

## **Audience Analysis Continued**

### **1. Summary of the Exploration Plan**

The problem statement focuses on analyzing temporal and geographical crime patterns in Los Angeles to help new or incoming LA residents have a better understanding of the crime patterns of areas. With this understanding, they can make informed decisions about their safety and avoid high-risk areas during peak crime hours. Along with this, they can make data-driven decisions about where to live, daily activities, and transportation routes. My primary goal is to ensure their personal safety and peace of mind by choosing neighborhoods that align with their lifestyle and risk tolerance.

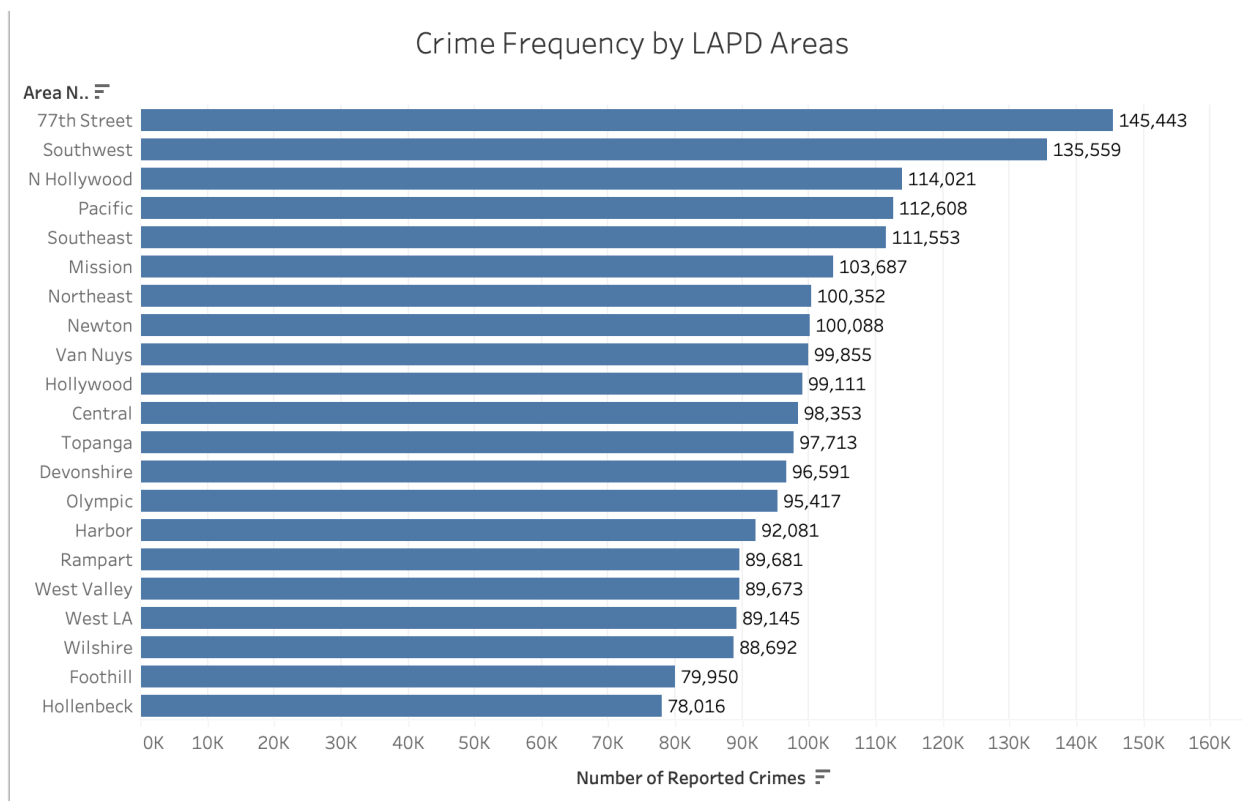
Some of the main analytical questions that we will be exploring based on the tasks identified are:

- What geographical areas are hotspots, and what types of crime happen in these areas?
- When do crimes most frequently occur, is there a specific time of day that is associated with higher crime risk?
- What weapons are most associated with violent crimes?
- Are specific age groups more vulnerable to certain crime types?

## Step 2

### Task 1: Identify Crime Hotspots

- a. State the task
  - i. **Action:** Identify areas with the highest frequency of crime.
  - ii. **Target:** Crime frequency by area.
- b. Identify the key(s) and value(s):
  - *Keys:* Area Name
  - *Values:* Crime count
- c. Choose a suitable visualization idiom
  - i. A suitable visualization would be a bar chart as it allows for the user to effectively compare the crime counts across areas to detect hotspots
- d. Generate the visual.



