

Garrett Gill

TRIP Internship

08-06-2021

TRIP Internship

Over the course of this internship, I have had a lot of unique opportunities when it comes to road construction and Civil Engineering. One of the first things that I did was develop a safety route with Cleveland Counties safety manager for our Sante Fe Road project. This was tricky because on this one mile we had two neighborhoods and a church. Another thing that I learned about on this project was about sub-grade stabilization, the different types and when is the right time to use them. During this project I also learned how to use USGS StreamStats to determine drainage rates for flood plains. With these rates we used them to decide on the size of culvert we needed for a certain stream. Over the course of this road project, I also learned about different types of asphalt and a lot of the tricks and certain ways that go into laying it. During this internship I also had the opportunity to meet with Oklahoma Cities Civil Engineer Bob Hanger. Bob and I talked a lot about all the different thoughts and procedures that go into road projects. I learned a lot from him about all the different problem that must be solved and the best ways to look at and solve these problems. The second big project that I was a part of was on Choctaw Road. For this project we preformed deep patches in spots that required it, cleared trees from the shoulders of roads, replaced culverts, repaired ditches, chip sealed and did an overlay. For this project our biggest problem was erosion of shoulders of the road. In having to solve these problems I learned how important erosion control is and the many ways that you can approach this problem. This project also taught me about how a roadway can be repaired without

tearing out the entirety of the road and starting from scratch. My favorite thing that I did this summer was learning about all the different factors that go into planning and performing a road project. I also really enjoyed learning about the processes performed during a road construction project and how important it is that these processes performed correctly. Overall, I really enjoyed this opportunity and feel that I have learned a lot of useful information about all the different factors that go into a road project.

2021 Transportation Intern Program *Summary*

Intern Name: Meghana Minnekanti

Local Government Agency: ACOG

Working as LTAP intern at ACOG gave me the opportunity to further enhance my knowledge in the field of transportation planning and ITS (Intelligent Transportation Systems).

I have attended the Bicycle-Pedestrian Advisory Committee, Areawide Planning and Technical Advisory Committee and ITTC (Intermodal Transportation Technical Committee) meetings, learned about the ongoing projects related to Encompass 2045. Attending Complete streets meeting, helped me understand the concept of complete streets. “Complete streets are the bridges, highways and streets which are planned, designed, operated and maintained to ensure the accessibility for all the road users (automobiles, pedestrians, bicyclists) which also includes people living with disabilities, older adults”. Also, from these meetings I got to know about different work groups, committees, developments, transportation planning projects and new ideas which have the potential to improve our transportation network. I have learned about the ongoing developments in different parts of central Oklahoma and how the funding is allocated to each project based on different criteria. I have attended few webinars related to Transportation planning. *Improving Traffic Signal for Bicycling and walking*: This webinar addressed how to improve the walkways and bicycle tracks for safe movement of pedestrians and other road users. I have used various tools in ArcGIS Pro to complete the given tasks.

Shadowing the Engineers in Midwest City, City of Edmond and ODOT gave me the opportunity to learn about the ongoing projects and the new developments around. It was interesting to see how “Traffic calming” is possible using simple techniques which are cost effective and efficient. I have learnt about the Traffic monitoring and controlling (which are the biggest challenges in traffic management) using ITS (Intelligent Transportation Systems). I have learned about different work zones of ODOT, different cameras that are used by ITS team, mobile applications in which people can report the accidents or any traffic incidents, RWIS stations, temperature sensors used in Bridges, different sizes and messaging techniques on traffic sign boards, Snow plowing configurations, Storm reporting. I also got a chance to look at the plans and detailed reports of the ongoing fibre optics work around Oklahoma city.

Cale Sawatzky

TRIP & LTAP

Summer 2021

Civil Engineering District 7

Internship Summary

Hello, my name is Cale Sawatzky and this summer I had the opportunity to intern at Circuit Engineering district Seven in Clinton, Oklahoma. My internship was made possible through the Transportation Research Internship Program with the Local Technical Assistance Program at OSU and the Southern Plains Transportation Center.

Circuit engineering district seven is one of the eight CEDs designated to work on improving the county highway system. There are 11 counties in southwest Oklahoma under CED7's jurisdiction. Their main goal is to provide an efficient service to improve the transportation system working alongside ODOT in their designated counties. A primary responsibility of CED is to manage the County Improvement for Roads and Bridges five year plan. The CIRB plan outlines the allotted funding towards chosen projects in designated counties. Another responsibility of CED is to provide resources which could be research on projects, assistance in construction and inspection, as well as efficiency in design through the pooling of resources. CED also has the power to contract services and companies for construction and transportation functions.

