

CYPRESS MANAGEMENT AND DESIGN

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TRAFFIC METHODOLOGY

Commerce Center US 17 and State Road 16

The following traffic methodology is being supplied by the owners of the 17-16 Commerce center. It has been a joint effort with the city of Green Cove Springs.

This document includes:

1. Traffic Methodology-Introduction and written Summary
2. Tables 1-4 Trip Generation Calculations
3. Existing Road segment- description
4. LOS Map
5. Description of Site access Points
6. Preliminary Master plan

Traffic Study Timeline:

The traffic study will begin upon certain events:

1. Completion and approval of PUD
2. Start of School (required for a traffic study)

The hope is to have the study completed prior to December of 2024, but this is a large study and may be completed in several phases to allow review by City and FDOT prior to final completion.

INTRODUCTION

This proposed commercial development will be located in the southeast quadrant of the US 17/SR 16 intersection in Green Cove Springs, Florida. As currently proposed, the development will have two full access driveways (one existing and one new) and one new right-in-right-out only driveway on SR 16 as well as two new full access driveways on US 17 (one opposite the entrance to the shopping center). Exclusive left turn lanes will be provided at all site driveways except driveways limited to right turns. This commercial center is planned for completion and full occupancy in 2035 and is expected to include the following new land uses:

- 119,000 sf of manufacturing space,
- 231,200 sf of retail space (including one gas station with convenience market on southeast corner of the US 17/SR 16 intersection),
- 264,000 sf of warehouse space,
- 130,500 sf of light industrial space, and
- A train-delivery system to above facility

The proposed site plan is provided in Attachment A. The development will proceed in phases with Phase 1 scheduled for completion by the end of 2025. This Phase is expected to include the following new land uses:

- 81,500 sf of manufacturing space, and
- 25,600 sf of retail space.

The proposed Phase 1 site plan is included in Attachment A. Access for this phase will be provided via the three SR 16 driveways.

The Phase 2 development is scheduled for completion in 2030 and is expected to include the following cumulative new land uses:

- 81,500 sf of manufacturing space
- 56,600 sf of retail space, and
- 30,500 sf of warehouse space
- 40,000 Light Industrial

The proposed Phase 2 site plan is included in Attachment A. Access for this phase will be provided using the same access scheme as for full development.

The existing full access driveway on SR 16 currently provides access to a boat manufacturing facility which will remain in place. The facility occupies two existing buildings (Buildings 1 and 2) that total 87,200 sf in size. The third existing building (Building 3) is 81,500 sf in size. This building will be renovated, and its square footage is included in the future manufacturing space listed above. US 17 (S. Orange Avenue) is a four-lane divided urban principal arterial with an FDOT access management classification of 3 and a posted speed limit of 45 mph in the vicinity of the site. SR 16 (Leonard C. Taylor Parkway) is also a four-lane divided urban principal arterial in the vicinity of the site with an FDOT access management classification of 3 and a posted speed limit of 45 mph.

STUDY AREA

The study area will consist of all roadway segments where site traffic represents at least 5% of the maximum service volume for the adopted level of service or where truck traffic increases by 5% or more. An estimated pre-model trip distribution of both total vehicles and trucks will be used to test the 5% criterion. This trip-distribution will be provided to the City of Green Cove Springs for review and approval prior to final establishment of the study area. Major intersections within these segments and all site driveway intersections will be evaluated. At a minimum include all road segments and signalized intersections on US 17 from the new Outer Beltway to Governor's Creek and on SR 16 from Oakridge Avenue to just east of the Shand's Bridge.

FUTURE ROADWAY IMPROVEMENTS

The Outer Beltway, which is scheduled for completion in November of 2024, will be included as a future roadway for all three phases. Other future roadway improvements, as reflected in the NERPM-AB areawide model, will be included in the future road network.

