Police Force Analysis System℠
First Summary Report

Vallejo Police Department

Use of Force Data from January 1, 2017 to December 31, 2019

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Background – The Lack of Data on Police Use of Force

In response to a recent series of highly publicized police shootings, the public and policy makers are demanding that law enforcement be more accountable and transparent about its use of force, particularly with regards to the impact on communities of color. But, as made clear in a 2013 survey by the U.S. Department of Justice,[1] there is wide variance in agency approaches to tracking force, a lack of in-depth review of force within many individual police departments, and simply no data allowing for a meaningful evaluation and comparison of use of force practices across the United States. Understanding police use of force in all its complexity requires a systematic examination of when, where, how, and why force is used in the approximately 400,000 force incidents occurring each year throughout the country.

While the FBI has attempted to collect information on justifiable homicides by police officers, this amounts to an extremely small percentage of all police uses of force that occur each year and the data is limited and incomplete.[2] The FBI recently launched a new attempt to collect national use of force data with limited success.[3] There are no reliable and comprehensive data sources available that could be used to develop evidence-based best practices for use of force. As a result, there currently exists a plethora of policies, training programs and procedures designed to guide officers on how to appropriately use force. Since none of these policies or programs have been evaluated for their effectiveness, agencies have no way of knowing whether their existing practices should be maintained, modified, or overhauled. Some organizations such as the Police Executive Research Forum (PERF) have attempted to develop guidelines on how officers should appropriately use force.[4] Unfortunately, with no data or evidence to back up the

[1] "Data on Use of Force by Police Across U.S. Proves Almost Useless," New York Times, August 11, 2015.
[2] "FBI director calls lack of data on police shootings 'ridiculous,' 'embarrassing,'" Washington Post, October 7, 2015.
[3] Police Use Of Force Data Remains A Mess And The FBI's Involvement Isn't Making Anything Any Better, TechDirt, September 24, 2019.
[4] Guiding Principles on Use of Force, Critical Issues in Policing Series, Police Executive Research Forum, March 2016.

effectiveness of these new proposals, they are often met with skepticism and resistance by the law enforcement community.[5] By issuing recommendations for sweeping reforms without providing any data to support those recommendations, the chasm between the public and police may actually widen as we debate how the police should reform themselves.[6]

The Department of Justice (DOJ) has attempted to reform dozens of law enforcement agencies over the last 25 years through a series of consent decrees and collaborative reform projects. Consent decrees can cost local governments millions of dollars and it can take up to a decade to reach compliance with court ordered mandates. Unfortunately, one thing that all consent decrees have lacked is a systematic and comprehensive data collection program that would be capable of assessing the effectiveness of the reforms and the long-term impacts of the decrees. A few studies by academic researchers have determined that the benefits of consent decrees are mixed at best.[7]

In May 2015 the Obama Administration launched the Police Data Initiative.[8] This initiative was the result of recommendations from the Task Force on 21st Century Policing and it has two primary goals: (1) Use open data to build transparency and increase community trust, and (2) Provide internal accountability and effective data analysis. One of the data elements collected by the initiative is police use of force. This data is currently available on an open data portal managed by the Police Foundation.[9] Only 24 law enforcement agencies have provided their data on use of force incidents and each of those agencies has a different method for reporting their stats. Some agencies only include 3 fields of information while others have more than 30 fields. Some agencies only report on officer involved shootings while others report on all uses of force

[5] Statement of the International Association of Chiefs of Police and the Fraternal Order of Police on PERF's Proposed Use of Force Standards, February 2016.
[6] Protocol for reducing police shootings draws backlash from unions, chiefs group, Washington Post, March 31, 2016.
[7] "Do federal consent decrees improve local police departments? This study says they might," Washington Post, May 24, 2017.
[8] "Launching the Police Data Initiative," The White House President Barack Obama, May 18, 2015.
[9] Police Data Initiative Open Data Portal

including the pointing of a firearm. Unfortunately, the use of force data provided to the Police Data Initiative provides little insight into how officers are using force and where efforts on reform need to be focused.

The State of California recently adopted one of the most comprehensive use of force data collection programs in the country.[10] The URSUS system uses an online reporting tool[11] to collect data from all law enforcement agencies in the state. The California DOJ provides access to some of the data on its Open Justice Portal[12] and releases annual reports.[13] The main limitation of URSUS is that it only collects data on use of force incidents that result in serious bodily injury or death of a civilian or officer or the discharge of a firearm. Each year about 700 use of force incidents that meet the URSUS reporting criteria which is less than 2% of the estimated 45,000[14] uses of force that occur in the state each year. Only 25 of the state's 509 law enforcement agencies had more than 5 incidents to report to URSUS in 2016 and more than half the agencies in the state did not have any incidents to report. While the URSUS system is a good first step, the limited amount of data it contains will provide little guidance to any department that wants to implement data-driven reforms.

While URSUS captures data on all firearms discharges, most officers will go their entire careers without ever discharging their firearms in the line of duty. By contrast, half of the nation's 800,000 law enforcement officers will use some type of force at least once each year. We need

[10] "California Launches Digital Platform to Collect Police Use-of-Force Data," Techwire.net, September 22, 2016.
[11] California Department of Justice URSUS Use of Force Incident Reporting
[12] California DOJ Open Justice Portal
[13] California DOJ URSUS 2017 Report
[14] This estimate of the total number of use of force incidents in the state was derived from the total number of arrests in 2016 (1,120,759) multiplied by 4% which is the average use of force rate per arrest of the 32 law enforcement agencies in the Police Force Analysis System℠. A use of force incident includes the use of any physical force to overcome resistance and/or the use of any weapon.

to begin collecting and analyzing data on all use of force incidents so that agencies can craft evidence-based best practices and closely monitor officer behavior in the field.

Early Intervention (Early Warning) Systems

Many law enforcement agencies have developed Early Intervention Systems (EIS) to identify potentially problematic behavior among their officers at an early stage so that corrective measures can be taken before a serious incident, complaint or lawsuit occurs. A number of these systems include use of force data as one of the risk components. Typically, some type of trigger will be set based upon the frequency of force (e.g. 3 or more uses of force in a 6-month period) and when an officer meets that trigger, they will be flagged for additional review. The efficacy of EIS systems has been challenged and there is little evidence to demonstrate that they are effective at identifying high risk officers.[15] The Los Angeles Police Department spent millions of dollars developing its TEAMS II system as part of a federal consent decree. Each month the system flags about 190 officers for additional review based in part on the frequency of use of force incidents. In 70% of the flagged cases supervisors did not find any issues with the officer's use of force and only 3% of the flagged officers were ordered to undergo retraining, were reprimanded or had some other action taken.[16] As will be discussed later in this report, measuring the frequency of an officer's use of force is a poor measure of the appropriateness of that force.

Building the Data Infrastructure to Support Democratic Policing

The core function of the police in a democratic society is to protect life, liberty, and property, and coercion is the fundamental means by which they achieve those democratic goals. While the police perform many complex and important roles within the communities they serve, the single defining characteristic of the police is their capacity to both verbally and physically coerce individuals to do things that they are not otherwise inclined to do, particularly those

[15] "Early Warning Systems: What's New? What's Working?" CNA, December 2015.
[16] "Report questions LAPD program to flag misconduct," Los Angeles Times, August 25, 2014.

individuals who are not obeying the rules. To be able to do this efficiently and effectively, the police must be viewed as a legitimate authority by the citizens they serve. This perceived legitimacy is driven by transparency in police decision-making, the presence of sufficient accountability structures, and perhaps most important, fundamental fairness in the distribution of coercive authority.