- e. Describe the insight(s) gained: What does this visualization reveal? Did it meet your expectations?
  - i. This visualization reveals crime frequency by areas in Los Angeles. This allows users to recognize crime hotspots and make decisions on where to live or carry out daily activities accordingly. This visualization meets my expectations because it clearly shows crime hotspots by locations in LA in descending order, meaning that the top areas on the chart are more crime dense. Specifically, this visual shows that 77th street has the greatest

number of reported crimes making it a highly unsafe area, so people that are new to LA who wouldn't have known this information can take this into consideration when deciding where to spend their time and money.

**Task 2: Examine Temporal Crime Patterns**

- a. **Action:** Explore the temporal distribution of crimes to detect patterns (e.g., peak hours, days).

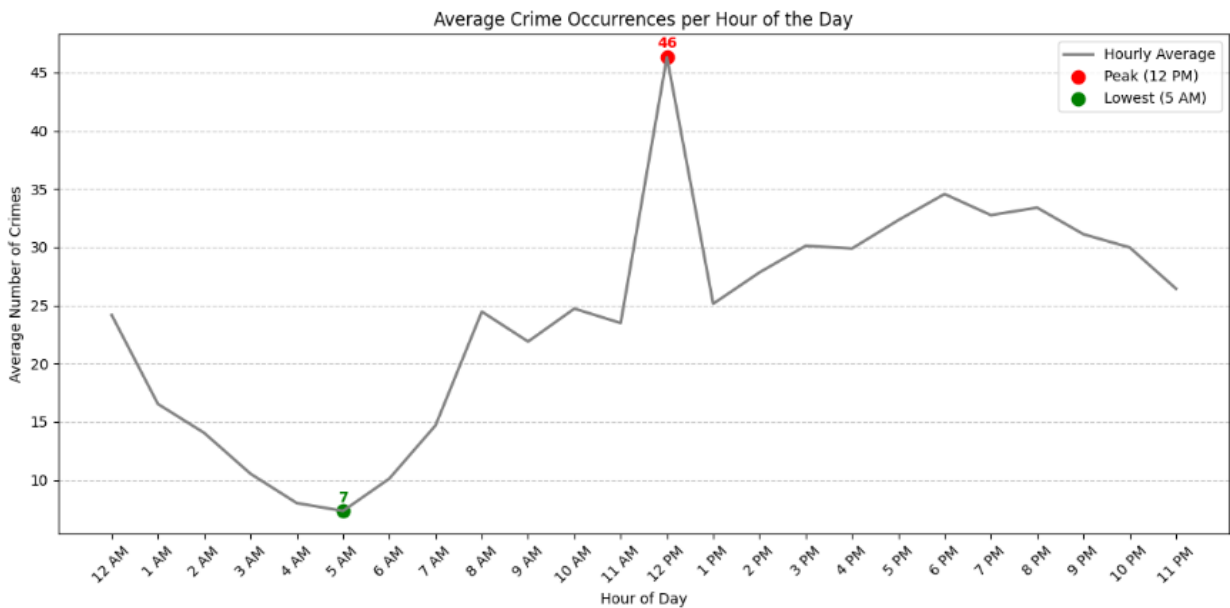
**Target:** Date and time of crime occurrence.

- b. **Keys:** Hours of the day (TIME OCC military time)

**Values:** Average number of crimes committed per hour

c.

I want to create a time series graph that looks at how the average number of crimes changes based on the hours of the day. In creating this visual, I needed to look at specific hours and take the average number of crimes that occur during that specific hour every day. I am looking to see what times average crime peaks and what time it is the lowest. To highlight this, I will have a red dot representing what hour crime peaks and a green dot representing what hour crime plummets. The legend will show what times correspond to these marks. To create redundancy within our graph, I will state in red what the average number of crimes was at the peak and in green what the average number of crimes was at the lowest. I also want to analyze the trend and see when crime increases and decreases throughout the day.



d.

