



College Station, TX

City Hall
1101 Texas Ave
College Station, TX 77840

Meeting Agenda - Final

City Council Workshop

Thursday, April 11, 2019

4:00 PM

City Hall Council Chambers

1. Call meeting to order.
2. Executive Session is closed to the public and will be held in the Administrative Conference Room. The open meeting will resume no earlier than 5:00 pm.

Consultation with Attorney {Gov't Code Section 551.071}:

Possible action. The City Council may seek advice from its attorney regarding a pending or contemplated litigation subject or settlement offer or attorney-client privileged information. Litigation is an ongoing process and questions may arise as to a litigation tactic or settlement offer, which needs to be discussed with the City Council. Upon occasion the City Council may need information from its attorney as to the status of a pending or contemplated litigation subject or settlement offer or attorney-client privileged information. After executive session discussion, any final action or vote taken will be in public. The following subject(s) may be discussed:

Litigation

- a. Kathryn A. Stever-Harper as Executrix for the Estate of John Wesley Harper v. City of College Station and Judy Meeks; No. 15,977-PC in the County Court No. 1, Brazos County, Texas
- b. McCrory Investments II, LLC d/b/a Southwest Stor Mor v. City of College Station; Cause No. 17-000914-CV-361; In the 361st District Court, Brazos County, Texas
- c. City of College Station v. Gerry Saum, Individually, and as Independent Executrix of the Estate of Susan M. Wood, Deceased; Cause No. 17-002742-CV-361; In the 361st District Court, Brazos County, Texas
- d. Carrie McIver v. City of College Station; Cause No. 18-003271-CV-85; In the 85th District Court, Brazos County, Texas

Personnel {Gov't Code Section 551.074}:

Possible action. The City Council may deliberate the appointment, employment, evaluation, reassignment, duties, discipline, or dismissal of a public officer. After executive session discussion, any final action or vote taken will be in public. The following public officer(s) may be discussed:

- a. Council Self Evaluation
- b. City Manager

3. Reconvene from Executive Session and take action, if any.
4. Presentation, possible action, and discussion on items listed on the consent agenda.
5. [19-0109](#) Presentation, discussion, and possible action regarding a Police Department resource allocation study conducted by Etico Solutions.
Sponsors: Norris
Attachments: [College Station PD Resource Allocation Report](#)
6. [19-0160](#) Presentation, discussion, and possible action regarding the 2018 Existing Conditions Report.
Sponsors: Golbabai
7. [19-0172](#) Presentation, discussion, and possible action on a report on the status of the Wolf Pen Creek Corridor.
Sponsors: Kersten
8. Council Calendar - Council may discuss upcoming events.
9. Discussion, review, and possible action regarding the following meetings: Animal Shelter Board, Annexation Task Force, Arts Council of Brazos Valley, Architectural Advisory Committee, Arts Council Sub-committee, Audit Committee, Bicycle, Pedestrian, and Greenways Advisory Board, Bio-Corridor Board of Adjustments, Blinn College Brazos Valley Advisory Committee, Brazos County Health Dept., Brazos Valley Council of Governments, Brazos Valley Economic Development Corporation, Bryan/College Station Chamber of Commerce, Budget and Finance Committee, BVSWMA, BVWACS, Compensation and Benefits Committee, Experience Bryan-College Station, Design Review Board, Economic Development Committee, FBT/Texas Aggies Go to War, Gulf Coast Strategic Highway Coalition, Historic Preservation Committee, Interfaith Dialogue Association, Intergovernmental Committee, Joint Relief Funding Review Committee, Landmark Commission, Library Board, Metropolitan Planning Organization, Parks and Recreation Board, Planning and Zoning Commission, Research Valley Technology Council, Regional Transportation Committee for Council of Governments, Sister Cities Association, Spring Creek Local Government Corporation, Transportation and Mobility Committee, TAMU Economic Development, TAMU Student Senate, Texas Municipal League, Twin City Endowment, Walk with the Mayor, YMCA, Youth Advisory Council, Zoning Board of Adjustments, (Notice of Agendas posted on City Hall bulletin board).
10. Adjourn.

The City Council may adjourn into Executive Session to consider any item listed on this agenda if a matter is raised that is appropriate for Executive Session discussion. An announcement will be made of the basis for the Executive Session discussion.

I certify that the above Notice of Meeting was posted at College Station City Hall, 1101 Texas Avenue, College Station, Texas, on April 5, 2019 at 5:00 p.m.


Deputy City Secretary

This building is wheelchair accessible. Persons with disabilities who plan to attend this meeting and who may need accommodations, auxiliary aids, or services such as interpreters, readers, or large print are asked to contact the City Secretary's Office at (979) 764-3541, TDD at 1-800-735-2989, or email adaassistance@cstx.gov at least two business days prior to the meeting so that appropriate arrangements can be made. If the City does not receive notification at least two business days prior to the meeting, the City will make a reasonable attempt to provide the necessary accommodations.

Penal Code § 30.07. Trespass by License Holder with an Openly Carried Handgun.

"Pursuant to Section 30.07, Penal Code (Trespass by License Holder with an Openly Carried Handgun) A Person Licensed under Subchapter H, Chapter 411, Government Code (Handgun Licensing Law), may not enter this Property with a Handgun that is Carried Openly."

Codigo Penal § 30.07. Traspasar Portando Armas de Mano al Aire Libre con Licencia.

"Conforme a la Seccion 30.07 del codigo penal (traspasar portando armas de mano al aire libre con licencia), personas con licencia bajo del Sub-Capitulo H, Capitulo 411, Codigo de Gobierno (Ley de licencias de arma de mano), no deben entrar a esta propiedad portando arma de mano al aire libre."



Legislation Details (With Text)

File #:	19-0109	Version:	2	Name:	College Station Police Department Resource Allocation Study
Type:	Presentation	Status:			Agenda Ready
File created:	3/7/2019	In control:			City Council Workshop
On agenda:	4/11/2019	Final action:			
Title:	Presentation, discussion, and possible action regarding a Police Department resource allocation study conducted by Etico Solutions.				
Sponsors:	Brandy Norris				
Indexes:					
Code sections:					
Attachments:	College Station PD Resource Allocation Report				

Date	Ver.	Action By	Action	Result
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Presentation, discussion, and possible action regarding a Police Department resource allocation study conducted by Etico Solutions.

Relationship to Strategic Goals: (Select all that apply)

- Core Services and Infrastructure
- Sustainable City

Recommendation(s): Staff recommends Council receive the information and provide feedback.

Summary: The Police Department consulted with Tim Freesmeyer of Etico Solutions to evaluate and analyze current police officer staffing. Mr. Freesmeyer presented a report recommending staffing based on best practices. This information is based on five years of call data and three years of leave data from the police department. Mr. Freesmeyer will present his findings to Council for review.

Budget & Financial Summary: N/A

Attachments:

Report from Etico Solutions

College Station Police Department

Resource Allocation Study

Field Operations & Operations Support



Etico Solutions, Inc., 3275 Sycamore Springs Rd., Mountain Home, AR 72653

Resource Allocation Study of the College Station Police Department Field Operations and Operations Support Bureaus Conducted by: Etico Solutions, Inc.

In December of 2017, the City of College Station, Texas, contracted with Etico Solutions, Inc. for a Resource Allocation Study of the College Station Police Department Field Operations Bureau and Operations Support Bureau. The agreement specified a data-driven study that would be based upon police workload data and officer leave information. The proposed deliverables included a complete report of the findings of the data analysis, the methodologies used throughout the study, and a set of interactive spreadsheets that would allow agency personnel to complete additional analysis in future years. The methodology for this study was based on a nationally recognized model known as the "Police Allocation Manual" (PAM). Employee availability for the Patrol Division was determined based on three years of officer leave data, payroll records, miscellaneous division documents, and the current scheduling practices of the agency. Workload data was obtained from five years of historical dispatch data pertaining to events and officer activity logs.

The study began with a two-day initial site visit on January 23–24, 2018. A series of meetings were conducted with department personnel who would be responsible for providing data. Patrol schedules, district maps, GIS data, and other reference data pertaining to the Police Department workload was obtained throughout the visit. At the conclusion of the initial site-visit, the origin of all necessary data streams for this study had been identified and agency personnel were actively gathering and compiling the information needed.

After receiving the workload and leave data, the information was reviewed, analyzed and compiled into a variety of spreadsheets to be used as managerial tools. A second on-site visit was made on August 18, 2018 to present the preliminary results of the data analysis to the College Station Police Department Command Staff. At that meeting, the current minutes of reactive time per hour for the average patrol officer was discussed and a number of optional schedule changes were presented to improve the patrol division's current schedule efficiency. There was discussion concerning schedule alternatives and two new patrol beat designs were offered. Preliminary data on the workload for the Operations Support Bureau was not fully completed at the time of the mid term visit.

The following report provides final recommendations for patrol staffing levels, recommended schedule changes to improve efficiencies, redesigned patrol beat configurations, and suggestions to improve current data collection methods. The recommendations being offered are based on the workload and leave data provided by the College Station Police Department. Implementation of any recommendations should be carefully considered by the Police Command Staff for the potential affect upon the culture of the agency, any existing collective bargaining restrictions, and the level of acceptance to change existing within the agency.

This is a new staffing methodology for the College Station Police Department and should not be expected to be 100% accurate within the first year. As data collection methods improve within the police department and members of the agency become more conscious of accurately reporting the work that is being performed, the outcomes from this methodology should progressively improve. With the inclusion of the aforementioned spreadsheets and the detailed description of the processes used during this study, the methodologies and processes put in place through this study should serve the College Station Police Department and the City of College Station for many years to come.

Respectfully Submitted,

Timothy J. Freesmeyer, MBA
Etico Solutions, Inc.

Executive Summary

The following report is the result of a twelve-month examination of the College Station Police Department (CSPD) Operations Bureau and Operations Support Bureau. The data used to support the recommendations in this study for the Operations Bureau were obtained directly from the CSPD and do not represent national averages or historical benchmarks. The workload was taken directly from five years of calls-for-service frequency data as well as the average times spent on calls-for-service by officers assigned to the bureau. Officer availability was determined based on a three-year sample of leave data, training data, overtime data and compensatory leave data.

A retired police chief once wrote, “Adequate police protection, like beauty, lies in the eye of the beholder. The optimal or appropriate ratio of officers to population, traffic volumes, reported crimes or accidents, etc., is not a matter of mathematics or statistics. It is a matter of human judgement and community resources.” This report and the accompanying models and spreadsheets are not designed to be a definitive answer to the question of “how many officers do we need?” Instead, they are meant to be a management tool to help the police administration and city leaders determine the number of officers required to meet specific performance objectives. The model is built to allow a great deal of interaction and manipulation. Each form of leave can be included or excluded with the click of a button to see how each category effects the total staffing requirements. The amount of proactive time per hour provided to the officers for community policing can be set by the user. As proactive time increases, performance variables improve but the total staff size required will increase as well.

This report is meant to provide understanding of the principles contained in the models and to describe the data upon which the models operate. A written report can only provide static answers known at the time the report is written. The accompanying models are dynamic and will provide updated answers with every change in the variable settings. Therefore, the reader is encouraged to read this report with the staffing models available for review and to make time to understand how the models work. With the included forecasting routines, the staffing and deployment models can aid in improving performance and efficiency within the department for years to come.

After thorough analysis of the workload handled by the Operations Bureau, it is evident that the agency is operating with far less than the optimal number of patrol officers. The exact number of officers that need to be added is dependent on the subjective choices made by the administration. For instance, if the agency wishes to have sergeants available for supervision at all times, enough officers must be allocated to handle the time spent by sergeants on calls for service. If the agency choses to have certain calls handled by civilian personnel, the number of sworn officers may be able to be reduced. If the agency decides to implement a new specialty unit, the amount of training required for that unit will increase the need for staffing.

In addition to the number of staff, this study addressed the current deployment of existing staff to determine if immediate improvements were possible. The amount of reactive workload taking place in the existing eight police beats varied by over 5% between the busiest beat and the least busy beat. Unequal beats can lead to longer response times in the busier beats and the potential for more overtime usage. Two new

beat plans were offered that reduced the variance between the busiest beat and the least busy beat to 0.54% and 0.53% respectively.

Patrol schedules currently in use by the agency were compared to the workload curve determined from the CAD data. There was a significant amount of deviation between the two curves which indicated that improvements in the work schedule were likely to exist. Four alternative schedules were created and each is described at length in this report. The suggested alternative schedules would increase the schedule efficiency from its current level of 64.96% efficient to as high as 78.81% without any additional personnel.

The Criminal Investigations Division and the Recruiting & Training Division, both of which exist within the Operational Support Bureau, were reviewed by examining historical workloads and using a benchmarking methodology against the metrics of comparable agencies. Members of these divisions are not CAD-driven and the majority of their work is not recorded in the agency CAD database.

Annual reports from the previous three years indicated an increasing workload upon the Recruiting and Training Division. A large reliance on members of other divisions has been present for many years in order for the unit to accomplish their mission. Based on this reliance and the switching costs for continuously “borrowing” resources from other divisions, there is a recommendation for additional staff for the Recruiting and Training Division.

The Criminal Investigations Division provided five years of previous annual reports and monthly workload statistics. The statistics show an increasing workload that is outpacing the increases in staffing. The division is assigner a smaller percentage of cases that are presented to them and the clearance rates for cases has dropped over the last five years.

In addition to the historical workload review, this study included a 14-week data collection period to provide a snapshot of how time is currently being used in the Criminal Investigation Division. The results showed:

- Investigators were on task for an appropriate amount of their workday.
- Sergeants were found to be spending just over half of their time performing functions similar to their subordinates.
- Police assistants were found to be spending over 80% of their time on case related work which has benefitted the division greatly in the last few years.
- The amount of time donated by two volunteers has been almost the equivalent of an additional paid staff member.

Finally, a benchmark comparison was made between College Station and 29 other cities around the country in an effort to determine appropriate staffing levels for the investigators. Using a scatterplot and a linear regression trend line, the ratio of investigators for the comparable agencies were compared to numerous metrics. Two reliable predictors were determined which indicated the need for four additional positions in the Criminal Investigations Division.

The models built for this study have been provided to the College Station Police Department along with this report. If the agency updates the forecasted numbers with actual workload results at the end of each year, this method should serve the CSPD and the citizens of College Station for many years to come.

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Jurisdiction and Agency

City of College Station, Texas

College Station is a city in Brazos County, Texas, situated in East-Central Texas in the heart of the Brazos Valley, in the center of the region known as the Texas Triangle. It is 90 miles (140 kilometers) northwest of Houston and 87 miles (140 km) northeast of Austin. As of the 2010 census, College Station had a population of 93,857,¹ which had increased to an estimated population of 119,304 as of August 2018.² College Station and Bryan together make up the Bryan-College Station metropolitan area, the 14th-largest metropolitan area in Texas with 255,589 people as of 2015.

College Station is home to the main campus of Texas A&M University, the flagship institution of the Texas A&M University System. The city owes both its name and existence to the university's location along a railroad. Texas A&M's triple designation as a Land-, Sea-, and Space-Grant institution reflects the broad scope of the research endeavors it brings to the city, with ongoing projects funded by agencies such as NASA, the National Institutes of Health, the National Science Foundation, and the Office of Naval Research.³

Founded around 1860 and officially incorporated in 1938, the city spans 40.3 square miles⁴ with an average population density of 2,786 people per square mile. Estimated growth statistics for the city of College Station show a 27.1% increase in the population since the 2000 census and a daytime population increase of 9.3% (+10,465 people) due to commuting.

The City of College Station's socioeconomic status is mixed compared to the average for the State of Texas. The estimated median household income in 2016 was \$39,068 which was 30.9% less than the state average of \$56,565. Conversely, the estimated median house or condo value in 2016 for the City of College Station was \$239,900 which was 48.5% higher than the state average of \$161,500. Of the 45,159 houses in College Station in 2016, 30.5% were owner occupied, 58.3% were renter occupied and 11.2% were unoccupied. Renter occupied homes far exceeds the state average of 39%. In March of 2016, the cost of living index in College Station was 90.2 compared to a national average of 100. Unemployment for the City of College Station in 2015 was 3.1% compared to a state average of 4.4%.⁴

Educational levels for residents are consistent with a city containing a large research university. Approximately 96.6% have a high school degree or higher, 57.7% have a bachelor's degree or higher, and 31.3% of residents have graduate or professional degrees. College Station's racial/ethnic composition in 2009 was predominately White Non-Hispanic (65.6%). The population also consisted of 15.2% Hispanic, 10.3% Asian, 6.7% Black, and 2.2% other race.⁴ The median resident age for

¹ Community Facts: College Station city, Texas". U.S. Census Bureau, American Factfinder. Retrieved November 17, 2018.

² Wiley, Kenny (Sep 23, 2018). "Big Questions". *The Eagle*. Retrieved November 17, 2018.

³ "College Station, Texas". Wikipedia. Retrieved November 17, 2018.

⁴ "College Station, Texas". City-Data.com. Retrieved November 17, 2018.

College Station in 2016 was 22.5 years of age which is significantly lower than the median resident age of 34.5 years for the state.

The City of College Station operates under a council-manager form of government. The City Council consists of a Mayor and six council members who are elected at-large. The City Council will elect a Mayor Pro Tem from its membership who will act as Mayor during the absence or disability of the Mayor. The council sets the general policies of the city, which are implemented by the city manager and staff. All council members serve staggered four-year terms. The City Manager is appointed by the City Council and functions as the administrative head of the City government, carrying out policy and handling operations as directed by the City Council.

College Station Police Department

The College Station Police Department (CSPD) is a full-service municipal law enforcement agency staffed by sworn and civilian personnel. As of November 20, 2018, the agency employed 204 employees. The agency was subdivided into the following divisions and staffed as shown in Table 1.

Table 1

Division	Sworn	Civilian	Total Personnel
Administrative	11	3	14
Operational Support	30	9	39
Field Operations	92	3	95
Administrative Support Bureau	0	56	56
Total	133	71	204

Administrative Bureau

The agency is led by a Chief of Police who reports to the City Manager. The Chief of Police is assisted by three Assistant Chiefs, a Business Services Specialist and two lieutenants.

- The Professional Standards Lieutenant is responsible for internal affairs, commendations, and complaints. A civilian Continuous Improvement Manager, who reports to the Professional Standards Lieutenant, is responsible for accreditation, research and planning, and best practices management.
- The second Lieutenant oversees the Public Information Office. The Public Information Office is responsible for grant management, volunteers, interns, chaplains, and the Community Enhancement Unit (CEU).
 - The CEU is supervised by a sergeant and staffed with three community enhancement officers, a social media officer and a civilian police assistant.

A total of 11 sworn personnel and 3 civilians are currently assigned to the Administrative Bureau.

Field Operations Bureau

The Field Operations Bureau Assistant Chief oversees the largest number of employees within the CSPD and is assisted by three patrol lieutenants.

- The day shift lieutenant oversees four patrol squads, each supervised by a sergeant and a corporal, and staffed with either five or six patrol officers. Additionally, the dayshift lieutenant oversees the traffic unit, supervised by a sergeant and corporal, and staffed with four traffic officers. An administrative sergeant, who supervises three police assistants, also reports to the day shift lieutenant. In total, the day shift lieutenant is responsible for 37 sworn personnel and 3 civilians.
- The evening shift lieutenant oversees two patrol squads, each supervised by a sergeant and a corporal, and staffed with six patrol officers and a K-9 officer. In addition, the College Station Tourism and Entertainment Patrol (CSTEP) Unit reports to the evening shift lieutenant. CSTEP is supervised by a sergeant and a corporal and is staffed with eight police officers. One administrative sergeant reports to the evening shift lieutenant. In total, the evening shift lieutenant is responsible for 29 sworn personnel.
- The night shift lieutenant oversees two patrol squads, each supervised by a sergeant and two corporals, and staffed with 8 or 9 patrol officers. In total, the night shift lieutenant is responsible for 23 sworn personnel.

A total of 92 sworn personnel and 3 civilians are currently assigned to the Field Operations Bureau.

Operational Support Bureau

The Operational Support Bureau Assistant Chief, assisted by three lieutenants, oversees the Criminal Investigations Unit, the Recruiting & Training Unit and Special Operations. One police officer assigned to the Joint Terrorism Task Force also reports to the Operational Support Bureau Assistant Chief.

- The Criminal Investigations Unit is administered by a lieutenant with direct reports from three sergeants, a civilian victim advocate, a civilian crime analyst, and a civilian staff assistant. There are a total of 22 sworn personnel and 6 civilians assigned to this unit.
 - A Property Crimes Sergeant is responsible for the follow-up investigation of fraud, burglary, and theft cases. This is not an inclusive list of case types investigated but accounts for the bulk of the unit's workload. The Property Sergeant is aided by a civilian police assistant and supervises eight criminal investigators.
 - A Person Crimes Sergeant is responsible for the follow-up investigation of any crimes against persons, both juvenile and adult. A non-inclusive list would include homicides, sexual assaults, assaults, batteries, etc. The Person Crimes Sergeant is aided by a civilian police assistant and supervises a civilian crime scene technician, a sworn crime scene investigator and five criminal investigators.
 - The SIU Sergeant supervises the Special Investigations Unit (SIU). This unit focuses primarily on drug offenses along with a lesser focus on gang activity. In addition to the sergeant, the unit is staffed with four criminal investigators.

- The Recruiting & Training Unit is supervised by a lieutenant with direct reports from two sergeants and a civilian administrative Support Technician. One sergeant, who serves as the Training Coordinator, supervises a sworn recruiting officer, a civilian training officer, and a civilian police assistant. The second sergeant, designated as the Weapons Coordinator, supervises two sworn training officers. There are a total of 6 sworn personnel and 3 civilians assigned to this unit.
- The Special Operations Unit is administered by a lieutenant with no direct reports yet who is responsible for coordinating the efforts of a large number of employees. The Special Operations Lieutenant serves as the Tactical Commander for the Special Weapons and Tactics (SWAT) team, the Hostage Negotiations Team (HNT) and the Bomb Squad. In addition, the lieutenant is responsible for coordinating special events, emergency management, volunteers, interns, chaplains and assisting with background checks when needed.

A total of 30 sworn personnel and 9 civilians are currently assigned to the Operational Support Bureau.

Administrative Support Bureau

The Administrative Support Bureau Assistant Chief oversees the majority of civilian positions within the organization. Four civilian managers and a civilian supervisor report directly to the Assistant Chief and supervise a total of 51 civilian employees.

- The Communications Manager oversees the agency's dispatching and call taking function. The manager is assisted by a dispatch assistant and three dispatch supervisors who oversee 23 tele-communicators.
- The Holding Facility Supervisor is responsible for the jail and is assisted by eight detention officers.
- The Information Services Manager oversees the records and evidence functions. A Records Supervisor reports to the Information Services Manager and supervises five other Records Technicians. Other direct reports include a police assistant, who is primarily responsible for permitting, and three evidence technicians.
- The Technical Services Manager is responsible for supporting and maintaining the many technical systems used throughout the agency. A geographic information services (GIS) analyst reports to the Technical Services Manager.
- The Support Services Manager is responsible for building maintenance, fleet maintenance, property, purchasing, and animal control. One property technician reports to the Support Services Manager as well as an Animal Control Supervisor and three Animal Control Officers.

A total of 56 civilians are currently assigned to the Administrative Support Bureau.

The remaining portion of this report will examine the Field Operations Bureau and the Criminal Investigations Unit and Recruiting & Training Unit within the Operational Support Bureau. The report will detail the findings concerning optimal staffing levels, optimal allocation, and optimal deployment.

Methodologies

The law enforcement profession presents a unique challenge to those responsible for staffing and scheduling public safety staff. Not only must they schedule a 24-hour operation that operates every day of the year, they must also attempt to staff proportionally to a workload that varies by time of day and day of the week.

Patrol workload can be best described as “non-uniform but predictable”. Calls-for-service are not received uniformly; one at a time in consistent intervals. Furthermore, the time required to handle a call-for-service can vary greatly depending on the nature of the call. In spite of this variability, police agencies can reliably predict the times of highest and lowest call volumes. Other divisions within an agency may have a more stable work-flow allowing a determination of staffing to be made based on position coverage.

Call-for-service loads are important but they are not the only considerations when determining staff sizes and scheduling employees. Minimum staffing levels must sometimes be considered. Even at times when call volume is expected to be low, agencies may need to staff additional employees to ensure the ability to answer sudden spikes in calls safely and promptly.

Law enforcement agencies operate in a volatile environment that often requires dealing with complex problems. Many facets of the agency function in an environment that is void of walls, roofs, or fences. Working conditions and workload is effected by weather, national events, political activities, natural disasters, demographic shifts, and numerous other environmental, economic, and social factors that affect a community. When the volume of work begins to exceed the available number of officers, a police agency cannot close its doors or stop answering the phone. Most agencies will resort to some combination of prioritizing calls, responding to calls with less than optimal numbers of responding units, or holding calls until a unit becomes available.

Officer-to-Population Ratios

Determinations of optimal staffing have been attempted in a number of ways over the last several decades. One of the more popular methods of estimating adequate staffing is using officer-to-population ratios published each year by the FBI in a report entitled “Crime in the United States” (CIUS). The CIUS report provides a plethora of tables, one of which is a table displaying the number of sworn officers per 1000 population. The ratios provided in the table are based on two criteria, a population range, and a general location within the United States.

The ratios are not particularly useful for individual police agencies since they do not take local criteria into account. The chart does not consider local demographics, socioeconomic status, crime rates, geographic size, or a host of other important considerations.

It should be noted that the authors of the CIUS report specifically state that the statistics provided are not to be used as staffing guidelines. The report states: “Because of law enforcement’s varied service requirements and functions, as well as the distinct demographic traits and characteristics of each jurisdiction, readers should use caution when drawing comparisons between agencies’ staffing levels based upon police employment data from the UCR program. In addition, the data presented in the reports reflect existing staffing levels and should not be interpreted as preferred officer

strengths recommended by the FBI. Lastly, it should be noted that the totals given for sworn officers for any particular agency reflect not only the patrol officers on the street but also officers assigned to various other duties such as those in administrative and investigative positions and those assigned to special teams.”⁵

As an agency creates specialty units, such as bicycle officers or canine units, those officers are most often drawn from patrol. This leaves fewer officers to answer calls-for-service and conduct routine patrol. This reduction in the patrol staffing is not recognized by the officer-to-population ratios since the officers in the newly created specialty units would still be counted as a sworn officer for purposes of the FBI statistics. Thus, the creation of specialty units to respond to specific requests of the community works against the agency when using officer-to-population ratios to estimate optimal staffing in patrol.

Population as a Workload

Population is an external workload that does not change based on the goals and self-motivation of the employees within the comparative divisions. More importantly, population does not adequately measure the amount of work created for the various divisions of the agency. Cities typically have a diverse demographic profile among residents. The amount of work created for a police department by a particular neighborhood can be affected by many variables such as the neighborhood’s socioeconomic status, unemployment rate, or demographic composition just to name a few.

Census populations only include the people who live in the community as residents. Ratios and comparisons based on population do not take into account additional people that commute into a community for work, tourists that are drawn to a community, college students that claim residency at an alternative home address, or migrant workers that do not appear on any US census poll. Although these additional groups are not reflected in the city’s population, they must be afforded police services and protection.

Benchmarking

A second method that is often used is a comparative analysis based on a number of “similar” agencies. This is referred to as “benchmarking.” This process, like officer-to-population ratios, is also fraught with inherent assumptions and limitations.

The first assumption is that the “similar” agencies used in the comparison are truly “similar.” Agencies must be found that share similar populations, agency sizes, and geographic locations. Other considerations such as demographics, socioeconomic status, geographic size, crime rate, and population density must also be considered. The list of comparable characteristics could be endless as an agency seeks to find the ultimate set of comparable agencies.

Benchmarking processes assume that the comparable cities are operating under the same philosophy and mission as the agency under study. Some communities applaud an agency that uses strict enforcement and zero tolerance to maintain a safe

⁵ “Crime in the United States 2017” U.S. Department of Justice Federal Bureau of Investigation 18 November 2018 World Wide Web: <https://ucr.fbi.gov/crime-in-the-u.s/2017/crime-in-the-u.s.-2017/topic-pages/police-employee-data>

community while others would view such tactics as oppressive and overzealous. One community may be willing to fund more officers per population to gain greater visibility and officer presence while another community merely tolerates the police department and believes they should only be seen when they are called.

A third assumption is that the chosen “similar” agencies are staffed appropriately. If an agency chooses four similar agencies that are all understaffed, the entire exercise becomes futile. If inquiries were to be made to the similar agencies about the appropriateness of their current staffing, one may receive many different answers, all dependent on who is answering the question.

Empirical Qualitative Analysis

The assumptions and limitations associated with population-based studies or benchmarking attempts can be overcome using internal workload measures that reflect the actual demands placed on the various divisions within an agency. By using available internal workload measures, collected and analyzed over a multi-year history, an agency can determine an optimal staff size for each division that is based on the unique characteristics of the community.

For most police patrol divisions, an appropriate internal workload already exists in the form of historical Computer Aided Dispatch (CAD) data. CAD systems typically capture each activity that an officer performs along with important dates and times such as dispatching times, arrival times, and cleared times. By carefully analyzing an agency’s CAD data over past years, a forecast can be made of the total hours of work that a patrol division can expect in the current year and years to come.

This workload measure, the total hours of expected work, can be used as the basis of an empirical qualitative staffing and allocation study. Once the workload is accurately determined, an agency can set performance levels for patrol based on the minutes of proactive patrol time each hour that is allotted to the average patrol officer. After determining the officer availability ratios for the agency based on current leave policies and schedules, an administrator can determine the optimal patrol staffing for the community being served.

This method is not a one-size-fits-all methodology for staffing. It is unique to the agency under study and driven by data. The method can be replicated in future years and does not rely on the assumptions of comparative methods. Most importantly, the process is easily modified based on data within the agency to meet special circumstances that may arise within the community.

Workloads for other divisions within police agencies are not always as easy to determine as that of patrol. For investigative divisions and other employees that are given a great amount of autonomy throughout the work-day, quantitative workload data may be limited or completely absent. In these situations, less reliable methodologies may have to be used temporarily until a valid workload determination can be made.

Methodologies Used

The Operations Bureau was analyzed using the PAM (Police Allocation Manual) methodology. PAM is an empirical methodology based on internal quantitative data provided by the College Station Police Department. Five years of historical CAD data was analyzed to produce a model capable of predicting future patrol workload. In addition, the agency provided three years of data pertaining to officer leave times,

training times, and other non-patrol days. This information was used to determine officer availability.

The historical CAD data and officer availability ratios were used to determine the current number of minutes spent per hour on reactive calls by the officers assigned to the Operations Bureau. The spreadsheets provided to the agency, along with this report, can be used to determine the necessary staff sizes needed to meet a desired balance of proactive and reactive time per hour for the bureau.

The same workload data from the CAD was used again to determine the workload distribution among the existing patrol beats. The heaviest workloads in the jurisdiction were identified and a new beat structure was created using the 2013–2017 CAD data to provide new beat designs with even workloads.

Finally, the CAD data was charted by hour and day to create a set of workload curves depicting when the workload was occurring within the city. These workload curves were compared with the current work schedules to measure the efficiency of the current work schedules and to determine more efficient alternatives to the existing schedule.

Initial Site Visit

The initial site visit was conducted on January 23–24, 2018. The main purpose of this visit was to meet with the Command Staff and the Operations Bureau and Operations Support Bureau administration to discuss their operational concerns and the methodology to be used for the study. A second objective for the first on-site visit was to meet with all agency representatives who would be responsible for providing workload and leave data to be used in the analysis.

The Operations Bureau Assistant Chief had scheduled meetings with various data providers prior to the site visit to best utilize the time during the two days on-site. Meetings were held with the Command Staff, Training Staff, Recruiting and Training Supervisors, CSTEP Supervisors, the GIS Coordinator, the Records Supervisor, Patrol Supervisors, CID staff and Supervisors, CEU Supervisors, Communications Supervisors, and personnel responsible for gathering Telestaff and other officer leave information.

By the end of the two-day visit, all necessary data for this study had been identified and meetings had been held with all personnel responsible for collecting the data.

