Alaska State Troopers B Detachment Patrol Staffing Study and Description of Dispatched Police Incidents

Rev. February 22, 2018

Alaska State Troopers
B Detachment Patrol Staffing Study
and
Description of Dispatched Police Incidents

Prepared for the
Alaska Department of Public Safety

by

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Executive summary

This purpose of this study is to provide a workload-based staffing model for police patrol in B Detachment of the Alaska State Troopers. Based on the hour-of-day pattern of obligated Troopers — the number of Troopers who are busy at any given time — the optimal staffing model for the Mat-Su West Post and Palmer Post is one that provides a base level of at least five Troopers available to service citizen-initiated incidents per shift on two 12-hour shifts, 0600-1800 and 1800-0600, plus a third 12-hour shift from 1300-0100 to handle peak demand with three Troopers. This three 12-hour shift schedule provides 8 Troopers during peak times, which is sufficient staffing to handle the median call volume for years 2013-2015 and meet a target of 60% obligated time, while also not overstaffing low-demand times. The Glennallen Post requires an additional two Troopers per shift.

After including leave and shift-relief, B Detachment requires 54 Troopers assigned to routine patrol. In addition, eight Sergeants, two Lieutenants, and one Captain are needed. For the past several years, B Detachment has staffed an additional Crime Suppression Unit with three Troopers and one Sergeant. One Trooper and one Sergeant are assigned to Judicial Services. **This brings the total recommended B Detachment compliment to 58 Troopers, 10 Sergeants, two Lieutenants, and one Captain: a total of 71 sworn staff.**

This is an increase of 26 sworn staff, or 57.8% of the August 2017 sworn staff of 45 (35 Troopers, seven Sergeants, two Lieutenants, and one Captain). Implementing this increase in sworn staff requires a multiyear, sustained effort to both retain existing Troopers and recruit new Troopers.

This study also sought to describe the pattern of police incidents in B Detachment. Over the study period, from 2009 through 2015, Alaska State Troopers and Alaska Wildlife Troopers responded to an average of 48,000 incidents per year. Incidents peak between 1400 hours and 2200 hours Thursday through Saturday.

While incident counts have stayed stable over the study period, the number of Trooper-hours spent on incidents has increased 14.7%. This increase is not uniform across incident types, with increases of Trooper-hours spent on follow-up investigations, assist public incidents, and court order service/violation. Trooper-hours spent on property crime also increased sharply in 2015, particularly burglary and vehicle theft. Trooper-hours spent on disorder, violence, and motor vehicle collisions were flat. Time spent on traffic stops has declined, which is confirmation of the staffing analysis finding that B Detachment Troopers are over-utilized. As non-discretionary incidents have increased, discretionary incidents have decreased.

Introduction

There are approximately 18,000 state and local police departments in the United States. There is no industry-standard or widely-accepted simple formula for determining the number of sworn patrol staff needed by a policing agency in the United States. Older staffing studies (prior to the 1990's) frequently used the ratio of sworn police staff to residential population. While such a calculation is simple, it cannot adjust for (among other things) non-residential populations, seasonal populations, different demands on police agencies by different local communities, and differential demand for police services by particular sub-populations within a jurisdiction. Such ratios vary widely, with a nation-wide average of 1.6 officers per 1,000 residents for cities with 50,000-99,999 population in 2015. In the Pacific region (Alaska, California, Hawaii, Oregon, and Washington), the average was lower: 1.1 officers per 1,000 residents.[1]

Over time, policing scholars and police agencies recognized that optimal police staffing is determined by a set of contextual factors including citizen demand for service, state law, agency policies, agency goals, and operational realities in the field. Modern staffing studies are generally based on an analysis of historical citizen demand for service and explicit assumptions about how other factors impact the number of sworn staff needed. This method is more complex to calculate and communicate than a simple ratio of police to population, but it comes with two distinct advantages. Because it is based on actual demand for police services, a workload-based method explicitly includes how the local community has used police services in the recent past. This method also makes all of its assumptions explicit, which allows agencies to examine agency policy and priorities.

This study has two purposes. The primary purpose is to provide a workload-driven patrol staffing model for the Alaska State Troopers in B Detachment that blends data-derived estimates of citizen demand for police services with reasonable and explicit goals for how Troopers should spend their time. The secondary purpose is to describe the citizen demand for police services within the B Detachment response area, including changes in demand for service over time.

B Detachment description and staffing as of August 2017

The Alaska State Troopers provide general policing services for the State of Alaska. The Alaska State Troopers divide the state into five service areas called *detachments* (A, B, C, D, and E). Management of each detachment is largely decentralized. Citizen demand for service, environmental conditions, and work style varies considerably among the detachments. Staffing analyses of each detachment would require different methods in each detachment. This report provides an examination of *only* B Detachment.

[1] Population and officer estimates from Table 71 of Crime in the United States 2015, available at https://ucr.fbi.gov/crime-in-the-u.s/2015/crime-in-the-u.s.-2015/tables/table-71.

Alaska State Troopers provide service in unincorporated areas of the state.[2] B Detachment's service area is a large part of the Matanuska-Susitna Borough and portions of the Valdez-Cordova Census Area along the Richardson Highway. B Detachment Troopers are dispatched by MatCom, a police radio dispatch and citizen call center operated by the Wasilla Police Department. MatCom provided the computer-aided dispatch data used in this report at the request of the Department of Public Safety. MatCom staff also provided assistance in interpreting the data provided.

In 2015, Troopers in B Detachment were routinely dispatched over an area of about 20,000 square miles containing 2,250 miles of roadways, shown in Figure 1. Additional incidents occasionally occur in more remote areas not shown in Figure 1. B Detachment's routine service area is nearly the size of the state of West Virginia (24,000 square miles). Municipal police departments in Wasilla and Palmer cover approximately 30 square miles within B Detachment's service area, but the majority of the B Detachment incident volume occurs near these municipal areas. From 2010 to 2016, the approximate population served by B Detachment in the Mat-Su has increased 16.5% (from 75,227 to 87,626).[3]

As of 1 August 2017, the staffing at B Detachment is a total of 45 sworn staff: 35 Troopers, seven line-level supervisors (Sergeants), and three commanders (two Lieutenants and one Captain)[4] as shown in Table 1. The Mat-Su and Palmer Posts share a schedule, with 28 Troopers assigned to general patrol on four teams. Teams 1-4 operate on 12-hour shifts from 0600-1800 and 1800-0600. These four teams work seven days out of each 14-day period, on a four days on / three off / three on / four off schedule. These teams handle approximately 95% of the B Detachment patrol incidents during the study period (2009-2015).

The Glennallen Post has three Troopers and a Sergeant who work more flexible schedules, including substantial numbers of hours on stand-by.

[2] In most other states, this work is done by county sheriffs. Compared to agencies nation-wide, B Detachment's workload and service area are most similar to a suburban county sheriff's department surrounded by large rural areas — with the notable difference that B Detachment's rural areas are larger than the total area of nine states.

[3] Annual population estimates exclude Wasilla and Palmer population. Population data sourced from the Alaska Department of Labor and Workforce Development Alaska Population Estimates, http://live.laborstats.alaska.gov/pop/.

[4] B Detachment also supervises seven Court Services Officers.

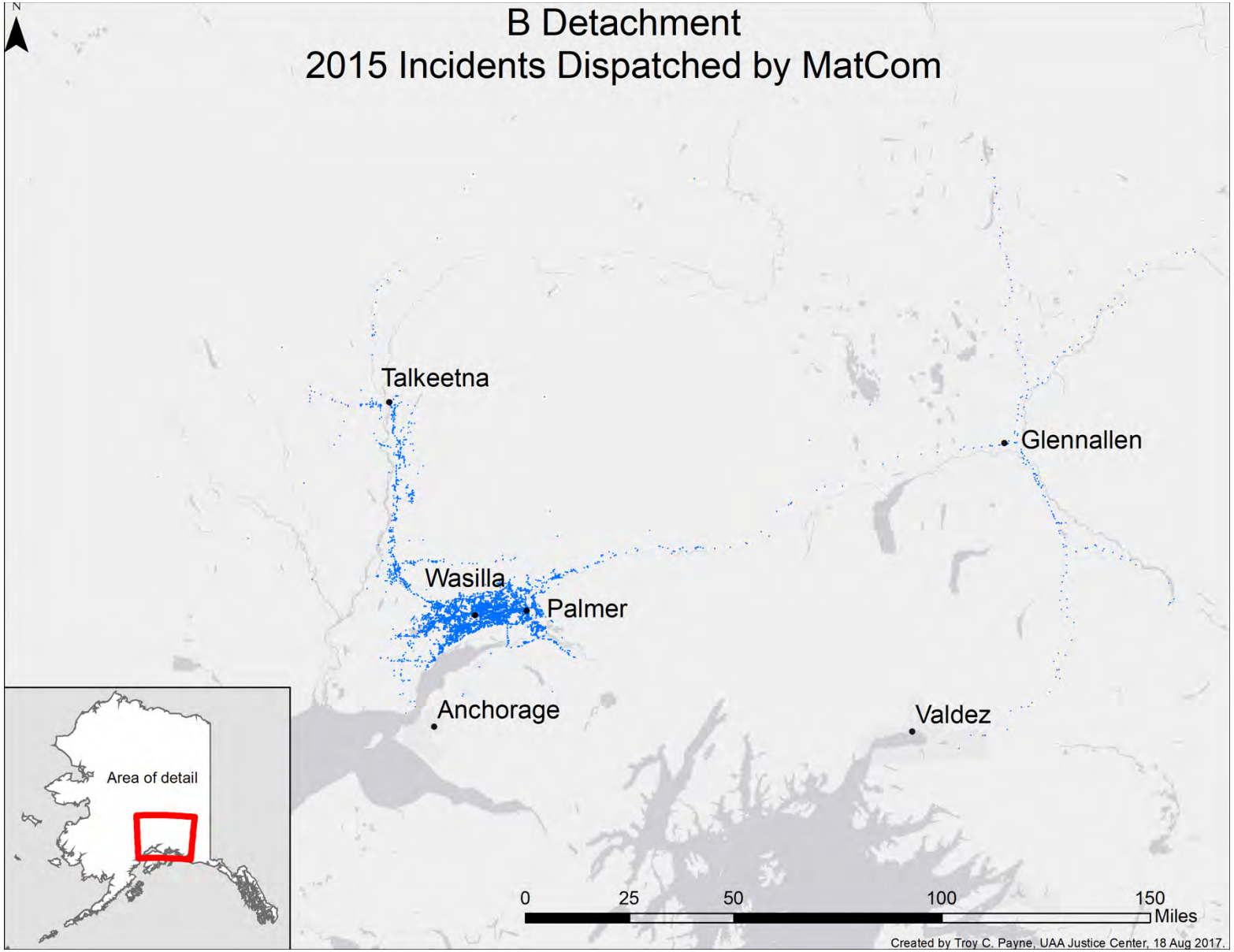

Figure 1: B Detachment service area and 2015 incidents

There are two units with sworn staff that are not generally available for patrol duties. Two Troopers are assigned to the Crime Suppression Unit (CSU) and work Tuesday through Friday 1200-2200. CSU Troopers carry out follow-up investigations, warrant service and conduct crime prevention. CSU also prepares cases for trial and completes related tasks for serial crimes and those requiring more investigative resources than patrol Troopers can provide. Judicial Services consists of one Trooper, one Sergeant, and seven Court Services Officers (CSOs are not shown in Table 1). Judicial Services provides a variety of security and law enforcement services for the Alaska Court System with B Detachment's service area. This report focuses on general patrol; CSU and Judicial services workloads were not analyzed.

Command staff consists of two Lieutenants and one Captain.

The total sworn staffing in B Detachment is 44, including specialized units and command. With a population of 87,626, this makes the ratio of Troopers to 1,000 population 0.5, considerably below the Pacific region average of 1.1.

Table 1: Sworn staff of B Detachment as of August 2017

Assignment	Troopers	Line-level Supervisors
Mat-Su West and Palmer Post general patrol		
Team 1	8	1
Team 2	6	1
Team 3	7	1
Team 4	7	1
Glennallen Post general patrol	3	1
CSU	3	1
Judicial Services	1	1
Total	**35**	**7**

Definitions and measurement

Obligated, administrative, and unobligated time

Obligated time is time spent traveling to and handling incidents. Obligated time is best thought of as time Troopers are not available to complete other tasks, although high-priority calls sometimes require reallocation of obligated Troopers (e.g., response to a serious violent incident may cause a Trooper to break from a routine traffic stop, depending on other resources available to respond).

For agencies using computer-aided dispatch systems, obligated time is the easiest aspect of police time to measure. MatCom, the dispatch center that provides citizen call-taking and radio dispatch for B Detachment, Alaska Wildlife Troopers in the area, and the Wasilla Police Department, creates a database record for each citizen call and police-initiated activity.

Database fields exist for among other things, type of call, police officer attached (unit designator), and date/time stamps for several stages of handling an incident.

A Trooper is obligated from the second they are attached to a police incident (dispatch time) to the second the Trooper is available to handle another incident (clear time). All times are as recorded by emergency services dispatchers at MatCom. Field observations and key informant interviews suggest that these times are a reasonable measure of obligated time in B Detachment.

