Social Determinants of Health:
Assessing Development Impacts
Parramore ACE School Zone

Background

Within the heart of Orlando, the Parramore community has been significantly impacted socially and physically by surrounding development over the past few decades. This capstone project, completed by the Masters of Urban and Regional Planning program at UCF, looks to summarize the changes to and provide solutions to address safety issues within the Parramore community.

The report is organized in three sections:

(I) Background, Demographics and History of the ACE School Zone and Parramore
(II) Collection of Data and Analysis
- Traffic Data - Volume and speed hose counters
- Walking Audit - Neighborhood inventory

(III) Proposal
- Specific lighting and pedestrian safety improvements recommended

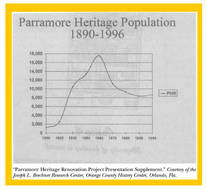
Methods

In order to collect data for this project, the following was completed:

- Census data collection
  - Demographic analysis and GIS mapping display
- Literature review of previous Parramore studies
  - Parramore historical background and timeline
- Community resident interviews to identify specific problems
  - Discussion with community leaders
- Pneumatic traffic counters placed in strategic locations
  - Determine traffic differences in event vs non-event days
- ACE School Zone Walking audit
  - Update to previous studies

History of Parramore

- Established in the 1880s as a segregated community for black residents.
  - Segregation forced black communities to develop their own robust economies and institutions to self-sustain.
- Parramore continued to grow until the 1960s when side effects of integration destabilized the community, causing a drop in local black institutions, businesses, education levels, income, and sociopolitical cohesion.
- After the 1960s, Parramore struggled to rebuild its foundation, but, recently, the City of Orlando declared Parramore revitalization a priority.
- The ACE school zone and Exploria Stadium represent major investments in the community and come with many quality-of-life improvements for residents.



"Parramore Heritage Renovation Project Presentation Supplement." *Courtesy of the Joseph L. Brechner Research Center, Orange County History Center, Orlando, Fla.*

University of Central Florida
College of Community Education and Innovation
M.S Urban & Regional Planning
Capstone Class Spring 2020

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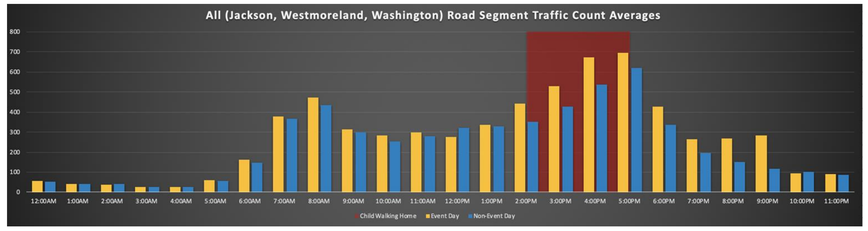
History of the ACE School Zone

- In 1970s, court-ordered integration shut down two all black schools in Parramore area.
  - Children living in the Parramore neighborhood were split up and bused to eight different schools (Dudenhoefer, 2017).
- In August 2019, Orange County Public Schools' (OCPS) Academic Center for Excellence (ACE) opened.
- It is Parramore's 1st Pre-K through 8th grade school.
- Located near the UCF Downtown campus.
- Joins collaboration between UCF, Valencia, and OCPS.
  - ACE's model is based on the innovative model, which is created by the collaboration team.
- Aims to develop long-term sustainable schools that serve students, as well as community members.

Community Engagement Council was recently renamed PARRAMORE COMMUNITY COUNCIL

Data Collection and Analysis



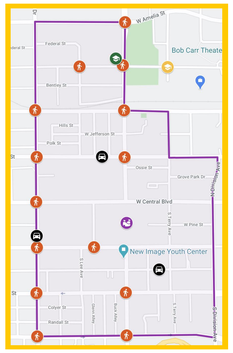
Objective:

- Community leaders raised concerns about children walking home from school when events are hosted at Exploria Stadium.
- Exploria Stadium is centrally located within the school district forcing many children to navigate event traffic to walk home.
- Parents and community leaders are interested in the impact stadium events had on pedestrian safety and what could be done to improve their neighborhood.

25%↑
Average increase in vehicle traffic
When comparing non-event day traffic counts to event day traffic counts, a significant increase was found during the hours when children walk home from school

Traffic Collection Methodology:

- Pneumatic traffic counters were strategically installed in 3 locations surrounding Exploria Stadium.
- Data was collected from two separate weekday events at Exploria Stadium - Orlando City vs Reykjavik game and the SheBelieves Cup.
- Traffic data was collected for both events in 72-hour segments - one day prior to the event, one day after the event, and the event day itself.



Observations:

- Between the hours of 2:00pm - 5:00pm, there was an average traffic increase of 25% on event days vs non-event days.
- Overall, throughout the entire day there was an average 14% increase in traffic on an event day vs non-event day.

Traffic Counts - Volume and Speed Hose Counters
Dates Taken: February 18th, 19th, & 20th- March 3rd, 4th, & 5th
Locations:
- Westmoreland Dr. between Pine St. and Church St.
- Washington St. between Garden Ave. and McQuigg Ave.
- Jackson St. between Lime Ave. and Terry Ave.

Data Collection and Analysis cont.

- The Parramore neighborhood and the area directly adjacent to the ACE school have recently changed dramatically.
  - Major developments include Exploria Stadium in 2017 and UCF and Valencia Downtown Campus in 2019
- The goal is to update the 2014 "Barriers to Access Study" in relation to sidewalk connectivity and streetlight coverage.
  - This 2020 study followed-up all previously listed sections of lighting and sidewalks that were considered in "poor" condition or quality.





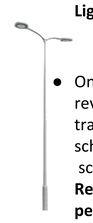
Lighting, Sidewalk Condition & Connectivity

- Prior studies have identified multiple areas within the Parramore community as having poor connectivity within their sidewalk network
- A recent walking audit concluded that the majority of the previously identified areas have since been improved.
- Many recent sidewalk improvements are likely a result from current construction of the downtown UCF and Valencia campus and adjoining developments.
- Prior studies have recommended lighting improvements and current steps are being taken to improve the area.

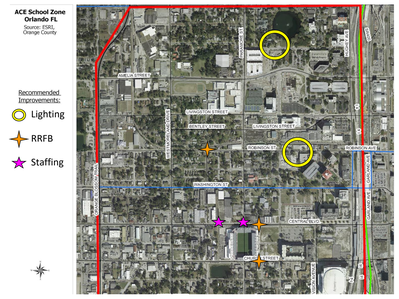
Proposal - Recommendations to enhance pedestrian safety

After performing background research, completing a neighborhood inventory, and conducting traffic counts to identify the impact development has had on the Parramore Community, we conclude the following:

- Although extensive enhancements in lighting, sidewalk conditions and connectivity have been made, there are still several locations that would benefit from further enhancements.
  Light Fixture Installation proposed:
  - **North side of W. Concord St. (Lake Dot)**
  - **Chatham St. and W. Robinson (intersection)**



- On event days, traffic collection data revealed a 25% increase in traffic during the hours when school children walk home from school.
  Recommendations to enhance pedestrian safety:
  - **On event days, increase crossing guards or safety officers nearest to Exploria Stadium (opportunity for the OCSC to provide security staff to assist).**
  - **Install 3 Rectangular Rapid Flash Beacons surrounding the stadium to increase pedestrian safety.**



Type of Improvement	Number of Improvements	Estimated Cost
Light Fixture Materials & Installation	10	$21,400
Crossing Guards	2 OCSC Officers	$1,440 Annually (2 Officers * 15 Events * 3 Hours * $16/hourly)
Rectangular Rapid Flash Beacons Materials & Installation	3	$12,000
Total	**$34,840**	

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Assessing Development Impacts: Parramore ACE School Zone

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Executive Summary

Within the heart of Orlando, the community of Parramore has been significantly impacted, socially and physically, by surrounding development growth over the past few decades. This capstone project completed by the Masters of Urban and Regional Planning program at UCF looks to summarize the changes to Parramore and provide solutions to address safety issues within the community.

The purpose of this study is to provide background, analysis and recommendations related to improving determinants of health within the Parramore Community, particularly within the ACE School Zone.

The objectives of this report are to inventory infrastructure/lighting deficiencies and event impacts on the community within the ACE School Zone study area. The report is organized into three primary parts: (I) Background, Demographics and History of the ACE School Zone and Parramore, (II) Collection of Data and Analysis (III) Proposal.

Part I Includes an overview of the community interactions and the need for this report. This will include demographic breakdowns and community profiles for the schools and Parramore, as well as events happening within the study area. Part I will also include a literature review of previous planning studies, initiatives, and an in-depth history of Parramore. Part II will include a neighborhood inventory identifying connectivity gaps, light deficient areas, and analysis. Part II also includes event day audits and traffic counts. Part III includes the specific proposal and interventions recommended.

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Part I: Background, Demographics, and History

Project Background and Reasoning

The UCF Masters of Urban and Regional Planning program concludes the program by completing a Capstone course project. Class of 2020 capstone students were asked to provide analysis on ways to improve the community through research of the social determinants of health within Orange County, Florida. The focus of this study is to consider the social determinants of crime, safety, and violence using Parramore as a study area.

The University of Central Florida (UCF) opened a new campus in the heart of downtown Orlando within the Parramore Community. The new campus presents a unique opportunity to rethink how universities connect to communities and how they organize themselves to carry out that work. UCF's College of Community Innovation and Education (CCIE) and the Center for Community Partnerships (CCP) have been strategizing around how to engage and work with the Parramore community to achieve this goal.

Responding to the elaborate efforts and feedback from the City of Orlando, VHB Orlando, and the Parramore community - the College of Community Innovation and Education (CCIE) and Center for Community Partnerships have collaborated with Valencia College to develop five strategic initiatives to engage and support the Parramore community. The five strategic initiatives include affordable housing, education, health, employment, and safety. The goal is to create opportunities for the residents of Parramore that will give them choices over how they decide to pursue their lives that will ultimately lead to success in life.

The partnership aims to assist in addressing physical, social and safety issues facing the residents of Parramore daily. As a part of this effort, community groups are partnered with to remove physical, perceptual, social, and organizational barriers to life success. As a result, the

goal is to create a safe environment where people can thrive and take advantage of resources and opportunities to enable future life success.

While researching and analyzing areas in Orange County, the group was presented with an opportunity to assist the community. The group partnered with the local community, attended community meetings, spoke with residents and crossing guards as well as community representatives. The group also did an overall assessment of the pedestrian and bicyclist safety in the area via a walking audit as well as traffic counts to assess the traffic volume at various times of the day and week.

Parramore Overview and Demographics

The Community of Parramore, the UCF Capstone focus area, is a combination of neighborhoods located between Interstate 4, Orange Blossom Trail and West Colonial Drive. Parramore is 1.3 square miles and there are three neighborhoods located within the OCPS Academic Center for Excellence Zone: Lake Dot, Callahan and Holden/Parramore. The zip codes associated with Parramore (Holden) neighborhood are 32801 and 32805.

Parramore Avenue is the main thorough street within the community. The primary land use in Parramore is residential, which includes public housing. There are also government facilities that include: Florida A&M Law School, the Amway Center, and the Middle-District Florida U.S. Courthouse. There are also neighborhood and business commercial along the Orange Blossom Trail Corridor, along with some industrial use. “The Parramore Heritage Community is home to over 250 businesses.” (Parramore, 2020)

Parramore is a neighborhood in west-central Orlando, Florida. It is a historical neighborhood for Orlando residents of African descent and suffered greatly during the Jim Crow era of institutionalized racism (Hudak, 2015). In 2015, the unemployment rate was reported as

23.8% and the median household income was $15,493 (Hudak, 2015). The area was developed as a segregated African American community (Fyotek, 2009). It was built in the 1880s by Orlando's fourteenth mayor, James B. Parramore, as a development "to house the blacks employed in the households of white Orlandoans." (Fyotek, 2009).

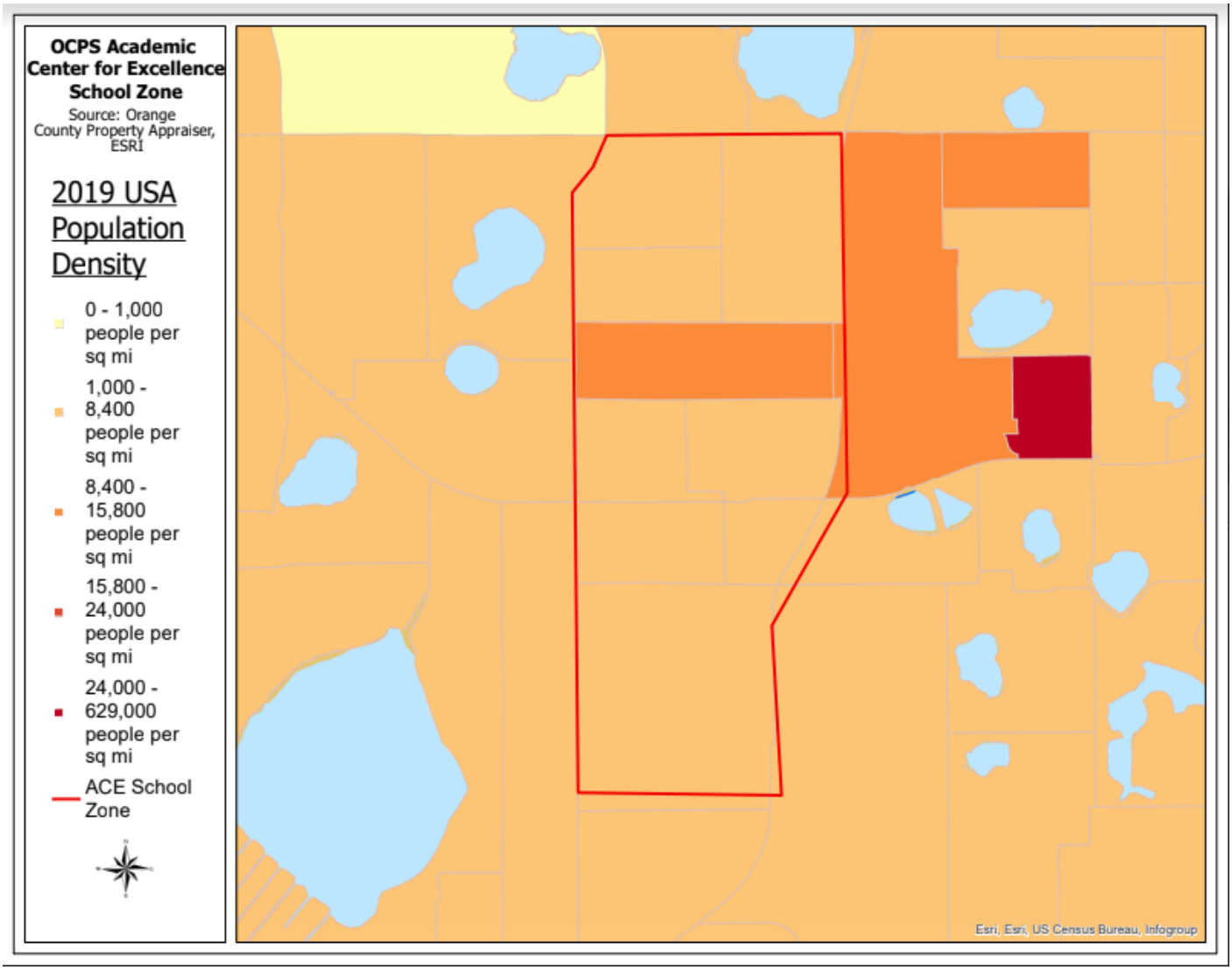
While the historic east border of Parramore was Division Avenue (which marked the line where African-American residents living in the west could not cross into the east after sundown), Interstate 4 was constructed directly between Parramore and the prosperous and mostly white neighborhoods of central downtown, just east of Division Avenue and just west of the railroad tracks. Parramore's "official" boundaries (according to the city of Orlando) extend to Interstate 4, but the regions in between Division and the interstate are generally not residential, hosting such facilities as the Amway Center and the Bob Carr Performing Arts Centre. Smaller businesses are, of course, located on the west side of Division Avenue and include grocery stores, barbershops, and soul food restaurants.

