Overview

Our project, Communities in Transition Community Walking Audits, aimed to improve road safety for pedestrians, bicyclists, and drivers through tactical urbanism. The intervention model has gained much popularity due to its practical advantages over larger scale planning and execution of road safety improvements. It is low-cost, it is implemented quickly and easily, and focuses on the communities in need. At the beginning of our project, we first conducted a series of surveys, which consisted of carefully and thoroughly observing several places within the southwest region of Lee County. Based on survey data and recommendations made by the county, we decided to focus on the intersection of Joel Blvd from East 5th to East 7th Street in Lehigh Acres. After choosing the sites, we began collecting extensive prerequisite data to understand what existing issues were present. We surveyed each area collecting data like the posted speed limit, actual speeds of drivers, number of pedestrians, number of bicyclists, who uses crosswalks, and more.

Our team researched and planned tactical urbanism designs (temporary improvements) specific to the area. The provisional designs were aimed at mitigating the safety issues that were observed. Based on feedback from the county, we updated our tactical urbanism design and proceeded with implementation. Proceeding the execution of the tactical urbanism, we collected post-data. In the end, we compared the data collected in its entirety and determined that the implementations indeed had an impact on improving the safety conditions for pedestrians and corroborated the imprudent and sometimes reckless behavior of motorists, which emphasizes the need to make permanent road safety changes in this area.

Methodology

To assess and have an accurate representation of the intersection of Joel Blvd our team made use of the app Survey 123. The app contained five surveys - What Would Make This Area Better For Walking?; Sidewalks; Who Travels in This Area?; Getting to Know Your Area; and Intersections: Crossing the Street. All surveys were used in the initial stage of the project to assess the conditions of the area. After that, we continued to use the Who travels in this area survey on a regular basis. When collecting information for our surveys, we made use of a radar gun to track vehicle speed, a click counter in order to keep track of the number of people using the area, reflective vests were worn for safety, and personal cell phones were used to access the surveys.

For the Who Travels in This Area survey, we recorded the number of pedestrians, bicyclists, people using public transit, the number of people crossing the road without a crosswalk, people using assistive devices (canes/wheelchairs/scooters), the speed limit, the number of cars speeding, and the number of people walking with children and/or strollers.
For the Sidewalks survey, we measured the width of the sidewalk, the conditions of the sidewalk, and noted if sections of the sidewalk were missing. We took note of any cracks and/or broken sections in the concrete, litter around the area, and any obstacles that would obstruct the pedestrian path. We determined whether the sidewalk was wide enough for two people - a minimum of 5 feet. If there were curbs, their conditions and buffers were examined. We looked for places to rest, shady areas, roadway lighting, and safety hazards in the immediate area. In addition, we took note of the conditions of bus stops, if there were exclusive lanes for cyclists, and/or if bicyclists share the same space with walking pedestrians.

The What Would Make This Area Better For Walking? survey questioned what would be beneficial for pedestrians. The format is simple and easy. The survey also asked questions about things that could be adopted in order to improve the area. It includes specific questions such as: if slow or less traffic would help; if better crosswalks for pedestrians would help; if having buffers between sidewalk and road would assist pedestrians; whether shaded and protected places to sit helped pedestrians; and if better lighting for the area was necessary. It also asks about the comfort-based, conditions of the bus stops, whether there was access to bathrooms in the area, and if bicycles being located off the sidewalk would be better for walking.

The Getting to Know Your Area survey evaluated the community within the area of the site(s). The questionnaire focused on aspects such as the proximity of grocery stores, schools ranging from daycares to secondary schools, bus stops, small businesses, franchises, and whether there were mixed-use buildings in the area. It also questioned about the availability of public spaces, parks, protected areas, environmental conditions, etc. The important thing was to determine if people within this community are able to eat, work, and play within a .25-mile radius of their homes within the sites’ epicenter.