Collection of Workload Data

The majority of the information used to estimate patrol workload had to be extracted from the CAD database. The CSPD dispatches in-house as opposed to a consolidated dispatch center shared with other agencies. The agency currently uses a CAD software suite from CentralSquare, formerly TriTech Software Systems, called “Inform” that is integrated with the CSPD report writing software, in-car computer systems, and records management system.

Five years of historical data including event history and unit log history, from 2013 through 2017, were requested. The combination of these extractions were needed to provide information on all calls for service handled by the Operations Bureau including the time spent on each call. This would allow activities to be sorted by individual employee, day of the week, hour of the day, or activity type. A listing of the CAD fields needed for this study was provided to the Communications Supervisor and all data was

requested in electronic format in a pipe delimited .txt file or a a comma separated variable (.csv) file using a pipe delimiter instead of a comma.

Collection of Officer Leave Data

Officer availability was the second major piece of information necessary for this study. To calculate officer availability, it was essential to determine the number of regularly scheduled days off, the time spent in training, the amount of leave time taken, the amount of overtime worked, and the amount of time spent on special assignments away from the main patrol function. This data was needed to determine a shift relief factor for the Operations Bureau. Three years of leave data, 2015 through 2017, were needed from various CSPD sources encompassing all leave, training, and overtime statistics.

Many police agencies struggle with the most effective way to utilize an officer's time while they are on light-duty status or when recovering from an on-duty injury. All law enforcement agencies, from time to time, will have employees who are injured, either on or off the job, and are unable to perform their full duties as a patrol officer. How agencies respond to these circumstances vary considerably. Some agencies will assign the officer to a desk assignment within the station, or assign them to take telephone reports for cases that do not require an officer response. Other agencies will allow the officer to work in business attire in an unmarked vehicle to take cold reports where there is no risk of contact with offenders. In each of these scenarios, the officer is still performing their duties to the benefit of the patrol mission and is performing in a capacity that would otherwise have to be done by a patrol officer.

Yet in other agencies, officers on injury or light duty leave are temporarily re-assigned to other divisions within the agency such as Records, Training, or Recruiting. This removes the officer from the Operations Bureau and creates additional work for the remaining patrol staff in their absence. The officer's position is held for the injured officer until their return preventing the Operations Bureau from hiring another officer to fill the void. If the time spent in other divisions is not properly documented in the resource analysis study, the total staff required for the Operations Bureau will be underestimated.

The CSPD follows many of the scenarios just described by assigning officers to limited duty positions in patrol when such positions are available but also by re-assigning officers to support divisions such as Investigations or Training & Recruiting. Assignments are based on a number of factors such as the availability of special assignments, the extent of injury, and the special skills of the officers involved. The decision of assignments for light duty officers can have an affect on patrol staffing needs. If a light duty officer can fill a position that would otherwise be staffed by full-duty patrol officers, such as a desk assignment, the light duty status will not affect staffing. However, if the light duty officer is reassigned outside of patrol, investigations or recruiting for instance, the time that is spent outside of the patrol division must be captured and included in the average amount of time off patrol. Conversations with the Field Operations Bureau command staff indicated that various assignments are used for officers on light duty. Based on past collection practices, it was determined that the total hours spent per year on modified duty may have to be hand tallied from departmental records.

A final consideration that must be analyzed is the number of Patrol Officers that are assigned to temporary detachments outside of the Patrol Division. Each day that a Patrol Officer is assigned to some other division, it increases the reactive workload of everyone else on the shift. This affects the total number of officers that must be assigned to Patrol to meet desired performance levels. Reassignments in the Patrol Division are not common but when an officer is reassigned, the time-frame is often significant. Reassignments are not captured in the agency's TeleStaff application and must be tracked on a case by case basis. If staffing allows, the agency would like to begin a program that places two patrol officers in the Criminal Investigations Unit on a rotating basis. This time must be accurately recorded and included in the next staffing study update.

Collection of Additional Resources

Additional resources were necessary for deployment analysis such as patrol maps, current schedules of the patrol division, and an organizational chart of the agency. Some of this information was provided during the initial site visit while other items were emailed following the visit.

Several pieces of information were needed to better understand the values found in many of the CAD fields. Radio numbers for all officers within the CSPD were requested along with a description of all disposition codes, all status codes, and all out of service codes. Due to the change in CAD systems in August of 2016, a translation from the old CAD types to the new CAD types was necessary. This CAD change will be described in more detail later in this report.

In order to estimate report writing times, a listing of all case numbers for all reports written in the last five years was requested from the Records Unit. This data would later be cross-referenced to the CAD data to estimate the percentage of time patrol writes reports for each CAD type.

Throughout the remainder of the study, there were many other CSPD employees who provided valuable information for analysis. The agency was quick to answer any questions posed by this researcher and were always willing to research for answers that were not readily available.

Initial Observations

The amount of workload data found in a CAD database is highly dependent on the reporting practices within the patrol division and the dispatching center. Work that is not reported by the patrol officers or not entered into the CAD by the dispatchers skews the amount of estimated workload for the patrol division.

As with most agencies in past studies, patrol supervisors at CSPD confirmed that patrol officers are not consistently documenting all activities that are being performed. In other cases, officers are advising the dispatchers to clear a call out of the CAD system prior to the call being handled completely. This practice of "pre-clearing a call" is often done in an attempt to keep the call-for-service queue empty and response times to a minimum. When work is performed and not called into the dispatcher, that work is not recorded and credited to the agency as patrol workload. This often occurs during times of high radio traffic when the radio channels become saturated. This issue will be addressed later in this report.

There was an initial assumption that the CAD change in 2016 was going to create a “hiccup” in the CAD data. This assumption was proved correct when the data was later analyzed.

Resource Analysis

The process of determining appropriate staffing size is referred to as “Resource Analysis.” There are two distinct parts to this analysis; (1) the determination of total workload for the Field Operations Bureau and (2) the calculation of officer availability. CAD data from 2013–2017 was analyzed to determine the total workload while leave data, training data, and overtime data from 2014 through 2017 was used to calculate officer availability. Due to the size of the CAD database, a statistical software package known as SPSS (Statistical Package for Social Sciences) was used to filter, collapse, and analyze the CAD database. Microsoft Excel was used to calculate officer availability and to display results from the SPSS software.

Patrol Workload

Total workload, in this study, was calculated by categorizing all work performed by the Field Operations Bureau and then calculating an average time to complete each category of work. The most logical and reliable method of identifying workload for an agency’s patrol division is using the agency’s CAD data to catch the bulk of activity and then identifying other workload that is not available through the CAD. Additional workload includes report writing, shift briefings, patrol vehicle maintenance, and other tasks that must be completed as part of an officer’s normal duties. A major CAD software change took place in August of 2016. The CSPD changed from a CAD package from “Enroute Emergency Systems LLC” to a CAD package from “CentralSquare”, formerly “TriTech Software Systems”. The CAD software change in 2016 significantly affected the foundational data used in this study. The number of events recorded per month in the CAD data dropped noticeably in the new CAD software shortly after the transition. The number of CAD incidents increased by 2.62%, 5.28%, and 7.31% respectively in the three years prior to the CAD change. After the CAD change, the number of events decreased by 13.33% between 2016 and 2017, a difference of approximately 16,500 events.

Numerous changes could account for the drop in the number of events in the CAD after August of 2016. The number of call types dropped from 144 call types in the old CAD to 132 in the new CAD. At least 25 call types changed to new call types under the new CAD requiring a translation of the data. Approximately 26,000 administrative events per year in the old CAD are no longer being captured in the new CAD. These event types included “break”, “busy”, “court time”, “fingerprint”, “report time”, and “vehicle service.” All of the aforementioned admin call types are now captured under a single event type of “Admin Incident” which has dropped to slightly over 800 per year in 2017. The majority of these admin events were not considered to be reactive activities and were not included in the final workload used to determine staffing.

The new CAD appears to handle “911 Hang Ups” much differently than the old CAD. The number of “911 Hang Up” events dropped from an average of 9,000 per year to 864 in 2017. This could be due to the way it processes the ORI for the call. A large portion of 911 hang up calls are handled by the dispatchers and are never assigned to an officer. Some newer systems do not assign an agency ORI to a call until an officer is

assigned to the call. This may account for the drastic decrease in numbers. Other event types that decreased in number included:

- Accident Nonreportable
- Assault Report
- Community Contact
- Criminal Trespass in Progress
- Parking Complaints
- Public Assists
- Suspicious Persons

Call types that increased in number included:

- Accident Minor
- Attempt Warrant Service
- Civil Disturbance in Progress
- Communications Incident
- Crossing Guard Duty
- Traffic Stop
- Welfare Concern

CAD Filtering and Collapsing

As mentioned earlier, CSPD provided five years of historical CAD data for analysis during this study. Four primary files were received, an incident file and a unit history file from 1/1/2013 to 8/16/16, and an incident file and unit history file from 8/16/16 to 7/5/18. The incident table provided information on every call that was dispatched through the CAD software. The important fields in this table identify the type of call, the call location information, the date and time of each call, and the call source (citizen generated or self initiated). Simply stated, the incident table identifies the “*what*”, “*when*”, “*where*”, and “*how*” for each call. There were over 944,500 records in the two incident files before any data cleaning began.

The unit history tables provide the “*who*” and additional “*when*” for each call in the CAD database. These tables provide detailed information on all officers assigned to every call. Each status change (dispatched, en-route, arrived, cleared, etc.) is time-stamped with the date and time of the change for every officer. These table are crucial in estimating the average service time per call for each call type handled by the agency. The unit history tables for College Station had over 954,700 records over the five year data collection period before any cleaning began.

Using these tables, call locations, dates, times, and unit identifiers are captured for every officer as they progress through each call. This provides information on the frequency of various calls-for-service and the average total time spent on each call-for-service by patrol officers. To better explain the process used, it is important to define several key terms concerning the CAD.

The CAD database looks like a large table. The rows in the table are called records while the columns in the table are called fields. Each time a unique activity is performed by an officer and recorded to the database, the system assigns a unique event ID which will appear in only one record of the incident table. Since the unit history table records each status change of every officer as they progress through a call, the unique event ID number will appear in multiple records of the unit history table.

If a call has two or more officers responding, the unique incident number for that call will appear in many records of the unit history table (called a one-to-many relationship). Therefore, when looking at the number of records in the incident table of an unfiltered CAD, the activity of the agency may be underestimated due to the number

of calls requiring a multiple officer response. Conversely, counting the number of records in an unfiltered unit history table will overestimate the activity of the agency since a new record is created for every officer assigned to each incident.

While the CAD database holds key information for a workload study, it must be filtered in a number of ways and collapsed before the information becomes useful for accurate analysis. The following steps detail the general process in filtering and collapsing the CAD data for analysis.

Selecting appropriate fields

The incident table in a CAD database holds a very large number of fields that may or may not be important in a resource analysis study. Prior to extracting the CAD data from the original database, a careful selection of fields was made. The selection criteria included any field that provided insight into the type of activity being handled, the location of the activity relative to different districts and emergency service zones, the times associated with the officer's response, the particular unit or employee responding, and any unique identifiers that would allow the various databases to be cross-referenced. If a field could possibly hold information of value, it was included in the list and could always be deleted later when found to be unnecessary. The following fields from the previous Enroute CAD were chosen for inclusion in the incident table exports:

- InNum
- PrimaryFirst
- Nature
- UnitID
- PrimaryCode
- Call Date Time
- Dispatch Date Time
- Enroute Date Time
- OnScene Date Time
- Available Date Time
- Closed Date Time
- Shipped Date Time
- PoliceArea
- Priority
- Grid
- Address
- Report
- Disposition
- Disposition2

The following fields from the current Inform CAD were chosen for inclusion in the incident table exports:

- Master Incident Number
- Code
- Problem
- UnitID
- Call Date
- Dispatch Time
- Enroute Time
- Arrived Time
- Closed Time
- Priority Number
- Priority Description
- Caller Name
- Longitude
- Latitude
- Map Info
- Response Area
- Address
- CaseNumber
- PrimaryDisposition
- Call Disposition
- MachineName
- ID
- Nature

The unit history table in a CAD database also holds a very large number of fields that may or may not be important in a resource analysis study. The following fields were chosen for inclusion in the unit history database extracts:

- InNum
- Problem
- Call Year
- Dispatch Date Time
- Enroute Date Time
- Onscene Date Time
- Available Date Time

Filtering by Unit IDs

Once the databases were extracted, they were provided to Etico Solutions in electronic format for analysis. There was a delay in getting the necessary CAD data in a useable format. On July 5th, the final CAD files needed were received and the data analysis could begin. The unit history files were the first to be cleaned. All records for units other than College Station Police Department employees were removed from the unit history databases. A new field was written to each record to identify the area of assignment for the Unit ID referenced in the record. This allowed the ability to separate the time on call spent by each classification of employee (patrol officers, patrol sergeants, CSTEP, CEU, traffic, police assistants, off duty officers and animal control)

Individual Unit On-Call Times

The next step in collapsing the database was to calculate the total time that each officer spent on each incident. The time was calculated by subtracting the dispatch date & time from the cleared date & time. This was not always possible for self-initiated events when there was no dispatch time, or for events where an officer was sent back to the scene multiple times and had more than one dispatch and clear time for a single event. The database had to be keyed so that in the case of a missing dispatch time, the next closest time would be used (en-route time). The database also had to be keyed to recognize multiple responses to the same event by the same unit.

Call Time Summation

To determine workload, the total amount of time spent on each incident by all officers assigned to that incident was summed and written to a new field in the database. The total of all officers in each unit category (patrol officers, CSTEP, traffic, etc.) was then summed for each event and written to a new field in the database. After aggregating the call times listed above, the database was collapsed to show only one record for each incident. Each record reflected the total time on call by all officers assigned to the incident sorted by the type of unit. In other words, for each call, the database showed the total time spent by patrol officers, the total time spent by patrol sergeants, the total time spent by detectives, etc. The analysis of the call-for-service data could now begin.

Call-for-Service Forecasting

A categorical frequency report was run in SPSS to show how many incidents of each incident type were recorded in 2013 through 2017 (Table 2). Using the frequency of each incident type from the past five years of historical data, a forecasting routine in Microsoft Excel was used to estimate the expected workload for 2018 through 2021 (Table 3). It is estimated that patrol activities for the next four years will approximate:

Table 2

Year	Patrol Activities
2013	107,025
2014	109,830
2015	115,634
2016	124,086
2017	107,550

Table 3

Year	Patrol Activities
2018	114,094
2019	117,348
2020	120,925
2021	125,127

The accuracy of this estimation gets lower as the estimate gets farther from the historical data. This estimate is based solely on the existing CAD data. It is expected that future patrol activity totals will increase over time as officers begin to document more of their activities and as activity tracking procedures improve within the police department. The data shown above was collected using two different CAD platforms, Enroute Emergency Systems and TriTech Software Systems. Since different CAD platforms collect data differently, it is very plausible that the reduction of calls for service in 2017 was more closely related to the measuring process instead of a true reduction in workload. This question can be answered more confidently in a few years when the agency has three to four years of historical data from the same TriTech Inform platform.

Calculating Patrol Workload

The desired workload metric for patrol is not the number of incidents or the number of calls-for-service to which patrol officers respond. An incident in one location could require vastly different amounts of time to complete than the same incident in another location. The best metric for measuring workload is the total number of hours required to meet the obligations of the patrol division. The average time spent on each call for service was calculated in the call time summation step listed earlier. The time spent on call from all incidents from 2013 through 2017 was averaged by type of call to determine the average amount of time spent by each type of unit on each type of incident. The frequency of each incident type for each year was then multiplied by the average time required to handle that activity type by each unit for that year. The sum of all patrol activity times determines the total number of reactive hours that patrol is responsible to meet.

By calculating an average time on call for each incident type by year, the average times can be multiplied by the forecasted incident frequencies for future years yielding an estimated workload for projected years. Over the last ten years, the time spent on calls for service has been growing for the majority of law enforcement agencies. As public scrutiny of law enforcement grows, courts are requiring more information to be contained in police reports. This higher level of scrutiny has led to longer report writing times for most agencies. In addition, more recent legislation has required additional steps by officers in the response to certain incident types. In western states, search warrants are now required for blood draws in DUI investigations. Some states are requiring mandatory tows for vehicles involved in suspected DUIs. Vehicle searches are now much more limited and may require impoundment and a search warrant to collect contraband lying in plain view within a motor vehicle. For these reasons, it has become important to estimate the average time spent on call by year so that the average time on call can be forecasted into future years as well. In order to get the most accurate picture of future workload, we must also take into account the increasing amount of time spent on each call.

Current Limitations of CAD Data

Law Enforcement CAD software encompasses a vast amount of data that can be used for managerial decision making within an agency. However, the usefulness of the data is highly dependent on the quality and the quantity of the information being entered

into the CAD. A number of situations exist that prevent workload data from being entered into the CAD accurately and consistently.

It is important to educate the officers in the Field Operations Bureau about the need to call in all work being performed in an accurate and consistent manner. The average patrol officer has little to no exposure to the concepts of resource allocation and how “patrol workload” is used to determine appropriate staffing levels. The majority of patrol officers believe that calling out self-initiated activities such as criminal traffic stops and suspicious subjects is done to inform the dispatcher of the officer’s location in case assistance is needed.

If the officer’s perception of documenting self-initiated activities in the CAD is based on officer safety, the officer is more likely to call out activities that have anticipated risk. Routine traffic stops, park checks, business checks, report writing, evidence processing, and many other self-initiated activities that are done between calls-for-service and which pose little to no risk for the officers may not be documented. This is currently happening on a daily basis in the City of College Station. To correct this, all officers need to be exposed to the concept of “patrol workload” and how the work they document in the CAD is used to determine proper staffing for the division. Once the perception of documenting workload is changed from an “officer safety” activity to a “workload documentation” activity, the amount of data collected in the CAD is almost certain to increase.

A second situation that limits the amount of data reaching the CAD is the method or process of documenting activities. In past studies, officers would call the dispatch center on the radio and ask the tele-communicator to “put them out” at a particular location on “available” status. The officer specifies an “available” status so any calls coming into their assigned area will still be sent to them while they are out at the designated location. When the officers ask to remain available, the tele-communicator does not create an event nor change the officer’s status, they simply make a comment in the unit log of their location. Any activities conducted by the officer will not be recorded in the CAD and cannot be used later as patrol workload. Unlike the first situation, where the officer is not calling out their activity, the officer is now calling out their activity but due to the desire to remain available for calls, the activity is not being entered in a way that can be used for workload. This issue is occurring within the CSPD at the present time.

Many variations of the previous problem exist. Instead of asking to be placed on “available” status, officers will notify the dispatcher that they are “out at the station” or “busy.” While this status can be tracked and the frequency of this status can be counted, it cannot be tied to a particular activity being performed. When examining data to determine reactive workload and proactive workload, categories such as “out at the station” and “busy” provide no insight into the nature of work being done. An admin code of “busy” was present in the old CAD system at CSPD but it was removed in the new CAD.

In some agencies, officers place a higher emphasis on keeping the call-for-service queue clear than on properly documenting the actual amount of work being performed. When handling low priority calls, officers will advise the dispatcher to clear the call long before they have completed checking the area. The officers are not completely at fault for this as there is sometimes strong encouragement by administration, supervisors, and other officers to address calls quickly and to maintain a minimal response time. The

officer's intention is to get the call out of the call-for-service queue quickly so that other calls can be addressed. However, by asking the tele-communicator to clear the call prematurely, the CAD data may indicate a call takes 3 minutes when, realistically, the call may have consumed 20 to 25 minutes of the officer's time. Advising back-up units to disregard when assigned to a two-officer call creates a similar problem. A two-officer alarm call which may require a total of 20 minutes of patrol officer time only reflects a 10 minute response when the secondary unit is called off prematurely. The officer is not trying to skew the workload reporting times, they are trying to free up the back-up officer for other calls and will often "advise" if they need the second unit upon arrival. It was confirmed at the initial site visit that this practice is taking place frequently at the CSPD.

The largest loss of workload data in most agencies is unreported or under-reported time spent writing police reports. During times of high call volume, most officers will respond to a call for service, obtain information for a report, and then clear the call. If calls are holding in the call for service queue or if there is abundant opportunity for proactive patrol, the officer will wait to write the report until later in the shift when the activity level slows. In the majority of cases, the officer will either write the report while still on an "available" status or they will call out using a generic out of service code such as "busy" or "out at the station." This practice prevents the agency from being able to accurately estimate the average time spent writing reports for the various call types (burglary, battery, DUI, theft, etc). If the average time to write a report is estimated at 30 minutes, and the agency writes 9,000 reports a year, the time spent writing reports could be as high as 4,500 hours per year. The need to document this workload should not be overlooked.

The previous Enroute CAD system had an admin type code of "Report Time" which was intended to be used to track the time when officers were writing police reports. In 2013, the Report Time code was used 1,656 times. However, according to information received from the College Station Police Department Records Unit, there were 12,413 case reports written in 2013. If it were to be assumed that patrol officers wrote 75% of these reports (a random percentage chosen), this assumption would indicate that just under 18% of the officer's report writing times may have been captured. It is possible that officers may have stayed on calls until their report was finished before clearing for the next call which would eliminate the need to call out at a later time for "report writing". This, however, is unlikely to account for the estimated 82% of the missing report writing times in this assumption.

The limitations of the CAD data, due to unrecorded workload, will cause the total workload for the Field Operations Bureau to be underestimated in this initial study. However, most of the under-reporting that is currently taking place can be corrected with new activity codes in the CAD, proper training on reporting protocols, and persistent supervision to ensure that all work is being called into the tele-communicator.

Daily Administrative Duties

There are a number of administrative duties that must be performed each day by the patrol officers. Based on discussions with agency personnel, the following activities and their average times per day per officer were estimated:

The administrative duties listed in Table 4 occur daily for every officer fielded in patrol. The time spent performing these administrative duties is time taken away from the ability to answer calls for service. Thus, each administrative duty increases the need for officers in the Field Operations Bureau. Many of these administrative duties are unavoidable either due to labor agreements or practicality. However, they should be reviewed continuously due to their direct effect on patrol staffing. Now that all officers are using body-worn cameras, the time spent donning and doffing the cameras, along with any additional administrative time to document camera footage, needs to be averaged across all officers and added to the administrative time per shift.

TABLE 4

Type	mins/shift	hrs/shift
Briefing	30	0.50
Breaks	30	0.50
Meals	45	0.75
Debriefing	15	0.25
Total	120	2.00

Total Reactive Workload

Bringing all of these activities together, the total reactive workload for the Field Operations Bureau consists of: the total time required to handle reactive activities reported in the CAD; the time required for report writing and any other activities that are not currently being captured by the CAD; the time required for the daily administrative duties of the officers; and the time required for expected service activities. An estimation was made on the amount of time required for report writing based on the number of reports written over the last five years and an estimated report writing time calculated from a survey completed by the patrol officers. It is important to remember that the total reactive workload assumes that officers will be responding from call to call with no proactive time in between. Therefore, this workload will determine only the minimum number of officers required to meet minimum expectations.

This report is accompanied by an Excel spreadsheet that contains the historical and predicted number of activities for each activity type. The spreadsheet also contains the

Chart 1.

Yearly Reactive Workload

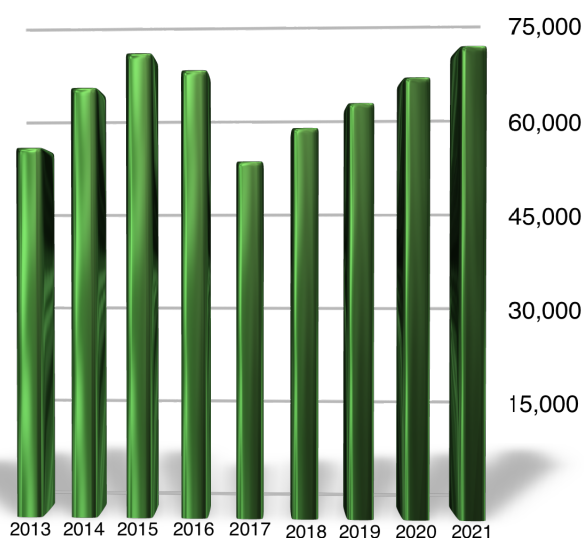


Table 5 Annual Reactive Workload

2013	54,337	2018	57,084
2014	63,080	2019	60,656
2015	68,075	2020	64,334
2016	65,556	2021	68,808
2017	52,243		

Table 6 12 Hour Shifts
Minimum On-Duty Officers per Day

2013	14.89	2018	15.64
2014	17.28	2019	16.62
2015	17.96	2020	17.63
2016	15.52	2021	18.85
2017	14.31		

average times calculated for each activity type and the average time required for daily administrative duties of the officers. From the spreadsheet calculations, the total hours of reactive workload for the Field Operations Bureau from past years, and forecasted into future years are graphed in Chart 1 and listed in Table 5.

The numbers reflected in Chart 1 are yearly totals. The minimum number of on-duty officers required per day can be determined by first dividing the annual totals by 365 (days in a year) to get an average daily reactive workload. The daily workload is then divided by the shift length (12 hours less 2 hours required for daily administrative duties) to determine the minimum number of on-duty officers that must be fielded every 24 hour period. The minimum on-duty officers required per day, each working one shift, is shown in Table 6.

Shift Relief Factor

The numbers reflected in Table 6 depict the number of officers that have to be fielded on a daily basis. Because officer's do not work every day of the year, a multiplying factor must be calculated to convert the number of officers needed per day to the number of officers needed on the entire patrol staff. This multiplier is referred to in this study as a "Shift Relief Factor" (SRF). By definition, the shift relief factor is *"the number of officers required to staff one shift position every day of the year."*

The SRF for an agency is affected by the amount of time off patrol given to each officer. Time off includes regularly scheduled days off determined by the work schedule of the agency, administrative and benefit time off based on the personnel policies and labor agreement of the agency, and compensatory time off given for overtime worked. Time off may also include special assignments and training that takes an officer away from their regular assignment for an extended period. If officers never took any time off (i.e., never had regular days off, got sick, took a vacation, or were temporarily reassigned), the SRF for an agency would be 1.00 (i.e., the agency would only have to hire one officer for each shift position to be covered). However, since officers do take time off, the actual SRF for an agency is always greater than 1.00; the more time off an officer receives, the higher the SRF value.

It is important to note that the shift relief factor is based on averages over a one-year duration and is used to calculate the overall staff size for the division under study. Using the average amount of officer leave, the average amount of training, and the average number of days off per year does not guarantee that the appropriate number of officers will appear for duty each day. The actual number of officers that will be on-duty each day will vary due to both scheduled and unscheduled time off (e.g., vacation leave and sick leave).

The following section will describe the data elements and calculations used to determine the shift relief factor for the Field Operations Bureau.

Data Sample

To determine the SRF for the Field Operations Bureau, leave times and overtime total were pulled from the City's TeleStaff software application for fiscal years '14/'15 through '16/'17. The total time lost due to light duty reassignments outside of patrol and special duty reassignments outside of Patrol for the same time period were provided by hand counts. Training time was gathered from various sources including the Training Unit and the specialty team supervisors.

The fiscal year used for archiving leave and overtime begins on July 1 and ends on June 30th of the following year. The shift bid process occurs annually and new bids go into effect on or around January 1st of each year. It is possible for an officer to bid a 10-hour shift for the first six months of the fiscal year and a 12-hour shift for the last six months. If an officer uses their entire vacation and personal time during the first six months of such a scenario, it would skew the data to make it appear that more vacation and personal time is being used by 10-hour shift workers. Since the shift relief factor is based on averages, it is not imperative to include the time used by all officers in patrol. A representative sample from a vetted list of officers may actually give more accurate results.

In order to compare the amount of leave time used by 10-hour shift employees and 12-hour shift employees, the patrol officers were categorized by the shift length they worked for each six month period from January 1, 2015 through December 31, 2017. Leave samples were taken from patrol officers and sergeants who appeared on the completed bid sheets from 2015, 2016, and 2017 and who worked the same shift length throughout the entire '15/'16 fiscal year and throughout the entire '16/'17 fiscal year.

The number of officers working 10-hour shifts and 12-hour shifts for the 2015–2017 bid periods are shown in Table 7. During fiscal year '15/'16 (July 1, 2015 through June 30, 2016) only three officers bid 10-hour shifts for both halves of the fiscal year. This represented approximately 20% of patrol officers working 10-hour shifts. Fiscal year '16/'17 (July 1, 2016 through June 30, 2017) also saw only three officers working 10-hour shifts for both halves of the fiscal year. Among the employees working 12-hour shifts, 32 worked 12-hour shifts for both halves of fiscal year '15/'16 and 35 worked 12-hour shifts for both halves of fiscal year '16/'17. This sample represented approximately 56% of patrol officers working 12-hour shifts.

TABLE 7

Shift Bid	10-hr shift	12-hr shift	Total
2015	18	51	69
2016	15	57	72
2017	16	48	64

Regular Days Off

Under the current patrol schedule, patrol officers work either a “4on – 3off” fixed day off schedule with a 10 hour shift length or they work a 14 day rotating locked schedule (known as the Pitman schedule) with a 12 hour shift length. The schedules create a 40 hour average workweek and a 42 hour average workweek respectively. Officers working the 12 hour shift replace one 12 hour day with an 8 hour day during each two week period to reduce their average workweek to 40 hours. Officers average four work days per week on the 10 hour shift and 3 ½ work days per week on the 12 hour shift. Officers working the 10 hour shift receive 156.4 regularly scheduled days off per year for a total of 1,564 hours off patrol. Officers working the 12 hour shift receive 182.5 days off per year for a total of 2,190 hours off patrol. An additional 104.29 hours off per year must be added to the 12-hour shifts due to the shortened 8-hour shift in each two-week period.

Administrative & Benefit Time Off

Administrative and benefit time off is the average amount of time off an officer uses each year. Since the amount of administrative and benefit time off is determined by the personnel and operating policies of an agency, it is not a calculated value, but rather is based on time off data from the agency. The amount of administrative and benefit time used to calculate the SRF only includes time off taken which may be less than the total administrative and benefit time earned. The reason for this distinction is that some agencies permit officers to sell some or all of their accrued administrative and benefit time back to the agency. Administrative and benefit time that is “bought” by the agency is accounted for in the agency’s budget. Administrative and benefit time that is taken as time off is accounted for with the SRF.

Table 8 shows the types of leave used by the patrol officers and the average hours used per employee per year.

Table 8

Leave Type	Avg annual hrs per officer	
	12-hr shifts	10-hr shifts
Bereavement	5.25	7.83
FMLA Sick	8.10	61.17
FMLA Vacation	4.81	24.67
Holiday Taken	0.80	
Military Taken	4.93	
Sick Taken	66.39	39.17
Vacation Taken	130.88	134.58
Personal Day (Sick)	7.42	9.67
Volunteer/Parent Leave	0.26	
Comp Taken	24.71	15.38
FMLA Comp Taken	0.49	3.83
Total	254.04	296.30

Non Patrol Time

Non-patrol time is on-duty time which the officer spends away from their normal assignment (e.g., patrol). Non-patrol time includes time spent on special assignments (e.g., assisting with background investigations), time spent for extended training (i.e., training that requires one or more days), time spent on reassignments due to injury or light duty, and any other detail that takes them away from their normal duty assignment. Similar to administrative and benefit time off, the average amount of non-patrol time is based exclusively on data obtained from the agency.

For statistical purposes, the total time spent in each category per year by all members of the sample was divided by the number of officers in the sample for that fiscal year. Realistically, only a relatively small number of officers per year receive light-duty reassignments. However, those reassignments could last for any length of time. The non-patrol time for the Field Operations Bureau is detailed in Table 9.

Table 9

Non-Patrol Type	Avg annual hrs per officer	
	12-hr shifts	10-hr shifts
General Training	85.40	166.83
Modified Duty	21.35	32.33
Total	106.75	199.16

Net Compensatory Time Off

The last component that must be included in the shift relief factor is the net compensatory time off patrol. Net compensatory time off measures the net gain or loss in work for an agency due to the amount of overtime worked and compensatory time off taken. There are two important observations concerning the net comp time effect:

- All comp time off taken by Patrol Officers is included in the calculation because regardless of where the overtime is worked, the time off is taken from patrol.
- Only overtime worked in furtherance of the patrol mission is included in the calculation since patrol gains no benefit from overtime worked on a non-patrol assignment.