Democratic policing is thus a process rather than an achievable end in itself, and it can only be demonstrated through constant evaluation in order to ensure that these democratic ideals are being satisfied. This process of evaluation requires adequate information about coercion. Recent tragic high-profile events have renewed our focus on an old problem: the fact that we simply do not have enough data about police coercion. The most important task to improve the quality of policing in the United States is to systematically collect and report data on police coercion, and to understand the distribution of coercion across people, places, and time.

Police Strategies LLC has partnered with the Center for the Study of Crime and Justice at Seattle University to develop comprehensive information about the intersection of individual and contextual factors that explain situational, temporal, and spatial variation in the distribution of police coercive authority with attention to the ways in which demographic factors such as race/ethnicity, gender, and age, situational/historical/individual characteristics such as mental illness, homelessness, and location impact police-citizen interactions and police coercive control. Data from this system will produce research and support community engagement about the relationship between the intersection of race, age, gender, status, and behavior on police coercion.

Police Strategies LLC

Police Strategies LLC is a Washington State based company that was formed in February 2015. The company was built by law enforcement professionals, attorneys, and academics with the primary goal of helping police departments use their own incident reports to make data-driven decisions and develop evidence-based best practices. The company's three partners are all former employees of the Seattle Police Department and were directly involved with the Department of Justice's pattern or practice investigation of the department in 2011 as well as

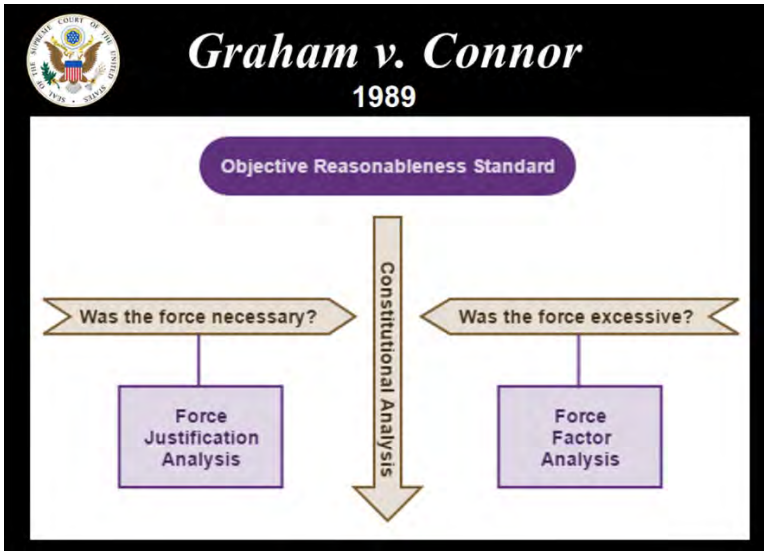
the federal consent decree that followed. They wanted to take the lessons learned from that experience and provide other police departments with the tools they need to monitor their use of force incidents, identify high risk behavior and evaluate the outcomes of any reforms that are implemented. The company has a partnership with the Center for the Study of Crime and Justice at Seattle University to assist in the analysis of the data.

Police Force Analysis System℠

In the summer of 2015, Police Strategies LLC launched the Police Force Analysis System℠ (PFAS). PFAS combines peer-reviewed research with state-of-the-art analytical tools to produce a powerful data visualization system that can be used by law enforcement, policy makers, academics, and the public.[17] The core of PFAS builds upon the research work of Professor Geoff Alpert and his Force Factor method. Force Factor analysis formed the basis of Professor Alpert's 2004 book "Understanding Police Use of Force – Officers, Subjects and Reciprocity"[18] and has been the subject of several scholarly articles.[19]

PFAS is a relational database that contains 150 fields of information extracted from law enforcement agencies' existing incident reports and officer narratives. The data is analyzed using legal algorithms that were developed from the evaluation criteria outlined in the United States Supreme Court case of *Graham v. Connor*, 490 U.S. 386 (1989). The Court adopted an objective reasonableness standard which evaluates each case based upon the information that the officer was aware of at the time the force was used and then comparing the officer's actions to what a reasonable officer would have done when faced with the same situation. PFAS uses Force Justification Analysis to determine the risk that a use of force incident would be found to be unnecessary and Force Factor Analysis to evaluate the risk that the force would be found to be excessive.

[17] Capitola Police creates online database to track use of force stats, Santa Cruz Sentinel, August 2016.
[18] Understanding Police Use of Force – Officers, Subjects, and Reciprocity, Cambridge Studies in Criminology, 2004.
[19] See, e.g., Reliability of the Force Factor Method in Police Use-of-Force Research, Police Quarterly, December 2015.



PFAS examines relevant temporal data from immediately before, during and after an application of force.

PFAS uses powerful data visualization software to display the information on dynamic dashboards. These dashboards can be used by police management to identify trends and patterns in use of force practices and detect high risk behavior of individual officers. The system can also be used to spot officers who consistently use force appropriately and effectively. Since the system can find both high risk and low risk incidents, PFAS can be used both as an Early

Intervention System to correct problematic behavior as well as a training tool that highlights existing best practices.

PFAS contains several years of historical data for each agency and is designed to be updated on a regular basis. This allows the department to immediately identify trends and patterns as well as measure the impacts and outcomes of any changes that are made to policies, training, equipment, or practices. For example, if a department provides crisis intervention and de-escalation training to its officers, the system will be able to evaluate whether that training has had any impact on officer behavior.

PFAS currently has use of force data from 88 law enforcement agencies in eight states involving more than 11,000 incidents and 4,500 officers who used force a total of 20,000 times. PFAS is the largest database of its kind in the nation. Although the incident reports from each of these agencies uses a different format, all the data extracted and entered into the system has been standardized which allows us to make meaningful interagency comparisons. The Police Force Analysis Network℠ allows agencies to compare their use of force practices with other agencies in the system.

The Police Force Analysis System℠ provides comprehensive information about police use of coercive authority and permits the study of the intersection of individual and contextual factors that explain situational, temporal, and spatial variation in the distribution of police coercive authority. PFAS supports meaningful community engagement about police coercion by providing comprehensive and relevant data to address and inform community concern regarding police-citizen interactions.

Key Findings from the Police Force Analysis System℠

Under our partnership with the Center for the Study of Crime and Justice at Seattle University, we are continuously analyzing the use of force data from all the agencies in the Network to identify trends, patterns, correlations and outcomes. Here are some of our initial key findings that were derived from the 88 agencies currently providing data for the system:

❖ Uses of Force are Linked to Arrests

Most use of force incidents are associated with an attempt by an officer to bring an individual into custody. If a subject resists a lawful arrest or detention, then it is usually necessary for the officer to use some type of force to gain control of the subject. A decline in use of force incidents generally follows falling arrest numbers, while an increase in force incidents is usually the result of rising arrest rates.

While many people view any use of force by police as a negative outcome regardless of how or why the force was used, our data shows that officers cannot do their jobs effectively without using some amount of force in appropriate circumstances. No matter how much de-escalation training an officer receives, there will always be a certain percentage of arrestees who will resist or flee regardless what the officer says or does. PFAS data shows that on average 4% of all arrests involve in a use of force.

Some departments have seen dramatic declines in uses of force when consent decrees are imposed, when departments come under intense public scrutiny or when body cameras are first implemented. However, these declines in uses of force are almost always associated with a corresponding decline in arrests as officers become less proactive and they are more reluctant to engage in situations involving minor crimes, infractions or suspicious circumstances.

