My MATC Internship at NDOT

Summer 2019

Max Meyer

My internship with the Nebraska Department of Transportation this summer was the first time I was able to experience for myself what Civil Engineers do on a day to day basis. NDOT runs all State, US, and Interstate Highways in Nebraska. I interned in the Traffic Engineering division, specifically the traffic control section. I mostly worked with traffic signals, but also did some work with signing and pavement marking.

One of the first projects I worked on was a traffic signal plan for eight signals in North Platte. NDOT runs traffic signals on all State and US highways in Nebraska unless they are in a town of 40,000 people or more. I helped design the removal, installation, and wiring diagram sheets by doing things such as calculating quantities and doing radar mapping. This was all done in MicroStation. Previous to this I only had experience with AutoCAD and other Autodesk products, but throughout my internship I was able to get much more proficient with MicroStation.

Throughout the internship I worked on a variety of temporary traffic control plans for workzones. This included calculating timings for temporary traffic signals and designing plans for sign and cone locations in workzones. Something new I learned about was the Driveway Assistance Device, or as NDOT calls them, a DAD. A DAD is simply a type of traffic signal that shows drivers approaching a one lane two-way road which direction they are allowed to turn at the moment. It is easier and cheaper than implementing a full traffic signal for all driveways affected by partial road closures. DADs are not in the MUTCD (the manual that NDOT follows for traffic control) so they must get permission to use them experimentally from the FHWA. I helped fill out requests for new experimentation locations and reports for current locations.

The largest project I worked on was collecting data on all 300+ signalized intersections NDOT runs throughout the state. I collected approach grades, intersection widths, and approaching speed limits using both as-built plans and Google Earth. This data will be used to check that all the signals have appropriate yellow and red clearance intervals that conform to the Institute of Transportation Engineers latest guidelines, improving safety.

I went on a few trips and saw some field work throughout the summer. The most interesting was helping to turn on a traffic signal at N-370 and 150th street near Omaha. We set up the conflict monitor by cutting off connections for allowed signal overlaps (e.g. allowing eastbound and westbound green to appear at the same time). If the conflict monitor detects that two incompatible signals are displaying at the same time such as northbound and eastbound green, it will send the intersection into flash mode. When in flash mode the primary road has flashing yellow, meaning yield, and the secondary road has flashing red, meaning stop. By doing this the conflict monitor prevents signal controller malfunctions from causing accidents. Once the conflict monitor was operational, we turned on the signal and made sure the radar detection was working properly.

I also went to Columbus where NDOT with Union Pacific set up advanced railroad preemption to better allow vehicles to leave tracks before a train arrived. This lets the controller begin to clear the leg that crosses tracks before the gates start going down, rather than at the same time.

One day the other MATC intern at NDOT and I went on a field trip of sorts to see projects around Omaha. The main stop was the District 2 Operations Center. There

they monitor and control traffic cameras, change the messages on dynamic message signs (the electronic signs with orange letters mostly above interstates), and more.

While I did learn a lot about traffic signals, and traffic engineering as a whole, the best part of the internship was experiencing the daily workflow of public sector engineering. It has prepared me more than any class could for working as a real engineer. I enjoyed this summer and I'm glad to have gotten the opportunity for this internship.