# Intersection Study:
# Stadium Drive and Gaines Street
# Intersection with N Lake Bradford Road

## DRAFT Existing Conditions Report

July 16, 2021

# Contents

# Background

Over the last several years, the southern portion of downtown Tallahassee, Florida has undergone dramatic growth and significant investments in transportation infrastructure. The Gaines Street Corridor Revitalization Plan included extensive infrastructure improvements designed to foster multimodal usage and economic investments. In addition to the corridor revitalization and redevelopment, the Capital Cascades Park, at the eastern end of Gaines Street, was also developed which fostered additional growth in the area. The adjacent streets within the area also received significant economic investments as the areas continue to redevelop.

With the presence of the Florida State University (FSU) campus and stadium, additional properties are being developed or redeveloped, and/or are anticipated to redevelop in the future. These developments include large apartment complexes targeted to the student market. This increasing presence of residential land uses has highlighted the need for pedestrian and bicycle safety as the number of users continues to rise, both during every-day conditions, as well as game day conditions.

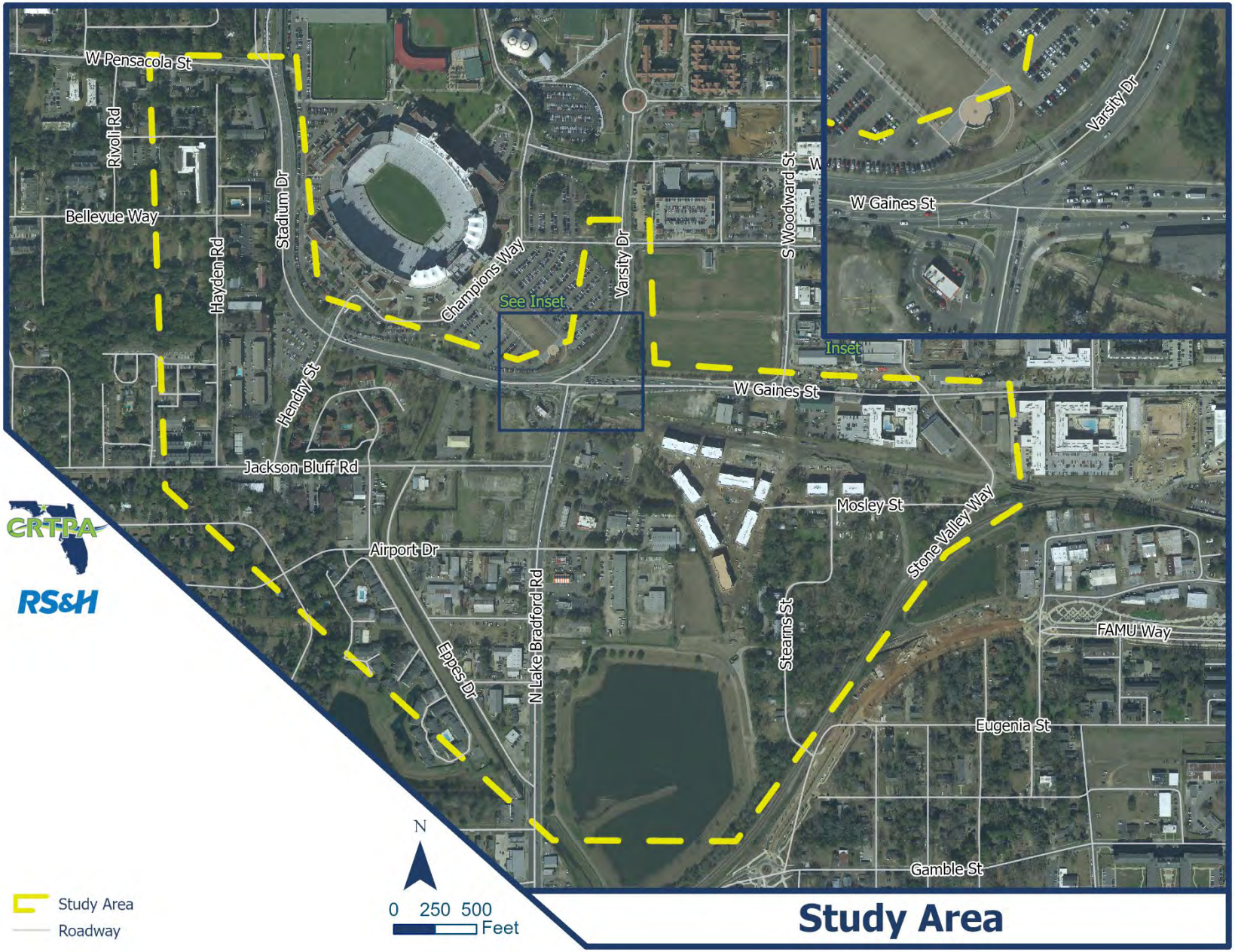
The intersection of Gaines Street, Stadium Drive, and North Lake Bradford Drive (project intersection) is a large, complex intersection that can easily confuse drivers and pedestrians. The width of pavement, complex turning movements, and the increasing number of pedestrians, particularly accessing campus from the residential areas on the south side of Gaines Street and Stadium Drive, pose multiple hazards for all entering the intersection regardless of the mode of travel.

In assessing the intersection area, it is important to consider both the “upstream” and “downstream” areas that potential recommendations will likely impact. Understanding these implications will be critical to ensure any recommendations are feasible and will not adversely impact other intersections or mobility efficiency in the surrounding area.

## Study Area

The study area for this effort includes upstream intersections and nearby areas that could be significantly impacted by modification of this intersection. The project study area is roughly bounded by Hayden Rd. to the west, Eppes Dr. and FAMU Way to the south, Stone Valley Way to the east, and along the northern side of Gaines St/Stadium Dr. Figure 1 depicts the study area with an inset of the main project intersection.

*Figure 1: Project Study Area*



## Goals and Objectives

As described above, the intent of this project is to identify existing and future conditions within the area which will be used to develop recommendations for improving the intersection. The project intersection has unconventional vehicle movements and lane merging areas, making it confusing for motorists in the area. Additionally, its location next to the FSU campus leads to an increased number of pedestrians and cyclists that frequent the area during the academic year. The following goals have been identified to provide the framework for this effort.

- General Improvement of traffic flow through the area within the future year 2045
    - Consider recommendations that allow this intersection to achieve Level of Service (LOS) C during peak hour traffic
    - Consider the transportation impact on nearby intersections for any proposed changes at the project intersection
- Reduction in vehicular crash severity and frequency within the study area
    - Propose recommendations that will lead to fewer and less severe crashes
    - Reduce pedestrian and cyclist conflict points
- Continue the trend of roadway improvement within Tallahassee
    - Consider the development of the Gaines Corridor and the planned improvements along N Lake Bradford Rd.

## Previous and Ongoing Studies

### SR 366 (STADIUM DRIVE) / VARSITY DRIVE & W. GAINES STREET AT STATE ROAD 371 (N. LAKE BRADFORD ROAD) NETWORK STUDY

Developed in 2017 by the Florida Department of Transportation (FDOT) District 3 (FDOT D3), this operations analysis was conducted for a similar study area as the current project. The FDOT study developed a series of conclusions and recommendations based on an analysis of a 20-year planning horizon. The intersections and conclusions found within the network study have been included below and the full report has been included within the appendix.

FDOT Project Intersections

- State Road 366 (Stadium Drive) / Varsity Drive and W. Gaines Street at State Road 371 (N. Lake
- Bradford Road)
- State Road 366 (Stadium Drive) at Hendry Street / Champions Way
- State Road 371 (N. Lake Bradford Road) at Jackson Bluff Road
- Varsity Drive at St. Augustine Street

#### *Summary of Conclusions*

- Within the three-year study period, the number of crashes was higher than the statistical average for similar facilities within D3, with the exception of the Varsity Dr/and St Augustine St intersection.
- During the AM and PM peak periods, three of the existing turn lanes are insufficient and are not meeting the current vehicular demand:
    - Stadium Dr./Hendry St., southeast bound left turn lane
    - N Lake Bradford Rd./ Jackson Bluff Rd., northbound left turn lane
    - Varsity Dr./St Augustine St., southbound left turn lane

- All signalized intersections are achieving acceptable LOS
- An analysis to determine the impact other intersections on a potential roundabout found that the southbound queue from the N Lake Bradford Rd./Jackson Bluff Rd. would interfere with the roundabout in existing PM volumes, and both AM and PM in the 20-year future conditions.
- Intersection Specific Conclusions
    - Stadium Dr./Gaines St./N Lake Bradford Rd.
        - Construction of dual left-turn lanes, exclusive thru, and an exclusive right-turn lane on the northbound approach would decrease the overall intersection delay by 4.7 sec/vehicle in the PM peak period.
        - Construction of a two-lane roundabout with right-turn slip lanes would decrease the overall intersection delay by 22.9 sec/vehicle in the AM peak period and decrease the overall intersection delay by 23.0 sec/vehicle in the PM peak period.
        - Within the 20-year planning horizon (1% yearly growth factor), construction of a two-lane roundabout with right-turn slip lanes would result in a LOS C in the AM peak period and a LOS F in the PM peak period.
    - Stadium Dr./Champions Way/Hendry St.
        - Construction of a northbound left-turn lane on Hendry Street at State Road 366 (Stadium Drive) would decrease the overall intersection delay by 5.1 sec/vehicle in the PM peak period.
    - N Lake Bradford Rd./Jackson Bluff Rd.
        - Construction of dual eastbound left-turn lanes on Jackson Bluff Road at State Road 371 (N. Lake Bradford Road) would decrease the overall intersection delay by 3.0 sec/vehicle in the PM peak period.
        - Removing split phasing operations for the side street movements at the intersection of State Road 371 (N. Lake Bradford Road) at Jackson Bluff Road would decrease the overall intersection delay by 4.0 sec/vehicle in the AM peak period and decrease the overall intersection delay by 5.4 sec/vehicle in the PM peak period.
- A SIDRA analysis was conducted to assess a roundabout at the Stadium Drive/Gaines St./N Lake Bradford Rd.
    - A Two-lane roundabout with right slip lanes would create the following:
        - LOS A for AM and LOS D for PM peak in existing conditions
        - LOS B for AM and LOS F for PM peak in future conditions
    - Step 1 of the roundabout screening was not satisfied

*Study Recommendation*

- Extend the existing southbound right turn lane at the Stadium Dr./Champions Way/Hendry St. intersection to provide 240 feet of storage and 145 feet of declaration lane for a total of 385 feet.

## CR 2203/SR 371 (Springhill Rd/Lake Bradford Rd) From SR 373 (Orange Avenue) to SR 366 (Stadium Drive) Access Management Study.

Completed in May 2020, the FDOT D3 Design Office conducted an access management study along Lake Bradford Rd. from Stadium Dr. to Orange Ave. Though a significant portion of this access management study is located outside of the project study area, potential changes along Lake Bradford Rd. would have significant impact on future improvements. The findings within the Access Management Report have been

summarized into short-term and long-term recommendations. The long-term recommendations are more intensive and may take advantage of the Airport Gateway concept being planned by Blueprint Intergovernmental Agency.

### *Short Term Recommendations*

The short-term recommendations were developed with the mindset that the existing right-of-way (ROW) would be maintained. Currently, much of the corridor is constrained and R/W expansion may not be possible. If implemented, the development of medians would be with the intent of limiting U-turns in the area.

- Consider the development of a median using the spacing and configuration detailed within Figure 2.
    - Two typical sections were developed and considered within the existing right-of-way. These are outlined below and explained within Figure 3.
        - Option 1 maintains better lane widths and median widths.
        - Option 2 completes the bike lane network along the Corridor with narrower median and travel lane widths.
- Gather additional bicycle and pedestrian counts along the corridor for the identification of appropriate mid-block crossing locations.
    - Potentially critical along the ½ mile section from south of Kissimmee Street to Pepper Drive, where five (5) pedestrian crashes occurred between 2017 – 2019.
    - Evaluate additional locations where mid-block crossings may be warranted based on current and future land use attractors and/or generators.

*Figure 2: Proposed median Opening Locations and Spacing*

| Intersecting Street Name | Proposed Median Opening (Y/N) | Proposed Median Opening Type | Dist. b/n Proposed Median Opening or Signal (ft) | % Tolerance for Full Median/ Signal Spacing | % Tolerance for Directional Median Spacing | Variance Required (Y/N) |
|---|---|---|---|---|---|---|
| SR 373 (Orange Ave) | Y | Signal | Existing Signalized Intersection | | | |
| | | | 996' | 75.5% | 150.9% | |
| Mills St. | Y | Full | | | | Y |
| | | | 1020' | 77.3% | 154.5% | |
| Lake Bradford Rd. | Y | Signal | Existing Signalized Intersection | | | |
| Coleman St. | N | | 885' | 67.0% | 134.1% | |
| Hutchinson St. | Y | Full | | | | Y |
| Kissimmee St. | N | | 1148' | 87.0% | 173.9% | |
| Levy Ave. | Y | Signal | Existing Signalized Intersection | | | |
| Renfroe Valley St. | N | | 1086' | 82.3% | n/a | Existing |
| Lake Ave. | N | | | | | |
| McCaskill Ave. | N | | | | | |
| Stuckey Ave. / FAMU Way | Y | Signal | Existing Signalized Intersection | | | |
| Elberta Dr. | N | | 990' | 75% | 150% | |
| Hernando Dr. | N | | | | | |
| Pepper Dr. | Y | Full | | | | Y |
| Eppes Dr. | N | | 1465' | 111.0% | 222.0% | |
| Lake Elberta Ln. | N | | | | | |
| Crate St. | N | | | | | |
| Airport Dr. | Y | Directional | | | | Y |
| | | | 440' | 33.3% | 66.7% | |
| Jackson Bluff Rd. | Y | Signal | Existing Signalized Intersection | | | |
| | | | 420' | 31.8% | | |
| SR 366 (Stadium Drive) | Y | Signal | Existing Signalized Intersection | | | |

Key: Median Opening Type
S = Signalized
F = Full
D = Directional

Source: CR 2203/SR 371 From SR 373 to SR 366 Access Management Study

*Figure 3: Options using the available R/W*

| | Option 1: Maintain Partial Bike Lane Using Existing Curb-to-Curb Width (ft)* | | Option 2: Complete Bike Lane Using Existing Curb-to-Curb Width (ft)* | |
|---|---|---|---|---|
| Item/Element | 64 ft | 68 ft | 64 ft | 68 ft |
| Existing Curb/Gutter | 2 ft | 2 ft | 2 ft | 2 ft |
| SB Bike Lane | | 4 ft | 4 ft | 5 ft |
| SB Travel Lane 1 | 11 ft | 11 ft | 10 ft | 11 ft |
| SB Travel Lane 2 | 11 ft | 11 ft | 10 ft | 10 ft |
| Median (incl. c/g) | 16 ft | 12 ft | 12 ft | 12 ft |
| NB Travel Lane 2 | 11 ft | 11 ft | 10 ft | 10 ft |
| NB Travel Lane 1 | 11 ft | 11 ft | 10 ft | 11 ft |
| NB Bike Lane | | 4 ft | 4 ft | 5 ft |
| Existing Curb/Gutter | 2 ft | 2 ft | 2 ft | 2 ft |
| Total Width | 64 ft | 68 ft | 64 ft | 68 ft |

Source: CR 2203/SR 371 From SR 373 to SR 366 Access Management Study

### *Long Term Recommendations*

The development of recommended median and travel lane widths should reduce the crash rates and complete streets features should be considered along the corridor given the current development in the area. Care should be taken to understand the operational impacts of reducing lane withs and adding complete streets infrastructure.

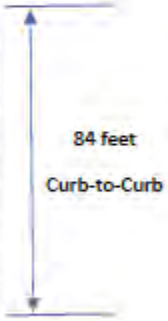
- Continue coordination with Blueprint Intergovernmental Agency (BPIA) when moving forward with the development of the planned Airport Gateway project. This access management plan and the suggested median spacing may be considered as future improvements are developed. Figure 4 depicts a roadway concept of Lake Bradford Rd. as part of the Airport Gateway project.
  - This access management plan identifies Option 3 (Figure 5) as the most holistic development of complete streets infrastructure along the corridor.
  - This concept allows for the development of buffered bike lanes, smaller travel lanes, a median and sidewalks.

*Figure 4: BPIA Concept - StreetMix.net*

Source: CR 2203/SR 371 From SR 373 to SR 366 Access Management Study; BPIA

*Figure 5: Reasonable ROW assumptions based on the BPIA Concept*

| Item/Element | Option 3: Comparable to the BPIA "Airport Gateway" Project R/W Width (ft) |
|---|---|
| R/W Buffer (1' min) | 1 |
| Sidewalk (LT) | 6 |
| Utility Strip (LT) | 8 |
| Type F Curb/Gutter | 2 |
| SB Buffered Bike Lane | 7 |
| SB Travel Lane 1 | 11 |
| SB Travel Lane 2 | 11 |
| Median (incl. c/g) | 18-22 |
| NB Travel Lane 2 | 11 |
| NB Travel Lane 1 | 11 |
| NB Buffered Bike Lane | 7 |
| Type F Curb/Gutter | 2 |
| Utility Strip (RT) | 4 |
| Expanded Sidewalk (RT) | 10 |
| R/W Buffer (1' min) | 1 |
| **Total** | **114 ft** |




Source: CR 2203/SR 371 From SR 373 to SR 366 Access Management Study.

## Intersection Concept Alternatives, 2017

As part of a similar planning effort, a series of three concept drawings were developed to identify potential changes to the project intersection. In 2017, five concepts were developed to potentially address concerns within the area. These concept drawings range from the modification of the travel lanes to the development of a two-lane roundabout and traffic divergence.

## Blueprint Intergovernmental Agency (BPIA)

The Blueprint Intergovernmental Agency (BPIA) is currently working on the Airport Gateway project which is focused on improvements to the corridors from the airport into Tallahassee's urban core. Though not the sole focus of the gateway project, Lake Bradford Rd. has been identified as one of the gateway corridors for suggested improvements.

