Caleb Gibson

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The Crossroads of Infrastructure

For my ethnography report I studied the crossroads of Port Republic road and South Main Street. These crossroads are often a part of every person who lives in Harrisonburg or even is just passing through. These crossroads connect multiple different infrastructures together as it allows off-campus students to be able to access the parking garages and campus. These crossroads also connect downtown Harrisonburg businesses to highway 81. Highway 81 serves as a main highway that tractor trailers use to bring goods to the local hotspots in downtown including Billy Jacks, Jack Browns, and Magnolias. Companies also use this to transport goods to other locations as the local poultry plant ships constantly to vendors and other plants. For my research question I wanted to ask “How does the time of day, day of the week, and presence of tractor trailers affect the traffic flow and driver behavior at the crossroads of Port Republic road and South Main Street. My research question aims to capture the extent of traffic congestion and what times are most congested and how this impacts driver behavior emotionally and behind the scenes.

Before diving deeper into this infrastructure I wanted to provide a little background information on how I conducted my study. First, I separated what times were often hot zones for traffic congestion in this area and I studied the times of Noon, 2 pm, and 5 pm in the afternoon. I choose these times as often many students are arriving on campus for their first class of the day, coming back to campus for the second class often, and finally when the majority of students

often finish class for the day as well as when many businesses close for the day. I choose to study these times on Monday, Wednesday, and Friday as these are when classes are only 50 mins most of the time and often students have most of their classes. While conducting my study I sat in a parking lot that is adjacent to the crossroads and for every light I would count how many cars can make it through the intersection if all cars proceed one after another with no interruptions. I would also take into account if a person was distracted by either a passenger in the car or if they were using their phone, how this impacted how many cars were able to make it through the light. Finally, I would compare how many cars were able to make it through the intersection if a tractor trailer was also turning onto Port Republic road.

I looked into how engineers combated traffic congestion in other big cities and states and different designs they introduced. Mike Perez is an SEH principal, senior professional engineer who leads design practice in Colorado and Wyoming. Mr. Perez came up with a design that creates a continuous flow intersection as thing main focus is to combat drivers making left turns (As seen in the photo)

“This intersection creates a safer options for left turns and can reduce the number of traffic incidents that occur from a normal traffic light (Wells, Paul 2023)

Another option that is recommended from the Insurance Institute for Highway Safety (IIHS) suggests a dual lane roundabout. This would allow for traffic to keep at a constant flow and be rated safer for pedestrians to cross. “The state of Virginia and New York have adopted a “roundabout first” policies which requires that roundabouts be considered a preferred alternative when building new intersections or upgrading older ones if feasible (New York State Department of Transportation; Virginia State Department of Transportation, 2009)”

Finally the third option I looked into was from the U.S. Department of Transportation (DOT) which suggested getting more out of what we have instead of creating a new infrastructure. The DOT stated “Advanced technologies using real-time information …… Collectively referred to as ITS” (Roundabouts, 2023). This would allow for the traffic light to adjust to which direction may be facing congestion at that time.

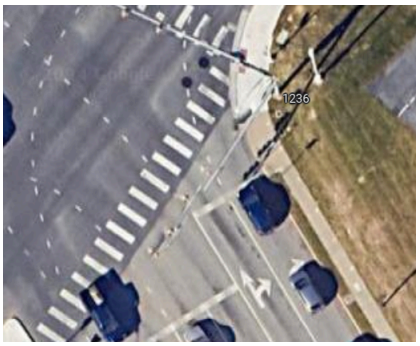
This intersection serves multiple purposes as it constantly supports students, residents of Harrisonburg, and truck drivers. These crossroads are supposed to support all these purposes by mitigating traffic congestion from each direction by constantly changing. The crossroads connect the majority of the off-campus apartments which students have to use to get to JMU’s parking

garage including Warsaw, Grace Street, and Chesapeake. In total JMU has 5 parking garages however 2 of them often are inconvenient to many students or fill up too quickly for others to be able to use. This results in the majority of JMU off campus students to use these crossroads at any time of the day. These cross roads also continue on to resident housing that is often used by local residents as well as commuters from the surrounding areas including Waynesburro and Staunton. This cross road connects to downtown Harrisonburg which is well known for its restaurants and other local businesses that operate out of this area. Often supplies is brought in by tractor trailers which travel at a slower rate of travel and also have long times getting up to the correct speed. These tractor trailers also use these crossroads to transfer local goods including the goods from the local poultry plant.

