FELSBURG HOLT & ULLEVIG

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SUMMER INTERNSHIP 2022

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MID-AMERICA TRANSPORTATION CENTER

First, I would like to introduce myself; my name is Tom Loseke. I am a senior here at the University of Nebraska-Lincoln. My expected graduation date is December 2022. For the past two years, I was interning at FYRA engineering in Omaha. FYRA is a water resource-based firm. At FYRA, I did a lot of AutoCAD and Excel work. I was enjoying my time there, but I wanted to get more experience in the traffic engineering field.

Over the summer, I interned at Felsburg Holt & Ullevig (FHU). At FHU, I helped with data collection, data processing, and analysis. One of the first things in a traffic study is to collect the number of vehicles traveling through a certain section of the road. To do this, traffic cameras are set up to record video of an intersection during the day. I learned how to set up traffic cameras that are strapped to a pole close to the intersection. I enjoyed setting the cameras up because it got me out in the field, and I got a firsthand look at the intersections in the study. Once the cameras were done recording, I would pick them up so the footage could be processed. The software used to count the cars from the video is Miovision. Another step in the traffic study is recording field notes. In our field notes, the intersections were drawn out with the current configuration of the intersection. This is necessary because google earth aerials are not always up to date. The last data that is needed to be collected is crash data. This can be given from the client or some other database. One program that I became familiar with is Iowa Crash Analysis Tool (ICAT). This is a very helpful tool in gathering crash data. One function that I found extremely useful was the intersection vs non-intersection-related crashes.

Once all the data was collected, it was time to analyze. This is where I got to apply what I learned in my classes and see how it is implemented. The turning movement counts (TMCs) come from Miovision and the footage of the intersection. The turning movements are broken down by direction and movement. An example is northbound left turn or eastbound through. The counts are broken down into 15-minute intervals. The reason for this is to figure out what the peak hours of traffic are. AM and PM peaks are always used with the occasional midday peak or Saturday peak being used. The peak hours could vary by intersection, so the whole corridor must be analyzed together. The peak hour volumes are then put into a spreadsheet to be balanced. Before my internship, I had never heard of balancing volumes. It was confusing to me at first, but once I figured it out, it became simple. Volume balancing is when two intersections that were counted aren't adding up correctly. If two intersections are on an east-west road, the eastbound traffic should be the same leaving the western intersection as coming into the eastern intersection. The reason for the inconsistent volumes could be that the intersections were counted on different days, or there are access points between the two intersections. Once the volumes are balanced, they are ready to be put into Synchro.

Synchro is a super cool software system that is a key part for traffic analysis. First, the corridor or study area is drawn into the software. Google maps is used to see the lane layout, but the field notes are always checked if the google maps image isn't up to date. The balanced volumes are then inputted. The Level of Service (LOS) is then obtained from Synchro. LOS was a big talking point in the traffic course I took during school. It describes how well the intersection is performing. There are ways to improve

the LOS like adding another turn lane or changing the timings on the traffic signal. All of this is stuff we learned during my class, which helped me apply the information in the field because I had already learned about it. Something that I learned this summer is why it is important to have the best LOS at each intersection. Yes, it has a lot to do with the delay time when driving through the intersection, but queuing length is also very important. I learned that the traffic could be so backed up that it can spill into the surrounding intersections, causing gridlock. Gridlock happens a lot downtown because of the short spacing between intersections and the amount of traffic they must handle. Getting the LOS as best as it can be is both convenient and necessary for traffic to flow smoothly. Seeing this in the studies we conducted throughout the summer, really helped me learn how important it is to have the best level of service.

The last major thing that I did during my internship is create and organize graphics. Graphics are the pictures and diagrams that are found in the reports. The way we start all graphics is with hand-drawn graphics. These graphics usually consist of a layout of the study area and a little bubble of each intersection. These bubbles could display the traffic volumes for each movement, lane layout, and even level of service. Graphics are important because most of the people that look at the report don't want to read the very mundane technical report. It was important for me in my role to make sure the graphics were 100% accurate. Graphics are easy to look at and they can display a lot of information about the project. These hand-drawn graphics are then sent to our graphics department for them to create them and make them look nice. Once the first copies of the graphics are sent back, it was time to do some redlines. Redlines are used to correct mistakes or change parts of the graphics. I spent a good amount of time this

summer redlining graphics because every number needs a match and there are multiple scenarios for each study. For example, each study has an existing year and a future projection year. Some studies will look at an interim year as well. Each alternative concept would have its own set of graphics to create and redline. So, I had to ensure that a lot of the numbers had to match.

The most enjoyable thing about this summer was getting to know the people at FHU. I spent a lot of time working with the people in the traffic group. My favorite time of the week was every Monday at 9 am. This was the time we had our weekly traffic group meetings. Getting to spend that hour hearing how everyone talked with each other was very helpful. Like most people, I struggle with communication. After a few weeks of engaging in the weekly meetings, I felt like my confidence had skyrocketed. I was able to give updates about the projects I was working on without a problem. It also helped that I talked with the other engineers on a daily basis. They would give me tasks to do, and I would often have questions about how and why I was doing things. Nobody at FHU hesitated for a second whenever I had a question. They were very informative and extremely helpful in expanding my knowledge of traffic engineering. Another great thing about working at FHU is that I get to work on projects in my own backyard. Not literally, but most of their projects are local projects. When a project is local, it gives you more excitement when working on them. Lastly, at FHU I never felt like I was an intern. Everyone there treated me like I was a full-time employee. I was rarely given a mundane task as most interns get. I was always a part of the projects.

Going into this summer I wasn’t sure what type of engineering I wanted to do. For the past two years, I was doing water resources. It was a great experience, but I knew

that there was something else out there for me. I have always had my mind on traffic and transportation engineering. Growing up I had always enjoyed playing the games where you get to design your own city. Traffic engineering isn't exactly that, but I know it is what I want to do. I am thankful for the opportunity at FHU, and for them welcoming me with open arms. I am also very grateful that they are a fantastic company to work for.