



Police Force Analysis SystemSM

Third Summary Report

Vallejo Police Department

Use of Force Data from January 1, 2017 to December 31, 2021

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Background

In June 2020 we produced the First Summary Report using data from 2017 to 2019 obtained from the Vallejo Police Department's Police Force Analysis SystemSM. This is our Third Summary Report which includes use of force data through the end of 2021. Police Strategies will continue to update the system on an annual basis and produce annual Summary Reports.

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.

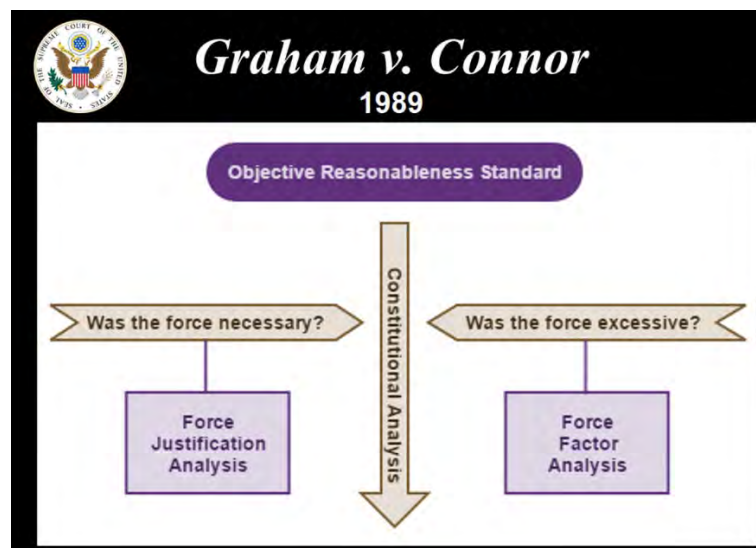
Police Force Analysis SystemSM

In the summer of 2015, Police Strategies LLC launched the Police Force Analysis SystemSM (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.¹ 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

¹ [Capitola Police creates online database to track use of force stats, Santa Cruz Sentinel, August 2016.](#)

2004 book “Understanding Police Use of Force – Officers, Subjects and Reciprocity”² and has been the subject of several scholarly articles.³

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.



² [Understanding Police Use of Force – Officers, Subjects, and Reciprocity, Cambridge Studies in Criminology, 2004.](#)

³ 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 more than ninety law enforcement agencies in eight states involving about 15,000 incidents and 5,000 officers who used force more than 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 interagency comparisons. The Police Force Analysis NetworkSM allows agencies to compare their use of force practices with other agencies in the system.

The Police Force Analysis SystemSM 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.

Data Collection from the Vallejo Police Department

Police Strategies LLC received use of force incident reports from 2021 from the Vallejo Police Department in February 2022. 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 SystemSM (PFAS) 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.

Incident data will only be entered into PFAS after the use of force investigation is completed, and the case is closed. There may be a delay in entering data from incidents that involve an officer involved shooting or are under pending investigation.

Summary of Vallejo PD's Police Force Analysis SystemSM

The Vallejo Police Department's Police Force Analysis SystemSM (PFAS) contains five years of use of force data from 2017 to 2021. The database includes detailed information on 699 subjects who had force used against them and the 123 officers who used force during the 5-year period. In 2021 there were 95 use of force incidents involving 56 officers who used force a total of 163 times. This report will examine the 5-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 five years the months with the most force incidents were May, August, and September with 13 incidents per year and the month with the fewest incidents was June with 8 incidents per year. During the week, Saturdays (24) and Sundays (25) had the most incidents each year. The peak time period for force incidents was between 9pm and 1am (42 incidents per year).

