The first step in time series analysis is to check for stationarity, because if the data is stationary, then many simplifying assumptions can be made.

The most important property of a stationary process is that the autocorrelation function (ACF) depends on lag alone and does not change with the time at which the function was calculated.

Pure stationary data will generally only appear in educational situations and is not generally seen in real-world situations, so for a more practical since we will be looking for at least A *weak stationary*process that at least meets the conditions of a constant mean and ACF (and therefore variance).

1. The Dedman information is 13 and a half months of data, and there is no firm evidence of a strong seasonal component to the series. There does appear to be a dip in traffic during the Summer of 2019 and others during brakes. Overall, there does not appear to be strong evidence that the mean is changing with time. We found the weekly rolling mean to be 934 almost equal to the data set's mean of 929—one more bit of information pointing to the mean not being dependent on time.
2. There is some evidence that the variance changes slightly at times, but the evidence does not seem to be strong enough to reject the possibility that the time series is stationary based on the second condition.
3. When we look at the first and second halves of the ACF for this realization, the correlation structure appears to be very similar. This would mean that the correlation between points only depends on how far apart the points are and not where they are, which gives evidence to support a stationary data set.

Finally, we can look at the sharp drop after lag one in the PACF. This shows that, though a bit weak, the Dedman data set is assumed to be "close enough" to stationarity. There does seem to be a bit of seasonality in the data being that it follows a general pattern of campus life (students are not there in the Summer). We will address this in the modeling of the data.