Population

As of the 2010 Census, there were 3,450 persons in the Holden-Parramore area, in 1,243 houses (Statistica Atlas, 2018). This makes it the 18th largest region in Orlando by population. The density is 5,900 people per square mile, the 30th most dense in Orlando (Statistica Atlas, 2018). Of this total, there were 969 children or 28.1%. Of the total households, 39.7% consisting of one person only (Statistica Atlas, 2018). Of the family households, 15.6% are married, 73.9% are single moms, and 10.9% single dads Statistica Atlas, 2018). See Figure 1: 2019 Population Density for ACE School Zone and Surrounding Area.

Figure 1

2019 Population Density for ACE School Zone and Surrounding Area



Source: Nathan Milch, 2020

Race

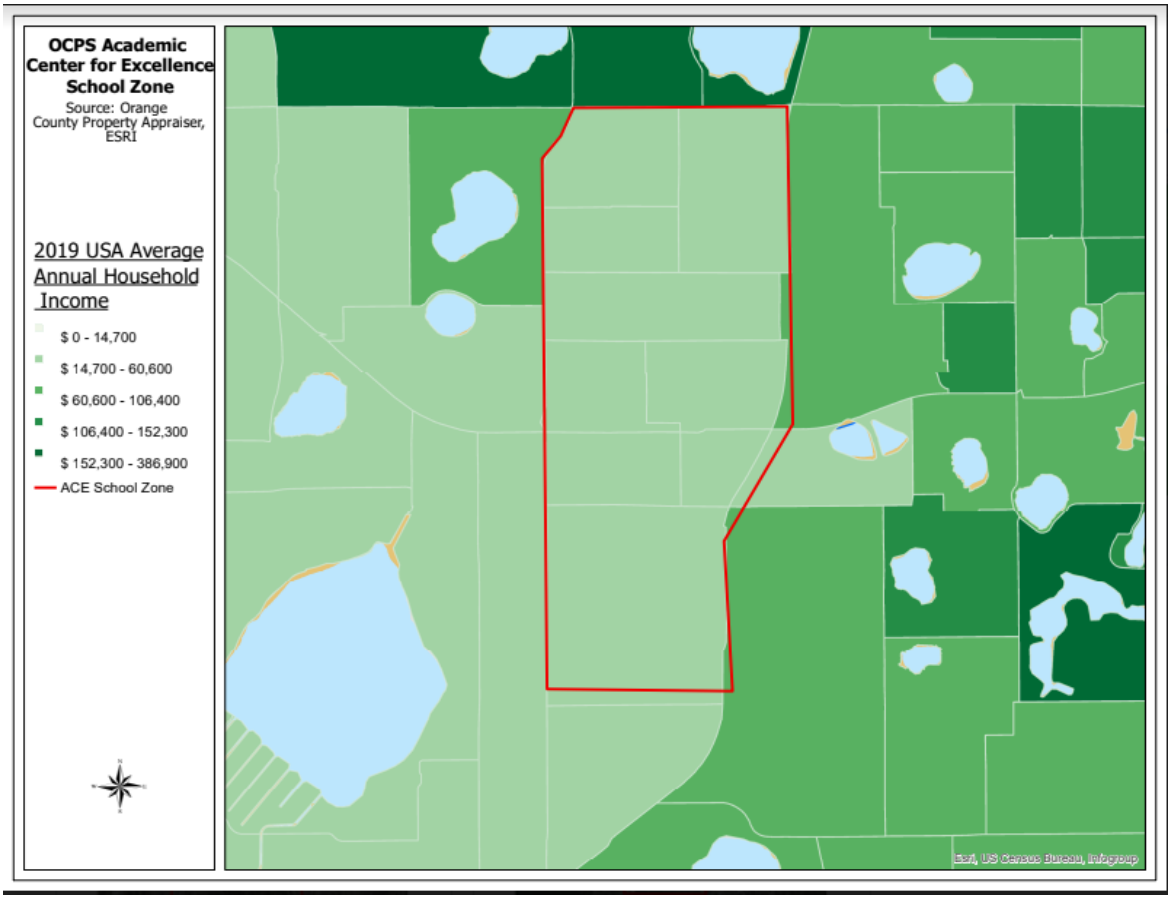
The distribution by race and ethnicity was 8.5% white, 12.8% Hispanic, and 76.6% black (Statistica Atlas, 2018). The citizenship status shows 84.3% are US-born citizens, and 6.7% non-citizens (Statistica Atlas, 2018).

Income

The 80th percentile household income is $36,100. Out of the 116 communities in Orlando, Holden-Parramore is number 114, with only two communities with lower household income (Statistica Atlas, 2018). Of residents between the ages of 25 and 65, 49.8% are employed, with approximately equal employment by each gender (Statistica Atlas, 2018). High school graduates of this group compose 52.0%, with an additional 25.1% having a higher degree, and 22.9% without a high school diploma (Statistica Atlas, 2018). See Figure 2: 2019 Average Annual Household Income in ACE School Zone and Surrounding Area below.

Figure 2

2019 Average Annual Household Income in ACE School Zone and Surrounding Area



Source: Nathan Milch, 2020

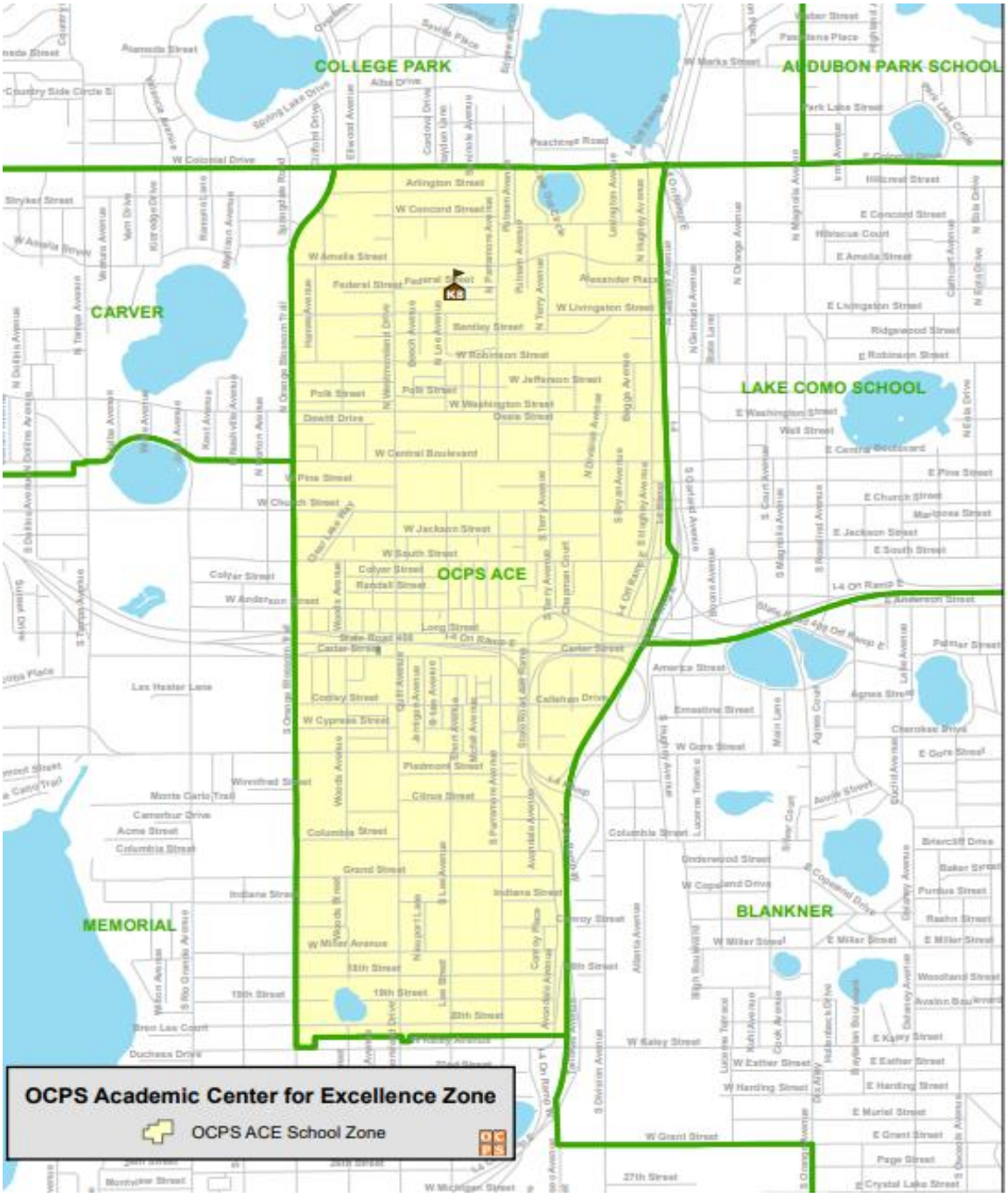
OCPS Academic Center for Excellence School Zone

In August of 2019, The Orange County Public School Academic Center for Excellence (ACE) opened its doors to serve the Parramore area. This is Parramore's first school for the students in preschool through eighth grade. The ACE is located near the UCF Downtown campus and joins collaboration between UCF, Valencia, and OCPS. ACE's model is based on the innovative model, which is created by the collaboration team. During the 1970s, two all black schools in the Parramore area were shut down due to the 1970s court-ordered integration. Children living in the Parramore neighborhood were split up and bused to eight different schools (Dudenhoefer, 2017) The Parramore school uses the Community Partnership School (CPS), which aims to develop long-term sustainable schools that serve students as well as community members.

The school offers programs which are beneficial to student's preschool through eighth grade as well as the community. One of the OCPS' goals for Parramore is safety. Part of the community school project is the development of safe routes to and from school. The City of Orlando has invested a significant amount to pedestrian signal upgrades, sidewalk/ramp upgrades, crosswalks, and bike paths. Sidewalks have been added on all sides of major streets (City of Orlando, 2016) A map with an outline of the Orange County Public Schools System (OCPS) Academic Center for Excellence (ACE) School Zone within the Parramore community is shown in *Figure 3: OCPS Academic Center for Excellence (ACE) - School Zone*. The aerial of the school zone is also displayed below in *Figure 4: Academic Center for Excellence (ACE) - School Zone – Aerial.*

Figure 3

OCPS Academic Center for Excellence (ACE) - School Zone



Source: PEID Strategic Plan 2019 & OCPS

Figure 4

Academic Center for Excellence (ACE) - School Zone - Aerial

Source: ESRI

Schools and Stakeholders

There are three organizations; the University of Central Florida, Valencia College, and Orange County Public Schools- collaborating to improve the lives of community members who live in the Central Florida area. In 2019, the three organizations created a plan for education improvement titled, Parramore Education and Innovation District Strategic Plan, 2019-2022. The leaders of this plan outlined a document and included a statement of purpose. “In communities like Parramore, where attainment lags neighboring communities, strategic investments and

innovative interventions in education are necessary to help lift families out of poverty" (PEID, 2019)

The goal of this collaboration is to create change in the Parramore Education Ecosystem. As it stands, educational attainment in Parramore lags behind surrounding areas. 22% of Parramore residents hold an associate degree or higher. This is compared to 46% of city residents and 42% of county residents (PEID, 2019). ***Figure 7: Educational Attainment Statistics within Parramore Area*** shows more educational attainment statistics within the Parramore area.

Background

Event Traffic Research Overview

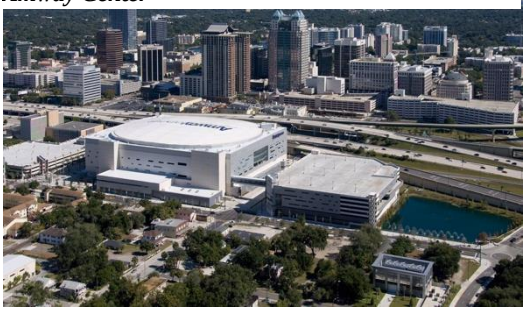
In response to concerns raised by community leaders within the Parramore community, specifically the area surrounding Exploria Stadium, regarding the safety of students travelling to and from the Orange County Public School Academic Center for Excellence (ACE School) during events hosted at nearby venues, research was undertaken to determine what, if any, impact these events had on the community and the students therein. The focus of this research was on Exploria Stadium, an event stadium located within the heart of the Parramore district and directly within the path of many students travelling to and from school. The goal of this research is to determine the impact of events and provide recommendations for improved safety for the ACE School students walking home through the Parramore neighborhood surrounding Exploria Stadium.

Using strategically placed pneumatic traffic counters in 3 locations surrounding Exploria stadium, data was collected over a period of 72 hours surrounding two events, beginning 24 hours prior to the event and ending 24 hours after the event. Based on the data collected, research

suggests that there is an increase in vehicular traffic counts on event days compared to non-event days.

Figure 5

Amway Center



Source: Pinterest.com/pin/3496, 2020

Amway Center

The Amway Center is an indoor multi-sports arena with a seating capacity of 20,000 and home to the National Basketball Association's Orlando Magic (see figure 5). While the Amway Center is located within the Parramore neighborhood, the physical location of the Amway Center is on the edge of the neighborhood, where it is also straddled alongside Interstate 4 and the 408 East-West Expressway. Considerations were made to include events that took place at the Amway Center, in addition to Exploria Stadium, but the inclusion of this venue was rejected. The first reason Amway Center was ultimately excluded from this study due to the location of the ACE School crossing guard and their proximity to the Amway Center. The crossing guard locations would infer a path of travel of children walking home from school that would not significantly interfere with the Amway Center operation. The second reason was due to input from interviews with Parramore and Callahan community leaders. All conversations with community leadership relating to pedestrian safety centered around the newer Exploria Stadium and no concerns were raised in relation to the Amway Center. Therefore, the Amway Center was excluded from this research.