Obligated time includes all Troopers attached to an incident. Travel time from dispatch to arrival on scene is included. Obligated time also includes travel time for Troopers who were dispatched to an incident but who were pre-empted or canceled before arriving at the incident scene. Obligated time does *not* include time spent returning from remote areas of the B Detachment service district. This unmeasured return travel time may be significant for some incidents; there is no accurate measure of return time available.

Unless otherwise indicated, obligated time includes both citizen-initiated incidents (calls for service) and Trooper-initiated activity such as traffic stops, warrant service, and follow-up investigations in the field.

Administrative time is time spent on required tasks such as follow up investigations at post, writing reports, logging evidence, and routine equipment maintenance. Administrative time also includes meal breaks and personal breaks. Troopers complete these tasks during time that they are not obligated.

Administrative time is frequently difficult to measure in police agencies because it is generally not systematically recorded. As in many other agencies, the common field practice in B Detachment is to "clear" each incident before conducting these administrative tasks — to signal to dispatch that the Trooper is available to handle another incident. This report uses estimates of administrative time based on time-task studies in the policing literature (see the Appendix for a brief review of these studies). This report estimates that Troopers spend about 33% of their shift time on administrative tasks. The practical impact of this time is to reduce the time each Trooper is available to respond to citizen calls for service and initiate proactive policing.

Unobligated time is time not spent on incidents or administrative tasks. Operationally, unobligated Troopers are generally considered to be available to handle calls for service and are dispatched to citizen-initiated incidents before obligated Troopers. It is important to note that unobligated does not mean *idle*. Unobligated time is used for tasks that are not time-sensitive, such as random patrol or traffic stops, or for directed tasks such as security checks at problematic places. Unobligated time is required for follow-up investigation tasks that occur at post[5]. Many policing strategies that have consistently been shown to reduce crime and citizen

[5] Follow-up investigation tasks that occur in the field are recorded by MatCom, and are classified as obligated time in this analysis.

fear of crime require unobligated time (e.g., community policing, problem-oriented policing, intelligence-led policing, and focused deterrence).

Unobligated time is not generally measured by police dispatch data, and must be inferred from total time minus obligated time minus an estimate of administrative time.

The "correct" staffing is determined by both citizen demand and organizational preferences

The mix of obligated plus administrative time and unobligated time among police officers in an agency is dependent on citizen demand for service, available resources, staffing of specialized units, distribution of work among patrol and those specialized units, agency priorities, and community preferences for how police spend their time.

There is no clear industry standard for how much police time should be spent in each category of work. This is because policing agencies vary considerably in the United States, and are responsive to a variety of local conditions. A review of other agency staffing studies suggests that targets for obligated time range from 30% to 67%. This report provides staffing estimates with 60% obligated time and 85% obligated time.

Number of obligated Troopers versus Trooper-hours obligated

The number of Troopers who are obligated changes by the minute. Imagine a hypothetical early morning, with four Troopers working and three total incidents between 12:00am and 3:00am:

- Trooper A responds to a noise complaint at 1:00am and clears the call at 1:30am.
- Trooper B responds to a burglary call at 12:00am and completes the report at 1:40am.
- Trooper C initiates a traffic stop at 1:00am. The driver is drunk, and a cover unit is requested at 1:15am.
- Trooper D provides cover for Trooper C starting at 1:15am until 2:30am.
- Trooper C completes processing the DUI suspect at 3:30 am.

This example is shown in Figure 2. The maximum number of Troopers obligated at any one time is four (from 1:15am to 1:30); the minimum number of obligated Troopers is one (from 12:00am to 1:00am and again from 2:30am to 3:00am).

Figure 2 shows why an hour-by hour analysis is needed, and why it is useful to describe obligated Troopers in addition to Trooper-hours. The total number of obligated Troopers is how many Troopers are conducting activity recorded by dispatch at any given time. This count explicitly includes incidents that require a cover unit and the unequal distribution of service demands throughout an hour. In the example used in Figure 2, the total number of Trooper-hours is approximately 7.02. In three hours, that's an average of 2.34 Troopers, which rounds up to three Troopers — but if this three-hour period were staffed with three Troopers, one of those calls will receive delayed service or a Trooper would have to break from one call to service another.

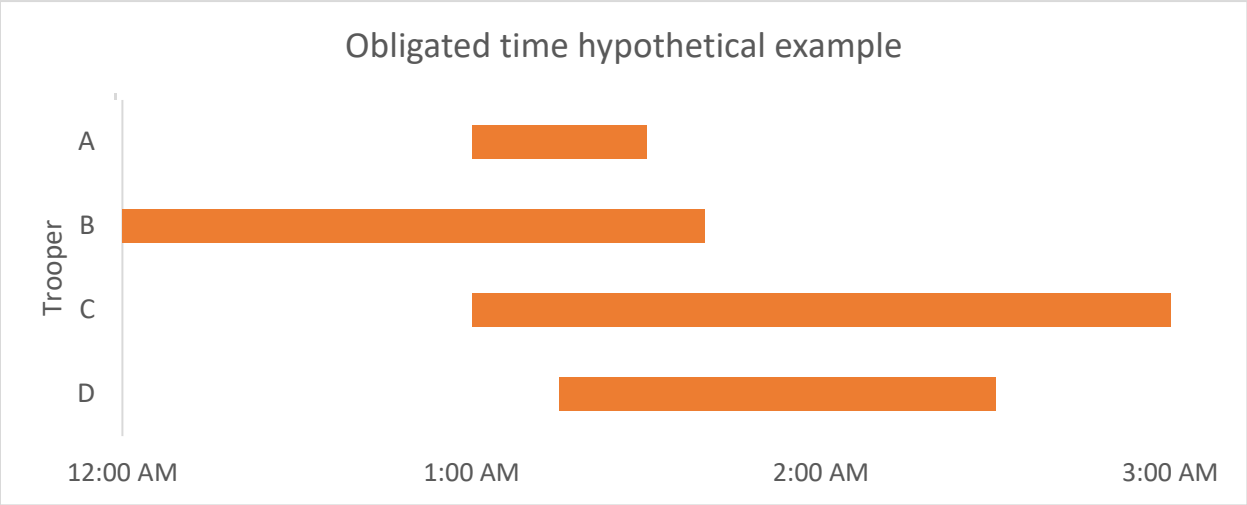

Figure 2: Obligated time hypothetical example

This report describes the number of obligated Troopers as well as Trooper-hours. Both serve as a check against the other. Recommendations for staffing changes are based on Trooper-hours, which is the most conservative estimate of the sworn staff required to provide police services at 2015 levels.

Patrol demand

Maximum number of obligated Troopers per hour

This section examines obligated Troopers according to MatCom dispatch data. The number of obligated Troopers was counted for each minute in the study period, and the maximum number of obligated Troopers was recorded for each hour in the data, from 1 Jan 2009 00:00 to 31 Dec 2015 23:59. This number of obligated Troopers is not an estimate — it is the maximum number of Troopers who were simultaneously engaged in activity recorded by MatCom in each hour.

The number of obligated Troopers ranged from 0 to 27, with variation by year, hour, and season. Over the entire period 2009-2015, the median[6] number of obligated Troopers was three at any given time, with slightly more Troopers obligated in the summer compared to

[6] The median, or 50th percentile, is preferred to the mean in this instance because of outliers. There are a small handful of critical incidents requiring *every* available Trooper, regardless of how many Troopers there happen to be. Because these incidents involve so many more Troopers than are typically on patrol, they bias the arithmetic mean (i.e., the average) upward, making the mean a poor measure of the typical number of Troopers who are obligated. This analysis uses the median because it is focused on patrol staffing, which requires a focus on the typical.

winter.[7] There was slow growth in the typical number of obligated Troopers over time and by summer 2015 the median number of obligated Troopers increased to four.

Figure 3 shows the number of obligated Troopers by hour in 2009 and 2015. The horizontal axis shows hour of the day; the vertical axis shows the number of obligated Troopers. The shaded areas in Figure 3 show the midspread — the counts between the 25th and 75th percentile — by hour for each season. The midspread can be thought of as the common or typical range of obligated Troopers. The dashed and dotted lines show the median number of obligated Troopers by hour for each season.

Examination of Figure 3 shows that the number of obligated Troopers peaks between 1400 and 1900 hours. In 2009, this peak was routinely between two and six Troopers. The peak time has remained the same over the study period, but the peak number of obligated Troopers slowly increased to between four and eight Troopers in 2015. Other partial-year (January through October) data from 2016 (not shown) was similar to 2015. Figure 3 also shows that the growth in the number of obligated Troopers is almost entirely in the afternoon and early evening — in the overnight and early morning hours, the number of obligated Troopers is approximately the same in 2009 and 2015.

Given that the August 2017 staffing in B Detachment is between five and six Troopers on patrol per shift, this analysis shows that it is not uncommon to have more than the assigned number of Troopers on shift obligated — either traveling to an incident or at an incident scene, as recorded by MatCom — for at least part of every hour between 1400 and 1900. This suggests a patrol force that is routinely over-utilized. Removing traffic stops from this count reduces the 75th percentile of obligated Troopers by one at peak times but has no other substantive effects. Recall that this measure of obligated Troopers does not include administrative time, report writing, or breaks.

[7] Summer (May through September) and winter (all other months) were defined such that the within-season variation is negligible. There was variation by day of week, with slightly higher median obligated Troopers on the weekend. These weekend medians are within the midspread, and day of week variation is not shown to simplify presentation.

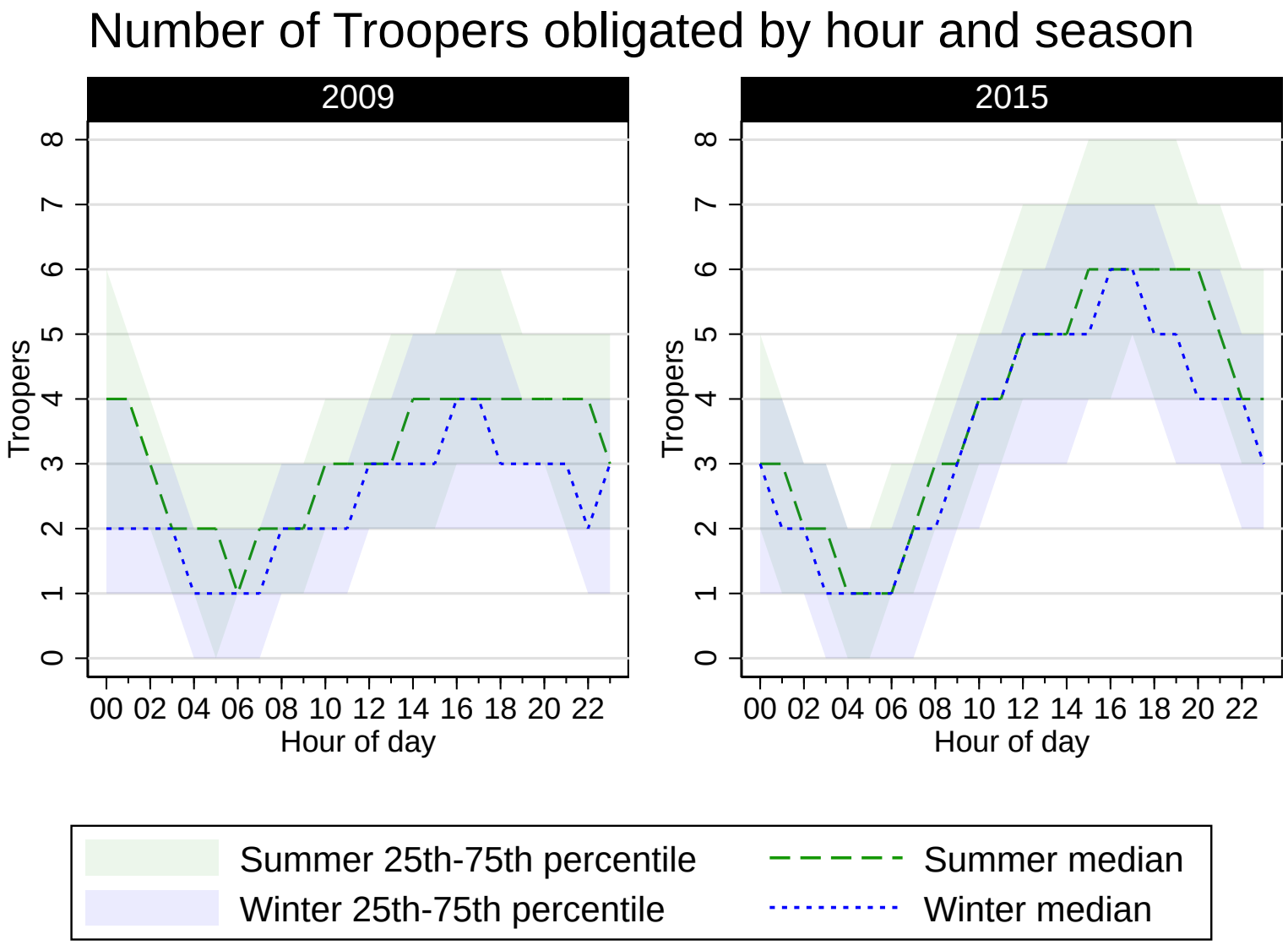

Figure 3: Number of Troopers obligated by hour and season all B Detachment Troopers, 2009 and 2015

Median obligated Trooper-hours — Mat-Su and Palmer Posts

The previous section shows that the number of obligated Troopers frequently exceeded six in 2015. Analysis of the median obligated Trooper-hours shows similar results. Table 2 shows the median number of obligated Trooper-hours by hour and day of week for 2013-2015. For example, from 00:00 to 01:00 on Mondays, the median number of obligated Trooper-hours was 2.9. When examined by season (not shown), median Trooper-hours are 0.5 higher per hour summer (May through September) than in winter (all other months).