EXISTING TRAFFIC VOLUMES

During fall of 2024 weekday AM and PM peak period manual turning movement counts will be conducted at the existing intersections listed above - as well as at the SR 16/Existing Site Entrance intersection. The data will be recorded at 15-minute intervals and will include a separate tabulation for trucks and pedestrians. Weekday AM and PM peak hours for analysis will be identified from a review of the peak period counts. Counts will be adjusted to the peak season using the latest set of FDOT seasonal adjustment factors for Clay County. In addition the existing traffic Exhibit-E is provided using FDOT traffic information.

SITE TRIP GENERATION

Trip generation calculations will be carried out using the 11th edition of ITE's Trip Generation Manual and referencing land use codes 110 (General Light Industrial), 140 (Manufacturing), 150 (Warehousing) and 820 (Shopping Center). Attached Tables 1 through 5 provide the trip generation calculations for the full development. Trip generation for the Train-to-Truck Transfer Facility was calculated using reasonable trip generation rates based on truck and employee activity. No internal trip-making reduction will be made although a reduction for retail pass-by traffic will be taken for road segments and off-site intersections. The expected total daily trip generation for the new development is 13,634 (6817 entering and 6817 exiting) with 516 trips occurring during the AM peak hour (366 entering and 150 exiting) and 1241 occurring during the PM peak hour (548 entering and 693 exiting). Expected truck trip generation will also be developed using available ITE trip rates. Any trip-making reductions taken for pass-by traffic will be limited to 10% of the

adjacent street traffic.

SITE TRIP DISTRIBUTION AND TRAFFIC ASSIGNMENT

Weekday AM and PM peak hour site trips will be directionally distributed and assigned to the future road network based on the results of an areawide model run supplemented by engineering judgment. Trucks will be distributed separately, and a map provided showing expected truck volumes.

DIVERTED TRAFFIC

Opening of the Outer Beltway can be expected to significantly alter traffic patterns and traffic volumes in the study area. The NERPM-AB areawide model will be used to estimate this diversion as well as the level of anticipated traffic growth through the development of growth-diversion factors for each intersection turning movement. Future model years include 2030 and 2045. 2035 growth-diversion factors will be identified via interpolation.

FUTURE TRAFFIC VOLUMES

The expected weekday AM and PM peak hour background (No Build) traffic volumes and total (Build) traffic volumes using road segments and intersections in the study area will be calculated for 2025 (Phase 1), 2030 (Phase 2) and 2035 (Full Build-Out). These volumes will be used in subsequent analyses. Traffic associated with the planned Rookery development will be included in future No Build traffic.

TURN LANE ANALYSIS

A formal analysis will be conducted to determine if an exclusive right turn lane is warranted on US 17 or SR 16 at any of the Site Drives under Build conditions. The methodology contained in NCHRP Report 457 will be used to conduct the right turn lane evaluation.

ROADWAY LINK ANALYSIS

The expected level of service for each roadway segment will be evaluated under 2025, 2030 and 2035 No Build and Build conditions using FDOT Generalized Level of Service Tables. Tables will be provided that contain for each segment the following items: number of lanes, FDOT group classification, adopted level of service, maximum service volume for the adopted level of service, current traffic count, existing v/c ratio, future projected traffic counts, future v/c ratios.

INTERSECTION CAPACITY ANALYSIS

Signalized intersections will be analyzed under both Existing and Build conditions using the operational control methodology contained in the 2024 version of the Highway Capacity Software. Unsignalized intersections will be analyzed under both Existing, No Build and Build conditions using the two-way stop control methodology contained in the 2024 version of the Highway Capacity Software. The effect of truck traffic will be included in the analysis.

ACCESS MANAGEMENT EVALUATION

FDOT access management guidelines will be evaluated based on the proposed driveway and median opening locations.

TRAIN CROSSING REVIEW

Determine the number of trains expected to use the at-grade crossing on US 17 and the expected delay to US 17 traffic. Current train activity will be determined through existing CSX data. Current Train crossing to Spur is limited to two trains a week based on CSX. We anticipate no additional train crossings to Spur. All future development projects generating additional train activity shall be required to project their impact on US 17 train crossings as part of the Site Development review.

