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Homework #4

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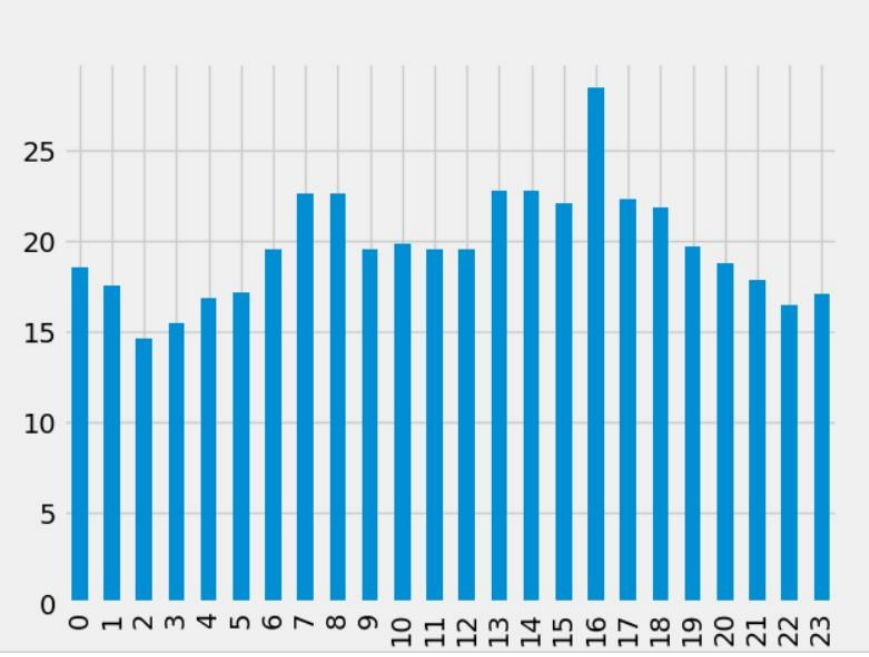
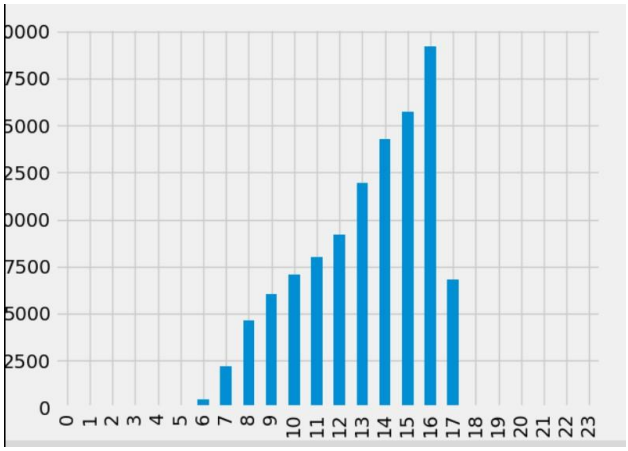
Traffic on 72nd street in Omaha is some of the most inconsistent in the city. Between construction and overwhelming congestion of cars, no two days on this street are the same. This is best represented at the intersection of 72nd and Q street, given that about two blocks north 72nd goes from a six lane road to a four lane road, and this is the first turn into the larger residential areas. There are lots of options to help the congestion at this intersection but only two are particularly worth it; adjusting the time of the stop lights, or put in another lane going north-south.

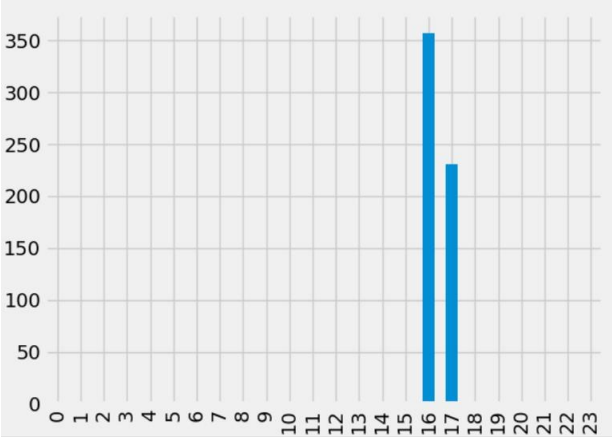
Given the current state of the intersection, there are two noticeable obstacles to overcome; the overwhelming traffic traveling north-south compared to that of east-west, and the four o'clock rush. These two issues can be solved by changing the lane in one singular way, but changing the intersection the wrong way can simply make things worse. The current set up of the intersection is not a bad one, but improvements could be made to help avoid longer wait times.