# Existing Conditions

## Project Intersection Characteristics

The intersection is not traditional in that two of the legs (eastbound and southbound) are generally on a curve as they enter the intersection. This intersection is signalized and has multiple pedestrian actuation points in addition to slip lanes and pedestrian islands. A drainage culvert is located approximately 700 ft. west of the project intersection and several trees located along the northwestern side impact sight distances when traveling westbound. The project intersection and the existing alignments are shown in Figure 6, and existing infrastructure is described below:

**Eastbound**

Vehicle Lanes

- One through lane
- Two northbound left turn lanes
- One southbound right turn slip lane

Pedestrian/Bicycle Facilities

- Sidewalks on both sides
- Bicycle Lane both right turn and through lane
- One crossing island, ~ 25 ft of crosswalk

**Westbound**

Vehicle Lanes

- Two through lanes
- Two southbound left turn lanes

Pedestrian/Bicycle Facilities

- Sidewalks on both sides
- One crossing island, ~ 105 ft of crosswalk

**Northbound**

Vehicle Lanes

- One through lane and westbound left turn lane
- One though lane and eastbound right turn lane / partial slip lane
- One westbound left turn lane

Pedestrian/Bicycle Facilities

- Sidewalks on both sides
- Two crossing islands, ~ 105 ft of crosswalk

**Southbound**

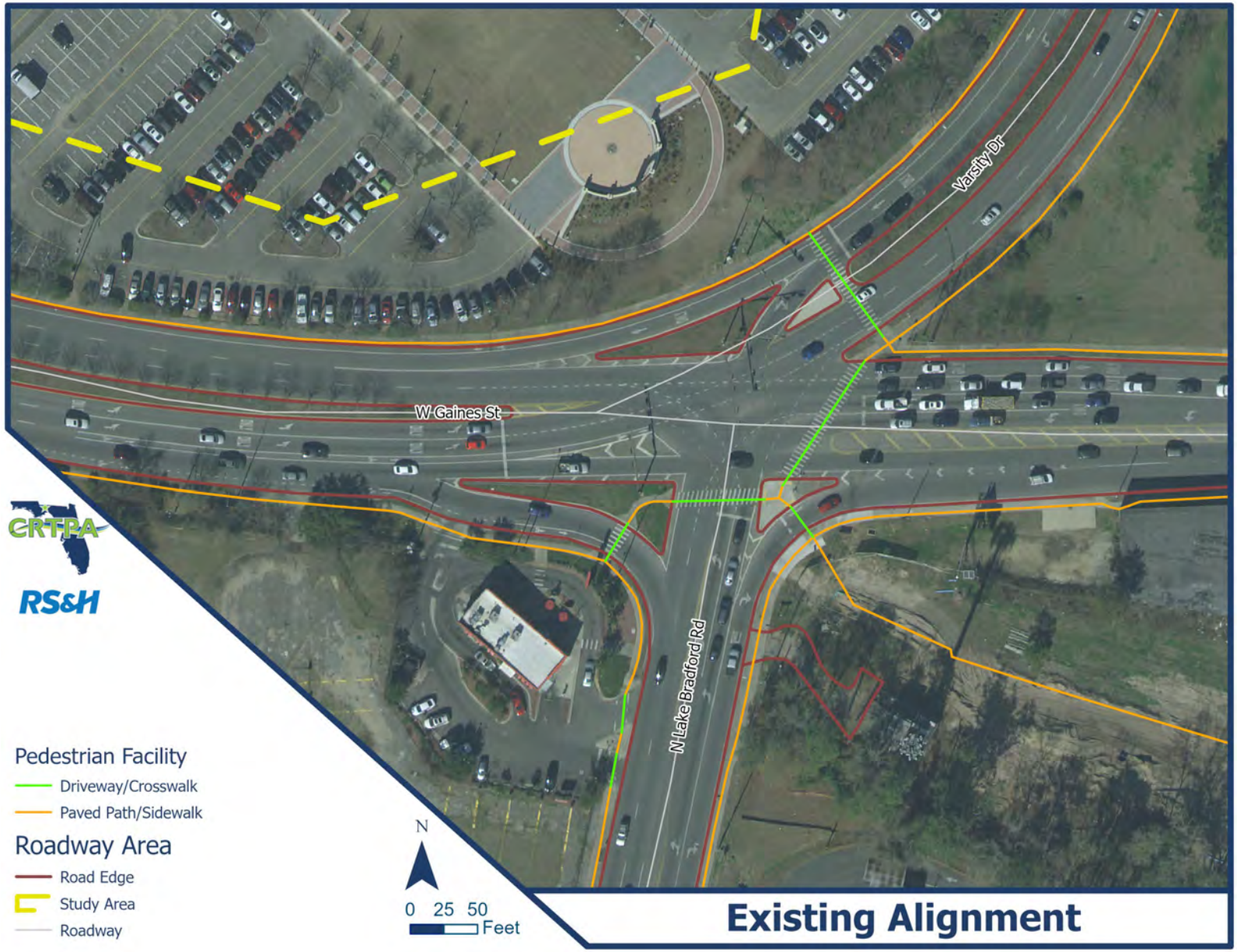
Vehicle Lanes

- One through lane and westbound left turn lane
- One westward right turn/slip lane

Pedestrian/Bicycle Facilities

- Sidewalks on both sides
- Median break for crosswalk, 80 ft of crosswalk
- Two Bicycle Lanes

*Figure 6:Existing Intersection Alignment*




Source: Tallahassee – Leon County GIS

## Existing Land Use

The land uses within the study area are varied, ranging from the Campus properties to the north to the primarily residential areas to the south. Figure 7 depicts the existing land uses nearby the project area. Of the 17 land uses identified within or adjacent to the study area, the top three by acreage are:

- Multi-family
- University (FSU)
- Vacant

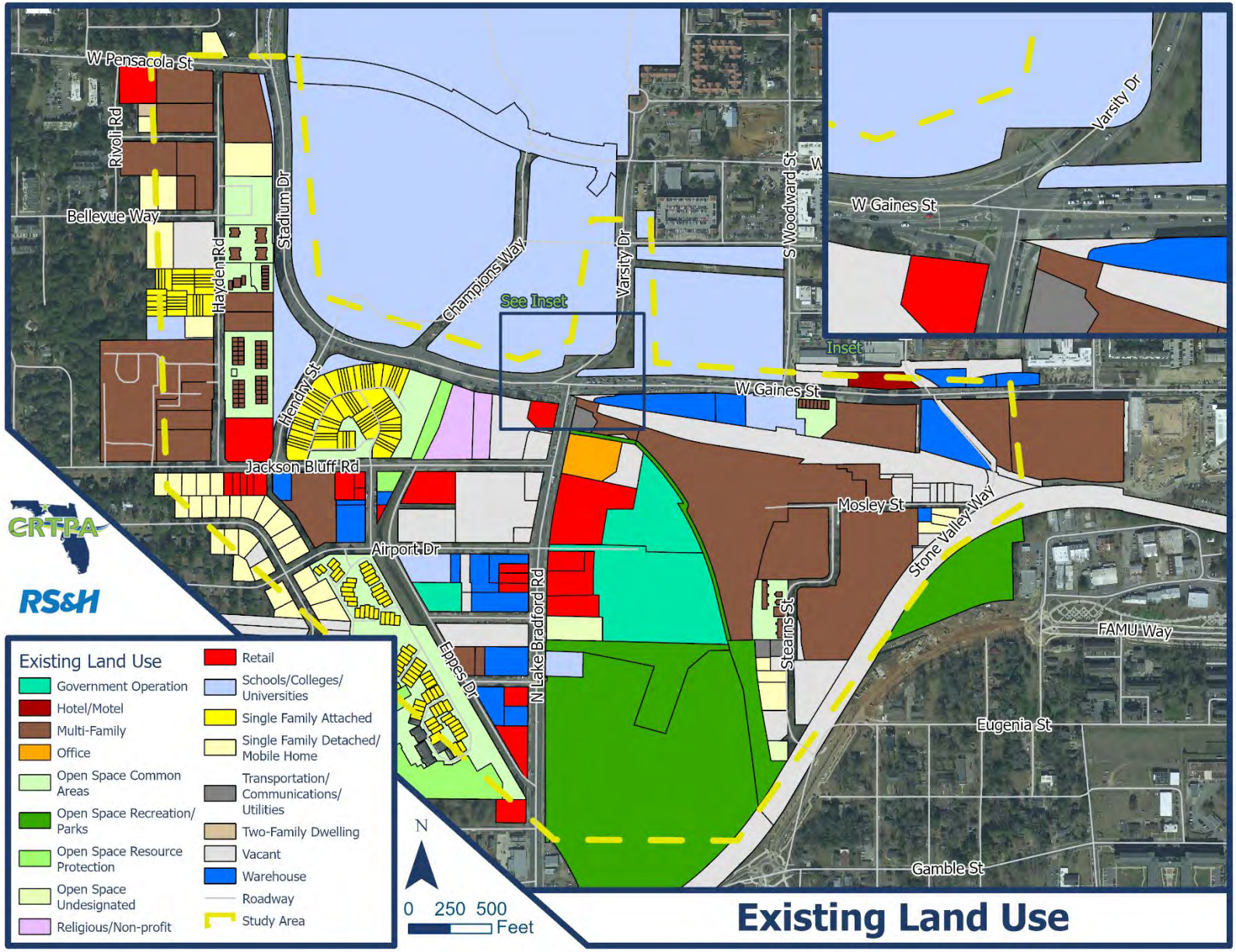
Though vacant is showing as one of the highest values by acreage, this may be a misnomer. Though much of the vacant space does not have structures, it is currently utilized. Significant portions of the vacant areas are currently gameday parking lots and the areas southeast of the intersection have a continuation of a multi-use trail that connects the intersection to a new student housing development in addition to the active railroad that runs adjacent to the corridor. The remaining land uses are depicted within Table 1 below:

*Table 1: Existing Land Uses within or Adjacent to the Study Area*

| Existing Land Use | Number of Parcels | Acres |
|---|---|---|
| Multi-Family | 319 | 220.56 |
| Schools/Colleges/Universities | 12 | 174.1 |
| Vacant | 40 | 65.49 |
| Open Space Recreation/Parks | 6 | 36.69 |
| Open Space Common Areas | 12 | 17.47 |
| Retail | 23 | 11.04 |
| Government Operation | 3 | 10.99 |
| Single Family Detached/Mobile Home | 39 | 10.83 |
| Single Family Attached | 186 | 10.13 |
| Open Space Resource Protection | 3 | 9.56 |
| Warehouse | 18 | 9.03 |
| Religious/Non-profit | 2 | 2.25 |
| Office | 1 | 1.33 |
| Open Space Undesignated | 2 | 1.06 |
| Hotel/Motel | 1 | 0.64 |
| Transportation/Communications/Utilities | 3 | 0.64 |
| Two-Family Dwelling | 1 | 0.18 |
| **Total** | **671** | **581.99** |

Source: Tallahassee – Leon County GIS

*Figure 7: Study Area Existing Land Use*




Source: Tallahassee – Leon County GIS

## Buildings

The study area is located within a rapidly developing area of Tallahassee; however, there are relatively few structures located adjacent to the project intersection. The area east of the project intersection, primarily along the Gaines Street corridor, has been experiencing heavy development in recent years. These developments have shifted the area from primarily warehousing style land uses toward mixed use with retail and medium/high density apartment buildings. The building locations are shown in Figure 8.

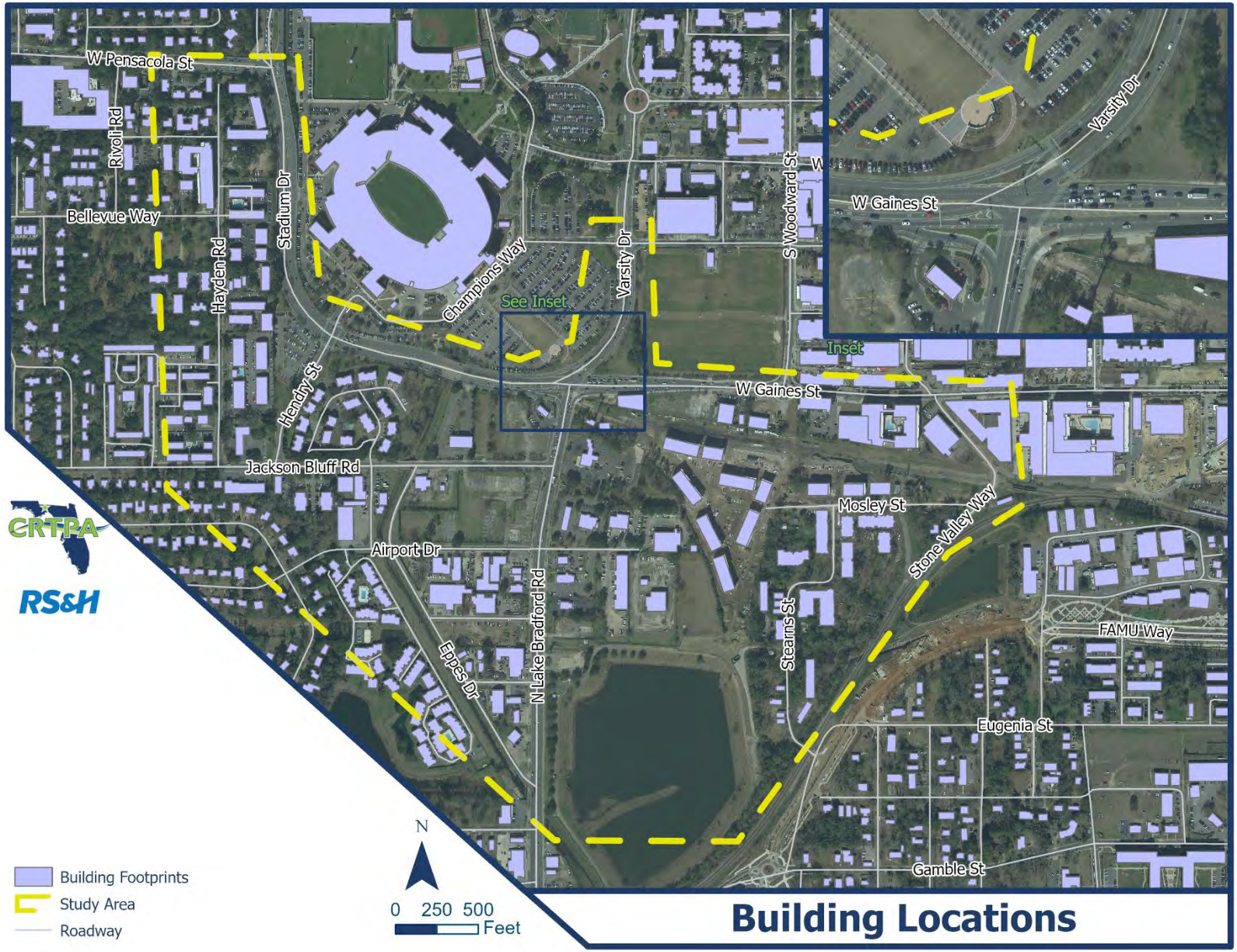
There are four buildings within 500 ft of the project intersection; the characteristics of these structures are as follows:

*Table 2: Structures and Buildings Nearby the Project Intersection*

| Building Type/Use | Location from Intersection Midpoint | Approximate Distance from Intersection Midpoint. |
|---|---|---|
| Checkers - Restaurant | Southwest | 220 feet |
| Bank of America - Bank | South East | 340 feet |
| Apartment Shelter/Pavilion | South East | 250 feet |
| Warehouse Structure | Southeast | 250 feet |

Source: Tallahassee – Leon County GIS

*Figure 8: Existing Building Footprints*




Source: Tallahassee – Leon County GIS

## Historic/Cultural Sites

As part of this analysis, a review of the Division of Historical Resources, State Historic Preservation Officer (SHPO) sites and resources was conducted. This information is made publicly available and was last updated in January 2021. Using this data, several historic structures, resource groups, surveys, and bridges have been identified within or nearby the study area from the Master Site File. Though these locations have been identified as historic, their significance and eligibility for inclusion within the National Register of Historic Places (NRHP) is dependent upon the individual feature and whether a review has been conducted. The identification of these features has been provided at a planning level. If impacts to these features are anticipated, a review will likely be necessary during the PD&E phase of the proposed project.

- Resource Groups are typically historically significant districts, complexes, or archeological areas.
- Historic Bridges depict the locations and attributes of historic bridges across the state.
- Historic Structures represent the approximate location of individual historic buildings or structures.
- Field Surveys represent the boundaries of cultural resource analysis in the region.

The sections below indicate the number of NRHP eligible properties within the study area and 500 ft from the project intersection, respectively.

### *Study Area Historic Resources*

#### Resource Groups

Three resource groups have been identified within the study area. Two of the three resources were identified as eligible for NRHP inclusion, however, due to recent development in the area, the St. Augustine Branch Drainage Ditch (runs adjacent to present day FAMU Way) area identified as no longer eligible. The railroad through the study area remains active and the SHPO evaluation identifies this as an eligible resource for inclusion into the NRHP. These resource groups are shown in Table 3.

*Table 3: SHPO Resource Groups*

| Site ID | Site Name | Evaluation | SHPO Evaluation | Location Notes |
|---|---|---|---|---|
| Le05204 | St. Augustine Branch Drainage Ditch | The section of 8le05204 within the Area of Potential Effect (APE) has been completely infilled and is no longer identifiable as a historic drainage ditch. As a result, the section of 8le05204 within the ape is recommended as no longer being eligible for listing in the NRHP. | Eligible for NHRP | Evaluation suggests that the resource is no longer eligible for NRHP. Located Adjacent to FAMU Way. |
| Le05208 | Central Drainage Ditch | The Central Drainage Ditch was constructed in the 1930s to provide flood relief and reclaim lands as Tallahassee grew and developed. Limited historic information is available. | Ineligible for NRHP | Located adjacent to Epps Drive. |
| Le05209 | Pensacola and Georgia Railroad | The section of 8le05209 within the ape continues to function as an active railroad corridor and retains a high degree of integrity as a historic railroad. As such, it is recommended to remain eligible for listing in the NRHP under criterion a. | Eligible for NRHP | Located parallel to FAMU Way on the border of the study Area. |

Source: SHPO Resource Group (FGDL 2021)

### Historic Structures

Within the study area, there are 33 historic structures identified. Of those 33 structures, two have been destroyed (one commercial and one residential) according to the latest SHPO data. The remaining structures within the area are either unevaluated or listed as ineligible for the NRHP. Figure 9 depicts the SHPO structures in the area and their evaluation status.

### SHPO Surveys

Since 1997, 14 historic and cultural surveys have been conducted within the study area. Table 4 describes the surveys.

*Table 4: Nearby SHPO Surveys Conducted*

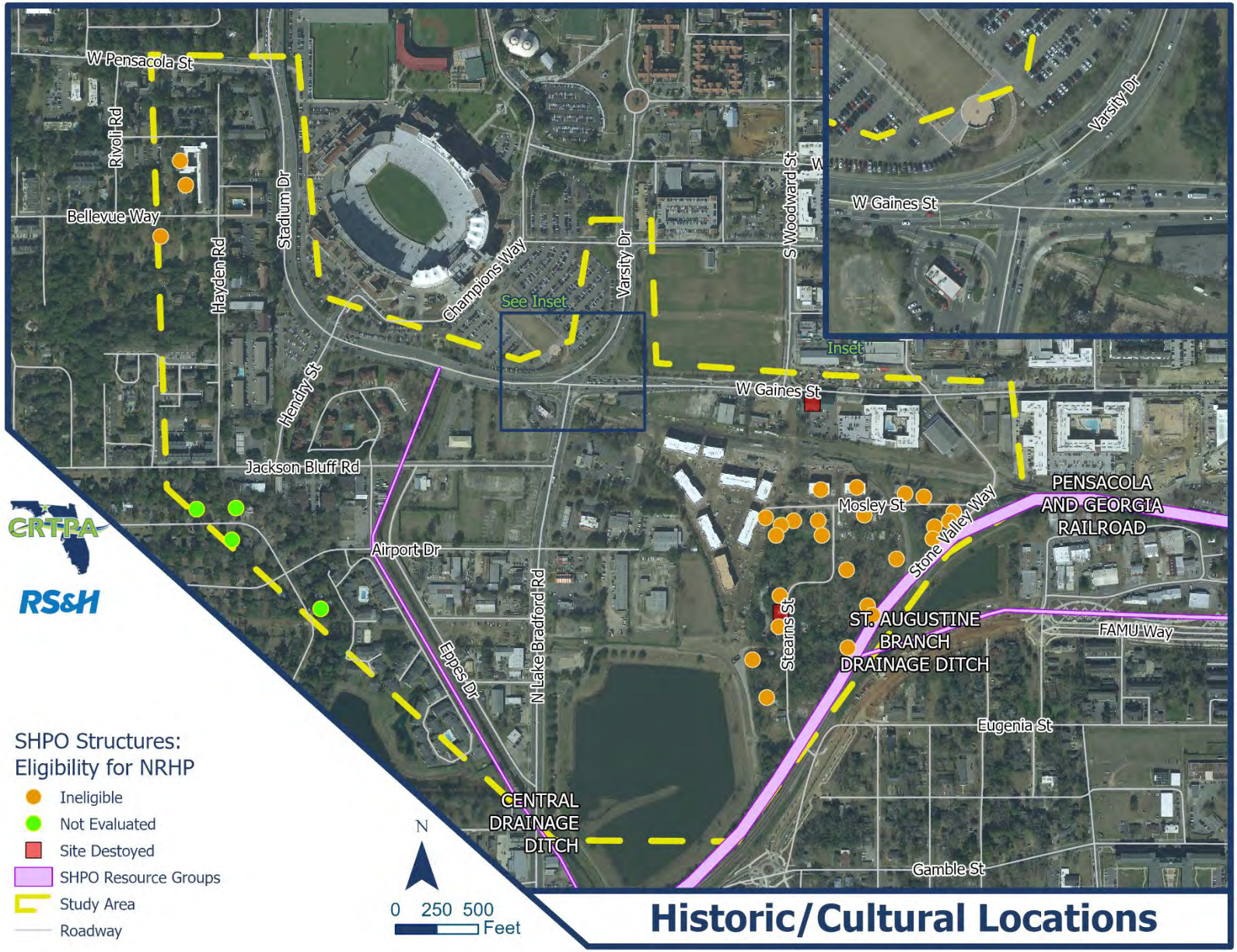
| Survey Number | Survey Title | Publish Date |
|---|---|---|
| 4521 | A cultural resource assessment survey of Gaines Street and Bloxham Street one-way pair study between Meridian Road on the east to vicinity of Lake Bradford Road on the west [two volumes] | 1991 |
| 4737 | April 1997 survey assessment of proposed Florida State University recreational area located between St. Augustine Road and Gaines Street in Tallahassee, Florida | 1997 |
| 4913 | Tallahassee neighborhood survey phase IV, Vol. I; ii | 1997 |
| 9013 | A cultural resource assessment of the Gaines Street corridor PD&E study, Leon County, Florida | 2000 |
| 7942 | Report of cultural resources assessment proposed black swamp tower site FL 119 p-c | 2002 |
| 9065 | A cultural resource survey of a proposed cell tower site at 810 Gay Street Tallahassee, Florida | 2003 |
| 9093 | Cultural resource survey, proposed cell tower site: Monroe Park, #j-584 Tallahassee, Leon county, Florida | 2003 |
| 9966 | Cultural resource survey. Proposed cell tower site: Monroe park, #j-584-6 2nd alternative, Tallahassee, Leon County, Florida | 2004 |
| 11163 | Cultural resource assessment: archaeology 11 stormwater management facilities, Capital Cascades Trail, Leon County, Florida | 2005 |
| 13959 | Cultural resource assessment survey Capital Cascades Trail, Leon county, Florida | 2006 |
| 19623 | Technical memorandum: cultural resource assessment survey FAMU Way extension - phase ii from Pinellas Street to Lake Bradford Road Tallahassee, Leon County, Florida | 2012 |
| 19718 | A cultural resources assessment of Belle Vue way tract, Leon County, Florida | 2013 |
| 21819 | Cultural resources technical memorandum: Lake Bradford at Gamble Street sewer replacement project | 2015 |
| 25160 | FCC / global acquisitions IV, LLC; stadium relo / bun number 830759, proposed 170 foot tall monopole telecommunications tower, 817 Lake Bradford Road, Tallahassee, Leon County, Florida martinenviro #2018-ccu-0134. | 2018 |

Source: SHPO, FGDL 2021

### *Project Intersection Historic Resources*

Using the available information of historic and cultural resources, there are no properties eligible for NRHP inclusion within 500 feet of the project intersection. The closest identified historic resource is the Central Drainage Ditch located adjacent to Epps Drive. Though this resource is not eligible for inclusion into the NRHP, specific restrictions may be necessary to modify this drainage ditch.