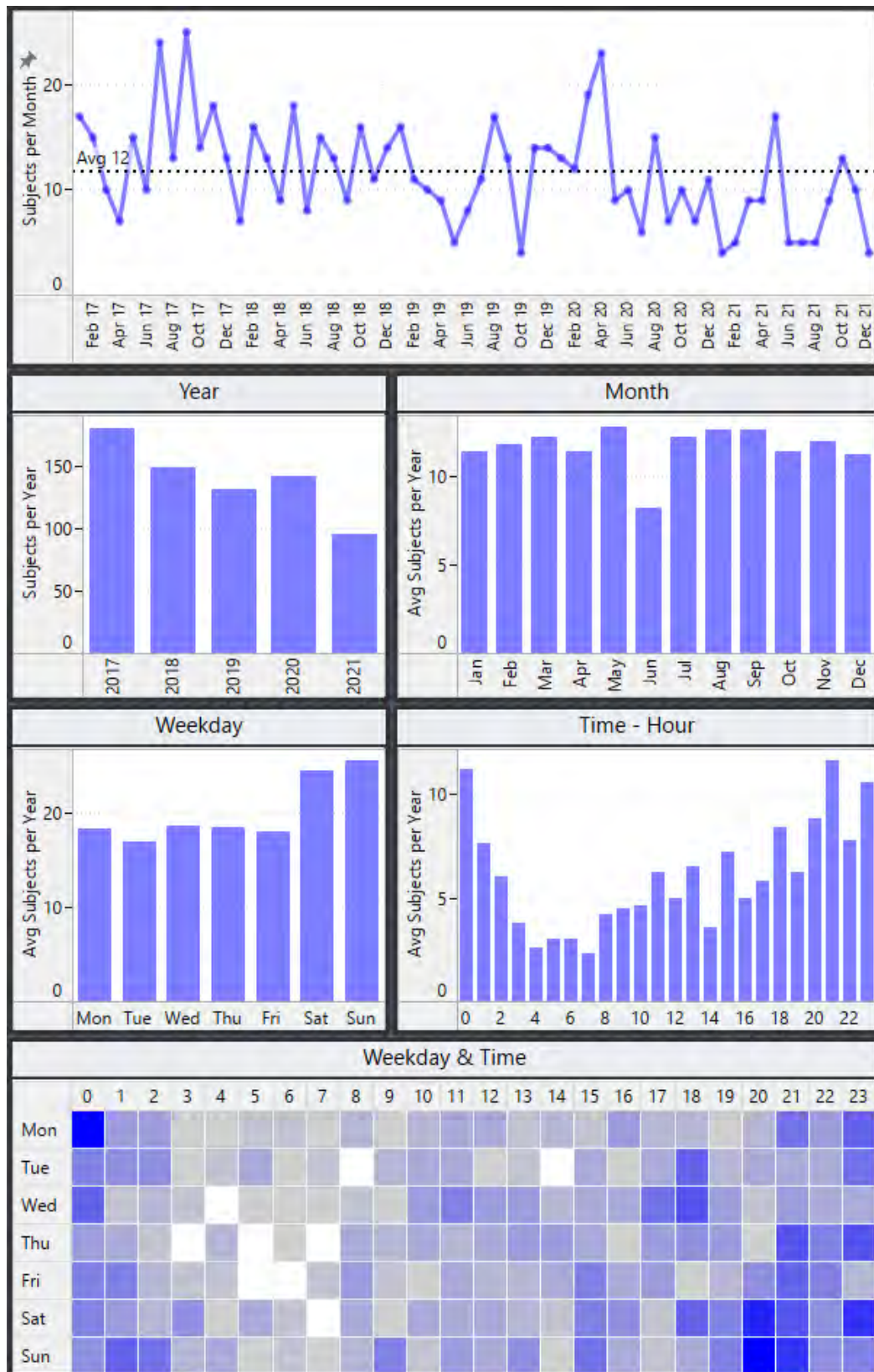
Compared to prior years, use of force incidents in 2021 occurred in similar types of locations with 52% of all incidents occurring on the street.

From 2017 to 2019 the annual number of force incidents fell from 181 to 132 a 28% decline before rising in 2020 to 142 incidents (8% increase over 2019). Between 2020 and 2021 use of force incidents fell 33% to 95 incidents which is the lowest number in the last five years.