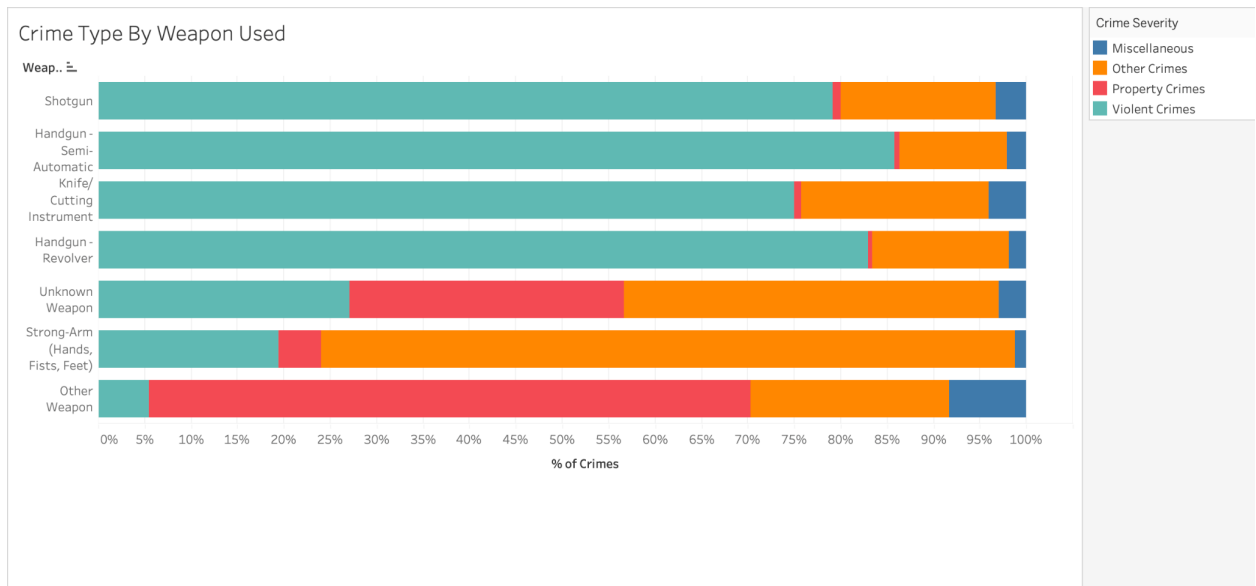
e.

Looking at the time series graph, we can see that the number of crimes falls from the hours of 12 am - 5 am and reaches an all-time low at 5 am. The lowest occurrence of crime is 7. Then, through the early hours, crime rates pick up, from 5 am to 8 am. Then, around 8 am-11am it fluctuates but the average number of crimes stays around 25. At 12 pm, the average number of crime rates reached an all-time high with 46 occurrences. Though this number goes down throughout the rest of the day, the average number of crimes are still well above 25.

With this visualization, we can see that the peak time for crime is 12 pm and the lowest point is 5 am. More crime activity occurs in the evening in comparison to early morning. This visualization did a great job identifying these crime patterns.

### Task 3: Analyze Crime Severity by Weapon Type

- a. State the task
  - i. **Action:** Investigate the weapon used in crimes, particularly for violent crimes.
  - ii. **Target:** Types of weapons used in crimes.
- b. Identify the key(s) and value(s):
  - **Keys:** Weapon Description, Crime code
  - **Values:** Crime count (for each weapon type)
- c. A stacked bar chart is the best choice for examining crime type distribution across different weapon types because it allows direct comparison of proportional relationships while showing the complete picture. Each horizontal bar represents 100% of crimes for a specific weapon, with colored segments showing the percentage breakdown across crime severity categories. The stacked percentage format eliminates the distraction of varying absolute crime numbers and focuses purely on distribution patterns. The horizontal orientation will ensure weapon labels remain readable.



