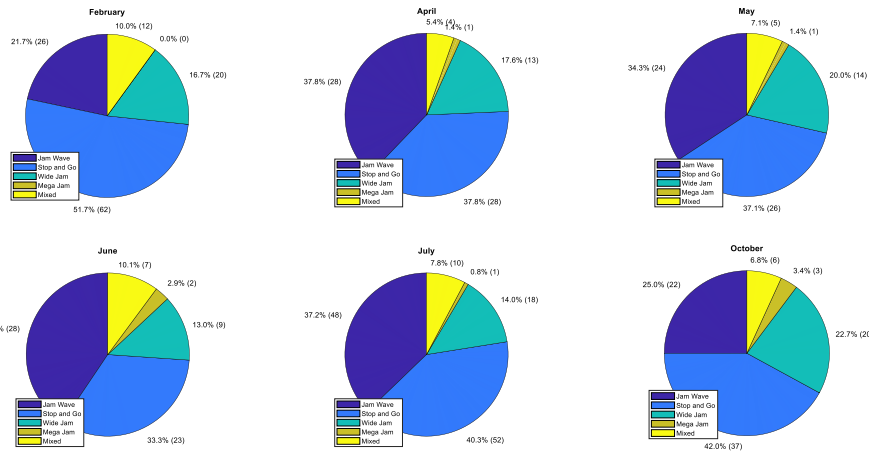


# Investigation of seasonality of congestion events

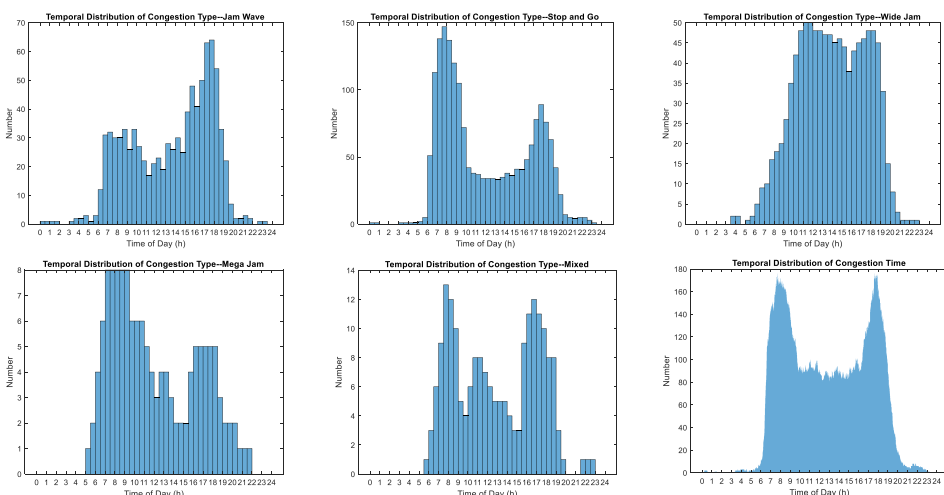
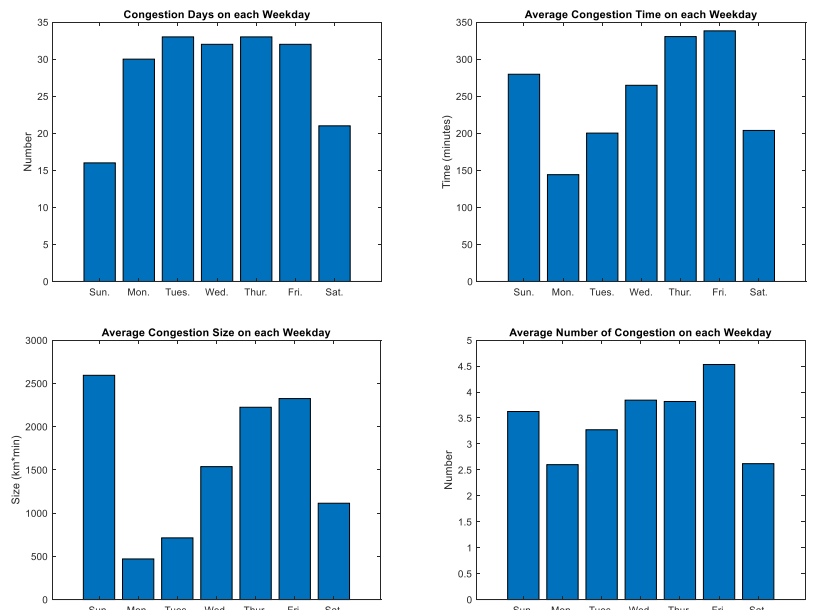
## Master's Thesis of Yuzhong Hu

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There are 5 congestion types: jam wave, stop and go, wide jam, mega jam and mixed. Through definition wide jam and mega jam represent longer congestion time and higher influences to traffic, which accounts for 19% of all. The difference between jam wave and stop and go are small, the influence of these two types is restricted to very short time. Congestion type mixed are sometimes mixture of jam wave and stop and go. If we combine jam wave, stop and go and mixed, we can find that, they occupy over 80% of all congestion in every month, which shows us that, if we look at the congestion incident as a whole, then the situation is not that bad since most of congestion are, in terms of time, very short of duration.



The chart congestion days on each weekday considers only if there is congestion happens, regardless of how many times of congestion happen in a day. The conclusion matches the people's daily experience, the traffic situation is much better in the weekend. The number of congestion days in weekend is significantly less than weekday, especially Sunday. Diagrams about average congestion time consider how much time congestion lasts during a day. Given the situation that there is not equal distribution of congestion times in terms of day of week. From the results we can roughly see that, even though there are less congestion days in weekend (especially Sunday), but average congestion time and size are much bigger than Monday and Tuesday, through which we can make conclusion that, the congestion situation is much worse if congestion happens during weekend.



Temporal distribution of congestion type in SB direction is more in line with people's perception of congestion time. The congestion happens most frequently in commuting time. The interesting thing is, jam wave occurs more frequently during off-duty time afternoon. Stop and go occurs more frequently during morning. Since we have known, the number of congestion events in SB direction is more than that in NB direction, from the diagram we can conclude that, the biggest increase lies in wide jam. The distribution of wide jam is evenly during 9:00-19:00, which shows serious traffic situation in SB direction. There are several congestion events in the midnight including jam wave and stop and go. The frequency of mega jam increases compared to NB direction. Compared to NB direction, the main increase of congestion events in SB direction lies in morning peak hours, which corresponds to 7:00-9:00.