Table 2: Median obligated Troopers, 2013-2015

Median obligated Trooper-hours, Mat-Su and Palmer Posts by hour and day of week, 2013-2015

Hour	Mon	Tue	Wed	Thu	Fri	Sat	Sun
00	2.9	2.3	2.5	2.4	2.8	3.8	4.2
01	2.5	1.9	1.8	2.0	2.3	3.4	3.7
02	2.0	1.5	1.6	1.8	2.1	2.9	3.2
03	1.6	1.3	1.4	1.8	1.7	2.6	2.7
04	1.4	1.2	1.4	1.5	1.4	2.4	2.4
05	1.2	1.3	1.1	1.3	1.2	2.0	1.7
06	1.4	1.3	1.4	1.4	1.3	2.0	1.8
07	1.5	1.8	1.6	1.7	1.5	1.8	2.0
08	2.2	2.2	1.9	1.9	2.4	2.1	2.0
09	2.7	2.6	2.7	2.4	2.7	2.2	2.4
10	3.2	3.3	3.0	3.1	3.3	3.1	2.8
11	3.2	3.5	3.4	3.1	3.5	3.4	2.9
12	3.7	3.9	3.8	3.7	3.9	4.2	3.7
13	4.2	4.0	4.0	3.9	4.3	4.2	3.8
14	4.1	4.2	4.3	4.3	4.6	4.7	4.1
15	4.5	4.7	4.6	4.9	5.4	5.3	4.4
16	4.6	4.7	4.7	5.0	5.3	4.9	4.7
17	4.3	4.8	4.8	5.2	5.3	5.0	4.3
18	4.2	4.6	4.6	4.9	5.1	4.9	4.3
19	4.0	3.8	4.5	4.5	4.3	4.8	4.5
20	3.6	3.5	4.0	4.5	4.4	4.5	4.4
21	3.3	3.1	3.8	4.1	4.1	4.9	4.0
22	3.2	2.7	3.2	3.7	4.3	4.6	3.6
23	2.7	2.8	2.9	3.1	4.2	4.2	3.3

The median number of obligated Trooper-hours is above 4.0 in 34.5% of day-of-week/hour combinations (58 of 168). The median number of obligated Troopers is equal to or greater than five Thursday through Saturday late afternoon and early evening (the shaded cells in Table 2). Recall that this does not include administrative time or unobligated time. Table 2 shows only *obligated* time, which in this analysis includes both officer-initiated and citizen-initiated incidents.

Percent of Trooper-hours that are obligated

After accounting for leave —a topic covered in more detail in a later section — the shift schedule as of August 2017 in B Detachment provides six Troopers for the day shift (0600-1800) and five for the night shift (1800-0600). Using this information and data from Table 2, we can calculate the median percentage of total Trooper-hours that are obligated per hour and day of week. This is shown in Table 3. The shaded cells in the table show days of the week and hours where the median percent obligated time exceeds 60% of existing staffing. Of the 168 hours in a week, 85 (50.1%) have median percent obligated hours exceeding 60%.

While 60% is an arbitrary target for obligated time, it is a reasonable target. When police officers spend more than 60% of their time responding to incidents it is difficult to consistently achieve community policing and crime prevention objectives — these activities require blocks of time where officers are free from responding to citizen calls for service.

Table 3: Median percent Trooper-hours obligated by day of week and hour, 2013-2015

Median percent Trooper-hours obligated, Mat-Su and Palmer Posts by hour and day of week, 2013-2015

Hour	Mon	Tue	Wed	Thu	Fri	Sat	Sun
00	57.6%	45.3%	50.6%	47.8%	56.7%	75.2%	84.6%
01	50.0%	38.1%	36.7%	39.9%	45.4%	67.0%	73.9%
02	39.3%	29.4%	31.2%	36.7%	42.2%	58.6%	64.5%
03	32.3%	25.7%	28.9%	36.1%	34.2%	51.9%	54.3%
04	27.6%	23.8%	27.7%	29.6%	28.4%	47.2%	47.6%
05	23.5%	25.1%	21.1%	26.8%	24.7%	39.6%	34.7%
06	23.6%	21.9%	24.1%	23.9%	21.0%	33.3%	30.8%
07	25.3%	29.8%	26.3%	28.1%	25.7%	30.2%	33.7%
08	35.9%	37.4%	32.3%	32.1%	40.5%	35.6%	33.1%
09	45.4%	43.4%	44.6%	40.2%	44.2%	37.2%	39.9%
10	52.6%	55.7%	49.7%	51.0%	55.3%	52.0%	46.2%
11	52.8%	58.8%	56.3%	52.1%	58.3%	56.6%	48.9%
12	62.1%	65.1%	63.0%	61.0%	64.4%	70.4%	60.9%
13	69.5%	66.0%	66.2%	65.4%	72.4%	70.4%	62.8%

14	68.1%	69.6%	71.7%	71.2%	77.0%	77.6%	68.8%
15	74.8%	78.2%	77.4%	81.7%	89.8%	88.4%	73.0%
16	76.2%	78.5%	77.6%	82.8%	87.5%	81.7%	78.5%
17	71.2%	79.5%	79.4%	87.3%	88.1%	84.0%	72.5%
18	83.8%	91.2%	92.9%	98.5%	101.5%	97.3%	85.9%
19	80.8%	75.3%	90.5%	89.0%	86.6%	95.5%	89.3%
20	71.1%	70.5%	80.1%	90.2%	88.5%	90.9%	87.7%
21	66.6%	61.9%	76.5%	81.0%	82.2%	97.5%	79.9%
22	63.1%	54.1%	64.1%	73.5%	85.3%	91.9%	71.6%
23	53.7%	56.4%	57.9%	61.1%	83.8%	84.8%	65.9%

The MatCom data provided for analysis lacks a good measure of Trooper-initiated activity — it is difficult to separate incidents that originate from a citizen complainant from incidents that originate from Trooper actions. However, the policing literature and key informant interviews in B Detachment suggest that most Trooper-initiated activity is likely to begin as a traffic stop. Table 4 removes traffic stops[8] from the percent obligated calculation. As in Table 3, days of the week and times with greater than 60% obligated time are shaded.

Even after excluding traffic stops, on most days of the week, more than 60% of Trooper-hours are obligated between the hours of noon and nine p.m. on all days of the week, and between noon and midnight Friday, Saturday, and Sunday.

Table 4: Median percent of time obligated, excluding traffic, 2013-2015

Median percent Trooper-hours obligated Mat-Su and Palmer Posts, by hour and day of week, excluding traffic stops, 2013-2015

Hour	Mon	Tue	Wed	Thu	Fri	Sat	Sun
00	55.9%	43.2%	50.3%	47.5%	52.4%	62.8%	62.8%
01	48.1%	37.4%	37.2%	41.8%	42.9%	54.0%	54.0%
02	37.2%	28.0%	33.2%	32.9%	40.7%	52.6%	52.6%
03	32.4%	25.8%	29.1%	35.6%	32.4%	48.2%	48.2%
04	32.6%	23.8%	29.7%	30.7%	31.2%	44.8%	44.8%
05	24.8%	28.4%	23.7%	26.5%	25.0%	43.4%	43.4%
06	25.6%	21.8%	22.7%	24.8%	26.3%	35.2%	35.2%
07	25.9%	32.2%	26.7%	28.5%	26.3%	32.6%	32.6%
08	35.1%	36.7%	32.0%	29.1%	38.7%	34.6%	34.6%

[8] Only incidents with a final type of traffic stop are excluded; incidents that begin as a traffic stop but end as another incident type (DWI, warrant arrest, etc) remain included.

09	42.9%	41.3%	42.4%	36.3%	42.0%	34.9%	34.9%
10	47.5%	55.4%	46.5%	48.3%	51.6%	50.7%	50.7%
11	51.1%	57.3%	52.7%	50.1%	56.3%	54.7%	54.7%
12	60.4%	61.0%	57.2%	54.9%	61.7%	65.3%	65.3%
13	62.3%	60.3%	60.3%	59.1%	66.8%	67.9%	67.9%
14	63.8%	66.5%	67.5%	63.3%	71.2%	70.1%	70.1%
15	70.4%	72.0%	71.9%	76.0%	80.3%	82.2%	82.2%
16	69.2%	71.1%	70.3%	75.1%	80.5%	71.8%	71.8%
17	65.8%	72.6%	74.2%	78.0%	81.2%	75.6%	75.6%
18	78.1%	83.1%	86.2%	90.0%	91.5%	85.4%	85.4%
19	72.7%	69.7%	80.7%	78.3%	78.2%	84.3%	84.3%
20	64.0%	63.3%	74.9%	82.3%	77.6%	78.1%	78.1%
21	59.9%	55.7%	69.9%	70.3%	72.2%	79.0%	79.0%
22	54.7%	47.8%	58.4%	64.8%	72.6%	76.9%	76.9%
23	50.0%	55.4%	56.3%	56.8%	70.4%	70.2%	70.2%

Troopers needed in the field

Minimum number of Troopers required for Trooper safety

In small and mid-size agencies, it is common to have a minimum number of police officers that must be in the field at any given time. Given the large geographic area serviced by B Detachment, desired response times, and Trooper safety concerns (including the availability of a cover unit) command has determined that the absolute minimum number of Troopers in the field is seven.

Five of these Troopers are split between the Mat-Su and Palmer Posts (these Troopers also cover Talkeenta). The other two Troopers are based at the Glennallen Post. Given the road distance between the two areas — approximately 100 miles — these two areas are staffed separately and are considered separately below.

When leave, training, sick time, or other circumstances result in fewer than five Troopers in the field between the Mat-Su Post and Palmer Post, one or more Troopers are called in for overtime until there are five in the field. When fewer than two Troopers are in the field from the Glennallen Post, off-duty Troopers are put on standby (essentially, on-call).

Number of Troopers in the field needed to meet median 2013-2015 demand at the Mat-Su and Palmer Posts

As the previous sections have shown, five Troopers in the field cannot adequately service the workload in B Detachment, particularly from noon to midnight. The workload analysis above suggests that staffing should be greater in some hours than in others, and that adding Troopers to either of the 0600-1800 / 1800-0600 shifts would result in a suboptimal allocation of

resources. It is therefore useful to think of the 0600-1800 / 1800-0600 shift schedule as providing a base that can be augmented with additional resources in peak demand hours.

Assuming that the target percent obligated time is 60%, and assuming that traffic enforcement should remain at 2015 levels, then the number of Troopers required on shift is calculated as

$$60\% \text{ of needed Trooper hours} = \text{expected workload}$$

$$\text{Needed Trooper-hours} = \frac{\text{expected workload}}{60\%}$$

Table 5 shows the result of this calculation for each day of the week and hour of the day, using 2013-2015 median obligated Trooper-hours from Table 2 as the expected workload. Cells with more than the August 2017 staffing level of five Troopers 1800-0600 and six Troopers 0600-1800 are shaded. This is the number of Troopers required in the field to meet median incident demand — this number does *not* yet include leave and shift relief, special assignments such as CSU, supervisors not attached to incidents, Glennallen Post Troopers and command in B Detachment.

It is clear from Table 5 and the obligated Trooper analysis in Figure 3 that the August 2017 six Troopers in the field 0600-1800 and five Troopers in the field 1800-0600 is inadequate to meet peak demand. Optimally deploying existing B Detachment Troopers is also inadequate to meet peak incident demand. If a 60% obligated time target is desired, additional Troopers must be assigned to B Detachment.

Table 5: Troopers needed to meet 2013-2015 median obligated time and 60% obligated time target

Troopers needed in the field from the Mat-Su and Palmer Posts to meet 2013-2015 median obligated time and 60% obligated time target

Hour	Mon	Tue	Wed	Thu	Fri	Sat	Sun
0	5.0	5.0	5.0	5.0	5.0	6.3	7.0
1	5.0	5.0	5.0	5.0	5.0	5.6	6.2
2	5.0	5.0	5.0	5.0	5.0	5.0	5.4
3	5.0	5.0	5.0	5.0	5.0	5.0	5.0
4	5.0	5.0	5.0	5.0	5.0	5.0	5.0
5	5.0	5.0	5.0	5.0	5.0	5.0	5.0
6	5.0	5.0	5.0	5.0	5.0	5.0	5.0
7	5.0	5.0	5.0	5.0	5.0	5.0	5.0
8	5.0	5.0	5.0	5.0	5.0	5.0	5.0
9	5.0	5.0	5.0	5.0	5.0	5.0	5.0
10	5.3	5.6	5.0	5.1	5.5	5.2	5.0
11	5.3	5.9	5.6	5.2	5.8	5.7	5.0
12	6.2	6.5	6.3	6.1	6.4	7.0	6.1

13	7.0	6.6	6.6	6.5	7.2	7.0	6.3
14	6.8	7.0	7.2	7.1	7.7	7.8	6.9
15	7.5	7.8	7.7	8.2	9.0	8.8	7.3
16	7.6	7.8	7.8	8.3	8.8	8.2	7.9
17	7.1	8.0	7.9	8.7	8.8	8.4	7.2
18	7.0	7.6	7.7	8.2	8.5	8.1	7.2
19	6.7	6.3	7.5	7.4	7.2	8.0	7.4
20	5.9	5.9	6.7	7.5	7.4	7.6	7.3
21	5.5	5.2	6.4	6.8	6.9	8.1	6.7
22	5.3	5.0	5.3	6.1	7.1	7.7	6.0
23	5.0	5.0	5.0	5.1	7.0	7.1	5.5

Note: The minimum number of Troopers in the field is five due to Trooper safety concerns; this table replaces medians less than five with this minimum number.