*Figure 9: Identified Historic and Cultural Sites*




Source: Florida State Historic Preservation Office

## Socioeconomic Data

In addition to the more static land uses and infrastructure within the area, the socioeconomic data for the study area have been collected and analyzed. The following information was gathered from the 2019 Census American Community Survey 5-Year Estimate at the block group level.

- Population
- Households Under the Poverty Level over a 12 Month Period
- Median Age
- Minority Population
- Population without a Car

## Existing Characteristics

### *Population*

The population trends within the study area show generally higher concentrations of population within the southwest, North (Campus), and northeast areas surrounding the corridor. These areas have historically had higher densities of homes and housing however trends indicate additional growth. As can be seen in Figure 10, significant development of apartment style and mixed-use development is continuing along the Gaines Street corridor and southeast of the project intersection. As this area continued to grow, the population located east of the project intersection is expected to increase significantly.

### *Household Poverty*

Similarly, the population in the area is experiencing a significant influx of both higher densities and gentrification. Using the 2019 ACS data, the highest areas of household poverty are located toward the eastern areas of the corridor. These areas were formerly economically depressed developments that have been redeveloped to accommodate apartment style developments supported by commercial and retail space. Much of the region surrounding the study area is comprised of higher density student housing, which may skew the data toward higher levels of household poverty due to student employment/incomes typically being below average. The areas south and southeast of the study area transition to a higher density of environmental justice populations, with lower densities of student occupancy.

### *Median Age*

The proximity to the FSU and FAMU Campuses leads to higher levels of study occupancy within the area. As such, the median age for the area is between 18-25 for all census block groups.

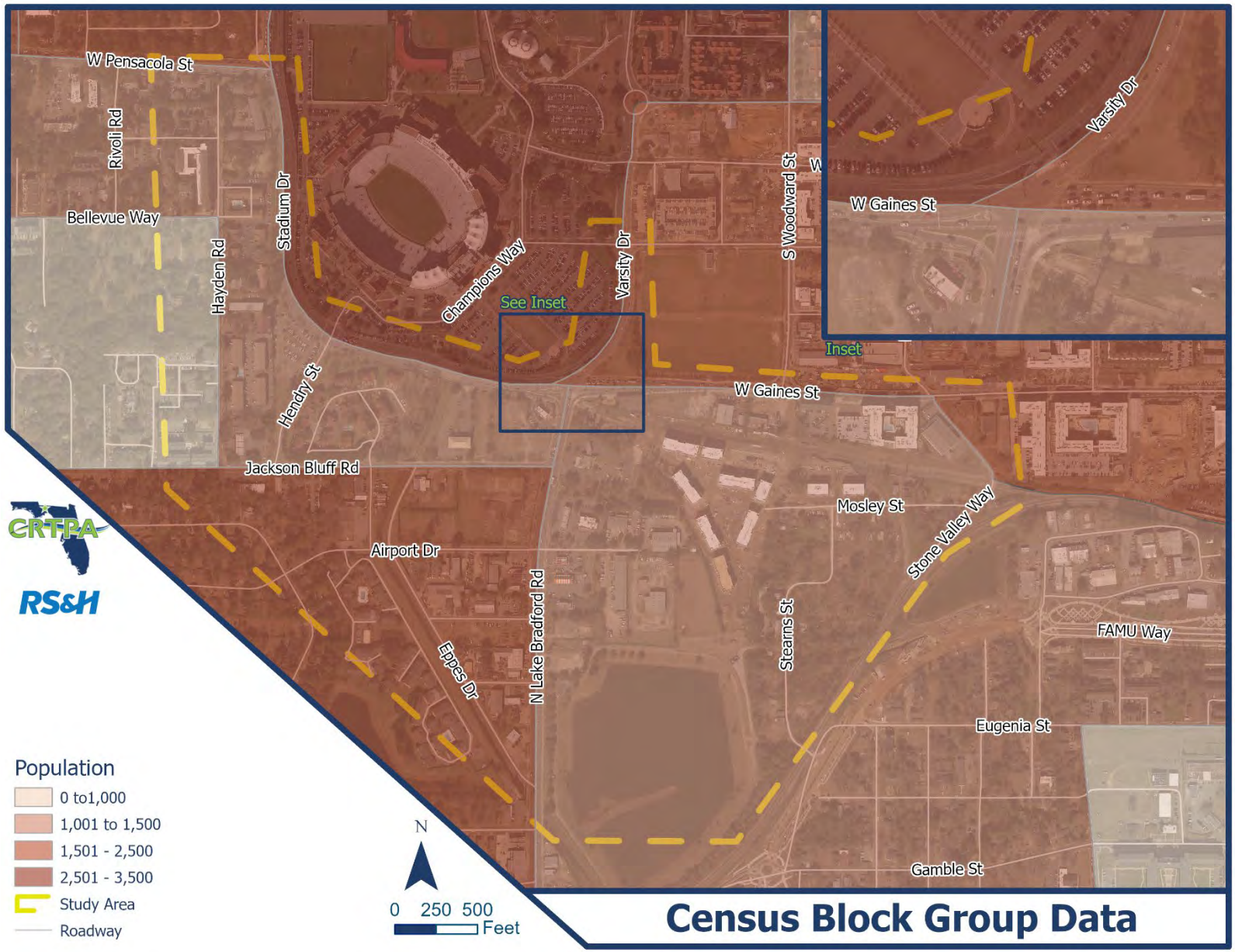
### *Minority Population*

The portion of the study area that has experienced the most recent development depicts less than 15% minority populations, while the area to the southwest and southeast have minority populations of over 30% and over 65% respectively.

### *Population without Access to a Vehicle*

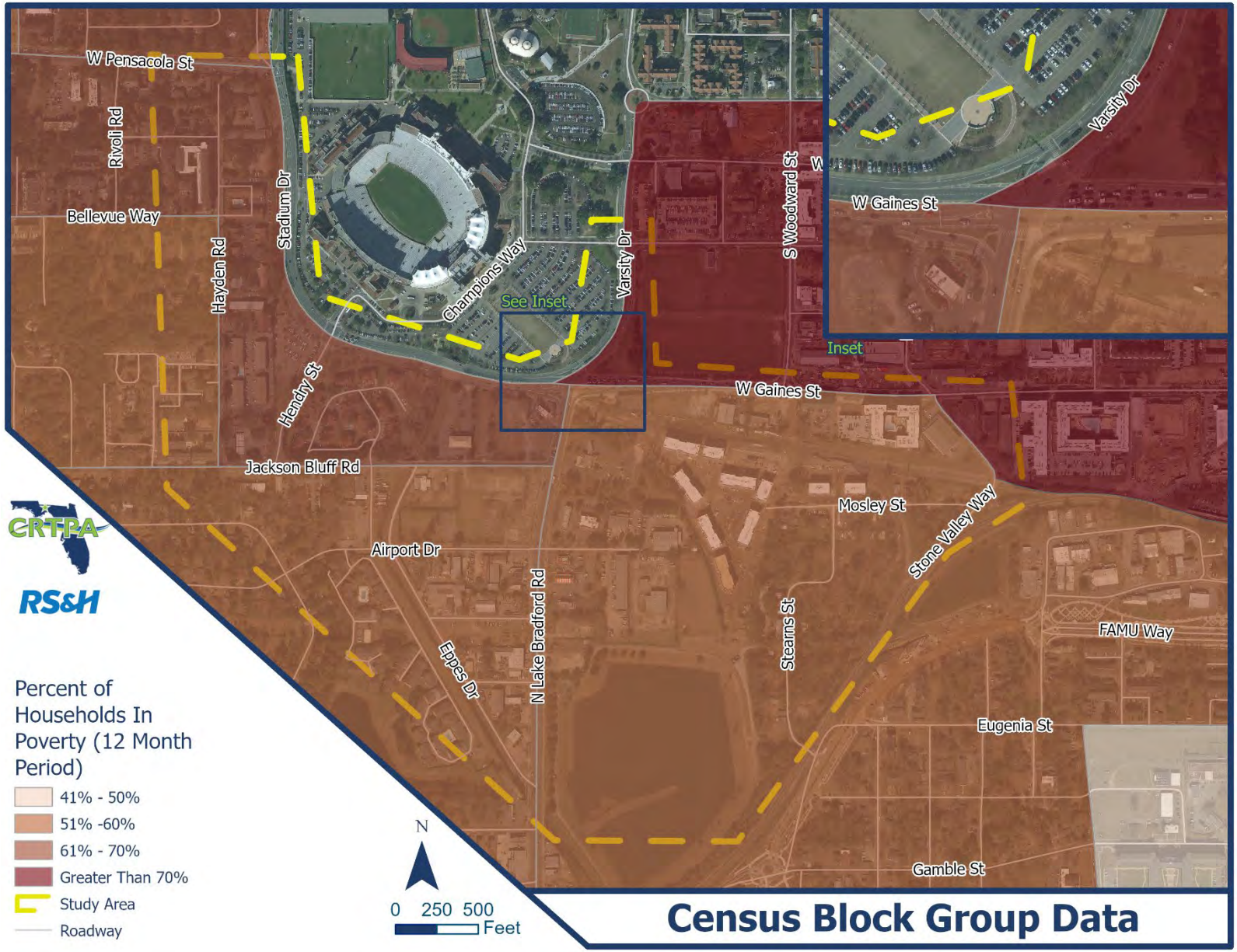
Generally, the majority of households have access to a vehicle, however the areas to the northeast are experiencing numbers between 10-15% of households without access to a vehicle. This percentage may be attributed to the number of students within the area without a vehicle, as well as to the level of household poverty described above. This vehicle access data was not available at the Block Group level but was available at the Census Tract level.

*Figure 10: Population by Block Group*



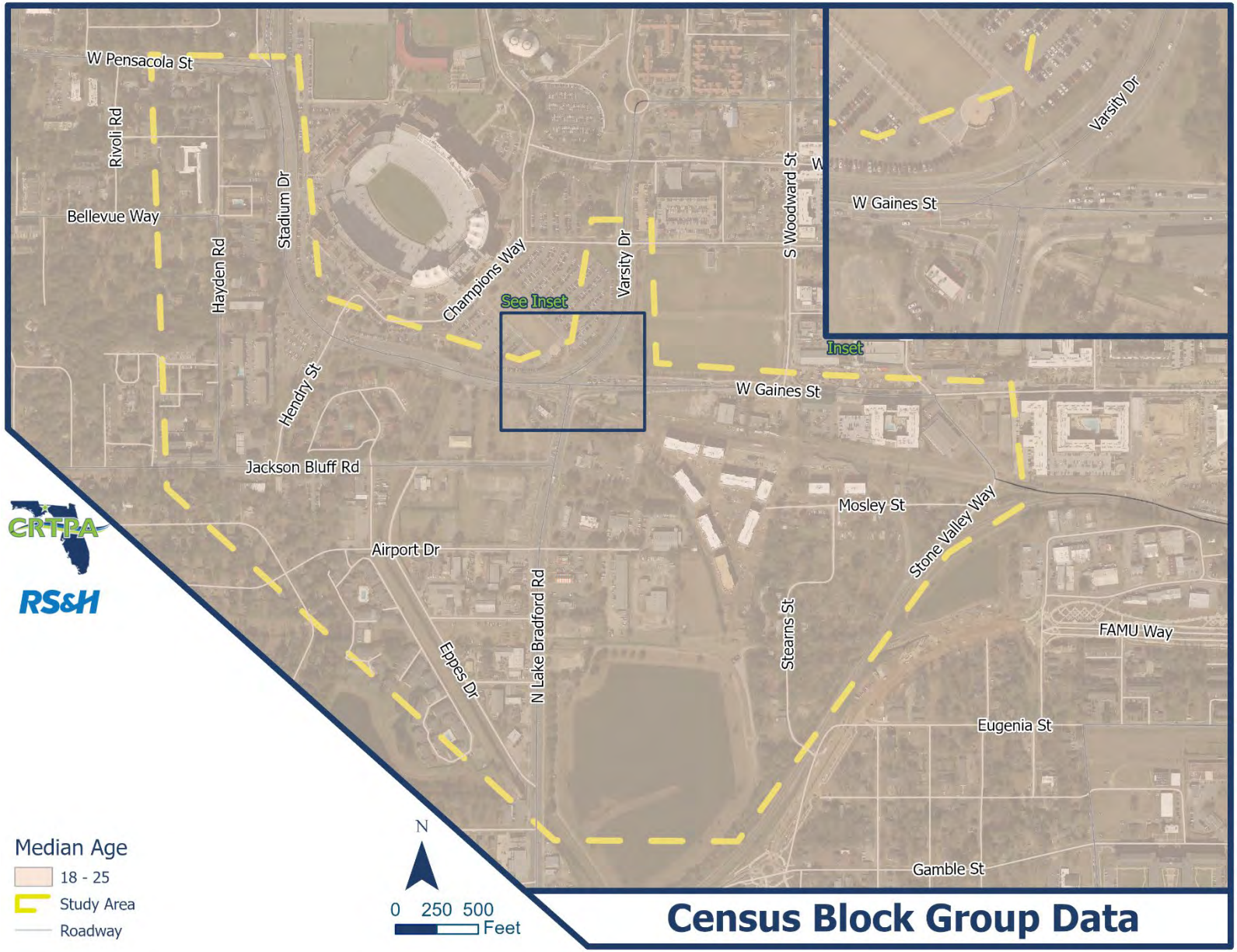

Source: Census ACS 2019 5-Year Estimates

*Figure 11: Percent of Households in Poverty by Block Group (Note: Campus Area Does Not Have Household Data)*



