minimal amount of undedicated or proactive time.

Scenario 3:

If Sycamore had a police department, the minimum staffing for patrol *only*, using the numbers scenario 2 above, would be 4 officers for day shift and 3 officers for the night shift, given minimal proactive patrol activity, problem solving, or other community policing activities. One has to take into account off days since officers don't work 7 days per week so each shift would have 2 squads for a total of 14 patrol units. Keep in mind that the number of officers will need to be increased if an agency decides to provide policing services within the IACP or ICMA guidelines for proactive or undedicated patrol time in order to engage in problem solving, community policing activities or other proactive measures as well as providing supervision.

Also, if Sycamore Township had its own police department, the total number of officers required would be more than the minimum number of patrol only officers required to solely answer citizen calls for service. The actual number of sworn personnel needed for a full service police department, operated by Sycamore, would be higher to take into account administration (a Chief), supervision, and support functions such as detectives.

Table 9 below shows the Staffing scenarios from the above analysis and discussion.

Table 9. Staffing Scenarios

Scenario 1		**Scenario 2**		**Scenario 3**		
Shift	Officers	Shift	Officers	Squad	Shift	Officers
Day Shift	2	Day Shift	4	A squad	6am -6pm	4
Night Shift	2	Night Shift	3	B squad	6pm - 6am	3
				C squad	6am -6pm	4
				D squad	6pm - 6am	3

Recommendations

ICS recommends using the information contained in Tables 3 and 4 above to ensure that HCSO power shift cars are assigned during the highest volume calls for service times and when multiple officer dispatches occur most frequently.

Sycamore Township should engage its citizens in determining the level and type of services it desires from the HCSO and communicate those service level desires to HCSO. The type and level of service has a direct impact on staffing needs. This staffing analysis provides only the

recommended staffing level required to answer citizen calls for service with no other proactive time such as problem solving, community based programs, etc included

Determine how much non-obligated or pro-active patrol time is desired for patrol officers (pro-active time target) and mandate specific activities for that unencumbered time for assigned HCSO officers. Adopt a formal problem-oriented policing approach to daily police service. (See Appendix B for more details about problem-oriented policing.)

Determine how many calls for service in Sycamore Township are answered by other HCSO contract cars from neighboring communities or by an HCSO unit assigned to the east side district of Hamilton County and determine how many times a Sycamore unit answers calls for service outside of Sycamore.

Regular meetings with HCSO staff assigned to oversee operations in Sycamore are important to ensure appropriate provision of policing services using high quality data to help inform decision making and that officers are deployed with a purpose so that time not spend answering calls for service (proactive time) is productive and is being properly used to maximize the benefit to Sycamore.

Recommend that HCSO work together with representatives from the Kenwood Towne Center to develop a comprehensive response plan for calls for service and criminal incidents. The Towne Center accounted for nearly 62 percent of Sycamore's property crime and nearly 10% of the total calls for service . Also, a plan should be developed to address traffic incidents on the Kenwood Road and Montgomery Road corridors. Traffic related calls for service are ranked second in total calls for service but first in hours spent on calls for service.

Ensure that robust, accurate data is gathered for all police activity in Sycamore to enable crime analysis and deployment of resources. (See list below). Because the HCSO does not have an electronic Records Management System, consider using a local data collection (RMS) system to allow for easier access and retrieval of information specific to Sycamore but with the possibility of sharing with surrounding jurisdictions.

Specific incident data for all Part I crime reports, including:
•Address of offense, including zip code, jurisdiction, and X, Y coordinates if available.
•Unique incident number
•Date of offence
•Time of offence
•UCR Code for offence

Appendix A. Sycamore Citizen Initiated CFS in 2017

CFS Type	Number of CFS	Total Minute Spent in a Year	Total Hour Spent
A/A-Advise On Injury	134	8880.5	148.0
A/A-Animal Struck	15	511.3	8.5
A/A-Building Struck (PD)	3	261.6	4.4
A/A-Entrapment (PD)	11	1539.9	25.7
A/A-Fire/Fuel Leak (PD)	3	169.5	2.8
A/A-Fire/Fuel Leak w/Inj (PD)	1	143.8	2.4
A/A-Hit Skip	78	4171.2	69.5
A/A-Injury (PD)	107	12434.5	207.2
A/A-Pedestrian Struck (PD)	4	410.6	6.8
Abandoned Veh	88	1544.4	25.7
Abdominal Pain (PD)	69	693.7	11.6
Abduction	3	189.2	3.2
All County Broadcast	5	77.0	1.3
Allergic Reaction (PD)	20	196.2	3.3
Animal Bite (PD)	4	98.6	1.6
Animal Complaint	140	2600.9	43.3
Appliance Fire (PD)	7	193.4	3.2
Assault In Progress	18	1736.3	28.9
Assault-Injury (PD)	10	1333.9	22.2
Attempt To Locate	42	1349.1	22.5
Attempt/Threat Suicide (PD)	53	5834.9	97.2
Audible Alarm	24	383.9	6.4
Auto Accident	802	32080.7	534.7
Auto Theft	9	581.5	9.7
Back Pain (PD)	29	368.5	6.1
Barking Dog	27	497.0	8.3
Be On Lookout For	677	6547.5	109.1
Bomb Threat/Device (PD)	2	347.3	5.8
Brush/Mulch/Field Fire (PD)	8	193.9	3.2
Burglary In Progress	59	4127.7	68.8
Check On Well Being	146	4490.2	74.8
Chest Pain (PD)	184	2620.8	43.7
Child/Juvenile Endangered	29	448.8	7.5
Choking (PD)	4	42.2	0.7
CO Alarm (PD)	28	337.0	5.6
CO Alarm-Illness (PD)	2	39.7	0.7
Criminal Damaging In Progress	10	852.1	14.2
Critical Missing Adult	12	1373.7	22.9