The 0600-1800 / 1800-0600 schedule can provide the Troopers that command has determined are the absolute minimum necessary for Trooper safety: five Troopers split between the Mat-Su and Palmer Posts. This leaves open the question of how to provide additional resources for peak demand. Peak demand occurs largely during a 12-hour block of time from 1300-0100 hours. A third 12-hour shift, from 1300-0100, could provide the needed capacity to meet peak demand. This power shift would provide the needed resources for peak demand (at least eight Troopers 1300-0100) without dramatically overprovisioning resources during off-peak times.[9]

Number of Troopers in the field required at the Glennallen Post

Similar analyses for the Glennallen Post showed that the median number of obligated Trooper-hours rarely exceeds the minimum safety threshold of two in any day-of-week / hour combination.

Leave, shift-relief, and administrative time

Like all employees, Troopers do not work every day of the year. Troopers are entitled to a variety of different types of leave, plus their regular days off and training.

Table 6 shows estimated leave, training, and regular days off for 12-hour shifts. The Public Safety Employees Association contract specifies that Troopers with 5-10 years of service accrue 24 hours of personal leave per month (personal leave includes both sick leave and vacation time). This tracks well with the average personal leave accrued by staff in B Detachment (23.2 hours per month) during the study period. The PSEA contract also specifies that Troopers belonging to reserve components of the United States Armed Forces are entitled to 132 hours of additional leave (16.5 working days times 8 hours per day). Five of the 35 Troopers assigned

[9] Other shift schedules are certainly possible. Eight- and 10-hour shift alternatives are not presented because 1) peak demand exists for longer than any 8-hour shift; 2) 10-hour shifts require more staff due to shift overlap; and 3) both command and line-level staff in B Detachment expressed a preference for 12-hour shifts.

to B Detachment during the study period are entitled to military leave (14.3%). A slightly more conservative estimate of 25% of staff is used in Table 6 to ensure sufficient flexibility in scheduling military leave.

Monthly leave data were provided by DPS for 2007-2015 from OARS. Specifically, the number of hours of administrative, court, comp time, sick, personal, PSEA union administration, military, leave without pay, and injury leave were provided, along with the total number of all other hours worked by Troopers were provided for each month. This data was used to calculate the monthly proportion of total Trooper hours spent on leave. The mean leave factor was 1.3 hours per hour of time worked, which is consistent with the estimates used here.

Training is estimated at 40 hours per Trooper per year. Accurate measures of in-service training were difficult to obtain from existing data systems. Forty hours is a minimum estimate; Troopers with additional assignments or specializations may spend considerably more time training.

Table 6: Time off (not available for patrol) each year for Troopers working 12-hour shifts

	Hours per year
Personal leave (5-10 years of service) 24 hours accrued per month	288
Military leave 132 hours per Trooper x 25% of Troopers	33
Training 40 hours in-service training per year	40
7 regular days off in each 14-day period 26 14-day periods x 7 days per period x 12 hours per day	2,184
Total time off	**2,587**

Troopers in B Detachment work seven days per 14-day rotation, leaving seven regular days off per two-week period. Summing the time off categories gives a total number of hours each Trooper is not available for patrol each year: 2,587.

For each 12-hour shift, there are 4,380 shift-hours per year (365 days x 12 hours). To have a single Trooper on patrol during a 12-hour shift 365 days per year, 2.44 Troopers must be assigned to that shift:

$$\text{Troopers per shift to get 1 on patrol} = \frac{\text{shift-hours per year}}{\text{shift-hours per year} - \text{time off per year}}$$

$$\frac{4{,}380}{4{,}380 - 2{,}587}$$

$$\cong 2.44$$

This estimate of leave and shift relief is likely a lower-bound. The actual number of Troopers needed is likely higher due to court time and light duty resulting from injury. Reliable estimates of court time and light duty were not available. While there is a court time leave type in OARS, hours billed to court time in the OARS data were unreasonably low. Key informant interviews suggested that court time is handled as either overtime or as comp time, and would frequently not be recorded as the OARS leave type provided.

Administrative time

Administrative time is not included in the obligated Trooper-hours discussed above. Administrative time is time spent on required tasks such as follow-up investigations at post, writing reports, logging evidence, routine equipment maintenance, meal breaks, and personal breaks.

Like most police departments, B Detachment does not keep records of administrative time. Based on the prior literature and interviews with line-level and command staff in B Detachment, a reasonable estimate of administrative time is 33% of a Trooper's shift. Because administrative time is time Troopers are not available to service incidents in the field, this has the effect of increasing the number of Troopers needed on shift by a factor of 1.33.

Number of Troopers required to meet 60% obligated time targets

Troopers with general patrol duties

After multiplying by the leave and shift-relief factor of 2.44 required to staff each 12-hour shift 365 days a year, and rounding up to the next whole Trooper, B Detachment requires 48 Troopers whose primary responsibility is responding to calls for service. In addition, each shift should have a line-level supervisor (Sergeant) who provides coverage during particularly busy times (e.g., Friday and Saturday nights) but has primarily supervisory duties — a total of six sergeants. This brings the total number of Troopers and line-level supervisors needed to meet 60% obligated time per hour, 33% administrative time per shift, and adequate leave and shift relief to 50. Table 7 shows the calculations in detail.

Specialized units and command

The available data do not allow separating specialized units from patrol. Some of the work performed by the Crime Suppression Unit (three Troopers and one Sergeant) is included in the above estimates. For example, follow-up investigations conducted in the field and warrant service are known to MatCom and are therefore included as obligated time in the above analysis. Other tasks completed by CSU, such as follow-up investigation conducted at post and preparing casefiles for prosecution, are invisible to MatCom.

Table 7: Calculating total number of Troopers with general patrol duties needed, three 12-hour shifts and 60% obligated time goal

Shift	Troopers in field	Plus administrative time (x1.33)	Plus leave and shift-relief (x2.44)	Full-time Troopers required	Line-level supervisors
Mat-Su / Palmer					
0600-1800	5	6.7	16.3	17	2
1300-0100	3	4.0	9.8	10	2
1800-0600	5	6.7	16.3	17	2
Glennallen*					
Shift 1	2	.	4.9	5	1
Shift 2	2	.	4.9	5	1
Total Troopers with primary patrol duties				**54**	**8**

Note: Glennallen workload is sufficiently low to allow Troopers to complete administrative tasks during their shift without additional resources.

It is, however, reasonable to assume the majority of CSU's workload is invisible to MatCom; the reason the unit exists is to enable a small number of Troopers to conduct follow-up investigation without being obligated to conduct general patrol duties. It is *possible* that CSU's responsibilities could be devolved to patrol Troopers if B Detachment were adequately staffed, but CSU's workload was not specifically examined for this report. Without augmenting B Detachment staff to meet service demand, it will likely be *necessary* to disband CSU and reallocate its Troopers in an attempt to meet citizen demands for general patrol services.

B Detachment also includes one Trooper, one Sergeant, and seven Court Services Officers. Their workloads were not examined for this report, which focuses on general patrol duties.

Finally, B Detachment requires command staff. During the study period, this consisted of two Troopers at the rank of Lieutenant and one at the rank of Captain. Given the span of control, this is an adequate number of command staff.

Total staffing recommendation

The total staffing recommendation is 58 Troopers (54 with general patrol duties, three in CSU, and one in Judicial Services), nine Sergeants (eight with general patrol duties, one with CSU, and one in Judicial Services), two Lieutenants, and one Captain. This is an increase of 23 Troopers and three Sergeants over August 2017 staffing.

Including command (but excluding Court Services Officers), the total recommended number of sworn staff is 71. Though this is a substantial increase — 57.8% — over the August 2017 staffing of 45 total sworn, the ratio of Troopers to 1,000 population would be 0.81, well below the Pacific region average of 1.1 police officers per 1,000 population for areas of 50,000 to 99,999.

Table 8: August 2017 staff and recommended staffing at B Detachment by assignment

Assignment	Current staff	Recommended staff	Change
Mat-Su West / Palmer	28 Troopers 4 Sergeants	44 Troopers 6 Sergeants	+16 Troopers +2 Sergeants
Glennallen	3 Troopers 1 Sergeant	10 Troopers 2 Sergeants	+7 Troopers +1 Sergeant
Crime Suppression Unit	3 Troopers 1 Sergeant	3 Troopers 1 Sergeant	.
Judicial Services	1 Trooper 1 Sergeant 7 Court Services Officers	1 Trooper 1 Sergeant 7 Court Services Officers	.
Command	2 Lieutenants 1 Captain	2 Lieutenants 1 Captain	.
Total	**35 Troopers** **7 Sergeants** **2 Lieutenants** **1 Captain**	**58 Troopers** **10 Sergeants** **2 Lieutenants** **1 Captain**	**+23 Troopers** **+3 Sergeants** **.** **.**

Alternate obligated time target: 85%

As discussed above, the 60% obligated time recommendation is somewhat arbitrary, and different agencies set different targets for percent obligated time. If the target were increased to 85% obligated time, then the number of Troopers in the field on the 1300-0100 shift at the Mat-Su West and Palmer Posts could be reduced to two. This reduced number of Troopers could allow the other shift Sergeants to supervise the 1300-0100 shift — though this would put these shift Sergeants at the upper end of a reasonable span of control.

The result is shown in Table 9. The overall number of Troopers is reduced to 41, with four Sergeants. Command, CSU, Glennallen, and Judicial Services recommendations would remain unchanged from the prior estimates. This alternative target would therefore still result in substantially higher staffing than was allocated to B Detachment during the study period.

Table 9: Calculating number of Troopers needed, three 12-hour shifts and 85% obligated time goal

Shift	Troopers in field	Plus administrative time factor (1.33)	Plus leave and shift-relief	Full-time Troopers required	Line-level supervisors
Mat-Su / Palmer					
0600-1800	5	6.7	16.3	17	2
1300-0100	2	2.7	6.5	7	.
1800-0600	5	6.7	16.3	17	2
Total Troopers with primary patrol duties				**41**	**4**

Troopers in B Detachment are chronically over-utilized — and this means workload-based staffing models may under-estimate demand

The August 2017 staffing in B Detachment was 31 Troopers with general patrol duties and five Sergeants. There are an additional three Troopers and a Sergeant in CSU, plus two Lieutenants and one Captain.

This staffing level is barely adequate to meet minimum safety requirements of five Troopers in the field from the Mat-Su West and Palmer Posts (combined) and two Troopers in the field from the Glennallen Post after including leave. This staffing level is also barely adequate to meet citizen demands for service. Even after excluding most Trooper-initiated activity (traffic stops), it is common for more than 80% of Trooper-hours to be obligated. This frequently leaves zero excess capacity. Stated slightly differently, it is common for *every* Trooper in the field to be handling an incident.

This chronic over-utilization creates a problem for any analysis of computer-aided dispatch data, like what is used for staffing recommendations in this report: the data used to create the staffing recommendations in this report may represent the lower bound of citizen demand. When a Trooper is unavailable to handle a call because she or he is already busy, the incident is put in a call stack (delayed) when it's low-priority. When an incident is high-priority, Troopers must break from another incident to service it. *In either case, the number of obligated Troopers or obligated Trooper-hours can never be higher than the number of Troopers working at any given time.*

Several methods not detailed in this report were used to estimate appropriate staffing levels. Average counts of incidents were multiplied by average incident durations, for example. *All* of these methods suggest that Troopers in B Detachment are chronically over-utilized, particularly during times of peak demand.

This over-utilization causes operational problems. Many evidence-based policing practices such as community policing, problem-oriented policing, and focused deterrence require unobligated time to conduct — without unobligated time, Troopers cannot engage in these activities. Near-100% utilization also leaves Troopers in a constant, day-to-day state of emergency. This causes safety, retention and recruitment problems as Troopers are unable or unwilling to take leave[10] or obtain advanced training. Trooper stress and fatigue are also increased by persistent over-utilization, potentially leading to increased injuries and poor decision-making.

[10] There are direct and indirect effects of high workloads on leave. The direct effect is that Troopers who request leave cannot take leave as requested. The indirect effect is that Troopers do not request leave because they know it will be denied, or because they know that there are insufficient resources to fill their shift and their fellow Troopers will be left short-handed. The direct effects on leave could be measured by comparing leave requests to granted and taken leave; it is harder to estimate indirect effects.

Fifty-eight Troopers, 10 Sergeants, two Lieutenants, and one Captain are required to meet citizen demand, provide 2013-2015 levels of proactive activity, meet 60% obligated time targets, and maintain existing specialized units. Reducing the target for obligated time to 85% reduces this recommendation by three Troopers and two Sergeants.

