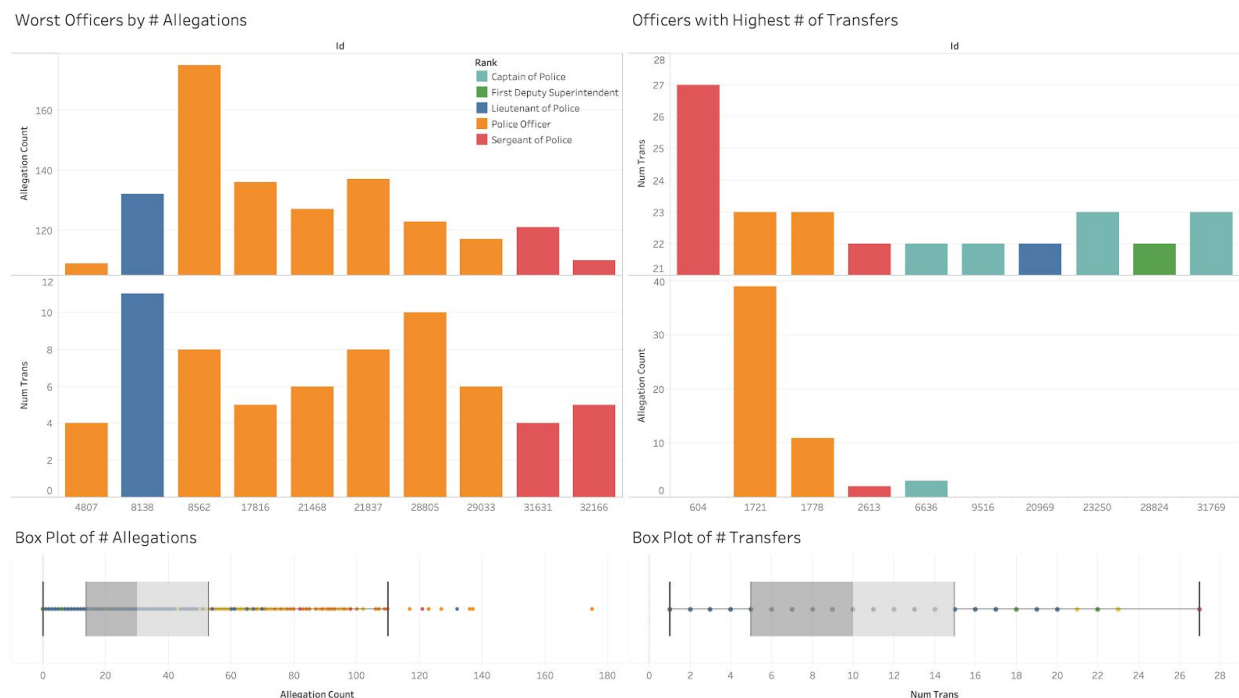


Nicholas Easton, William Ansehl, Krish Seth CPDB Checkpoint 2 - Data Visualization - Findings



Our Tableau dashboard has 6 main visualizations - 4 bar charts and 2 box and whisker plots. Enlarged plots can be found at the bottom of this report, along with their respective orders for convenient referencing in this paper. For example, Figure (A) depicts a bar chart of the 10 officers (among all CPDB officers) with the highest counts of allegations, along with each of their respective number of transfers. Inversely, Figure (B) depicts a bar chart of the 10 officers with the highest number of transfers and their respective allegation counts. Figure (C) depicts a box and whisker plot representing the distribution of total allegation counts across all CPDB officers. Figure (D) also depicts a box and whisker plot representing the same as figure (D), but for total number of transfers per officer. The dashboard is color-coded, whereby colors are indicative of a particular officer's rank. For example, blue indicates an officer who is of rank "Lieutenant of Police." Similarly, via hovering one's mouse over a respective officer's data point (or bar), the user can see the officer's gender (M or F).

From Figure (C), we see that officers with higher ranks tend to have fewer allegations. The left hand side is dominated by the ranks of Lieutenant and Captain. The right hand side is filled with ranks of Police Officer and Sergeant. This makes sense as higher ranks have fewer interactions with the public in the course of their duties. Furthermore, this is likely a selection pressure within the department. Hopefully, officers with more allegations made against them are more likely to be passed over for promotions. This also plays into the political nature of advancements, these high allegation count officers are more riskier promotions given the public backlash towards them we've seen in recent years.

