DATA VISUALIZATION AND STORY TELLING

TEAM - 15

FINAL PROJECT PHASE-3

PRANAY DATTA KAVUKUNTLA, LOKESH VANGULA

Research question:

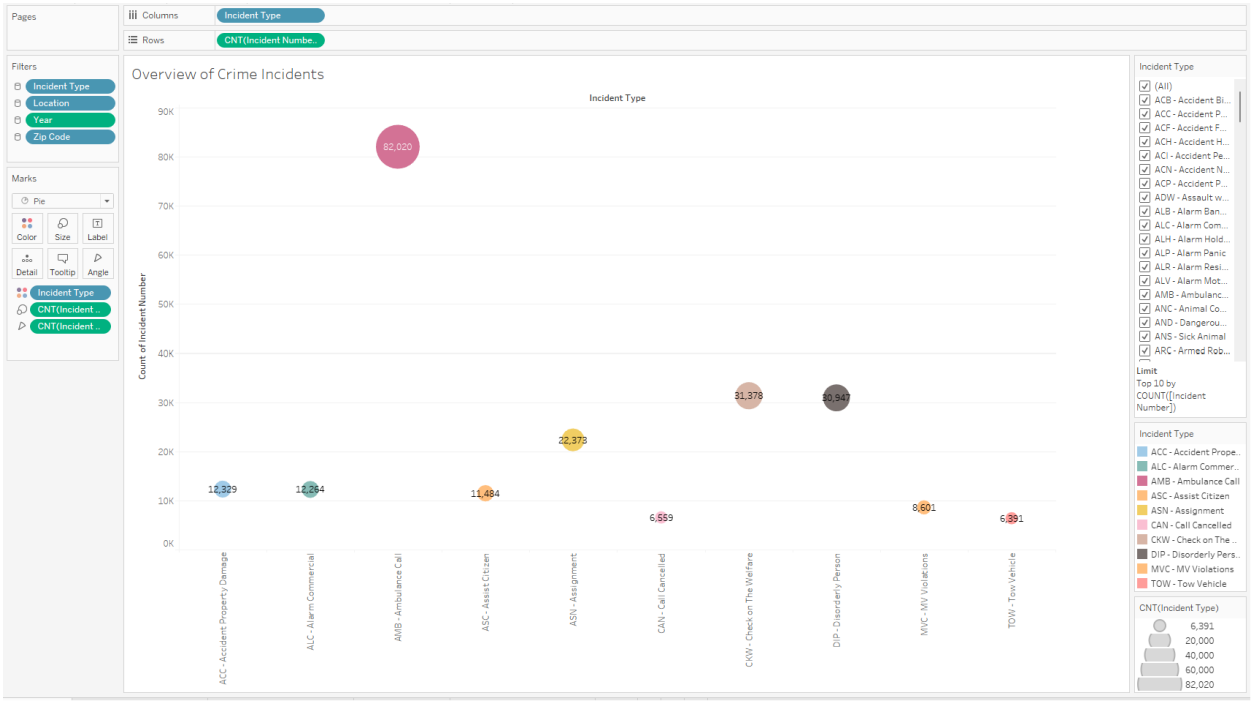
- **The addition of the 'Time Range' column allows for the identification of patterns in the frequency and types of crime incidents that occur in various locations of Worcester. Furthermore, how can this information be utilized to enhance the implementation of targeted community safety measures?**