Under either obligated time target, B Detachment should have substantially more sworn staff than its August 2017 staffing level. Implementing the recommended sworn staffing increases will require a multi-year retention and recruitment plan beyond the scope of this report.

How much excess capacity police agencies require is a policy question that, ultimately, is not answerable by a workload analysis such as that reported here. The 60% obligated time target used here is a guideline, not a hard rule, and considerable variation exists among police agencies in the United States. This analysis has, however, made it clear that B Detachment is operating at a utilization rate that is unlikely to be sustainable in the long term.

Workload description

Incident counts

Between 1 Jan 2009 and 31 Dec 2015, the Alaska State Troopers or Alaska Wildlife Troopers dispatched via MatCom in B-Detachment were the primary unit for an average of 48,000 incidents per year, including traffic stops. The Wasilla Police Department (and, before 2011, the Houston Police Department) handled an additional 22,000 incidents combined. Figure 4 shows the number of incidents by primary unit agency and year.[11] The overall trend of the total number of incidents where AST/AWT Troopers are the primary is one of stability, neither consistently increasing nor decreasing.

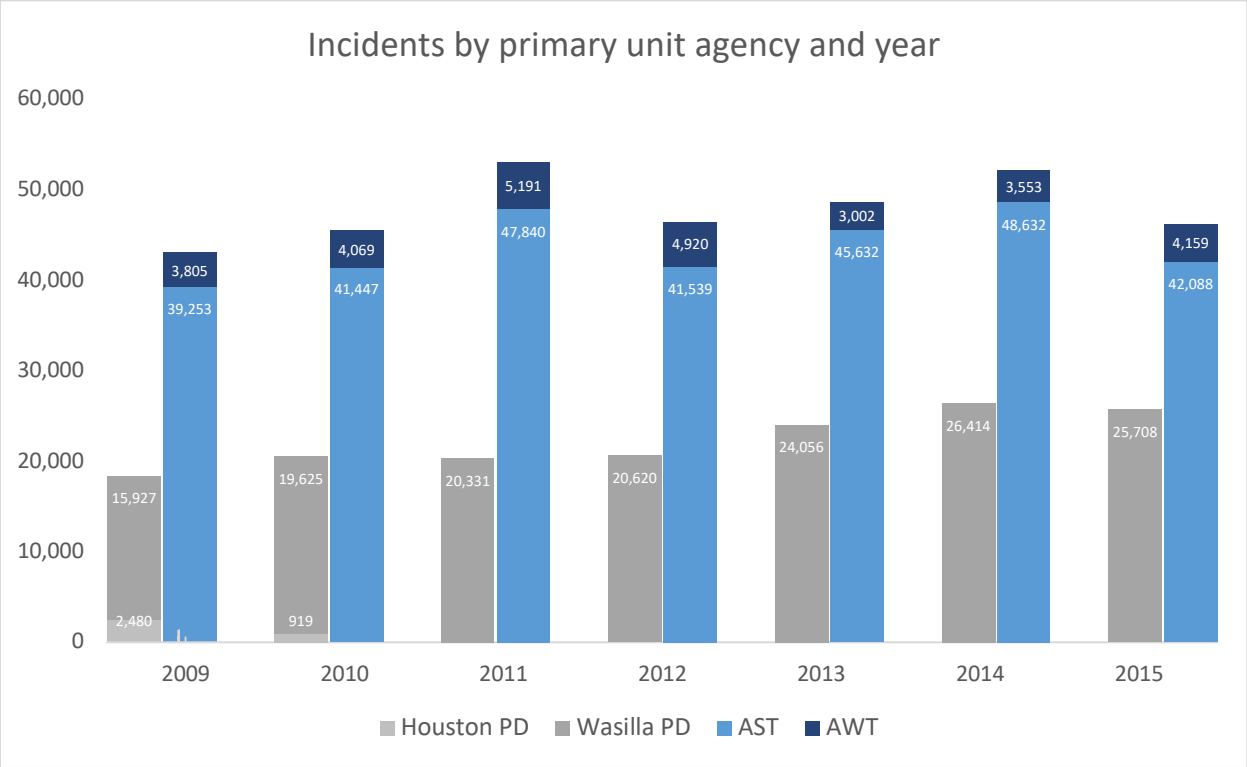

Figure 4: Incidents by primary unit agency and year

MatCom data includes the times calls were dispatched and when they were cleared, allowing for the calculation of Trooper-hours spent servicing calls. The measures of Trooper-hours used here include both travel time and time onscene. Figure 5 shows the total number of Trooper-hour spent servicing calls by year. The number of Trooper-hours spent servicing calls has increased 14.7% from 2012 to 2015. Over the same period, the number of incidents has decreased 0.5. Together, this suggests that the Troopers are either spending more time per incident, or that the types of incidents have shifted over time.

[11] Incidents where AST or AWT Troopers responded but were not the primary unit are additional 500 (approx.) incidents per year.

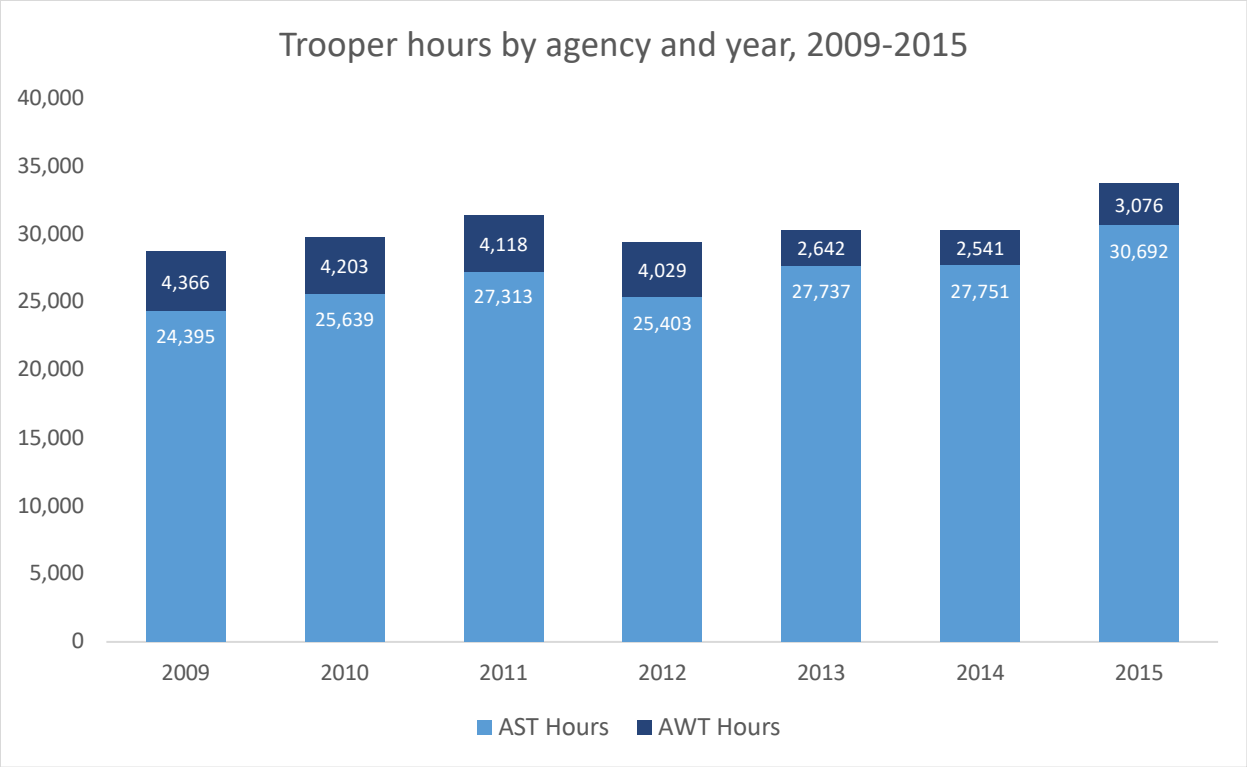

Figure 5: Trooper-hours spent from dispatch time to clear time; includes all incidents where AST/AWT units responded

Incidents by month

Citizen demand for police services typically varies throughout the year. The average number of incidents serviced by Alaska State Troopers and Alaska Wildlife Troopers in B-Detachment are 24.3% higher in May-August (4,600 per month) than in September-April (3,700 per month)[12], as shown in Figure 6. Traffic stops are 29.6% to 39.3% of monthly AST/AWT incidents in the MatCom data during the 2009-2015 period.[13]

[12] Monthly average count of incidents where at least one AST/AWT Trooper responded regardless of what agency was primary for years 2009-2015.

[13] "Traffic stops" include incidents with a final code of traffic stop or ATV stop. Traffic stops do not include other vehicle-related incidents such as vehicle collisions, driving while suspended, driving while intoxicated, etc.

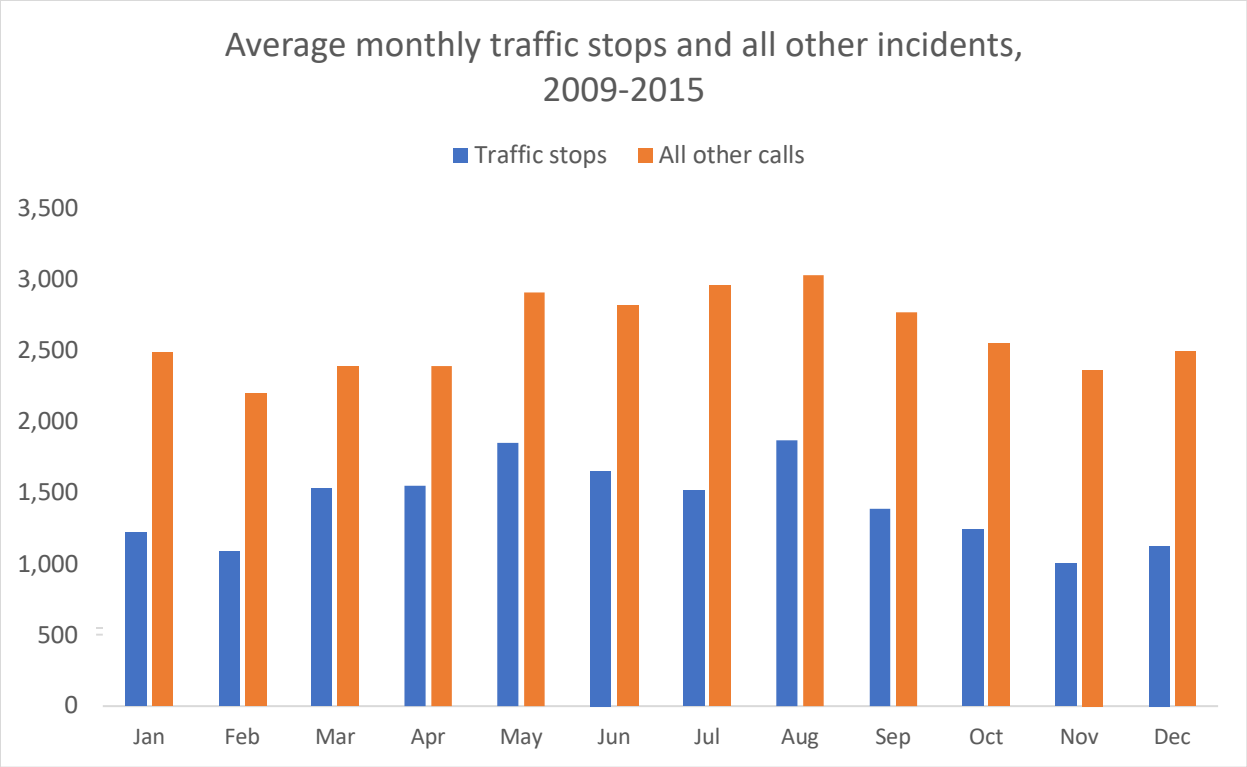

Figure 6: Average monthly incidents by type (traffic stop v. all other incidents), 2009-2015; includes all incidents where AST/AWT units responded

Figure 7 shows the average number of incidents by day of week, again splitting traffic stops from all other incidents. On average, incidents tend to increase on the weekend, with Monday through Thursday having lower average incident counts (119.2) than Friday through Sunday (152.8).