There is a strong correlation between the total number of uses of force a department has and the total number of arrests their officers make. Similarly, the more proactive and productive an officer is, the more arrests they will make and the more uses of force they will have. Rather than simply measuring the frequency of force, a better metric to assess risk is the number of uses of force compared to number of arrests made. For example, an officer

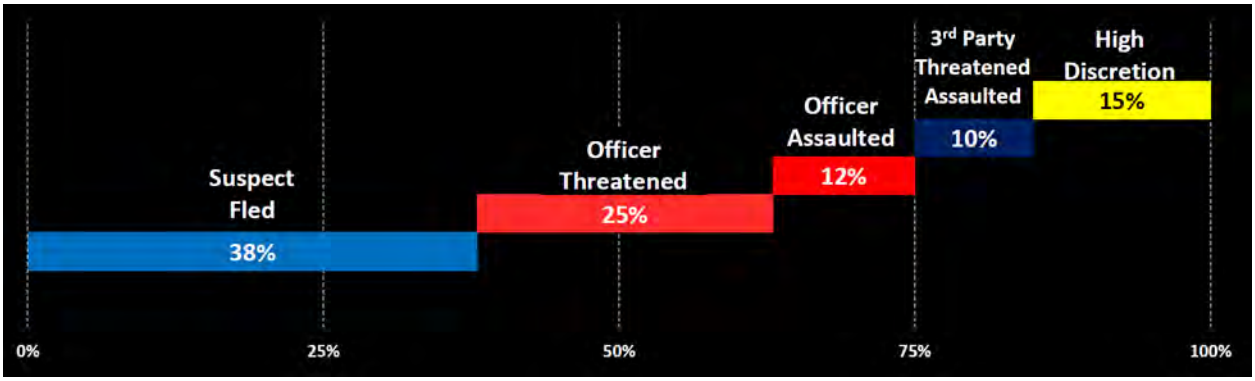
who makes 10 arrests and uses force against 4 of those subjects (40% use of force rate) is a higher risk than an officer who makes 300 arrests and uses force against 12 subjects (4% use of force rate).

When an agency begins to analyze its use of force incidents, the focus should be on the use of force rate per arrest, the necessity of the force used (i.e. whether the force was justified) and the proportionality of force to resistance (i.e. whether the force was excessive). Unfortunately, most departments and most Early Intervention Systems simply look at the frequency of force and work from the assumption that more force is bad, and less force is good. This type of simplistic analysis tends to penalize more productive and proactive officers and could lead to public safety problems if officers are encouraged to disengage and make fewer arrests.

❖ Most officer decisions to use force are low discretion

There are four primary factors that will motivate an officer to use force:

1) Suspect fled from the officer (38% of all force incidents)
2) Subject threatened the officer verbally or physically (25% of all force incidents)
3) Subject assaulted the officer before force was used (12% of all force incidents)
4) Subject threatened or assaulted a third party in the officer's presence (10% of all force incidents.



The presence of one or more of the above factors creates a sense of immediacy for the need to use force and often the officer will have no reasonable alternative than to use force.

In only 15% of all force incidents, none of the four factors were present. In these circumstances the officer may have additional options and more time available to attempt to bring the subject into custody without having to use force. These are the types of situations where de-escalation techniques can be used effectively.

❖ The Force Factor used will determine the outcomes

The Force Factor examines the level of force used compared to the level of resistance presented. While high Force Factor scores may be an indicator of potential excessive uses of force, if the officer does not respond with a sufficient level of force, it can take much longer to bring the subject under control with a much higher risk of injury to the officers involved. High Force Factor incidents are resolved quickly with a low risk of injury to officers, but a high subject injury rate. In any given situation, officers must make quick decisions about both the timing of force and the level of force to use in order to effectively take control of the subject and minimize the risk of injury to both officers and subjects.

Outcome % of Force Incidents	Low Force Factor	Medium Force Factor	High Force Factor
Short Force Duration	24%	26%	64%
Subject Injury Rate	36%	48%	68%
Officer Injury Rate	21%	16%	4%

❖ Members of the public tend to be more concerned about the fact that force was used at all rather than the level of force that was used

Some of the agencies in the Police Force Analysis Network℠ have provided data on complaints about uses of force and this data has been incorporated into PFAS. An analysis of that data has shown that when individuals complain about an officer using excessive force against them, it is more common for these incidents to have a low Justification Score rather than a high Force Factor Score. It appears that primary the motivation for the use of force

complaint is not the level of force that was used, but rather the fact that force was used at all. Complaints about use of force are most common when low levels of force are used against individuals who are engaged in minor crimes or infractions or when they are suspected incorrectly of being involved in criminal behavior. When these individuals fail to cooperate, the officer can usually gain control with a minimal amount of force and no injury. However, the subjects in these types of situations tend to view any level force used against them as unwarranted since they believe the officer does not have the authority to detain them. By contrast when a subject was engaged in serious criminal behavior, threatened the officer, actively resisted, and/or tried to flee, subjects are less likely to complain even if the officer used an extremely high level of force and the subject sustained an injury. This finding is consistent with a recent study from the John F. Finn Institute for Public Safety:

> "In our recently published study of policing, Mirage of Police Reform, we found that citizens' assessments of procedural justice are shaped much less by how officers use their enforcement powers—such as using physical force or conducting searches—than whether they use them…[I]ndividual officers' decisions about whether to use their coercive authority matter far more to public perceptions of police legitimacy than how they use it."[20]

[20] "Building Trust in Police: What Really Works?" The Crime Report, Center of Media Crime and Justice at John Jay College, July 18, 2017.

Data Collection from the Vallejo Police Department

Police Strategies LLC began working with the Vallejo Police Department in February 2020. Our first task was to code the Department's use of force reports from January 1, 2017 to December 31, 2019 and enter the data into the Police Force Analysis System℠. Vallejo PD personnel provided copies of the reports through a secure online file sharing system.

Vallejo PD provided incident reports and officer narrative statements for each incident where force was used. These reports were received as Adobe Acrobat files. Additional data was provided from the Department's IAPro records management system. Data was extracted from the incident reports and officer narrative statements and entered into a relational database. Interactive dashboards were then built for use by Vallejo PD.

The Police Force Analysis System℠ contains data on all use of force incidents where an officer used a weapon or any physical force. The system does not contain data on incidents where force was threatened but not used (e.g. the pointing of a firearm or ECW). The database also does not include reports where the subject alleges that force was used but the officer denies using force.

Summary of Vallejo PD's Police Force Analysis System℠

The Vallejo Police Department's Police Force Analysis System℠ (PFAS) contains 3 years of use of force data from 2017 to 2019. The database includes detailed information on 460 subjects who had force used against them and the 100 officers who used force during the 3-year period. In 2019 there were 131 use of force incidents involving 60 officers who used force a total of 235 times. This report will examine the 3-year trends in uses of force and will summarize the use of force data from the entire period.