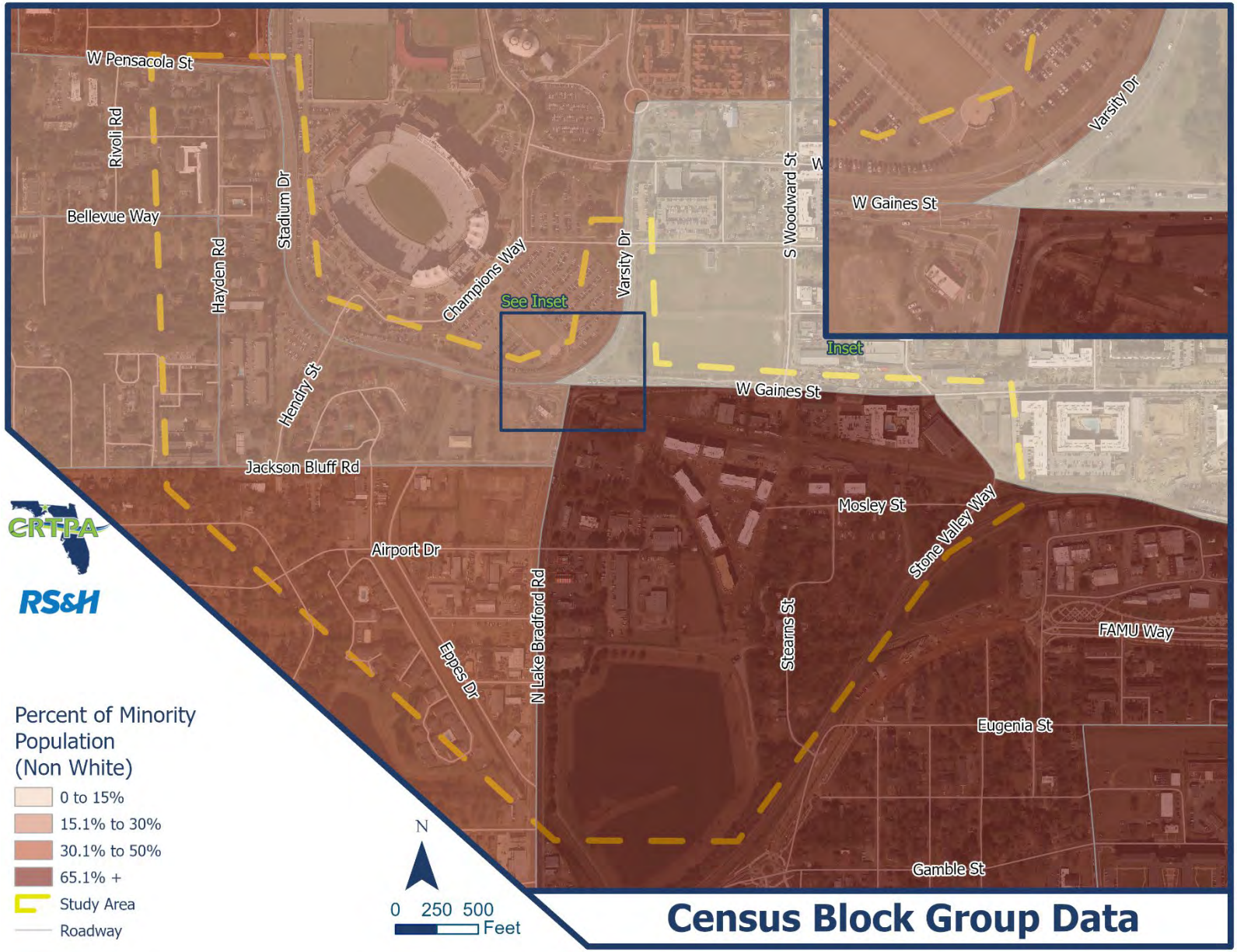

Source: Census ACS 2019 5-Year Estimates

*Figure 12: Median Age by Block Group (All 18-25)*



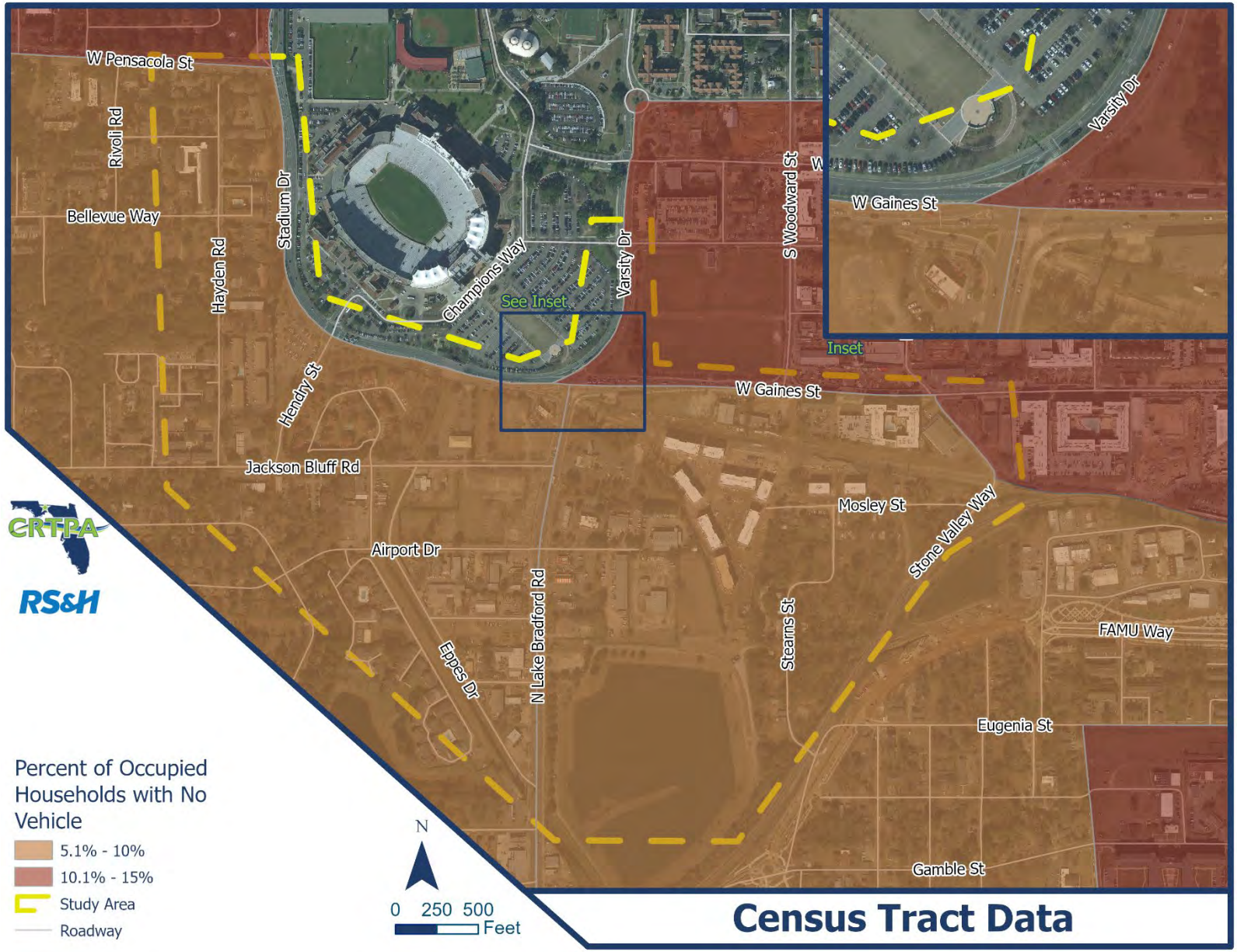

Source: Census ACS 2019 5-Year Estimates

*Figure 13: Percent of Minority Population by Block Group (Self-Identified as Non-White)*




Source: Census ACS 2019 5-Year Estimates

*Figure 14: Percent of Occupied Households with No Vehicle by Census Tract (Note: Campus Area Does Not Have Household Data)*




Source: Census ACS 2019 5-Year Estimates

## Existing Conditions Traffic Analysis Assumptions, Methodology, and Results

The following section summarizes the methodology used in the analysis of the intersections within the Stadium Drive/Lake Bradford Road intersection analysis study area. This methodology includes data collection, existing conditions peak hour traffic development, and operational analysis.

### *Analysis Years*

The following analysis years have been identified for this study:

- Existing Year: 2021
- Design Year: 2045

### *Area of Influence*

The primary study area includes the study intersection, and the adjacent intersections in all four directions of travel. The study intersection is situated such that both streets change names on either side of the intersection. West of the intersection, Stadium Drive is a six-lane urban minor arterial. East of the intersection, Stadium Drive transitions to Gaines Street, which is classified as a two-lane urban arterial within the study area. South of the intersection, Lake Bradford Road is a four-lane urban minor arterial, which transitions to Varsity Drive north of the study intersection. Varsity Drive is classified as a two-lane urban major collector within the study area. The other signalized intersections within the study area are Stadium Drive/Hendry Street, Varsity Drive/St. Augustine Street, and Lake Bradford Road/Jackson Bluff Road. The adjacent intersection east of the study intersection (Gaines Street/Woodward Avenue) is a three-leg, single-lane roundabout. Several unsignalized driveways and intersections exist within the limits of the study area; however, they were not included in this analysis.

## Existing Data Collection

Field traffic counts provided by the City of Tallahassee were the basis of the existing traffic data for the five intersections included in the study area. Turning movement counts (TMCs) were collected on December 6th, 2018, with the exception of the Gaines Street/Woodward Avenue roundabout for which the TMCs were collected on January 11th, 2011. The TMC data included separate data sets for heavy vehicles as well as pedestrians. 24-hour pedestrian actuation counts were collected at the signalized intersections during September and October of 2019. Additional traffic data from FDOT Florida Traffic Online was used to supplement the field data where necessary. The data collection locations are summarized below:

### *Turning Movement Counts*

1. Stadium Drive @ Lake Bradford Road
2. Stadium Drive @ Hendry Street
3. Varsity Street @ St. Augustine Street
4. Lake Bradford Road @ Jackson Bluff Road
5. Gaines Street @ Woodward Avenue

### *24-hour Pedestrian Actuation Counts*

1. Stadium Drive @ Lake Bradford Road
2. Stadium Drive @ Hendry Street
3. Varsity Street @ St. Augustine Street
4. Lake Bradford Road @ Jackson Bluff Road

The raw turning movement counts used in this study is found in the Appendix.

## Peak Hour Determination

Based on the raw TMC data, it was determined that an assessment of the mid-day peak hour would lend itself to a more accurate analysis of the study area intersections. Four out of the five count locations show higher overall traffic during their mid-day peak hour than during their morning peak hour, while following the same general directional patterns as the morning peak hour. It should also be noted that the afternoon peak hour traffic is generally higher than the morning and mid-day traffic by a considerable amount. It was presumed that this deviation from the standard is the result of the study area lying within and adjacent to a college campus, which does not conform to typical commute patterns.

Given that the mid-day peak reflects similar directional trends as the morning peak (except with higher traffic volumes), it was determined that this study would utilize a mid-day peak hour analysis rather than the standard AM peak period. Based on the raw TMC data, a mid-day peak hour of 11:45-12:45 and a PM peak hour of 4:30-5:30 were selected for this study.

## Existing Traffic Development

Because the field traffic counts were collected in 2018, historical data from Florida Traffic Online was reviewed to determine the appropriate growth rate to bring the counts to a 2021 Existing Year. The review of the historical data showed inconsistent growth within the study area. Due to the inconsistent growth within the study area a minimum growth rate of 1% was used to extrapolate the raw TMC data from 2018 to 2021 (where 2018 TMC data was available).

In the case of the roundabout at Gaines Street and Woodward Avenue (which lies adjacent to the study intersection, to the east), the available TMC data was from 2011. Given that significant development has taken place in areas northeast of the study area between 2011 and 2021, it was determined that extrapolating the raw data using a 1% minimum growth rate may not sufficiently reflect the actual existing traffic volumes. In order to develop a more accurate estimate of the total traffic entering and exiting the roundabout, the total traffic on the eastern leg of the study intersection (Stadium Drive/Lake Bradford Road) was maintained for the western leg of the Gaines Street/Woodward Avenue roundabout. The turning movement ratios observed in the 2011 raw counts were then applied to the traffic entering and exiting the western leg. For turning movements that do not use the western leg (the westbound right-turn and southbound left-turn), the 1% annual growth rate was applied to the raw counts; it was assumed that these movements would have only a minimal impact on the findings of this analysis.

In cases where driveways exist between the study area intersections, the 2021 peak hour traffic was maintained, as developed, using the methodology described above. Where driveways are not present, the peak hour traffic was balanced to ensure that no traffic is lost or gained between the study area intersections. The mid-day and PM peak hour traffic volumes are shown in Figure 15.

Annual Average Daily Traffic (AADT) volumes are presented in Figure 16.

*Figure 15: Peak Hour Volume*

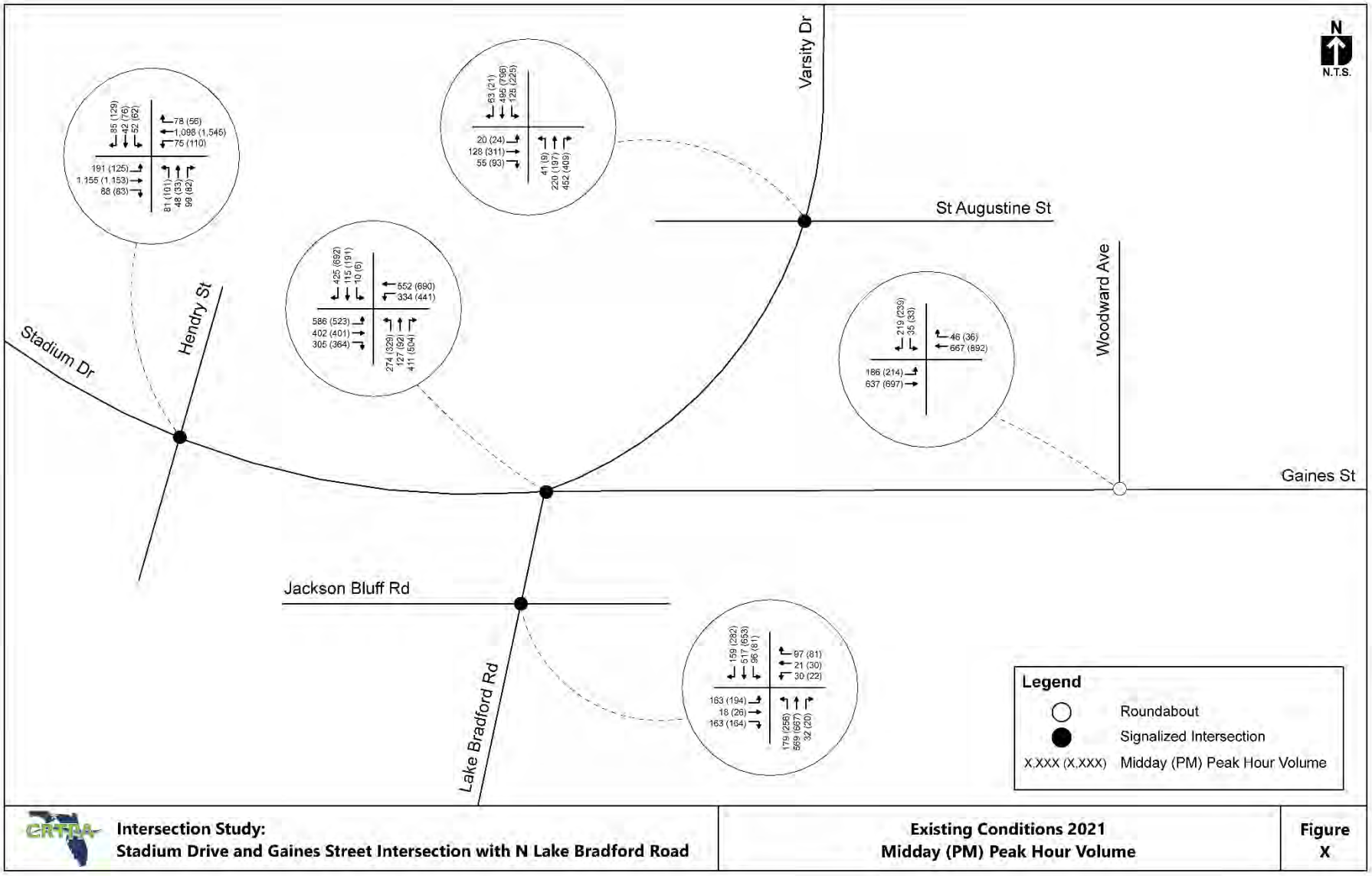
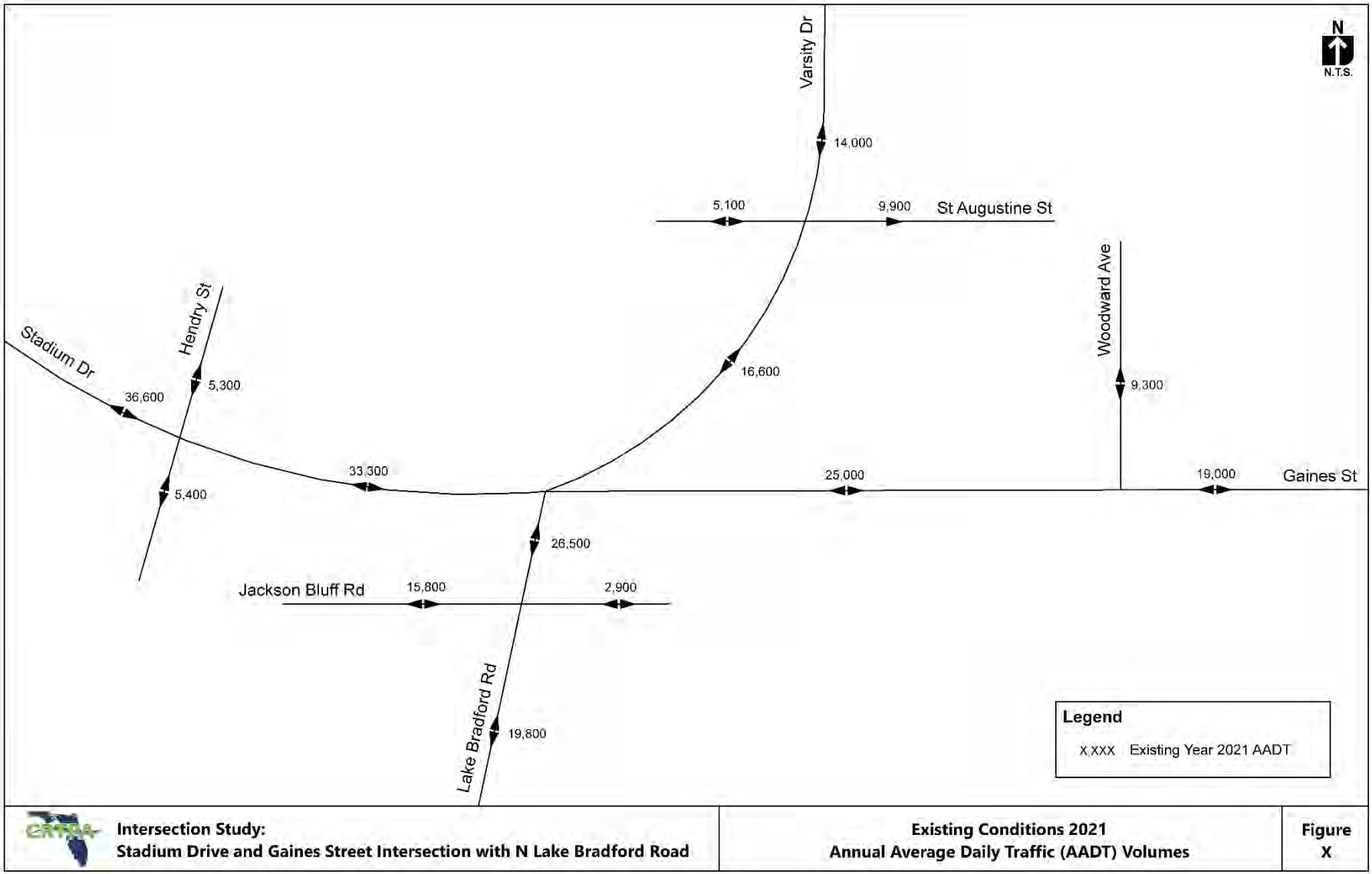


*Figure 16: Existing AADT*



## Traffic Factors

The factors used for the existing conditions traffic analysis included the peak hour factor (PHF) and peak hour truck factor ($T_{peak}$). The peak hour factor is the relationship between the peak 15-minute flow rate and the full hourly volume and is given by the formula [PHF = hourly volume/ (4 x peak 15-minute flow)]. The mid-day and PM PHFs used in the Existing Year analysis were calculated based on the raw TMC data and vary by intersection, shown in Table 5.

*Table 5: Existing Conditions Peak Hour Factors*

| Intersection | Mid-day PHF | PM PHF |
|---|---|---|
| Gaines St @ Lake Bradford Rd | 0.91 | 0.93 |
| St Augustine St @ Varsity Dr | 0.85 | 0.77 |
| Jackson Bluff Rd @ Lake Bradford Rd | 0.89 | 0.93 |
| Hendry St @ Stadium Dr | 0.89 | 0.93 |
| Gaines St @ Woodward Ave | 0.97 | 0.94 |

The $T_{peak}$ factor is the percentage of truck traffic occurring during the peak hour. The $T_{peak}$ factors used in this study were derived from the existing mid-day and PM peak hour TMCs and vary by street, shown in Table 6.

*Table 6: Peak Hour Truck Factor Summary*

| Street Name | Raw Mid-day $T_{peak}$ | Raw PM $T_{peak}$ |
|---|---|---|
| Gaines St / Stadium Dr | 2% | 2% |
| Varsity Dr / Lake Bradford Rd | 3% | 2% |
| St Augustine St | 4% | 2% |
| Jackson Bluff Rd | 2% | 2% |
| Hendry St | 8% | 5% |
| Woodward Ave | 6% | 3% |

Note that the more conservative Mid-day factor was used for both analysis periods.

## Analysis Procedures

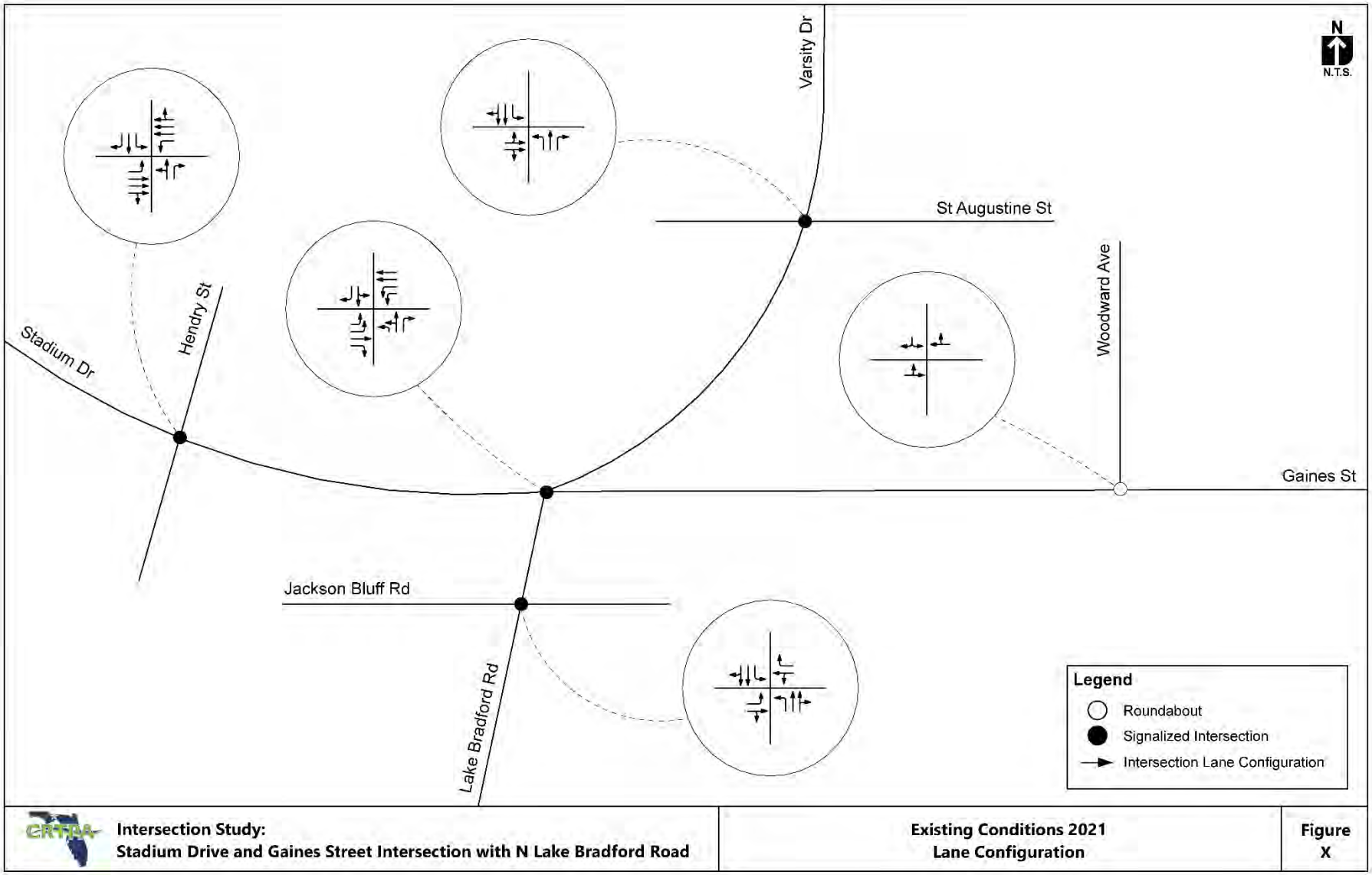
The capacity-based operational analysis for the signalized intersections in the study area was performed primarily using Synchro 11. For the Gaines Street/Woodward Avenue roundabout, SIDRA Intersection 9 was used. The Existing Year 2021 analysis reflected the roadway geometry as it currently exists in the field along with the existing signal timing and phasing as coded in Synchro models obtained from the City of Tallahassee. Pedestrian phasing information (walk times and clearance intervals) were also maintained from the models provided by the city, and the number of pedestrian calls were coded based on the raw actuation counts. Pedestrians per hour (used by Synchro to determine conflicts with the opposing turning movements) were based on the raw pedestrian counts provided with the TMC data. The Existing Year 2021 intersection lane configuration is shown in Figure 17.