Exploria Stadium

Figure 6

Exploria Stadium

Source: walterpmoore.com, 2020

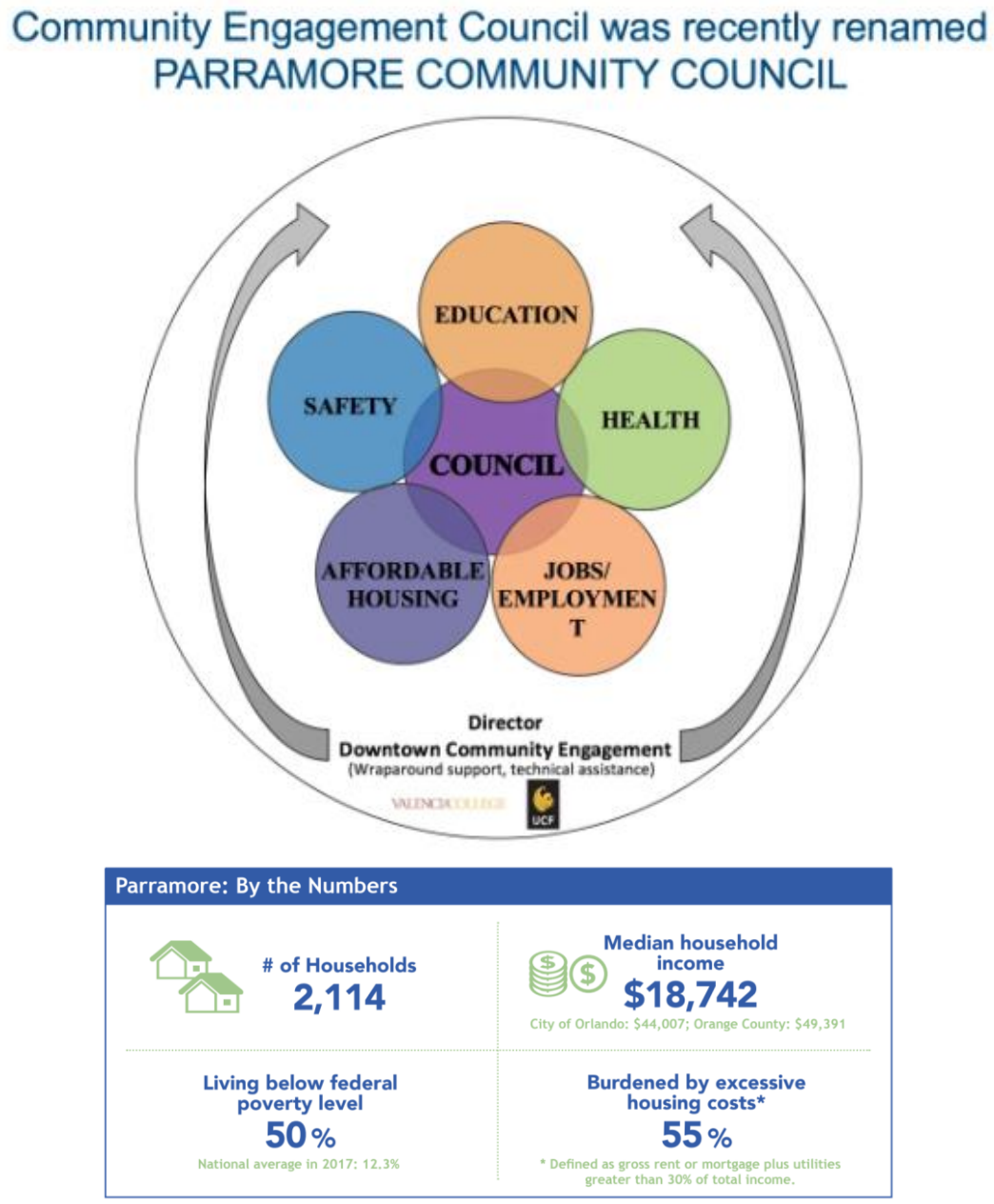
Located within the center of the Parramore neighborhood is Exploria Stadium, a soccer specific stadium with a seating capacity of 25,500 (see figure 6). Because of Exploria Stadium's location and tight integration into the Parramore neighborhood, it became the primary focus of the traffic impact research. The stadium location is built in a mixed-use community with commercial and residential uses in a walkable, urban setting. When the Exploria Stadium location is compared to the locations of the ACE School crossing guards, there is a clear path of travel that a majority of students must navigate around the stadium to walk to and from school. In addition to the crossing guard and stadium locations, local community leaders, parents, and crossing guards voiced concerns about the pedestrian safety of children walking home during events hosted at Exploria Stadium. Based on this initial research and the concerns from the community, research was focused on the Exploria Stadium and the events hosted therein.

Justification

Community leaders from the Parramore neighborhood articulated concerns about children walking home safely from the Ace School. One of the key concerns was children walking home during an event at Exploria Stadium, which is situated directly in the Callahan and Parramore neighborhoods, where most school children must cross in order to get home from school. While there have been no known injuries or deaths related to children walking home during events, parents, community leaders, and representatives from the ACE School and the New Image Youth Center expressed unease about the potential increase in traffic for children to safely navigate. There was significant interest from the community in quantifying the impact

Exploria Stadium events have on traffic during the hours when children are walking home from school.

Figure 7
Educational Attainment Statistics within Parramore Area



Source: https://www.cohpa.ucf.edu/ccp/parramore/ &

https://www.moderncities.com/article/2017-mar-the-rise-and-fall-of-an-african-american-inner-city

History

The First Parramore

How did Parramore end up as one of Orlando's most disadvantaged neighborhoods? Despite being a thriving black community during the segregation era, external pressures during the integration period squeezed the community for most of its social, political, and economic vitality.

During the era of institutionalized segregation strict social barriers forced black communities to be internally self-sufficient. Parramore exists to the west of Orlando's central business district, originally physically separated only by the railroad tracks and the aptly named Division Street. Prior to the 1960s it was a thriving community; total segregation necessitated black-only schools, businesses, churches that formed a sort of cultural mirror to white societies. Orlando had its own Negro Chamber of Commerce that maintained a business directory, and in 1955 Parramore contained at least 15 churches, two elementary schools, Jones High School, kindergartens, and preschools, two attorneys, eight doctor's offices, and more. Parramore was essentially a thriving commercial center in an era where black-only businesses were seeing significant growth; the 1949 Negro Chamber of Commerce Director listed 169 total businesses, which grew to 389 businesses by 1957. (University of Richmond, n.d.)

These black-only institutions were the social and economic backbone of the Parramore, and the institutional leaders like school principals, religious leaders, and business owners were the social and political heads of the community.

The Socioeconomic Impact of Desegregation in Parramore

Though the end of institutionalized segregation and beginning of integration was supposed to help minority communities, these processes were stalled and taken advantage of in many ways, limiting the benefits black communities were able to secure. School integration moved many black students from all-black schools to nearby white schools, but instead of a similar reverse-integration from the white community, the response was flight to suburban schools.

Traditional black schools thus declined from lack of enrollment. Students faced longer commutes, the black community lost many of its best teachers to transfers as the social fabric of the black community was slowly chipped away. (Porter, 2004, pp. 306-307.) Both Parramore elementary schools closed and never reopened (although the site of Callahan Elementary reopened in 1987 as the Dr. J.B. Callahan Neighborhood Center, which has become a key community institution once again). (City of Orlando, 2014.)

Another consequence of desegregation was reduced demand for black-only businesses, especially by actual black patrons. The most successful black businesses were no longer restricted to certain communities, so many left, moving to new areas with more opportunity. Black patrons were also not as limited in their options, so they spent more of their dollars outside the community than before. A lot of what remained in Parramore was there by necessity rather than choice, including failed businesses, vacated homes, drug dealers, and the poor and unemployed. (Porter, 2004, p. 308)

The Physical Decline of Parramore

Segregation and integration did not directly cause the physical decline of Parramore, but the destabilizing effect on the community left it ripe for exploitation that had been in progress for decades already. Low incomes and absentee landlords that were typical of black neighborhoods

led to the overall decline of the building stock from lack of maintenance, making Parramore a prime location for slum-clearing projects.

In 1940 construction of Griffin Park projects required demolition of 154 houses to construct a large multifamily project that ultimately would add 254 families to the area, further densifying the area and concentrating poverty within the black community. (Porter, 2004, p. 309.) In 1957, still during the segregation era, Parramore saw even more demolition of homes and businesses as 551 properties were displaced to construct Interstate 4 between it and the central business district of Orlando, simultaneously destroying much of the community and creating a physical barrier. (Field, 2017.) Later, in 1974, construction of the East-West Expressway (now SR-408) cut the neighborhood in half again with another physical barrier, this time to the north and south as shown below in ***Figure 8.*** As many as 1000 houses, 200 businesses, and 3 major churches were lost to demolition and at least 600 renters lost their homes. (Porter, 2004, pp. 309-310.)

Figure 8

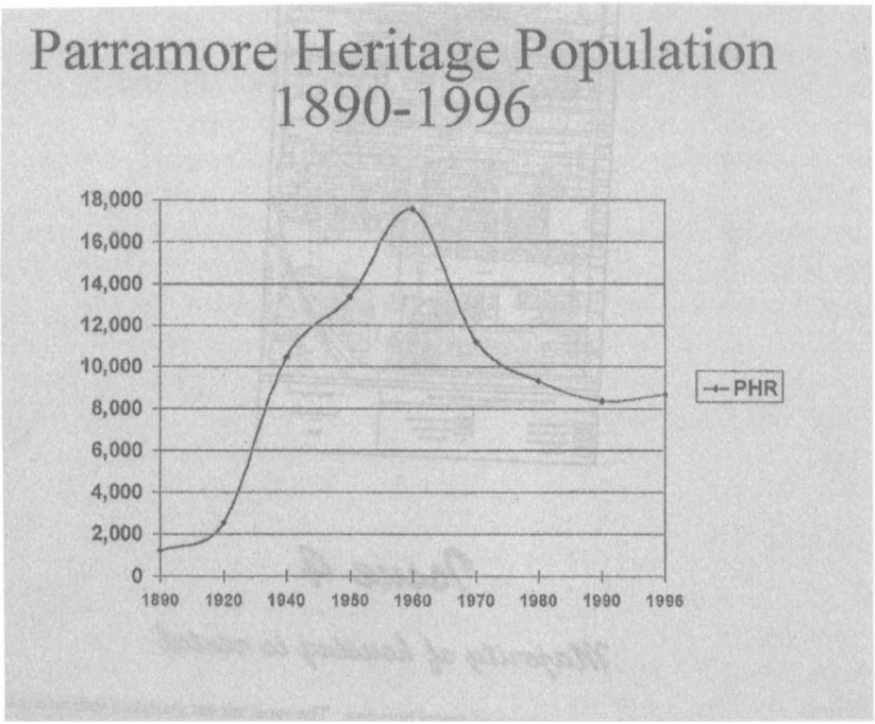
Source: Field, 2017

To illustrate how things could have gone differently, in Winter Park, an affluent predominately white suburb to the north of Orlando, there was a successful campaign to disallow the construction of I4 through their downtown. (Field, 2017.) Parramore did not have the same level of political organization and influence to protect their community, and one can examine modern Parramore compared to modern Winter Park to see just how different the trajectories could have been.

The expressways now completely encircle the Griffin Park projects. The emerging consensus in environmental health links proximity to high amounts of vehicle traffic to serious health risks. The most socio-economically disadvantaged therefore must add health complications to the list of burdens they face every day. (Craven, 2018.)

This history of Parramore reveals how a neighborhood with such strong character has reached its present-day state. External pressures sapped the community of its internal strength, limited its growth, and set forth a chain-reaction of generational poverty that severely inhibited efforts to revitalize the area. The graphic showing the rise and fall of Parramore's population over the century tells the same story.

Figure 9



"Parramore Heritage Renovation Project Presentation Supplement." *Courtesy of the Joseph L. Brechner Research Center, Orange County History Center, Orlando, Fla.*

Part II: Data Collection, Observation, and Analysis

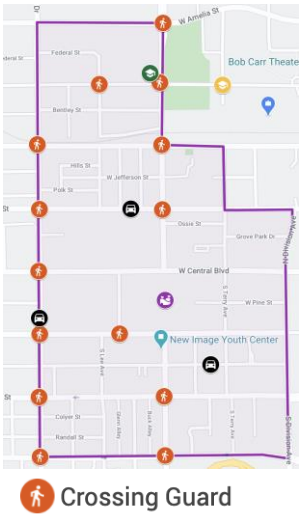
Methods

Crossing Guard Interviews

Crossing guards are posted at a total of intersections within the school district in which the ACE School is located (see figure 10). The crossing guards are scheduled for morning hours, between approximately 8:00am to 9:00am, and afternoon hours, between approximately 2:00pm to 3:00pm and 3:00pm to 4:00pm (depending on the daily dismissal time. Currently, neither the quantity of crossing guards stationed within the district, nor the locations change, regardless if there is an event taking place at the Exploria Stadium.

Figure 10

Crossing Guards



Source: Joshua Blackman, 2020

One qualitative element of this research would have been to interview each crossing guard to identify issues unique to each crossing guard post that may take place during events. The interview notes would have been added to this report. The original intent of this research was to interview each crossing guard at their respective posts during the months of March and April 2020 to identify location specific concerns and issues. However, the global COVID-19 pandemic began to change and alter the environment in mid-March 2020. During this time schools, universities, and began to transition to online platforms or temporarily shut down. The pandemic rapidly began changing to change operations, schedules, and lifestyles to the point that collecting data would no longer have accurately reflected the typical day-to-day life and vehicular driving patterns. At the time of publication, the global pandemic had forced the State of Florida to shut down all non-essential businesses and services, which resulted in an incomplete survey of crossing guards.

Event Dates

Traffic impact, street parking, and parking lot usage reports were collected from two events hosted at Exploria Stadium. To ensure consistent and relevant data, data was collected during events hosted on weekdays when children were walking to their homes from the ACE School. No data was collected or evaluated from a weekend date.

The first event was a preseason game featuring Orlando City Soccer Club vs. Reykjavik, which was on Tuesday, February 18th, 2020. The second event was a U.S. Soccer event, called the "SheBelieves" Cup, hosted on Thursday, March 5th, 2020.

Weather

Weather variation was also taken into consideration during the data collection. During the days and hours when all data was collected, there were no wet weather and/or abnormal climatic conditions including, but not limited to, hail, cold, high winds, severe storms, or extreme high temperatures.

Parking Lot and On-Street Parking Surveys

Exploria Stadium is a unique stadium experience because of its location, being tightly woven into the urban fabric of the Parramore neighborhood. One method of identifying the impact of Exploria Stadium event traffic, is to compare event day and non-event day on-street parking and parking lot usage rates.

The data used herein was collected by student project researchers performing a walking audit of the predetermined focus area within the Parramore neighborhood surrounding Exploria Stadium (see figure 11) The research was collected from the predetermined area. While performing the audit, only the number of vehicles were counted in each parking lot and street segments where street parking is legally permissible. No illegally parked vehicles were taken into consideration for purposes of this research. Within the predetermined area, each parking lot and street segment were counted within the same timeframe on both event and non-event days, specifically, only during the hours between 3:00pm and 5:00pm, when children would be walking home from school.

Parking Lots

There are very few designated event parking lots and no nearby parking structures within close proximity to Exploria Stadium. There are also a limited number of official parking lots operated by the Orlando City Soccer Club on event days. Those same parking lots on non-event days, serve the needs of the local community and businesses and are not used by Orlando City Soccer Club.

As a result of few nearby designated parking options to the stadium, a significant number of people park in downtown parking structures and take a shuttle to the stadium or take ride-sharing options. Furthermore, many local residents and business owners sell their private parking for event parking. There are many small parking operators, and each parking lot has its own ingress and egress points, thereby potentially increasing the number of vehicles crossing

over pedestrian walking areas. These additional transportation options still increase traffic to the area but were not quantifiable through parking counts within the methods of this research.

The goal of this research was to compare at least two Exploria Stadium events against four non-event days to parking lot usage rates. Due to the limited nature of weekday events at Exploria Stadium, the priority was given to collect event data first and after collect non-event data starting in mid-March. However, due to circumstances beyond the researchers' control, only the event parking lot data collected was for the two events at Exploria Stadium and the data for non-event days was unable to be collected before publication. However, the global COVID-19 pandemic began to change and alter the environment in mid-March 2020. During this time schools, universities, and sports stadiums began to transition to online platforms or temporarily shut down. The pandemic rapidly began changing to change operations, schedules, and lifestyles to the point that collecting the data would no longer have accurately reflected the typical day-to-day life and vehicular parking patterns. At the time of publication, the global pandemic had forced the State of Florida to shut down all non-essential businesses and services which resulted in an incomplete survey of parking lot usage rates. Unfortunately, the goal of identifying all parcels of land being used for event parking and comparing the usage rates during both event days and non-event days was unable to be completed due to the inability to collect data on non-event days.