In Clinton, CED7 offers several services that include engineering design of new projects, construction inspectors who manage current projects, the bridge inspections crew, and a sign shop. My first several days of the summer I spent some time with the bridge inspection crew going to different bridge sights in Blaine county. Their directive is to provide safety bridge inspections certified under the Federal Highway Administration. CED7 has around 2200 bridges that are under their jurisdiction. Every bridge needs to be inspected every two years, but they can be moved up to a 12 or 6 month inspection time based on the severity of condition. I was able to see a large variety of bridges from small box overpasses to a multispan bridge that contained beams from the Oklahoma City I-40 crossing. In class we learned the math behind how a beam can fail and only saw on a small scale how it applies. In the field I was able to see first hand where exactly failures occurred due to different loads being applied.

Where the bridge inspectors look at already finished projects, the construction inspectors monitor bridge and road projects currently underway. Everyone always asked why construction projects took so long, and now I am able to explain that every step of the process must be inspected to ensure that the best product is delivered to the customer. I spent most of my time this summer with the construction inspectors visiting various job sites and making sure all materials met the ODOT specifications. The construction inspectors stay on the job site to manage the project and make sure the contractors are properly following the designed plans and answer any questions or help solve any problems that may arise.

There can be several projects happening across the 11 counties under CED7s jurisdiction at one time. This summer, two major projects that were under construction during my time were a bridge project in Watonga and an eight-mile road project in Seiling. The bridge in Watonga was a pretty typical construction project. It was very interesting to follow the progress throughout the summer seeing various stages of completion. A CED7 inspector had to be on site everyday that contracted workers were there. Occasional interviews were conducted to ensure proper pay and other mandates were being followed. All of the concrete that was poured had to have cylinders cut and broken at 7 and 28 days after being made. The concrete cylinders were broken to ensure that the concrete met the specified psi level.

While the bridge in Watonga was at a single location, the road project in Seiling was eight miles long. A project manager from CED still had to be on site to ensure that the contractors followed the engineering design accordingly. It had several cross and sides drains as well as concrete box bridges. A majority of the work that occurred while I was here was asphalt being poured on the front end of the project. A hot sample of asphalt was taken from the plant out of every 500 tons poured. This sample was then taken back to the lab where we did a variety of tests that included finding the oil percentage, density, rice number, and performing a sieve analysis test on the washed aggregate. Asphalt cores were also made where it had already been poured and pressed. We then tested the cores in the lab to verify that they met the correct thickness and density. When pouring asphalt was at its peak, we were taking around 7 hot samples a week.

Another large portion of the summer was spent in the field and lab collecting and testing geotechnical dirt samples for future road projects. We collected dirt samples from three different future project sites in Custer, Jackson, and Harmon counties. To collect the sample we first had to cut out and measure an asphalt core from what was already there. We took three cores from every mile section each of which was three feet deep. A soil sample was taken from each foot of the core and individually tested in the lab. Every soil sample had to have a sieve analysis test, sulphate test, liquid limit test, and find the plasticity index after being properly dried. Using the data found in the lab I could then classify the soil and fill out a report to give to the engineer.

Once the geotech report was filled out and given to the engineer, they could then use it to start designing the road project. Using the geotech report and various websites I worked with the engineers to look at how to design the hydraulics for a future road. Key factors when designing for hydraulics include the permeability of the soil, slope of the terrain, and area of land that sends water to a certain point along the road. We also used the soil study for the pavement design of a different future road project. For the pavement design, we looked at the OSI (Oklahoma Subgrade Index) ranking and the amount of sulphate in the soil to determine the amount of subsoil stabilization needed along with the amount of aggregate and pavement thickness required. The engineers at CED7 have a variety of other jobs other than simple design to ensure that the entire project can be completed. From working with landowners to secure right away to contracting companies that will actually build what they design, much more goes into construction projects than most people think.

Throughout the summer I was able to observe several different projects at various stages of construction from start to finish. I was able to sit in on board meetings that discussed budgeting for future projects and go to final inspections for completed projects. I was also able to pull soil samples from the field, test them in the lab, and write a report to hand to the engineer who then showed me how that data could be used for design. This summer at CED7 I learned valuable skills and information that can't be taught in a classroom.