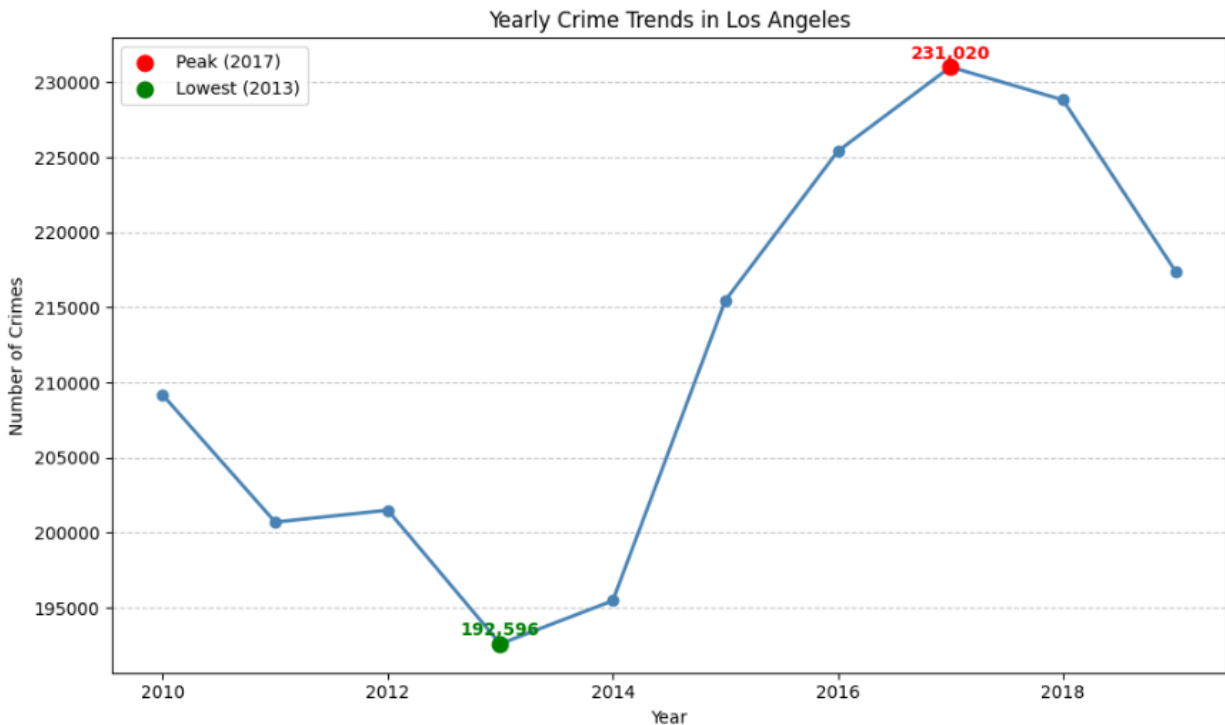
- d.
- e. Looking at the graph, we can see that firearms and knives are overwhelmingly used in violent crimes, with 90% of shotgun use being linked to violent crimes, 85% from semi-automatic handguns, 75% for revolvers, and 80% for knives. This clearly shows that traditional weapons are primarily associated with serious violent offenses. In contrast, "other weapon" shows the opposite pattern, dominated by property crimes at roughly 65%. "Other weapons" primarily includes tools and improvised items (screwdrivers, chemicals, chains, or household objects) that are more commonly used to break into property as opposed to using them to harm people. Strong arm tactics show a more balanced distribution, with about 55% other crimes and 35% violent crimes, suggesting physical force is used across a broader range of criminal activities. Overall, the visualization reveals that weapon type is a strong predictor of crime severity, with traditional weapons almost exclusively tied to violent crimes.

#### Task 4: Examine Crime Trends Over Time

- a. **Action:** Compare crime rates across years to track trends (e.g., increasing or decreasing crime rates).  
**Target:** Yearly crime frequency.
- b. **Keys:** Year (we derive this from DATE OCC)  
**Values:** Crime counts per year
- c.

For the visualization, a time series graph will make the most logical sense. We want to assess the patterns/trends in crime over time. Therefore, we will look at the number of crimes through the years. We want to know when the trend shifts/changes,

so we still have blue marks indicating these changes. We will have a red mark to signal when the number of crimes peak and have a green mark to represent when crime is the lowest. The legend will show what years correspond to their marks. To create redundancy within our graph, we will state in red what the number of crimes was at its peak and in green what the number of crimes was at its lowest.



e.

Looking at the graph, we can see that in 2013, the number of crimes was the lowest with 192,596. In 2017, the number of crimes was the highest with 231,020 reported. From 2010-2013, the number of crimes began to decrease in Los Angeles. However, from 2013-2017, the number of crimes was steadily increasing. Recently since 2017, the number of crimes has been on a decline; however, it has still not been able to reach the rates of the number of crimes before 2014.

This graph does a really good job displaying how the number of crimes has changed throughout the year and what the trend has been .