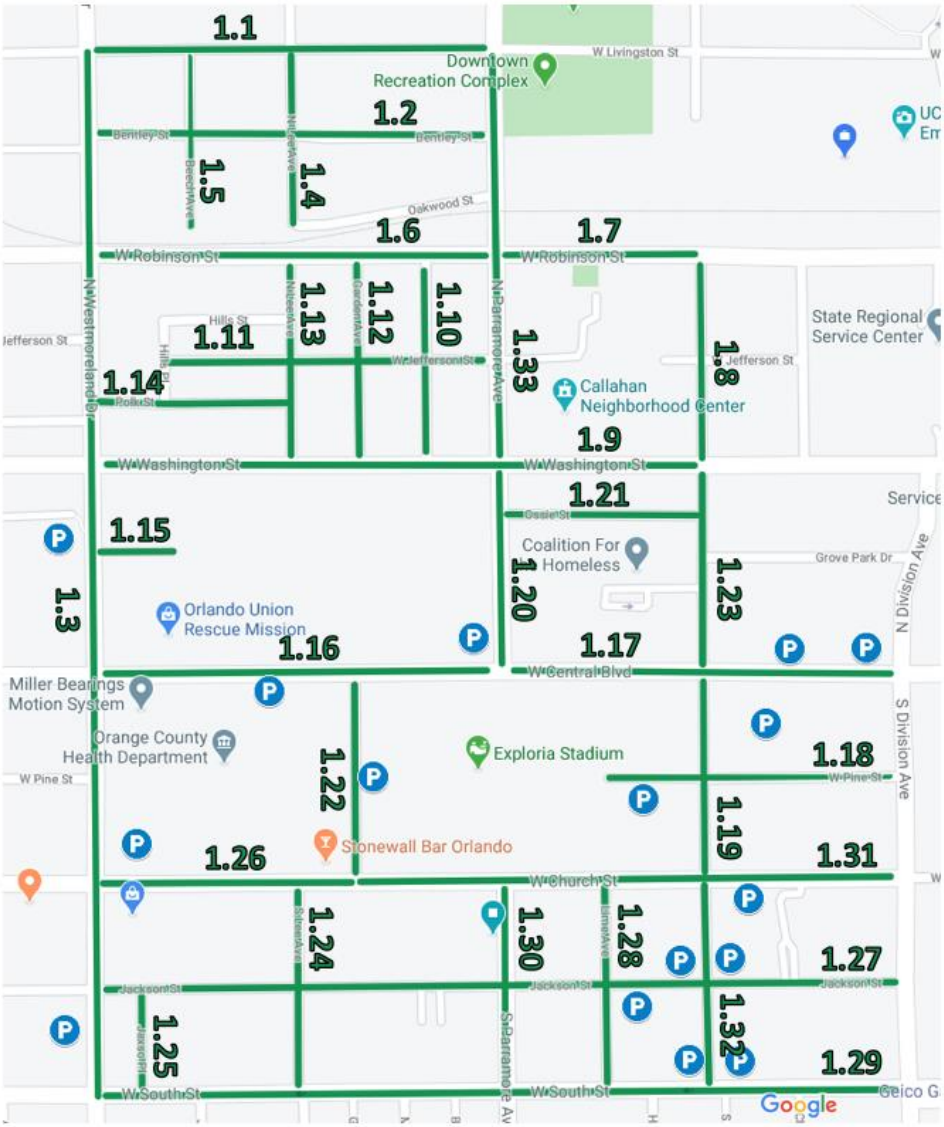
On-Street Parking

The Parramore Neighborhood is located in an urban setting that neighbors Downtown Orlando's central business district. Similar to the popularity of on-street parking in Downtown Orlando, on-street parking is also commonly found in Parramore. The goal of this research was to count the number of vehicles utilizing on-street parking segments and compare the differences between event days and non-event days. In order to accurately compare individual road segments, instead of providing only a total car count of all street parking within the focus area, an organized mapping system was created. The focus area was divided up into 33 unique road segments and an on-street parking car count was made for each road segment (see figure 11).

The goal of this research was to compare on-street parking lot usage rates for two Exploria Stadium events against four non-event days. Data was collected on both Exploria Stadium event days, but, at the time of publication, only one day of data was collected from non-event days. Due to the limited nature of weekday events at Exploria Stadium, the priority was given to collect event data first and after collect non-event data starting in mid-March. Again, the incomplete data comes as a result of the COVID-19 pandemic which quickly thwarted all opportunities to continue to collect accurate and usable data. The limited data that has been collected is very diminutive in scope, but the research will still provide a basic overview in the data and analysis section of this report.

Figure 11

Segments for On-Street Parking Survey



Source: Joshua Blackman, 2020

Tailgating

One important observation made during the parking lot and on-street parking surveys was the occurrence of tailgating in private parking lots surrounding the stadium. Tailgating is defined

for the context of this research as any visibility or usage of coolers, folding chairs, folding tables, and grills, etc. near personal vehicles. This research project was not able to identify how many parking lots were used for tailgating, nor was it able to quantify how many vehicles were partaking in tailgating activity. Tailgating was visible in multiple parking lots during both observed events. Tailgating was not an initial focus of this research project, but there was enough tailgating activity present during event days to warrant mentioning and highlighting as an opportunity for more in-depth research on the impact on the students in the area.

Figure 12

Pneumatic Traffic Counter

Source: Joshua Blackman, 2020

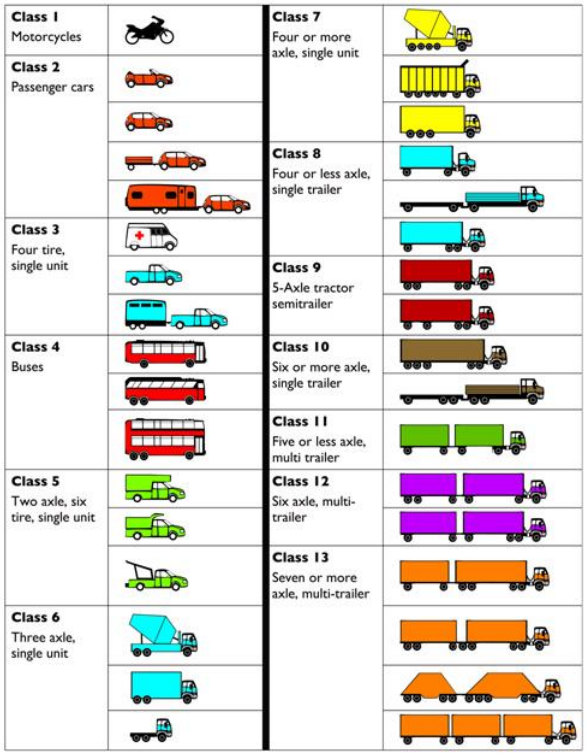
Traffic Counts

This research project will partner with Luke Transportation Engineering Consultants, Inc. to provide vehicle traffic counts in the Parramore neighborhood (see figure 11). The three locations surrounding Exploria Stadium that were studied within this publication include, Jackson Street, Westmoreland Drive, and Washington Street. The traffic counts will include, not only include numbers of vehicles traveled, but capture the rate of speed and the vehicle type based on class (see figure 13), from the Florida Department of Transportation Florida Highway Administration below, which depicts the different vehicle classes. The traffic counters collected data on both event and non-event days during the hours when children will be walking home from the ACE School.

The traffic collection data took place in February 2020 and the first week in March 2020. While the global COVID-19 pandemic began to change the neighborhood environment in mid-March 2020, no significant discrepancies appeared to have taken place during the time when traffic counters were used. Traffic data collection took place before any government messaging of social distancing and before schools, universities, and sports stadiums began to transition to online platforms or temporarily shut down (Federal Highway Administration, 2014).

Figure 13

Vehicle Category Classification



Source: FDOT, 2014

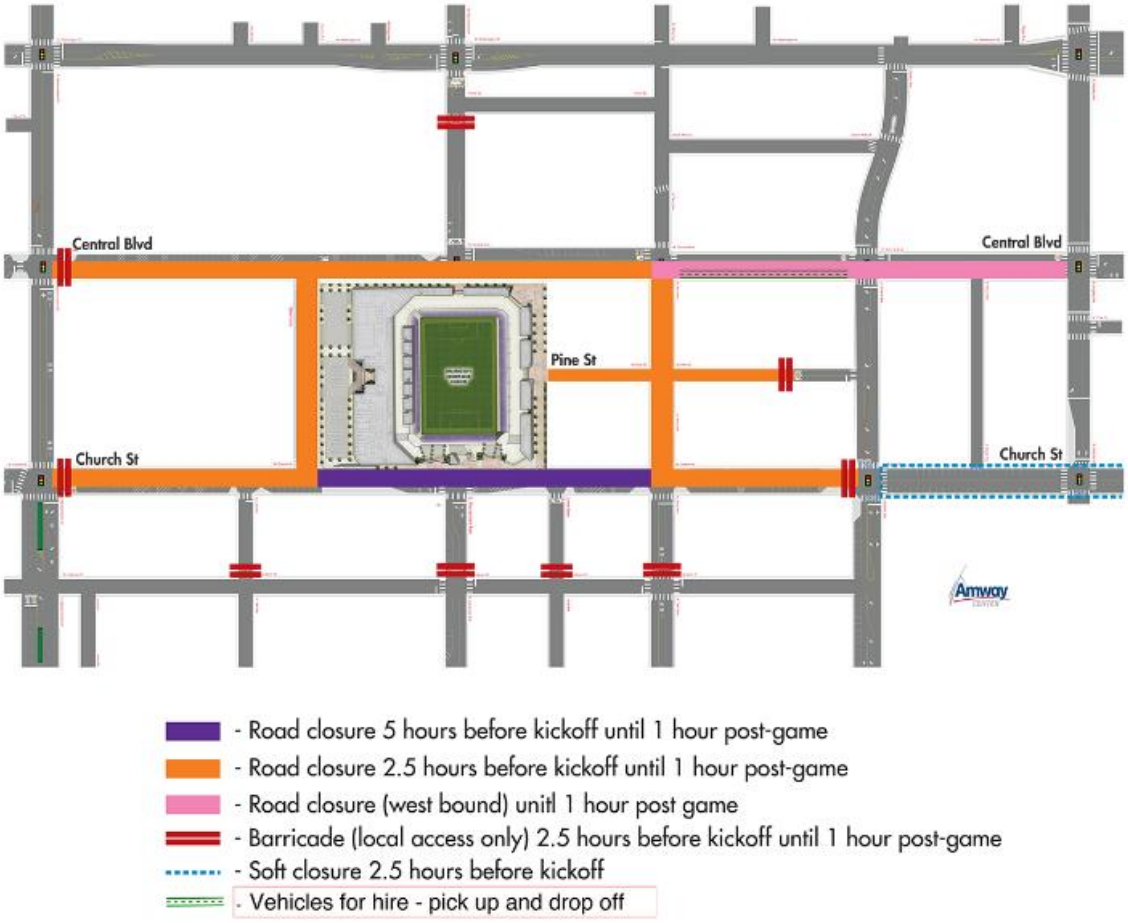
Special Event Maintenance of Traffic (MOT) Considerations

The scope of this research took the special event MOT plan surrounding Exploria Stadium into consideration when conducting research. The special event MOT requires specific segments of roads surrounding the stadium to be shut down to vehicular traffic at different predetermined points in time (see figure 14 for specific times and locations). Through initial research and review of the special event MOT, it was determined that only one segment had an impact on the data collected for the research project, which was a small portion of Church Street between Terry Avenue and Glenn Lane. This segment closes five hours prior to the start of an event. Given the fact that most weekday events begin between 7:00pm and 8:00pm, the road closures in this area would begin as early as 2:00pm on event days. All other segments will

typically remain open during the hours when children are most likely to be walking home from school (Orlando City Soccer Club, n.d.).

Figure 14

Orlando City Soccer Special Event Maintenance of Traffic



Source: Orlando City Soccer Club, n.d.

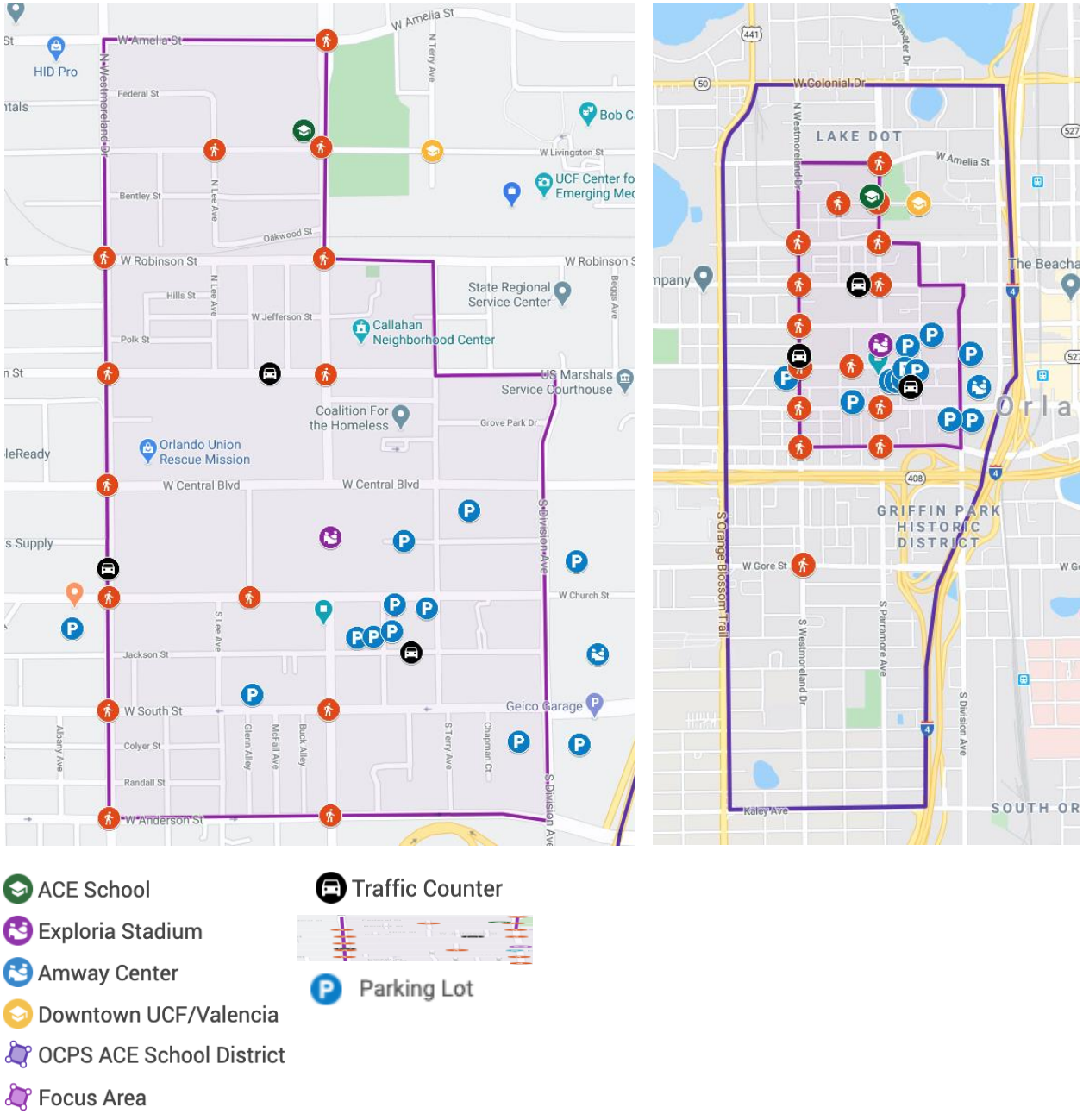
Project Map

A map can be found of the complete research area with all features listed below (see figure 15). Within figure 15, the map on the right depicts the complete view of the district in

which the ACE School resides, while the map on the left highlights the focus area of this research.