While Figure A might suggest that officers with a high number of allegations tend to be transferred frequently, closer inspection suggests otherwise. These officers are sitting right

around the median number of transfers, shown in Figure (D). Furthermore, the officers with the most number of transfers, Figure (B), are typically lower than average in their respective allegation counts. As such, these measures do not seem well correlated with each other. It seems that officers with many allegations levied against them do not tend to transfer at a higher rate. Similarly, officers who tend to transfer frequently do not seem to do so because they have been accused of wrongdoing.

We aim to further connect the relationship between allegations and transfers among individual officers and better understand the usage of transfers as a mechanism in police administration. Specifically, we will proceed with analyzing officer allegation records as they are continuously transferred. Can transferring officers be a viable preventative tool against the development of biases over time? Our current results indicate that the officers transferred the most are accruing fewer allegations than their peers. Further investigation needs to be conducted to better understand if this tool is preventing the development of biases and therefore minimizing allegation risk, or if these officers are simply being taken out of high-risk zones and therefore are not as susceptible to allegations being lodged against them.

We faced many challenges while using Tableau. For one, we received connection errors every time fields of a visualization were changed after connecting to the AWS server. We explored multiple potential solutions to this issue, including downgrading to multiple previous versions of Postgres, creating our own local Postgres servers, and exporting all files in a csv format and manually connecting to these local files. Downgrading to earlier versions did not prove to change how Tableau was interfacing with the server, and we received the same previously mentioned errors. Creating a localhost for the CPDB database also did not solve our problem. Finally, exporting CPDB as csv files and importing those files into Tableau proved troublesome as well. In our project proposal, we said that we wanted to create a choropleth heatmap. However, when importing csv files, the Polygon column was in an incorrect format, making it impossible to create these map representations that we needed to be able to answer our proposal questions. We eventually figured out how to make our own shape files, but this process took a lot of unnecessary time. It required downloading QGIS in order to connect to the AWS instance of the database. From there, we use QGIS to export the id and polygon to a shapefile that Tableau was then able to correctly parse. We understand that this is due to compatibility issues with Postgres and Tableau, but in this case, most of our time was spent troubleshooting connection issues, rather than working on the checkpoint itself. This was both unproductive and time-consuming.

