# Checkpoint 2 - Visualization

We attempt to answer two intriguing questions with Tableau visualizations.
We are analyzing the CPDB data to identify whether ‘good’ police officers are rewarded by the Chicago PD. We differentiate between ‘good’ and ‘bad’ police officers via a metric we have defined - Complaint Severity Score (CSS). Before we identify good/bad officers, we need to explore the different reward categories.

## Question 1 - What does the distribution of rewards look like? Which ones are the most common and which ones are the rarest reward categories?

We observe the distribution of rewards using two visualizations (Q1- Treemap and Q1.1- horizontal bar graph)
The most common rewards are listed below in decreasing order of reward counts -

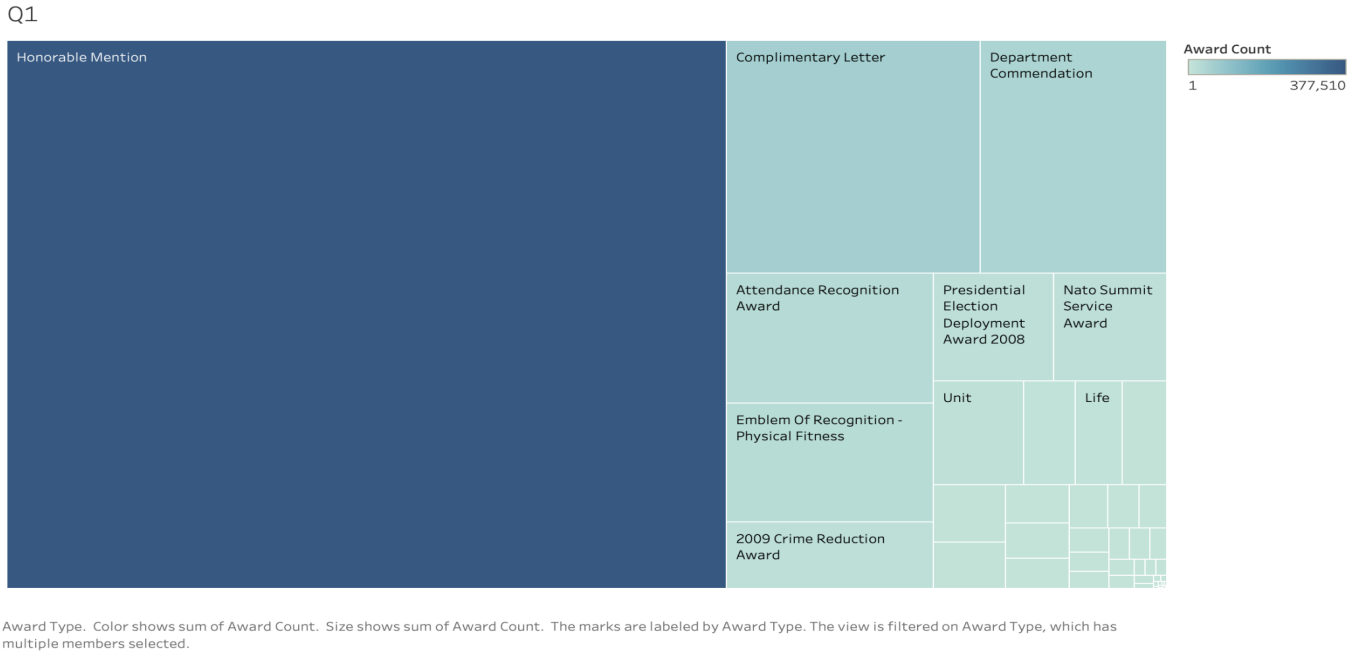
1. Honorable Mention
2. Complimentary Letter
3. Department Commendation
4. Attendance Recognition Award
5. Emblem of Recognition- Physical Fitness