Figure 15

ACE School District, Focus Area and Legend of Research Project



Source: Joshua Blackman, 2020

Data and Analysis

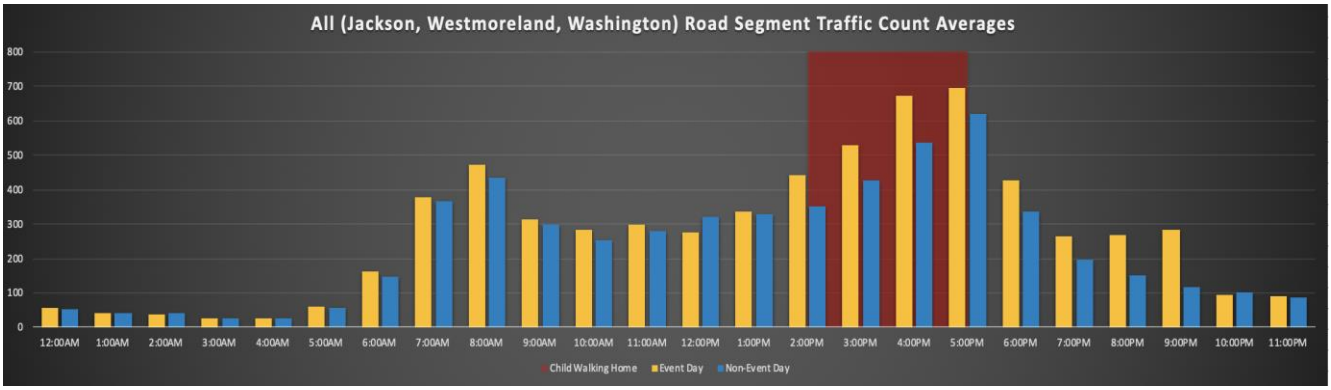
Traffic Counts

Three locations were selected from the area surrounding Exploria Stadium in order to record vehicular traffic counts using pneumatic traffic counting strips. The traffic counting locations were set up at major thoroughfares to the south, north, and west sides of Exploria Stadium. This research excluded the east side of Exploria Stadium because there is a limited residential use in that area and, based on the pattern of crossing guard placement, it is unlikely that children will travel through the eastern side of the stadium. The three focus locations within the identified area were Jackson Street, Westmoreland Drive, and Washington Street. The traffic counters collected data 24 hours prior to an event day, 24 hours during the event day, and 24 hours after an event day. The results of that data collection demonstrated (see figure 16 and table 1):

- Throughout the majority of a 24-hour period, there was an increase in traffic on event days as compared to non-event days. The most significant increases take place between the hours of 2:00pm to 4:00pm and 8:00pm to 9:00pm.
- During the hours of 2:00pm to 5:00pm, when children are most likely to be walking home, there was a 25% increase in traffic activity on average during an event day, as compared to a non-event day.
- Measuring all three streets, the overall traffic activity increased during a 24-hour period rose 17% on an event day, as compared to a non-event day.

Figure 16

Hourly Event Day vs. Non-Event Day Pneumatic Traffic Counter Results



Source: Joshua Blackman, 2020

Table 1
Total and Afternoon Highlights of Event Day vs. Non-Event Day Pneumatic Traffic Counter Results

Street Segment	Day Type	2:00PM	3:00PM	4:00PM	Daily Total
Washington	Event Day Total	480.5	563	752.5	7768.5
Washington	Non-Event Day Total	369	428.5	554	6427.2
Washington	**% Change**	**30.2%**	**31.3%**	**35.8%**	**20.8%**
Westmoreland	Event Day Total	612.5	750	909.5	8490.5
Westmoreland	Non-Event Day Total	501.25	625.5	773.5	7370.75
Westmoreland	**% Change**	**22.1%**	**19.9%**	**17.5%**	**15.1%**

Jackson*	Event Day Total	18	27	34	463
Jackson*	Non-Event Day Total	23	25	29	432.5
Jackson*	**% Change**	**-21.7%**	**8%**	**17.2%**	**7%**
All Segments	Event Day Total	441	531	672	6596.2
All Segments	Non-Event Day Total	353	427	537	5605.7
All Segments	**% Change**	**24.9%**	**24.3%**	**25.1%**	**17.6%**

*Limited Jackson Street traffic collection only occurred on February 17th, 18th, and 19th. Data collected on March dates were corrupted with technical failures and as a result, not represented in this report.

Source: Joshua Blackman, 2020

On-Street Parking Usage Survey

Within the predetermined research area, there were 33 pre-identified street segments to measure the on-street parking usage on non-event days as compared to usage on event days at Exploria Stadium (see figure 11). The original intent was to identify trends through conducting research over the course of two event days and four non-event days. Because of disruptions resulting from the COVID-19 pandemic, only two event days and one non-event day were measured, which severely limits the ability to identify trends. However, there are still a few important, but also potentially premature, observations that can still be made based on the limited data procured over the course of those three days. These observations include (see table 2):

- All segments north of Washington Street (1.9) remained pretty consistent. This is likely because the area is far enough removed from Exploria Stadium to avoid event related disruptions. Also, there were a number of vehicles parked near the ACE School during this time, which likely contained parents and caregivers waiting for students to be released from school to be transported home or to after school activities.
- All segments south of Church Street (1.26 and 1.31) resulted in significantly higher on-street parking usage rates on event days compared to non-event days. This is likely due to the proximity to Exploria Stadium and the large cluster of event parking lots in this area, which may encourage more on-street parking in this region on event days.

Table 2
On-Street Parking Usage Survey

On-Street Parking Segment	Car Count (2/18) (Event)	Car Count (3/5) (Event)	Car Count (2/25) (Event)
Livingston On-Street Parking (1.1)	15	17	16
Bentley St. On-Street Parking (1.2)	8	6	6
Westmoreland On-Street Parking (1.3)	0	0	0
Lee On-Street Parking (1.4)	8	6	5
Beech On-Street Parking (1.5)	1	2	2
Robinson On-Street Parking (1.6)	2	4	1
Robinson On-Street Parking (1.7)	25	19	22
Terry On-Street Parking (1.8)	26	13	17
Washington On-Street Parking (1.9)	0	0	0
McQuigg On-Street Parking (1.10)	1	2	1
Jefferson On-Street Parking (1.11)	0	1	4
Garden On-Street Parking (1.12)	1	2	2
Lee On-Street Parking (1.13)	1	0	1
Polk On-Street Parking (1.14)	1	5	2
Macbro On-Street Parking (1.15)	1	1	0
Central On-Street Parking (1.16)	8	3	2

Central On-Street Parking (1.17)	2	0 (Closed: MOT)	0
Pine On-Street Parking (1.18)	0	0	0
Terry On-Street Parking (1.19)	12	12	4
Parramore On-Street Parking (1.20)	6	2 (Closed: MOT)	1
Ossie On-Street Parking (1.21)	2	3	1
Glenn On-Street Parking (1.22)	1	0	0
Terry On-Street Parking (1.23)	0	0	0
Lee On-Street Parking (1.24)	5	10	1
Jaxso On-Street Parking (1.25)	0	0	1
Church On-Street Parking (1.26)	6	4	2
Jackson On-Street Parking (1.27)	20	20	5
Lime On-Street Parking (1.28)	15	20	6
South On-Street Parking (1.29)	2	23	2
Parramore On-Street Parking (1.30)	4	16	3
Church On-Street Parking (1.31)	0	47	7
Terry On-Street Parking (1.32)	4	10	2
Parramore On-Street Parking (1.33)	0	0	0

Source: Joshua Blackman, 2020

Parking Lot Usage Survey

At the time of publication, the only data collected for the parking lot usage survey was collected during two event days (see table 3). As a result of the COVID-19 pandemic, no data was collected on non-event days. Because there was no data collected on non-event days, there is no baseline dataset to compare the event day parking lots and no analysis can be made. Regardless, the decision was made to include the collected incomplete data in this report to assist future research.

Table 3
Parking Lot Usage Survey

Parking Lot	Car Count (2/18) (Event)	Car Count (3/5) (Event)
Westmoreland / Macbro	5	10
Central / Terry (Orange Lot)	54	60
Pine / Terry	30	40
Central / Terry (Lot G)	75	160
Central / Division (small lot)	8	7
Parramore / Central (Lot C)	15	60
Central / Glenn (Lot B)	2	5
Glenn (Lot D)	18	22
Westmoreland / Church (Lot A)	45	60
Jackson / Westmoreland	15	45

Jackson / Lime	1	9
Jackson / Terry Lot 1	1	10
Jackson / Terry Lot 2	1	15
South / Terry Lot 1	1	10
South / Terry Lot 2	1	12
Church / Parramore	5	13

Source: Joshua Blackman, 2020

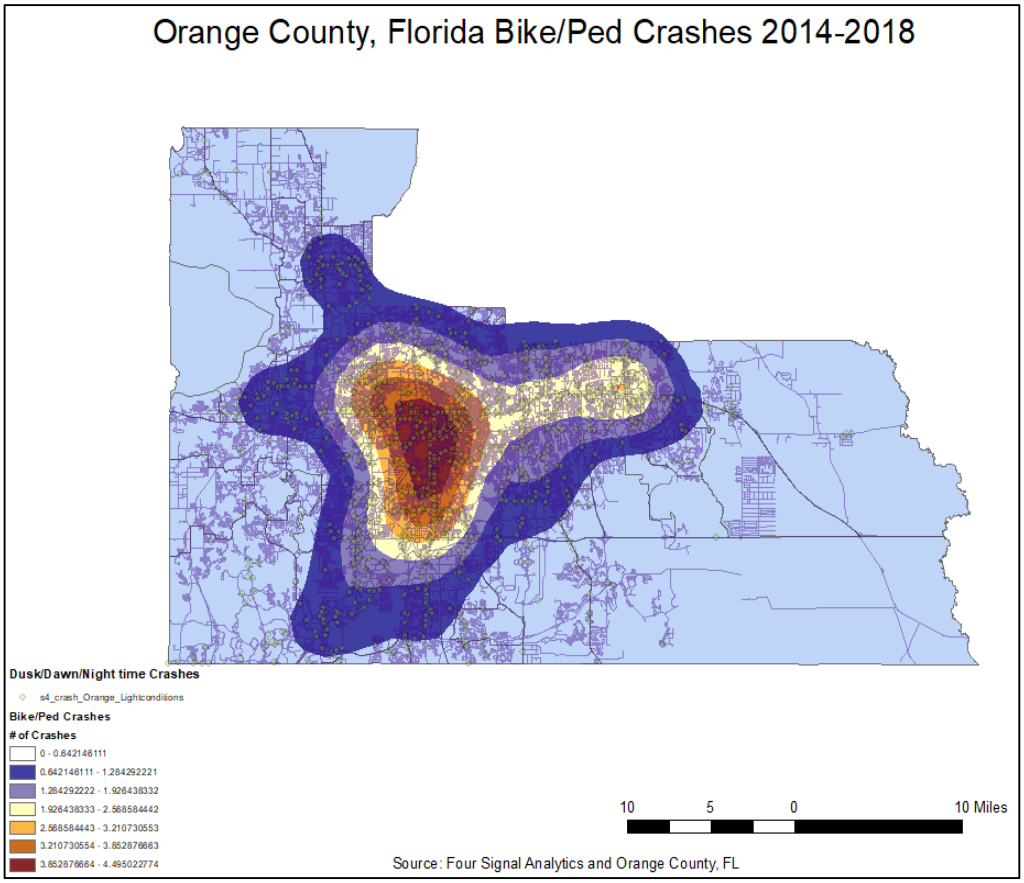
Walking Audit & Neighborhood Inventory

In order to better understand how the Parramore area around the ACE School Zone has grown and changed in more recent years, a walking audit was conducted on March 13th, 2020 to inventory the changes in lighting, sidewalk condition and connectivity. The intention of this audit was to give a 2020 update of the Barriers to Access Study completed in December of 2014. There has been a significant amount of construction since 2014 within our study area, with many locations still under construction, which will be noted below. This section of the study is intended to inventory locations previously identified as deficient and give current 2020 updates. Specifically, we looked at locations close to the ACE School including those along West Concord Street, West Amelia Street, West Livingston Street, and West Robinson Street.

Figure 17 below displays a dot density map of Orange County using bike and pedestrian crash data from Four Signal Analytics. With the proximity to downtown Orlando, we can see that the ACE School zone study area is located within locations where the highest density of

crashes occurs. From our analysis, we found that 46.4% of bike/ped crashes between 2014 and 2018 were during dawn, dusk, or nighttime conditions. The Dangerous by Design annual report, compiled by Smart Growth America, measures the pedestrian danger index of every major metro in the United States. This index measures how deadly it is for people to walk based on the number of people struck and killed by drivers while walking, controlling for the number of people that live in that state or metro area and the share of people who walk to work. Unfortunately, what the index found is that 8 of the top 10 most dangerous metros in the country are in Florida and the number 1 most dangerous metro in the country is Orlando/Kissimmee/Sanford. There have been 656 pedestrian deaths in Central Florida between 2008 to 2017.

Figure 17



Source: Nathan Milch, 2020

While the cause for every vehicle crash is different, many of the crashes could have been avoided or mitigated with better street design. We believe that there are opportunities to add more high efficiency lighting to highly traveled pedestrian pathways with known dangerous stretches of roads and intersections. The results from previous studies suggest that street lighting may prevent road traffic crashes, injuries, and fatalities. Better lighting also results in return on investment, traffic improvement, crime reduction and Increased economic development.

Lighting

Overall, there are very few lighting deficiencies within locations surrounding the ACE School and UCF. The barriers to access study identifies stretches of road along Concord, Amelia, Livingston and Robinson as lighting deficient and many of these locations have been fixed. Pictures shown below were taken during the walking audit in order to document improvements and areas overlooked.

West Concord St

Figure 18

Source: Nathan Milch, 2020

Figure 19

Source: Nathan Milch, 2020

Along the southern side of W. Concord St. there are new LED lights approximately every 70 feet. However, on the Northern side of Concord, there is no lighting along Lake dot.

West Amelia

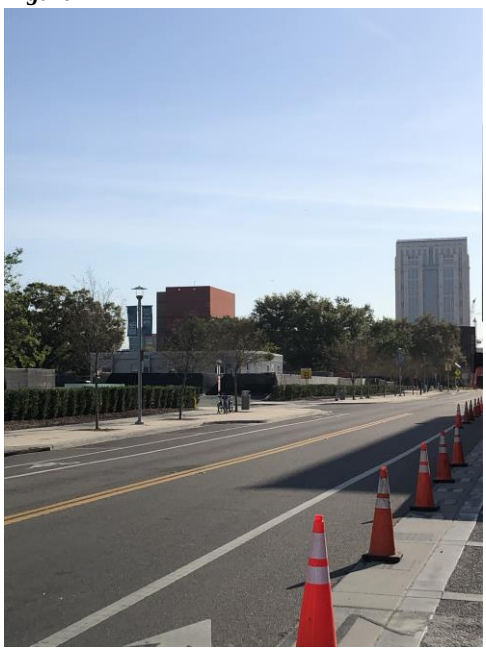
Figure 20

Source: Nathan Milch, 2020

Along W Amelia, there is ample lighting with fixtures about every 70 ft. This area has been improved significantly with UCF Downtown Development taking place.

West Livingston

Figure 21



Source: Nathan Milch, 2020

Figure 22

Source: Nathan Milch, 2020

Along W Livingston (the main street through UCF Downtown Campus) - there is ample lighting.

This area has been recently updated with UCF downtown campus development.

West Robinson

Figure 23

Source: Nathan Milch, 2020

Along W Robinson there is one light post every four electric poles, leaving around 200ft between light fixtures along the North side of the street. On the South side, near the community garden, there were no lighting fixtures.

West Robinson & Chatham

Figure 24

Source: Nathan Milch, 2020

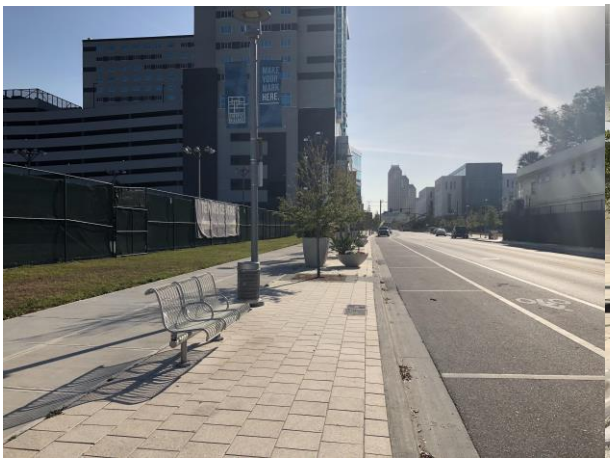
There have been no updates to lighting since 2014, as there are no lights along Chatham Street. Recommendation is for multiple lighting fixtures installed along Chatham Street.