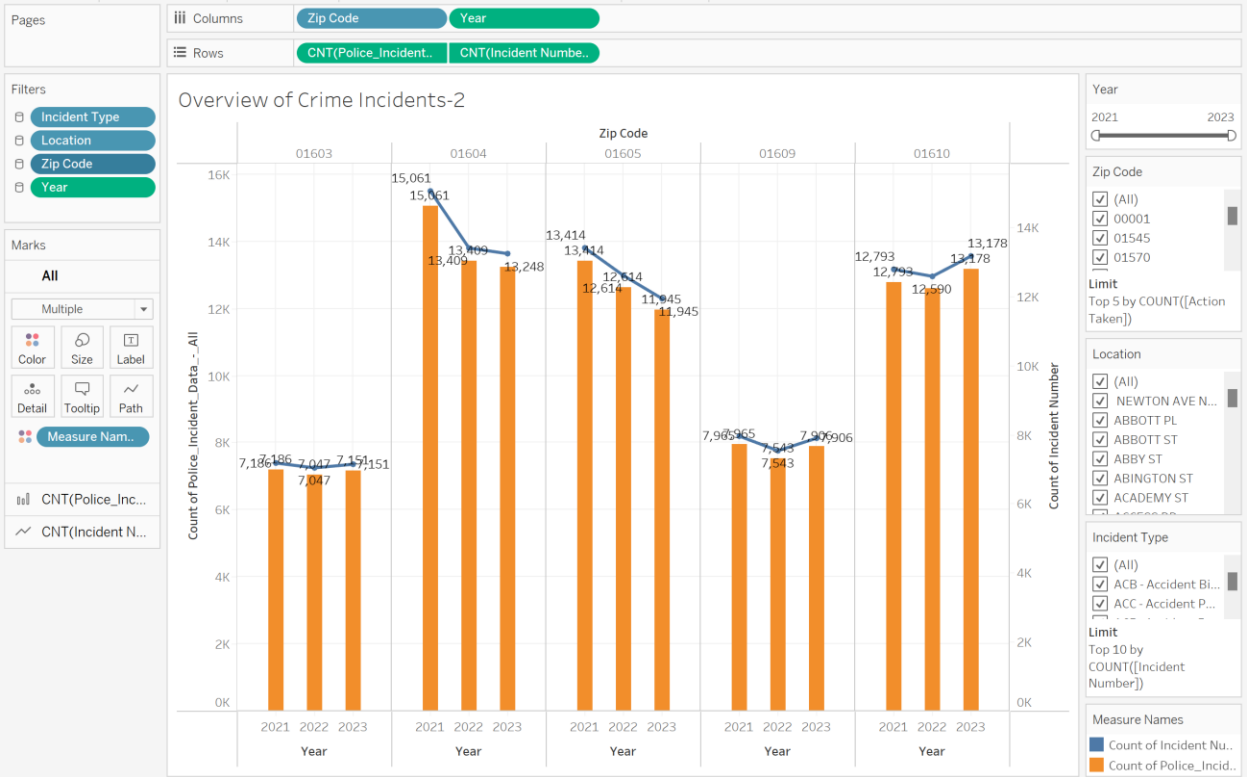
Introduction:

My research intends to discover patterns and connections within the Worcester crime incident dataset by making use of the powerful data visualization features of Tableau. More specifically, I will be concentrating on the 'Time Range' column that was recently added to the dataset. In line with the objective of making complex data understandable and illuminating for a wide range of audiences, this technique is appropriate.

I have enhanced the dataset significantly to facilitate more precise analysis. I corrected errors and standardized data formats in the dataset. For better analysis, I made a 'Time Range' column that breaks down time data into hourly blocks; for example, instead of writing 1:20 PM as '1-2 PM,' I wrote it as '1-2 PM'. Another addition is the 'Year' column, which lets you see how crime rates have changed throughout the years.