These reward categories account for 79.98% of total rewards

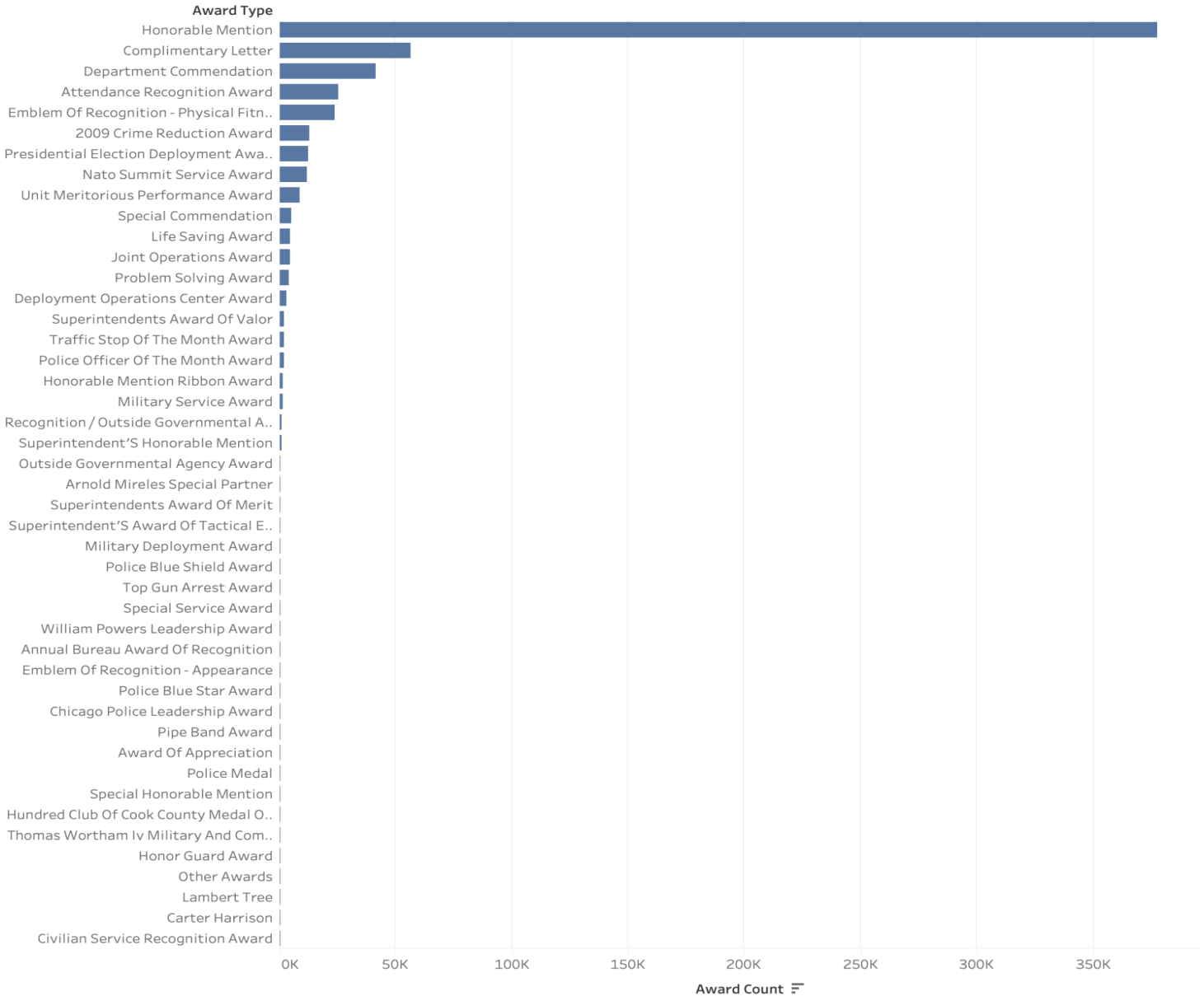
The most rare reward categories are listed below in increasing order of reward counts -

1. Civilian Service Recognition Award
2. Carter Harrison Award
3. Lambert Tree Award
4. Honor Guard Award
5. Thomas Wortham Iv Military and Community Service Award

These reward categories account for 0.0038% of total rewards



Q1.1




Sum of Award Count for each Award Type. The view is filtered on Award Type, which has multiple members selected.

This visual analysis gives us an idea of the most important rewards to look at while comparing officers with high and low Complaint Severity Scores (CSS). The most common reward to an officer is an Honorable Mention.

## Question 2 - What is the relationship between rewards categories and the average CSS of officers who have received the award?

We display the relationship between reward categories and average CSS of officers through a box and whisker plot, which allows us to visualize the variance between each category while also showing us the outliers. From the figure shown below, we see that reward categories and CSS of officers have a very non-uniform relationship. Several categories have outliers for the CSS metric, with the highest CSS score being 16.94 for honorable mentions. This indicates that despite having a high CSS, several cops have received awards. On the other hand, categories such as the Chicago police leadership award have relatively lowered CSS values. It is also interesting to note that the Outside Governmental Agency Award has lower CSS values, indicating that they might include complaints as a factor in their awards criteria.

