STAFFING ANALYSIS FOR THE COLERAIN POLICE DEPARTMENT

May 30, 2017

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Executive Summary

When examining a police organizations operational structure, staffing and resource allocation, and instrumental measures of effectiveness, there are a number of factors that must be taken into consideration. The purpose of this comprehensive review of the Colerain Police Department (CPD) is to examine and illustrate where CPD is fits into the broader recommended policies for police agencies as well as instrumental effectiveness, and to highlight areas where CPD is inconsistent with recommended policies in order to facilitate further discussion on these important issues. A number of important findings are illustrated below.

- The number of uniformed officers per citizen in Colerain is significantly lower than other police settings with populations of 50,000 residents and greater. Specifically we found that Colerain's officer-to-citizen ratio ranks at the 4th percentile (i.e., 96% of similar sized agencies have more uniformed officers per citizen than does Colerain PD).

- Police departments with similar crime rates as Colerain typically have 1.4 to 1.7 uniformed officers per 1,000 residents. However, Colerain currently employs 0.92 uniformed officers per 1,000 residents. In short, police settings that have crime patterns commensurate with Colerain have considerably more uniformed officers; and, police agencies that have the same number of officers as Colerain typically have much lower crime rates.

  - Additionally, Colerain PD is proactively engaged with local citizens in their community, which is a staple of a well-integrated service-based police agency. In 2016 Colerain PD conducted 532 extra patrol/vacation checks. This equated to roughly 40 to 45 per month and the average time devoted to these requests are

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roughly 15 minutes per request (or an additional 10 hours of patrol time per month).

- Currently, Colerain PD has 30 sworn patrol officers out of 54 sworn police personnel, which equates to 55.5% of its workforce. The ICMA recommends that 60% of uniformed officers should be assigned to patrol to address workload distribution for police assistance.

- The Sergeant-to-Patrol Officer ratio (2.0 Sergeants for every 10 patrol officers) in Colerain is currently below the national average (2.4) for all law enforcement agencies. Thus, Colerain PD does not have fewer patrol officers as recommended as a consequence of an enhanced number of supervisors. CPD is in fact lower than expected on both supervisors and patrol officers.

- Analysis of citizen generated calls for service indicates that Colerain PD does not have (especially during peak hours) the minimum number of patrol officers necessary to address citizen generated calls for service. This is particularly true from 6am-7am, and from 5pm-8pm.
    - The understaffed patrol period during these peak hours leads to an increased rate of patrol time allocated to citizen generated calls for service in non-peak hours as a way to compensate for the backlog that occurs due to insufficient patrol allocation.
    - The average response time to calls for service is considerably higher (between 75% to 83% longer) during the peak hours of 6:00am and 6:00pm when compared to the remainder of the day for response times.

- We suggest that Colerain PD should employ at least 35 patrol officers (currently CPD has 30 patrol officers), and 8 Sergeants (currently CPD has 6 Sergeants). We believe that the addition of seven uniformed officers (five in patrol and two sergeants) would allow CPD to address calls for service as needed; would closer approximate the recommended 60% patrol recommendation; and would make CPD more consistent with the number of uniformed officers per citizen among settings with similar crime rates.

Colerain Police Department Staffing Comparison

In order to achieve the goals of this study, we initially provide overview of the number of sworn officers as compared to both Uniform Crime Report (UCR) Part I offenses and city population size. This information is used to compare Colerain to other townships and cities nationally and by region.

Next, we present a patrol staffing analysis based upon calls-for-service (CFS) data within Colerain to measure workload demands for the CPD. We further break these analyses down by season, type of call, day/time, the cumulative response time devoted to CFS, and the recommended number of responding officers based upon these analyses to determine the necessary number of officers that are needed to address citizen requests as well as other fundamental policing activities, such as proactive police patrol at any given time.

