CITY OF DELAND
REGULAR MEETING OF THE PLANNING BOARD
DECEMBER 10, 2025 AT 5:00 PM
CITY HALL, COMMISSION CHAMBERS
120 SOUTH FLORIDA AVENUE

AGENDA

CALL TO ORDER

PLEDGE OF ALLEGIANCE

ROLL CALL

VERBAL REPORT ON CITY COMMISSION MEETINGS

MINUTES

1. Approval of the November 12, 2025 Meeting Minutes.

VARIANCE OLD BUSINESS

VARIANCE NEW BUSINESS

1. Applicant Name: Gerard Galluci
   Project Number: V25-190 - Variance Request
   Project Location: 1141 N. McDonald Avenue
   Project Description: Variance request to reduce the required rear yard setback from 25 feet to 20 feet to construct an addition.
   Project Planner:Samuel Nelson

PUBLIC PARTICIPATION PROCEEDINGS

PLANNING - OLD BUSINESS

PLANNING - NEW BUSINESS

1. Applicant Name: Harry MacNaught - Longleaf Four, LLC
   Project Number: PSB24-150 - Preliminary Plat for DeLand Tech Park
   Project Location: 1445 Cassadaga Road
   Project Description: A preliminary plat to allow for construction of roadway and retention ponds on 144.88 acres of property, known as DeLand Tech Park
   Project Planner: Kendall Story

2. Applicant Name: Mark Watts, Esq. - Cobb Cole
   Project Number: SMLU24-154 – Comprehensive Plan Amendment
   Project Location: Northwest of the intersection of E. Rich Ave. and N. Hill Ave.
   Project Description: Land use change for ±1.49 acres from Low Density Residential (LDR) To Medium Density Residential (MDR)
   Project Planner: Kendall Story

3. Applicant Name: Mark Watts, Esq. - Cobb Cole
   Project Number: Z24-153 – Rezoning for North Hill Villas
   Project Location: Northwest of the intersection of E. Rich Ave. and N. Hill Ave.
   Project Description: Rezone ±1.49 acres from R-1B (Single-Family Dwelling) to North Hill Villas Planned Development
   Project Planner: Kendall Story

OTHER BUSINESS

ADJOURNMENT

CITY OF DELAND
PLANNING BOARD REGULAR MEETING
MINUTES
WEDNESDAY, NOVEMBER 12, 2025 - 5:00 P.M.
CITY HALL

CALL TO ORDER

The meeting began at 5:03 p.m.

PLEDGE OF ALLEGIANCE

Pledge of Allegiance – Mr. Owens, Chairperson

ROLL CALL

Henry Thiry	Absent
Nora Lewis	Present
Aaron Preston	Present
Don Liska	Present
Troy Baumgartner	Present
Harper Hill, *Vice Chairperson*	Present – Late Arrival: 5:04 p.m.
Jeremy Owens, *Chairperson*	Present

Quorum: Yes

Present – Darren Elkind, City Attorney; Carol Kuhn, Planning Director; Chris Carson, Senior Planner; Kendall Story, Senior Planner; Kendall Story, Senior Planner; Vivian Ford, Administrative Coordinator; applicants; and members of the public.

VERBAL REPORT ON CITY COMMISSION MEETINGS

Ms. Kuhn provided a verbal report.

MINUTES

1. Approval of the October 9, 2025 Meeting Minutes.

   Ms. Lewis moved to approve the October 9, 2025 meeting minutes. Mr. Baumgartner seconded the motion. The board otherwise unanimously voted to approve the October 9, 2025 Meeting Minutes.

2. Approval of the October 22, 2025 Meeting Minutes.

   Mr. Liska moved to approve the October 22, 2025 meeting minutes. Mr. Baumgartner seconded the motion. The board otherwise unanimously voted to approve the October 22, 2025 Meeting Minutes.

PUBLIC PARTICIPATION PROCEEDINGS

Mr. Owens read the Public Participation procedures.

VARIANCE OLD BUSINESS

None.

VARIANCE NEW BUSINESS

None.

OLD BUSINESS

None.

PLANNING – NEW BUSINESS

1. Applicant Name: Mark Watts
   Project Number: Z25-170 - PD Amendment
   Project Location: 1445 Cassadaga Road
   Project Description: Request for 2nd Amendment to DeLand Tech Park PD
   Project Planner: Kendall Story

Jessica Gow, Esq., of Cobb Cole, on behalf of applicant, was present and available to answer questions from the board.

Public Participation: Mr. Randy Heimsoth inquired about future intersection plans for the southern entrance into the DeLand Tech Park development and SR 472. Staff advised that the plans have not been finalized and are under review by FDOT.

Ms. Lewis moved to recommend approval for this item. Mr. Preston seconded the motion. The motion to recommend approval passed unanimously.

OTHER BUSINESS

None.

ADJOURNMENT

The meeting ended at 5:15 p.m.

PLANNING DIVISION STAFF REPORT
TO
PLANNING BOARD

A. DATE: December 10, 2025

APPLICATION NO.: V25-190

STAFF PLANNER: Sam Nelson, *Planner I*

APPLICANT: Gerard Gallucci, Owner

REQUEST: To reduce the required rear yard setback for a single-family residence from 25-feet to 20 feet for an addition.

B. APPLICABLE REGULATIONS:

Article II **Primary Uses**
Sec. 33-17.04 – R-1B - Single-Family Dwelling District

Article III **Accessory Uses and Structures**
Sec. 33-28.01. – Accessory Structures

C. SITE FACTORS:

Location: 1141 N McDonald Ave

Parcel Size: ± 8,000 square feet

Existing Zoning: R-1B Single-Family Dwelling

Existing Land Use: Low Density Residential

	SURROUNDING USE:	SURROUNDING ZONING:
North:	Low Density Residential	R-1B, Single-Family Dwelling
South:	Low Density Residential	R-1B, Single-Family Dwelling
East:	Low Density Residential	R-1B, Single-Family Dwelling
West:	Low Density Residential	R-1B, Single-Family Dwelling

Required Minimum Setbacks in feet				
Front	**Rear**	**Side**	**Corner Lot: Street Side**	**Accessory Uses & Structure**
30’	25’	10’	15’	7.5’

Proposed Minimum Setbacks in feet				
Front	**Rear**	**Side**	**Corner Lot: Street Side**	**Accessory Uses & Structure**
30’	20’	10’	15’	7.5’

D. BACKGROUND: The property located at 1141 N McDonald Avenue was constructed in 2002, and is part of the Lake Lindley Village Unit 1 subdivision, platted in 1988. The property, located in the R-1B single-family dwelling zoning district, and Low Density Residential future land use, was developed with a 1,708 sq. ft. single-family residence. Both the property and residence comply with all dimensional and setback standards of the R-1B zoning district. The surrounding area consists primarily of similar single-family residences (SFRs) within the same R-1B zoning district.

The applicant purchased the property in 2022 to use as their primary residence. In 2023 the applicant obtained permit approval to construct a 10-ft x 23-ft uncovered concreate pad in the rear of the home, which is setback approximately 20'-5" from the rear property line. As the structure is not covered, it was not required to meet the building's 25-ft rear yard setback. In October, 2025 the applicant applied for a building permit to construct a 9'-11" x 22' screen room with an attached insulated roof over the patio cover. Staff reviewed the application and found that the proposal encroached into the required rear-yard setback area. Because of this encroachment, staff did not approve issuance of the permit. The applicant is now requesting variance approval to reduce the required rear yard setback from 25-ft to 20-ft to permit the roofed screen porch at this location.

E. ANALYSIS: The applicant is proposing to construct a 9'-11" in length by 22' in width solid roofed screened-porch with a height of approximately 8-ft at the rear of the residence. The subject property is 80-ft wide at the street line and 100-ft deep, with a size of 8,000 square feet. The existing single-family residence is 1,708 square feet in area and is setback approximately 30-ft from the front property line, 30-ft from the rear property line, 16-ft from the northern side-yard property line, and 12-ft from the southern side-yard property line. Therefore, the home and property conform to the requirements of the R-1B zoning district. The subject property is not irregularly shaped and no unusual site conditions are present. Surrounding properties are similar in size, shape, and appearance and appear to meet the requirements of the R-1B zoning district

Generally, accessory structures are required to be setback a minimum of 7.5-ft from a rear or side yard, and be setback 6-ft from another structure. When attached to the principal structure by a breezeway, roofed passage, or otherwise, Sec. 33-28.01. of the code deems said structure part of the principal building and therefore, the addition shall meet the same setback requirements as the principal building. This requirement is a safeguard to prevent the expansion of the residence into the required setback areas. As such, the applicant's proposal to construct an addition to the rear of the residence will encroach into the required 25-ft rear-yard setback by 4'-7". Due to this encroachment, the applicant is requesting variance approval to reduce the required rear yard setback for a single-family residence to 20-ft to allow this addition. The Land Development Regulations allow staff to administratively reduce a rear-yard setback to 20-ft for residences where 60 percent of neighboring residential structures within 500 feet have an existing lesser setback. Staff performed a review of neighboring residences within 500 feet and found that all homes meet the required rear setback of 25-ft, so an administrative reduction cannot be granted.

There are options available to the applicant to construct a covered porch without the need for a variance. As the residence is setback 30-ft from the rear property line, the applicant could reduce the depth of the enclosure to 5-ft and be within the permitted setback area. The applicant could also construct a detached covered patio area with a screen enclosure and be setback 7.5-ft from the rear or side property lines.

F. VARIANCE CRITERIA: Per Section 33-103.03, as amended, the Planning Board will consider the following criteria in making a determination concerning the granting or denial of the requested variance:

1. Special conditions and circumstances exist which are peculiar to the land, structure or building involved, and which are not applicable to other lands, structures or buildings in the same zoning district;

   There are no special conditions or circumstances unique to the property or residence. All dimensional and setback standards for the R-1B zoning district are currently provided or exceeded.

2. Literal interpretation and enforcement of these Land Development Regulations will deprive the applicant of rights commonly enjoyed by other properties in the same zoning district under the terms of these Land Development Regulations, and work unnecessary and undue hardship on the applicant such as natural site conditions, size or shape of lot or existing structure(s);

   Literal interpretation and enforcement of these Land Development Regulations would not prohibit the applicant from the construction of a roofed screen room altogether; however, it would be reduced in depth to 5-ft. There is no unique site condition, size, or shape which creates hardship for the applicant.

3. Granting of the variance request will not confer on the applicant any special privilege that is denied by these Land Development Regulations to other lands, buildings or structures in the same zoning district;

   Granting of the variance will confer special privileges when compared with other R-1B district properties as it would allow the applicant to expand their residence into the required rear-yard setback area, which all other single-family residences (SFRs) in the R-1B district must observe.

4. The granting of the variance will be in harmony with the general intent and purpose of these Land Development Regulations and the Comprehensive Plan, as amended, and will not be injurious to the surrounding properties or detrimental to the public welfare;

   The granting of this variance will not be in harmony with the general intent and purpose of these Land Development Regulations as the requirement to provide a 25-ft rear yard is applicable to all conforming SFR development. If the property was nonconforming due to size or shape, the code options provisions to administratively reduce the rear-yard setback to 20-ft. As this property is conforming there is no option for administrative relief. The proposal is unlikely to be injurious to surrounding properties as many surrounding properties contain detached, enclosed structures within the rear-yard setback area.

Detached accessory structures are not required to meet the principal building setback requirements.

5. The variance, if granted, is the minimum variance necessary to make possible the reasonable use of the land, building or structure; and

   The property is already developed with a conforming single-family residence. Regarding the applicant's desire to construct a covered porch, there are other options which could meet the Land Development Regulations. The applicant could construct a detached porch and only be required to meet the 7.5-ft accessory structure setback. The applicant could also construct a smaller porch than what is proposed.

6. The special conditions or circumstances are not the result of actions of the applicant or owner.

   There are no special conditions or circumstances applicable to the property.

G. STAFF SUMMARY: The applicant is requesting a variance to reduce the required rear yard setback for a single-family residence from 25-feet to 20-feet to allow the construction of a covered screen-porch which will be attached to the rear of the residence. The subject property meets all R-1B standards, and there are no special conditions or circumstances applicable to the property or residence which would prohibit the construction of a smaller or detached patio compliant with the Land Development Regulations. The Planning Board may grant this request as presented, grant this request with any conditions or safeguards deemed necessary, or deny this request. If the request is approved, staff recommends the Planning Board limit the scope of the setback reduction to the footprint of the screen enclosure and limit the height of the addition.

H. STAFF RECOMMDNATION: Staff finds the request does not meet any of the hardship criteria as defined in Sec. 33-103.03 of the Land Development Regulations and therefore recommends the Planning Board deny this variance request.

EXHIBITS

Exhibit 1 - Aerial

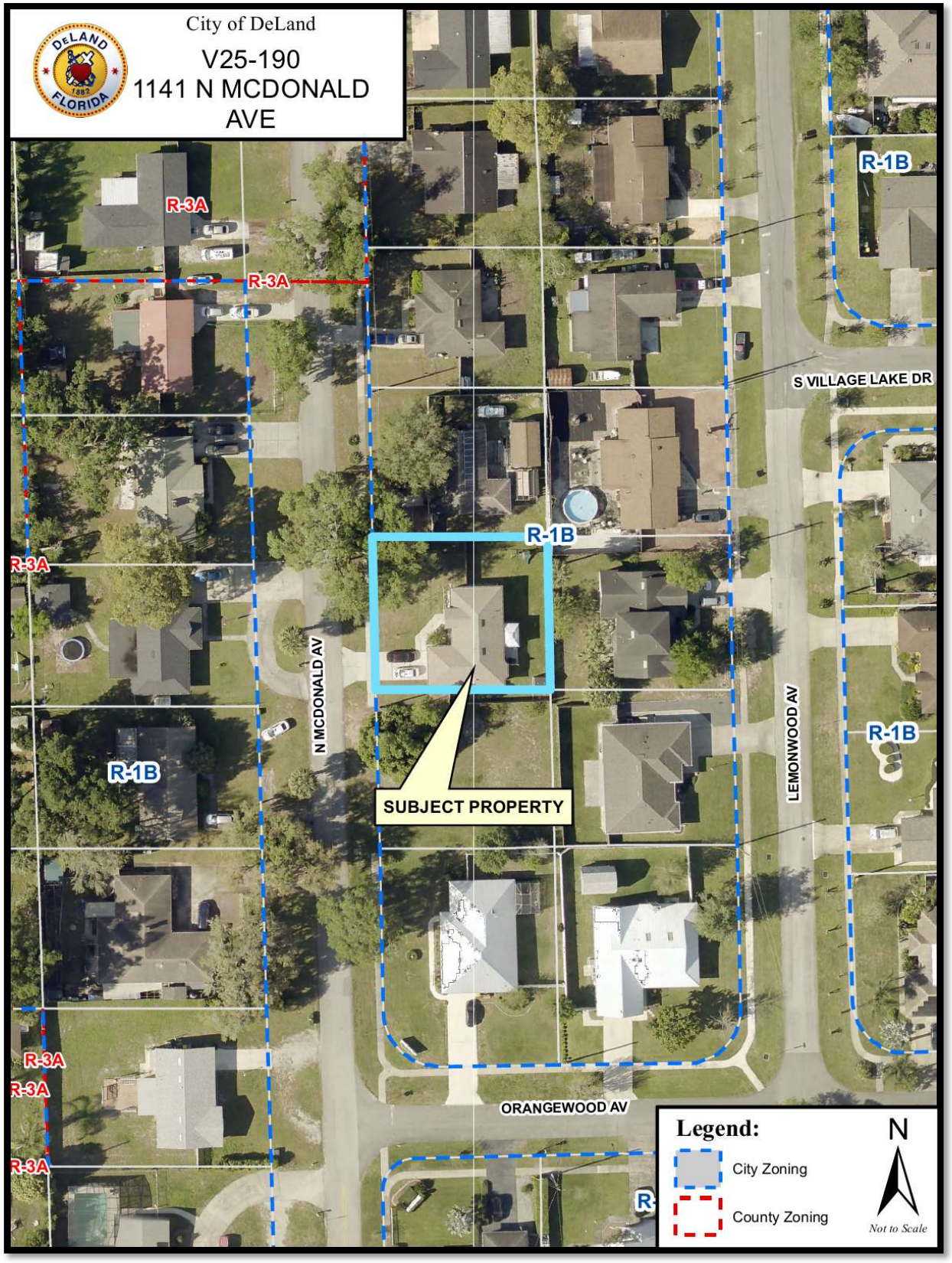
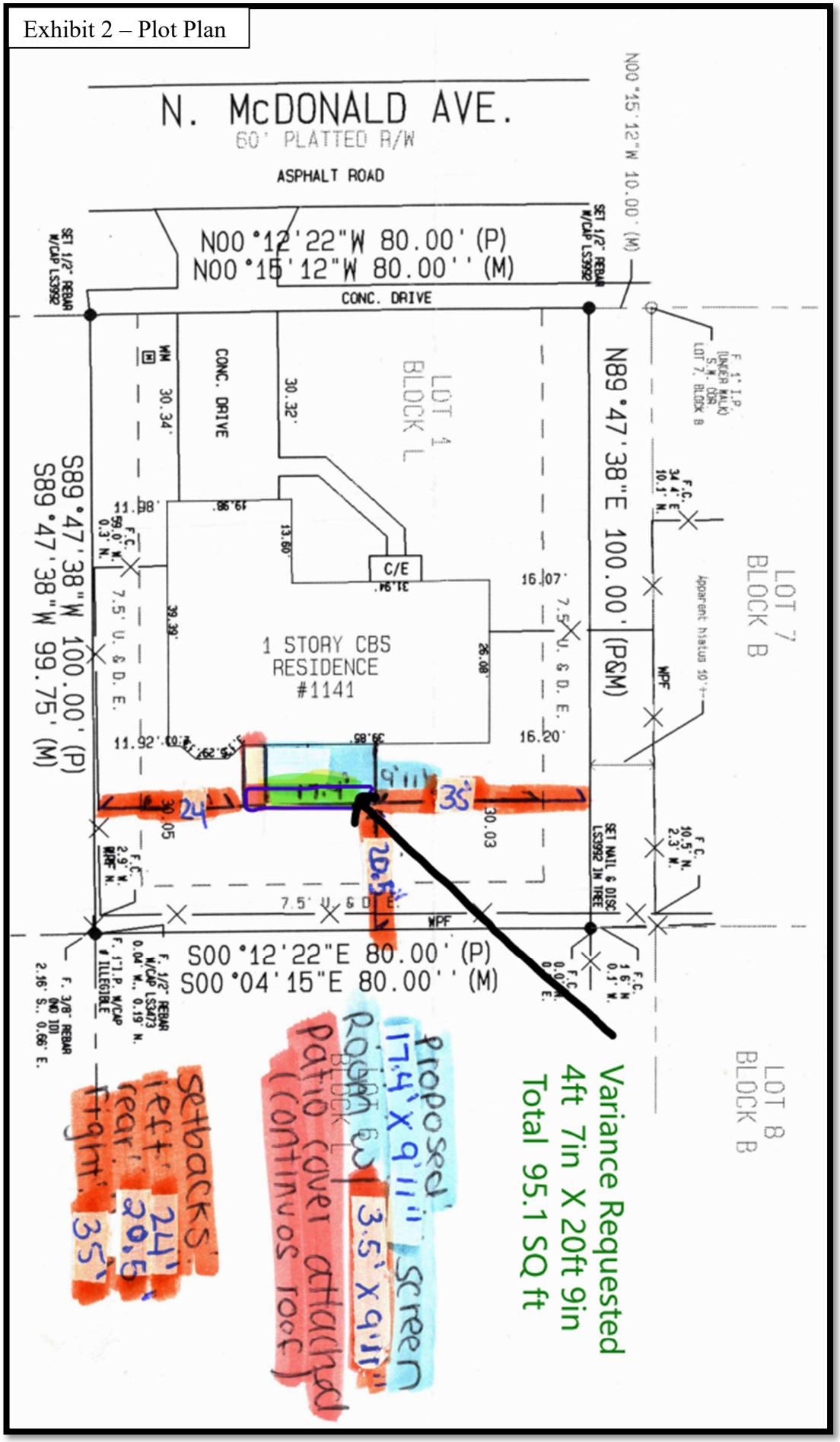
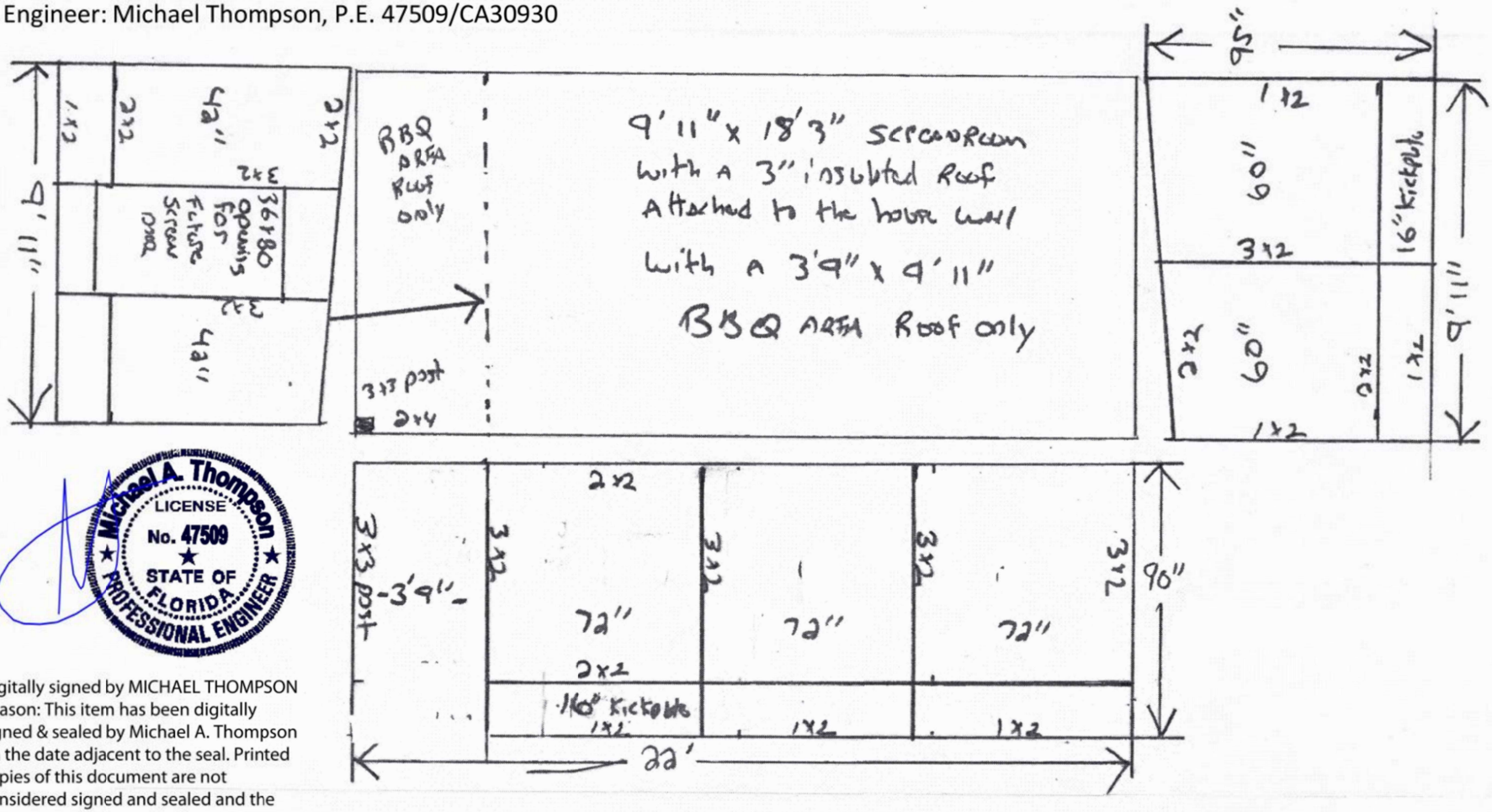


Exhibit 2 – Plot Plan



In the event of a conflict in member sizes shown on the plans and the general notes, the contractor must utilize the more stringent member size requirements.
Engineer: Michael Thompson, P.E. 47509/CA30930

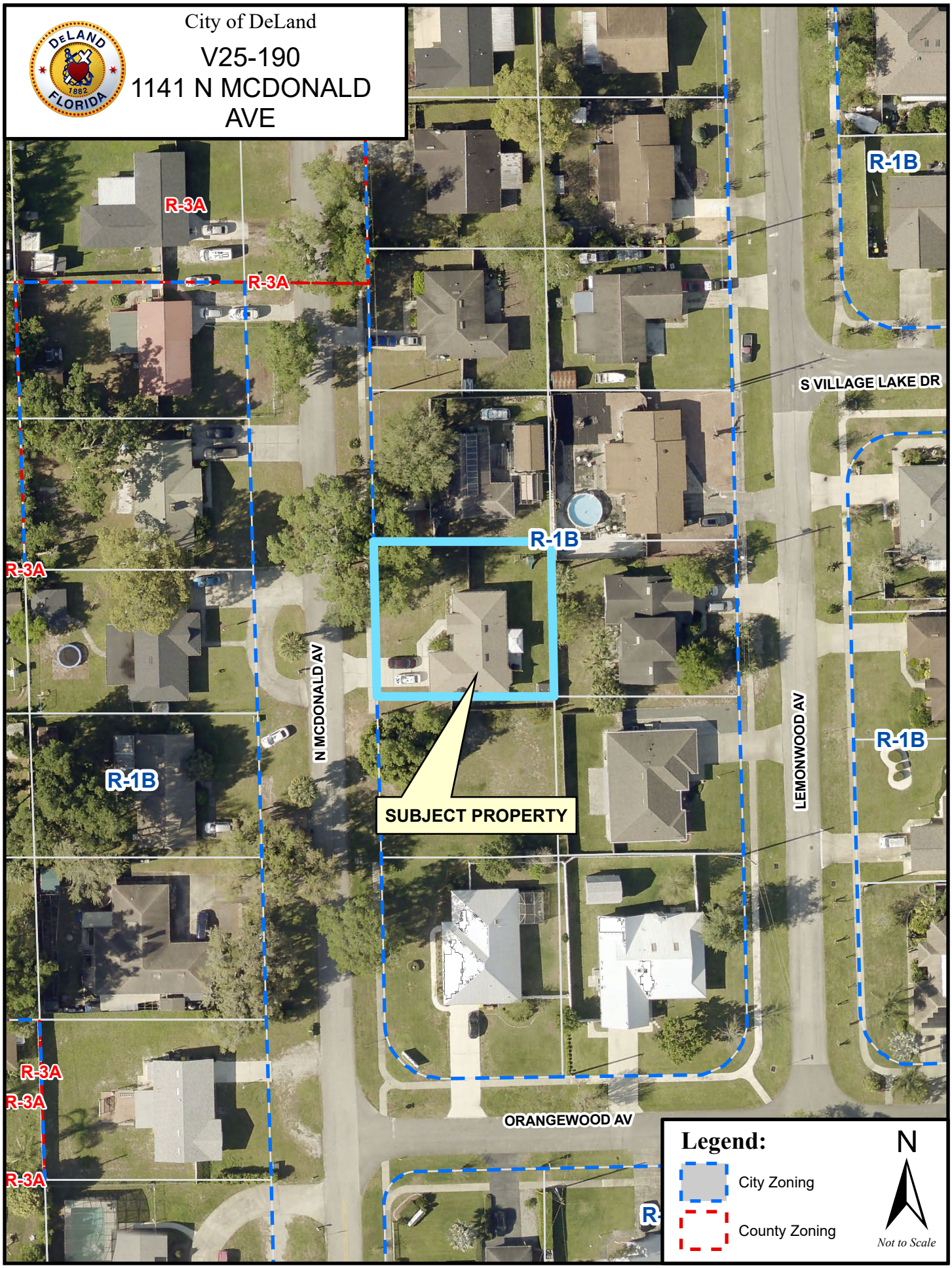


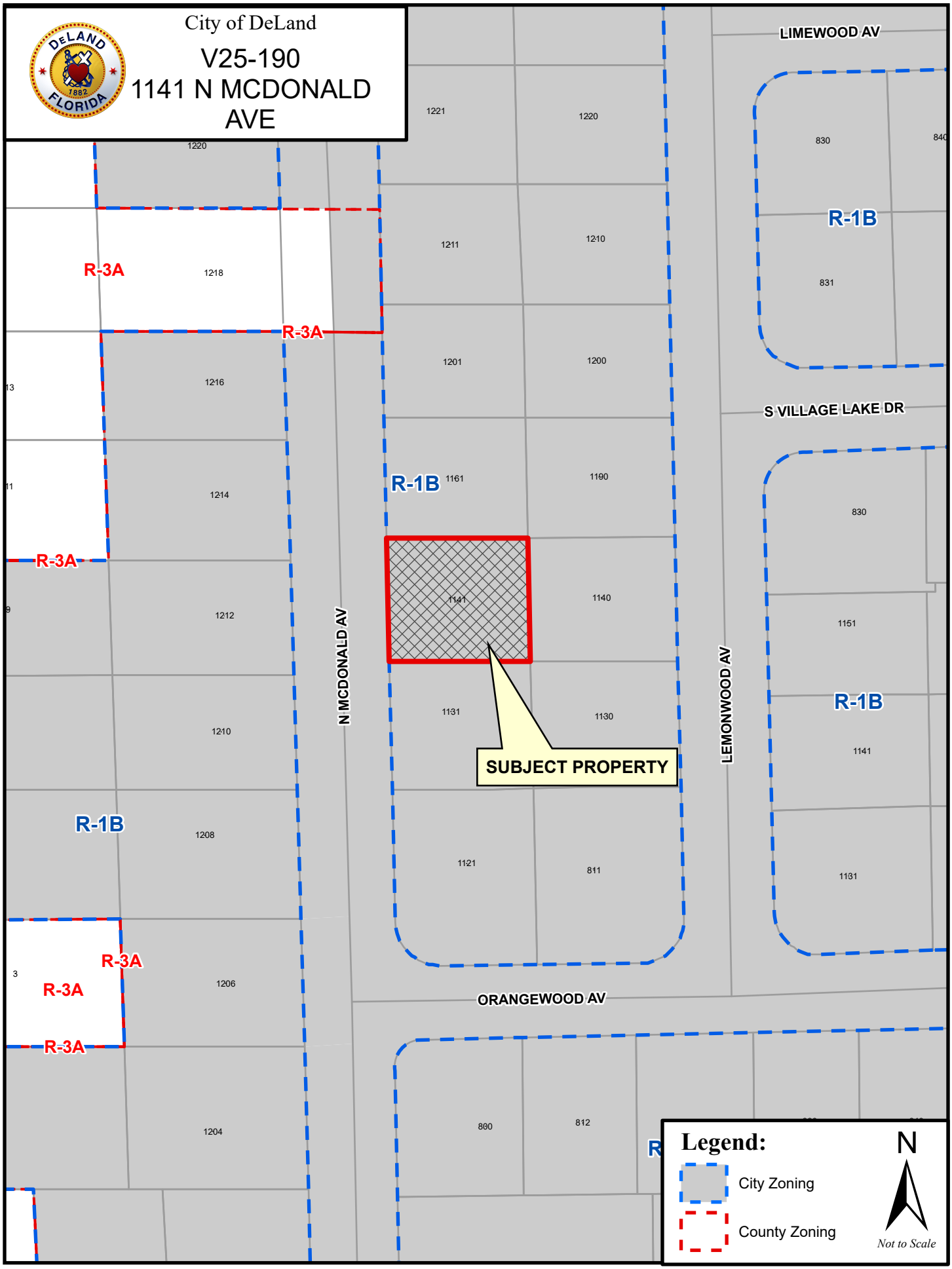
Michael A. Thompson LICENSE No. 47509 STATE OF FLORIDA PROFESSIONAL ENGINEER

Digitally signed by MICHAEL THOMPSON
Reason: This item has been digitally signed & sealed by Michael A. Thompson on the date adjacent to the seal. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.
Date: 2025.10.15 15:15:06 -04'00'

A "First Class" Aluminum Co. Inc.
597 Pleasant St.
Lake Helen, FL 32744
(386) 228-3933

Gallucci job
1141 N. McDONALD AVE
DeLand, Fl
1/4 SCALE


City of DeLand
V25-190
1141 N MCDONALD AVE
R-3A
R-3A
R-1B
S VILLAGE LAKE DR
R-3A
R-1B
N MCDONALD AV
LEMONWOOD AV
R-1B
R-1B
SUBJECT PROPERTY
R-3A
R-3A
R-3A
ORANGEWOOD AV
Legend:
City Zoning
County Zoning
N
Not to Scale


City of DeLand
V25-190
1141 N MCDONALD AVE
LIMEWOOD AV
S VILLAGE LAKE DR
ORANGEWOOD AV
N MCDONALD AV
LEMONWOOD AV
R-1B
R-3A
SUBJECT PROPERTY
Legend:
City Zoning
County Zoning
N
Not to Scale

10/28/2025 Reference Record Number BD25-4490

Request for Variance – Rear Setback for Screen Room Addition

Dear Members of the Zoning Board,

I am writing to respectfully request a variance from the rear setback requirement for my property located at 1141 N McDonald Ave Deland FL 32724. I wish to construct a screened-in patio enclosure and attached patio cover on the existing concrete slab at the back of my home. The proposed structure will consist of a 17.4 ft × 9 ft 11 in screen room, with an attached 3.5 ft × 9 ft 11 in open patio cover. The structure will attach directly to the existing rear wall, which is located 30 feet from the rear property line. With the new roof extending 9 feet 11 inches, the edge of the new roof will be approximately 20.5 ft from the property line. Under current zoning regulations, a 25-foot rear setback is required from the roof edge to the property line. Therefore, I am requesting a variance of 4 ft 7 in, to allow this improvement. Our hardship is that we are both retired and in our late 60s to early 70s, and we wish to have a comfortable outdoor space where we can safely enjoy the fresh air without the nuisance of insects. The existing slab at the rear of our home is ideally suited for this purpose, but the 25-foot setback requirement prevents us from enclosing it in a practical and functional way. Granting this variance would allow us to make reasonable use of our property and improve our quality of life in our retirement years. The proposed screened patio will be constructed on an existing slab and will match the design and appearance of the home. It will enhance the property's usability without adversely affecting neighboring properties or drainage. The enclosure will be used strictly for personal residential enjoyment, and I believe it will remain compatible with the character of the surrounding neighborhood. I kindly ask the Board to consider granting this variance to allow the proposed screen room and patio cover as described.

Thank you very much for your time and consideration.

Respectfully submitted,

Gerard Gallucci

Gerardjg@gmail.com 386 479-1037

Homeowner

1141 N McDonald Ave

Deland FL 32724

BOUNDARY SURVEY OF:

Lot 1, Block L, LAKE LINDLEY VILLAGE - UNIT 1, according to the plat thereof as recorded in Plat Book 42, Page 77, of the Public Records of Volusia County, Florida.

THIS SURVEY IS CERTIFIED TO:

Chicago Title Insurance Company
Reliant Title Group, A Division of
LandCastle Title Group, LLC
Gerard J. Gallucci and Donna Gallucci
JP Morgan Chase Bank, N.A.

FLOOD CERTIFICATION:

This is to certify that I have consulted the National Flood Insurance Flood Hazard Boundary Map and found the subject property is not within a special flood hazard area, according to Map No, 12127C 0470H, dated 02/19/2014. (ZONE X)

PROPERTY ADDRESS:

1141 N. McDONALD AVE., DELAND, FL

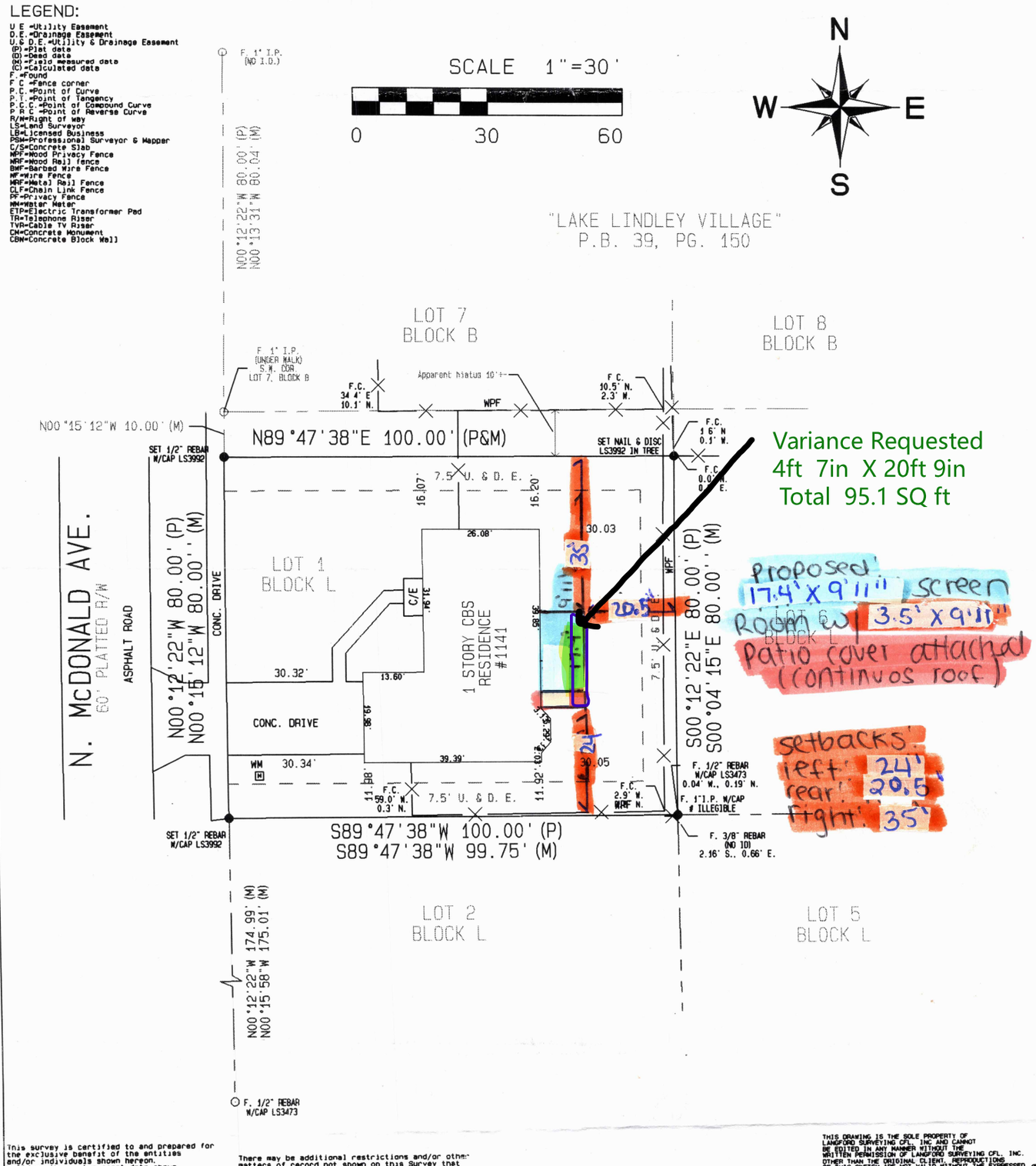
BEARINGS BASED ON RECORD PLAT--The Northerly line of Lot 1 being N.89°47'38"E.

NOTES:

1) Subject to restrictions, reservations, easements and rights-of-way, if any, appearing of record.
2) Survey performed without the benefit of a title search.
3) Underground utilites and other below ground features, not located, other than shown.

LEGEND:

U.E.=Utility Easement
D.E.=Drainage Easement
U.&D.E.=Utility & Drainage Easement
(P)=Plat data
(D)=Deed data
(M)=Field measured data
(C)=Calculated data
F.=Found
F.C.=Fence corner
P.C.=Point of Curve
P.T.=Point of Tangency
P.C.C.=Point of Compound Curve
P.R.C.=Point of Reverse Curve
R/W=Right of way
LS=Land Surveyor
LB=Licensed Business
PSM=Professional Surveyor & Mapper
C/S=Concrete Slab
WPF=Wood Privacy Fence
WRF=Wood Rail fence
BWF=Barbed Wire Fence
WF=Wire Fence
MRF=Metal Rail Fence
CLF=Chain Link Fence
PF=Privacy Fence
WM=Water Meter
ETP=Electric Transformer Pad
TR=Telephone Riser
TVR=Cable TV Riser
CM=Concrete Monument
CBW=Concrete Block Wall



Variance Requested
4ft 7in X 20ft 9in
Total 95.1 SQ ft

proposed
17.4' X 9'11" screen
ROOM 3.5' X 9'11"
patio cover attached
(continuos roof)

setbacks:
left: 24'
rear: 20.5'
right: 35'

This survey is certified to and prepared for the exclusive benefit of the entities and/or individuals shown hereon. valid on the most current date shown, and shall not be relied upon by any other entity or individual whatsoever.

There may be additional restrictions and/or other matters of record not shown on this Survey that may be found in the Public Records of the County or contained within the Title Commitment.

THIS DRAWING IS THE SOLE PROPERTY OF LANGFORD SURVEYING CFL, INC AND CANNOT BE EDITED IN ANY MANNER WITHOUT THE WRITTEN PERMISSION OF LANGFORD SURVEYING CFL, INC. OTHER THAN THE ORIGINAL CLIENT, REPRODUCTIONS OF THIS SKETCH ARE NOT VALID WITHOUT THE EXPRESSED WRITTEN PERMISSION OF LANGFORD SURVEYING CFL, INC. ©

Langford Surveying CFL, Inc.
931 N. State Road 434 Ste 1201
Altamonte Springs, FL 32714
407-332-7202 386-738-5080
www.langfordsurveying.com
jim@langfordsurveying.com

NOTE:
Date of survey may differ from date of signature. If so, the date of survey is the applicable date.

DATE SIGNED: 9/18/2022

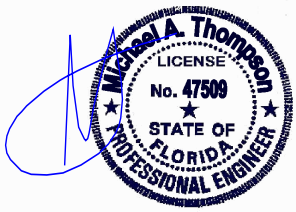
James P. Langford, P.L.S. 3992 LB7803
VALID ONLY WITH AN AUTHENTICATED ELECTRONIC OR EMBOSSED SURVEYOR'S SEAL & SIGNATURE

Date of Survey:	Drawn by:	Checked by:	Scale:	File name/no.
9/13/2022	JPL	JPL	1"=30'	22-09/

ASD ALUMINUM SCREEN DESIGN
Aluminum & Construction Engineering

***Plan Types:**

- [x] **Screen Room** [ ] **Sun Room** [ ] **Fill In**
- [ ] **Pool Screen/Cage** (Non-Removable Screen – Designed to withstand actual Wind Speed)
  - [ ] **Expansion View (Non Standard)**
- [x] **Car Port /Patio Cover**
- [ ] **Pergola**
- [ ] **Swimming Pool (Non Standard)**
- [ ] **Summer Kitchen (Non Standard)**
- [ ] **Other**_____



Digitally signed by MICHAEL THOMPSON
Reason: This item has been digitally signed & sealed by Michael A. Thompson on the date adjacent to the seal. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.
Date: 2025.10.15 15:17:29 -04'00'

* [ ] **Standard** [x] **Non Standard** [ ] **Revision** [ ] **Commercial** [ ] **$75.00 Rush Fee**

***Project Address:** 1141 north mcdonald ave.

***City:** deland,fl. **Date:** 10/14/2025

***Contractor/Company Name:** A First Class Aluminum Co INC

***Address:** 597 Pleasant Street
***City:** Lake Helen
***Zip Code:** 32744
***Phone/Fax:** 386-228-3933
***Email:** admin@afirstclassaluminum.com

Choose One:** [ ] **Mail** [ ] **Pick Up** [x] **E-File** [ ] **Fed Ex/UPS _____**# of Copies**

- [x] Single PDF
- [ ] Each Page Separate

*(For FedEx option go to www.aluminumscreendesign.com and provide FedEx/UPS account #)

*** Payment:** [ ] **Check** [x] **Credit Card***

*(For Credit Card option go to www.aluminumscreendesign.com to pay by credit card)

Engineering prepared by:

ASD

Engineer: Michael Thompson, MSc, P.E. (P.E. # 47509)
4401 Vineland Road- Suite A6 Orlando, FL 32811
Office:888-607-0747 or 407-734-1470 Cell: 407-721-2292
Project Manager Paul Thomas 386-479-9504 Fax: 888-923-8181
Email: aluminumscreendesign@yahoo.com
Website: www.aluminumscreendesign.com **CA#30930**

ASD ALUMINUM SCREEN DESIGN
Aluminum & Construction Engineering

Michael A. Thompson LICENSE No. 47509 STATE OF FLORIDA PROFESSIONAL ENGINEER

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Reason: This item has been digitally signed & sealed by Michael A. Thompson on the date adjacent to the seal. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.
Date: 2025.10.15 15:17:14 -04'00'

* Ultimate Wind Speed (mph): 130 Exposed Category: C Risk Category: 1

☒ Screen Room ☐ Fill In ☐ Sun Room (Window Type ☐ Vinyl or ☐ Glass)
Roof Type: ☒ Insulated 3 " ☐ Pan Roof ____"
Roof Connecting to: ☐ Gutter ☐ Fascia ☒ Block Wall ☐ Conventional Wall ☐ 4th Wall ☐ Riser
Front Wall: Uprights 3 X 2 Top Plate 2 X 2 Bottom Plate 1 X 2 Chair Rail ____X____
Side Wall: Uprights 3 X 2 Top Plate 2 X 2 Bottom Plate 1 X 2 Chair Rail ____X____
Roof Ridge Beam (gable style): Beams ____X____ Kick Plate 16

Pool Screen/Cage :
Roof Type: ☐ Dome ☐ Gable ☐ Mansard/Hip ☐ Flat/Slope
Roof Connecting to: ☐ Gutter ☐ Fascia ☐ Block Wall ☐ Conventional Wall ☐ Riser
Roof: Beams ____X____ Front Wall: Uprights ____X____ Purlin ____X____ Chair Rail ____X____
Side Wall: Uprights ____X____ Chair Rail ____X____
Expansion View: Beams ____X____ Post ____X_____ Kick Plate ____

☒ Car Port/Patio Cover or ☐ Pergola (pergola material ☐ Aluminum ☐ Wood)
Roof Type: ☒ Insulated 3 " ☐ Pan Roof ____" ☐ None (Pergola Only)
Roof Connecting to: ☐ Gutter ☐ Fascia ☒ Block Wall ☐ Conventional Wall ☐ 4th Wall
Beams 2 X 4 Post 3 X 3 Pergola Purlins ____ X ____
Roof Ridge Beam (gable style): Beams ____X____

Swimming Pool ☐ Gunite ☐ Fiberglass Overall Deck SQ FT _____

☐ Summer Kitchen

Concrete:
☒ Existing ☐ New 4" w/6" Thickened Edge ☐ Pier _____X_____X_____
☐ Ribbon Footer ____X____ With _____#_____Rebar
☐ Pavers with Footer ____X____ With _____#_____Rebar

Other: _____

Note: In the event that there is a conflict with the design plans and general notes and design standard, the contractor shall utilize the more stringent dimensions and member sizes prior to ordering materials, fabrication and/or construction between the plans and the general notes and design standard.

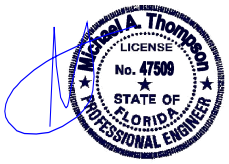
Engineer: Michael Thompson, MSc, P.E. (PE#47509)
4401 Vineland Road Suite A6, Orlando, FL 32811
(CA#30930)-Ph 407-734-1470/Fax 407-734-1790

General Notes & Design Standards

(Screen Patio Room Enclosure)

The following are general design standards. More stringent design standards may be noted on the plans. In the event of a conflict in plans and/or design standard dimensions and/or member sizes, the contractor must utilize the more stringent dimensions and/or member sizes prior to ordering materials, fabrication and/or construction.

Design Codes:
Florida Building Code 2023 (8th Edition)
Aluminum Design Manual 2020
ASCE 7-22



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Design Loads:
Pursuant to FBC Chapters 16 & 20
Ultimate Wind: -**130 MPH** (FBC Table 2002.4) (35 psf)
Risk Category:-See attach site specific plan sheet (FBC Table 1604.5)
Exposure Category: -See attach site specific plan sheet (FBC 1609.4.3)

Additional Load requirements:
Structural members supporting screened enclosures are designed for wind in both of two orthogonal directions using the pressures given in Table 2002.4. Each primary member is also designed for a 300 pound load applied vertically downward along any 1 foot of any member, not occurring simultaneously with wind load. In addition to wind pressures, purlins is also be designed for a 200 pound load applied vertically downward along any 1 foot of any member, not occurring simultaneously with wind load.

Design Basis:
Allowable Stress Design (ASD) =Allowable Strength Design (ASD) divide by safety factor

General Requirements:
Reproductions of contract drawings by contractor in lieu of preparation of shop drawings signifies acceptance of information shown as correct and obligates himself to any expense, real or implied, arising from their use.

A change to the structural drawings due to the acceptance of alternates and/or substitutes is the responsibility of the contractor and must be submitted to the engineer for approval.

The general contractor and each subcontractor shall review the approve construction plans in its entirety and verify all existing conditions prior to the start of any work. All inconsistencies shall be reported to the designer and/or structural engineer, if needed. Should contractor construct the premises in a fashion not consistent with the plans prepared by the designer and/or structural engineer, or in any fashion, change the plans and drawing without the review and approval from the designer and/or structural engineer. Then designer and/or structural engineer shall bear no responsibility or liability for the construction of premises and accuracy of the drawings.

Foundation and Earthwork:
Applicable only when unsuitable soils are encountered.
When unsuitable soils are encountered as specified bearing strata, notify owner's representative/engineer.
Soil bearing capacity – 2,000 psf Minimum

Provide neat excavation for footing and place concrete immediately after excavation and inspection.

Pump water from footing excavation if greater than one inch.
Compact all fill to 95% ASTM D698 density.

Unit soil weight = 105 pcf
Internal angle of friction = 30 degrees

Coeff. Of friction between footing and soil = 0.5

Structural Aluminum:
Conform to latest edition of Florida Building Code and Aluminum Design Manual standard practice for aluminum design.

All aluminum shall be 6005-T5 (E= 10,000 ksi; Fy = 35 ksi) with a minimum wall thickness of 0.046"

Splicing prohibited without prior approval as to location and type.

Burning of holes in aluminum members is prohibited. Any member with burned holes must be replaced.

Aluminum Protection:
Shall be pursuant FBC 2003.8.4. Aluminum surfaces in contact with dissimilar materials, lime-mortar, concrete, or other masonry materials, shall be protected with powder coated or ESP paint or alkali-resistant coatings, such as heavy-bodied bituminous paint or water-white methacrylate lacquer.

Screws:
Aluminum self-tapping screws shall conform to ASME B18.6.4 specification.
Self –tapping screws shall meet the requirements of ADM J.5
Maximum fastener spacing shall not exceed (3+20t) where "t" is the member thickness in inches.
For roofing and siding connection, use minimum #12 screws for end and side laps spaced at 12" max for side lap and end lap fasteners shall be no more than 2" from the end of overlapping sheets.
For bottom plate and column base, secure with ¼" tapcons a minimum embedment of 1 1/8" and 2 ¼" respectively into concrete footer.

Bolts:
Bolts and other fasteners shall be aluminum, stainless steel, hot-dip or electro-galvanized steel. Double cadmium plated steel bolts may also be used. Bolt holes diameter shall not exceed 1/16" larger than the bolt diameter and shall be spaced at a minimum of 2.5 times the bolt diameter with minimum edge distance of 1.5 times the bolt diameter.
Bolts shall meet the requirements of ADM J.3

Chair Rails, Purlins & Wind Brace:
Chair rails, purlins and wind brace shall conform with the below maximum span length. If the event contractor's specific site plan conflict with the below recommended length, the contractor shall utilize the more stringent dimensions and member sizes prior to ordering materials, fabrication and/or construction.

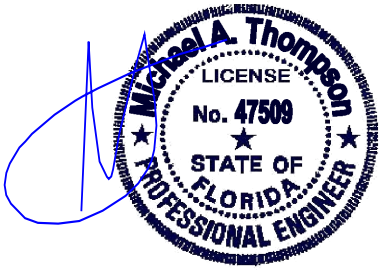
Wind Speed = 130 MPH

2 x 2 Chair Rail = 6'-6"	2 x 2 Purlins = 6'-6"	2 x 2 Wind Brace = 4'-3"	2 x 3 (0.125) Wind Brace = 9'-0"
2 x 3 Chair Rail = 8'-0"	2 x 3 Purlins = 8'-0"	2 x 3 Wind Brace = 8'-0"	2 x 4 Wind Brace = 9'-0"

Concrete:
Conform to ACI 318, latest edition and ACI 301
Compressive Ultimate Strength (Minimum at 28 days) shall be 3000 psi
Exposed chamfer edges shall be ¾"

Reinforcing Steel:
Conform to ACI 318 and 315, Latest edition
All reinforcement steel shall be ASTM A615 Grade 60.
Smooth dowels & ties shall be ASTM A185
Welded Wire Fabric shall be ASTM A185 or A82 (Flat sheet).
Deformed bar anchors shall be ASTM A496, Grade 70
Cover: Footing 3"

Washer:
Washers shall be used under bolt heads and under nuts.



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Hole Alignment:
Poor matching holes must be rejected. Contractor shall prevent holes from drifting and distort the metal. All chips and foreign matter between contacting surfaces shall be removed before assembly.

Beams & Uprights:
In the event of a conflict with the values in this table and the site specific plan, the contractor must utilize the more stringent dimensions and/or member sizes between the site specific plan and the below applicable span limitations prior to ordering materials, fabrication and/or construction.

130 MPH					
PRIMARY BEAMS & COLUMNS-SCREEN & PATIO ROOM ENCLOSURES				ROOF PANELS	
Beam-Size	Max Beam Span & Max Column Spacing	Column-Size	Max Column-Height	Pan Roof Span	Insulated Roof Span
2 X 3	6'-0"	2 X 3	8'-0"	3" Spans 13'-6"	3" Spans 15'-0"
2 X 4	8'-6"	2 X 4	8'-6"		6" Spans 20'-0"
2 x 5	10'-0"	2 x 5	9'-0"		
2 X 6	12'-0"	2 X 6	10'-0"		

Knee Bracing:
Contractor shall provide knee bracing on 45 degree angle pursuant the attach detail sheet that specified size and length requirements. Knee bracing on upright above super gutter intersection shall be connected to upright no more than 6" above the super gutter. Knee brace size shall be a minimum of 2 x 2 for beam span of 15' max; 2 x 3 for 30' max; 2 x 4 for beam span greater than 30'.

Purlin:
Contractor is required to install purlins spaced to align with column spacing; however, spacing between purlins shall not exceed 7'-2".

Intermediate/Header Beam:
Contractor is required to install a minimum 2 x 7 intermediate header beam supported with 3 x 3 column spaced at 10 feet (max) when insulated roof span exceeds 15 feet.

Patio Cover:
Contractor is required to install insulated roof covering pursuant to the Florida product approval specification. Overhang shall be a maximum of 1'-0" along the side, 3'-0" along the front and 1/2" along the front interface between the super gutter and the attached pool cage knee riser wall. Maximum deflection shall be limited to L/80.

Edge Distance:
Contractor is required to install uprights to provide a 2" minimum clearance from edge of slab and/or footer.

Vinyl, tempered glass, and acrylic panels:
Vinyl, tempered glass, and acrylic panels shall be removable. Removable panels shall be identified as removable by a decal. The identification decal shall essentially state "Removable panel SHALL be removed when wind speeds exceed 75 mph (34 m/s)." visible when the panel is installed.



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4401 Vineland Road., Suite A6, Orlando, FL 32811. (P) 407-734-1470 (F) 407-734-1790
www.aluminumscreendesign.com

General Notes & Design Standards

(Unscreened Patio Room Enclosure)

The following are general design standards. More stringent design standards may be noted on the plans. In the event of a conflict in plans and/or design standard dimensions and/or member sizes, the contractor must utilize the more stringent dimensions and/or member sizes prior to ordering materials, fabrication and/or construction.

Design Codes:
Florida Building Code 2023 (8th Edition)
Aluminum Design Manual 2020
ASCE 7-22



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Design Loads:
Pursuant to FBC Chapters 16 & 20
Ultimate Wind: -**130 MPH** (FBC Table 2002.4) (35 psf)
Risk Category:-See attach site specific plan sheet (FBC Table 1604.5)
Exposure Category: -See attach site specific plan sheet (FBC 1609.4.3)

Additional Load requirements:
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Design Basis:
Allowable Stress Design (ASD) =Allowable Strength Design (ASD) divide by safety factor

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Foundation and Earthwork:
Applicable only when unsuitable soils are encountered.
When unsuitable soils are encountered as specified bearing strata, notify owner's representative/engineer.
Soil bearing capacity – 2,000 psf Minimum

Provide neat excavation for footing and place concrete immediately after excavation and inspection.

Pump water from footing excavation if greater than one inch.
Compact all fill to 95% ASTM D698 density.

Unit soil weight = 105 pcf
Internal angle of friction = 30 degrees

Coeff. Of friction between footing and soil = 0.5

Structural Aluminum:
Conform to latest edition of Florida Building Code and Aluminum Design Manual standard practice for aluminum design.

All aluminum shall be 6005-T5 (E= 10,000 ksi; Fy = 35 ksi) with a minimum wall thickness of 0.046"

Splicing prohibited without prior approval as to location and type.

Burning of holes in aluminum members is prohibited. Any member with burned holes must be replaced.

Aluminum Protection:
Shall be pursuant FBC 2003.8.4. Aluminum surfaces in contact with dissimilar materials, lime-mortar, concrete, or other masonry materials, shall be protected with powder coated or ESP paint or alkali-resistant coatings, such as heavy-bodied bituminous paint or water-white methacrylate lacquer.

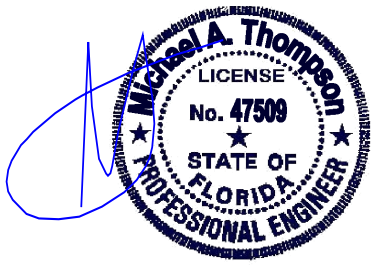
Screws:
Aluminum self-tapping screws shall conform to ASME B18.6.4 specification.
Self –tapping screws shall meet the requirements of ADM J.5
Maximum fastener spacing shall not exceed (3+20t) where "t" is the member thickness in inches.
For roofing and siding connection, use minimum #12 screws for end and side laps spaced at 12" max for side lap and end lap fasteners shall be no more than 2" from the end of overlapping sheets.
For bottom plate and column base, secure with ¼" tapcons a minimum embedment of 1 1/8" and 2 ¼" respectively into concrete footer.

Bolts:
Bolts and other fasteners shall be aluminum, stainless steel, hot-dip or electro-galvanized steel. Double cadmium plated steel bolts may also be used. Bolt holes diameter shall not exceed 1/16" larger than the bolt diameter and shall be spaced at a minimum of 2.5 times the bolt diameter with minimum edge distance of 1.5 times the bolt diameter.
Bolts shall meet the requirements of ADM J.3

Concrete:
Conform to ACI 318, latest edition and ACI 301
Compressive Ultimate Strength (Minimum at 28 days) shall be 3000 psi
Exposed chamfer edges shall be ¾"

Reinforcing Steel:
Conform to ACI 318 and 315, Latest edition
All reinforcement steel shall be ASTM A615 Grade 60.
Smooth dowels & ties shall be ASTM A185
Welded Wire Fabric shall be ASTM A185 or A82 (Flat sheet).
Deformed bar anchors shall be ASTM A496, Grade 70
Cover: Footing 3"

Washer:
Washers shall be used under bolt heads and under nuts.



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Hole Alignment:
Poor matching holes must be rejected. Contractor shall prevent holes from drifting and distort the metal. All chips and foreign matter between contacting surfaces shall be removed before assembly.

Beams & Uprights:
In the event of a conflict with the values in this table and the site specific plan, the contractor must utilize the more stringent dimensions and/or member sizes between the site specific plan and the below applicable span limitations prior to ordering materials, fabrication and/or construction.

130 MPH					
PRIMARY HEADER BEAM MEMBERS-OPEN COVERED PATIO-(No Screen Insert)					
SIZE	3" Insulated/Pan Roof Span Maximum Roof Span = 6'-0"	3" Insulated/Pan Roof Span Maximum Roof Span = 8'-0"**	3" Insulated/Pan Roof Span Maximum Roof Span = 10'-0"**	3" Insulated/Pan Roof Span Maximum Roof Span = 12'-0"**	3" Insulated/Pan Roof Span Maximum Roof Span = 15'-0"**
2 X 4	10'-0"	9'-0"	9'-0"	8'-0"	8'-0"
2 X 5	13'-0"	12'-0"	11'-0"	10'-0"	9'-0"
2 X 6	15'-0"	14'-0"	13'-0"	12'-0"	11'-0"
2 X 7	17'-0"	16'-0"	14'-0"	14'-0"	13'-0"
2 X 8	21'-0"	20'-0"	18'-0"	17'-0"	16'-0"
2 X 9	21'-0" *	20'-0" *	20'-0"	20'-0"	19'-0"
2 X 10	21'-0" *	20'-0" *	20'-0" *	20'-0" *	19'-0" *

Column size is 3 x 3 x 0.125" (1/8") unless noted otherwise with a max height of 9'-0" -*(CSR) control < 1.0. Larger span req larger column size.
**Pan roof span limitation is based on Florida Product approval and intermediate purlins/cross beams shall be provided to underside of pan roof when pan roof span exceeds 7'-0".

Knee Bracing:
Contractor shall provide knee bracing on 45 degree angle pursuant the attach detail sheet that specified size and length requirements. Knee bracing on upright above super gutter intersection shall be connected to upright no more than 6" above the super gutter. Knee brace size shall be a minimum of 2 x 2 for beam span of 15' max; 2 x 3 for 30' max; 2 x 4 for beam span greater than 30'.

Intermediate/Header Beam:
Contractor is required to install a minimum 2 x 7 intermediate header beam supported with 3 x 3 column spaced at 10 feet (max) when insulated roof span exceeds 15 feet.

Patio Cover:
Contractor is required to install insulated roof covering pursuant to the Florida product approval specification. Overhang shall be a maximum of 1'-0" along the side, 3'-0" along the front and 1/2" along the front interface between the super gutter and the attached pool cage knee riser wall. Maximum deflection shall be limited to L/80.

Edge Distance:
Contractor is required to install uprights to provide a 2" minimum clearance from edge of slab and/or footer.



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4401 Vineland Road., Suite A6, Orlando, FL 32811. (P) 407-734-1470 (F) 407-734-1790
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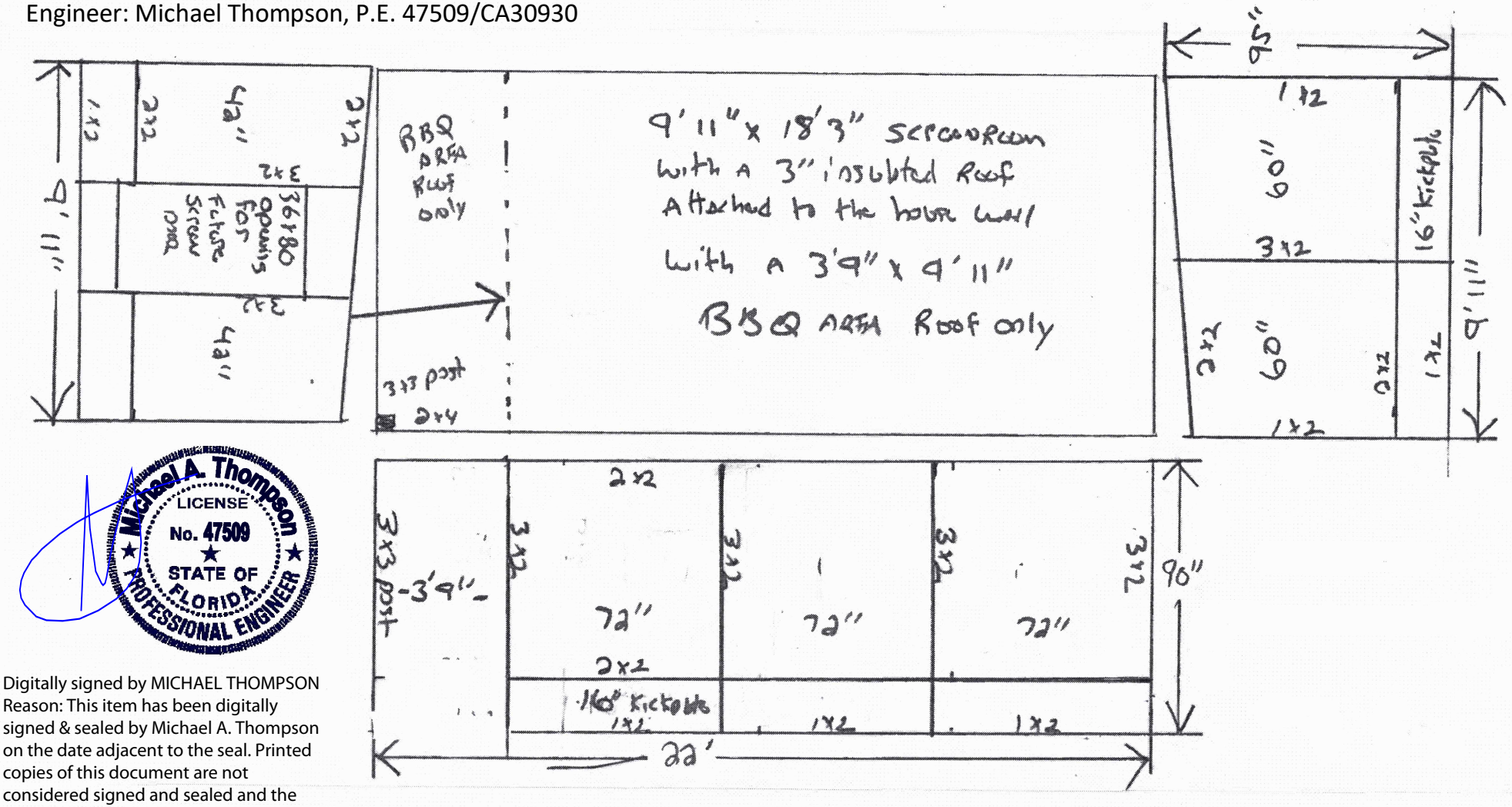
In the event of a conflict in member sizes shown on the plans and the general notes, the contractor must utilize the more stringent member size requirements.
Engineer: Michael Thompson, P.E. 47509/CA30930



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A "First Class" Aluminum Co. Inc.
597 Pleasant St.
Lake Helen, FL 32744
(386) 228-3933

Gallucci job
1141 N. McDONALD AVE
Deland, Fl
1/4 SCALE

ALUMINUM SCREEN DESIGN

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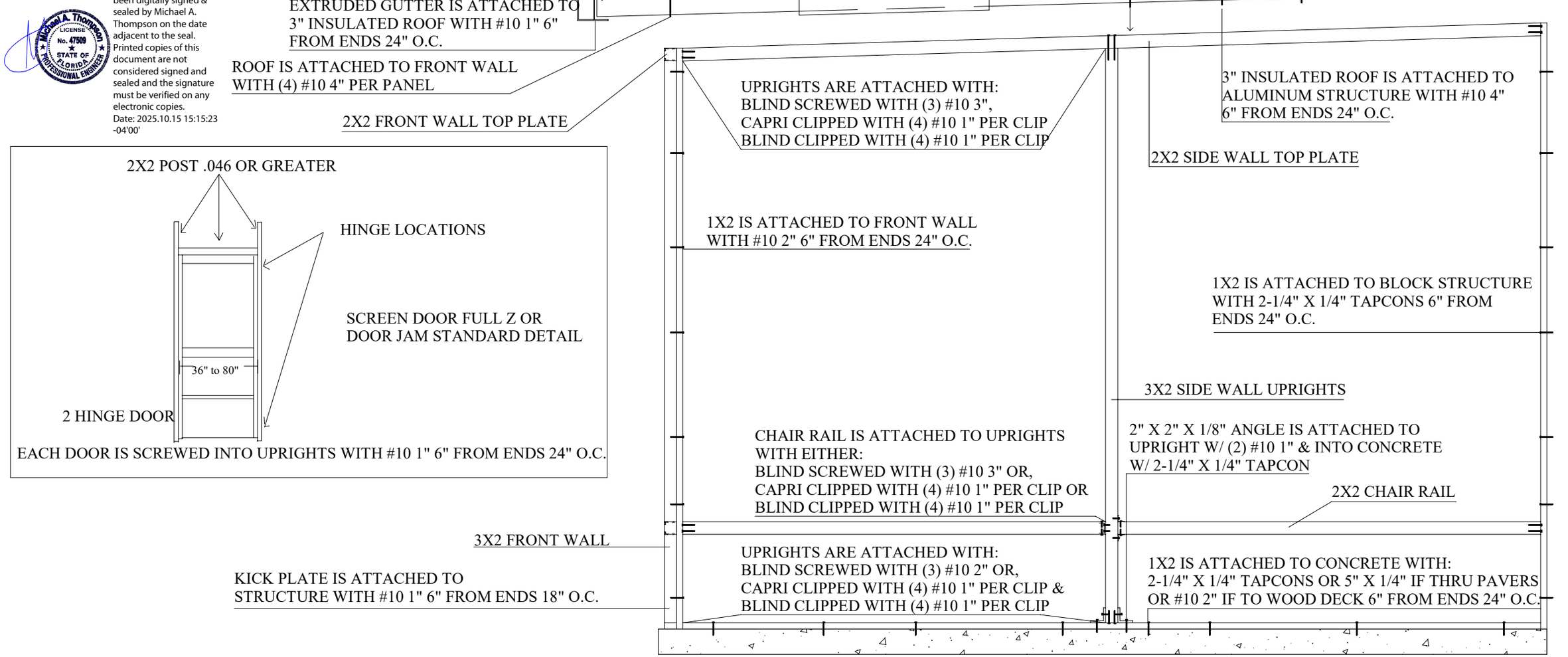


ALUMINUMSCREENDESIGN.COM
ALUMINUMSCREENDESIGN
@YAHOO.COM
PHONE: 407-734-1470
FAX: 407-734-1790

DESIGN STATEMENT

METAL IS .046 THICKNESS OR GREATER, ALLOY IS 6005-T5
ALL TAPCONS SHALL PROVIDE MINIMUM OF 1 1/8" CONCRETE EMBEDMENT DEPTH

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE TO MEET THE REQUIREMENTS OF THE 2023 (8TH EDITION) FLORIDA BUILDING CODE FOR OPEN AND SEMI-OPEN STRUCTURES AND SHALL WITH STAND ULTIMATE WIND SPEEDS OF 130 MPH (FOR 3 SECOND GUSTS) NOMINAL SPEED 101.4 MPH UP TO A 15FT ROOF HEIGHT, FACTOR OF 1.0, AND EXPOSURE C, RISK CATEGORY 1.
CONTRACTOR SHALL FIELD VERIFY ALL PLANS DIMENSIONS PRIOR TO MATERIAL PURCHASE, FABRICATION AND CONSTRUCTION
CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY SHOULD SITE CONDITIONS DIFFER FROM CONSTRUCTION PLANS

MICHAEL THOMPSON
4401 VINELAND ROAD
SUITE A6
ORLANDO, FL 32811
P.E. # 47509
CA#30930

ALUMINUM SCREEN DESIGN

3" C CHANNEL IS ATTACHED TO BLOCK STRUCTURE WITH 2-1/4" X 1/4" TAPCONS
6" FROM ENDS 24" O.C. & TO 3" INSULATED ROOF WITH (6) #10 1" PER SIDE

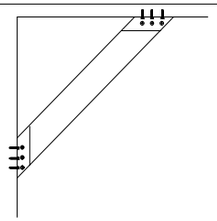
EXTRUDED GUTTER IS ATTACHED TO
3" INSULATED ROOF WITH #10 1" 6"
FROM ENDS 24" O.C.

EXTRUDED FASCIA IS ATTACHED TO
3" INSULATED ROOF WITH #10 1" 6"
FROM ENDS 24" O.C.

ROOF IS ATTACHED TO FRONT WALL
WITH (4) #10 4" PER PANEL

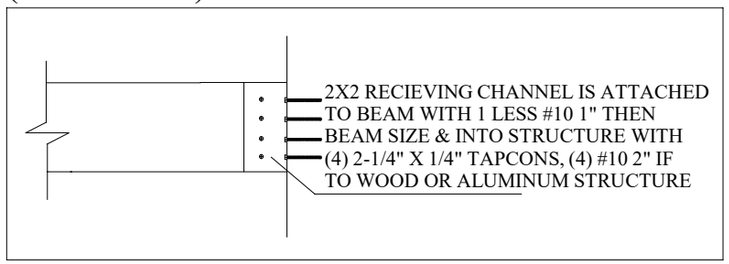
3X3 POSTS ARE ATTACHED
TO 2X4 BEAM (2) 3/8" X 3 1/2"
CARRIAGE BOLTS TYP.