The Existing Year 2021 capacity analysis was developed for the mid-day and PM peak hours. The following measures of effectiveness (MOEs) were used to evaluate the operational performance of each of the study intersections:

- Overall Intersection Delay (seconds/vehicle)
- Level of Service

Intersection level of Service (LOS) is determined based on the overall intersection delay and provides the primary MOE for comparing alternatives during the future conditions analysis. Based on guidance in the FDOT 2020 Quality/Level of Service Handbook, LOS D or better will be used as the acceptable condition.

*Figure 17: Existing Lane Configuration*



## Existing Operational Performance

Table 7 summarizes the delay and LOS for the five study intersections. The results of the analysis show that the study intersections operate under acceptable conditions with overall LOS of D or better during both the mid-day and PM peak hours. It should be noted that while the study intersection operates at an acceptable level in terms of the overall intersection performance, the eastbound and westbound approaches experience high levels of delay particularly during the PM peak hour. As development continues in the surrounding areas, congestion on those approaches is expected to increase, which will likely cause this intersection to operate below an acceptable level of service. Detailed results from Synchro are provided in the Appendix.

*Table 7: Existing Year 2021 Intersection Analysis Summary*

| Intersection / Approach | Existing Conditions | |
|---|---|---|
| | Midday Peak Delay (LOS) | PM Peak Delay (LOS) |
| Lake Bradford Rd @ Stadium Dr | 41.7 (D) | 53.1 (D) |
| Varsity Dr @ St Augustine St | 14.5 (B) | 21.4 (C) |
| Lake Bradford Rd @ Jackson Bluff Rd | 22.6 (C) | 34.7 (C) |
| Hendry St @ Stadium Dr | 32.3 (C) | 38.8 (D) |
| Gaines St @ Woodward Ave | 13.0 (B) | 27.7 (D) |

[1.] Delay is reported in seconds per vehicle (sec/veh)

## National Performance Management Research Dataset (NPMRDS)

The National Performance Management Research Data Set (NPMRDS) is a compilation of vehicle probe data used to create varying traffic and roadway analysis. This dataset provides near-real time traffic updates and information and is also a valuable tool in understanding existing trends. The NPMRDS information allows for a regional look at travel trends using he existing roadways and trends over set time periods. Within this study, a congestion trend analysis and a user delay report were run through the NPMRDS system.

### User Delay Analysis

The user delay report was developed for the timeframe between Monday December 3rd, 2018 and Friday December 7th, 2018. This report assigns a regional cost to the overall delay within the area using the following Parameters:

- Volume data – INRIX, 2013
- Speed Data – NPMRDS from INRIX for Trucks and Passenger Cars
- Vehicle Costs
    - Passenger: $17.91
    - Commercial: $100.49
- Percent of vehicle distribution is based on each individual road segment.
- For segments that do not have percent information, the defaults of 90% passenger and 10% commercial are used.
- Delay is calculated against the free flow speed for segments whose speeds fall below free flow.

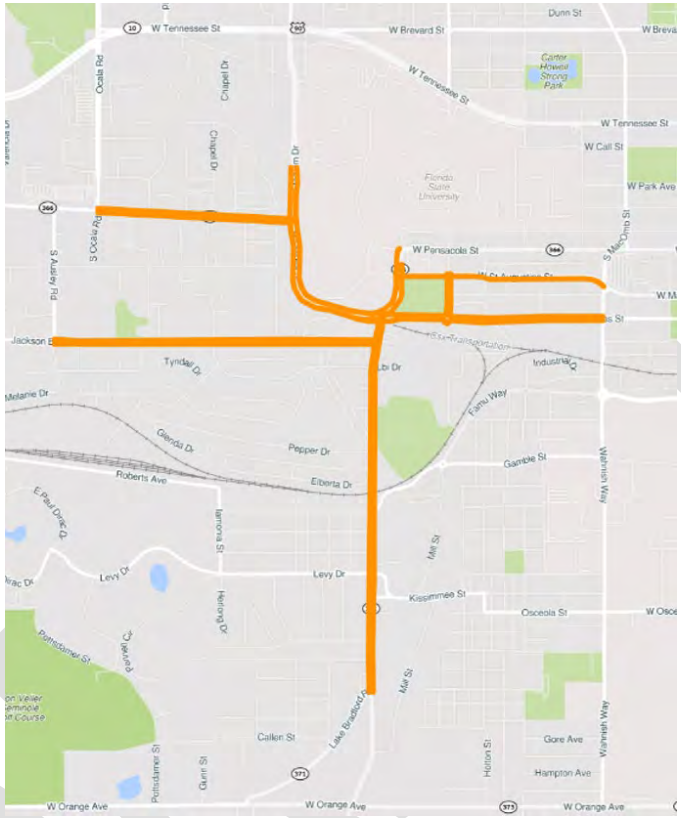
The NPMRDS user delay network, shown in Figure 18, encompassed the majority of the major roadways within the study area allowing for an approximation of the delay costs associated within a given week. Using this network, the user delay results in Figure 19 were generated. These results are consistent with the results of the traffic analysis included within this report, depicting higher delay cost within the mid-day and afternoon hours.

Within Figure 19, red is indicative of higher delay cost while green represents lower costs. Data was unavailable for the timeframes with "N/A".

## Congestion Trend Analysis

Additionally, a congestion trend analysis was conducted within the region to cross check data developed within the traffic analysis. This analysis tool allows for the development of trend maps, shown in Figure 20 through 22, which can provide an understanding of how congestion is experienced over a given timeframe. As part of this analysis, the 8am, 12 PM and 5 PM hours of congestion have been highlighted. This analysis consisted of the traffic data collected by NPMRDS over the 2019 year, but only considering weekday travel (Monday-Friday) In each of the figures below, congestion is measured as the present of speed to free flow speed for each segment. Areas in red indicate areas where the speeds were at or below 15% of free flow speeds and areas in green those speeds are at least 85% of free flow speeds. Within each of the three time periods, significant delay is being experienced at and around the project intersection. As identified within the traffic analysis, this trend analysis also identifies the 12 PM and 5 PM travel periods as having more significant congestion when compared with the 8 AM morning period.

*Figure 18: NPMRDS User Delay Network*



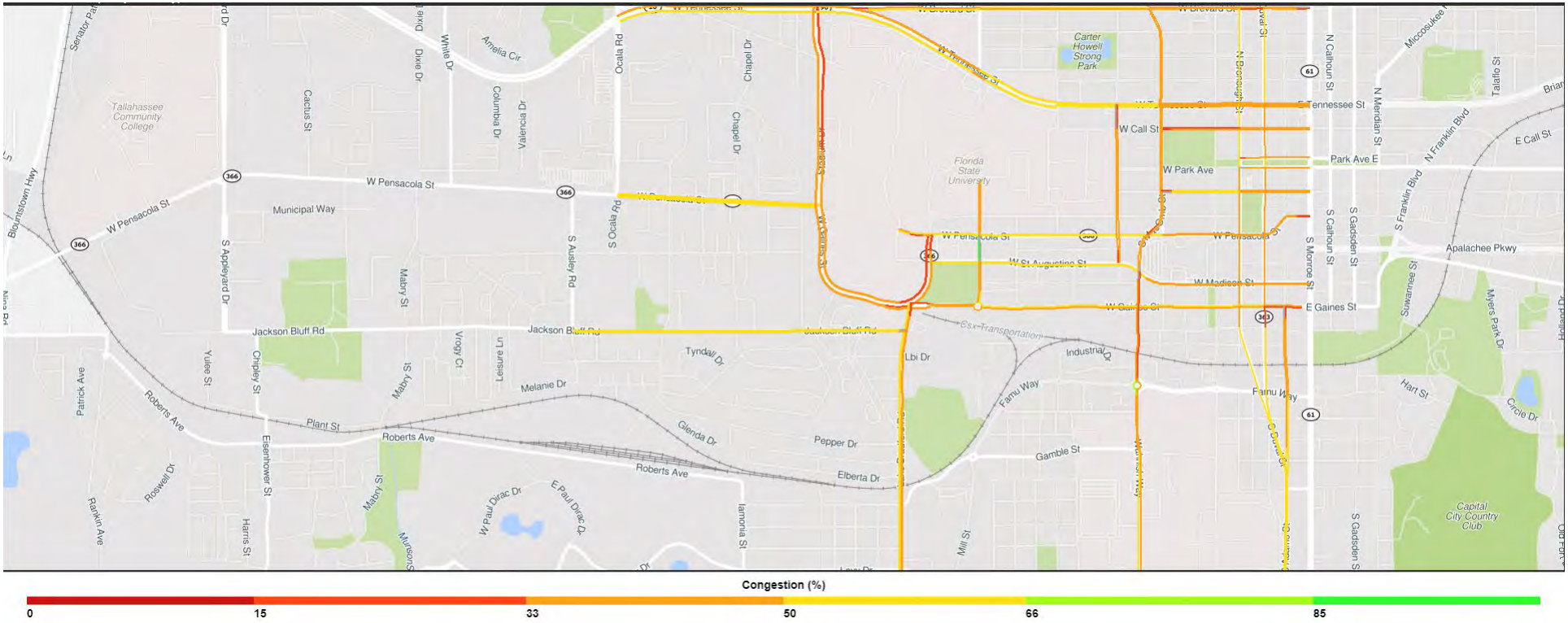

Source: RITIS: NPMRDS Analytics

*Figure 19: NPMRDS User Delay Analysis by Hour (December 3, 2018 to December 7, 2018)*

| Monday, December 03, 2018 to Saturday, December 08, 2018 | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | AM | | | | | | | | | | | | PM | | | | | | | | | | | | |
| **Day** | **12** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **Daily Totals** |
| **12/03/18** | $ 5 | $ 55 | $ 56 | $ 52 | $ 140 | $ 91 | $ 461 | $ 764 | $ 620 | $ 425 | $ 217 | $ 89 | $ 413 | $ 818 | $1,890 | $ 597 | $ 882 | $ 478 | $ 382 | $ 293 | $ 75 | $ 75 | $ 1 | $ 24 | **$ 8,903** |
| **12/04/18** | N/A | N/A | N/A | N/A | N/A | N/A | N/A | $ 31 | $ 983 | $ 696 | $ 626 | $1,750 | $ 890 | $ 453 | $ 939 | $1,364 | $1,828 | $ 579 | $ 596 | $ 40 | N/A | $ 123 | $ 25 | $ 18 | **$ 10,941** |
| **12/05/18** | N/A | $ - | N/A | N/A | N/A | $ 1 | $ 402 | $ 670 | $ 208 | $ 496 | $ 690 | $ 766 | $ 789 | $ 756 | $ 927 | $1,245 | $1,014 | $ 602 | $ 74 | $ 93 | $ 322 | $ 108 | N/A | N/A | **$ 9,164** |
| **12/06/18** | N/A | $ - | N/A | $ 3 | $ 2 | $ 19 | $ 353 | $ 867 | $ 610 | $ 462 | $ 426 | $1,392 | $2,061 | $ 947 | $ 966 | $ 840 | $ 866 | $ 914 | $ 458 | $ 212 | $ 209 | $ 133 | $ 11 | $ 26 | **$ 11,777** |
| **12/07/18** | $ 23 | $ 20 | $ 5 | $ 2 | $ 17 | $ 5 | $ 150 | $ 326 | $1,447 | $ 443 | $ 400 | $ 837 | $ 739 | $ 461 | $1,081 | $1,865 | $ 960 | $ 878 | $1,256 | $ 137 | $ 4 | $ 31 | $ 233 | $ 40 | **$ 11,359** |
| **Hourly totals** | **$ 28** | **$ 76** | **$ 60** | **$ 57** | **$ 159** | **$ 116** | **$1,366** | **$2,658** | **$3,868** | **$2,522** | **$2,359** | **$4,834** | **$4,891** | **$3,435** | **$5,803** | **$5,911** | **$5,549** | **$3,450** | **$2,766** | **$ 776** | **$ 610** | **$ 471** | **$ 270** | **$ 109** | **$ 52,144** |

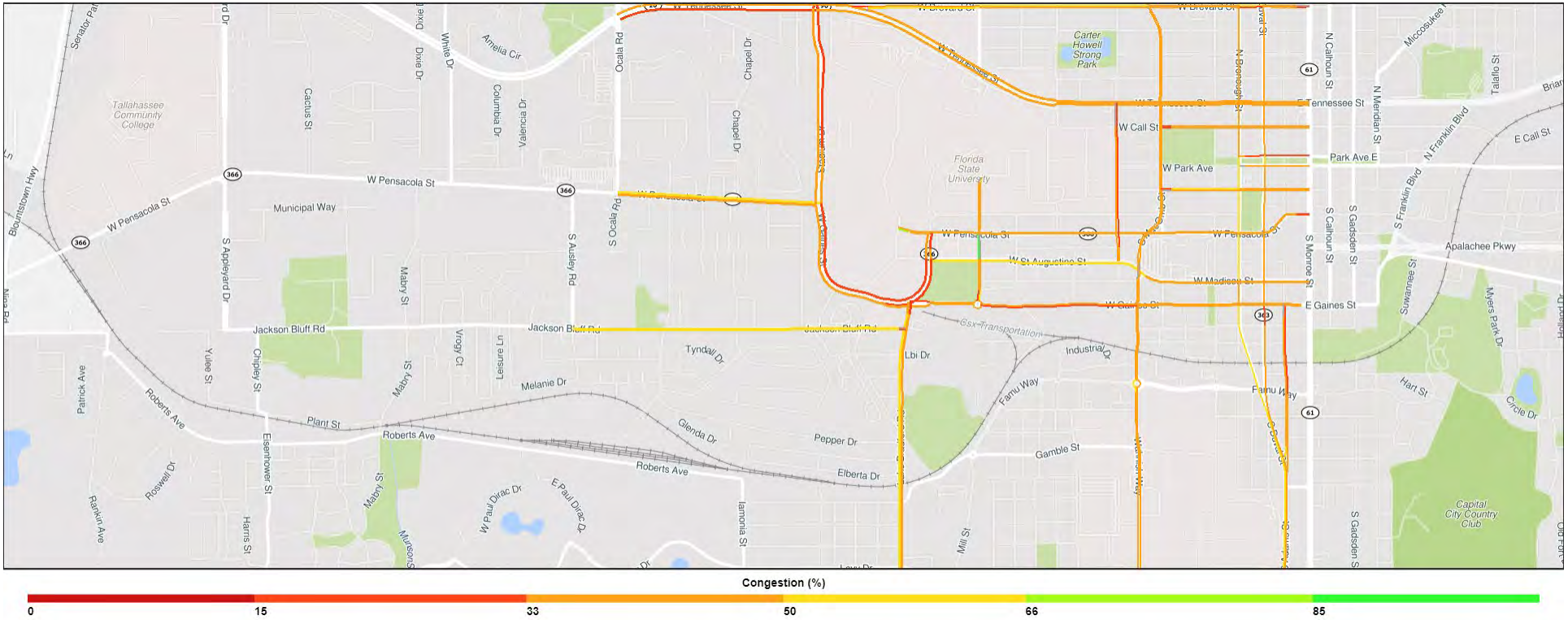
Source: RITIS: NPMRDS Analytics

*Figure 20: NPMRDS 2019 Weekday Congestion 2019 Trend Map: 8 AM*



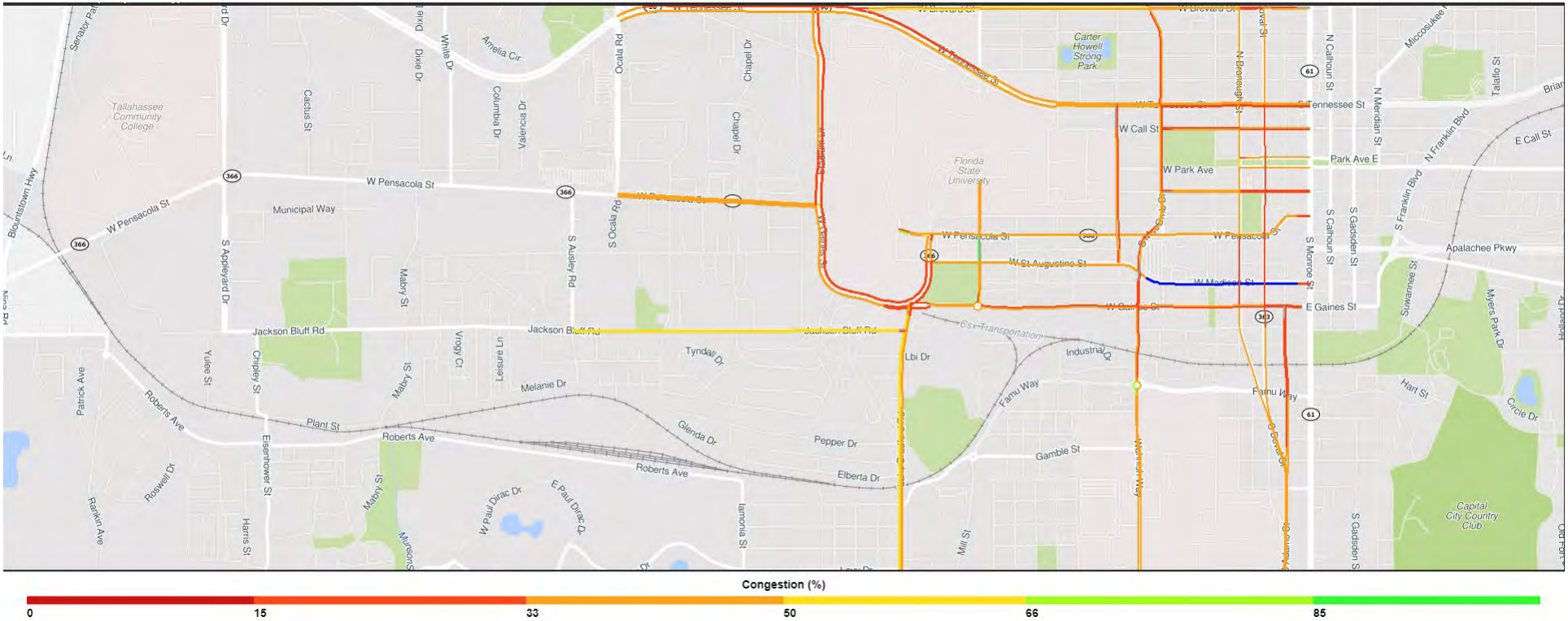

Source: RITIS: NPMRDS Analytics

*Figure 21: NPMRDS 2019 Weekday Congestion Trend Map: 12 PM*




Source: RITIS: NPMRDS Analytics

*Figure 22: NPMRDS 2019 Weekday Congestion Trend Map: 5 PM*




Source: RITIS: NPMRDS Analytics

## Pedestrian Movement Analysis

### Pedestrian Movement

Given the study area's proximity to FSU's main campus and the continued development of mixed-use properties, the movement of pedestrians throughout the area is a significant concern. Pedestrian data was gathered from the five (5) signalized intersections within the study area. Signalized intersections were utilized due to the presence of crosswalk infrastructure which monitors use and could be used to estimate volumes of pedestrians. The five signalized intersections in which pedestrian data was gathered are as follows:

- Gaines St./Stadium Dr. at Lake Bradford St.
- Gaines St. at Stone Valley Way
    - This intersection was not signalized prior to 2020, limiting data availability
- Jackson Bluff Rd. at Lake Bradford St.
- Stadium Dr. at Hendry St.
- St Augustine Rd. at Varsity Dr.