TRUCK TRAFFIC

The truck trip generation for industrial uses is based on cite ITE 11th Edition. See attached truck trip generation exhibit.

RECOMMENDED IMPROVEMENTS

Recommended roadway and intersection improvements for each of the three development phases will be identified. Mitigation requirements shall comply with the City of Green Cove Springs Traffic Study Guidelines set forth in Resolution R-29-2020.

FINAL REPORT

A signed and sealed traffic engineering report will be submitted complying with the guidelines set forth in the City of Green Cove Springs Traffic Study, Resolution R-29-2020.

Addendum to Huntley Commerce Center Traffic Impact Study Methodology

Below is an addendum to the previously submitted Traffic Study Methodology Document.

Proposed Development Trip Generation

Traffic analysis will be performed based on the trip generation for the following proposed land uses:

- 119,000 SF of manufacturing space,
- 231,200 SF of retail space (including one gas station with convenience market on southeast corner of the US 17/SR 16 intersection),
- 264,000 SF of warehouse space,
- 130,500 SF of light industrial space, and
- A train-delivery system to above facility

Project Phases:

The proposed development is anticipated to be developed in Three (3) Phases. Hence the traffic analysis will include evaluation of the study roadway segments and intersection in three phases.

Project Traffic Distribution:

As stated previously, the project traffic distribution will be obtained based on the distribution obtained from the MERPM_AB travel demand model runs for each of the development phases. The model runs will include the following improvements by phases.

Bonded and Approved Projects:

As suggested in the previously submitted Methodology Document, traffic volumes on US 17 at Ferris Street/SR 16 West and SR 16 East/Green Cove Avenue are anticipated to be reduced upon completion of the following projects:

- County Road 209 (Clay County Bonded Project 2): From CR 315B to US 17 and from CR 315B to South of Peters Creek - 100% Project Complete (04/2026)
- County Road 209 (Clay County Bonded Project 3A & 3B): from Sandridge Road to Peters Creek Bridge Operational Improvements - Widening and Pavement. Project Completed (10/2025)
- CR 739B/Sandridge Rd (Clay County Bonded Project 4): from Henley Rd to West of CR 209 - 100% Project Complete (03/2025)
- CR 315 Group 2 (Clay County Bonded Project 6A. 1 & 6A. 2): from Maryland Ave to US 17 - 100% Project Complete (03/2026)
- CR 216/Cathedral Oak (Clay County Bonded Project 6B): from SR 23 to Maryland Ave (Design-Build) - 100% Project Complete (06/2025)
- FDOT Funded First Coast Expressway – West of US 17 Completed by year 2028 and east of US 17 to St. Johns County to be Completed by year 2030.

Intersection Analysis:

Intersection capacity analysis for the US 17 intersections at SR 16 West/Ferris Street and SR 16 East/Green Cove Avenue will be conducted under each of the project build phases. The analysis will be consistent with both FDOT and City of Green Cove Springs traffic study procedures. The traffic study will determine deficiencies at the study intersections and identify any improvements that could

be implemented to improve operational conditions at the study intersections and at each of the project access locations under each of the project development phases. Any improvements to the above stated intersections will be subject to FDOT's Intersection Control Evaluation (ICE Analysis) review and approval process. Additionally, all the project access intersections are also subject to FDOT review and approvals.

Traffic Counts and Study Time Line:

The traffic counts data for the study intersections and the project access intersections will be obtained when the schools are in session. A complete traffic study will be submitted with the project construction plan approvals.

Trip Attractors vs Trip Generators

Commercial and industrial developments are considered trip attractors because they draw trips from existing origins rather than creating new ones. They reassign trips by offering new or better destinations for activities that people are already undertaking. To understand why commercial and industrial developments are considered trip attractors rather than trip generators, and how they reassign trips rather than create entirely new ones, it is important to delve into the concepts of trip generation and trip attraction within the context of urban planning and transportation studies.