(OPTIONAL) KICKER DETAIL



KNEE BRACE 2X3 45" MAX 25" MINIMUM ON A 45 DEGREE
SCREWED INTO C CHANNEL WITH (6) #10 1" SMS ON EACH SIDE
C CHANNEL IS ATTACHED TO BEAM & POST WITH (3) #10 1"

(OPTIONAL) BEAM TO WALL CONNECTION



BRACKET FROM 3X3 IS ATTACHED
TO CONCRETE WITH (2) 1/4" X 2"
TAPCONS TYP. ((2) 1/4" X 5"
TAPCONS IF THRU PAVERS)
((2) #14 3" EMBEDDED INTO TO WOOD JOIST)

3X3 POST IS ATTACHED TO
BRACKET WITH (2) 3/8" X 3
1/2" CARRIAGE BOLTS



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4401 VINELAND ROAD
SUITE A6
ORLANDO, FL 32811
P.E. # 47509
CA#30930

PLANNING DIVISION STAFF REPORT
TO
THE CITY OF DELAND PLANNING BOARD

December 10, 2025

A. **APPLICATION NO.**: PSB24-150 (DeLand Tech Park Preliminary Plat)
APPLICANT: Harry McNaught, Longleaf Four LLC
OWNER: Longleaf Four LLC
STAFF PLANNER: Kendall Story, *Senior Planner*
REQUEST: Preliminary plat approval for DeLand Tech Park, to include grading, stormwater ponds, roads and other infrastructure.

B. **APPLICABLE REGULATIONS:**

Article XIII **SUBDIVISION OF LAND**
Sec. 33-146 – Procedures for Subdivision Plat Approval

C. **SITE FACTORS:**

PARCEL NUMBER*:* 810604000170+
LOCATION: 1445 Cassadaga Rd.
SIZE OF PROPERTY: ±143 acres

D. **LAND USE DESIGNATION & ZONING OF SUBJECT PROPERTY:**

Future Land Use: Southwest Activity Center (SWAC)
Existing Zoning: DeLand Tech Park Planned Development (PD)
Existing Use: Mostly vacant, undeveloped

E. **SURROUNDING LAND USE & ZONING:**

	LAND USE	ZONING
North:	VC: ULI; SWAC Community	Kirk DeLand PD (Canopy Terrace); R-4
South:	Orange City	Orange City
East:	VC: ULI	VC: RR
West:	VC: Unincorporated	VC: Unincorporated

F. **Applicable Regulations:**

Sec. 33-146.05. *Subdivision of Land.*
DeLand Tech Park Planned Development Agreement

G. **Physical Characteristics:**

The proposed development consists of ± 143.2 acres at the northwest quadrant of SR 472 and Interstate 4. The property is wooded and consists of a tree farm, open cattle pasture, former poultry/egg production buildings, construction company office and vacant residences. The site lies outside of the 100-year floodplain and does not contain any wetlands.

H. Public Utilities and Service:

Water: The proposed development will be served by City potable water facilities.
Sewer: The proposed development will be served by City sanitary sewer facilities.

I. Analysis:

The applicant seeks to subdivide the subject property into three developable lots, along with tracts for stormwater ponds, tree protection areas landscape buffers, and other site infrastructure. As described in the original Planned Development, the applicant seeks to develop the eastern side of the subject property as industrial space and the western side of the property as commercial/neighborhood retail. This is the first of three phases of development for the DeLand Tech Park PD.

Phase I (current preliminary plat) includes the construction of Kirk and Pinehurst Drive to provide site access and transportation circulation, associated infrastructure improvements, and mass clearing and grading of the property. Pinehurst Drive will connect to Martin Luther King Jr. Beltway to the west of the property, and Kirk Drive will connect Cassadaga Road to SR 472. The preliminary plat shows this right of way in tracts. However, staff has requested it to be shown as right of way on the preliminary plat. A condition of approval to revise the preliminary plat to relabel the right of way has been added. Both roads are being dedicated to the city. The right-of-way will include landscaping, a pedestrian/bicycle trail, three stormwater ponds, and other associated infrastructure.

The ponds are part of a master stormwater system that are designed to retain the 100-year/24 hr. storm event for the entire site at full buildout, which includes up to 70% impervious area for the eastern Industrial area and up to 60% impervious area for the western Retail area set forth by the DeLand Tech Park PD. The stormwater design will use Low Impact Development (LID) stormwater strategies, such as the utilization of Florida-friendly vegetation and swale channel lines.

The applicant intends to mass grade the entire site and install infrastructure, roadways, and stormwater ponds for the entire development. However, since individual sites and lots will be developed in multiple phases, over many years staff is including a condition of approval to address the need for site stabilization to help mitigate off-site impacts.

The development is consistent with the Comprehensive Plan, lying within the Southwest Activity Center (SWAC) and shall comply with the policies identified within the Local Plan as “Commerce” and “West Central”. According to the vision of the SWAC, the ultimate goal is to develop a key employment area for the City of DeLand and the rest of Southwest Volusia County.

J. Environmental Report:

An environmental report dated March 25, 2022, was submitted as part of the application. Per the report, the project falls within the USFWS consultation area for several species in which consultation and/or species-specific surveys may be recommended by the U.S. Florida Fish & Wildlife Service (FWC). No wetlands were located on the property.

K. School Concurrency:

A School Concurrency Determination Letter was not required, as this project does not include any residential development.

L. Previous Approvals:

City Commission approved the request for rezoning of the subject property to the DeLand Tech Park Planned Development on October 3, 2022. An amendment to Planned Development Agreement was approved on January 22, 2025, to allow off-site tree protection area. A second PD amendment to allow one additional use is currently under review and tentatively scheduled for City Commission in January of 2026.

M. Staff Summary:

The proposed preliminary plat includes the approved civil construction plans for the infrastructure improvements, roadway, stormwater ponds, landscape buffering, and tree protection areas. The plans are consistent with the adopted PD agreement, concept plan, phasing plan and applicable land development regulations. All future retail and industrial buildings and improvements will require a separate site plan for review.

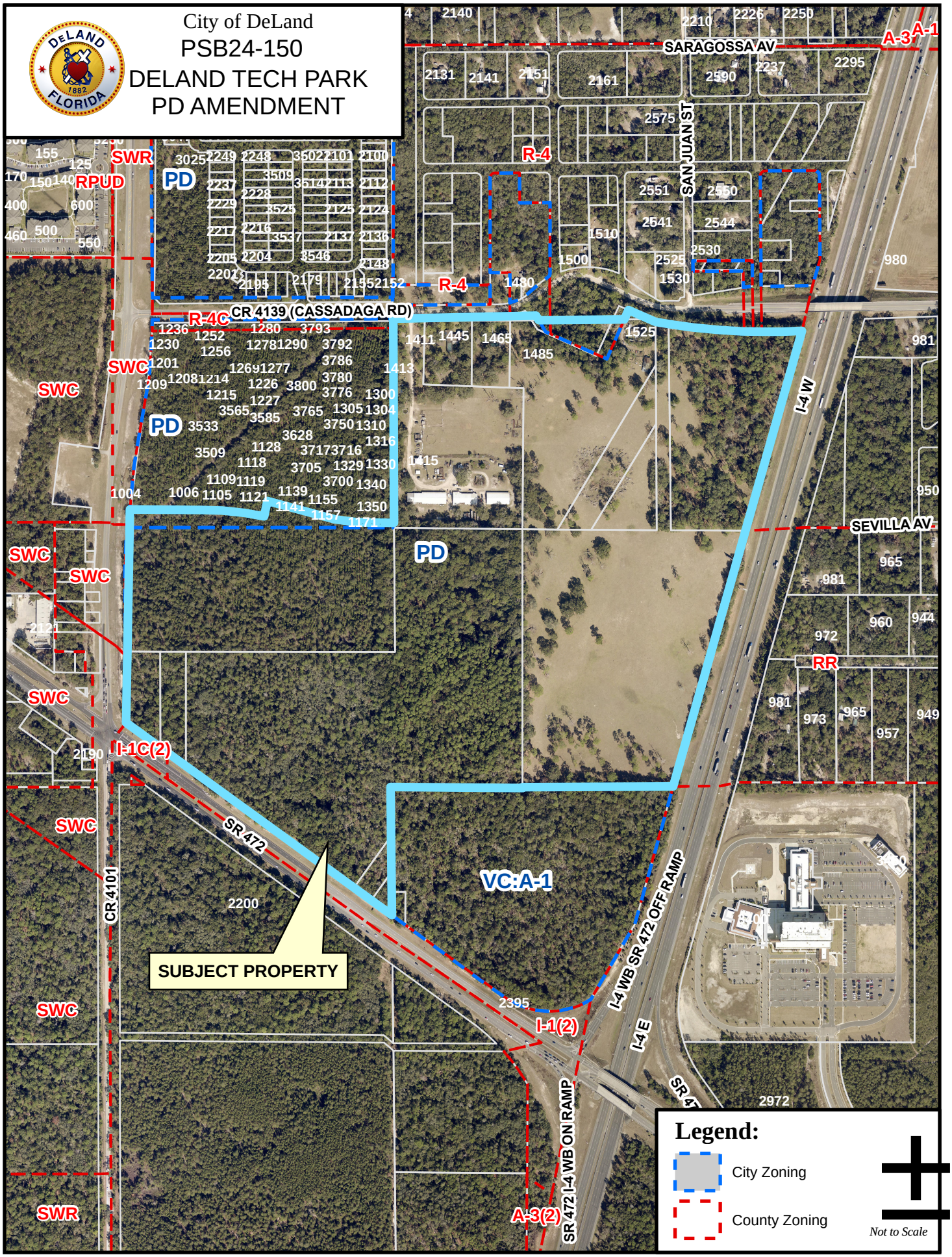
At the Technical Review Committee (TRC) meeting on September 19, 2024, the Technical Review Committee members recommended the Preliminary Plat be forwarded on to the Planning Board, pending comments from staff are addressed. The comments have since been addressed.

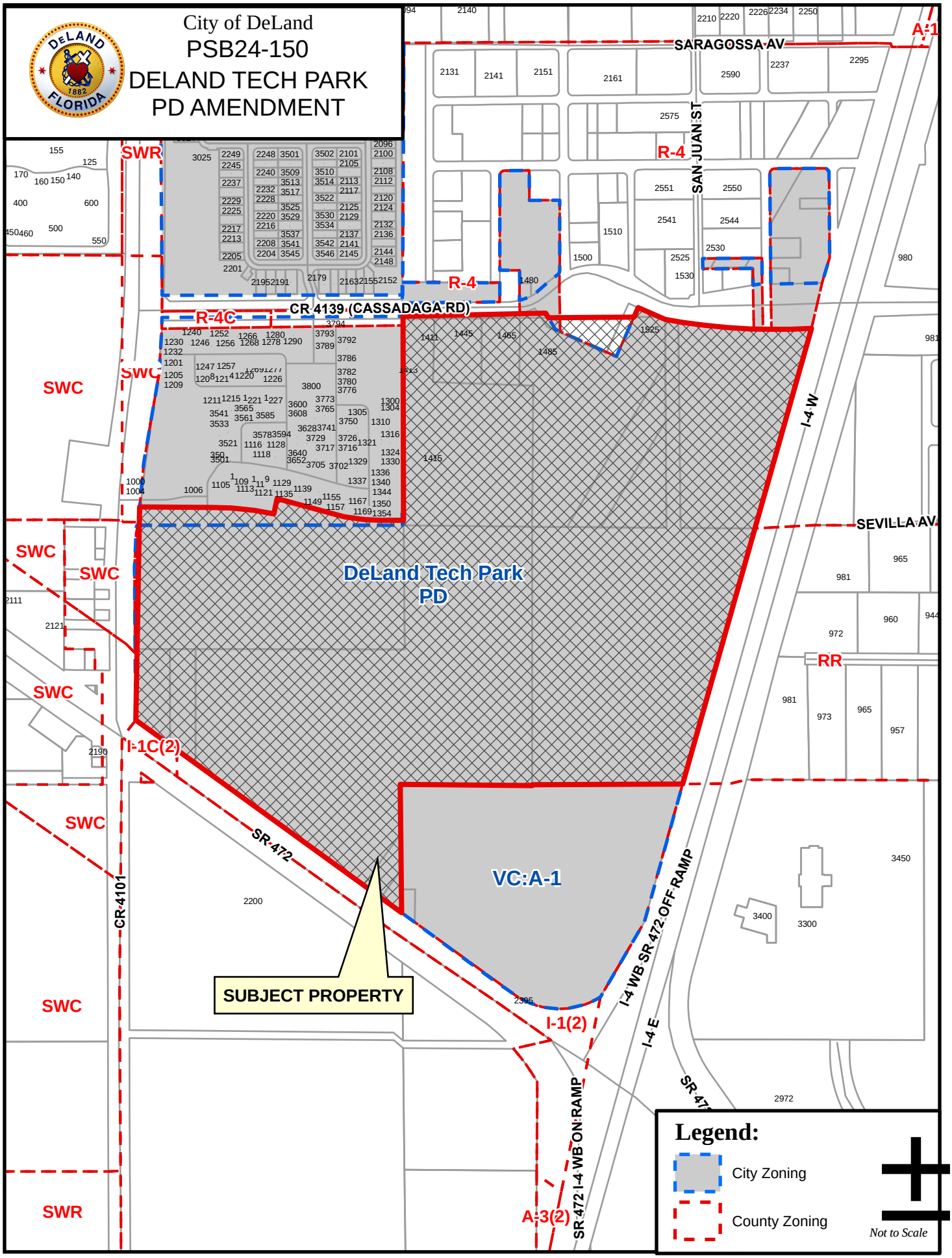
N. Recommendation:

Staff recommends that the Planning Board forward the preliminary plat to the City Commission recommending approval of the request for preliminary plat approval for the development of DeLand Tech Park, subject to two conditions of approval:

1. The applicant shall revise the preliminary plat to show all public roadway as right-of-way, rather than tracts. The tract tables and site data tables shall also be revised to reflect the right of way designation.

2. To minimize stormwater impacts and ensure the site is stabilized for the duration of the development, all areas disturbed by construction, and soil stockpiles, shall be stabilized as soon as possible to reduce the duration of soil exposure to runoff events and the potential for erosion. All stockpiles shall be encompassed by silt fence. All disturbed areas which are either final graded or will remain inactive for a period of more than 30 days, shall be required to be stabilized within 14 days of the completion of the grading activities.


City of DeLand
PSB24-150
DELAND TECH PARK
PD AMENDMENT
SARAGOSSA AV
SAN JUAN ST
CR 4139 (CASSADAGA RD)
SEVILLA AV
I-4 W
I-4 WB SR 472 OFF RAMP
I-4 E
SR 472 I-4 WB ON RAMP
CR 4101
SR 472
SUBJECT PROPERTY
R-4
R-4C
PD
RPUD
SWR
SWC
VC:A-1
I-1C(2)
I-1(2)
A-3(2)
A-3
A-1
RR
Legend:
City Zoning
County Zoning
Not to Scale


City of DeLand
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I-4 WB SR 472 OFF RAMP
I-4 E
SR 472 I-4 WB ON RAMP
SR 472
CR 4101
SUBJECT PROPERTY
Legend:
City Zoning
County Zoning
Not to Scale

Longleaf Four, LLC
320 N. Meridian Street, Suite 700
Indianapolis, IN 46204
(317) 439-4577

July 15, 2024

DeLand Tech Park
Project Narrative

The proposed project is approximately 144 acres located on the northeast corner of State Road 472 and Martin Luther King, Jr. Beltway (County Road 4101). It is also bound on the east by I-4 and on the north by Cassadaga Rd (County Road 4139). The project site consists of the following thirteen parcel IDs: 810600000060, 810600000070, 810600000071, 810600000072, 810600000090, 810600000091, 810600000100, 810600000110, 810600000121, 810600000122, 810600000124, 810600000170, 810600000272. Each of these parcels lie within the City of DeLand limits as well as part of the DeLand Tech Park PD. Parcel 810600000272 is 0.65 acres and is outside of the property limits but will be impacted during construction. Therefore, the total parcels impacted by this project will be 144.88 acres.

The site consists of woods, tree farm as well as open cattle pasture, three former poultry/egg production buildings, construction company office and a vacant residence.

The planned road and infrastructure improvements will consist of proposed Kirk Drive connecting State Road 474 to Cassadaga Road and proposed Pinehurst Drive connecting Kirk Drive to Martin Luther King, Jr. Beltway. North of the intersection of Pinehurst and Kirk, Kirk Drive is designed as a 26’ wide asphalt road section with a two-foot (2’) curb and gutter on each side, a 10’ landscape area off of each curb, and a 10’ wide pedestrian/bicycle trail along the western side of the Right-of-Way. Pinehurst Drive is designed as a 24’ wide asphalt road section with two-foot (2’) curb and gutter on both sides, a 12’ landscape area along the southerly and then westerly side of the Right-of-Way as the drive bends north, and a 6’ landscape area and a 10’ pedestrian/bicycle trail along the northerly and easterly sides of the Right-of Way. Landscaping, Irrigation and Street Lighting will also be added to the roads. Both roads will be platted and the roads will be dedicated as public right-of-way to the City of DeLand.

In addition to the roads, the site will be cleared and mass graded, subject to certain tree presentation and buffer areas. Four dry retention ponds will be constructed to serve the site. Pond A will serve Kirk Drive and Pinehurst Drive along with the mass graded area and future improvements west of Kirk Drive for the planned retail area. Ponds C and D will serve the eastern portion of the site east of Kirk Drive as planned for industrial uses. Pond E is a small pond that serves just a small portion of the northernly section of Pinehurst Drive. The ponds are designed to handle the maximum 70% impervious area for the eastern industrial area and 60% impervious for the western retail area. All ponds are also designed to attenuate and recover the required storm events set forth by the St. John’s River Water Management District and the City of DeLand’s criteria.

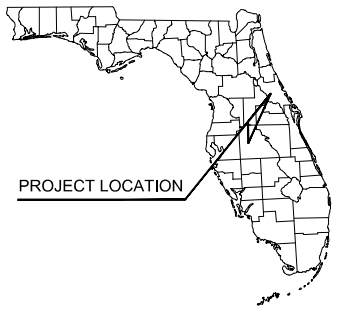
There will be certain areas of the site that will not be impacted or cleared. The non-impacted areas include a small area fronting the northern part of the site along Martin Luther King, Jr. Beltway, along the northern side of Pond A bordering The Yardly project, a buffer along Cassadaga Road, and a buffer area along I-4. These areas are defined in the Existing Conditions/Demolition Plans provided in the package.

Stormwater pipes and inlets serving Pinehurst Drive and Kirk Drive are also proposed in this project that will convey the stormwater to Pond A and Pond E. The pipes have been sized to accommodate future buildout of the retail area along the western side of the site.

A new proposed 12" PVC water main and a 12" PVC reclaimed water main are also proposed along both Kirk Drive and Pinehurst Drive. These mains will provide potable water and reclaimed water for irrigation for the future retail and industrial tracts. A gravity sanitary sewer system is also proposed under both roads which will connect into the stub out provided at the northern end of Pinehurst Drive where the flow will connect to the new sanitary lift station that is currently under construction at the Yardly. In order to handle the future flows from the retail and industrial site, the pumps are to be switched out with larger capacity pumps and a new 6" PVC sanitary forcemain is proposed to be installed.

This set of construction plans is for the above improvements. As future retail and industrial buildings and improvements are developed, specific plans for those improvements will be submitted to the City for review and approval.

The construction plans follow the guidelines and requirements set forth by the DeLand Tech Park PD.



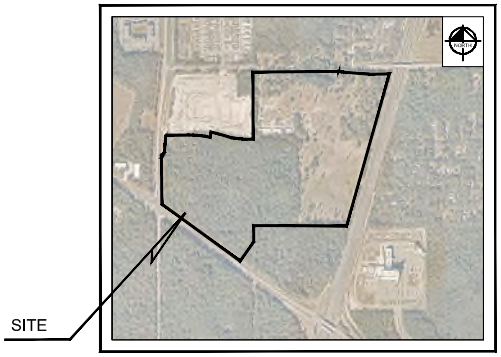
CONSTRUCTION PLANS

FOR

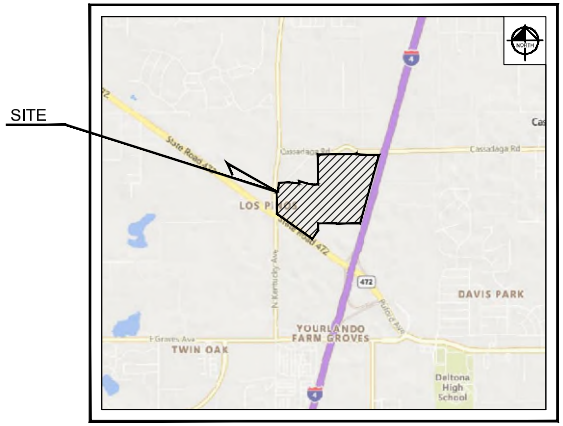
DELAND TECH PARK

PARCEL #:
810600000090, 810600000100, 810600000110,
810600000070, 810600000071, 810600000060,
810600000124, 810604000170, 810600000091,
810600000121, 810600000122, 810600000072

CITY OF DELAND, FLORIDA
AUGUST 19, 2024



AERIAL PHOTOGRAPH
SCALE: 1" = 900'



SECTION 06 , TOWNSHIP 18, RANGE 31
LOCATION MAP
SCALE: 1" = 2000'

LEGAL DESCRIPTION:

A PORTION OF SECTION 6, TOWNSHIP 18 SOUTH, RANGE 31 EAST LYING IN VOLUSIA COUNTY, FLORIDA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCE AT THE NORTHWEST CORNER OF SECTION 6, TOWNSHIP 18 SOUTH, RANGE 31 EAST, THENCE RUN N89°54'53"E ALONG THE NORTH LINE OF SAID SECTION 6, A DISTANCE OF 1406.09 FEET TO THE EAST LINE OF GOVERNMENT LOT 4, SAID SECTION 6; THENCE ALONG SAID EAST LINE S00°05'07"E, 1400.66 FEET TO THE MONUMENTED SOUTHERLY RIGHT OF WAY LINE OF CASSADAGA ROAD AND THE POINT OF BEGINNING; THENCE ALONG SAID SOUTHERLY RIGHT OF WAY LINE AND THE EASTERLY EXTENSION THEREOF N89°31'56"E, 1314.15 FEET; THENCE N00°23'02"W, 3.98 FEET TO THE AFORESAID SOUTHERLY RIGHT OF WAY LINE AND TO THE BEGINNING OF A NON-TANGENT CURVE CONCAVE NORTHERLY, HAVING A RADIUS OF 567.62 FEET, A CENTRAL ANGLE OF 10°54'08", A CHORD BEARING OF S80°02'11"E AND A CORD DISTANCE OF 107.84 FEET; THENCE ALONG THE AFORESAID SOUTHERLY RIGHT OF WAY LINE AND THE ARC OF SAID CURVE 108.01 FEET; THENCE CONTINUE ALONG SAID SOUTHERLY RIGHT OF WAY LINE S85°29'15"E, 356.07 FEET; THENCE CONTINUE ALONG SAID SOUTHERLY RIGHT OF WAY LINE N89°16'03"E, 313.13 FEET TO THE WESTERLY LIMITED ACCESS RIGHT OF WAY LINE OF INTERSTATE 4 (STATE ROAD 400) AS SHOWN ON FLORIDA DEPARTMENT OF TRANSPORTATION RIGHT OF WAY MAP, SECTION 79110, FINANCIAL PROJECT 242655-1; THENCE DEPARTING SAID SOUTHERLY RIGHT OF WAY LINE ALONG SAID WESTERLY RIGHT OF WAY LINE S15°45'16"W, 2426.29 FEET TO THE SOUTH LINE OF THE NORTH 1/2 OF GOVERNMENT LOT 7, SAID SECTION 6; THENCE DEPARTING SAID WESTERLY LIMITED ACCESS RIGHT OF WAY LINE ALONG SAID SOUTH LINE OF THE NORTH 1/2 OF GOVERNMENT LOT 7 AND GOVERNMENT LOT 6, N89°30'43"W, 802.91 FEET TO THE SOUTHEAST CORNER OF LOT 19, YOURLANDO FARMS AND GROVES, ACCORDING TO THE MAP OF PLAT RECORDED IN MAP BOOK 10, PAGES 227-228, PUBLIC RECORDS OF VOLUSIA COUNTY, FLORIDA; THENCE N89°50'02"W, ALONG THE SOUTH LINE OF SAID LOTS 19 AND 20, A DISTANCE OF 617.62 FEET TO THE SOUTHWEST CORNER OF SAID LOT 20, ALSO BEING THE NORTHEAST CORNER OF LOT 27 OF SAID PLAT; THENCE S00°14'30"E ALONG EAST LINE OF LOT 27, A DISTANCE OF 250.12 FEET; THENCE DEPARTING SAID EASTERLY LINE S35°50'39"W, 354.19 FEET TO THE NORTHERLY RIGHT OF WAY LINE OF STATE ROAD 472, AS SHOWN ON SAID FLORIDA DEPARTMENT OF TRANSPORTATION RIGHT OF WAY MAP, SECTION 79110; THENCE ALONG SAID NORTHERLY RIGHT OF WAY LINE N54°12'54"W, 1481.04 FEET TO THE EASTERLY RIGHT OF WAY LINE OF DR. MARTIN LUTHER KING, JR BELTWAY AS SHOWN ON VOLUSIA COUNTY RIGHT OF WAY MAP, PROJECT 1113-3; THENCE DEPART SAID NORTHERLY RIGHT OF WAY LINE OF STATE ROAD 472 ALONG SAID EASTERLY RIGHT OF WAY LINE OF DR. MARTIN LUTHER KING, JR BELTWAY N00°27'19"W, 703.97 FEET TO THE BEGINNING OF A CURVE CONCAVE SOUTHEASTERLY, HAVING A RADIUS OF 98.09 FEET, A CENTRAL ANGLE OF 45°56'03"; THENCE ALONG SAID EASTERLY RIGHT OF WAY LINE AND ALONG THE ARC OF SAID CURVE 78.64 FEET; THENCE CONTINUE ALONG SAID EASTERLY RIGHT OF WAY LINE N45°28'45"E, 26.79 FEET TO THE BEGINNING OF A NON-TANGENT CURVE CONCAVE EASTERLY HAVING A RADIUS OF 5629.58 FEET, A CENTRAL ANGLE OF 02°41'26", A CHORD BEARING OF N04°10'14"E AND A CHORD DISTANCE OF 264.32 FEET; THENCE CONTINUE ALONG SAID EASTERLY RIGHT OF WAY LINE AND THE ARC OF SAID CURVE 264.35 FEET; THENCE DEPART SAID EASTERLY RIGHT OF WAY LINE N89°31'31"E, 361.54 FEET TO THE BEGINNING OF A NON-TANGENT CURVE CONCAVE SOUTHWESTERLY HAVING A RADIUS OF 1440.00 FEET, A CENTRAL ANGLE OF 12°42'11", A CHORD BEARING OF S84°07'35"E AND A CHORD DISTANCE OF 318.61 FEET; THENCE CONTINUE ALONG THE ARC OF SAID CURVE 319.26 FEET; THENCE N12°13'31"E, 80.00 FEET TO THE BEGINNING OF A NON-TANGENT CURVE CONCAVE SOUTHERLY HAVING A RADIUS OF 1519.95 FEET, A CENTRAL ANGLE OF 03°39'55", A CHORD BEARING OF S75°56'11"E AND A CHORD DISTANCE OF 97.21 FEET; THENCE ALONG THE ARC OF SAID CURVE 97.23 FEET; THENCE S74°06'12"E, 169.11 FEET TO THE BEGINNING OF A CURVE CONCAVE NORTHERLY HAVING A RADIUS OF 1000.00 FEET AND A CENTRAL ANGLE OF 15°36'56"; THENCE ALONG THE ARC OF SAID CURVE 272.54 FEET TO THE SOUTH LINE OF GOVERNMENT LOT 4, SAID SECTION 6; THENCE ALONG SAID SOUTH LINE S89°43'08"E, 118.51 FEET TO THE SOUTHEAST CORNER OF SAID GOVERNMENT LOT 4; THENCE ALONG THE EASTERLY LINE OF SAID GOVERNMENT LOT 4, N00°10'37"W, 1028.79 FEET TO THE POINT OF BEGINNING.

CONTAINING 6263726 SQ. FT., OR 143.795 ACRES MORE OR LESS.

UTILITY PROVIDERS

WATER, SEWER, AND RECLAIMED WATER :
CITY OF DELAND
1102 S AMELIA AVE
DELAND, FL 32724
CONTACT: STEVEN DANSKINE
PHONE: (386) 626-7199

CABLE/TELEPHONE:
CENTURYLINK
1325 BLAIRSTONE RD RM 113
TALLAHASSEE, FL 32301
CONTACT: BILL MCCLOUD
PHONE: (850) 599-1444

POWER:
DUKE ENERGY
1150 GREENWOOD BLVD
LAKE MARY, FL 32746
CONTACT: CUSTOMER SERVICE
PHONE: (407) 629-1010

TELEPHONE
AT & T/ T
2901 W BUSCH BLVD,SUITE 711
TAMPA, FL 33618
CONTACT: KEVIN TALECKI / MIKE GAMBOA
PHONE: (610) 200-3365

TELEPHONE
AT & T/ T DISTRIBUTION
6628 LAKESIDE RD
WEST PALM BEACH, FL 33411
CONTACT: DINO FARRUGIO
EMAIL: G27896@ATT.COM

PROJECT TEAM

DEVELOPER
LONGLEAF FOUR, LLC
320 N. MERIDIAN ST, SUITE 700
INDIANAPOLIS, IN 46204
CONTACT: HARRY F. MCNAUGHT
PHONE: (317) 439-4577
EMAIL: HARRYMCNAUGHT@GMAIL.COM

CIVIL ENGINEER
KIMLEY-HORN AND ASSOCIATES, INC.
200 S. ORANGE AVE., SUITE 600
ORLANDO, FL 32801
CONTACT: JEFFREY R. SWISHER, P.E.
PHONE: (407) 898-1511
EMAIL: JEFFREY.SWISHER@KIMLEY-HORN.COM

LANDSCAPE ARCHITECT
KIMLEY-HORN AND ASSOCIATES, INC.
200 S. ORANGE AVE., SUITE 600
ORLANDO, FL 32801
CONTACT: JOHN GRIFFIN, PLA
PHONE: (407) 427-1630
EMAIL: JOHN.GRIFFIN@KIMLEY-HORN.COM

SURVEYOR:
VHB
225 E. ROBINSON STREET
ORLANDO, FLORIDA 32801
CONTACT: JOHN PROWELL
PHONE: (407) 839-4006
EMAIL: JPROWELL@VHB.COM

SURVEYOR:
SLIGER & ASSOCIATES, INC.
3921 NOVA ROAD
PORT ORANGE, FLORIDA 32127
CONTACT: CHRIS WILLIAMS, P.S.M.
PHONE: (386) 761-5385
EMAIL: CWILLIAMS@SLIGERASSOCIATES.COM

PREPARED BY
Kimley»Horn

© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
200 S Orange Ave, Suite 600, Orlando, FL 32801
Phone: (407) 898-1511
WWW.KIMLEY-HORN.COM Registry No. 35106

SHEET LIST TABLE

SHEET NUMBER	SHEET TITLE
C0.0	COVER
C1.0-C1.1	GENERAL NOTES
C2.0	STORMWATER POLLUTION PREVENTION PLAN
C2.1	EROSION CONTROL DETAILS
C3.0	OVERALL EXISTING CONDITIONS AND DEMOLITION PLAN
C3.1-C3.8	EXISTING CONDITIONS AND DEMOLITION PLAN
C4.0	OVERALL SITE PLAN
C5.0	OVERALL PAVING, GRADING AND DRAINAGE PLAN
C5.1 - C5.8	PAVING, GRADING AND DRAINAGE PLAN
C5.8A	DRAINAGE STRUCTURES TABLE
C5.9	TYPICAL SECTIONS
C5.10	POND SECTIONS - RETAIL
C5.11	POND SECTIONS - INDUSTRIAL
C6.0	OVERALL UTILITY PLAN
C7.0 - C7.3	PLAN AND PROFILE - PINEHURST DRIVE
C7.4 - C7-7	PLAN AND PROFILE - KIRK DRIVE
C8.0 - C8.4	CITY OF DELAND DETAILS
C9.0 - C9.2	CONSTRUCTION DETAILS
L0.50	OVERALL TREE MITIGATION PLAN
L0.51 - L0.58	TREE MITIGATION PLAN
L0.59	TREE MITIGATION CALCULATIONS
L0.60	TREE MITIGATION SPECIFICATIONS
L1.00	OVERALL LANDSCAPE PLAN
L.101 - L.108	LANDSCAPE PLAN
L1.50	LANDSCAPE DETAILS
L1.51	LANDSCAPE SPECIFICATIONS
L2.00	OVERALL IRRIGATION PLAN
L2.01 - L2.08	IRRIGATION PLAN
L2.50	IRRIGATION DETAILS
L2.51	IRRIGATION SPECIFICATIONS
L4.00	OVERALL PHOTOMETRICS PLAN
L4.01 - L4.08	PHOTOMETRICS PLAN
L4.09	PHOTOMETRICS SCHEDULE

Jeffrey R. Swisher, P.E., State of Florida, Professional Engineer, License No. 60275

This item has been digitally signed and sealed by Jeffrey R. Swisher, P.E. on the date indicated here.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

10/24/2025
JEFFREY R. SWISHER, P.E.
60275

The above named professional engineer shall be responsible for the above sheets listed in the Index, with the exception of all L Sheets, in accordance with Rule 61G15-23.004, F.A.C.

No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/21/24	JOR
2	REVISED PER CITY COMMENTS	07/10/25	JOR
3	REVISED PER CITY COMMENTS	08/15/25	JOR
4	REVISED PER CITY COMMENTS	10/24/25	JOR

SHEET NUMBER
C0.0

Drawing name: K:\ORL_Civil\249418000-Deland Tech Park\CADD\CONST (Waiting for Approval)\PlanSheets\C0.0-COVR.dwg Layout: Oct 22, 2025 1:31pm by: Joan.Ramirez
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

GENERAL

1. WATER SERVICE AND WASTEWATER SERVICE SHALL BE PROVIDED BY CITY OF DELAND. THE WATER DISTRIBUTION SYSTEM AND WASTEWATER COLLECTION SYSTEM SHOWN ON THESE PLANS SHALL BE INSTALLED BY THE CONTRACTOR AND CONSTRUCTION SHALL CONFORM TO ORANGE COUNTY STANDARDS, FOR WATER AND SEWER SERVICE. ON-SITE WATER DISTRIBUTION SYSTEM,WITHIN THE PUBLIC RIGHT-OF-WAY, SHALL BE OWNED AND MAINTAINED BY CITY OF DELAND AFTER COMPLETION OF CONSTRUCTION, CERTIFICATION, AND CLEARANCE BY THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION (FDEP).
2. WASTEWATER COLLECTION SYSTEM, WITHIN THE PUBLIC RIGHT-OF-WAY, AND LIFT STATION SHALL BE OWNED AND MAINTAINED BY CITY OF DELAND AFTER COMPLETION OF CONSTRUCTION, CERTIFICATION, AND CLEARANCE BY THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION (FDEP). THE SANITARY FORCEMAIN SHALL BE OWNED AND MAINTAINED BY CITY OF DELAND AFTER COMPLETION OF CONSTRUCTION, CERTIFICATION, AND CLEARANCE BY THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION (FDEP).
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO BECOME FAMILIAR WITH THE PERMIT AND INSPECTION REQUIREMENTS SPECIFIED BY THE VARIOUS GOVERNMENTAL AGENCIES AND THE ENGINEER. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS, SUCH AS RIGHT OF WAY PERMIT(S), EXCAVATION/FILL PERMIT(S), FIRE PROTECTION PERMIT(S), OR UNDERGROUND UTILITY PERMIT(S), PRIOR TO START OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING ALL INSPECTION CRITERIA OF APPLICABLE AGENCIES, SCHEDULING OF INSPECTIONS, AND OBTAINING REQUIRED INSPECTIONS FROM AGENCY.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND VERIFYING (HORIZONTALLY AND VERTICALLY) ALL EXISTING UTILITIES PRIOR TO START OF CONSTRUCTION AND FOR NOTIFYING THE VARIOUS UTILITY COMPANIES TO MAKE THE NECESSARY ARRANGEMENTS FOR ANY RELOCATION, TEMPORARY DISTRIBUTION SERVICE, OR CLARIFICATION OF ACTIVITY REGARDING SAID UTILITY. THE CONTRACTOR SHALL EXERCISE CAUTION WHEN CROSSING AN UNDERGROUND UTILITY, WHETHER SHOWN ON THESE PLANS OR FIELD LOCATED. ALL OTHER UTILITIES WHICH INTERFERE WITH THE PROPOSED CONSTRUCTION SHALL BE RELOCATED BY THE RESPECTIVE UTILITY COMPANIES AND THE CONTRACTOR SHALL COOPERATE WITH THEM DURING RELOCATION OPERATIONS. ANY DELAY OR INCONVENIENCE OF THE VARIOUS UTILITIES SHALL BE INCIDENTAL TO THE CONTRACT AND NO EXTRA COMPENSATION WILL BE ALLOWED. CONTRACTOR SHALL CALL "SUNSHINE ONE" AT 811 TO HAVE EXISTING UTILITIES LOCATED AT LEAST 48 HOURS PRIOR TO CONSTRUCTION.
4. THE LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES, STRUCTURES, STORM DRAINAGE SYSTEMS, AND TOPOGRAPHIC FEATURES SHOWN ON THE PLANS HAVE BEEN DETERMINED FROM THE BEST AVAILABLE INFORMATION AT THE TIME OF PREPARATION AND ARE PROVIDED FOR THE CONVENIENCE OF THE CONTRACTOR. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THEIR ACCURACY. SHOULD A DISCREPANCY ARISE BETWEEN THESE PLANS AND ACTUAL FIELD CONDITIONS, WHICH WOULD APPRECIABLY AFFECT THE EXECUTION OF THESE PLANS, THE CONTRACTOR SHALL HALT CONSTRUCTION AND NOTIFY THE ENGINEER IMMEDIATELY.
5. ALL DISTURBED AREAS NOT DESIGNED TO BE LANDSCAPED OR SODDED SHALL BE SEEDED AND MULCHED AS DIRECTED BY THE ENGINEER OR LANDSCAPE ARCHITECT.
6. THE CONTRACTOR SHALL NOT EXCAVATE, REMOVE, OR OTHERWISE DISTURB ANY MATERIAL, STRUCTURE, OR PART OF A STRUCTURE WHICH IS LOCATED OUTSIDE THE LINES, GRADES, OR GRADING SECTIONS ESTABLISHED FOR THIS PROJECT, EXCEPT WHERE SUCH EXCAVATION OR REMOVAL IS PROVIDED FOR IN THE CONTRACT, PLANS, OR SPECIFICATIONS. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY DAMAGE TO EXISTING FACILITIES, ABOVE OR BELOW GROUND, THAT MAY OCCUR AS A RESULT OF THE WORK PERFORMED, BY THE CONTRACTOR OR SUB-CONTRACTORS, AS CALLED FOR IN THESE CONTRACT DOCUMENTS.
7. ALL WORK AND MATERIALS FURNISHED SHALL BE REASONABLY CLOSE IN CONFORMITY WITH THE LINES, GRADES, GRADING SECTIONS, CROSS SECTIONS, DIMENSIONS, MATERIAL REQUIREMENTS, AND TESTING REQUIREMENTS THAT ARE SPECIFIED IN THE CONTRACT PLANS OR SPECIFICATIONS.
8. ALL SPECIFICATIONS AND DOCUMENTS REFERENCED HEREIN SHALL BE OF THE LATEST REVISION, AS APPLICABLE AT THE TIME ALL PERMITS HAVE BEEN OBTAINED.
9. ALL UNDERGROUND UTILITIES MUST BE IN-PLACE, TESTED AND INSPECTED PRIOR TO BASE AND SURFACE CONSTRUCTION.
10. ALL UTILITY SERVICE STUB-OUTS (WATER, SANITARY SEWER, ETC.) ARE TO BE INSTALLED WITHIN 5' OF BUILDING(S), UNLESS OTHERWISE NOTED ON THE PLANS.
11. THE GRAPHIC INFORMATION DEPICTED ON THESE PLANS HAS BEEN COMPILED TO PROPORTION BY SCALE AS ACCURATELY AS POSSIBLE. HOWEVER, DUE TO REPRODUCTIVE DISTORTION, REDUCTION, AND/OR REVISIONS, INFORMATION CONTAINED HEREIN IS NOT INTENDED TO BE SCALED FOR CONSTRUCTION PURPOSES.
12. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS ON ALL PRECAST AND MANUFACTURED ITEMS TO THE OWNER'S ENGINEER FOR REVIEW. FAILURE TO OBTAIN APPROVAL BEFORE INSTALLATION MAY RESULT IN REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE.
13. CONTRACTOR TO COORDINATE WITH THE APPLICABLE ELECTRIC UTILITY SUPPLIER REGARDING ANY NECESSARY RELOCATION(S) OF UNDERGROUND AND/OR OVERHEAD ELECTRIC FACILITIES, AND FOR THE LOCATION AND INSTALLATION OF TRANSFORMER PAD(S) AND ASSOCIATED ELECTRIC FACILITIES.
14. THE CONTRACTOR SHALL RESTORE OFF-SITE CONSTRUCTION AREAS TO EQUAL AND/OR BETTER CONDITION THAN EXISTING PRIOR TO START OF CONSTRUCTION.
15. THE CONTRACTOR SHALL COMPLY WITH THE LEGAL LOAD RESTRICTIONS IN HAULING OF MATERIALS IN PUBLIC ROADS BEYOND THE LIMITS OF WORK. A SPECIAL PERMIT WILL NOT RELIEVE THE CONTRACTOR OF LIABILITY FOR THE DAMAGE WHICH MAY RESULT FROM THE MOVING OF MATERIAL AND EQUIPMENT.
16. SURVEY MONUMENTS OR BENCHMARKS, WHICH HAVE TO BE DISTURBED BY THIS WORK, SHALL BE REPLACED UPON COMPLETION OF WORK BY A A LICENSED LAND SURVEYOR CURRENTLY REGISTERED IN THE STATE OF FLORIDA.
17. CONTRACTOR IS TO ADJUST ANY UTILITY ELEMENT MEANT TO BE FLUSH WITH GRADE (CLEAN OUT, MANHOLES, CATCH BASINS, INLETS, ETC.) THAT IS AFFECTED BY SITE WORK OR GRADE CHANGES, WHETHER SPECIFICALLY NOTED ON PLANS OR NOT.
18. CONTRACTOR TO COORDINATE ABANDONMENT OF ANY EXISTING MONITORING WELLS AND REMEDIATION SYSTEM WITH A LICENSED WELL DRILLER. AS SITE WORK ADVANCES, CONTRACTOR TO COORDINATE WITH THE NAVY AND FDEP FOR THE NEW MONITORING WELL LOCATIONS. MONITORING WELLS TO BE INSTALLED BY A LICENSED WELL DRILLER.
19. A MANDATORY PRECONSTRUCTION MEETING IS REQUIRED WITH CITY OF DELAND, GENERAL CONTRACTOR AND UTILITIES SUBCONTRACTOR PRIOR TO THE INITIATION OF WORK ON ANY CITY OF DELAND UTILITIES. PRIOR TO SCHEDULING PRECONSTRUCTION MEETING, SEND SUBMITTALS TO UTILITIES DEPARTMENT FOR REVIEW.
20. CONTRACTOR TO REFER TO THE FLORIDA DEPARTMENT OF TRANSPORTATION 2024 DESIGN STANDARDS AND REVISED INDEX DRAWINGS AS APPENDED HEREIN, AND 2024 STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, AS AMENDED BY CONTRACT DOCUMENTS.

SAFETY

1. DURING THE CONSTRUCTION AND/OR MAINTENANCE OF THIS PROJECT, ALL SAFETY REGULATIONS ARE TO BE ENFORCED. THE CONTRACTOR OR HIS REPRESENTATIVE SHALL BE RESPONSIBLE FOR THE CONTROL AND SAFETY OF THE TRAVELING PUBLIC AND THE SAFETY OF HIS/HER PERSONNEL.
2. LABOR SAFETY REGULATIONS SHALL CONFORM TO THE PROVISIONS SET FORTH BY OSHA.
3. THE MINIMUM STANDARDS AS SET FORTH IN THE CURRENT EDITION OF "THE STATE OF FLORIDA, MANUAL ON TRAFFIC CONTROL AND SAFE PRACTICES FOR STREET AND HIGHWAY CONSTRUCTION, MAINTENANCE AND UTILITY OPERATIONS" SHALL BE FOLLOWED IN THE DESIGN, APPLICATION, INSTALLATION, MAINTENANCE AND REMOVAL OF ALL TRAFFIC CONTROL DEVICES, WARNING DEVICES AND BARRIERS NECESSARY TO PROTECT THE PUBLIC AND CONSTRUCTION PERSONNEL FROM HAZARDS WITHIN THE PROJECT LIMITS.
4. ALL TRAFFIC CONTROL MARKINGS AND DEVICES SHALL CONFORM TO THE PROVISIONS SET FORTH IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES PREPARED BY THE U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION.
5. ALL SUBSURFACE CONSTRUCTION SHALL COMPLY WITH THE "TRENCH SAFETY ACT". THE CONTRACTOR SHALL INSURE THAT THE METHOD OF TRENCH PROTECTION AND CONSTRUCTION IS IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) REGULATIONS.
6. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO COMPLY AND ENFORCE ALL APPLICABLE SAFETY REGULATIONS. THE ABOVE INFORMATION HAS BEEN PROVIDED FOR THE CONTRACTOR'S INFORMATION ONLY AND DOES NOT IMPLY THAT THE OWNER OR ENGINEER WILL INSPECT AND/OR ENFORCE SAFETY REGULATIONS.

DEMOLITION

1. CONTRACTOR SHALL SUBMIT DEMOLITION SCHEDULE TO OWNER PRIOR TO PROCEEDING WITH DEMOLITION ACTIVITIES.
2. EXTENT OF SITE CLEARING IS SHOWN ON DRAWINGS.
3. CONTRACTOR SHALL CONDUCT SITE DEMOLITION OPERATIONS TO ENSURE MINIMUM INTERFERENCE WITH ROADS, STREETS, WALKS, AND OTHER ADJACENT OCCUPIED OR USED FACILITIES. DO NOT CLOSE OR OBSTRUCT STREETS, WALKS OR OTHER OCCUPIED OR USED FACILITIES WITHOUT PERMISSION FROM AUTHORITIES HAVING JURISDICTION.
4. CONTRACTOR SHALL PROVIDE PROTECTION NECESSARY TO PREVENT DAMAGE TO EXISTING IMPROVEMENTS INDICATED ON PLAN "EXISTING TO REMAIN".
5. CONTRACTOR SHALL RESTORE DAMAGED IMPROVEMENTS TO THEIR ORIGINAL CONDITION, AS ACCEPTABLE TO PARTIES HAVING JURISDICTION.
6. CONTRACTOR SHALL REMOVE WASTE MATERIALS AND UNSUITABLE AND EXCESS TOPSOIL FROM PROPERTY AND DISPOSE OF OFF-SITE IN A LEGAL MANNER.
7. CONTRACTOR SHALL DEMOLISH AND COMPLETELY REMOVE FROM SITE MATERIAL INDICATED ON PLAN OR NOTES "TO BE REMOVED".
8. CONTRACTOR SHALL PROTECT STRUCTURES, UTILITIES, SIDEWALKS, PAVEMENTS, AND OTHER FACILITIES FROM DAMAGE CAUSED BY SETTLEMENT, LATERAL MOVEMENT, UNDERMINING, WASHOUT AND OTHER HAZARDS CREATED BY THE DEMOLITION OPERATION.

EARTHWORK/PAVING/GRADING/DEMUCKING PROCEDURES

1. A GEOTECHNICAL ENGINEERING INVESTIGATION REPORT HAS BEEN PREPARED FOR PURPOSES OF STORM WATER DESIGN, OF WHICH COPIES ARE AVAILABLE THROUGH THE OWNER OR THEIR SOIL TESTING COMPANY. A GEOTECHNICAL ENGINEER SHALL BE RETAINED BY THE CONTRACTOR TO PROVIDE ON-SITE INSPECTIONS DURING EXCAVATION/FILL OPERATIONS AND TESTING OF THE COMPACTED FILL SO THAT PROPER DOCUMENTATION OF THE REQUIRED COMPACTING CRITERIA CAN BE PROVIDED.
2. ALL EXISTING DEBRIS (ABOVE OR BELOW GROUND), CONSTRUCTION DEBRIS AND OTHER WASTE MATERIAL SHALL BE DISPOSED OF OFF-SITE BY THE CONTRACTOR, IN ACCORDANCE WITH APPLICABLE REGULATORY AGENCY REQUIREMENTS IN A LEGAL MANNER.
3. ALL EXCESS FILL MATERIAL SHALL BE HAULED OFF SITE TO AN APPROVED DISPOSAL LOCATION.
4. FINAL GRADES SHOWN INCLUDE SOD HEIGHT.
5. ALL DELETERIOUS SUBSURFACE MATERIAL (I.E. MUCK, PEAT, BURIED DEBRIS) IS TO BE EXCAVATED AND REPLACED WITH SUITABLE/COMPACTED SOILS, AS DIRECTED BY THE OWNER OR THEIR SOILS TESTING COMPANY. DELETERIOUS MATERIAL IS TO BE STOCKPILED OR REMOVED FROM THE SITE AS DIRECTED BY THE OWNER. EXCAVATED AREAS ARE TO BE BACKFILLED WITH APPROVED MATERIALS AND COMPACTED AS SHOWN ON THESE PLANS. CONTRACTOR IS RESPONSIBLE FOR ACQUIRING ANY PERMITS THAT ARE NECESSARY FOR REMOVING DELETERIOUS MATERIAL FROM THE SITE.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING EXCAVATIONS AGAINST COLLAPSE AND WILL PROVIDE BRACING, SHEETING OR SHORING AS NECESSARY. DEWATERING METHODS SHALL BE USED AS REQUIRED TO KEEP TRENCHES DRY WHILE PIPE AND APPURTENANCES ARE BEING PLACED.
7. ALL ON-SITE AND OFF-SITE DEWATERING SHALL BE PERMITTED THROUGH THE WATER MANAGEMENT DISTRICT, FDEP, AND LOCAL MUNICIPALITY. DEWATERING SHALL FOLLOW THE REQUIREMENTS OF THE CITY OF DELAND'S LATEST ENGINEERING STANDARDS MANUAL.
8. ALL NECESSARY FILL AND EMBANKMENT THAT IS PLACED DURING CONSTRUCTION SHALL CONSIST OF MATERIAL SPECIFIED BY THE OWNER'S SOILS TESTING COMPANY OR ENGINEER AND BE PLACED AND COMPACTED ACCORDING TO THESE PLANS.
9. THE CONTRACTOR SHALL INSURE THAT PROPER SOIL DENSITIES ARE ACHIEVED FOR PLACEMENT OF ALL HEADWALL/ENDWALL FOOTINGS, RETAINING WALL FOOTINGS, AND IN GENERAL, ANY FOOTING SUPPORT DESCRIBED ON THESE PLANS. IT WILL ALSO BE THE RESPONSIBILITY OF THE CONTRACTOR TO INSURE THAT SUFFICIENT SOILS TESTING HAS BEEN PERFORMED PRIOR TO FINAL INSTALLATION OF IMPROVEMENTS.
10. ANY UNSUITABLE ORGANIC SOIL SHALL BE EXCAVATED TO A MINIMUM MARGIN OF 6 FEET BEYOND ITS PERIPHERY EXCAVATED TO EXPOSE THE UNDERLYING NON-ORGANIC FINE SAND.
11. IF DETERMINED NECESSARY, DEWATERING DURING EXCAVATING/BACKFILLING OPERATIONS MAY BE ACCOMPLISHED BY DITCHING AND THE USE OF SUMP PUMPS AND/OR OTHER METHODS (WELL POINTS), AS NECESSARY. CONTRACTOR TO OBTAIN ALL REQUIRED PERMITS FOR DEWATERING ACTIVITIES THAT MAY BE REQUIRED.
12. UPON APPROVAL OF THE GEOTECHNICAL ENGINEER, THE EXCAVATED AREAS MAY BE BACKFILLED WITH CLEAN FINE SAND FREE OF UNSUITABLE OR DELETERIOUS MATERIAL. HOWEVER, THE FILL SHOULD NOT BE PLACED IN MORE THAN 6 INCHES OF STANDING WATER. ONCE THE FILL IS AT LEAST 2 FEET ABOVE THE DEWATERED LEVEL, BACKFILLING MAY PROCEED AS DIRECTED BY THE GEOTECHNICAL ENGINEER.
13. CONTRACTOR SHALL TRIM, TACK AND MATCH EXISTING PAVEMENT AT LOCATIONS WHERE NEW PAVEMENT MEETS EXISTING PAVEMENT.
14. CURBING SHALL BE PLACED AT THE EDGES OF ALL PAVEMENT, UNLESS OTHERWISE NOTED. REFER TO THE THE LATEST EDITION OF F.D.O.T. "DESIGN STANDARDS FOR DESIGN, CONSTRUCTION, MAINTENANCE, AND UTILITY OPERATIONS ON THE STATE HIGHWAY SYSTEM" FOR DETAILS AND SPECIFICATIONS OF ALL CURB AND GUTTERS CALLED FOR IN THESE PLANS WITHIN PUBLIC RIGHTS OF WAY.
15. PROPOSED SPOT ELEVATIONS REPRESENT FINISHED PAVEMENT, TOP OF CURB OR GROUND SURFACE GRADES, UNLESS OTHERWISE NOTED.
16. IT MAY BE NECESSARY TO FIELD ADJUST PAVEMENT ELEVATIONS TO PRESERVE THE ROOT SYSTEMS OF TREES SHOWN TO BE SAVED. CONTRACTOR TO COORDINATE WITH OWNER'S ENGINEER PRIOR TO ANY ELEVATION CHANGES.
17. PRIOR TO CONSTRUCTING CONCRETE PAVEMENT, THE CONTRACTOR IS TO SUBMIT A PROPOSED JOINTING PATTERN TO THE SOILS ENGINEER AND CIVIL ENGINEER FOR APPROVAL.
18. CONTRACTOR TO PROVIDE A 1/2" TO 1" BITUMINOUS EXPANSION JOINT MATERIAL WITH SEALER AT ABUTMENT OF CONCRETE AND OTHER MATERIALS (STRUCTURES, OTHER POURED)
19. ALL PAVEMENT MARKINGS SHALL BE MADE IN ACCORDANCE WITH F.D.O.T. STANDARD INDEX #17346.
20. THE CONTRACTOR WILL STABILIZE BY SEED AND MULCH, SOD, OR OTHER APPROVED MATERIALS ANY DISTURBED AREAS WITHIN ONE WEEK FOLLOWING CONSTRUCTION OF THE UTILITY SYSTEMS AND PAVEMENT AREAS. CONTRACTOR SHALL MAINTAIN SUCH AREAS UNTIL FINAL ACCEPTANCE BY OWNER. CONTRACTOR TO COORDINATE WITH OWNER REGARDING TYPE OF MATERIAL, LANDSCAPING AND IRRIGATION REQUIREMENTS.
21. UNLESS OTHERWISE NOTED, GRADE TO MEET EXISTING ELEVATION AT PROPERTY LINES.
22. ALL AREAS SHALL BE GRADED TO DRAIN AWAY FROM THE BUILDINGS.

TREES AND VEGETATION

1. THE CONTRACTOR IS TO MINIMIZE THE REMOVAL OF VEGETATION TO THE GREATEST EXTENT PRACTICAL. NO TREES SHALL BE REMOVED OR DAMAGED WITHOUT OWNER'S APPROVAL. ALL TREES THAT ARE TO REMAIN SHALL BE PROTECTED BY TREE BARRICADES PER DETAIL ON SHEET C2.1.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF ALL LANDSCAPE BUFFERS AND RETENTION AND DETENTION FACILITIES UNTIL THE WORK HAS BEEN ACCEPTED BY THE OWNER. ALL DISTURBED AREAS SHALL BE RETURNED TO THEIR ORIGINAL CONDITION.

STORM DRAINAGE SYSTEM

1. THE LATEST EDITION OF F.D.O.T. "DESIGN STANDARDS FOR DESIGN, CONSTRUCTION, MAINTENANCE, AND UTILITY OPERATIONS ON THE STATE HIGHWAY SYSTEM" IS REFERRED TO FOR THE STRUCTURAL DESIGN OF DRAINAGE STRUCTURES SPECIFIED IN THESE PLANS, AS REFERENCED BY STANDARD INDEX. ALL SPECIALTY DRAINAGE STRUCTURES REQUIRE SEPARATE STRUCTURAL DESIGN, WHICH IS NOT INCLUDED IN THESE PLANS. STATION OFFSETS ARE TO THE CENTERLINE OF THE STRUCTURE TOP (I.E. DITCH BOTTOM INLET OR CURB INLET TOP), AS OPPOSED TO THE STRUCTURE BASE.
2. ALL STORM SEWER PIPE SHALL BE REINFORCED CONCRETE CLASS III (ASTM C-76) UNLESS OTHERWISE NOTED ON PLANS. ALL DRAINAGE STRUCTURES SHALL BE IN ACCORDANCE WITH F.D.O.T. ROADWAY AND TRAFFIC DESIGN STANDARDS UNLESS OTHERWISE NOTED ON PLANS.
3. PIPE LENGTHS SHOWN ARE APPROXIMATE AND TO CENTER OF DRAINAGE STRUCTURES, WITH THE EXCEPTION OF MITERED END AND FLARED END SECTIONS. LENGTHS OF PIPE SHOWN WHICH TERMINATE WITH MITERED END OR FLARED END SECTIONS ARE MEASURED TO THE DOWNSTREAM INVERT OF THE MITERED END OR FLARED END SECTION.
4. ALL DRAINAGE STRUCTURE GRATES AND COVERS, EITHER EXISTING OR PROPOSED SHALL BE TRAFFIC RATED FOR H-20 LOADINGS.
5. CONSTRUCTION OF THE STORM WATER MANAGEMENT SYSTEM MUST BE COMPLETE AND ALL DISTURBED AREAS STABILIZED IN ACCORDANCE WITH THE PERMITTED PLANS AND CONDITIONS PRIOR TO ANY OF THE FOLLOWING: ISSUANCE OF THE FIRST CERTIFICATE OF OCCUPANCY; INITIATION OF INTENDED USE OF THE INFRASTRUCTURE; OR TRANSFER OF RESPONSIBILITY FOR MAINTENANCE OF THE SYSTEM TO A LOCAL GOVERNMENT OR OTHER RESPONSIBLE ENTITY.
6. STORM WATER PIPES, STRUCTURES, MINIMUM COVER, AND INSTALLATION PROCEDURES TO BE IN ACCORDANCE WITH CITY OF DELAND CODE OF ORDINANCES.
7. DURING CONSTRUCTION, NO DIRECT DISCHARGE OF WATER TO DOWNSTREAM RECEIVING WATERS WILL BE ALLOWED. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING WATER QUALITY AND SHALL ROUTE DISCHARGE WATER IN SUCH A MANNER AS TO ADEQUATELY REMOVE SILT PRIOR TO RUNOFF FROM THE SITE.
8. ALL DRAINAGE PIPES SHALL BE FILTER FABRIC WRAPPED PER FDOT "STANDARD SPECIFICATIONS".

OWNER INSTRUCTIONS FOR MAINTENANCE AND INSPECTION OF STORMWATER FACILITIES

1. THE ENTIRE STORMWATER SYSTEM SHOULD BE INSPECTED ON AT LEAST A SEMI-ANNUAL BASIS. THIS SHOULD INCLUDE A VISUAL INSPECTION OF THE POND, POND BANKS, BLEED-DOWN ORIFICES, OTHER CONTROL STRUCTURES, AND DISCHARGE PIPES. THESE SHOULD BE KEPT FREE OF DEBRIS AND CLEANED ON A FREQUENCY AS REQUIRED TO KEEP THEM FUNCTIONAL, AS DESIGNED. MOWING/CLEARING AROUND THE STRUCTURES MAY BE REQUIRED TO PREVENT VEGETATION FROM CLOGGING THEM.
2. WETLAND PLANTS IF INTENTIONALLY INSTALLED, SHOULD BE MONITORED AND MAINTAINED AS REQUIRED ON THE APPROVED CONSTRUCTION PLANS. AREAS OF LITTORAL SHELVING, WHICH ARE REQUIRED TO BE VEGETATED BUT NOT INTENTIONALLY PLANTED, SHOULD NOT BE CLEARED OF THE WETLAND PLANTS. THESE AREAS SHOULD HAVE AS HIGH A PLANT COVERAGE AS POSSIBLE, FOR MAXIMUM WATER FILTRATION.
3. SEDIMENT SUMPS, IF DESIGNED AND INSTALLED, SHOULD HAVE SEDIMENT REMOVED AS NECESSARY TO ALLOW THEM TO EFFICIENTLY REMOVE SUSPENDED PARTICLES. THEY SHOULD BE RE-DUG TO THE ORIGINAL DESIGN SPECIFICATIONS, IF SILTED IN.
4. FOR PERCOLATION TREATMENT PONDS/SWALES, THE OWNER OF THE FACILITY SHALL INSPECT THE POND BOTTOM PERIODICALLY AFTER HEAVY RAINFALL EVENTS TO CHECK FOR PERSISTENT PONDING OR POOLING OF WATER. ALL LARGE DEBRIS SHALL BE REMOVED AND DISPOSED OF ELSEWHERE. IF PROLONGED PONDING PERSISTS, I.E., IN EXCESS OF 72 HOURS, THE OWNER SHALL RAKE OR SCARIFY THE SURFACE. IF REQUIRED, THE SOIL IN THE AREA OF PONDING SHALL BE REMOVED AND REPLACED WITH CLEAN SANDY, NON-COHESIVE SOILS.
5. PLEASE CHECK THE CONSTRUCTION PLANS TO SEE IF WRITTEN REPORTS ON MONITORING OR PLANT SURVIVAL RATES ARE REQUIRED TO BE SENT TO ANY REVIEWING AGENCIES. WRITTEN NOTES SHOULD ALWAYS BE KEPT WHICH DESCRIBE MAINTENANCE ACTIVITIES UNDERTAKEN DURING EACH INSPECTION.
6. SPECIFIC CONDITIONS OF ALL PERMITS MAY REQUIRE ADDITIONAL MAINTENANCE ACTIVITIES ABOVE AND BEYOND THOSE OUTLINED ABOVE. PLEASE BE AWARE OF ALL PERMIT CONDITIONS AS ISSUED BY REGULATORY AGENCIES TO ENSURE PERMIT COMPLIANCE.

DRAINAGE SYSTEM TESTING AND INSPECTION

1. THE STORM DRAINAGE PIPING SYSTEM SHALL BE SUBJECT TO A VISUAL INSPECTION BY THE OWNER'S ENGINEER PRIOR TO THE PLACEMENT OF BACKFILL. CONTRACTOR TO NOTIFY THE ENGINEER 48 HOURS IN ADVANCE TO SCHEDULE INSPECTION.
2. THE CONTRACTOR SHALL MAINTAIN AND PROTECT FROM MUD, DIRT, DEBRIS, ETC. THE STORM DRAINAGE SYSTEM UNTIL FINAL ACCEPTANCE OF THE PROJECT. THE STORM SYSTEM WILL BE REINSPECTED BY THE OWNER'S ENGINEER PRIOR TO APPROVAL FOR CERTIFICATE OF OCCUPANCY PURPOSES. THE CONTRACTOR MAY BE REQUIRED TO RECLEAN PIPES AND INLETS AT THE CONTRACTORS EXPENSE AND PRIOR TO FINAL ACCEPTANCE.
3. THE CONTRACTOR SHALL LASER PROFILE AND CCTV ALL STORMWATER PIPES AND SUBMIT THAT REPORT TO THE OWNER'S ENGINEER FOR SUBMITTAL TO THE CITY OF DELAND.

DATUM

VERTICAL INFORMATION SHOWN HEREON REFERS TO A RECOVERED BRASS FDOT SURVEY DISK, NAME:91503036-1990, LOCATED AT N-1684051.255, E-571309.647, AND HAVING AN ELEVATION OF 49.32' (NAVD88)

SIGNING AND MARKING

1. ALL SIGNS WITHIN THE R/W SHALL BE 2" SQ. GALV. POLES, WITH QUICK PUNCH (NOT PRE-PUNCHED). ALL BOLTS, NUTS, AND WASHERS TO BE STAINLESS STEEL (5/16 INCH).
2. STOP SIGNS AT INTERSECTIONS SHALL BE 3" ALUMINUM ROUND POLES WITH Z-BARS AND U-BOLT ATTACHMENTS. DRILLING THROUGH THE POLE TO ATTACH THE SIGN IS NOT ALLOWED.
3. SIGNS WITHIN THE SIDEWALKS TO BE CORE BORED THROUGH THE SIDEWALK, NOT SURFACE MOUNTED.
4. SIGN BLADE SHEETING SHALL BE DIAMOND GRADE WITH EC FILM.
5. ALL STOP SIGNS SHALL BE PLACED ADJACENT TO THE 24" WHITE STOP BARS AND SHALL BE PLACED 4' BEHIND THE CROSSWALK.

Always call 811 two full business days before you dig to have underground utilities located and marked.
Sunshine811.com

No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/21/24	JDR
2	REVISED PER CITY COMMENTS	07/10/25	JDR
3	REVISED PER CITY COMMENTS	09/15/25	JDR

Kimley»Horn
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200 S. ORANGE AVENUE, SUITE 800, ORLANDO, FL 32801
PHONE: (407) 898-1511
WWW.KIMLEY-HORN.COM CA-00000696

KHA PROJECT 240418000
DATE 09/09/2025
SCALE AS SHOWN
DESIGNED BY —
DRAWN BY —
CHECKED BY —

JEFFREY R. SWISHER, P.E.
FLORIDA LICENSE NUMBER 60275

GENERAL NOTES

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER C1.0

Plotted By: Spencer Jones Saved: DELAND TECH PARK Layout: C1.0 GENERAL NOTES September 29, 2025 - 10:39:23 am K:\ORL_Civil\240418000-Deland Tech Park\CADD\CONST Working for Approval\Plans\Sheets\C1.0 NOTES.dwg
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SANITARY SYSTEM

1. ALL PVC PIPE SHALL BE SOLID WALL POLYVINYL CHLORIDE PIPE AND COMPLY WITH ASTM D 3034 AND ALL APPLICABLE ASTM DOCUMENTS AS COVERED IN SECTION NO. 2 OF ASTM D 3034. MAIN LINES SHALL BE A MINIMUM OF 8" DIAMETER, AND LATERALS SHALL BE A MINIMUM 6" DIAMETER.

2. ALL GRAVITY SEWERS MUST BE SDR 35 PVC, EXCEPT FOR PIPE DEEPER THAN 14 FEET, IN WHICH CASE SDR 26 PIPE SHALL BE USED. ELASTOMERIC GASKET JOINTS SHALL BE UTILIZED FOR PVC PIPE, AND SHALL COMPLY WITH ASTM F477, ASTM D3034 & ASTM F679. JOINTS SHALL COMPLY WITH ASTM D3212.

3. ALL ON-SITE PVC FORCE MAINS (IF REQUIRED) SHALL BE CLASS 200, DR 14 FOR 4" DIAMETER, AND CLASS 150 DR 18 FOR 6" TO 12" DIAMETER PIPE, IN ACCORDANCE WITH AWWA C900 STANDARDS. PVC FORCE MAIN PIPE SMALLER THAN 4" DIAMETER SHALL BE CLASS 200, SDR 21, IN ACCORDANCE WITH ASTM D 2241. FORCE MAIN SHALL BE SPIRAL WRAPPED WITH 2 INCH WIDE DARK GREEN STICK-ON VINYL TAPE. FORCE MAINS WITHIN THE RIGHT-OF-WAY SHALL BE CLASS 52 DIP, MINIMUM 4" DIAMETER.

4. ALL SANITARY MANHOLES SHALL BE LOCATED NO MORE THAN 400 FEET APART AND SHALL CONFORM TO THE DETAILS CONTAINED HEREIN, AS WELL AS WITH ASTM C478.

5. ALL SLOPES FOR GRAVITY SEWER MAINS AND SERVICE CONNECTIONS SHALL COMPLY WITH THE FOLLOWING MINIMUM GRADES: 4" @ 2.00% 6" @ 1.00% ; AND 8" @ 0.40%.

6. ALL SANITARY SEWER WORK SHALL CONFORM WITH APPLICABLE CITY OF DELAND UTILITIES DEPARTMENT STANDARDS AND SPECIFICATIONS.

7. PRIOR TO COMMENCING WORK WHICH REQUIRES CONNECTING PROPOSED FACILITIES TO EXISTING LINES OR APPURTENANCES, THE CONTRACTOR SHALL VERIFY THE LOCATION AND ELEVATION(S) OF EXISTING CONNECTION POINT(S) AND NOTIFY THE OWNER'S ENGINEER OF ANY CONFLICTS OR DISCREPANCIES.

8. SANITARY SEWER MAINS SHALL HAVE 4" DIAMETER GREEN MARKER BALLS INSTALLED AT A DEPTH BETWEEN 2 FEET AND 4 FEET DEEP ABOVE THE SANITARY SEWER MAIN EVERY 100 FEET OF LENGTH. AT LEAST 6" OF SOIL SHALL BE HAND FILLED OVER THE MARKER TO PREVENT DAMAGE DURING BACKFILL.

SANITARY TESTING AND INSPECTION

1. ALL GRAVITY SEWER PIPING SHALL BE SUBJECT TO A VISUAL INSPECTION BY THE OWNER'S ENGINEER AND APPLICABLE MUNICIPALITY/AGENCY. THE CONTRACTOR SHALL NOTIFY THE ENGINEER 48 HOURS IN ADVANCE TO SCHEDULE INSPECTION(S). THE CONTRACTOR SHALL BE RESPONSIBLE FOR COSTS ASSOCIATED WITH A TELEVISED INSPECTION (TV) OF THE PROPOSED GRAVITY SEWER LINE CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE COPIES OF THE TV INSPECTION PRODUCED ON A USB FLASH DRIVE WITH PAPERWORK BACKUP TO THE ENGINEER, THE OWNER AND THE APPLICABLE MUNICIPALITY/AGENCY.

2. THE CONTRACTOR SHALL PERFORM AN INFILTRATION/EXFILTRATON TEST ON ALL GRAVITY SEWERS IN ACCORDANCE WITH THE REGULATORY AGENCY HAVING JURISDICTION. SAID TESTS ARE TO BE CERTIFIED BY THE ENGINEER OF RECORD AND SUBMITTED TO THE REGULATORY AGENCY FOR APPROVAL. THE SCHEDULING, COORDINATION AND NOTIFICATION OF ALL PARTIES IS THE CONTRACTOR'S RESPONSIBILITY.

3. LEAKAGE TESTS ARE SPECIFIED REQUIRING THAT:
   A. THE LEAKAGE EXFILTRATION OR INFILTRATION DOES NOT EXCEED 200 GALLONS PER INCH OF PIPE DIAMETER PER MILE PER DAY FOR ANY SECTION OF THE SYSTEM.
   B. EXFILTRATION OR INFILTRATION TESTS BE PERFORMED WITH A MINIMUM POSITIVE HEAD OF 2 FEET
   C. AIR TESTS, AS A MINIMUM, CONFORM TO THE TEST PROCEDURE DESCRIBED IN ASTM C-828 FOR CLAY PIPE, ASTM C 924 FOR CONCRETE PIPE, ASTM F-1417 FOR PLASTIC PIPE, AND FOR OTHER MATERIALS APPROPRIATE TEST PROCEDURES.

4. CONTRACTOR TO PERFORM APPROPRIATE DEFLECTION TESTS FOR ALL FLEXIBLE PIPE. TESTING IS REQUIRED AFTER THE FINAL BACKFILL HAS BEEN IN PLACE AT LEAST 30 DAYS TO PERMIT STABILIZATION OF THE SOIL-PIPE SYSTEM. TESTING REQUIREMENTS SPECIFY:
   A. NO PIPE SHALL EXCEED A DEFLECTION OF 5%
   B. USING A RIGID BALL OR MANDREL FOR THE DEFLECTION TEST WITH A DIAMETER NOT LESS THAN 95% OF THE BASE INSIDE DIAMETER OR AVERAGE INSIDE DIAMETER OF THE PIPE, DEPENDING ON WHICH IS SPECIFIED IN THE ASTM SPECIFICATION, INCLUDING THE APPENDIX, TO WHICH THE PIPE IS MANUFACTURED.
   C. PERFORMING THE TEST WITHOUT MECHANICAL PULLING DEVICES.

5. CONTRACTOR TO INSPECT & TEST MANHOLE FOR WATERTIGHTNESS OR DAMAGE PRIOR TO PLACING INTO SERVICE. AIR TESTING, IF SPECIFIED FOR CONCRETE SEWER MANHOLES, SHALL CONFORM TO THE TEST PROCEDURES DESCRIBED IN ASTM C-1244.