### Parameters

Actuations and pedestrian crossings for each intersection were collected by each individual travel direction identified as the phase. The parameters are defined as:

- Actuation – the number of initiations of the crosswalk button.
- Average delay – the length of time, measured in seconds, between the initiation of the crosswalk button and the flashing "Walk" sign.
- Intersection Phase – the direction of travel at each intersection. Phases will typically correlate to east/west or north/south travel and may be representative of multiple sides of the intersection.

Pedestrian volumes were estimated using the 2018 Synchro pedestrian counts by phase and making a comparison to the known actuations gathered within the 2019 – 2020 year. This analysis was conducted to further estimate the pedestrians per hour, per direction at each of the signalized intersections.

### Sample Selection

To estimate the peak of expected pedestrian travel within the area, pedestrian actuation data was gathered over two (2) week-long periods within September and October in 2019 and 2020. During these periods, FSU classes are in session, home football games are frequent, and historically moderate temperatures occur. These periods were selected to visualize pedestrian traffic movements believed to be peaking during these periods. The selected two (2) week periods were:

- 2019: September 23 to October 7
- 2020: September 28 to October 12

Daily actuation counts were recorded for each phase by intersection during the two-week period for both 2019 and 2020. Table 8 reports the sample sizes collected for each intersection.

*Table 8: Sample Size by Intersection*

| Intersection | 2019 | 2020 | Total |
|---|---|---|---|
| | Actuation Counts | Actuation Counts | Actuation Counts |
| Gaines St./Lake Bradford Rd. | 24 | 24 | 48 |
| Gaines St. /Stone Valley Rd. | - | 32 | 32 |
| Jackson Bluff Rd. /Lake Bradford Rd. | 32 | 32 | 64 |
| Stadium Dr. /Hendry St. | 30 | 32 | 62 |
| St. Augustine St./Varsity Dr. | 16 | 16 | 32 |

*Note: The values in the table reflect the number of daily actuation counts collected during the two (2) week period for each phase.*

## Summary of Pedestrian Results

The three (3) main pedestrian datapoints include:

- Pedestrian actuation changes between 2019 and 2020 showing the impact of COVID-19 on pedestrian movement in the area
- The estimated average number of pedestrians per actuation
- The flow of pedestrian traffic through the study signalized intersections

### *Pedestrian Actuations Between 2019 and 2020*

Significant reduction of actuations, as much as 61 percent, was recorded indicated by the comparison of 2019 and 2020 actuations found in Table 9**.** The St. Augustine St. – Varsity Dr. intersection experienced the most significant drop off in actuations. The table also summarizes the highest actuation and pedestrian per hour phase and direction for each intersection.

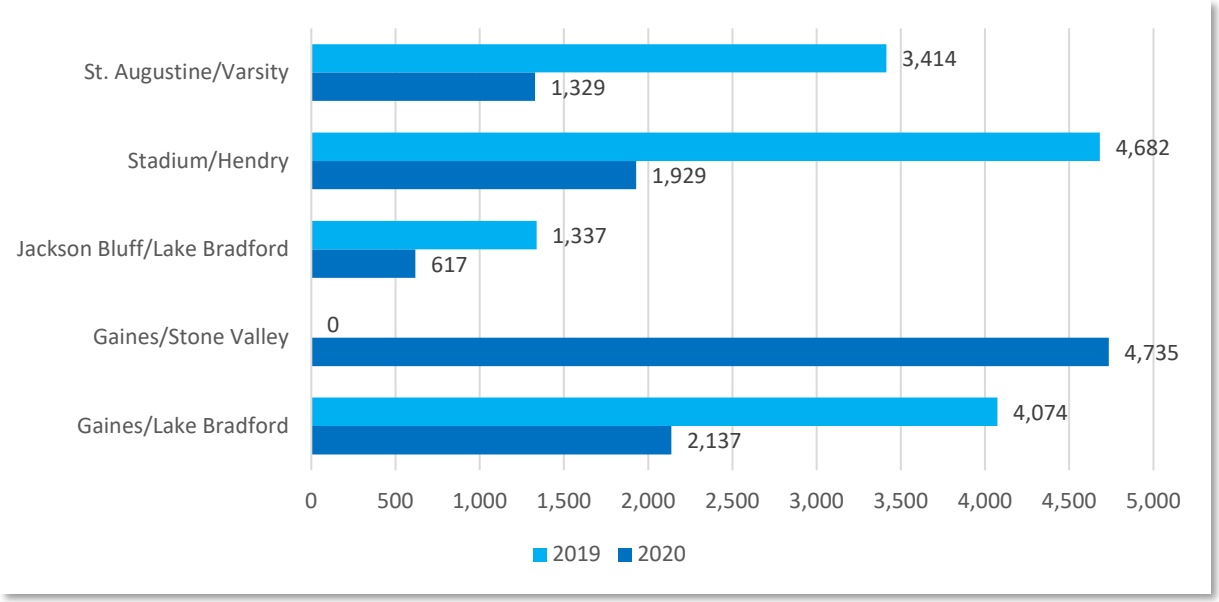
*Table 9: Actuation, Pedestrian per Hour, and Average Delay Results (2019-2020, Two-week Periods)*

| Intersection | Highest Actuation Direction | Highest Pedestrian per Hour | Actuation Percent Change (2019-2020) |
|---|---|---|---|
| Gaines St./Lake Bradford Rd. | Phase 4 (N/S) | Phase 4 (N/S) | -48% |
| Gaines St. /Stone Valley Rd. | Not Available | Not Available | Not Available |
| Jackson Bluff Rd. /Lake Bradford Rd. | Phase 3 (E/W) | Phase 6 (N/S) | -54% |
| Stadium Dr. /Hendry St. | Phase 6 (E/W) | Phase 4 (N/S) | -59% |
| St. Augustine St./Varsity Dr. | Phase 4 (E/W) | Phase 4 (E/W) | -61% |

Source: City of Tallahassee – Traffic Signal Operations (2021)

Figure 23 depicts the number of actuations between 2019 and 2020 two-week periods.

*Figure 23: Total Actuations (2019-2020, Two-week Periods)*




Source: City of Tallahassee – Traffic Signal Operations (2021)

The intersection of Gaines St. and Stone Valley Way was first signalized in 2020; therefore, the 2019 results show zero actuations. Additionally, the area is surrounded by a series of apartment buildings, mixed use development and continued growth which warrants the high pedestrian actuation within the area.

The pedestrian analysis was conducted in two stages, with the first being the identification of pedestrian actuation data and the second being the comparison of the actuations with the 2018 Synchro pedestrian count data. Pedestrian actuations are representative of requested crossings at each intersection by direction. Each crosswalk button push represents one actuation, and the identified delay represents the time (in seconds) between button push and the walk symbol.

The second phase of this pedestrian analysis was supplemented with the 2018 Synchro model network pedestrian volume data. Using these two main data sources, an estimation of the pedestrian movement within the area was developed. By combining these two data sources, approximate volumes and the timeframes for these movements have been quantified and summarized in Table 10.

Using this data, both the Stadium Drive/Hendry Rd. and the St Augustine St./Varsity Dr. intersections experienced the highest average pedestrians per hour and the associated signal actuations. However, when comparing average number of pedestrians per actuation, both Stadium Dr./Hendry Rd. and the Jackson Bluff Rd./ Lake Bradford Rd. intersections experienced the highest ratios.

*Table 10: Per Hour Pedestrians and Actuations by Intersection*

| Intersection | 6 AM - 7 PM | | |
|---|---|---|---|
| | Average Actuation per hour | Average Pedestrian per hour | Average Number of pedestrians per actuation per intersection[1] |
| Gaines St./Lake Bradford Rd. | 4.0 | 3.8 | 1 |
| Gaines St. /Stone Valley Rd. | - | - | - |
| Jackson Bluff Rd. /Lake Bradford Rd. | 1.1 | 3.3 | 3 |
| Stadium Dr. /Hendry St. | 4.7 | 15.0 | 3 |
| St. Augustine St./Varsity Dr. | 7.0 | 17.0 | 2 |

Daily pedestrian counts were sourced from 2018 raw Synchro files provided by the City of Tallahassee. The data was summarized into hourly pedestrian crossings for each direction by intersection – between 6 AM to 7 PM. The Stadium Dr. intersections with Hendry St. (n/s) and the St. Augustine Rd. with Varsity Dr. (east/west) had the highest daily pedestrian count – upwards of 300 pedestrians per day. Lowest estimated values occurred in the Jackson Bluff Rd./ Lake Bradford Rd. intersection with the most desired direction occurring in the north-south direction. Table 11 reports 2018 daily pedestrian counts for each intersection with the most desired direction.

[1] Comparison was made using Sept/Oct 2019 actuations with Dec 2018 pedestrian counts.

*Table 11: Daily Pedestrian Count by Intersection (2018)*

| Intersection | 6 AM - 7 PM | |
|---|---|---|
| | Daily Pedestrian Count Total[2] | Most active direction |
| Gaines St./Lake Bradford Rd. | 138 | Phase 4 (N/S) |
| Gaines St. /Stone Valley Rd.[3] | Not Available | Not Available |
| Jackson Bluff Rd. /Lake Bradford Rd. | 117 | Phase 6 (N/S) |
| Stadium Dr. /Hendry St. | 540 | Phase 4 (N/S) |
| St. Augustine St./Varsity Dr. | 309 | Phase 4 (E/W) |

Source: City of Tallahassee Synchro (2018)

### *Pedestrian Actuation Analysis*

This two-phase pedestrian analysis began with the identification of pedestrian actuations at each of the signalized intersections within the study area.

- Mid-day (11:45 AM – 12:45 PM)
- PM (4:30 PM – 5:30 PM)

Counts were also filtered to only include days between Tuesday through Thursday to capture typical pedestrian movement. The following sub-sections summarize pedestrian movement patterns per intersection.

Figure 24 indicates the average actuation per hour for each intersection. Phase 4 in the east/west direction accounts for two sides of the intersection of St. Augustine St./ Varsity Dr.

Figure 25 indicates the average pedestrian per hour for each intersection. Phase 4 in the east/west direction accounts for two sides of the intersection of St. Augustine St./Varsity Dr.

[2] Reflects the sum of daily pedestrian crossing for all phases. Data was collected on Dec 2018 between 6 AM to 7 PM.

[3] This intersection was not signalized prior to 2020; limited data availability.

*Figure 24: Average Actuation Per Hour*

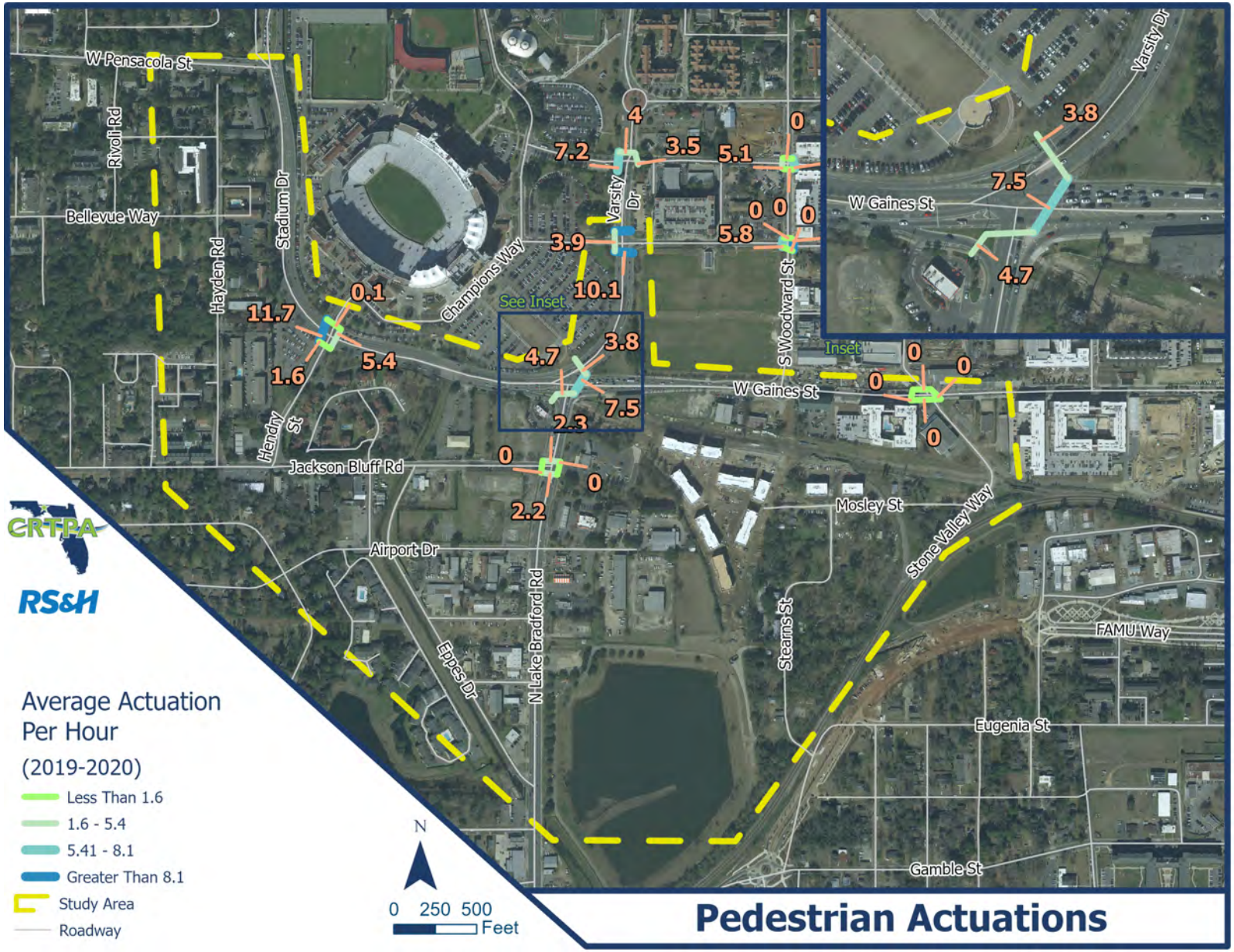
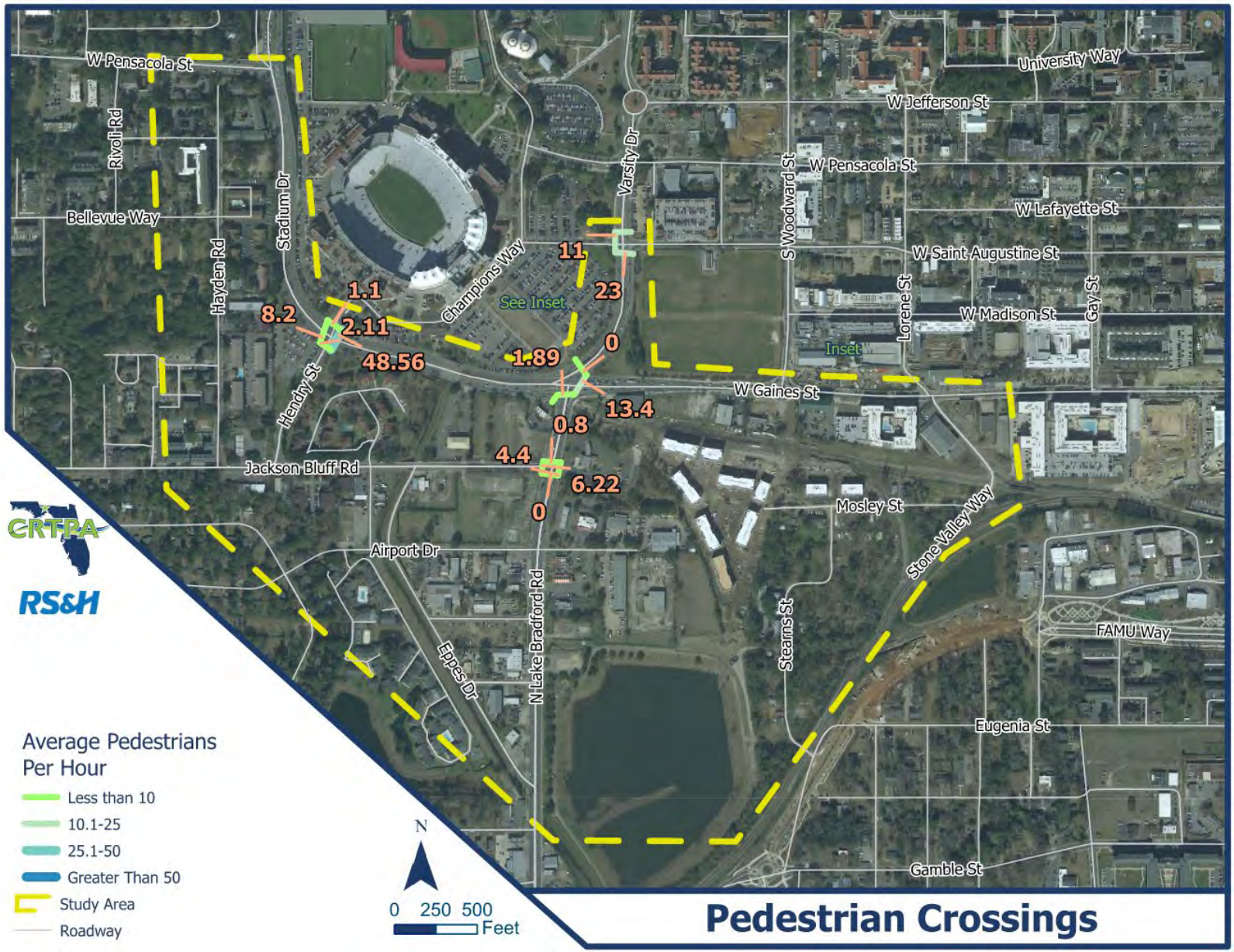


*Figure 25: Intersection Phase Pedestrian Per Hour*



## Bicycle and Micro-Mobility Considerations

Though the number of cyclists within the area has not been quantified, the bicycle infrastructure within the area has been identified. Within the study area, bicycle lanes are included along the following roadways:

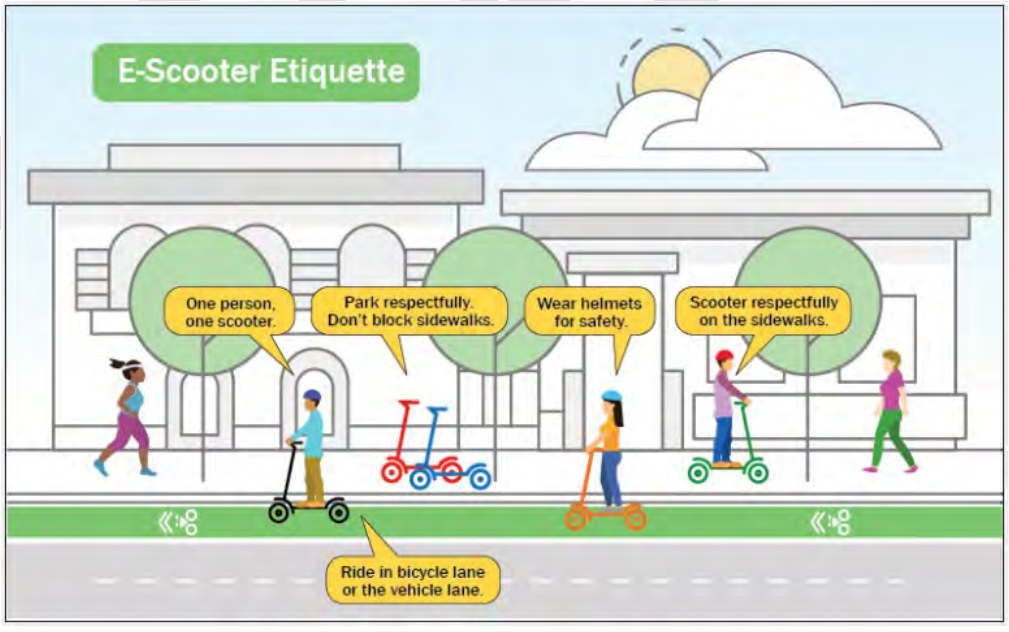
- Hendry Street
- Pensacola Street
- Stadium Drive
- St. Augustine St
- Varsity Drive

Figure 27 depicts the location of bicycle lanes in the area.