Definitions:

- **Trip Generators:** These are places or activities that create new trips. For instance, residential areas generate trips as people need to travel to work, school, shopping, or other activities from their homes.
- **Trip Attractors:** These are destinations that attract trips from various origins. Commercial and industrial developments fall into this category because they draw people from different locations who need to access these sites for work, shopping, services, or other purposes.

Key Points:

1. Reassignment of Trips:

- When a new commercial or industrial development is proposed, it typically shifts the destination of existing trips rather than creating new trips. For example, if a new shopping mall is built, people who previously shopped at a different location may now choose to shop at the new mall. Similarly, a new industrial park may attract employees who previously commuted to different work locations.
- This reassignment is influenced by factors such as convenience, accessibility, and the attractiveness of the new development compared to existing options.

2. Impact on Trip Patterns:

- **Redistribution:** The new development redistributes the existing trip demand rather than increasing the overall number of trips. This redistribution can alleviate congestion in some areas while potentially increasing it in others.
- **Proximity and Convenience:** People tend to prefer destinations that are closer or more convenient. New developments that offer better facilities, services, or employment opportunities can draw trips away from less favorable destinations.

3. Examples:

- **Shopping Centers:** A new retail center will attract shoppers who might have previously visited other retail locations. Thus, it doesn't generate new shoppers but attracts existing ones from different locations.
- **Office Parks:** A new office park may attract businesses and their employees from various other office locations. Employees who used to commute to one part of the city may now commute to the new office park.

4. **Transportation Planning Implications:**

- **Traffic Flow and Infrastructure:** Understanding that these developments are trip attractors helps planners design infrastructure that accommodates redirected traffic flows. For example, they might need to enhance road networks, public transportation, and parking facilities around the new development.
- **Economic Considerations:** Recognizing the role of commercial and industrial developments as trip attractors can aid in economic planning and zoning decisions, ensuring that new developments contribute positively to the urban landscape.

TABLE 1

TRIP GENERATION CALCULATIONS

WAREHOUSING

Land Use Code 150

T = Number of Vehicle Trip Ends

Size of Building = 264,000 gsf (X = 264)

TIME PERIOD	TOTAL TRIP GENERATION EQUATION	TOTAL TRIP ENDS	PERCENT ENTERING	PERCENT EXITING	TOTAL TRIP ENDS ENTERING	TOTAL TRIP ENDS EXITING
AVERAGE WEEKDAY						
Daily	$T = 1.58 (X) + 38.29$	456	50%	50%	228	228
AM Peak Hour	$T = 0.12 (X) + 23.62$	55	77%	23%	42	13
PM Peak Hour	$T = 0.12 (X) + 26.48$	58	28%	72%	16	42

SOURCE: Institute of Transportation Engineers, "Trip Generation", 11th Edition (2021)

TRAFFIC

TABLE 2

TRIP GENERATION CALCULATIONS

GENERAL LIGHT INDUSTRIAL

Land Use Code 110

T = Number of Vehicle Trip Ends

Size of Building = 130,500 gsf (X = 130.5)

TIME PERIOD	TOTAL TRIP GENERATION EQUATION	TOTAL TRIP ENDS	PERCENT ENTERING	PERCENT EXITING	TOTAL TRIP ENDS ENTERING	TOTAL TRIP ENDS EXITING
WEEKDAY						
Daily	$T = 3.76 (X) + 50.47$	542	50%	50%	271	271
AM Peak Hour	$T = 0.68 (X) + 3.81$	93	88%	12%	82	11
PM Peak Hour	$\ln(T) = 0.72 \ln(X) + 0.38$	49	14%	86%	7	42

SOURCE: Institute of Transportation Engineers, "Trip Generation", 11th Edition (2021)