Dead Animal In The Road	15	210.6	3.5
Debris In The Road	163	2983.5	49.7
Diabetic Emergency (PD)	53	985.0	16.4
Disabled Vehicle	316	8413.2	140.2
Disorderly Crowd	1	18.5	0.3
Disorderly Juveniles	28	400.4	6.7
Disorderly Person	3	81.5	1.4
Domestic Trouble	237	16840.9	280.7
Drug Violation	52	1486.6	24.8
Dumpster Fire (PD)	3	80.1	1.3
Electrical Fire (PD)	7	82.6	1.4
Elevator Alarm-Rescue (PD)	10	139.2	2.3
Emergency To Property (PD)	11	150.5	2.5
EMS Lift Assist (PD)	200	2020.8	33.7
Eye Injury (PD)	2	17.9	0.3
Failure To Pay Just Occurred	11	1360.0	22.7
FD General Resp (PD)	16	187.4	3.1
Fight In Progress	18	1151.9	19.2
Fire Alarm (PD)	252	1939.9	32.3
Fireworks Complaint	32	338.4	5.6
Fuel Spill (PD)	5	111.7	1.9
Head Injury (PD)	252	3476.4	57.9
Headache (PD)	9	50.3	0.8
Hemorrhaging (PD)	48	566.9	9.4
High Fever (PD)	21	209.0	3.5
High Water	5	331.6	5.5
Holding A Shoplifter	50	5094.3	84.9
Holdup Alarm	46	997.3	16.6
Hyperthermia (PD)	2	11.7	0.2
Information Incident	215	1669.5	27.8
Injured Animal	37	752.1	12.5
Injured Person (PD)	47	764.8	12.7
Injury From A Fall (PD)	382	4609.1	76.8
Intrusion Alarm	994	17823.5	297.1
Intrusion Alarm-No Code	52	696.6	11.6
Investigate (See Comments)	43	1081.2	18.0
Investigate Shots Fired	24	990.8	16.5
Juvenile Complaint	27	764.4	12.7
Laceration (PD)	11	407.8	6.8
Lock Out Assist	108	1911.2	31.9
Loud Music	41	945.1	15.8

Loud Party	19	330.3	5.5
Maternity Run (PD)	7	129.1	2.2
Medical Alarm (PD)	41	444.5	7.4
Meet An Officer	10	713.1	11.9
Miscarriage (PD)	2	23.5	0.4
Missing Child	19	1543.6	25.7
Neighbor Trouble	21	920.2	15.3
Noise Complaint	41	603.4	10.1
Non-Breather/Cardiac Arr (PD)	76	12486.9	208.1
Odor Of Natural Gas (PD)	30	373.1	6.2
Officer Needs Assistance	1	15.9	0.3
Open Burn (PD)	17	188.4	3.1
Overdose (PD)	24	2487.3	41.5
OVI Being Followed	15	989.0	16.5
Panic Alarm	57	897.1	15.0
Parking Violation	82	1291.5	21.5
Person With A Gun	23	4024.0	67.1
Person With A Knife	2	1032.8	17.2
Person With A Weapon	4	909.5	15.2
Pick Up A Prisoner	4	402.6	6.7
Place Found Open	45	1065.6	17.8
Poisoning (PD)	6	110.5	1.8
Pole/Transformer Fire (PD)	6	299.6	5.0
Possible Heart Attack (PD)	71	746.2	12.4
Prowlers	24	1627.6	27.1
Psychiatric Emer (PD)	51	3362.5	56.0
Reckless Operator	37	468.9	7.8
Recorded Elevator Alarm (PD)	1	8.6	0.1
Recorded Fire Alarm (PD)	1	0.3	0.0
Recorded Intrusion Alarm	8	106.2	1.8
Repo Vehicle Information	63	221.8	3.7
Report	94	2729.0	45.5
Report-Animal Bite	5	222.3	3.7
Report-Assault	22	1678.1	28.0
Report-Auto Accident	117	3093.0	51.5
Report-Auto Theft	48	2098.2	35.0
Report-Bad Check	16	508.4	8.5
Report-Burglary	34	1918.9	32.0
Report-Found Property	40	907.4	15.1
Report-Harassment/Threats	70	2417.3	40.3
Report-Lost Property	10	247.8	4.1