The Intersections - Crossing the Street survey evaluated the general conditions of the intersection of each given site. Each corner of the intersection was evaluated on the same standard. It asked information about pedestrian markings on the ground, the visibility of said markings, and the conditions of those markings. It also asked if there was a pedestrian signal with a push button, if the pedestrian signal was within working conditions, and whether the signal had any visual and/or audible features for the disabled. It also asked if the signal was long enough for pedestrians to cross the road safely and requested the recorded time. The survey also measured the behavior of motorists, such as if they stopped in front and/or after the crosswalk lanes, if drivers yielded to pedestrians - or even speed up. Towards the end, there was a question about how safe it was to cross the street.
Joel Site

Figure 1: Google map image showing the initial stretch of Joel Blvd that we surveyed. We later lessened the length of street we were going to continue working with, which is shown below.

Figure 2: Google map image of the stretch of road we continued surveying and where we later implemented our tactical urbanism designs.
Background

Along the east side of Joel Blvd between East 5th and East 6th Street, there are a variety of businesses that include a franchised Dollar General, a local market called Jack’s Market, a local restaurant (Restaurant N Lechonera El Jibarito), a local tattoo shop (Tattoos by Will), a place of worship (Amazing Grace Family Worship Center O Lehigh Acres), two local stores (Humantronic, Inc., and Leslie’s lovely loot), a franchised pizzeria (Hungry Howie's Pizza & Subs) and a 7-Eleven gas station. These businesses continue to see a substantial flow of customers throughout the day. Around these businesses, there are small communities and neighborhoods. Across the street, there are three smaller communities. Some demographic characteristics observed during our time in the area were elderly, retired and veterans.

Issues, Observations, Testimonials

While collecting prerequisite data, many safety issues were observed in this area. One of the biggest concerns was the high number of pedestrians crossing Joel Blvd, which is a four-lane road without a crosswalk, with drivers going speeds ranging from 45 to 82 mph. The average speed was about 55 mph, ten miles over the posted speed limit of 45 mph. Many of these pedestrians who were crossing Joel Blvd were elderly individuals using assistive devices such as canes, walkers, or even motorized wheelchairs and scooters to get across. Undoubtedly, not having a crosswalk presented an imminent danger to pedestrians who cross Joel daily.

Figures 3, 4, and 5: Images show elderly pedestrians crossing by walking, with a scooter, and with a walker.
Figures 6, 7, and 8: Show some speeds caught with our radar gun on Joel Blvd.

Figure 9: Shows a crosswalk in disrepair at the intersection of Joel Blvd. and East 5th Street.

When cars would pull out of parking lots and/or connecting streets onto Joel Blvd, they would not stop at the stop sign or for the crosswalk in front of them. Instead, they would pull right onto it and/or over it, not actively looking for pedestrians and/or bicyclists who may be crossing the road. Drivers may have done this because the crosswalks were not very visible. The drivers may not have realized how many pedestrians used the area. They also were possibly trying to see the road more in order to turn onto Joel Blvd.
Another issue we observed were bus stops being inaccessible or nearly impossible to get to. One of the bus stops was on a grassy, sloping area next to a drainage ditch. We witnessed an older woman fall while trying to get to this particular bus stop. There were no crosswalks or sidewalks leading to this bus stop. Four of the five bus stops available were just a sign where people would stand and wait. The final bus stop had a bench, a bike rack, a trash bin, and a sheltered area for pedestrians to wait under. There were no crosswalks to cross the street to get to these different bus stops and three of the five bus stops had sidewalk next to them. None of the bus stops had a crosswalk leading to them from the other side of the road.
There was a stretch of sidewalk that did not have a curb or grass buffer. Instead, it was only separated from the road by the shoulder. Despite many “no parking” signs, we observed some vehicles parked on the curbless stretch of sidewalk - although there was plenty of parking available in parking lots a few feet away. Because of this, pedestrians and bicyclists had to walk on the grass to the side of the sidewalk. Additionally, when cars would turn on and/or off of Joel Blvd, many would cut corners on sidewalks where there was no curb. We saw small cars, trucks, and a semi-truck do this.
A member of our team interviewed a resident in one of the communities between East 5th and East 6th Street off of Joel Blvd. The particular elderly resident, uses a walker, rides public transit, and shops for their groceries across the street from their neighborhood. The following is their statement:

“Cars fly on Joel Blvd. Catching the bus[,] I have been close to getting hit by cars, [and] people cut the corner where there is no curbing. The other side has no sidewalk and using the walker, I can’t be in a ditch. Cars speed up when people are crossing so they don’t have to slow down or stop for you. Neighbors in my community feel they take their life in their hands trying to cross the street.”