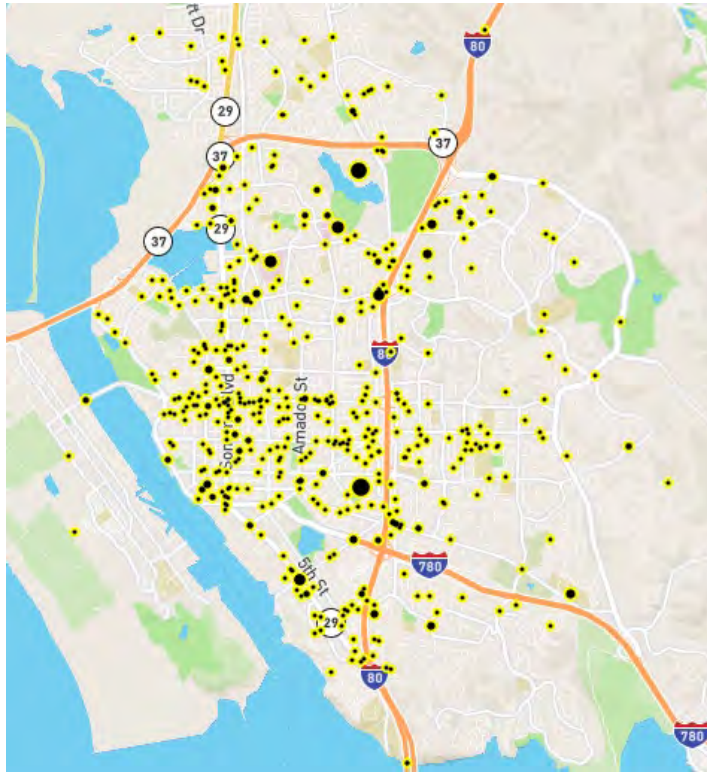
In 2021 there were 7 incidents that occurred at Six Flags compared to a total of 12 incidents during the prior four years. Only one use of force incident occurred at Six Flags in 2021 which was probably due to pandemic closures.

The day with the most use of force incidents (4 incidents) was March 18, 2021. The longest period of time without any use of force incidents was between December 11, 2021 and December 28, 2021.

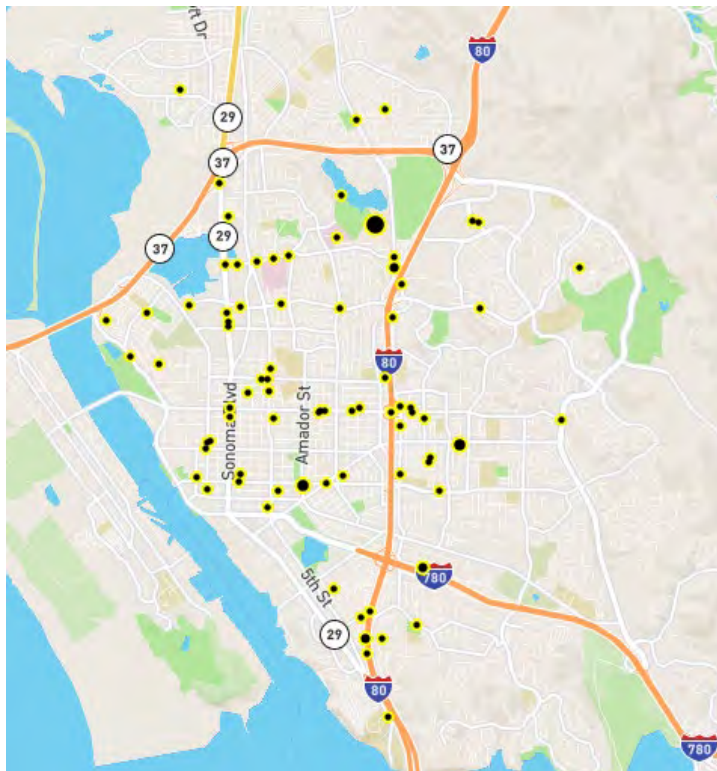
Use of Force Incidents – 2017 to 2021



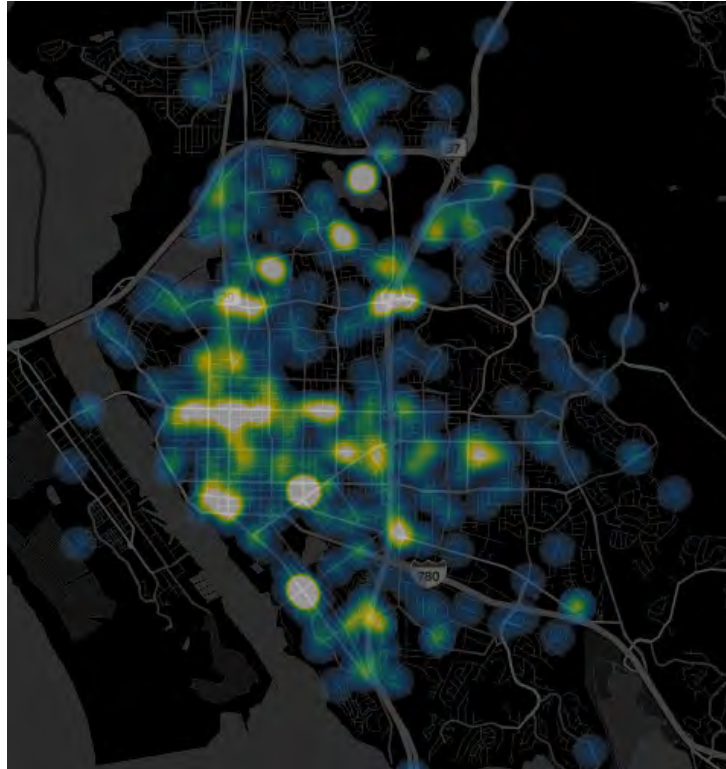
Use of Force Incident Locations – 2017 to 2020



