

“What I Did During My MATC Summer Internship”

By Garret Menard

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Nebraska Department of Roads

Final Report



“All you need is the plan, the road map, and the courage to press on to your destination.”

- Earl Nightingale

Interning at the Nebraska Department of Roads (NDOR) with the Traffic Engineering division has been a perfect experience. I have finally been able to see traffic engineers in action. I have been able to pick their brains and just listen to how they go about solving different problems throughout the day. I see how important traffic engineers are in providing safe roadways for all travelers.

NDOR consists of 8 districts with 610 buildings at 217 different locations throughout the state of Nebraska. They include 2,200 employees and more than 8,000 pieces of equipment, including snowplows, motor graders, and dump trucks. NDOR oversees approximately 9,949 miles of highways on the state system, including 482 miles of Interstate.

My internship was with the Traffic Engineering division located in the central headquarters in Lincoln. At NDOR, I have worked with the three main sections in the Traffic Engineering division – Signing & Marking, Traffic Analysis, and Signal Design. With the Signing & Marking section, I designed and updated signs using SignCad, updated junction plans throughout the state using MicroStation V8i, and calculated paint

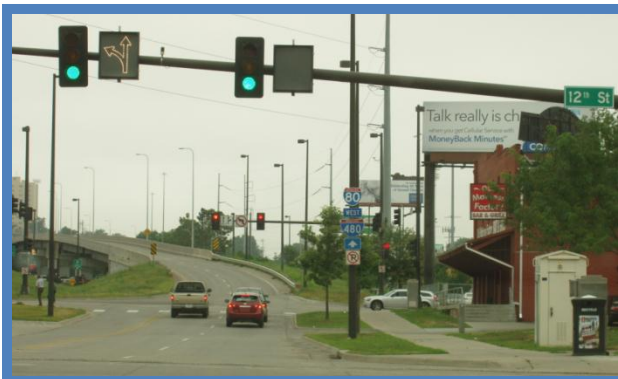


Fig. 1. Picture taken while reviewing the I-480 signs in downtown Omaha.

quantities using NDOR’s PathWeb program – a video log of all the roadways NDOR oversees. I have been able to do some field work, as well. An example is when Tim Foss and I reviewed the signing for I-480 in downtown Omaha (Fig. 1). I also went on a work zone

review with six other engineers and reviewed the current District 1 (Southeast Nebraska) projects under construction and visited the Sign Shop. At the Sign Shop, we were able to see the whole process of making a road sign.

With the Traffic Analysis section, I prepared several accident records analysis memos. For this process, I would create a file for the project, review any relevant files that have been created in the past, analyze the accidents within the project limits, and prepare a memo to Ryan Huff, the Assistant Traffic Engineer. I also prepared many citizen request study memos. Examples of a citizen request are adding a traffic signal at an intersection, adding a left-turn lane, or reducing the speed limit. I would then prepare a map for the data collectors showing them where and what field data to collect. Then, I would use their data, along with the Manual on Uniform Traffic Control Devices, AASHTO Green Book, and Traffic Engineering Policies & Procedures Manual, to see if the citizen’s request was supported by the study.

The Signal Design section has introduced me to two traffic programs I have never used before – HCS 2010 and Synchro. These programs use equations and calculations I learned in the Highway Engineering class at UNL. Using these programs, I was able to input traffic volumes collected by our data collectors as well as the signal timing and phasing plan provided by the Signal Design engineers. In return, the software would output the delay and level of service of the intersection. I could also compare different types of controls for intersections to see which would service the intersection the best. Also, I was able to use SimTraffic, a simulation program, to visualize the delays and backups of traffic. Finally, I was able to go out in the field and look inside a traffic signal control box. For example, at the intersection of Highway 81 &



Fig. 2. Working on a traffic signal control box in Columbus, NE.

8th Street in Columbus we changed the timing and made sure the traffic was flowing smoothly (Fig. 2).

Throughout my internship at NDOR, I have finally been able to apply concepts I’ve learned in my Civil Engineering classes. Although, the best part of the internship was just listening. I was able to learn a lot from just listening to conversations between engineers and also

between engineers and the citizens of Nebraska, NDOR’s customers. The main thing I learned from listening is be able to justify anything I calculated or wrote in a memo. The internship has solidified my interest in traffic engineering. Every time I am on the road, I catch myself looking at the roadway and lane configurations and wonder if there is a better solution. My friends get annoyed whenever I bring up anything traffic related while we are driving, but I cannot help it. I am excited to continue learning and growing in the civil engineering field. I would like to thank MATC for this opportunity and also everyone at the NDOR’s Traffic Engineering Division for being so welcoming and helpful throughout the summer.