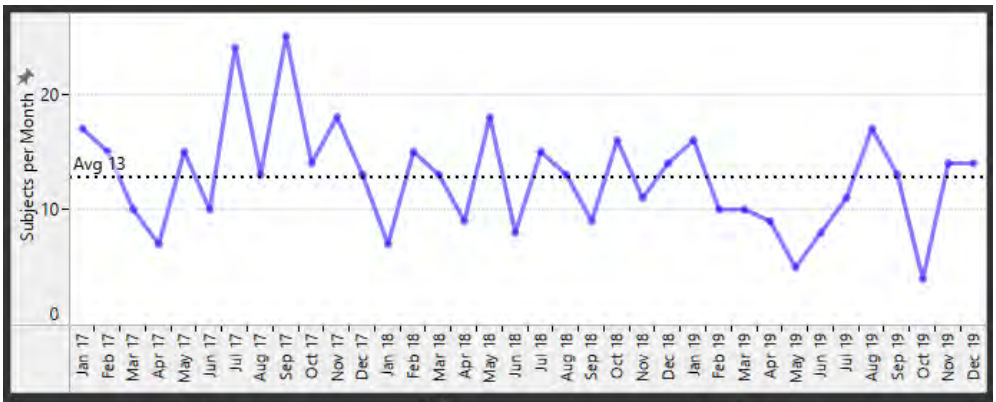
1) Date, Time and Location of Use of Force Incidents

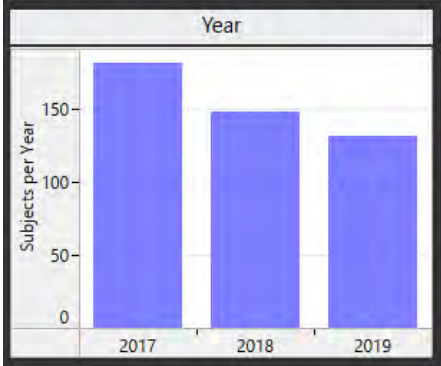
Over the last three years the month with the most force incidents was August with 17 incidents per year and the month with the fewest incidents was April with 8 incidents per year. During the week, Saturdays had the most incidents (25 per year) and Fridays had the fewest (19 per year). The peak time period for force incidents was between 11pm and 1am (25 per year).

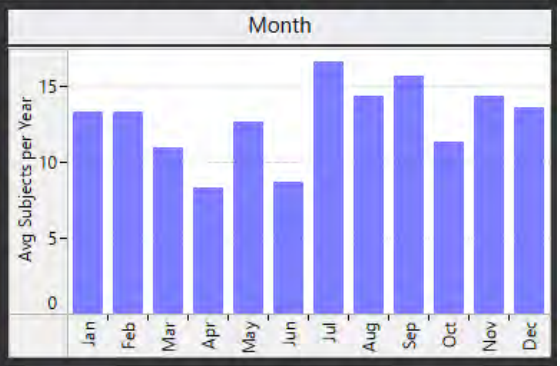
More than half of all force incidents in 2019 occurred on the street, 15% occurred at a business and 26% occurred inside or outside a home.

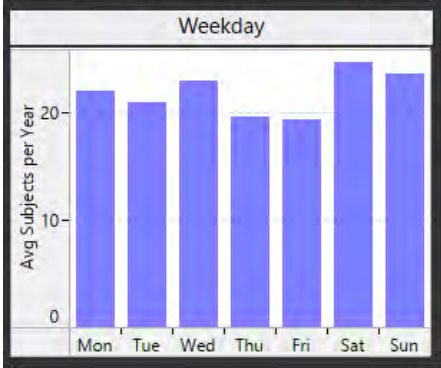
From 2017 to 2019 the annual number of force incidents fell from 181 to 131 a 28% decline.

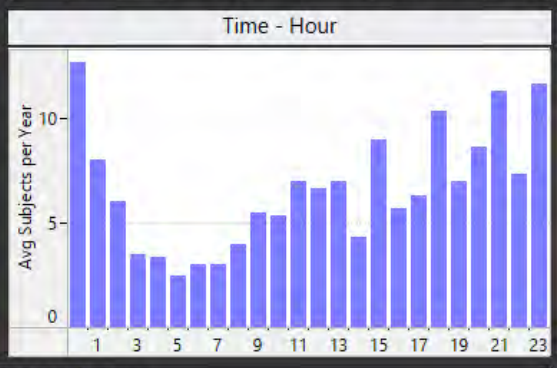
Use of Force Incidents – 2017 to 2019







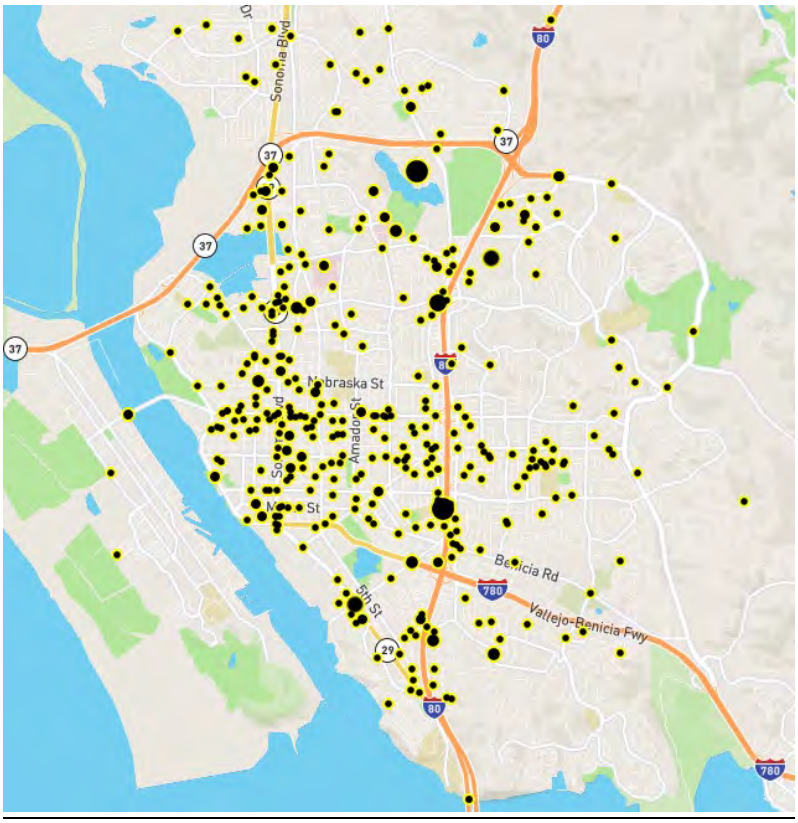




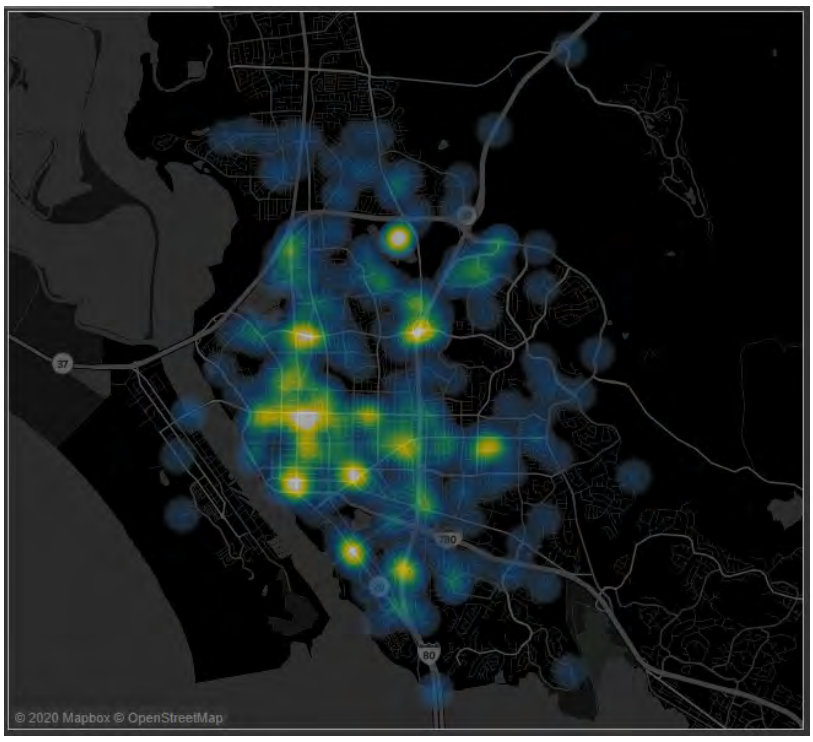
Weekday & Time

	12am-4am	4am-8am	8am-Noon	Noon-4pm	4pm-8pm	8pm-12am
Mon	20	3	7	8	8	20
Tue	12	7	9	6	14	15
Wed	11	1	12	16	17	12
Thu	8	2	7	14	16	12
Fri	11	3	7	11	11	15
Sat	12	4	9	13	14	22
Sun	13	7	9	13	8	21

Use of Force Incident Locations – 2017 to 2019



Use of Force Heat Map – 2017 to 2019



2) Reason for Contact

Over the last 3 years 59% of officers who used force were responding to a dispatched call for service. Twenty-eight percent of officers were making an officer-initiated contact and 13% of officers were responding to assist other officers. From 2017 to 2019 the percentage of officer-initiated contacts leading to a use of force fell from 33% to 21%.