TABLE 3

TRIP GENERATION CALCULATIONS

MANUFACTURING

Land Use Code 140

T = Number of Vehicle Trip Ends

Size of Buildings = 119,000 gsf (X = 119.0 kgsf)

TIME PERIOD	TOTAL TRIP GENERATION EQUATION	TOTAL TRIP ENDS	PERCENT ENTERING	PERCENT EXITING	TOTAL TRIP ENDS ENTERING	TOTAL TRIP ENDS EXITING
WEEKDAY						
Daily	$T = 3.77 (X) + 201.98$	650	50%	50%	325	325
AM Peak Hour	$T = 0.61 (X) + 9.54$	82	76%	24%	62	20
PM Peak Hour	$T = 0.87 (X) - 17.50$	86	31%	69%	27	59

SOURCE: Institute of Transportation Engineers, "Trip Generation", 11th Edition (2021)

BUCKINGHAM TRAFFIC

**TABLE 4
TRIP GENERATION CALCULATIONS**

SHOPPING CENTER (> 150,000 gsf)

Land Use Code 820

T = Number of Vehicle Trip Ends

Size of Buildings = 231,200 gsf -----> X= 231.2

<u>TIME PERIOD</u> <u>AVERAGE WEEKDAY</u>	<u>TOTAL</u> <u>TRIP GENERATION</u> <u>EQUATION</u>	<u>TOTAL</u> <u>TRIP</u> <u>ENDS</u>	<u>PERCENT</u> <u>ENTERING</u>	<u>PERCENT</u> <u>EXITING</u>	<u>TOTAL</u> <u>TRIP ENDS</u> <u>ENTERING</u>	<u>TOTAL</u> <u>TRIP ENDS</u> <u>EXITING</u>
Daily	$T = 26.11 (X) + 5863.73$	11900	50%	50%	5950	5950
AM Peak Hour	$T = 0.59 (X) + 133.55$	270	62%	38%	167	103
PM Peak Hour	$\ln(T) = 0.72 \ln(X) + 3.02$	1032	48%	52%	495	537

SOURCE: Institute of Transportation Engineers, "Trip Generation", 11th Edition (2021)

NEW TRIPS

<u>TIME PERIOD</u> <u>AVERAGE WEEKDAY</u>	<u>PERCENT NEW TRIPS</u>	<u>NEW</u> <u>TRIP</u> <u>ENDS</u>	<u>PERCENT</u> <u>ENTERING</u>	<u>PERCENT</u> <u>EXITING</u>	<u>NEW</u> <u>TRIP ENDS</u> <u>ENTERING</u>	<u>NEW</u> <u>TRIP ENDS</u> <u>EXITING</u>
Daily	71.0%	8450	50%	50%	4225	4225
AM Peak Hour	71.0%	192	62%	38%	119	73
PM Peak Hour	71.0%	733	48%	52%	352	381

SOURCE: ITE, "Trip Generation", 11th Edition, Excel Spreadsheet (LUC 820), < 300,000 gsf

Estimated Value

TRAFFIC

Truck Trip Generation Exhibit

Huntley 17/16 Commerce Center
Based on Phase 1-2 Buildout

Use	ite code	trip type	square ft	truck rt	trips
Light Industrial		110 Daily	40	0.25	10
Light Industrial		110 am	40	0.03	1
Light Industrial		110 Pm	40	0.05	2
Warehousing		150 Daily	30.5	0.6	18
Warehousing		150 am	30.5	0.06	2
Warehousing		150 Pm	30.5	0.06	2
Manufacturing		140 Daily	81.5	0.45	37
Manufacturing		140 am	81.5	0.02	2
Manufacturing		140 Pm	81.5	0.05	4
Total Industrial Daily Truck Trips		65			
Total Industrial AM PH Truck Trips		5			
Total Industrial PM PH Truck Trips		8			
ITE 11th Edition					