Worst Officers by # Allegations

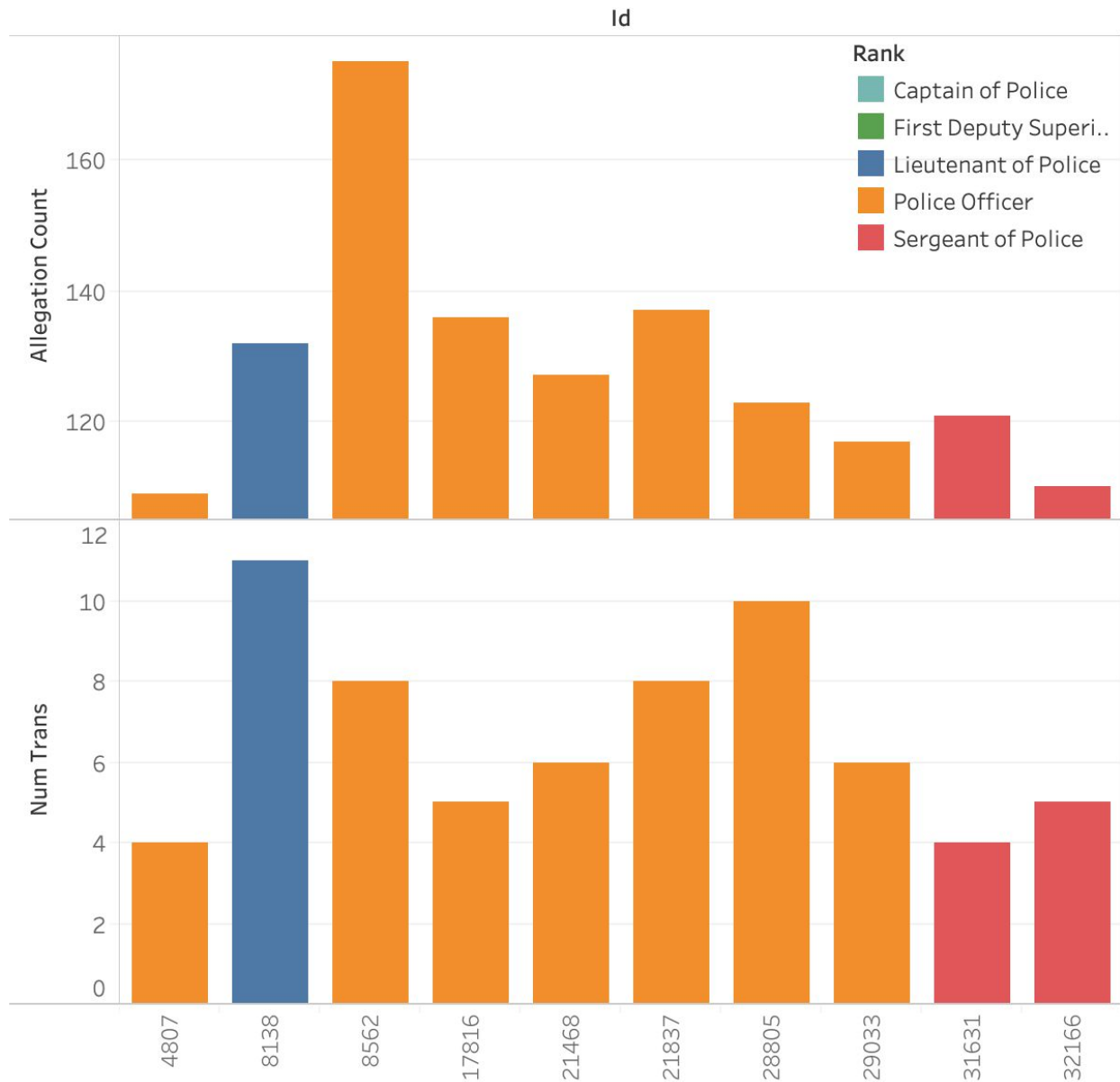


Figure A: Officers with the highest allegation counts and their corresponding number of transfers, color-coded by officer rank.