Sidewalk Condition and Connectivity

In general, the sidewalk condition was greatly improved in the north part of the neighborhood in and around Creative Village and UCF Downtown. Wider sidewalks, functional street furniture, decorative elements, and curbside parking were present in much of the newly constructed area.

UCF & Valencia Downtown

Figure 25



Source: Tatum Jordan-Madden, 2020

Figure 26

Source: Tatum Jordan-Madden, 2020

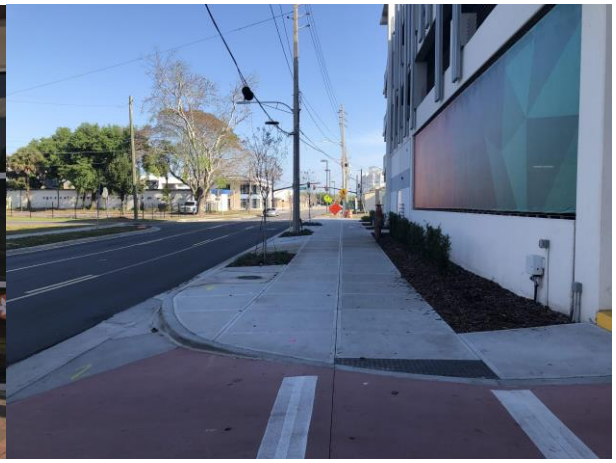
Major improvements to Livingston St (left) and Terry Ave (right) streetscapes featuring on-street parking, bike lanes, wider sidewalks, and increased street furniture.

Parramore Avenue

Figure 27

Source: Tatum Jordan-Madden, 2020

Figure 28



Source: Tatum Jordan-Madden, 2020

Major Improvements to streetscape on Parramore Ave leading to (right) and adjacent to the ACE School.

Putnam Avenue

Figure 29

Source: Tatum Jordan-Madden, 2020

Figure 30

Source: Tatum Jordan-Madden, 2020

Improvements to streetscape and new wayfinding features near Putnam Ave & Concord

St.Concord Street

Figure 31

Source: Tatum Jordan-Madden, 2020

Figure 32

Source: Tatum Jordan-Madden, 2020

Concord St near Lake Dot was designated “Poor” sidewalk condition in the 2014 report. It is mostly unchanged but currently sandwiched between brand new development and active construction, so improvements may be coming.

Robinson Street

Figure 33 ***Figure 34***

Source: Tatum Jordan-Madden, 2020 ***Source: Tatum Jordan-Madden, 2020***

The sidewalk condition at Robinson St & Parramore Ave was also designated “Poor” in the 2014 report. Unlike the neighborhood closer to UCF Downtown, this area is mostly unchanged. However, similarly to the previous area near Lake Dot there was active construction nearby, further along the street heading east toward downtown Orlando, which may suggest improvements in the future.

Analysis of the Neighborhood

The Walk Score measures the walkability of neighborhoods based on a patented methodology developed that analyzes hundreds of walking routes to nearby amenities. Walk Scores also measures pedestrian friendliness by analyzing population density and road metrics such as block length and intersection density. Data sources include Google, Factual, Great

Schools, Open Street Map, the U.S. Census, Localeze, and places added by the Walk Score user community (Walkscore, 2020). Looking at the changes in Walk and Bike scores are a way to judge how improvements have impacted the community.

Table 4
2014 Walk & Bike Scores

Neighborhood	Walk Score	Bike Score
Central Business District	83	74
Holden/Parramore	75	75
Callahan	70	81
Lake Dot	59	77

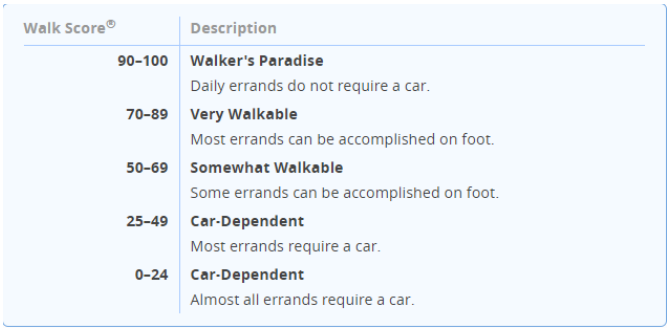
Source: https://www.walkscore.com/FL/Orlando/Holden-Parramore

Table 5
2020 Walk & Bike Scores

Neighborhood	Walk Score	Bike Score
Central Business District	85	78
Holden/Parramore	73	79
Callahan	73	84
Lake Dot	62	82

Source: https://www.walkscore.com/FL/Orlando/Holden-Parramore

Figure 35



Walk Score®	Description
90–100	**Walker's Paradise** Daily errands do not require a car.
70–89	**Very Walkable** Most errands can be accomplished on foot.
50–69	**Somewhat Walkable** Some errands can be accomplished on foot.
25–49	**Car-Dependent** Most errands require a car.
0–24	**Car-Dependent** Almost all errands require a car.

Source: https://www.walkscore.com/methodology.shtml

Improvements

After updating the walk and bike scores of the neighborhoods surrounding our study area, we can see that slight improvement to the scores have been made in almost every category. ***Figure 35*** displays the range of scores and how they are categorized. When analyzing the walk and bike scores by the standards from Walkscore.com, we can see that majority of the area is designated as 'Very Walkable'. Although these improvements are miniscule, with the continued investment and the recommendations of this Capstone project, these scores can continue to improve, which will result in an overall more walkable community.

Funding Mechanisms

This section evaluates the financial feasibility of the recommendations… There are opportunities to apply for funding at the federal, state, and local levels. Also, a number of local and regional agencies often contribute to pedestrian safety projects. (Walk, Ride, Thrive)

Safe Routes to School

The Florida Department of Transportation provides grants to local safety-related agencies to assist in the development and implementation of safety related projects. "The Safe Routes to

School program provides funds for projects that may include planning, design, and construction of infrastructure-related projects that will substantially improve the ability of students to walk and bicycle to school." (FDOT, 2019)

Safety related projects are typically funded through Orlando City, FDOT, and private partnerships. Safe Routes to School is a cost-reimbursement program that is managed and funded through the Florida Department of Transportation. City and County governments utilize their own funds to provide pedestrian safety improvements. (MetroPlan, 2012)

Orange County Pedestrian Safety Initiative

Locally, Orange County is involved in several pedestrian/bicycle safety initiatives providing funds annually to improve pedestrian-oriented infrastructure. This fiscal year, Orange County's Walk Ride Thrive initiative has allocated a total of $5.5 million for sidewalk repairs, road safety audit projects, school safety audits, and similar project

In 2015, as part of Orange County's Pedestrian and Bicycle Safety Action Plan, Mayor Jacobs' announced a new program (Orange County, 2020) INVEST *in our Home for Life* provides support for initiatives focused on infrastructure, making safety improvements for pedestrians, and improving transportation connectivity throughout Orange County. As part of their efforts, INVEST has allocated $15 million for pedestrian safety improvements. (Orange County, 2020**)**

The funds can be used to address certain intersection improvements, which includes:

- Pedestrian crosswalks at uncontrolled locations
- Pedestrian lighting at intersections and crosswalks with high pedestrian volume
- Traffic signal upgrades including signage

Part III: Proposal

As a result of the data collected over the course of this research, there was a clear demonstration of a significant increase in vehicular traffic, in addition to an increase in street parking and parking lot usage during Exploria Stadium event day. The most important conclusion from the data collected is that there is a clear increase in traffic activity in the ACE School vicinity and Parramore community during the hours when school children are most likely to be walking home from school.

From the collected data, two different recommendations will be made to enhance pedestrian safety in the Parramore neighborhood during events at Exploria Stadium. The first recommendation is to install additional rectangular rapid flash beacons and, the second, to add additional crossing guards or safety officers to intersections near Exploria Stadium during the hours when children walk home from school.

Rectangular Rapid Flash Beacons

Based on the research collected herein, the installation of rectangular rapid flash beacons at three additional locations is recommended to improve pedestrian safety in the Parramore neighborhood and areas near the Exploria Stadium.

Figure 36

Robinson Street

Source: Joshua Blackman, 2020

1: West Robinson Street & North Lee Avenue (Latitude: 28.5457 | Longitude: -81.3912) (see figure 36).

This location is only 675 feet directly south of the ACE School. North Lee Avenue is only staffed by one crossing guard at the intersection with Livingston Street. This corridor has less traffic because Lee ends immediately before connecting with Robinson Street because of the railroad cutting through the neighborhood. Currently, there is a dedicated pedestrian crossing pathway at this location, but the connection ends at Robinson and there is no crosswalk. Because of the current pedestrian infrastructure, continuing the momentum with a rectangular rapid flash beacon would encourage more pedestrian activity in a safer environment.

Figure 37

Central Boulevard

Source: Joshua Blackman, 2020

2: West Central Boulevard between North Parramore Avenue and Terry Avenue (Latitude: 28.542 | Longitude: -81.3883) (see figure 37).

3: West Church Street Lime Avenue (Latitude: 28.5401 | Longitude: -81.3881) (see figure 38).

Figure 38

Church Street

Source: Joshua Blackman, 2020

This is a mid-block location located across the street from Exploria Stadium. The pattern of the crossing guards suggests that a significant number of children travel south along Parramore Avenue, but there is no crossing guard at the intersection of

Parramore Avenue and Central Avenue. On non-event days at Exploria Stadium, crossing in this area would likely be a non-issue; however, with a 25% increase in vehicular traffic in this area during events, investment should be made to prioritize pedestrian safety here. There is a sidewalk along the eastern edge of Exploria Stadium that connects Central Avenue and Church Street. The recommendation of this paper is to add a rectangular rapid flash beacon at both sides of this sidewalk to increase pedestrian safety.

These rectangular rapid flash beacons would not only make it safer for children travelling home from school but have the added benefit of providing a safer pedestrian experience for guests attending events and walking to Exploria Stadium. As noted, unlike the Amway Center, Exploria Stadium does not have access to on-site parking structures and many guests attending an event at Exploria Stadium will park in downtown parking structures and walk or shuttle to the stadium. The proposed rectangular rapid flash beacons would be located on the eastern side of Exploria Stadium, which is closer to downtown and where the typical influx of pedestrian traffic takes place.

The expected cost for the purchase and installation for three rectangular rapid flash beacons is approximately $12,000. Each rectangular rapid flash beacon costs approximately $2,829 and the installation cost per unit is approximately $1,170 (LED Lighting Solutions, n.d.).

Increased Intersection Staffing

It is the recommendation of this paper to add additional crossing guards and/or security officers at two locations in order to further improve pedestrian safety in the area near the Exploria Stadium. The proposed locations include:

Figure 39

Intersection of Central & Parramore

Source: Joshua Blackman, 2020

1: West Central Boulevard & North Parramore Avenue (Latitude: 28.542 | Longitude: -81.3890) (see figure 38).

The southbound Parramore Avenue crossing guard pattern remains consistent until it reaches Central Boulevard, where crossing guards are no longer present.

2: West Central Boulevard & Glenn Lane (Latitude: 28.542 | Longitude: -81.3905) (see figure 40).

There is an existing crossing guard location at the south intersection of Glenn and Church Street; however, there is no crossing guard located at the northern intersection of Glenn and Central Boulevard.

Figure 40

Intersection of Central & Glenn

Source: Joshua Blackman, 2020

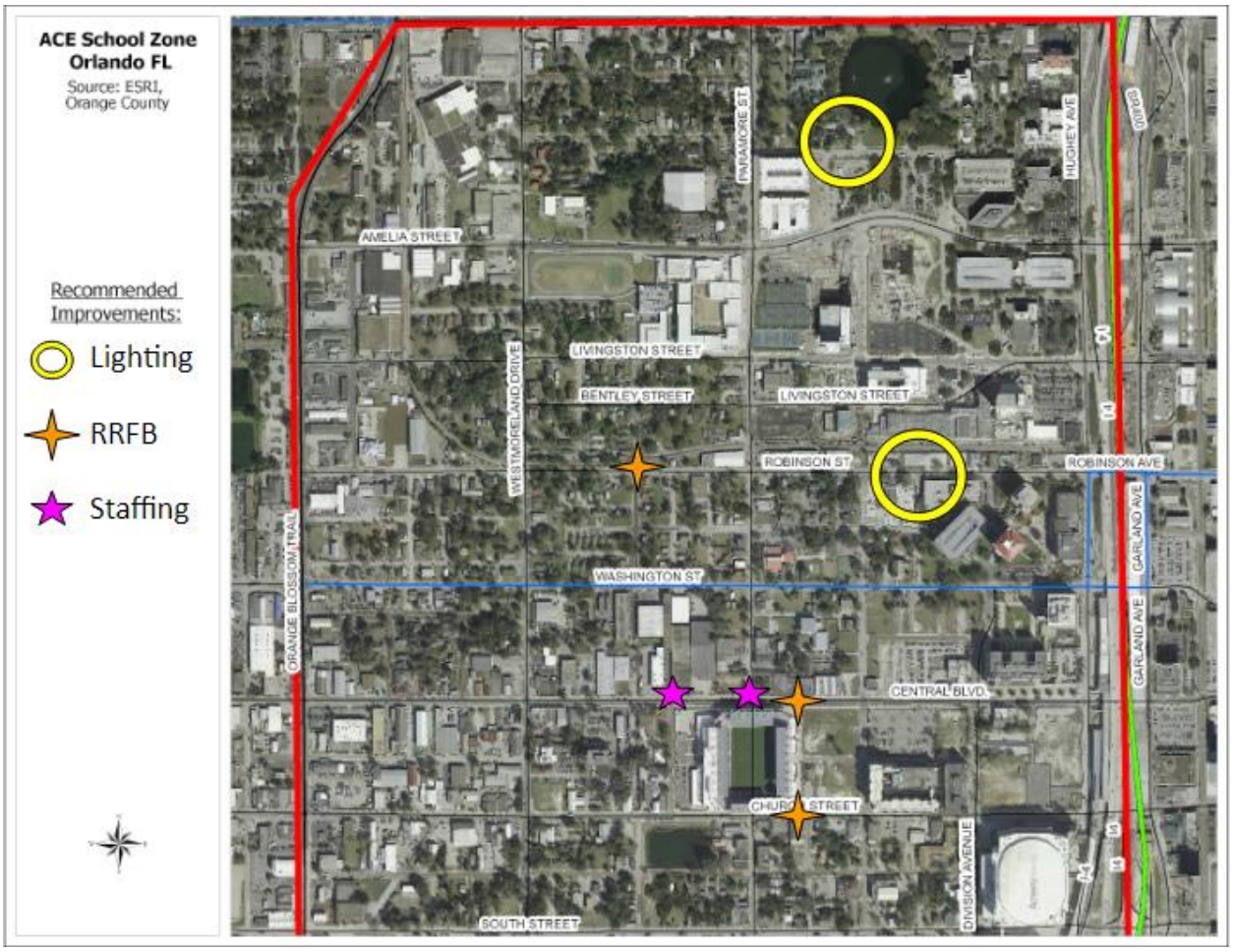
Following the crossing guard pattern, children likely and regularly navigate through this particular corridor and adding a crossing guard at these two locations on event days would likely prove beneficial due to the increase in vehicular traffic. Exploria Stadium is located on Central Boulevard and Church Street, which are busy thoroughfares on event days. These two locations (see figure 41) would be a natural opportunity for a public-private partnership between the Orange County Public School System and the Orlando City Soccer Club to share resources. Additional staffing would only be required on days where an event is hosted at Exploria Stadium. On event days, Orlando City Soccer Club could utilize existing event security staff to ensure children are safely crossing the street at this intersection between the hours of 2:00pm and 5:00pm.