AS BUILT

1. UPON COMPLETION OF CONSTRUCTION, THE CONTRACTOR SHALL FURNISH THE OWNER'S ENGINEER AND THE CITY OF DELAND WITH COMPLETE "AS-BUILT" INFORMATION, CERTIFIED BY A LICENSED LAND SURVEYOR CURRENTLY REGISTERED IN THE STATE OF FLORIDA. AT A MINIMUM, THIS "AS-BUILT" INFORMATION SHALL INCLUDE: TOP OF PIPE/INVERT ELEVATIONS AND HORIZONTAL LOCATIONS OF ALL WATER, SANITARY SEWER, AND RECLAIM WATER UTILITIES INSTALLED (AS APPLICABLE); PAVEMENT GRADE BREAK LOCATIONS AND SUFFICIENT ELEVATIONS OF FINISHED GRADE SURFACES WHICH ALLOW THE ENGINEER TO DETERMINE COMPLIANCE WITH THE PROPOSED DESIGN; TOP & INVERT ELEVATIONS OF THE STORMWATER COLLECTION SYSTEM, INCLUDING THE POND GRADES, POND CONTROL STRUCTURE, & SWALES; ANY IMPROVEMENTS WITHIN THE FDOT RIGHT-OF-WAY. NO ENGINEER'S CERTIFICATIONS OF COMPLETION OR REQUESTS FOR FINAL ACCEPTANCE WILL BE SUBMITTED UNTIL THIS INFORMATION HAS BEEN RECEIVED AND APPROVED BY THE OWNER'S ENGINEER.

2. THE CONTRACTOR SHALL PROVIDE UTILITY AS-BUILT AND GRADING/DRAINAGE AS-BUILT RECORD DRAWINGS BASED ON THE CIVIL DESIGN PLAN SHEETS. ALL AS-BUILTS SHALL BE OVERLAID ON THE CIVIL DESIGN PLANS WITH THE DESIGN SHADED BACK AND THE AS-BUILT BOLD. THE AS-BUILTS SHALL BE SIGNED AND SEALED BY A REGISTERED LAND SURVEYOR.

3. THE UTILITY AS-BUILT SHALL INCLUDE ALL SANITARY SEWERS AND FORCE MAIN SYSTEMS, POTABLE AND RECLAIMED WATER MAIN SYSTEMS, METERS, VALVES, FORCE MAINS, GAS MAINS, AND IRRIGATION LINES (2-INCH AND LARGER). CONTRACTOR TO PROVIDE ALL UTILITY CROSSING INFORMATION ON THE AS-BUILT. THE UTILITY AS-BUILTS SHALL IDENTIFY ALL WATER MAIN CROSSINGS WITH STORM AND SANITARY LINES INDICATING TOP OF PIPE AND INVERTS OF THE ABOVE CROSSING PIPE ALONG WITH CLEARANCE DIMENSIONS. THIS SHALL ALSO BE DONE FOR SANITARY/STORM CROSSINGS. ALL TEMPORARY SAMPLE POINT NUMBER (TSP#) LOCATIONS SHALL ALSO BE NOTED ON THE AS-BUILT. CONTRACTOR TO ALSO PROVIDE AN AS-BUILT ASSET TABLE IDENTIFYING SIZE OF PIPE OR FITTING AS WELL AS DEPTH TO TOP OF PIPE AND NORTHING AND EASTING OF EACH FITTING/VALVE, ETC.

4. THE GRADING/DRAINAGE AS-BUILT SHALL INCLUDE ALL CONSTRUCTED IMPROVEMENTS THAT HAVE LOCATION AND/OR ELEVATION INFORMATION CALLED-OUT ON THE PLANS. THE AS-BUILT SHALL CLEARLY PROVIDE THE SAME INFORMATION IDENTIFIED ON THE DESIGN DOCUMENTS AND ALSO THE CONSTRUCTED LOCATIONS AND ELEVATIONS AS-BUILT INFORMATION.

POTABLE WATER SYSTEM

1. ALL DIP PIPE SHALL BE CLASS 50 OR HIGHER. REFER TO NOTE #4 BELOW FOR ADDITIONAL DIP SPECIFICATIONS. ADEQUATE MEASURES AGAINST CORROSION SHALL BE UTILIZED.

2. ALL WATER MAIN PIPE FITTINGS AND APPURTENANCES SHALL BE INSTALLED TO COMPLY WITH CITY OF DELAND STANDARDS AND SPECIFICATIONS.

3. ALL WATER SERVICE LINES, VALVES AND METERS SHALL BE INSTALLED TO COMPLY WITH APPLICABLE MUNICIPALITY/AGENCY DEPARTMENT STANDARDS AND SPECIFICATIONS.

4. ALL DUCTILE IRON PIPE, 4" TO 24", SHALL BE MANUFACTURED IN ACCORDANCE WITH THE LATEST EDITION OF AWWA C151/A21.51. PIPE SHALL BE FURNISHED IN 18 OR 20 FOOT SECTIONS, PIPE THICKNESS SHALL BE CLASS 50, UNLESS OTHERWISE SPECIFIED.

5. ALL WATER SYSTEM CONSTRUCTION, UP TO AND INCLUDING POINT OF METERING AND BACK FLOW PREVENTION (IF REQUIRED), SHALL BE BUILT ACCORDING TO CITY OF DELAND STANDARDS AND SPECIFICATIONS.

6. CONTRACTOR TO INSTALL TEMPORARY BLOWOFFS, AT THE END(S) OF PROPOSED WATER MAINS AND SERVICE LATERALS TO BUILDING(S), TO ASSURE ADEQUATE FLUSHING AND DISINFECTION/CHLORINATION.

7. ALL WATER MAINS SHALL BE PRESSURE TESTED IN ACCORDANCE WITH AWWA MANUAL M23, CONCERNING HYDROSTATIC TESTING OF PVC PIPING. OFF-SITE UTILITIES HYDROSTATIC TESTING TO BE WITNESSED BY CITY OF DELAND WATER DEPARTMENT INSPECTOR.

8. ALL WATER MAINS SHALL BE STERILIZED IN ACCORDANCE WITH THE APPLICABLE SECTION OF THE LATEST AWWA SPECIFICATION C651 AND CITY OF DELAND WATER DEPARTMENT SPECIFICATIONS.

9. ALL PVC WATER MAIN, 4" TO 8" DIAMETER PIPING, SHALL CONFORM TO ASTM D2241 AND ASTM 1784. PIPE SHALL BE AWWA C-900 DR-18. JOINTS SHALL BE RUBBER GASKETED PUSH-ON CONFORMING TO ASTM D1869.

10. POTABLE WATER MAINS WILL BE PVC SDR 21 (200 PSI) FOR PIPES LESS THAN 4". SCHEDULE 40 AND SCHEDULE 80 PIPING MATERIAL ARE ALSO ACCEPTABLE FOR PIPES SIZES LESS THAN 4". THE ABOVE TYPE INSTALLATIONS MUST BEAR THE "NFS" STAMP FOR COMPATIBILITY WITH POTABLE WATER USE.

11. ALL POLYVINYL CHLORIDE PIPE SHALL BE LAID WITH AN INSULATED 12 GAUGE A.W.G. SOLID STRAND COPPER WIRE WOUND AROUND THE PIPE FORMING ONE COMPLETE SPIRAL PER JOINT OF PIPE. THIS WIRE IS TO BE CONTINUOUS WITH SPLICES MADE ONLY BY METHODS APPROVED BY THE ENGINEER. THIS WIRE IS TO BE SECURED TO ALL VALVES, TEES AND ELBOWS.

12. ALL POTABLE WATER MATERIALS AND INSTALLATION SHALL CONFORM WITH THE CITY OF DELAND STANDARDS AND CONSTRUCTION SPECIFICATIONS MANUAL.

POTABLE WATER TESTING AND INSPECTION

1. ALL COMPONENTS OF THE WATER SYSTEM, INCLUDING FITTINGS, HYDRANTS, CONNECTIONS, AND VALVES SHALL REMAIN UNCOVERED UNTIL PROPERLY PRESSURE TESTED AND ACCEPTED BY THE OWNER'S ENGINEER. PRESSURE TESTS TO BE IN ACCORDANCE WITH ORANGE COUNTY UTILITIES DEPARTMENT SPECIFICATIONS. CONTRACTOR TO NOTIFY THE OWNER'S ENGINEER AND APPLICABLE AGENCY INSPECTORS 48 HOURS IN ADVANCE OF PERFORMING TESTS.

2. CONTRACTOR TO PERFORM CHLORINATION AND BACTERIOLOGICAL SAMPLING, AND OBTAIN CLEARANCE OF DOMESTIC AND FIRE LINE WATER SYSTEM(S). COPIES OF ALL BACTERIOLOGICAL TEST RESULTS ARE TO BE SUBMITTED TO THE OWNER'S ENGINEER FOR CERTIFICATION PURPOSES.

CITY OF DELAND DEVELOPMENT REVIEW – STANDARD SITE PLAN NOTES

1. ALL UTILITY CONSTRUCTION SHALL COMPLY WITH THE CITY OF DELAND STANDARDS AND SPECIFICATIONS.
2. ALL ON-SITE WATER AND SEWER FACILITIES SHALL BE OWNED AND MAINTAINED BY THE CITY OF DELAND. THIS WILL ALSO BE CONFIRMED IN THE UTILITY SERVICE AGREEMENT WITH THE CITY OF DELAND.
3. INSTALLATION OF FUEL STORAGE TANKS REQUIRES REVIEW AND APPROVAL BY THE FIRE MARSHAL AND THE ISSUANCE OF A SEPARATE BUILDING PERMIT. APPROVAL OF THE SITE PLAN DOES NOT CONSTITUTE APPROVAL OF THE LOCATION OF THE FUEL TANKS.
4. ALL PROPOSED SIGNS MUST BE APPLIED FOR, APPROVED, AND PERMITTED ON AN INDIVIDUAL BASIS APART FROM ANY ULTIMATELY APPROVED SITE PLAN. APPROVAL OF THIS SITE PLAN DOES NOT CONSTITUTE APPROVAL OF ANY SIGNAGE.
5. HANDICAP PARKING SPACES WILL BE PROPERLY SIGNED AND STRIPED IN ACCORDANCE WITH FLORIDA STATUTE 316, THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, OR OTHER APPLICABLE STANDARDS.
6. THE ARCHITECT/ENGINEER CERTIFIES THAT THE SITE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT.
7. ALL ON-SITE PARKING SPACES WILL BE STRIPED AND SIGNED IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION. PARKING SPACES, DIRECTIONAL ARROWS, AND STOP BARS SHALL BE STRIPED IN WHITE. IT SHALL BE THE OWNER/DEVELOPER'S RESPONSIBILITY TO PROPERLY SIGN AND STRIPE IN ACCORDANCE WITH APPLICABLE STANDARDS.
8. THE OWNER/DEVELOPER ACKNOWLEDGES THAT THIS APPROVAL DOES NOT INCLUDE ANY WORK IN THE COUNTY RIGHT-OF-WAY. ALL RIGHT-OF-WAY WORK SHALL BE A FUNCTION OF AN APPROVED CITY OF DELAND RIGHT-OF-WAY USE PERMIT.
9. ALL CLEAR-SITE AREAS SHALL BE KEPT FREE OF ANY SIGNAGE PLANTINGS, TREES, ETC. IN EXCESS OF THREE-AND-A-HALF (3-1/2) FEET IN HEIGHT.
10. NO IRRIGATION SYSTEM OR LANDSCAPING SHALL BE INSTALLED IN ANY COUNTY OR STATE RIGHT-OF-WAY WITHOUT ISSUANCE OF APPROPRIATE RIGHT-OF-WAY USE PERMIT.
11. THE OWNER/DEVELOPER ACKNOWLEDGES THAT THE SITE AND ITS SUBSEQUENT BUILDING PERMITS SHALL COMPLY WITH ALL REZONING/MPUD/PUD CONDITIONS.
12. ALL STRUCTURES, INCLUDING BUFFER WALLS, RETAINING WALLS, SIGNAGE, ETC. REQUIRE BUILDING PERMITS.
13. IF A PROJECT SITE CONTAINS AN EASEMENT, ESPECIALLY A POWER COMPANY EASEMENT, A LETTER OF NO OBJECTION IS REQUIRED FROM THE EASEMENT HOLDER. BY SIGNING AND SEALING THIS PLAN THE ENGINEER OF RECORD IS ATTESTING THAT HE/SHE HAS IDENTIFIED AND ACCURATELY SHOWN ALL EASEMENTS OF RECORD ON THE PLANS.

RIGHT-OF-WAY MAINTENANCE OF TRAFFIC NOTES

1. MAINTENANCE OF TRAFFIC SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (LATEST EDITION AND REVISIONS) AND THE FLORIDA DEPARTMENT OF TRANSPORTATION ROADWAY DESIGN STANDARDS (LATEST EDITION AND REVISIONS)
2. THE CONTRACTOR SHALL COORDINATE WITH THE CITY OF DELAND AND VOLUSIA COUNTY PRIOR TO THE START OF ANY PHASE OF WORK TO REQUEST STREET, LANE OR SIDEWALK CLOSURE AUTHORIZATION.
3. LOCAL RESIDENTIAL/BUSINESS ACCESS SHALL BE MAINTAINED AT ALL TIMES.
4. NO LANE CLOSURES WILL OCCUR BETWEEN THE HOURS OF 6 A.M. AND 9 A.M. OR BETWEEN THE HOURS OF 3:30 P.M. AND 6:30 P.M. MONDAY THROUGH FRIDAY.
5. THE USE OF TRAFFIC CONES WILL BE RESTRICTED TO ACTIVE WORK PERIODS ONLY. CHANNELIZING DEVICES (TYPE I, II, DRUMS) SHALL BE USED DURING INACTIVE WORK PERIODS UNLESS OTHERWISE SPECIFIED.
6. THE CITY OF DELAND AND VOLUSIA COUNTY RESERVES THE RIGHT TO REQUIRE ADDITIONAL DEVICES AND/OR CHANGES TO THE TRAFFIC CONTROL PLAN BASED UPON CHANGING TRAFFIC CONDITIONS.
7. PEDESTRIAN CONTROL SHALL BE MAINTAINED ON ONE SIDE OF THE ROAD AT ALL TIMES. IF UNABLE TO DO SO, THE CONTRACTOR SHALL PROVIDE TEMPORARY WALKWAYS, BOARDWALKS AND/OR TEMPORARY CONCRETE SIDEWALKS.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSURING EACH EMPLOYEE SUPERVISING THE SELECTION AND PLACEMENT OF MAINTENANCE OF TRAFFIC (MOT) CONTROL DEVICES SHALL BE PROPERLY TRAINED BY ATTENDING AND SUCCESSFULLY COMPLETING A FLORIDA DEPARTMENT OF TRANSPORTATION (FDOT) APPROVED MOT COURSE. THE TRAINING SHALL BE AT A LEVEL APPLICABLE TO THE EMPLOYEE'S LEVEL OF INVOLVEMENT. COPIES OF CERTIFICATIONS SHALL BE PROVIDED TO THE CITY TRANSPORTATION ENGINEERING DIVISION PRIOR TO IMPLEMENTING ANY PHASE OF MOT.
9. THE CONTRACTOR SHALL PROVIDE A TRAFFIC CONTROL SUPERVISOR (TCS) WHO IS RESPONSIBLE FOR INITIATING, INSTALLING AND MAINTAINING ALL TRAFFIC CONTROL DEVICES.
10. THE TCS SHALL BE AVAILABLE ON A 24-HOUR PER DAY BASIS, PARTICIPATE IN ALL CHANGES TO TRAFFIC CONTROL AND REVIEW THE PROJECT ON A DAY-TO-DAY BASIS.
11. THE TCS SHALL BE PRESENT DURING THE INITIAL SETUP OF THE TRAFFIC CONTROL PLAN AND ALL SUBSEQUENT PHASES OR CHANGES TO THE TRAFFIC CONTROL.
12. THE TCS SHALL IMMEDIATELY CORRECT ALL DEFICIENCIES.
13. THE CONTRACTOR SHALL ENSURE THE TCS BE AVAILABLE ON SITE WITHIN 45 MINUTES OF NOTIFICATION OF AN EMERGENCY SITUATION AND IS PREPARED TO RESPOND TO AND CORRECT THE TRAFFIC CONTROL OR PROVIDE ALTERNATE ARRANGEMENTS FOR CORRECTIVE ACTIONS.
14. THE TCS SHALL BE RESPONSIBLE FOR PERFORMING WEEKLY, DAYTIME AND NIGHTTIME INSPECTIONS OF ALL TRAFFIC CONTROL DEVICES, TRAFFIC FLOW, AND PEDESTRIAN, BICYCLIST MOVEMENT THROUGH THE WORK AREA AND BUSINESS ACCOMMODATIONS.
15. THE CITY OF DELAND AND VOLUSIA COUNTY MAY DISQUALIFY AND REMOVE FROM THE PROJECT A TRAFFIC CONTROL SUPERVISOR THAT FAILS TO COMPLY WITH THESE PROVISIONS. THEY MAY ALSO SUSPEND ALL WORK ACTIVITIES UNTIL CORRECTIVE ACTIONS HAVE BEEN COMPLETED.
16. PROJECT AREAS THAT ARE NOT ACTIVE CONSTRUCTION AREAS ARE TO BE KEPT FREE OF CONSTRUCTION DEBRIS AND ANY UNNECESSARY TRAFFIC CONTROL DEVICES.
17. TRAFFIC SHALL BE MAINTAINED IN ACCORDANCE WITH CURRENT FDOT DESIGN STANDARDS INDEX 102-XXX SERIES, THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION AND THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AS A MINIMUM.
18. ALL MAINTENANCE OF TRAFFIC ITEMS REQUIRED BY THE FDOT 102-XXX SERIES INDEX SHALL BE SUPPLIED, INSTALLED, AND MAINTAINED TO PROPERLY MAINTAIN TRAFFIC AND DROP OFF CRITERIA IN THE WORK ZONE.
19. THE REGULATORY SPEED LIMIT SHALL BE MAINTAINED DURING ALL PHASES OF CONSTRUCTION.
20. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DEVELOPING A WORK ZONE SCHEDULE SO THAT ANY LOCATION UNDER CONSTRUCTION WILL NOT BE LEFT IN A HAZARDOUS CONDITION AT THE COMPLETION OF ANY WORK PERIOD.
21. ARROWS ON THE TRAFFIC CONTROL PLANS DENOTE THE DIRECTION OF TRAFFIC ONLY AND DO NOT REFLECT PAVEMENT MARKINGS UNLESS SPECIFICALLY NOTED.
22. IN THE EVENT OF A HURRICANE OR OTHER EVACUATION NEED, THE CONTRACTOR, WHEN NOTIFIED BY THE ENGINEER, SHALL COORDINATE THE SECURING OF ALL LOOSE MATERIAL, OPEN CLOSED LANES, BACKFILL EXCAVATIONS, REMOVE OBSTRUCTIONS TO DRAINAGE AND WATER FLOW, AND ANY OTHER MEASURES REQUIRED BY THE ENGINEER.
23. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE EXISTING SIGNS WITHIN THE CONSTRUCTION LIMITS. A LIST OF THE EXISTING SIGNS SHALL BE SUBMITTED TO THE PROJECT ENGINEER PRIOR TO THE BEGINNING OF CONSTRUCTION. ANY EXISTING OR PROPOSED SIGNS THAT CONFLICT WITH THE TRAFFIC CONTROL PLANS SHALL BE REMOVED OR COVERED PER INDEX 600 BY THE CONTRACTOR AND WHEN THE CONFLICT NO LONGER EXISTS, THE SIGNS SHALL BE RESTORED TO THEIR ORIGINAL POSITION.
24. AT THE END OF EACH WORK PERIOD, ANY DROP OFF IN THE AREA ADJACENT TO THE TRAVEL WAY SHALL BE PROTECTED BY THE APPROPRIATE METHOD AS REQUIRED BY FDOT INDEX 600.
25. THE TRAFFIC AND TRAVEL WAYS SHALL NOT BE ALTERED BY THE CONTRACTOR TO CREATE A WORK ZONE UNTIL ALL LABOR, EQUIPMENT AND MATERIALS ARE AVAILABLE FOR THE CONSTRUCTION IN THE AREA.
26. CONTRACTOR SHALL MAINTAIN ACCESS TO BUSINESS DRIVES IN ACCORDANCE WITH FDOT DESIGN STANDARDS, INDEX 102-XXX SERIES.
27. ANY DETOURS SHALL BE COORDINATED WITH THE CITY OF DELAND AND VOLUSIA COUNTY FOR SCHEDULING.
28. 10 DAYS PRIOR TO ROAD CLOSURE, A1 PORTABLE CHANGEABLE (VARIABLE) MESSAGE SIGNS SHALL BE IN PLACE AND THE CITY OF DELAND AND VOLUSIA COUNTY NOTIFIED.
29. THE CONTRACTOR SHALL NOTIFY ALL AFFECTED BUSINESSES ONE WEEK PRIOR TO ROAD CLOSURE. DRIVEWAY ACCESS OUTSIDE OF THE ROAD CLOSURE LIMITS SHALL REMAIN AT ALL TIMES.
30. THE CONTRACTOR SHALL FILE A RIGHT OF WAY CONSTRUCTION PERMIT WITH CITY OF DELAND OR VOLUSIA COUNTY FOR WORK DONE WITHIN CITY OF DELAND AND VOLUSIA COUNTY RIGHT OF WAY.
31. ALL DISTURBED AREAS WITHIN THE RIGHT-OF-WAY MUST BE SODDED ONLY WITH COMMON BERMUDA SOD.
32. CONTRACTORS CERTIFICATE OF LIABILITY INSURANCE MUST BE ISSUED PRIOR TO STARTING CONSTRUCTION IN FDOT RIGHT-OF-WAY.
33. MAINTENANCE OF TRAFFIC TO BE SUPERVISED BY CERTIFIED PERSON. THE NAME AND NUMBER OF A CERTIFIED PERSON WILL BE PROVIDED AT TIME OF CONSTRUCTION.
34. ALL WORK PERFORMED WITHIN THE RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH THE 2018 FDOT DESIGN STANDARDS, STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, AND THE UTILITY ACCOMMODATION MANUAL.
35. IT WILL BE THE RESPONSIBILITY OF THE PERMITTEE TO REPAIR ANY DAMAGE TO FDOT FACILITIES CAUSED BY CONSTRUCTION OF THE PROJECT.
36. ALL SIDEWALK CLOSURES SHALL ABIDE TO THE STANDARD PROCEDURES PER FDOT INDEX #102-075.
37. CONTRACTOR SHALL COORDINATE WITH CITY OF DELAND AND VOLUSIA COUNTY ON LANE CLOSURE TIMES.
38. THE CONTRACTOR SHALL PROVIDE PEDESTRIAN CONTROL FOR CLOSURE OF SIDEWALKS PER FDOT INDEX #102-075.

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No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/21/24	JDR
2	REVISED PER CITY COMMENTS	07/10/25	JDR

Kimley»Horn
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200 S. ORANGE AVENUE, SUITE 600, ORLANDO, FL 32801
PHONE: 407 898-1511
WWW.KIMLEY-HORN.COM CA-00000696

KHA PROJECT 240418000
DATE 07/9/2025
SCALE AS SHOWN
DESIGNED BY —
DRAWN BY —
CHECKED BY —

JEFFREY R. SWISHER, P.E.
FLORIDA LICENSE NUMBER 60275

GENERAL NOTES

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER C1.1

Plotted By: Ramirez, Jason Saved Set: DELAND TECH PARK Layout: C1.1 GENERAL NOTES Last Saved By: Jason Ramirez on: 10/21/2025 09:17:30pm K:\ORL_Civil\240418000-Deland Tech Park\CAD\DOCS\TitleSheets\C1.1 NOTES.dwm
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STORMWATER POLLUTION PREVENTION PLAN

SITE DESCRIPTION

PROJECT NAME AND LOCATION

DELAND TECH PARK
TAX PARCELS : 810600000090, 810600000100, 810600000110, 810600000070, 810600000071, 810600000060, 810600000124, 810604000170, 810600000091, 810600000121, 810600000122, 810600000072.
DELAND, FL 32724

*SEE COVER SHEET FOR LOCATION MAP

DEVELOPER NAME AND ADDRESS

LONGLEAF FOUR, LLC
320 N. MERIDIAN ST, SUITE 700
INDIANAPOLIS, IN 46204

PROJECT DESCRIPTION

DELAND TECH PARK IS A RETAIL AND INDUSTRIAL DEVELOPMENT ON A 143.80 AC SITE. THE SITE IS LOCATED AT THE NORTHEAST CORNER OF STATE ROAD 472 AND DR. MARTIN LUTHER KING BELTWAY IN THE CITY OF DELAND, FLORIDA.

PROJECT AREA: 143.80+/- ACRES
CONTRIBUTING DRAINAGE AREA: 143.80+/- ACRES

ACTIVITIES THAT REQUIRE EROSION CONTROL

SITE CLEARING AND GRUBBING; PROVIDING A STABILIZED CONSTRUCTION ENTRANCE, PERIMETER, AND OTHER EROSION AND SEDIMENT CONTROLS; EXCAVATION FOR THE RETENTION POND; SITE GRADING; INSTALLATION OF STORM WATER, SANITARY SEWER, AND WATER STRUCTURES; CURB, ROADWAYS, AND PARKING FACILITIES.

*SEE PLANS FOR THE LOCATION OF TEMPORARY SEDIMENT BARRIERS AND OTHER EROSION CONTROL METHODS.

SOIL PARAMETERS

SOIL TYPES:

HYDROLOGIC SOIL GROUP SUMMARY		
SOIL TYPE	SOIL NAME	SOIL RATING
1	APOPKA FINE SAND, 0 TO 5 PERCENT SLOPES	A
4	ASTATULA FINE SAND, 0 TO 8 PERCENT SLOPES	A
5	ASTATULA FINE SAND, 8 TO 17 PERCENT SLOPES	A
63	TAVARES FINE SAND, 0 TO 5 PERCENT SLOPES	A

DEWATERING

DISCHARGE OF GROUNDWATER FROM DEWATERING OPERATIONS REQUIRES APPROVAL FROM FDEP AND THE APPLICABLE WATER MANAGEMENT DISTRICT. DISCHARGES DIRECTED TO THE COUNTY'S MS4 REQUIRES A RIGHT-OF-WAY UTILIZATION PERMIT FOR DEWATERING PRIOR TO THE START OF DISCHARGES.

SEQUENCE OF MAJOR ACTIVITIES

THE ORDER OF CONSTRUCTION IS AS FOLLOWS:

1. PROVIDE STABILIZED CONSTRUCTION ENTRANCE
2. INSTALL SILT FENCES AND OTHER EROSION CONTROL METHODS
3. CLEAR AND GRUB FOR SEDIMENT BASIN AND EARTH DIKE
4. CONSTRUCT EARTH DIKE AND SEDIMENT BASIN
5. FINISH CLEARING AND GRUBBING
6. REMOVE AND STORE TOPSOIL
7. PROVIDE INITIAL GRADING AS REQUIRED
8. STABILIZE ALL DISTURBED AREAS AS SOON AS POSSIBLE
9. INSTALL UTILITIES, STORM SEWER, CURB AND GUTTER
10. INSTALL BASE TO ROAD AND PARKING AREA
11. FINISH GRADING ENTIRE SITE
12. CONSTRUCT FINAL PAVING
13. REMOVE ACCUMULATED SEDIMENT
14. REMOVE ANY ITEMS THAT ARE NOT REQUIRED

NOTE : THE SEQUENCE OF CONSTRUCTION SHOWN ABOVE IS A GENERAL OVERVIEW AND IS INTENDED TO CONVEY THE GENERAL CONCEPTS OF THE EROSION CONTROL DESIGN AND SHOULD NOT BE RELIED UPON FOR CONSTRUCTION PURPOSES. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR DETAILED PHASING AND CONSTRUCTION SEQUENCING NECESSARY TO CONSTRUCT THE PROPOSED IMPROVEMENTS INCLUDED IN THESE PLANS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING IMMEDIATELY, PRIOR TO AND/OR DURING CONSTRUCTION IF ANY ADDITIONAL INFORMATION ON THE CONSTRUCTION SEQUENCE IS NECESSARY. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR COMPLYING WITH THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION AND ALL OTHER APPLICABLE LAWS

TIMING OF CONTROL MEASURES

THE INSTALLATION OF SILT FENCE (AND OTHER EROSION CONTROL MEASURES), A STABILIZED ENTRANCE AND SEDIMENT BASIN SHALL OCCUR PRIOR TO CLEARING AND GRUBBING ACTIVITY. AFTER CONSTRUCTION IS COMPLETE, THE ACCUMULATED SEDIMENT SHALL BE REMOVED AND THE AREAS SHALL BE REGRADED AND PERMANENTLY STABILIZED AS SHOWN ON THE PLANS.

EROSION AND SEDIMENT CONTROLS

BEST MANAGEMENT PRACTICES SHALL BE USED FOR THIS PROJECT TO CONTROL EROSION AND TURBIDITY CAUSED BY STORM WATER RUN-OFF. THE LOCATION AND DETAILS OF EROSION CONTROL METHODS ARE SHOWN ON THE PLANS. THE CONTRACTOR IS RESPONSIBLE FOR PLACING AND MAINTAINING THESE CONTROL METHODS AS SHOWN ON THE PLANS OR AS REQUIRED. HE/SHE SHALL ALSO PROVIDE THE REQUIRED EROSION PROTECTION AS REQUIRED BY LOCAL, STATE AND FEDERAL LAW.

STORM WATER MANAGEMENT

STORM WATER COLLECTION SHALL BE PROVIDED BY CATCH BASINS. THE POND SYSTEM HAS BEEN DESIGNED TO KEEP FLOW RATES FROM THE 25 YEAR/96 HOUR STORM EVENT, AND RECOVER WITHIN 14 DAYS FOR ATTENUATION.

STABILIZATION PRACTICES:

TEMPORARY STABILIZATION - TOPSOIL STOCK PILES AND DISTURBED PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITY TEMPORARILY OR PERMANENTLY CEASE, SHALL BE STABILIZED WITH TEMPORARY SEED AND MULCH WITHIN 7 DAYS OF THE LAST CONSTRUCTION ACTIVITY IN THAT AREA. THE TEMPORARY SEED REQUIRED CAN BE FOUND IN TABLE 1.65 A OF THE FLORIDA DEVELOPMENT MANUAL. PRIOR TO SEEDING, WHERE SOILS ARE ACIDIC 2 TONS OF PULVERIZED AGRICULTURAL LIMESTONE SHOULD BE ADDED PER ACRE AND 450 POUNDS OF 10-20-20 FERTILIZER SHALL BE APPLIED TO EACH ACRE. AFTER SEEDING, EACH AREA SHALL BE IMMEDIATELY MULCHED WITH STRAW OR EQUIVALENT EQUAL. AREAS OF THE SITE WHICH ARE TO BE PAVED SHALL BE TEMPORARILY STABILIZED BY APPLYING GEOTEXTILE AND STONE SUB-BASE UNTIL BITUMINOUS PAVEMENT CAN BE APPLIED.

PERMANENT STABILIZATION - DISTURBED PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES PERMANENTLY CEASE SHALL BE STABILIZED WITH PERMANENT SEED NO LATER THAN 7 DAYS AFTER THE LAST CONSTRUCTION ACTIVITY. THE APPROPRIATE PERMANENT SEED MIX CAN BE FOUND IN TABLES 1.66A, 1.66B AND 1.66C OF THE FLORIDA DEVELOPMENT MANUAL. PRIOR TO SEEDING, 2 TONS/ACRE OF FINELY GROUND AGRICULTURAL LIMESTONE AND THE PROPER FERTILIZER BASED ON THE TYPE OF SEEDING SHALL BE APPLIED TO EACH ACRE TO PROVIDE PLANT NUTRIENTS. AFTER SEEDING, EACH AREA SHALL BE MULCHED IMMEDIATELY.

STRUCTURAL PRACTICES:

EARTH DIKE - IF REQUIRED, AN EARTH DIKE SHALL BE CONSTRUCTED ALONG THE SITE PERIMETER. A PORTION OF THE DIKE SHALL DIVERT RUN-ON AROUND THE CONSTRUCTION SITE. THE REMAINING PORTION OF THE DIKE SHALL COLLECT RUNOFF FROM THE DISTURBED AREA AND DIRECT THE RUNOFF TO THE SEDIMENT BASIN.

SEDIMENT BASIN - A SEDIMENT BASIN SHALL BE CONSTRUCTED IN THE COMMON DRAINAGE AREA FOR THE SITE. ALL SEDIMENT COLLECTED IN THE BASIN MUST BE REMOVED FROM THE BASIN UPON COMPLETION OF CONSTRUCTION. SEDIMENT FROM THE BASIN MAY BE USED AS FILL ON THE SITE IF IT IS SUITABLE SOIL.

WASTE DISPOSAL

WASTE MATERIALS - ALL WASTE MATERIALS SHALL BE COLLECTED AND STORED IN A METAL DUMPSTER WITH A SECURE LID IN ACCORDANCE WITH ALL LOCAL AND STATE LAWS. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE SHALL BE DEPOSITED IN THE DUMPSTER. THE SUPERINTENDENT SHALL COORDINATE WITH THE LOCAL UTILITIES TO HAVE THE DUMPSTER EMPTIED AT LEAST TWICE A WEEK AND THE WASTE TAKEN TO AN APPROPRIATE LANDFILL. NO CONSTRUCTION WASTE MATERIALS SHALL BE BURIED ON SITE. THE SUPERINTENDENT SHALL ORGANIZE TRAINING FOR THE EMPLOYEES IN THE PROPER PRACTICES WHEN DEALING WITH WASTE MATERIALS. THE SUPERINTENDENT SHALL BE RESPONSIBLE FOR POSTING AND ENFORCING WASTE MATERIAL PROCEDURES.

HAZARDOUS WASTE - HAZARDOUS WASTE MATERIALS SHALL BE DISPOSED OF IN ACCORDANCE WITH ALL LOCAL AND STATE LAWS OR AS DIRECTED BY THE MANUFACTURER. THE SUPERINTENDENT SHALL ORGANIZE THE PROPER TRAINING FOR EMPLOYEES IN THE PROPER PRACTICES WHEN DEALING WITH HAZARDOUS WASTE MATERIALS. THESE PROCEDURES SHALL BE POSTED ON THE SITE. THE PERSON WHO MANAGES THE SITE SHALL BE RESPONSIBLE FOR ENFORCING THE PROCEDURES.

SANITARY WASTE - SANITARY WASTE SHALL BE COLLECTED AND DISPOSED OF IN ACCORDANCE WITH ALL LOCAL AND STATE LAWS. THE SUPERINTENDENT SHALL COORDINATE WITH THE LOCAL UTILITY FOR COLLECTION OF THE SANITARY WASTE AT LEAST THREE TIMES A WEEK TO PREVENT SPILLAGE ONTO THE SITE.

OFF-SITE TRACKING

A STABILIZED CONSTRUCTION ENTRANCE SHALL BE PROVIDED TO REDUCE SEDIMENT TRACKING OFFSITE. THE MAJOR ROAD CONNECTED TO THE PROJECT SHALL BE CLEANED ONCE A DAY TO REMOVE ANY EXCESS MUD, DIRT OR ROCK RESULTING FROM CONSTRUCTION TRAFFIC. ALL TRUCKS HAULING MATERIALS OFFSITE SHALL BE COVERED WITH A TARPAULIN.

DUST & DEBRIS CONTROL
THE CONTRACTOR SHALL BE RESPONSIBLE FOR DUST CONTROL WITHIN THE CONSTRUCTION LIMITS AS WELL AS ALONG HAUL ROUTES AND ROADWAYS USED BY THE EQUIPMENT AND VEHICLES. THE CONTRACTOR SHALL ENSURE THAT EXCESSIVE DUST IS NOT TRANSPORTED BEYOND THE LIMITS OF CONSTRUCTION IN POPULATED AREAS. THE CONTRACTOR MAY CONTROL DUST FOR EMBANKMENTS OR OTHER CLEARED OR UNSURFACED AREAS BY APPLYING WATER. INSTALL MULCH, SEED, SOD, OR TEMPORARY PAVING AS EARLY AS PRACTICAL. CONTROL DUST DURING STORAGE AND HANDLING OF DUSTY MATERIALS BY WETTING, COVERING, OR OTHER MEANS AS APPROVED BY THE ENGINEER. CONTRACTOR SHALL ENFORCE REDUCED VEHICLE SPEEDS ON UNPAVED ROADS AND IF NECESSARY PROHIBIT CONSTRUCTION GRADING WHEN WIND GUSTS EXCEED 25 MPH, OR OTHERWISE DIRECTED BY E.O.R. OR COUNTY INSPECTOR.

DEBRIS AND TRASH SHALL NOT BE ALLOWED TO ACCUMULATE ON THE PROJECT SITE. CONTRACTOR SHALL COLLECT LOOSE DEBRIS & TRASH DAILY, AND DISPOSE OF IT INTO APPROPRIATE CONSTRUCTION TRASH RECEPTACLES OR CONTAINERS.

ITEMS REQUIRING POLLUTION PREVENTION

THE FOLLOWING ITEMS ARE EXPECTED TO BE PRESENT ON THE PROJECT SITE:

-ASPHALT
-CONCRETE
-FERTILIZERS
-METAL PIECES
-PETROLEUM BASED PRODUCTS
-TAR
-CLEANING SUPPLIES
-DETERGENTS
-MASONARY BLOCK/BRICKS
-PAINT
-WOOD

THE FOLLOWING ARE NON-STORM WATER SOURCES THAT WILL BE ENCOUNTERED AT THE SITE AND SHOULD BE DIRECTED TO THE SEDIMENT BASIN PRIOR TO DISCHARGE:

-UNCONTAMINATED GROUNDWATER EXPOSED DURING EXCAVATION
-WATER FROM WATER LINE FLUSHING
-PAVEMENT WASH WATERS (WHERE NO SPILLS OR LEAKS OF TOXIC OR HAZARDOUS MATERIALS HAVE OCCURRED).

SPILL PREVENTION AND CONTROL

THE FOLLOWING ARE THE MATERIAL MANAGEMENT PRACTICES THAT WILL BE USED TO REDUCE THE RISK OF SPILLS OR OTHER ACCIDENTAL EXPOSURE OF MATERIALS AND SUBSTANCES TO STORM WATER RUNOFF.

GOOD HOUSEKEEPING

-SUPERINTENDENT SHALL INSPECT PROJECT AREA DAILY FOR PROPER STORAGE, USE, AND DISPOSAL OF CONSTRUCTION MATERIALS.

-STORE ONLY ENOUGH MATERIAL ON SITE FOR PROJECT COMPLETION.

-ALL SUBSTANCES SHOULD BE USED BEFORE DISPOSAL OF CONTAINER.

-ALL CONSTRUCTION MATERIALS STORED SHALL BE ORGANIZED AND IN THE PROPER CONTAINER AND IF POSSIBLE, STORED UNDER A ROOF OR PROTECTIVE COVER.

-PRODUCTS SHALL NOT BE MIXED UNLESS DIRECTED BY THE MANUFACTURER.

-ALL PRODUCTS SHALL BE USED AND DISPOSED OF ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.

HAZARDOUS PRODUCTS

-MATERIALS SHOULD BE KEPT IN ORIGINAL CONTAINER WITH LABELS UNLESS THE ORIGINAL CONTAINERS CANNOT BE RESEALED. IF ORIGINAL CONTAINERS CANNOT BE USED, LABELS AND PRODUCT INFORMATION SHALL BE SAVED.

-PROPER DISPOSAL PRACTICES SHALL ALWAYS BE FOLLOWED IN ACCORDANCE WITH MANUFACTURER AND LOCAL/STATE REGULATIONS.

PRODUCT SPECIFIC PRACTICES

-PETROLEUM PRODUCTS MUST BE STORED IN PROPER CONTAINERS AND CLEARLY LABELED. VEHICLES CONTAINING PETROLEUM PRODUCTS SHALL BE PERIODICALLY INSPECTED FOR LEAKS. PRECAUTIONS SHALL BE TAKEN TO AVOID LEAKAGE OF PETROLEUM PRODUCTS ON SITE.

-THE MINIMUM AMOUNT OF FERTILIZER SHALL BE USED AND MIXED INTO THE SOIL IN ORDER TO LIMIT EXPOSURE TO STORM WATER. FERTILIZERS SHALL BE STORED IN A COVERED SHED. THE CONTENTS OF ANY PARTIALLY USED BAGS OF FERTILIZER SHALL BE TRANSFERRED TO A SEALABLE PLASTIC BIN TO AVOID SPILLS.

-PAINT CONTAINERS SHALL BE SEALED AND STORED WHEN NOT IN USE. EXCESS PAINT MUST BE DISPOSED OF IN AN APPROVED MANNER.

-CONCRETE TRUCKS SHALL NOT BE ALLOWED TO WASH OUT OR DISCHARGE SURPLUS CONCRETE OR DRUM WASH WATER ON THE SITE.

SPILL CONTROL PRACTICES

IN ADDITION TO THE GOOD HOUSEKEEPING AND MATERIAL MANAGEMENT PRACTICES DISCUSSED IN THE PREVIOUS SECTIONS OF THIS PLAN, THE FOLLOWING PRACTICES SHALL BE FOLLOWED FOR SPILL PREVENTION AND CLEANUP:

-SPILL CLEANUP INFORMATION SHALL BE POSTED ON SITE TO INFORM EMPLOYEES ABOUT CLEANUP PROCEDURES AND RESOURCES.

-THE FOLLOWING CLEAN-UP EQUIPMENT MUST BE KEPT ON-SITE NEAR THE MATERIAL STORAGE AREA: GLOVES, MOPS, RAGS, BROOMS, DUST PANS, SAND, SAWDUST, LIQUID ABSORBER, GOGGLES, AND TRASH CONTAINERS.

-ALL SPILLS SHALL BE CLEANED UP AS SOON AS POSSIBLE.

-WHEN CLEANING A SPILL, THE AREA SHOULD BE WELL VENTILATED AND THE EMPLOYEE SHALL WEAR PROPER PROTECTIVE COVERING TO PREVENT INJURY.

-TOXIC SPILLS MUST BE REPORTED TO THE PROPER AUTHORITY REGARDLESS OF THE SIZE OF THE SPILL.

-AFTER A SPILL, THE PREVENTION PLAN SHALL BE REVIEWED AND CHANGED TO PREVENT FURTHER SIMILAR SPILLS FROM OCCURRING. THE CAUSE OF THE SPILL, MEASURES TO PREVENT IT, AND HOW TO CLEAN THE SPILL UP SHALL BE RECORDED.

-THE SUPERINTENDENT SHALL BE THE SPILL PREVENTION AND CLEANUP COORDINATOR AND IS RESPONSIBLE FOR THE DAY TO DAY SITE OPERATIONS. THE SUPERINTENDENT ALSO OVERSEES THE SPILL PREVENTION PLAN AND SHALL BE RESPONSIBLE FOR EDUCATING THE EMPLOYEES ABOUT SPILL PREVENTION AND CLEANUP PROCEDURES.

MAINTENANCE AND INSPECTION PRACTICES

THE FOLLOWING ARE MAINTENANCE AND INSPECTION PRACTICES THAT SHALL BE COMPLETED BY THE CONTRACTOR:

-ALL SEDIMENT AND EROSION CONTROL METHODS SHALL BE CHECKED AT A MINIMUM OF EVERY 7 DAYS AND WITHIN 24 HOURS OF EACH 0.5 INCH OR GREATER RAINFALL BY THE SUPERINTENDENT OR SOMEONE UNDER HIS/HER DIRECT SUPERVISION.

-ALL SEDIMENT AND EROSION CONTROL METHODS SHALL BE KEPT IN GOOD CONDITION. REPAIRS MUST BE MADE WITHIN 24 HOURS OF REPORT.

-THE SILT FENCE SHALL BE INSPECTED AT A MINIMUM OF EVERY 7 DAYS AND WITHIN 24 HOURS OF A 0.5" OR GREATER RAIN EVENT FOR HEIGHT OF SEDIMENT AND CONDITION OF FENCE.

-THE SILT FENCE SHALL BE CLEARED OF SEDIMENT WHEN SEDIMENT MEASURES ONE-THIRD THE HEIGHT OF THE FENCE.

-THE SEDIMENT BASINS/DITCHES SHALL BE CHECKED AT A MINIMUM OF EVERY 7 DAYS AND WITHIN 24 HOURS OF A 0.5" OR GREATER RAIN EVENT FOR DEPTH OF SEDIMENT. THEY SHALL BE CLEANED WHEN SEDIMENT REACHES 10% OF TOTAL CAPACITY AND AFTER CONSTRUCTION IS COMPLETE.

-DIVERSION DIKES SHALL BE INSPECTED AT A MINIMUM OF EVERY 7 DAYS AND WITHIN 24 HOURS OF A 0.5" OR GREATER RAIN EVENT. ANY BREACHES SHALL BE PROMPTLY REPAIRED.

-ALL SEEDING SHALL BE CHECKED FOR PROPER GROWTH AND UNIFORMITY. UNSTABALIZED AREAS SHALL BE RE-SODDED.

-A MAINTENANCE REPORT SHALL BE COMPLETED DAILY AFTER EACH INSPECTION OF THE SEDIMENT AND EROSION CONTROL METHODS. THE REPORTS SHALL BE FILED IN AN ORGANIZED MANNER AND RETAINED ON-SITE DURING CONSTRUCTION. AFTER CONSTRUCTION IS COMPLETED, THE REPORTS SHALL BE SAVED FOR AT LEAST THREE YEARS. THE REPORTS SHALL BE AVAILABLE FOR ANY AGENCY THAT HAS JURISDICTION OVER EROSION CONTROL.

-THE SUPERINTENDENT SHALL ORGANIZE THE TRAINING FOR INSPECTION PROCEDURES AND PROPER EROSION CONTROL METHODS FOR EMPLOYEES THAT COMPLETE INSPECTIONS AND REPORTS.

POLLUTION PREVENTION PLAN CERTIFICATION

I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHERED AND EVALUATED THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS.

SIGNED: _____ DATE: _____

JEFFREY R. SWISHER, P.E.
FLORIDA REGISTRATION NUMBER: 60275
PROFESSIONAL ENGINEER

CONTRACTOR'S CERTIFICATION

I CERTIFY UNDER PENALTY OF LAW THAT I UNDERSTAND, SHALL COMPLY WITH, THE TERMS AND CONDITIONS OF THE STATE OF FLORIDA GENERIC PERMIT FOR STORMWATER DISCHARGE FORM LARGE AND SMALL CONSTRUCTION ACTIVITIES AND THIS STORMWATER POLLUTION PREVENTION PLAN PREPARED THEREUNDER.

SIGNATURE AND DATE	NAME AND TITLE, COMPANY / ADDRESS AND TELEPHONE NUMBER	RESPONSIBILITY

No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/21/24	JDR
2	REVISED PER CITY COMMENTS	07/10/25	JDR

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
200 S. ORANGE AVENUE, SUITE 800, ORLANDO, FL 32801
PHONE: (407) 898-1511
WWW.KIMLEY-HORN.COM CA- 00000696

JEFFREY R. SWISHER, P.E.
FLORIDA LICENSE NUMBER
60275

KHA PROJECT 240418000
DATE 07/9/2025
SCALE AS SHOWN
DESIGNED BY —
DRAWN BY —
CHECKED BY —

STORMWATER POLLUTION PREVENTION PLAN

DELAND TECH PARK
CITY OF DELAND FLORIDA

SHEET NUMBER
C2.0

Plotted By: Spencer Jones Sheet Set: DELAND TECH PARK Layout: C2.0 SWPPP July 10, 2025, 05:12:49pm K:\ORL_Civil\240418000-Deland Tech Park\CAD\DOCS\STP\SheetSet\C2.0-SWPPP.dwg
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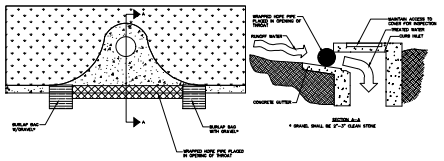
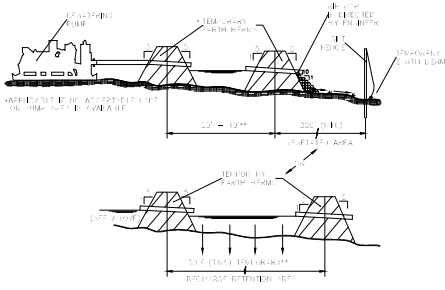


SOCK DRAIN INLET SEDIMENT FILTER

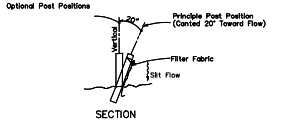
NTS

NOTE: THE PERFORATED PIPE MUST EXTEND AT LEAST 1' BEYOND THE CURB OPENING ON EACH SIDE AND BE ANCHORED WITH GRAVEL BAGS, OR SIMILAR, ON EACH END. A SPACER MUST BE PROVIDED FOR BETWEEN THE INLET OPENING AND THE PIPE TO ALLOW FOR OVERFLOW, PREVENT FLOODING AND TO PREVENT THE PIPE FROM FALLING INTO THE INLET.

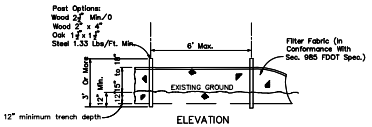


TYPICAL DEWATERING DISCHARGE PLAN

N.T.S.



SECTION



ELEVATION

TYPE III SILT FENCE

NTS



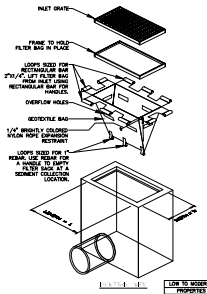
CONTRACTOR TO PLACE FILTER FABRIC UNDER GRATE DURING CONSTRUCTION.

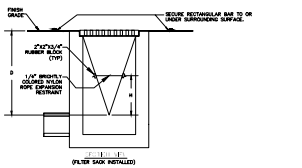
Type III Silt Fence Protection Around Ditch Bottom Inlets.

Do not deploy in a manner that silt fences will act as a dam across permanent flowing watercourses. Silt fences are to be used at upland locations and turbidity barriers used at permanent bodies of water.

SILT FENCE APPLICATIONS

NTS





LOW TO MODERATE FLOW GEOTEXTILE FABRIC SPECIFICATION TABLE		
PROPERTIES	TEST METHOD	UNITS
GRAB TENSILE STRENGTH	ASTM D-4632	200 LBS
GRAB TENSILE ELONGATION	ASTM D-4632	15 %
PUNCTURE	ASTM D-4833	120 LBS
MULLEN BURST	ASTM D-3786	400 PSI
TRAPEZOID TEAR	ASTM D-4533	90 LBS
UV RESISTANCE	ASTM D-4355	70 %
APPARENT OPENING SIZE	ASTM D-4751	40 US SIEVE
FLOW RATE	ASTM D-4491	40 GAL/MIN/SQ FT
PERMITTIVITY	ASTM D-4491	0.55 SEC $^{-1}$

MODERATE TO HIGH FLOW GEOTEXTILE FABRIC SPECIFICATION TABLE		
PROPERTIES	TEST METHOD	UNITS
GRAB TENSILE STRENGTH	ASTM D-4632	265 LBS
GRAB TENSILE ELONGATION	ASTM D-4632	15 %
PUNCTURE	ASTM D-4833	135 LBS
MULLEN BURST	ASTM D-3786	400 PSI
TRAPEZOID TEAR	ASTM D-4533	90 LBS
UV RESISTANCE	ASTM D-4355	70 %
APPARENT OPENING SIZE	ASTM D-4751	30 US SIEVE
FLOW RATE	ASTM D-4491	200 GAL/MIN/SQ FT
PERMITTIVITY	ASTM D-4491	1.5 SEC $^{-1}$

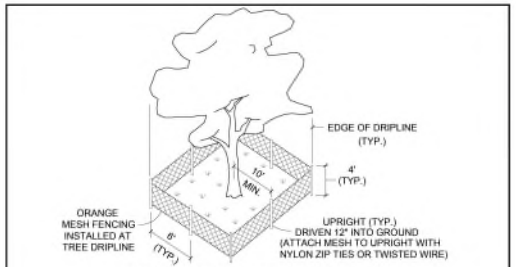
NOTES:
1. GEOTEXTILE SHALL BE A WOVEN POLYPROPYLENE FABRIC THAT MEETS OR EXCEEDS REQUIREMENTS IN THE SPECIFICATIONS TABLE.
2. PLACE AN OIL ABSORBENT PAD OR PILLOW OVER INLET GRATE WHEN OIL SPILLS ARE A CONCERN.
3. THE WIDTH, "B", OF THE FILTER SACK SHALL MATCH THE INSIDE WIDTH OF THE GRATED INLET BOX.
4. THE DEPTH, "D", OF THE FILTER SACK SHALL BE BETWEEN 18 INCHES AND 24 INCHES.
5. THE LENGTH, "L", OF THE FILTER SACK SHALL MATCH THE INSIDE LENGTH OF THE GRATED INLET BOX.

MAINTENANCE NOTES:
1. INLET PROTECTION DEVICES MUST BE INSPECTED FOR SEDIMENT ACCUMULATION WITHIN THE CATCH BASIN. REMOVE TRAPPED SEDIMENT WHEN BRIGHTLY COLORED EXPANSION RESTRAINT CAN NO LONGER BE SEEN.
2. REMOVAL OF SEDIMENT ACCUMULATED IN OR ADJACENT TO A STORM DRAIN INLET MUST BEGIN IMMEDIATELY UPON DISCOVERY, AND BE COMPLETED WITHIN 24 HOURS OF DISCOVERY IF CONDITIONS POSE A HAZARD TO THE PUBLIC.
3. INLET PROTECTION DEVICES SHALL BE INSPECTED FOR STRUCTURAL FAILURE (COLLAPSE) THAT MAY CAUSE DOWNSTREAM FLOODING.
4. CONTACT THE CEO FOR ULTIMATE INLET PROTECTION IF THE DESIGNED PROTECTION MAY IMPACT DOWNSTREAM INVES, ADJACENT SLOPES, ETC., DUE TO PONDING ISSUES. ENSURE THAT NO UNDERMINING OF INLET PROTECTION DEVICES HAS OCCURRED.
5. INLET PROTECTION DEVICES AND BARRIERS SHALL BE REPAIRED OR REPLACED IF THEY SHOW SIGNS OF UNDERMINING OR DETERIORATION.

FOR USE ONLY IN PAVED AREAS WHERE SEDIMENT LOADS ARE EXPECTED TO BE VERY LOW. FILTER SACK MUST HAVE OVERFLOW HOLES TO PREVENT PONDING

INLET PROTECTION FILTER SACK

NTS



TYP. CITY TREE BARRICADE DETAIL

N.T.S.

TREE BARRICADES ARE REQUIRED AROUND ALL TREES WHICH HAVE BEEN DESIGNATED ON THE SITE PLAN TO BE RETAINED AND PROTECTED. PRIOR TO ANY CLEARING OR CONSTRUCTION ACTIVITY OCCURRING ON THE SITE, TREE BARRICADES SHALL BE CONSTRUCTED BY THE CONTRACTOR AND APPROVED BY THE CITY. TREE BARRICADES SHALL BE PLACED AT THE EDGE OF THE DRIPLINE OR A MINIMUM OF 10' FROM THE TRUNK OF THE TREE, WHICH EVER IS GREATER.

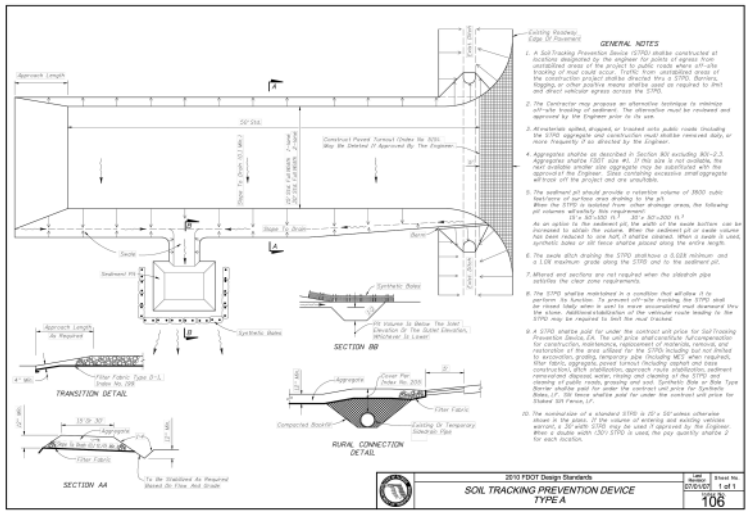
FOR THE BARRIER THE CITY RECOMMENDS SAFETY BARRICADE FENCING.

NOTE: EXISTING TREES IN LANDSCAPE BUFFER SHALL ALSO BE PROTECTED.

DATE: JANUARY 31, 2023	TREE BARRICADE DETAIL	M112
City of DeLand - Standard Details		

NOTE:

SILT FENCE AND TREE BARRICADES WILL NEED TO BE INSTALLED PRIOR TO ANY LAND DISTURBANCE

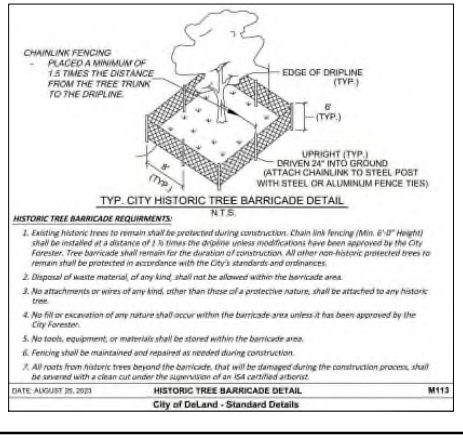


2010 FDOT Design Standards

SOIL TRACKING PREVENTION DEVICE TYPE A

Sheet No. 1 of 1

106



TYP. CITY HISTORIC TREE BARRICADE DETAIL

N.T.S.

HISTORIC TREE BARRICADE REQUIREMENTS:

1. *Existing historic trees to remain shall be protected during construction. Chain link fencing (Min. 6'-0" Height) shall be installed at a distance of 1 ½ times the dripline unless modifications have been approved by the City Forester. Tree barricade shall remain for the duration of construction. All other non-historic protected trees to remain shall be protected in accordance with the City's standards and ordinances.*
2. *Disposal of waste material, of any kind, shall not be allowed within the barricade area.*
3. *No attachments or wires of any kind, other than those of a protective nature, shall be attached to any historic tree.*
4. *No fill or excavation of any nature shall occur within the barricade area unless it has been approved by the City Forester.*
5. *No tools, equipment, or materials shall be stored within the barricade area.*
6. *Fencing shall be maintained and repaired as needed during construction.*
7. *All roots from historic trees beyond the barricade, that will be damaged during the construction process, shall be severed with a clean cut under the supervision of an ISA certified arborist.*

DATE: AUGUST 25, 2023	HISTORIC TREE BARRICADE DETAIL	M113
City of DeLand - Standard Details		

Always call 811 two full business days before you dig to have underground utilities located and marked.

Sunshine811.com

No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/21/24	JDR
2	REVISED PER CITY COMMENTS	07/10/25	JDR

Kimley»Horn

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200 S. ORANGE AVENUE, SUITE 600, ORLANDO, FL 32801
PHONE: 407-898-1511
WWW.KIMLEY-HORN.COM CA-00000696

JEFFREY R. SWISHER, P.E.

FLORIDA LICENSE NUMBER 80275

KHA PROJECT 240418000

DATE 07/9/202085

SCALE AS SHOWN

DESIGNED BY —

DRAWN BY —

CHECKED BY —

EROSION CONTROL DETAILS

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER C2.1

Plotted By: Spencer, Jason Saved Set: DELAND TECH PARK - Layout: C2.1 EROSION CONTROL DETAILS - July 10, 2025 - 09:17:58am - K:\ORL_Civil\240418000\Drawing\Tech Plan\CADD\CONSTRUPlanSheets\C2.1 EROSION.dwg
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NOTES
1. LIDAR SURFACE CONTOURS HAVE BEEN ADDED OUTSIDE OF THE PROPERTY BOUNDARY FOR INFORMATIONAL PURPOSES.
2. TREE IDENTIFICATION IS PROVIDED IN THE SURVEY PROVIDED BY VHB. PLEASE REFER TO THE VHB SURVEY FOR TREE IDENTIFICATION.

SITE DATA:

TOTAL AREA OF NON-DISTURBANCE	±6.98 ACRES
TOTAL AREA OF DISTURBANCE	±136.82 ACRES
TOTAL PROJECT AREA:	±6,263,726 SF/±143.80 ACRES

GENERAL DEMOLITION NOTES:

1. LOCATIONS, ELEVATIONS, AND DIMENSIONS OF EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES ARE SHOWN ACCORDING TO THE BEST INFORMATION AVAILABLE AT THE TIME OF PREPARATION OF THESE PLANS. THE EXISTING UTILITY INFORMATION SHOWN IS BASED ON THE BOUNDARY AND TOPOGRAPHIC SURVEY PROVIDED BY SLIGER & ASSOCIATES AS WELL AS UTILITY MAPS PROVIDED BY THE LOCAL MUNICIPALITIES. THE CONTRACTOR SHALL VERIFY THE LOCATIONS, ELEVATIONS, AND DIMENSIONS OF ALL EXISTING UTILITIES, STRUCTURES AND OTHER FEATURES, AFFECTING THIS AREA PRIOR TO CONSTRUCTION WORK.
2. ELEVATIONS SHOWN ON THIS PLAN ARE RELATIVE TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), BASED ON THE FOLLOWING: FDOT SURVEY DISK, NAME: 9160306—1990, LOCATED AT N-1684051.255, E-571309.647, AND HAVING AN ELEVATION OF 49.32'
3. THERE MAY BE ON-SITE UNDERGROUND UTILITIES (INCLUDING, BUT NOT LIMITED TO IRRIGATION, SANITARY SEWER, POTABLE WATER MAINS, NATURAL GAS LINES, ELECTRIC, TELEPHONE, AND CABLE LINES) THAT WERE NOT LOCATED OR IDENTIFIED BY THE PROJECT SURVEYOR, PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING ON-SITE UTILITIES AND RIGHT-OF-WAY UTILITIES.
4. IF EXISTING UTILITIES ARE DISCOVERED THAT ARE NOT IDENTIFIED BY THE CONSTRUCTION DOCUMENTS, AND WILL BE IMPACTED BY THE CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY PRIOR TO PROCEEDING WITH CONSTRUCTION.
5. CONTRACTOR TO COORDINATE WITH LOCAL UTILITY COMPANY FOR DEMOLITION REQUIREMENTS OF ELECTRICAL SYSTEMS.
6. CONTRACTOR SHALL REVIEW THE ENVIRONMENTAL SITE ASSESSMENT AND GEOTECHNICAL REPORT PRIOR TO CONSTRUCTION.
7. REFER TO SWPPP SHEET C2.0 FOR ADDITIONAL NOTES AND DETAILS
8. THE CONTRACTOR SHALL INSPECT EROSION & SEDIMENT CONTROL EFFORTS DAILY TO DETERMINE EFFECTIVENESS. ANY NECESSARY REMEDIES SHALL BE PERFORMED IMMEDIATELY.
9. INSTALL AND MAINTAIN SILT FENCE PER FDOT INDEX #102 AT LIMITS OF CONSTRUCTION. SEE DETAIL ON SHEET C2.1.
10. PROVIDE SOIL TRACKING PREVENTION DEVICE AT ALL CONSTRUCTION ACCESS POINTS. SEE DETAIL ON SHEET C2.1.
11. UTILIZE SOCK DRAIN (OR EQUIVALENT) IN FRONT OF EXISTING/PROPOSED INLETS ADJACENT TO THE CONSTRUCTION ACTIVITIES. SEE DETAIL ON SHEET C2.1.
12. INSTALL AND MAINTAIN FILTER FABRIC UNDER GRATES OF EXISTING/PROPOSED INLETS. SEE DETAIL ON SHEET C2.1.
13. CONTRACTOR TO ENSURE ADEQUATE COVER REMAINS OVER THE EXISTING UTILITIES.
14. ALL UNDERGROUND UTILITIES SHALL BE CUT AND CAPPED AT THE PROPERTY BOUNDARY, UNLESS OTHERWISE NOTED.
15. ENTIRE SITE IS TO BE CLEARED, GRUBBED AND/OR DEMOLISHED UNLESS OTHERWISE NOTED.
16. CONTRACTOR TO CLEAR AND STRIP THE TOP 6" OF EXISTING TOPSOIL ON THE SITE.
17. ALL EXCESS FILL MATERIAL SHALL BE HAULED OFF SITE.
18. NO EXCAVATING MATERIAL SHALL BE STOCKPILED IN A MANNER AS TO DIRECT RUNOFF DIRECTLY OFF THE PROJECT SITE OR INTO ANY ADJACENT WATER BODY, WETLAND OR STORMWATER COLLECTION FACILITY.
19. DEWATERING SHALL BE DONE IN ACCORDANCE WITH THE CITY OF DELAND AND ST. JOHN'S RIVER WATER MANAGEMENT CRITERIA.
20. DEWATERING ACTIVITIES SHALL NOT RESULT IN ANY DISCHARGE OF WATER WITH TURBIDITY GREATER THAN 29 NTU'S FROM THE SITE.
21. SHOULD ANALYTICAL RESULTS FROM GROUNDWATER SAMPLES DETERMINE THAT THE SITE IS CONTAMINATED, A CITY WASTEWATER INDUSTRIAL WASTE PRE-TREATMENT GROUNDWATER PERMIT MUST BE OBTAINED FOR PROPER DISPOSAL INTO THE CITY SANITARY SYSTEM.
22. IF DEWATERING ACTIVITIES ARE REQUIRED, THE CONTRACTOR SHALL FILE A WATER MANAGEMENT DISTRICT DEWATERING PERMIT. THE CONTRACTOR SHALL PROVIDE A COPY OF THE DEWATERING PERMIT APPROVAL UPON RECEIPT.
23. IF SEPTIC TANKS ARE NOT COMPLETELY REMOVED, BREAK OR CORE BOTTOM TO PREVENT LIQUID RETENTION.
24. THE CONTRACTOR SHALL INSTALL A CONSTRUCTION FENCE AROUND THE PERIMETER OF THE SITE, ADJACENT TO THE SILT FENCE, AS NEEDED.
25. 23. A TEMPORARY FENCE NOT EXCEEDING 8 FEET IN HEIGHT MAY BE ERECTED DURING CONSTRUCTION. SUCH FENCE SHALL BE REMOVED PRIOR TO ANY CERTIFICATE OF OCCUPANCY OR CERTIFICATE OF COMPLETION BEING APPROVED.

No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/21/24	JDR
2	REVISED PER CITY COMMENTS	07/11/25	JDR
3	REVISED PER CITY COMMENTS	09/15/25	JDR

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JEFFREY R. SWISHER, P.E.
FLORIDA LICENSE NUMBER
80275

KHA PROJECT
245418000
DATE
09/09/2025
SCALE AS SHOWN
DESIGNED BY —
DRAWN BY —
CHECKED BY —

OVERALL EXISTING CONDITIONS PLAN

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER
C3.0

Plotted By: Raymond Jones Sheet Set: DELAND TECH PARK Layout: XCOVER, September 29, 2025 - 12:43:12pm K:\ORL_Civil\245418000-Deland Tech Park\CAD\CIVIL\SHEET\Working for Approval\Sheet Sheets\C3.0-XCOVER.dwg
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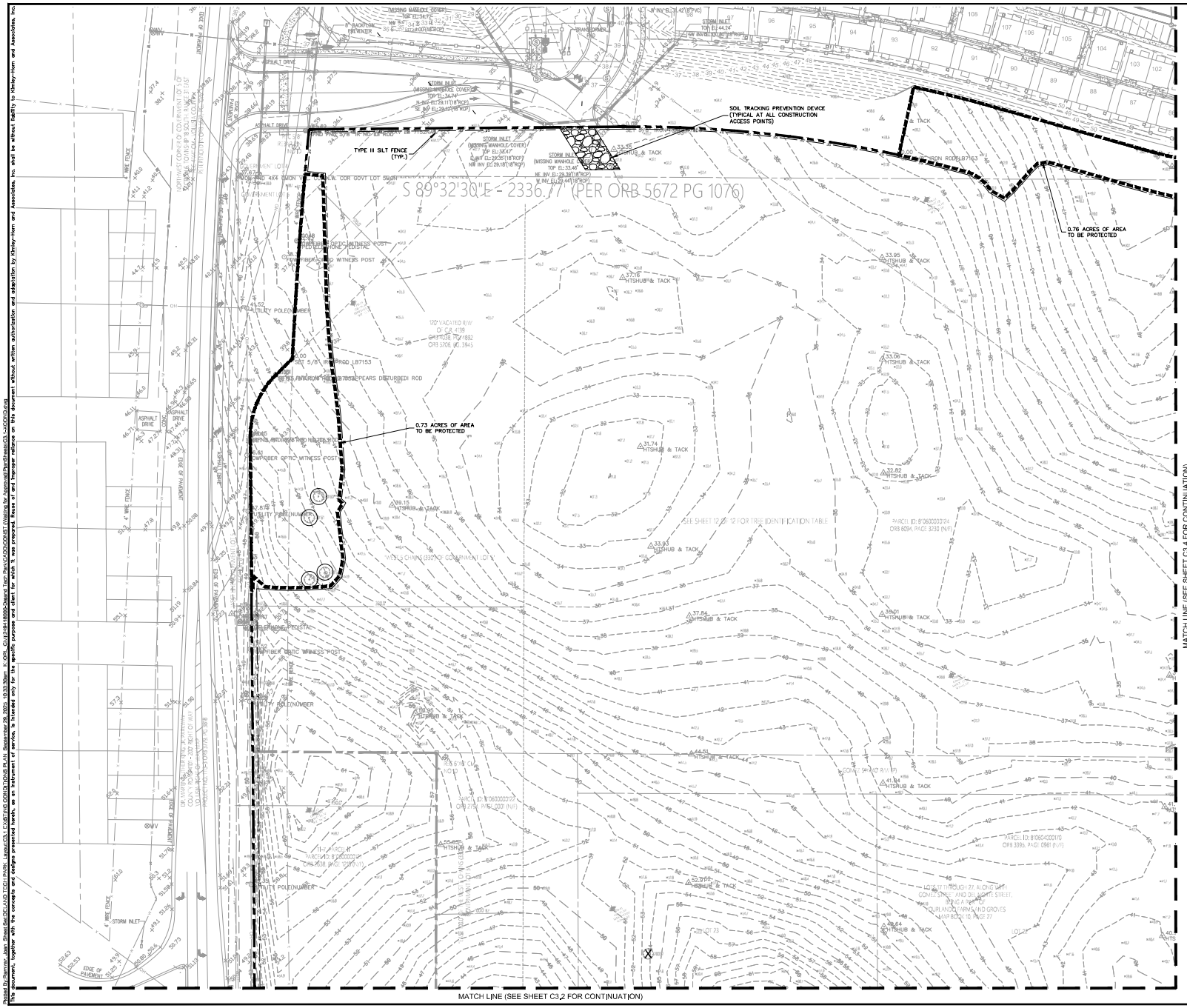

No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/21/24	JDR
2	REVISED PER CITY COMMENTS	07/10/25	JDR
3	REVISED PER CITY COMMENTS	09/15/25	JDR

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JEFFREY R. SWISHER, P.E.
FLORIDA LICENSE NUMBER 60275

KHA PROJECT 240418000
DATE 09/09/2025
SCALE AS SHOWN
DESIGNED BY —
DRAWN BY —
CHECKED BY —

EXISTING CONDITIONS AND DEMOLITION PLAN

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER C3.1

Plotted By: Spencer Jones Sheet Set: DELAND TECH PARK Layout: C3.1 EXISTING CONDITIONS PLAN September 29, 2025 - 10:33:39am K:\ORL_Civil\240418000\Project Team Files\CAD\CIVIL\Drawing Files\Xrefs\sht\SheetsC3.1-xCIVIL.dwg
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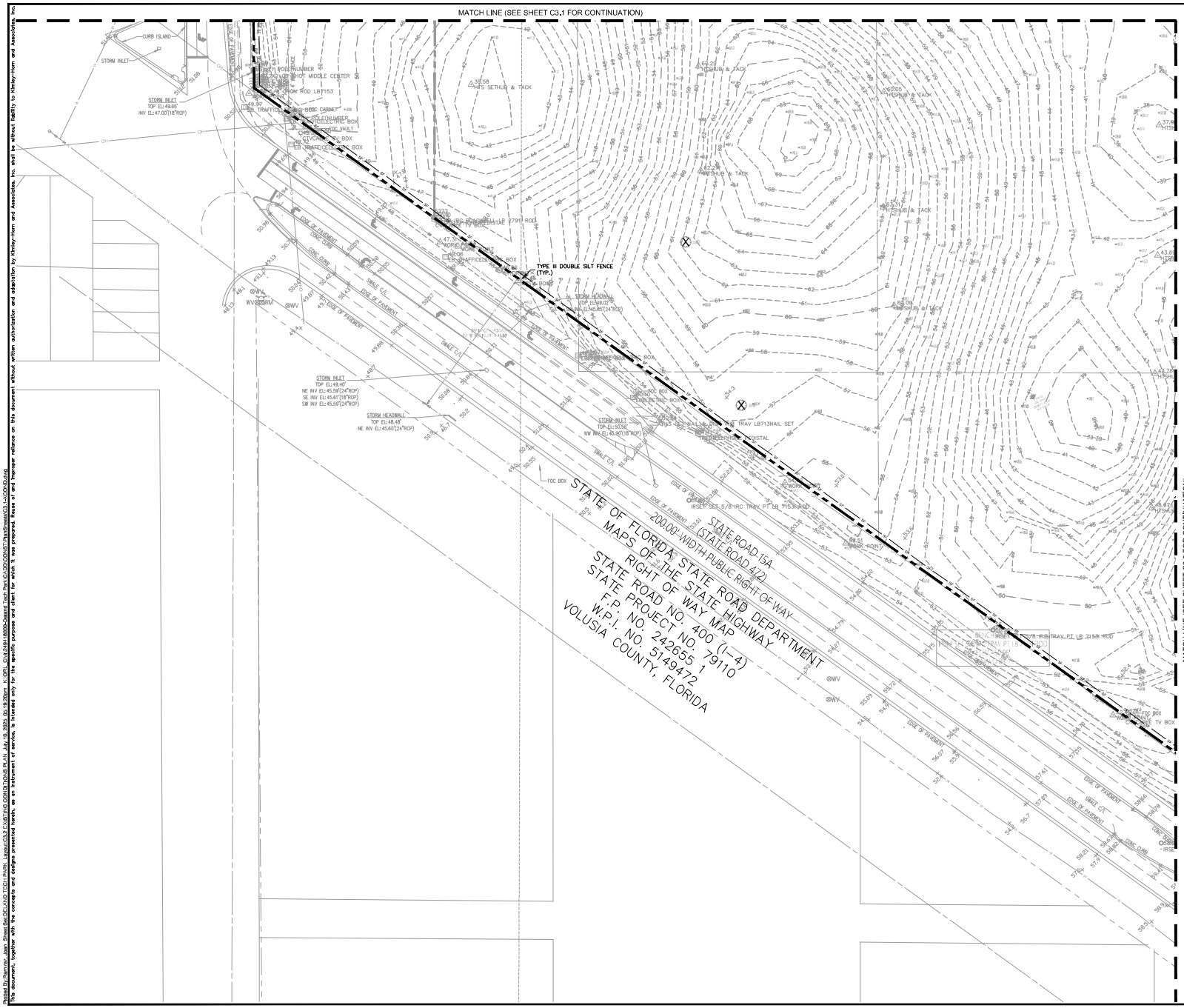
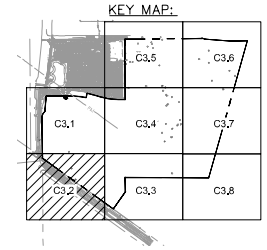


LEGEND

- PROPERTY BOUNDARY
- TYPE III SILT FENCE (SEE SHEET C2.1 FOR DETAIL)
- REMOVE ABOVE/BELOW GROUND FEATURE
- SOIL TRACKING PREVENTION DEVICE (SEE SHEET C2.1 FOR DETAIL)
- ASPHALT TO BE DEMOLISHED
- ASPHALT TO BE MILLED AND OVERLAYED
- EXISTING HISTORIC TREES TO BE REMOVED WITHIN PROJECT LIMITS
- EXISTING TREES TO BE PROTECTED WITHIN PROJECT LIMITS
- ×41.3 EXISTING SPOT ELEVATION
- 48 EXISTING CONTOUR ELEVATION

NOTES
1. LIDAR SURFACE CONTOURS HAVE BEEN ADDED OUTSIDE OF THE PROPERTY BOUNDARY FOR INFORMATIONAL PURPOSES.
2. TREE IDENTIFICATION IS PROVIDED IN THE SURVEY PROVIDED BY VHB. PLEASE REFER TO THE VHB SURVEY FOR TREE IDENTIFICATION.