Additionally, both Jackson Bluff Rd. and Gaines St. have shared lane use markings (sharrows). The presence of sharrows indicates to drivers that bicyclists are entitled to use the entire lane, on low-speed roadways.

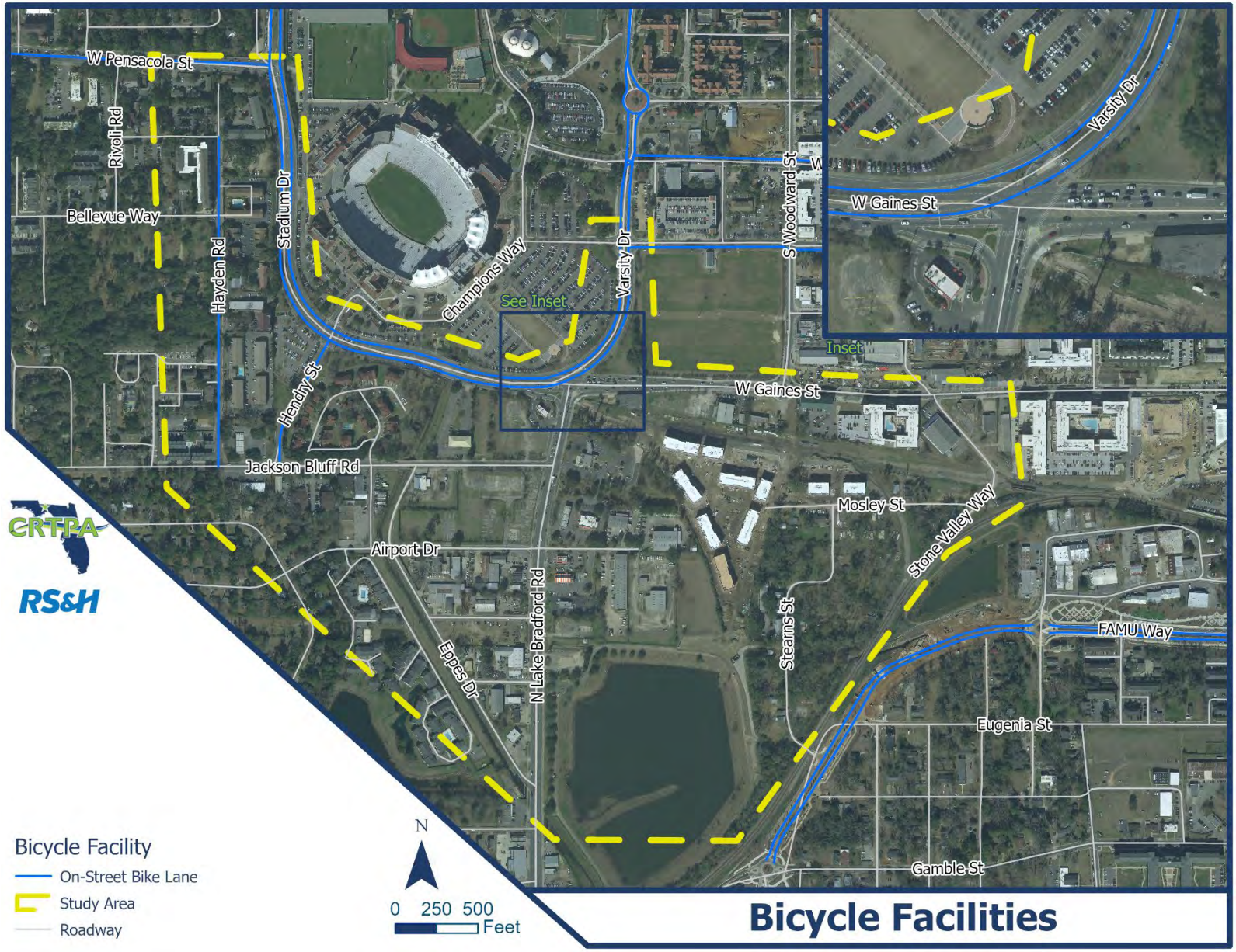
Micro-mobility options in the form of electric scooters were recently approved within the city. In October of 2020, the city entered into agreement with two micro-mobility companies after a successful pilot program was conducted. These scooters are intended to be used within bicycle and vehicle lanes and should be parked on sidewalks. These scooters generally provide quick transportation alternatives that help reduce personal vehicle trips and parking demands in high demand areas. Due to the ability of the scooters to be misused or misplaced, the city developed the following etiquette graphic to increase safety.

*Figure 26: Electric Scooter Etiquette*




Source: https://www.talgov.com/place/pln-scoot.aspx

*Figure 27: Bicycle Facilities*




Source: Tallahassee – Leon County GIS

## Crash Analysis

As part of this study, an analysis of the crashes within a five-year period was conducted. This five-year analysis utilized crash data from both the study area and the project intersection between 2015 and 2019 as gathered from FDOT's publicly available crash data[4]. The data utilized ended in 2019 due to the unavailability of the total 2020 dataset.

### Study Area Crash Analysis

#### *Study Area Crashes*

Overall, there have been 669 total crashes identified within 500 ft. of the project study area between 2015 and 2019. Over this period, the number of vehicle collisions in the area began to decline in 2018 to 2019 with a higher number of fatalities happening within the 2015-2017 years. The count of crashes and their percentage of the total 669 crashes are included within Table 12.

*Table 12: Yearly Crash Numbers and Percent of Total*

| Crash Year | Number of Crashes | Percent of Total |
|---|---|---|
| 2015 | 156 | 23.3% |
| 2016 | 155 | 23.2% |
| 2017 | 163 | 24.4% |
| 2018 | 120 | 17.9% |
| 2019 | 75 | 11.2% |
| Grand Total | 669 | - |

Source: FDOT Open Data

#### *Study Area Crash Severity*

Using the information above, Figure 28 depicts the location of these crashes and their severity, ranging from no injury (property damage only) to incapacitating injuries. There were no fatalities within the study area over the five-year period. The breakdown of injury severity within the study area is depicted within Table 13.

[4] https://gis-fdot.opendata.arcgis.com/

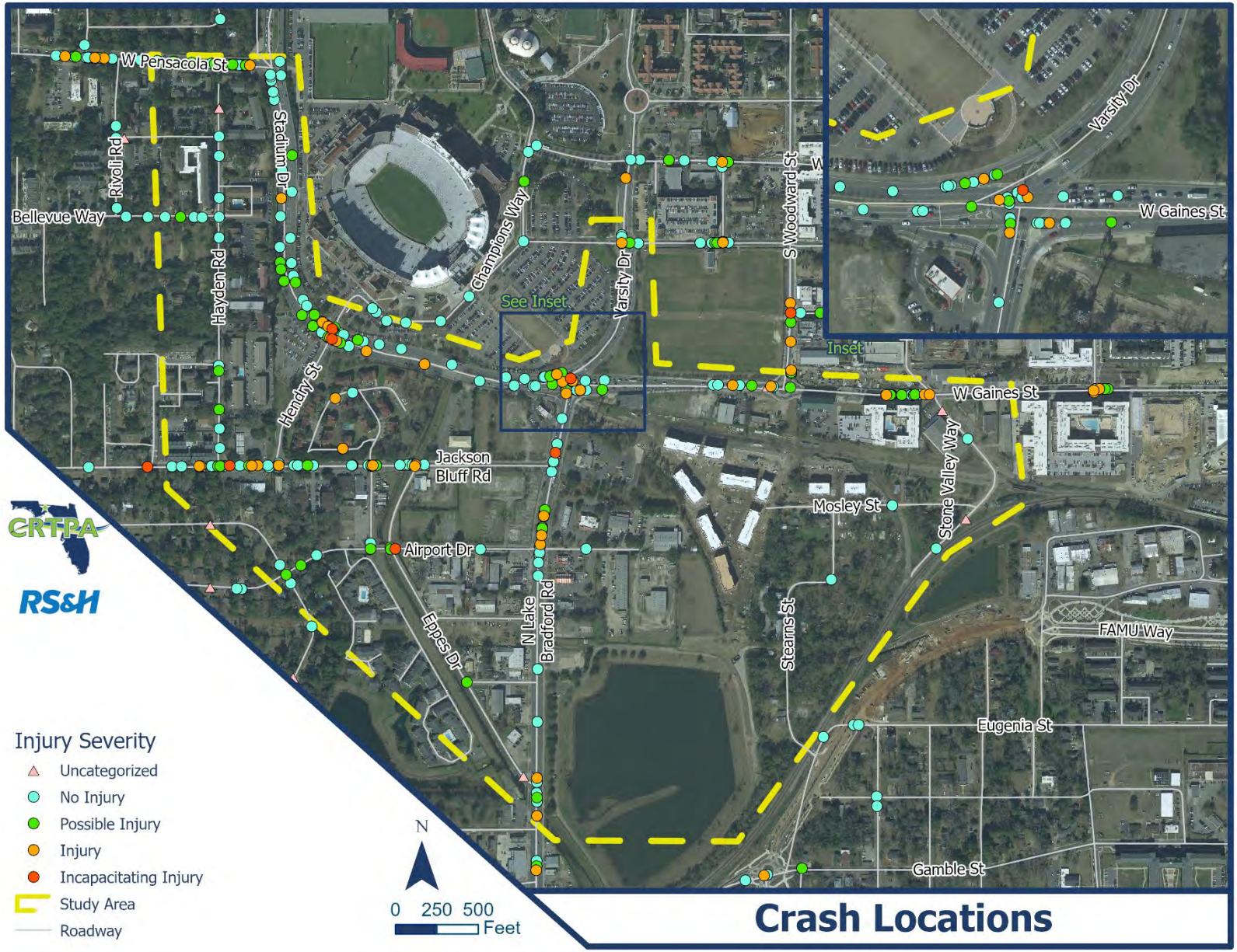
*Table 13: Study Area Crash Severity*

| Crash Code | Injury Severity | Number of Crashes | Percent of Total |
|---|---|---|---|
| 0 | Uncategorized | 21 | 3.1% |
| 1 | No Injury | 428 | 64.0% |
| 2 | Possible Injury | 133 | 19.9% |
| 3 | No-Incapacitating Injury | 79 | 11.8% |
| 4 | Incapacitating Injury | 8 | 1.2% |
| Grand Total | - | 669 | - |

Source: FDOT Open Data

*Note: Uncategorized crashes indicate that the crash form did not conform to the FDOT code system and therefore was not categorized. These crashes could range from no injury to fatality.*

*Figure 28: Crash Severity and Location (2015-2019)*




Source: FDOT Open Data

### *Study Area Collision Types*

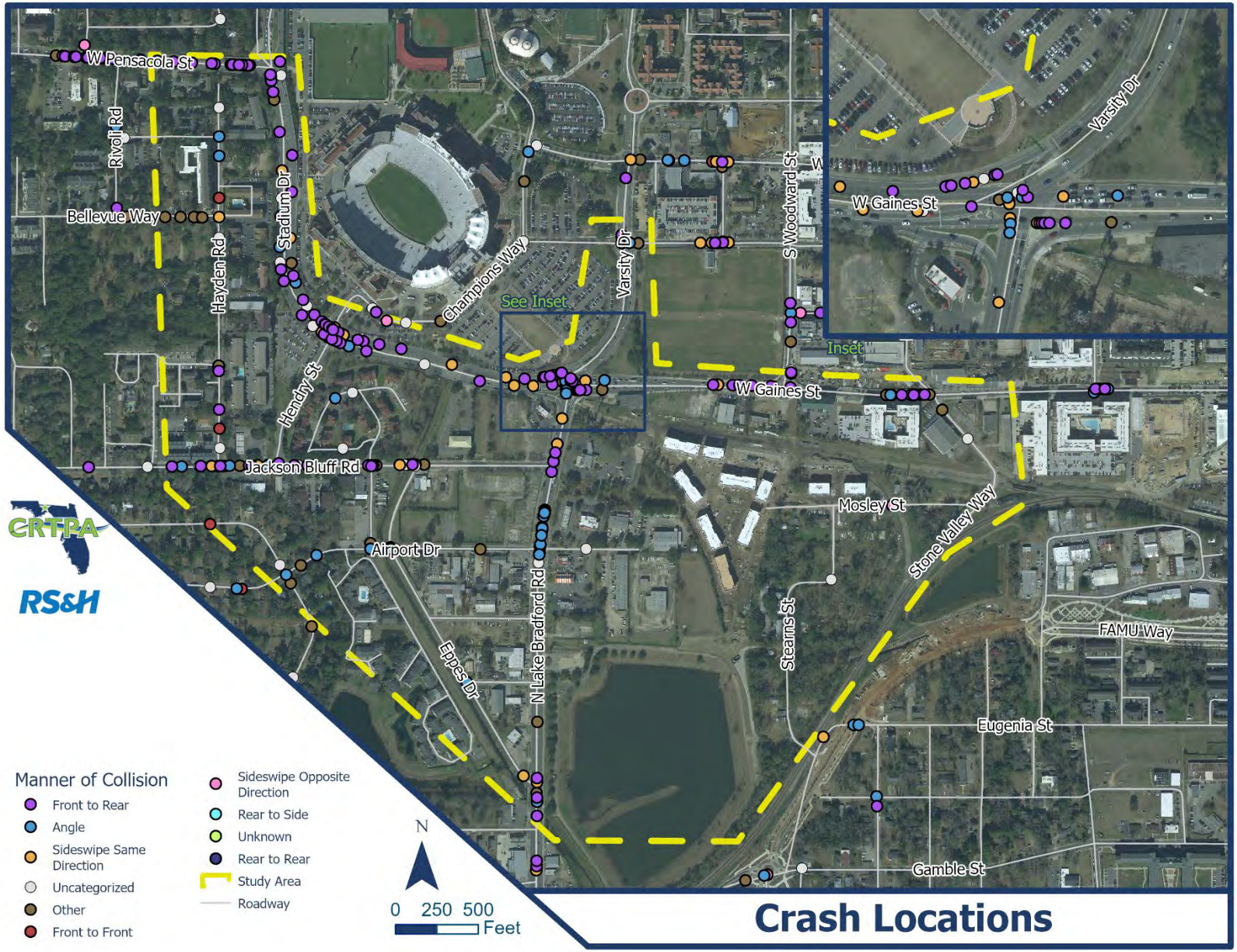
Of the 669 crashes within the study area, the most common crash type was rear end collisions (31.8%), followed by angle collisions (25.6%). With these two crash types being most prevalent, the assumption is that these crashes are due to congestion, unanticipated stopping, and distracted driving, and the angle crashes are indicative crashes at intersections. The types of crashes are outlined in Table 14 and graphically shown in Figure 29.

*Table 14: Study Area Crashes by Collision Type*

| Crash Code | Description of Crash | Number of Crashes_ | Percent of Total |
|---|---|---|---|
| 1 | Front to Rear | 213 | 31.8% |
| 3 | Angle | 171 | 25.6% |
| 4 | Sideswipe Same Direction | 98 | 14.6% |
| 0 | Uncategorized | 68 | 10.2% |
| 77 | Other | 65 | 9.7% |
| 2 | Front to Front | 33 | 4.9% |
| 5 | Sideswipe Opposite Direction | 12 | 1.8% |
| 6 | Rear to Side | 4 | 0.6% |
| 88 | Unknown | 3 | 0.4% |
| 7 | Rear to Rear | 2 | 0.3% |
| **Total** | - | **669** | - |

Source: FDOT Open Data

*Figure 29: Manner of Collision (2015-219)*




Source: FDOT Open Data

### *Pedestrian and Bicyclist Crashes*

With the 2015-2019 time period, seven bicycle and pedestrian crashes occurred within the project study area. However, only one pedestrian crash was reported within the project intersection. The pedestrian and bicycle crashes and their severity are shown in Figure 30.

Although not included within this data set, a bicyclist sustained critical injuries within the project intersection while this study was being developed.

### *Study Area Impaired Drivers*

With the proximity to Florida State University (FSU) and Florida Agricultural and Mechanical University (FAMU), there is a significant student population traveling within the area. In addition to these two universities, several bars are located within, or very near to the study area. As such, an additional look into the number of crashes were identified in which the driver was impaired. Of the 669 crashes, 20 of the crashes involved an impaired driver. Table 15 depicts the impaired driver crashes, and the injury severity associated in these instances. Additionally, Figure 32 depicts the location of the impaired driver crashes within the corridor.