Over the last 3 years there has been a trend towards more officers being present on scene when force was used. In 2017 14% of all force incidents had 4 or more officers on scene when force was used, and that percentage rose to 24% by 2019. Despite more officers being present, 86% of all force incidents involved only one or two officers using force.

Over the last 3 years the most common original call types for force incidents were general disturbances/suspicious circumstances (26%), property crimes (23%) and violent crimes (22%). There were 78 incidents related to a traffic offense, 42 burglaries and 30 trespass.

3) Force Frequency

In 2019 there were 131 use of force incidents involving 60 officers who used force a total of 235 times. There were four officers who used force between 10 and 12 times each, eleven officers who used force between 6 and 9 times each, twenty officers who used force 3 or 4 times, and twenty-five officers who used force once or twice. The top 10% of officers made up 25% of all force used by the Department.

Over the last three years one officer used force 30 times and eight officers used force between 20 and 25 times each. These are likely the officers who are making the most arrests in the Department.

4) Force Justification

The Force Justification Score is based upon the four Graham Factors: (1) seriousness of the crime being investigated; (2) the level of threat to the officer or others; (3) the level of resistance; and (4) whether the subject fled from the officer. Low Justification Scores are indicative of incidents where subjects were not committing serious crimes, did not pose a

significant threat to the officer or others, did not present a high level of resistance and did not flee.

From 2017 to 2019, 15% of the Department's use of force incidents had low Force Justification scores (<6). The average Force Justification score was 10.0 on a scale of 0 to 20. The annual average Force Justification score increased from 9.6 in 2017 to 10.5 in 2019.

For each of the four Graham factors, Vallejo PD scored highest in the resistance level and crime level and lowest in the threat level and flight level categories. This indicates that when Vallejo PD officers use force, they are facing higher levels of resistance and more serious crimes, but subjects present a lower level of threat to officers and are less likely to flee from officers. The threat level, crime level and resistance level scores were higher in 2019 than prior years.

Over the last three years there were 29 incidents that received the highest justification score of 20. These incidents involved an assault on the officer before the officer made the decision to use force.

In 2019 there were 23 officers who were involved in at least one incident with a low Force Justification score. One officer was involved in 3 low Force Justification incidents and four officers were involved two low Force Justification incidents each.

Low Force Justification incidents were more likely to have the following characteristics than cases with higher Force Justification scores:

- Subject was under the influence of alcohol or drugs (55%)
- Subject was Black (69%)
- Subject was over age 50 (18%) or a juvenile (9%)
- The original call type was a traffic offense (28%)
- The most serious charge referred for prosecution was a probation violation/warrant (21%), disorderly conduct (13%), or drugs (10%)

Average Force Justification Scores did not vary significantly by the gender, race or age of the subjects.

Officers were less likely to use ECWs (12%) or impact weapons (1%) during a low Force Justification incident but were more likely to use canines (12%). Officers were more likely to resolve a low Force Justification incident by using only physical force (75%), but they were less likely to use strikes, pain compliance techniques, LNR, wrestling and using weight to hold down subjects. Low Force Justification incidents were most likely to be resolved using a takedown (76%).

5) Force Factor

The Force Factor Score is based upon the proportionality of force to resistance and scores range from -6 to +6. A negative score means that the subject's resistance level was higher than the officers' force level. A medium Force Factor Score is between 0 and +2. This is the range where most officers can gain control of a subject by using force that is at least proportional to the level of resistance or slightly above. A Force Factor of +3 or above is considered a high score. This does not mean that the force was excessive, but these incidents do present a higher risk to the department.

Over the last three years 11% of force incidents had a high Force Factor score (+3 or above). The average annual Force Factor score has remained stable at 0.9. In 2019 nine incidents had a +3 Force Factor and there were no incidents with a higher score. Eleven officers were involved in those high Force Factor incidents and one officer was involved in two of the incidents.

High Force Factor incidents were more likely to have the following characteristics than cases with lower Force Factor scores:

- Subject was Male (94%)
- Subject was Black (60%)
- Subject was between 30 and 39 years old (32%)
- Subject was not under the influence of alcohol or drugs (64%)
- The original call type was a warrant or wanted person (10%)

Average Force Factor scores were lower for female subjects (0.8) and Native American subjects (0.0) and were highest for Asian subjects (1.4).

Over the last three years two-thirds of high Force Factor incidents involved only the use of weapons: ECWs (48%), canines (18%) and projectile weapons (8%). Only 14% of high Force Factor incidents involved physical force only.

The most common Force Factor Score was +1 (50%) followed by +2 (23%) and 0 (15%). These numbers indicate that most officers in the department behave very consistently when faced with a given level of resistance and they tend to use the minimal amount of force necessary to gain compliance.

When high levels of force are used against lower levels of resistance the subjects are controlled much faster with lower injury rates for officers but higher injury rates for subjects.

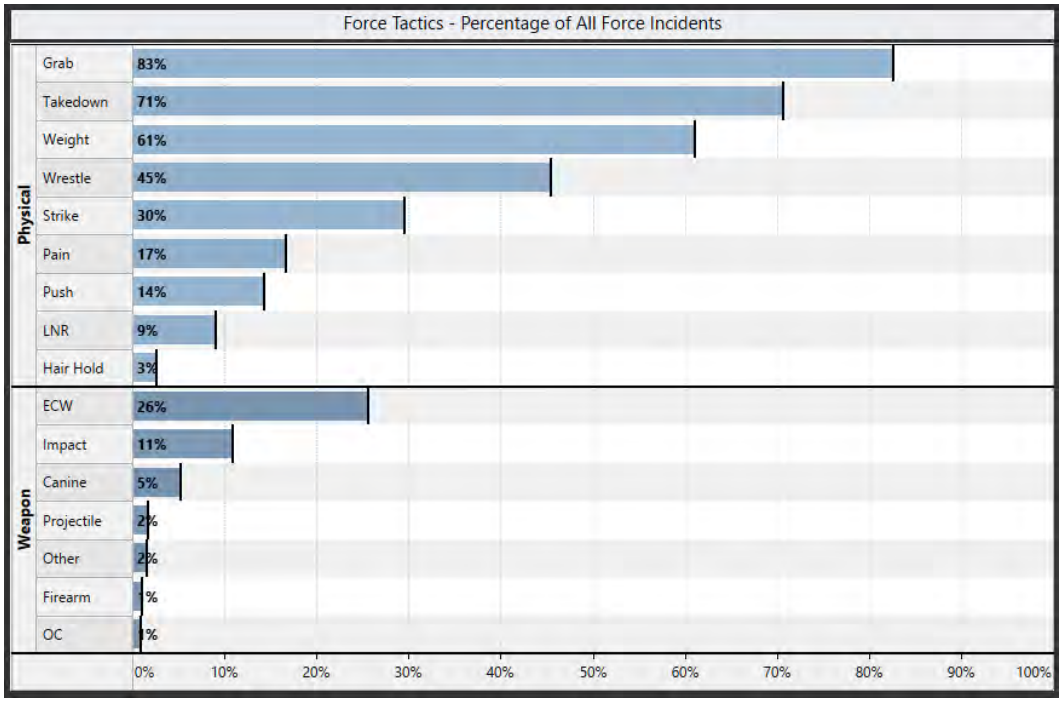
	Force Factor – 2017 to 2019		
	Low (-1 to -3)	Medium (0 to +2)	High (+3 to +5)
Subject brought under control within 1 or 2 Force Sequences	0%	12%	74%
Subject Injury Rate	17%	42%	58%
Officer Injury Rate	17%	8%	0%
Weapon Used by Officer	50%	34%	76%