KEY MAP:



No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/21/24	JOR
2	REVISED PER CITY COMMENTS	07/10/25	JOR

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DATE 07/9/2025
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EXISTING CONDITIONS AND DEMOLITION PLAN

DELAND TECH PARK
CITY OF DELAND FLORIDA

SHEET NUMBER
C3.2

Plotted By:Ramirez, Joan Sheet Set:DELAND TECH PARK Layout:C3.2 EXISTING CONDITIONS PLAN July 10, 2025 05:19:20pm K:\ORL_CIV\249418000-Deland Tech Park\CADD\CONST\Plan\Sheets\C3.1-XCONDX.dwg
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Plotted By:Ramirez, Joan Sheet Set:DELAND TECH PARK Layout:C3.3 EXISTING CONDITIONS PLAN July 10, 2025 05:19:39pm K:\ORL_Civil\249418000-Deland Tech Park\CADD\CONST\PlanSheets\C3.1-XCOND.dwg
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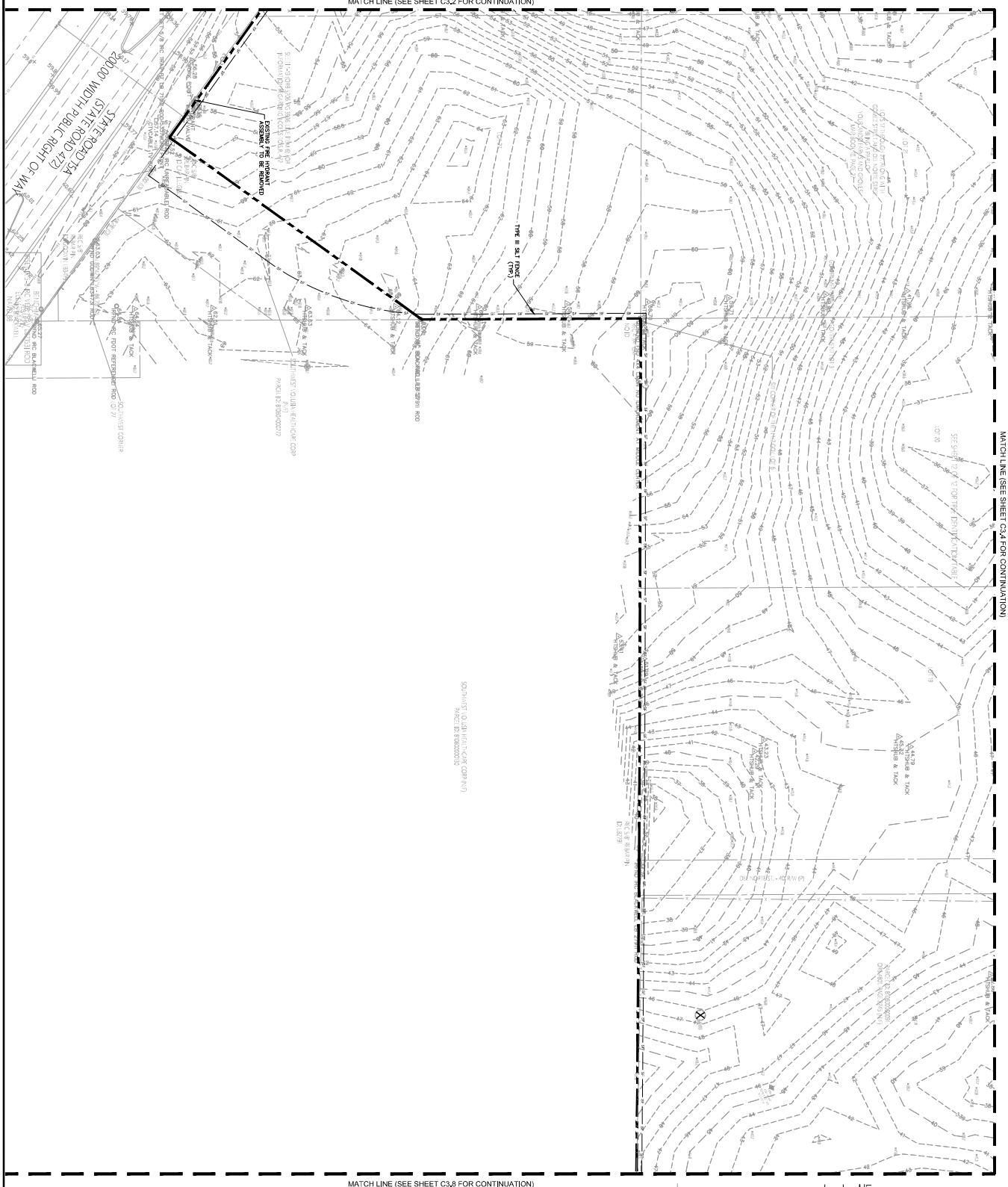
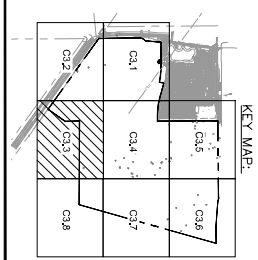
MATCH LINE (SEE SHEET C3.2 FOR CONTINUATION)





NOTES
1. LIDAR SURFACE CONTOURS HAVE BEEN ADDED OUTSIDE OF THE PROPERTY BOUNDARY FOR INFORMATIONAL PURPOSES.
2. FOR TREE PROTECTION AND REMOVAL PLAN BY VHB, PLEASE REFER TO THE VHB SURVEY FOR TREE IDENTIFICATION.

LEGEND
- PROPERTY BOUNDARY
- TYPE III SILT FENCE (SEE SHEET C2.1 FOR DETAIL)
- REMOVE ABOVE/BELOW GROUND FEATURE
- SOIL TRACKING PREVENTION DEVICE (SEE SHEET C2.1 FOR DETAIL)
- ASPHALT TO BE DEMOLISHED
- ASPHALT TO BE MILLED AND OVERLAYED
- EXISTING HISTORIC TREES TO BE REMOVED WITHIN PROJECT LIMITS
- EXISTING TREES TO BE PROTECTED WITHIN PROJECT LIMITS
- EXISTING SPOT ELEVATION
- EXISTING CONTOUR ELEVATION

GRAPHIC SCALE IN FEET 0 25 50 100

NORTH

SHEET NUMBER					
C3.3	DELAND TECH PARK CITY OF DELAND FLORIDA	EXISTING CONDITIONS AND DEMOLITION PLAN	KHA PROJECT 249418000 DATE 07/9/2025 SCALE AS SHOWN DESIGNED BY — DRAWN BY — CHECKED BY —	JEFFREY R. SWISHER, P.E. FLORIDA LICENSE NUMBER 60275	Kimley»Horn © 2024 KIMLEY-HORN AND ASSOCIATES, INC. 200 S. ORANGE AVENUE, SUITE 600, ORLANDO, FL 32801 PHONE: (407) 898-1511 WWW.KIMLEY-HORN.COM CA-00000696

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Plotted By: Ramirez, Joan Sheet Set: DELAND TECH PARK Layout: C3.4 EXISTING CONDITIONS PLAN July 10, 2025 05:19:53pm K:\ORL_Civil\249418000-Deland Tech Park\CADD\CONST\PlanSheets\C3.1-XCOND.dwg
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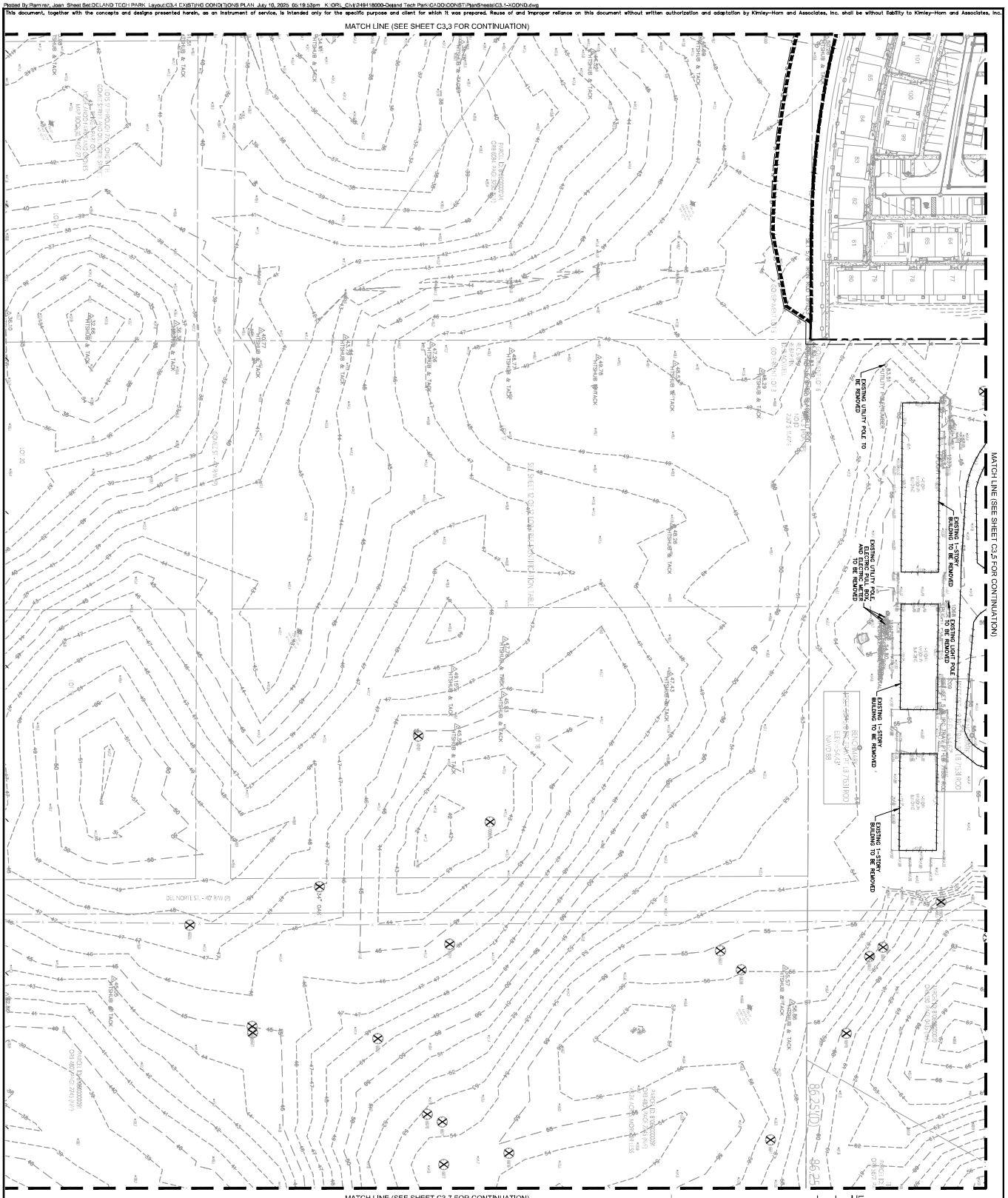

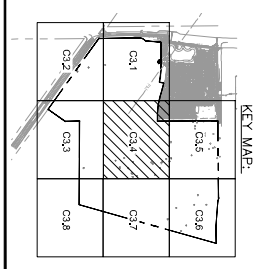

NOTES
1. LIDAR SURFACE CONTOURS HAVE BEEN ADDED OUTSIDE OF THE PROPERTY BOUNDARY FOR INFORMATIONAL PURPOSES.
2. TREE LOCATIONS SHOWN ARE APPROXIMATE AND PROVIDED BY VHB. PLEASE REFER TO THE VHB SURVEY FOR TREE IDENTIFICATION.

LEGEND

- PROPERTY BOUNDARY
- TYPE III SILT FENCE (SEE SHEET C2.1 FOR DETAIL)
- REMOVE ABOVE/BELOW GROUND FEATURE
- SOIL TRACKING PREVENTION DEVICE (SEE SHEET C2.1 FOR DETAIL)
- ASPHALT TO BE DEMOLISHED
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- EXISTING TREES TO BE PROTECTED WITHIN PROJECT LIMITS
- EXISTING SPOT ELEVATION
- EXISTING CONTOUR ELEVATION

GRAPHIC SCALE IN FEET 0 25 50 100

NORTH

SHEET NUMBER C3.4	DELAND TECH PARK CITY OF DELAND FLORIDA	EXISTING CONDITIONS AND DEMOLITION PLAN	KHA PROJECT 249418000 DATE 07/9/2025 SCALE AS SHOWN DESIGNED BY — DRAWN BY — CHECKED BY —

JEFFREY R. SWISHER, P.E.
FLORIDA LICENSE NUMBER 60275

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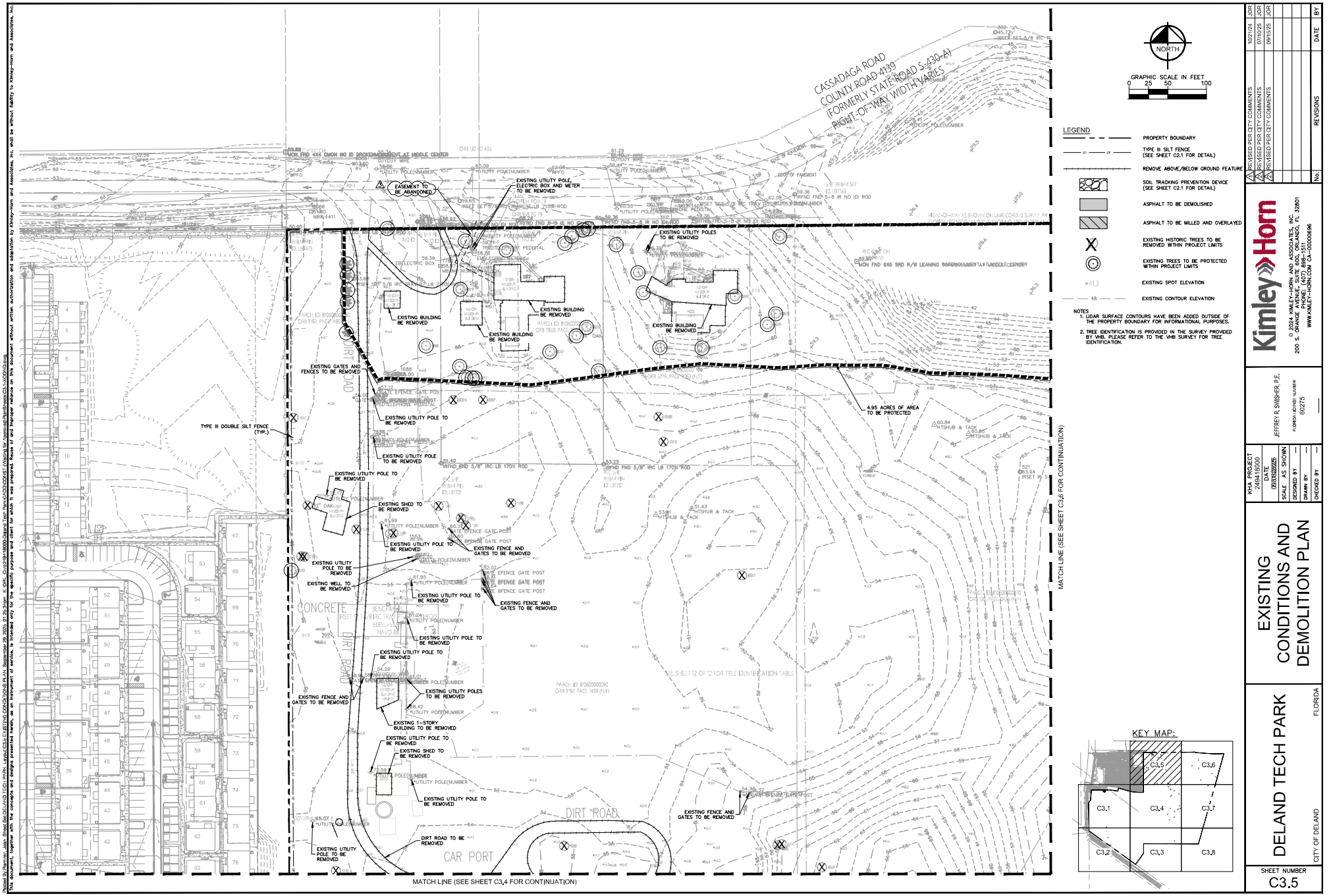
No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/21/24	JOR
2	REVISED PER CITY COMMENTS	07/10/25	JOR



No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/21/24	JDR
2	REVISED PER CITY COMMENTS	07/10/25	JDR
3	REVISED PER CITY COMMENTS	09/15/25	JDR

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FLORIDA LICENSE NUMBER 60275

KHA PROJECT 240418000
DATE 09/30/2025
SCALE AS SHOWN
DESIGNED BY —
DRAWN BY —
CHECKED BY —

EXISTING CONDITIONS AND DEMOLITION PLAN

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER C3.5

Plotted By: Raymond Jones Sheet Set: DELAND TECH PARK Layout: C3.5 EXISTING CONDITIONS PLAN September 29, 2025 - 01:25a Xrefs: X:\DWG_Civil\240418000-Project Team Files\CAD\DGN\XST Utility for Xrefs\utilSheetXrefs.t-xDGN.dgn
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NORTH

GRAPHIC SCALE IN FEET
0 25 50 100

LEGEND

- PROPERTY BOUNDARY
- TYPE III SILT FENCE (SEE SHEET C2.1 FOR DETAIL)
- REMOVE ABOVE/BELOW GROUND FEATURE
- SOIL TRACKING PREVENTION DEVICE (SEE SHEET C2.1 FOR DETAIL)
- ASPHALT TO BE DEMOLISHED
- ASPHALT TO BE MILLED AND OVERLAYED
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- ×41.3 EXISTING SPOT ELEVATION
- 48 EXISTING CONTOUR ELEVATION

NOTES
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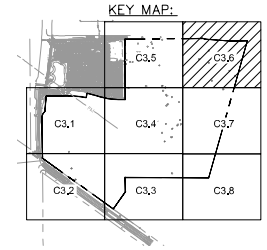
KEY MAP:



No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/21/24	JOR
2	REVISED PER CITY COMMENTS	07/10/25	JOR

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FLORIDA LICENSE NUMBER 60275

KHA PROJECT 249418000
DATE 07/9/2025
SCALE AS SHOWN
DESIGNED BY —
DRAWN BY —
CHECKED BY —

EXISTING CONDITIONS PLAN

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER
C3.6

Plotted By:Ramirez, Joan Sheet Set:DELAND TECH PARK Layout:C3.6 EXISTING CONDITIONS PLAN July 10, 2025 05:29:21pm K:\ORL_CA\249418000-Deland Tech Park\CADD\CONST\Plan\Sheets\C3.1-XCONTD.dwg
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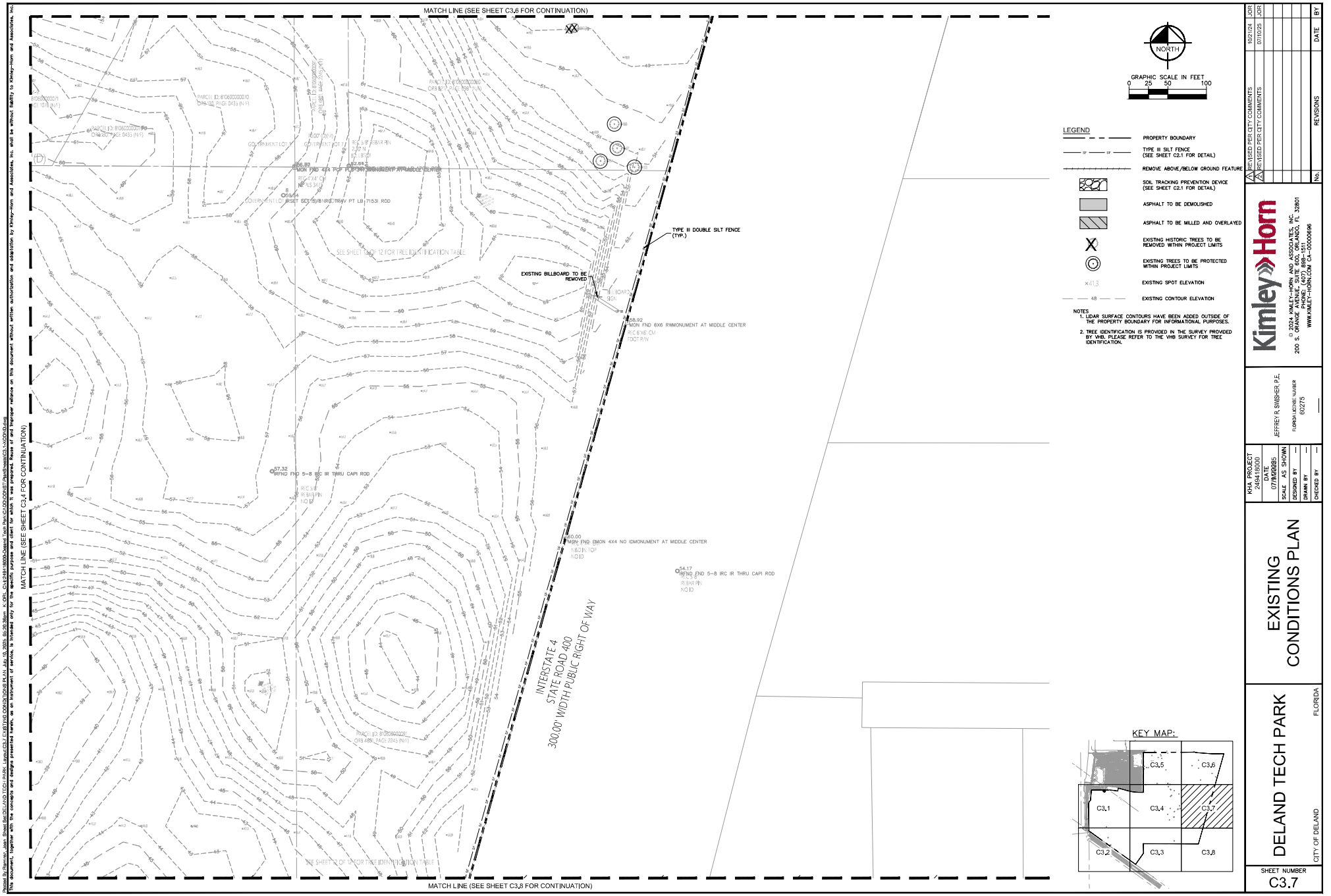

No.	REVISIONS	DATE	BY
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2	REVISED PER CITY COMMENTS	07/10/25	JOR

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KHA PROJECT 240418000
DATE 07/9/2025
SCALE AS SHOWN
DESIGNED BY —
DRAWN BY —
CHECKED BY —

JEFFREY R. SWISHER, P.E.
FLORIDA LICENSE NUMBER 60275

EXISTING CONDITIONS PLAN

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER C3.7

Plotted By: Ramirez, Jason Sheet Set: DELAND TECH PARK Layout: C3.7 EXISTING CONDITIONS PLAN July 10, 2025 - 09:39:39am K:\ORL_Civil\240418000-Deland Tech Park\CAD\CONST\Sheets\C3.7-EXISTING CONDITIONS PLAN.dwg
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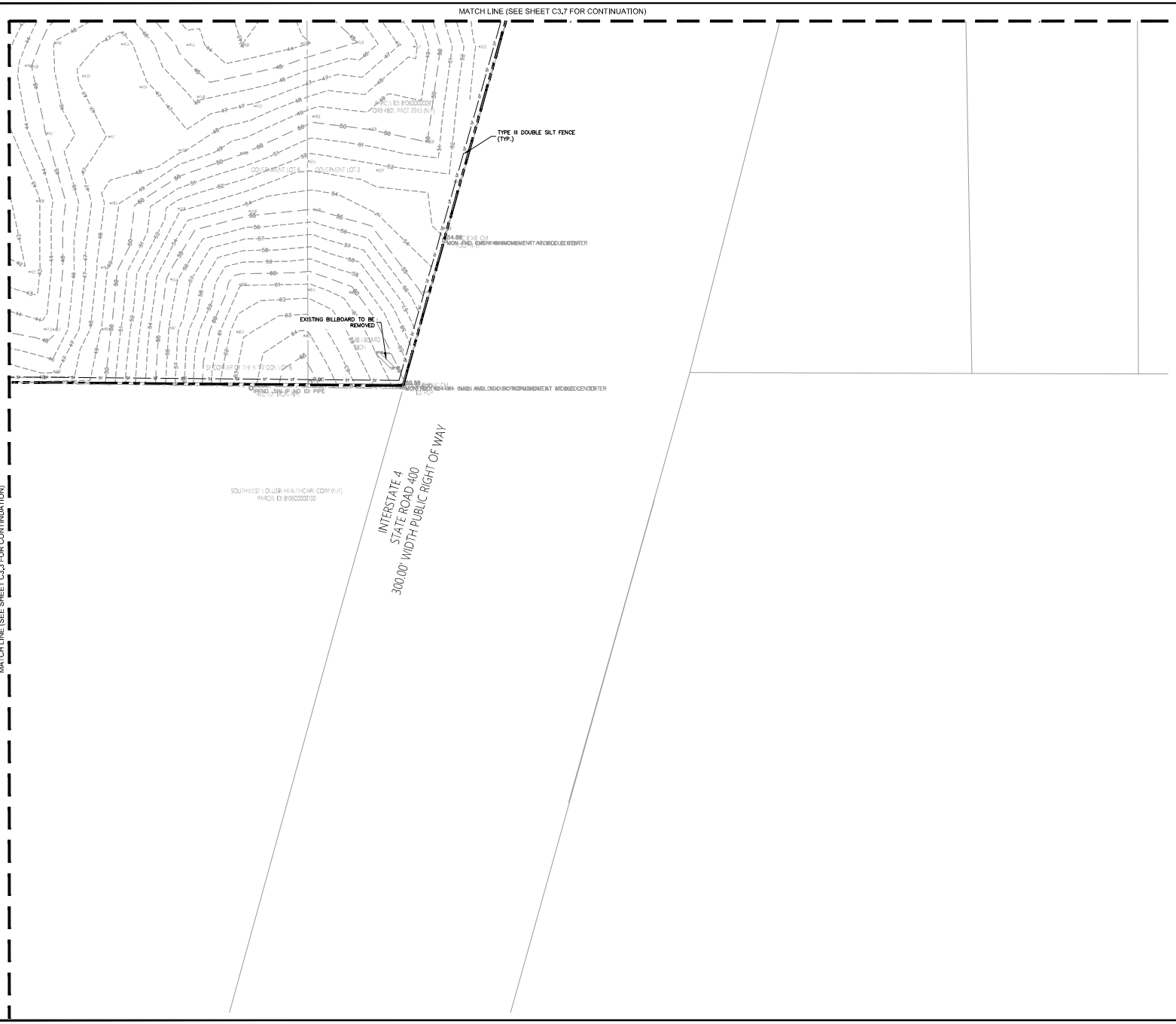

No.	REVISIONS	DATE	BY
	REVISED PER CITY COMMENTS	10/21/24	JOR
	REVISED PER CITY COMMENTS	07/10/25	JOR

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JEFFREY R. SWISHER, P.E.
FLORIDA LICENSE NUMBER
60275

KHA PROJECT
240418000
DATE
07/9/202085
SCALE AS SHOWN
DESIGNED BY —
DRAWN BY —
CHECKED BY —

EXISTING CONDITIONS PLAN

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER
C3.8

Plotted By: Ramirez, Jason Sheet Set: DELAND TECH PARK Layout: C3.8 EXISTING CONDITIONS PLAN July 10, 2025 - 09:39:09am K:\ORL_Civil\240418000-Deland Tech Park\CAD\CONSTR\Sheets\C3.1-EXISTING CONDITIONS PLAN.dwg
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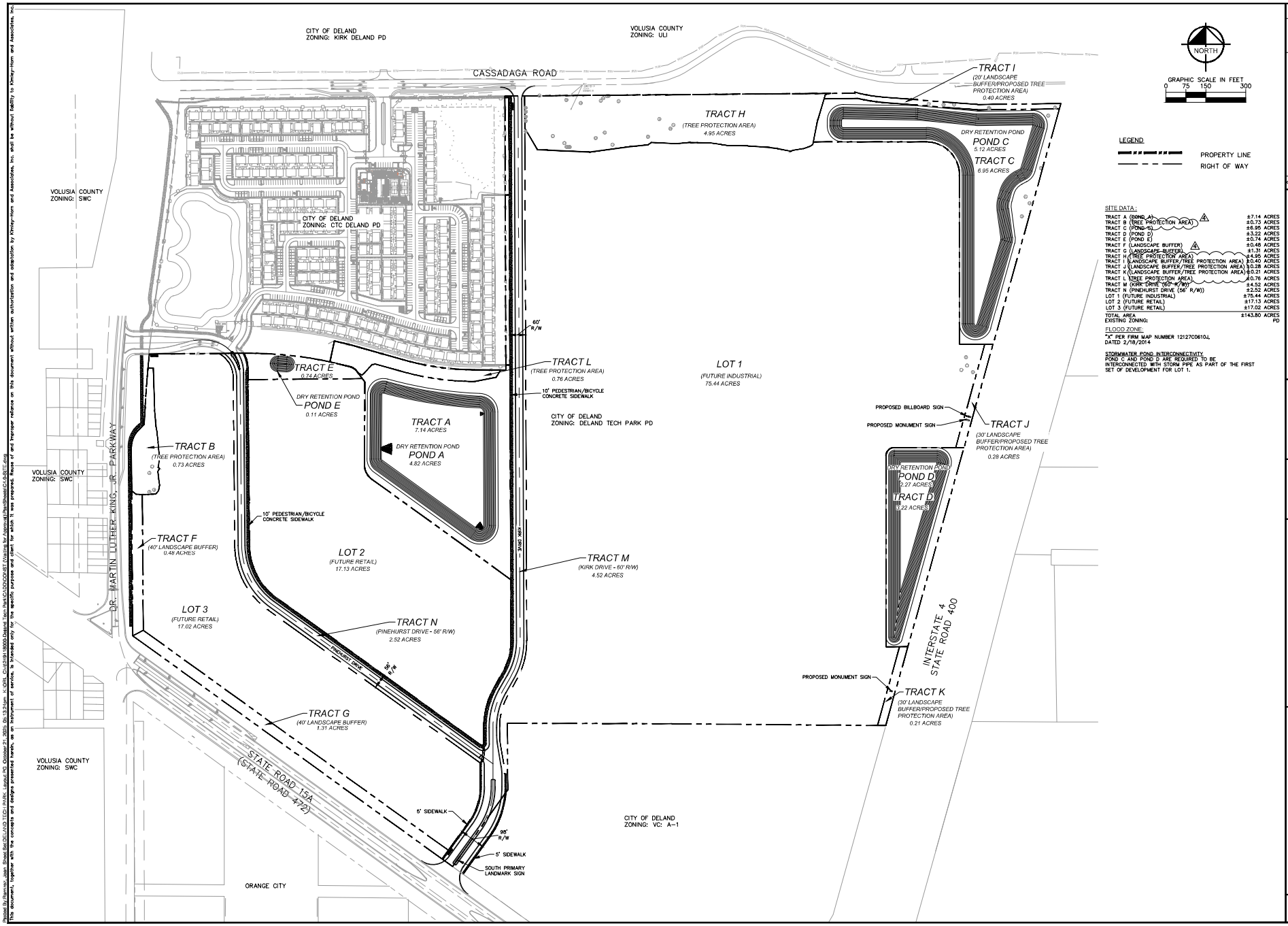

SITE DATA:

TRACT A (POND A)	±7.14 ACRES
TRACT B (TREE PROTECTION AREA)	±0.73 ACRES
TRACT C (POND C)	±6.95 ACRES
TRACT D (POND D)	±3.22 ACRES
TRACT E (POND E)	±0.74 ACRES
TRACT F (LANDSCAPE BUFFER)	±0.48 ACRES
TRACT G (LANDSCAPE BUFFER)	±1.31 ACRES
TRACT H (TREE PROTECTION AREA)	±4.95 ACRES
TRACT I (LANDSCAPE BUFFER/TREE PROTECTION AREA)	±0.40 ACRES
TRACT J (LANDSCAPE BUFFER/TREE PROTECTION AREA)	±0.28 ACRES
TRACT K (LANDSCAPE BUFFER/TREE PROTECTION AREA)	±0.21 ACRES
TRACT L (TREE PROTECTION AREA)	±0.76 ACRES
TRACT M (KIRK DRIVE (60' R/W))	±4.52 ACRES
TRACT N (PINEHURST DRIVE (56' R/W))	±2.52 ACRES
LOT 1 (FUTURE INDUSTRIAL)	±75.44 ACRES
LOT 2 (FUTURE RETAIL)	±17.13 ACRES
LOT 3 (FUTURE RETAIL)	±17.02 ACRES
TOTAL AREA	±143.80 ACRES
EXISTING ZONING:	PD

FLOOD ZONE:
"X" PER FIRM MAP NUMBER 12127C0610J, DATED 2/18/2014

STORMWATER POND INTERCONNECTIVITY
POND C AND POND D ARE REQUIRED TO BE INTERCONNECTED WITH STORM PIPE AS PART OF THE FIRST SET OF DEVELOPMENT FOR LOT 1.

No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/7/24	JDR
2	REVISED PER CITY COMMENTS	07/11/25	JDR
3	REVISED PER CITY COMMENTS	08/15/25	JDR
4	REVISED PER CITY COMMENTS	10/24/25	JDR

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JEFFREY R. SWISHER, P.E.
FLORIDA LICENSE NUMBER
60275

KHA PROJECT
245418000
DATE
10/07/2025
SCALE AS SHOWN
DESIGNED BY —
DRAWN BY —
CHECKED BY —

OVERALL SITE PLAN

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER
C4.0

Plotted By: Raymond Jones Sheet Set: DELAND TECH PARK Layout: C4.0 October 21, 2025 - 02:13:24pm K:\ORL_Civil\245418000\Deland Tech Park\CADD\CONSET Water for Approval\SheetSheets\C4.0-SITE.dwg
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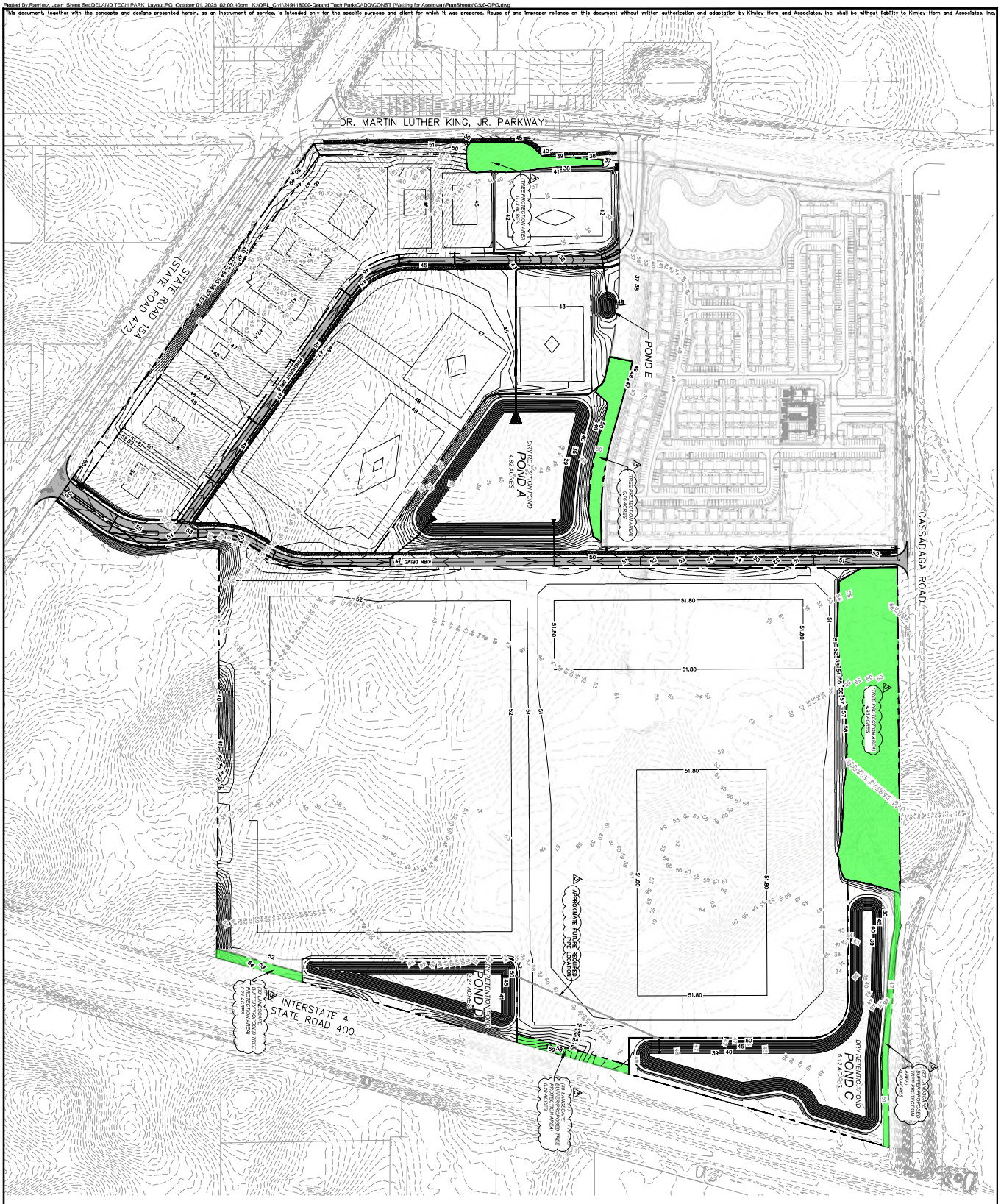
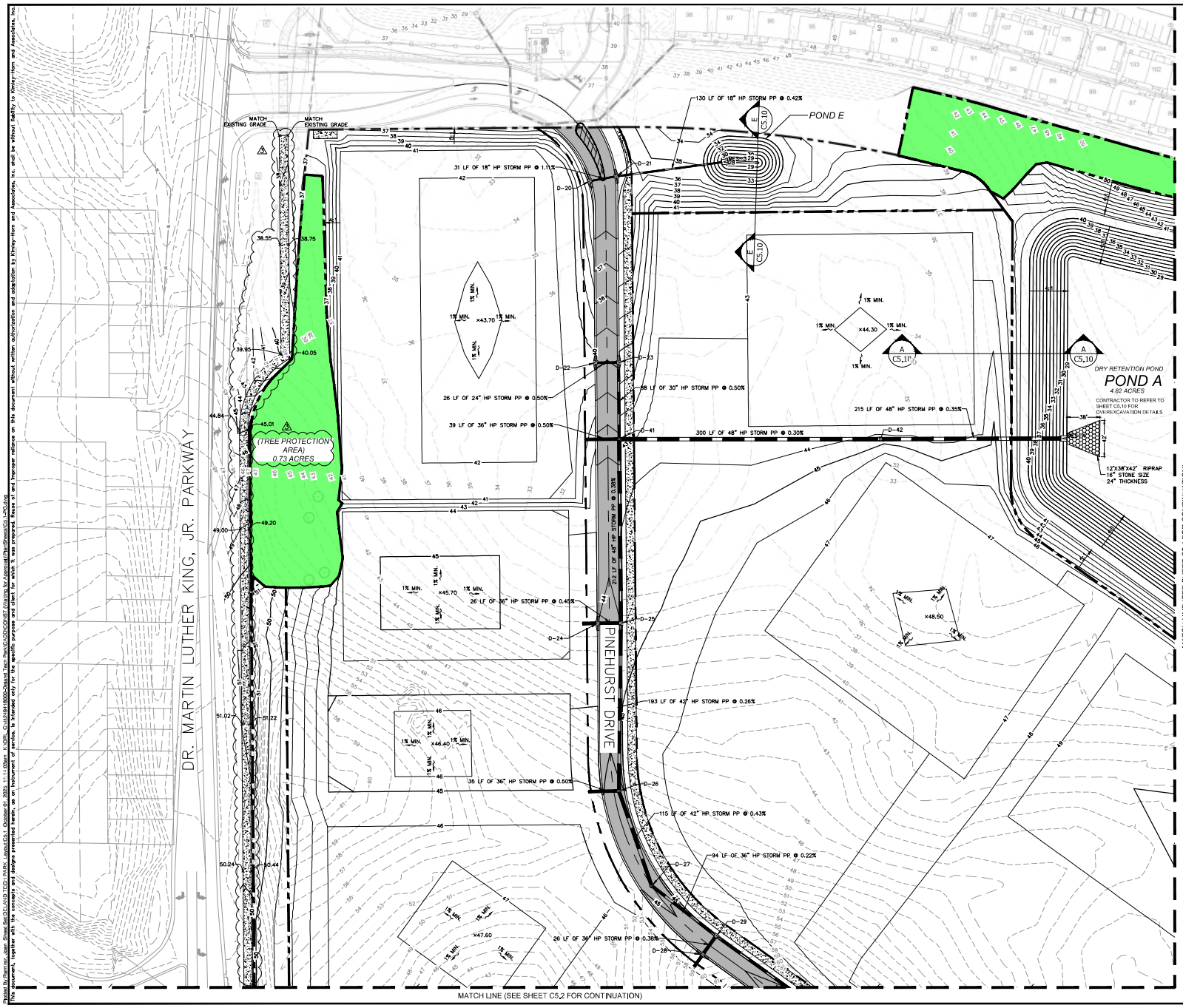

DR. MARTIN LUTHER KING, JR. PARKWAY
STATE ROAD 15A (STATE ROAD 472)
CASSADAGA ROAD
INTERSTATE 4
STATE ROAD 400
POND A
DRY RETENTION POND
4.82 ACRES
POND B
DRY RETENTION POND
2.17 ACRES
POND C
DRY RETENTION POND
5.12 ACRES
POND E
TREE PROTECTION AREA
0.24 ACRES
TREE PROTECTION AREA
0.49 ACRES
TREE PROTECTION AREA
0.28 ACRES
TREE PROTECTION AREA
0.08 ACRES
TREE PROTECTION AREA
0.08 ACRES
TREE PROTECTION AREA
0.08



NORTH

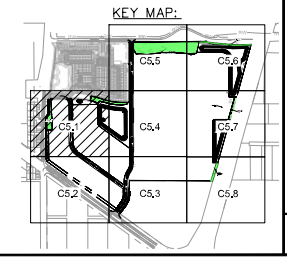
GRAPHIC SCALE IN FEET
0 25 50 100

LEGEND

- PROPERTY LINE PROPOSED
- 50 CONTOURS PROPOSED
- 50 CONTOURS EXISTING
- PROPOSED HEAVY DUTY ASPHALT
- PROPOSED CONCRETE SIDEWALK
- TREE PROTECTION AREA
- STORM PIPE PROPOSED
- STORM MANHOLE PROPOSED
- STORM INLET PROPOSED
- CURB INLET PROPOSED
- STORM MES PROPOSED

NOTE:
LIDAR SURFACE CONTOURS HAVE BEEN ADDED OUTSIDE OF THE PROPERTY BOUNDARY FOR INFORMATIONAL PURPOSES.

KEY MAP:



No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/21/24	JOR
2	REVISED PER CITY COMMENTS	07/10/25	JOR
3	REVISED PER CITY COMMENTS	09/15/25	JOR

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JEFFREY R. SWISHER, P.E.
FLORIDA LICENSE NUMBER
60275

KHA PROJECT 249418000
DATE 09/30/2025
SCALE AS SHOWN
DESIGNED BY —
DRAWN BY —
CHECKED BY —

PAVING, GRADING AND DRAINAGE PLAN

DELAND TECH PARK
CITY OF DELAND FLORIDA

SHEET NUMBER
C5.1

Plotted By:Ramirez, Joan Sheet Set:DELAND TECH PARK Layout:C5.1 October 01, 2025 11:14:03am K:\ORL_Civil\249418000-Deland Tech Park\CADD\CONST (Waiting for Approval)\Plan Sheets\C5.1-PD.dwg
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Plotted By:Ramirez, Joan Sheet Set:DELAND TECH PARK Layout:C5.2 September 29, 2025 10:34:32am K:\ORL_Civil\249418000-Deland Tech Park\CADD\CONST (Waiting for Approval)\PlanSheets\C5.1-PG.dwg
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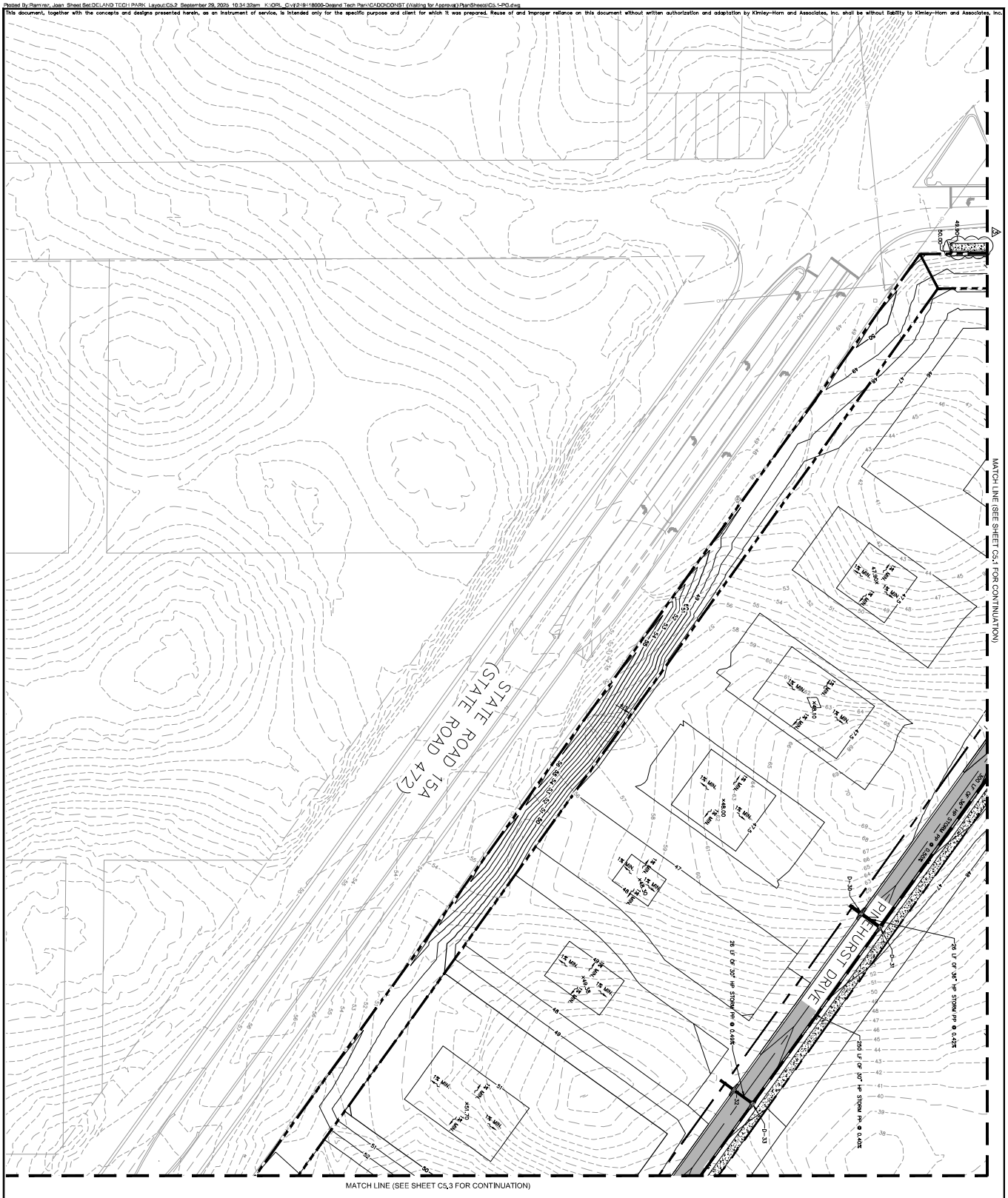
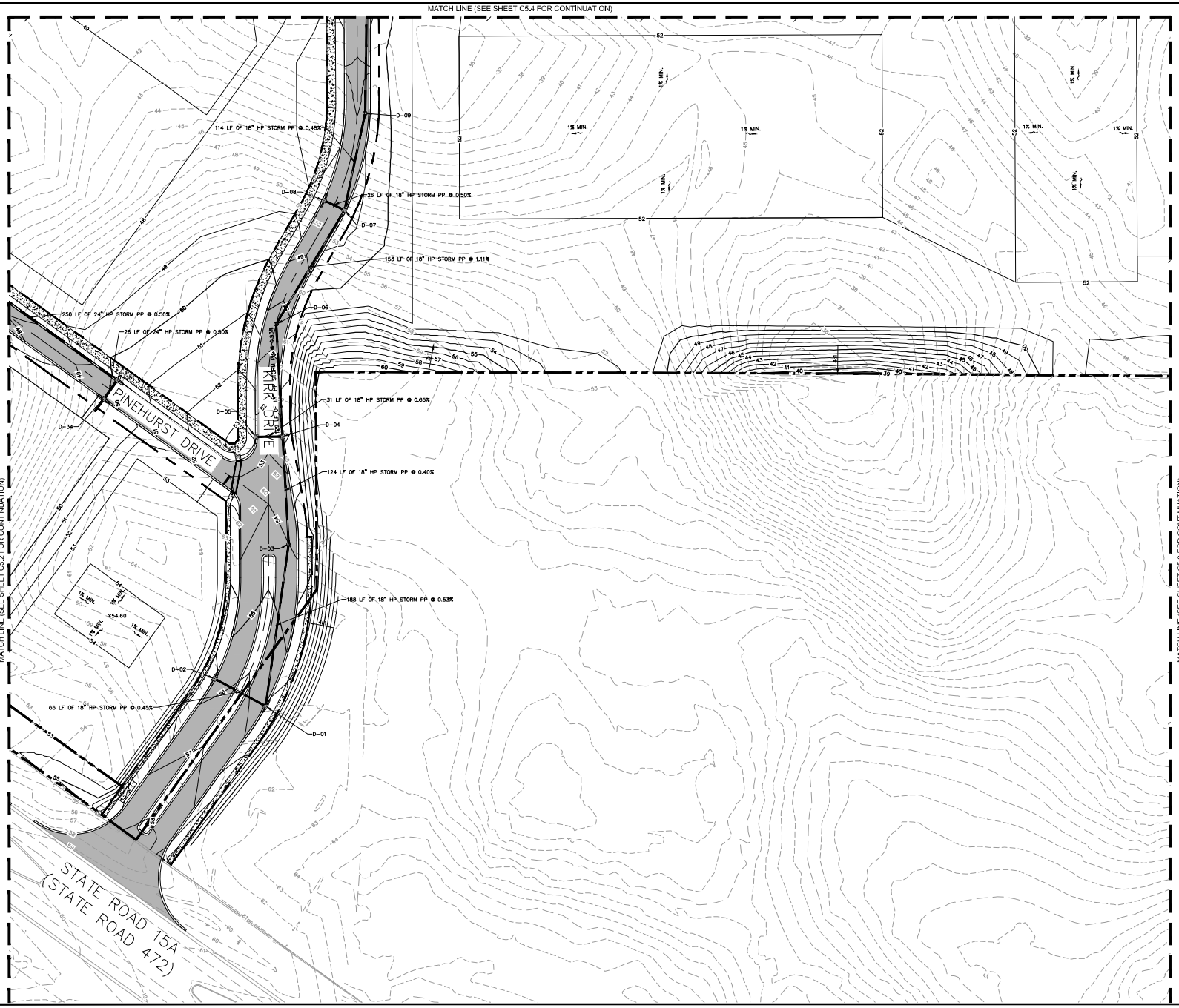


SHEET NUMBER C5.2	DELAND TECH PARK CITY OF DELAND FLORIDA	PAVING, GRADING AND DRAINAGE PLAN	KHA PROJECT 249418000 DATE 09/30/2025 SCALE AS SHOWN DESIGNED BY — DRAWN BY — CHECKED BY —	JEFFREY R. SWISHER, P.E. FLORIDA LICENSE NUMBER 60275	Kimley»Horn © 2024 KIMLEY-HORN AND ASSOCIATES, INC. 200 S. ORANGE AVENUE, SUITE 600, ORLANDO, FL 32801 PHONE: (407) 898-1511 WWW.KIMLEY-HORN.COM CA-00000696	1 REVISED PER CITY COMMENTS 10/21/24 JOR 2 REVISED PER CITY COMMENTS 07/10/25 JOR 3 REVISED PER CITY COMMENTS 09/15/25 JOR No. REVISIONS DATE BY



NORTH

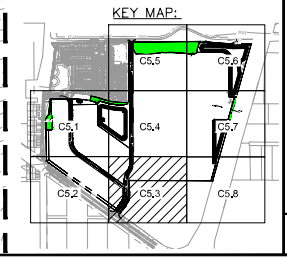
GRAPHIC SCALE IN FEET
0 25 50 100

LEGEND

- PROPERTY LINE PROPOSED
- 50 CONTOURS PROPOSED
- 50 CONTOURS EXISTING
- PROPOSED HEAVY DUTY ASPHALT
- PROPOSED CONCRETE SIDEWALK
- TREE PROTECTION AREA
- STORM PIPE PROPOSED
- STORM MANHOLE PROPOSED
- STORM INLET PROPOSED
- CURB INLET PROPOSED
- STORM MES PROPOSED

NOTE:
LIDAR SURFACE CONTOURS HAVE BEEN ADDED OUTSIDE OF THE PROPERTY BOUNDARY FOR INFORMATIONAL PURPOSES.

KEY MAP:



No.	REVISIONS	DATE	BY
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2	REVISED PER CITY COMMENTS	07/10/25	JOR
2	REVISED PER CITY COMMENTS	09/03/25	JOR

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JEFFREY R. SWISHER, P.E.
FLORIDA LICENSE NUMBER
60275

KHA PROJECT
249418000
DATE
09/03/2025
SCALE AS SHOWN
DESIGNED BY —
DRAWN BY —
CHECKED BY —

PAVING, GRADING AND DRAINAGE PLAN

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER
C5.3

Plotted By:Ramirez, Joan Sheet Set:DELAND TECH PARK Layout:C5.3 September 09, 2025 04:36:03pm K:\ORL_Civil\249418000-Deland Tech Park\CADD\CONST (Waiting for Approval)\Plan Sheets\C5.1-PG.dwg
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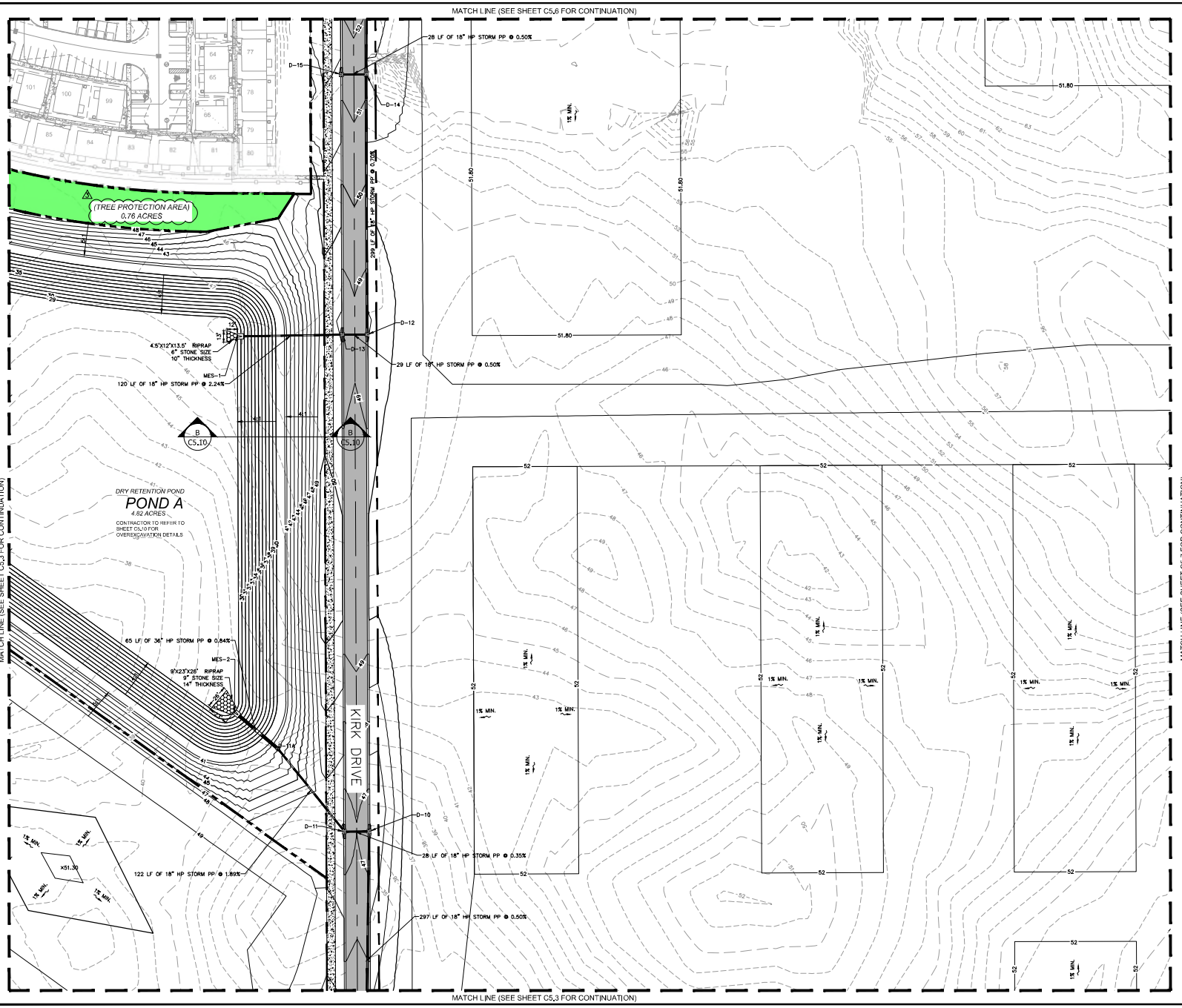

No.	REVISIONS	DATE	BY
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2	REVISED PER CITY COMMENTS	07/10/25	JOR
3	REVISED PER CITY COMMENTS	09/03/25	JOR

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FLORIDA LICENSE NUMBER
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KHA PROJECT 249418000
DATE 09/03/2025
SCALE AS SHOWN
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PAVING, GRADING AND DRAINAGE PLAN

DELAND TECH PARK
CITY OF DELAND FLORIDA

SHEET NUMBER
C5.4

Plotted By:Ramirez, Joan Sheet Set:DELAND TECH PARK Layout:C5.4 September 09, 2025 04:36:13pm K:\ORL_Civil\249418000-Deland Tech Park\CADD\CONST (Waiting for Approval)\Plan\Sheets\C5.4-PG.dwg
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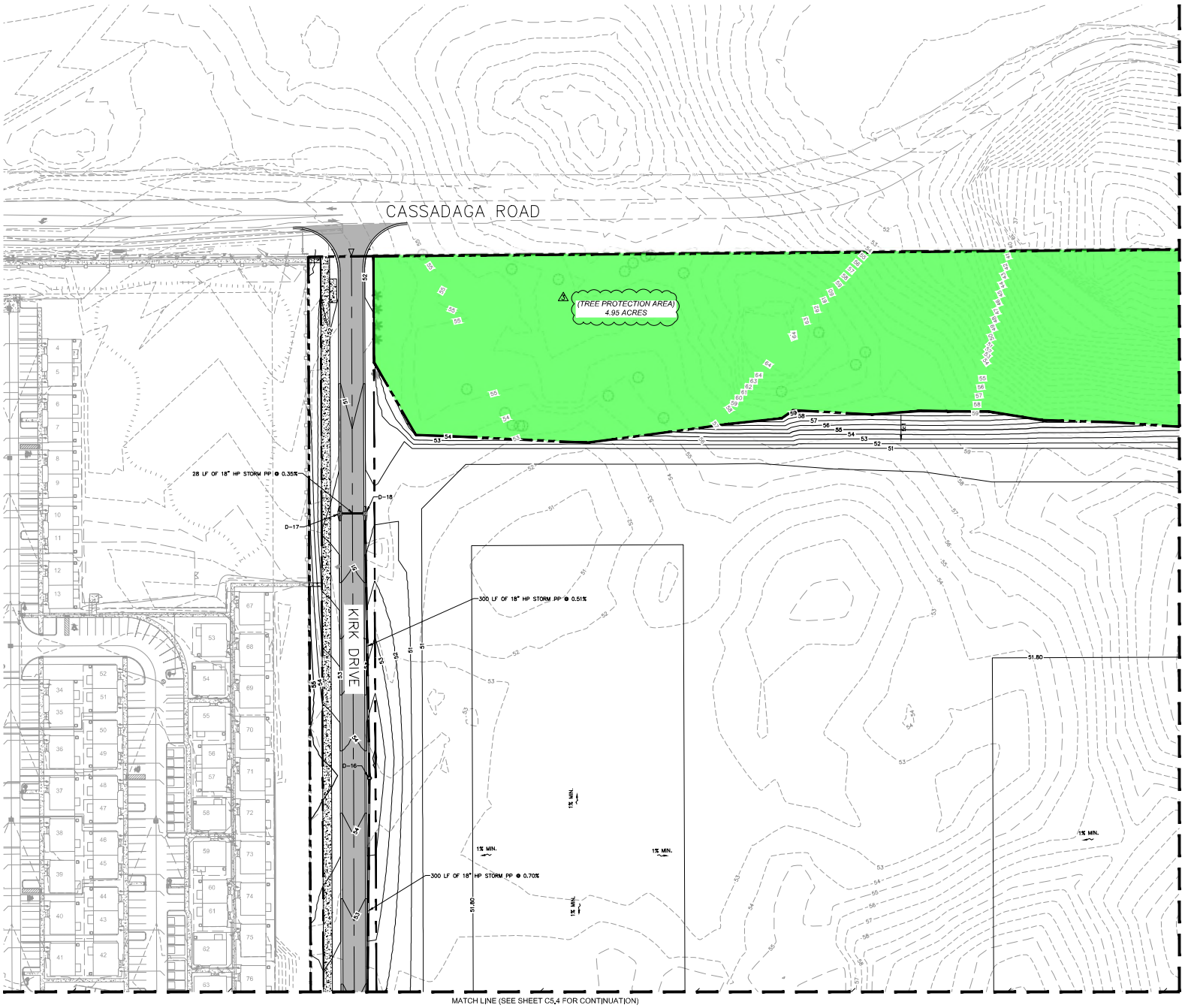


NORTH

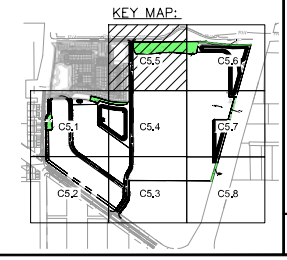
GRAPHIC SCALE IN FEET
0 25 50 100

LEGEND

- PROPERTY LINE PROPOSED
- 50 CONTOURS PROPOSED
- 50 CONTOURS EXISTING
- PROPOSED HEAVY DUTY ASPHALT
- PROPOSED CONCRETE SIDEWALK
- TREE PROTECTION AREA
- STORM PIPE PROPOSED
- STORM MANHOLE PROPOSED
- STORM INLET PROPOSED
- CURB INLET PROPOSED
- STORM MES PROPOSED

NOTE:
LIDAR SURFACE CONTOURS HAVE BEEN ADDED OUTSIDE OF THE PROPERTY BOUNDARY FOR INFORMATIONAL PURPOSES.