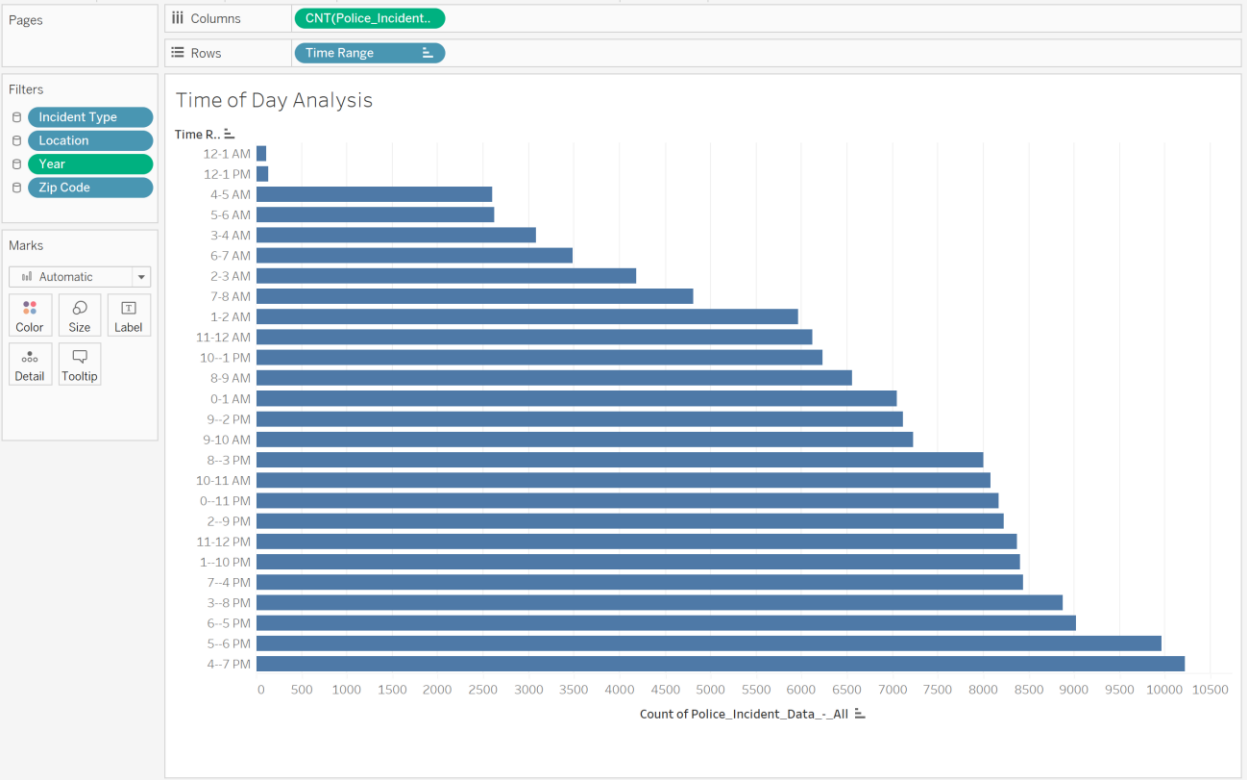
First Story Point - Overview of Crime Incidents