Use of Force Incident Locations – 2021



Use of Force Heat Map – 2017 to 2020



Use of Force Heat Map – 2021



2) Reason for Contact

Over the last five years 60% 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 12% of officers were responding to assist other officers.

Over the last five years there has been a trend towards more officers being present on scene when force was used. In 2017 an average of 2.7 officers were on scene and by 2021 that had risen to 3.2 officers. In 2021 58% of use of force incidents had three or more officers on scene when force was used. Despite more officers being on scene, 85% of force incidents in 2021 involved only one or two officers using force.

The original call types for use of force incidents in 2021 were similar to prior years with most calls involving a property crime (25%), suspicious circumstance (24%) or a violent crime (23%).

3) Force Frequency

In 2021 there were 95 use of force incidents involving 56 officers who used force a total of 163 times. There was one officer who used force 11 times, five officers who used force between 6 and 9 times each, ten officers who used force 4 or 5 times, and twenty officers who used force 2 or 3 times and twenty officers who used force once. The top 10% of officers made up 29% of all uses of force by the Department.

Over the last five years, officers who used force most frequently were involved in fewer than 10 incidents each year. These are likely the officers who had patrol assignments during the entire 5-year period and were 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 2020, 13% of the Department's use of force incidents had low Force Justification scores (<6). The average Force Justification score was 10.3 on a scale of 0 to 20. In 2021 the percentage of low Force Justification scores remained at 13%, but the average Force Justification score decreased from 10.9 in 2020 to 10.0 in 2021.

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 resistance level scores were higher in 2021 than prior years and the flight level scores were lower. This indicates that subjects were presenting a higher level of resistance in 2021 and were less likely to flee from officers.

In 2021 there were 9 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 2021 there were 12 low Force Justification incidents involving 15 officers. Five officers were involved in two low Force Justification incidents each.

In 2021 only one low Force Justification incident involved a weapon (ECW) and 92% of incidents involved physical force only. Officers were less likely to resolve a low Force Justification incidents by using physical strikes (17%) than higher Force Justification incidents (26%).

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.

Between 2017 and 2020 11% of force incidents had a high Force Factor score (+3 or above). In 2021 the percentage of high Force Factor incidents fell to 6%. The average Force Factor fell from 1.0 to 0.4 in 2021. In 2021 only six incidents had a +3 Force Factor score and there were no incidents with a higher score. Six officers were involved in those high Force Factor incidents. One officer was involved in two high Force Factor incidents.

In 2021 four high Force Factor incidents involved the use of ECW and one incident involved the use of a projectile weapon. One high Force Factor incident involved physical force only. Eighty-three percent of high Force Factor incidents involved only one officer using force.