KEY MAP:



No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/21/24	JOR
2	REVISED PER CITY COMMENTS	07/10/25	JOR
2	REVISED PER CITY COMMENTS	09/15/25	JOR

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PAVING, GRADING AND DRAINAGE PLAN

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER
C5.5

Plotted By:Ramirez, Joan Sheet Set:DELAND TECH PARK Layout:C5.5 September 29, 2025 05:22:36pm K:\ORL_Civil\249418000-Deland Tech Park\CADD\CONST (Waiting for Approval)\Plans\Sheets\C5.5-PG.dwg
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Plotted By:Ramirez, Joan Sheet Set:DELAND TECH PARK Layout:C5.6 September 29, 2025 03:16:19pm K:\ORL_C\v12\249418000-Deland Tech Park\CADD\CONST (Waiting for Approval)\PlanSheets\C5.1-PG.dwg
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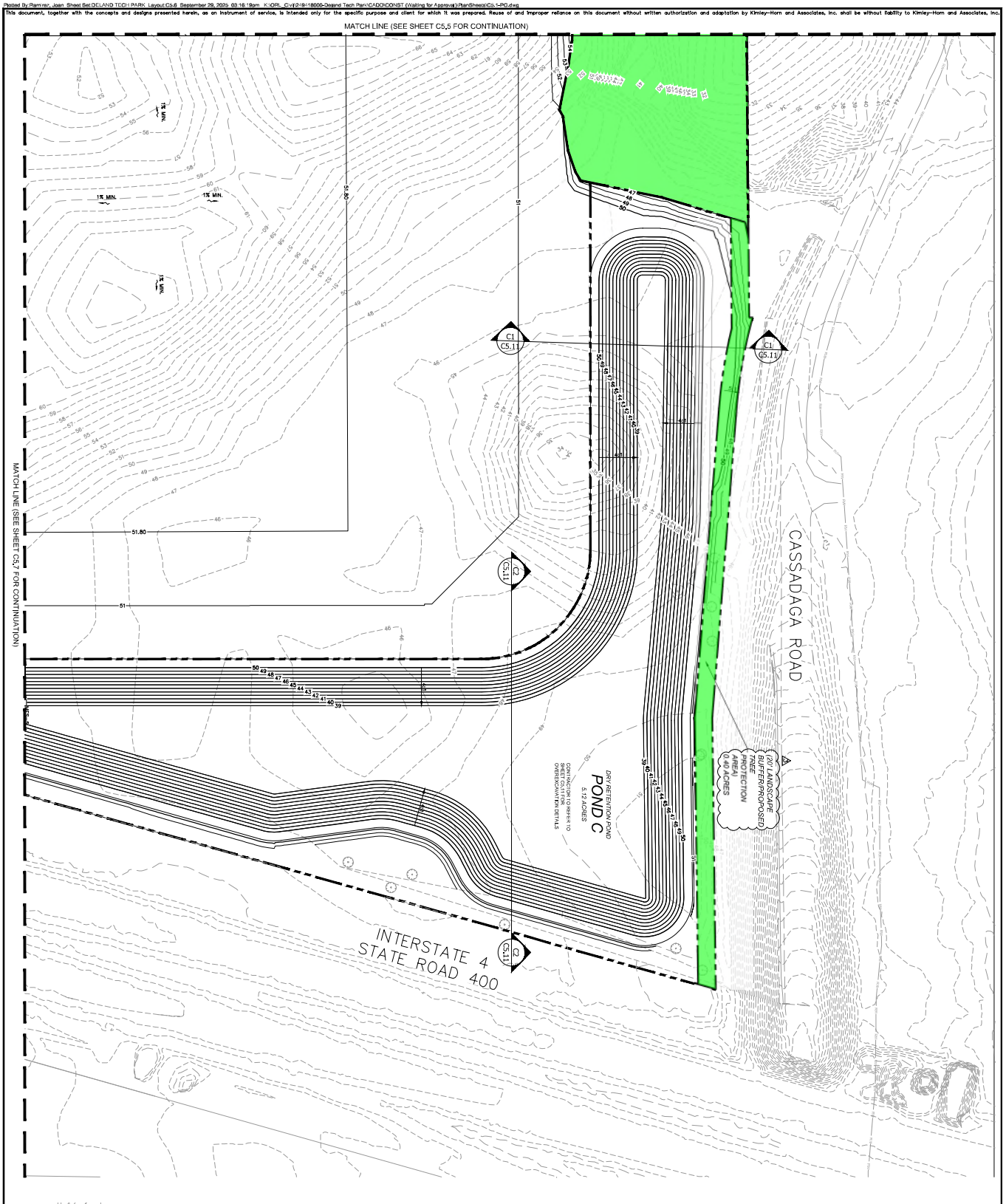
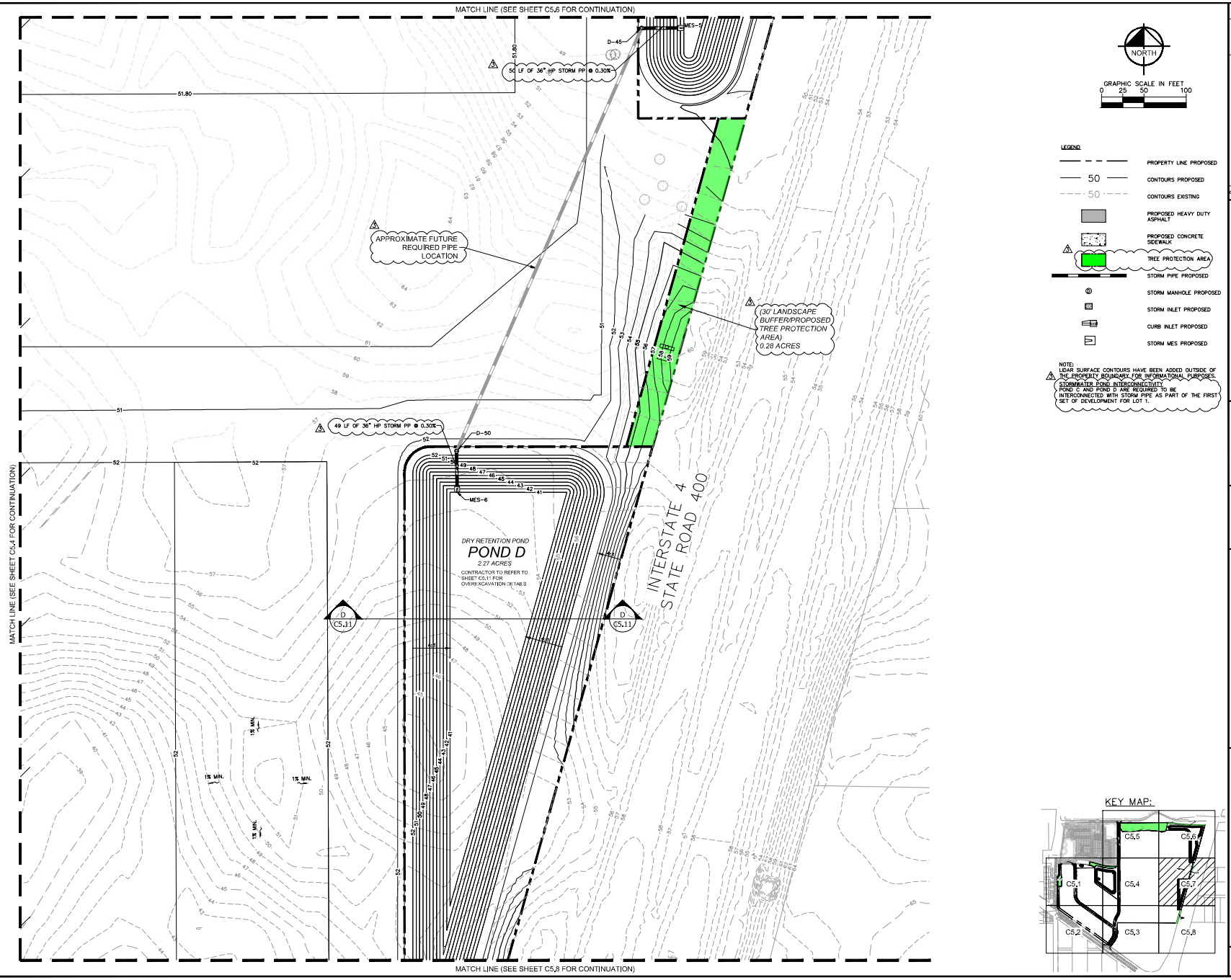


SHEET NUMBER C5.6	DELAND TECH PARK CITY OF DELAND FLORIDA	PAVING, GRADING AND DRAINAGE PLAN	KHA PROJECT 249418000 DATE 09/26/2025 SCALE AS SHOWN DESIGNED BY — DRAWN BY — CHECKED BY —	JEFFREY R. SWISHER, P.E. FLORIDA LICENSE NUMBER 60275	Kimley»Horn © 2024 KIMLEY-HORN AND ASSOCIATES, INC. 200 S. ORANGE AVENUE, SUITE 600, ORLANDO, FL 32801 PHONE: (407) 898-1511 WWW.KIMLEY-HORN.COM CA-00000696

No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/21/24	JOR
2	REVISED PER CITY COMMENTS	07/10/25	JOR
3	REVISED PER CITY COMMENTS	09/15/25	JOR



No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/21/24	JDR
2	REVISED PER CITY COMMENTS	07/10/25	JDR
3	REVISED PER CITY COMMENTS	09/15/25	JDR

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JEFFREY R. SWISHER, P.E.
FLORIDA LICENSE NUMBER 60275

KHA PROJECT 240418000
DATE 09/09/2025
SCALE AS SHOWN
DESIGNED BY —
DRAWN BY —
CHECKED BY —

PAVING, GRADING AND DRAINAGE PLAN

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER C5.7

Plotted By: Raymond Jones Sheet Set: DELAND TECH PARK Layout: C5.7 September 29, 2025 - 03:16:39pm K:\ORL_Civil\240418000-Deland Tech Park\CADD\CIVIL\Utilities for Approval\UtilitySheets\C5.7.dwg
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Plotted By:Ramirez, Joan Sheet Set:DELAND TECH PARK Layout:C5.8 October 01, 2025 02:32:10pm K:\ORL_Civil\249418000-Deland Tech Park\CADD\CONST (Waiting for Approval)\PlanSheets\C5.1-PC.dwg
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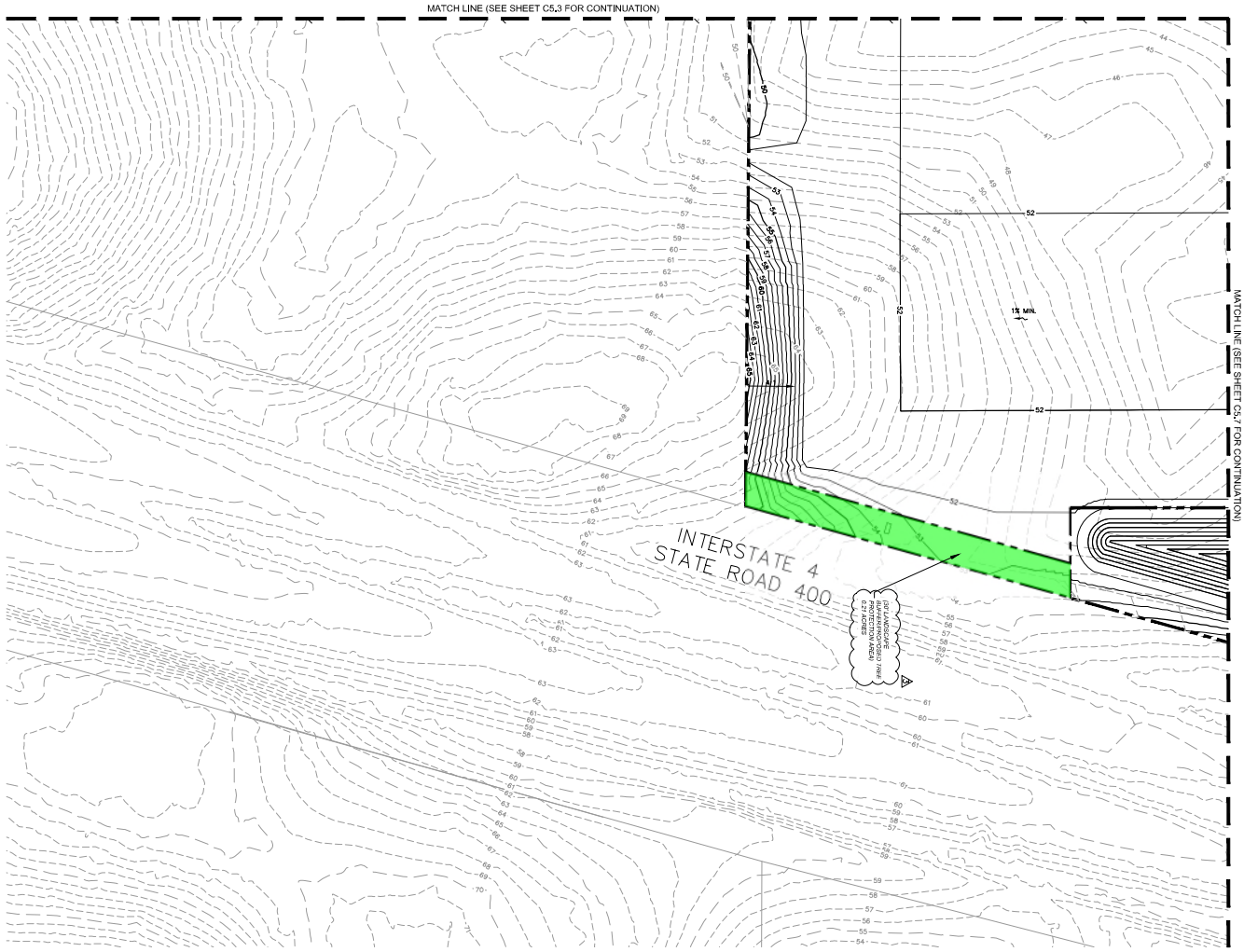

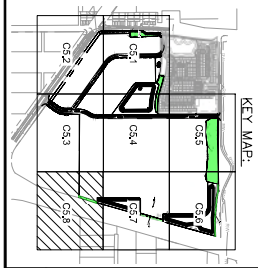

LEGEND

PROPERTY LINE PROPOSED

CONTOURS PROPOSED

CONTOURS EXISTING

PROPOSED HEAVY DUTY ASPHALT

PROPOSED CONCRETE SIDEWALK

TREE PROTECTION AREA

STORM PIPE PROPOSED

STORM MANHOLE PROPOSED

STORM INLET PROPOSED

CURB INLET PROPOSED

STORM MES PROPOSED

NOTE: SURFACE CONTOURS HAVE BEEN ADDED OUTSIDE OF THE PROPERTY BOUNDARY FOR INFORMATIONAL PURPOSES.

GRAPHIC SCALE IN FEET
0 25 50 100

NORTH

SHEET NUMBER C5.8	DELAND TECH PARK CITY OF DELAND FLORIDA	PAVING, GRADING AND DRAINAGE PLAN	KHA PROJECT 249418000 DATE 09/08/2025 SCALE AS SHOWN DESIGNED BY — DRAWN BY — CHECKED BY —	JEFFREY R. SWISHER, P.E. FLORIDA LICENSE NUMBER 60275	Kimley»Horn © 2024 KIMLEY-HORN AND ASSOCIATES, INC. 200 S. ORANGE AVENUE, SUITE 600, ORLANDO, FL 32801 PHONE: (407) 898-1511 WWW.KIMLEY-HORN.COM CA-00000696

No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/21/24	JOR
2	REVISED PER CITY COMMENTS	07/10/25	JOR
3	REVISED PER CITY COMMENTS	09/15/25	JOR

PINEHURST DRIVE STRUCTURES

STORM STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
D-20	STA: 2+26.59 (16.33 RT) TYPE "6" CURB INLET PER FDOT INDEX #425-021 EOP: 35.13 E. INV OUT: 28.89 (18" HP STORM PP)
D-21	STA: 2+26.57 (−14.24 LT) TYPE "6" CURB INLET PER FDOT INDEX #425-021 EOP: 35.28 W. INV IN: 28.55 (18" HP STORM PP) E. INV OUT: 28.55 (18" HP STORM PP)
D-22	STA: 4+38.56 (13.22 RT) TYPE "5" CURB INLET PER FDOT INDEX #425-021 EOP: 39.84 E. INV OUT: 34.35 (24" HP STORM PP)
D-23	STA: 4+38.58 (−13.26 LT) TYPE "5" CURB INLET PER FDOT INDEX #425-021 EOP: 39.84 W. INV IN: 34.22 (24" HP STORM PP) S. INV OUT: 33.03 (30" HP STORM PP)
D-24	STA: 7+38.61 (13.22 RT) TYPE "6" CURB INLET PER FDOT INDEX #425-021 EOP: 44.02 W. INV IN: 35.80 (36" HP STORM PP) E. INV OUT: 35.80 (36" HP STORM PP)
D-25	STA: 7+38.63 (−13.25 LT) TYPE "5" CURB INLET PER FDOT INDEX #425-021 EOP: 44.02 W. INV IN: 35.68 (36" HP STORM PP) S. INV IN: 34.50 (42" HP STORM PP) N. INV OUT: 33.80 (48" HP STORM PP)
D-26	STA: 9+32.97 (−5.96 LT) TYPE "J7" MANHOLE PER FDOT INDEX #425-010 EOP: 45.12 S. INV IN: 35.00 (42" HP STORM PP) W. INV IN: 35.00 (36" HP STORM PP) N. INV OUT: 35.00 (42" HP STORM PP)
D-27	STA: 10+50.00 (0.00) TYPE "J7" MANHOLE PER FDOT INDEX #425-010 EOP: 45.23 SE. INV IN: 36.19 (36" HP STORM PP) N. INV OUT: 35.50 (42" HP STORM PP)
D-28	STA: 11+46.10 (13.25 RT) TYPE "6" CURB INLET PER FDOT INDEX #425-021 EOP: 44.62 SW. INV IN: 36.60 (36" HP STORM PP) NE. INV OUT: 36.60 (36" HP STORM PP)
D-29	STA: 11+46.10 (−13.25 LT) TYPE "6" CURB INLET PER FDOT INDEX #425-021 EOP: 44.62 SW. INV IN: 36.50 (36" HP STORM PP) SE. INV IN: 36.40 (36" HP STORM PP) NW. INV OUT: 36.40 (36" HP STORM PP)

STORM STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
D-30	STA: 14+46.10 (13.24 RT) TYPE "5" CURB INLET PER FDOT INDEX #425-021 EOP: 46.01 SW. INV IN: 38.20 (36" HP STORM PP) NE. INV OUT: 38.10 (36" HP STORM PP)
D-31	STA: 14+46.10 (−13.25 LT) TYPE "5" CURB INLET PER FDOT INDEX #425-021 EOP: 46.01 SE. INV IN: 38.13 (30" HP STORM PP) SW. INV IN: 37.99 (36" HP STORM PP) NW. INV OUT: 37.90 (36" HP STORM PP)
D-32	STA: 16+96.10 (13.25 RT) TYPE "5" CURB INLET PER FDOT INDEX #425-021 EOP: 47.26 SW. INV IN: 39.62 (30" HP STORM PP) NE. INV OUT: 39.62 (30" HP STORM PP)
D-33	STA: 16+96.10 (−13.23 LT) TYPE "5" CURB INLET PER FDOT INDEX #425-021 EOP: 47.26 SE. INV IN: 40.38 (24" HP STORM PP) SW. INV IN: 39.49 (30" HP STORM PP) NW. INV OUT: 39.12 (30" HP STORM PP)
D-34	STA: 19+46.10 (13.24 RT) TYPE "5" CURB INLET PER FDOT INDEX #425-021 EOP: 49.63 SW. INV IN: 42.00 (24" HP STORM PP) NE. INV OUT: 42.00 (24" HP STORM PP)
D-35	STA: 19+46.10 (−13.23 LT) TYPE "5" CURB INLET PER FDOT INDEX #425-021 EOP: 49.63 SW. INV IN: 41.87 (24" HP STORM PP) NW. INV OUT: 41.63 (24" HP STORM PP)
D-41	STA: 5+26.54 (−13.25 LT) TYPE "J9" MANHOLE PER FDOT INDEX #425-010 EOP: 42.20 S. INV IN: 33.00 (48" HP STORM PP) N. INV IN: 32.59 (30" HP STORM PP) W. INV IN: 31.00 (36" HP STORM PP) E. INV OUT: 31.00 (48" HP STORM PP)
D-42	STA: 5+29.18 (−313.34 LT) TYPE "J7" MANHOLE PER FDOT INDEX #425-010 EOP: 44.49 W. INV IN: 30.10 (48" HP STORM PP) E. INV OUT: 29.75 (48" HP STORM PP)

NOTE:
TOP OF INLET STRUCTURES ARE 4.5" ABOVE EOP

KIRK DRIVE STRUCTURES

STORM STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
D-01	STA: 3+06.80 (33.25 RT) TYPE "5" CURB INLET PER FDOT INDEX #425-021 EOP: 55.60 NW. INV IN: 50.00 (18" HP STORM PP) N. INV OUT: 50.00 (18" HP STORM PP)
D-02	STA: 3+06.84 (−33.24 LT) TYPE "5" CURB INLET PER FDOT INDEX #425-021 EOP: 55.60 SE. INV OUT: 50.30 (18" HP STORM PP)
D-03	STA: 4+82.18 (22.99 RT) TYPE "P7" MANHOLE PER FDOT INDEX #425-010 EOP: 54.01 S. INV IN: 49.00 (18" HP STORM PP) N. INV OUT: 49.00 (18" HP STORM PP)
D-04	STA: 6+06.16 (16.34 RT) TYPE "5" CURB INLET PER FDOT INDEX #425-021 EOP: 52.36 W. INV IN: 46.70 (18" HP STORM PP) S. INV IN: 48.50 (18" HP STORM PP) E. INV OUT: 46.20 (18" HP STORM PP)
D-05	STA: 6+06.00 (−14.27 LT) TYPE "5" CURB INLET PER FDOT INDEX #425-021 EOP: 52.43 E. INV OUT: 46.90 (18" HP STORM PP)
D-07	STA: 8+88.29 (13.00 RT) TYPE "6" CURB INLET PER FDOT INDEX #425-021 EOP: 48.11 NW. INV IN: 42.87 (18" HP STORM PP) SW. INV IN: 43.30 (18" HP STORM PP) N. INV OUT: 40.20 (18" HP STORM PP)
D-08	STA: 8+88.29 (−13.00 LT) TYPE "6" CURB INLET PER FDOT INDEX #425-021 EOP: 48.11 SE. INV OUT: 43.00 (18" HP STORM PP)
D-09	STA: 9+98.29 (9.12 RT) TYPE "P7" MANHOLE PER FDOT INDEX #425-010 EOP: 48.84 S. INV IN: 39.65 (18" HP STORM PP) N. INV OUT: 39.65 (18" HP STORM PP)
D-10	STA: 12+94.52 (14.18 RT) TYPE "6" CURB INLET PER FDOT INDEX #425-021 EOP: 44.49 S. INV IN: 38.18 (18" HP STORM PP) W. INV OUT: 38.00 (18" HP STORM PP)
D-11	STA: 12+94.52 (−14.25 LT) TYPE "6" CURB INLET PER FDOT INDEX #425-021 EOP: 46.51 E. INV IN: 37.90 (18" HP STORM PP) NW. INV OUT: 36.00 (18" HP STORM PP)

NOTE:
TOP OF INLET STRUCTURES ARE 4.5" ABOVE EOP

STORM STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
D-11A	STA: 13+90.01 (−90.03 LT) TYPE "P7" MANHOLE PER FDOT INDEX #425-010 EOP: 42.00 SE. INV IN: 33.70 (18" HP STORM PP) NW. INV OUT: 29.55 (36" HP STORM PP)
D-12	STA: 18+65.14 (14.23 RT) TYPE "6" CURB INLET PER FDOT INDEX #425-021 EOP: 48.46 N. INV IN: 39.28 (18" HP STORM PP) W. INV OUT: 36.00 (18" HP STORM PP)
D-13	STA: 18+65.14 (−14.28 LT) TYPE "6" CURB INLET PER FDOT INDEX #425-021 EOP: 48.46 E. INV IN: 35.86 (18" HP STORM PP) W. INV OUT: 31.70 (18" HP STORM PP)
D-14	STA: 21+64.14 (14.23 RT) TYPE "5" CURB INLET PER FDOT INDEX #425-021 EOP: 51.31 W. INV IN: 44.24 (18" HP STORM PP) N. INV IN: 41.38 (18" HP STORM PP) S. INV OUT: 41.38 (18" HP STORM PP)
D-15	STA: 21+64.09 (−14.23 LT) TYPE "6" CURB INLET PER FDOT INDEX #425-021 EOP: 51.31 E. INV OUT: 44.38 (18" HP STORM PP)
D-16	STA: 24+64.32 (18.12 RT) TYPE "P7" MANHOLE PER FDOT INDEX #425-010 EOP: 54.90 N. INV IN: 43.48 (18" HP STORM PP) S. INV OUT: 43.48 (18" HP STORM PP)
D-17	STA: 27+64.35 (−14.24 LT) TYPE "6" CURB INLET PER FDOT INDEX #425-021 EOP: 50.25 E. INV OUT: 45.40 (18" HP STORM PP)
D-18	STA: 27+64.35 (14.24 RT) TYPE "6" CURB INLET PER FDOT INDEX #425-021 EOP: 50.25 W. INV IN: 45.30 (18" HP STORM PP) S. INV OUT: 45.00 (18" HP STORM PP)

STORM STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
MES-1	MITERED END SECTION PER FDOT INDEX #430-021 E. INV IN: 29.00 (18" HP STORM PP)
MES-2	MITERED END SECTION PER FDOT INDEX #430-022 SE. INV IN: 29.00 (36" HP STORM PP)
MES-3	MITERED END SECTION PER FDOT INDEX #430-021 W. INV IN: 28.00 (18" HP STORM PP)
MES-4	MITERED END SECTION PER FDOT INDEX #430-022 W. INV IN: 29.00 (48" HP STORM PP)
MES-5	MITERED END SECTION PER FDOT INDEX #430-022 W. INV IN: 39.00 (36" HP STORM PP)
MES-6	MITERED END SECTION PER FDOT INDEX #430-022 N. INV IN: 41.00 (36" HP STORM PP)

STORM STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
D-45	STA: 22+23.67 (1658.79 RT) TYPE "J7" MANHOLE PER FDOT INDEX #425-010 RIM: 50.30
D-50	STA: 17+25.13 (1438.53 RT) TYPE "J7" MANHOLE PER FDOT INDEX #425-010 RIM: 52.10

No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/21/24	JDR
2	REVISED PER CITY COMMENTS	07/10/25	JDR
3	REVISED PER CITY COMMENTS	09/03/25	JDR

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PHONE: 407 898 1511
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JEFFREY R. SWISHER, P.E.
FLORIDA LICENSE NUMBER
80275

KHA PROJECT
240418000
DATE
09/09/2025
SCALE AS SHOWN
DESIGNED BY —
DRAWN BY —
CHECKED BY —

DRAINAGE STRUCTURES TABLE

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER
C5.8A

Plotted By: Barrows, Jason Saved Set: DELAND TECH PARK Layout: C5.8A September 12, 2025 09:14:03am K:\ORL_Civil\240418000-Deland Tech Park\CAD\CONST\Working for Approval\StartSheets\C5.8A.dwg
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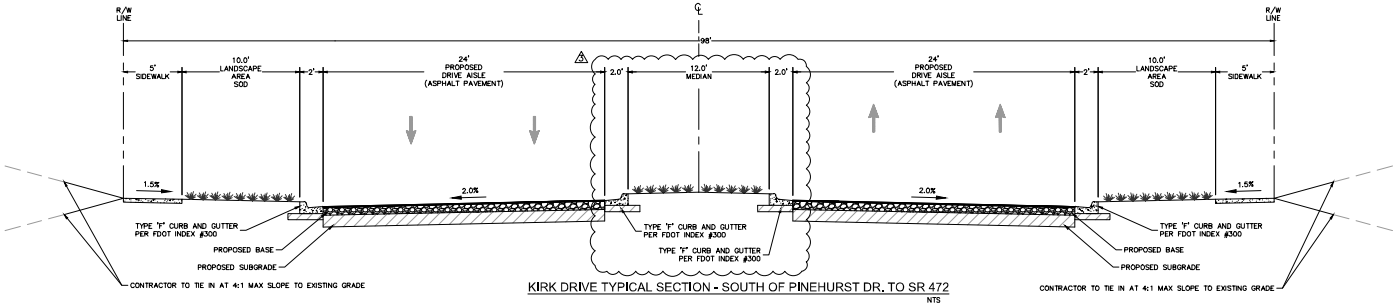
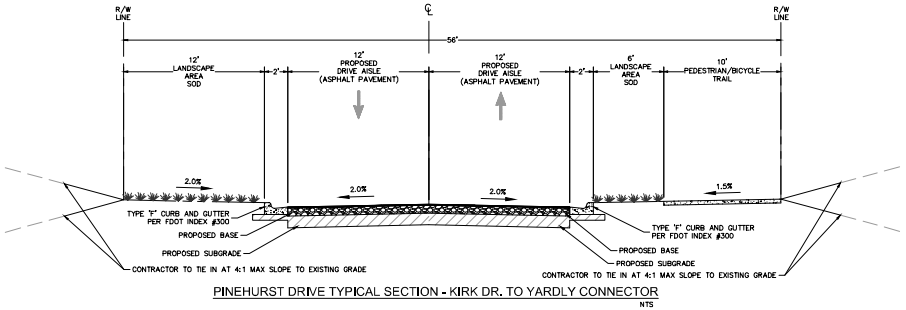
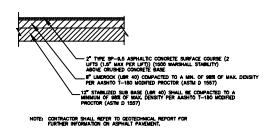


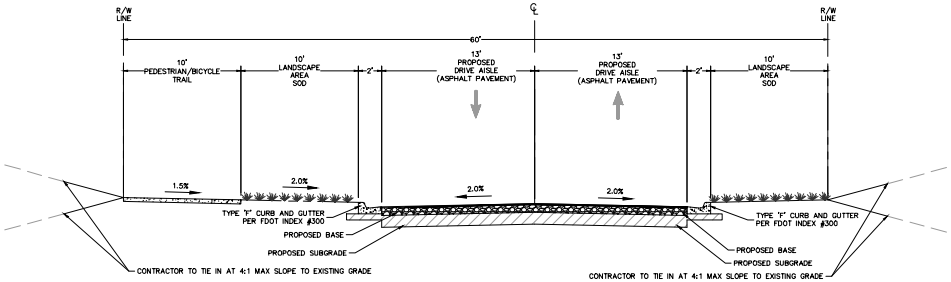
KIRK DRIVE TYPICAL SECTION - SOUTH OF PINEHURST DR. TO SR 472
NTS



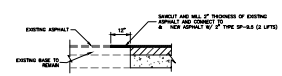
PINEHURST DRIVE TYPICAL SECTION - KIRK DR. TO YARDLY CONNECTOR
NTS



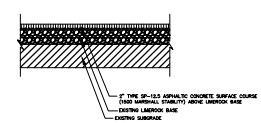
TYPICAL ASPHALT PAVEMENT SECTION FOR PINEHURST AND KIRK DRIVE
NTS



KIRK DRIVE TYPICAL SECTION - NORTH OF PINEHURST DR. TO CASSADAGA RD.
NTS



PAVEMENT CONNECTION
NTS



NOTES:
- MILL EXISTING ASPHALT PAVEMENT 1 1/2-INCH AVERAGE DEPTH
- RESURFACE 1 1/2-INCH ASPHALT SURFACE COURSE (FDOT SUPERPAVE 9.5 TL-C)

TYP. MILL & RESURFACE SECTION
N.T.S.

No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/21/24	JOR
2	REVISED PER CITY COMMENTS	07/10/25	JOR
3	REVISED PER CITY COMMENTS	09/15/25	JOR

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JEFFREY R. SWISHER, P.E.
FLORIDA LICENSE NUMBER
60275

KHA PROJECT 249418000
DATE 09/08/2025
SCALE AS SHOWN
DESIGNED BY —
DRAWN BY —
CHECKED BY —

TYPICAL SECTIONS

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER
C5.9

Plotted By:Ramirez Jean Sheet Set:DELAND TECH PARK Layout:SECTIONS September 29, 2025 01:50:33pm K:\ORL_Civil\249418000-Deland Tech Park\CAD\CONST\Waiting for Approval\Plan\Sheets\C5.5-XSEC.dwg
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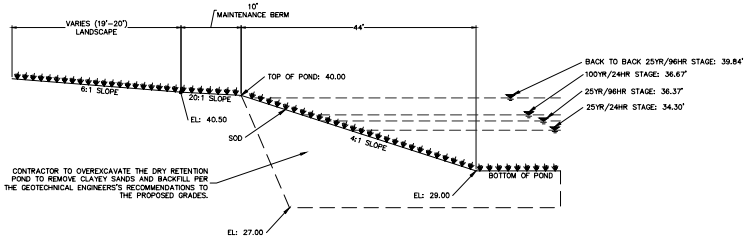
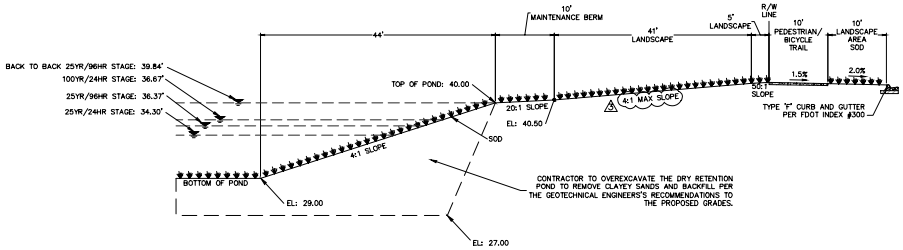
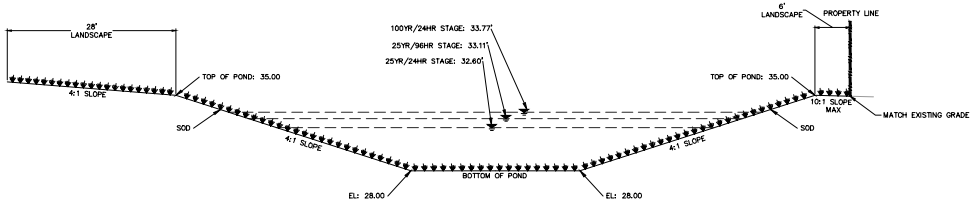


TYPICAL POND SECTION A-A
NTS



TYPICAL POND SECTION B-B
NTS

POND A



TYPICAL POND SECTION E-E
NTS

POND E

Plotted By: Ramirez, Jason Saved Set: DELAND TECH PARK Layout: SECTIONS-SET1 Saved on: Sep 18, 2025, 09:21:34pm K:\ORL_Civil\061816000-Deland Tech Park\CAD\CIVIL\Grading by Approved\DaySheets\C5.10-POND-DaySEC.dwg
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3	REVISED PER CITY COMMENTS	09/15/25	JDR

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FLORIDA LICENSE NUMBER
80275

KHA PROJECT
240418000
DATE
09/18/2025
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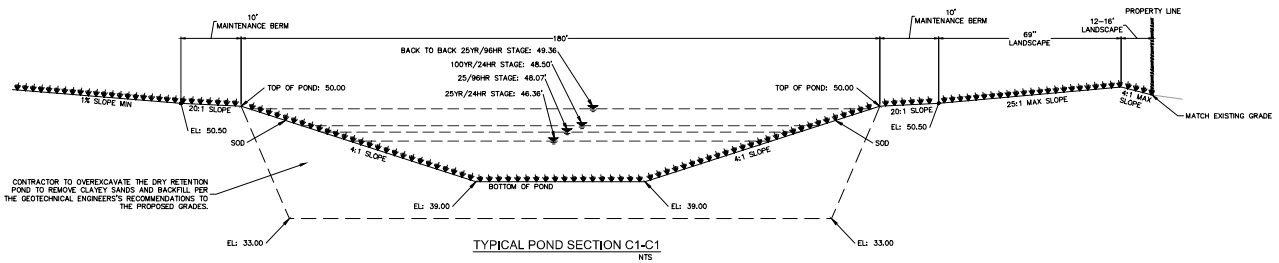
DESIGNED BY —
DRAWN BY —
CHECKED BY —

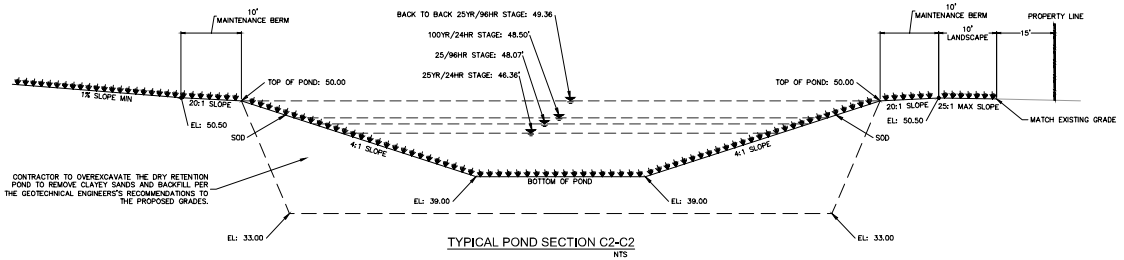
POND SECTIONS - RETAIL

DELAND TECH PARK
CITY OF DELAND FLORIDA

SHEET NUMBER
C5.10

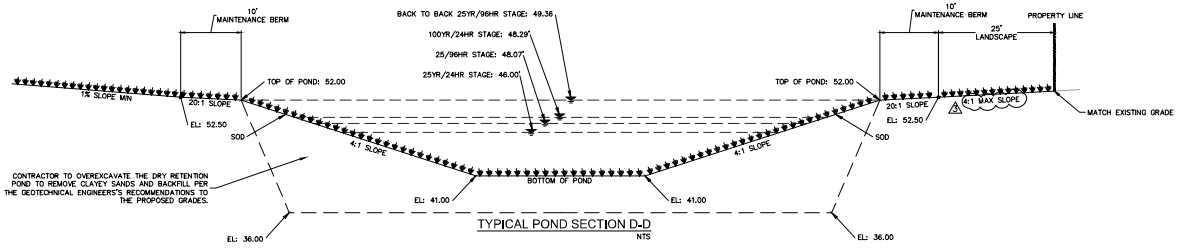


TYPICAL POND SECTION C1-C1
NTS



TYPICAL POND SECTION C2-C2
NTS

POND C



TYPICAL POND SECTION D-D
NTS

POND D

No.	REVISIONS	DATE	BY
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2	REVISED PER CITY COMMENTS	07/11/25	JDR
3	REVISED PER CITY COMMENTS	09/15/25	JDR

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JEFFREY R. SWISHER, P.E.
FLORIDA LICENSE NUMBER
80275

KHA PROJECT
240418000
DATE
09/09/2025
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POND SECTIONS - INDUSTRIAL

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER
C5.11

Plotted By: Ramirez, Jason Sheet Set: DELAND TECH PARK Layout: SECTIONS-INDUSTRIAL September 16, 2025 - 04:23:39pm K:\ORL_Civil\240418000-Deland Tech Park\CAD\CIVIL\SHEETS\Utilities for Approval\SiteSheets\C5.11-POND-SECT.dwg
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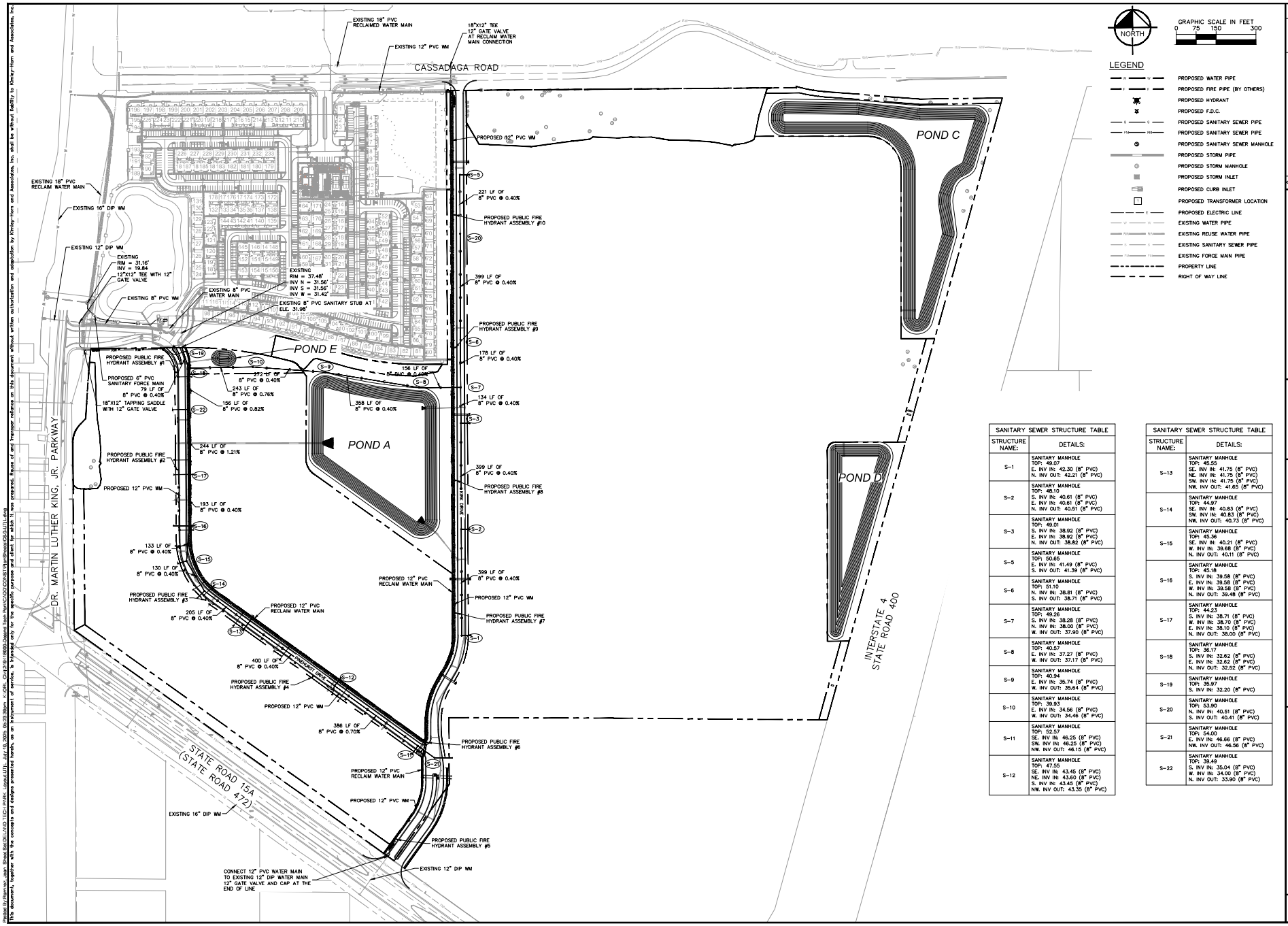

SANITARY SEWER STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
S-1	SANITARY MANHOLE TOP: 49.07 E. INV IN: 42.30 (8" PVC) N. INV OUT: 42.21 (8" PVC)
S-2	SANITARY MANHOLE TOP: 48.10 S. INV IN: 40.61 (8" PVC) E. INV IN: 40.61 (8" PVC) N. INV OUT: 40.51 (8" PVC)
S-3	SANITARY MANHOLE TOP: 49.01 S. INV IN: 38.92 (8" PVC) E. INV IN: 38.92 (8" PVC) N. INV OUT: 38.82 (8" PVC)
S-5	SANITARY MANHOLE TOP: 50.65 E. INV IN: 41.49 (8" PVC) S. INV OUT: 41.39 (8" PVC)
S-6	SANITARY MANHOLE TOP: 51.10 N. INV IN: 38.81 (8" PVC) S. INV OUT: 38.71 (8" PVC)
S-7	SANITARY MANHOLE TOP: 49.26 N. INV IN: 38.28 (8" PVC) W. INV OUT: 37.90 (8" PVC)
S-8	SANITARY MANHOLE TOP: 40.57 E. INV IN: 37.27 (8" PVC) W. INV OUT: 37.17 (8" PVC)
S-9	SANITARY MANHOLE TOP: 34.94 E. INV IN: 35.74 (8" PVC) W. INV OUT: 35.64 (8" PVC)
S-10	SANITARY MANHOLE TOP: 39.93 E. INV IN: 34.56 (8" PVC) W. INV OUT: 34.46 (8" PVC)
S-11	SANITARY MANHOLE TOP: 52.57 SE. INV IN: 46.25 (6" PVC) SW. INV IN: 46.25 (8" PVC) NW. INV OUT: 46.15 (8" PVC)
S-12	SANITARY MANHOLE TOP: 47.55 SE. INV IN: 43.45 (6" PVC) NE. INV IN: 43.60 (8" PVC) S. INV IN: 43.45 (8" PVC) NW. INV OUT: 43.35 (8" PVC)

SANITARY SEWER STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
S-13	SANITARY MANHOLE TOP: 45.55 SE. INV IN: 41.75 (6" PVC) NE. INV IN: 41.75 (8" PVC) SW. INV IN: 41.75 (8" PVC) NW. INV OUT: 41.65 (8" PVC)
S-14	SANITARY MANHOLE TOP: 44.97 SE. INV IN: 40.83 (6" PVC) SW. INV IN: 40.83 (8" PVC) NW. INV OUT: 40.73 (8" PVC)
S-15	SANITARY MANHOLE TOP: 45.36 SE. INV IN: 40.21 (8" PVC) W. INV IN: 39.68 (8" PVC) N. INV OUT: 40.11 (8" PVC)
S-16	SANITARY MANHOLE TOP: 45.18 S. INV IN: 39.58 (8" PVC) E. INV IN: 39.58 (8" PVC) W. INV IN: 39.58 (8" PVC) N. INV OUT: 39.48 (8" PVC)
S-17	SANITARY MANHOLE TOP: 44.23 S. INV IN: 38.71 (8" PVC) W. INV IN: 38.70 (8" PVC) E. INV IN: 38.10 (8" PVC) N. INV OUT: 38.00 (8" PVC)
S-18	SANITARY MANHOLE TOP: 36.17 S. INV IN: 32.62 (8" PVC) E. INV IN: 32.62 (8" PVC) N. INV OUT: 32.52 (8" PVC)
S-19	SANITARY MANHOLE TOP: 35.97 S. INV IN: 32.20 (8" PVC)
S-20	SANITARY MANHOLE TOP: 53.90 N. INV IN: 40.51 (6" PVC) S. INV OUT: 40.41 (8" PVC)
S-21	SANITARY MANHOLE TOP: 54.00 E. INV IN: 46.66 (8" PVC) NW. INV OUT: 46.56 (8" PVC)
S-22	SANITARY MANHOLE TOP: 39.49 S. INV IN: 35.04 (8" PVC) W. INV IN: 34.00 (8" PVC) N. INV OUT: 33.90 (8" PVC)

No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/21/24	JDR
2	REVISED PER CITY COMMENTS	07/10/25	JDR

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KHA PROJECT 240418000
DATE 07/9/2025
SCALE AS SHOWN
DESIGNED BY —
DRAWN BY —
CHECKED BY —

JEFFREY R. SWISHER, P.E.
FLORIDA LICENSE NUMBER 60275

OVERALL UTILITY PLAN

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER C6.0

Plotted By: Raymond Jones Sheet Set: DELAND TECH PARK Layout: UTIL July 10, 2025 03:29:39pm K:\ORL_Civil\018900-Osteen Town Park\CAD\CONSTR\Plan Sheets\C6.0-UTIL.dwg
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Plotted By:Ramirez, Joan Sheet Set:DELAND TECH PARK Layout:C7.0 PINEHURST July 10, 2025 05:24:26pm K:\ORL_Civil\249418000-Deland Tech Park\CADD\CONST\PlanSheets\C7.0-PLAN-PROF.dwg
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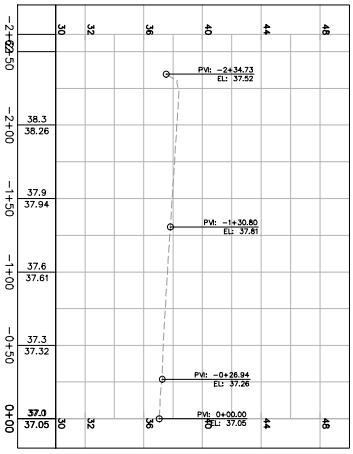
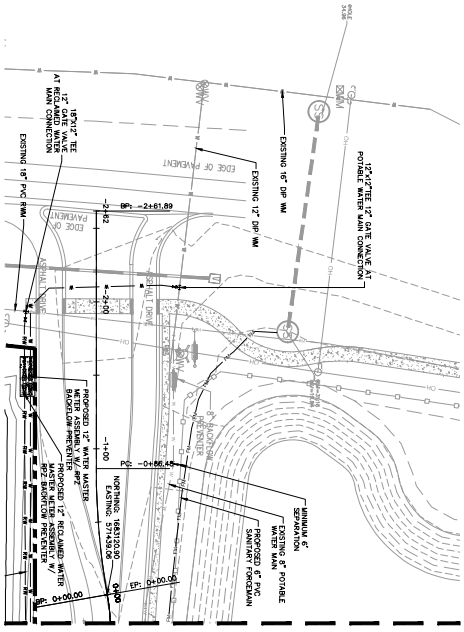
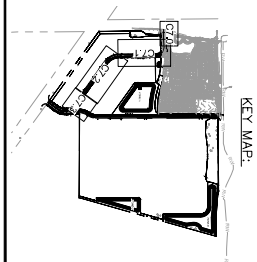




MATCH LINE STA 0+00 (SEE SHEET C7.1 FOR CONTINUATION)



LEGEND

- RIGHT OF WAY LINE
- CONCRETE
- PROPOSED STORM PIPE
- PROPOSED CURB INLET
- PROPOSED STORM MANHOLE
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED WATER PIPE
- PROPOSED FIRE PIPE (BY OTHERS)
- PROPOSED HYDRANT
- PROPOSED F.D.C.
- PROPOSED SANITARY SEWER PIPE
- PROPOSED SANITARY SEWER MANHOLE
- EXISTING STORM PIPE
- EXISTING RECLAIM WATER PIPE
- EXISTING WATER PIPE
- EXISTING SANITARY SEWER PIPE

GRAPHIC SCALE IN FEET
0 20 40 80

NORTH

SHEET NUMBER C7.0

DELAND TECH PARK
CITY OF DELAND FLORIDA

PLAN AND PROFILE - PINEHURST DRIVE

KHA PROJECT 249418000
DATE 07/9/2025
SCALE AS SHOWN
DESIGNED BY —
DRAWN BY —
CHECKED BY —

JEFFREY R. SWISHER, P.E.
FLORIDA LICENSE NUMBER 60275

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No.	REVISIONS	DATE	BY
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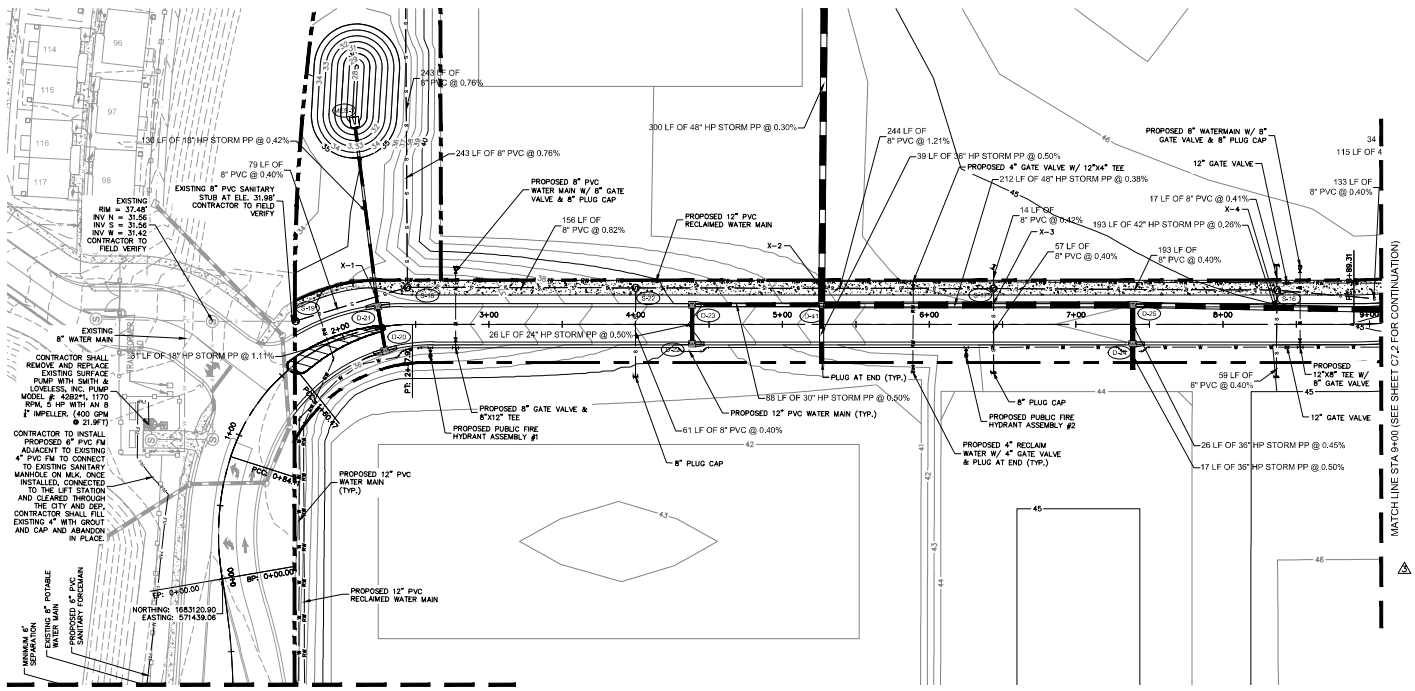
2	REVISED PER CITY COMMENTS	07/10/25	JOR



LEGEND

- RIGHT OF WAY LINE
- CONCRETE
- PROPOSED STORM PIPE
- PROPOSED CURB INLET
- PROPOSED STORM MANHOLE
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED WATER PIPE
- PROPOSED FIRE PIPE (BY OTHERS)
- PROPOSED HYDRANT
- PROPOSED F.D.C.
- PROPOSED SANITARY SEWER PIPES
- PROPOSED SANITARY SEWER PIPE
- PROPOSED SANITARY SEWER MANHOLE
- EXISTING STORM PIPE
- EXISTING WATER PIPE
- EXISTING REUSE WATER PIPE
- EXISTING SANITARY SEWER PIPE
- EXISTING FORCE MAIN PIPE

NORTH

GRAPHIC SCALE IN FEET
0 20 40 80

SANITARY CROSSING TABLE

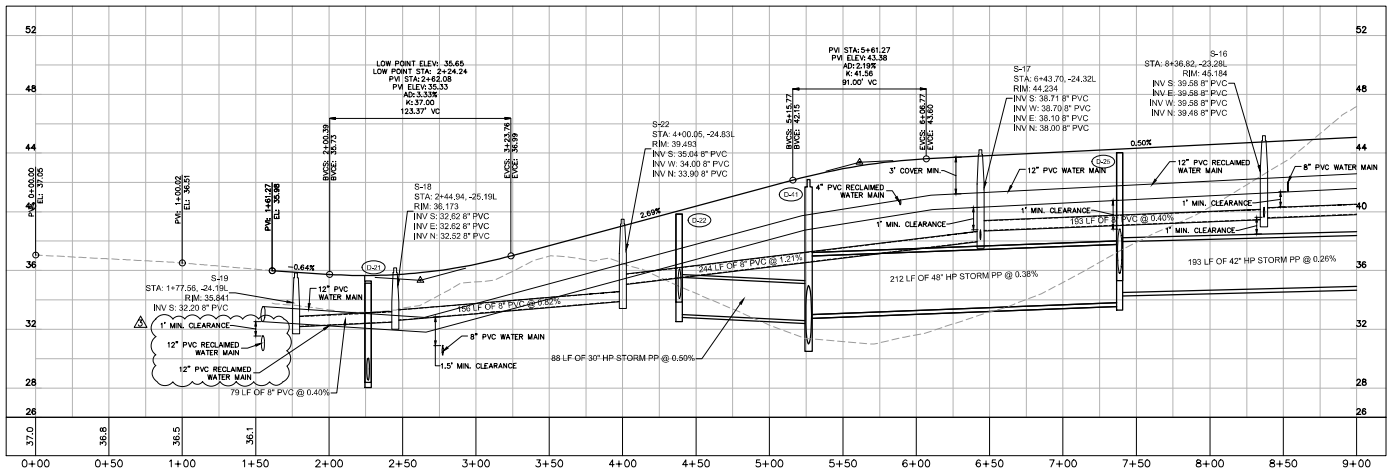
X-1	BOTTOM OF SANITARY: 32.94' TOP OF 18" HP STORM: 30.16' CLEARANCE: 2.78'
X-2	BOTTOM OF SANITARY: 36.55' TOP OF 48" HP STORM: 35.18' CLEARANCE: 1.37'
X-3	BOTTOM OF SANITARY: 38.73' TOP OF 48" HP STORM: 37.66' CLEARANCE: 1.06'
X-4	BOTTOM OF SANITARY: 39.61' TOP OF 48" HP STORM: 38.48' CLEARANCE: 1.13'

NOTE:
FOR ALL WATER AND RECLAIM WATER CROSSING SEE DETAIL W420 ON SHEET C8.1. CONTRACTOR SHALL PROVIDE AS-BUILTS FOR EACH CROSSING.

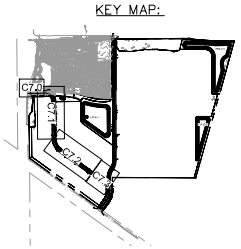
STORM STRUCTURE TABLE

STRUCTURE NAME:	DETAILS:
D-20	STA: 2+26.59 (16.33 R) TYPE "6" CURB INLET PER FDOT INDEX #425-021 EOP: 35.13 E. INV OUT: 28.89 (18" HP STORM PP)
D-21	STA: 2+26.57 (-14.24 L) TYPE "6" CURB INLET PER FDOT INDEX #425-021 EOP: 35.28 W. INV IN: 28.55 (18" HP STORM PP) E. INV OUT: 28.55 (18" HP STORM PP)
D-22	STA: 4+38.56 (13.22 R) TYPE "5" CURB INLET PER FDOT INDEX #425-021 EOP: 39.84 E. INV OUT: 34.35 (24" HP STORM PP)
D-23	STA: 4+38.58 (-13.26 L) TYPE "5" CURB INLET PER FDOT INDEX #425-021 EOP: 39.84 W. INV IN: 34.22 (24" HP STORM PP) S. INV OUT: 33.03 (30" HP STORM PP)
D-24	STA: 7+38.61 (13.22 R) TYPE "5" CURB INLET PER FDOT INDEX #425-021 EOP: 44.02 W. INV IN: 35.80 (36" HP STORM PP) E. INV OUT: 35.80 (36" HP STORM PP)
D-25	STA: 7+38.63 (-13.25 L) TYPE "5" CURB INLET PER FDOT INDEX #425-021 EOP: 44.02 W. INV IN: 35.68 (36" HP STORM PP) S. INV IN: 34.50 (42" HP STORM PP) N. INV OUT: 33.80 (48" HP STORM PP)
D-41	STA: 5+26.54 (-13.25 L) TYPE "J7" MANHOLE PER FDOT INDEX #425-010 EOP: 42.20 S. INV IN: 33.00 (48" HP STORM PP) N. INV IN: 32.59 (30" HP STORM PP) W. INV IN: 31.00 (36" HP STORM PP) E. INV OUT: 31.00 (48" HP STORM PP)
MES-3	STA: 2+28.99 (-143.96 L) MITERED END SECTION PER FDOT INDEX #430-021 EOP: 29.63 W. INV IN: 28.00 (18" HP STORM PP)

NOTE:
TOP OF STRUCTURES ARE 4.5' ABOVE THE EOP.



KEY MAP:



No.	REVISIONS	DATE	BY
1	REVISED PER QTY COMMENTS	10/21/24	JDR
2	REVISED PER QTY COMMENTS	07/10/25	JDR
3	REVISED PER QTY COMMENTS	09/09/25	JDR

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PHONE: 407-898-1511
WWW.KIMLEY-HORN.COM CA- 00000696

JEFFREY R. SWISHER, P.E.
FLORIDA LICENSE NUMBER
80275

KHA PROJECT
240418000

DATE
09/09/2025

SCALE AS SHOWN

DESIGNED BY —

DRAWN BY —

CHECKED BY —

PLAN AND PROFILE - PINEHURST DRIVE

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER
C7.1

Plotted By: Ramirez, Jason Sheet Set: DELAND TECH PARK Layout: C7.1 PINEHURST Saved: September 11, 2025 02:39:12pm K:\ORL_Civil\240418000-Deland Tech Park\CAD\CONST (Waiting for Approval)\PlanSheets\C7.1_PH_ALIGNPROF.dwg
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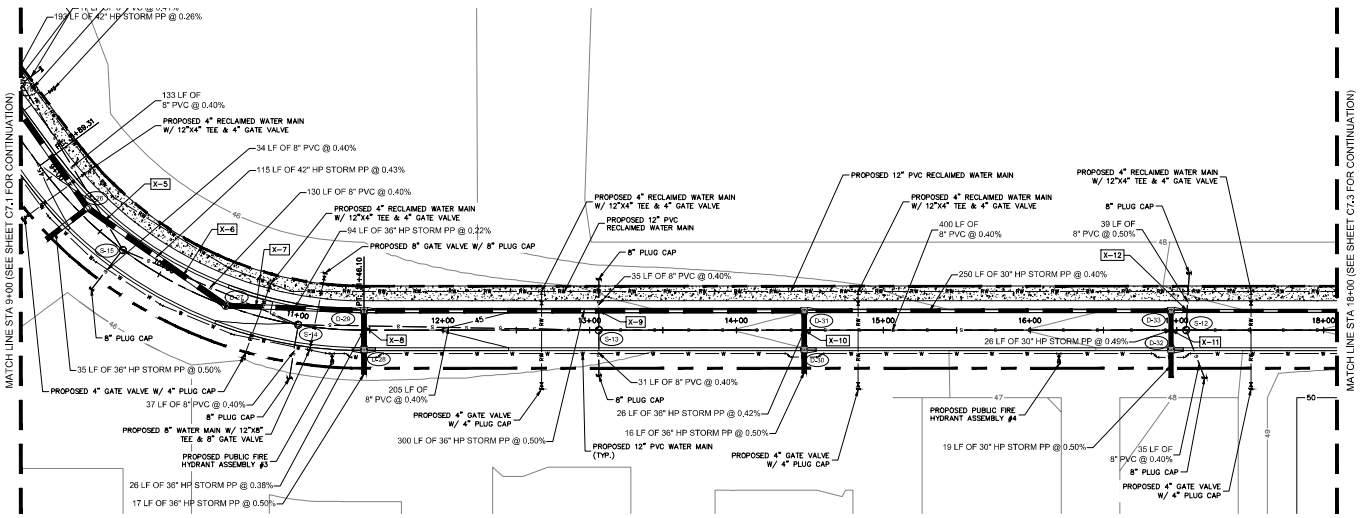
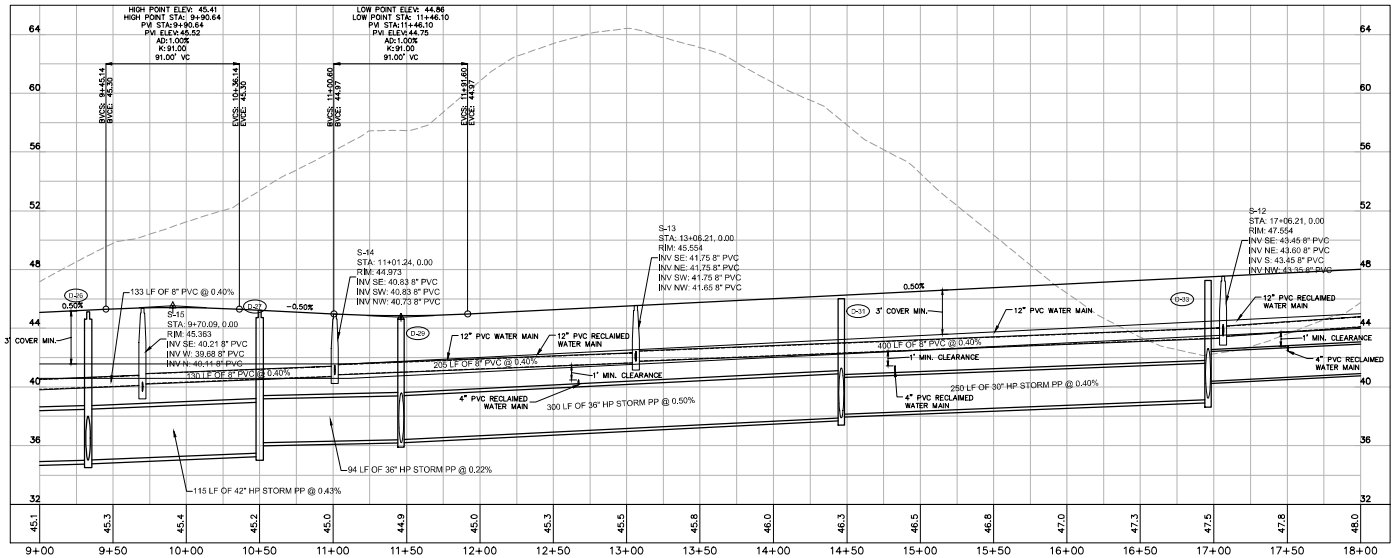




LEGEND

- RIGHT OF WAY LINE
- CONCRETE
- PROPOSED STORM PIPE
- PROPOSED CURB INLET
- PROPOSED STORM MANHOLE
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED WATER PIPE
- PROPOSED FIRE PIPE (BY OTHERS)
- PROPOSED HYDRANT
- PROPOSED F.D.C.
- PROPOSED SANITARY SEWER PIPE
- PROPOSED SANITARY SEWER PIPE
- PROPOSED SANITARY SEWER MANHOLE
- EXISTING STORM PIPE
- EXISTING WATER PIPE
- EXISTING REUSE WATER PIPE
- EXISTING SANITARY SEWER PIPE

NORTH

GRAPHIC SCALE IN FEET
0 20 40 80

SANITARY CROSSING TABLE

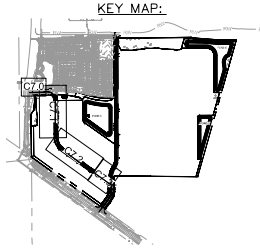
X-5	BOTTOM OF SANITARY: 39.99' TOP OF 42" HP STORM: 38.78' CLEARANCE: 1.21'
X-6	BOTTOM OF SANITARY: 40.37' TOP OF 42" HP STORM: 39.07' CLEARANCE: 1.30'
X-7	BOTTOM OF SANITARY: 40.58' TOP OF 36" HP STORM: 39.45' CLEARANCE: 1.13'
X-8	BOTTOM OF SANITARY: 40.99' TOP OF 36" HP STORM: 39.75' CLEARANCE: 1.24'
X-9	BOTTOM OF SANITARY: 41.78' TOP OF 18" HP STORM: 40.42' CLEARANCE: 1.36'
X-10	BOTTOM OF SANITARY: 42.29' TOP OF 36" HP STORM: 41.26' CLEARANCE: 1.03'
X-11	BOTTOM OF SANITARY: 43.29' TOP OF 30" HP STORM: 42.26' CLEARANCE: 1.03'
X-12	BOTTOM OF SANITARY: 43.64' TOP OF 30" HP STORM: 42.60' CLEARANCE: 1.05'

STORM STRUCTURE TABLE

STRUCTURE NAME:	DETAILS:
D-26	STA: 9+32.97 (-5.96 L) TYPE "J7" MANHOLE PER FDOT INDEX #425-010 EOP: 45.12 S. INV IN: 35.00 (42" HP STORM PP) W. INV IN: 35.00 (36" HP STORM PP) N. INV OUT: 35.00 (42" HP STORM PP)
D-27	STA: 10+50.00 (0.00) TYPE "J7" MANHOLE PER FDOT INDEX #425-010 EOP: 45.23 SE. INV IN: 36.19 (36" HP STORM PP) N. INV OUT: 35.50 (42" HP STORM PP)
D-28	STA: 11+46.10 (13.25 R) TYPE "6" CURB INLET PER FDOT INDEX #425-021 EOP: 44.62 SW. INV IN: 36.60 (36" HP STORM PP) NE. INV OUT: 36.60 (36" HP STORM PP)
D-29	STA: 11+46.10 (-13.25 L) TYPE "6" CURB INLET PER FDOT INDEX #425-021 EOP: 44.62 SW. INV IN: 36.50 (36" HP STORM PP) SE. INV IN: 36.40 (36" HP STORM PP) NW. INV OUT: 36.40 (36" HP STORM PP)
D-30	STA: 14+46.10 (13.24 R) TYPE "5" CURB INLET PER FDOT INDEX #425-021 EOP: 46.01 SW. INV IN: 38.20 (36" HP STORM PP) NE. INV OUT: 38.10 (36" HP STORM PP)
D-31	STA: 14+46.10 (-13.25 L) TYPE "5" CURB INLET PER FDOT INDEX #425-021 EOP: 46.01 SE. INV IN: 38.13 (30" HP STORM PP) SW. INV IN: 37.99 (36" HP STORM PP) NW. INV OUT: 37.90 (36" HP STORM PP)
D-32	STA: 16+96.10 (13.25 R) TYPE "5" CURB INLET PER FDOT INDEX #425-021 EOP: 47.26 SW. INV IN: 39.62 (30" HP STORM PP) NE. INV OUT: 39.62 (30" HP STORM PP)
D-33	STA: 16+96.10 (-13.23 L) TYPE "5" CURB INLET PER FDOT INDEX #425-021 EOP: 47.26 SE. INV IN: 40.38 (24" HP STORM PP) SW. INV IN: 39.49 (30" HP STORM PP) NW. INV OUT: 39.12 (30" HP STORM PP)

NOTE:
TOP OF STRUCTURES ARE 4.5' ABOVE THE EOP.

KEY MAP:



No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/21/24	JDR
2	REVISED PER CITY COMMENTS	07/10/25	JDR

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200 S. ORANGE AVENUE, SUITE 600, ORLANDO, FL 32801
PHONE: 407 - 898 - 1511
WWW.KIMLEY-HORN.COM CA- 00000696

JEFFREY R. SWISHER, P.E.
FLORIDA LICENSE NUMBER
60275

KHA PROJECT
240418000
DATE
07/9/2025
SCALE AS SHOWN
DESIGNED BY —
DRAWN BY —
CHECKED BY —

PLAN AND PROFILE - PINEHURST DRIVE

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER
C7.2

Plotted By: Ramirez, Jason Sheet Set: DELAND TECH PARK Layout: C7.2 PINEHURST July 10, 2025 - 8:24:53pm K:\ORL_Civil\240418000-Deland Tech Park\CAD\CONST\PlanSheets\C7.2 PLAN AND PROF...dwg
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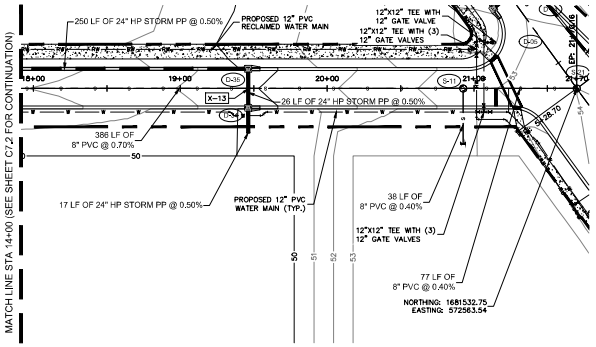
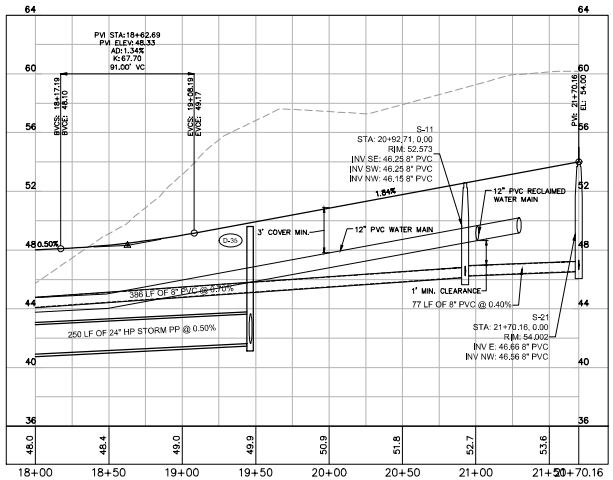




LEGEND

- RIGHT OF WAY LINE
- CONCRETE
- PROPOSED STORM PIPE
- PROPOSED CURB INLET
- PROPOSED STORM MANHOLE
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED WATER PIPE
- PROPOSED FIRE PIPE (BY OTHERS)
- PROPOSED HYDRANT
- PROPOSED F.D.C.
- PROPOSED SANITARY SEWER PIPE
- PROPOSED SANITARY SEWER PIPE
- PROPOSED SANITARY SEWER MANHOLE
- EXISTING STORM PIPE
- EXISTING WATER PIPE
- EXISTING REUSE WATER PIPE
- EXISTING SANITARY SEWER PIPE
- EXISTING FORCE MAIN PIPE

NORTH

GRAPHIC SCALE IN FEET
0 20 40 80

SANITARY CROSSING TABLE

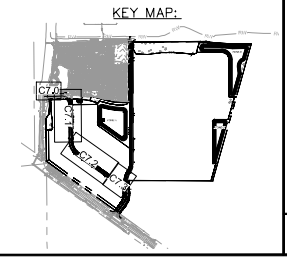
X-13 BOTTOM OF SANITARY: 45.10'
TOP OF 18" HP STORM: 44.10'
CLEARANCE: 1.00'

STORM STRUCTURE TABLE

STRUCTURE NAME:	DETAILS:
D-34	STA: 19+46.10 (13.24 R) TYPE "5" CURB INLET PER FDOT INDEX #425-021 EOP: 49.63 SW. INV IN: 42.00 (24" HP STORM PP) NE. INV OUT: 42.00 (24" HP STORM PP)
D-35	STA: 19+46.10 (-13.23 L) TYPE "5" CURB INLET PER FDOT INDEX #425-021 EOP: 49.63 SW. INV IN: 41.87 (24" HP STORM PP) NW. INV OUT: 41.63 (24" HP STORM PP)

NOTE:
TOP OF STRUCTURES ARE 4.5" ABOVE THE EOP.

KEY MAP:



No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/21/24	JOR
2	REVISED PER CITY COMMENTS	07/10/25	JOR

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JEFFREY R. SWISHER, P.E.
FLORIDA LICENSE NUMBER 60275

KHA PROJECT 249418000
DATE 07/9/2025
SCALE AS SHOWN
DESIGNED BY —
DRAWN BY —
CHECKED BY —

PLAN AND PROFILE - PINEHURST DRIVE

DELAND TECH PARK
CITY OF DELAND FLORIDA

SHEET NUMBER
C7.3

Plotted By:Ramirez, Jean Sheet Set:DELAND TECH PARK Layout:C7.3 PINEHURST July 10, 2025 05:25:06pm K:\ORL_Civil\249418000-Deland Tech Park\CADD\CONST\PlanSheets\C7.0-PLAN-PROF.dwg
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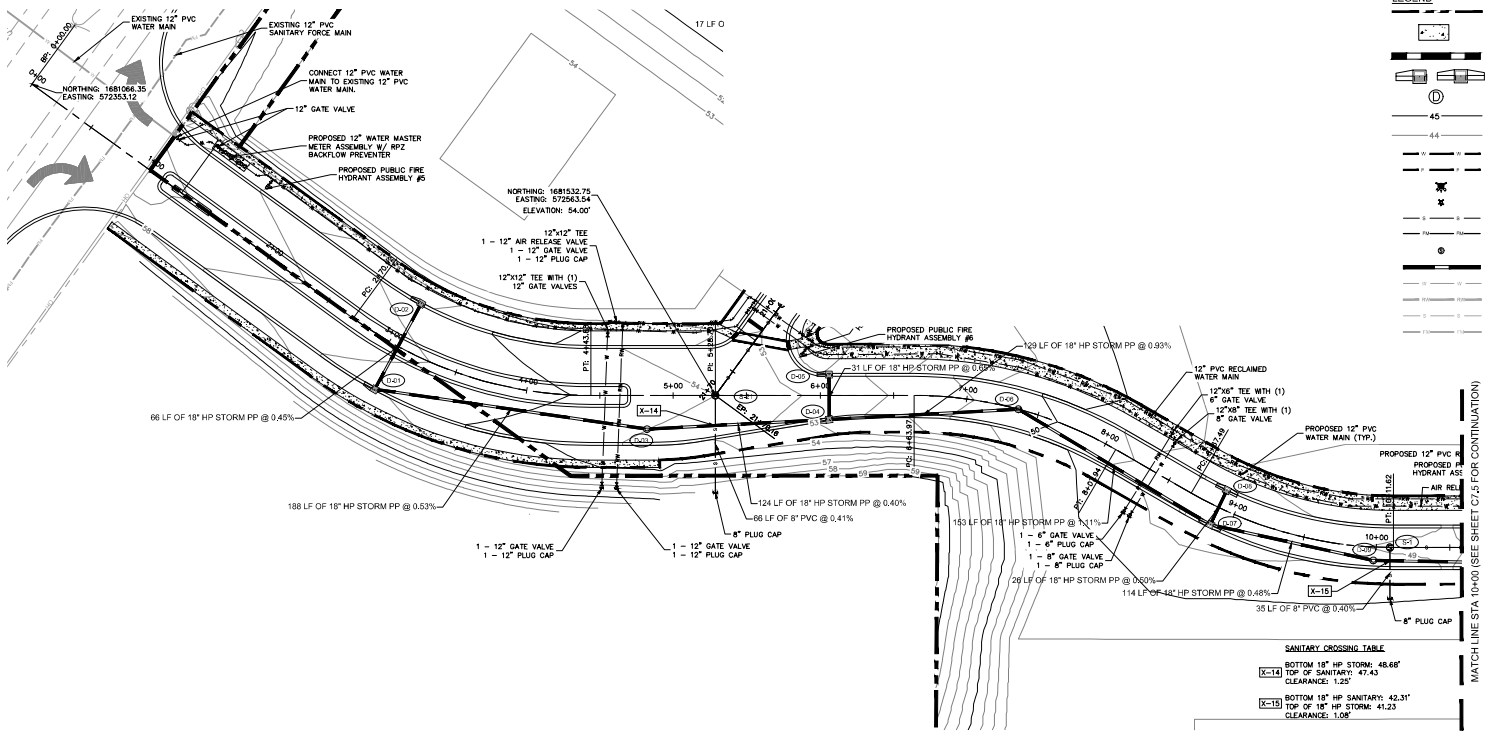
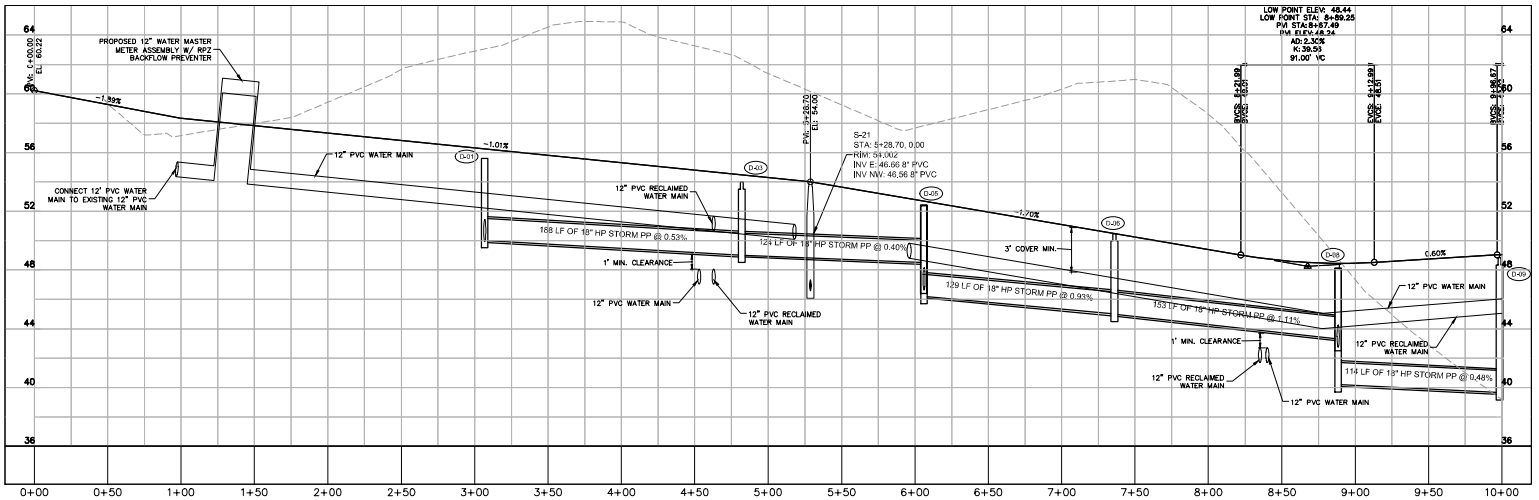
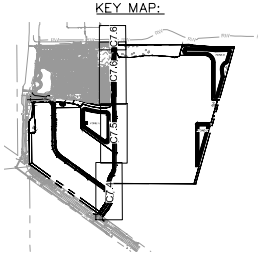


STORM STRUCTURE TABLE	
STRUCTURE NAME:	DETAILS:
D–01	STA: 3+06.80 (33.25 R) TYPE "S" CURB INLET PER FDOT INDEX #425–021 EOP: 55.60 NW. INV IN: 50.00 (18" HP STORM PP) N. INV OUT: 50.00 (18" HP STORM PP)
D–02	STA: 3+06.84 (–33.24 L) TYPE "S" CURB INLET PER FDOT INDEX #425–021 EOP: 55.60 SE. INV OUT: 50.30 (18" HP STORM PP)
D–03	STA: 4+82.18 (22.99 R) TYPE "P7" MANHOLE PER FDOT INDEX #425–010 EOP: 54.01 S. INV IN: 49.00 (18" HP STORM PP) N. INV OUT: 49.00 (18" HP STORM PP)
D–04	STA: 6+06.16 (16.34 R) TYPE "S" CURB INLET PER FDOT INDEX #425–021 EOP: 52.36 W. INV IN: 46.70 (18" HP STORM PP) S. INV IN: 46.50 (18" HP STORM PP) N. INV OUT: 46.20 (18" HP STORM PP)
D–05	STA: 6+06.00 (–14.27 L) TYPE "S" CURB INLET PER FDOT INDEX #425–021 EOP: 52.43 E. INV OUT: 46.90 (18" HP STORM PP)
D–06	STA: 7+35.95 (0.00) TYPE "P7" MANHOLE PER FDOT INDEX #425–010 EOP: 50.48 S. INV IN: 45.00 (18" HP STORM PP) NE. INV OUT: 45.00 (18" HP STORM PP)
D–07	STA: 8+88.29 (13.00 R) TYPE "S" CURB INLET PER FDOT INDEX #425–021 EOP: 48.11 NW. INV IN: 42.87 (18" HP STORM PP) SW. INV IN: 43.30 (18" HP STORM PP) N. INV OUT: 40.20 (18" HP STORM PP)
D–08	STA: 8+88.29 (–13.00 L) TYPE "S" CURB INLET PER FDOT INDEX #425–021 EOP: 48.11 SE. INV OUT: 43.00 (18" HP STORM PP)
D–09	STA: 9+98.29 (9.12 R) TYPE "P7" MANHOLE PER FDOT INDEX #425–010 EOP: 48.84 S. INV IN: 39.65 (18" HP STORM PP) N. INV OUT: 39.65 (18" HP STORM PP)

NOTE:
TOP OF STRUCTURES ARE 4.5' ABOVE THE EOP.