### Task 5: Assess Crime Risk by Time of Day and Week

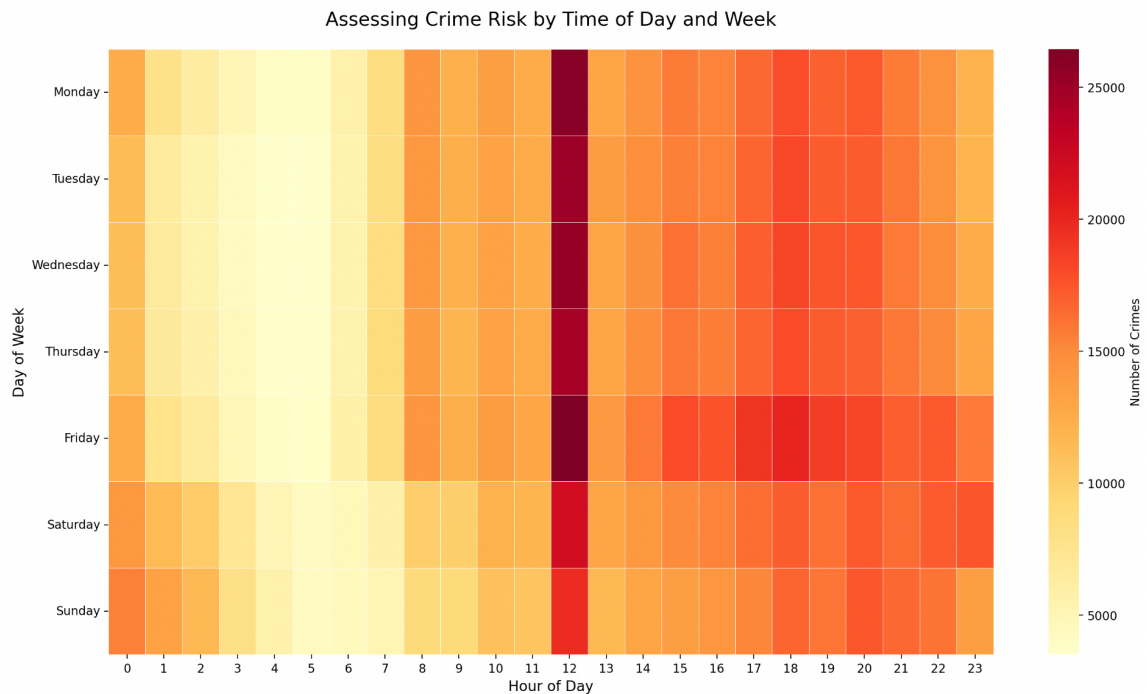
a. **Action:** Identify peak times of day and days of the week for various crime types

**Target:** Hourly and daily crime patterns

b. **Keys:** Time of Day divided into hourly intervals or categories such as Morning, Afternoon, Evening and Night. Also, Day of the Week.

**Values:** Crime Count which is the total number of crimes that occurred during each time interval or day.

- c. A Heatmap is the most suitable visualization for this task because it allows for simultaneous temporal dimensions (hour of day and day of week) using color intensity to represent crime frequency.
- d.



- e. The heatmap reveals that crime activity in Los Angeles fluctuates significantly throughout the day and across the week, with the highest frequency occurring around midday (12 PM) and remaining elevated through the afternoon and evening hours (12 PM–10 PM). Fridays and Saturdays show slightly higher crime intensity compared to other days, suggesting that increased public activity and nightlife may contribute to the rise in incidents. In contrast, the early morning hours (2 AM–6 AM) consistently exhibit the lowest crime rates, likely due to reduced outdoor and social movement. These findings partly align with expectations, though the pronounced midday spike indicates that many crimes may be non-violent offenses such as theft or property-related incidents occurring during peak daily activity. Overall, the visualization highlights that crime risk is not confined to nighttime but is distributed throughout active hours of the day, offering a nuanced understanding of urban safety patterns.

## Task 6: Investigate Crime Hotspots by Crime Type

- a. **Action:** Compare crime rates by type across various areas to determine if certain areas are prone to specific types of crime

**Target:** Crime type distribution across areas.

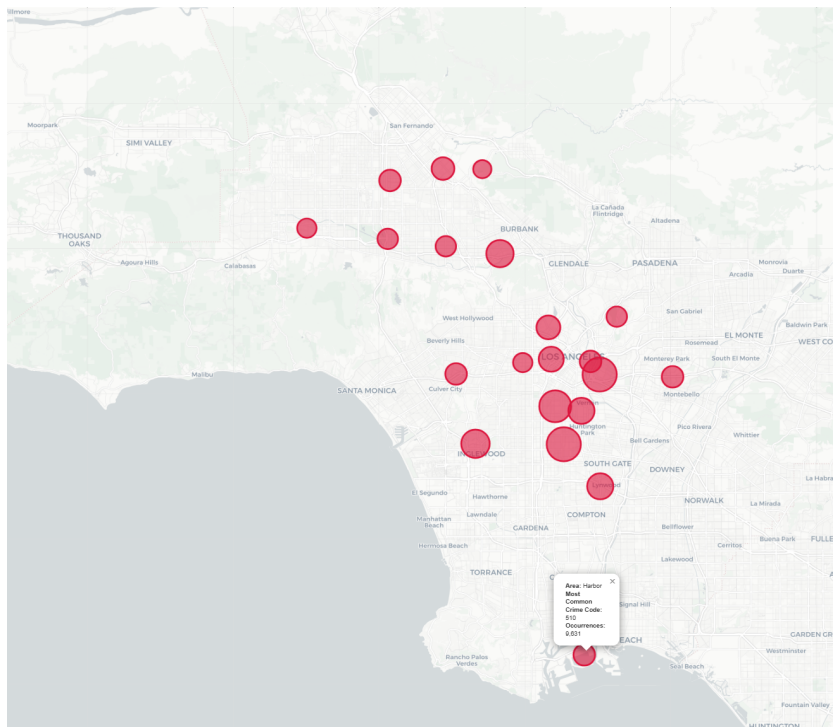
- b. **Keys:** Area Name (categorical, spatial grouping), Crime Type (Crm Cd Desc)