If an agency adopts a policy of paying for all overtime as it is worked instead of giving compensatory leave at a later time, the net comp time off value may be negative. A negative net comp time off value indicates that the agency has gained more hours of work in overtime than it has granted in comp time leave. As a result, the total hours worked per year per officer will be greater, producing a lower SRF and a lower total staff requirement. The advantage of a lower staff requirement, however, is offset by an immediate increase in the budgetary cost to pay for the overtime. Simply put, an agency can “pay now” (by compensating officers for overtime immediately with overtime pay) or “pay later” (by compensating the officer with leave time that will be taken off in the future). The first effects the agency budget immediately, the second creates a need for more patrol staff which effects the agency budget during personnel allocation times.

Data for the net comp time calculation was obtained from the TeleStaff records mentioned earlier in this section. The average patrol officer assigned to a 10-hour shift worked 101.08 hours of overtime per year for pay, an average of 6.46 hours of overtime per year for compensatory time, and took an average of 19.21 hours of comp leave per year. This created a negative net comp time effect of -88.33 hours meaning that they worked 88.33 hours more than expected in the given year. This will reduce the shift relief factor for the 10-hour shift. The average patrol officer assigned to a 12-hour shift worked 47.87 hours of overtime per year for pay, an average of 14.90 hours of overtime per year for compensatory time, and took an average of 25.02 hours of comp leave per year. This created a negative net comp time effect of -37.75 hours meaning that they worked 37.75 hours more than expected in the given year. This will reduce the shift relief factor for the 12-hour shift.

Total Hours On Patrol Per Year Per Officer

Summing the data from the Regular Scheduled Days Off, the Administrative and Benefit Time Off, the Non-Patrol Time, and the Net Comp Time Off, the total hours off patrol per year per officer is estimated at 2,592.30 hours for the 12-hour shift and 1,952.20 for the 10-hour shift. Based on these estimates, the average officer working the 12-hour shift can be expected to work 1,787.7 hours per year. The average officer working the 10-hour shift can be expected to work 1,697.8 hours per year.

Calculating the Shift Relief Factor

The shift relief factor was defined earlier as *“the number of officers required to staff one shift position every day of the year.”* Therefore, the shift relief factor is the total hours needed per year to cover one position, divided by the number of hours worked by the average officer.

The shift relief factor for the 12-hour shift, given the leave data, training data, administrative data, and overtime data provided by the agency, was calculated to be 2.45. The shift relief factor for the 10-hour shift was calculated to be 2.15.

The resulting shift relief factor for the 12-hour shift is within an expected range for most law enforcement agencies (2.45 to 2.55). The 10-hour shift relief factor is slightly above the expected range (2.02 – 2.12) but well within reason. Since the sample size for the 10-hour shift was small (20% or 3 officers), it is possible that specialty training for one of the three officers increased the amount of training time above the normal range. This would account for the increase in the shift relief factor. The two components that showed the greatest variance between the 12-hour leave times and the 10-hour leave times was sick leave usage and general training.

Unlike most other municipal divisions, the Field Operations Bureau requires consistent and continuous staffing 24 hours a day, seven days a week. In many cases, when a patrol officer takes a day off, for any reason, the position cannot be left vacant and must be filled with another patrol officer. The shift relief factor for the 10-hour shift (2.15) dictates that in order for the Field Operations Bureau to put one unit on the street, working one 10-hour shift per day, every day of the year, they must have 2.15 officers on the total patrol staff. To put one unit on the street working one 12-hour shift per day, every day of the year, the bureau must have 2.45 officer on the total total patrol staff.

If the agency chooses to put one unit on the street, around the clock, the shift relief factor would be multiplied by the number of shifts required to cover a 24-hour period. This second factor, called a daily relief factor, indicates that for each 12-hour unit the bureau puts on the street around the clock, they will require 4.9 officers on their total patrol staff. For each 10-hour unit the bureau puts on the street around the clock, they will require 6.45 officers. During that 24-hour period, the agency will get 18 hours of non-overlap time where the staffing on the street will be slightly less than an 8 or 12 hour shift. During the remaining 6 hours of overlap time, the staffing level will be temporarily doubled which may provide more officers than the workload warrants.

Improving Patrol Performance with Proactive Time

To the casual observer, it might appear that to achieve maximum patrol efficiency, officers should be engaged in reactive activities every minute of every hour. In fact, quite the opposite is true. Including an appropriate amount of proactive time provides benefits for the agency, the officer, and the citizens of the jurisdiction. A lack of sufficient proactive time can negatively affect the ability of an agency to provide optimal police services to the community.

Among the arguments for including proactive time is the need to avoid having officers running from call to call. Agencies that operate in such an environment report several drawbacks. The most obvious is the inevitable officer burn-out that can occur. Less obvious is the loss of information that may help to reduce crime. It is an accepted axiom for police investigations that the solvability of a case begins to deteriorate from

the moment the incident occurs. If the initial responding officer is rushed to move on to the next call, there is a greater chance that important follow-up opportunities and information will not be collected, diminishing the solvability of the case.

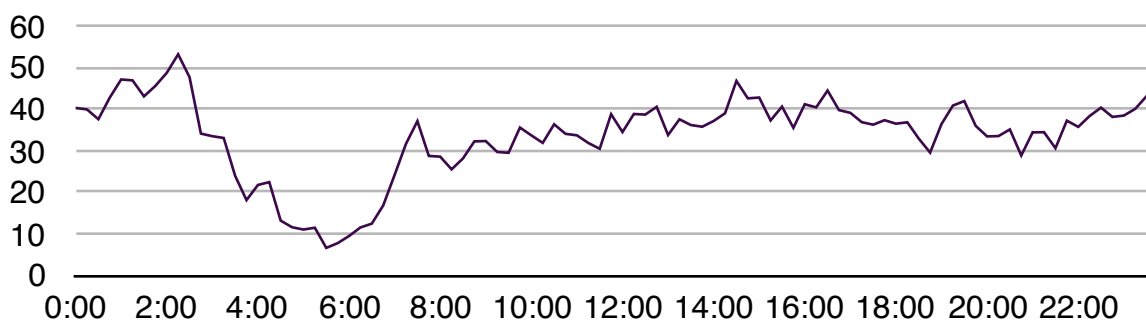
Another drawback is the loss of time for on-the-job training. In agencies where shift assignments are based on seniority, it is possible to have shifts where the majority of officers have very limited experience. When corrective action is needed by the supervisor, proactive time must be available. If officers are clearing calls and going directly to the next call throughout the shift, the supervisor will not have the training opportunities needed to help officers improve their performance.

Perhaps most importantly, proactive time has a direct affect upon several accepted measures of patrol performance. These performance measures include: (1) *cross-beat dispatching*, (2) *patrol intervals*, and (3) the *probability of saturation*. All three measures are discussed in the next section. Each measurement is dependent on the variable " M_R " which refers to the "average number of minutes spent during each patrol hour on *reactive* activities." The remaining minutes of each patrol hour are spent on *proactive* activities. Therefore, the "average number of minutes spent during each patrol hour on *proactive* activities" is referred to as " M_P ". For purposes of staffing calculations, M_R and M_P should always sum to 60 minutes (one hour).

Proactive time per hour per officer, or M_P , is hard to calculate directly. Instead, the total reactive time per officer per hour (M_R) is calculated from the frequency of calls and the average time per call. Given the workload in 2017 and the number of officers assigned to patrol at the time (64), the average officer in the Patrol Division spent approximately 33.6 minutes per hour on reactive activities (M_R) leaving 26.4 minutes per hour for proactive patrol (M_P).

In 2017, the officers were deployed over eight different squads with primarily four different start times. Although the staffing on the four shifts were somewhat equal, the number of calls for service varied significantly throughout the day. This leads to a significant difference in the average M_R values across the 24 hour clock. Chart 2 shows the average M_R value per hour for the average officer based on 2017 calls for service only.

Chart 2. Average Reactive Minutes Per Hour Per Officer



Cross-Beat Dispatching

A main tenet of community-oriented policing is the need to have officers become familiar with a small geographic area of the jurisdiction. In many agencies this is

accomplished by assigning officers to patrol districts or beats. By working in the same area for extended periods of time, officers can develop ownership of the area and, equally important, build relationships with the local residents. Often overlooked, however, is the frequency and duration of time that officers are directed from their assigned district or beat to answer a call-for-service (CFS) in another area. Dispatching an officer from their assigned district to respond to a call in another district is referred to as “*cross-beat dispatching*.”

Using probability theory, the amount of time an officer spends on cross-beat dispatches per hour, designated as “ M_x ,” can be estimated if the number of minutes of reactive time per hour per officer (M_R) and the number of districts (N) are known. Assuming one patrol unit per district and approximately the same level of M_R in each district, the formula for cross-beat dispatching is:

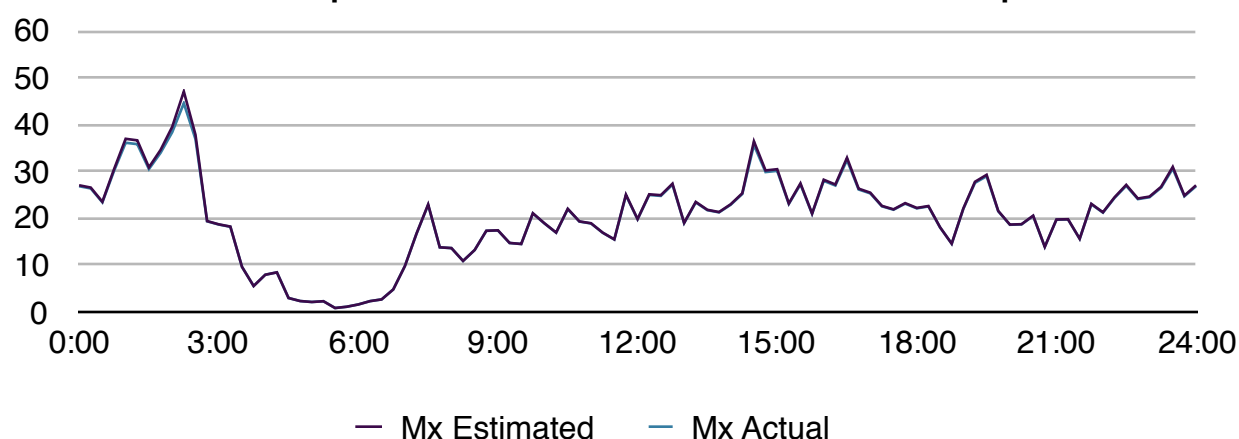
$$\frac{m_R^2}{60} \left(1 - \frac{1}{n} \left(\frac{m_R}{60} \right)^{(n-1)} \right) \quad \text{As the number of beats increases,} \quad \frac{m_R^2}{60}$$

M_x can be estimated as:

Notice that in both formulas, M_R is squared (i.e., multiplied by itself). As the minutes of reactive time per hour per officer increase, the minutes of cross-beat dispatching (M_x) per hour per officer increase at an exponential rate.

The average level of cross-beat dispatching for the City of College Station in 2017 is illustrated in Chart 3. Two graphs are depicted, one for the exact formula for M_x and a second for the estimated formula for M_x assuming an 8-beat deployment. The curves are based on historical CAD data and the number of officers in Patrol in 2017. This value assumes that one officer is assigned per district with no additional roving units. If the CSPD assigns roving units responsible for multiple shifts, the actual cross-beat dispatching level for the agency would be lower.

Chart 3. Minutes Spent Per Hour Per Officer on Cross-Beat Dispatches



Patrol Intervals

A second patrol performance measure that is directly related to proactive time is the patrol interval (PI). A patrol interval is defined as “*the average time interval between two consecutive passes by the same location by police units while on random patrol.*” The patrol interval is a measure of how much “visibility” the patrol force provides in the

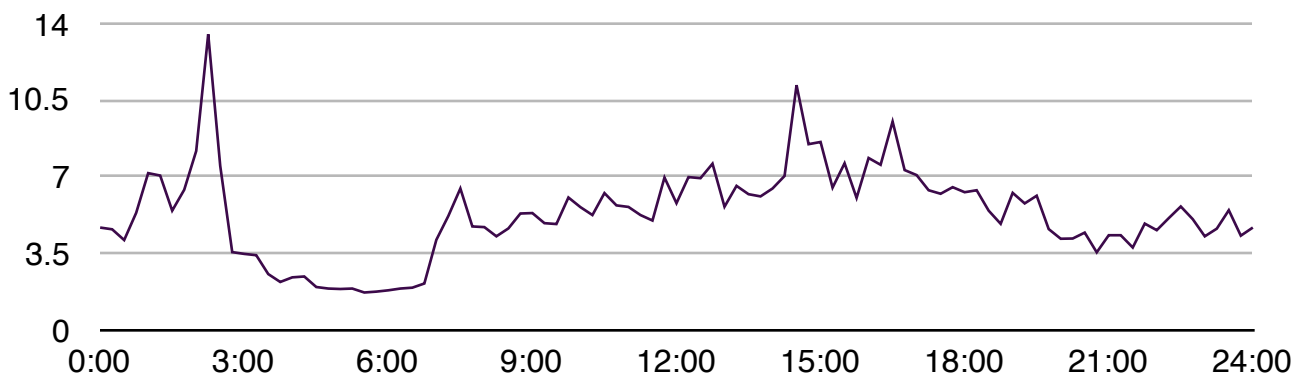
community. The lower the patrol interval, the greater the level of visibility and the greater potential crime deterrent.

The patrol interval is calculated based on: (1) the number of street miles in a defined area, (2) the average patrol speed, (3) the number of proactive minutes per hour per officer (M_P), and (4) the number of units on patrol. The formula is given by:

$$PI = \frac{\text{Street Miles in Jurisdiction}}{\text{Patrol Speed} \times \left(\frac{M_P}{60}\right) \times \# \text{ of Units}}$$

The formula indicates that the patrol interval will decrease if either the minutes of proactive time per hour per officer increases or the number of units are increased. Chart 4 shows the average patrol interval for the agency by hour of the day, using the average reactive minutes per hour per officer from Chart 2. An average patrol speed of 15 mph was used from 7am to 7pm, 20 mph from 7pm to 11 pm, and 24 mph from 11 pm to 7 am. The differences throughout the day reflect the difference in the average reactive time per officer per hour, the different patrol speeds, and the difference in the number of on-duty officers. An estimate of 508.4 street miles was obtained from Brent Blankner, GIS Coordinator for the City of College Station.

Chart 4 **Patrol Interval By Hour of Day**



Probability of Saturation

The probability of saturation (POS) is defined as the probability that when the next call-for-service arrives at the dispatching center, there will be no free units available to take the call. The POS is directly related to: (1) the average number of calls-for-service per hour (CFS), (2) the average time required to complete each call-for-service, and (3) the number of units on patrol. These three variables are the same variables that determine the average number of reactive minutes per hour per officer (M_R). As a result, as M_R increases, the POS also increases; that is, as time spent per hour reacting to calls for service increases, the likelihood that a CFS will have to be “stacked” at the dispatching center increases. POS values for an agency are constantly changing as call volumes fluctuate, as the time required to handle calls changes, and/or as the number of units in the field is altered.

One way to reduce the POS value is to field additional units. The consequence of this option is the cost of paying for additional personnel and equipment. A second option is to reduce the CFS workload handled by patrol by using call screening or by implementing alternative ways to handle low priority calls such as telephone response units or Internet reporting. A third option is to reduce the amount of time officers spend on each call. Call screening and reducing the amount of time on call could have the potential for negative reactions from the community.

Charts 5a and 5b show the call for service rate and the service rate per call for the CSPD Patrol Division by hour of the day for 2017.

Chart 5a

Call for Service Rate

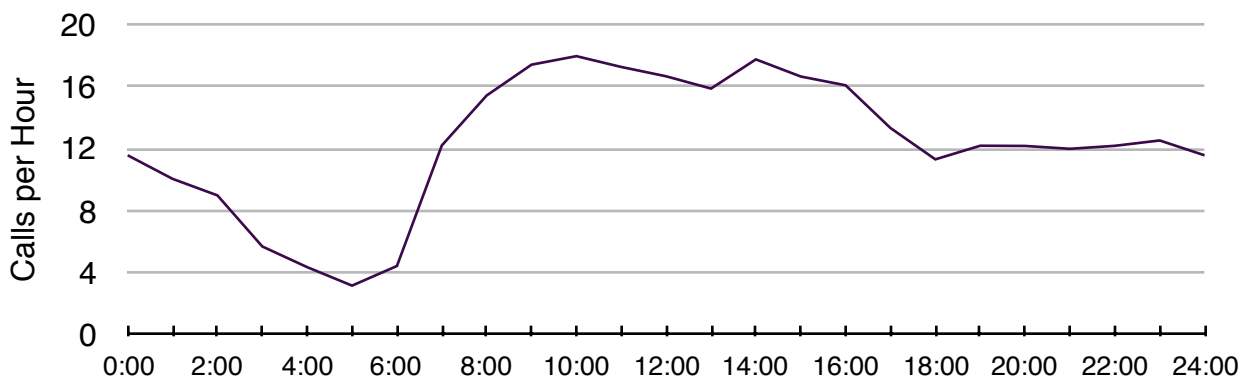


Chart 5b

Service Rate Per Call

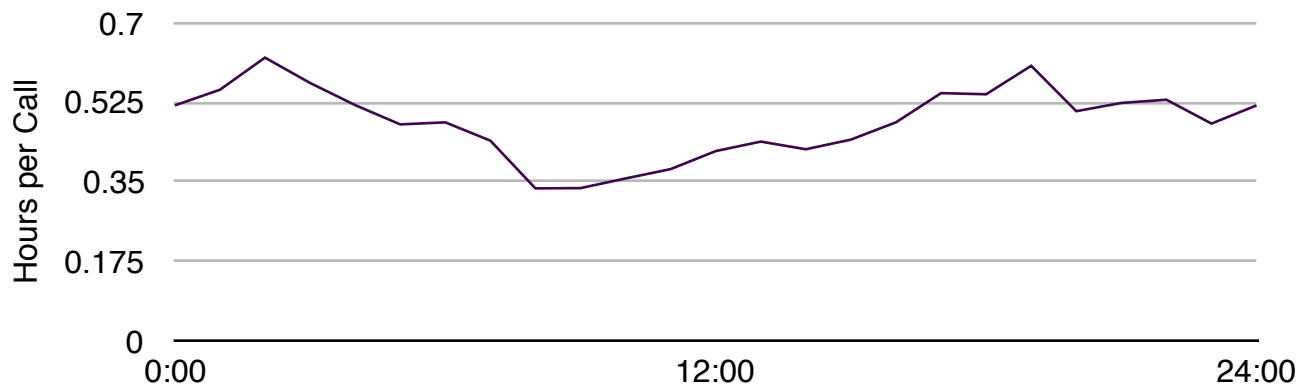
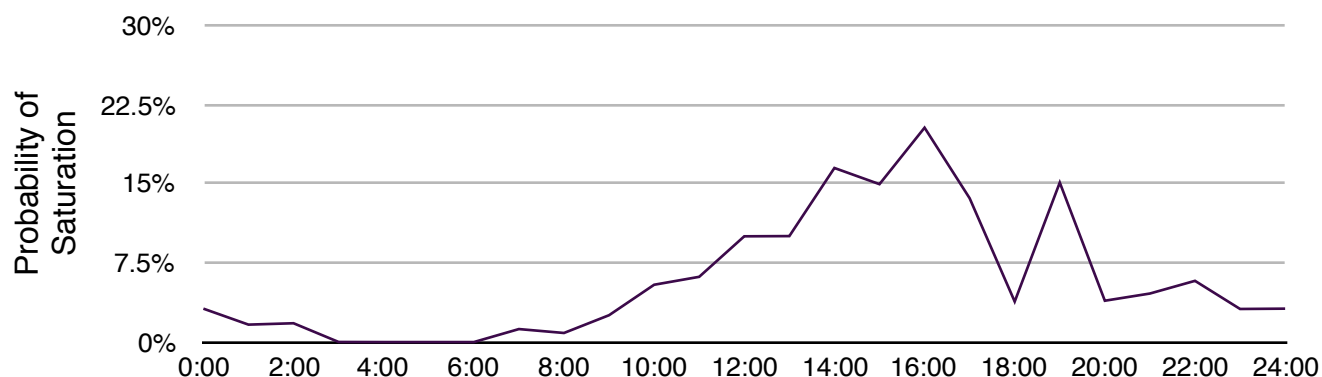


Chart 5c shows the estimated average probability of saturation in 2017. Weekends nights and early mornings would certainly have a higher probability of saturation but are reduced in the chart due to the average of the weekdays. The highest probability of saturation, estimated at 20.27%, occurred at approximately 4:00 pm.

Chart 5c**Probability of Saturation****How Much Proactive Time is Needed?**

The three patrol performance measures just described (cross-beat dispatching, patrol intervals, and the probability of saturation) are all directly related to the amount of reactive and proactive time available per hour for each patrol officer.

To reduce cross-beat dispatching, lower patrol intervals, and reduce the probability of saturation, an agency has three options: (1) reduce the patrol workload, (2) reduce the amount of time spent on patrol activities, or (3) increase the number of officers on patrol. Many departments have instituted programs to reduce the patrol call-for-service workload but at the same time instituted community-oriented policing initiatives which emphasize the need for officers to spend more time with citizens.

For many agencies, the biggest question to be answered is “how many officers are needed to handle the reactive and proactive workload of the department?” The answer to that question is a subjective decision which was once eloquently posed by John Schuiteman in the July 1985 edition of *Police Chief* magazine. Schuiteman stated: “Adequate police protection, like beauty, lies in the eye of the beholder. The optimal or appropriate ratio of officers to population, traffic volumes, reported crimes or accidents, etc., is not a matter of mathematics or statistics. It is a matter of human judgement and community resources.”

Based on the level of police presence and service expected by the citizen’s of College Station and the resources available to the CSPD, the department will have to decide how many minutes out of each hour the average patrol officer should have available for proactive activities such as community-oriented policing and free patrol

At the time of this report, assuming forecasted numbers are accurate for the 2018 workload and a patrol size of 63 officers and 8 sergeants, and assuming that sergeants are not considered call-takers, the patrol officers have an estimated M_R value of 37.3 minutes per hour. The spreadsheets that accompany this report illustrate the impact of various changes to these M_R values by showing the changes in various patrol performance measures. As the number of reactive minutes per hour per officer (M_R) decreases and the number of proactive minutes per hour per officer (M_P) increases, the probability that no units will be available when the next CFS arrives (POS) and the time spent by units on cross-beat dispatches (M_X) will decrease. Patrol visibility, as measured by the patrol interval, will increase. All of this is accomplished, of course, by an increase

in the number of on-duty officers required per day, and the total number of patrol officers assigned to the patrol division.

When feasible, Etico Solutions recommends an even split of proactive and reactive time per hour per officer, or an average M_R value of 30 minutes. To reach this level at the present time, the agency would need a total staff of 78 officers. Forecasted staffing needs for 2019 through 2021 indicate a steady increase. If the agency does not see major changes in the next three years, optimal patrol staffing in 2019 will increase to 83 patrol officers, 2020 will bring a need for an increase to 88 patrol officers, 2021 will bring a need for 95 patrol officers. These forecasts are subject to change if the agency begins to collect more workload data than the amount collected in the past or if efficiencies can be found in the current work practices. The forecasted staffing levels determined in this report are for employees classified as call-takers. If the desire of the agency is to have sergeants available for supervision, they should not be included as call-takers and would constitute additional positions needed above the forecasted call-taker staffing levels. Therefore, as the number of call-takers increases, the number of first line supervisors increases, the number of middle-managers (lieutenants) may increase, and the staffing for support services may need to increase.

Beat Analysis

The second objective of this study was to examine the current beat design to determine if the workload among beats was equitable. After analysis of the existing beat configuration, the objective was to equalize the amount of reactive time per beat across the entire jurisdiction. The analysis for this section was completed based on the hours of reactive time spent on reactive calls for service in the CAD database between August 16, 2016 and June 30, 2018. The resource analysis described in the previous section of this report determines the number of officers required on the street each day. Beat analysis is used to deploy a pre-determined number of officers equally based on workload. Contrary to some opinions, the number of officers required on the street is not determined by the number of beats within a jurisdiction. When establishing a beat plan, it is best to avoid prime numbers such as 3, 5, 7, 11, 13, etc. Composite numbers such as 4, 6, 8, 9, and 10 can be divided by either 2 or 3 if there are not enough officers to assign one into each beat. If 12 beats are created, they can be divided by 2, 3, 4, or 6 based on the number of available officers for deployment.

Current Beat Configuration

The City of College Station is currently subdivided into eight beats. Each beat is further divided into a number of smaller “map info” areas. Calls for service are recorded in the CAD based on the beat and the “map info” area in which they occurred. Table 10 provides comparative information about the districts as they currently exist. Figure 1 shows the current beats.

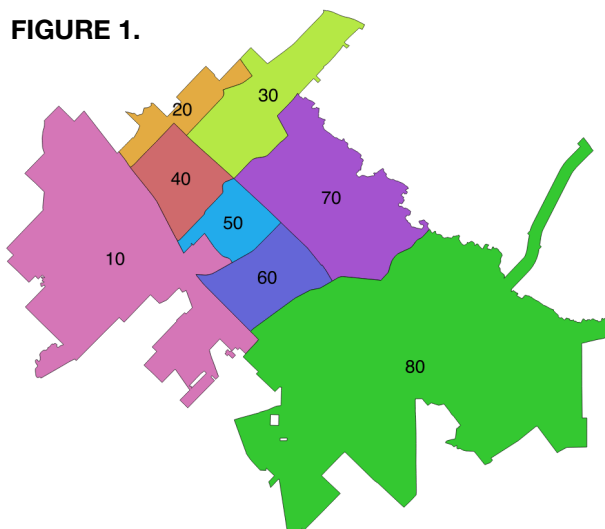
For a number of reasons, many cases use the police department address for the incident location. Therefore, the reactive workload for the Police Department was listed separately. If it were credited to the reactive workload in 70 Beat, it would have overestimated the workload in that beat.

As evidenced in Table 10, the current workload among the existing eight beats is not equitable. Officers assigned to Beats 40, 50 and 60 have less workload than officers assigned to Beats 10, 20, 30 and 80. If the workload for the Police Department is removed from Beat 70, it would contain the least workload with almost a 5% difference in workload from the heaviest beat. This means a potentially higher level of cross-beat dispatching, longer patrol intervals, and a higher

TABLE 10

Beat	# of map info areas	Reactive Hours	% Reactive hours
10 Beat	33	10,651	13.62%
20 Beat	15	10,256	13.11%
30 Beat	30	10,624	13.58%
40 Beat	17	7,850	10.03%
50 Beat	16	7,253	9.27%
60 Beat	22	7,702	9.85%
70 Beat	33	6,835	8.74%
80 Beat	52	10,179	13.01%
CSPD	1	6,877	8.79%
Total	219	78,227	100.00%

FIGURE 1.



probability of saturation in some beats than others.

Current beats are configured in a way that officers do not have to cross through a different beat to reach remote areas of their own. The northeast extension of 80 Beat greatly increases the possible drive-time from one side of the beat to the other but there are no obvious alternatives.

Beat Optimization

To improve the deployment of patrol officers and equalize workload across the city, two new beat structures were created for the City of College Station. The first optimized beat plan used the 219 map areas to reconfigure eight new beats throughout the city. The second optimized plan used the 219 map areas to configure twelve new beats throughout the city. The map info areas appear to follow major streets, highways, and natural boundaries when available as the area borders.

Areas of high activity, such as the Northgate area, were divided into relatively small areas. Residential areas that generate fewer calls for service, such as the southeast neighborhoods and the northwest corner of the city, were grouped into larger areas. Figure 2 depicts the 219 map info areas established throughout the city.

In order to equalize the workload among the new beats, a workload score was determined for each map info area in the city. For this study, the total reactive hours worked in each area from August 16, 2016 through June 30, 2018 was determined and used as the workload measure. Once the workload scores were determined for each map info area, the most active areas (hot spots) were identified on the map and used as the starting points to create the new beat designs.

The total reactive time used for district design differed from the total reactive time used in the resource analysis section described earlier. The difference is due to the amount of valid data available in the CAD. Report writing times and evidence processing times were not included in the overall workload scores for district design because they do not necessarily reflect where the incident occurred. The CAD contained 3,172 hours of reactive time that was mapped to areas outside the city limits. Finally, proactive activities including, but not limited to: alcohol violation patrol, community contacts, foot patrols, off duty jobs, S.T.E.P. traffic, security awareness and special events were removed from the database to prevent self-initiated activities from skewing the true picture of geographic demand. After the beat design database had

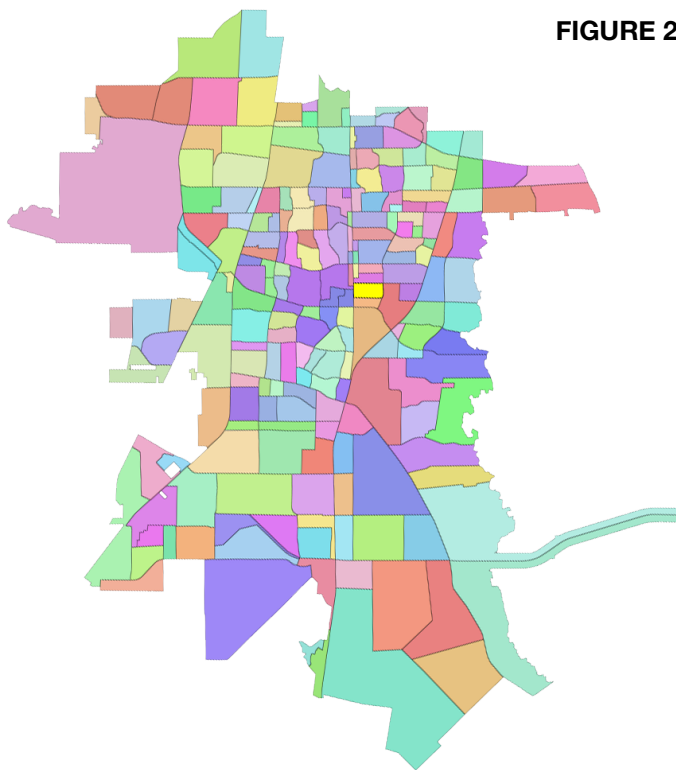


FIGURE 2.

been cleaned and thinned, the total hours of reactive work for the agency, used for purposes of beat design, across all map info areas, was 78,229 hours.

Figure 3 illustrates the results of an 8-beat optimization based on equal reactive workload per beat. An attempt was made to create eight new beats that each contained approximately 12.5% of the total reactive hours throughout the city, minus the reactive hours credited to the map info area containing the College Station Police Department. The resultant workload for each district is shown in Table 10.

FIGURE 3.

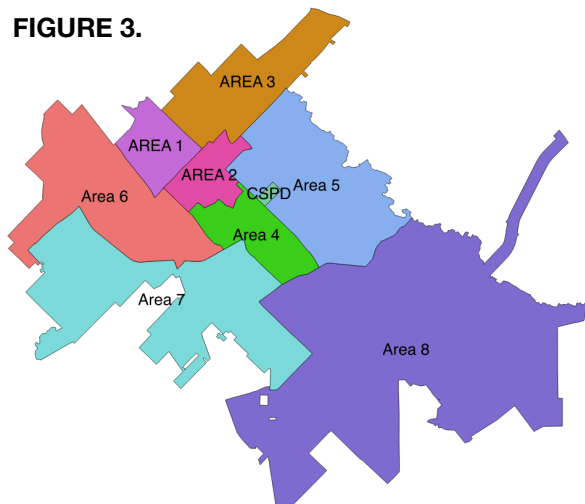


Table 10.

Beat	Reactive Hours	Workload %
Area 1	8,764	12.28%
Area 2	8,744	12.25%
Area 3	8,969	12.57%
Area 4	8,911	12.49%
Area 5	8,904	12.48%
Area 6	9,127	12.79%
Area 7	8,967	12.57%
Area 8	8,965	12.56%
CSPD	6,877	
Total	78,228	100.00%

Figure 4 illustrates the results of a 12-beat optimization based on equal reactive workload per beat. An attempt was made to create twelve new beats that each contained approximately 8.33% of the total reactive hours throughout the city, minus the reactive hours credited to the map info area containing the College Station Police Department. The resultant workload for each district is shown in Table 11.