Report-Missing Person	7	345.8	5.8
Report-Phone Harr/Threats	35	1138.9	19.0
Report-Property Damage	134	3648.8	60.8
Report-Supplemental	38	1123.1	18.7
Report-Theft	434	13463.1	224.4
Robbery In Prog/Just Occurred	8	2006.0	33.4
See Compl At Station	60	1652.6	27.5
See Complainant	105	2805.8	46.8
See Comp-Ref Suspicious Item	5	82.4	1.4
See Key Holder	3	40.3	0.7
Seizures (PD)	87	1715.7	28.6
Sexual Assault	2	164.6	2.7
Sick Person (PD)	505	6409.1	106.8
Silent E911 Call	85	1149.4	19.2
Smoke/Odor Indoors (PD)	10	156.2	2.6
Smoke/Odor Outdoors (PD)	6	56.2	0.9
SPCA Respond/Call	29	281.4	4.7
Stroke (PD)	69	885.7	14.8
Structure Fire (PD)	19	3356.2	55.9
Suspicious Person	360	8568.4	142.8
Suspicious Vehicle	65	2053.8	34.2
Suspicious Veh-Occupied	178	4202.2	70.0
Telephone Call	741	3302.1	55.0
Theft In Prog/Just Occ	107	10305.7	171.8
Traffic Hazard	61	1260.4	21.0
Traffic Light Malfunction	25	193.0	3.2
Trbl-Cell Phone GPS Location	30	975.0	16.2
Trespassers	19	750.2	12.5
Trouble	139	8134.1	135.6
Trouble Breathing (PD)	281	3688.5	61.5
Trouble Brewing	129	7325.9	122.1
Trouble W/A Customer	87	4026.3	67.1
Trouble W/An Employee	24	879.2	14.7
Unconscious (PD)	205	6911.6	115.2
Unknown Trouble	26	2095.3	34.9
Vehicle (GPS) Alarm	8	67.6	1.1
Vehicle Fire (PD)	22	1129.9	18.8
Vehicle Tampering	15	866.9	14.4
Wanted Person	40	3262.4	54.4
Water Flow Alarm (PD)	16	109.6	1.8
Wires Down/Arcing/Fire (PD)	29	1273.8	21.2

TOTAL	**12228.0**	**347364.0**	**5789.4**

Appendix B The Key Elements of Problem-Oriented Policing

- A problem is the basic unit of police work rather than a crime, a case, calls, or incidents.
- A problem is something that concerns or causes harm to citizens, not just the police. Things that concern only police officers are important, but they are not problems in this sense of the term.
- Addressing problems means more than quick fixes: it means dealing with conditions that create problems.
- Police officers must routinely and systematically analyze problems before trying to solve them, just as they routinely and systematically investigate crimes before making an arrest. Individual officers and the department as a whole must develop routines and systems for analyzing problems.
- The analysis of problems must be thorough even though it may not need to be complicated. This principle is as true for problem analysis as it is for criminal investigation.
- Problems must be described precisely and accurately and broken down into specific aspects of the problem. Problems often aren't what they first appear to be.
- Problems must be understood in terms of the various interests at stake. Individuals and groups of people are affected in different ways by a problem and have different ideas about what should be done about the problem.
- The way the problem is currently being handled must be understood and the limits of effectiveness must be openly acknowledged in order to come up with a better response.
- Initially, any and all possible responses to a problem should be considered so as not to cut short potentially effective responses. Suggested responses should follow from what is learned during the analysis. They should not be limited to, nor rule out, the use of arrest.
- The police must pro-actively try to solve problems rather than just react to the harmful consequences of problems.
- The police department must increase police officers' freedom to make or participate in important decisions. At the same time, officers must be accountable for their decision-making.
- The effectiveness of new responses must be evaluated so these results can be shared with other police officers and so the department can systematically learn what does and does not work. (Michael Scott and Herman Goldstein 1988.)

The concept of problem-oriented policing can be illustrated by an example. Suppose the police find themselves responding several times a day to calls about drug dealing and vandalism in a neighborhood park. The common approach of dispatching an officer to the scene and repeatedly arresting offenders may do little to resolve the long term crime and disorder problem. If, instead,

police were to incorporate problem-oriented policing techniques into their approach, they would examine the conditions underlying the problem. This would likely include collecting additional information—perhaps by surveying neighborhood residents and park users, analyzing the time of day when incidents occur, determining who the offenders are and why they favor the park, and examining the particular areas of the park that are most conducive to the activity and evaluating their environmental design characteristics. The findings could form the basis of a response to the problem behaviors. While enforcement might be a component of the response, it would unlikely be the sole solution because, in this case, analysis would likely indicate the need to involve neighborhood residents, parks and recreation officials and others.

Problem-oriented policing can be applied at various levels of community problems and at various levels in the police organization. It can be applied to problems that affect an entire community, involving the highest level of police agency, government, and community resources. It can be applied at intermediate levels (for example, a neighborhood or a police district), involving an intermediate level of resources. Or it can be applied at a very localized level (for example, a single location or a small group of problem individuals), involving the resources of only a few police officers and other individuals.