

2010 MATC Internship

Nebraska Transportation Center, UNL

Kevin Hock

8/11/2010



Have you been driving around Lincoln and seen that at some intersections the pedestrian signals have countdown timers when the flashing “don’t walk” signal is on? At the Nebraska Transportation Center, NTC, a research study is being conducted to find the effect of these timers on safety and efficiency. Through the MATC internship program this summer I have been lucky enough to work on this project with Dr. Anuj Sharma and Jacob Schmitz, one of Dr. Sharma’s graduate students. The reason that this study is being conducted is because the Nebraska Department of Roads wants to determine if the countdown timers will have a positive or negative effect on both pedestrians and drivers.

For this project two intersections in Lincoln were selected: 17th/G and 27th/Cornhusker. All information from cameras, sensors, and signals are sent to Lincoln Public Works.

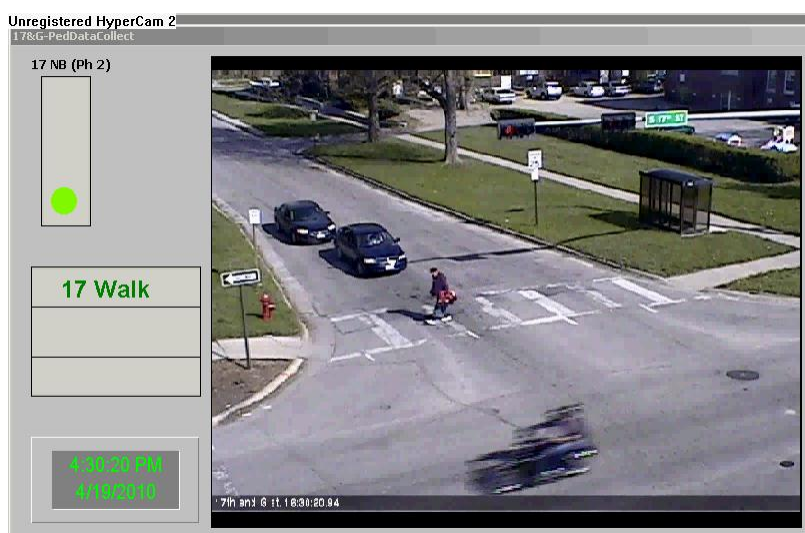


Figure 1. This is an example of the video created by Wonderware.

From there a software program called Wonderware then combines all that information so all of it can be viewed in one application. Once the information is combined using Wonderware, see Figure 1, it was my task to reduce all the video.

When reducing the video I would fast forward until I came to a pedestrian. Then I marked down the times when the pedestrian reached certain points in the crosswalk. These times were then used to determine if a pedestrian changed their pace while crossing. At the same time I marked down what the pedestrian signal was displaying to

see if a violation was committed and if the signal may have been the reason for how fast a person was going in the crosswalk. From the data I found that a third of the pedestrians would commit a violation at the crosswalk. It is hoped that when the new countdown timers are installed at the intersections there will be a lower percentage of violations.

The next step at each intersection is to determine driver behavior when the pedestrian signal turns to flashing don't walk. During the flashing "don't walk" a driver is likely to use the pedestrian signal to determine when his/her traffic light is going to change from green to yellow. With countdown timers in place drivers would be able to determine exactly when the light will change because the "don't walk" signal comes on at the same time as the yellow light. The study is primarily looking at the number of drivers who accelerate or decelerate during the flashing "don't walk" phase. An increase in the amount of drivers accelerating to get through the intersection before it turns red will increase the chance for accidents.

For most of my time working at NTC I was at my computer reducing video and then doing analysis with the data in Excel. During weekly meetings I would then report how much video had been reduced and present all the data I had collected. This may sound repetitive, but it helps when you can set your own hours and listen to music as you work. On occasion I would get to leave the office to help Jacob do some field work. This might include painting lines at intersections or using a radar gun to check speeds of cars. On one day that I was helping with the radar gun a police officer stopped to see what Jacob and I were doing and who we were working for. While talking with the cop

we were told that the reason she stopped was because someone called in because they did not know if we could check vehicle speeds with a radar gun.

I also had opportunities to help Nate Burnett, another grad student at NTC, do a conflict study at Highway 2 and 84th St. For about a week and a half I would go out to the site from one to three in the afternoon and make notes when I saw a conflict for vehicles heading east. This was a nice reprieve from watching videos all day even if it got hot sitting in my car. Nate later looked at the video of when we were out there together one time and saw that a car heading south on 84th ran a red light. Thankfully we did not witness a collision, but I wonder what that driver was doing when he went straight through the intersection without slowing.

Another side project I did during my internship was researching traffic signal controllers that Dr. Sharma had acquired from the city of Lincoln. The main objective of the task was to create a timeline of when the controllers were all used. From my



Figure 2. A 1940's vintage controller is on the left and on the right is a more modern controller.

research I found out that the oldest ones used were from around 1940 and were basically just timers. For one of the older models, technicians used whale oil for a time when they conducted maintenance. The newer controllers took less work to maintain and they could use information from vehicle and pedestrians detectors to determine when lights should change.

From this internship I have come to learn that research can be a long process. The pedestrian signal study that I worked on started before I was even hired and when this internship is over it will still not be completed. Enough data has been collected and reduced at 17th and G to start putting up the countdown timers, but 27th and Cornhusker is taking longer due to fewer pedestrians. Luckily I may get to see this project to the end as I have been asked to stay once classes start up again. This summer has been a great experience for me to see how research at UNL is conducted and has shown me firsthand what I have been learning in my classes.