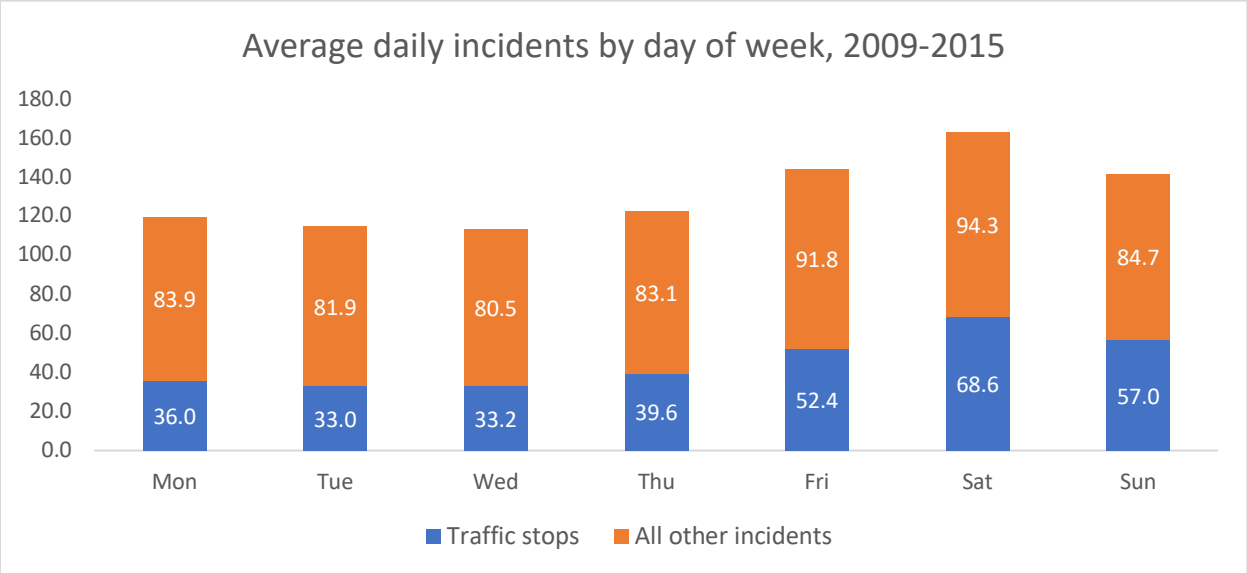

Figure 7: Average daily incidents by day of week and type (traffic stop v. all other incidents), 2009-2015; includes all incidents where AST/AWT units responded

Figure 8 shows the average monthly incident counts by hour. Total incident counts peak during the 1600 hour and decline smoothly until 0500. The proportion of incidents that are traffic stops remains relatively stable across all hours.

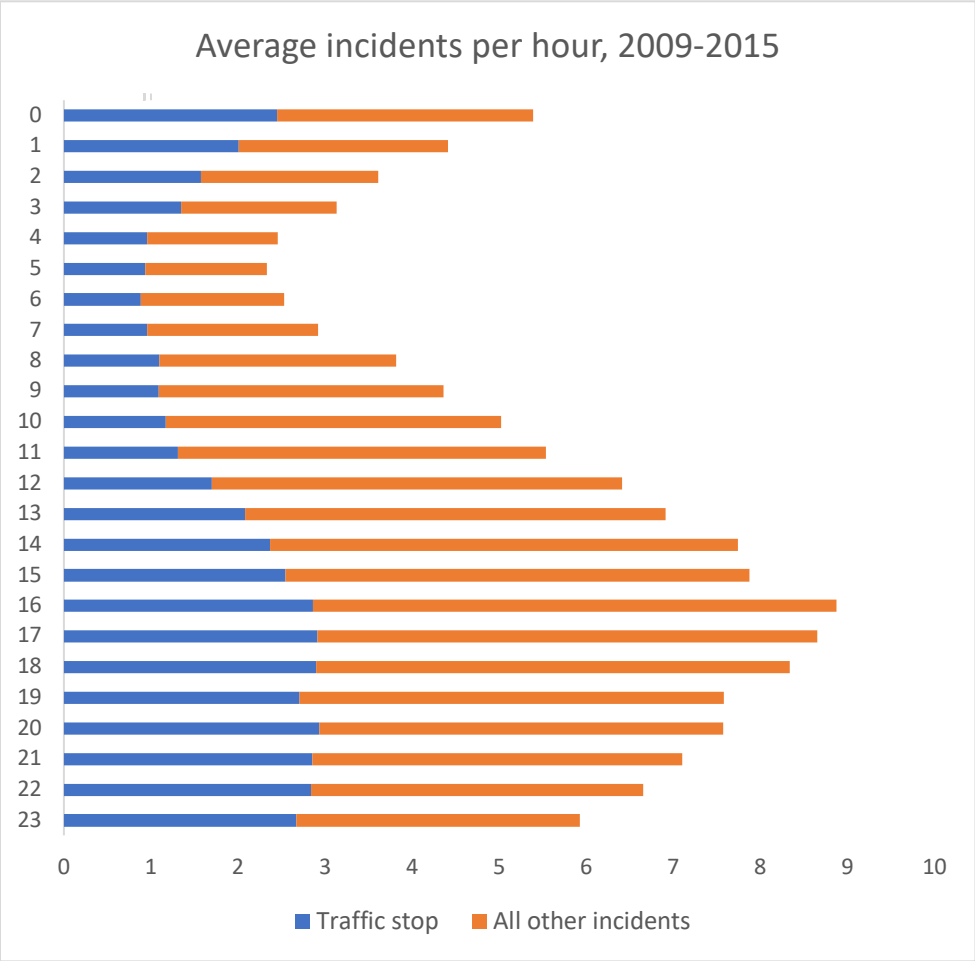

Figure 8: Average incident counts by hour, 2009-2015; includes all incidents where AST/AWT units responded

Day of week and time of day can be combined into a contour plot, as shown in Figure 9. In terms of total incidents, the busiest time of day and day of week is Thursday-Sunday 1500-2300, shown in red in Figure 9. Figure 9 also shows that the average number of incidents per hour is otherwise relatively stable across days of the week.

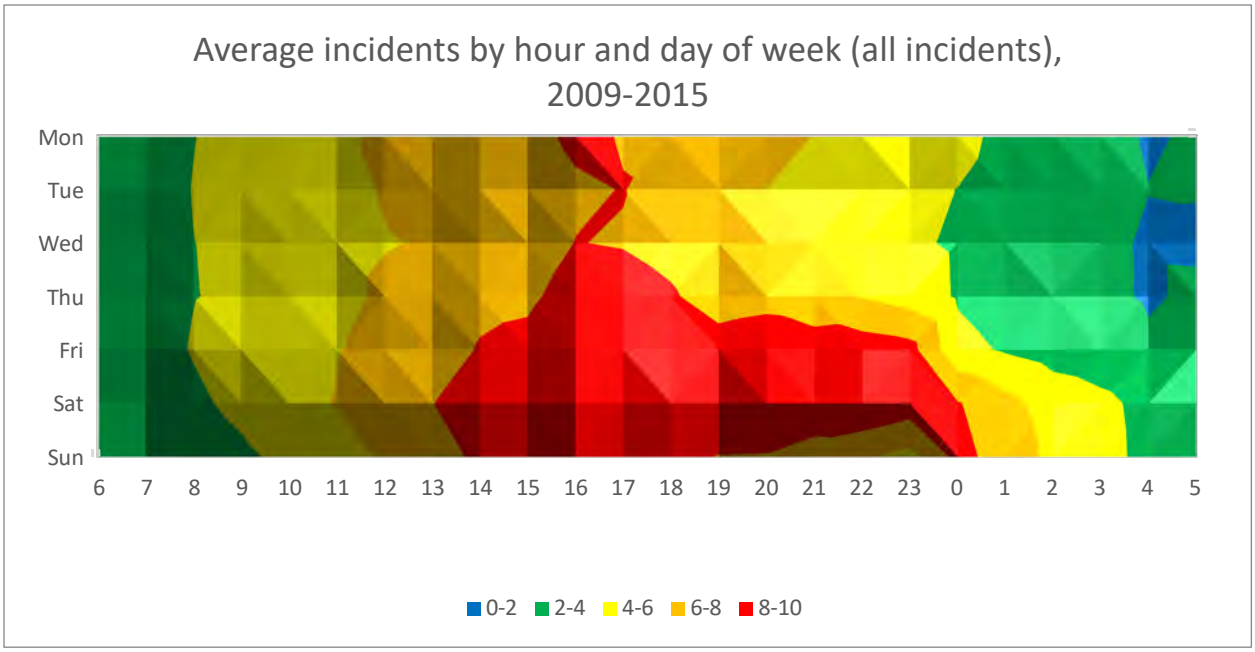

Figure 9: Average incident counts by time of day and day of week, 2009-2015

Incident counts and Trooper-hours by call type

Incident type is measured as the final call type as recorded by MatCom after the unit arrives on-scene. Final incidents types can vary from original incident types. Each incident can have one and only one final incident type.

Figure 10 splits incidents by type (see Appendix I for how calls were categorized). Figure 10 shows the percent of total Trooper hours (in orange) and the percent of total incidents (in blue). Trooper time was estimated by differencing cleared times from dispatched times in the MatCom data for any incident where at least one AST or AWT Trooper was attached to the call.[14]

Figure 10 shows the importance of examining both incident counts and Trooper time spent on calls. While violent incidents are rare (2.1% of incidents), they consume 9% of Trooper hours during the study period. Traffic incidents, which include any non-collision vehicle-related incident (traffic stops, road kill, DWI) are 45.4% of incidents but consume 21.7% of Trooper-hours. The analysis of B-Detachment workload therefore pivots to focus on Trooper-hours spent rather than incident counts, because Trooper-hours is the most relevant measure for the purpose of patrol staffing.

[14] Estimated times includes travel time. Observation of field practice and radio procedure suggest that the time estimates included here are reasonably accurate but not exact. Multiple Troopers can be attached to a single call; time estimates include all units attached to the call, including Troopers who never arrived on-scene (e.g., Troopers who were preempted by higher priority calls while traveling to the scene).

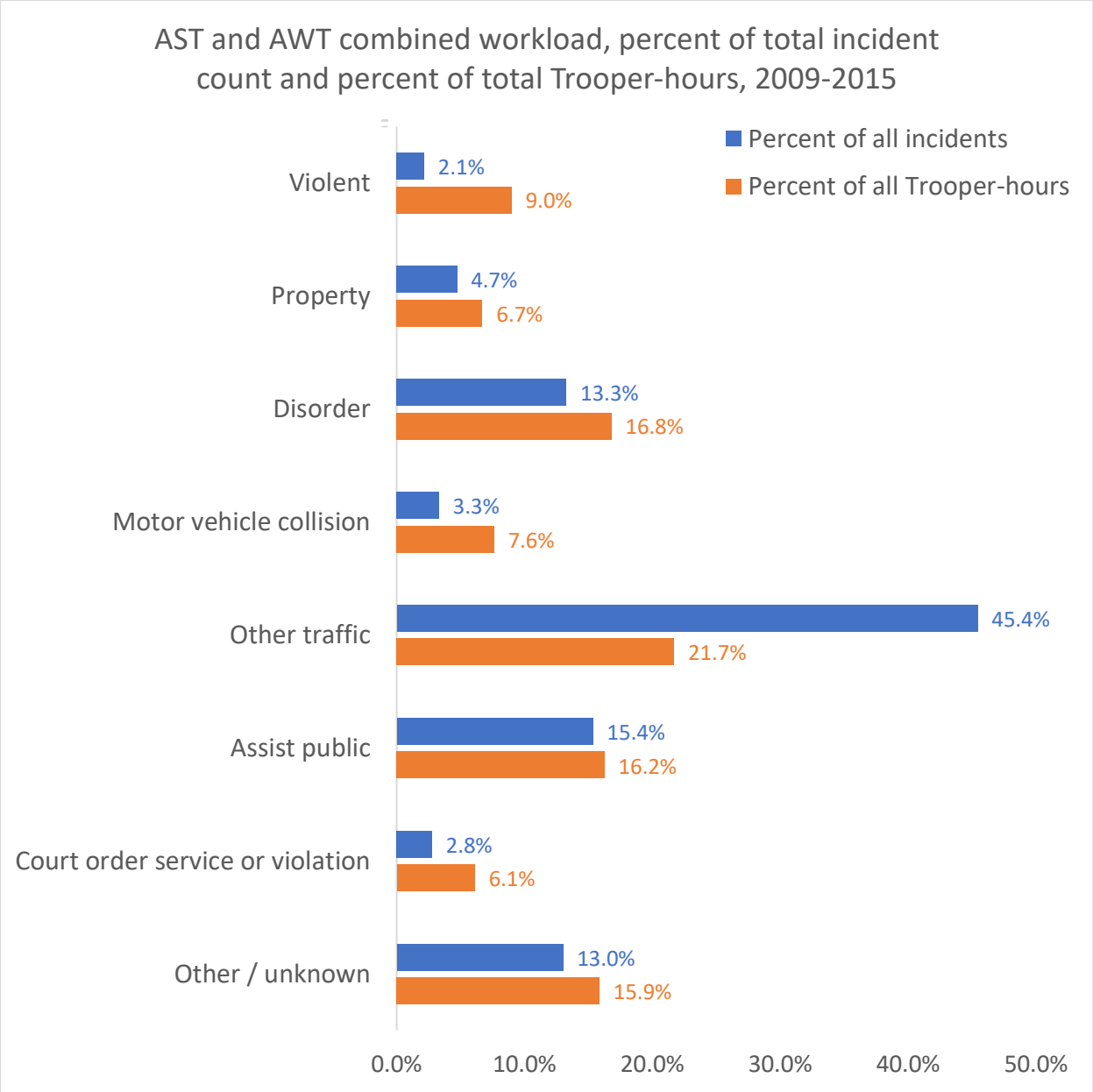

Figure 10: Percent of total incidents and percent of total Trooper hours by type, 2009-2015

Trooper hours by incident type and Trooper-hour growth over time

When including all Troopers attached to a call, the average number of Trooper-hours spent per incident is 0.6 (about 36 minutes). The typical time spent on an incident varies considerably by type. Violent crimes are the most time consuming, taking 2.8 Trooper-hours per incident. Motor vehicle collisions are next and take 1.5 Trooper-hours on average. Court order service and violations are third, taking 1.4 Trooper-hours. Figure 11 shows the average Trooper-hours spent per incident by incident type over the study period (2009-2015).