FIGURE 4.

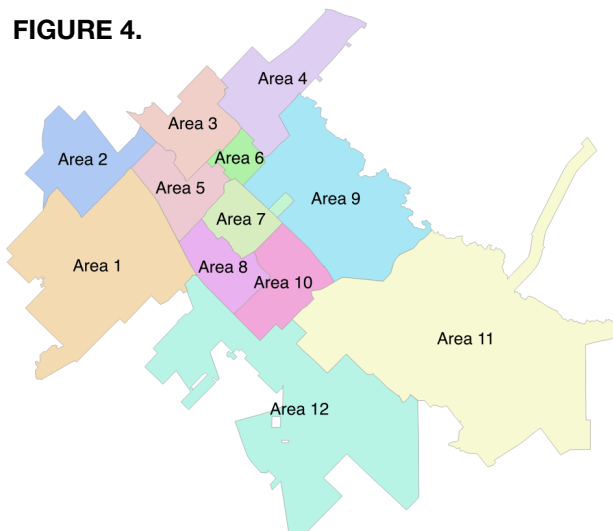


Table 11.

Beat	Reactive Hours	Workload %
Area 1	6,070	8.51%
Area 2	5,991	8.40%
Area 3	5,890	8.25%
Area 4	5,986	8.39%
Area 5	6,037	8.46%
Area 6	6,168	8.64%
Area 7	5,788	8.11%
Area 8	5,830	8.17%
Area 9	5,899	8.27%
Area 10	5,837	8.18%
Area 11	5,950	8.34%
Area 12	5,906	8.28%
CSPD	6,877	
Total	78,229	100.00%

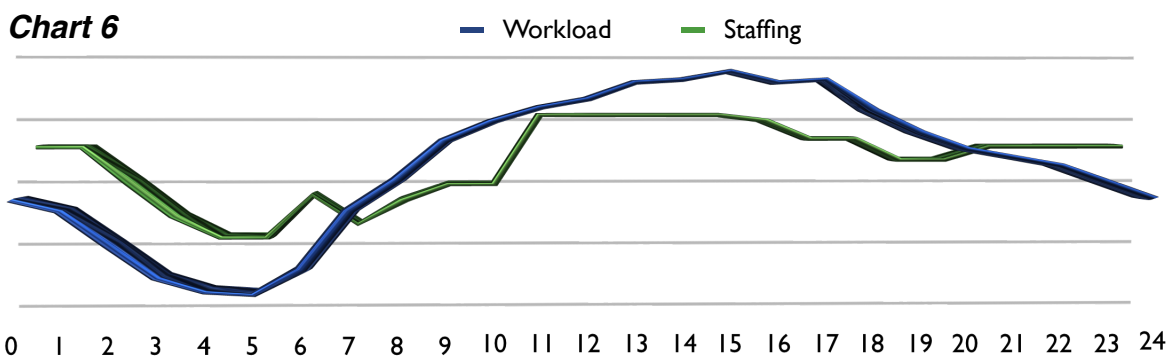
The two beat optimization plans reduced the variance between the heaviest workload and the lightest workload to .54% and .53% respectively. Implementation of either plan would not only help to equalize the workload for the officers, but would also improve the quality of service to all citizens by helping to equalize response times, patrol intervals, and follow-up opportunities for the patrol officers. However, equalizing the beats does not guarantee that all cross-beat dispatching will be eliminated. GIS shapefiles were created for the newly created beats and forwarded to Stormy Potter.

Resource Deployment

The patrol workload determined in the first part of this section was used to make a determination of the necessary patrol staffing size to meet a desired performance level. In this section, the same workload data will be used again to temporally compare the reactive workload of the Patrol Division to the current staffing practices.

Police departments are fluid entities. Officers transfer in and out of patrol and total staff sizes for patrol divisions often fluctuate as conditions change within the department and within the city they serve. Staffing levels that were provided at the beginning of this study may have changed by the time this report was prepared. However, the process remains consistent and can be repeated whenever necessary with updated numbers from Patrol.

Deployment plans in this section have been calculated based on the percentage of total workload for each quarter hour of the day instead of the actual number of hours of work reflected in the CAD for each quarter hour of the day. By basing graphs on percentages, the percentage of available officers by hour of day can be charted against the percentage of workload by hour of day. An example of this comparison is shown in Chart 6.



If officer staffing were directly proportional to the reactive workload, the two lines shown in Chart 6 would overlap completely. Areas existing between the two lines show the potential for optimization. Deployment plans will never achieve an exact match to workload. While officers are scheduled in finite blocks of time depending on the shift length, the workload changes continuously.

The least intrusive technique for optimizing the current schedule is to alter the number of officers assigned to each shift. This does not require a change in the duty-cycle-schedule currently in use by the agency and does not involve changing the starting and stopping times of the existing shifts. The next option is to change the days off assigned to the various shifts in an attempt to match the workload curve more accurately. The third alternative is to change the starting times of the existing shifts to match the workload throughout the day.

When all modifications to the existing schedule are exhausted, the next alternative is to change to a different shift length or a different duty-cycle-schedule entirely that would allow more flexibility by management to match staffing to workload.

Current Shift Length and Duty Cycle Schedule

The department is currently using a combination of 10-hour and 12-hour shift lengths. The two afternoon shifts each work a 10-hour shift from 4 pm to 2 am with a “4 on – 3 off” fixed day off schedule. There are currently six patrol officers, a corporal, a sergeant, and a K-9 unit assigned to each afternoon team.

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Team 5	4p - 2a	4p - 2a	4p - 2a	4p - 2a	Off	Off	Off
Team 6	Off	Off	Off	4p - 2a	4p - 2a	4p - 2a	4p - 2a

The four day shifts and two night shifts work a “2 on – 2 off- 3 on – 2 off – 2 on – 3 off” locked rotating schedule shown below.

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Week 1			Off	Off			
Week 2	Off	Off			Off	Off	Off

Teams 1 and 3 work day shift from 6 am to 6 pm in opposite weeks of the 12-hour schedule with six patrol officers, a corporal and a sergeant assigned to each team. Teams 2 and 4 work day shift from 7 am to 7 pm in opposite weeks of the 12-hour schedule with five patrol officers, a corporal and a sergeant assigned to each team. Teams 7 and 8 work night shift from 7 pm to 7 am in opposite weeks of the 12-hour schedule. Team 7 currently has eight patrol officers, two corporals and a sergeant assigned. Team 8 currently has nine patrol officers, two corporals and a sergeant assigned.

Table 12.

Shift	Sergeants	Corporals	Officers	K-9 units
Team 1	1	1	6	
Team 2	1	1	5	
Team 3	1	1	6	
Team 4	1	1	5	
Team 5	1	1	6	1
Team 6	1	1	6	1
Team 7	1	2	8	
Team 8	1	2	9	
Total	8	10	51	2

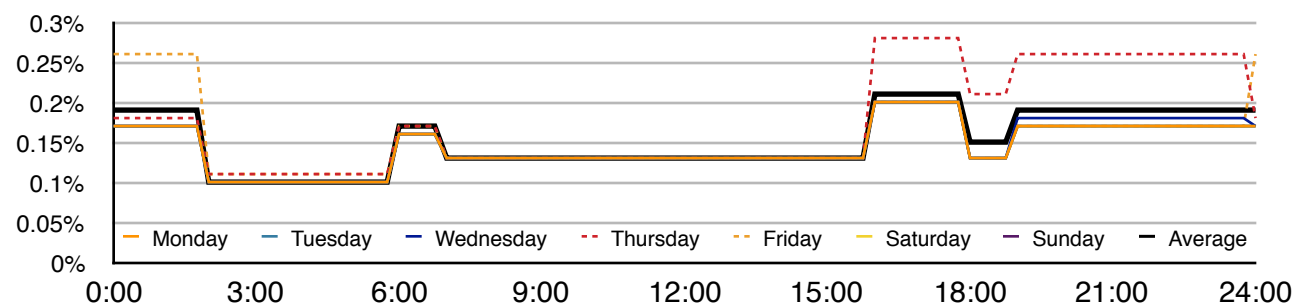
The Field Operations Bureau includes a number of specialty units along with the general patrol staff. Eight officers, a corporal and a sergeant are assigned to the College Station Tourism and Entertainment Policing (CSTEP) Unit. This unit has a primary assignment of the Northgate District and works three 12-hour shifts on Thursday, Friday and Saturday. To finish their 40-hour average workweek, the CSTEP officers attend an 8-hour training day every other Wednesday. CSTEP officers were included in the patrol scheduling model since they are a supplement to patrol for Northgate area calls.

Four officers, a corporal, and a sergeant are assigned to the Traffic Unit within the Field Operations Bureau. A fifth officer position is currently vacant. The team utilizes police motorcycles and patrol cars for traffic enforcement. Traffic units are intended to be serve as proactive enforcement units and therefore were not counted as call-takers for purposes of resource allocation or deployment.

Three civilian police assistants report to a day shift administrative sergeant. Police assistants have limited capabilities within the patrol division due to their civilian status but they relieve patrol officers of a great deal of work that does not require a sworn status to complete such as found property and abandoned vehicles. The police assistants were not included in the resource allocation or deployment figures.

Based on the sum of 51 patrol officers, 10 corporals, two canine officers, and nine CSTEP officers, the current schedule and all optimized schedules were based on a total of 72 call takers within patrol. Daily staffing levels, based on the current assignments shown in Table 12, are depicted in Chart 7. The dotted line represents Thursday evening going into Friday morning when the two 10-hour shifts overlap. The chart is based on the percentage of total staff scheduled per quarter hour.

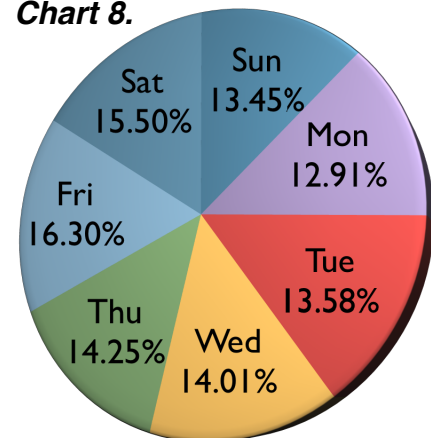
Chart 7 *Staffing % by Hour of Day*



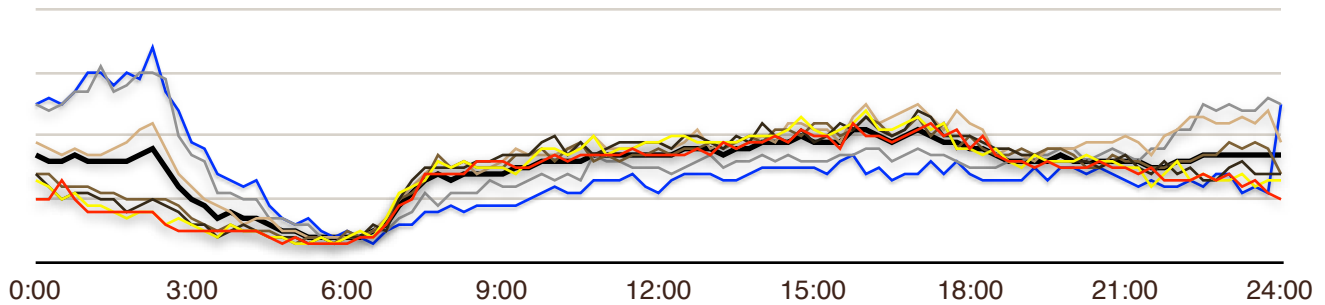
Analysis of Current Workload

The workload for 2013–2017 was sorted by day of the week to compare the average number of reactive hours per day. The results, shown in Chart 8, revealed little difference in call volume throughout the week. Call volumes on Monday are the lowest at 12.91% and then they begin to steadily increase throughout the week reaching a maximum of 16.30% on Friday. Reactive time then drops on Saturday and Sunday to finish out the weekend.

Chart 8.



In Chart 9, the workload by hour of day for the seven days of the week is charted by percentage to determine if there is consistency throughout the day for all days. The heavy black line shows the average percentage of workload for all seven days. The thinner lines show the average percentage of workload for each hour of the day for each day of the week. Consistent with the demographics of a college town, the workload curve throughout each day of the week is fairly consistent and predictable. The workload on Friday and Saturday nights leading into Saturday and Sunday mornings are higher than most and the workload during the day for Saturday

Chart 9.**Workload % by Hour of Day**

and Sunday is lower than the weekdays. Chart 9 indicates that supplemental shifts on Friday and Saturday nights and lower staffing levels during weekend days might improve schedule efficiencies. However, the staffing provided by the CSTEP team on the weekends in the Northgate area must be considered in the final staffing picture.

The small variance in workload from day to day indicates that the agency should be able to use any type of schedule (unstructured, locked rotating schedules, unlocked rotating schedules, or fixed day off schedules). Rotating schedules with equal staffing per day would require one or more supplemental shifts during the weekend to avoid overstaffing on the weekdays and understaffing on weekends. An 8-hour fixed day off schedule or a 10-hour fixed day off schedule would allow proportional staffing by day of the week. Once again, the presence of the CSTEP unit on the weekends may also be the answer to the increased weekend activity.

Characteristics of Police Work Schedules

To reduce inefficiencies in the schedule, it is important to choose a staffing schedule for the Patrol Division that closely matches the workload. However, there are also a number of schedule characteristics that should be considered due to their affect upon officer's lives and the ability to maintain proper supervision and communication within the agency.

Unity of Command

"Unity of command" provides three important benefits to the operation of the Patrol Division; a clear chain of command, consistent lines of communication, and comprehensive supervision. Past studies in large agencies have shown that an unclear chain of command can lead to increased stress on the officers and a lack of unity within the police department. The military has recognized the need for a clear chain of command as a necessity for improved performance and job completion.

A clear chain of command leads to consistent lines of communication. When officers work a portion of their workweek under one supervisor and the remainder of their week under another, it is very easy for the officer to get two separate messages concerning the goals of the agency. Patrol priorities may differ among the two supervisors leaving the officer guessing upon the expectations for each particular day.

Comprehensive supervision is obtained when an officer consistently reports to one supervisor. Under such a scenario, the supervision and evaluation of that officer can be completed in a more thorough manner. If officers report to multiple supervisors over the course of a single bid period, their evaluation should include input from all supervisors involved. This practice is seldom done and noteworthy accomplishments or deficiencies

in the officer's performance are overlooked. Unity of command provides the greatest opportunity for a supervisor to provide meaningful and comprehensive feedback concerning an officer's overall performance.

Under the current schedule, there is complete unity of command for all eight shifts. Each shift is led by a sergeant and corporal(s) and all members of the team share the same days off and the same starting times for each workday.

Team Integrity

“Team integrity” is another valuable benefit to the operation of the Patrol Division. Team integrity infers that officers will work with the same group of officers each day and take their days off with the same group of officers. When officers work in a unified team, their comfort level in the expectations of each other and non-verbal communication improves. This can lead to increased productivity for the agency and increased safety for the officer. The current schedule and 8-shift configuration for patrol provides complete team integrity on a shift level since the officers on each shift share the same days off. Some team integrity is lost on the division level since the two 10-hour shifts have different days off. Officers working the 12-hour shifts will work with one afternoon team at the beginning of the week and a second afternoon team during the end of the week. This is a minor loss and may have no effect on the overall efficiency of the bureau.

Schedule Equity

“Schedule equity” means that every officer in patrol gets the same opportunity for weekend time off or long off-duty periods. All officers on the six teams working the 12-hour shifts currently get every other weekend off as a three day weekend, thus providing complete schedule equity. The officers on the 10-hour shifts get either Friday, Saturday and Sunday off, or they get Monday, Tuesday and Wednesday off. The 10-hour shifts rotate days off every three months of the bid period so that all 10-hour shift officers get the same number of weekends off per year.

Training Compatibility

Law enforcement agencies use a number of methods to schedule training for employees. Agencies using 10-hour fixed days off may overlap one day every week for training which can provide an overabundance of training time and reduce the resources on the street for routine patrol. Agencies using 8-hour shifts and 12-hour shifts typically do not build training into the schedule, choosing to pull employees from various shifts as manpower allows and as training necessitates. Some agencies will train employees in “blocks” of one or two weeks during slow periods of the year and will change their work schedule for those weeks to an 8-hour, Monday through Friday, schedule.

Many agencies with high-risk teams such as SWAT teams, bomb teams, and K9 teams prefer to also train as a team. This is important for law enforcement since many critical responses require a team-approach with each responder fulfilling a specific role. When an entire shift can train as one team, they gain a better understanding of each person's role and each shift member's strengths and weaknesses. Consistent training leads to consistent behavior which enables shift members to anticipate other employee's actions in potentially dangerous situations.

Training as a shift allows employees to train under the conditions in which they work. For instance, if all night shift employees receive range training at the same time, the range training can be scheduled to take place during their normal work hours to simulate the environment in which they normally work. Responding to an incident that requires the use, or potential use, of a firearm at 3 am creates a different set of challenges and skills than a response at 3 pm. Lighting is different, background identification is different, shoot/don't shoot decisions are harder to make, and some officers may even have to work through early morning fatigue issues in the midst of the incident. This same "situational training" can be done for a number of topics in order to train the employees to perform optimally under their usual working conditions. Training during normal work hours is less disruptive to the employee's sleep schedule opposed to changing their work hours for one day a week to train.

Fatigue Risks

A critical property of any law enforcement schedule is the amount of fatigue that it places on the employees. Agencies differ greatly in the amount and type of fatigue placed on their staff. High call loads, early morning hours, rotating shifts, split shifts, random court appearances, and personal obligations at home are just some of the things that can lead to increased fatigue and reduced productivity/alertness on the job.

Studies indicate that one of the main contributors to police fatigue is the number of consecutive nights worked on the night shift before a period of rest. Medical studies conducted on night-shift physicians indicate that cognitive ability decreases after three consecutive night shifts.⁶ In the August 2003 edition of the American College of Emergency Physicians newsletter, an article entitled "*Circadian Rhythms and Shift Work*"⁷ addressed the issue of rotation periods and consecutive nights stating "Working 4 to 7 night shifts in a row is universally condemned." Bryan Vila, a noted expert on the issue of police fatigue, participated in a keynote address to police psychologists at the IACP National Conference in October of 2010. He expanded on his remarks in an interview with Force Science News in 2011 stating: "The more night shifts you work in a row, the less and less resilient you become to being tired. After about 3 consecutive night shifts, you'll start to see a substantial problem and you need time off so you can catch up on your sleep."⁸ Finally, the most comprehensive reference to risk by consecutive night shifts is contained in a study entitled "*Shift work, safety and productivity*" released in 2003.⁹ The authors combined the results of seven different studies that reported incident (accidents and injuries) frequencies separately for each night over a span of at least four successive night shifts. The summed results of the seven studies were then expressed relative to the first night. "On average, risk was approximately 6% higher on the second night, approximately 17% higher on the third

⁶ Dula DJ, Dula NL, Hamrick C, Wood GC. The effect of working serial night shifts on the cognitive functioning of emergency physicians. *Ann Emerg Med.* 2001;38:152–155.

⁷ Thomas HA., Circadian rhythms and shift work. *Clinical & Practice Management*, ACEP 2003

⁸ Lewinski B., Anti-fatigue measures could cut cop deaths 15 percent, researcher claims. Force Science Institute. March 2011

⁹ Folkard S, Tucker P., Shift work, safety and productivity. *Occupational Medicine* 2003; 53:95–101

night, and 36% higher on the fourth night.” This same study found that fatigue increases as shift length increases with a 10-hour shift posing greater risk than an 8-hour shift and a 12-hour shift posing more than a 10-hour shift. A third result of the research showed that the highest levels of fatigue appear on the night shift hours when our bodies are used to sleeping. When we combine these three findings, we find that officers working extended hours, on the night shift, for four or more consecutive nights can experience a synergistic effect that compounds the effects of fatigue. While the study subjects were not law enforcement officers, the principle findings of the study are assumed to be applicable to law enforcement scheduling.

Analysis of Current Deployment

Serious consideration should be given before changing an established work schedule within an agency. Schedules and rotations have a major impact upon the health and family life of those officers who work them. Changing the length of the shift, the number of consecutive work days, or the frequency of off-duty weekends can affect childcare arrangements, off-duty jobs, contract overtime opportunities, and continuing education plans. More than anything else, moving from one schedule to another presents a *major change* for the officers and is not always greeted with open anticipation. This section presents four methods for optimizing work schedules within the patrol division in a way that minimizes the impact of change upon the officers.

- The first method is to redistribute officers across the existing shifts to match staffing levels to workload levels. This will vary the span of control but should decrease cross-beat dispatching levels and probabilities of saturation during the hours of 7 am to 4 pm.
- The second method is to redistribute officers and alter start times for the shifts to better match the changes in the workload curve.
- The third method is to distribute the days off for the existing 10-hour shifts across the days of the week to allow greater flexibility per day. This allows a greater degree of variability for staffing by day of week to account for the heavier weekend activity.
- The fourth method is to transition to a new schedule that will provide the staffing necessary to correlate with the workload, yet still provide benefits to the officers and agency such as team integrity, unity of command, and schedule equity.

Allocation Index

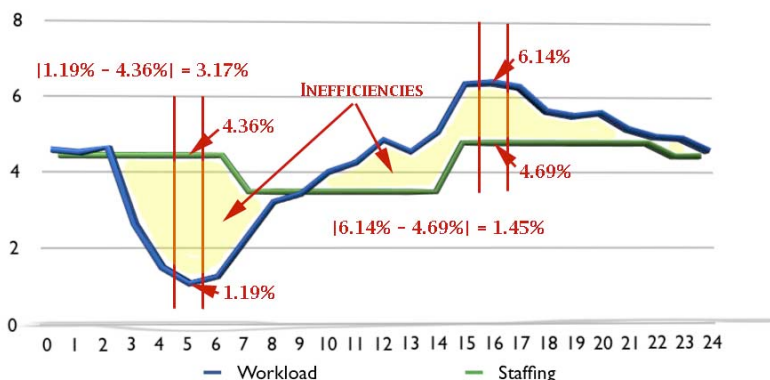
In Chart 9, the current workload for the agency was charted by the average percentage of reactive workload by hour of the day and day of the week. To gauge the effect of alternative schedules, each schedule was compared to the average daily workload curve and an **Allocation Index** was created. The allocation index is a measure of “fit” or “closeness” of the two curves being compared (staffing vs. workload). The area between each set of curves was measured by calculating the absolute value of the difference between the percentages of the two curves for each quarter-hour of the day. Summing the absolute values of the differences for all 24 hours and subtracting that sum from 100% produced an overall allocation index for the set of curves being evaluated. Under this methodology, if the two curves were perfectly aligned, the allocation index would be 100%. Chart 10 displays an example of the allocation index. The green line represents the staffing curve for a hypothetical agency and the blue line represents the workload curve. The light yellow areas in the example represent areas of

inefficiency where one curve deviates from the other. The hypothetical agency appears to be proportionally overstaffed between the hours of 2 am to 8 am and proportionally understaffed between 9 am and midnight.

Chart 10.

Efficiency Index =

$$100\% - \left[\sum_{i=0}^{23} |\text{Workload}_i - \text{Staffing}_i| \right]$$

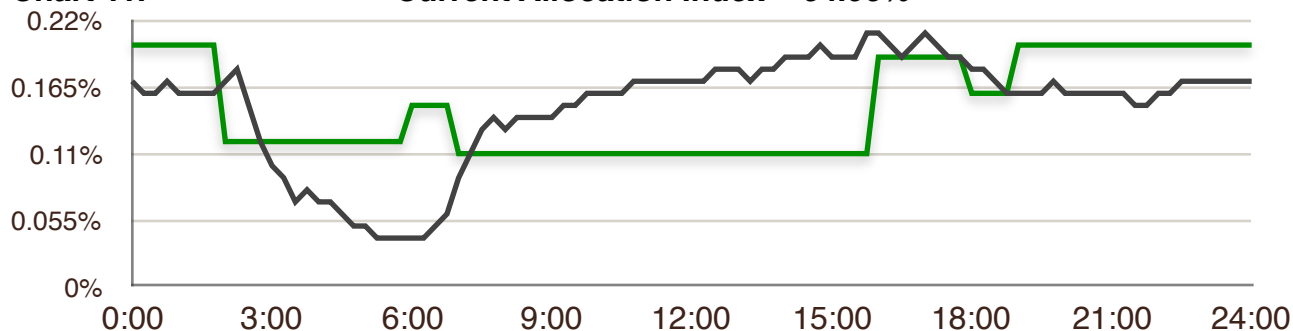


Efficiency of the Current Schedule

The November 2018 schedule for the Field Operations Bureau was charted across the 24 hours of the day along with the 2013–2017 workload curve from the agency CAD data. The average staffing per quarter-hour per day was compared against the average number of reactive minutes per quarter-hour. The closeness-of-fit of the current staffing curve and the current workload curve is shown below in Chart 11. The green line represents the average current staffing per hour and the dark brown curve represents the average 20013- 2017 reactive time per hour.

Chart 11.

Current Allocation Index = 64.96%



The current schedule has an allocation index of 64.96%. As shown in Chart 11, using the current schedule the agency is proportionally overstaffed between 6 pm and 2 am. The staffing drops off prematurely before the workload begins to decline at around 2:45 am. By 3 am, the reactive workload drops to its lowest level while staffing still remains higher than dayshift staffing levels. At around 7 am, the agency becomes proportionally understaffed until around 7 pm. Bringing both the 10-hour evening shift and the CSTEP units in at 6 pm leaves the earlier day shift hours understaffed. In addition, due to the presence of the CSTEP unit, the night shift staffing between 3 am and 7 am could be reduced to increase the allocation index.

Deployment Optimization

First Alternative - Redistributing Officers Among Shifts

The least invasive modification to the existing schedule is to change the number of officers assigned to each shift. This modification will create an efficiency gain of about 8.5% and does not require a change to shift start times, days off, or the current duty-cycle patterns.

In this alternative, day shift teams 1 and 3 were increased significantly while afternoon teams and night shift teams were reduced. This change increased the schedule efficiency from 64.96% to 73.58% without adding any additional officers or changing any start times. The graph for the first alternative is shown in Chart 12.

Chart 12. *First Alternative Allocation Efficiency = 73.58%*

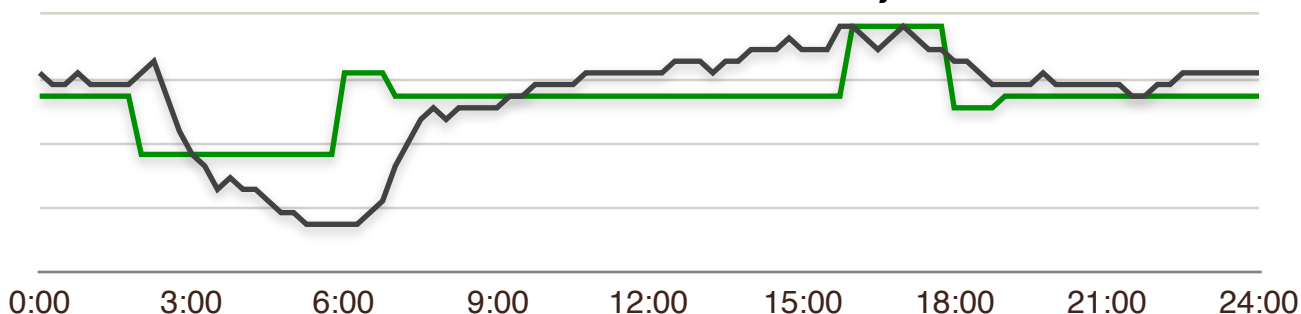


Table 13 shows the officer assignments and start times for the first alternate schedule. The efficiency index increased while the level of team integrity and unity of command remained unchanged. Schedule equity was not changed as long as the 10-hour shifts continue to rotate days off every three months.

The biggest advantage to this alternative schedule is the anticipated decrease in cross-beat dispatching, patrol intervals, and probabilities of saturation during the morning and early afternoon hours. This change could be implemented immediately without additional staffing. It may be necessary to move the second corporal positions on nights to the day shifts due to span of control.

Table 13.

Shift	Days and Hours of Work	# Assigned
Team 1	6 am – 6 pm; Rotating days	12
Team 3	6 am – 6 pm; Rotating days	12
Team 2	7 am – 7 pm; Rotating days	6
Team 4	7 am – 7 pm; Rotating days	6
Team 5	4 pm – 2 am; Mon – Thurs	4
Team 6	4 pm – 2 am; Thurs – Sun	5
Team 7	7 pm – 7 am; Rotating days	8
Team 8	7 pm – 7 am; Rotating days	8
K-9	4 pm – 2 am; Mon – Thurs	1
K-9	4 pm – 2 am; Thurs – Sun	1
CSTEP	6 pm – 6 am; Thurs – Sat	9
		72

Second Alternative - Redistribute Officers and Modify Start Times

The next alternative modification to the existing schedule is to redistribute the officers based on workload and to modify shift start times to match the growth and decline in the workload curve. This modification adds an additional 3.5% efficiency gain to the first alternative and does not require a change in the existing duty cycle patterns.

The current level of team integrity and unity of command is unchanged. Complete schedule equity is still not achieved.

In this alternative, the day shift start times are moved back to 6:30 am and 7:30 am respectively to better match the growth in the workload curve during that time. The afternoon shift is moved back to a 5 pm start time to keep them later in the morning hours until the workload curve begins to drop. The night shifts and CSTEP teams are moved to 6:30 pm and 7:30 pm respectively to coordinate with the new day shift start times. The graph for the second alternative is shown in Chart 13.

Chart 13. Second Alternative Schedule Efficiency = 77.07%

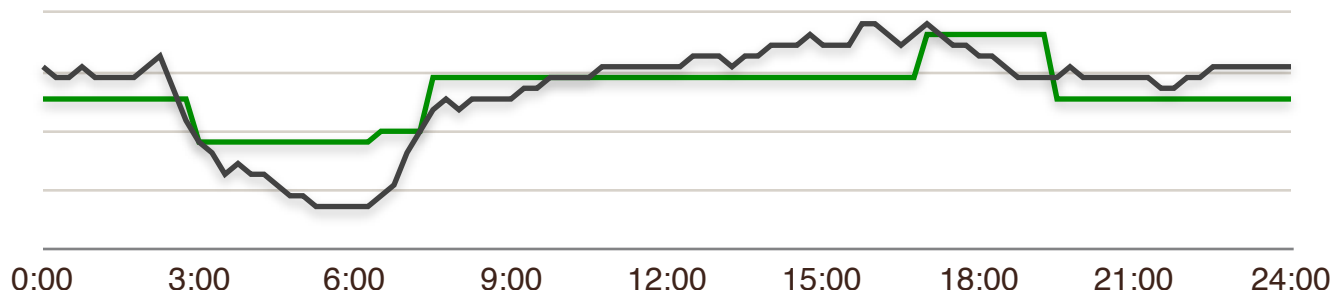


Table 14 shows the shift start times, days off, and number of officers assigned per team for the second alternative schedule. This change could be implemented immediately without additional staffing.

Table 14.

Shift	Days and Hours of Work	# Assigned
Team 1	6:30 am – 6:30 pm; Rotating days off	9
Team 3	6:30 am – 6:30 pm; Rotating days off	9
Team 2	7:30 am – 7:30 pm; Rotating days off	10
Team 4	7:30 am – 7:30 pm; Rotating days off	10
Team 5	5 pm – 3 am; Mon – Thurs	4
Team 6	5 pm – 3 am; Thurs – Sun	3
Team 7	6:30 pm – 6:30 am; Rotating days off	8
Team 8	6:30 pm – 6:30 am; Rotating days off	8
K-9	5 pm – 3 am; Mon – Thurs	1
K-9	5 pm – 3 am; Thurs – Sun	1
CSTEP	7:30 pm – 7:30 am; Thurs – Sat	9
		72

Third Alternative - Distribute 10-hour Days Off throughout the Week

Afternoon Teams 5 and 6 work 10-hour shifts with fixed days off each week. Team 5 works Monday through Thursday and Team 6 works Thursday through Sunday. The overlap on Thursdays, when both teams are working, is used as a training day. This creates an opportunity for approximately 260 hours of training per year for each officer working the 10-hour shifts.