Officer-to-Citizen Ratio by Region

The first phase of our detailed staffing analysis is to examine the per capita method to determine the expected number of sworn police officers per person based on the crime rate (see Orrick, 2008). One of the most common, though limited, analytical approaches to staffing has been to examine the number of police officers per population (i.e., rate calculation) to approximate the number of sworn officers needed to address community crime problems. A relative comparison against other regional jurisdictions or other police departments is a common approach for the per capita staff analysis. Since the FBI collects both police employee and crime data for each reporting agency, calculating the officer ratio is a popular technique due to its

relative ease of analysis. A simple cross-sectional analysis of 2016 Uniform Crime Reports data illustrates that there were 0.92 sworn police officers in Colerain per 1,000 residents (FBI, 2016).[1]

As expected, police force size per population varies across both city population size (i.e., larger cities contain more officers per citizen) and geographic region, and thus we disentangle these averages further. An examination of national population ratios shows there were 1.47 sworn police officers per 1,000 residents among Midwestern U.S. cities of a similar population demography (50-99K) as reported to the FBI in 2016. Table 1 below presents the geographic and population specific averages from 2016.

The Colerain Police Department is responsible for investigations, responding to calls for police assistance, and ultimately arresting offenders who commit criminal incidents against the city's *58,604 inhabitants* (as of 2016). As noted earlier, *Colerain PD has 0.92 officers per 1,000 residents,* which is far less than the *1.47 officers in similar U.S. police settings located within the Midwest*.

In order for Colerain PD to be consistent with similar regional and population sized police settings the agency would need to employ roughly 86 sworn officers (86 / 58,604 x 1,000 = 1.47), an increase of nearly 59% over its current staffing allocation of 54 sworn officers.

Table 1: Comparing the Colerain Police Department Sworn Police Officer per 1,000 Residents with Other U.S. Police Departments (N = 349) in 2016

Population Category	Northeast	Midwest	South	West
0 – 49,999	2.00	2.10	3.17	3.46
50,000 -99,999	1.92	1.47	1.95	1.16
Unweighted (Raw) Average	*1.97*	*1.78*	*2.56*	*2.31*
Colerain PD	**--**	**0.92**	**--**	**--**

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[1] The data for this analysis were obtained from the Uniform Crime Reports, Table 78, Crime in the United States, Full Time Law Enforcement Employees by State by City.

Crime Rates and Sworn Officer to Citizen Ratios: A Comparison

We next compare the average number of sworn officers by citizen population (i.e., per 1,000 residents) among police agencies with similar UCR crime rates as Colerain PD to assess the average number of sworn officers by population for settings that have comparable crime rates. Settings with lower crime rates have fewer resource constraints and pressures than do police settings with higher crime rates.

Relying upon the FBI Uniform Crime Reports data for 2016 for all U.S. cities with a population of 50,000 or greater (N = 611), we see that Colerain township's UCR crime rate is consistent with the lower to middle quartiles for each offense type below. Perhaps most importantly, the average number of sworn officer per citizen is considerably higher for the vast majority of other cities with similar crime rates than CPD's (0.92 officers per 1,000 residents). Thus, settings with the same level of crime as Colerain Township have roughly 57% (using the theft-rate average comparison) to 91% (using the homicide rate average comparison) additional sworn officers than does Colerain PD. Finally, these findings show that 96% of all U.S. settings with a population of 50,000 or greater has a higher ratio of uniformed officers per 1,000 residents than does Colerain PD.

Table 2: Comparing the Colerain Police Department Crime Rate with All Other U.S. Cities 50,000 and Greater (N = 611) in 2016

	Colerain Crime Rate	**Colerain PD Quartile Comparison**	**Comparison Quartile Average Sworn/Citizen**
Homicide Rate	3.41	50th to 75th	1.76
Rape Rate	34.12	50th to 75th	1.75
Assault Rate	59.70	1st to 25th	1.51
Robbery Rate	110.91	50th to 75th	1.69
Theft Rate	523.85	25th to 50th	1.45
Auto Theft Rate	117.73	1st to 25th	1.70

Calls for Service Staffing Analysis - Patrol

The cornerstone of police operations is the patrol division. This is particularly the case when handling public requests for assistance since patrol officers are the tasked with the vast majority of such requests. As a result, patrol encompasses the bulk of a police organization's personnel resources.