6) Force Tactics

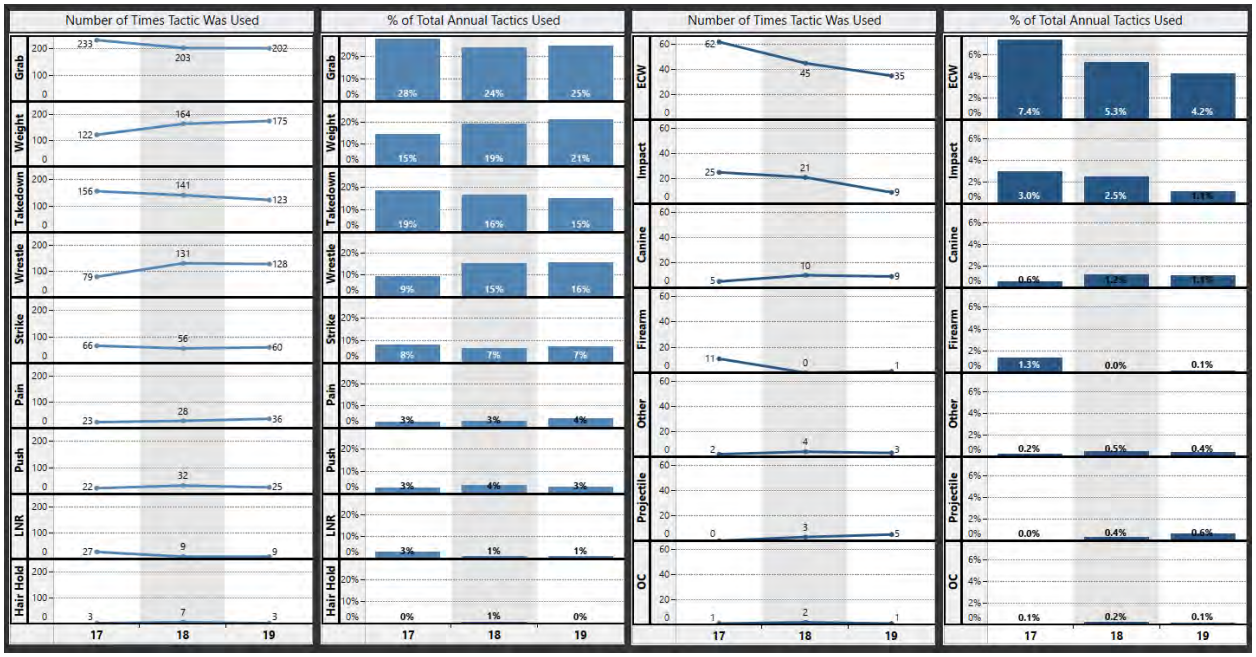
Of the 460 use of force incidents that occurred from 2017 to 2019, 60% involved physical force only, 11% involved only the use of weapons by officers and 29% involved both physical force and the use of a weapon.

Grabbing/pulling (83%) and takedowns (71%) were the most common physical tactics used while ECWs (26%) and impact weapons (11%) were the most common weapons used.

Force Tactics Used - 2017 to 2019



Over the last three years officers have used 2,517 individual physical force tactics and weapons during 460 incidents. The use of body weight to hold a subject down has been increasing while the use of takedowns has been falling. From 2017 to 2019 the use of tasers fell by nearly half from 62 to 35 while impact weapon use fell from 25 to 9. The use of canines was more common in 2018 and 2019 than 2017 but was only used 9 or 10 times a year. VPD officers began using projectile weapons in 2018 and 5 were used in 2019. OC is rarely used.



7) Subjects

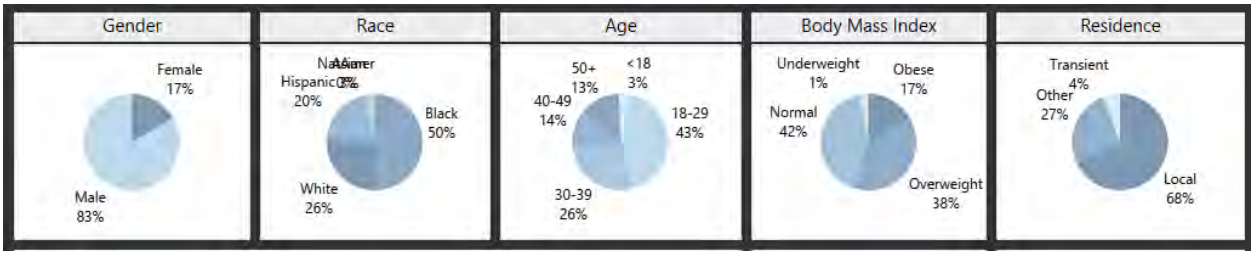
From 2017 to 2019 there were three demographic groups (gender, race and age) that made up more than one-third of all use of force subjects.

Most Common Characteristics of Use of Force Subjects 2017 - 2018				
Gender	**Race**	**Age**	**Number of Subjects**	**Percentage of Force Incidents**
Male	Black	18-29	82	18%
Male	Black	30-39	50	11%
Male	Hispanic	18-29	41	9%
All Other Demographic Groups or Unknown			287	62%

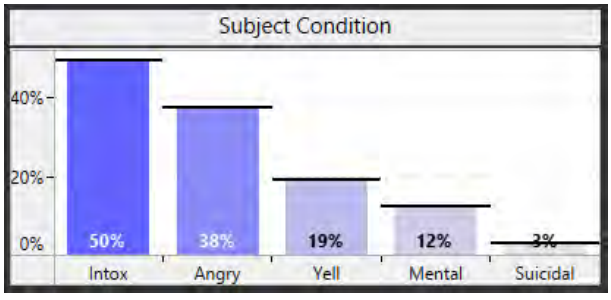
From 2017 to 2019 the following subject trends were observed:

- Hispanic subjects increased from 16% to 24% while White subjects fell from 27% to 23%
- Subjects residing outside of Vallejo fell from 31% to 24%
- Intoxicated subjects rose from 40% to 57%
- Subjects with mental health issues increased from 5% to 17% and suicidal subjects rose from 1% to 6%
- Subjects possessing less lethal weapons increased from 2% to 6%

Use of Force Subject Characteristics - 2017 to 2019



Subject Condition – 2017 to 2019



8) Injuries

Over the last three years there were 27 officers who were injured during a force incident. One of those officers was injured four times and four officers were injured two or three times each. Five percent of force applications by officers resulted in an injury to the officer who used force. Five officers only complained of pain, 17 officers had a bruise or a scrape, 13 officers received a cut, and two officers were contaminated with bodily fluid. About a quarter of the injured officers received treatment from EMTs or at a hospital.