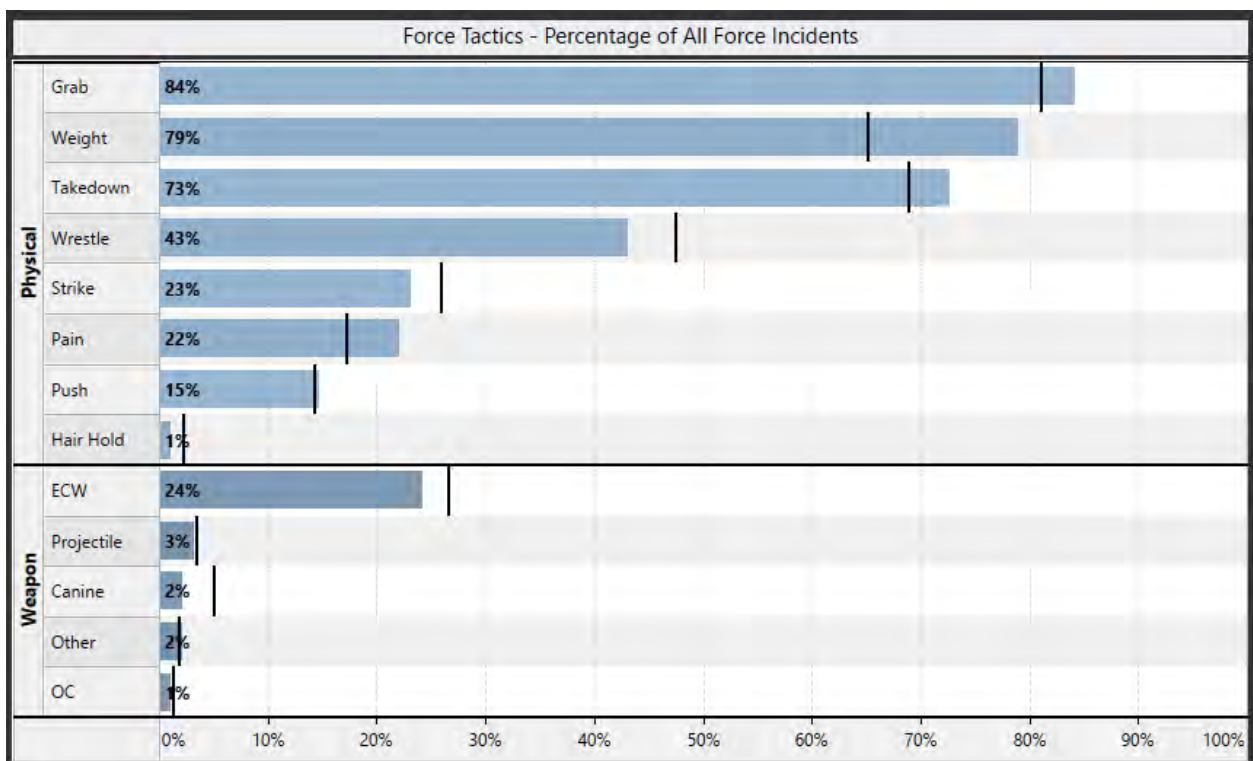
The most common Force Factor Score was +1 (38%) followed by +2 (26%) and 0 (20%). These numbers indicate that most officers in the department behave very consistently when faced with a given level of resistance and they tend to use the minimal amount of force necessary to gain compliance. The distribution of Force Factor scores changed dramatically in 2021 compared to the previous four years. Between 2017 and 2020 9% of incidents had a +3 Force Factor and 2% of incidents had a +4 Force Factor. In 2021 only 6% of incidents had a +3 Force Factor and no incidents had a +4 Force Factor. By contrast the number of negative Force Factor incidents increased four times from 2% of all incidents to 8% of all incidents in 2021. This indicates that in 2021 officers used lower levels of force against higher levels of subject resistance in 2021 than in prior years.