Figure 41

Source: Nathan Milch, 2020

The annual estimated cost for the increased staffing would be approximately $1,440. This amount is based on having one class-D certified security officer, not Orange County crossing guards, posted at each intersection. The average estimated amount of weekday events is listed at 15 events and with a total of six hours required per event (3 hours per intersection). The average cost for a class-D security officer is $16 per hour (Salary.com, 2020).

Figure 42

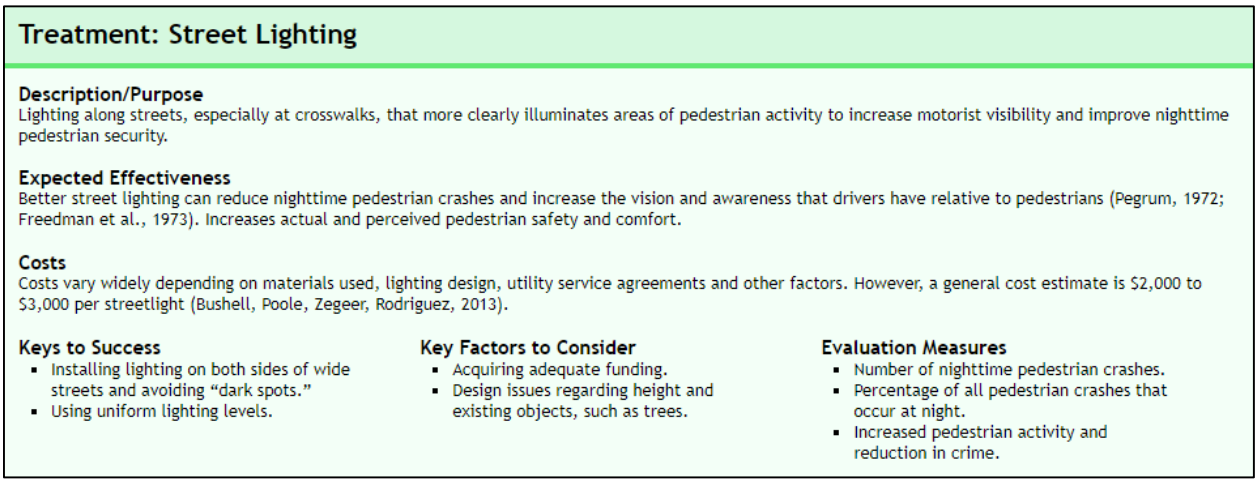


Source: Nathan Milch, 2020

Based on material and installation pricing obtained from the City of Tampa, approximate costs are **$2,140.80** per light fixture. Before specific survey is done, estimates to fix lighting inadequacies total from **$15,000-20,000** In order to provide adequate lighting within the study area, multiple light fixtures are recommended in the following locations:

- Northern side of W. Concord St. surrounding the lake dot area.
- Chatham St. and W Robinson Intersection.

Figure 43



Treatment: Street Lighting

Description/Purpose
Lighting along streets, especially at crosswalks, that more clearly illuminates areas of pedestrian activity to increase motorist visibility and improve nighttime pedestrian security.

Expected Effectiveness
Better street lighting can reduce nighttime pedestrian crashes and increase the vision and awareness that drivers have relative to pedestrians (Pegrum, 1972; Freedman et al., 1973). Increases actual and perceived pedestrian safety and comfort.

Costs
Costs vary widely depending on materials used, lighting design, utility service agreements and other factors. However, a general cost estimate is $2,000 to $3,000 per streetlight (Bushell, Poole, Zegeer, Rodriguez, 2013).

Keys to Success
- Installing lighting on both sides of wide streets and avoiding "dark spots."
- Using uniform lighting levels.

Key Factors to Consider
- Acquiring adequate funding.
- Design issues regarding height and existing objects, such as trees.

Evaluation Measures
- Number of nighttime pedestrian crashes.
- Percentage of all pedestrian crashes that occur at night.
- Increased pedestrian activity and reduction in crime.

Source: Bushell, Poole, Zegeer, Rodriguez, 2013

After performing background research, completing a neighborhood inventory, and conducting traffic counts to identify the impact development has had on the Parramore Community, we conclude the following:

Although extensive enhancements in lighting, sidewalk conditions and connectivity have been made, there are still several locations that would benefit from further enhancements.

Light Fixture Installation proposed:

- North side of W. Concord St. (Lake Dot)
- Chatham St. and W. Robinson (intersection)

On event days, traffic collection data revealed a 25% increase in traffic during the hours when school children walk home from school.

Recommendations to enhance pedestrian safety:

- On event days, increase crossing guards or safety officers nearest to Exploria Stadium

(opportunity for the OCSC to provide security staff to assist).

- Install 3 Rectangular Rapid Flash Beacons surrounding the stadium to increase pedestrian safety.

Table 6

Type of Improvement	**Number of Improvements**	**Estimated Cost**
Light Fixture Materials & Installation	10	$21,400
Crossing Guards	2 OCSC Officers	$1,440 Annually (2 Officers*15 Events*3Hrs*$16hrly)
Rectangular Rapid Flash Beacons Materials & Installation	3	
Total	**$34,840**	

Source: Nathan Milch, 2020

Conclusions

The Capstone Parramore Safety project was conducted in order to provide our Capstone project group with insights into the planning process and community of Parramore. After thorough examination of the previous planning efforts within the Parramore Community and the ACE School Zone, we were able to see that although extensive study and resident outreach was conducted within the community, there are still many concerns that were overlooked. The improvements within the ACE School Zone have been substantial, but with certain pedestrian

crossing improvements along with added lighting, many of the issues caused by the growth of development can be mitigated resulting in a safer Parramore Community. Several important take-aways from our recommendations include:

1. The traffic study results provided quantifiable evidence that on days where there is an event held at Exploria Stadium, traffic counts significantly increase. Throughout the entire day average, there is an increase of traffic of 17% on event days compared to non-event days but more importantly, there is an increase of 25% in traffic on event days compared to non-event days during the time when children are walking home from school, passing by the stadium. Recommendations would be to add staffing at intersections that are currently missing during events at Exploria Stadium. The other recommendation is to add three rectangular rapid flash beacons in the Parramore community to assist with pedestrian safety.
2. Lighting had been improved within the neighborhood since the 2014 barriers to access report was conducted. Majority of the noted lighting deficiencies have been improved, with exceptions for the Capstone groups recommended locations for installation. The locations surrounding the ACE School have been completed revamped with lighting infrastructure installed to accommodate the increase in neighborhood activity. However, the recommendations in this report and map would further increase the walkability and safety of the area with the possible subsidiary benefits of decreased crime.
3. Sidewalk condition in the neighborhood has significantly improved in the areas adjacent to the newest developments. The streetscapes along the ACE School, UCF Downtown Campus and Exploria Stadium are designed to encourage pedestrian travel and the wide sidewalks, street parking and bus lanes provide a protective buffer from flowing

automobile traffic. In most of the area's children are walking after school the sidewalks have been maintained or were recently upgraded and are in good condition. The infrastructure around the new developments facilitates the large crowds present during events and provide a consistent quality of life improvement for the residents as well. The improvement in walk score and bike score for most of the neighborhoods supports the conclusions from the audit with regard to pedestrian infrastructure. Our infrastructure recommendations focus on key intersections that create points of conflict between pedestrians and automobiles that put the unprotected individuals at risk.