For my infrastructure I interviewed a couple of students as well as some locals who use these crossroads when they are coming to or from work throughout the week. I followed these interviews up with an expert interview as I conducted one with Traffic Superintendent Shawn Adams as well as some of the local officers from Harrisonburg Police Department. My findings start with my interview with Harrisonburgs local police department has they stated “Majority of the red light violations happen at this intersection.” The officers followed this statement up with another statement saying “often head-on accidents happen on the opposite side of the intersection as cars constantly roll through the yield sign without paying attention to oncoming traffic. I witnessed first hand how this can happen as a car continued through the yield sign striking the side of another vehicle totalling both vehicles. This first hand experience showed me how the yield sign is often ignored and how easy accidents happen at this intersection. Finally the police officers stated that tractor trailer accidents are also very frequent through this intersection as many drivers do not have much experience driving with tractor trailers in crowded areas. Often

these cars would ride alongside the tractor trailers throughout the curve which results in the tractor trailers either side swiping or rear ending these cars as the trucks are often 55-60 feet long and need about 2.5-3x more space to complete a full turn. My interview with Traffic Superintendent Shawn Adams I asked how do these lights register to change direction of traffic and what has Harrisonburg done to combat the congested area during these times of the day. Mr. Adams quoted that “The intersection relies on motion detectors underneath the ground which implement a 45 second relay to change the direction of the light. He explained after that the pedestrian crossing signals can change the direction of traffic as it has the same 45 second timer however traffic from direction needs to not pass the intersection for more than 5 seconds or the 5 second time will reset till no cars pass through. Mr.Adams finished off our interview explaining to me that these crossroads used to be set on a 1 minute cycle, however has been changed to 45 seconds to eliminate the traffic without creating a light that is constantly changing and not being too quick. Finally, I interviewed a couple of my roommates and friends who work in Harrisonburg full time and many of their answers lined up. Majority of these informal interviews stated that they often are sitting at this light and the majority of their ride home is sitting at this light. Many said they experienced other drivers who would get impatient and cut them off if they didn't like how fast they would leave the intersection and come close to clipping the front of the vehicle as traffic usually is bumper to bumper. When I interviewed my friends who work full time instead of attending school they said that this light is directly in their path as they get on highway 81 to travel 1 exit. Often they said they have to leave 20-25 minutes early if they want to make it to work on time since they work from 5pm to 2am in the morning. They said this light has affected them so much that they were 10 minutes late to work as a result of the traffic at this light.

During my observation of this crossroads I wrote down and averaged the amount of cars that were able to pass through the intersection during 1 light cycle. Once the light turned green an average of 14 cars were able to make it through the light if there were no interruptions and every car followed the car in front. This average allowed me to compare the light if an individual was distracted from a passenger in the vehicle or their cell phone. On average 2 cars would miss the light compared to the average of 14 if any individual was distracted. This would cause the drivers behind to get agitated and either show expression by honking at the car. If a tractor trailer was in either lane an average of 6 cars would miss the light compared to the average of 14. These tractor trailers often would affect both lanes of traffic as they would come into the opposite lane when turning as they have a wider turning radius. Coming from Port Republic road there on two right hand turn lanes that allow traffic to flow into both lanes on South Main Street. Once this light turns red the far right hand lane will get a green arrow allowing traffic to still turn right. From my observation I witnessed on average about 5 cars during each of my sessions run this light from the left right turn lane.



Thinking about the future of this intersection and combating the congestion that is constantly delaying traffic each day I came up with two options. The first option would be to address factors to optimize the traffic light timing. This would allow the traffic light to change

when one side of traffic builds up greater and is able to stay green for a longer period of time eliminating the long lines of traffic that occur. My second option would be to implement measures to mitigate the impact of tractor trailers. This would be to restrict tractor trailers to a certain lane that allows cars to have one free lane at all times. By understanding the dynamics of traffic flow at this intersection we can improve future transportation planning and infrastructure development, which can result in a more sustainable and livable urban environment.

Work Cited

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