The International City/County Management Association (ICMA – McCabbe, 2012) suggests that police agencies follow the "rule of 60" in that 1) at least 60% of the total number of sworn officers should be assigned to patrol; 2) the average workload (respond to CFS) should not exceed 60%; and 3) the total service time should not exceed a factor of 60. Additionally, the U.S. Department of Justice Community Oriented Policing Services (COPS) staffing guidelines recommend that both police and citizen services should not encompass more than 33% of a patrol officer's time (see Wilson and Weiss, 2012).

Additionally for both citizen and police generated CFS combined, the IMCA (as well as Shane, 2007) cites a 60% rule for both citizen and police generated CFS (i.e., that roughly 60% of patrol time should be used to address both citizen and police generated CFS). Thus, our staffing models draw from both guiding models, and the results from both sets of analyses provide highly comparable performance objectives.

In terms of the first recommended standard, we found that within Colerain Police Department approximately 55.5% (N = 30 out of 54) of the sworn officers were assigned in the patrol division in 2016. While very close to the recommended allocation, the Colerain Police Department is roughly 4.5% below the recommended *bottom-threshold* of the recommended patrol personnel distribution.

The next step in our analysis was to assess the commitment to citizen-generated calls for police assistance based on prior CFS data. In terms of a general trend of services, Table 3 shows that Colerain PD is responsible for addressing between 48,000 to 51,000 CFS per year over the past three years.

Table 3: Citizen-Initiated Calls for Service By Year (2014-2016)

Year	Number of CFS
2014	50,955
2015	47,926
2016	47,850

Table 4 below shows the percentage distribution for CFS by call type for 2015 and 2016 for each year. Traffic related calls for assistance comprise the majority of all CFS in Colerain. Additionally, medical responses, public service requests, and alarm requests also comprise a large majority of patrol time for Colerain patrol officers. Investigations and responding to suspicious activity also account for a large proportion of citizen generated requests.

Table 4: Classification of Calls for Service By Percentage of Calls (January 2015-December 2016)

Call Type	2015	2016
Traffic Related	9.03	11.31
Medical Response	7.43	8.54
Alarm	8.07	8.32
Public Service	9.01	8.10
Investigation	5.96	8.08
Suspicious Activity	7.51	7.55
Theft	7.84	6.10
Vehicle Check	5.43	5.47
Domestic Dispute & Violence	4.67	4.82
Complaint	4.34	4.65
Accident	4.17	4.55
Harassment/Threat	3.75	3.76
Disorderly Conduct	3.63	3.24
Hazard	2.64	2.79
Suspect	2.22	2.33
Squad Run	3.23	2.17

Zoning	3.41	1.90
Physical Disorder	2.54	1.83
Breaking and Entering	2.17	1.67
Drug Related	1.53	1.60
Misdemeanor	1.43	1.21
TOTAL	100%	100%

Table 5 displays seasonal daily percentages of CFS for Winter (December-February),

Spring (March-May), Summer (June-August), and Fall (September-October). It is important to

note that the daily percentages were obtained by using column totals for each day to minimize

possible disproportional effects of seasonal variation. Table 5 shows that the average CFS

percentage is 14.3, and the majority of the percentages across the days are very close to that

average. The only exceptions are Fridays and Sundays. Fridays consistently receive the highest

number of CFS; likewise, Sundays receive the lowest numbers of CFS.

Table 5: Daily Distribution of Citizen Generated CFS across Seasons January 2015 to December 2016

Day	Winter	Fall	Spring	Summer	Total
Monday	14.03%	14.22%	13.95%	14.58%	14.21%
Tuesday	13.63%	14.66%	13.84%	14.22%	14.12%
Wednesday	13.50%	13.74%	14.38%	14.47%	14.06%
Thursday	14.90%	14.01%	13.55%	13.62%	13.96%
Friday	15.00%	14.70%	14.51%	14.58%	14.68%
Saturday	15.36%	14.69%	15.28%	14.69%	14.98%
Sunday	13.57%	13.97%	14.48%	13.84%	13.99%
Total	19194	24122	24508	26021	93845

Table 6 displays a distribution plot of citizen generated CFS to Colerain Police

Department by both day and time. The results reveal that citizen-generated CFS are consistently

the lowest between midnight and 5:00am (with an exception for 12:00 midnight to 1:00am on

Saturdays and Sundays), and the most heavy concentration between 2:00pm through 10:00pm across all days.