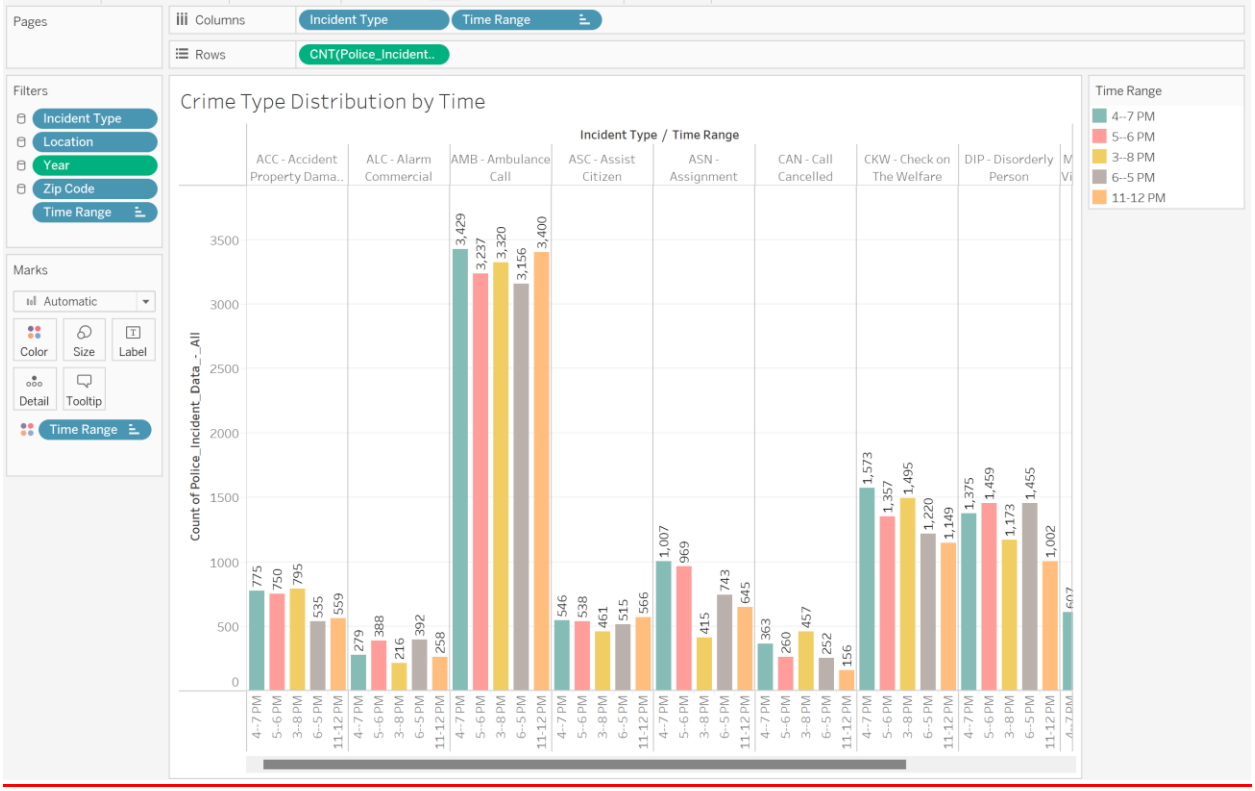
- **Objective**: Overall, in order to illustrate the frequency of criminal acts and the many kinds of offenses that are committed in Worcester, the following information is presented.
- **Audience Benefit**:
    - Government Officials and Law Enforcement: They can determine the frequency of certain crimes, which helps with planning and allocating resources.
    - Academic Community and University Students: Gives a basic outline of the local criminal scene, helpful for both academic study and self-awareness.
    - General Public: Provides a clear picture of the crime rate in their area, raising awareness and perhaps affecting choices about individual safety.

Second Story Point - Time of Day Analysis



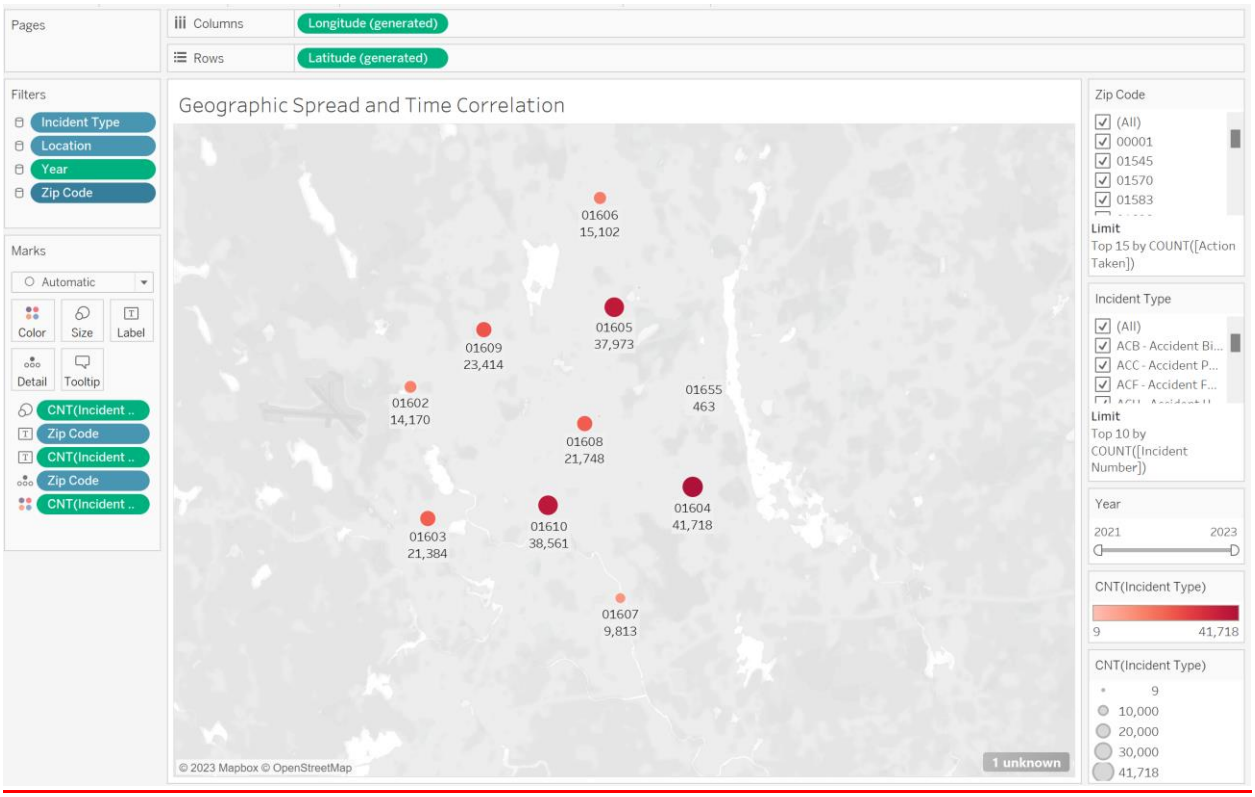
- **Objective**: In order to assess the relative volatility of the daily crime rate in Worcester, the goal of this study is to conduct an analysis of the rate.
- **Visualization Approach**: Implementing line graphs to depict trends over time and heat maps to illustrate crime concentrations at various times and days.
- **Audience Benefit**:
    - Government officials and law enforcement: knowing when crimes tend to happen most helps with planning patrols and developing strategies to avoid them.
    - Academic Community and University Students: learning about patterns of crime according to time can help shape security measures and individual schedules on campus.
    - General Public: People can use this research to better arrange their actions based on when it is safest and riskiest to do so.