6) Force Tactics

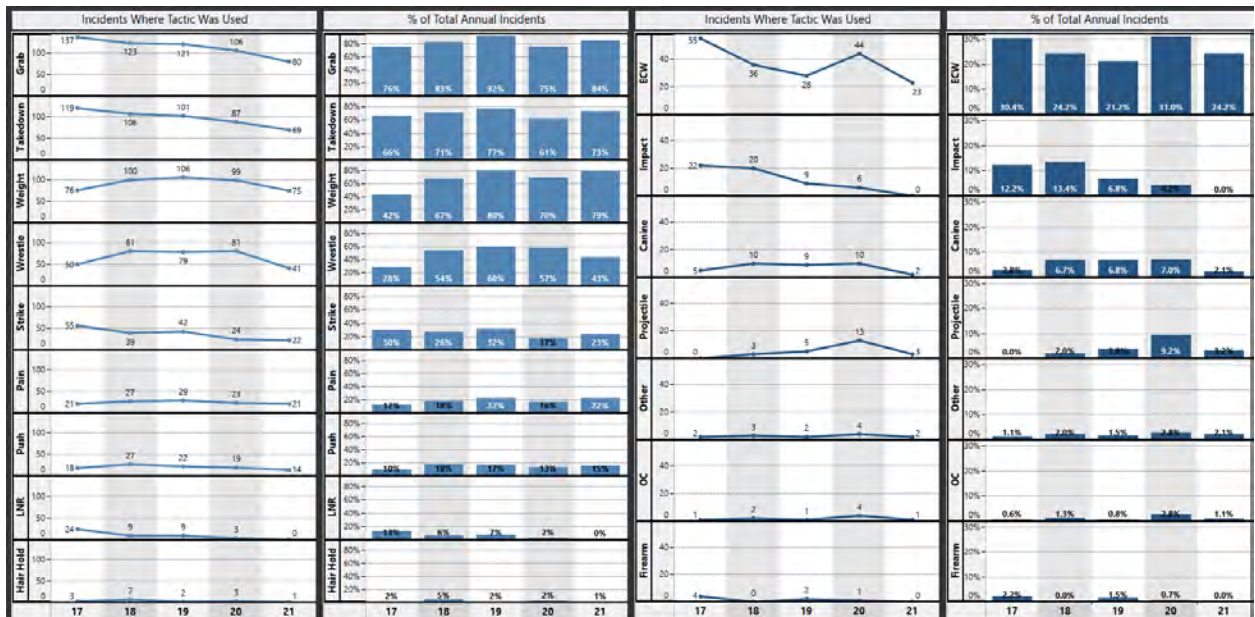
Officers were more likely to use physical force in 2021 and less likely to use weapons than in prior years. Of the 95 use of force incidents that occurred in 2021, 69% involved physical force only, 9% involved only the use of weapons by officers and 22% involved both physical force and the use of a weapon.

Compared to prior years, officers were less likely to use strikes, wrestling and hair holds in 2021 and were more likely to use weight, takedowns and pain compliance techniques. No neck restraints were used in 2021. Electronic control weapons and canines were used less often in 2021 and no firearms or impact weapons were used.

Force Tactics Used - 2021



Over the last five years officers have used 3,814 individual physical force tactics and weapons during 699 incidents. The use of neck restraints has fallen steadily during the five-year period from 24 incidents in 2017 to 0 incidents in 2021. Similarly the use of impact weapons has fallen from 22 incidents in 2017 to 0 incidents in 2021. Only two incidents involved canine bites in 2021 (2.1%) which was the lowest percentage in the last five years.



7) Subjects

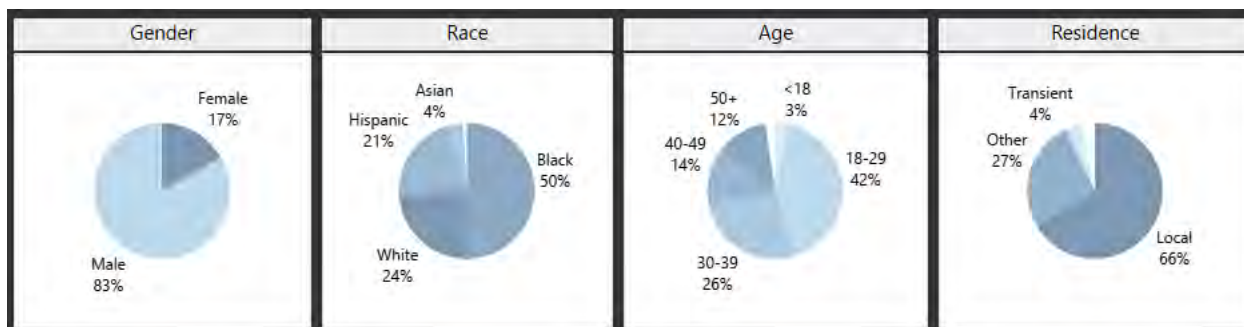
From 2017 to 2020 there were three demographic groups (gender, race and age) that made up more than half of all use of force subjects – males between 18 and 39 who were Black, Hispanic or White. In 2021 these three demographic groups were also involved in about half of all force incidents, but the percentage of Black and White male subjects fell while Hispanic male subjects increased.