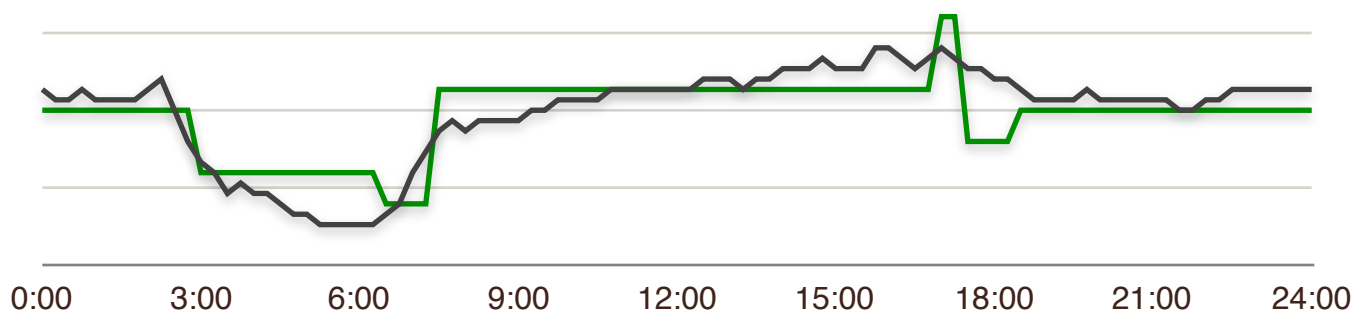
According to training records provided by the agency, the average officer on the 10-hour shift spends 166.83 hours per year in general training. The use of overlapping workdays for training is a relatively common practice in agencies attempting to use 10-

hour shifts while still keeping some unity of command and team integrity. However, since a 10-hour fixed day off schedule will *always* produce a four-day workweek, it is impossible to schedule equally across a seven day workweek without an overlap day. In prior studies, overlap days are usually characterized by lower productivity, lower accountability, and an ineffective use of patrol resources. Based on the variation in workload between weekdays and weekends in College Station, the agency may wish to consider distributing the days off for the 10-hour shifts across all days of the week. This would allow variable staffing by day of the week and greater flexibility to meet the variance in the workload curve from day to day. However, this change will eliminate all team integrity and unity of command currently existing among the 10-hour shifts.

In this alternative, the day shift start time is moved back to 6:30 am to better match the growth in the workload curve and the second day shift start time is eliminated. The night shifts and CSTEP teams are moved to 6:30 pm to coordinate with the new day shift start times. The afternoon shifts are converted to 10-hour “power” shifts which start at 7:30 am and 5 pm respectively and a K-9 unit is added to each. The days off for the two power shifts are distributed across all seven days of the week to allow for a greater flexibility for proportional staffing. The graph for this alternative is shown in Chart 14.

Chart 14.

Third Alternative Schedule Efficiency = 78.81%



Implementation of this change would increase the efficiency of the patrol schedule to 78.81%, an increase of 13.85% over the current schedule, but at the cost of team integrity and unity of command for the 10-hour shifts. Table 15 shows the hours worked, days off, and staffing levels for each team. An efficiency increase of only 1.3% may not be worth the loss of schedule equity and the team concept currently present on the 10-hour shifts.

Table 15.

Shift	Hours	Days Off	# Assigned
Day Team 1	6:30 am – 6:30 pm	Rotating	6
Day Team 3	6:30 am – 6:30 pm	Rotating	6
Night Team 2	6:30 pm – 6:30 am	Rotating	6
Night Team 4	6:30 pm – 6:30 am	Rotating	6
Early Power 1	7:30 am – 5:30 pm	Fri, Sat, Sun	3
Early Power 2	6:30 am – 6:30 pm	Sat, Sun, Mon	1
Early Power 3	6:30 am – 6:30 pm	Sun, Mon, Tue	6
Early Power 4	6:30 am – 6:30 pm	Mon, Tue, Wed	6
Early Power 5	6:30 am – 6:30 pm	Thu, Fri Sat	8
Late Power 1	5:00 pm – 3:00 am	Fri, Sat, Sun	1
Late Power 2	5:00 pm – 3:00 am	Sat, Sun, Mon	1
Late Power 3	5:00 pm – 3:00 am	Sun, Mon, Tue	1
Late Power 4	5:00 pm – 3:00 am	Mon, Tue, Wed	1
Late Power 5	5:00 pm – 3:00 am	Tue, Wed, Thu	2
Late Power 6	5:00 pm – 3:00 am	Wed, Thu, Fri	3
Late Power 7	5:00 pm – 3:00 am	Thu, Fri, Sat	4
K-9	5:00 pm – 3:00 am	Fri, Sat, Sun	1
K-9	5:00 pm – 3:00 am	Mon, Tue, Wed	1
CSTEP	6:30 pm – 6:30 am	Sun, Mon, Tues, Wed*	9

* CSTEP Officers train every other Wednesday for 8 hours to maintain a 40 hour workweek.

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Fourth Alternative - Adopt a New Schedule

The 12-hour schedule that is currently in use at the agency works easily with a 24-hour day. Using two 12-hour schedules per day provides 24 hour coverage without shift overlaps or the need to schedule two teams on the same day during the same shift times. There is no reason to discontinue the use of the 12-hour shift.

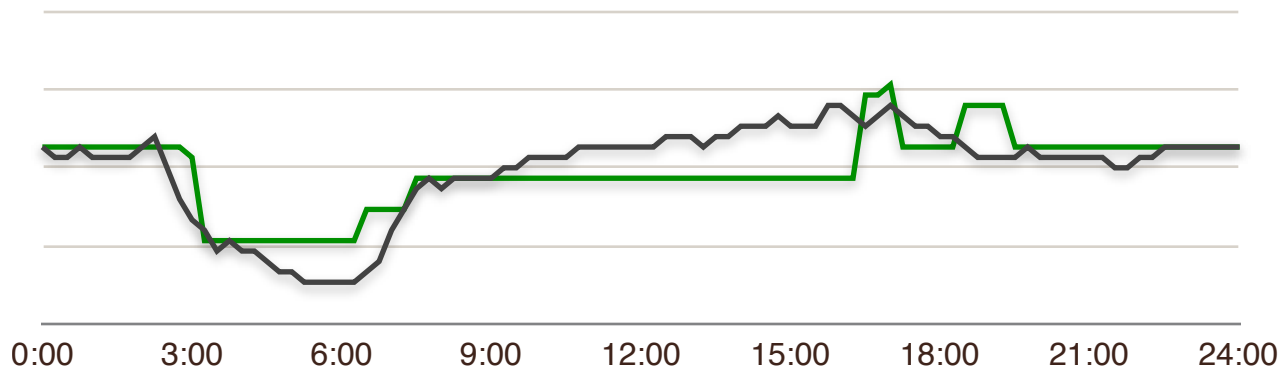
It is logically sound to use a 10-hour shift as a power shift to cover the busier parts of the day. The traditional 4 on – 3 off schedule requires either an overlap day, or the loss of schedule equity and unity of command. The fourth alternative is to explore alternate schedules that may be close to a 10-hour shift length but still provide better schedule characteristics.

Several cities in the northwest have been utilizing a four-week locked rotating schedule with a shift length of 10 hours and 40 minutes (10:40). Two teams are required per start time to provide uniform coverage by day of the week. The first team is started in week one, the second team is started in week three. At the end of each week, the officers move to the next week in the cycle. After concluding the fourth week, the officer moves back to week one. Throughout the 4-week cycle, each officer receives two full weekends off. In the fourth week of the schedule, each officer gets five days off in a row. By using a 10 hour and 40 minutes shift length, the schedule averages 40 hours per week over the 28 day cycle. The “10:40” is compliant with the FLSA and does not require overtime pay. The duty cycle pattern is written as “2(5 on – 4 off) 5 on – 5 off”.

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Week 1					Train	Off	Off
Week 2	Off	Off					
Week 3	Off	Off	Off	Off			
Week 4			Off	Off	Off	Off	Off

The 10:40 provides schedule equity for all officers, complete team integrity, and complete unity of command. For officers who do not want to work 12-hour shifts, the 10:40 provides an alternative that is close to the 10-hour shift. The first Friday of each cycle serves as a built in training day providing 130 hours of annual training for each person on the 10:40 schedule. The major characteristic concern of the 10:40 is the potential for fatigue when officers are working five days in a row at 10 hours and 40 minutes. The greatest potential exists on the midnight shift in the early morning hours. Using the 10:40 for power shifts that work primarily dayshift and evening hours greatly reduces the potential for fatigue related incidents. The graph for this alternative is shown in Chart 15.

Chart 15. Fourth Alternative Schedule Efficiency = 77.49%



Implementation of this change would increase the efficiency of the patrol schedule to 77.49%, an increase of 12.53% over the current schedule without any additional officers. The agency would still be staffing eight teams so no additional supervisors would be needed. The staffing for the power shifts would be more consistent by day of the week without the overlap every Thursday. Service delivery to the citizens would be more consistent due to less deviation between the workload curve and the staffing curve (see chart 15). Table 16 shows the recommended hours, days off, and staffing assignments for each team.

Table 16.

Shift	Hours	Days Off	# Assigned
Day Team 1	7:30 am – 7:30 pm	Rotating	9
Day Team 2	7:30 am – 7:30 pm	Rotating	9
Night Team 3	7:30 pm – 7:30 am	Rotating	5
Night Team 4	7:30 pm – 7:30 am	Rotating	5
Early Mids Team 5	6:30 am – 5:10 pm	Rotating	7
Early Mids Team 6	6:30 am – 5:10 pm	Rotating	7
Late Mids Team 7	4:30 pm – 3:10 pm	Rotating	9
Late Mids Team 8	4:30 am – 3:10 pm	Rotating	10
K-9	5:00 pm – 3:00 am	Fri, Sat, Sun	1
K-9	5:00 pm – 3:00 am	Mon, Tue, Wed	1
CSTEP	6:30 pm – 6:30 am	Sun, Mon, Tue, Wed*	9
			72

* CSTEP Officers train every other Wednesday for 8 hours to maintain a 40 hour workweek.

Recruiting and Training Division

Turnover in an organization is inevitable and plays a significant role in agency staffing. While the first part of this report focused on the number of authorized positions needed for the CSPD, it is important to review the division that is primarily responsible for filling those authorized positions, the Recruiting and Training Division (R&T). For an agency of over 200 employees, a turnover rate of 10% means the agency must bring 20 new employees in the front door every year. Once hired, those 20 new employees have to be oriented to their new function within the organization and then trained for the position they will hold.

Chapter 3 of Jim Collin's #1 best seller, *Good to Great*, is devoted to the topic of "First who...then what." Collins points out an unexpected finding in his research. He states: "The old adage 'People are your most important asset' is wrong. People are not your most important asset. The *right* people are."¹⁰ The author uses an analogy throughout the chapter of "getting the right people on the bus", "the wrong people off the bus", and "the right people in the right seats." For law enforcement agencies, where over 80% of spending is on personnel, and where employees are not only empowered but are sometimes required to make life or death decisions in highly critical scenarios, getting the right people on the bus cannot be understated. Finding the right people starts long before they walk through the front door for their first day on the job.

The hiring process begins with recruitment, advertising, and direct correspondence with prospective employees. The profession of law enforcement in the eyes of today's society, and especially social media, is not what it once was. Many agencies throughout the country are expressing that their pool of candidates, who have an interest in a law enforcement career, who have a realistic expectation of what the job entails, and who are able to successfully pass all phases of the testing process is getting smaller and more difficult to find. Recruitment efforts are becoming more intentional and targeted towards hand-picked markets such as law enforcement career fairs, people already in tangential careers such as corrections or military police, and existing officers looking to relocate to a new department.

Two testing periods are held each year for new applicants that are not TCOLE certified as peace officers. Entry-level testing is done monthly for applicants that are already TCOLE certified. Applicants are put through a written exam (waived for TCOLE certified applicants), a physical fitness test, a preliminary interview, an oral interview board, and a polygraph examination. Applicants successfully passing the oral interviews are subject to an extensive background investigation before moving on to the final interview with the Chief of Police. If the candidate is given a conditional offer, it will be contingent on a psychological exam, a medical exam, and a drug screen. Members of R&T are responsible for scheduling, administering, and tracking all of these tests as well as conducting the background investigations. All of these steps are major keys to "getting the *right* people on the bus."

Once the new hire is brought on-board, the R&T staff will track the new employee through an 18-week police academy offering encouragement and assistance as

¹⁰Collins, J. (2001). *Good to Great: Why Some Companies Make the Leap...and Others Don't*. New York, NY: HarperCollins Publishers Inc.

needed. The candidate will return for seven weeks of orientation by the division staff and then 20 weeks of supervised field training under the watchful eye of a Field Training Officer. It can easily be an entire year between the time an officer submits their application until they are able to function as a solo patrol officer. The hiring process can be a bit shorter with certified peace officers who transfer from other law enforcement agencies. The academy requirements are either waived or shortened and field training may be expedited.

A similar process exists for civilian personnel. The civilian hiring process also begins with recruitment to find the *right* people for the agency. Depending on the position being sought, the hiring process may involve: a written exam, a records check, an oral interview, a fingerprint check, a background investigation, an interview with the Assistant Chief, a psychological exam, a medical exam, and or a drug screen.

Over the last 19 years, the CSPD has experienced an average attrition rate for sworn employees of 9.8% per year with some years as low as 2.9% (2004) and some as high as 19.1% (2017). The attrition rate for civilian personnel has averaged 22.63% per year from 2012 through 2017 with some years as low as 14.52% (2013) and some as high as 28.36% (2015). Using these averages and the staffing levels at the time of this report, it is estimated that the agency will need to hire 13 sworn personnel and 16 civilian personnel in 2019 just to keep up with attrition. That is not to mention any additional positions as a result of the resource analysis study, the increased workload per year, and the growth of the city.

In 2017, according to statistics provided for this study, there were a total of 1338 applications processed by R&T and 304 tests administered. This led to 54 backgrounds being conducted (32 of which were conducted by R&T personnel and the remainder were conducted by CSPD staff from outside the division), and ultimately resulted in the hiring of 46 new employees (32 sworn, 14 civilian).

The recruiting and hiring efforts expended by the division is necessary to give new officers and staff a start in their careers and to get “the *right* people on the bus.” However, their job does not end there. The division is also responsible for ensuring all department personnel have received the appropriate continuing education training, whether that training is mandated by TCOLE, CALEA, or some other entity. R&T personnel review lesson plans, arrange training facilities, conduct or facilitate instruction, and manage training records by reporting completion to TCOLE and archiving the training records. For training attended outside the department, the administrative assistant registers employees for external training, arranges transportation and lodging, and then completes the appropriate expense reports upon the employee’s return. The division personnel serve as the liaison to the TEEX Police Academy and aid in providing a portion of the academy instruction. Recently, the Bryan Police Department has begun their own academy which will most likely diminish the hours of instruction they provide to the TEEX Academy. The exact ramifications of these changes are unknown but they could have an effect on the division’s workload.

In 2017 there were over 8300 hours of training received by department personnel from trainings conducted or set up by the division. To facilitate this training, there were 1420 hours of internal instructor hours, of which R&T staff conducted 65%, or 922 hours. Employees were registered for 373 classes outside of the department, resulting in just over an additional 7600 hours of training.

Division personnel are responsible for supervising the department's physical fitness programs, which consist of FitLife and Fitness and Strength Testing (FAST). The FitLife program is a partnership with the Texas A&M Applied Exercise Science Laboratory, aimed at providing cardiovascular and overall fitness testing, along with educational exercise and nutrition classes. The FAST program is an incentive based program designed to encourage employees to increase their physical stamina and health. The program is designed around a series of tests (1.5 mile run, 300 meter sprint, push-ups, and sit-ups) in which a candidate's performance is ranked using age and gender norms from the Cooper Institute. The candidate is then eligible to receive a monetary incentive based on that ranking. In 2017 there were 13 testing sessions and two dedicated blood draws that were arranged for the FitLife program. There were 33 sessions over the course of 10 different days in which FAST testing was conducted.

The CSPD Weapon's Coordinator and TASER/ Self-Aid Buddy Aid (SABA) Coordinator are both members of R&T. The Weapons Coordinator is tasked with inspecting and selecting weapons issued to and used by agency personnel. As such, the Weapon's Coordinator maintains an inventory of all weapons and ammunition, and is responsible for identifying and ordering any items that are needed. The TASER/ SABA Coordinator is responsible for making sure Electronic Control Devices have received the most current software updates, as well as inspecting any device deployed in the field to make sure it operated properly. In regards to the SABA program, the coordinator makes sure that emergency medical equipment is not expired and maintains the inventory and surplus of those items.

In addition to their recruiting and hiring efforts, and continuous improvement and training efforts, the division is responsible for posting openings for specialized positions and promotions. The division ensures that the appropriate study materials are on hand for promotional exams, coordinates the administering of those exams with the Human Resources Department and organizes any required assessment centers. In 2017, there was one sergeant test, one lieutenant test, an assessment center for sergeant and 17 position announcements arranged. These efforts constitute a concerted effort to not only "get the *right* people on the bus", but to "get the *right* people in the *right* seats."

All of the aforementioned tasks in 2017 were completed by a staff of 6 sworn officers and three civilians, along with a large amount of assistance from other CSPD members assigned to other divisions. The division is staffed by one lieutenant, two sergeants, two training officers, a recruiting officer, a training coordinator for civilian/ professional staff, a police assistant, and an administrative assistant.

Without the assistance of other CSPD staff, the Recruiting and Training Division would not be able to accomplish their mission. In 2015, R&T staff conducted 36% of all background investigations and provided 63% of instructor hours for training. An internal goal was established at that time to have 70% of all background investigations and 70% of all instructor hours completed by R&T staff. At the close of 2016, R&T had conducted 52% of all background investigations and provided 60% of all instructor hours for the agency. At the close of 2017, R&T staff had conducted 59% of all background investigations and provided 65% of all instructor hours for the agency. However, the total number of training hours offered in 2017 had dropped due to the R&T Divisions staffing limitations. During this same time period from 2015 through 2017, the number of employees hired per year increased from 21 to 38 to 46 respectively.

As the city grows and a demand for more first responders is met, there is a very real downstream effect on support divisions within the agency. In the last year, the R&T Division has added a police assistant and re-filled the administrative assistant position that had been temporarily vacant. The police assistant has proven to be a very valuable asset and has been able to free up time for trainers to develop and deliver more curriculum and instruction. Likewise, the administrative assistant has resumed the responsibility of training reimbursements, scheduling, travel, and other required administrative tasks.

Given the growth that is taking place within the City of College Station and the current staffing levels of the patrol division, the increased workload for recruiting, testing, interviewing, hiring, orienting, and training is only likely to increase further. The potential changes with the TEEX Police Academy and the new Bryan Police Academy present the possibility of increased workload on CSPD instructors. Based on the amount of outside assistance being given to the division and the steady increase in workload over the last three years, there is strong evidence for the need to increase the staffing levels within the R&T Division.

In a service industry, like law enforcement, there is a “switching cost” when an employee is pulled from their normal work assignment to assist in another area of the organization. This switching cost could manifest as specialty training that must be provided for the temporary task being assigned. A switching cost could manifest as an orientation period for the temporary employee to learn the environment and expectations of their new supervisor. The switching costs could simply be the time required for the new assignee to become proficient at the task being assigned. In many cases, there could be multiple forms of switching costs taking place simultaneously that reduce the efficiency and productivity of the unit.

Criminal Investigations Division

At the time of this report, the Criminal Investigations Division (CID) is staffed with 28 people. The Division is led by a lieutenant who is directly assisted by a civilian staff assistant, a civilian crime analyst, a civilian victim advocate and three sergeants. The unit is subdivided into three separate units: the Property Unit, the Persons Unit, and the Special Investigations Unit (SIU).

- The Property Unit Sergeant oversees seven sworn investigators and a civilian police assistant. The majority of the unit's workload consists of fraud, burglary, and theft cases.
- The Persons Unit Sergeant oversees six sworn investigators, a sworn crime scene investigator, a civilian police assistant, and a civilian crime scene technician. This unit is primarily responsible for crimes against persons, both adult and juvenile, such as assaults, batteries, homicides, and sexual assaults.
- The Special Investigations Unit (SIU) Sergeant oversees four sworn investigators. One investigator handles both gang and narcotics cases while the other three are focused primarily on narcotics investigations.

The CID receives valuable assistance from two volunteers and a three to four interns each semester. The senior volunteer donates 30 to 40 hours a week to the department and has taken over many duties that would have to be completed by investigators in his absence. The second volunteer donates approximately 16 hours per week and also provides valuable assistance to the division that would otherwise have to be performed by paid employees. The interns each provide about 6 to 8 hours of assistance per week but their duration in the unit is only usually only for a semester. The agency has plans to implement a new program that would assign two patrol officers to the CID on a two month rotation. This would provide additional resources to the unit and would provide a learning experience to enrich the patrol officers in their investigative efforts on the street after the rotation.

Very few support divisions within law enforcement agencies document their workload in the agency's CAD database and the CID is no exception. Investigators are expected to schedule their day based on the cases they are currently working. If investigators are leaving the office on an activity that could place them at risk, such as an arrest or to execute a search warrant, they will often notify the dispatcher ahead of time and then check in with them on a limited basis once they arrive at their destination. Other activities such as custodial transports and on-view traffic stops may also be found in the CAD database. However, since investigators often jump from one case to another throughout the day, the majority of their work is never captured in real time. Most agencies will track the number of cases assigned to investigators and may keep record on the number of cases currently assigned to investigators at the end of the month, but the number of hours spent per investigation or the number of hours spent per year on investigations is never captured.

In the absence of historical workload data, stringent quantitative analysis must be put aside in favor of a more subjective and qualitative style of analysis. Three major steps were used in this endeavor.

- The first step was to review any available historic records that may have been kept by the agency such as: case assignments, case closures, staffing levels, and unassigned cases. If such records are available, a general review is conducted in search of any historical trends taking place within the division.
- The second step is to determine how time is currently being spent by division staff. This is accomplished by tracking their daily activity for a three-month period and then aggregating the final results into reactive and proactive categories.
- The final step was to conduct a benchmark analysis using available metrics from other law enforcement agencies. A number of correlation analyses with the comparable agencies were conducted using various metrics. After finding the metrics with the strongest correlation coefficients, a histogram was created and a recommended staffing level for the division was derived from the equation of the histogram trend line.

Review of Historical Records

The CID has been keeping monthly statistics on case assignments, case loads, staffing levels, and a variety of other metrics for more than a decade. From the monthly statistics, the CID Commander prepares an annual informal memorandum containing a Criminal Investigations Division Workload Assessment. Upon request, the monthly statistics for calendar years 2013 through 2017 and year to date 2018 were provided in Excel format along with the annual Workload Assessment documents from 2014 through 2018.

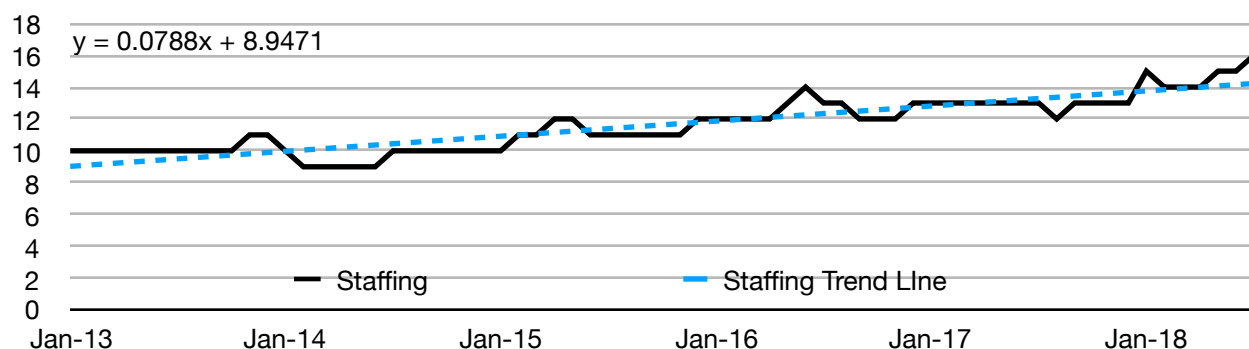
Understaffing was a common theme throughout the five years of Workload Assessments reviewed for this study. Later memos stressed the value of the main volunteer that has been assisting the CID. In 2016, the volunteer donated 1,431 hours to the division, the equivalent of 36 weeks for a full time employee. There is a fear that should the volunteer decide to pursue other ventures, the CID would not have enough resources to absorb the work the volunteer has been doing. In addition to more investigators, CID Commanders have been advocating for additional staff for the SIU unit for several years. The goal has been to reach an optimal team of six narcotics investigators and a narcotics sergeant. More recent assessments have also expressed a need for a second victim advocate to keep up with the workload and a dedicated forensic investigator to focus on the analysis of cell phones, computers, and other electronic devices. Two police assistants have been added over the years and the division commanders have indicated that their contribution has been very beneficial.

A review of the the monthly workload reports from January of 2013 to June of 2018 showed a great amount of irregularity from month to month. However, applying a trend line to each metric provided the following insights.

The investigator staffing in the CID has grown since January of 2013. The unit is susceptible to turnover just like any other part of the agency and this has taken a toll on the division at times. The monthly stats reflect the addition of a police assistant in January of 2015 and then a second in October of 2017. By April of 2018, the division was back to one police assistant. The staffing for sworn investigators and civilian police assistants, based on the monthly stats, are shown in Chart 16. The trend line shows an overall increase in staffing during the review period from a beginning value of 10 investigators to a final count of 16. It must be noted that the counts from the more

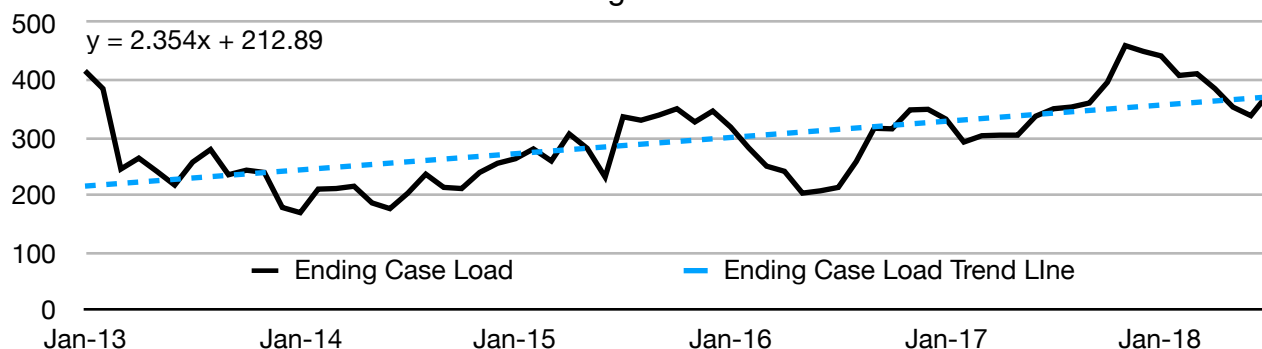
recent years included two investigators from SIU in addition to the police assistants that were mentioned earlier.

CHART 16. Investigator and Police Assistant Staffing



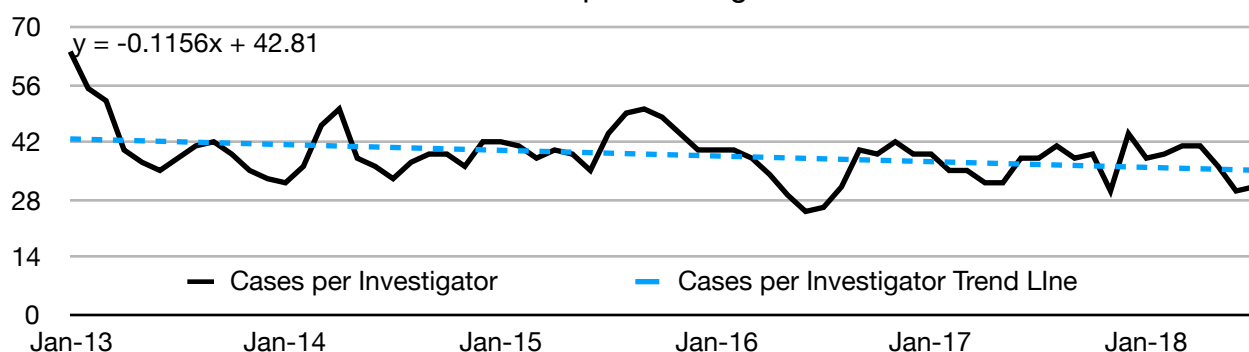
While the number of investigators was slowly increasing, the total case load for the division was also climbing. One of the metrics kept was the “Ending Case Load.” This value was determined by adding the number of cases carried over from the previous month, new cases assigned for the month, and any cases that were reassigned or reactivated during the month. From this sum, the number of cleared cases and the number of cases set to inactive were subtracted. The final result was the “ending case load” and is shown in Chart 17.

CHART 17. Ending Case Load



Combining these two metrics together gives an insight into the number of cases carried per investigator over the review period.

CHART 18. Cases per Investigator



Caution must be taken in interpreting Chart 18 above. The trend line indicates that investigators are carrying a lighter workload in recent years. It is important to remember that the chart is counting the number of cases assigned, not the time required to handle all cases assigned. Improved technologies and higher scrutiny on law enforcement are just two causes of increased investigative time per case over the years. Fraud cases are becoming more involved and farther-reaching due to the Internet and society's increased dependence on plastic over cash. Crimes against persons require a thorough investigation of all potential evidentiary items, including cell phones, personal computers, and digital cameras. A thorough forensic examination of such devices cannot be performed by just anyone and add an extended complexity to many cases.

Over the 66 month period, an average of 140 cases per month were assigned to investigators. The trend line for the number of cases assigned was flat showing consistency over the entire duration. The number of cases closed or set to an inactive status (meaning all leads were exhausted or there was not sufficient manpower to continue an active investigation) showed a decrease over the review period from just over 60 cases per month to approximately 45 cases per month. The number of cases exceptionally cleared by either arrest, an unfounded result, or a refusal to prosecute dropped during the time period from approximately 112 cases per month to about 95 cases per month. Chart 19 shows all three metrics.