REVISIONS	DATE	BY
1 REVISED PER CITY COMMENTS	10/21/24	JOR
2 REVISED PER CITY COMMENTS	07/10/25	JOR

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JEFFREY R. SWISHER, P.E.
FLORIDA LICENSE NUMBER
60275

KHA PROJECT
245418000
DATE
07/9/2025
SCALE AS SHOWN
DESIGNED BY —
DRAWN BY —
CHECKED BY —

PLAN AND PROFILE - KIRK DRIVE

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER
C7.4

Plotted By: Brennan Jones Sheet Set: DELAND TECH PARK Layout: C7.4 KIRK May 09, 2025 - 09:35:29am K:\ORL_Civil\245418000\Deland Tech Park\CIVIL\DOCS\SET\Plan Sheets\C7.4 KIRK.dwg
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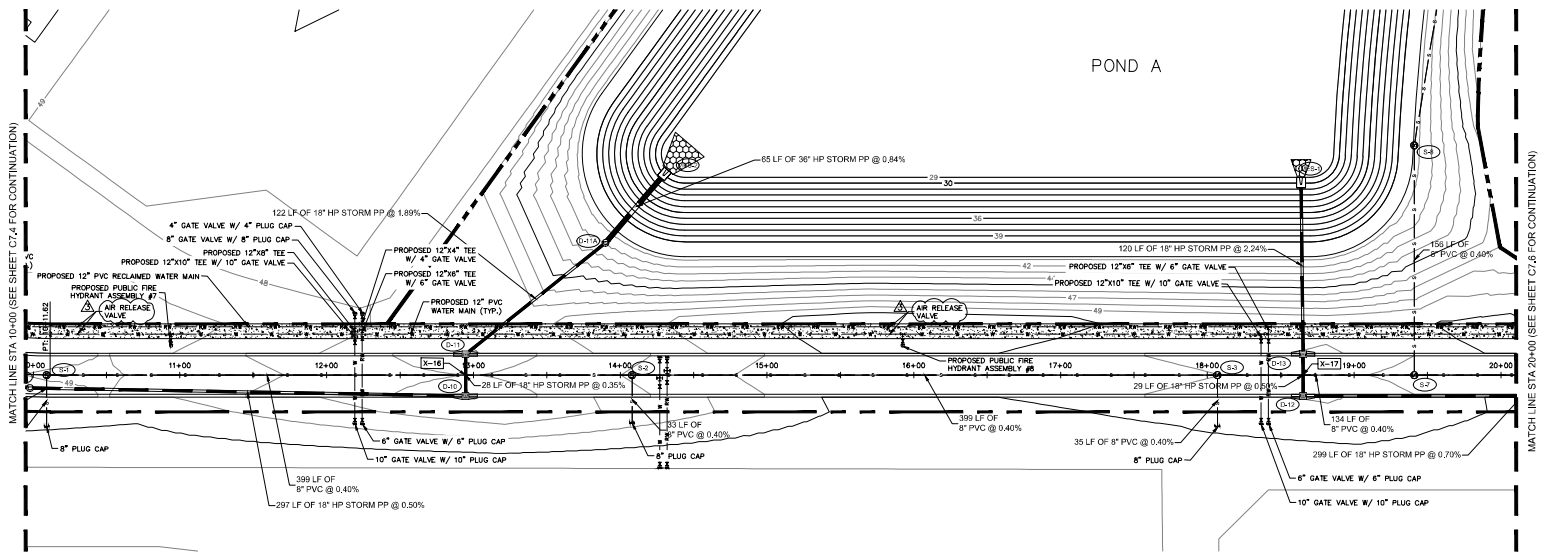
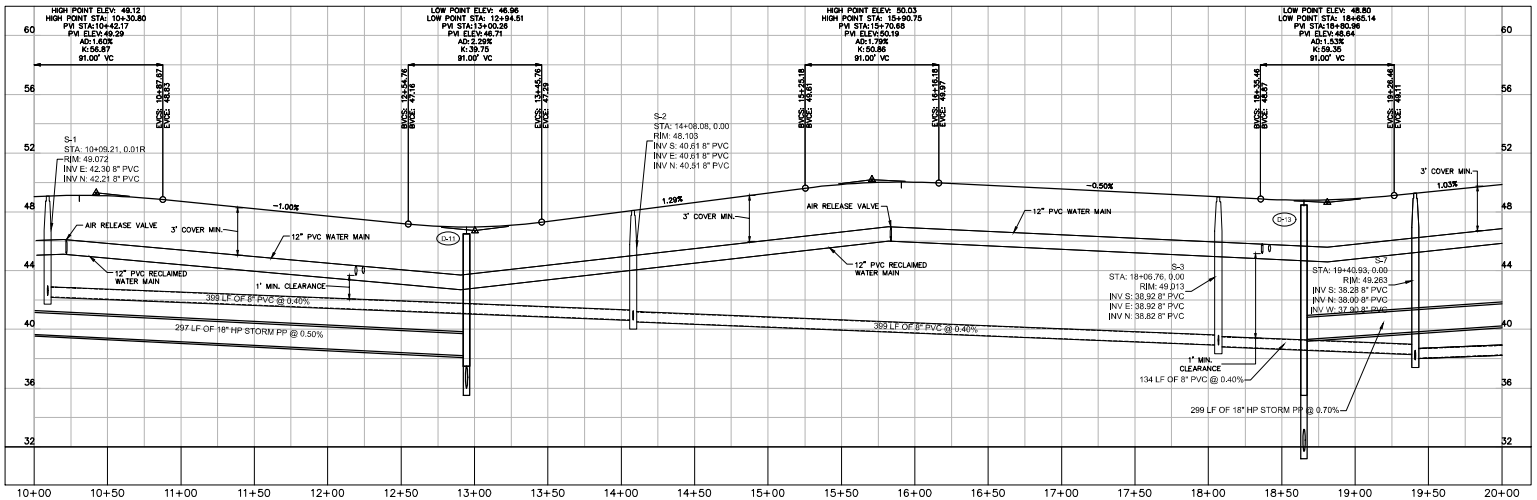




NOTE:
FOR ALL WATER AND RECLAIM WATER CROSSING SEE DETAIL W420 ON SHEET C8.1. CONTRACTOR SHALL PROVIDE AS-BUILTS FOR EACH CROSSING.

SANITARY CROSSING TABLE

X-16	BOTTOM OF SANITARY: 41.04' TOP OF 18" HP STORM: 39.58' CLEARANCE: 1.46'
X-17	BOTTOM OF SANITARY: 38.56' TOP OF 18" HP STORM: 37.56' CLEARANCE: 1.00'

LEGEND

- RIGHT OF WAY LINE
- CONCRETE
- PROPOSED STORM PIPE
- PROPOSED CURB INLET
- PROPOSED STORM MANHOLE
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED WATER PIPE
- PROPOSED FIRE PIPE (BY OTHERS)
- PROPOSED HYDRANT
- PROPOSED F.D.C.
- PROPOSED SANITARY SEWER PIPE
- PROPOSED SANITARY SEWER PIPE
- PROPOSED SANITARY SEWER MANHOLE
- EXISTING STORM PIPE
- EXISTING WATER PIPE
- EXISTING REUSE WATER PIPE
- EXISTING SANITARY SEWER PIPE

NORTH

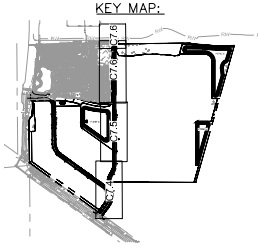
GRAPHIC SCALE IN FEET
0 20 40 80

STORM STRUCTURE TABLE

STRUCTURE NAME:	DETAILS:
D-10	STA: 12+94.52 (14.18 R) TYPE "E" CURB INLET PER FDOT INDEX #425-021 EOP: 46.51 S. INV IN: 38.18 (18" HP STORM PP) W. INV OUT: 38.00 (18" HP STORM PP)
D-11	STA: 12+94.52 (−14.25 L) TYPE "E" CURB INLET PER FDOT INDEX #425-021 EOP: 46.51 E. INV IN: 37.90 (18" HP STORM PP) NW. INV OUT: 36.00 (18" HP STORM PP)
D-11A	STA: 13+90.01 (−90.03 L) TYPE "P7" MANHOLE PER FDOT INDEX #425-010 EOP: 42.00 SE. INV IN: 33.70 (18" HP STORM PP) NW. INV OUT: 29.55 (36" HP STORM PP)
D-12	STA: 18+65.14 (14.23 R) TYPE "E" CURB INLET PER FDOT INDEX #425-021 EOP: 46.46 N. INV IN: 39.28 (18" HP STORM PP) W. INV OUT: 36.00 (18" HP STORM PP)
D-13	STA: 18+65.14 (−14.28 L) TYPE "E" CURB INLET PER FDOT INDEX #425-021 EOP: 46.46 E. INV IN: 35.86 (18" HP STORM PP) W. INV OUT: 31.70 (18" HP STORM PP)
MES-1	STA: 18+63.68 (−134.64 L) MITERED END SECTION PER FDOT INDEX #430-021 EOP: 30.63 E. INV IN: 29.00 (18" HP STORM PP)
MES-2	STA: 14+32.44 (−139.62 L) MITERED END SECTION PER FDOT INDEX #430-022 EOP: 32.22 SE. INV IN: 29.00 (36" HP STORM PP)

NOTE:
TOP OF STRUCTURES ARE 4.5' ABOVE THE EOP.

KEY MAP:



No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/21/24	JDR
2	REVISED PER CITY COMMENTS	07/10/25	JDR
3	REVISED PER CITY COMMENTS	09/03/25	JDR

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WWW.KIMLEY-HORN.COM CA- 00000696

JEFFREY R. SWISHER, P.E.
FLORIDA LICENSE NUMBER
60275

KHA PROJECT
240416000
DATE
09/09/2025
SCALE AS SHOWN
DESIGNED BY —
DRAWN BY —
CHECKED BY —

PLAN AND PROFILE - KIRK DRIVE

DELAND TECH PARK
CITY OF DELAND FLORIDA

SHEET NUMBER
C7.5

Plotted By: Barrows, Jason Sheet Set: DELAND TECH PARK Layout: C7.5 KIRK Saved: September 12, 2025 - 11:32:10am K:\ORL_Civil\240416000-Deltona Tech Park\CAD\CONST Working for Approval\Plan\Sheets\C7.5-PLAN-PROF.dwg
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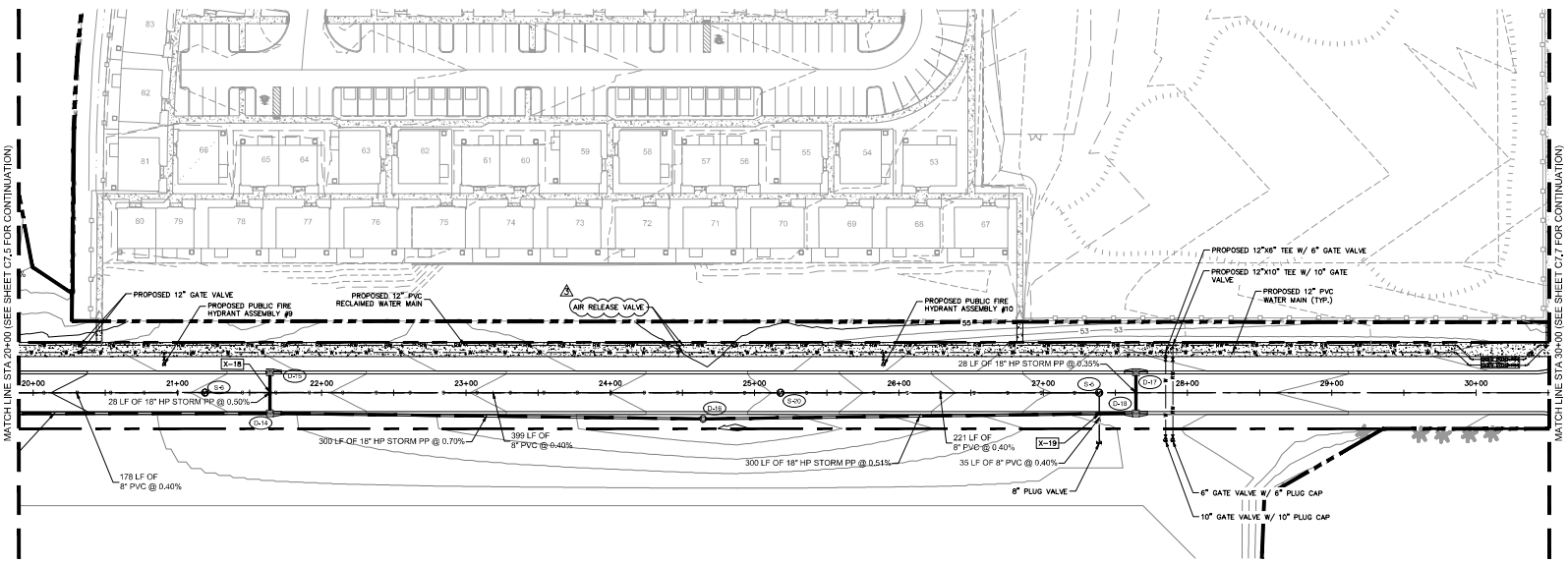


NORTH

GRAPHIC SCALE IN FEET
0 20 40 80

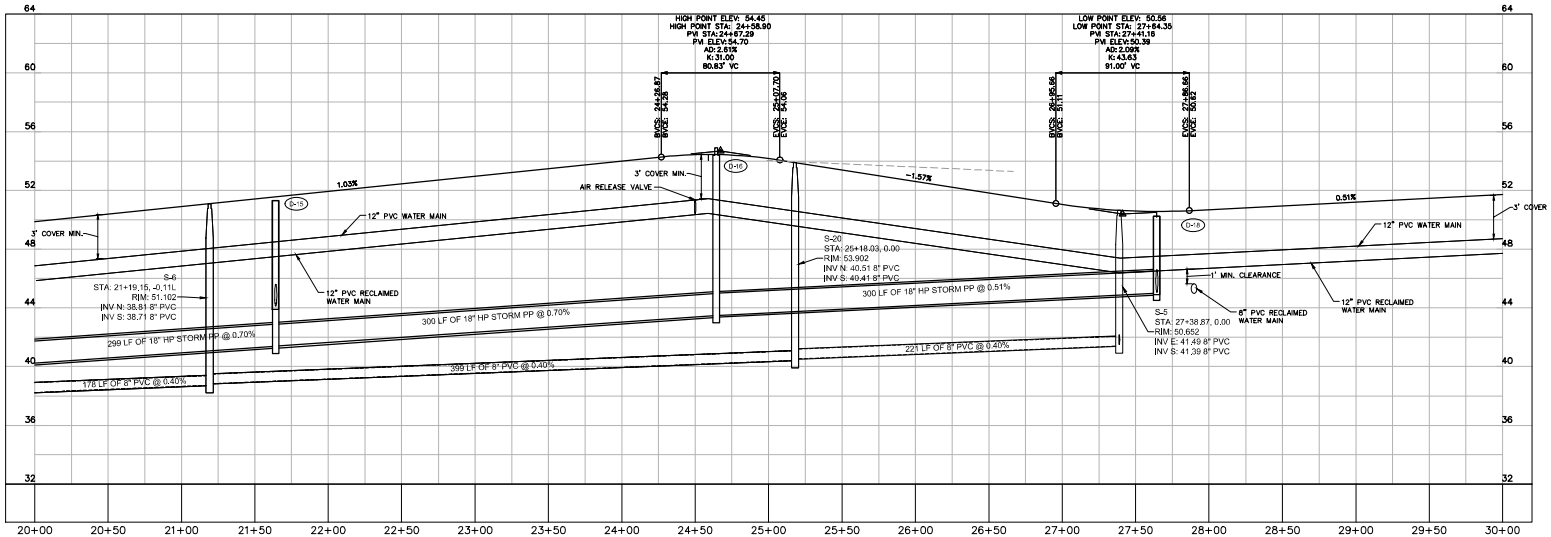
LEGEND

- RIGHT OF WAY LINE
- CONCRETE
- PROPOSED STORM PIPE
- PROPOSED CURB INLET
- PROPOSED STORM MANHOLE
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED WATER PIPE
- PROPOSED FIRE PIPE (BY OTHERS)
- PROPOSED HYDRANT
- PROPOSED F.D.C.
- PROPOSED SANITARY SEWER PIPE
- PROPOSED SANITARY SEWER PIPE
- PROPOSED SANITARY SEWER MANHOLE
- EXISTING STORM PIPE
- EXISTING WATER PIPE
- EXISTING REUSE WATER PIPE
- EXISTING SANITARY SEWER PIPE

⚠ NOTE:
FOR ALL WATER AND RECLAIM WATER CROSSING SEE DETAIL #420 ON SHEET C8.1. CONTRACTOR SHALL PROVIDE AS-BUILTS FOR EACH CROSSING.

SANITARY CROSSING TABLE

X-18	BOTTOM OF 18" STORM: 44.18' TOP OF SANITARY: 39.68' CLEARANCE: 4.50'
X-19	BOTTOM OF 18 HP STORM: 44.74' TOP OF SANITARY: 42.24' CLEARANCE: 2.50'

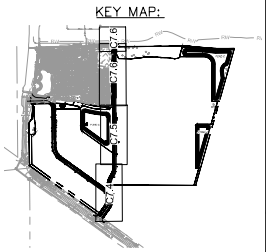


STORM STRUCTURE TABLE

STRUCTURE NAME:	DETAILS:
D-14	STA: 21+64.14 (14.23 R) TYPE "S" CURB INLET PER FDOT INDEX #425-021 EOP: 51.31 W. INV IN: 44.24 (18" HP STORM PP) N. INV IN: 41.38 (18" HP STORM PP) S. INV OUT: 41.38 (18" HP STORM PP)
D-15	STA: 21+64.09 (-14.23 L) TYPE "S" CURB INLET PER FDOT INDEX #425-021 EOP: 51.31 E. INV OUT: 44.38 (18" HP STORM PP)
D-16	STA: 24+64.32 (18.12 R) TYPE "P7" MANHOLE PER FDOT INDEX #425-010 EOP: 54.90 N. INV IN: 43.46 (18" HP STORM PP) S. INV OUT: 43.48 (18" HP STORM PP)
D-17	STA: 27+64.35 (-14.24 L) TYPE "S" CURB INLET PER FDOT INDEX #425-021 EOP: 50.25 E. INV OUT: 45.40 (18" HP STORM PP)
D-18	STA: 27+64.35 (14.24 R) TYPE "S" CURB INLET PER FDOT INDEX #425-021 EOP: 50.25 W. INV IN: 45.30 (18" HP STORM PP) S. INV OUT: 45.00 (18" HP STORM PP)

NOTE:
TOP OF STRUCTURES ARE 4.5' ABOVE THE EOP.

KEY MAP:



No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/21/24	JOR
2	REVISED PER CITY COMMENTS	07/10/25	JOR
3	REVISED PER CITY COMMENTS	09/03/25	JOR

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200 S. ORANGE AVENUE, SUITE 600, ORLANDO, FL 32801
PHONE: 407-898-1511
WWW.KIMLEY-HORN.COM CA-00000696

JEFFREY R. SWISHER, P.E.
FLORIDA LICENSE NUMBER 60275

KHA PROJECT 240418000
DATE 09/09/2025
SCALE AS SHOWN
DESIGNED BY —
DRAWN BY —
CHECKED BY —

PLAN AND PROFILE - KIRK DRIVE

DELAND TECH PARK
CITY OF DELAND FLORIDA

SHEET NUMBER
C7.6

Plotted By: Spencer, Jason Sheet Set: DELAND TECH PARK Layout: C7.6 KIRK September 12, 2025 - 11:32:29am K:\ORL_Civil\kha\180000-Deltona Tech Park\CAD\CONST Working for Approval\Plan\Sheets\C7.6 KIRK.dwg
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Plotted By:Ramirez, Joan Sheet Set:DELAND TECH PARK Layout:C7.7 KIRK July 10, 2025 05:26:02pm K:\ORL_Civil\249418000-Deland Tech Park\CADD\CONST\PlanSheets\C7.0-PLAN-PROF.dwg
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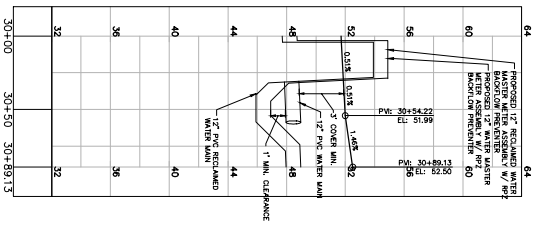

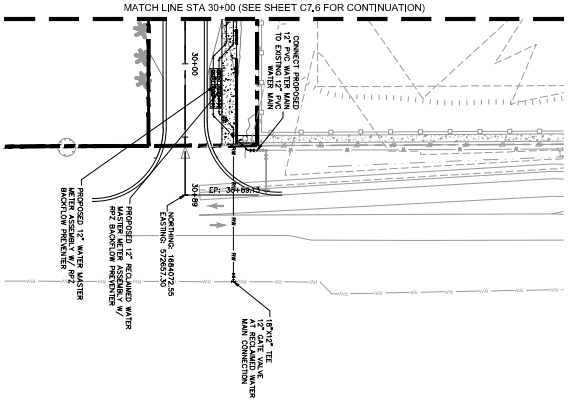

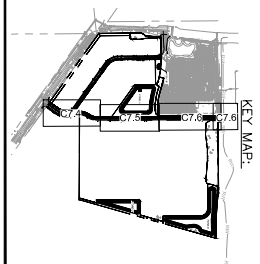

LEGEND

- RIGHT OF WAY LINE
- CONCRETE
- PROPOSED STORM PIPE
- PROPOSED CURB INLET
- PROPOSED STORM MANHOLE
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED WATER PIPE
- PROPOSED FIRE PIPE (BY OTHERS)
- PROPOSED HYDRANT
- PROPOSED F.D.C.
- PROPOSED SANITARY SEWER PIPE
- PROPOSED SANITARY SEWER MANHOLE
- EXISTING STORM PIPE
- EXISTING WATER PIPE
- EXISTING REUSE WATER PIPE
- EXISTING SANITARY SEWER PIPE

GRAPHIC SCALE IN FEET
0 20 40 80

NORTH

SHEET NUMBER C7.7

DELAND TECH PARK

CITY OF DELAND FLORIDA

PLAN AND PROFILE - KIRK DRIVE

KHA PROJECT	249418000
DATE	07/9/2025
SCALE	AS SHOWN
DESIGNED BY	—
DRAWN BY	—
CHECKED BY	—

JEFFREY R. SWISHER, P.E.
FLORIDA LICENSE NUMBER
60275

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200 S. ORANGE AVENUE, SUITE 600, ORLANDO, FL 32801
PHONE: (407) 898-1511
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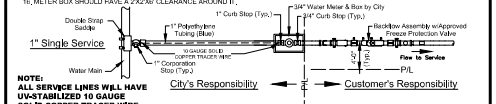
No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/21/24	JOR
2	REVISED PER CITY COMMENTS	07/10/25	JOR

NOTES:
1. WATER MAINS TO BE ON NORTH or EAST SIDE OF R.O.W., APPROX. 4 FT. BACK OF CURB UNLESS OTHERWISE AUTHORIZED BY CITY ENGINEER.
2. SERVICE CONNECTIONS TO BE 4 FT. FROM SIDE LOT LINE ON EITHER SIDE OF LOT. THESE SERVICES TO BE CONSISTENT WITHIN THE SUBDIVISION. DRIVEWAYS SHALL NOT BE BUILT OVER METERS.
3. ALL LINES SHALL BE CHLORINATED and PRESSURE TESTED (TEST FOR TWO HOURS @ 150 P.S.I.) UNDER THE DIRECTION OF THE UTILITIES DEPARTMENT, AFTER SUCCESSFUL COMPLETION OF THE TESTING and CHLORINATION, THE PRESSURE SHALL REMAIN ON THE SYSTEM AT ALL TIMES.
4. TEN FT. SEPARATION REQUIRED BETWEEN PARALLEL WATER & SANITARY SEWER LINES.
5. SADDLE IS REQUIRED FOR ALL SERVICE CONNECTIONS TO 4" PVC MAINS. SADDLE IS REQUIRED FOR 2" SERVICE CONNECTIONS TO 6" and LARGER PVC MAINS. LARGEST SERVICE CONNECTION TO A 4" MAIN IS MIN. 1-1/2" and LARGEST TO ANY MAIN IS 2".
6. MINIMUM DISTANCE BETWEEN SERVICE TAPS TO BE NOT LESS THAN 36".
7. SINGLE SERVICE TAP SHALL BE 1".
8. DOUBLE SERVICE TAP SHALL BE 1-1/2".
9. ALL FITTINGS SHALL BE BRASS ONLY.
10. ALL CORPORATION STOPS, SHALL BE "FORD" OR "MUELLER" ONLY.
11. FREEZE PROTECTION VALVE, SHALL BE "COMBRACO" 4XLF000PP/GF.
12. ALL 3/4", 1", 1-1/2", & 2" W.M., SHALL BE SDR 9, 200 psi, ASTMD 2737, (BLUE) POLYETHYLENE TUBING.
13. ALL BRASS FITTINGS SHALL BE LEAD FREE.
14. NO GALVANIZED FITTINGS CONNECTED TO BRASS FITTINGS.
15. PLAN VIEWS and DISTRUCTIONS SHOULD BE AVOIDED WITHIN 3 FT. RADIUS FOR SERVICE ACTIVITY.
16. METER BOX SHOULD HAVE A 2'X2'X6" CLEARANCE AROUND IT.

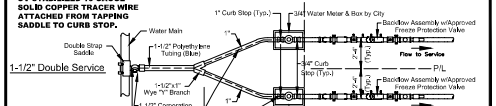
1" Single Service



NOTE:
ALL SERVICE LINES WILL HAVE UV-STABILIZED 10 GAUGE SOLID COPPER TRACER WIRE ATTACHED FROM TAPPING SADDLE TO CURB STOP.

City's Responsibility | Customer's Responsibility

1-1/2" Double Service



Note: For Water Meter location w/sidewalk See Detail W402

DATE: 12/30/2024 **WATER MAIN SERVICE CONNECTION (BACKFLOW)** W401

City of DeLand - Standard Details

NOTES:
1. WATER MAINS TO BE ON NORTH or EAST SIDE OF R.O.W., APPROX. 4 FT. BACK OF CURB UNLESS OTHERWISE AUTHORIZED BY CITY ENGINEER.
2. SERVICE CONNECTIONS TO BE 4 FT. FROM SIDE LOT LINE ON EITHER SIDE OF LOT. THESE SERVICES TO BE CONSISTENT WITHIN THE SUBDIVISION. DRIVEWAYS SHALL NOT BE BUILT OVER METERS.
3. ALL LINES SHALL BE CHLORINATED and PRESSURE TESTED (TEST FOR TWO HOURS @ 150 P.S.I.) UNDER THE DIRECTION OF THE UTILITIES DEPARTMENT, AFTER SUCCESSFUL COMPLETION OF THE TESTING and CHLORINATION, THE PRESSURE SHALL REMAIN ON THE SYSTEM AT ALL TIMES.
4. TEN FT. SEPARATION REQUIRED BETWEEN PARALLEL WATER & SANITARY SEWER LINES.
5. SADDLE IS REQUIRED FOR ALL SERVICE CONNECTIONS TO 4" PVC MAINS. SADDLE IS REQUIRED FOR 2" SERVICE CONNECTIONS TO 6" and LARGER PVC MAINS. LARGEST SERVICE CONNECTION TO A 4" MAIN IS MIN. 1-1/2" and LARGEST TO ANY MAIN IS 2".
6. MINIMUM DISTANCE BETWEEN SERVICE TAPS TO BE NOT LESS THAN 36".
7. SINGLE SERVICE TAP SHALL BE 1".
8. DOUBLE SERVICE TAP SHALL BE 1-1/2".
9. ALL FITTINGS SHALL BE BRASS ONLY.
10. ALL CORPORATION STOPS, SHALL BE "FORD" OR "MUELLER" ONLY.
11. FREEZE PROTECTION VALVE, SHALL BE "COMBRACO" 4XLF000PP/GF.
12. ALL 3/4", 1", 1-1/2", & 2" W.M., SHALL BE SDR 9, 200 psi, ASTMD 2737, (BLUE) POLYETHYLENE TUBING.
13. ALL BRASS FITTINGS SHALL BE LEAD FREE.
14. NO GALVANIZED FITTINGS CONNECTED TO BRASS FITTINGS
15. METER BOX SHOULD HAVE A 2'x2'x6" CLEARANCE AROUND IT.

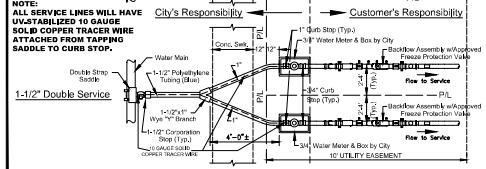
1" Single Service



NOTE:
ALL SERVICE LINES WILL HAVE UV-STABILIZED 10 GAUGE SOLID COPPER TRACER WIRE ATTACHED FROM TAPPING SADDLE TO CURB STOP.

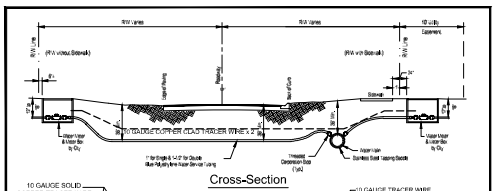
City's Responsibility | Customer's Responsibility

1-1/2" Double Service



DATE: 12/30/2024 **WATER MAIN SERVICE CONNECTION WITH SIDEWALK (BACKFLOW)** W402

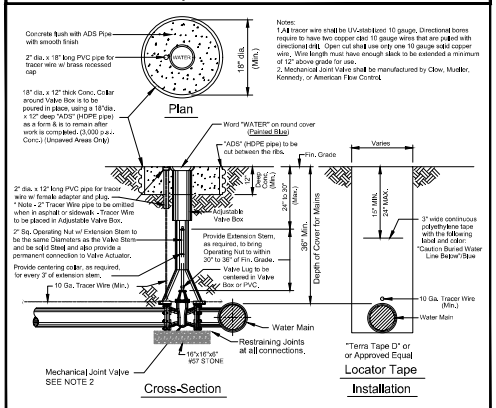
City of DeLand - Standard Details



NOTES:
1. SINGLE WATER SERVICE SHALL BE 1" PCA YETHYLENE TUBING (BLUE).
2. DOUBLE WATER SERVICE SHALL BE 1-1/2" POLYETHYLENE TUBING (BLUE).
3. WATER MAINS TO BE MIN. 36" BELOW GRADE and APPROX. 4' BACK OF CURB.
4. CURB STOPS TO BE LOCATED APPROX. 2 FOOT BACK OF RIGHT-OF-WAY and MUST HAVE LOCK WING.
5. SERVICE LINE TO BE MIN. 36" BELOW GRADE IN RIGHT-OF-WAY.
6. ALL 3/4", 1", 1-1/2 & 2" W.M., SHALL BE SDR 9, 200 psi, ASTMD 2737, (BLUE) POLYETHYLENE TUBING.
7. ALL TRACER WIRE SHALL BE (BLUE) UV-STABILIZED 10 GAUGE, DIRECTIONAL BORES REQUIRED TO HAVE TWO 10 GAUGE COPPER CLAD WIRES THAT ARE PULLED WITH DIRECTIONAL DRILL, OPEN CUT SHALL USE ONLY ONE 10 GAUGE SOLID COPPER WIRE.
8. ALL SERVICE TAPS TO MEET AWWA STANDARD 45° FROM HORIZONTAL UNLESS PRIOR AUTHORIZATION RECEIVED FROM CITY.
9. ALL SERVICE LINES WILL HAVE TRACER WIRE ATTACHED FROM TAPPING SADDLE TO CURB STOP.

DATE: 12/30/2024 **WATER MAIN SERVICE LINES** W403

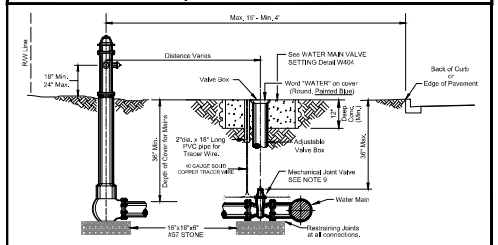
City of DeLand - Standard Details



Notes:
1. All tracer wire shall be UV-stabilized 10 gauge, Directional bores require to have two copper clad 10 gauge wires that are pulled with directional drill. Open cut shall use only one 10 gauge solid copper wire, Wire length must have enough slack to be extended a minimum of 12" above grade for use.
2. Mechanical Joint Valve shall be manufactured by Clow, Mueller, Kennedy, or American Flow Control.

DATE: 12/30/2024 **WATER MAIN VALVE SETTING** W404

City of DeLand - Standard Details



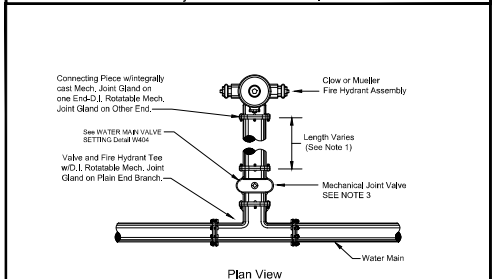
NOTES:
1. Steamer Connection to Face Street.
2. All Fire Hydrants to have 5 1/4" Valve Seat.
3. Fire Hydrants Shall be Placed at Street Corners or in the R.O.W. Adjacent to Side Lot Lines Whenever Possible.
4. See Detail W406 for Typical Connections & Fittings.
5. Fire Hydrants Shall be Painted City Safety Yellow w/Richards Paint No. 1009, Rust Shield Polyurethane.
6. Remove Chains from Cap.
7. Min. 3 ft. Clearance Should be Maintained Around Fire Hydrant for Emergency Operation Purposes.
8. All tracer wire shall be UV-stabilized 10 gauge, Directional bores require to have two copper clad 10 gauge wires that are pulled with directional drill. Open cut shall use only one 10 gauge solid copper wire.
9. Mechanical Joint Valve shall be manufactured by Clow, Mueller, Kennedy, or American Flow Control.

ONLY APPROVED CITY FIRE HYDRANTS
— Mueller Super Centurion 200
— Clow Medallion

See W406 for Plan View

DATE: 12/30/2024 **FIRE HYDRANT SETTING SECTION** W405

City of DeLand -Standard Details



NOTES:
1. On Fire Hydrants Requiring Runout Last Two Joints Must Be Restrained Per Detail W409.
2. Fire Hydrants Should Have a 2'x2'x9' Clearance Around it.
3. Mechanical Joint Valve shall be manufactured by Clow, Mueller, Kennedy, or American Flow Control.

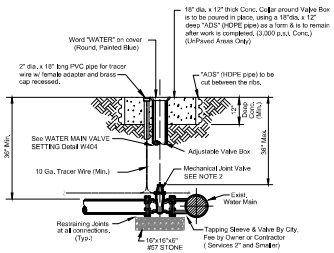
ONLY APPROVED CITY FIRE HYDRANTS
— Mueller Super Centurion 200
— Clow Medallion

See W405 for Cross Section

DATE: 12/30/2024 **FIRE HYDRANT SETTING PLAN** W406

City of DeLand - Standard Details

NOTES:
1. All tracer wire shall be UV-stabilized 10 gauge, Directional bores require to have two copper clad 10 gauge wires that are pulled with directional drill. Open cut shall use only one 10 gauge solid copper wire.

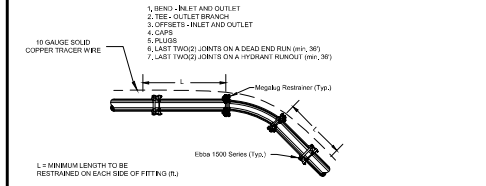


Notes:
1. For Wet Taps larger than 2". Sleeves & Valves will be furnished and installed by the contractor in the presence of the city inspector. Tapping sleeve shall be Ford, Romac, or JCM stainless steel only.
2. Mechanical Joint Valve shall be manufactured by Clow, Mueller, Kennedy, or American Flow Control.

DATE: 12/30/2024 **TAPPING SLEEVE & VALVE** W407

City of DeLand - Standard Details

THE FOLLOWING JOINTS MUST BE RESTRAINED IN ALL APPLICATIONS:
1. BEND - INLET AND OUTLET
2. TEE - OUTLET BRANCH
3. OFFSETS - INLET AND OUTLET
4. CAPS
5. PLUGS
6. LAST TWO(2) JOINTS ON A DEAD END RUN (min. 36')
7. LAST TWO(2) JOINTS ON A HYDRANT RUNOUT (min. 36')



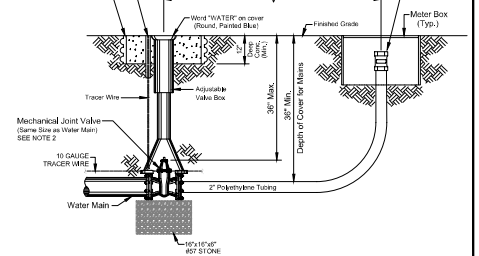
L = MINIMUM LENGTH TO BE RESTRAINED ON EACH SIDE OF FITTING (ft.)

NOM. PIPE SIZE	ELBOWS (deg.)				VALVE TEES
	11.25	22.50	45	90	
4	3	5	8	12	9
6	4	6	10	15	11
8	4	7	13	20	14
10	5	9	15	25	18
12	6	10	17	29	21
14	6	13	26	61	30
16	7	14	28	67	49
18	8	15	31	73	68
20	8	16	33	80	85

NOTE: THRUST RESTRAINT AT FITTINGS AND VALVES SHALL BE BY USE OF EBBA IRON MEGALUG RESTRAINERS. THRUST RESTRAINT BETWEEN PIPE JOINTS SHALL BE BY EBBA IRON SERIES 1500 RESTRAINERS.

DATE: 12/30/2024 **THRUST RESTRAINING DETAIL FOR PVC PIPE** W408

City of DeLand - Standard Details



Notes:
1. All tracer wire shall be UV-stabilized 10 gauge, Directional bores require to have two copper clad 10 gauge wires that are pulled with directional drill. Open cut shall use only one 10 gauge solid copper wire.
2. Mechanical Joint Valve shall be manufactured by Clow, Mueller, Kennedy, or American Flow Control.

DATE: 12/30/2024 **WATER MAIN BLOWOFF DETAIL** W410

City of DeLand - Standard Details

No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/21/24	JOR
2	REVISED PER CITY COMMENTS	07/10/25	JOR
3	REVISED PER CITY COMMENTS	09/15/25	JOR

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PHONE: 407-898-1511
WWW.KIMLEY-HORN.COM CA- 000000696

KHA PROJECT 240418000
DATE 09/09/2025
SCALE AS SHOWN
DESIGNED BY —
DRAWN BY —
CHECKED BY —

CITY OF DELAND DETAILS

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER C8.0

Plotted By: Ramirez, Jose Saved Set: DELAND TECH PARK Layout: C8.0 CITY OF DELAND DETAILS September 15, 2025 - 09:33:36am K:\ORL_Civil\240418000\Signed Tech Plan\CIVIL\CIVIL\CIVIL\Working for Approval\Sheets\C8.0 CITY OF DELAND DETAILS.dwg
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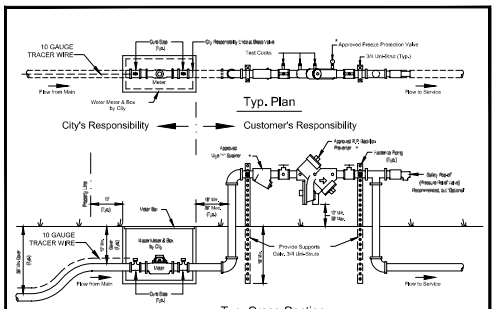
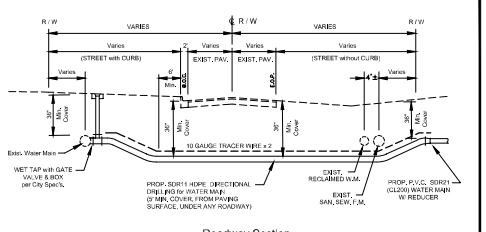


DATE: 12/30/2024 **WATER METER & BACKFLOW ASSEMBLY - 1" THRU 2-1/2" MODELS** W411

City of DeLand - Standard Details



Notes:
1. Directional bores from 1-3 inches diameter must be a minimum of 36 inches in depth below edge of pavement.
2. Directional bores, 4 inches or greater, must be 10 times the diameter of the borer/backreamer, whichever diameter is greater, in depth, below edge of pavement and to extend a minimum of 6 feet beyond the edge of pavement, either side.
3. Any/All directional bore affiliated drill mud/slurry must be cleaned/reclaimed from right of way/bore pits and disposed of an approved off-site location.
4. All tracer wire shall be UV-stabilized 10 gauge. Directional bores require to have two copper clad 10 gauge wires that are pulled with directional drill. Open cut shall use only one 10 gauge solid copper wire.
5. No directional bores on Fridays, Weekends or Holidays. Pull backs are allowed.
6. Steel clad copper wire for main lines only: transition to solid copper wire with water proof connector pulled into valve can.

NOTE: Tie Existi. Water Service Lines into New Water Main as per City Specifications.

DATE: 12/30/2024 **DIRECTIONAL BORE** W415

City of DeLand - Standard Details

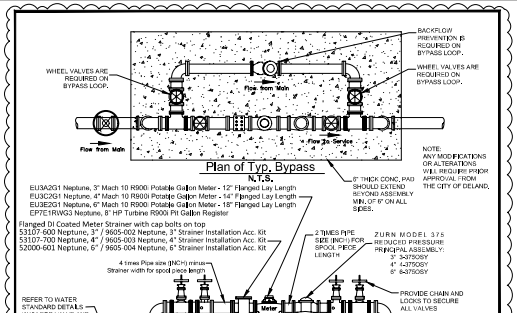
LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH F.A.C. RULE 62-555.314

Other pipe	Horizontal Separation	Crossings (1)	Joint Spacing @ Crossing (Full Joint Centered)
Storm Sewer Stormwater Force Main, Reclaimed Water (2)	WATER MAIN — 3 ft. minimum	WATER MAIN — 12 Inches is the minimum except for storm sewer,then 6 Inches is the minimum and 12 Inches is preferred	Alternate 3' ft. minimum — WATER MAIN
Vacuum Sanitary Sewer	WATER MAIN — 10 ft. preferred 3 ft. minimum	WATER MAIN — 12 Inches preferred 6 Inches minimum	Alternate 3' ft. minimum — WATER MAIN
Gravity Sewer Sanitary Sewer, Sanitary Sewer Force Main, Reclaimed Water (4)	WATER MAIN — 10 ft. preferred 6 ft. minimum (3)	WATER MAIN — 12 Inches is the minimum except for gravity sewer,then 6 Inches is the minimum and 12 Inches is preferred	Alternate 6' ft. minimum — WATER MAIN
On-Site Sewage Treatment & Disposal System(4)	10 ft minimum	---	---

(1) Water Main Should Cross Above other pipe. When Water Main Must Be Below Other Pipe,the Minimum Separation is 12" Inches.
(2) Reclaimed Water Regulated Under Part II of chapter 62-610, F.A.C.
(3) 3 ft. for Gravity Sanitary sewer where the Bottom of the Water Main is laid at least 6 Inches above the top of gravity sanitary sewer.
(4) Reclaimed water not regulated under Part II of Chapter 62-160, F.A.C.

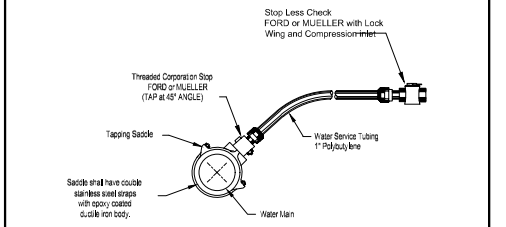
DATE: 12/30/2024 **WATER PIPE SEPERATION REQUIREMENTS** W420

City of DeLand - Standard Details



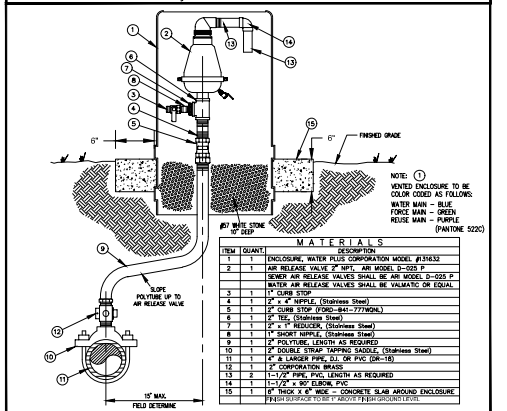
DATE: 12/30/2024 **3" AND ABOVE POTABLE WATER METER WITH BYPASS LOOP** W412

City of DeLand - Standard Details



DATE: 12/30/2024 **CHLORINATION TAP** W416

City of DeLand - Standard Details

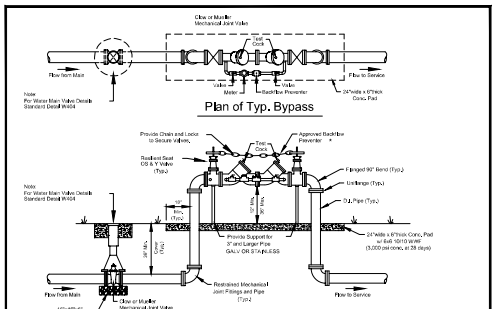


ITEM	QUANT.	DESCRIPTION
1	1	ENCLOSURE, WATER PLUS CORPORATION MODEL #13632
2	1	AIR RELEASE VALVE 2" NPT, AIR MODEL D-025 P SEWER AIR RELEASE VALVES SHALL BE AIR MODEL D-025 P WATER AIR RELEASE VALVES SHALL BE VALMATIC OR EQUAL
3	1	1" CURB STOP
4	1	2" x 4" NIPPLE, (Stainless Steel)
5	1	2" CURB STOP (FORD--844--777WHL)
6	1	2" TEE, (Stainless Steel)
7	1	2" x 1" REDUCER, (Stainless Steel)
8	1	1" SHORT NIPPLE, (Stainless Steel)
9	1	2" POLYTUBE, LENGTH AS REQUIRED
10	1	2" DOUBLE STRAP TAPPING SADDLE, (Stainless Steel)
11	1	4" & LARGER PIPE, D.I. OR PVC (DR-18)
12	1	2" CORPORATION BRASS
13	2	1-1/2" PIPE, PVC, LENGTH AS REQUIRED
14	1	1-1/2" x 90° ELBOW, PVC
15	1	6" THICK x 6'-0" WIDE - CONCRETE SLAB AROUND ENCLOSURE FINISH SURFACE TO BE 1" ABOVE FINISH GROUND LEVEL

NOTE: (1) VENTED ENCLOSURE TO BE COLOR CODED AS FOLLOWS: WATER MAIN – BLUE FORCE MAIN – GREEN REUSE MAIN – PURPLE (PANTONE 522C)

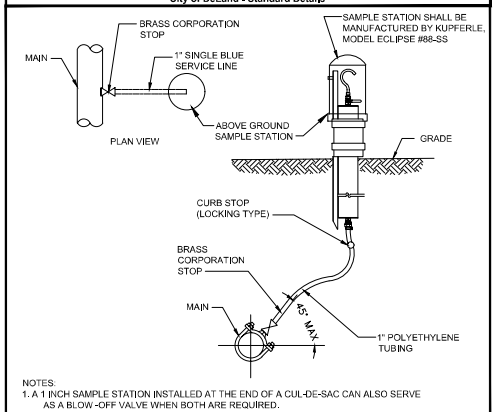
DATE: 12/30/2024 **OFFSET AIR RELEASE VALVE** W421

City of DeLand - Standard Details



DATE: 12/30/2024 **DOUBLE DETECTOR CHECK VALVE ASSEMBLY - 4" THRU 12"** W413

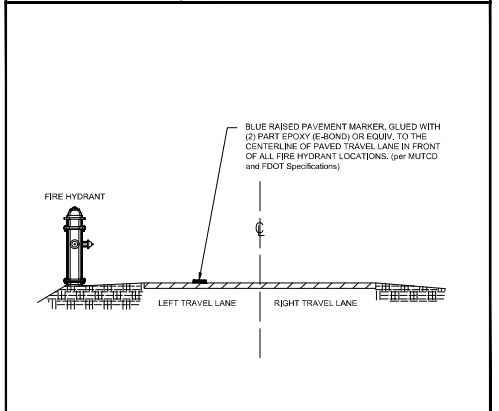
City of DeLand - Standard Details



NOTES:
1. A 1 INCH SAMPLE STATION INSTALLED AT THE END OF A CUL-DE-SAC CAN ALSO SERVE AS A BLOW -OFF VALVE WHEN BOTH ARE REQUIRED.

DATE: 12/30/2024 **WATER SAMPLE STATION** W419

City of DeLand - Standard Details



DATE: 12/30/2024 **REFLECTIVE PAVEMENT MARKER FOR FIRE HYDRANT LOCATION** W423

City of DeLand - Standard Details

No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/21/24	JOR
2	REVISED PER CITY COMMENTS	07/10/25	JOR
3	REVISED PER CITY COMMENTS	09/15/25	JOR

Kimley»Horn
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200 S. ORANGE AVENUE, SUITE 600, ORLANDO, FL 32801
PHONE: 407-898-1511
WWW.KIMLEY-HORN.COM CA- 00000696

KHA PROJECT 240418000
DATE 09/09/2025
SCALE AS SHOWN
DESIGNED BY —
DRAWN BY —
CHECKED BY —

CITY OF DELAND DETAILS

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER C8.1

Plotted By: Brannon, Jason Saved Set: DELAND TECH PARK Layout: C8.1 CITY OF DELAND DETAILS September 15, 2025 - 09:32:13am K:\ORL_Civil\240418000\Signed Tech Plans\CIVIL\CIVIL\CIVIL\Working for Approval\Sheets\C8.1 CITY OF DELAND DETAILS.dwg
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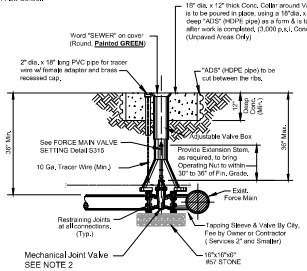
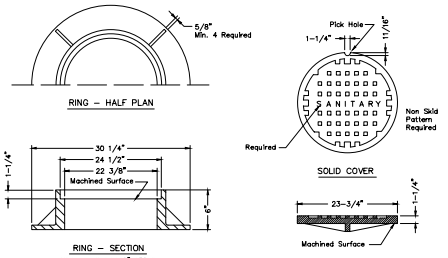
Notes:
1. All tracer wire shall be 10 gauge. Directional bores require to have two 10 gauge copper clad wires that are pulled with directional drill. Open cut shall use only one 10 gauge solid copper wire. Wire length must have enough slack to be extended a minimum of 18" above grade for use.
2. Mechanical Joint Valve shall be manufactured by Clow, Mueller, Kennedy, or American Flow Control.



Note:
For Wet Taps larger than 2", Sleeves & Valves will be furnished and installed by the contractor in the presence of the city inspector. Tapping sleeve shallbe Ford, Romac, or JCM stainless steel only.

DATE: 12/30/2024 **FORCE MAIN TAPPING SLEEVE & VALVE** S407

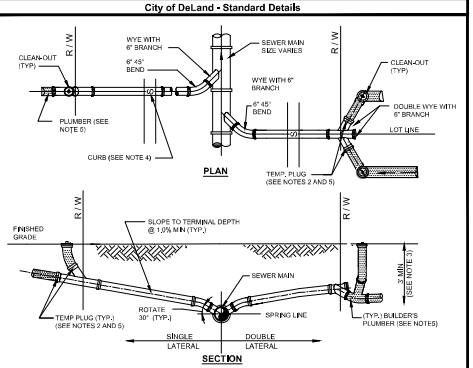
City of DeLand - Standard Details



NOTE:
Manufacturers model of storm ring and cover to be approved by City Engineer.

DATE: 12/30/2024 **SANITARY MANHOLE COVER - USF 170-E** S301

City of DeLand - Standard Details



NOTES:
1. INVERT OF SERVICE LATERAL MUST BE ABOVE SPRING LINE.
2. SERVICE LATERAL SHALL BE CAPPED BY THE CONTRACTOR.
3. WYE SHALL BE NO SHALLOWER THAN 3.FEET AND NO DEEPER THAN 5.FEET.
4. CUT OR CAST "S" IN CONCRETE CURB AT SEWER LATERAL LOCATION AND PAINT GREEN.
5. PLUMBER SHALL REMOVE PLUG, INSTALL CLEAN-OUT, AND CONNECT SERVICE LATERAL TO HOUSE.

DATE: 12/30/2024 **SANITARY SERVICE LATERALS** S305

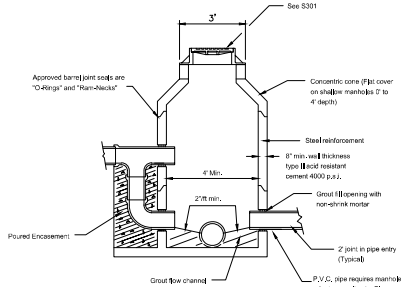
City of DeLand - Standard Details

Gravity Sewer Video Inspection Notes:

Sewer and Stormwater Pipe Installations: All gravity piping shall be flushed, cleaned and checked for line and grade and air tested according to sewer air testing specifications. No section of pipe shall have more than $^1/_2$" of standing water at any time during the video inspection. Jet vac trucks are not allowed to be used in the pipe while the pipe is being video inspected. *For all gravity sewer mains installed a video inspection is to be conducted when backfill reaches a minimum of 3 feet above the pipe crown or upon completion of placement of the stabilized subgrade. After conducting the video inspections, a thumb drive containing all the video recordings and sewer inspection reports shall be submitted to the City's Utilities Department. The thumb drive shall contain all video recording of installed gravity wastewater pipes including video of the insides of all sewer manholes and manhole channels. Submit pipe videoing and sewer inspection reports to Scott Zender at the Utilities Department for review prior to the start of road paving.*

DATE: 12/30/2024 **GRAVITY SEWER VIDEO REQUIREMENTS** S408

City of DeLand - Standard Details

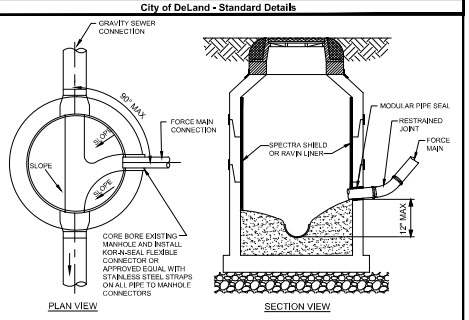


NOTES
1. Precast manhole drop may be approved by City Engineer. Shop drawing submittal required.
2. Drop required when 2' or over.
3. Manholes shall have an interior and exterior coating of at least 15 mils dry thickness PROLO EP214-351 Epoxi-Mastic
4. Polymer concrete manholes are accepted upon review and approval by the City of DeLand Engineering Dept.

SEE S303 FOR PLAN VIEW

DATE: 12/30/2024 **SANITARY MANHOLE** S302

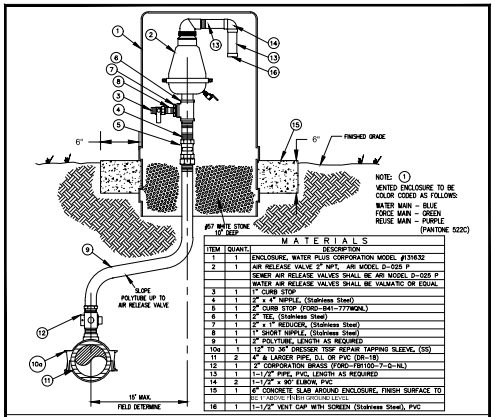
City of DeLand - Standard Details



NOTES:
1. FORCE MAIN ORIENTED TO FACILITATE FLOW AND SHALL ENTER MANHOLE WITHIN 1' ABOVE INVERT OF THE EFFLUENT PIPE.
2. BENCH AS REQUIRED FOR NEW FORCE MAIN.
3. MANHOLE RECEIVING FORCE MAIN AND NEXT MANHOLE SHALL BE LINED. EXISTING MANHOLES RECEIVING FORCE MAIN SHALL BE LINED WITH SPECTRA SHIELD OR RAVIN.
4. CONTRACTOR TO COORDINATE THE PRESENCE OF UTILITIES INSPECTOR DURING CORING AND CONNECTIONS TO EXISTING MANHOLES.

DATE: 12/30/2024 **FORCE MAIN TO GRAVITY SEWER CONNECTION** S306

City of DeLand - Standard Details

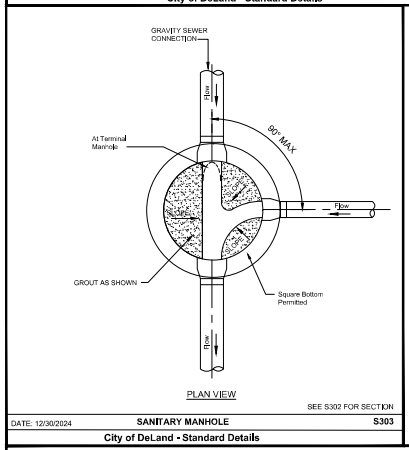


MATERIALS

ITEM	QUANT.	DESCRIPTION
1	1	ENCLOSURE, WATER PLUS CORPORATION MODEL #13632
2	1	AIR RELEASE VALVE 2" NPT, ARI MODEL D-025 P
		SEWER AIR RELEASE VALVES SHALL BE ARI MODEL D-025 P
		WATER AIR RELEASE VALVES SHALL BE VALMATIC OR EQUAL
3	1	1" CURB STOP
4	1	2" x 4" NIPPLE, (Stainless Steel)
5	1	2" CURB STOP (FORD-B41-777WQNL)
6	1	2" TEE, (Stainless Steel)
7	1	2" x 1" REDUCER, (Stainless Steel)
8	1	1" SHORT NIPPLE, (Stainless Steel)
9	1	2" POLYTUBE, LENGTH AS REQUIRED
10a	1	1/2" TO 30" DRESSER TFSF REPAIR TAPPING SLEEVE, (SS)
11	2	4" & LARGER PIPE, D.I. OR PVC (DR-18)
12	1	2" CORPORATION BRASS (FORD-FB1100-7-Q-NL)
13	1	1-1/2" PIPE, PVC, LENGTH AS REQUIRED
14	2	1-1/2" x 90° ELBOW, PVC
15	1	6" CONCRETE SLAB AROUND ENCLOSURE, FINISH SURFACE TO BE 1" ABOVE FINISH GROUND LEVEL
16	1	1-1/2" VENT CAP WITH SCREEN (Stainless Steel), PVC

DATE: 12/30/2024 **OFFSET AIR RELEASE VALVE** S311A

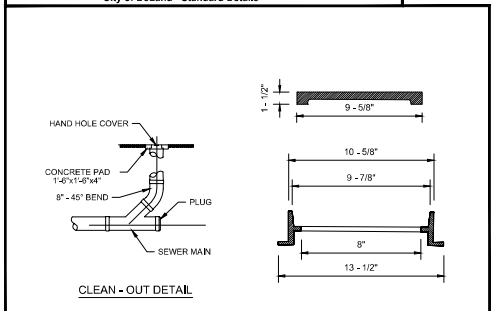
City of DeLand - Standard Details



SEE S302 FOR SECTION

DATE: 12/30/2024 **SANITARY MANHOLE** S303

City of DeLand - Standard Details



NOTE: HAND HOLE COVER TO BE U.S. FOUNDRY 7621 OR EQUAL

DATE: 12/30/2024 **CLEAN - OUT** S308

City of DeLand - Standard Details

No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/21/24	JOR
2	REVISED PER CITY COMMENTS	07/10/25	JOR
3	REVISED PER CITY COMMENTS	08/15/25	JOR

Kimley»Horn

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200 S. ORANGE AVENUE, SUITE 600, ORLANDO, FL 32801
PHONE: 689-4800
WWW.KIMLEY-HORN.COM CA-00000696

KHA PROJECT 240418000
DATE 09/09/2025
SCALE AS SHOWN
DESIGNED BY —
DRAWN BY —
CHECKED BY —

CITY OF DELAND DETAILS

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER C8.2

Plotted By: Ramirez, Jason Saved Set: DELAND TECH PARK Layout: C8.2 CITY OF DELAND DETAILS September 15, 2025 - 09:32:48am K:\ORL_Civil\240418000\Signed Tech Plan\CIVIL\CIVIL\CIVIL\Working for Approval\Sheets\C8.2 CITY OF DELAND DETAILS.dwg
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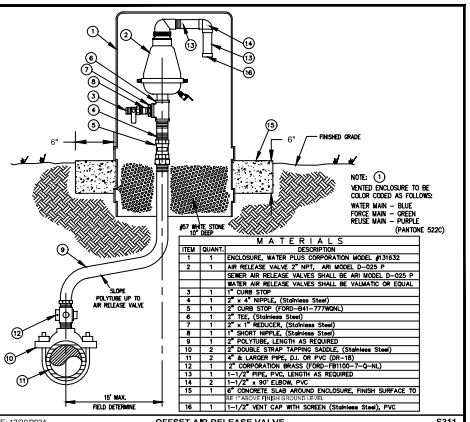
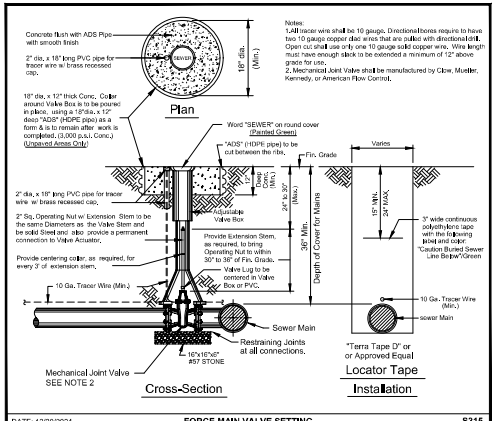


M A T E R I A L S		
ITEM	QUANT.	DESCRIPTION
1	1	ENCLOSURE, WATER PLUS CORPORATION MODEL #131632
2	1	AIR RELEASE VALVE 2" NPT, AIR MODEL D-025 P
		SEWER AIR RELEASE VALVES SHALL BE ARI MODEL D-025 P
		WATER AIR RELEASE VALVES SHALL BE VALMATIC OR EQUAL
3	1	1" CURB STOP
4	1	2" x 4" NIPPLE, (Stainless Steel)
5	1	2" CURB STOP (FORD–B41–777WQNL)
6	1	2" TEE, (Stainless Steel)
7	1	2" x 1" REDUCER, (Stainless Steel)
8	1	1" SHORT NIPPLE, (Stainless Steel)
9	1	2" POLYTUBE, LENGTH AS REQUIRED
10	2	2" DOUBLE STRAP TAPPING SADDLE, (Stainless Steel)
11	2	4" & LARGER PIPE, D.I. OR PVC (DR–18)
12	1	2" CORPORATION BRASS (FORD–FB1100–7–Q–NL)
13	1	1–1/2" PIPE, PVC, LENGTH AS REQUIRED
14	2	1–1/2" x 90° ELBOW, PVC
15	1	6" CONCRETE SLAB AROUND ENCLOSURE, FINISH SURFACE TO BE 1" ABOVE FINISH GROUND LEVEL
16	1	1–1/2" VENT CAP WITH SCREEN (Stainless Steel), PVC

DATE: 12/30/2024 — **OFFSET AIR RELEASE VALVE** — S311

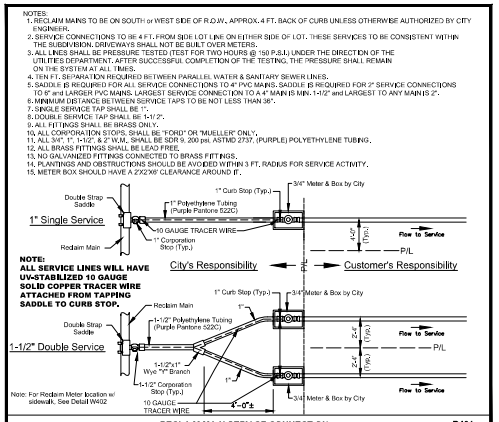
City of DeLand - Standard Details



Notes:
1.All tracer wire shall be 10 gauge. Directional bores require to have two 10 gauge copper clad wires that are pulled with directional drill. Open cut shall use only one 10 gauge solid copper wire. Wire length must have enough slack to be extended a minimum of 12" above grade for use.
2. Mechanical Joint Valve shall be manufactured by Clow, Mueller, Kennedy, or American Flow Control.

DATE: 12/30/2024 — **FORCE MAIN VALVE SETTING** — S315

City of DeLand - Standard Details

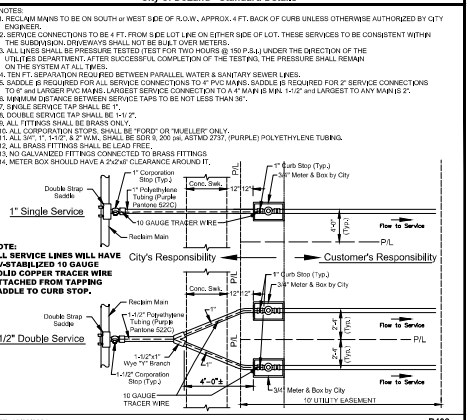


NOTES:
1. RECLAIM MAINS TO BE ON SOUTH or WEST SIDE OF R.O.W., APPROX. 4 FT. BACK OF CURB UNLESS OTHERWISE AUTHORIZED BY CITY ENGINEER.
2. SERVICE CONNECTIONS TO BE 4 FT. FROM SIDE LOT LINE ON EITHER SIDE OF LOT. THESE SERVICES TO BE CONSISTENT WITHIN THE SUBDIVISION. DRIVEWAYS SHALL NOT BE BUILT OVER METERS.
3. ALL LINES SHALL BE PRESSURE TESTED (TEST FOR TWO HOURS @ 150 P.S.I.) UNDER THE DIRECTION OF THE UTILITIES DEPARTMENT. AFTER SUCCESSFUL COMPLETION OF THE TESTING, THE PRESSURE SHALL REMAIN ON THE SYSTEM AT ALL TIMES.
4. TEN FT. SEPARATION REQUIRED BETWEEN PARALLEL WATER & SANITARY SEWER LINES.
5. SADDLE IS REQUIRED FOR ALL SERVICE CONNECTIONS TO 4" PVC MAINS. SADDLE IS REQUIRED FOR 2" SERVICE CONNECTIONS TO 8" and LARGER PVC MAINS. LARGEST SERVICE CONNECTION TO A 4" MAIN IS MIN. 1-1/2" and LARGEST TO ANY MAIN IS 2".
6. MINIMUM DISTANCE BETWEEN SERVICE TAPS TO BE NOT LESS THAN 36".
7. SINGLE SERVICE TAP SHALL BE 1".
8. DOUBLE SERVICE TAP SHALL BE 1-1/2".
9. ALL FITTINGS SHALL BE BRASS ONLY.
10. ALL CORPORATION STOPS, SHALL BE "FORD" OR "MUELLER" ONLY.
11. ALL 3/4", 1", 1-1/2", & 2" W.M., SHALL BE SDR 9, 200 psi. ASTMD 2737, (PURPLE) POLYETHYLENE TUBING.
12. ALL BRASS FITTINGS SHALL BE LEAD FREE.
13. NO GALVANIZED FITTINGS CONNECTED TO BRASS FITTINGS.
14. PLANTINGS AND OBSTRUCTIONS SHOULD BE AVOIDED WITHIN 3 FT. RADIUS FOR SERVICE ACTIVITY.
15. METER BOX SHOULD HAVE A 2'X2'W' CLEARANCE AROUND IT.

NOTE:
ALL SERVICE LINES WILL HAVE UV-STABILIZED 10 GAUGE SOLID COPPER TRACER WIRE ATTACHED FROM TAPPING SADDLE TO CURB STOP.