Officers with Highest # of Transfers

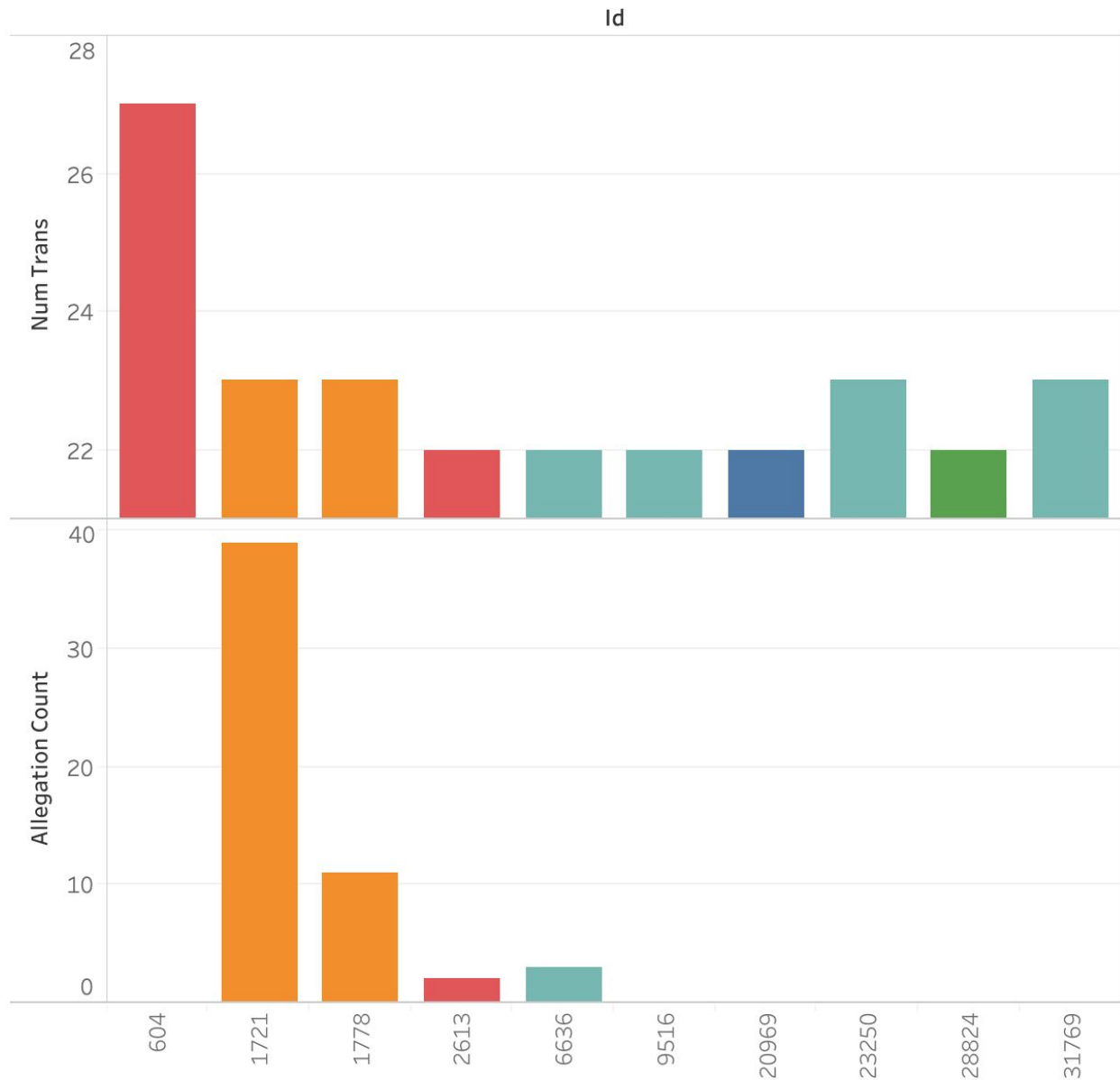


Figure B: Officers with the highest number of transfers and their corresponding allegation counts, color-coded by officer rank.

Box Plot of # Allegations

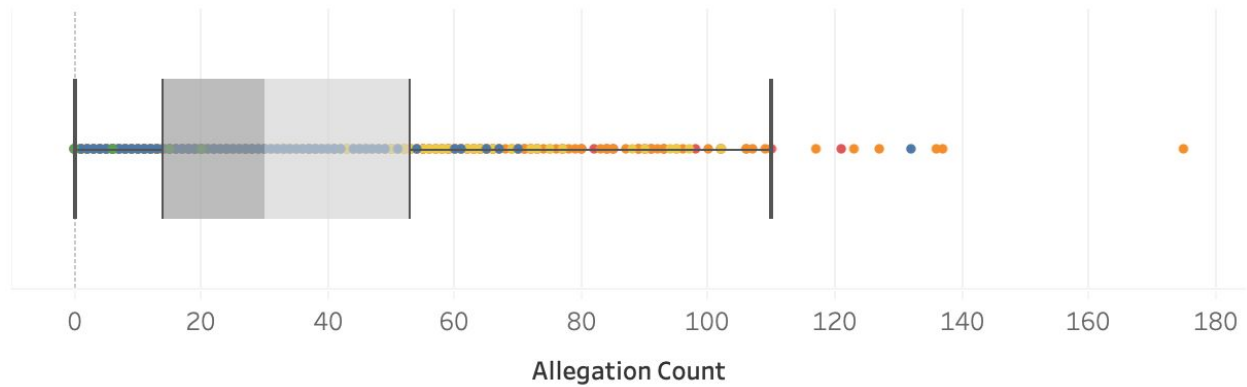


Figure C: Box and Whisker Plot depicting the distribution of allegation counts across all CPDB officers. Data points are color-coded by officer rank.

Box Plot of # Transfers

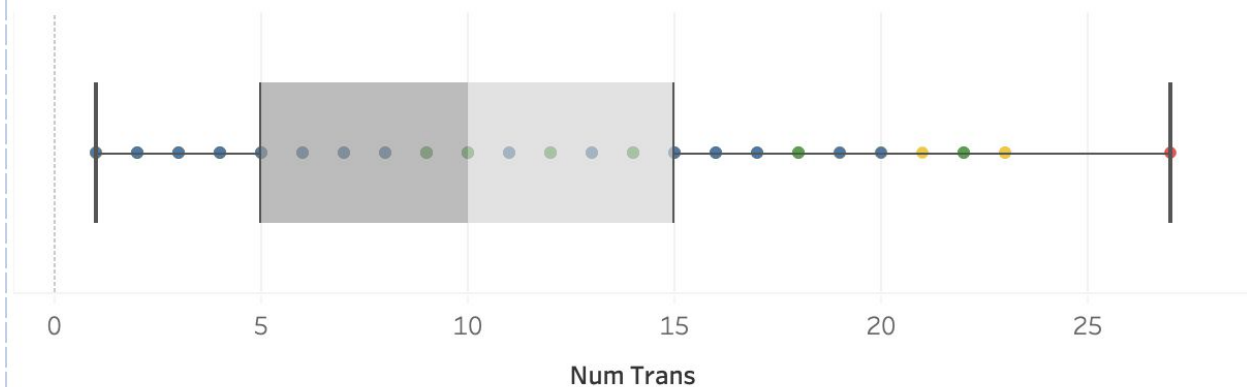


Figure D: Box and Whisker Plot depicting the distribution of total number of transfers per officer across all CPDB officers. Data points are color-coded by officer rank.