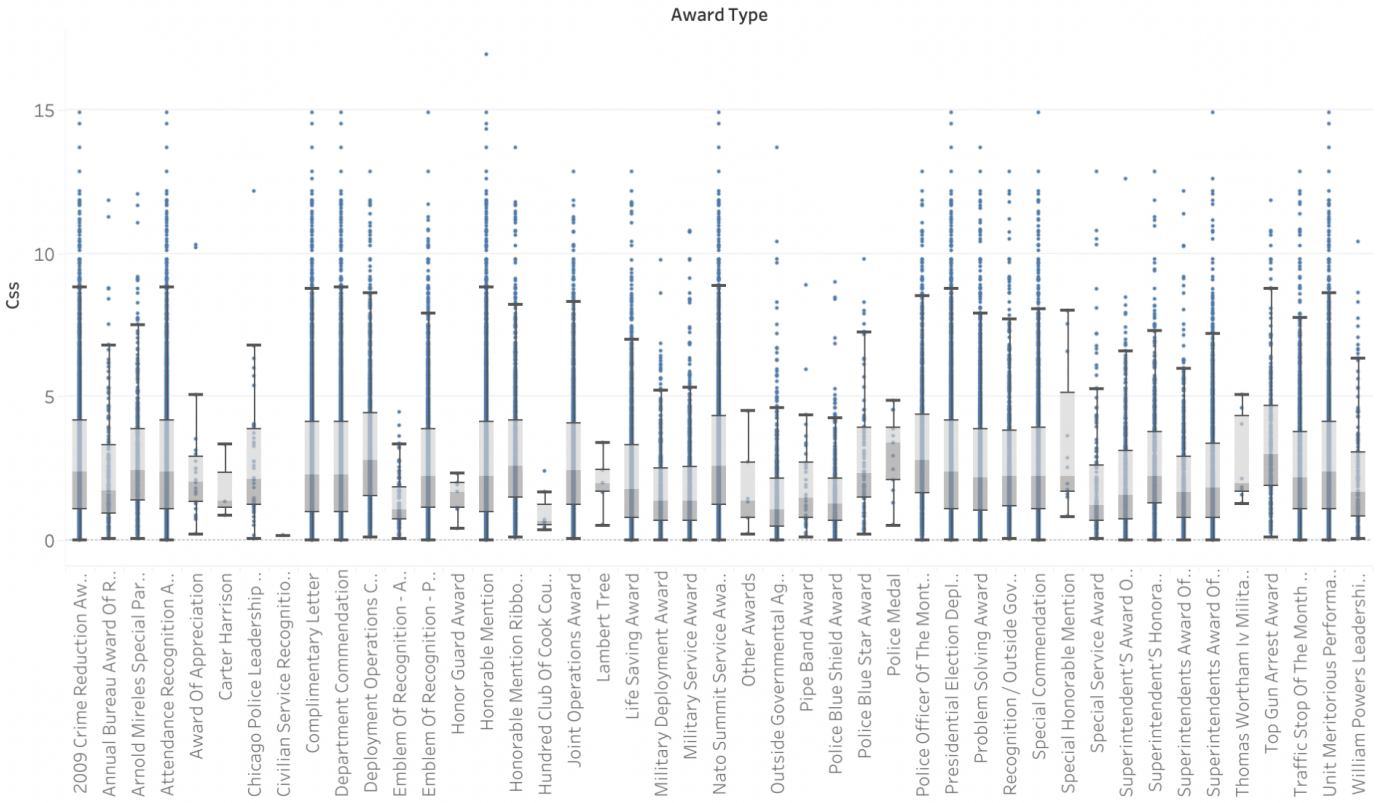



Tableau provides an easy-to-use GUI and reduces development time. It was easy to create visualizations by dragging and dropping features to rows, columns and values. Furthermore, Tableau suggests relevant visualizations based on the data and we can observe different graphs for the same data. The alternative would have been creating visualizations by writing Python code using ‘matplotlib’ and ‘plotly’ libraries which is considerably more effort.

We have observed the count of awards to the Chicago police officers for each reward category which highlights the rewards with high frequency - **Honorable Mention, Complimentary Letter, Department Commendation, Attendance Recognition Award and Emblem of Recognition- Physical Fitness**. These reward categories account for nearly **80%** of all rewards to the Chicago police officers. Hence, these would be the primary categories for our project. Furthermore, the second question/ visualization focuses on the average and range of CSS values for each reward category. Although we observe a non-uniform relationship between CSS and reward types (as expected), it is **interesting to observe certain outliers having a high CSS. These outliers account for ‘bad’ cops who are being rewarded by the department.**

On the other hand, reward categories like Outside Governmental Agency Award and Carter Harrison Award have lower CSS values, **indicating that they might include complaints against the officer as a factor in their awards criteria**.

Submitted by: Akshay Kumar
Dhruv Narayan
Keshav Bhandari