DATE: 12/30/2024 — **RECLAIM MAIN SERVICE CONNECTION** — R401

City of DeLand - Standard Details

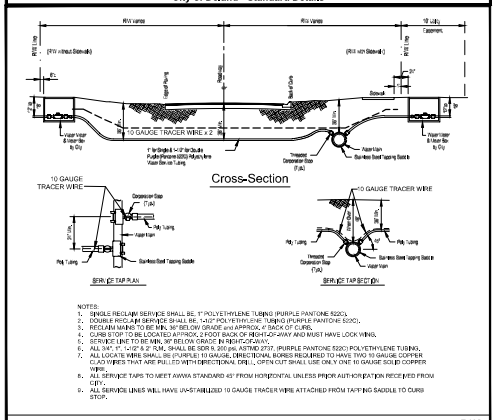


NOTES:
1. RECLAIM MAINS TO BE ON SOUTH or WEST SIDE OF R.O.W., APPROX. 4 FT. BACK OF CURB UNLESS OTHERWISE AUTHORIZED BY CITY ENGINEER.
2. SERVICE CONNECTIONS TO BE 4 FT. FROM SIDE LOT LINE ON EITHER SIDE OF LOT. THESE SERVICES TO BE CONSISTENT WITHIN THE SUBDIVISION. DRIVEWAYS SHALL NOT BE BUILT OVER METERS.
3. ALL LINES SHALL BE PRESSURE TESTED (TEST FOR TWO HOURS @ 150 P.S.I.) UNDER THE DIRECTION OF THE UTILITIES DEPARTMENT. AFTER SUCCESSFUL COMPLETION OF THE TESTING, THE PRESSURE SHALL REMAIN ON THE SYSTEM AT ALL TIMES.
4. TEN FT. SEPARATION REQUIRED BETWEEN PARALLEL WATER & SANITARY SEWER LINES.
5. SADDLE IS REQUIRED FOR ALL SERVICE CONNECTIONS TO 4" PVC MAINS. SADDLE IS REQUIRED FOR 2" SERVICE CONNECTIONS TO 8" and LARGER PVC MAINS. LARGEST SERVICE CONNECTION TO A 4" MAIN IS MIN. 1-1/2" and LARGEST TO ANY MAIN IS 2".
6. MINIMUM DISTANCE BETWEEN SERVICE TAPS TO BE NOT LESS THAN 36".
7. SINGLE SERVICE TAP SHALL BE 1".
8. DOUBLE SERVICE TAP SHALL BE 1-1/2".
9. ALL FITTINGS SHALL BE BRASS ONLY.
10. ALL CORPORATION STOPS, SHALL BE "FORD" OR "MUELLER" ONLY.
11. ALL 3/4", 1", 1-1/2", & 2" W.M., SHALL BE SDR 9, 200 psi. ASTMD 2737, (PURPLE) POLYETHYLENE TUBING.
12. ALL BRASS FITTINGS SHALL BE LEAD FREE.
13. NO GALVANIZED FITTINGS CONNECTED TO BRASS FITTINGS.
14. METER BOX SHOULD HAVE A 2'X2'W' CLEARANCE AROUND IT.

NOTE:
ALL SERVICE LINES WILL HAVE UV-STABILIZED 10 GAUGE SOLID COPPER TRACER WIRE ATTACHED FROM TAPPING SADDLE TO CURB STOP.

DATE: 12/30/2024 — **RECLAIM MAIN SERVICE CONN. WITH SIDEWALK** — R402

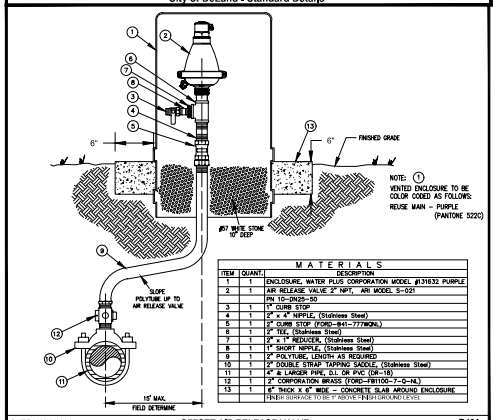
City of DeLand - Standard Details



NOTES:
1. SINGLE RECLAIM SERVICE SHALL BE 1" POLYETHYLENE TUBING (PURPLE PANTONE 522C).
2. DOUBLE RECLAIM SERVICE SHALL BE 1-1/2" POLYETHYLENE TUBING (PURPLE PANTONE 522C).
3. RECLAIM MAINS TO BE MIN. 36" BELOW GRADE and APPROX. 4' BACK OF CURB.
4. CURB STOP TO BE LOCATED APPROX. 2 FOOT BACK OF RIGHT-OF-WAY AND MUST HAVE LOCK WING.
5. SERVICE LINE TO BE MIN. 30" BELOW GRADE IN RIGHT-OF-WAY.
6. ALL 3/4", 1", 1-1/2" & 2" TUM., SHALL BE SDR 9, 200 psi. ASTMD 2737, (PURPLE PANTONE 522C) POLYETHYLENE TUBING.
7. ALL LOCATE WIRE SHALL BE (PURPLE) 10 GAUGE, DIRECTIONAL BORES REQUIRED TO HAVE TWO 10 GAUGE COPPER CLAD WIRES THAT ARE PULLED WITH DIRECTIONAL DRILL. OPEN CUT SHALL USE ONLY ONE 10 GAUGE SOLID COPPER WIRE.
8. ALL SERVICE TAPS TO MEET AWWA STANDARD 45° FROM HORIZONTAL UNLESS PRIOR AUTHORIZATION RECEIVED FROM CITY.
9. ALL SERVICE LINES WILL HAVE UV-STABILIZED 10 GAUGE TRACER WIRE ATTACHED FROM TAPPING SADDLE TO CURB STOP.

DATE: 12/30/2024 — **RECLAIM MAIN SERVICE LINES** — R403

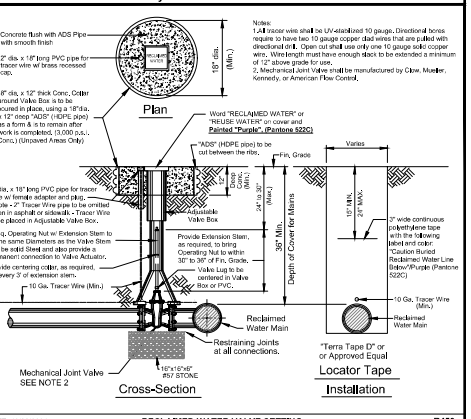
City of DeLand - Standard Details



M A T E R I A L S		
ITEM	QUANT.	DESCRIPTION
1	1	ENCLOSURE, WATER PLUS CORPORATION MODEL #131632 PURPLE
2	1	AIR RELEASE VALVE 2" NPT, AIR MODEL S–021
		PN 10–3029–50
3	1	1" CURB STOP
4	1	2" x 4" NIPPLE, (Stainless Steel)
5	1	2" CURB STOP (FORD–B41–777WQNL)
6	1	2" TEE, (Stainless Steel)
7	1	2" x 1" REDUCER, (Stainless Steel)
8	1	1" SHORT NIPPLE, (Stainless Steel)
9	1	2" POLYTUBE, LENGTH AS REQUIRED
10	1	2" DOUBLE STRAP TAPPING SADDLE, (Stainless Steel)
11	1	4" & LARGER PIPE, D.I. OR PVC (DR–18)
12	1	2" CORPORATION BRASS (FORD–FB1100–7–Q–NL)
13	1	6" THICK X 6" WIDE – CONCRETE SLAB AROUND ENCLOSURE
		FINISH SURFACE TO BE 1" ABOVE FINISH GROUND LEVEL

DATE: 12/30/2024 — **OFFSET AIR RELEASE VALVE** — R421

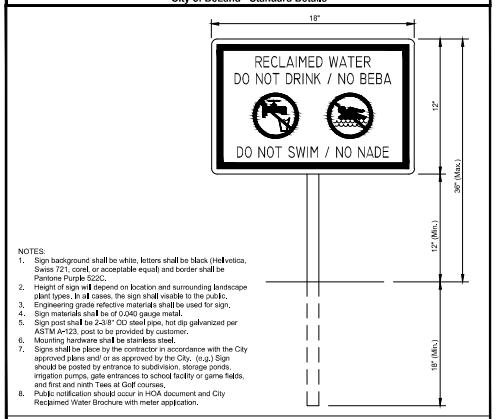
City of DeLand - Standard Details



Notes:
1.All tracer wire shall be UV-stabilized 10 gauge. Directional bores require to have two 10 gauge copper clad wires that are pulled with directional drill. Open cut shall use only one 10 gauge solid copper wire. Wire length must have enough slack to be extended a minimum of 12" above grade for use.
2. Mechanical Joint Valve shall be manufactured by Clow, Mueller, Kennedy, or American Flow Control.

DATE: 12/30/2024 — **RECLAIMED WATER VALVE SETTING** — R450

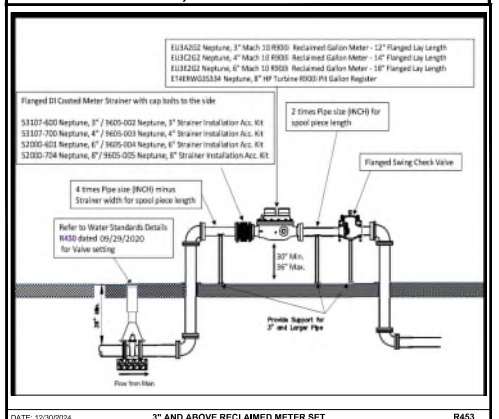
City of DeLand - Standard Details



NOTES:
1. Sign background shall be white, letters shall be black (Helvetica, Swiss 721, coreL or acceptable equal) and border shall be Pantone Purple 522C.
2. Height of sign will depend on location and surrounding landscape plant types. In all cases, the sign shall visable to the public.
3. Engineering grade refective materials shall be used for sign.
4. Sign materials shall be of 0,040 gauge metal.
5. Sign post shall be 2-3/8" OD steel pipe, hot dip galvanized per ASTM A-123, post to be provided by customer.
6. Mounting hardware shall be stainless steel.
7. Signs shall be place by the contractor in accordance with the City approved plans and/ or as approved by the City. (e.g.) Sign should be posted by entrance to subdivision, storage ponds, irrigation pumps, gate entrances to school facility or game fields, and first and ninth Tees at Golf courses,
8. Public notification should occur in HOA document and City Reclaimed Water Brochure with meter application.

DATE: 12/30/2024 — **RECLAIMED WATER SIGNAGE** — R451

City of DeLand - Standard Details



DATE: 12/30/2024 — **3" AND ABOVE RECLAIMED METER SET** — R453

City of DeLand - Standard Details

No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/21/24	JOR
2	REVISED PER CITY COMMENTS	07/10/25	JOR
3	REVISED PER CITY COMMENTS	09/15/25	JOR

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200 S. ORANGE AVENUE, SUITE 880, ORLANDO, FL 32801
PHONE: 407 898 1511
WWW.KIMLEY-HORN.COM CA- 00000696

KHA PROJECT 240418000
DATE 09/09/2025
SCALE AS SHOWN
DESIGNED BY JOR
DRAWN BY JOR
CHECKED BY JRS

CITY OF DELAND DETAILS

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER C8.3

Plotted By: Brennen Jones Saved Set: DELAND TECH PARK Layout: C8.3 CITY OF DELAND DETAILS September 15, 2025 - 09:53:03am K:\ORL_Civil\240418000\Signed Tech Park\CIVIL\DOCS\DOST (Utilities for Approval)\Sheets\C8.3 DETAILS.dwg
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1. THE CITY OF DeLand's UTILITIES DEPARTMENT (386-626-7250) SHALL BE GIVEN A MINIMUM OF 48 HOURS ADVANCE NOTICE (NOT INCLUDING HOLIDAYS OR WEEKENDS) PRIOR TO the BEGINNING OF ANY RECLAIMED WATER SYSTEM CONSTRUCTION.
2. DEWATERING SHALL BE PROVIDED TO KEEP GROUNDWATER ELEVATION A MINIMUM OF 6 INCHES BELOW PROPSED RECLAIMED WATER MAIN.
3. ALL RECLAIMED WATER MAINS SHALL BE LAID ON A FIRM FOUNDATION WITH ALL UNSUITABLE MATERIAL (MUCK, ROCK, COQUINA, ETC.) REMOVED AND REPLACED WITH CLEAN GRANULAR MATERIAL.
4. TRENCHES SHALL BE BACKFILLED WITH MATERIAL ACCEPTABLE TO THE CITY WITH A MINIMUM COMPACTION OF 95% IN UNPAVED AREAS AND 98% IN PAVED AREAS IN ACCORDANCE WITH AASHTO T-180.
5. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO ENSURE THAT TRENCH COMPACTION TESTS ARE PROVIDED AT POINTS 1 FOOT ABOVE THE PIPE AND AT 1 FOOT VERTICAL INTERVALS TO FINISH GRADE, AT A MINIMUM SPACING OF EVERY 300 FEET
6. 3" METALLIZED PIPE LOCATION TAPE SHALL BE LOCATED BETWEEN 15" AND 24" BELOW FINISHED GRADE OR AS SPECIFIED BY MANUFACTURER FOR ALL PVC LINES. MARKER TAPE SHALL BE PROVIDED ON ALL DIPS AS WELL.
7. ALL SINGLE RESIDENTIAL RECLAIMED WATER SERVICES SHALL BE 1" AND DOUBLE RESIDENTIAL SERVICES SHALL BE 1-1/2". SERVICES SHALL BE CTS 3408 HIGH DENSITY POLYETHYLENE TUBING RATED FOR A MINIMUM OF 200 PSI WITH SDR 9 (CTS). THE TUBING SHALL HAVE A VIRGIN HIGH DENSITY POLYETHYLENE CENTER FOR WHICH THE MANUFACTURER SHALL FURNISH A CERTIFICATE OF PURITY. THE TUBING SHALL BE "PURPLE" (PANTONE) IN COLOR AND SHALL HAVE THE WORDS "RECLAIMED WATER" PERMANENTLY PRINTED ON THE OUTSIDE. THE TUBING SHALL HAVE U.V. PROTECTION AND SHALL NOT BE AFFECTED BY DIRECT SUNLIGHT. THE TUBING SHALL COMPLY WITH OR EXCEED THE APPLICABLE STANDARDS OF A.S.D.M. D1248, D3350, D2239, D2737, N.S.F.-14 AND A.W.W.A. C901 AND SHALL COME WITH A LIFETIME WARRANTY. APPROVED SIZES: 1", 1-1/2" AND 2" DIAMETERS. ACCEPTABLE MANUFACTURERS: ENDOT ENDOCORE RWT OR APPROVED EQUAL
8. REFER TO "NEW POTABLE AND REUSE SERVICE WHIP" R426.
9. RECLAIMED WATER VALVES SHALL BE PLACED AT ALL STREET INTERSECTIONS AND AT MAXIMUM SPACING OF 1,000 FEET.
10. AT ALL RECLAIMED WATER MAIN TEES AND CROSSES, VALVES SHALL BE INSTALLED ON ALL LEGS EXCEPT ONE.
11. APPROVED WATER VALVE TYPES MUELLER OR CLOW:
    A. STANDARD GATE VALVES EQUAL TO OR LESS THAN 24" DIAMETER (AWWA C-500) OR RESILIENT SEAT GATE VALVES (AWWA C-509)
    B. TAPPING VALVES WITH MECHANICAL OR STAINLESS STEEL TAPPING SLEEVE.
12. ALL RECLAIMED WATER VALVES SHALL BE ADJUSTED TO FINISH GRADE AND THE CAPS SHALL BE PAINTED PURPLE (PANTONE 522C) TO MAKE THEM PLAINLY DISTINGUISHABLE.
13. AS STANDARD PRACTICE RECLAIMED WATER MAINS SHALL BE INSTALLED 4 FEET OFF THE BACK OF THE CURB ON THE OPPOSITE SIDE OF THE POTABLE WATER LINES OR AS APPROVED BY THE CITY.

DATE: 12/30/2024 | RECLAIMED WATER NOTES - 1 OF 3 | R460

City of DeLand - Standard Details

14. ALL RECLAIMED WATER MAINS SHALL HAVE A MINIMUM COVER OF 36 INCHES. IN SPECIAL CASES WHERE IT IS IMPOSSIBLE OR INAPPROPRIATE TO PROVIDE ADEQUATE COVER, DUCTILE IRON PRESSURE CLASS 350 OR CONCRETE ENCASEMENT MAY BE USED AS APPROVED BY THE CITY.
15. THE CONTRACTOR SHALL NOTIFY THE CITY'S DESIGNATED INSPECTOR PRIOR TO ATTEMPTING TO CLEAR ANY RECLAIMED WATER MAIN FOR USE. THE INSPECTOR SHALL COORDINATE WITH CITY PERSONNEL AT THE RECLAIMED WATER PLANT 48 HOURS PRIOR TO BEGINNING OF ANY FULL-DIAMETER FLUSH OF MAINS. THE CONTRACTOR WILL CONDUCT A STANDARD WATER PRESSURE TEST, 150 PSI STATIC PRESSURE FOR A PERIOD OF 2 HOURS PER AWWA POTABLE WATER STANDARDS. THE RECLAIMED LINES WILL THEN BE DISINFECTED WITH CHLORINE, FLUSHED CLEAR AGAIN.
16. THE CONTRACTOR SHALL BE REQUIRED TO PIG ALL RECLAIMED MAINS IN EXCESS OF 4" IN DIAMETER AND PRIMARY DISTRIBUTION MAINS LOCATED ON COLLECTOR AND ARTERIAL ROADWAYS. LAUNCHING AND EXTRACTION POINTS SHALL BE DETERMINED BY THE CONTRACTOR. ALL PIGGING OPERATIONS SHALL BE WITNESSED BY A PUBLIC UTILITIES REPRESENTATIVE OR CITY UTILITY INSPECTOR.
17. RECLAIMED WATER MAINS SHALL BE PVC AWWA CLASS C-900 OR C-905, CL 150 (COLOR: "PURPLE" PANTONE 522C) OR DIP PRESSURE CLASS 350, STANDARD CEMENT LINED UNLESS APPROVED OTHERWISE BY THE CITY.
18. ALL RECLAIMED WATER MAINS SHALL USE A THRUST RESTRAINED JOINT METHOD IN COMPLIANCE WITH THE DUCTILE IRON PIPE RESEARCH ASSOCIATION (DIPRA) GUIDELINES. IN THE EVENT THAT PVC FITTINGS ARE SPECIFIED, THE RESTRAINED JOINT SHALL BE MODIFIED IN ACCORDANCE WITH THE RECOMMENDED ADDITIONAL RESTRAINED LENGTH REQUIRED FOR PIPE WRAPPED WITH POLYETHYLENE. IN NO INSTANCE SHALL THRUST BLOCKS BE PERMITTED.
19. MEGALUGS, BOLTLESS RESTRAINED JOINTS, OR GRIPPER GASKETS SHALL BE USED ON ALL RESTRAINED JOINT INSTALLATIONS. MINIMUM DEPTH OF BURY ON PIPES NOT MEETING REQUIRED COVER REQUIREMENTS SHALL FOLLOW THE MOST RECENT DIPRA THRUST RESTRAINT DESIGN GUIDELINES. SEE DETAILS W408 AND W409.
20. GRIPPER RING GASKETS BY ROMAC MAY BE USED AS APPROPRIATE FOR RESTRAINING PRESSURE PIPE TO FITTINGS, VALVES, ETC.
21. UPON CONSTRUCTION COMPLETION AND ACCEPTANCE OF THE SYSTEM, IT SHALL BE THE DESIGN ENGINEER'S RESPONSIBILITY TO INSURE THAT THE SYSTEM IS PROPERLY CERTIFIED AND ACCEPTED BY THE CITY OF DeLand UTILITIES AND "AS-BUILTS" ARE PROVIDED TO THE CITY, PRIOR TO ANY USE OF THIS SYSTEM.
22. ALL RECLAIMED WATER MAINS AND SERVICE LINES SHALL BE READILY DISTINGUISHABLE BY THEIR "PURPLE" (PANTONE 522C) COLOR OR TAPE MARKINGS. DUCTILE IRON PIPE SHALL BE WRAPPED WITH PURPLE PANTONE 522C POLYETHYLENE.
23. ALL RECLAIMED WATER SERVICES SHALL BE MARKED ALONG THE OUTSIDE EDGE OF CURB WITH AN "R". VALVES AND BLOW-OFFS FOR RECLAIMED WATER MAINS SHALL BE MARKED BY AN "X" SET INTO THE CURB.
24. RECLAIM WATER SERVICES SHALL BE NORMALLY DOUBLE 1-1/2" SERVICES LOCATED AT SIDE LOT LINES ALTERNATING WITH POTABLE WATER SERVICE LOCATIONS. IN INSTANCES WHERE RECLAIMED WATER SERVICES NEED TO BE OFFSET, DUE TO SEWER LATERAL CONNECTION, 1" SINGLE SERVICES SHALL BE SPECIFIED, THESE SERVICES MAY BE OFFSET FROM THE LOT LINE A MAXIMUM DISTANCE OF 4.0'.

DATE: 12/30/2024 | RECLAIMED WATER NOTES - 2 OF 3 | R461

City of DeLand - Standard Details

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1	REVISED PER CITY COMMENTS	10/2/24	JOR
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CITY OF DELAND DETAILS

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER C8.4

Plotted By: Ramirez, Jose Sheet Set: DELAND TECH PARK Layout: C8.4 CITY OF DELAND DETAILS September 15, 2025 - 09:52:53am K:\ORL_Civil\240418000\Island Tech Park\CIVIL\CONSTRUCT\Working for Approval\Sheets\C8.4 CITY OF DELAND DETAILS.dwg
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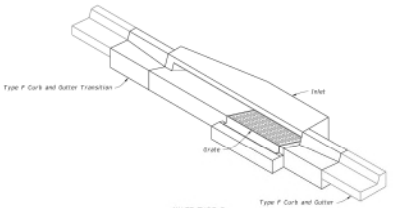
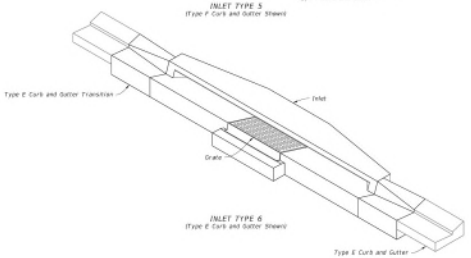
GENERAL NOTES:

1. Work this Index with Index 425-001 and Index 425-030.
2. Conform the finished grade and slope of the inlet tops with the finished cross slope and grade of the proposed sidewalk and/or border.
3. For inlets constructed on a curve, refer to the plans to determine the radius. Bend steel when necessary.
4. Use Grade 60 reinforcing bars with 1½" minimum cover unless otherwise shown, see Sheet 6 for equivalent area Welded Wire Reinforcement details.
5. Inlet tops may be either cast-in-place or precast concrete. Conform precast units to the dimensions shown or in accordance with approved shop drawings.
6. Corner fillets are required at inlet opening for precast units or C-I-P units used in conjunction with circular inlet bottoms or skewed rectangular inlet boxes. Finish top of fillets flush with grate throat bottom and match slope.
7. For Type E curb and gutter, transition the shape of the curb over the gutter transition length to match the face of the inlet (Type F).
8. Meet the requirements of ASTM A36/A36M with steel used for frames and grates.
9. Use either cast iron grates or steel grates.



INLET TYPE 5
(Type F Curb and Gutter Sheets)



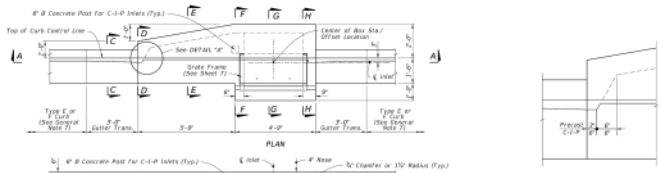
INLET TYPE 6
(Type E Curb and Gutter Sheets)

CURB INLETS TOPS

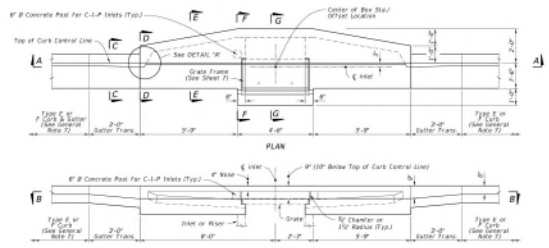
TABLE OF CONTENTS:

Sheet	Description
1	General Notes and Contents
2	Type 5 and 6 Dimensional Details
3	Type 5 and 6 Reinforcing and Bar Bending Details
4	Precast Dimensional and Reinforcing Details
5	Cast-In-Place Dimensional and Reinforcing Details
6	Alternate Welded Wire Reinforcing (WWR) Details
7	Grate, Anchor, and Grouting Details

LAST REVISION 11/01/20 | KEY SHEET | DESCRIPTION: | FDOT FY 2023-24 STANDARD PLANS | CURB INLET TOP TYPES 5 AND 6 | INDEX 425-021 | SHEET 1 of 7



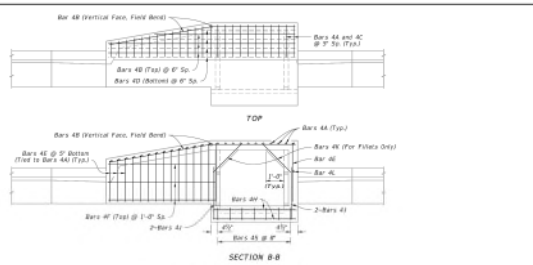
TYPE 5 DIMENSIONAL DETAILS



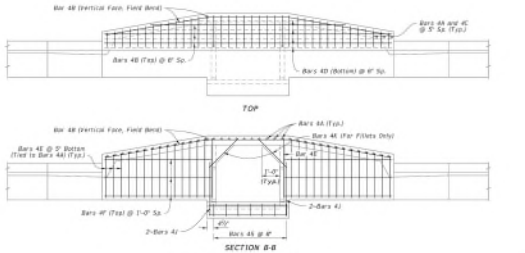
TYPE 6 DIMENSIONAL DETAILS

TYPE 5 AND 6 DIMENSIONAL DETAILS

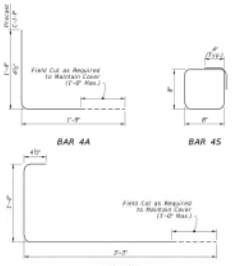
LAST REVISION 11/01/20 | KEY SHEET | DESCRIPTION: | FDOT FY 2023-24 STANDARD PLANS | CURB INLET TOP TYPES 5 AND 6 | INDEX 425-021 | SHEET 2 of 7



TYPE 5 REINFORCING DETAILS



TYPE 6 REINFORCING DETAILS



BILL OF REINFORCING STEEL

MARK	SIZE	TYPE 5 INLET NO.	TYPE 5 INLET LENGTH	TYPE 6 INLET NO.	TYPE 6 INLET LENGTH
A (Precast)	4	29	3'-3"	38	3'-7"
A (C-I-P)	4	25	2'-11½"	38	2'-11½"
B	4	6	10'-3"	6	11'-9"
C	4	25	13" to 1'-11"	38	11" to 1'-11"
D	4	4	10'-3"	4	11'-9"
E	4	16	4'-11½"	30	4'-11½"
F	4	3	9'-9"	9	11'-9"
H	3	4	9'-9"	4	9'-9"
J	4	4	3'-0"	4	3'-0"
K (Fillet)	4	2	2'-3"	2	2'-3"
L (Precast)	4	1	1'-4"	0	---
L (C-I-P)	4	10	1'-4"	9	1'-4"
S	4	7	3'-2"	7	3'-2"

NOTES:
1. All bar dimensions in the bending diagrams are out to out.
2. Bars 4A and 4E may be combined into a single bar.
3. Welded Wire Reinforcement consists of smooth or deformed wire meeting the requirements of Specification 931.

TYPE 5 AND 6 REINFORCING AND BAR BENDING DETAILS

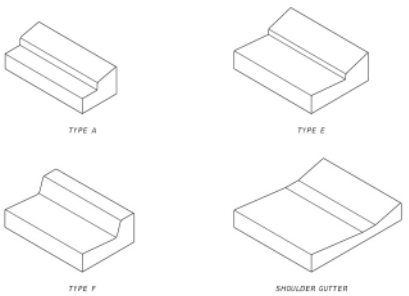
LAST REVISION 11/01/20 | KEY SHEET | DESCRIPTION: | FDOT FY 2023-24 STANDARD PLANS | CURB INLET TOP TYPES 5 AND 6 | INDEX 425-021 | SHEET 3 of 7

GENERAL NOTES:

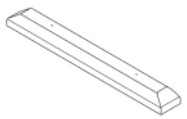
1. For curb, gutter and curb & gutter provide ⅜" - ½" contraction joints at 10' centers (max.). Contraction joints adjacent to concrete pavement on tangents and flat curves are to match the pavement joints, with intermediate joints not to exceed 10' centers.
2. Locate expansion joints for curb, gutter and curb & gutter in accordance with Specification 520.

TABLE OF CONTENTS:

Sheet	Description
1	General Notes and Contents
2	Concrete Curb and Gutter
3	Curb and Gutter Joints and Eddings, Concrete Bumper Guard, and Asphaltic Concrete Curb



TYPE A, TYPE E, TYPE F, AND SHOULDER GUTTER
(Other Types Similar)



CONCRETE BUMPER GUARD

LAST REVISION 11/01/21 | KEY SHEET | DESCRIPTION: | FDOT FY 2023-24 STANDARD PLANS | CURB AND GUTTER | INDEX 520-001 | SHEET 1 of 3

No.	REVISIONS	DATE	BY
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KHA PROJECT 244116000
DATE 07/9/2025
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CHECKED BY --

CONSTRUCTION DETAILS

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER C9.0

Plotted By: Ramirez, Jose; Sheet Set: DELAND TECH PARK; Layout: C9.1_CONSTRUCTION DETAILS; Jul 10, 2025 - 09:26:46am; K:\ORL_Civil\094189000-Deland Tech Park\CADD\CONSTR\Sheets\C9.0_CONST-DETAILS.dwg
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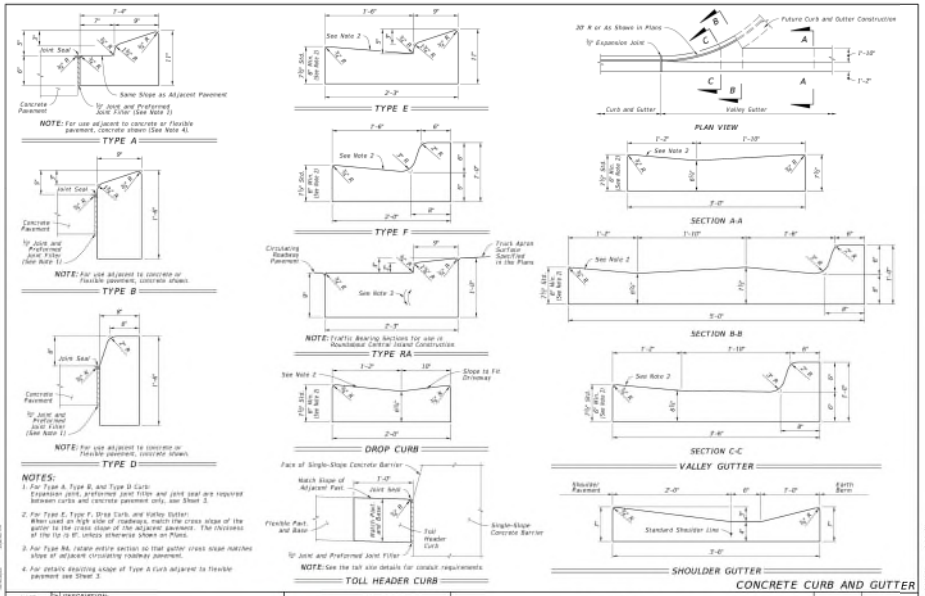
CONCRETE CURB AND GUTTER



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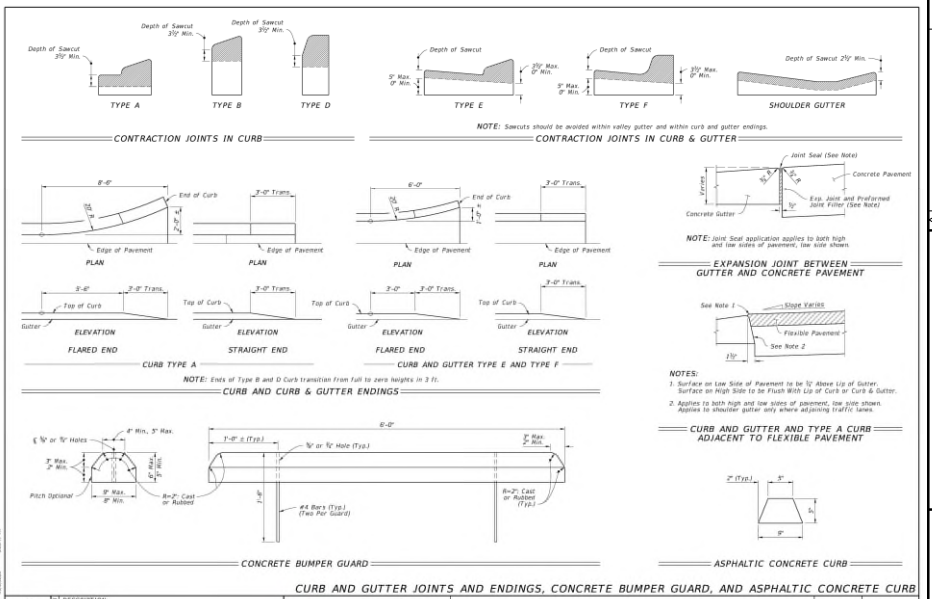
11/01/21	ADDITIONS				520-001	2 of 3

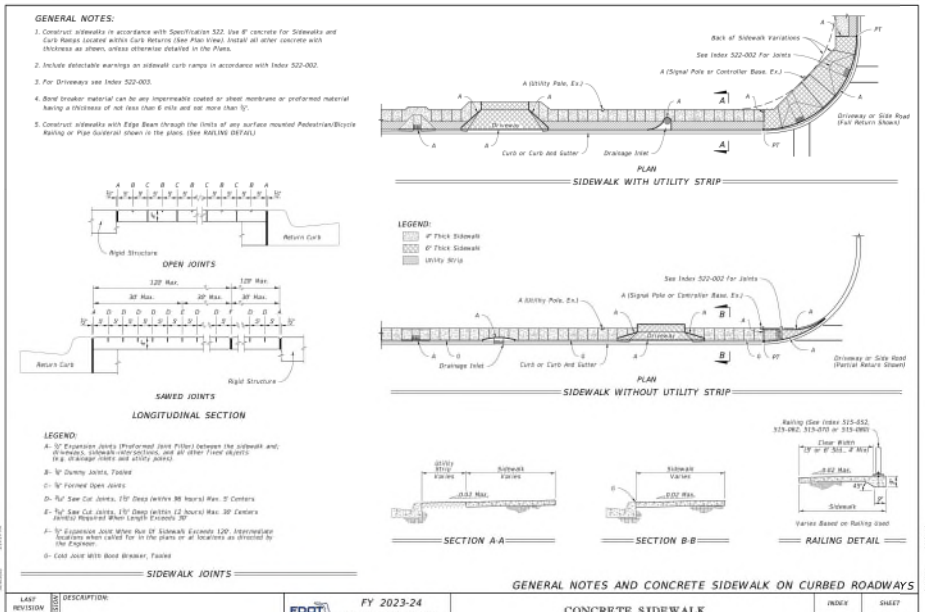
CURB AND GUTTER JOINTS AND ENDINGS, CONCRETE BUMPER GUARD, AND ASPHALTIC CONCRETE CURB



LAST REVISION	DESCRIPTION:	FDOT	FY 2023-24 STANDARD PLANS	CURB AND GUTTER	INDEX	SHEET
11/01/21	ADDITIONS				520-001	3 of 3

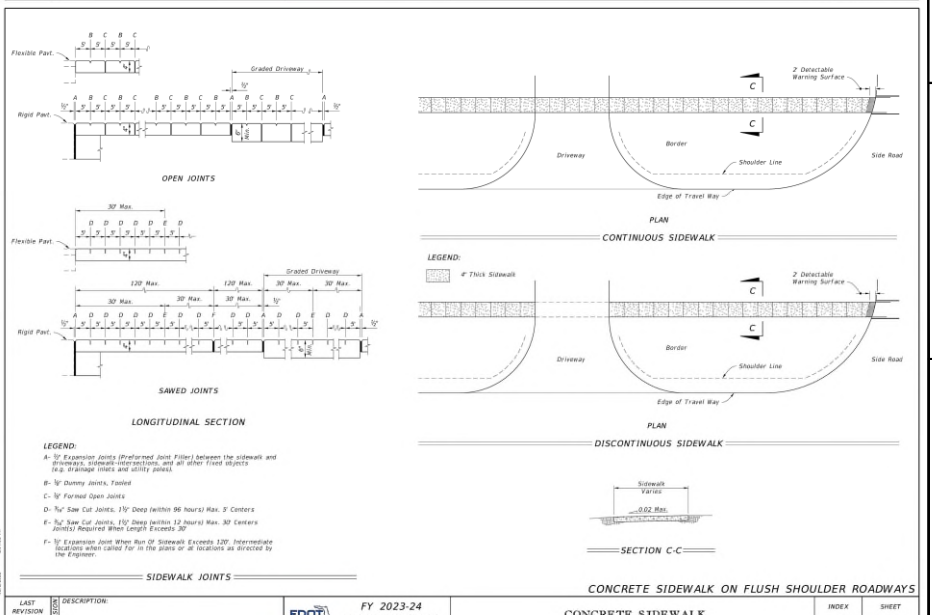
GENERAL NOTES AND CONCRETE SIDEWALK ON CURBED ROADWAYS

GENERAL NOTES:
1. Construct sidewalks in accordance with Specification 522. Use 8" concrete for Sidewalks and Curb Ramps located within Curb Returns (See Plan View). Install all other concrete with thickness as shown, unless otherwise detailed in the Plans.
2. Include detectable warnings on sidewalk curb ramps in accordance with Index 522-002.
3. For Driveways see Index 522-003.
4. Bond breaker material can be any impermeable coated or sheet membrane or preformed material having a thickness of not less than 6 mils and not more than ½".
5. Construct sidewalks with Edge Beam through the limits of any surface mounted Pedestrian/Bicycle Railing or Pipe Guiderail shown in the plans. (See RAILING DETAIL)



LAST REVISION	DESCRIPTION:	FDOT	FY 2023-24 STANDARD PLANS	CONCRETE SIDEWALK	INDEX	SHEET
11/01/18	REVISIONS				522-001	1 of 2

CONCRETE SIDEWALK ON FLUSH SHOULDER ROADWAYS



LAST REVISION	DESCRIPTION:	FDOT	FY 2023-24 STANDARD PLANS	CONCRETE SIDEWALK	INDEX	SHEET
11/01/18	REVISIONS				522-001	2 of 2

No.	REVISIONS	DATE	BY
1	REVISED PER QTY COMMENTS	10/21/24	JOR
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CONSTRUCTION DETAILS

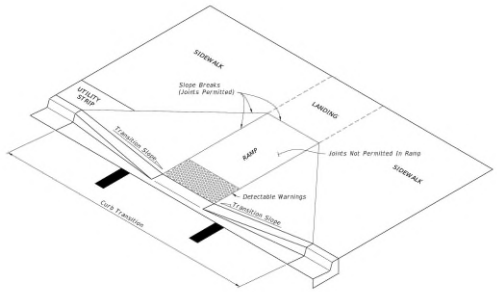
DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER C9.1

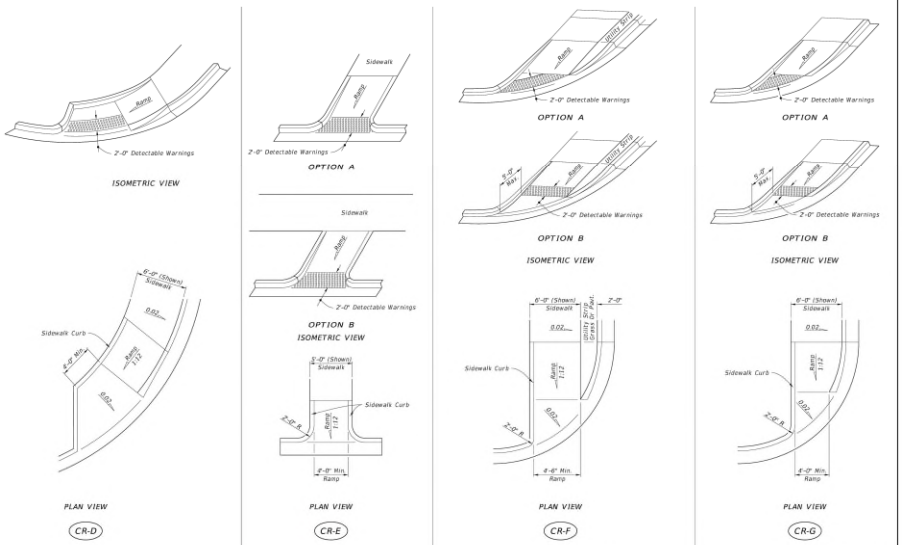
GENERAL NOTES:

1. Cross Slopes and Grades:
   A. Sidewalk, ramp, and landing slopes (i.e. 0.02, 0.05, and 1:12) shown in this Index are maximums. With approval of the Engineer, provide the minimum feasible slope where the requirements cannot be met.
   B. Landings must have cross-slopes less than or equal to 0.02 in any direction.
   C. Maintain a single longitudinal slope along each side of the curb ramp. Ramp slopes are not required to exceed 15 feet in length.
   D. Joints permitted at the location of Slope Breaks. Otherwise locate joints in accordance with Index 522-001. No joints are permitted within the ramp portion of the Curb Ramp.
2. Curb, Curb and Gutter and/or Sidewalk:
   A. Refer to Index 522-001 for concrete thickness and sidewalk details.
   B. Remove any existing curb, curb and gutter, or sidewalk to the nearest joint beyond the curb transition or to the extent that no remaining section is less than 5 feet long.
   C. Width of Curb Ramp is 4'-0" minimum. Match sidewalk or Shared Use Path width as shown in the Plans.
3. Curb Ramp Alpha-Identification:
   A. Sidewalk curb ramp alpha-identifications (e.g. CR-A) are provided for reference purposes in the Plans.
   B. Alpha-identifications CR-I and CR-J are intentionally omitted.
4. Detectable Warnings:
   A. Install detectable warnings in accordance with Specification 527.
   B. Place detectable warnings across the full width of the ramp or landing, to a minimum depth of 2 feet measured perpendicular to the curb line and no greater than 5 feet from the back of the curb or edge of pavement.
   C. If detectable warnings are shown in the Plans on slopes greater than 5%, align the truncated domes with the centerline of the ramp; otherwise, the truncated domes are not required to be aligned.



CURB RAMP NOMENCLATURE

LAST REVISION 11/01/21	REVISION	DESCRIPTION:	FDOT	FY 2023-24 STANDARD PLANS	DETECTABLE WARNINGS AND SIDEWALK CURB RAMPS	INDEX 522-002	SHEET 1 of 7

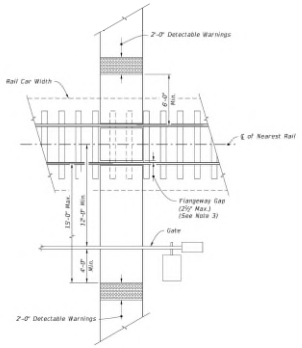


SIDEWALK CURB RAMPS CR-D, CR-E, CR-F & CR-G

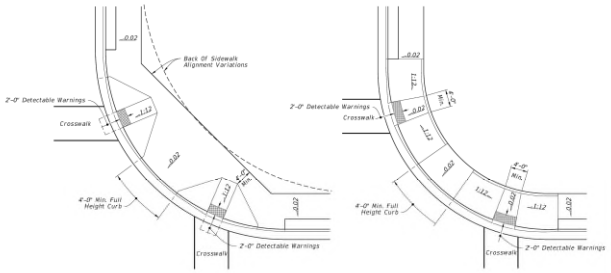
LAST REVISION 11/01/21	REVISION	DESCRIPTION:	FDOT	FY 2023-24 STANDARD PLANS	DETECTABLE WARNINGS AND SIDEWALK CURB RAMPS	INDEX 522-002	SHEET 4 of 7

NOTES:

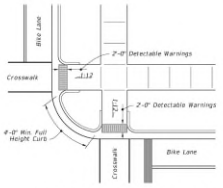
1. Where crosswalk markings are used, ramps must fall within the crosswalk limits. A clear space of 48" minimum is required at the bottom of the ramp within a marked crosswalk. If crosswalk markings are not present, a clear space of 48" minimum is required at the bottom of the ramp outside of active travel lanes.
2. Crosswalk widths and configurations vary; must conform to Index 711-001.
3. Flangeway Gap may be up to 3" for Freight-only Railways.



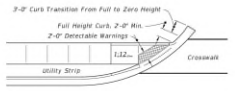
RAILROAD CROSSING



CURB RAMPS WITHIN RADIAL RETURN



CURB RAMPS OUTSIDE RADIAL RETURN



LINEAR SIDEWALK RAMPS

PLACEMENT OF SIDEWALK CURB RAMPS AT CURBED RETURNS (TYP.)

RAILROAD CROSSING AND CURB RAMPS AT CURBED RETURNS

LAST REVISION 11/01/20	REVISION	DESCRIPTION:	FDOT	FY 2023-24 STANDARD PLANS	DETECTABLE WARNINGS AND SIDEWALK CURB RAMPS	INDEX 522-002	SHEET 7 of 7

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CONSTRUCTION DETAILS

DELAND TECH PARK
FLORIDA
CITY OF DELAND

SHEET NUMBER C9.2

Plotted By: Ramirez, Jose; Sheet Set: DELAND TECH PARK; Layout: C9.2 CONSTRUCTION DETAILS; July 10, 2025 - 09:26:58am; K:\ORL_Civil\240418000\Orland Tech Park\CAD\CONSTR\Sheets\C9.2_CONSTRUCTION DETAILS.dwg
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DATE 10/27/2025
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CHECKED BY JTG

OVERALL TREE MITIGATION PLAN

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER
L0.50

Plotted By:Marjie Jake Sheet Set:DELAND TECH PARK Layout:L0.50 October 27, 2025 10:08:18am K:\ORL_Civil\249418000-Deland Tech Park\CADD\CONST\PlanSheets\L0.50-TREE MITIGATION PLANS.dwg
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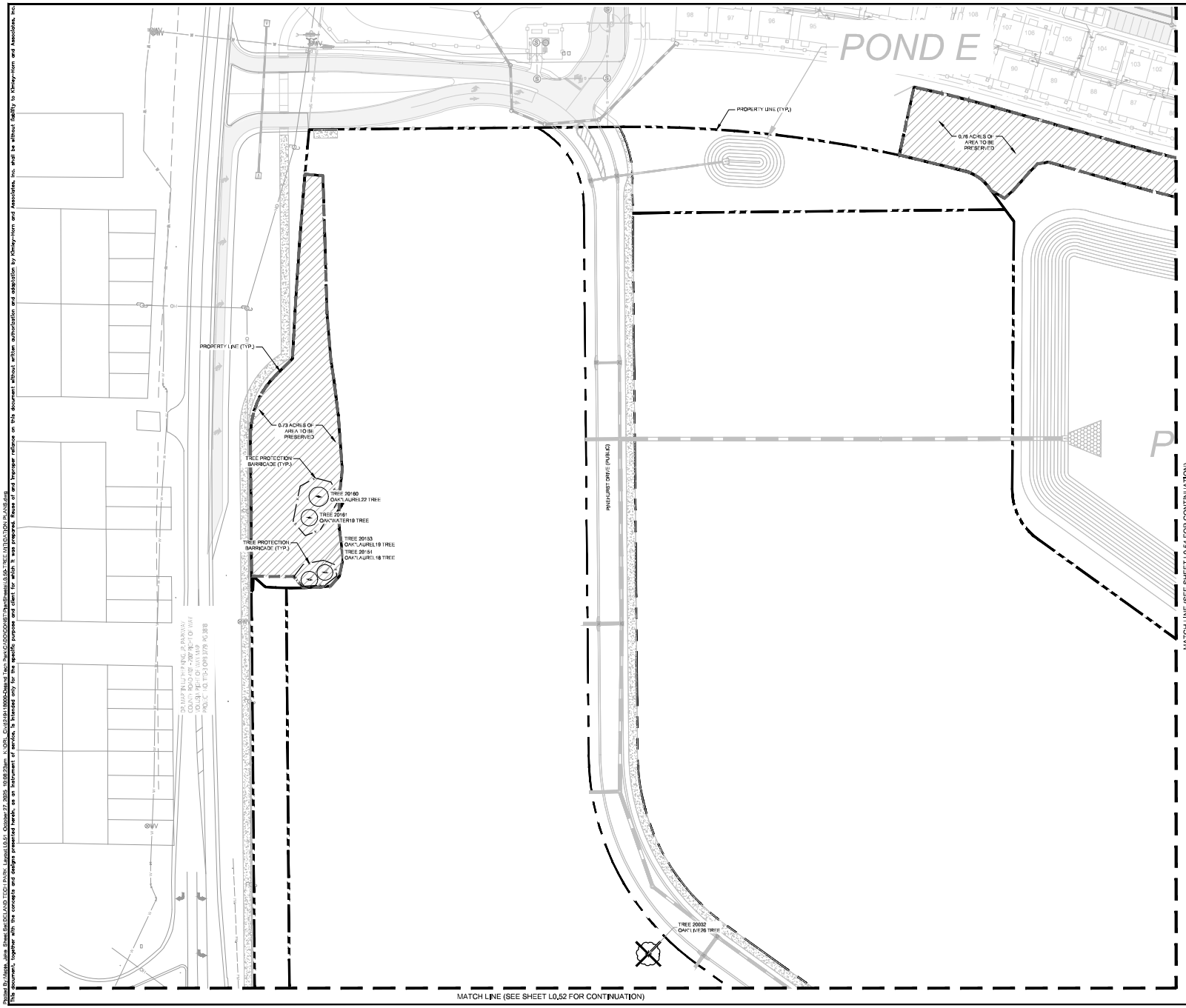

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TREE MITIGATION PLAN

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER
L0.51

Plotted By:Marja Jake Sheet Set:DELAND TECH PARK Layout:L0.51 October 27, 2025 10:08:23am K:\ORL_Civil\249418000-Deland Tech Park\CADD\CONST\PlanSheets\L0.50-TREE MITIGATION PLANS.dwg
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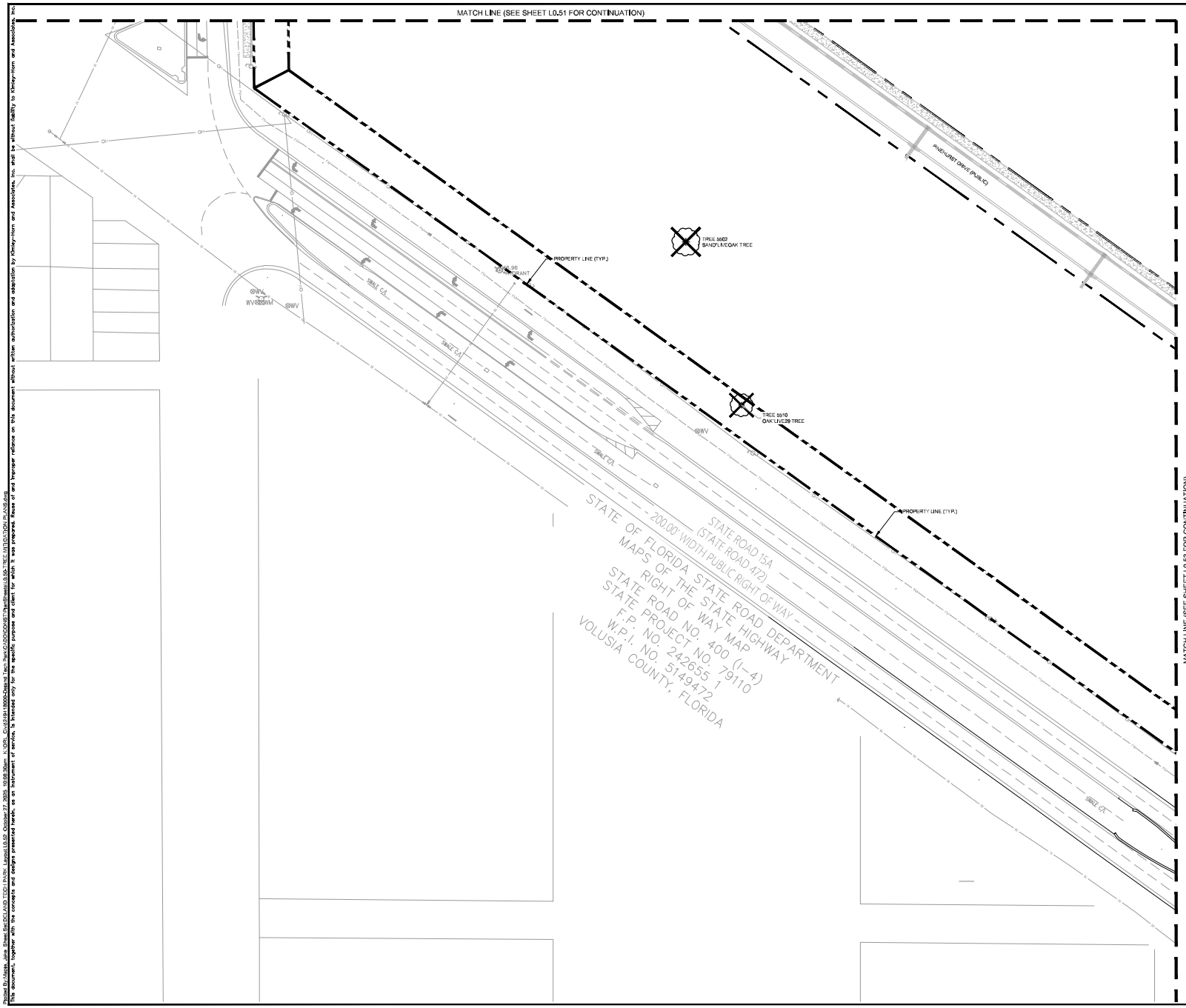


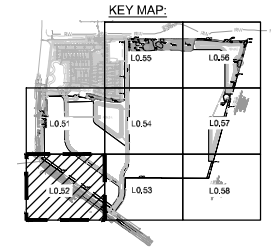
NORTH

GRAPHIC SCALE IN FEET
0 25 50 100

KEY:

- TREE TO PRESERVE
- TREE TO REMOVE
- HISTORIC TREE TO PRESERVE
- HISTORIC TREE TO REMOVE
- OFF-SITE TREE
- PALM TO PRESERVE
- TREE PROTECTION BARRICADE
- HISTORIC TREE PROTECTION BARRICADE

KEY MAP:



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TREE MITIGATION PLAN

DELAND TECH PARK
CITY OF DELAND FLORIDA

SHEET NUMBER
L0.52

Plotted By:Marjie Juke Sheet Set:DELAND TECH PARK Layout:L0.52 October 27, 2025 10:08:30am K:\ORL_Civil\249418000-Deland Tech Park\CADD\CONST\PlanSheets\L0.56-TREE MITIGATION PLANS.dwg
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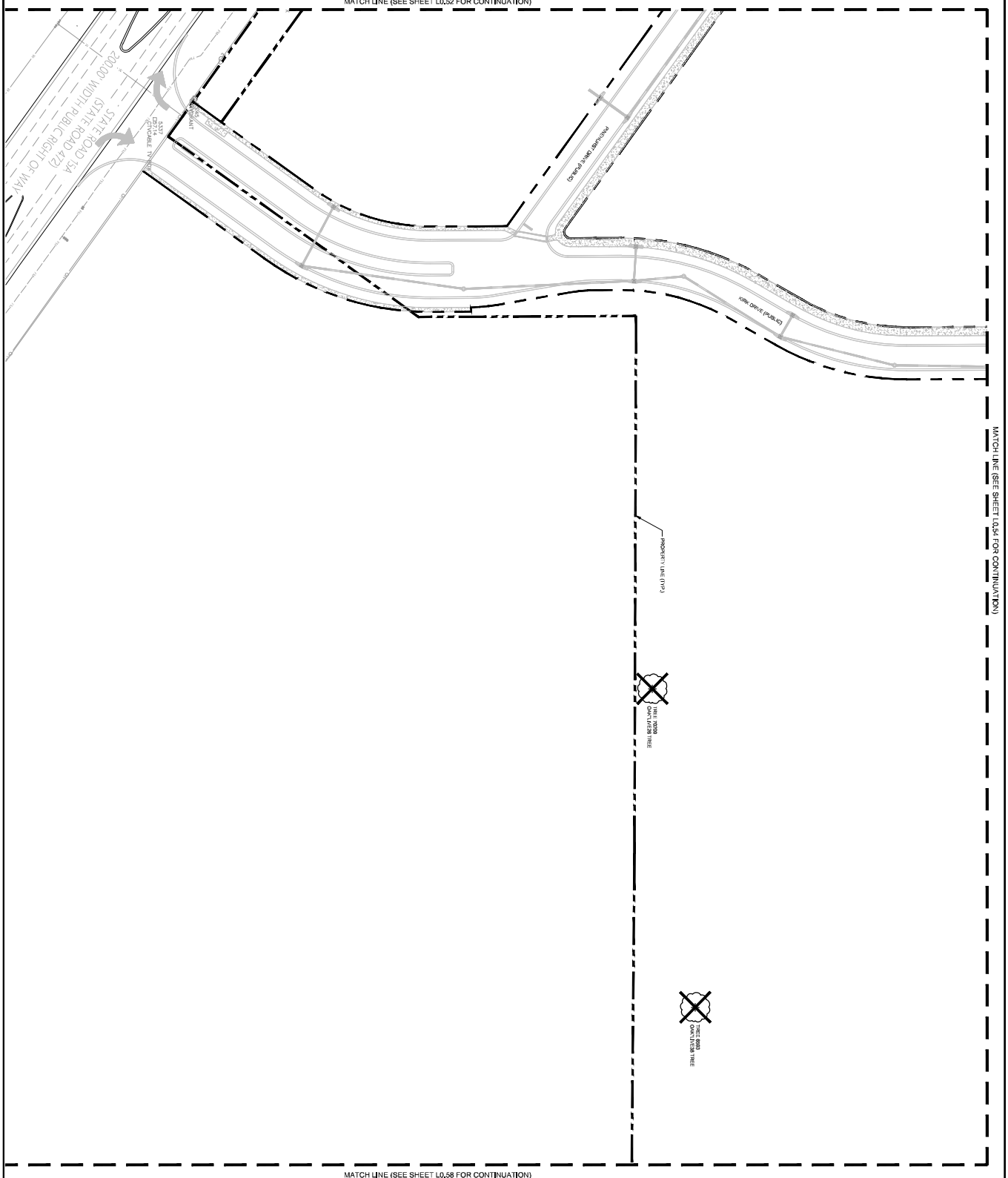
MATCH LINE (SEE SHEET L0.52 FOR CONTINUATION)



MATCH LINE (SEE SHEET L0.54 FOR CONTINUATION)

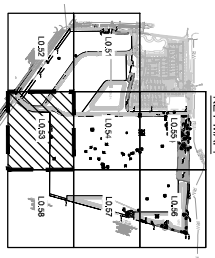
MATCH LINE (SEE SHEET L0.58 FOR CONTINUATION)

KEY:
- TREE TO PRESERVE
- TREE TO REMOVE
- HISTORIC TREE TO PRESERVE
- HISTORIC TREE TO REMOVE
- OFF-SITE TREE
- PALM TO PRESERVE
- TREE PROTECTION BARRICADE
- HISTORIC TREE PROTECTION BARRICADE

GRAPHIC SCALE IN FEET
0 25 50 100

NORTH

KEY MAP:



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SHEET NUMBER	DELAND TECH PARK	TREE MITIGATION PLAN
L0.53	CITY OF DELAND FLORIDA	

KHA PROJECT	249418000
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DRAWN BY	JM
CHECKED BY	JTG

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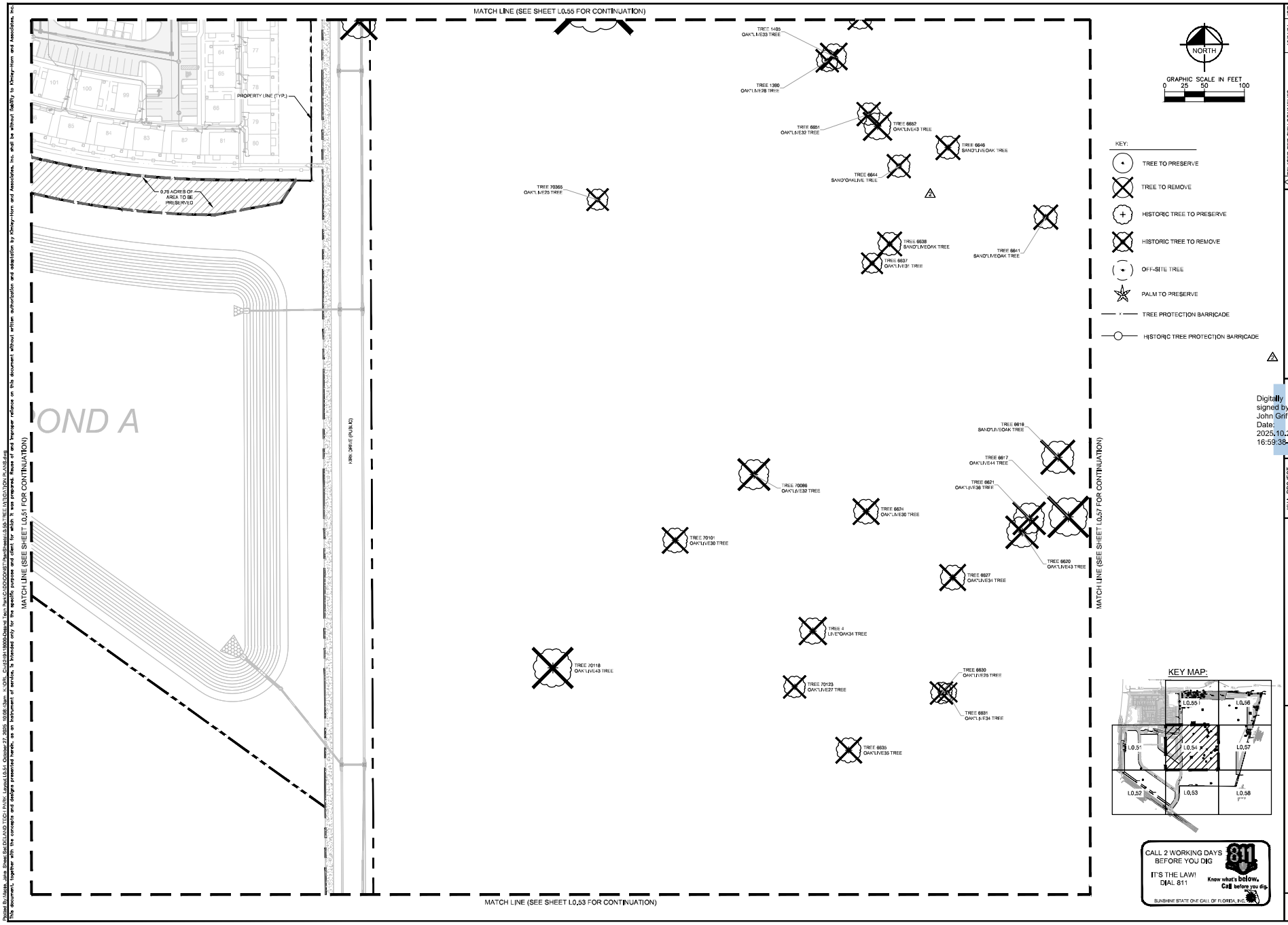

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TREE MITIGATION PLAN

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER
L0.54

Plotted By:Marja Jake Sheet Set:DELAND TECH PARK Layout:L0.54 October 27, 2025 10:08:43am K:\ORL_Civil\249418000-Deland Tech Park\CADD\CONST\PlanSheets\L0.56-TREE MITIGATION PLANS.dwg
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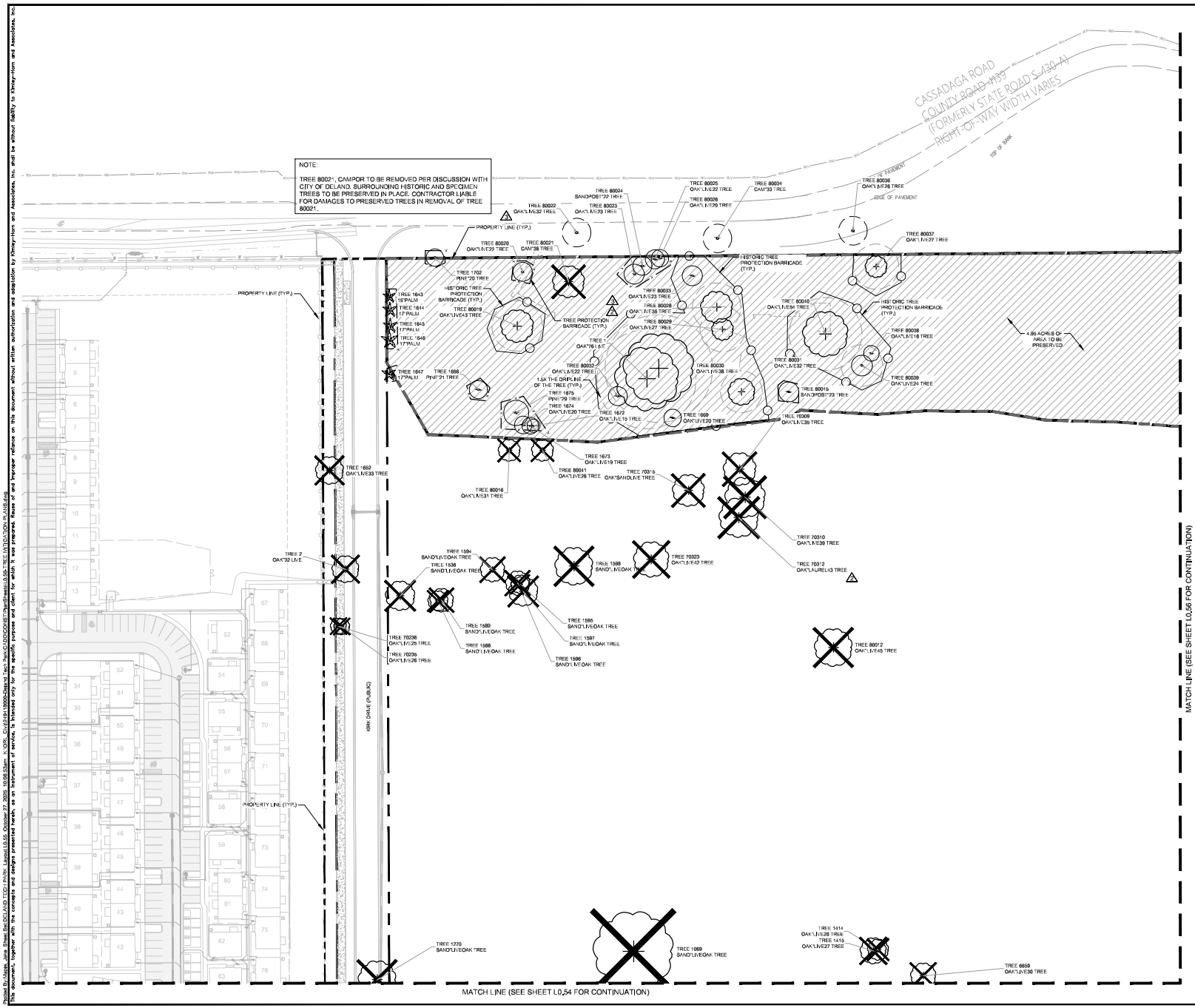

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TREE MITIGATION PLAN

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER
L0.55

Plotted By:Marie Jake Sheet Set:DELAND TECH PARK Layout:L0.55 October 27, 2025 10:08:53am K:\ORL_Civil\249418000-Deland Tech Park\CADD\CONST\PlanSheets\L0.55-TREE MITIGATION PLANS.dwg
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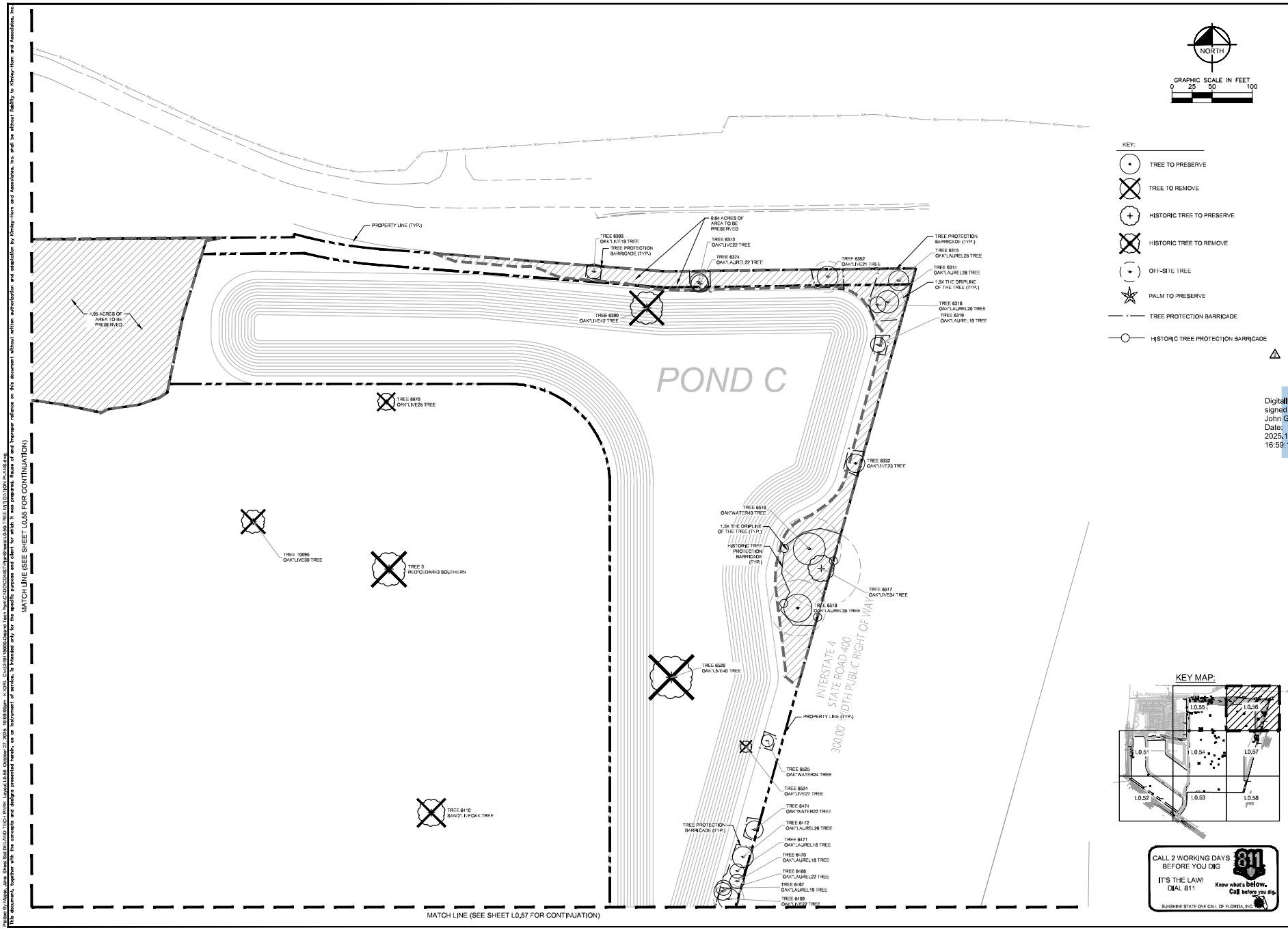

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TREE MITIGATION PLAN

DELAND TECH PARK
CITY OF DELAND FLORIDA

SHEET NUMBER
L0.56

Plotted By:Marie, Jake Sheet Set:DELAND TECH PARK Layout:L0.56 October 27, 2025 10:09:09am K:\ORL_Civil\249418000-Deland Tech Park\CADD\CONST\PlanSheets\L0.56-TREE MITIGATION PLANS.dwg
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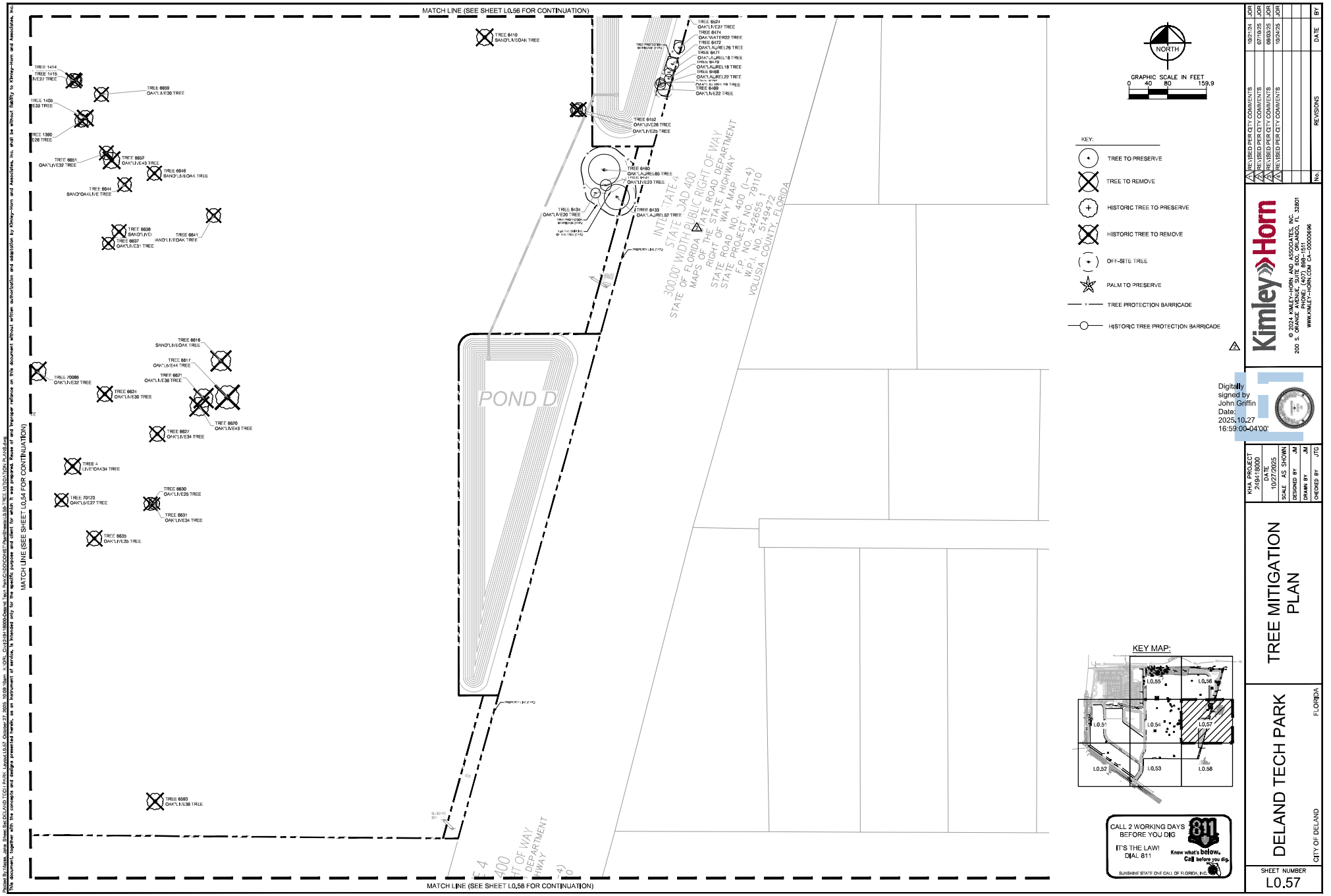

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CHECKED BY JTG

TREE MITIGATION PLAN

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER L0.57

Plotted By: Hardy, Jake Steve Bell
DELAND TECH PARK- Layout L0.57 - October 27, 2025 - 10:59:19am - K:\ORL_Civil\248418000-Orchard Tech Park-CLOUDCONSET\Sheets\L0.57 TREE MITIGATION PLANS.dwg
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MATCH LINE (SEE SHEET L0.53 FOR CONTINUATION)

INTERSTATE 4
STATE ROAD 400
300.00' WIDTH PUBLIC RIGHT OF WAY
STATE OF FLORIDA STATE ROAD DEPARTMENT
MAPS OF THE STATE HIGHWAY
RIGHT OF WAY MAP
STATE ROAD NO. 400 (I-4)
STATE PROJECT NO. 79110
F.P. NO. 242655 1
W.P.I. NO. 5149472
VOLUSIA COUNTY, FLORIDA

PROPERTY LINE (TYP.)