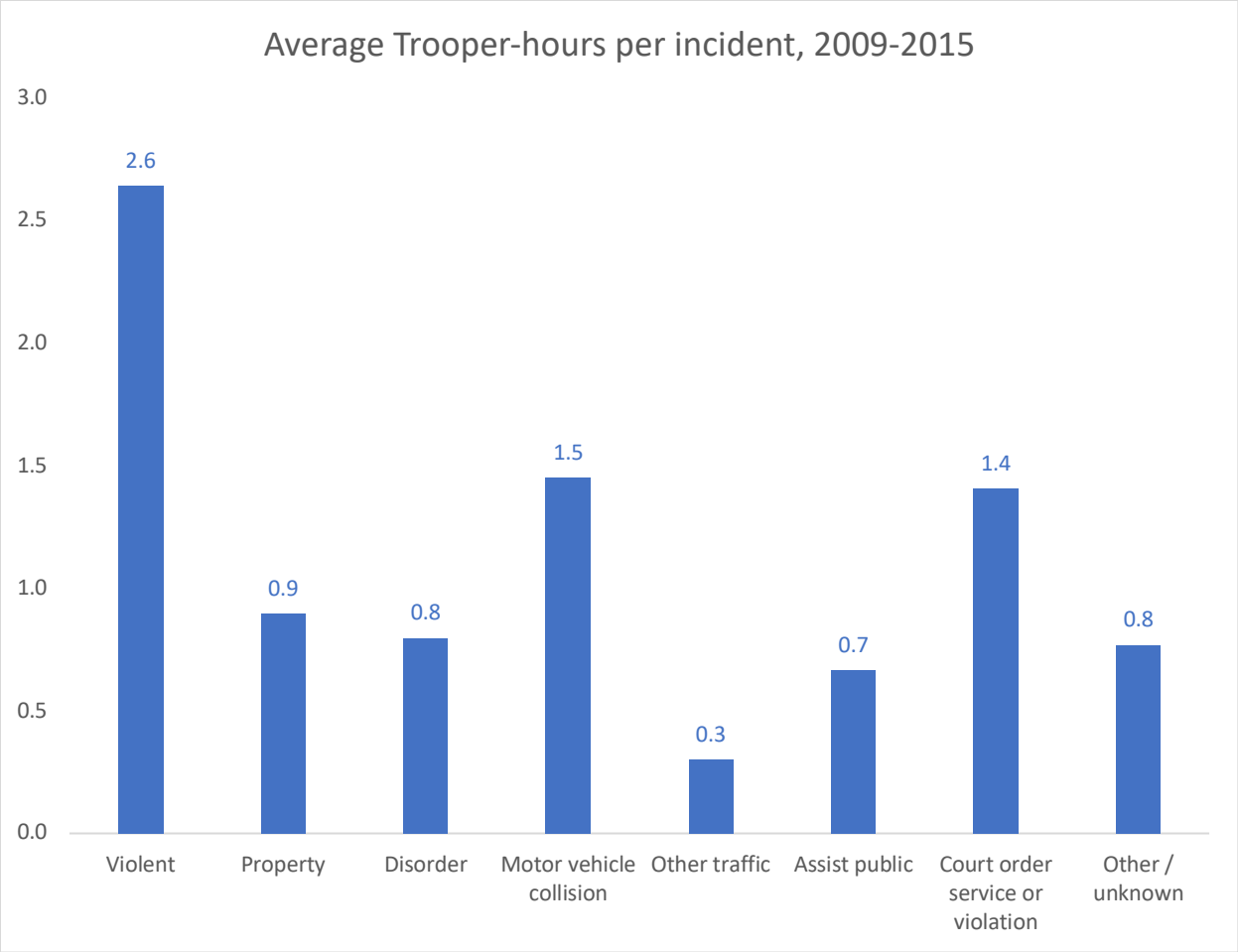

Figure 11: Average Trooper-hours per incident, AST and AWT B Detachment, 2009-2015

Recall that Figure 5 showed total Trooper-hours. The total number of Trooper-hours spent on incidents increased 17.4%, to 33,768 from 28,761 over the 2009-2015 period. This increase is not uniform across categories of incidents, which suggests there is value in examining the Trooper-hour trend over time by incident category. Figure 12 shows Trooper-hours spent by year and incident category for the study period.

During the study period, Trooper hours spent on traffic incidents, which are typically discretionary, have decreased slightly as Troopers have spent more time on non-discretionary incidents such as assist public, court order service (and in 2015, property crime). Trooper-hours spent on traffic incidents have decreased 7.6%, from 6,149 in 2009 to 5,683 in 2015.

Other / unknown incidents include agency assists and follow-up activity. Trooper-hours spent on these incidents have more than doubled during the study period, from 1,247 to 2,714. Other / unknown also includes and catch-all categories of “other activity not categorized”, “suspicious circumstance”, and “all other calls”. Over the study period, the number of Trooper-hours in these catch-all categories has decreased 43%, from 4,761 to 2,706, which may explain increases in other categories.

Disorder incidents include an array of nuisance incidents such as disturbances, civil complaints, drug complaints, non-criminal family offenses, harassment complaints, runaway juveniles, and trespassing complaints. Overall, Trooper hours spent on disorder incidents are up 27.3% from 4,504 in 2009 to 5,732 in 2015. Half of the Trooper hours in this category are spent on disturbance incidents, which have increased 17.9% (from 2,135 to 2,516). Trooper hours spent on trespassing complaints increased sharply over the study period, to 329 from 148, a 122.3% increase. Trooper hours spent on minors in need of supervision incidents increased 115.7%, to 358 from 166. Other incidents in this category showed non-remarkable changes from 2009-2015.

Assist public incidents include a wide variety of incidents where the public requires some sort of help. Overall, Trooper hours spent on these calls showed a steady increase from 2009 to 2015. Trooper hours spent on assist public incidents increased 34.0% over the study period, from 4,223 to 5,659 hours per year. These calls include motorist assist, medical assist, and public assist incidents, which together increased 29.9% (from 1,343 to 1,744) from 2009 to 2015. This category also includes search and rescue, security check, 911 hang-up, and animal issues (domestic and wildlife). Trooper hours on these incidents increased 12.6%, from 2,028 to 2,284. This category also includes fires with law enforcement requested, a category that was not captured in 2009. In 2015, 125 Trooper hours were spent on these fires. Trooper hours spent on welfare checks increased 76.7%, from 852 to 1,505.

Trooper hours spent on court order service grew 110% over the study period, to 2,683 hours in 2015 from 1,277 hours in 2009. Much of this growth was in warrant arrests, with Trooper hours on warrant arrests increasing from 973 in 2009 to 2,087 in 2015. It is unclear if this increase in warrant arrests is due to a real change in field practice or a change in reporting practices over the study period. In additional analyses (not shown) the average number of Troopers attached to each arrest incident *increased* over the study period, from 1.8 in 2009 to 2.7 in 2015. Over the same time, the number of warrant arrest incidents increased from 655 to 825. MatCom data includes an “original” incident type as well, allowing exploration of incidents with a final type of warrant arrest to see if they originated as warrant arrests. From 2009-2015, there was *not* a clear pattern of increasing incidents that originated as warrant arrests. This is true even if “follow up investigations” are added to warrant arrests (this is the most likely incident type miscategorization, given the available types).

The available data suggests that Troopers may be encountering increasing numbers of citizens who have warrants while Troopers are handling other incidents, and on average those incidents have more Troopers attached for more Trooper-hours in 2015 compared to 2009. There is insufficient data to explain why this is the case. Plausible explanations include changes in policy/procedures regarding warrant checks or changes in policy/procedure that increase arrestee processing time. It is, of course, also possible that an increased number of citizens have open warrants.

In property crime, Trooper-hours spent on burglary increased 63.1%, from 470.5 in 2009 to 767.4 in 2015, with the increase being almost entirely in 2015. Burglary incident counts (not

shown separately) increased by 14.5% over this same time period, from 338 in 2009 to 387 in 2015. The average number of Troopers assigned per burglary call increased from 1.6 to 2.2 in the same period, suggesting that the majority of the increase is in more Troopers being sent per call. Trooper hours spent on vehicle thefts increased 207.9% from 135.7 in 2009 to 417.8 in 2015. Vehicle theft incident counts increased 66.7%, from 126 to 210. As with burglary incidents, the average number of Troopers responding to vehicle thefts increased also increased, from 1.4 in 2009 to 2.3 in 2015.

Trooper-hours spent on violent crime incidents is virtually flat. Violent crime includes clear acts of violence such as assault, child abuse, domestic violence, homicide, robbery, and sexual assault. This category also includes potentially violent incidents, such as suicides and deceased persons. There is no consistent change in Trooper-hours spent on violent crime incidents from 2009-2015, with 3,053 Trooper-hours in this category in 2015. The noteworthy trend in this category is overall growth in the average number of Troopers attached to each incident. In 2009, 2.0 Troopers were attached on average; by 2015 this number had grown to 2.6. In fact, Troopers responded to slightly fewer violent incidents in 2015 (961) than in 2009 (1,085).

Trooper-hours spent on motor vehicle collisions is largely flat, with 2,608 Trooper-hours in 2015.

Overall, this examination shows two categories that merit further attention. First, the number of Trooper hours spent on vehicle thefts and burglaries showed a large increase in 2015. This increase is due to both an increase in incident counts *and* an increase in Troopers attached to each incident. Second, the number of Trooper-hours spent on court order service and violations, in particular warrant arrests, has shown steady increases since 2012. Further examination (beyond the scope of what can be analyzed for this report) is suggested.

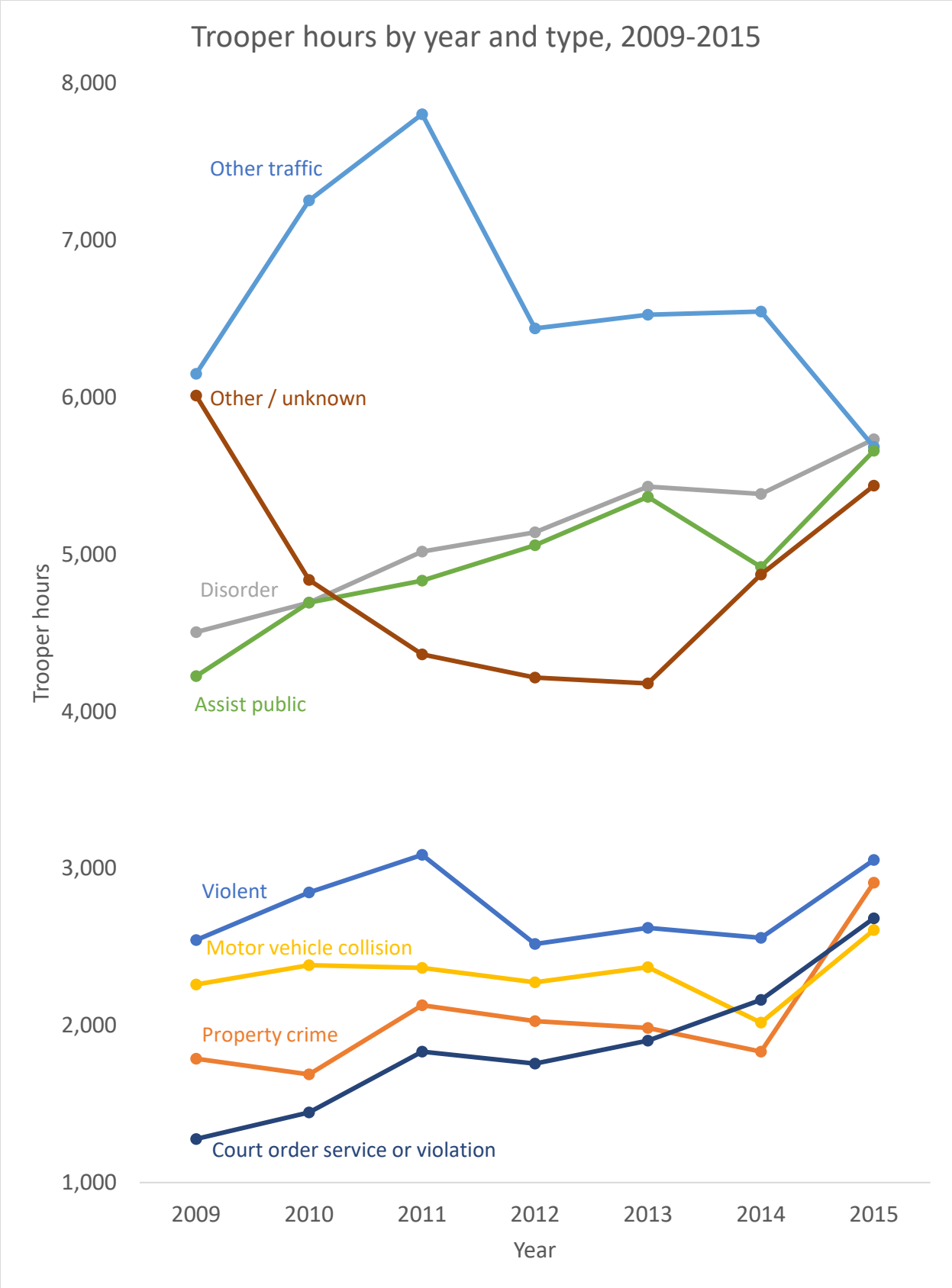

Figure 12: Trooper hours by year and type, 2009-2015

Appendix

Call classification, data source, and methods

Table 10: Number of incidents, average Troopers attached, and average Trooper-hours, B Detachment, 1 Jan 2009-31 Oct 2016