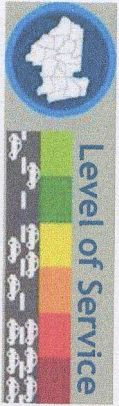
Based on 100% Buildout

Use	ite code	trip type	square ft	truck rt	trips
Light Industrial		110 Daily	130.5	0.25	33
Light Industrial		110 am	130.5	0.03	4
Light Industrial		110 Pm	130.5	0.05	7
Warehousing		150 Daily	264	0.6	158
Warehousing		150 am	264	0.06	16
Warehousing		150 Pm	264	0.06	16
Manufacturing		140 Daily	119	0.45	54
Manufacturing		140 am	119	0.02	2
Manufacturing		140 Pm	119	0.05	6
Total Industrial Daily Truck Trips		245			
Total Industrial AM PH Truck Trips		22			
Total Industrial PM PH Truck Trips		28			
ITE 11th Edition					

Huntley 17-16 Commerce Center-Traffic-

Existing Road Segments

	Roadway Classification	Classification Description	Annual Av.		Current LOS
			Daily Traffic AADT	Truck-Daily Traffic truck-AADT	
US 17					
CR-15a to CR 209s	C3C	Suburban-Commercial	15300	1943	B
CR 209 s to SR 16	C3C	Suburban-Commercial	15300	1943	C
SR 16 to Oak	C3C	Suburban-Commercial	19,500	4,583	C
Oak to Ferris	C4	Urban General	22,500	4,583	C
Ferris to Center	C-4	Urban General	22,500	2,115	C
Center to Governors	C-4	Urban General	22,500	2,115	C
SR 16					
US 17 to Clark Rd	C3C	Suburban-Commercial	20,500	1,866	D
Clark Rd to Bridge	C-2	Rural town	20,500	1,866	C



Map Legend

- Map Layer Transparency
- Level of Service Segment Breaks
- Level of Service Segments
 - B
 - C
 - D
 - E
 - F
- Strategic Intermodal System (SIS)
 - Existing SIS
 - Proposed SIS
- County Boundary

Location Search

Enter an address or landmark and click the First Address button to verify the address and zoom to that location.

Sample address: 100 S Main St
 Sample Intersection: E Bay St & Main St
 Sample landmark: The Jacksonville Landing
 Sample city: Jacksonville

Address, Intersection or Landmark:

City:

Find Address:

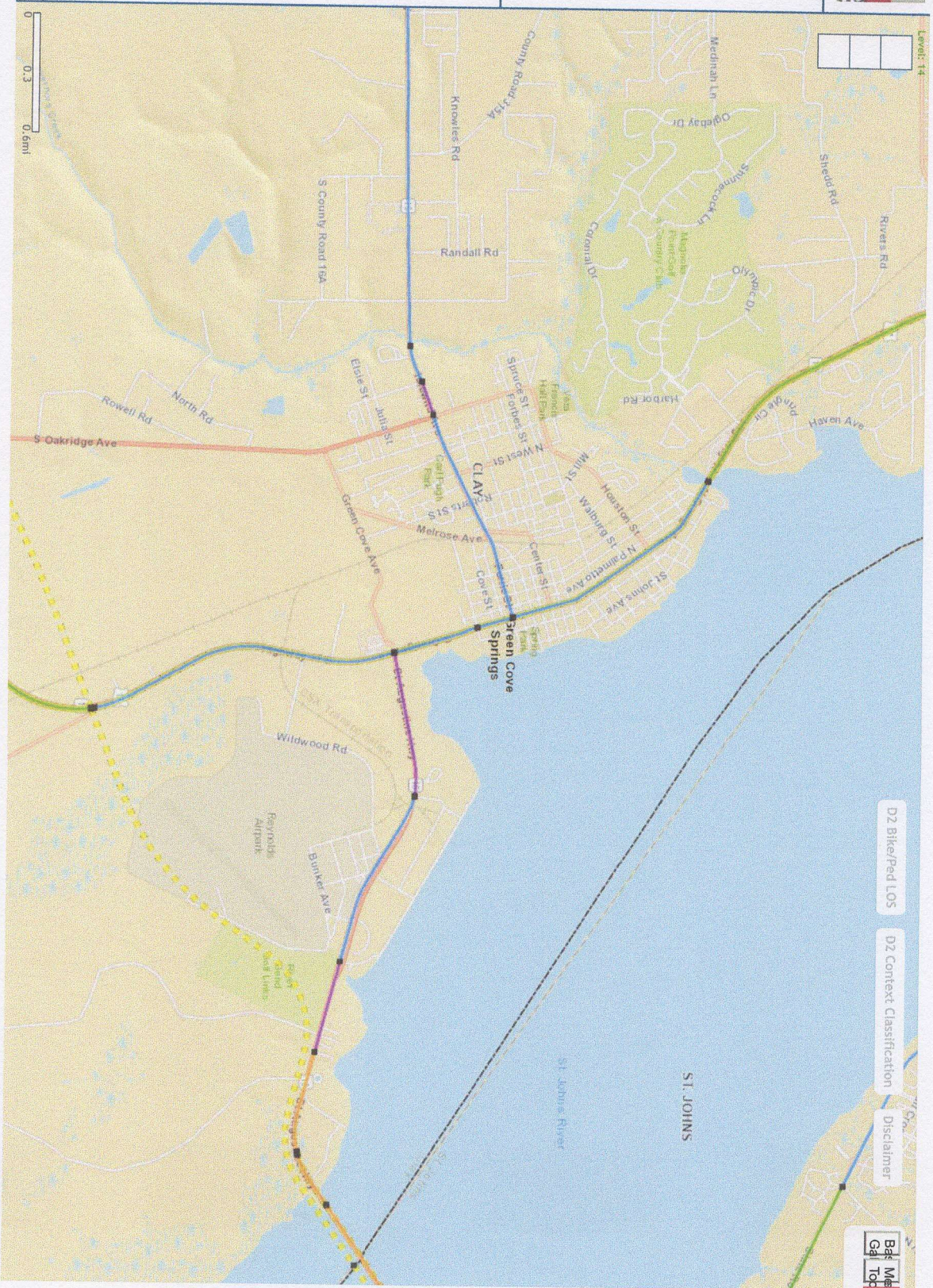
Attribute Search

Filter:

Search All Fields -

Search value:

FDOT DISTRICT TWO



D2 Biked/Ped LOS

D2 Context Classification

Disclaimer



CYPRESS MANAGEMENT AND DESIGN

P.O. Box 8880
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32006

EXHIBIT B

Commerce Center US 17 and State Road 16

Site Access:

The following will be the starting point for the traffic study. The owner may determine in the future that access points or controls of access points may change. But any change will require FDOT approval.

Access A- Directional

This will be a wide entrance- Right turn in- right turn out- and at this time a Left turn out. Our initial analysis will be on 30% of the Commercial vehicles entering and exiting the site. We will attribute 10% of truck traffic to this entrance.

Access B-

This will be right turn-in - right turn out only access point. Our initial analysis will be on 20% of the Commercial vehicles entering and 15 % exiting the site. We will attribute 40% of Convenience store to this entrance.

Access C-

This will be right turn-in - right turn out only access point. Our initial analysis will be on 10% of the Commercial vehicles entering and 15 % exiting the site. We will attribute 40% of Convenience store to this entrance.

Access D- Directional

This will be a wide entrance- Right turn in- right turn out- and at this time a Left turn in. Our initial analysis will be on 20% of the Commercial vehicles entering and exiting the site. We will attribute 20% of truck traffic to this entrance.

Access E- Full access

This will be an full access entrance- Our initial analysis will be on 10% of the Commercial vehicles entering and 20% exiting the site. We will attribute 70% of truck traffic to this entrance.