Over the last three years 200 subjects who had force used against them were injured (43% of all incidents). Of the subjects who were injured, most of the injuries were minor: complaint of pain (9%), ECW probe (20%), bruise/scrape (20%) or minor cut (23%). Twenty-five subjects were bitten by canines, seventeen subjects lost consciousness and six subjects had a broken bone or tooth.

Eighty-seven percent of subjects who were injured or complained of injury received treatment. EMTs treated 8% of injured subjects and 79% were treated at a hospital.

9) Trends

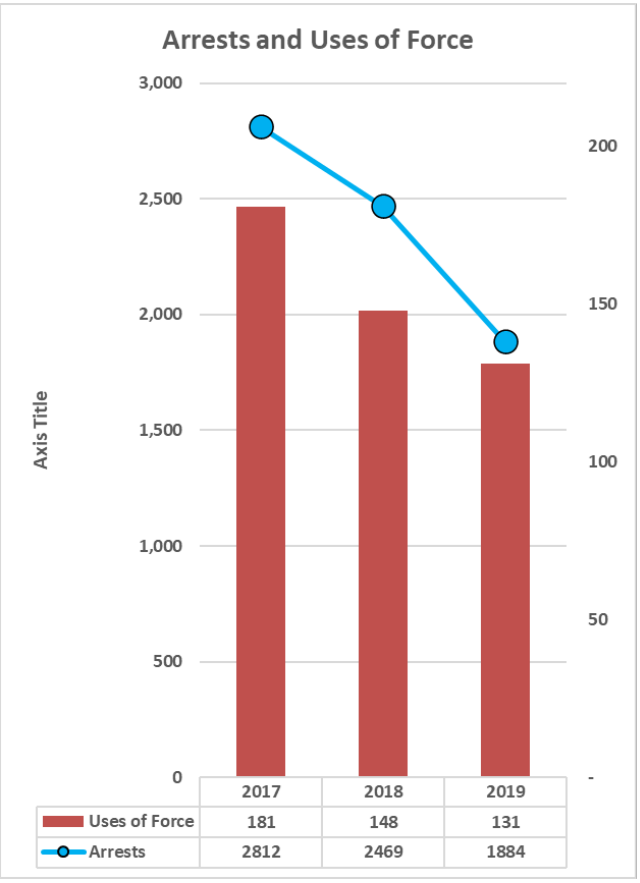
Over the period from 2017 to 2019 the following force trends were observed:

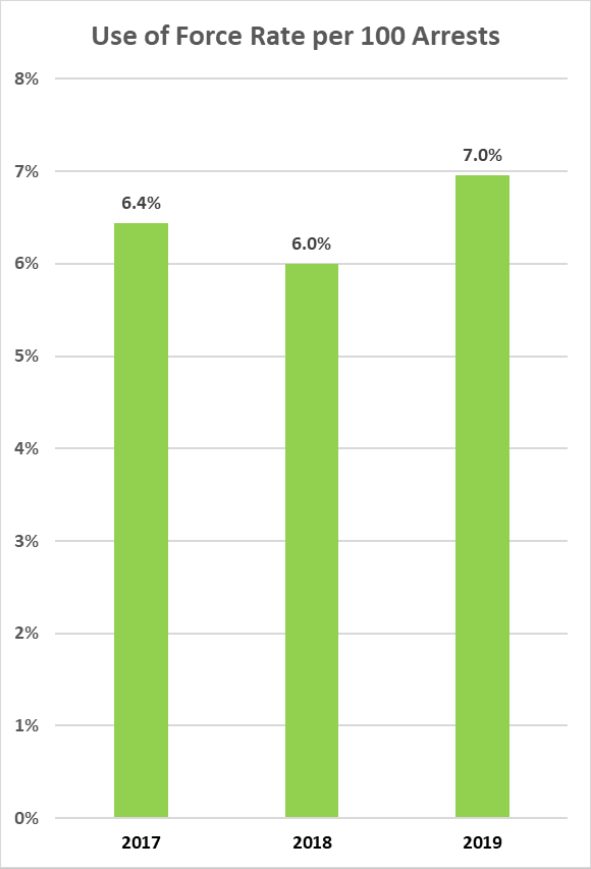
- Average Force Justification Scores rose from 9.6 in 2017 to 10.5 in 2019. This indicates that in recent years use of force incidents have involved more serious crimes, higher levels of resistance, greater threat levels and more fleeing subjects.
- Average Force Factor Scores remained stable averaging 0.95.
- The average number of Force Sequences has increased over the last three years from 4.5 sequences to 5.4 sequences. By 2019 62% of force incidents were lasting 5 or 6 sequences. The increasing number of Force Sequences is likely due to the declining use of weapons and the increasing Force Justification scores. Officers are facing higher threats and more resistance from subjects and are resolving incidents with fewer weapons, so it is taking longer to control the subjects.
- In 2017 56% of force incidents involved only physical force and 13% only involved the use of a weapon. By 2019 the use of physical force increased to 65% and the use of weapons only fell to 7%.
- Subject injury rates have remained stable over the last three years at 43% while officer injury rates have climbed from 2% to 7%. Severity of injuries for both officers and subjects has increased. Subjects are becoming more likely to be treated by both EMTs and at hospitals.
- By 2019 a higher percentage of officers age 21 to 29 were involved in force incidents (21%) and fewer officers over age 40 were using force (15%). In 2019 36% of uses of force involved officers with less than three years' experience compared to only 9% in 2017.
- Sergeants and higher ranking officers were less likely to use force in 2019 (12%) than in 2017 (25%).
- By 2019 uses of force resulting from a call about a violent crime (18%) were lower than prior years and calls about property crimes or trespass were higher (30%).

10) Use of Force Frequency Trends

a) Arrests and Uses of Force

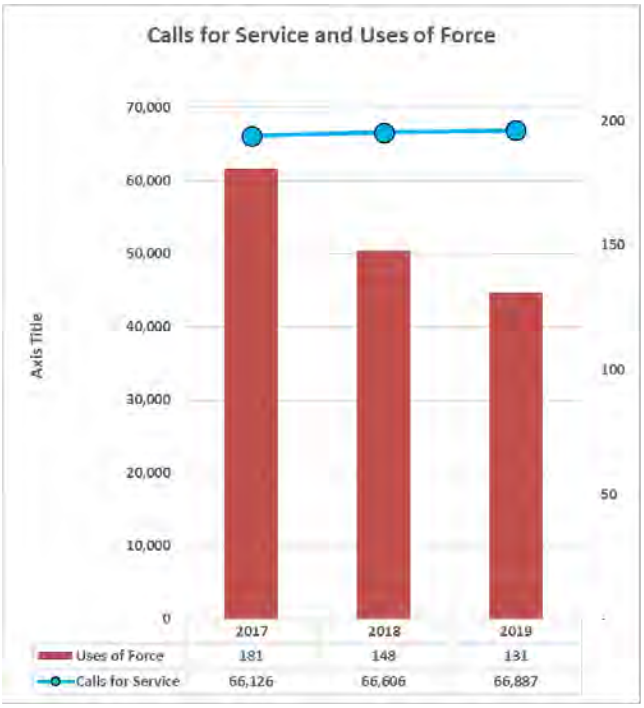
From 2017 to 2019 the number of annual arrests made by Vallejo PD fell by 33% from 2,812 arrests to 1,884 arrests. During this same time period the number of uses of force fell by 28% from 181 in 2017 to 131 in 2019. From 2017 to 2019 the use of force rate per 100 arrests has varied between 6% and 7%.