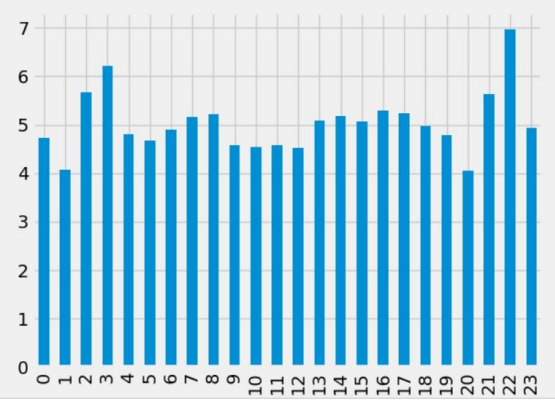
The worst option out of the four is stop signs by quite a fair margin. Conceptually they would not make any sense in the spot given the high volume of traffic that goes through the area. While it is the cheapest to install and maintain, the amount of people who would use the area after being installed would be close to none. The maximum wait time was above seven thousand, seven hundred fifty seconds which is roughly ten times the amount as the second next longest wait time.



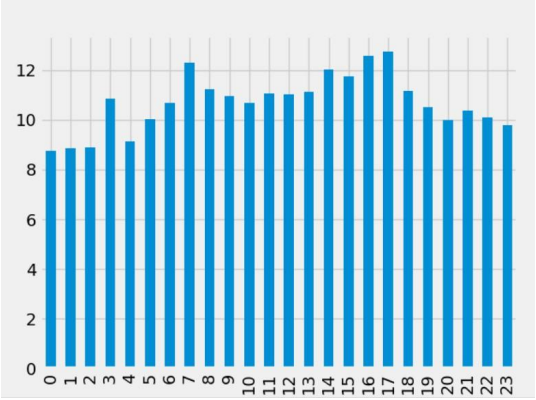
The option with the second largest wait time was the roundabout option. While throughout all times of the day except for the four o'clock rush there was next to no wait time, during those two hours the wait time exceeded three hundred fifty seconds. This did help make it a contender for installation, but given such an extreme average wait time for these two hours, it would make the intersection almost useless for that stretch of time. Given the cost of installation being around one hundred fifty thousand dollars, the city would save eight thousand dollars yearly, but the loss of traffic through the area simply wouldn't make up the cost.



One option the city has is to build an extra lane and adjust the light times. Given the extra lane north-south, then changing the times to twenty seconds for north-south and fifteen for east-west, this creates the lowest average wait times but for the highest cost. Building the third lane would not need to be more than half a mile long as it could simply connect to the lane that ended half a mile north, but that is still around a one and a half million dollar job, mixed with another twelve thousand added onto the already forty eight thousand dollars in yearly maintenance fees. This brings the total yearly maintenance up to eighty thousand dollars with the lights and road maintenance. Given such low wait times, the street would become busier, but given that 72nd is one of the few points for people to head south over the creek it wouldn't be an extreme difference.



The most simple and cost effective thing the city could do, is correlate the light times to the amount of traffic heading in that direction. This option cut the average wait time nearly in half for no additional price. The lights are already being run, it would simply be a means of changing the amount of time to eighty seconds for north-south and thirty seconds for east-west. This works because the amount of traffic that builds up going north-south is roughly three times as much as what travels east-west, so making the times match this imbalance keeps the stop lights from wasting unnecessary time. Once again coming with no additional cost, simply the eight thousand that the city is already paying.



The city only has two clear options, either build an extra lane or adjust the times to match the flow of traffic . The city could pay an initial cost of one and a half million and add twelve thousand a year to add a lane, not only getting rid of the traffic problem, but also turning 72nd street into a more useful and extremely popular road. The better choice however would be to simply adjust the light times, cutting the average wait times in half without any additional cost to the city. This is also the most likely choice for the city to make given how cheap yet effective it is, but if the city were to wish to develop further south, it would be worth considering adding that additional lane.