CHART 19. Cases Assigned, Closed, and Cleared

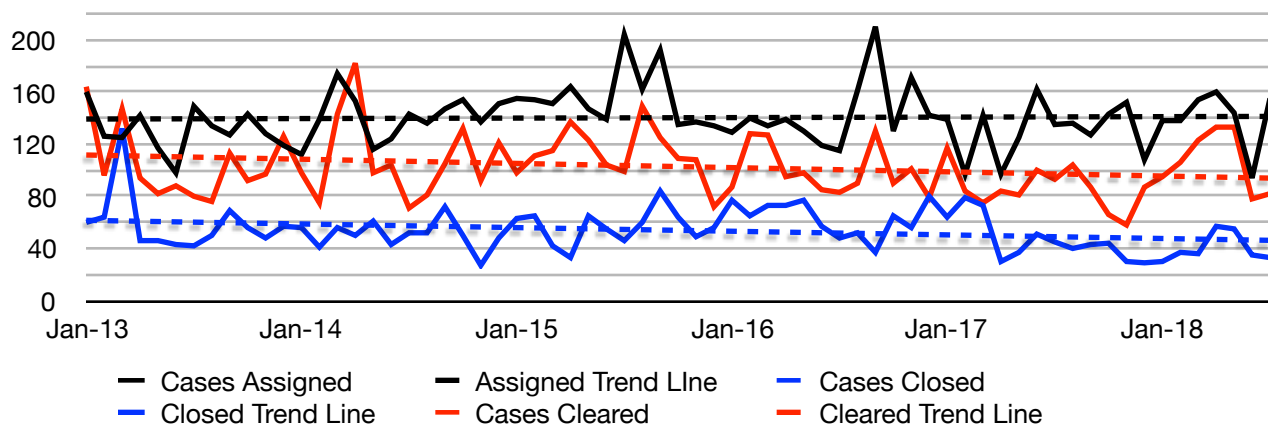
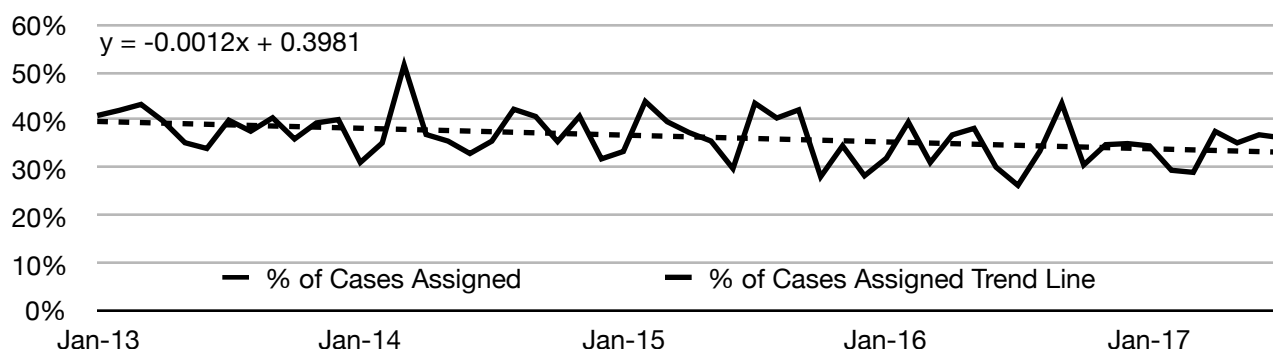
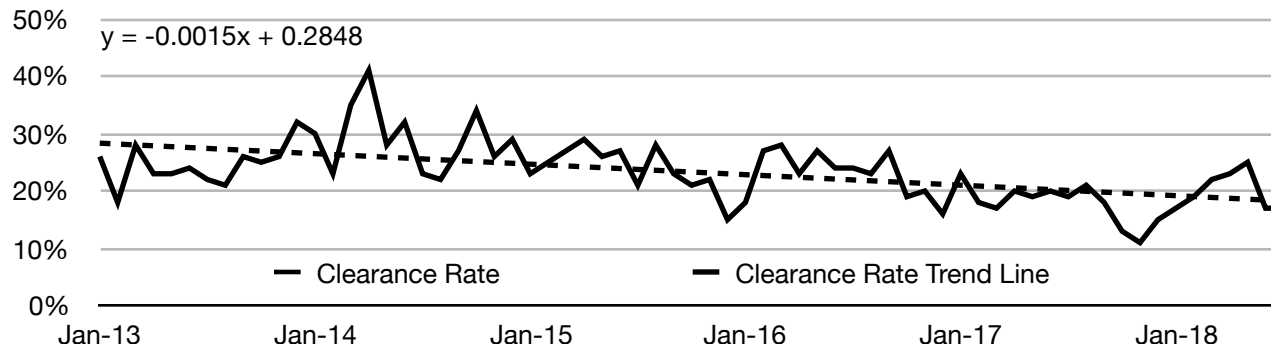


Chart 19 showed that although the number of cases assigned per month varied wildly, the trend line over the entire duration remained relatively unchanged over the 66 month period. This could lead to an erroneous assumption that if the number of cases assigned remained consistent, the workload must have also remained consistent. Based on the monthly stats from January 2013 through July of 2017 when the new CAD went into effect for the CID, the percentage of agency reports assigned to an investigator for followup decreased from approximately 40% to approximately 33% (Chart 20). This represents a 17.5% decrease in the percentage of cases assigned for follow-up by the CID. Any number of variables could have effected this statistic. If the nature of calls had changed suddenly or if patrol had begun to conduct more case follow-up on their own, this might explain some of the decrease. However, these are unlikely to have made a 17.5% decrease. A lack of resources in CID is more likely.

CHART 20.**% of cases assigned**

The final metric examined was the clearance rate for investigators. The clearance rate shown on the monthly statistics were calculated by dividing the number of cases per month that were either exceptionally cleared, cleared by arrest, or unfounded by the beginning caseload (newly assigned cases, cases carried over from the previous month, and any additional cases reassigned or reactivated). Cases that were closed as inactive were not included in the clearance rate. It should be expected that if the number of cases assigned is remaining constant and the number of cases being exceptionally cleared, cleared by arrest, or unfounded is decreasing, the clearance rate for the division is also going to decrease. Chart 21 shows the clearance rates over the 66 month review period based on the monthly statistics provided by the CID.

CHART 21.**Clearance Rate**

The historical statistics for the CID lend credibility to the need for more staffing, a recurring theme contained in the annual workload assessments completed by the CID Commanders. The consistent drop in the percentage of cases being assigned, combined with the dropping clearance rates indicates that the workload is exceeding the capabilities of the current staff. This leads to the second step of this analysis, the analysis of a 14 week activity sample to determine if the time spent by investigators is being used efficiently and effectively.

A Snapshot of Current Practices

The time spent on various activities was self-reported by the members of each unit within the CID by means of an on-line activity tracking application. The activities to be recorded were different for each unit based on varying job descriptions. Members of the division were given some time to get used to using the application before it went live

and were allowed to begin entering data by mid February of 2018. By the first week of March, employees had become accustomed to using the tracking application and data entry had become more consistent. The sample used in this study was from March 5, 2018 to June 8, 2018 giving a 14-week sample. The division lieutenant was given administrator access to the tracking software so the application could be loaded with unit specific tasks, shifts, and codes. The following sections detail the results of the time study for each of the three units within CID as well as most of the specialty functions. The Crime Scene Investigator was only present for about a week of the sample period and therefore the results were not robust enough to be usable. Since this was merely a sample of an entire work year, the use of leave time may be greater for some units than others simply because of the 14-week time span chosen for the study.

Unlike patrol, members of the CID do not engage in proactive activities. Therefore, the recommended split of 50% of time spent on reactive time and 50% of time spent on proactive time does not apply as it does in patrol. An industry standard of time spent on main case activities for a CID unit has not been established. In past studies conducted by this researcher, time spent on main case investigation has been as high as 75% and as low as 35%. The appropriate percentage of time dedicated to the primary task of case investigation is a subjective decision based on the types of cases the agency chooses to investigate, the level to which they wish to take investigations, and the amount of specialty tasks placed upon the division.

Property Crimes Unit

Seven members from the Property Crimes Unit participated in the time tracking study and tracked approximately 2,583 hours of work over the 14 week sample period. A total of 78 activities were identified by the staff as primary activities that create work within the unit. The activities were aggregated into eight activity categories based on similarities in the nature of the tasks. The activities tracked in the time study by the Property Crimes Unit are shown below.

General Admin Tasks

Division meeting	Shift briefing	Supervisor meeting
Employee evaluations	Data entry	Staffing interviews
Employee meetings	Multidisciplinary meetings	Pawn tickets
COPLOG entry	Stationary/supplies	MUNIS processing

Case Work

Report writing	Case review	Case research
Interviews	Preparing warrants	Phone time
Subpoenas/Court Orders	Obtaining warrants	Case discussions
Processing evidence	Digital forensics	Scene support
Evidence submission	On-scene processing	
Case assignments	Victim contact	

Training

Inservice	HNT Training	Outside training	Training instructor
SWAT Training	Bomb Training	Training preparation	Honor Guard Training

Leave

Sick	Vacation	FMLA	Workout time
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Volunteer hours
City holiday

Bereavement
Personal day

Floating holiday

Assistance

CEU
CSTEP
Patrol
Motors

ACO
Jail
Dispatch
Records

Evidence
Quartermaster
Detectives
Investigators

Victim Services

Post Arrest

Prosecutor contact

Grand Jury

Trial/trial preparation

Defense contact

Special Assignment

SWAT
HNT

Bomb
Honor Guard

CIT

Outside Assistance

BCSO
BPD
UPD

TXDPS
FBI
USSS

DEA
District Attorney
County Attorney

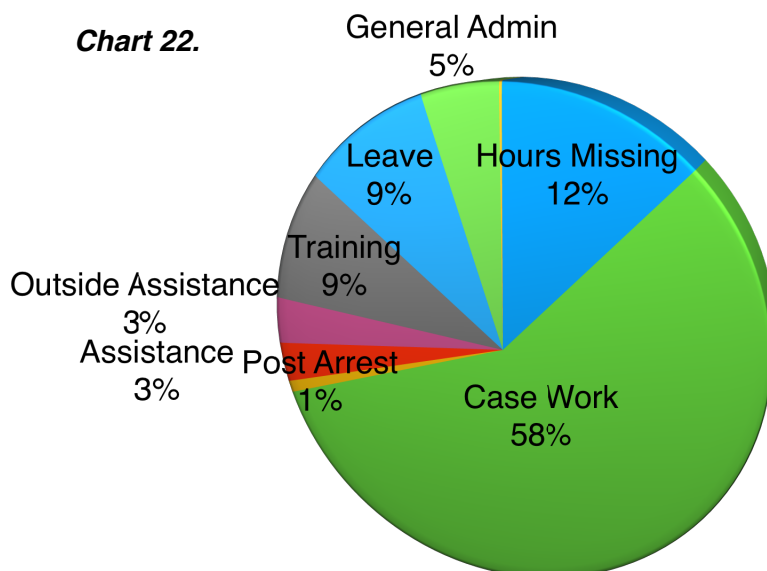
Other
JTTF

Case work, post arrest follow-up, and assistance to other divisions both inside and outside the agency comprised 65% of the property crimes investigator's time during the study. These activities related directly to the main job function of a CID investigator. Another 23% was consumed by internal activities such as training, leave, and general administrative duties that took them away from working cases. These are tasks that are completed by most every employee in the agency, regardless of assignment. It was estimated that 12% of time during the study was undocumented in the tracking tool.

According to the results of the time study, the property crimes investigators were focusing 65% of their time on their main job function. Based on past studies using this methodology, 65% of documented time spent on the primary task of the unit is indicative of good time management within the unit with limited distractions and special duties unrelated to their primary task. Since the amount of leave time per employee is a finite amount based on the employee's time in service, the amount reflected in the

workload sample is most likely a function of when the sample was taken. Therefore, to increase the amount of time spent on case work, cuts would have to be made in the amount of time spent on general admin, training, or undocumented hours. The other

Chart 22.



alternative to increasing the amount of time available for case work is to add additional personnel.

Crimes Against Persons Unit

Four members from the Persons Unit participated in the time tracking study and tracked approximately 1,956 hours of work over the 14 week sample period. A total of 77 activities were identified by the staff as primary activities that create work within the unit. The activities were aggregated into eight activity categories based on similarities in the nature of the tasks. The activities tracked in the time study by the Persons Unit are shown below.

General Admin Tasks

Division meeting	Shift briefing	Supervisor meeting
Employee evaluations	Data entry	Staffing interviews
Employee meetings	Multidisciplinary meetings	MUNIS processing
COPLOG entry	Stationary/supplies	

Case Work

Report writing	Case review	Case research
Interviews	Preparing warrants	Phone time
Subpoenas/Court Orders	Obtaining warrants	Case discussions
Processing evidence	Digital forensics	Scene support
Evidence submission	On-scene processing	
Case assignments	Victim contact	

Training

Inservice	HNT Training	Outside training	Training instructor
SWAT Training	Bomb Training	Training preparation	Honor Guard Training

Leave

Sick	Workout time	Bereavement
Vacation	Volunteer hours	Personal day
FMLA	City holiday	Floating holiday

Assistance

CEU	ACO	Evidence	Victim Services
CSTEP	Jail	Quartermaster	
Patrol	Dispatch	Detectives	
Motors	Records	Investigators	

Post Arrest

Prosecutor contact	Grand Jury	Trial/trial preparation	Defense contact
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Special Assignment

SWAT	Bomb	CIT
HNT	Honor Guard	

Outside Assistance

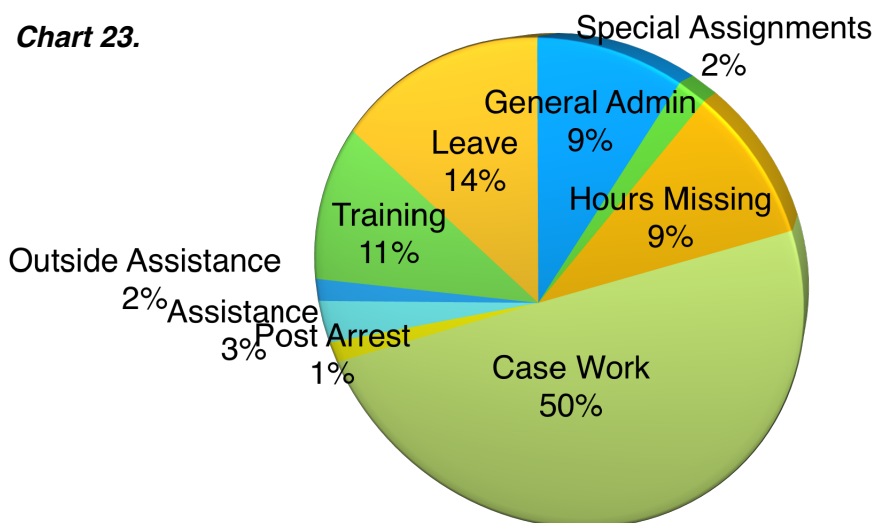
BCSO	TXDPS	DEA	Other
BPD	FBI	District Attorney	JTTF
UPD	USSS	County Attorney	

Case work, post arrest follow-up, and assistance to other divisions both inside and

outside the agency comprised 56% of the member's time during the study. These activities related directly to the main job function of a CID investigator. Another 34% was consumed by internal activities such as training, leave, and general administrative duties that took them away from working cases. These are tasks that are completed by most every employee in the agency, regardless of assignment. An estimated 2% of the member's time was spent on special assignments and 9% was undocumented in the tracking tool.

According to the results of the time study, the participating investigators spent 56% of their time on their main job function. This is lightly less than the time devoted by the Property Crimes Unit but still greater than half of their time. Since the amount of leave time per employee is a finite amount based on the employee's time in service, the amount reflected in the workload sample is most likely a function of when the sample was taken. Therefore, to increase the amount of time spent on case work, cuts would have to be made in the amount of time spent on general admin, training, or undocumented hours. The other method of increasing the overall amount of time spent on casework is to add additional personnel.

Chart 23.



Special Investigations Unit (SIU)

Four members from the Special Investigations Unit participated in the time tracking study and tracked approximately 1,940 hours of work over the 14 week sample period. A total of 74 activities were identified by the staff as primary activities that create work within the unit. The activities were aggregated into eight activity categories based on similarities in the nature of the tasks. The activities tracked in the time study by the Special Investigations Unit are shown below.

General Admin Tasks

Division meeting
Employee evaluations
Employee meetings
COPLOG entry

Shift briefing
Data entry
Multidisciplinary meetings
Division Reports

Supervisor meeting
Staffing interviews
MUNIS processing

Case Work

Report writing
Interviews
Subpoenas/Court Orders

Processing evidence
Evidence submission
Case assignments

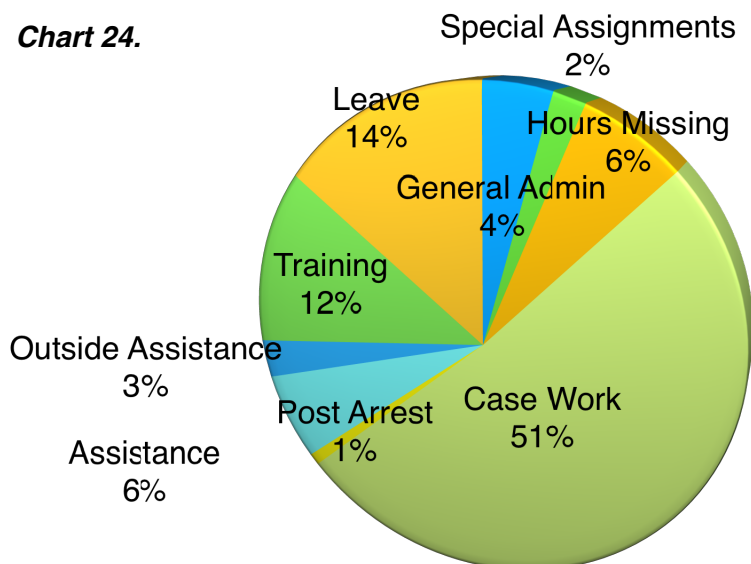
Case review
Preparing warrants
Obtaining warrants

On-scene processing	Phone time	Scene support	
Case research	Case discussions		
<u>Training</u>			
Inservice	HNT Training	Outside training	Training instructor
SWAT Training	Bomb Training	Training preparation	
<u>Leave</u>			
Sick	Workout time	Bereavement	
Vacation	Volunteer hours	Personal day	
FMLA	City holiday	Floating holiday	
<u>Assistance</u>			
CEU	ACO	Evidence	Victim Services
CSTEP	Jail	Quartermaster	
Patrol	Dispatch	Detectives	
Motors	Records	Investigators	
<u>Post Arrest</u>			
Prosecutor contact	Grand Jury	Trial/trial preparation	Defense contact
<u>Special Assignment</u>			
SWAT	Bomb	CIT	
HNT	Honor Guard		
<u>Outside Assistance</u>			
BCSO	TXDPS	DEA	Other
BPD	FBI	District Attorney	JTTF
UPD	USSS	County Attorney	

Case work, post arrest follow-up, and assistance to other divisions both inside and outside the agency comprised 61% of the member's time during the study. These activities related directly to the main job function of the investigators. Another 30% was consumed by internal activities such as training, leave, and general administrative duties that took them away from working cases. These are tasks that are completed by most every employee in the agency, regardless of assignment. An estimated 2% of the member's time was spent on special assignments and 6% was undocumented in the tracking tool.

According to the results of the time study, the SIU investigators spent 61% of their time on their main job function. Based on past studies using this methodology, this appears to be an appropriate amount of time to spend on primary duties. Unlike the other units in the CID, the SIU is responsible for creating their own cases and leads and are therefore expected to be more proactive. Since the amount of leave time

Chart 24.



per employee is a finite amount based on the employee's time in service, the amount reflected in the workload sample is most likely a function of when the sample was taken. Therefore, to increase the amount of time spent on case work, cuts would have to be made in the amount of time spent on general admin, training, or undocumented hours. The other method of increasing the overall amount of time spent on casework is to add additional personnel.

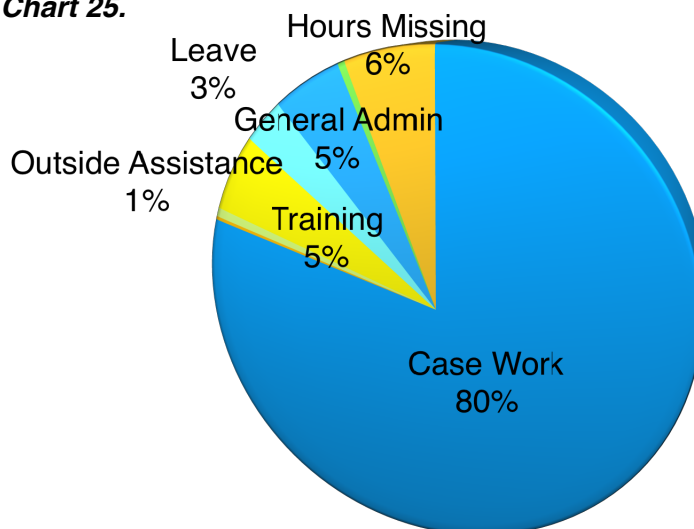
Police Assistants

The two police assistants assigned to the CID participated in the activity tracking sample and recorded a combined total of 619.5 hours of work over the 14 week sample. The police assistants used the same job tasks and activity categories as the Person Unit or Property Unit in which they worked. The results of their data sample were significantly different than that of the sworn investigators.

Most noticeably, the percentage of time dedicated to course work by the police assistants was significantly higher than the time spent by sworn investigators. This could be due to less training time and less leave time. Time spent on both internal and external assistance was less than sworn staff and special assignments were not noted at all during the collection period.

Limitations may or may not exist on the type of investigative work that can be performed by civilian police assistants. However, with 81% of their time being spent on case work and outside assistance, the position of police assistant appears to be cost effective to the agency.

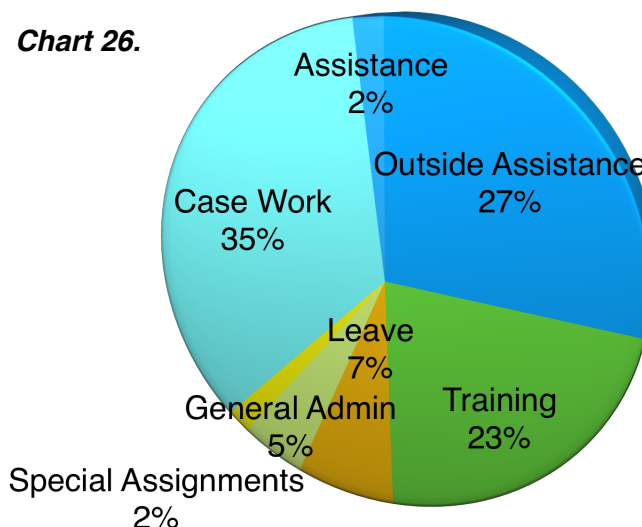
Chart 25.



Evidence Technician

The division has one civilian evidence technician who reports to the Persons Unit Sergeant. The evidence technician participated in the study and logged 337.5 hours of work during the 14 week period. The time recorded by the evidence technician was more diverse than the time spent by any other type of employee in the division. As shown in Chart 26, 35% of the evidence technician's time was spent on case related activities, 27% was spent on outside assistance and 2%

Chart 26.

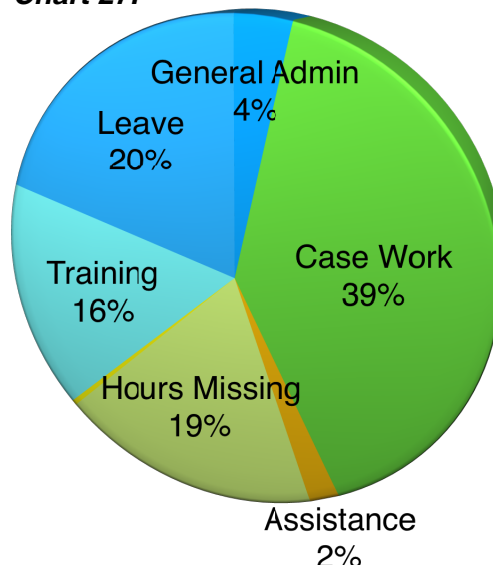


on internal assistance. This was the largest percentage of time dedicated to outside assistance from within the CID. The percentage of time spent on training was higher than anticipated at 23% but leave and general admin were consistent with other civilian positions. With a total of 64% of their time spent on activity related to their primary tasks, the data indicates an appropriate amount of time on task.

Victim Advocate

The Victim Advocate assigned to the CID participated in this study and documented 227.63 hours over the course of 34 work days. Training, leave, and general admin accounted for 40% of their time during the study. Case work and assistance accounted for only 41%. The remaining 19% of the time was undocumented during the sample period. There is reason to believe that the workload for the victim advocate can be erratic and the timing of this data collection sample could have happened during a slow work period. However, the data in this sample shows a low percentage of time spent on the primary tasks of the position.

Chart 27.



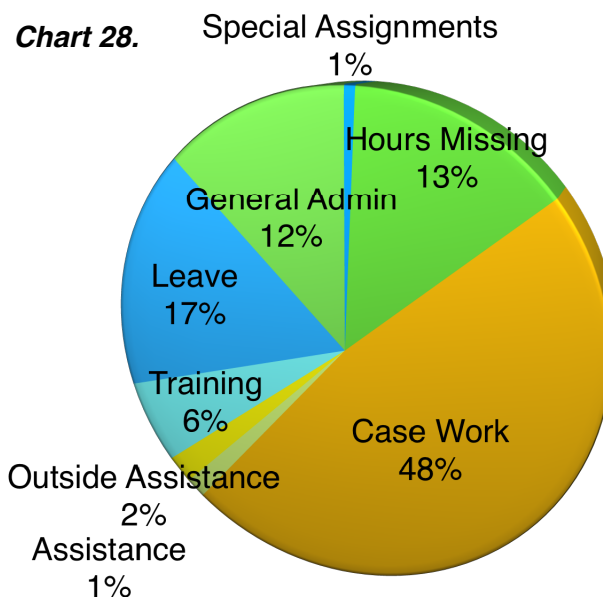
CID Sergeants

The three sergeants within the CID participated in the study. However, one of the three missed a large portion of the sample period causing their totals to be significantly lower than the others. For this reason, the third sergeant was not counted in the data and the work of the Property Sergeant and Persons Sergeant were used.

The data from the study shows the sergeants spending 51% of their time on case work, internal assistance, and external assistance. Another 35% of the documented time was spent on training, leave, and general admin. Special assignments only occupied 1% of the documented time and 13% of the time during the study was not documented.

The results for the time study of the sergeants looked very similar to the time usage of those they supervise. This indicates that the sergeants in this study are working sergeants doing the job of investigator and supervisor in one. This arrangement is typically seen during times of understaffing or in very small agencies. Given the turnover that has

Chart 28.



taken place within the CSPD in the last decade and the lack of tenure with new investigators, the agency should give strong consideration to the amount of casework being done by supervisors.

During the data collection study, the two volunteers working in the CID documented 558.60 hours over a combined total of 98 work days. Of the time recorded, 506.1 hours were devoted to case work, internal assistance, and outside assistance. The remaining 52.5 hours were spent on general admin duties. This was almost the equivalent time spent by two other civilians in the unit who are in paid positions. The time that is currently being donated by the volunteers is a windfall for the CID but the agency cannot count on it being available forever. When the time comes that the volunteers are no longer present, the duties they are performing will have to be accomplished by someone else in the division.

Benchmarking with Trend Line Analysis

In 1997, a group of cities from across the country began to compare benchmark metrics on staffing levels, performance measures, city characteristics, and a host of additional quantitative data. This group eventually became known as the “Benchmark Cities” and their annual data report is known as the “Benchmark City Survey.” This group currently consists of 29 law enforcement agencies from 16 different states. The agencies range from a total authorized strength of 115 officers up to 394 officers. The population range of cities serve ranges from 93,105 people to 307,926 people. Square mileage of the cities represent a range from 24 square miles up to 353 square miles. Etico Solutions has completed staffing studies for two of these agencies and has taught the members of the command staff for many others on the list. Ten of the 29 agencies are currently CALEA certified with several more in the self-assessment phase. The agencies represented in the 2017 Benchmark City Survey include:

- | | | |
|--------------------|-----------------------|-----------------------|
| • Bellevue, WA * | • Columbia, MO | • Lincoln, NE |
| • Boca Raton, FL | • Coral Springs, FL * | • Naperville, IL * |
| • Boise, ID | • Edmond, OK | • Norman, OK |
| • Boulder, CO | • Fort Collins, CO | • Olathe, KS |
| • Broken Arrow, OK | • Fremont, CA | • Overland Park, KS * |
| • Carlsbad, CA | • Garland, TX | • Peoria, AZ * |
| • Cary, NC * | • Grand Prairie, TX | • Plano, TX * |
| • Cedar Rapids, IA | • Henderson, NV * | • Richardson, TX |
| • Chesapeake, VA * | • Irving, TX | • Springfield, MO * |
| • Chula Vista, CA | • Lawrence, KS | |

* CALEA Accredited Agency

Workload metrics such as population, calls for service, evidentiary items received, number of first responders, and total authorized staff were used to form an estimate of staff sizes required for the College Station Police Department. Staffing sizes were calculated for the Criminal Investigations Division which includes the Property Crimes Unit, the Crimes against Persons Unit, and the Special Investigations Unit.

Demographic Comparability of Benchmark Cities

The validity of benchmarked results is highly dependent on the similarities of the agencies chosen for comparison. A number of demographic characteristics that should be considered include, but are not limited to: population, geographic size (square miles), socioeconomic status, and crime statistics. Charts 29 and 30 show how the 2017 demographics of the City of College Station compare to the 29 cities from the “Benchmark City Survey.”

City Population

Population is often used as a comparison metric for law enforcement agencies. The data is easy to obtain and is easily understood by most people. However, population does not directly indicate the level of work for a law enforcement agency. Demographic characteristics such as age, gender, ethnicity, socioeconomic status, and occupations must be carefully considered. Furthermore, U.S. Census population totals do not include transient populations that flow in and out of a city. College students, homeless populations, and migrant workers may not be included

CHART 30. Population Density

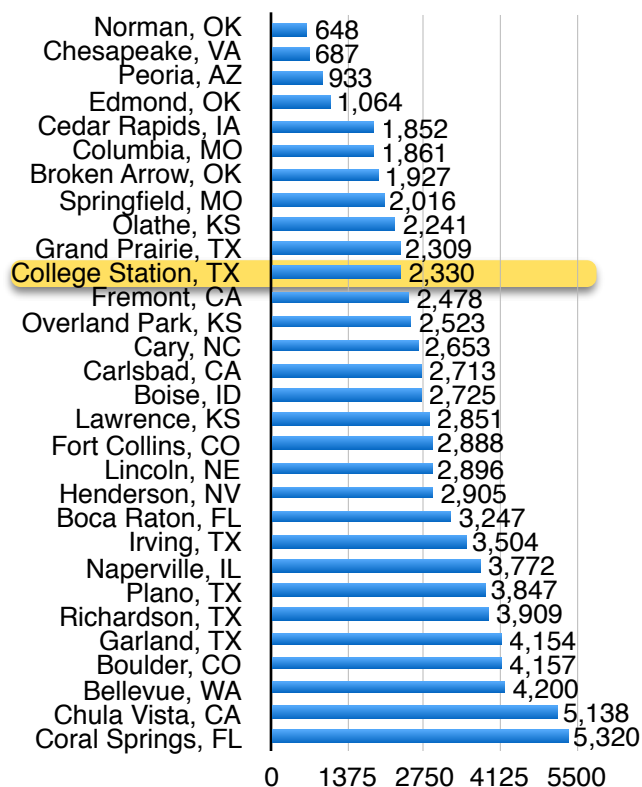
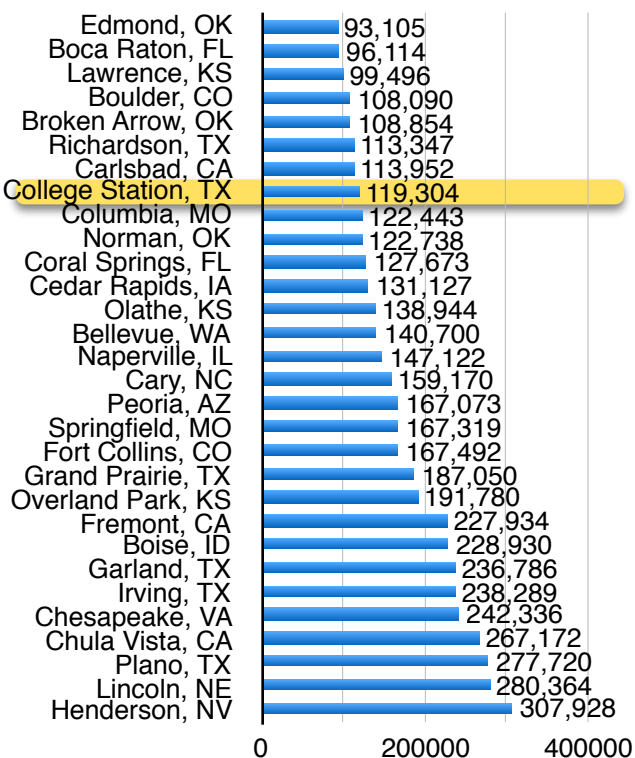


CHART 29.

City Population



in census tabulations.

The 2018 population of College Station, according to the city website, is estimated to be 119,304 people. As shown in Chart 29, College Station lies in the upper third of the comparable cities included in the benchmark survey group for population.

Population Density

A population density was determined for each of the 29 comparable cities and for the City of College Station. Population density can effect the amount of potential witnesses to crimes being investigated and increase the complexity of calls when they occur in densely populated areas. Since

the data is readily available, a comparison was calculated and included in this report.

The population density of College Station in 2018 was estimated to be 2,330 people per square mile. As shown in Table 30, the population density of College Station falls in the middle third of the sample cities included in the benchmark city survey.