Table 6: Call Distribution Density by Days and Times for January 2015 through December 2016

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
0	385	355	348	327	387	464	573
1	269	287	278	294	303	392	467
2	228	251	243	264	270	326	389
3	189	210	189	228	244	286	327
4	146	161	173	165	202	195	242
5	179	146	177	174	177	190	186
6	326	319	292	325	316	198	191
7	471	415	418	413	459	293	258
8	517	504	524	555	510	397	325
9	598	604	574	621	555	514	410
10	672	690	652	691	641	652	557
11	680	710	713	648	718	722	693
12	698	657	757	714	737	745	749
13	800	730	775	767	769	844	711
14	830	825	851	757	890	825	707
15	812	867	846	767	849	811	731
16	806	781	733	775	781	850	739
17	823	841	834	784	841	897	906
18	794	801	757	742	834	835	818
19	725	729	715	713	734	782	760
20	736	717	699	676	689	775	709
21	627	651	684	674	702	696	667
22	548	557	560	563	609	724	563
23	477	439	403	467	561	646	448
Total	**13336**	**13247**	**13195**	**13104**	**13778**	**14059**	**13126**

Table 7 below shows the average total time spent based on different numbers of patrol officers assigned to CFS throughout the day. The last column "average total time spent" shows the average number of hours spent to clear all calls for service for the various times in the day for all of 2015-2016. For midnight, the average total time spent on calls for service (weighted by the

number of responses that required one, two, three, four, five, six, or seven or more patrol

officers) was roughly 82.6 patrol-officer hours; the highest demands were placed on TPD

officers around 5:00pm (341.5 patrol officer-hours) and 6:00am (276 patrol officer-hours) with

the lowest commitment centering on 4am-5am per day.

Table 7: Total Time Spent on (In Minutes) CFS in a Day (January 2015 through December 2016)

Time	One Officer	Two Officers	Three Officers	Four Officers	Five Officers	Six Officers	Seven or More Officers	Average Total Time Spent
0	52.9	18.6	5.9	2.6	1.8	0.5	0.3	82.6
1	42.7	12.4	4.4	2.6	1.6	1.2	1.3	66.2
2	35.0	11.8	4.5	2.8	1.1	0.3	2.0	57.5
3	30.3	9.1	4.3	2.0	1.0	0.5	0.8	48.0
4	23.7	6.0	2.9	2.3	0.9	0.5	0.4	36.5
5	24.2	6.7	2.0	1.0	0.5	0.4	0.2	34.9
6	257.2	14.8	1.9	0.8	0.9	0.8	0.1	276.6
7	106.2	17.5	2.9	0.8	0.4	0.0	0.3	128.0
8	74.2	16.1	4.9	1.8	1.8	0.4	0.7	99.8
9	85.0	19.1	5.3	1.4	0.8	0.5	0.5	112.5
10	89.2	17.0	6.3	2.6	0.2	0.1	1.6	116.9
11	108.4	24.5	8.2	1.6	1.0	1.1	0.5	145.2
12	110.5	22.1	7.9	1.4	1.6	1.4	0.4	145.4
13	126.0	26.1	8.6	2.8	2.5	0.4	1.9	168.4
14	126.9	28.7	6.2	2.6	1.4	0.1	1.8	167.6
15	132.7	30.7	8.6	3.0	1.5	0.6	0.5	177.7
16	136.0	29.1	8.2	2.0	1.0	0.5	0.9	177.6
17	297.6	31.4	6.3	3.4	0.8	1.3	0.8	341.5
18	181.5	32.6	7.7	5.5	1.4	0.6	0.6	230.0
19	127.5	32.8	8.5	1.7	2.7	0.5	2.5	176.3
20	154.8	28.3	8.1	4.2	1.7	0.6	0.9	198.6
21	120.1	24.3	7.8	3.7	1.8	1.2	0.8	159.7
22	88.5	25.3	8.9	3.4	1.7	0.8	2.1	130.7
23	70.5	19.9	6.9	3.2	1.6	0.6	0.5	103.1
Total	**2601.7**	**504.8**	**147.2**	**58.9**	**31.6**	**14.8**	**22.4**	**3381.4**

Table 8 displays the total number of minutes spent by patrol officers for CFS – from call

response to call clearance (i.e., the end of police-citizen interaction) as well as from call response

to call closure (i.e., the completed filing of the report). In cases where two or more officers respond to a CFS, the difference between call clearance and closure increases (relative to a single officer responding) because the assisting officer often leaves the scene before the primary officer closes the call. This can be seen in cases where a single officer responds to a CFS (roughly 82.2% of the time) compared with two officers responding (roughly 13% of the time). Three or more officers responded to CFS roughly 2.5% of the time, with few calls receiving four or more officers on sight.

Table 8: Number of Assigned Patrol Officers to Calls for Service (Jan 2015- December 2016)

Numbers of Officers	Number of CFS	Percentage of CFS	Total Service Time(in hours) to Clear	Total Service Time (in hours) to Close	Time Difference
1	77147	82.21%	6224.09	30743.01	24518.92
2	12975	13.83%	1476.31	5965.15	4488.84
3	2419	2.58%	296.77	1739.49	1442.72
4	768	0.82%	72.99	696.00	623.01
5+	536	0.57%	43.20	812.65	769.45
Totals and Averages	**18769**	**100.00%**	**1622.67**	**7991.26**	**6368.59**

Using the Department of Justice's four minute average response time for an emergency CFS as the benchmark with an urban average response time of roughly 8 to 10 minutes for a standard CFS, we see that Colerain PD has a strong response time throughout the day, on average. The exception to this excellent performance is during peak hours/intensity when the response time is roughly 75%-83% longer (at 6am and 6pm when compared to the remainder average), which is likely calibrated with its backlog during peak hours.

Table 9: Response Time by Days and Times (January 2015- December 2016)

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total Average
0	6.31	5.75	5.76	5.19	5.06	5.98	7.80	6.11

1	5.58	4.86	4.65	4.90	4.41	5.42	6.59	5.32
2	6.00	5.18	5.28	4.40	6.45	4.37	5.62	5.30
3	5.93	4.62	3.94	5.87	5.91	5.42	6.51	5.57
4	7.19	7.37	5.14	6.38	5.41	5.51	7.15	6.28
5	8.75	7.80	6.78	7.42	7.42	7.58	8.13	7.70
6	8.14	7.33	7.40	8.05	6.80	11.79	12.95	8.36
7	11.4	11.56	11.22	9.20	9.99	14.23	13.39	11.21
8	9.03	7.82	10.22	7.62	8.43	8.65	11.51	8.90
9	6.98	8.36	8.23	6.74	7.46	10.18	10.17	8.20
10	7.85	8.46	7.69	6.81	7.81	8.53	9.39	8.06
11	8.17	6.04	7.51	7.38	7.49	8.91	9.67	7.92
12	7.93	6.28	6.62	8.57	6.92	9.49	10.91	8.13
13	8.67	6.67	6.72	7.17	7.17	9.10	10.40	8.00
14	7.25	7.00	6.57	9.01	8.19	8.04	9.07	7.84
15	8.02	8.66	7.52	7.94	8.90	7.90	9.73	8.36
16	9.87	8.91	9.00	8.21	10.12	8.94	8.90	9.14
17	9.44	8.32	9.86	9.27	8.52	8.12	9.61	9.01
18	10.46	9.56	9.27	10.04	9.37	10.37	11.00	9.99
19	7.87	8.05	9.13	7.87	7.87	7.72	9.26	8.25
20	6.93	6.60	6.70	8.00	6.24	6.70	7.76	6.98
21	6.61	5.62	7.58	6.97	7.29	8.01	9.26	7.32
22	6.21	5.67	6.51	7.14	7.16	8.14	6.64	6.84
23	5.48	5.81	7.27	6.74	6.13	7.26	6.21	6.43
Total Average	**7.75**	**7.18**	**7.36**	**7.37**	**7.35**	**8.18**	**9.07**	**7.72**

Each CFS also varies in the time it takes for an officer from arrival to clearance; thus, we average (by hour) the total service time required for CFS, which are displayed in Table 10. Calls that occur in the busiest parts of the day also require more total officer time (on average) to clear the call. For example, calls that occur between 6:00am and 7:00am have a much longer duration and time commitment for CPD for closure than other calls throughout the day (1.7 average officer hours spent per CFS). Additionally the most time devoted by the entire patrol force for CFS is at roughly 5pm (5.7 officer hours on average devoted to calls during this time).

Table 10: Total Service Times for Call For Service (January 2015-December 2015)

Time	Number of CFS	Total Time in Minutes	Total Time in Hours	Average Hours Spent per CFS	Average Number of CFS per Day	Total Hour Needed to Clear CFS
0	2839	58543.9	975.7	0.3	4.0	1.4
1	2290	46926.0	782.1	0.3	3.2	1.1
2	1971	40796.0	679.9	0.3	2.8	1.0
3	1673	34032.2	567.2	0.3	2.4	0.8
4	1284	25898.4	431.6	0.3	1.8	0.6
5	1229	24749.5	412.5	0.3	1.7	0.6
6	1967	196081.5	3268.0	1.7	2.8	4.6
7	2727	90777.4	1513.0	0.6	3.8	2.1
8	3332	70780.9	1179.7	0.4	4.7	1.7
9	3876	79785.4	1329.8	0.3	5.5	1.9
10	4555	82879.7	1381.3	0.3	6.4	1.9
11	4884	102932.2	1715.5	0.4	6.9	2.4
12	5057	103120.6	1718.7	0.3	7.1	2.4
13	5396	119402.3	1990.0	0.4	7.6	2.8
14	5685	118857.9	1981.0	0.3	8.0	2.8
15	5683	125957.4	2099.3	0.4	8.0	3.0
16	5465	125911.3	2098.5	0.4	7.7	3.0
17	5926	242151.8	4035.9	0.7	8.4	5.7
18	5581	163043.9	2717.4	0.5	7.9	3.8
19	5158	124999.9	2083.3	0.4	7.3	2.9
20	5001	140782.6	2346.4	0.5	7.1	3.3
21	4701	113192.6	1886.5	0.4	6.6	2.7
22	4124	92668.7	1544.5	0.4	5.8	2.2
23	3441	73105.8	1218.4	0.4	4.9	1.7

Based upon this distribution of citizen requests, it is important to estimate the current workload of Colerain PD patrol officers in terms of the total time spent for each CFS. Calculation for calls for service handled by one patrol officers is straight forward; therefore, no extra calculations are required. However, the calculation process of calls for service that require more than one patrol officers becomes more complex since each officer may (and most often do) arrive and leave at different times.

Table 11 displays the number of patrol officers needed to devote 100% of their time for CFS for each hour, on average. Our findings suggest that during lag periods (e.g., 4am to 5am)

current patrol staffing levels (of roughly 10 patrol officers per shift) is sufficient; however, during many of the peak hours throughout the day, 10 patrol officers is inadequate even if patrol spend 100% of their time responding to CFS. *We estimate that 13 to 17 (with an average of 15) patrol officers should be on shift each day to address peak times (6am-7am; 5pm-8pm).*