**Values:** Count of crimes per crime type per area

c.

I want to create a bubble heatmap to show where crimes most frequently occur and what crime type is most prominent in that specific area. We will be able to create a map using LAT/LON values given. There are 21 LAPD stations, each circle represents a specific area that each cover. The size of the circle will increase as the crime counts increase based on the area we are looking at. When we press the popup, we will be able to look at the Area Name, Most Common Crime Code, and number of crime occurrences.

With this information, we will be able to identify the crime hotspots and what the most popular crime code is.



e.

Looking at the map, we see that the largest crime hotspot is 77th Street with 15,050 crime occurrences. The most common crime code in this area is 624. The second largest is Central with 14,752 occurrences and it also had the most common

crime code as 624. In general, the Crime codes 510, 624, 440, and 310 repeated were shown as the most frequent. To gain even more insight the future step is to print what Crime Code Description this code represents.

This visualization did a good job identifying hotspots, but to interpret the graph we need to also be able to know what the crime code types mean.

### **Task 7: Identify the Average Age of the Victim Affected Characterized by Crime**

- a. **Action:** Highlight what the average age of victims targeted based on various crime codes and the descriptions.

**Target:** Age distributions across criminal codes.

- b. **Keys:** Crm Cd (identity the top 10 most frequent crimes individual bar), Crm Cd Desc (map from Crm Cd to group by crime category)

**Values:** Average Victim Age (Derived using Vict Age and group by Crm Cd)

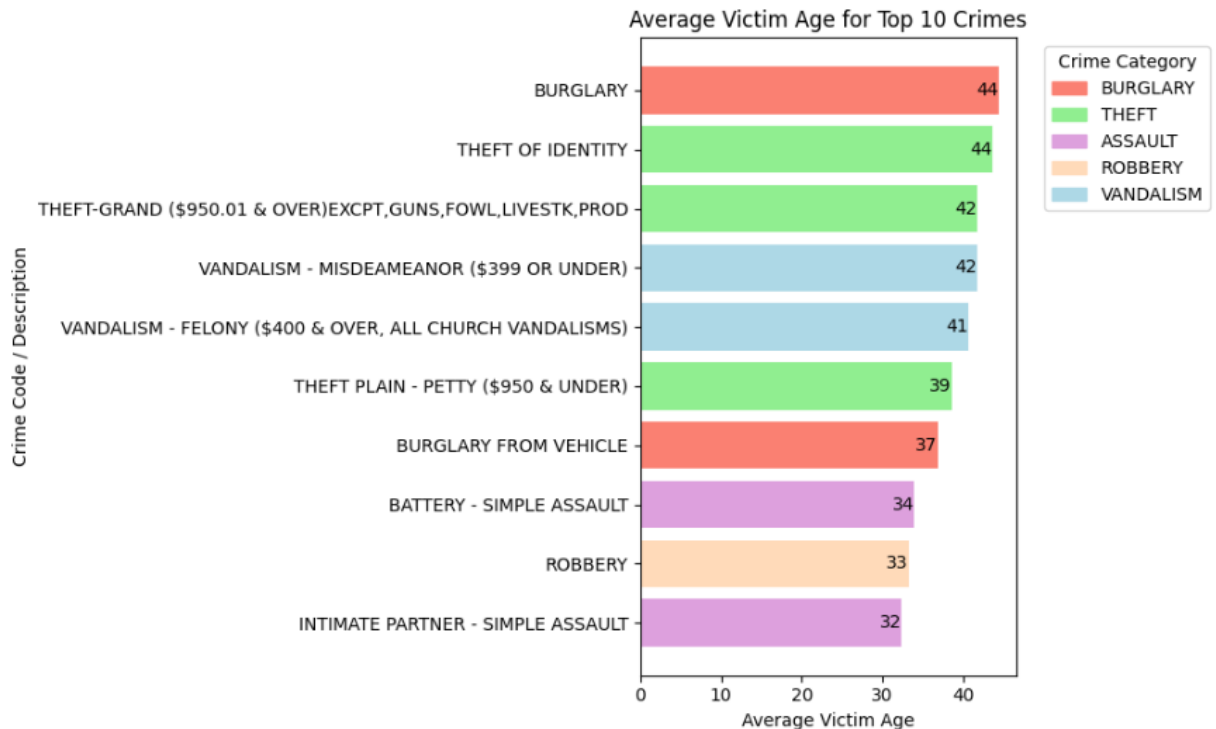
c.