Workload Comparability of Benchmark Cities

A second characteristic that should be considered when determining comparability between benchmark cities is the amount of workload placed upon each agency. Population and population density serve as *external predictors* of workload but they do not provide a *direct measure* of workload. Charts 31 and 32 show the number of calls for service per 1,000 citizens and the number of Part I offenses per 1,000 citizens for the City of College Station in 2017 compared to the 29 cities from the “Benchmark City Survey.”

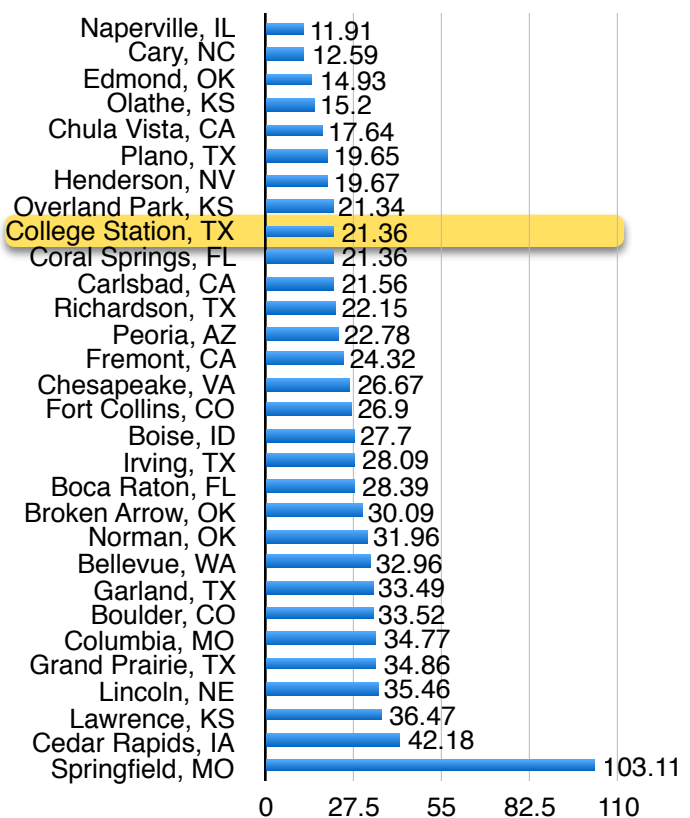
Part I Offenses

Part I offenses are limited to: murder and non-negligent homicide, forcible rape, robbery, aggravated assault, burglary, motor vehicle theft, larceny-theft, and arson. These rank among the more serious crimes and provide an indication of the major crime occurring within a city. College Station ranks in the upper third of the sample cities. As indicated in Chart 31, the part I crimes in Springfield, MO will cause this comparable to be thrown out of the comparisons in the later part of this study.

College Station has been ranked 3rd on Kiplinger magazine’s list of “10 Great Places to Live” as well as one of the nations “10 Best Places to Raise a Family.” A low crime rate, particularly among part 1 crimes, is a main factor in these prestigious rankings. This is a major accomplishment in a town that is also named “America’s No 1 College Town.”

CHART 31.

Part 1 Offenses



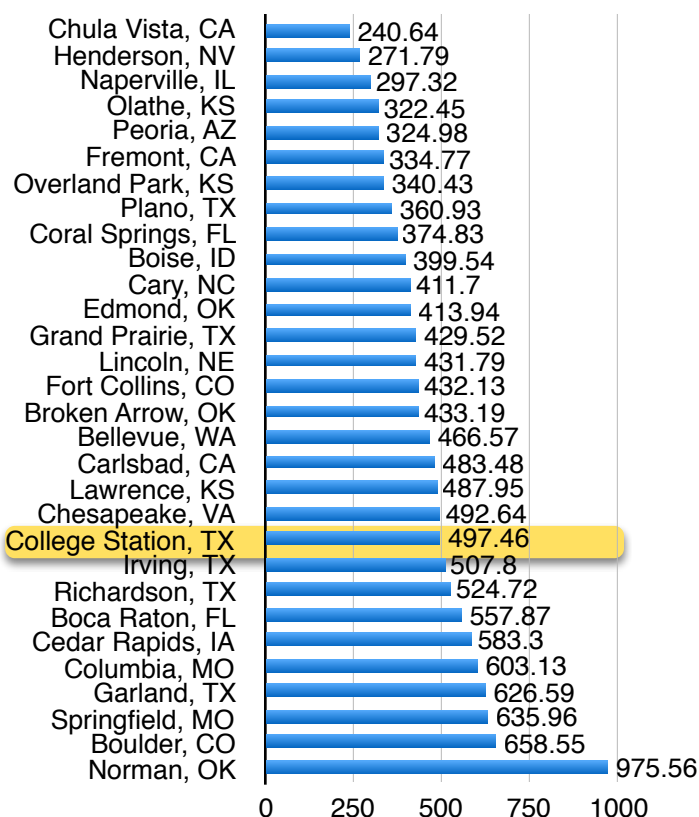
Calls for Service

The 2017 Benchmark City Survey included the number of calls for service per 1,000 citizens from each participating agency. This metric did not include officer-initiated calls. The 2017 CAD data received from College Station did not include a “source” field to distinguish between officer generated calls and citizen requests for service. In an attempt to estimate the number of citizen generated requests, all incidents in 2017 which originated from an in-car computer were removed. A manual review was then conducted to remove any calls which are traditionally officer generated such as foot patrols, traffic stops, community contacts, etc. Once the data was sorted there were 59,349 calls remaining. This equates to 497 calls for service per 1,000 citizens. and places College Station in the lower third of the comparable cities.

As indicated in Chart 32, the calls for service in Norman, OK will cause this comparable to be thrown out of the comparisons in the later part of this study.

CHART 32.

Calls for Service



Economic Comparability of Benchmark Cities

A third characteristic that was considered in this analysis to determine the comparability of cities included the fiscal allocations within the cities and within the law enforcement agencies represented in the Benchmark City Survey. Five economic benchmarks were provided in the 2017 Benchmark City Survey: (1) department budget as a percentage of the city budget; (2) department budget per capita; (3) personnel costs as a percentage of department budget; (4) training costs as a percentage of department budget; and (5) overtime as a percentage of personnel budget. Charts 33 -37 show the ranking of these fiscal metrics for the City of College Station in 2017 compared to the 29 cities from the 2017 “Benchmark City Survey.”

Dept Budget as a % of City Budget

The 2017 CSPD budget comprised 27.5% of the City of College Station budget. The average for the 29 comparable cities in the Benchmark City Survey was 27.48% placing College Station in the middle of the sample. The budget percentages for each comparable city are shown in Chart 33.

CHART 33.

Department Budget as % of City Budget

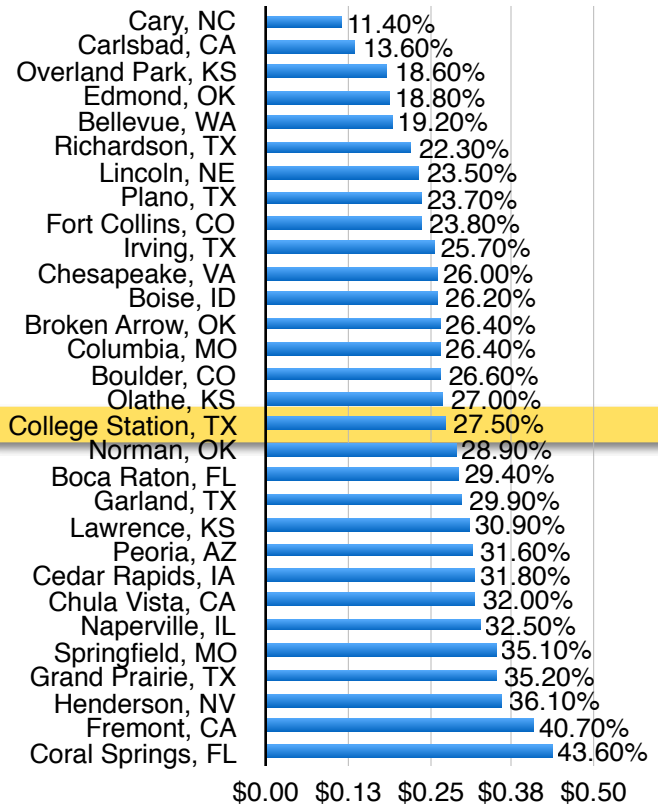
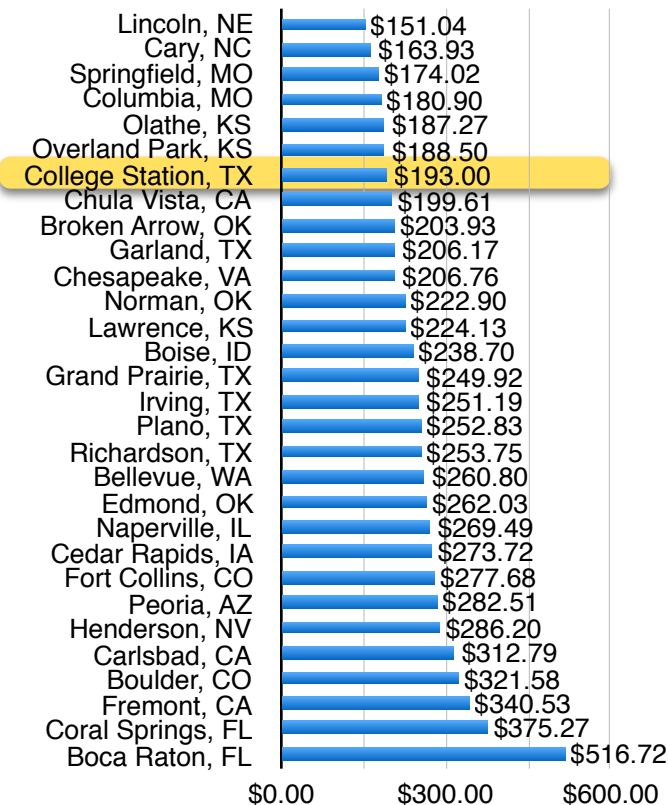


CHART 34.

Department budget per capita



Department Budget per Capita

By dividing the 2017 CSPD budget by the population reported for 2017, the average cost per citizen for police services was \$193.00. The average per capita cost in 2017 for the 29 comparable cities in the Benchmark City Survey was \$252.93 placing College Station in the upper third of the agencies.

Personnel Costs as a % of Dept Budget

The third economic metric was the percentage of the police department budget spent on personnel costs. As shown in Table 35, the College Station Police Department spends the smallest percentage of their department budget on personnel. The average for the 30 benchmark cities was 85.13%.

CHART 35.

Personnel costs as a % of department budget

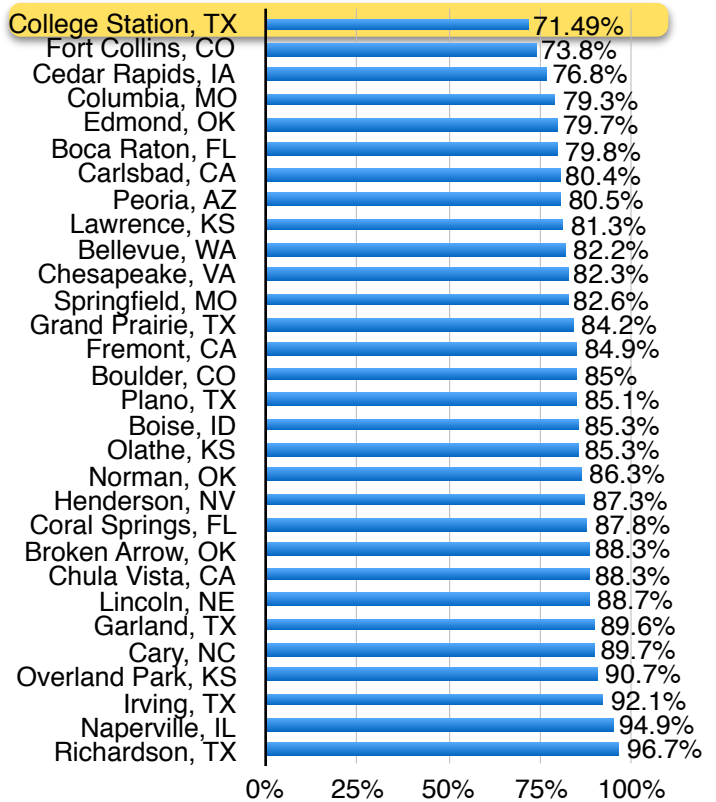
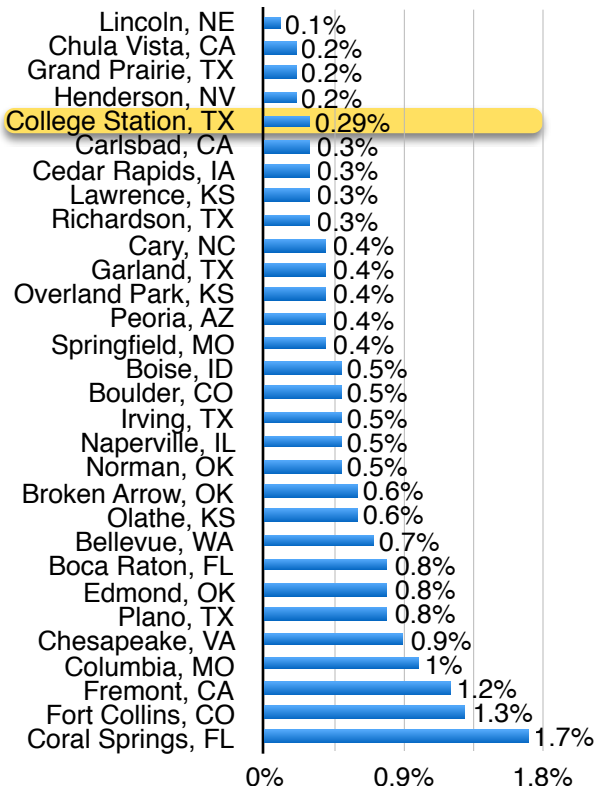


CHART 36.

Training costs as a % of department budget



Training Costs as a % of Dept Budget

The fourth economic benchmark was the training costs for each agency as a percentage of their department budget. This number was consistently low with all values below 1.75% of the overall department budgets. College Station was ranked in the top third once again with 0.29% of their total budget going to training costs. The average for the 30 benchmark cities was 0.58%.

Overtime Costs as a Percentage of Department Budget

The final economic benchmark was the overtime costs for each agency as a percentage of their department budget. This number can be driven by staffing shortages, unexpected events, natural or man-made disasters, improper schedules, or a number of other factors. The overtime costs for the College Station Police Department was 4.5% of their personnel budget for 2017. The average for the 29 benchmark cities was 3.93%.

CHART 37.

Overtime costs as a % of department budget

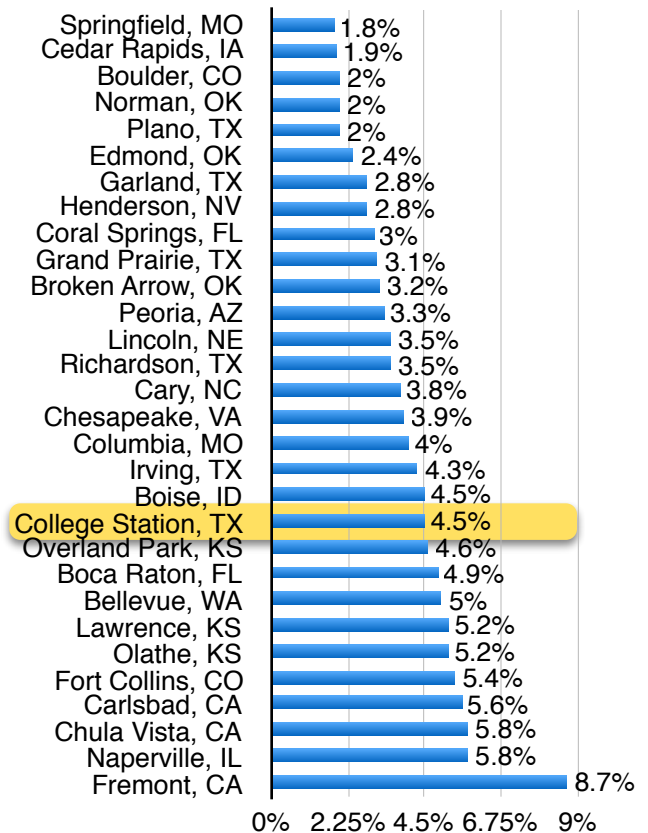


Chart 33 shows that the percentage of the City of College Station budget that is allocated to the Police Department fell in the middle of the 29 comparable cities. However, the cost of police services per citizen shown in Chart 34 was approximately \$60 less per person than the comparable agencies. Putting these two metrics together suggests a greater efficiency in the delivery of services to the citizens.

The CSPD overtime costs as a percentage of the police department budget, as shown in chart 37, was in the low end of the middle third. However, chart 35 shows that the percentage of the CSPD budget dedicated to personnel costs was lower than all 29 comparables. This could be explained by the agency's inability to fill authorized positions which created a liability on overtime to maintain operations.

Selecting Suitable Metrics from "Benchmark Cities"

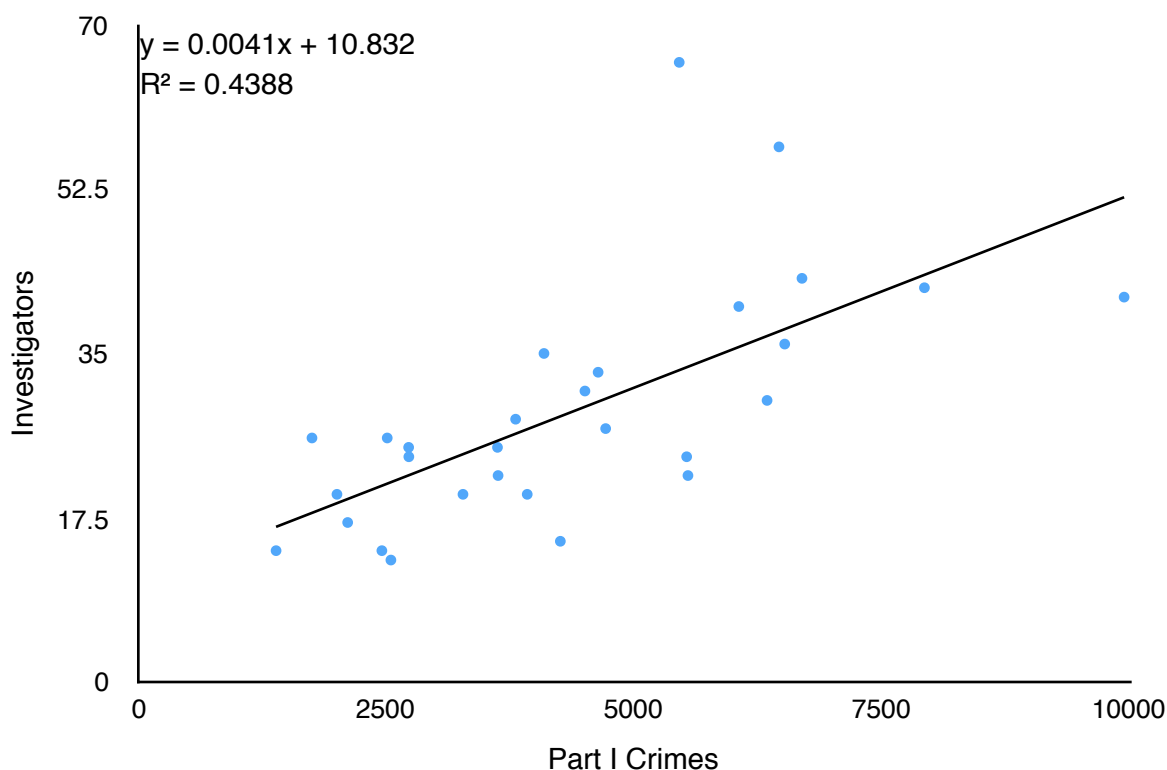
The choice of metrics was limited by the data available in the Benchmark City Survey as well as the logical applicability of each metric to the unit under analysis. While the goals of all law enforcement agencies may be similar, the way in which they accomplish those goals can vary widely. The CSPD may perform some services for their citizens that are not available in many of the benchmark cities. While measures could be taken to quantify such special services within the CSPD, comparable metrics for the same activity would not be available from the other 29 benchmark cities rendering the metrics unusable.

Multiple metrics contained in the survey that might have a correlation to the investigative workload were selected and tested for application. To calculate the reliability of each metric to determine staffing needs, an interactive scatterplot was used. The scatterplot allows each applicable metric in the database to be plotted against the investigative staffing levels of each agency in the 2017 Benchmark City Survey.

In the following example, the number of investigators in each benchmark city was plotted against their number of Part I crimes. The result is a scatterplot containing 29 points showing the relation of investigators to Part I crimes for each agency (Chart 38).

Chart 38.

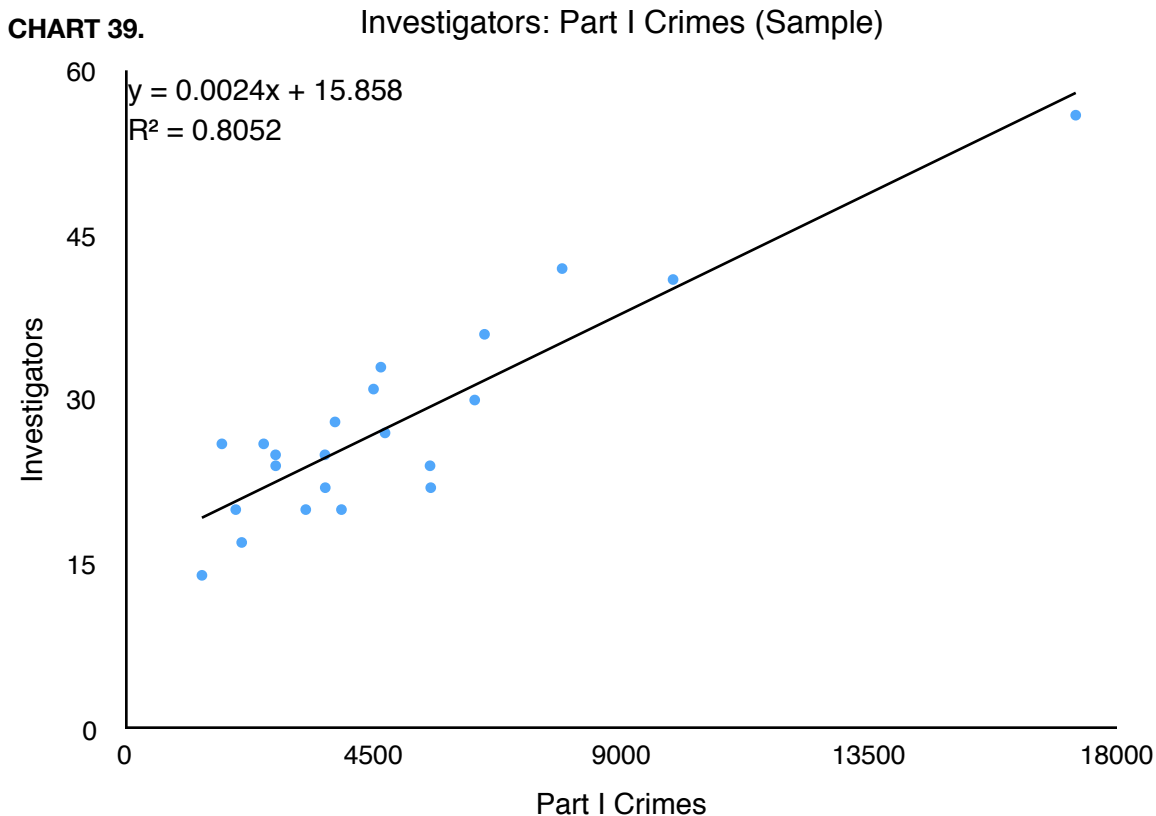
Investigators: Part I Crimes (Sample)



The line shown in the middle of Chart 38 is a linear regression trend line, or sometimes called a “best-fit” line between all points on the chart. For any “X” value, which in this case is the number of Part 1 Crimes, the trend line indicates the average number of investigator positions among the 29 benchmark agencies. The equation of the line is shown in the upper left area of the chart, $y = 0.0041x + 10.832$. This equation will yield the number of investigators required based on the number of Part I crimes occurring in the city if the agency wished to staff consistently with the average of all 30 benchmark cities.

The second variable shown in the upper left corner of the chart is a value for R^2 . The coefficient of determination (denoted by R^2) is a key output of regression analysis. It is interpreted as the proportion of the variance in the dependent variable that is predictable from the independent variable. The R^2 variable ranges from 0 to 1. An R^2 value of 0 means that the dependent variable, in this case the number of required

investigators, cannot be predicted from the independent variable, the number of Part 1 Crimes. An R^2 value of 1 means the dependent variable, the number of required investigators, can be predicted without error from the independent variable, the number of Part 1 Crimes. In Chart 38, the R^2 value is 0.4388 which means that 43.88% of the variance in investigators is predictable by the number of Part I crimes. For this study, comparable metrics were not considered valid until the R^2 value exceeded 0.8.



In Chart 39, 7 of the 29 comparable agencies were removed from the scatterplot based on the standard error of their regression. This changed the equation of the line, but more importantly, increased the R^2 value to a result greater than 0.8. Based on the R^2 value in Chart 39, the independent variable of Part I Crimes explained 80.52% of the variance in the dependent variable, the number of investigators assigned to the 22 agencies.

A number of metrics were tested for each unit under analysis in this study using an interactive scatterplot similar to Charts 38 and 39. The R^2 values were found for each metric and unit and then outlying agencies were deleted from the regression sample until an R^2 value greater than 0.8 was found. The 29 benchmark cities provided a large sample of data in which to test the coefficient of determination for each applicable metric. Since College Station falls within the range of the comparable cities, the benchmarking results should be directly applicable.

Charts 38 and 39 indicated the coefficient of determination (R^2) for a sample regression analysis. The R^2 value is typically considered to be the most important output of regression analysis. In this section of the report, a more detailed regression analysis

was conducted for each chosen metric. The following values were sought for each comparison:

- **R^2** – This value, also known as the “Coefficient of Determination” gives an indication of the overall regression accuracy by indicating how well the regression line approximates the real data. A lower threshold of 0.8 (80%) was set for this study.
- **r** – The Correlation Coefficient indicates the strength of the linear relationship. For example, a value of 1 means a perfect positive relationship, a value of -1 means a perfect inverse relationship, and a value of zero means no relationship at all. Values closer to 1 or -1 are preferred over values near 0. For this analysis, values of .9 or higher are deemed acceptable.
- **Significance F** – This indicates the probability that the Regression output could have been obtained by chance. A small Significance F confirms the validity of the Regression output. For example, if Significance F = 0.030, there is only a 3% chance that the regression output was merely a chance occurrence. Significance F values less than 0.001 are acceptable in this analysis.
- **P-value** – The P-Values of the variables provide the likelihood that they are real results and did not occur by chance. The lower the P-Value, the higher the likelihood that the coefficient is valid. For example, a P-Value of 0.016 for a regression coefficient indicates that there is only a 1.6% chance that the result occurred only as a result of chance. P-Values less than 0.001 are acceptable in this analysis.

For the CID, the workload metrics from the Benchmark City Survey producing the highest R^2 values were plotted on a scatterplot against the number of authorized investigators for each Benchmark City. A full regression analysis was then conducted on the metric and used to eliminate any agencies whose standard residual error was greater than two standard deviations. If the resulting regression model was acceptable for use, the equation of the regression line was used to calculate the necessary staffing required for the CSPD based on their own dependent metrics.

Four metrics were selected from the nationwide benchmarking survey that are believed to be potential predictors of workload for the Investigations Unit.

- Authorized Sworn Positions
- First Responders
- Part I Crimes
- Calls for Service

Investigative Positions : Authorized Sworn Positions

The number of investigator positions for the 29 comparable benchmark agencies were plotted against their number of authorized sworn positions. Four cities among the Benchmark Cities produced results found to be more than 2 standard deviations away from the trend line. These cities (Bellevue, Chesapeake, Plano, and Springfield) were removed from the sample and the analysis was repeated. The results from the remaining 25 comparable cities produced the scatterplot shown in Chart 40. According to the R^2 value, 83.62% of the variance in authorized investigator positions among the 28 benchmark cities can be predicted by their number of authorized sworn positions. The R^2 and r values shown in Table 17 indicate that the regression model has a high degree of accuracy using the sample data and that a strong linear relationship exists between the dependent and independent variables used. The low F and P values of the independent variable (authorized sworn positions) indicates practically no chance that the regression output was merely a chance occurrence.

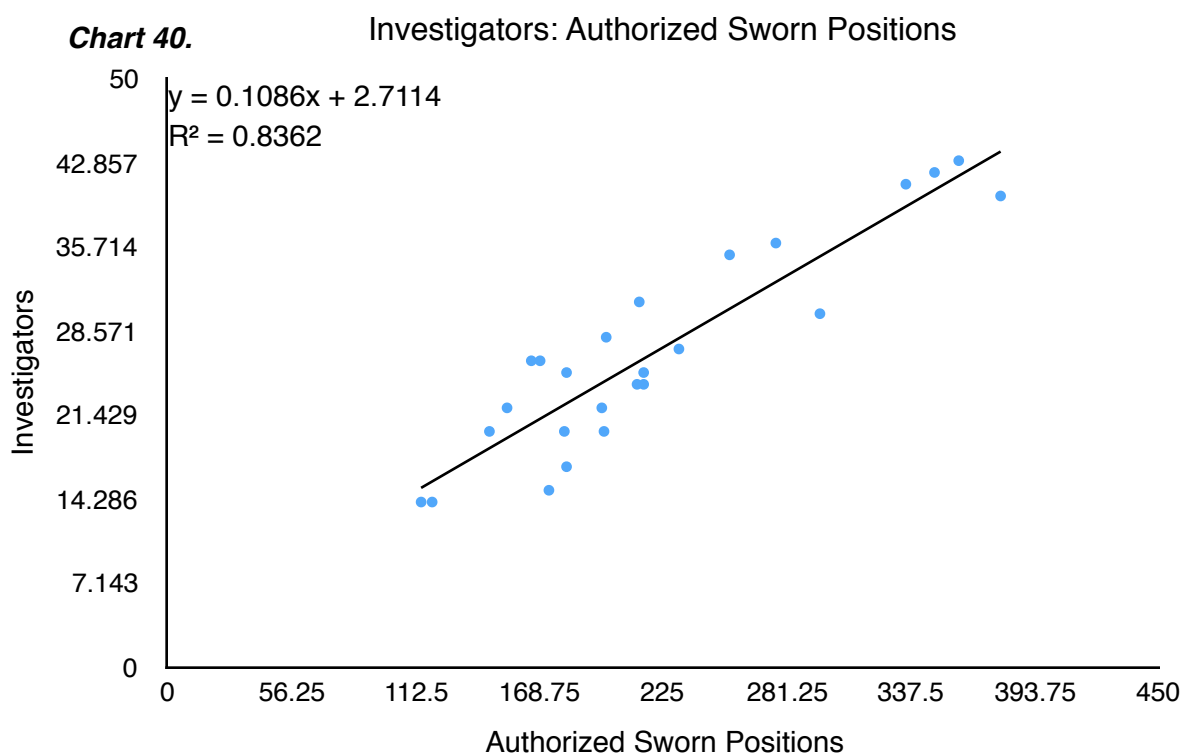


Table 17	Observed Value	Status
Coefficient of Determination (R^2)	0.8362	Acceptable (> 0.8)
Correlation Coefficient (r)	0.9145	Acceptable (> 0.9)
Significance F	1.6426E-10	Acceptable (< 0.001)
P-Value of metric	1.6426E-10	Acceptable (< 0.001)
<i>Regression Model Accepted as Valid</i>		

Using the equation for the regression line and the number of authorized sworn positions within the College Station Police Department (148), the number of recommended authorized investigative positions can be determined as followed.

$$y = 0.1086x + 2.7144 \text{ where "x" is the number of authorized sworn positions (148).}$$

$$y = (0.1086 * 148) + 2.7144 \text{ (substituting 148 for "x")}$$

$$y = 16.0728 + 2.7144 = 18.79 \text{ or } 19 \text{ authorized investigative positions}$$

Using authorized sworn staff as a predictor for authorized investigative staff creates a circular methodology since investigators are included in the authorized sworn staff total. The increase of 6 investigators would increase the total staff to 154. Rerunning the equation with 154 authorized sworn positions creates the following result:

$$y = 0.1086x + 2.7144 \text{ where "x" is the number of authorized sworn positions (154).}$$

$$y = (0.1086 * 154) + 2.7144 \text{ (substituting 154 for "x")}$$

$$y = 16.7244 + 2.7144 = 19.44 \text{ or } 19 \text{ authorized investigative positions}$$

Upon analysis, the recommended increase in investigator positions did not raise the total authorized sworn positions enough to activate a circular reference.