Table 11: Total Service Time and Staff Analysis Based on 2015 and 2016 CFS Data

Time	Number of CFS	Total Time in Minutes	Total Time in Hours	Average Hours Per Day	Number of Personnel Needed if they Devote Their 100% Time to CFS	Number of Personnel Needed for 60% Rule	Number of Personnel Needed with Vacation and Sick Times	Number of Police Officers Needed for Each Shift
0	285	10386	173.1	2.79	0.35	0.58	0.78	6.20
1	210	8211	136.9	2.21	0.28	0.46	0.61	4.91
2	177	6399.17	106.7	1.72	0.22	0.36	0.48	3.82
3	130	5817	97.0	1.56	0.20	0.33	0.43	3.47
4	110	3059	51.0	0.82	0.10	0.17	0.23	1.83
5	121	3419	57.0	0.92	0.11	0.19	0.26	2.04
6	177	28213.68	470.2	7.58	0.95	1.58	2.11	**16.85**
7	277	12150.51	202.5	3.27	0.41	0.68	0.91	7.26
8	294	13127.85	218.8	3.53	0.44	0.74	0.98	7.84
9	336	11128.34	185.5	2.99	0.37	0.62	0.83	6.65
10	392	11569.51	192.8	3.11	0.39	0.65	0.86	6.91
11	476	13017.17	217.0	3.50	0.44	0.73	0.97	7.78
12	479	16736.34	278.9	4.50	0.56	0.94	1.25	**10.00**
13	521	16125.85	268.8	4.33	0.54	0.90	1.20	9.63
14	582	14637.34	244.0	3.93	0.49	0.82	1.09	8.74
15	551	16634.85	277.2	4.47	0.56	0.93	1.24	9.94
16	520	17325	288.8	4.66	0.58	0.97	1.29	10.35
17	550	23645.02	394.1	6.36	0.79	1.32	1.77	**14.12**
18	510	20251.34	337.5	5.44	0.68	1.13	1.51	**12.10**
19	520	15427.17	257.1	4.15	0.52	0.86	1.15	9.22
20	528	23010.17	383.5	6.19	0.77	1.29	1.72	**13.75**
21	481	13410.34	223.5	3.60	0.45	0.75	1.00	8.01
22	413	12176	202.9	3.27	0.41	0.68	0.91	7.27
23	366	10331.68	172.2	2.78	0.35	0.58	0.77	6.17

The national average shift-relief factor for police agencies is 2.3 (Weiss and Wilson, 2011). Using an estimated necessary average of 15 patrol officers per shift x shift relief factor (to account for days off,

overtime, special assignments, illness, and leave time) we estimate that Colerain PD should employ roughly 35 patrol officers to account for the time needed to devote to CFS.

Sergeant to Patrol Ratio

A natural extension of the patrol staffing model is to assess whether the Sergeant-to-Patrol Officer ratio is proportionally high to supervision and less toward patrol. Mid-level management, specifically the role of Sergeants, has been widely acclaimed in the scholarly literature as fundamental to successful police organizational management. A review of the 2013 Law Enforcement Management and Administrative Statistics (LEMAS) for cities between 40,000 and 75,000 citizens (the range for CPD) shows that the average Sergeant to Patrol officer ratio (# of Sergeants / # of patrol officers x 10) is 2.4 (i.e., there are 2.4 Sergeants for every 10 patrol officers). Colerain PD has 2.0 Sergeants for every 10 patrol officers, which equates to roughly the 43rd percentile among LEMAS reporting agencies in this range. Thus, CPD has fewer Sergeants per patrol officer than most law enforcement agencies.

Colerain Staffing Conclusions and Recommendations

Combining all of these various benchmarks, and adjusting for the average shift relief factor needed for patrol officers, we recommend that Colerain PD should employ at least 35 patrol officers (currently CPD has 30 patrol officers), and 8 Sergeants (currently CPD has 6 Sergeants). We suggest that the addition of seven uniformed officers (five in patrol and two sergeants) would allow CPD to address calls for service as needed; would closer approximate the recommended 60% patrol recommendation; and would make CPD more consistent with the number of uniformed officers per citizen among settings with similar crime rates.

Additionally, the peak periods where citizen generated CFS are higher (and take noticeably longer – an average of 1.5 hours to clear in some cases) backlog the Colerain PD to devote a higher than expected ratio of their time to address citizen generated CFS. By including additional patrol officers, particularly during peak periods, but also immediately before and after peak periods will reduce the caseload distribution for patrol officers and allow Colerain PD to conduct other important functions such as preventative crime prevention and citizen-generated service requests.

References

McCabe, J. (2012). *An analysis of police department staffing: How many officers do you really need? A Review of 62 police agencies analyzed by the ICMA/CPSM*. Washington, DC: International City/County Management Association.

Shane, J. (2007). *What every chief executive should know: Using data to measure police performance.* New York: Looseleaf Law Publications.

Wilson, J.M., & Weiss, A. (2012). A *performance-based approach to police staffing and allocation.* Washington, DC: US Department of Justice: Community Oriented Policing Services (COPS) Office.