Goals
After observing these issues, we decided on some improvements for the area. We wanted to implement crosswalks and make it safer for pedestrians to cross. To do this, we wanted to lower the speed limit in crosswalk areas and make drivers aware of upcoming crosswalks and slow zones. Additionally, we wanted drivers to pay more attention to their surroundings so that they did not cut the corners of the sidewalks when turning. We also aimed to improve current bus stops to make them more accessible, safer, and comfortable.

Tactical Urbanization Plan
Shortly after setting goals for what we wanted improved, we each came up with our own tactical urbanism designs to implement. We combined our ideas creating our first tactical urbanism plan, which we then presented to Lee County Department of Transportation officials. In the initial plan below, we recommended three crosswalks across Joel Blvd, slow zones, pedestrian crossing signs, and reflective road tape. We also recommended the installment of benches, flexible delineators, and rubber curbs.
Figures 17 through 19: Show the initial Joel Blvd tactical urbanism design presented to Lee County Department of Transportation.

During our first meeting with Lee County, one of the officials proposed their own plan, using his experience and education to adjust our design. This plan incorporated areas of refuge in the middle of the four-lane road as part of our suggested crosswalks so that
pedestrians could pause before crossing the rest of the way. Additionally, the pedestrian signs were placed in the middle of the road as part of the crosswalk and the area of refuge so that drivers would be more likely to see the signs and yield. Our team liked these additions, as they were two designs we had not had in our own plan. We were also told to make the crosswalks a solid color like green or white to keep crosswalks consistent in the area.

Challenges We Ran Into

During our project we dealt with a few challenges. There were concerns with our first design regarding liability associated with temporary crosswalks across Joel Blvd, which is highly trafficked and with vehicles traveling at high speeds. As a result of these concerns, we were unable to implement crosswalks across Joel Blvd, establish slow zones, and put reflective tape. However, we were able to come up with new and alternative ideas for the Joel site. In addition, we dealt with inclement weather conditions. Our project was conducted during the summer, a time when it rains and storms almost everyday. Additionally, temperatures ranged between 75 and 90 degrees Fahrenheit. During times of severe storms with thunder and lightning, and typically heavy rain, we were unable to
collect data properly, as this altered the levels of pedestrians and bicyclists. Furthermore, the levels of pedestrians and bicyclists may be different in the fall, winter, or spring due to less intense heat and less rain. Likely, during other seasons there is more pedestrian traffic in the area.

**Implementation**

Despite some challenges we initially encountered with our tactical urbanism design, our team managed to implement some temporary ideas to improve the lives of those in this community. Our group enhanced the crosswalk on East 5th street just before Joel Blvd. We painted parallel green lines along the existing white borders so that pedestrians could cross more safely. At the same intersection, in the southeast corner, we placed a stationary pedestrian crossing sign for drivers to see. We also placed three rubber curbs in this area to reduce the likelihood of individuals being hit by vehicles while waiting for the bus or when getting ready to cross. On the northeast side, we placed another stationary pedestrian crossing sign and installed three delineators, which are flexible posts intended to guide traffic on roads (similar to cones, but less bulky), along the curve as vehicles drive onto Joel Blvd.
Figures 22 and 23: The above images show two important parts of our tactical urbanism design for Joel Blvd and a key.

Moving down to the intersection of 6th Street and Joel Blvd, we applied a similar tactic. We placed a crossing sign five meters before the turn, a rubber curb in the immediate corner followed by five delineators. This was aimed at alerting the motorists and making them aware of pedestrians in the area. The last piece of the implementation phase was the enhancement of bus stops. Our group decided to make some improvements at four specific bus stops (Joel Blvd @ E 5th St.,@ Gladiola Dr., @ E 6th St-NB and @ E 6th St-SB). We installed and secured benches at all the bus stops on the east side of Joel Blvd in front of where the businesses are. We also applied a coat of green paint on all of them to reinforce the optics and make it safer for people in the community using public transportation.
Figures 24 and 26: Images show how we enhanced the bus stops.
Figures 27 through 31: Show our team implementing the tactical urbanism designs on Joel Blvd. and interacting with a pedestrian utilizing public transit.

