

# Life, Liberty, and the Pursuit of Traffic Engineering

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I wake up to the sound of birds chirping, like a piano chord amidst a crescendo, eyes still shut, not entirely cognizant. I realize that the steadily increasing volume of chirping birds is my alarm telling me it's time to get ready for work. Finals week was last week and I'm almost though my first week of my summer job. I eat a bowl of cereal, pick out some clothes, and head for the shower. I play some music off my phone while showering to help me fully wake up a. After a few minutes, the music stops. My phone begins to vibrate and I notice I'm getting a call from an unknown number. The call end, my music continues to play, and I finish showering shortly after. I go to check my phone and notice that I have a voicemail. I listen to it, it's a call from the City of Lincoln's head of Traffic Engineering asking me if I'd like to meet up for an interview and to call him back. On my way to work I call Lonnie Burklund and he asks me to interview for a position I applied for. I stop by his office shortly after the phone call and we talk about the MATC Internship Program. After talking for about half an hour, Lonnie offered me the position and I accepted. On June 1<sup>st</sup>, 2017, I began my MATC Internship with the City of Lincoln's Traffic Engineering Department.

During my time with the MATC Program I worked under two Senior Engineers, Lonnie Burklund and Mark Lutjeharms. Both have their Professional Engineer and Professional Traffic Operations Engineer certifications. Many of the projects I worked on this summer were derived from them.

My first task I was assigned was to help out with the documentation of the conversion of 16<sup>th</sup> Street and 17<sup>th</sup> Street from one way corridors to two way corridors. I photographed and cataloged all areas along those 2 streets that would experience a change in scenery and traffic flow. This would allow for the public, and the department, to get an idea of what the streets and intersections looked like before, compared to the improvements made after.

My next task was a much more time consuming project. During the course of the summer, the Traffic Engineering department had been coordinating with three different firms to optimize signal timings throughout several corridors in Lincoln. This project was called Green Light Lincoln, or GL<sup>2</sup>. The first phase of this project contained nine main corridors and all of the signals along those streets. Most of the

consulting work was already done by the time I came on with the City. The only major parts left with Phase One are the implementation of the signal timings and the fine-tuning after trial runs.

My project during this summer was to work on Phase Two. I was given 86 different intersections throughout the city. At all of these intersections I was asked to measure the distance of each crosswalk, along with the distance from the crosswalk to the corresponding Pedestrian Push Button, if there was one. I documented the approach speed of vehicular traffic in each direction, along with the respective slope of the road. I was asked to check if Pedestrian Push Buttons were accessible from the sidewalk (10 inch reach distance) and the location of the end of the mast arms with respect to their turning lanes. The location of the end of the mast arms helps determine what type of signal setup can go on that intersection. For example, if a mast arm enters into at least one quarter of the turning lane, a flashing yellow arrow, or FYA, is allowed to direct traffic in that lane.

My final major project was to organize the pole yard, where the City kept all of their unused signal poles and mast arms. The City of Lincoln has four different sizes of signal poles. They are organized based on their bolt patterns. The different bolt patterns have different lengths of mast arms for which they can support. For example, a signal pole with a bolt pattern of 17.5" can support a mast arm of length from 34' to 46'. My job was to measure each of the poles and mast arms and properly organize them based on their bolt patterns and their length. The bolt patterns that matched up with the appropriate mast arm lengths were color coordinated with zip ties to help identify them easier.

Aside from major projects, I was also exposed to many other sides of the engineering field. I worked with computer programs like Excel and Avigilon to accomplish unique assignments. I used Excel to create a template to display several different graphs that represented vehicular and pedestrian traffic at an intersection. The end goal of the template was to display the direction and location at which traffic moved during peak hours during the work day. Traffic counts would be taken at an intersection and then pasted into the template where it would display the Peak Hourly Factor (PHF) for both cars and pedestrians. Avigilon is a computer program that allows you to view several different cameras stationed throughout an

area. I used this technology to readjust camera angles at intersections and do counts at intersections to identify new trends in the traffic.

I had the opportunity to attend several different meetings throughout the summer. Meetings I attended ranged from the demolition of the Cather Pound residential hall to determine which type of traffic control needed place for that, to a crash study screening to determine which intersections required special attention due to increased crash rates. Many of these meetings were amazing opportunities for me in more ways than one. I learned about how an effective meeting is run and how to interact with industry professionals. I believe the most beneficial part of this internship came from my experiences during these meetings. There were things that would take place during these meetings that no classroom can prepare you for. For instance, when consultants disagree with how a project should proceed, how to do reach a compromise? What class can you take to deal with that type of adversity? Real work experiences with people are things that can only be found while in the field. This internship did an excellent job to prepare me for the unexpected challenges a professional individual must go through in the work force.

Transportation engineering is something that everyone interacts with on a daily basis. Whether it be the placement of a sign, the radius of a horizontal curve, or the length of a green light, transportation engineering is all around us. My experiences with this internship have broadened my view on the transportation field, mainly due to the public opinions I received while working with the City of Lincoln. On multiple occasions I was approached by civilians about something they thought should be changed in their neighborhood. This aspect of the internship really made me feel connected to the work I was doing and all the good the community would receive from it. I hope I have more experiences like this one in my future with transportation engineering.

I would like to thank everyone in the Mid-America Transportation Center for making this internship a possibility and the City of Lincoln for making my experience a unique one. If given the opportunity to choose between this internship and another again, I would make the same decision every time. It has been such a wonderful learning experience I will take with me for the rest of my professional career.