Most Common Characteristics of Use of Force Subjects 2017 - 2020				
Gender	Race	Age	Number of Subjects	Percentage of Force Incidents
Male	Black	18-39	177	29%
Male	Hispanic	18-39	78	13%
Male	White	18-39	64	11%
All Other Demographic Groups or Unknown			285	47%

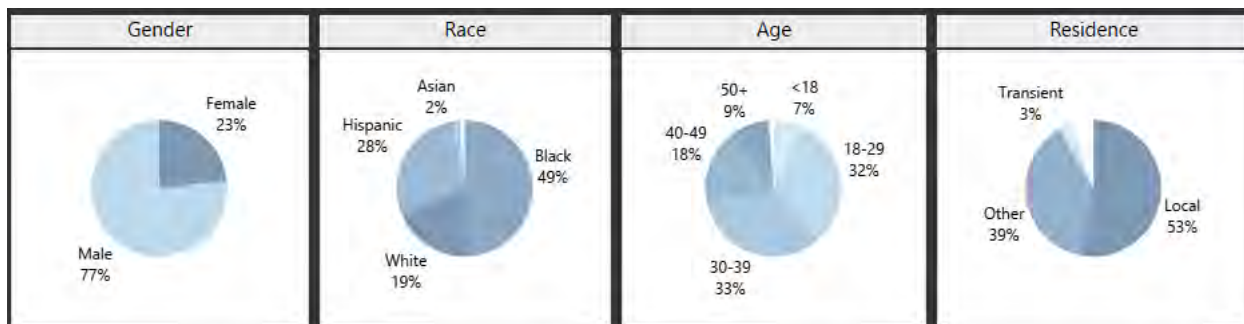
Most Common Characteristics of Use of Force Subjects 2021				
Gender	Race	Age	Number of Subjects	Percentage of Force Incidents
Male	Black	18-39	26	27%
Male	Hispanic	18-39	16	17%
Male	White	18-39	5	5%
All Other Demographic Groups or Unknown			48	51%

The demographics of use of force subjects in 2021 changed significantly from prior years. Female subjects were more likely to be involved in force incidents in 2021 than prior years. A higher percentage of force incidents involved Hispanic subjects in 2021 and a lower percentage involved White subjects. Subjects between 18 and 29 were less likely to be involved in a force incident in 2021 while juveniles and subjects between 30 and 49 were more likely. Between 2017 and 2020 27% of use of force subjects resided outside the City of Vallejo, but in 2021 the number of non-resident subjects grew to 39%.

Use of Force Subject Characteristics - 2017 to 2020

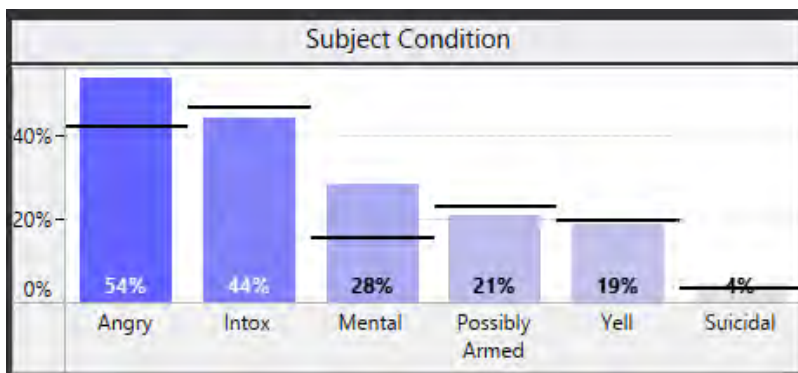


Use of Force Subject Characteristics - 2021



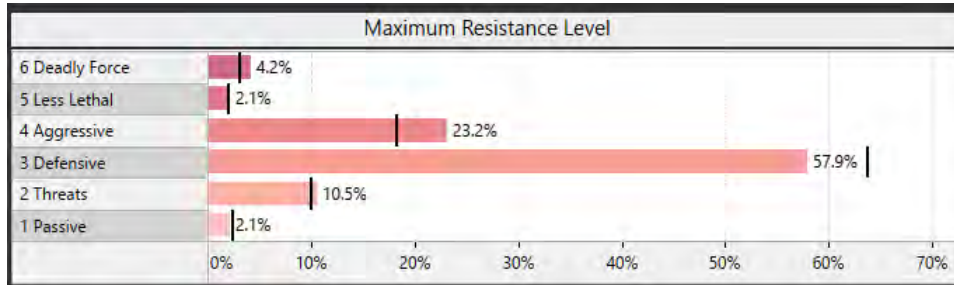
Compared to prior years, use of force subjects in 2021 were more likely to have mental health issues (28% vs 15%) and were more likely to be angry (54% vs 42%).