Results

Our team spent over a month collecting pre-data on the Joel Blvd site, but because of temporary tactical urbanism designs (like chalk paint which washes away), we only spent about a week collecting post-data. Despite the limited time to collect post-data, we were able to observe changes in driver and pedestrian behavior.

From the post-data collected, we observed that the drivers’ speed stayed consistent with pre-data. We measured speeds ranging from 45 to 75 mph. This was expected because the speed limit of 45 mph was not changed for the implementation phase of the project. We were also not able to implement slow zones, crosswalks across, reflective tape, or more visible pedestrian crossing signs across Joel Blvd. Driver behavior changed in the areas where we added curb stops and flexible delineators to prevent drivers from cutting the corners of sidewalks. We noticed motorists taking wider and slower turns, paying more attention to driving in their lane. Drivers were unable to run over sidewalks because of these safety features we implemented, thus showing the effectiveness of our plan.
Figures 32 through 34: The above images show drivers not driving over sidewalk curbs due to flexible delineators and rubber curb stops.

The application of bright green crosswalks made drivers more aware of pedestrian crossing in the area. Because of this, most drivers would stop at the stop bars and then check for pedestrians before turning. Before the tactical urbanization, drivers would stop on the crosswalks without paying much attention to pedestrian crossing. As anticipated, pedestrians and bicyclists also made use of the new crosswalks.
The benches that were installed to improve the bus stops were promptly used by local residents. Those waiting on public transit, particularly elderly individuals, appreciated the benches. It gave them a chance to sit and rest especially during the Florida summer heat after walking from their homes, the store, or perhaps just waiting to catch the bus. The green paint on sidewalks at bus stops made the community, drivers, and pedestrians more aware of where bus stops were located. Overall, the new bus stops were more visible, making them safer. They also made waiting for the bus more comfortable and less strenuous.
Figures 37 through 39: Two of these photos show an elderly woman waiting for the bus and then boarding using the benches we had just implemented. She expressed how much she appreciated the improved bus stop. The photo on the right shows a man walking towards the bus stop.

To summarize our findings, the designs we were able to implement did improve the area in ways we had predicted they would. Drivers stopped running over the sidewalk corners and quickly corrected vehicles from stopping on top of crosswalks. The crosswalk we implemented made drivers pay more attention to pedestrians in the area. Pedestrians using public transit made use of our improved bus stops. However, our pedestrian crossing signs on the sides of Joel Blvd did little to mitigate the problem of speeding. If we had been able to lower the speed limit, implement slow zones, rumble strips, reflective tape, or pedestrian crossing signs between the four lanes of traffic, it is possible that we could have had a greater impact, especially when it comes to speeding.

Suggestions
Below are recommendations for the area based on the data collected.

Short-term recommendations (1 month to 1 year):
- Construct at least two crosswalks across Joel Blvd.
- Place pedestrian signage along the Joel Blvd.
- Improve existing crosswalks parallel to Joel Blvd.
- Create a buffer or curbing where drivers cut corners on sidewalks (while ensuring sidewalk access is still accessible to
those with wheelchairs, etc.)
- Provide benches for pedestrians to sit and rest at bus stops
- Place bike racks near each bus stop
- Provide trash/recycling bins between sidewalks and businesses

Midterm recommendations (1 to 5 years):
- Decrease the speed limit to 35 MPH on Joel Blvd. from Edwards Ave. to East 8th Street
- Create buffer or curbing for stretch of sidewalk where there is none
- Create sheltered bus stops similar to the bus stop at the intersection of Joel and East 6th Street.
- Improve sidewalk conditions – cracks, ditches, etc.

Long-term recommendations (5 to 10 years):
- Create a median or permanent areas of refuge between the 4 lanes of traffic for pedestrians using crosswalks.
- Construct bike lanes along Joel Blvd. from Alexander Graham Bell Blvd. to East 10th Street

Final Remarks
In general, this area has a lot of potential for great things. There are many things that can and should be done to improve this area. Increasing safety for the high amount of pedestrians and bicyclists should be priority, as they seem to be the most vulnerable to injury or fatality in this area. It will be very exciting to see how this particular area will develop and transform in the near and distant future. This is a great opportunity to make improvements and impact the community, and we believe this report will serve as a starting point to take action.

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