MID-AMERICA
TRANSPORTATION CENTER

Summer 2018 MATC Internship

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The summer before graduating from college is exciting! School is almost done, and a career is about to begin. The average person will spend one-third of her life at work, so there is a lot of pressure to find one that is good and enjoyable. When I began my Mid-America Transportation Center internship, I was starting to feel apprehensive about my future. I had just finished my junior year of college, and my postgraduate plans were constantly changing. I was bouncing back and forth between wanting to find a job as a forensic engineer and thinking about applying to law school - while, at the same time, feeling the increasing pressure of time passing.

The first couple months of my internship were spent working with Gabe Bruguier in Outreach. I already had experience in this field, having spent the previous school-year working for Mr. Bruguier as a middle school mentor for the afterschool program: Roads, Rails, and Race Cars. My days were oftentimes a little unorthodox and included such tasks as building structures with popsicle sticks, taking apart remote control cars, and making numerous trips to Walmart and Hobby Town. I even had the pleasure of traveling to Macy, Nebraska, a few times while working with fourth through eighth graders. I also worked with students from Culler Middle School and the Ponca tribe. During the classroom visits, I would present a short educational PowerPoint program related to the day's engineering concept. We would then work with the students to apply that concept through a hands-on activity. Simply attending classes to obtain an engineering degree can be a tedious and difficult process. However, applying the classroom concepts to a science project, and getting kids excited about it, helped remind me why I chose engineering in the first place. I was even allowed to develop a few of my own lessons and projects to present. In addition to the student engineering

projects, I was also testing new projects to be part of the Sovereign Native Youth Science Technology Engineering and Math (STEM) Leadership Academy curriculum.

The week-long camp involved hosting 17 Native American high school students from all over Nebraska. The Lincoln-based program involved the campers spending their days from the 7:30 AM wake up, to the 10 PM curfew, participating in STEM-based activities and learning to become better leaders. Our days were jam-packed with everything from museum visits, to science projects, to panels with special Native American role models. I developed projects related to boats and we worked on them for two days at the Innovation Studio.

The first day was all about the relationship between buoyancy with surface area and water displacement. Dr. Cornelius walked the students through a presentation on the concepts and then I presented the activity - stage one: aluminum foil boats. The students were tasked with using a single sheet of foil to make a boat, and designing it to hold the most weight possible while it floated in a pool. In stage two, they applied their newly acquired foil boat knowledge to the construction of bigger boats made from wooden dowels and trash bags. The most successful boat in stage two held 56 pounds! For the third and final stage, the students split into two groups and made people-sized boats out of PVC, painter's tarp, and duct tape. Going into the project, I was really hoping the boats would hold at least one small person. I was pleasantly shocked when the boat that held the most weight held 12 people with a combined total weight of over 1,800 pounds! The students really enjoyed the activities and I was extremely proud of and impressed by their work. The second day of activities at the Innovation Studio, we continued our theme on boats, but this time we built remote

control boats. Using the parts from a remote control (RC) car, propellers, and a couple of 3D printed parts, (courtesy of the Innovation Studio), we were able to put together a few RC boats. There were many unexpected challenges with this project. RC cars run on a radio frequency and we quickly learned that a couple of the remotes would control all the boats. When someone turned on his or her motor, it would instantly start spinning in reaction to someone else's controller from somewhere else in the room. Even with those unexpected challenges, I would consider it an overall success!

At our opening dinner, Senator Tom Brewer spoke to the group. The theme of his talk was to ensure that the campers understood how learning is an all-the-time activity - and each camper's own personal effort would determine the individual benefit. Although I was a mentor at the camp, I learned so much during the activities, from the other mentors, and from the various speakers throughout the week. Given the opportunity to do it again - I absolutely would!

When things settled down after the Summer Academy, my internship focus shifted to a more technical aspect. Dr. Rilett assigned me to work on a traffic engineering project on the Omaha Nation reservation in Macy, Nebraska. The town of Macy is located just off of Highway 75. The community has a dangerous problem due to most of the town being located southwest of the highway, with the exception of the Nebraska Indian Community College, which is located northeast of the highway. Many college students walk to school, which means they have to cross a highway with traffic travelling 60 MPH, in order to get to and from school. In addition to the safety concerns, the land owner near that area of the highway objects to people walking through his property. Our task was to do a traffic study of the cars and pedestrians in the area,

outline the specific problems, and come up with possible solutions. Because the pedestrian traffic is dependent upon the college classes being in session, the pedestrian study cannot take place until the fall. The vehicle traffic study will begin later this month. Until then, I am becoming more familiar with the equipment that will be used to gather data. To complete the project, I have accepted a part-time position with the Mid-America Transportation Center continuing into the fall.

Spending my summer working at the Mid-America Transportation Center has been an excellent opportunity! It was not the typical office job, and that is why I loved it. This position has allowed me to work on interesting projects and work on things that always made me feel as though my work was appreciated - both by my coworkers and my supervisors. Working here has inspired me to pursue a Master's degree - a postgraduate option completely different than what I was considering at the beginning of the summer. I look forward to continuing my work at the Mid-America Transportation Center and genuinely appreciate the opportunities that I have been provided.