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Appendices

Figure 1: 2019 Population Density for ACE School Zone and Surrounding Area

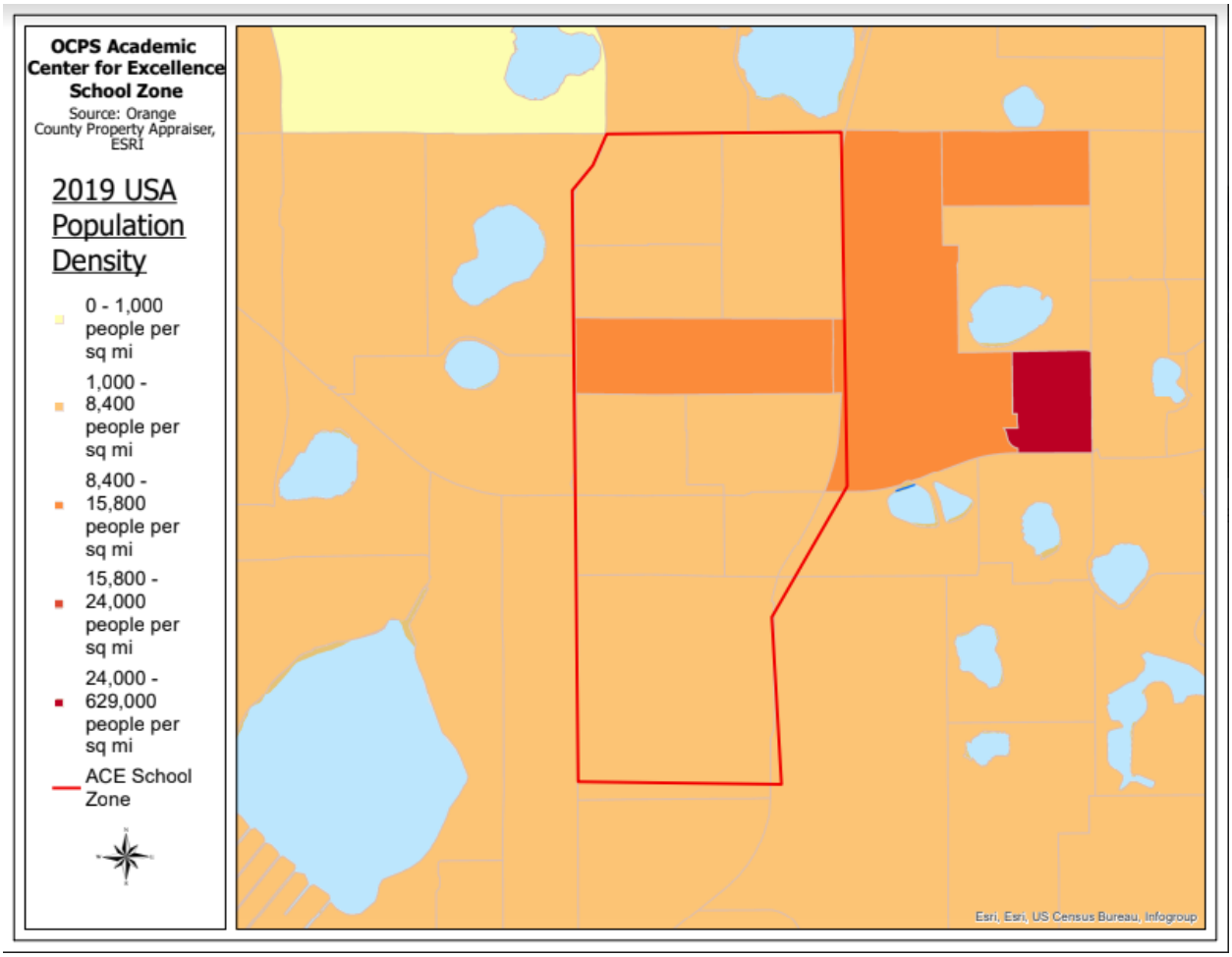


Figure 44: 2019 Education Spending with the ACE School Zone and Surrounding Area

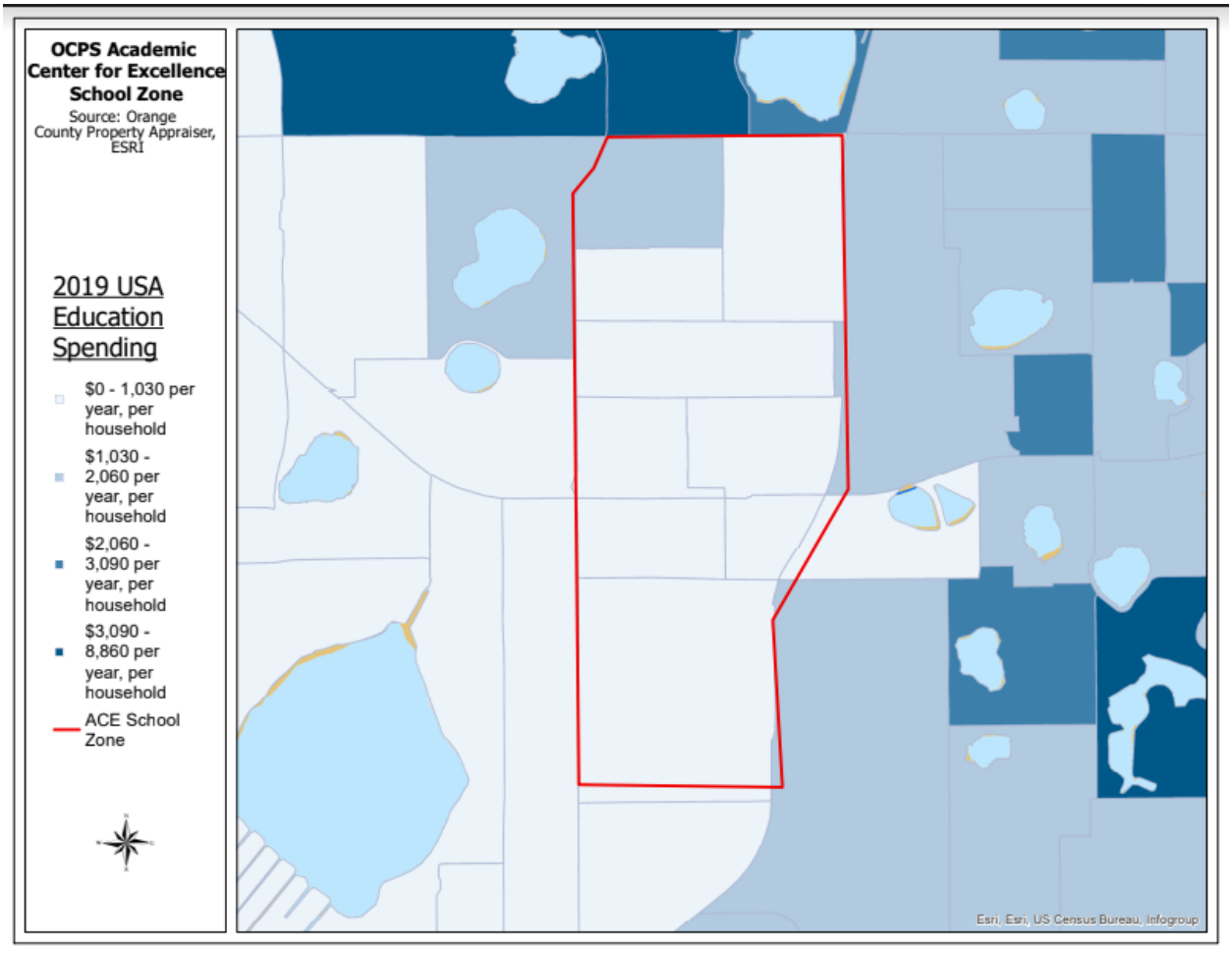
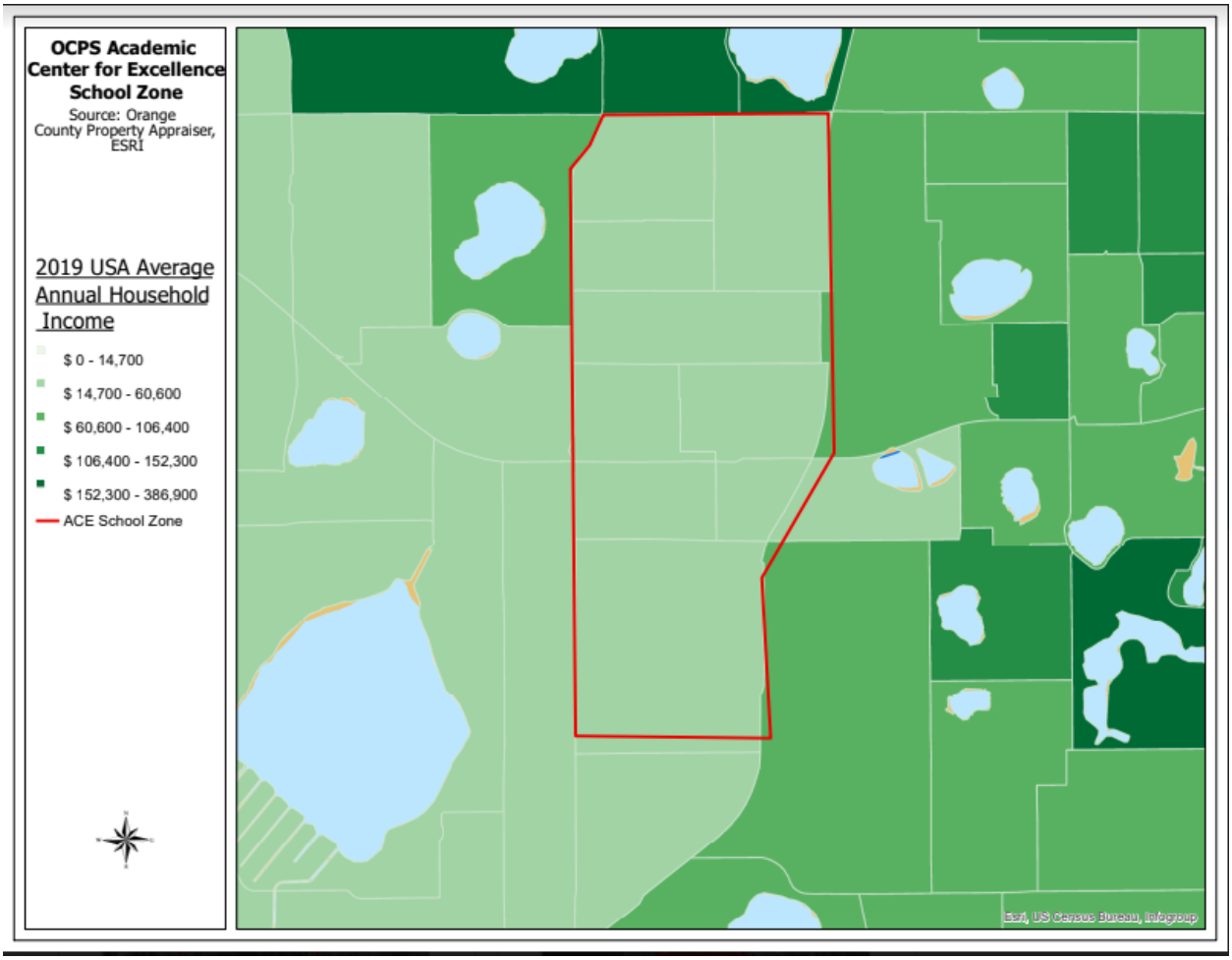
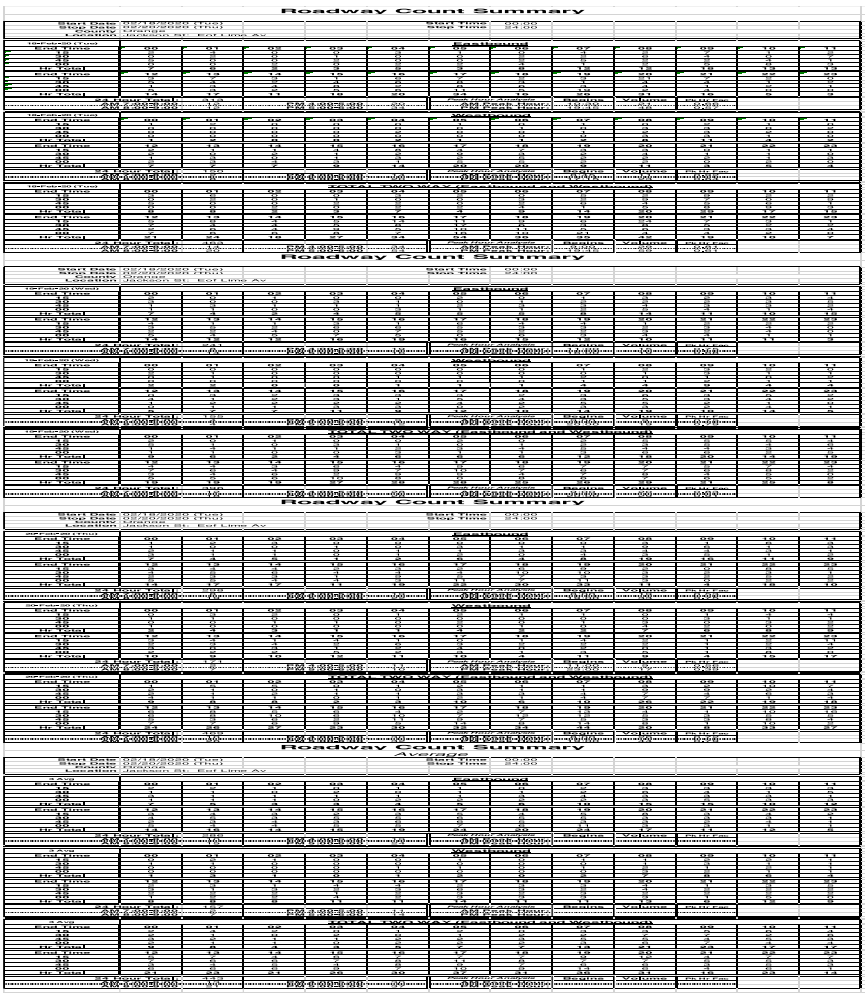


Figure 2: 2019 Income for ACE School Zone and Surrounding Area



Raw Traffic Count Data


Roadway Count Summary
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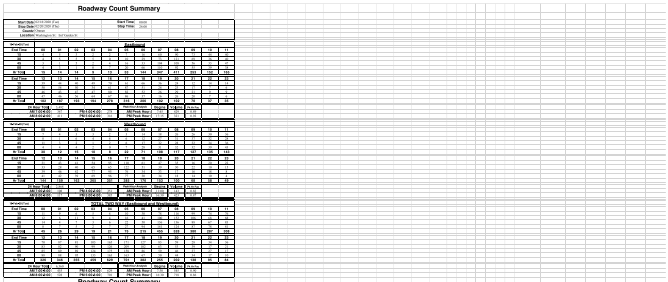
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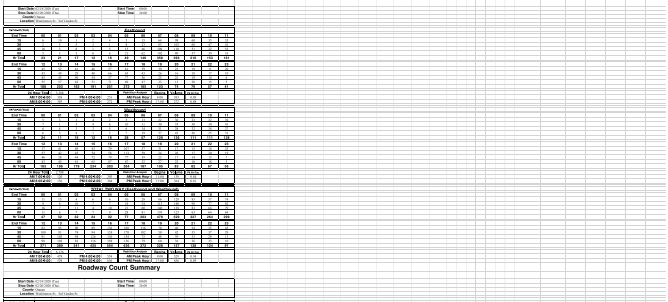
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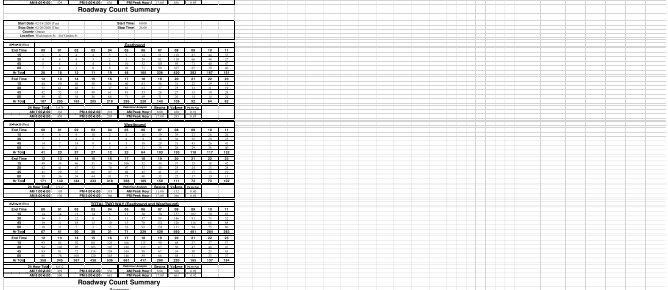
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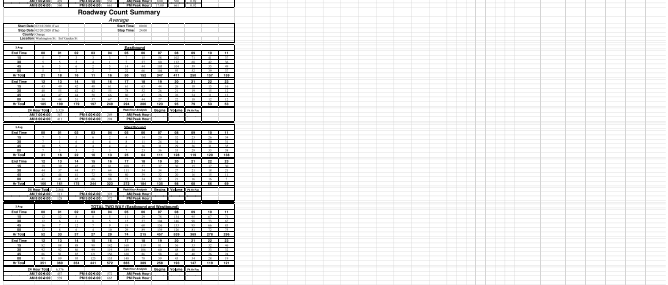
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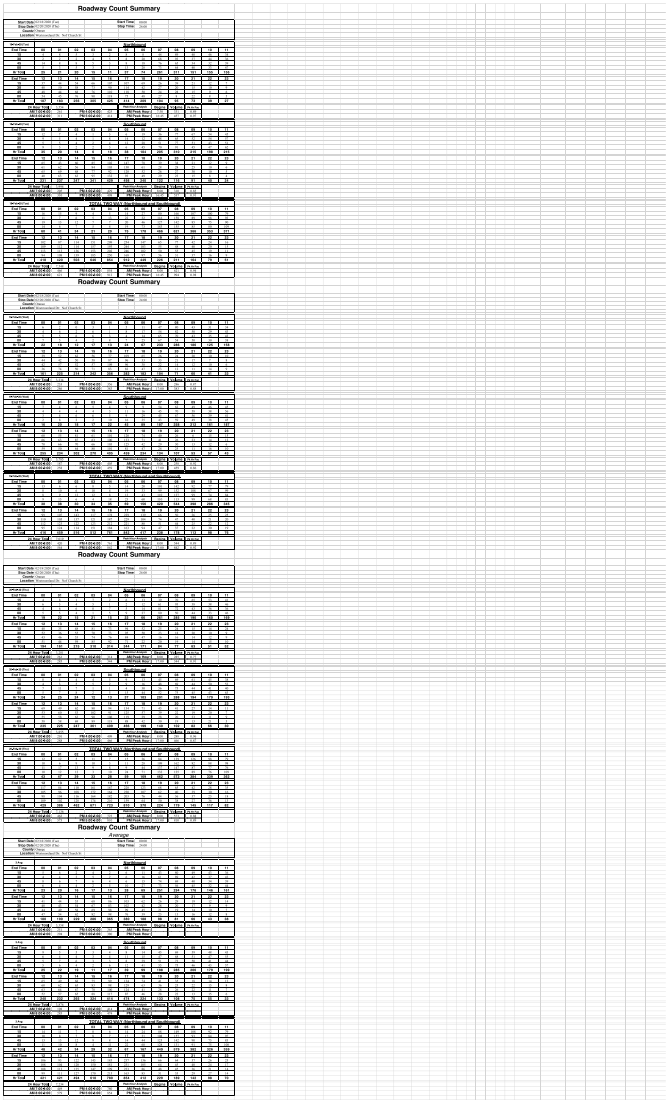
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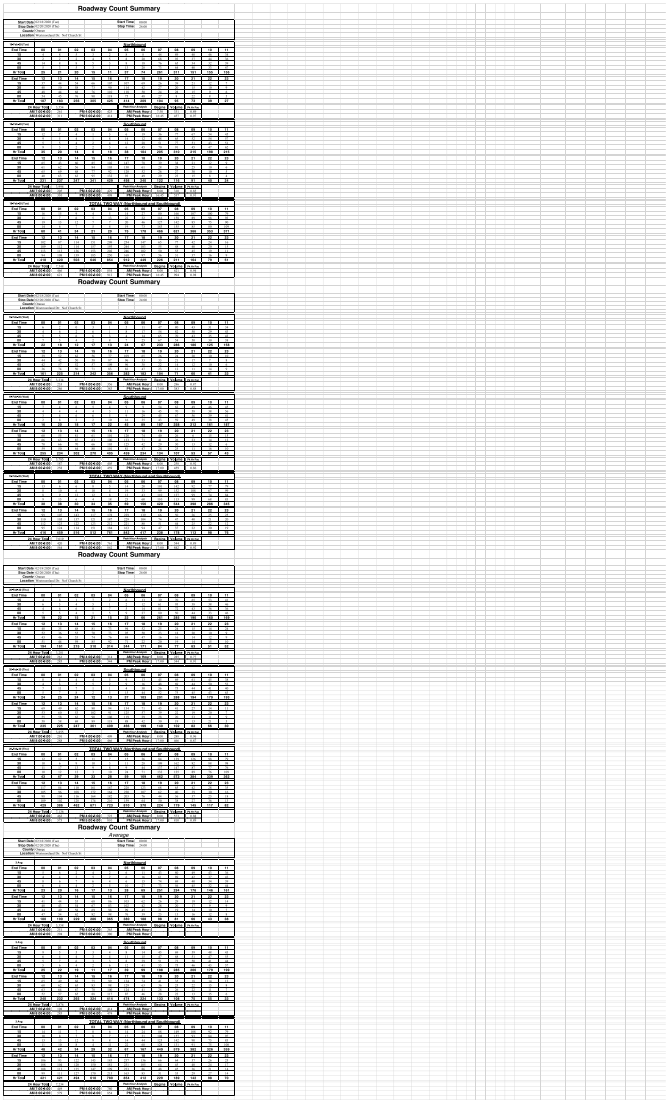
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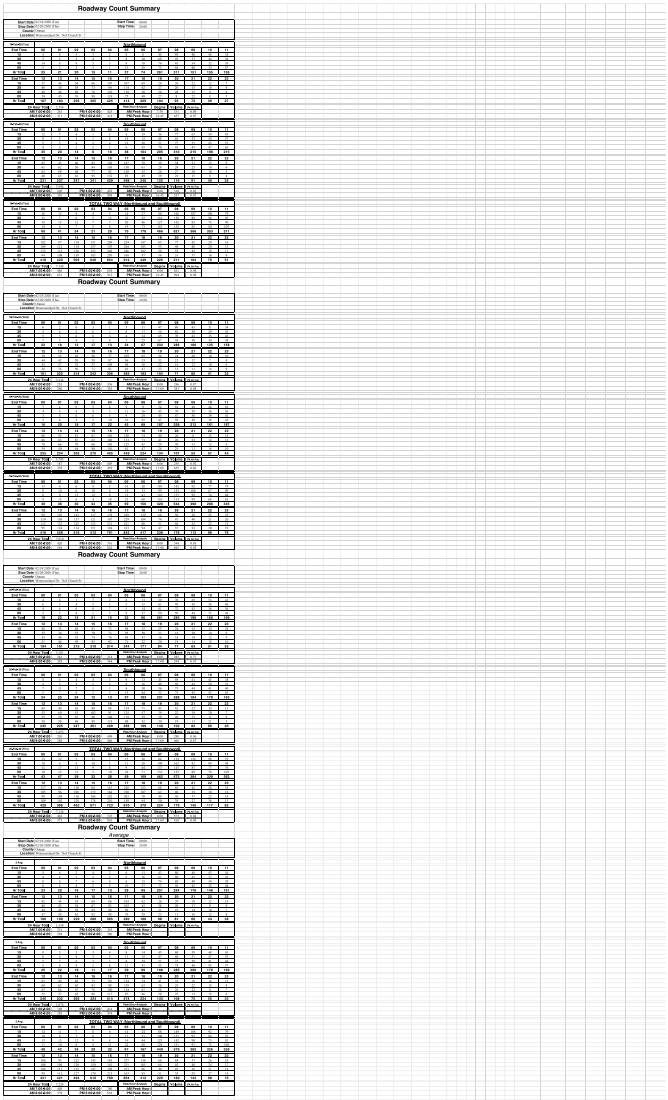

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