Investigative Positions : First Responders

The number of investigator positions for the 29 comparable benchmark agencies were plotted against their number of first responders. Seven cities among the Benchmark Cities produced results found to be more than 2 standard deviations away from the trend line. These cities (Bellevue, Boca Raton, Chesapeake, Fort Collins, Henderson, Plano, and Springfield) were removed from the sample and the analysis was repeated. The results from the remaining 22 comparable cities produced the scatterplot shown in Chart 41. According to the R^2 value, 84.10% of the variance in authorized investigator positions among the 22 benchmark cities can be predicted by their number of first responders. The R^2 and r values shown in Table 18 indicate that the regression model has a high degree of accuracy using the sample data and that a strong linear relationship exists between the dependent and independent variables used. The low F and P values of the independent variable (first responders) indicates practically no chance that the regression output was merely a chance occurrence.

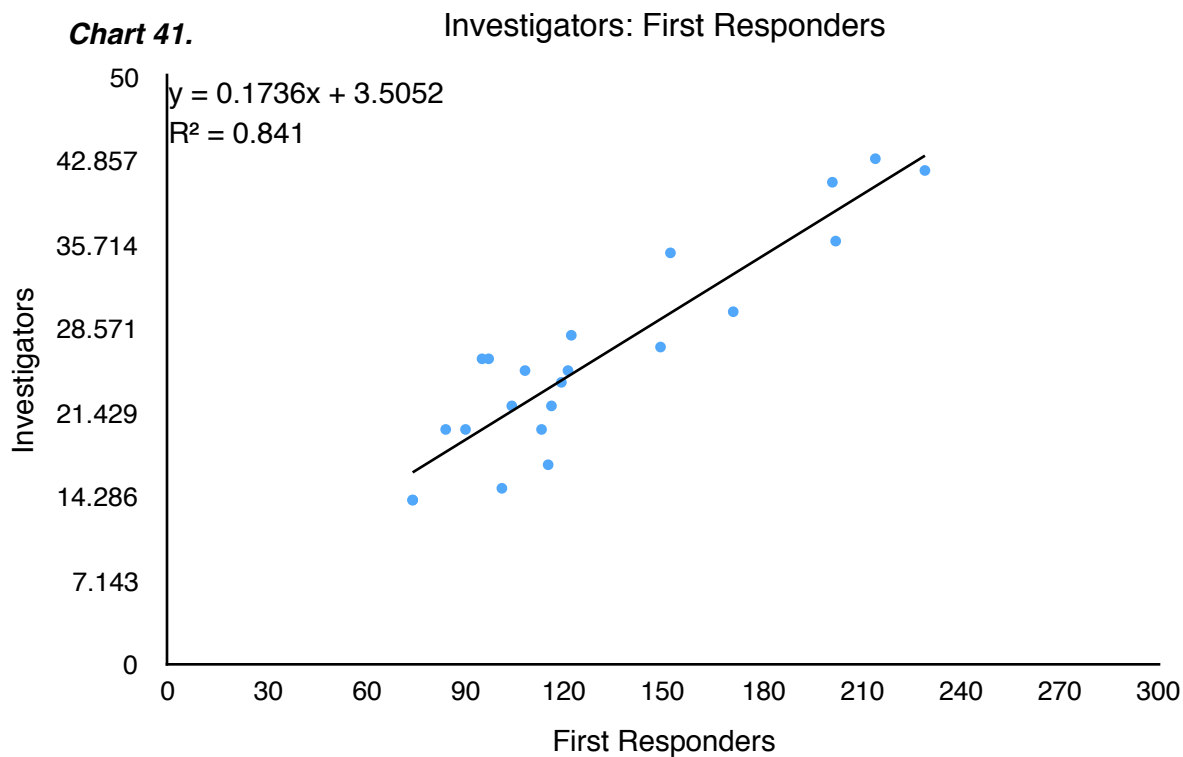


Table 18	Observed Value	Status
Coefficient of Determination (R^2)	0.841	Acceptable (> 0.8)
Correlation Coefficient (r)	0.917	Acceptable (> 0.9)
Significance F	1.9628E-09	Acceptable (< 0.001)
P-Value of metric	1.9628E-09	Acceptable (< 0.001)
Regression Model Accepted as Valid		

Using the equation for the regression line and the number of first responders within the College Station Police Department (87), the number of recommended authorized investigative positions can be determined as followed.

$y = 0.1736x + 3.5052$ where “x” is the number of first responders (87).

$y = (0.1736 * 87) + 3.5052$ (substituting 87 for “x”)

$y = 15.1032 + 3.5052 = 18.61$ or 19 authorized investigative positions

Investigative Positions : Part 1 Crimes

The number of investigator positions for the 29 comparable benchmark agencies were plotted against their number of part 1 crimes. Three cities among the Benchmark Cities produced results found to be more than 2 standard deviations away from the trend line. These cities (Chesapeake, Columbia, and Plano) were removed from the sample and the analysis was repeated. The results from the remaining 26 comparable cities produced the scatterplot shown in Chart 42. According to the R^2 value, 72.31% of the variance in authorized investigator positions among the 26 benchmark cities can be predicted by their number of Part 1 Crimes. The R^2 and r values shown in Table 19 indicate that the regression model has a relatively high degree of accuracy using the sample data and that a linear relationship exists between the dependent and independent variables used. The low F and P values of the independent variable (first responders) indicates practically no chance that the regression output was merely a chance occurrence. However, since the R^2 value did not reach the 0.8 threshold, this metric was not used for staffing recommendations.

Chart 42.

Investigators: Part 1 Crimes

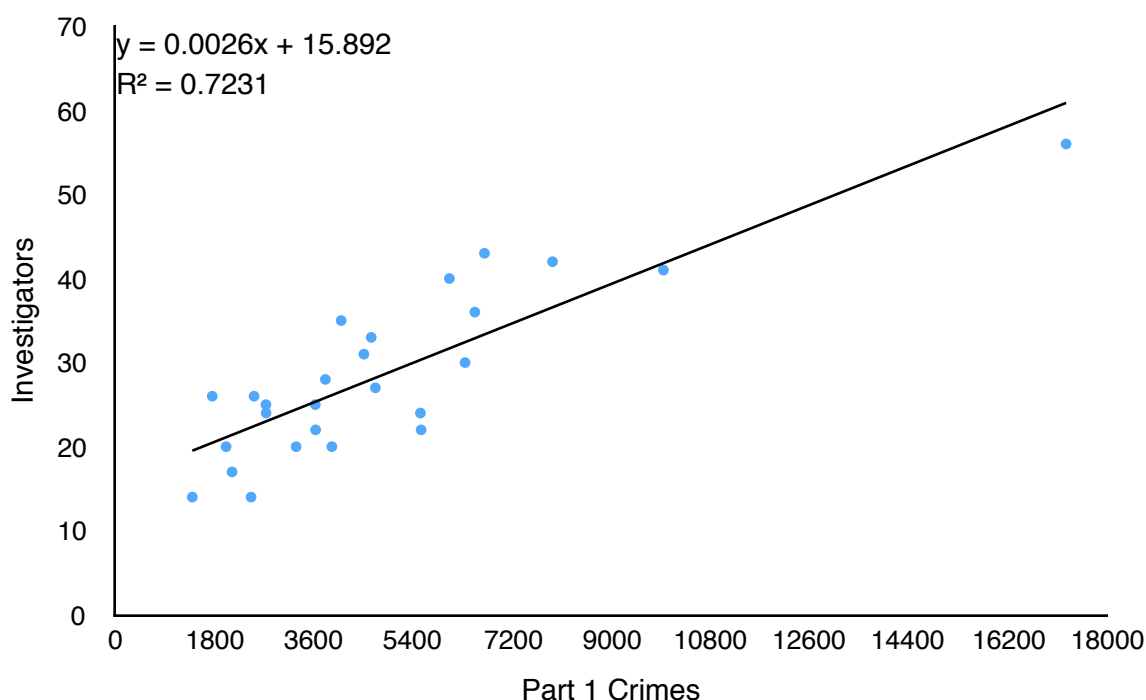


Table 19	Observed Value	Status
Coefficient of Determination (R^2)	0.7231	Acceptable (> 0.8)
Correlation Coefficient (r)	0.8503	Acceptable (> 0.9)
Significance F	3.8043E-08	Acceptable (< 0.001)
P-Value of metric	3.8043E-08	Acceptable (< 0.001)
Regression Model Not Accepted as Valid		

Using the equation for the regression line and the number of Part 1 Crimes within the College Station Police Department (2,548), the number of recommended authorized investigative positions can be determined as followed.

$$y = 0.0026x + 15.892 \text{ where "x" is the number of Part 1 Crimes (2,548).}$$

$$y = (0.0026 * 2,548) + 15.892 \text{ (substituting 2,548 for "x")}$$

$$y = 6.6248 + 15.892 = 22.52 \text{ or } 23 \text{ authorized investigative positions}$$

This number was somewhat higher than the estimates based on the number of authorized sworn positions and the number of first responders. This observance is likely due to the lower coefficient of determination (R^2) for Part 1 Crimes providing less reliable results.

Investigative Positions : Calls for Service

The number of investigator positions for the 29 comparable benchmark agencies were plotted against their number of calls for service. Five cities among the Benchmark Cities produced results found to be more than 2 standard deviations away from the trend line. These cities (Chesapeake, Columbia, Norman, Plano, and Springfield) were removed from the sample and the analysis was repeated. The results from the remaining 24 comparable cities produced the scatterplot shown in Chart 43. According to the R^2 value, 62.74% of the variance in authorized investigator positions among the 24 benchmark cities can be predicted by their number of calls for service. The R^2 and r values shown in Table 20 indicate that the regression model has a moderate degree of accuracy using the sample data and that a moderately linear relationship exists between the dependent and independent variables used. The low F and P values of the independent variable (calls for service) indicates practically no chance that the regression output was merely a chance occurrence. However, since the R^2 value did not reach the 0.8 threshold, this metric was not used for staffing recommendations.

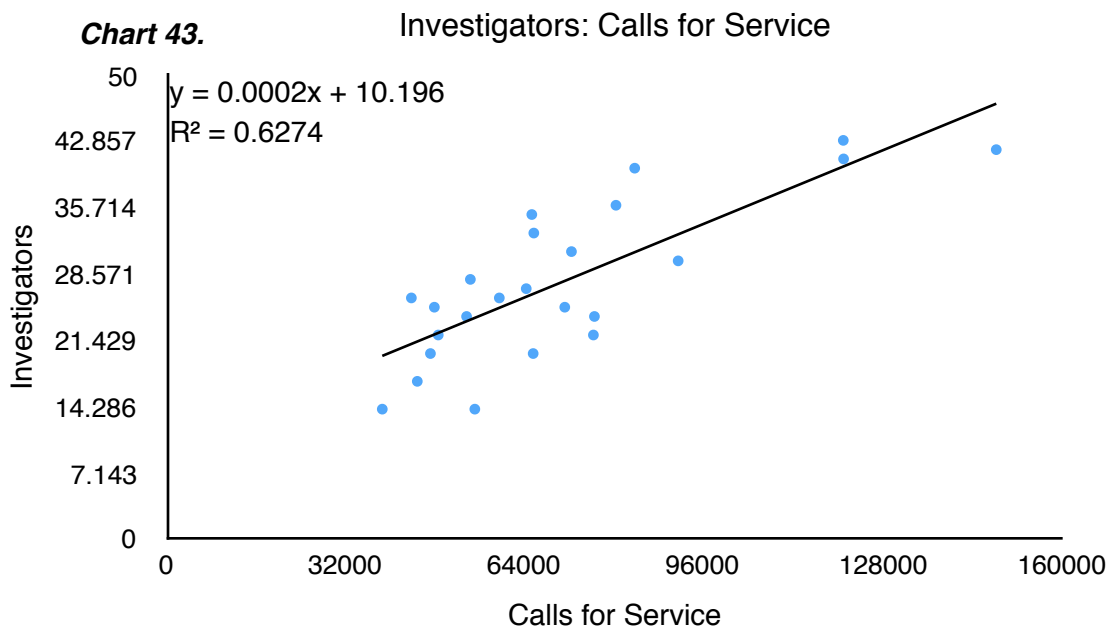


Table 20	Observed Value	Status
Coefficient of Determination (R²)	0.6274	Acceptable (> 0.8)
Correlation Coefficient (r)	0.7921	Acceptable (> 0.9)
Significance F	3.9829E-06	Acceptable (< 0.001)
P-Value of metric	3.9829E-06	Acceptable (< 0.001)
	Regression Model Not Accepted as Valid	

Using the equation for the regression line and the number of calls for service within the College Station Police Department (59,349), the number of recommended authorized investigative positions can be determined as followed.

$$y = 0.0002x + 10.196 \text{ where "x" is the number of calls for service (59,349).}$$

$$y = (0.0002 * 59,349) + 10.196 \text{ (substituting 59,349 for "x")}$$

$$y = 11.8698 + 10.196 = 22.07 \text{ or } 22 \text{ authorized investigative positions}$$

This number was also somewhat higher than the estimates based on the number of authorized sworn positions and the number of first responders. This observance is likely due to the lower coefficient of determination (R²) for calls for service providing less reliable results.

The number of narcotics investigators were recorded separately in the Benchmark City Survey. The final number of authorized positions were for criminal investigators only. All available metrics were tested in an attempt to find a usable metric for determining the number of narcotics officers but none could be found. The results of all metrics tested returned R2 values of less than .5 which was deemed unreliable.

Summary

This analysis looked at the workload of the Criminal Investigations Division from three separate perspectives.

- The analysis of historical workload documents disclosed that division commanders have been requesting staff for many years. As the years progressed, the requests for additional staff became more urgent and more assertive. The addition of two police assistant positions has provided some relieve for the investigators and increased the productivity of the division. Two volunteers have provided tremendous assistance to the division and have become crucial members of the team. There has also been numerous requests from the division commander to increase the staffing in the SIU to six investigators and one sergeant.

Monthly statistics showed the number of cases sent to the CID Commander for review increasing over the last five years (Chart 17) while the percentage of those cases assigned to detectives for investigation has decreased (Chart 20). This supports a lack of sufficient staffing to handle the number of cases that could potentially be assigned or it could indicate that fewer cases require follow-up by

investigators. Given the staffing levels in patrol, the former hypothesis seems more likely. Chart 19 showed that the number of cases assigned to investigators has not changed over the last five years. Additional positions within the division (Chart 16) has caused a slight drop in the number of cases assigned per investigator (Chart 18) but this could be offset by the increasing time required to handle cases. Chart 21 shows that the clearance rate by arrest, unfounded, or exceptionally cleared dispositions have been declining over the last five years.

The historical workload analysis shows an increasing workload that is outpacing the increase in staffing. The trend in the referenced workload charts support additional staffing but provide little insight on the type of staff or the exact number of additional positions needed.

- A 14-week snapshot of current practices provided some insight regarding how time is being spent by members of the CID. Investigators in the Property Unit were spending 65% of their time on tasks primary to their investigative duties. Crimes against Persons investigators were spending 56% on primary tasks. SIU investigators recorded 61% of their time on primary tasks related to their unit's mission. Police assistants recorded 81% of their time on primary tasks. The Property Crimes Sergeant and Crimes Against Persons Sergeant recorded 51% of their time on case work related activities performed by their subordinates.

The results of the current practices snapshot indicates that members of the CID are on task consistent with the mission of the division. The amount of special assignments were very low compared to other studies done by this researcher. The amount of training time by some units may be having an effect on time spent on task. However, the training time may be needed for other services provided to the citizens of College Station such as a skilled and competent SWAT team, skilled and competent hostage negotiators, or a highly trained bomb team that can safely contain a hazardous explosive. Therefore, while training may be taking away from time to investigate cases in some circumstances, it should not be considered wasted time.

The snapshot revealed that sergeants are spending a large portion of their time on investigations. If staffing were higher in the CID, sergeants would be allowed a greater amount of time for administration and supervision.

The amount of time spent on primary tasks by police assistants was surprising. However, based on less required training and less leave time, it is very possible that police assistants have fewer distractions on their time. If the abilities of the police assistants and their status as a non-sworn employee do not prevent them from performing too many tasks, then police assistants appear to be a very cost-effective addition to the division.

Finally, the workload snapshot showed a large amount of work being performed by volunteers within the CID that would otherwise have to be done by paid staff. This is a great benefit to the agency but plans must be in place to take over the work being performed should the volunteers become unavailable.

- The third perspective used for evaluation of the CID staffing was a benchmarking analysis. The CSPD was found to be comparable to the majority of the 29 cities who participate in the Benchmark City Survey. Four different metrics were used to draw comparisons between the investigative staffing of the CSPD and the average

investigative staffing of the 29 comparable cities. Two metrics, fully authorized staff and first responders, were found to be statistically reliable in predicting staffing levels for criminal investigators. The results of both metrics indicated that the CSPD would need 19 authorized investigator positions if they wanted to be staffed consistently with the benchmark cities. There were no suitable metrics found to estimate narcotics officers (SIU members).

Combining the insights from the three different analysis perspectives, the following conclusion could be made. The historic workload shows that the CID workload is increasing but the increase in staffing is not keeping pace. The historic workload also shows that a smaller percentage of cases are being assigned and that clearance rates are decreasing. The snapshot analysis demonstrates that the employees in the unit are on task with their primary duties and that special assignments are not taking them away from their mission. The snapshot also indicates that police assistants provide a good return on investment and that the reliance on volunteers creates an unfunded expectation for future work completion. The benchmark analysis indicates that in order for the CSPD CID to be staffed consistently with other agencies across the country, the agency would have to staff approximately 19 criminal investigators in the division. This does not include evidence technicians, crime scene technicians, victim advocates, narcotics officers, administrative assistants, or supervisors.

Recommendations

Accounting and Accountability

Report Writing

The need for better documentation of report writing times was described earlier in this report as a limitation of the CAD data. In past studies, Etico Solutions has recommended the use of “out of service” codes in the CAD system to properly document report writing times. This option is already available to the officers but is not being used consistently. Officers have the ability to set their status to either “available” or “unavailable” while on a report writing status. Each out-of-service code in the Inform system allows at least one text line that is inserted in the comment field of the Unit History table. Before an officer begins any report, they should call out on one of the two out-of-service codes, either to a tele-communicator or by a shortcut key on their in-car computers. If the officer is writing the report in the field and chooses to remain available for any calls in their district, they would be put on “Report – Available” status. If the officer is staying past their normal duty hours to finish reports, they would be placed on “Report – Unavailable” status. For each report written, the officer should create a separate “reporting” record in the CAD so that the time spent on each report can be differentiated. In addition, the case number for the report being written must be inserted into the text field of the out-of-service event so that it can be associated back to the nature of event at the end of the year. This type of detailed accounting not only documents how much time is being spent writing reports but it can also tie report writing times to specific types of cases and forecasted in future years based on the offense type forecasts.

For this report, a group of 14 CSPD employees were asked to assist in providing estimated times for report writing and evidence processing for the agency. The team was selected by the day shift patrol lieutenant to get a varied sample of officers. Officers were asked to enter what they believed to be an average time for report writing for calls for service into a spreadsheet of calls for service codes. Each team member’s entry was aggregated together and an average was obtained. That recorded average time was then used in this report to estimate report writing times. The results represent an educated guess at the true time required for these activities. If out-of-service codes are implemented and officers are held accountable to document times, the actual time spent on report writing, as well as evidence processing, could be determined in future years.

It is recommended that the agency continue to encourage the documentation of all work activities after this study is completed. Most importantly, the need for documenting report writing times should be emphasized with the officers and the proper format for recording time spent on report writing should be monitored to reduce unusable results.

Follow Up

The agency currently has an event code for “FOLLOW UP”. Over the last five years, the code has been used an average of about 5,300 time per year. Since this is an event code, it counts the same as a burglary, an assault, or any other call for service. However, “follow up” is conducted pursuant to some other event that has already been recorded in the CAD. If an officer responds to a burglary call, the dispatcher will create an event for burglary to record the activity. If the officer conducts follow up on the

burglary later that week, another event is created in the CAD under “follow up”. If the officer conducts four follow up activities on the burglary, a total of five CAD events are created instead of just one for the burglary. It would be a better collection practice to create an out-of-service code similar to the report writing code. If an officer chooses to conduct some follow up activity, they should put themselves on the appropriate out-of-service code and indicate the case number subject to the follow up activity. Instilling this habit would provide a more accurate account of calls for service and allow follow up time to be tracked by case number or incident type.

Light Duty Injury Assignments

When a patrol officer is placed on light duty and given a temporary reassignment in another division, it increases the minutes of reactive time per hour of the remaining patrol officers and creates a need for a higher shift relief factor and a larger patrol staff size. It is recommended that whenever possible, officers on light duty should be reassigned within the Patrol Division on tasks that are still within the patrol mission. If such positions are not available within patrol, the time spent on reassignment to other divisions must be properly documented. This can be done in the agency’s Kronos system with the creation of a few additional codes. In a similar fashion, the time that officers spend on reassignments to other divisions, not related to light duty, must also be properly documented for use in future staffing studies.

CAD Data

Accurately recording events handled by the agency involves clear communication and a clear understanding of when to use the various incident types. An argument between family members may be titled “domestic disturbance” by one responder and “civil disturbance” by another. The CAD event type list contains codes of “close patrol”, “directed patrol”, and “directed traffic patrol.” Without careful training of new officers, it may be very easy to mix up these three types of events. The CAD contains a type code of “ordinance violation” as well as a second code of “ordinance violation other.” When would “ordinance violation other” be used in place of “ordinance violation”?

The best way to resolve the issue of unclear type codes is to go through the entire list, one type code at a time, and define the activity as proactive or reactive, define the person who handles the call most often (tele-communicator, patrol officer, traffic officer, animal control, etc), and define the type of situation where each type code would be appropriate. If the answers to these questions are not clear, the category may need to be broken into multiple categories or subcategories to enable better data analysis in future years.

Finally, comprehensive training on workload documentation is highly recommended for the officers and the tele-communicators. If the officers and dispatchers understand why the data is being collected and how it will be used in the future, there is a greater chance of successfully improving the collection process.

Patrol Staffing

A forecast of the Patrol Bureau’s workload and officer availability based on 2013–2017 data indicates that in 2019, patrol officers will be spending approximately 39.7 minutes out of each hour on reactive activities. This leaves 20.3 minutes out of

each patrol hour for proactive activities such as community contacts, foot patrol, S.T.E.P. enforcement, and other administrative duties.

In keeping with the practices of Northwestern University's Center for Public Safety and the International Association of Chiefs of Police, Etico Solutions consistently advises agencies to strive for an even split of proactive and reactive time per hour. To reach an even split of proactive and reactive time per hour in 2019, the agency would need 79 patrol officers assigned to patrol. This is an increase of sixteen additional officers to the current Patrol Division staffing. If patrol sergeants were to be relieved of assisting on calls for service in order to remain available for supervision, another four officers would be required taking the total to 83 patrol officers. This estimate does not include CSTEP officers, traffic officers, or police assistants.

In 2020, the total patrol officer need is estimated to increase to 84 patrol officers if sergeants continue to assist on calls. Without sergeants, the estimated need in 2020 is 88 patrol officers. This is an increase of five patrol officers from 2019.

In 2021, the total patrol officer need is estimated to increase to 89 patrol officers if sergeants continue to assist on calls. Without sergeants, the estimated need in 2021 is 95 patrol officers. This is an increase of seven patrol officers from 2020.

Beat Realignment

An earlier section of this report entitled "Beat Optimization" detailed a plan for optimizing the current eight beat design. Two new designs, an eight beat and a twelve beat plan, were created with .54% and .53% deviation in workload among the heaviest and lightest districts respectively. It is recommended that one of the new district plans described in the Beat Optimization section be implemented soon. Equalizing workload among the districts is a win/win since it evens the workload for the officers and improves performance for the agency. Equalized workloads lead to lower response times, less call-stacking in the areas that had the higher call volumes, and a reduced probability of saturation.

Resource Deployment

A number of work schedule improvements for the Patrol Division were provided in the Resource Deployment section of this report. All recommendations created a higher efficiency index than the current schedule but had differing effects on characteristics such as unity of command, team integrity and schedule equity.

The first alternative retained the existing 12-hour and 10-hour duty cycle schedules but changed the staffing levels on the shifts. Ten officers were moved to the 6 am shift to address the workload that is occurring during the morning and early afternoon hours. Five officers were taken from the afternoon shifts and five officers were taken from the night shifts. This change resulted in an efficiency increase of 8.98% over the current schedule.

The second alternative retained the existing duty cycle schedules but changed the start times for many of the shifts. Starting times for the two day shift teams were moved back to 6:30 am and 7:30 am respectively. Night shifts and the CSTEP unit were moved back to 6:30 pm and 7:30 pm respectively to correspond with the day shift changes. The afternoon teams and K-9 units were moved back to a 5:00 pm start time. All changes were made to realign the start times with the times when the workload curve

was changing significantly. This change resulted in an efficiency increase of 12.11% over the current schedule.

The third alternative kept the same duty cycle schedules and the modified start times from the second alternative. However, instead of using a squad-system for the 10-hour shifts, the days off were distributed across the week. This created greater flexibility to vary staffing proportionally to workload by day of week. This change resulted in an efficiency increase of 13.85% over the current schedule. While this is the highest efficiency of any proposed schedule, it comes at the cost of team integrity and unity of command for the 10-hour shifts and may not be worth the extra 1.74% efficiency gain.

The final schedule alternative keeps the 12-hour day shift and night shift starting at 7:30 am and 7:30 pm respectively. The two K-9 units remain on the 10-hour schedule working from 5 pm to 3 am on the current days off. CSTEP officers work their current Thursday, Friday, and Saturday nights from 6:30 pm to 6:30 am. The biggest change in this schedule is the departure from the traditional “4 on – 3 off” 10-hour shift to a “2(5 on – 4 off) – 5 on – 5 off” locked rotating schedule using a 10 hour and forty minute shift length. The current afternoon shifts would be converted to power shifts starting at 6:30 am and 4:30 pm each day. This schedule would bring complete schedule equity, complete team integrity, and complete unity of command to the power shifts while improving the current schedule efficiency by 12.53%.

Change is hard for many agencies and moving away from the current 10-hour schedule could be uncomfortable for many officers. If the overwhelming majority of the Patrol Division staff wish to stay with the 10-hour shift, it is recommended that the agency change to the second alternate schedule listed in the report. The increase in efficiencies should show immediate cost savings in overtime. If the officers are willing to try the 10:40 schedule, the improvement in efficiency and the long off-duty periods for the officers could be a win/win.

Recruiting and Training

As the agency grows, the Recruiting and Training Division must also grow. The duties and workload of the division was described in detail in this report. The increase in hiring and testing processes has to be completed by somebody. Relying on other divisions of the CSPD to assist in the workload of the R&T Division should be used as a stop-gap under exceptional circumstances. Since there has been a clear reliance on other units for many years, the agency is encouraged to increase the staffing level within the R&T Division with a second police assistant and a third Training Officer in order to reduce the switching costs that are likely occurring. Additional staffing would also allow the division trainers to seek new skills in their areas of expertise and to remain current in their instruction.

Criminal Investigations Division

At the present time, the unit has 13 sworn investigators and 2 police assistants. Based on this analysis, it is recommended that the CSPD add four additional positions to the CID in the form of two additional police assistants and two sworn investigators. While there has been many requests for additional positions in the SIU, the data does not indicate the obvious presence of a need for additional staff at this time.

Summary

The observations and recommendations documented and proposed in this report are believed to be in the best interest of the organization as a whole. Viewed from an individual perspective, a single recommendation may bring relief to one employee and perceived hardship to another. Andrew Carnegie once wrote, “teamwork is the ability to work together toward a common vision. The ability to direct individual accomplishments toward organizational objectives. It is the fuel that allows common people to attain uncommon results.”

The results of the study showed that the Patrol Division is spending more than the recommended amount of time per hour on reactive activities. To bring the reactive time and proactive time per hour to an even split, the agency will need to increase their staffing in 2019 by approximately 16 positions to a total staff size of 79 patrol officers. In order to free up sergeants from calls for service so they can properly supervise, a total of 20 positions would need to be added taking the total staff size to 83. In 2020, this number is expected to increase by five additional positions. In 2021, the estimated total staff will rise another seven positions to a total staff size of 95 patrol officers. In order to maintain proper spans of control, especially for the number of new and potentially young officers coming on board, the number of first-line supervisors and managers will also need to grow accordingly.

Some improvement can be made without adding additional personnel. Implementing a new beat plan that equalizes the workload among all beats should help to equalize the response times throughout the city. Equal beat workloads will also equalize the workload for the officers and could lead to a decreased need for overtime. The current work schedule also has room for improvement if start times were changed and the number of officers per shift was distributed proportionally to workload. Moving away from the traditional 4-on 3-off 10-hour shift to a locked rotating shift would eliminate double staffing on Thursdays and reallocate more officer time to patrol duties.

This study looked at staffing needs in a way that is probably quite different from past methods of determining staffing. Some of the data that was needed for this study was not available at the time this study was conducted. Methods to obtain such data have been included in this report. The path has been paved to repeat this study in future years using the included spreadsheets and the methodology explained in this report. With time and careful attention to developing collection needs, the results of this process will get increasingly more accurate. The agency is encouraged not to abandon the process. When resources are challenged, this staffing methodology can create a firm foundation on which to build a cause for adequate patrol staffing but only if the officers are continually required to document their work.

In times of economic scarcity, “that’s the way we have always done it” is no longer a viable management model. This research study, with its accompanied results, should serve as a model for future data-based staffing studies.



Legislation Details (With Text)

File #:	19-0160	Version:	1	Name:	2018 Existing Conditions Report
Type:	Presentation	Status:		Status:	Agenda Ready
File created:	3/26/2019	In control:		In control:	City Council Workshop
On agenda:	4/11/2019	Final action:		Final action:	
Title:	Presentation, discussion, and possible action regarding the 2018 Existing Conditions Report.				
Sponsors:	Justin Golbabai				
Indexes:					
Code sections:					
Attachments:					

Date	Ver.	Action By	Action	Result
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Presentation, discussion, and possible action regarding the 2018 Existing Conditions Report.

Relationship to Strategic Goals:

- Good Governance
- Financially Sustainable City
- Core Services and Infrastructure
- Neighborhood Integrity
- Diverse Growing Economy
- Improving Mobility
- Sustainable City

Recommendation: Staff recommends that Council receive the information and provide feedback, as appropriate.

Summary: This presentation is an overview of the City of College Station's 2018 Existing Conditions Report. The report kicks off the Comprehensive Plan update process by providing an overview of College Station's existing conditions for the natural environment, demographics, economic development, land use, public facilities, and transportation. An online copy of the report can be found at <http://cstx.gov/Modules/ShowDocument.aspx?documentid=26802>.

Budget & Financial Summary: N/A

Attachments: None



Legislation Details (With Text)

File #: 19-0172 **Version:** 1 **Name:**

Type: Presentation **Status:** Agenda Ready

File created: 4/2/2019 **In control:** City Council Workshop

On agenda: 4/11/2019 **Final action:**

Title: Presentation, discussion, and possible action on a report on the status of the Wolf Pen Creek Corridor.

Sponsors: Jeff Kersten

Indexes:

Code sections:

Attachments:

Date	Ver.	Action By	Action	Result
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Presentation, discussion, and possible action on a report on the status of the Wolf Pen Creek Corridor.

Recommendation(s): Staff recommends Council receive the report and provide direction.

Summary: Councilman Maloney requested a future agenda item to discuss the status of the Wolf Pen Creek Corridor.

Budget & Financial Summary: The City has made a significant investment in the Wolf Pen Creek Corridor over the last 30 years.

Legal Review:

Attachments: