MATC Internship Program

Summer 2019

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What I Did During My MATC Summer Internship

The pressure was on to get an internship for the summer and gain some real-world job experience going into my final, senior year of college. Not knowing where to start, I asked a trusted friend of mine, an engineer who worked for many private companies around the Omaha area, for advice. She gave me a comprehensive list of small, respected companies that she personally knew to be hard working, informed, and ethical. Within one day of applying to Felsburg Holt & Ullevig (FHU), I had received a call back, set up an interview, and conducted an in-person interview. It must have went well, because my summer plans were quickly set in stone; I would be a traffic intern at FHU's Omaha office working under Mark Meisinger, PE, PTOE and Adam Denney, PE. I would also have the pleasure of working with Tim Adams, an Engineer in training, and Peyton Weiss, a fellow college intern.

Going into this job, I had little experience with traffic apart from owning a driver's license. I was quickly shown the intricacies of the discipline, specifically trip generation models, peak flow factors, SYNCRO modeling, warrant analysis, and field data collection. One of the main reasons I was hired for the summer was to support two significant traffic projects; the City of Lincoln's Signal Retiming Phase 3 Project and SDDOT Decennial Statewide Interstate Evaluation. Both projects required vast amounts of data collection, perfect work for a first-year employee looking to gain tangible experience.

The Lincoln Signal Retiming project, or Green Light Lincoln, is a large-scale signal retiming throughout the Downtown area, including a total of 92 intersections. By the time I arrived at FHU on May 28th the field data collection had already started, but I was able to help the team wrap up the process. Essentially, we needed a way to find out what the existing traffic signal system looks like without having to dig through old stacks of paper.

The solution was the ArcGIS Collector App. This app, which can be used on a tablet or even a cell phone, allowed us to input data onto a personalized spreadsheet for each intersection as we moved across the city. This cleanly kept us from making input errors, as we could see the exact location that we were standing, and it allowed us to upload all images we wanted to include to each pin location. Personally, I spent 2 days in Lincoln measuring distances, taking photos, and imputing cabinet and signal head information. It was a lot of fun to put on a vest and walk the streets of downtown Lincoln opening controller cabinets and seeing how everything works. It was fascinating to me to see how old some of the equipment was that we drive by every day.

The second large scale data collection we did was for the South Dakota Department of Transportation (SDDOT). Every 10 years South Dakota re-evaluates all interstate interchanges across the state for updates and improvements. Based on our experiences from the data collection in Lincoln, we elected to continue using the ArcGIS Collector App in the field. I spent a few days creating paper data collection sheets for use in combination with the app for intersection geometry by taking aerial pictures of the interchanges. Equipped with paper, pen, and tablet, we began our voyage by training in our Sioux Falls branch. Since there is nearly 1000 miles of interstate in South Dakota, it was determined that 3 teams of 2 people each would divide and conquer the data collection. I was paired with Tim to do the I-90 corridor east of the Missouri River. After completing our section, we were to meet up with the group coming down I-29 to complete Sioux Falls and the remaining interstate to the south. Our job simply put was to stop at each interchange and take pictures of all the legs and any damages or interesting things there, fill out the questionnaire in the app including measurements of all ramps, as well as draw out the

intersection diagrams. Each one took approximately a half hour, and the total trip including training and the return drive took 4 full days.

Although the field work was arguably the most exciting part of our job, most days were spent in an office at a computer. FHU provides many services, but as a consulting firm we must seek out work and market ourselves to win new work. At FHU traffic engineering is often a gateway service that opens doors for other practice areas. One of the most frequent tasks we do is a TIA, or a Traffic Impact Study. These studies are small scale projects that are pivotal to municipalities and private businesses/developers and are the first step in understanding how proposed improvements will affect not just the roadways but the neighborhoods we live in. Once we have our “foot in the door” with these traffic studies, we are a proven future partner for larger transportation, water resources and environmental projects. This aspect of the job was fascinating to me because I always wondered how different parts of a company interact and affect one another. As part of the traffic group, my job played an important part in business development for the rest of the office.

I worked on different parts of many TIA’s which mainly deal with some sort of build that is in the works, and the city would like to know how it will affect the surrounding traffic. We start by getting turning movement counts for the impacted intersections and using the data to find the peak AM and PM hours. The site is then evaluated using an ITE Trip Generator to find an accurate estimation of the amount of vehicle trips that will be going to and from the proposed site. The new trips are then combined with the existing counts to determine what the future traffic volumes will look like. Once these numbers are determined, many other factors about the study can be evaluated. The most powerful tool used in the traffic group is Synchro. This software allows us to digitally map a series of

intersections and run simulation models based off the individual specifications of the job site. It can take an existing geometry and show what different signal timings and patterns appear. Personally, I have just scratched the surface of what this immense program can do, and there is something very satisfying about building an intersection and watching cars travel through it, albeit animated cars. The rest of the report is compiled with various needs of the project, like left turn phasing, crash history, levels of service, and the like. These reports can be anywhere from 10 to 50 pages long and have shaped the backbone of what I learned this summer.

I have been given such an amazing opportunity to work for Felsburg Holt & Ullevig and be part of the MATC Intern Program this summer. I had no idea what to expect going into this job, having taken Civil Engineering classes but not seen them applied to real-world experience. It's safe to say that things are much different outside of the classroom, and my biggest take away from my time here is how to work in an office setting with members of a team. I had the opportunity to learn from people with established careers and see how they communicate with the hierarchy of the office. I was impressed by the way people respect each other, regardless of office rank. My time in FHU's Traffic Group has given me untold skills and future connections in this field, and it was wonderful to get a full taste of the business of engineering. I'm not sure where my career will take me and what I want to specialize in, but the fast-moving world of transportation is an attractive option for my future.