		Average per call	
	Freq.	*Troopers*	*Trooper-hours*
Other / unknown			
Agency Assist	5,452	1.6	1.0
Escape Custody of Le Corrections	5	5.0	6.6
Foot Pursuit	7	7.3	7.0
Follow Up Activity	14,273	1.2	0.7
Other Activity Not Categorized	6,850	1.2	1.2
Suspicious Circumstance (All)	21,873	1.4	0.6
All other calls	1,218	1.6	1.3
Disorder			
Abandoned Vehicle	2,810	1.2	0.5
Alarm (Any)	11,015	1.3	0.4
Atv Complaint	1,867	1.1	0.4
Civil Complaint	9,015	1.2	0.6
Disorderly Conduct	229	2.8	2.6
Disturbance	13,376	2.2	1.3
Drug Complaint	1,973	1.8	1.7
Family Offenses Non-Criminal	898	2.2	1.2
Fireworks Complaint	391	1.2	0.3
Harassment Complaint	3,301	1.2	0.6
Intoxicated Person	272	1.5	0.7
Minor Consuming	3	3.0	2.2
Minor in Need of Supervision	2,302	1.5	0.9
Prostitution Complaint	5	1.8	1.7
Runaway Juvenile	739	1.5	1.0
Trespassing Complaint	2,004	1.5	0.9
Property			
Burglary	2,730	1.7	1.5
Counterfeit	22	1.2	0.9
Found Property	945	1.3	0.9

		Average per call	
	Freq.	*Troopers*	*Trooper-hours*
Forgery Complaint	24	1.0	1.0
Fraud Complaint	2,021	1.1	0.5
Lost Property Complaint	703	1.1	0.5
Malicious Mischief, Vandalism	2,712	1.4	0.9
Theft from Merchant by Concealment	195	1.6	0.9
Theft by Taking or Receiving	7,845	1.3	0.8
Vehicle Theft	1,197	1.8	1.5
Violent			
Assault	2,913	2.7	3.4
Attempted Suicide	296	2.7	1.9
Child Abuse	44	1.2	1.1
Deceased Person	1,546	1.7	2.7
Domestic Violence Complaint	859	2.6	2.7
Domestic Violence in Progress	33	3.2	2.3
Violate DV Protective Order	859	1.5	1.2
Homicide	29	11.1	31.3
Indecent Exposure or Activity	28	1.5	0.7
Kidnap	11	6.3	12.6
Robbery	95	4.5	5.2
Report of Harm	156	1.3	1.1
Sexual Assault	514	1.4	1.8
Suicide	176	3.3	5.6
Weapons Offense-Shots Fired	549	1.7	1.5
Assist public			
911	6,827	1.4	0.6
Domestic Animal Related	2,749	1.1	1.0
Emergency Locator Beacon Alert	36	1.3	0.5
Fire (Any Fire Le Are Requested)	474	1.7	1.4
Motorist Assist	8,700	1.1	0.2
Medical Assist	2,041	1.9	1.1
Public Assist	16,577	1.2	0.5
Search and Rescue	436	2.4	5.2
Security Check	2,165	1.1	0.3

		Average per call	
	Freq.	*Troopers*	*Trooper-hours*
Welfare Check	11,035	1.6	0.8
Wildlife Related Animal Issues	8,112	1.2	1.0
Court order service or violation			
Court Order Service or Violation	922	1.8	2.1
Serve DV Protective Order	993	1.5	0.9
Eviction from Premises by Court Order	25	1.6	0.9
Fail to Register as Sexual Offender	159	1.1	0.3
Serve Subpoena, Summons	1,735	1.1	0.3
Warrant Arrest	6,551	2.1	1.8
Motor vehicle collision			
Hit and Run	706	1.5	1.0
Damage Only Collision	8,425	1.5	1.0
Collision Resulting in Fatality	95	6.3	15.8
Collision Resulting in Injury	1,884	2.7	3.1
Collision Occurring on Private Property	175	1.2	0.5
Motor Vehicle Accident (injuries unknown)	1,272	1.5	1.3
Other traffic			
Aircraft Incident	188	2.1	3.6
Driving Under Influence	3,673	2.6	4.1
Drive While License Suspended Cancelled	2,905	1.5	1.2
Minor Operating Motor Vehicle After Consuming	154	2.0	1.8
Operating Without Valid License	560	1.4	0.9
Road Kill	116	1.3	0.7
Reckless Driving	1,253	1.3	0.3
Report Every Dangerous Driver Immediately	16,014	1.2	0.2
Subject Stop	3,122	1.1	0.2
Traffic Stop	130,569	1.1	0.2
Atv Stop	171	1.1	0.2
Traffic Hazzard	3,963	1.2	0.4
Traffic Offense	884	1.6	1.0
Traffic Pursuit (Fail to Yield)	339	3.8	3.0
Vehicle in Ditch	3,695	1.3	0.5
Municipal ordinance violation	24	1.0	0.5

Data structure and agency identification

MatCom (Wasilla Police Department dispatch) provided computer-aided dispatch (CAD) data for 1 Jan 2007 through 31 Oct 2016. Data were provided in two tables: 1) incident-based; 2) unit-based. The incident table has one record per incident. Incidents can have multiple Troopers or police officers (i.e., more than one *unit*) dispatched to them. Each record in the unit table has one record per incident-unit combination. These tables were merged using the incident number.

Unit number prefixes are used to identify the agency of a unit. For example, 1B45 is a unit designator, with a prefix of "1B". Table 11 shows the agencies and associated prefixes.

Table 11: Agency identification by unit designator prefix

Agency	Prefixes
Alaska State Troopers	1B 1D 1E 1H 1T 1V 1X 2N 2X 4V 5H 8T HELO
Wildlife Troopers	5N 5B
Court Services	3B 3J
Alaska Bureau of Investigation	2I
Wasilla Police Department	W K R
Federal agencies	10B 11B
Commercial enforcement	8O
Houston Police Department	HPD
Parks	24C 24G
Department of Public Safety Fire	7G

The agencies of primary interest for this report are the Alaska State Troopers and Wildlife Troopers — but other agencies cannot be ignored.

First, multiple agencies can respond to a single incident. This is to be expected when large, unusual incidents occur. Even routine incidents can have units from multiple agencies respond. This is especially true of situations requiring backup, or incidents along the borders of the service areas for each agency.

Second, MatCom's CAD records the "primary unit" based on which unit was assigned *first*. The primary unit did not necessarily spend the most time on scene. Incidents can be handed off from one unit to another, which sometimes results in a different agency handling most of the work related to an incident. Where practicable, unit-level data is used within this report to estimate trooper-hours.

Data dropped from the analysis

The original MatCom data contained 795,417 incidents. Incidents that were never assigned to a unit were dropped (68,326). Inconsistencies in incident type codes in years 2007 and 2008 caused those years to be dropped (121,263). Incidents with locations in Anchorage were dropped (815) because they were outside the study area. Records with a final incident type of "locate" (521) or request for patrol of a particular geographic area (13,745) were dropped after consultation with MatCom — these are frequently information-only items and not incidents that require a response. Incidents where the primary agency was the Alaska Railroad (10), federal agencies (148), ABI (1,958), DPS fire (30), Court Services (28,885), Parks (2,676), Commercial enforcement (1,833), or where the agency was unknown or unrecorded (416) were all dropped.

Finally, the primary Sockeye fire incident record was dropped. Many resources from many agencies were attached at various times. Including this incident in the analyses is difficult — this was a unique event in terms of the number of troopers/officers and police hours spent (377 units were dispatched over 12 days, spending at least 1,035 Trooper/officer hours on-scene). This left 554,790 incidents from 1 Jan 2009 through 31 Oct 2016 from all agencies served by MatCom. Of these incidents, 379,187 had at least one AST or AWT unit assigned to the incident, regardless of which agency was the primary.

Brief review of administrative time literature

A comprehensive review of the literature showed relatively few studies of administrative and personal time specifically, but several observational time-task studies exist. Most studies collected data in the late 1990's. Combined, these studies show a wide range of estimates of police officer time spent on administrative tasks, meal breaks, and personal breaks, but they converge on an estimate the IACP first suggested decades ago: about one-third of officer time is spent on these tasks. Nine studies included time-task data from 26 agencies.

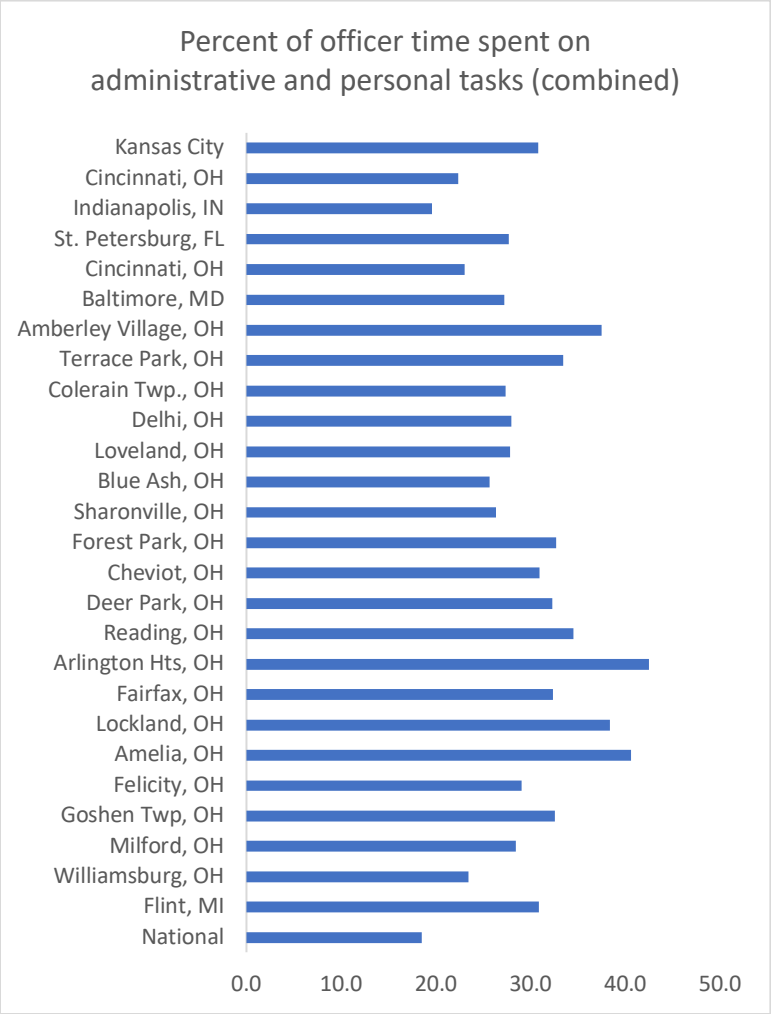

Figure 13: Percent of officer time spent on administrative and personal tasks

Many of the included studies are from Ohio — a research team from the University of Cincinnati conducted a series of studies using direct observations of police officers in 1999-2000. Many of these are small-midsize agencies serving rural areas. The workload of these agencies is likely similar to that of B Detachment Troopers.

More recent studies are rare. The most recent study available, from 2012, used a national survey of officers. This study found substantially lower estimates of administrative and personal time than the other studies, all of which used direct observation of officers. While it is possible that administrative/personal time changed 1999-2012, it is more likely that officers underestimate the amount of time spent on these tasks relative to other tasks.

The average of administrative and personal time in these studies is 29.8% of officer time. For estimating workloads, this report uses a slightly more conservative estimate of 33.3% that is still well within the common range of these studies.

Table 12: Percent of shift spent on administrative and personal tasks

Percent of shift spent on administrative and personal tasks	Data collection site	Year of collection
30.8	Kansas City	1972-1973[15]
22.3	Cincinnati, OH	1995[16]
19.6	Indianapolis, IN	1996[17]
27.7	St. Petersburg, FL	1996[3]
23.0	Cincinnati, OH	1997-1998[18]
27.2	Baltimore, MD	1999[19]
37.5	Amberley Village, OH	1999-2000[20]
33.4	Terrace Park, OH	1999-2000[6]
27.3	Colerain Twp., OH	1999-2000[6]
27.9	Delhi, OH	1999-2000[6]
27.9	Loveland, OH	1999-2000[6]
25.6	Blue Ash, OH	1999-2000[6]
26.3	Sharonville, OH	1999-2000[6]
32.7	Forest Park, OH	1999-2000[6]
30.9	Cheviot, OH	1999-2000[6]
32.3	Deer Park, OH	1999-2000[6]
34.5	Reading, OH	1999-2000[6]
42.5	Arlington Hts, OH	1999-2000[6]
32.4	Fairfax, OH	1999-2000[6]
38.4	Lockland, OH	1999-2000[6]
40.6	Amelia, OH	1999 - 2000[21]
29.0	Felicity, OH	1999-2000[7]
32.5	Goshen Twp, OH	1999-2000[7]
28.4	Milford, OH	1999-2000[7]
23.4	Williamsburg, OH	1999-2000[7]
30.9	Flint, MI	2010-2011[22]
18.5	National survey	2012[23]

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