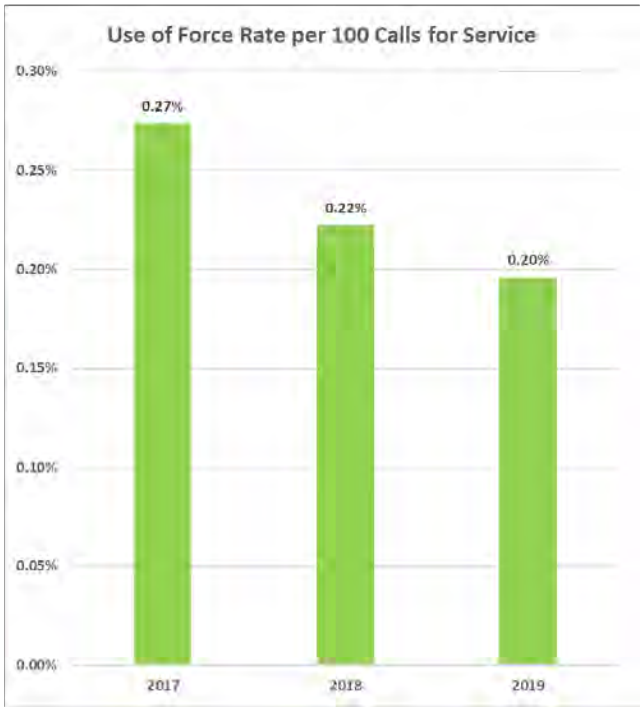




b) Calls for Service and Uses of Force

From 2017 to 2019 the number of annual calls for service to Vallejo PD increased by 1.2% from 66,126 calls to 66,887 calls. During this same time period the number of uses of force fell by 28% from 181 in 2017 to 131 in 2019. Over the last three years the use of force rate (uses of force per 100 calls for service) has declined steadily from 0.27% in 2017 to 0.20% in 2019.





11) Disparity Analysis for Subject Demographics

While census data of the residential population is sometimes used as a benchmark for a disparity analysis, it does not provide an adequate measure to assess the possible impacts of bias by police officers. There are many factors that could affect the demographic disparities between uses of force and the population that have nothing to do with officer bias such as crime rates, compliance rates, possession of weapons, poverty rates, deployment strategies, etc.

A better benchmark for measuring demographic disparities in police uses of force is arrest data.[21] Almost every use of force incident is associated with an arrest. All things being equal, we would expect to see the same proportion of subject characteristics for those who are arrested as those who have force used against them. If there is any demographic disparity observed between the use of force data and the arrest data, this disparity could be caused by differential subject behavior (i.e. one subject group is more or less likely to resist arrest than other groups) or differential officer behavior (i.e. officers are more or less prone to use force against one subject group than other groups) or a combination of differential behavior from both subjects and officers.

Arrest data from the Vallejo Police Department from 2017, 2018 and 2019 was examined and compared to the use of force data collected by the Police Force Analysis System.[22] Arrest

[21] A recent report from the University of Texas at San Antonio and the University of Cincinnati used this methodology to examine racial disparities between uses of force and arrests using data from the from the Tulsa Police Department.
https://bloximages.newyork1.vip.townnews.com/tulsaworld.com/content/tncms/assets/v3/editorial/6/48/64860d34-4fe8-5c06-bc0f-92e7a85acab3/5e60500e75e7e.pdf.pdf

[22] About 10% of the arrest data was missing certain demographic characteristics so these incidents were excluded from the calculations.

data was broken down by gender, race and age and the use of force data was organized into the same demographic categories as the arrest data.[23] We also gathered population demographic data from the US Census Bureau and other sources.

In 2018 the estimated total population of the City of Vallejo was 121,913. During the three-year period from 2017 to 2019 the Department made 7,165 arrests and used force against 460 subjects. The annual arrest rate per thousand population was 1.3 and the use of force rate per 100 arrests was 6.4%. The following tables provide the gender, race and age composition of the estimated population of Vallejo in 2018 and the demographic composition of all arrestees and subjects who had force used against them between 2017 and 2019:

Gender	Population	Arrests	Uses of Force
Male	48.3%	77.6%	83.5%
Female	51.7%	22.4%	16.5%

Race	Population	Arrests	Uses of Force
Black	21.2%	49.9%	49.8%
White	24.2%	24.8%	25.9%
Hispanic	25.5%	18.1%	20.1%
Other	29.1%	7.2%	4.2%

Age	Population	Arrests	Uses of Force
<18	21.0%	5.0%	3.3%
18-29	17.0%	38.2%	43.0%
30-39	12.0%	27.2%	26.4%
40-49	13.0%	16.1%	13.8%
50+	37.0%	13.4%	13.5%

A Disparity Index was calculated for both arrests and uses of force. The Arrest Disparity Index is the percentage of arrests of a demographic subgroup compared to that group's

[23] The arrest data was broken down into four racial/ethnic groups (Hispanic, Black, White and Other). The "Other" group is comprised mostly of Asian arrestees and would also include Native Americans, Pacific Islanders and other racial categories.

percentage in the overall population. The Use of Force Disparity Index is the percentage of uses of force of a demographic subgroup compared to that group's proportion of overall arrests. A disparity index of 1 means that there is no disparity between the two variables. A disparity index of less than 1 means that the group appears less frequently than would be expected while a disparity index greater than once means that the group appears more frequently than expected.

When we examine arrests by gender, we find that males are 61% more likely to be arrested than we would expect based on their percentage of the population while females are 57% less likely to be arrested. When arrests by race are examined, we find that Hispanics and Other races are underrepresented in the arrests while Whites are slightly overrepresented, and Blacks are more than two times more likely to be arrested. We also find disparities by age. Adults between the ages of 18 and 39 are more than two times more likely to be arrested than their population numbers would suggest while juveniles and adults over 50 are more than 60% less likely to be arrested. The arrest disparities observed for gender and age are supported by criminal behavior research – males are more likely to commit crimes than females and the peak age range for criminal behavior is between 18 and 24.

When we compare uses of force and arrests, we see much less disparity. Males are only 8% more likely to have force used against them than we would expect based on their arrest numbers, and females are 26% less likely. Arrestees between the ages of 18 to 29 have the highest disparity and are 12% more likely to have force used against them than we would expect based upon their proportion of arrests. Juvenile arrestees were the least likely to have force used against them. While there were large arrest disparities by race when compared with the population, there are much smaller disparities when comparing uses of force with arrests. Hispanics were underrepresented in arrests, but they were 11% more likely to have force used against them after arrest. White subjects were also overrepresented in uses of force by 4%, but there was no use of force disparity

with Black subjects. Arrested subjects in Other racial groups were much less likely to have force used against them than we would expect from their percentage of all arrestees.

Based on the available data, we cannot reach any definitive conclusions as to the cause of observed demographic disparities. However, the lack of any significant racial disparities between uses of force and arrests for Black, White, and Hispanic subjects suggests that resistive behavior is similar across these racial/ethnic groups and that officers do not treat subjects differently based solely on the subject's race.

Disparity Index

Population, Arrest and Use of Force Data from 2017-2019

Gender	Arrests / Population	Uses of Force / Arrests
Male	1.61	1.08
Female	0.43	0.74
Race		
Black	2.35	1.00
White	1.02	1.04
Hispanic	0.71	1.11
Other	0.25	0.59
Age		
<18	0.24	0.66
18-29	2.25	1.12
30-39	2.27	0.97
40-49	1.24	0.86
50+	0.36	1.01