Subject Condition in 2021



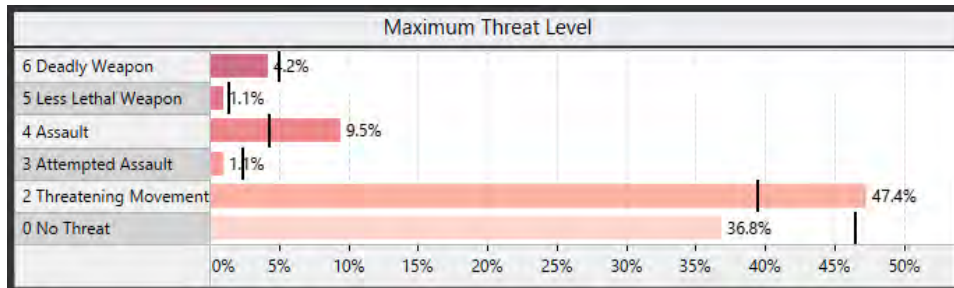
In 2021 officers were more likely to face resistance involving deadly force or aggressive physical force than in prior years.

Subject Maximum Resistance Level - 2021



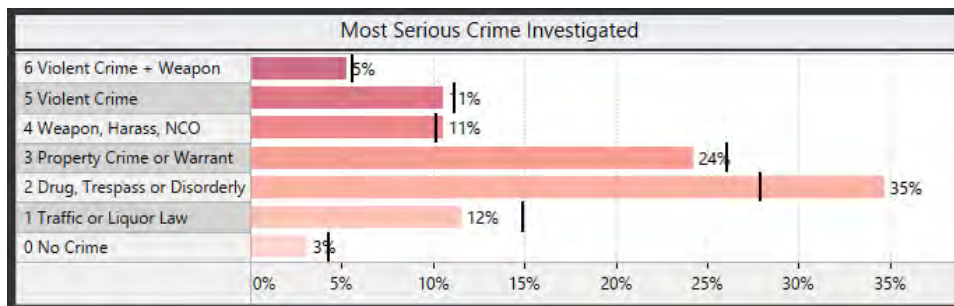
In 2021 officers were twice as likely to be physically assaulted by subjects than in prior years and were also more likely to face threatening behavior from subjects.

Subject Maximum Threat Level - 2021



In 2021 use of force subjects were more likely to be involved in drug crimes, trespassing and disorderly conduct than in prior years and were less likely to be violating traffic or liquor laws.

Most Serious Crime Involved – 2021



8) Injuries

Over the last five years there were 54 officers who were injured during a force incident. Three of those officers were injured four times each and five officers were injured two or three times each. Four percent of force applications by officers resulted in an injury to the officer who used force. Six officers only complained of pain, 25 officers had a bruise or a scrape, 18 officers received a cut, and five officers were contaminated with bodily fluid. About a third of the injured officers received treatment from EMTs or at a hospital.

Over the last five years 270 subjects who had force used against them were injured (39% of all incidents). Of the subjects who were injured, most of the injuries were minor: complaint of pain (9%), ECW probe (21%), bruise/scrape (22%) or minor cut (21%). Thirty-five subjects were bitten by canines, 21 subjects lost consciousness, 6 subjects had a broken bone or tooth, and 8 subjects were either killed or had a gunshot wound. In 2021 no subjects were seriously injured in any force incident.

Eighty-eight percent of subjects who were injured or complained of injury received treatment. EMTs treated 7% of injured subjects and 81% were treated at a hospital.

9) Trends

Over the period from 2017 to 2021 the following force trends were observed:

- Average Force Justification Scores in 2021 were similar to the five-year average, but average Force Factor scores fell dramatically in 2021 to their lowest level in the last five years. This is due to the lack of use of firearms, impact weapons and neck restraints in 2021.
- The average number of Force Sequences has remained high over the last four years with use of force incidents averaging more than 5 sequences.
- The average number of officers present on scene (3.2) and the average number of officers using force (2.4) was higher in 2021 than any prior year.
- In 2020 48% of force incidents involved the officers' use of a weapon but this fell to 32% in 2021.
- Between 2017 and 2021 the percentage of use of force subjects with mental health issues increased from 5% to 28% while suicidal subject increased from 1% to 4%.
- Subject injury rates during the pandemic in 2020 and 2021 were lower than injury rates in prior years (30% pandemic vs 43% in prior years). Officer injury rates over the last five years have remained stable at around 5%. The average severity of subject injuries dropped significantly in 2021.