MATC Internship Program

Summer 2022

Ye Jung Cho

This summer I had a great opportunity to work at the Nebraska Department of Transportation (NDOT) through the MATC internship. I was able to experience practical work and different aspects of civil engineering. I was part of the Highway Safety section in the Traffic Engineering Division which is responsible for the safety of all road users. I worked on a safety project Benefit-Costs Analysis (BCA) and the pedestrian crossing inventory.

In the first few weeks, I was trained by reading some manuals on basic information for my internship, especially BCA where I spent my most of my time for two months. BCA is a systematic process for calculating and comparing the benefits and costs of a project. I also read the Proven Safety Countermeasures from Federal Highway Administration (FHWA). I was able to learn some of the Proven Safety Countermeasure and its conditions supporting consideration and potential benefit. I had time to use the NDOT databases to obtain information about crashes. I reviewed the crash type and fatality and injury severity by investigator reports.

The first task given to me was to review an intersection for safety improvements by implementing countermeasures and analyzing the benefits and costs of the proposed safety improvements. I reviewed five different intersections in Nebraska and began each review with attributes of crashes for a 3-year or 5-year time-period. I analyzed the crash patterns, number of lanes, width of the roadway, etc. from NDOT databases and Google Earth to find what type of safety countermeasures will be the best to reduce the crashes at intersections. With each location’s project information, the construction details of the project and estimated project costs were provided by the Roadway Design Division. I then calculated the components that are necessary to obtain BCA. The BCA

provides details such as crash rates, the average cost per crash, and economic losses based on the databases and the crash modification factors (CMF). A CMF is a factor used in calculations to estimate the crashes expected after implementing the safety countermeasure. I was able to learn what conditions of roadways make us safer from crashes and what things to consider during construction.

The other project that I worked on was a pedestrian crossing inventory. This inventory will be supporting data to improve pedestrian safety and will be helpful to reach the traffic safety goal of zero fatalities. I identified existing pedestrian crosswalks in Nebraska and inserted comprehensive data of the crosswalk elements such as lighting, crosswalk marking, etc. at each location in the GIS application by using PathWeb and Google Earth. The PathWeb is a video log that shows the forward, rear, and surface view of all roadways in Nebraska. I was able to see and compare the elements of the crosswalk in the urban and rural areas. There are not as many crosswalk elements in rural areas compared to urban areas. In rural, there are some intersections that have one light pole in the four lanes and no pedestrian sign.

Additionally, I had the opportunity to attend a monthly Highway Safety Committee meeting. In this meeting, engineers and planners from the large municipalities, metropolitan planning organizations, and larger population counties in Nebraska discuss the approved safety projects and new business. It was motivating to see the experts discussing the projects.

Working as an intern at NDOT, I was able to experience how transportation engineering is used in society and how it connects to our safety. I was very fortunate to get trained and work with good people. I was really motivated to see professional

engineers and experts working professionally in their field. I am grateful that what I have learned at NDOT is the beginning of my career. I enjoyed this summer, and I would recommend this MATC internship program to people who are looking for internships in transportation engineering.