To identify the average age of the victim affected by the top ten crimes, I decided to create a horizontal bar chart. The crime codes representing each bar correspond to the top 10 most frequent crimes. Then, computed the average victim age for these crime codes.

The x-axis is the average victim age, and the y-axis is the crime code mapped to the crime description. We can further categorize these crime codes using key words like Burglary, Theft, Assault, Robbery, Vandalism, etc. Based on what category the crime falls under, we will have a specific color. To create redundancy in the graph, the average victim age is listed within each bar.

This visualization will help compare the average victim ages clearly while also categories the top ten crimes into specific overarching circumstances.

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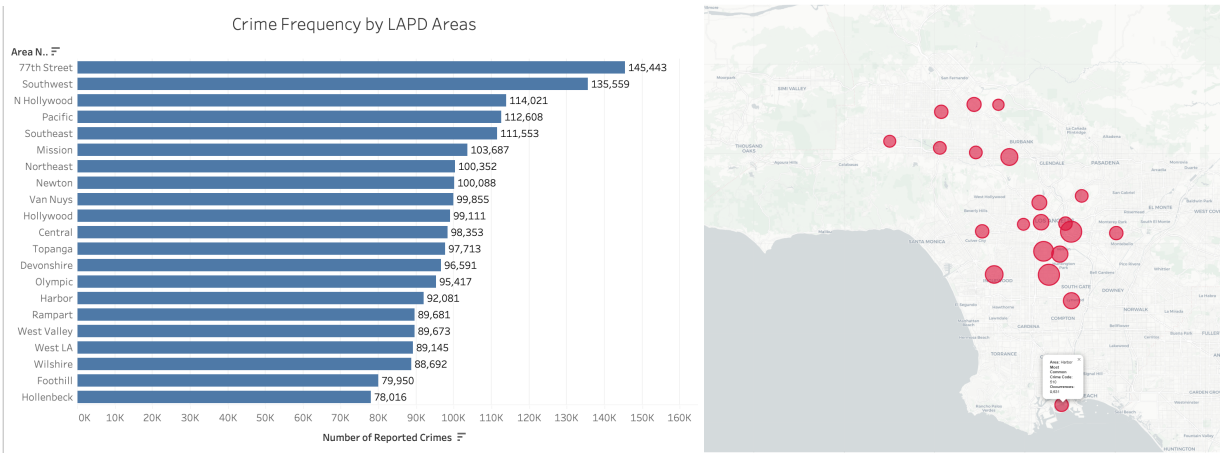
e.

The horizontal bar chart does a great job displaying the distributions of the average victim age most affected by the frequent crime codes. Having the crime category, helps direct viewers' eyes to see the relationship between the crime codes using burglary, theft, assault, robbery, and vandalism specific.

For example, now we can say burglary crimes effect on average victims who are 44 and 47. Theft related crimes affect victims on average who are 44, 42, and 39. Vandalism occurs on average to those who are 42 and 41. Victims who experience assault are on average younger 34 and 32. We also see that on average victims who are 33 are affected by robberies.

Though this list of crime codes and average victim ages are not extensive, we can see there is on average different ages victims may be targeted based on crime codes. Therefore, this visualization did meet my expectations and provided helpful insight.