*Table 15: Impaired Driver Crash Severity*

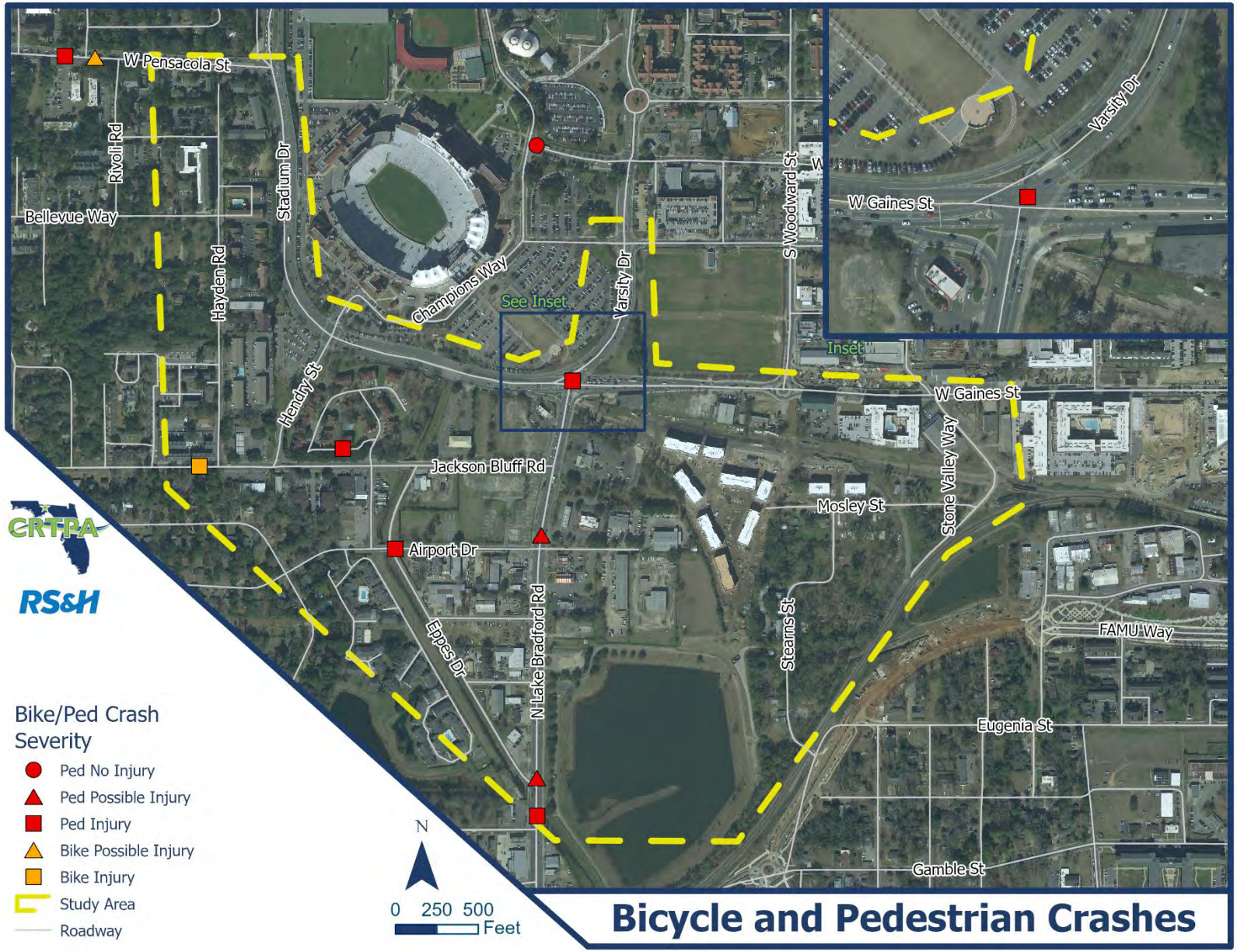
| Injury Severity | Number of Impaired Driver Crashes | Percent of Driver Impaired Crashes |
|---|---|---|
| No Injury | 11 | 55% |
| Possible Injury | 6 | 30% |
| No-Incapacitating Injury | 3 | 15% |
| **Total** | **20** | - |

Source: FDOT Open Data

## Heatmap

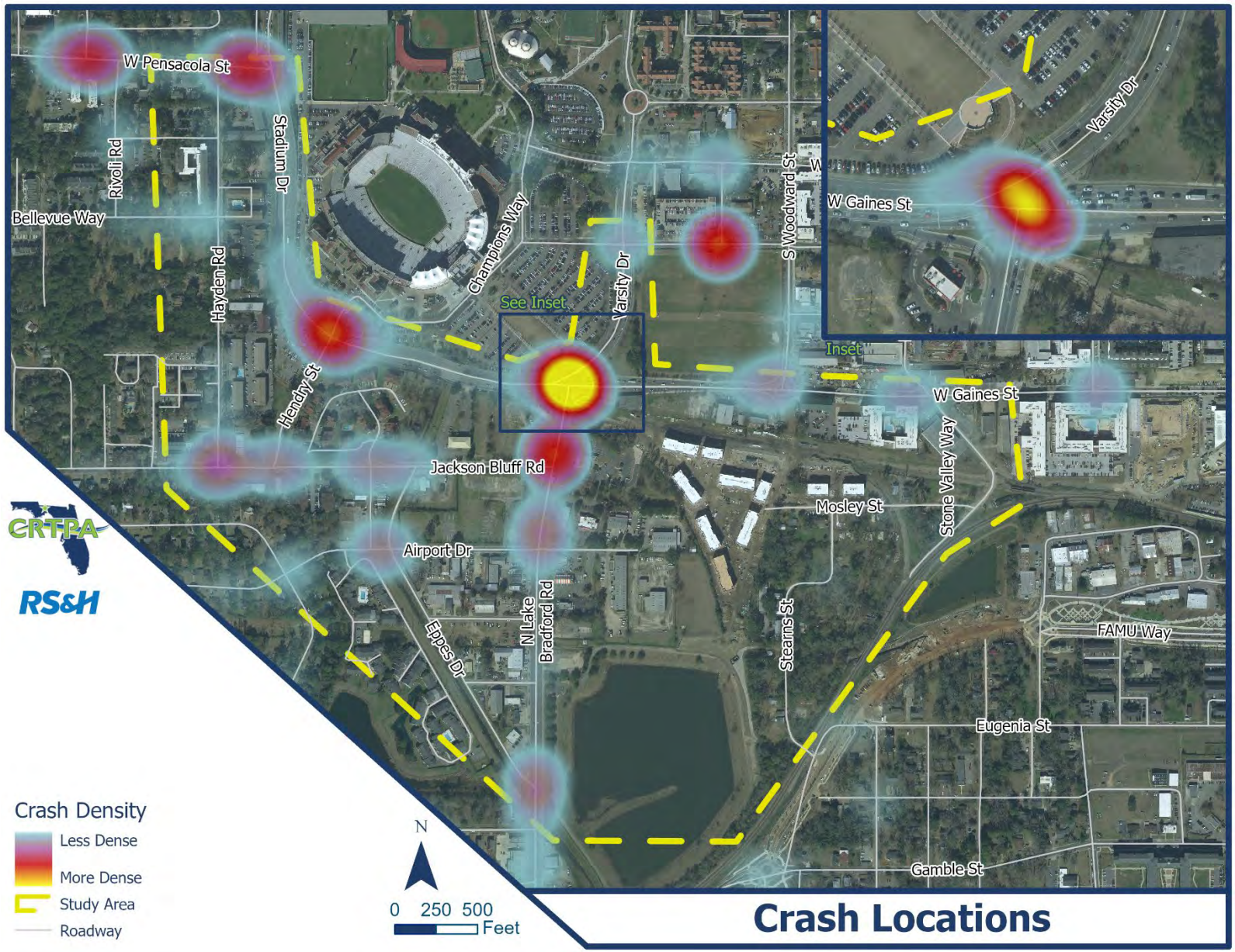
The location of crashes within the study area can help identify issue areas and areas of higher density. Crash density visualization which depicts areas of higher crash occurrences (yellow) with areas of lower occurrences (blue) is shown in Figure 31. The crashes within the study area are primarily focused nearby the intersections, with the highest density of crashes located within the project intersection.

*Figure 30: Bicycle and Pedestrian Crash Severity*



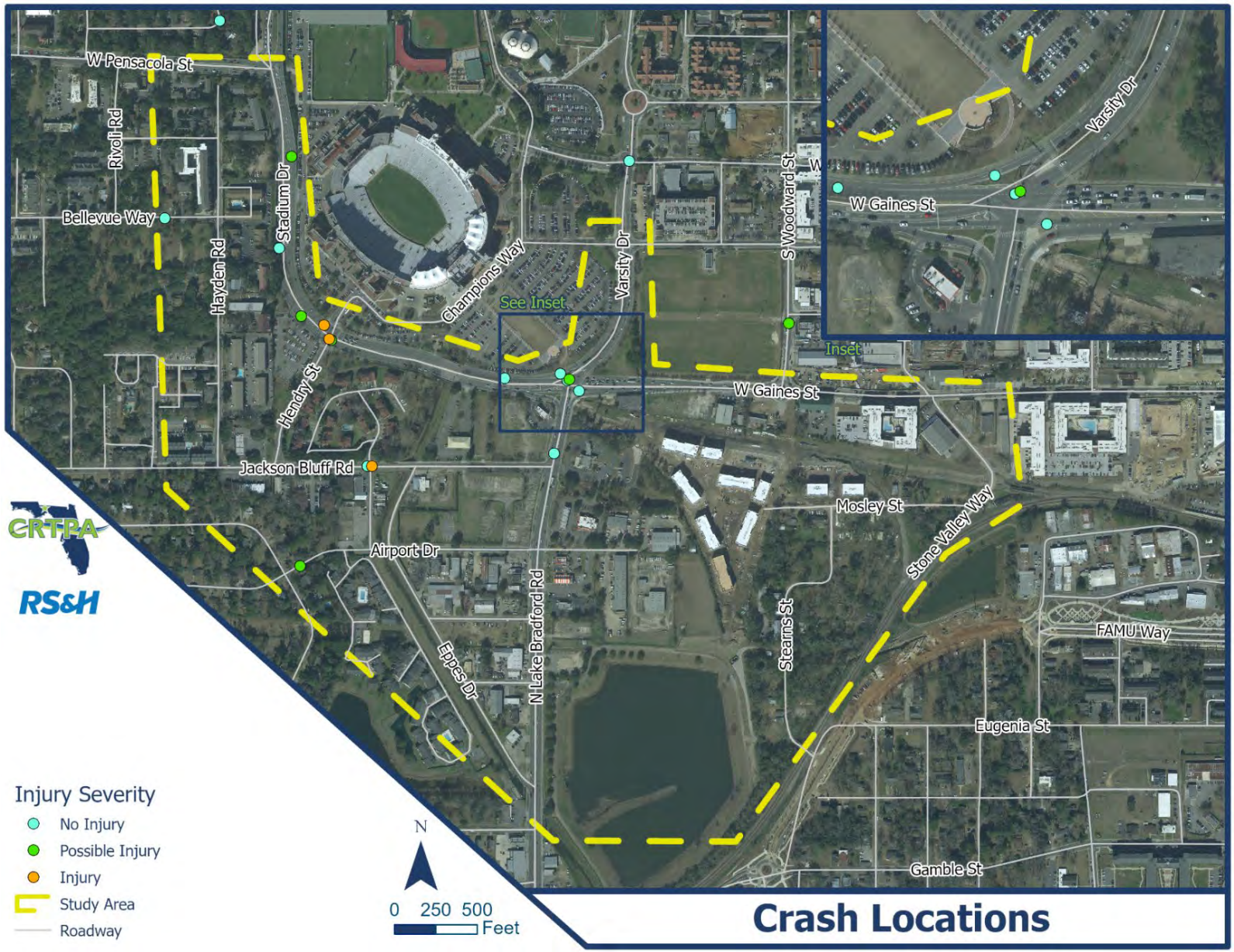

Source: FDOT Open Data

*Figure 31: Heat Map Depicting Crash Density*




Source: FDOT Open Data

*Figure 32: Impaired Driver Injury Severity Location Map*



## Study Intersection Crash Analysis

In addition to the study area analysis, a more in-depth investigation at the crashes occurring at the project intersection was conducted. Of the 669 crashes within the study area, 126 (~19%) were located within or immediately adjacent to the project intersection.

### *Study Intersection Crashes*

The number of crashes per year at the intersection has remained fairly consistent across the five-year period with an average of 25.2 crashes a year. The year 2017 had the highest number of crashes (32) while 2018 experienced the lowest number (22).

*Table 16: Gaines St./Stadium Dr. and Lake Bradford Rd. Crashes*

| Crash Year | Number of Crashes | Percent of Total |
|---|---|---|
| 2015 | 23 | 18.3% |
| 2016 | 25 | 19.8% |
| 2017 | 32 | 25.4% |
| 2018 | 22 | 17.5% |
| 2019 | 24 | 19.0% |
| **Total** | **126** | - |

Source: FDOT Open Data

### *Study Intersection Crash Severity*

Within the project intersection, the majority of the crashes (68.3%) were identified as no injury collisions, while 39 crashes identified at least a possible injury or worse. No fatalities were identified over the five-year period, and the worst injury experienced was one crash (0.8% or total) resulting in an incapacitating injury.

*Table 17: Gaines St./Stadium Dr. and Lake Bradford Rd. Crash Severity*

| Crash Code | Crash Severity | Number of Crashes | Percent of Total |
|---|---|---|---|
| 0 | Uncategorized | 1 | 0.8% |
| 1 | No Injury | 86 | 68.3% |
| 2 | Possible Injury | 23 | 18.3% |
| 3 | No-Incapacitating Injury | 15 | 11.9% |
| 4 | Incapacitating Injury | 1 | 0.8% |
| **Total** | - | **126** | - |

Source: FDOT Open Data

### *Study Intersection Collision Types*

When looking at the collision types, the two most common experienced within the intersection were rear end collisions (41.3%) and sideswipes traveling the same direction (23.0%). These rear-end collisions are typically indicative of stopping short or unexpected slowing through the intersection, or distracted driving, and the sideswipes typically indicate merging through the intersection. The same direction sideswipes may be caused by confusion in the intersection which currently has unconventional lane movements.

*Table 18: Gaines St./Stadium Dr. and Lake Bradford Rd. Crash Manner of Collision*

| Crash Code | Crash Type | Number of Crashes | Percent of Total |
|---|---|---|---|
| 1 | Front to Rear | 52 | 41.3% |
| 4 | Sideswipe Same Direction | 29 | 23.0% |
| 3 | Angle | 17 | 13.5% |
| 77 | Other | 11 | 8.7% |
| 2 | Front to Front | 10 | 7.9% |
| 0 | Uncategorized | 7 | 5.6% |
| **Total** | - | **126** | - |

Source: FDOT Open Data

### *Study Intersection Impaired Drivers*

With the proximity of the universities, entertainment districts, and sports stadiums in the area, a review of potentially impaired drivers was conducted. Of the total 126 crashes within the intersection, five crashes (~4%) involved a driver that was identified as impaired. These five crashes represent 25% of the total (20) number of crashes within the study intersection.

*Table 19: Gaines St./Stadium Dr. and Lake Bradford Rd. Impaired Driver Crash Severity*

| Injury Severity | Number of Impaired Driver Crashes | Percent of Driver Impaired Crashes |
|---|---|---|
| No Injury | 4 | 80% |
| Possible Injury | 1 | 20% |
| **Total** | **5** | - |

Source: FDOT Open Data

## Transit Operations

StarMetro is the Tallahassee area transit provider that offers service throughout the study area. StarMetro maintains 16 routes (eight FSU campus routes and two trolley routes) that operate within the study area, with varying schedules.

### Routes within the Study Area

**Weekday Routes**

- Forest Route
- Tall Timbers Route

Two weekday bus routes traverse the study area and utilize the project intersection. The Tall Timbers Route provides east/west service along Stadium Drive and Gaines Street, while the Forest Route travels along Jackson Bluff Road using Lake Bradford Road/Varsity Drive to access both St. Augustine Street and Jefferson Street.

**Weekend Routes**

- Forest Saturday Route
- Tall Timbers Saturday Route
- Sunday Bus Route 3

Three weekend routes are present within the study area. The Saturday Forest and Tall Timbers Routes follow the same alignments through the area, using the Saturday stop schedule. The Sunday Bus Route 3 is an additional route that utilizes the Stadium Drive/Gaines Street Corridor passing through the project intersection. This route also traverses Lake Bradford Road and Jackson Bluff, but does not make a direct connection to the project intersection.

**Night Routes**

- Night Route 3

Night Route 3 follows the same alignment through the study area as the Sunday Bus Route 3.

**Campus Routes (All FSU/Seminole Express Routes)**

- Garnet
- Gold
- Heritage
- Innovation
- Osceola
- Renegade
- Tomahawk
- Night Nole

Doak Campbell Stadium serves as a primary hub for the FSU bus route system, and as such, each of the routes traverse the study area. Though this main transit stop is approximately 900 ft. from the project intersection, most FSU bus routes utilize the Champions Way at Stadium Drive intersection to access Campus. The only campus route currently using the project intersection is the Innovation Route, which provides service between Innovation Park Campus and the Main FSU campus.

**Trolley Routes**

In addition to the standard bus routes described above, StarMetro operates Trolley routes that provide intermittent services during lunch and dinner times.

- Lunchtime College Town Trolley
- Dinnertime Trolley

Both trolley routes described above follow the same alignment through the study area, with service being provided along Gaines Street and Madison Street east of Woodward Drive. This route is on the edge of the study area but provides significant peak restaurant hours service.

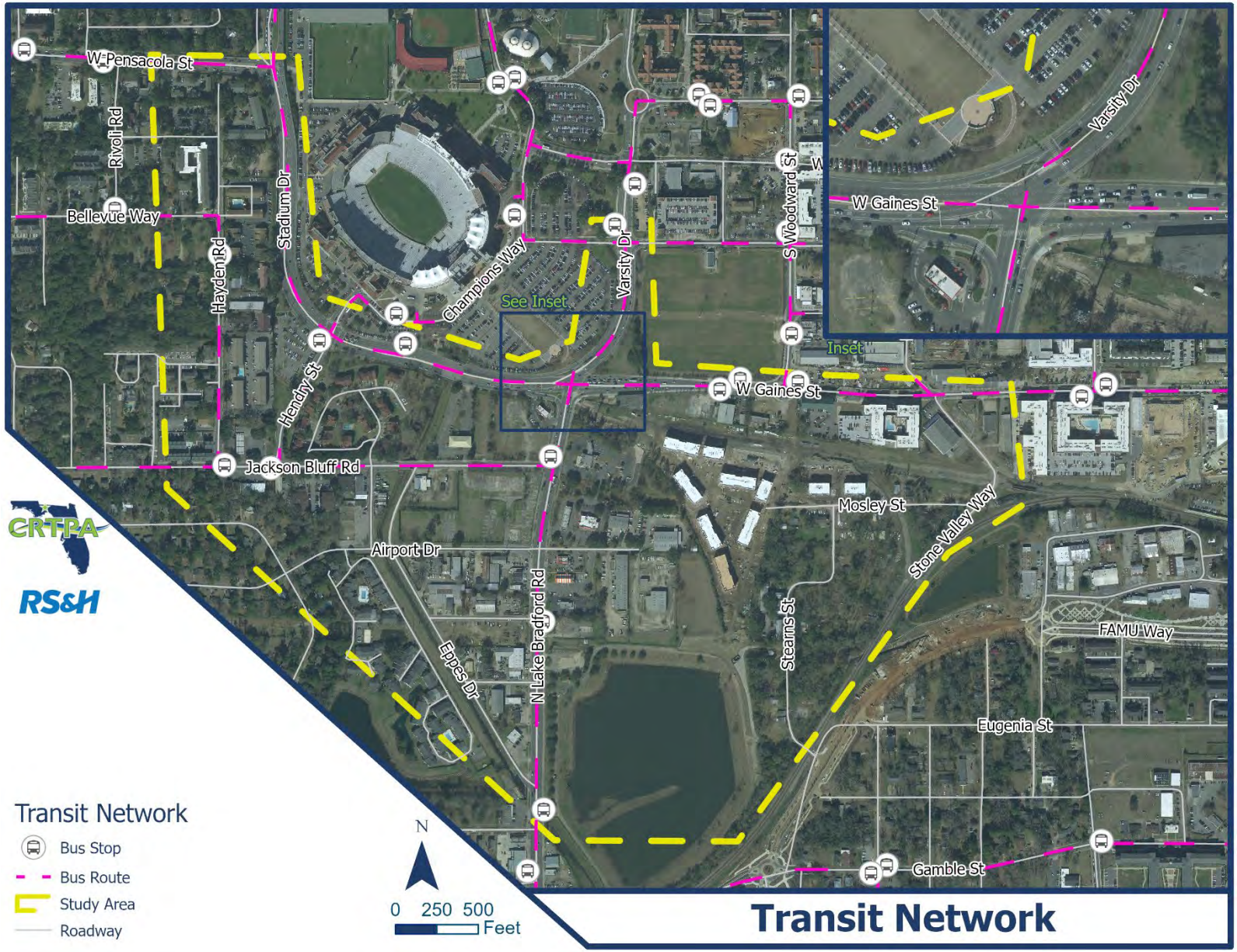
## Bus Stops within the Study Area

As described above, StarMetro has several routes that provide significant coverage of the study area for both residents and the student populations in the area. There are currently 13 bus stop locations that provide access to this network, each with varying amenities available. Table 20 depicts the stop locations and their existing amenities and the locations are graphically shown in Figure 33.

*Table 20: StarMetro Stop Locations within the Study Area*

| Bus Stop ID # | Bus Stop Location | Bus Stope Amenities |
|---|---|---|
| 202 | FSU SECOND CIRCLE | Shelter - Campus |
| 2458 | GAINES AT WOODWARD EB | 2 Seat Bus Pole |
| 2484 | GAINES AT WOODWARD WB | Shelter - StarMetro |
| 209 | GAINES ST AT WOODWARD AVE WB | Shelter - StarMetro |
| 438 | HAYDEN RD BELLEVUE WAY | No Seating |
| 172 | JACKSON BLUFF RD AT HAYDEN RD WB | Bench - StarMetro |
| 2144 | JACKSON BLUFF RD AT HENDRY ST EB | Bench - StarMetro |
| 2289 | LAKE BRADFORD AT PEPPER DRIVE NB | No Seating |
| 203 | STADIUM DR AND DOAK CAMPBELL WB | No Seating |
| 201 | STADIUM DR HENDRY ST EB | No Seating |
| 176 | W LAKE BRADFORD RD AT JACKSON BLUFF SB | Bench - StarMetro |
| 851 | W LAKE BRADFORD RD CRATE ST | No Seating |
| 2607 | Varsity/St Aug Southbound | No Seating |

*Figure 33: Existing Transit Routes and Bus Stop Locations*




Source: StarMetro and Tallahassee-Leon County GIS