Third Story Point - Crime Type Distribution by Time



- **Objective**: The objective is to investigate the manner in which various types of criminal activity are distributed throughout the day.
- **Visualization Approach**: Creating bar charts or stacked area charts to show the frequency of specific crime types within designated time ranges.
- **Audience Benefit**:
    - Government officials and law enforcement: Permits the implementation of time-sensitive tactics to counteract particular forms of crime when they are most common.
    - Academic Community and University Students: Helps with research and personal protection by increasing their knowledge of when specific crimes are more likely to occur.
    - General Public: Can help in planning for one's own safety by revealing when specific crimes seem to be more common.

Fourth Story Point - Geographic Spread and Time Correlation



- **Objective**: In order to discover the nature of the connection that exists between crime rates and the spatial distribution of those rates across time.
- **Visualization Approach**: Employing geographical maps overlaid with crime data categorized by time ranges.
- **Audience Benefit**:
    - Government officials and law enforcement: The ability to pinpoint crime hotspots and their link with time is essential for law enforcement and community engagement initiatives that are focused on the desired outcomes.
    - Academic Community and University Students: This article draws attention to particular locations surrounding campuses that may require greater attention with regard to safety, particularly during certain times of the day.
    - General Public: It provides information on the areas of the city that are safer and riskier at different times, so assisting in the process of making informed decisions regarding travel and activities.

Dashboard Design

In order to provide users with the best possible experience when using Tableau, each visualization is meticulously designed to ensure that it fits each dashboard without the need for

scrollbars. The primary objective is to create an interface that is not only intuitive and engaging but also conveys the narrative of the facts.

Data Analysis and Initial Observations

Through the utilization of the 'Time Range' column, it is possible to identify patterns in the incidence of crimes within the preliminary research being conducted. At various periods during the day, notably in the late evening, there is an increase in the incidence of theft and vandalism. This discovery has the potential to have a considerable impact on the strategies employed by the police and the neighborhood watch organizations.

Conclusion

One of the most important objectives of this project is to provide findings that are based on the data analysis that are quite persuasive. The information presented in the story points is intended to guide the audience through a narrative that is both informative and practical, with a particular focus on the community safety and law enforcement in Worcester.