### Step 3: Synthesize Insights with Faceted Views



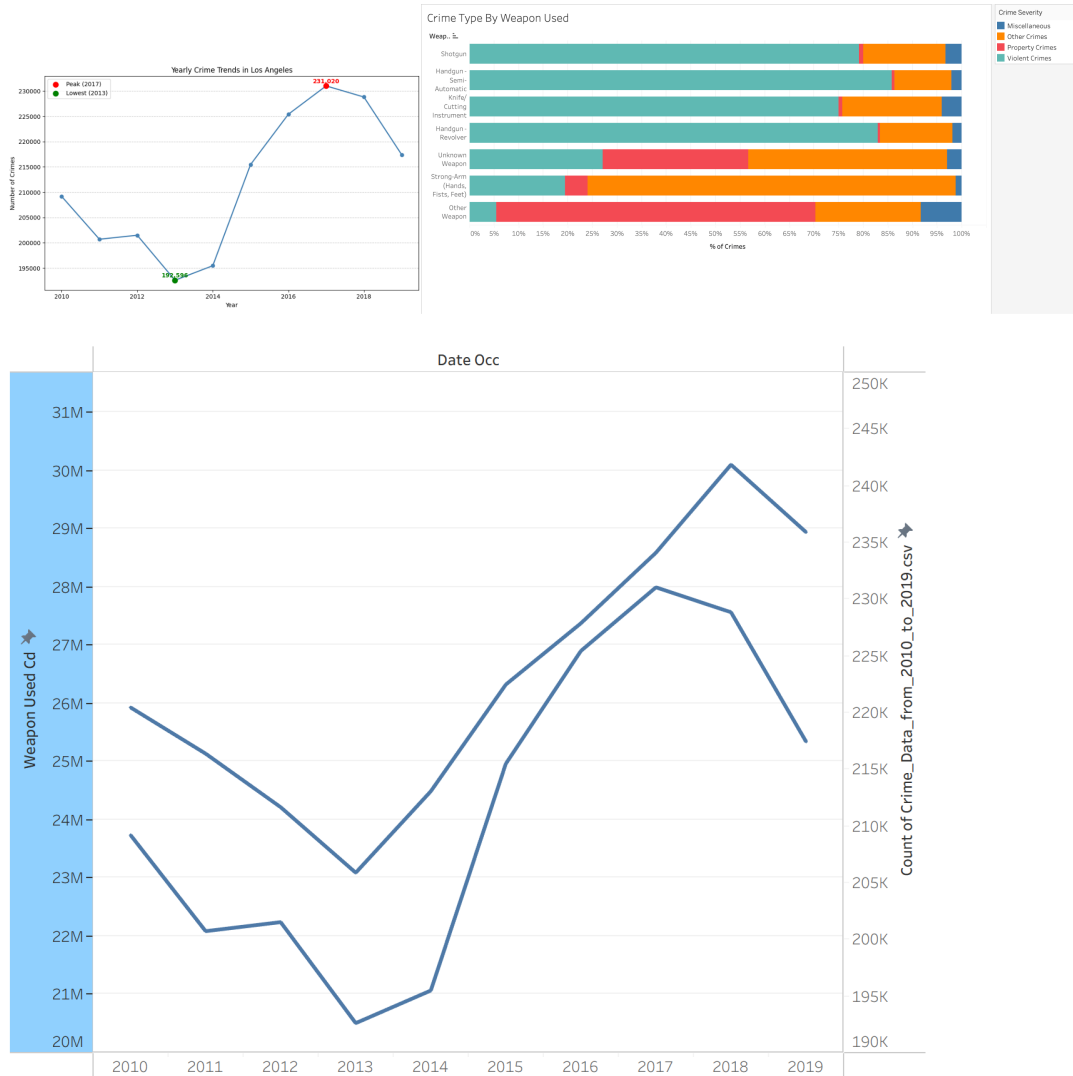
In this visualization I used Juxtaposition.

Insight: This view identifies which crime types are most prevalent in each hotspot



Technique: Partitioning

Insight: This visualization gives a more detailed look into the exact hours and days in which peak crime occurs.



Technique: Superimposition

Insight: Gives added insight into the divergence of frequency and severity of crimes.

## **Step 4: Reflection and Alignment Check**

Throughout the process, I successfully built upon the foundation established, by aligning our analytical tasks with the needs of our target audience which are new or incoming residents of Los Angeles seeking to make informed decisions about safety. Each visualization was designed with this audience in mind, providing accessible and actionable insights into when and where crime occurs, what weapons are used, and who is most affected. This alignment ensures that the project not only answers our analytical questions but also serves a practical, real-world purpose.

From a reflective standpoint, our team worked collaboratively and efficiently to divide responsibilities, discuss visualization choices, and refine interpretations. The use of diverse visualization types such as heatmaps, bar charts, and time series plots allowed us to represent multiple dimensions of the data clearly and comprehensively. While we faced minor challenges with coordination and time management, we overcame them through consistent communication and teamwork.

Overall, this project successfully bridges data analytics with audience relevance. The insights derived from the visuals directly help our audience understand crime dynamics in Los Angeles, empowering them to make safer, data-informed lifestyle and location choices. This step reinforced the importance of connecting technical analysis with meaningful, user-centered storytelling in data visualization.