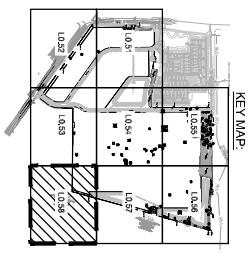
MATCH LINE (SEE SHEET L0.57 FOR CONTINUATION)

KEY:
TREE TO PRESERVE
TREE TO REMOVE
HISTORIC TREE TO PRESERVE
HISTORIC TREE TO REMOVE
OFF-SITE TREE
PALM TO PRESERVE
TREE PROTECTION BARRICADE
HISTORIC TREE PROTECTION BARRICADE

GRAPHIC SCALE IN FEET
0 25 50 100

NORTH

KEY MAP:



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DIAL 811
Know what's below. Call before you dig.
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SHEET NUMBER	DELAND TECH PARK	TREE MITIGATION PLAN
L0.58	CITY OF DELAND FLORIDA	

KHA PROJECT	249418000
DATE	10/27/2025
SCALE	AS SHOWN
DESIGNED BY	JM
DRAWN BY	JM
CHECKED BY	JTG

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4	REVISED PER CITY COMMENTS	10/24/25	JOR

HISTORIC TREES TO BE MITIGATED				
TREE NUMBERS	SPECIES	DBH (INCHES)	ACTION	DESCRIPTION
2	LIVE OAK	32	REMOVE	HISTORIC
3	SOUTHERN RED CEDAR	43	REMOVE	HISTORIC
4	LIVE OAK	34	REMOVE	HISTORIC
1069	SAND LIVE OAK	60	REMOVE	HISTORIC
1270	SAND LIVE OAK	43	REMOVE	HISTORIC
1390	LIVE OAK	28	REMOVE	HISTORIC
1405	LIVE OAK	33	REMOVE	HISTORIC
1414	LIVE OAK	26	REMOVE	HISTORIC
1415	LIVE OAK	27	REMOVE	HISTORIC
1536	SAND LIVE OAK	45	REMOVE	HISTORIC
1588	SAND LIVE OAK	25	REMOVE	HISTORIC
1589	SAND LIVE OAK	29	REMOVE	HISTORIC
1594	SAND LIVE OAK	26	REMOVE	HISTORIC
1595	SAND LIVE OAK	33	REMOVE	HISTORIC
1596	SAND LIVE OAK	25	REMOVE	HISTORIC
1597	SAND LIVE OAK	35	REMOVE	HISTORIC
1598	SAND LIVE OAK	41	REMOVE	HISTORIC
1652	LIVE OAK	33	REMOVE	HISTORIC
5502	SAND LIVE OAK	34	REMOVE	HISTORIC
5510	LIVE OAK	29	REMOVE	HISTORIC
6390	LIVE OAK	42	REMOVE	HISTORIC
6410	SAND LIVE OAK	29	REMOVE	HISTORIC
6451	LIVE OAK	25	REMOVE	HISTORIC
6452	LIVE OAK	26	REMOVE	HISTORIC
6524	LIVE OAK	27	REMOVE	HISTORIC
6526	LIVE OAK	40	REMOVE	HISTORIC
6593	LIVE OAK	38	REMOVE	HISTORIC
6616	SAND LIVE OAK	43	REMOVE	HISTORIC
6617	LIVE OAK	44	REMOVE	HISTORIC
6620	LIVE OAK	43	REMOVE	HISTORIC
6621	LIVE OAK	36	REMOVE	HISTORIC
6624	LIVE OAK	30	REMOVE	HISTORIC
6627	LIVE OAK	34	REMOVE	HISTORIC
6630	LIVE OAK	25	REMOVE	HISTORIC
6631	LIVE OAK	34	REMOVE	HISTORIC
6635	LIVE OAK	35	REMOVE	HISTORIC
6637	LIVE OAK	31	REMOVE	HISTORIC
6638	SAND LIVE OAK	28	REMOVE	HISTORIC
6641	SAND LIVE OAK	27	REMOVE	HISTORIC
6644	SAND LIVE OAK	29	REMOVE	HISTORIC
6646	SAND LIVE OAK	27	REMOVE	HISTORIC
6651	LIVE OAK	32	REMOVE	HISTORIC
6652	LIVE OAK	43	REMOVE	HISTORIC
6659	LIVE OAK	30	REMOVE	HISTORIC
6670	LIVE OAK	25	REMOVE	HISTORIC
10095	LIVE OAK	30	REMOVE	HISTORIC
20032	LIVE OAK	26	REMOVE	HISTORIC
70086	LIVE OAK	32	REMOVE	HISTORIC
70101	LIVE OAK	30	REMOVE	HISTORIC
70118	LIVE OAK	43	REMOVE	HISTORIC
70123	LIVE OAK	27	REMOVE	HISTORIC
70209	LIVE OAK	26	REMOVE	HISTORIC
70235	LIVE OAK	26	REMOVE	HISTORIC
70236	LIVE OAK	25	REMOVE	HISTORIC
70309	LIVE OAK	35	REMOVE	HISTORIC
70310	LIVE OAK	39	REMOVE	HISTORIC
70315	SAND LIVE OAK	31	REMOVE	HISTORIC
70323	LIVE OAK	42	REMOVE	HISTORIC
70365	LIVE OAK	25	REMOVE	HISTORIC
80012	LIVE OAK	45	REMOVE	HISTORIC
80016	LIVE OAK	31	REMOVE	HISTORIC
80041	LIVE OAK	26	REMOVE	HISTORIC

HISTORIC TREES TO BE PRESERVED				
TREE NUMBERS	SPECIES	DBH (INCHES)	ACTION	DESCRIPTION
1	LIVE OAK	76	PRESERVE	HISTORIC
6517	LIVE OAK	34	PRESERVE	HISTORIC
80019	LIVE OAK	43	PRESERVE	HISTORIC
80022	LIVE OAK	32	PRESERVE	OFFSITE
80028	LIVE OAK	36	PRESERVE	HISTORIC
80029	LIVE OAK	27	PRESERVE	HISTORIC
80030	LIVE OAK	38	PRESERVE	HISTORIC
80031	LIVE OAK	32	PRESERVE	HISTORIC
80036	LIVE OAK	26	PRESERVE	OFFSITE
80037	LIVE OAK	27	PRESERVE	HISTORIC
80040	LIVE OAK	54	PRESERVE	HISTORIC

HISTORIC TREE CALCULATION TABLE :	
HISTORIC TREE INCHES TO BE MITIGATED:	2043
NUMBER OF HISTORIC TREES TO BE MITIGATED:	62
HISTORIC TREE INCHES TO BE PRESERVED:	367
NUMBER OF HISTORIC TREES TO BE PRESERVED:	9

HISTORIC TREE REMOVAL NOTE:
PER TREE ADVISORY COMMITTEE MEETING DATED MAY 13, 2025

1. IN ACCORDANCE WITH THE REPLACEMENT REQUIREMENTS, 62 TREES, EACH WITH A 6-INCH CALIPER, SHALL BE PLANTED TO COMPENSATE FOR THE REMOVAL OF 62 HISTORIC TREES AS SHOWN ON THE DELAND TECH PARK TREE MITIGATION PLANS.
2. IN ADDITION, PARCELS NORTH OF CASSADAGA, REFERENCED AS "THE TREE BANK" (81060000092, 8106030801 40, 8106030801 10, 8106030800 80, 8106030800 10, 8106030700 4, AND 8106030600 40) ARE TO BE DESIGNATED AS A TREE PROTECTION AREA TO AID IN THE MITIGATION OF THE REMOVAL OF 62 HISTORIC TREES.

TREE CALCULATION TABLE :	
TOTAL TREE REPLACEMENT INCHES REQUIRED TO MEET PD	
TREE REPLACEMENT	2,800.0
PROPOSED INCHES:	2,992
SITE DEFICIENT TREE INCHES TO BE PAID:	0
TOTAL INCHES TO PAY INTO THE CITY'S REPLACEMENT RESERVE ACCOUNT (AT $75 PER TREE):	0

NOTE:

PER PD, APPLICANT TO PAY MONETARY SUM NO MORE THAN 2,800 INCHES TO CITY'S TREE REPLACEMENT RESERVE (TO BE PAID WITHIN 30 DAYS FOLLOWING APPROVAL OF THE SITE AND DEVELOPMENT PLAN FOR THE FIRST INDUSTRIAL OR COMMERCIAL BUILDING)

NOTE:	
MULTI =	MULTIPLE TRUNKS

TREES TO BE PRESERVED			
TREE NUMBERS	SPECIES	DBH (INCHES)	ACTION
1643	PALM	15	PRESERVE
1644	PALM	17	PRESERVE
1645	PALM	17	PRESERVE
1646	PALM	17	PRESERVE
1647	PALM	17	PRESERVE
1669	LIVE OAK	20	PRESERVE
1672	LIVE OAK	15	PRESERVE
1673	LIVE OAK	19	PRESERVE
1674	LIVE OAK	20	PRESERVE
1675	PINE	29	PRESERVE
1698	PINE	21	PRESERVE
1702	PINE	20	PRESERVE
6314	LAUREL OAK	28	PRESERVE
6315	LAUREL OAK	25	PRESERVE
6316	LAUREL OAK	20	PRESERVE
6319	LAUREL OAK	19	PRESERVE
6332	LIVE OAK	23	PRESERVE
6352	LIVE OAK	21	PRESERVE
6373	LIVE OAK	22	PRESERVE
6374	LAUREL OAK	22	PRESERVE
6393	LIVE OAK	19	PRESERVE
6431	LIVE OAK	23	PRESERVE
6434	LIVE OAK	20	PRESERVE
6460	LAUREL OAK	65	PRESERVE
6467	LAUREL OAK	19	PRESERVE
6468	LAUREL OAK	22	PRESERVE
6469	LIVE OAK	22	PRESERVE
6470	LAUREL OAK	18	PRESERVE
6471	LAUREL OAK	18	PRESERVE
6472	LAUREL OAK	26	PRESERVE
6474	WATER OAK	22	PRESERVE
6516	WATER OAK	40	PRESERVE
6518	LAUREL OAK	35	PRESERVE
6525	WATER OAK	24	PRESERVE
20153	LAUREL OAK	19	PRESERVE
20154	LAUREL OAK	18	PRESERVE
20160	LAUREL OAK	22	PRESERVE
20161	WATER OAK	19	PRESERVE
80015	SAND LIVE OAK	23	PRESERVE
80020	LIVE OAK	22	PRESERVE
80024	SAND LIVE OAK	22	PRESERVE
80025	LIVE OAK	22	PRESERVE
80026	LIVE OAK	20	PRESERVE
80032	LIVE OAK	22	PRESERVE
80033	LIVE OAK	23	PRESERVE
80038	LIVE OAK	18	PRESERVE
80039	LIVE OAK	24	PRESERVE
6433	LAUREL OAK	52	PRESERVE

2

INVASIVE TREES TO BE REMOVED			
80021	CAMPOR	38	REMOVE

NOTE:

TREE 80021, CAMPOR TO BE REMOVED PER DISCUSSION WITH CITY OF DELAND. SURROUNDING HISTORIC AND SPECIMEN TREES TO BE PRESERVED IN PLACE. CONTRACTOR LIABLE FOR DAMAGES TO PRESERVED TREES IN REMOVAL OF TREE 80021.

3

No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/7/24	JOR
2	REVISED PER CITY COMMENTS	07/10/25	JOR
3	REVISED PER CITY COMMENTS	08/05/25	JOR
4	REVISED PER CITY COMMENTS	10/24/25	JOR

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
200 S. ORANGE AVENUE, SUITE 600, ORLANDO, FL 32801
PHONE: (407) 898-1511
WWW.KIMLEY-HORN.COM CA- 000006696

Digitally signed by John Griffin
Date: 2025.10.27 16:58:34-04'00'

KHA PROJECT 240418000
DATE 10/27/2025
SCALE AS SHOWN
DESIGNED BY JM
DRAWN BY JM
CHECKED BY JTG

TREE MITIGATION CALCULATIONS

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER L0.59

Plotted By: Hardy, Jake, Steve Bar DELAND TECH PARK\ Layout L0.59, October 27, 2025, 10:09:23am K:\ORL_Civil\240418000-Deland Tech Park\CADD\COGO\ETS\TreeSheets\L0.59_TREE MITIGATION CALCULATIONS.dwg
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TREE MITIGATION SPECIFICATIONS

A. GENERAL

1. CONTRACTOR SHALL ADHERE TO ALL TREE PROTECTION REQUIREMENTS LISTED IN THESE SPECIFICATIONS AND/OR THOSE LISTED IN THE CITY OR COUNTY ZONING CODE, TREE PROTECTION (LATEST EDITION), WHICHEVER IS MORE STRINGENT SHALL APPLY.
2. CONTRACTOR SHALL COORDINATE ALL CONSTRUCTION PROCEDURES WITH THE PROJECT ARBORIST PRIOR TO BEGINNING WORK.
3. ANY AREAS SUBJECT TO EROSION MUST BE ADEQUATELY STABILIZED WITH VEGETATION MATERIAL THAT WILL, WITHIN A REASONABLE TIME FRAME, DETER SOIL DISTURBANCE.
4. NO SIGNS, BUILDING PERMITS, WIRES OR OTHER ATTACHMENTS OF ANY KIND SHALL BE ATTACHED TO ANY TREE OR PALM. GUY WIRES DESIGNED TO PROTECT TREES ARE EXCLUDED FROM THIS PROHIBITION.
5. EXISTING TREE LOCATIONS AND SIZES ARE ESTIMATES AND ARE BASED ON A SURVEY PROVIDED BY THE OWNER SELECTED SURVEYOR.
6. CONTRACTOR SHALL COORDINATE TREE REMOVAL WITH PERMITTING AGENCY AND PROJECT ARBORIST PRIOR TO CONSTRUCTION. NO PERSON MAY REMOVE OR CAUSE TO BE REMOVED ANY PROTECTED TREE OR PALM WITHOUT FIRST HAVING PROCURED A PERMIT AS PROVIDED BY THE APPROPRIATE PERMITTING AGENCY.
7. FOR PROTECTED TREES OR PALMS BEING REMOVED, THE CONTRACTOR MUST GIVE THE PERMITTING AGENCY REASONABLE OPPORTUNITY TO RELOCATE TREES DESIGNATED FOR REMOVAL TO ANOTHER SITE AT THE PERMITTING AGENCY'S EXPENSE.
8. CONTRACTOR IS RESPONSIBLE FOR POSSESSING ALL REQUIRED APPLICATOR LICENSES, BUSINESS REGISTRATIONS AND INSURANCE, PESTICIDE LABELS, AND MATERIAL DATA SAFETY SHEETS. THE CONTRACTOR IS ALSO RESPONSIBLE FOR HAVING ALL SPILL CONTAINMENT MATERIALS AND REQUIRED PERSONAL PROTECTIVE EQUIPMENT FOR PESTICIDE APPLICATIONS AND ACCIDENTAL SPILLS ON SITE AT ALL TIMES. THE OWNER RESERVES THE RIGHT TO INSPECT EACH APPLICATOR AND HAVE THESE MATERIALS PRESENTED BEFORE AND DURING ANY PESTICIDE TREATMENT.
9. WHERE TRAFFIC AREAS ARE PROPOSED WITHIN THE DRIP LINE OF PROTECTED TREES AND LESS THAN FOUR (4) INCHES OF GRADE CHANGE ARE PROPOSED, PERMEABLE SURFACES THAT ALLOW AIR AND WATER INTO THE SOIL SHOULD BE USED IN LIEU OF ASPHALT OR OTHER SUCH IMPERVIOUS SURFACES.
10. THE SEQUENCE OF TREE MITIGATION AND PRESERVATION MEASURES IS IMPERATIVE TO THE HEALTH AND SURVIVABILITY OF THE SUBJECT TREES AND SHALL BE COORDINATED WITH THE OWNER SELECTED PROJECT ARBORIST. THE DESIRED SEQUENCE IS OUTLINED BELOW:
    a. TREE PROTECTION BARRICADE.
    b. ROOT PRUNING AND ROOT BARRIERS.
    c. CLEARING.
    d. TREE CANOPY PRUNING.
    e. INSECTICIDE.
    f. IRRIGATION.

B. TREE PROTECTION BARRICADE

1. PRIOR TO THE ERECTION OF ANY TREE PROTECTION BARRICADE, ALL FOREIGN SURFACE MATERIAL, TRASH OR DEBRIS SHALL BE REMOVED FROM THE AREA TO BE ENCLOSED BY THE BARRICADE. AFTER ERECTION OF THE BARRICADE NO SUCH MATERIAL OR LITTER SHALL BE PERMITTED TO REMAIN WITHIN THE PROTECTED AREA.
2. TREE PROTECTION BARRICADE SHALL BE PLACED AROUND ALL PROTECTED TREES TO CREATE A PROTECTIVE ROOT ZONE AND SHALL REMAIN IN PLACE UNTIL SITE CLEARING, LAND ALTERATION, AND CONSTRUCTION ACTIVITIES ARE COMPLETE.
3. NATIVE GROUND COVER AND UNDERSTORY VEGETATION EXISTING WITHIN THE PROTECTED AREA SHALL REMAIN THROUGHOUT CONSTRUCTION. OTHER DESIGNATED VEGETATION AND INVASIVE PLANT SPECIES SHALL BE REMOVED ONLY BY MANUAL LABOR UTILIZING HAND TOOLS, OR BY OTHER METHODS APPROVED BY THE PROJECT ARBORIST.
4. TREE PROTECTION BARRICADE TYPES AND LOCATIONS SHALL BE ERECTED AS SHOWN ON THE TREE MITIGATION PLANS AND DETAILS, OR AS REQUESTED BY LOCAL AGENCY.
5. FINAL LOCATIONS SHALL BE COORDINATED WITH AND APPROVED BY THE PROJECT ARBORIST AND CITY FORESTER.
6. NO MATERIALS, EQUIPMENT, SPOIL, WASTE OR WASHOUT WATER MAY BE DEPOSITED, STORED, OR PARKED WITHIN 20 FEET OF THE TREE PROTECTION AREAS.
7. EROSION CONTROL DEVICES SUCH AS SILT FENCING, DEBRIS BASINS, AND WATER DIVERSION STRUCTURES SHALL BE INSTALLED TO PREVENT SILTATION AND/OR EROSION WITHIN THE TREE PROTECTION AREA.
8. CONSTRUCTION ACTIVITY SHALL NOT DESTROY OR IRREVERSIBLY HARM THE ROOT SYSTEM OF PROTECTED TREES. POST HOLES AND TRENCHES LOCATED CLOSE TO PROTECTED TREES SHALL BE ADJUSTED TO AVOID DAMAGE TO MAJOR ROOTS.
9. DO NOT INSTALL CONDUIT, DRAIN OR IRRIGATION LINES, OR ANY UTILITY LINE WITHIN THE TREE PROTECTION AREA WITHOUT THE APPROVAL OF THE PROJECT ARBORIST. IF LINES MUST TRAVERSE THE PROTECTION AREA, THEY SHALL BE TUNNELED OR BORED UNDER THE TREE.
10. CONTRACTOR'S ACCESS TO FENCED TREE PROTECTION AREAS WILL BE PERMITTED ONLY WITH APPROVAL OF THE PROJECT ARBORIST.
11. STRUCTURES AND UNDERGROUND FEATURES TO BE REMOVED WITHIN THE TREE PROTECTION AREA SHALL BE COORDINATED WITH THE PROJECT ARBORIST.
12. TREE PROTECTION BARRICADE AROUND TREES TO BE RELOCATED SHALL BE ERECTED UNTIL THE TREE IS READY TO BE RELOCATED AND NEW BARRICADE SHALL BE ERECTED AT THE TREES NEW LOCATION AND WILL REMAIN IN PLACE UNTIL ALL CONSTRUCTION ACTIVITIES ARE COMPLETE.
13. IF ANY DAMAGE TO TREE PROTECTION BARRICADE SHOULD OCCUR BY ACCIDENT OR NEGLIGENCE, THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMMEDIATE REPAIRS.
14. IF TEMPORARY HAUL OR ACCESS ROADS MUST PASS OVER THE PROTECTED AREA OF TREES TO BE PRESERVED, A ROAD BED OF SIX (6) INCHES OF MULCH OR GRAVEL SHALL BE CREATED TO PROTECT THE SOIL. THE ROAD BED MATERIAL SHALL BE REPLENISHED AS NECESSARY TO MAINTAIN A SIX (6) INCH ROAD BED AT ALL TIMES. CONTRACTOR SHALL REMOVE ALL SUCH MATERIALS FROM THE SITE AS SOON AS TEMPORARY ACCESS IS NO LONGER NECESSARY.
15. CONTRACTOR SHALL COORDINATE WITH THE PROJECT ARBORIST PRIOR TO THE REMOVAL OF ALL TREE PROTECTION BARRICADE.

C. ROOT PRUNING/TRENCHING

1. TRENCHING LOCATIONS SHALL BE APPROVED IN THE FIELD BY THE PROJECT ARBORIST.
2. TRENCHING EQUIPMENT THAT WILL TURN AT HIGH RPM'S IS PREFERRED, AND SHALL BE APPROVED BY THE PROJECT ARBORIST. APPROVED EQUIPMENT WILL BE USED TO PERFORM ALL ROOT PRUNING OPERATIONS. A MINIMUM DEPTH OF THREE FEET IS REQUIRED.
3. INSTALL ROOT BARRIER WHERE DESIGNATED. SEE TREE MITIGATION PLAN AND DETAIL SHEETS.
4. THE TRENCH SHALL BE BACKFILLED WITH PREVIOUSLY EXCAVATED SOIL AND COMPACTED IMMEDIATELY.
5. TREES TO BE RELOCATED SHALL BE ROOT PRUNED A MINIMUM OF TWELVE (12) WEEKS PRIOR TO TREE RELOCATION.
6. WHEN THE TREE ROOT ZONE WILL BE DISTURBED, AFFECTED ROOTS MUST BE SEVERED BY CLEAN PRUNING CUTS AT THE POINT WHERE CONSTRUCTION IMPACTS THE ROOTS.

D. CLEARING

1. ANY BRUSH CLEARING REQUIRED WITHIN THE TREE PROTECTION AREA SHALL BE ACCOMPLISHED WITH HAND-OPERATED EQUIPMENT.
2. CONTRACTOR SHALL CLEAR ALL TREE PROTECTION AREAS OF VINES, SHRUBS, GROUND COVERS, WEEDS, SAPLINGS, AND INVASIVES LISTED ON THE LATEST EDITION OF THE FLORIDA EXOTIC PEST PLANT COUNCIL'S LIST OF INVASIVE SPECIES.
3. PROJECT ARBORIST MUST APPROVE METHODS OTHER THAN HAND CLEARING. ANY METHOD OTHER THAN HAND CLEARING WILL NEED APPROVAL FROM THE CITY FORESTER.
4. A TWO (2) INCH LAYER OF MULCH SHALL BE APPLIED OVER THE SURFACE OF EXPOSED ROOTS OF PROTECTED TREES DURING THE SITE CLEARING PHASE.

E. TREE CANOPY PRUNING

1. TREE PRUNING SPECIFICATIONS SHALL BE DEFINED BASED ON SPECIFIC RECOMMENDATIONS OF THE PROJECT ARBORIST. INFORMATION PRESENTED BELOW SHOULD BE USED AS A GUIDELINE.
2. CONTRACTOR SHALL VISIT THE SITE WITH THE PROJECT ARBORIST TO VERIFY THE EXTENT OF REQUIRED PRUNING.
3. ALL PRUNING SHALL BE PERFORMED IN ACCORDANCE WITH THE RECOMMENDATIONS OF A QUALIFIED INTERNATIONAL SOCIETY OF ARBORICULTURE (ISA) CERTIFIED ARBORIST OR AN AMERICAN SOCIETY OF CONSULTING ARBORISTS (ASCA) REGISTERED CONSULTING ARBORIST (RCA).
4. AT LEAST ONE MEMBER OF THE PRUNING CREW SHALL BE AN ISA CERTIFIED ARBORIST.
5. WHILE IN THE TREE, THE ARBORIST SHALL PERFORM AN AERIAL INSPECTION TO IDENTIFY DEFECTS THAT REQUIRE TREATMENT. ANY ADDITIONAL WORK NEEDED SHALL BE REPORTED TO THE OWNER.
6. PRUNING CUTS SHALL BE DONE IN ACCORDANCE WITH THE LATEST EDITION OF THE ANSI A300 PRUNING STANDARD (AMERICAN NATIONAL STANDARD FOR TREE CARE OPERATIONS) AND WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST EDITION OF ANSI Z133.1 SAFETY STANDARD. PRUNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF ISA'S "BEST MANAGEMENT PRACTICES: TREE PRUNING".
7. WHERE TEMPORARY CLEARANCE IS NEEDED FOR ACCESS, BRANCHES SHALL BE TIED BACK TO HOLD THEM OUT OF THE CLEARANCE ZONE.
8. NO MORE THAN 20 PERCENT OF LIVE FOLIAGE SHALL BE REMOVED WITHIN ANY TREE.
9. ALL TREES WITHIN THE PROJECT AREA SHALL BE PRUNED AS FOLLOWS:
    a. LIVE BRANCH PRUNING SHOULD BE PERFORMED ONLY WHEN THE DANGER OF INSECT OR DISEASE INFESTATION IS NOT PRESENT.
    b. REMOVE STUBS, CUTTING OUTSIDE THE WOUND WOOD TISSUE THAT HAS FORMED AROUND THE BRANCH.
    c. CLEANING, FOR THE SELECTIVE REMOVAL OF DEAD, DISEASED, BROKEN, OR CROSSING BRANCHES DOWN TO ONE INCH IN DIAMETER OR AS DIRECTED BY THE PROJECT ARBORIST.
    d. PRUNING CUTS LARGER THAN 4 INCHES IN DIAMETER, EXCEPT FOR DEAD WOOD, SHALL BE AVOIDED.
    e. PRUNING CUTS THAT EXPOSE HEARTWOOD SHALL BE AVOIDED WHENEVER POSSIBLE.
    f. ALL TREES WITH CROWNS THAT PROJECT INTO PARKING LOT/ROADWAY AREAS SHALL BE RAISED TO 14 FEET ABOVE FINISHED GRADE.
    g. ALL TREES WITH CROWNS THAT PROJECT INTO SIDEWALK AREAS SHALL BE RAISED TO A HEIGHT OF 8 FEET ABOVE FINISHED GRADE.
9. TREES, WHOS ROOT SYSTEMS WILL BE IMPACTED SHALL RECEIVE THE FOLLOWING PRUNING TO COMPENSATE FOR ROOT LOSS:
    a. THE LOCATION AND SIZE OF BRANCHES FOR REDUCTION SHALL BE DEFINED BY THE PROJECT ARBORIST.
    b. REDUCTION, OR THE SELECTIVE PRUNING TO REDUCE TREE HEIGHT OR SPREAD.
    c. REDUCE END WEIGHT ON HEAVY, HORIZONTAL BRANCHES BY SELECTIVELY REMOVING SMALL DIAMETER BRANCHES, NO GREATER THAN 2 TO 3 INCHES, NEAR THE ENDS OF SCAFFOLD BRANCHES.
    d. RAISING SHALL CONSIST OF SELECTIVE PRUNING TO PROVIDE VERTICAL CLEARANCE.
10. PROPOSED REPLACEMENT TREES
    a. PRUNING SHALL BE LIMITED TO CLEANING.
11. BRUSH SHALL BE CHIPPED AND SPREAD (ONLY WHEN DISEASE OR INSECT INFESTATION IS NOT PRESENT) UNDERNEATH TREES WITHIN THE TREE PROTECTION AREA TO A MAXIMUM DEPTH OF THREE (3) INCHES, LEAVING THE TRUNK CLEAR OF MULCH.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING ALL EXCESS DEBRIS ON A DAILY BASIS.

F. INSECTICIDE

13. NOTIFY PROJECT ARBORIST IF ANY INFESTATION IS NOTICED.
14. FOLLOW PROJECT ARBORIST'S RECOMMENDED PROCEDURES.
15. FOLLOW ALL MANUFACTURERS' RECOMMENDATIONS CONCERNING APPLICATION. READ ALL WARNING LABELS.
16. ANY PETS, AS WELL AS, THE PET'S FOOD AND WATER BOWLS SHOULD BE REMOVED FROM THE AREA AND ANY SWIMMING POOLS SHOULD BE COVERED. COORDINATE WITH PROJECT ARBORIST FOR FURTHER INSTRUCTION.
17. ENSURE COMPLETE COVERAGE AND REAPPLY 2-3 MONTHS AFTER INITIAL APPLICATION UTILIZING SAME PROCEDURE.

H. IRRIGATION

1. EVERY EFFORT SHALL BE MADE TO WATER THE PRESERVED TREES AND TRANSPLANTS. CONTRACTOR SHALL IRRIGATE BY HAND OR BY TEMPORARY IRRIGATION.
2. IRRIGATE AS REQUIRED BY PROJECT ARBORIST UNTIL PERMANENT IRRIGATION IS INSTALLED AND OPERATING.
3. UNDERGROUND IRRIGATION SHALL NOT BE INSTALLED WITHIN THE DRIP LINES OF EXISTING TREES UNLESS ROOT PROTECTION MEASURES ARE PROVIDED AND APPROVED BY PROJECT ARBORIST.

I. TREE REMOVALS

1. PRIOR TO AND DURING LAND CLEARING, INCLUDING GRUBBING, ALL TREES TO BE REMOVED SHALL BE CLEARLY MARKED BY PROJECT ARBORIST WITH RED SURVEY RIBBONS AT 36 INCHES MINIMUM ABOVE GRADE.
2. CONTRACTOR SHALL REMOVE ALL TREES AS SHOWN ON THE TREE MITIGATION PLANS AFTER THE TREE PROTECTION BARRICADE IS INSTALLED.
3. ALL TREES SHOWN TO BE REMOVED SHALL BE FELLED WITH A CHAIN SAW AND STUMP GROUND 6" BELOW SURFACE. ANY TREE SHOWN TO BE REMOVED THAT IS IN AN AREA WHERE COMPACTION IS CRITICAL SHALL BE FELLED WITH A CHAIN SAW AND STUMP REMOVED BY CONTRACTOR.
4. ALL WOOD AND STUMPS FROM REMOVALS SHALL BE HAULED FROM THE SITE THE SAME DAY, EXCEPT FOR TOPS. ALL TOPS ARE TO BE MULCHED AND STOCKPILED OR HAULED DIRECTLY TO MULCHED AREAS FOR RELOCATED TREES IF SCHEDULING PERMITS. TOPS SHALL BE CHIPPED AND PLACED IN THE TREE PROTECTION AREA TO A DEPTH OF THREE (3) INCHES. ALL EXCESS WOOD CHIPS SHOULD BE HAULED OFF SITE AFTER TRANSPLANTING IS COMPLETE.
5. TREES TO BE REMOVED THAT HAVE BRANCHES EXTENDING INTO THE CANOPY OF TREES TO REMAIN MUST BE REMOVED BY A QUALIFIED ISA CERTIFIED ARBORIST AND NOT BY DEMOLITION OR CONSTRUCTION CONTRACTORS. THE QUALIFIED ARBORIST SHALL REMOVE THE TREE IN A MANNER THAT CAUSES NO DAMAGE TO THE TREES AND UNDERSTORY VEGETATION TO REMAIN.
6. TREES TO BE REMOVED LOCATED WITHIN THE TREE PROTECTION AREA SHALL BE REMOVED BY A QUALIFIED ISA CERTIFIED ARBORIST. THE TREES SHALL BE CUT NEAR GROUND LEVEL AND THE STUMP GROUND OUT.

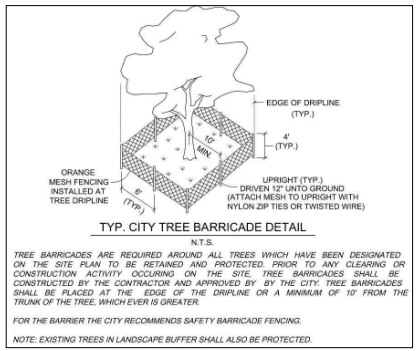
L. TOPSOIL

10. CONTRACTOR SHALL COORDINATE ALL EARTHWORK OPERATIONS WITHIN TREE PROTECTION AREAS WITH THE PROJECT ARBORIST PRIOR TO BEGINNING WORK.
11. ALL TOPSOIL SHALL BE NATURAL, FRIABLE, FERTILE, FINE LOAMY SOIL POSSESSING CHARACTERISTICS OF REPRESENTATIVE TOPSOIL IN THE VICINITY THAT PRODUCES HEAVY GROWTH.
12. TOPSOIL, PH RANGE OF 5.5 TO 7.0, 3-5 PERCENT ORGANIC MATERIAL MINIMUM, FREE FROM SUBSOIL, OBJECTIONABLE WEEDS, LITTER, SODS, STIFF CLAY, STONES LARGER THAN ONE (1) INCH IN DIAMETER, STUMPS, ROOTS, TRASH, TOXIC SUBSTANCES, OR ANY OTHER MATERIAL WHICH MAY BE HARMFUL TO PLANT GROWTH.
13. VERIFY AMOUNT STOCKPILED IF ANY, AND SUPPLY ADDITIONAL AS NEEDED FROM NATURALLY WELL-DRAINED SITES WHERE TOPSOIL OCCURS AT LEAST FOUR (4) INCHES DEEP. DO NOT OBTAIN TOPSOIL FROM BOGS OR MARSHES.
14. PROJECT ARBORIST SHALL APPROVE ALL TOPSOIL PRIOR TO PLACEMENT.

M. REPAIR OF DAMAGED TREES

1. IF DAMAGE TO ANY TREE SHOULD OCCUR BY ACCIDENT OR NEGLIGENCE DURING THE CONSTRUCTION PERIOD, THE PROJECT ARBORIST SHALL APPRAISE THE DAMAGE AND MAKE RECOMMENDATIONS TO THE OWNER FOR REPAIR BY THE CONTRACTOR.
2. IF ANY TREE DESIGNATED TO BE SAVED IS REMOVED FROM THE SITE WITHOUT PERMISSION OF THE OWNER'S REPRESENTATIVE, THE PROJECT ARBORIST SHALL APPRAISE THE TREE AND MAKE RECOMMENDATIONS TO THE OWNER FOR REPLACEMENT BY THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACEMENT OF THE TREE AND ANY FEES THAT MAY BE ASSESSED TO THE OWNER BY THE GOVERNING AGENCY.

1 L0.60 TYPICAL TREE MITIGATION NOTES



TYP. CITY TREE BARRICADE DETAIL

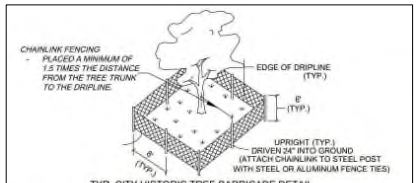
N.T.S.

TREE BARRICADES ARE REQUIRED AROUND ALL TREES WHICH HAVE BEEN DESIGNATED ON THE SITE PLAN TO BE RETAINED AND PROTECTED. PRIOR TO ANY CLEARING OR CONSTRUCTION ACTIVITY OCCURING ON THE SITE, TREE BARRICADES SHALL BE CONSTRUCTED BY THE CONTRACTOR AND APPROVED BY BY THE CITY. TREE BARRICADES SHALL BE PLACED AT THE EDGE OF THE DRIPLINE OR A MINIMUM OF 10' FROM THE TRUNK OF THE TREE, WHICH EVER IS GREATER.

FOR THE BARRIER THE CITY RECOMMENDS SAFETY BARRICADE FENCING.

NOTE: EXISTING TREES IN LANDSCAPE BUFFER SHALL ALSO BE PROTECTED.

2 L0.60 STANDARD TREE BARRICADE ELEVATION NTS



TYP. CITY HISTORIC TREE BARRICADE DETAIL

N.T.S.

HISTORIC TREE BARRICADE REQUIREMENTS:

1. *Existing historic trees to remain shall be protected during construction. Chain link fencing (Min. 6' 0" Height) shall be installed at a distance of 1.5 times the dripline unless modifications have been approved by the City Forester. Tree barricade shall remain for the duration of construction. All other non-historic protected trees to remain shall be protected in accordance with the City's standards and ordinances.*
2. *Disposal of waste material, of any kind, shall not be allowed within the barricade area.*
3. *No attachments or wires of any kind, other than those of a protective nature, shall be attached to any historic tree.*
4. *No fill or excavation of any nature shall occur within the barricade area unless it has been approved by the City Forester.*
5. *No tools, equipment, or materials shall be stored within the barricade area.*
6. *Fencing shall be maintained and repaired as needed during construction.*
7. *All roots from historic trees beyond the barricade, that will be damaged during the construction process, shall be severed with a clean cut under the supervision of an ISA certified arborist.*

DATE: AUGUST 25, 2023 | **HISTORIC TREE BARRICADE DETAIL** | M113

City of DeLand - Standard Details

3 L0.60 STANDARD HISTORIC TREE BARRICADE ELEVATION NTS

Plotted By: Hardy, Jake Steve Bar DELAND TECH PARK - Layout L0.60 - October 27, 2025 - 10:09:23am - K:\ORL_Civil\049418900-Deland Tech Park-CLIO\DOCS\SET\SheetSet\L0.60_TREE MITIGATION PLANS.dwg
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DATE 10/27/2025
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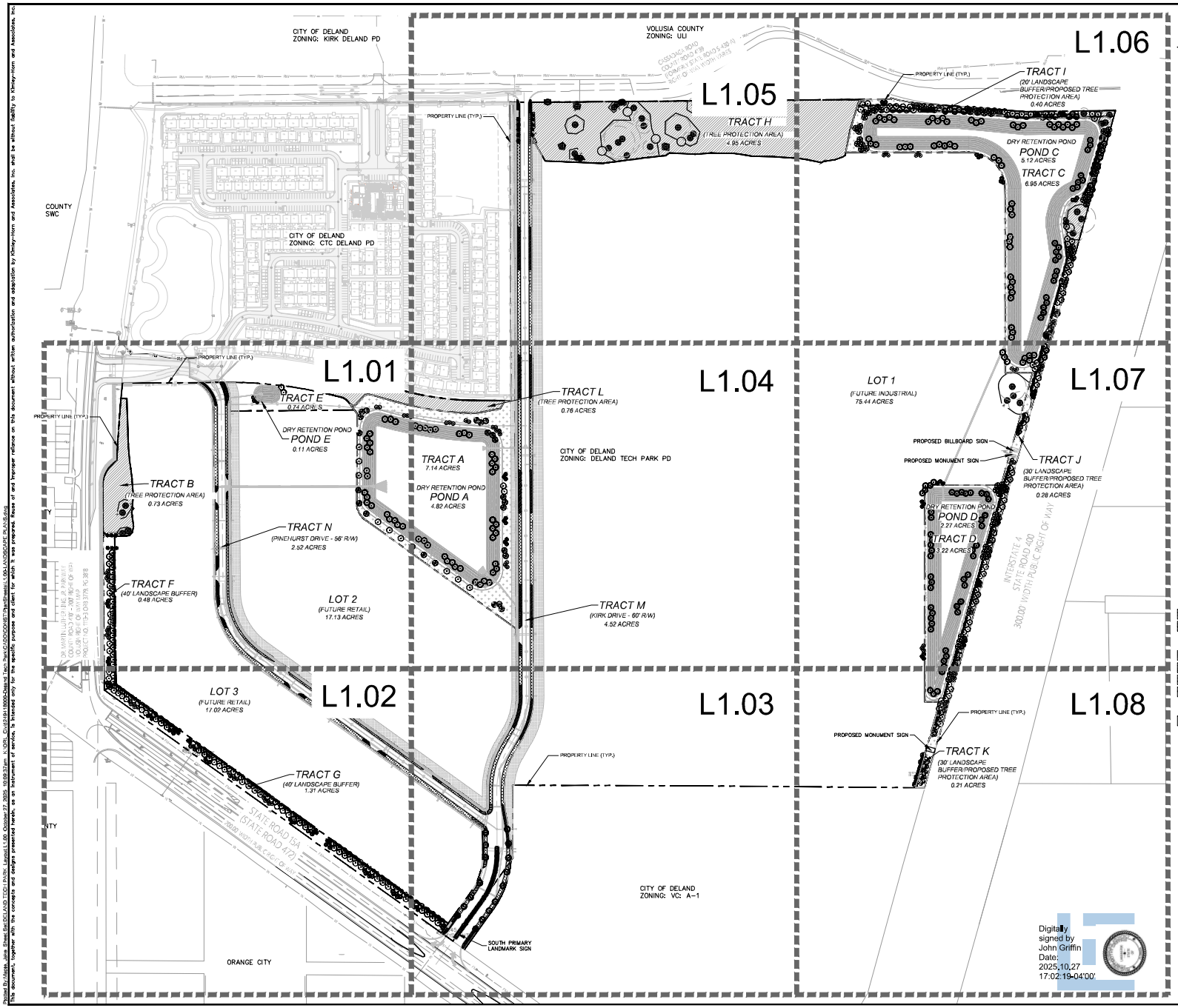
CHECKED BY JTG

TREE MITIGATION SPECIFICATIONS

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER L0.60



PLANT SCHEDULE

SYMBOL	CODE	BOTANICAL NAME	CAL
TREES			
	EP	EXISTING PALM TREE TO REMAIN	EXISTING
	EX	EXISTING TREE TO REMAIN	EXISTING
	SS	SABAL PALMETTO	-
CANOPY TREE			
	AF	ACER RUBRUM 'FLORIDA FLAME'	5" CAL MIN (4" DBH)
	AF2	ACER RUBRUM 'FLORIDA FLAME'	3" CAL MIN (2" DBH)
	BC2	BALD CYPRESS	3" CAL MIN (2" DBH)
	BC3	BALD CYPRESS	4" CAL MIN (3" DBH)
	DE	DRAKE ELM	5" CAL MIN (4" DBH)
	DE2	DRAKE ELM	3" CAL MIN (2" DBH)
	DE3	DRAKE ELM	4" CAL MIN (3" DBH)
	LP2	PINUS ELLIOTTII 'DENSA'	3" CAL MIN (2" DBH)
	MG	MAGNOLIA GRANDIFLORA	5" CAL MIN (4" DBH)
	MG2	MAGNOLIA GRANDIFLORA	4" CAL MIN (3" DBH)
	QV	QUERCUS VIRGINIANA	5" CAL MIN (4" DBH)
	QV2	QUERCUS VIRGINIANA	3" CAL MIN (2" DBH)
	QV3	QUERCUS VIRGINIANA	4" CAL MIN (3" DBH)
	QV4	QUERCUS VIRGINIANA	3" CAL MIN (2" DBH)
UNDERSTORY TREES			
	EA	ELAEOCARPUS APICULATUS	2" CAL MIN
	EH	ILEX X ATTENUATA 'EAGLESTON'	2" CAL MIN
	LM	LAGERSTROEMIA X 'NATCHEZ'	5" CAL. TOT.
SYMBOL	**CODE**	**BOTANICAL NAME**	
SHRUBS			
	HC	HAMELIA PATENS 'FIREFLY'	
	MC2	MUHLENBERGIA CAPILLARIS	
	SV	SCHEFFLERA ARBORICOLA 'VARIEGATA'	
	VO	VIBURNUM ODOVATUM 'SCHILLERS DWARF'	
SHRUB AREAS			
	MC4	MUHLENBERGIA CAPILLARIS	
	TTL	TRIPSACUM FLORIDANA	
GROUND COVERS			
	MS	MIMOSA STRIGILLOSA	
	TM	TRACHELOSPERMUM ASIATICUM 'MINIMA'	
	TV	VERBENA TAMPENSIS	
	ZP	ZAMIA PUMILA	
SOD			
	SOD B	PASPALUM NOTATUM 'ARGENTINE'	

No.	REVISIONS	DATE	BY
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FLORIDA LICENSE NUMBER
66667700
10/27/2025

KHA PROJECT 249418000
DATE 10/27/2025
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DRAWN BY JM
CHECKED BY JTG

OVERALL LANDSCAPE PLAN

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER
L1.00

Plotted By: Hardy, Jake Steve Bell
DELAND TECH PARK - Layout: L1.00 - October 27, 2025 - 10:09:32am - K:\ORL_Civil\249418000-Orchard Tech Park-CA\DOCS\CSET\SheetSheets\L1.00 LANDSCAPE PLAN.dwg
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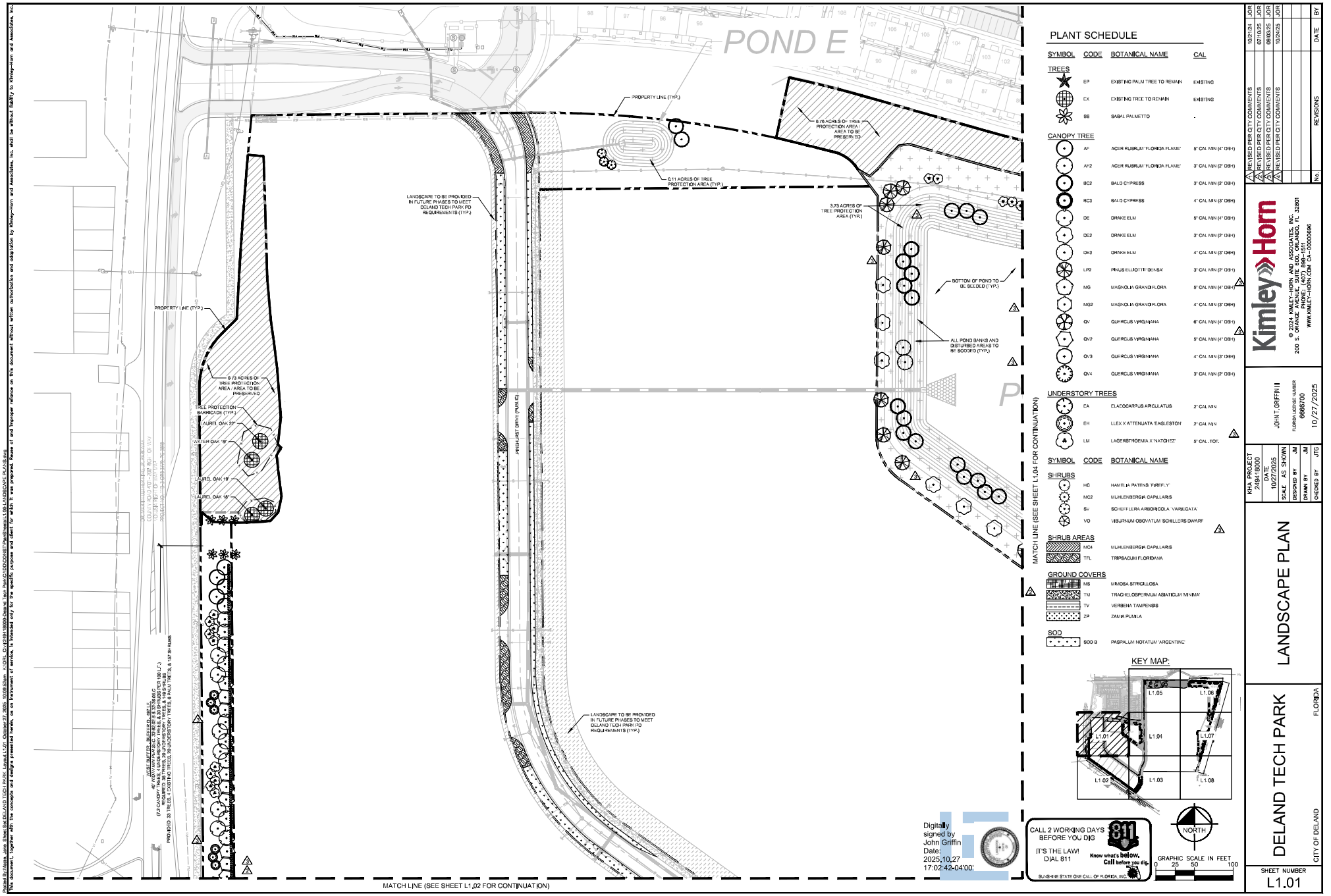

PLANT SCHEDULE

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TREES			
	EP	EXISTING PALM TREE TO REMAIN	EXISTING
	EX	EXISTING TREE TO REMAIN	EXISTING
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CANOPY TREE			
	AF	ACER RUBRUM 'FLORIDA FLAME'	5" CAL MIN (4" DBH)
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	BC2	BALD CYPRESS	3" CAL MIN (2" DBH)
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	DE3	DRAKE ELM	4" CAL MIN (3" DBH)
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	QV3	QUERCUS VIRGINIANA	4" CAL MIN (3" DBH)
	QV4	QUERCUS VIRGINIANA	3" CAL MIN (2" DBH)
UNDERSTORY TREES			
	EA	ELAEOCARPUS APICULATUS	3" CAL MIN
	EH	ILEX X 'ATTENUATA 'EAGLESTON'	3" CAL MIN
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SYMBOL	**CODE**	**BOTANICAL NAME**	
SHRUBS			
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	MC2	MUHLENBERGIA CAPILLARIS	
	SV	SCHEFFLERA ARBORICOLA 'VARIEGATA'	
	VO	VIBURNUM OBOVATUM 'SCHILLERS DWARF'	
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	MC4	MUHLENBERGIA CAPILLARIS	
	TFL	TRIPSACUM FLORIDANA	
GROUND COVERS			
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	TV	VERBENA TAMPENSIS	
	ZP	ZAMIA PUMILA	
SOD			
	SOD B	PASPALUM NOTATUM 'ARGENTINE'	

KEY MAP:

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FLORIDA LICENSE NUMBER 66667700
10/27/2025

KHA PROJECT 248418000
DATE 10/27/2025
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LANDSCAPE PLAN

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER L1.01

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PLANT SCHEDULE

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	MS	MIMOSA STRIGILLOSA	
	TM	TRACHELOSPERMUM ASIATICUM 'MINIMA'	
	TV	VERBENA TAMPENSIS	
	ZP	ZAMIA PUMILA	
SOD			
	SOD B	PASPALUM NOTATUM 'ARGENTINE'	

KEY MAP:

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10/27/2025

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DELAND TECH PARK
FLORIDA
CITY OF DELAND

LANDSCAPE PLAN

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PLANT SCHEDULE

SYMBOL	CODE	BOTANICAL NAME	CAL
TREES			
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	EX	EXISTING TREE TO REMAIN	EXISTING
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SYMBOL	**CODE**	**BOTANICAL NAME**	
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SOD			
	SOD B	PASPALUM NOTATUM 'ARGENTINE'	

KEY MAP:

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10/27/2025

KHA PROJECT 248418000
DATE 10/27/2025
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DELAND TECH PARK
CITY OF DELAND FLORIDA

LANDSCAPE PLAN

SHEET NUMBER L1.03

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PLANT SCHEDULE

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SYMBOL	**CODE**	**BOTANICAL NAME**	
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	ZP	ZAMIA PUMILA	
SOD			
	SOD B	PASPALUM NOTATUM 'ARGENTINE'	

KEY MAP:

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DATE 10/27/2025
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DELAND TECH PARK
CITY OF DELAND FLORIDA

LANDSCAPE PLAN

SHEET NUMBER L1.04

Plotted By: Hardy, Jake Status: Set DELAND TECH PARK\ Layout: L1.04 - October 27, 2025 - 10:10:58am K:\ORL_Civil\248418000\Deland Tech Park\CADD\COSET\SheetSheets\L1.04 LANDSCAPE PLAN.dwg
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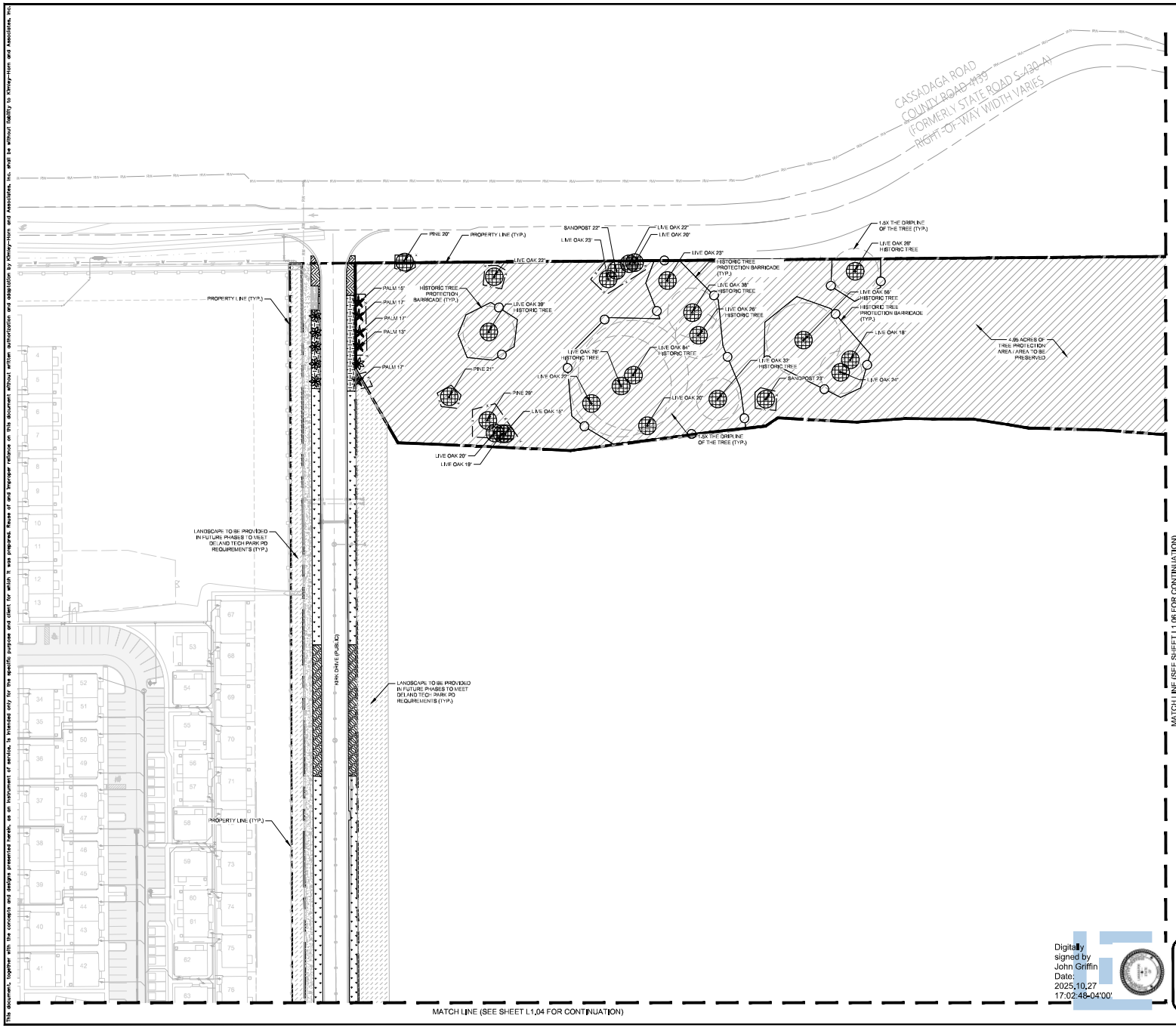
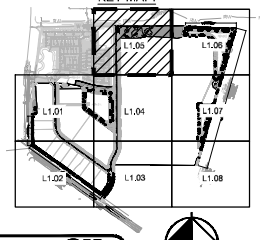


PLANT SCHEDULE

SYMBOL	CODE	BOTANICAL NAME	CAL
TREES			
	EP	EXISTING PALM TREE TO REMAIN	EXISTING
	EX	EXISTING TREE TO REMAIN	EXISTING
	SS	SABAL PALMETTO	-
CANOPY TREE			
	AF	ACER RUBRUM 'FLORIDA FLAME'	5" CAL MIN (4" DBH)
	AF2	ACER RUBRUM 'FLORIDA FLAME'	3" CAL MIN (2" DBH)
	BC2	BALD CYPRESS	3" CAL MIN (2" DBH)
	BC3	BALD CYPRESS	4" CAL MIN (3" DBH)
	DE	DRAKE ELM	5" CAL MIN (4" DBH)
	DE2	DRAKE ELM	3" CAL MIN (2" DBH)
	DE3	DRAKE ELM	4" CAL MIN (3" DBH)
	LP2	PINUS ELLIOTTII 'DENSA'	3" CAL MIN (2" DBH)
	MG	MAGNOLIA GRANDIFLORA	5" CAL MIN (4" DBH)
	MG2	MAGNOLIA GRANDIFLORA	4" CAL MIN (3" DBH)
	QV	QUERCUS VIRGINIANA	6" CAL MIN (4" DBH)
	QV2	QUERCUS VIRGINIANA	5" CAL MIN (4" DBH)
	QV3	QUERCUS VIRGINIANA	4" CAL MIN (3" DBH)
	QV4	QUERCUS VIRGINIANA	3" CAL MIN (2" DBH)
UNDERSTORY TREES			
	EA	ELAEOCARPUS APICULATUS	3" CAL MIN
	EH	ILEX X ATTENUATA 'EAGLESTON'	3" CAL MIN
	LM	LAGERSTROEMIA X 'NATCHEZ'	8" CAL. TOT.
SYMBOL	**CODE**	**BOTANICAL NAME**	
SHRUBS			
	HC	HAMELIA PATENS 'FIREFLY'	
	MC2	MUHLENBERGIA CAPILLARIS	
	SV	SCHEFFLERA ARBORICOLA 'VARIEGATA'	
	VO	VIBURNUM OBOVATUM 'SCHILLERS DWARF'	
SHRUB AREAS			
	MC4	MUHLENBERGIA CAPILLARIS	
	TFL	TRIPSACUM FLORIDANA	
GROUND COVERS			
	MS	MIMOSA STRIGILLOSA	
	TM	TRACHELOSPERMUM ASIATICUM 'MINIMA'	
	TV	VERBENA TAMPENSIS	
	ZP	ZAMIA PUMILA	
SOD			
	SOD B	PASPALUM NOTATUM 'ARGENTINE'	

KEY MAP:



NORTH

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1	REVISED PER CITY COMMENTS	10/7/25	JGR
2	REVISED PER CITY COMMENTS	07/10/25	JGR
3	REVISED PER CITY COMMENTS	06/03/25	JGR
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PHONE: (407) 898-1511
WWW.KIMLEY-HORN.COM CA- 00000696

JOHN T. GRIFFIN III
FLORIDA LICENSE NUMBER
66667700
10/27/2025

KHA PROJECT 248418000
DATE 10/27/2025
SCALE AS SHOWN
DESIGNED BY AM
DRAWN BY AM
CHECKED BY JTG

DELAND TECH PARK
CITY OF DELAND, FLORIDA

LANDSCAPE PLAN

SHEET NUMBER
L1.05

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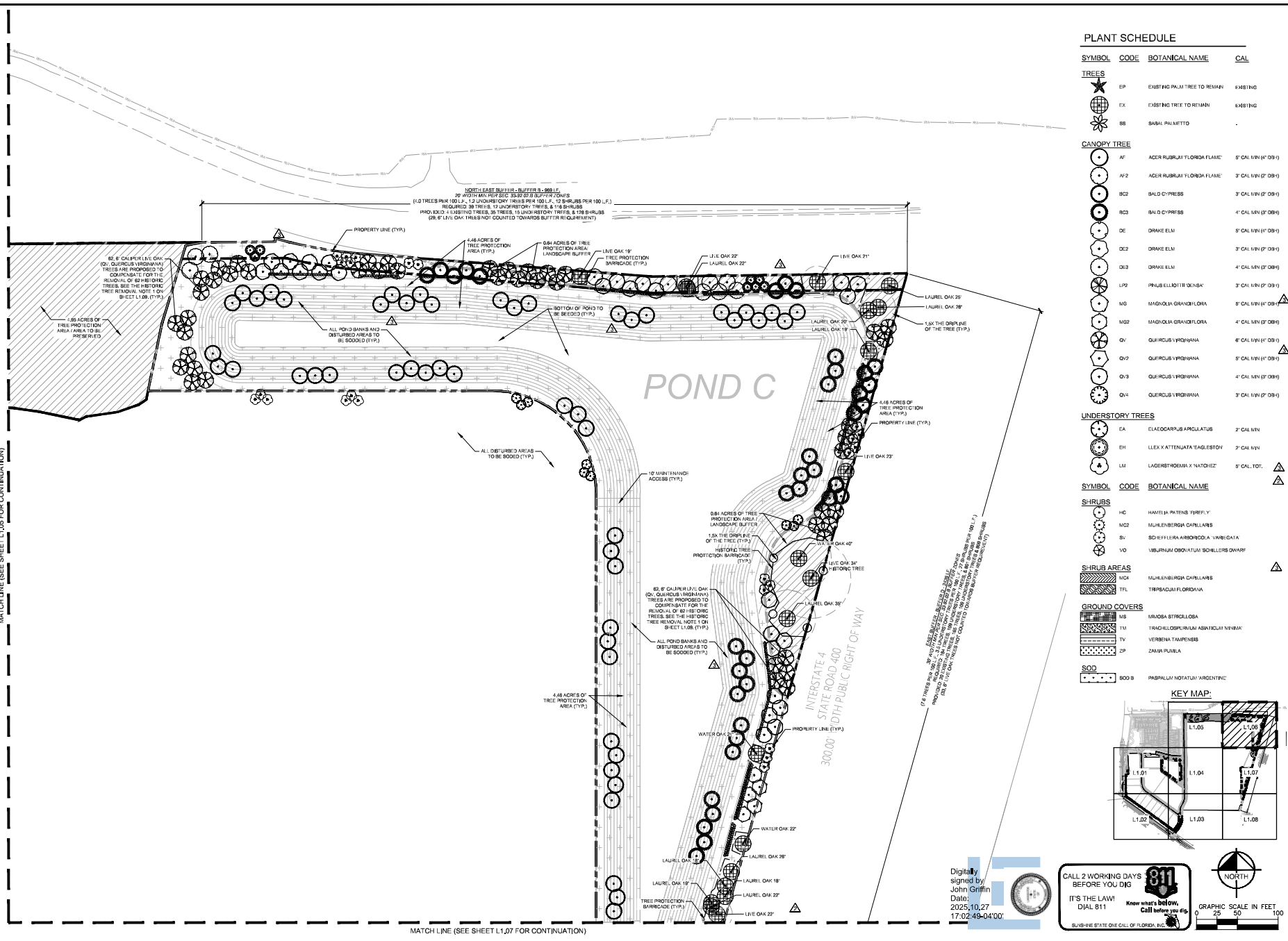
Plotted By: Haste, Jake Sheet Set: DELAND TECH PARK Layout: L1.05 October 27, 2025 10:19:53am K:\ORL_Civil\248418000\Design\Tech Plan\C4D\DOCS\TechPlanSheets\L1.0X1-LNDSCAPE PLAN.dwg



PLANT SCHEDULE

SYMBOL	CODE	BOTANICAL NAME	CAL
TREES			
	EP	EXISTING PALM TREE TO REMAIN	EXISTING
	EX	EXISTING TREE TO REMAIN	EXISTING
	SS	SABAL PALMETTO	-
CANOPY TREE			
	AF	ACER RUBRUM 'FLORIDA FLAME'	5" CAL MIN (4" DBH)
	AF2	ACER RUBRUM 'FLORIDA FLAME'	3" CAL MIN (2" DBH)
	BC2	BALD CYPRESS	3" CAL MIN (2" DBH)
	BC3	BALD CYPRESS	4" CAL MIN (3" DBH)
	DE	DRAKE ELM	5" CAL MIN (4" DBH)
	DE2	DRAKE ELM	3" CAL MIN (2" DBH)
	DE3	DRAKE ELM	4" CAL MIN (3" DBH)
	LP2	PINUS ELLIOTTII 'DENSA'	3" CAL MIN (2" DBH)
	MG	MAGNOLIA GRANDIFLORA	5" CAL MIN (4" DBH)
	MG2	MAGNOLIA GRANDIFLORA	4" CAL MIN (3" DBH)
	QV	QUERCUS VIRGINIANA	6" CAL MIN (4" DBH)
	QV2	QUERCUS VIRGINIANA	5" CAL MIN (4" DBH)
	QV3	QUERCUS VIRGINIANA	4" CAL MIN (3" DBH)
	QV4	QUERCUS VIRGINIANA	3" CAL MIN (2" DBH)
UNDERSTORY TREES			
	EA	ELAEOCARPUS APICULATUS	3" CAL MIN
	EH	LLEX X ATTENUATA 'EAGLESTON'	3" CAL MIN
	LM	LAGERSTROEMIA X 'NATCHEZ'	5" CAL. TOT.
SYMBOL	**CODE**	**BOTANICAL NAME**	
SHRUBS			
	HC	HAMELIA PATENS 'FIREFLY'	
	MC2	MUHLENBERGIA CAPILLARIS	
	SV	SCHEFFLERA ARBORICOLA 'VARIEGATA'	
	VO	VIBURNUM OBOVATUM 'SCHILLERS DWARF'	
SHRUB AREAS			
	MC4	MUHLENBERGIA CAPILLARIS	
	TFL	TRIPSACUM FLORIDANA	
GROUND COVERS			
	MS	MIMOSA STRIGILLOSA	
	TM	TRACHELOSPERMUM ASIATICUM 'MINIMA'	
	TV	VERBENA TAMPENSIS	
	ZP	ZAMIA PUMILA	
SOD			
	SOD B	PASPALUM NOTATUM 'ARGENTINE'	

KEY MAP:

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JOHN T. GRIFFIN III
FLORIDA LICENSE NUMBER
66667/00
10/27/2025

KHA PROJECT 240418000
DATE 10/27/2025
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DELAND TECH PARK
LANDSCAPE PLAN

CITY OF DELAND FLORIDA

SHEET NUMBER
L1.06

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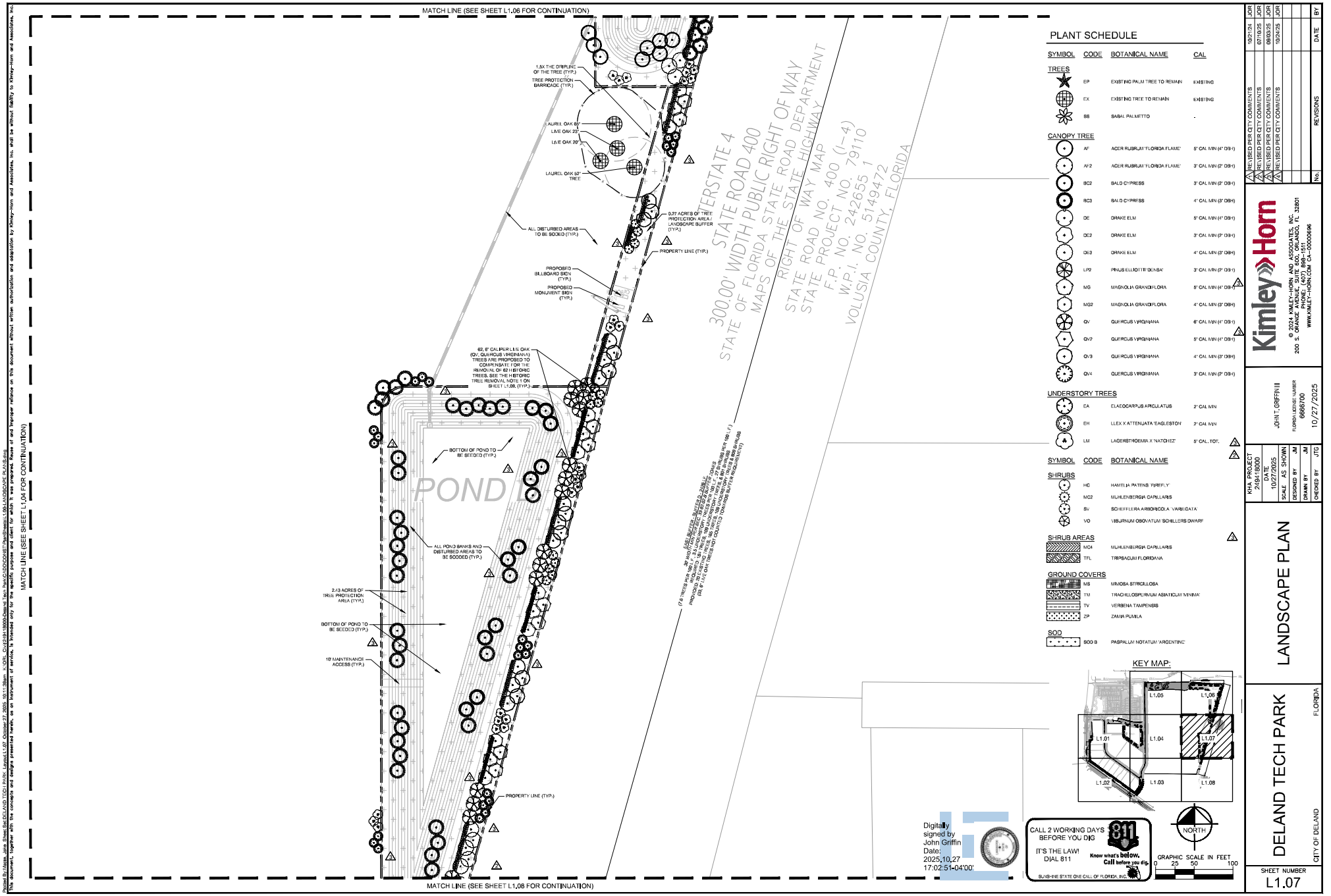

PLANT SCHEDULE

SYMBOL	CODE	BOTANICAL NAME	CAL
TREES			
	EP	EXISTING PALM TREE TO REMAIN	EXISTING
	EX	EXISTING TREE TO REMAIN	EXISTING
	SS	SABAL PALMETTO	-
CANOPY TREE			
	AF	ACER RUBRUM 'FLORIDA FLAME'	5" CAL MIN (4" DBH)
	AF2	ACER RUBRUM 'FLORIDA FLAME'	3" CAL MIN (2" DBH)
	BC2	BALD CYPRESS	3" CAL MIN (2" DBH)
	BC3	BALD CYPRESS	4" CAL MIN (3" DBH)
	DE	DRAKE ELM	5" CAL MIN (4" DBH)
	DE2	DRAKE ELM	3" CAL MIN (2" DBH)
	DE3	DRAKE ELM	4" CAL MIN (3" DBH)
	LP2	PINUS ELLIOTTII 'DENSA'	3" CAL MIN (2" DBH)
	MG	MAGNOLIA GRANDIFLORA	5" CAL MIN (4" DBH)
	MG2	MAGNOLIA GRANDIFLORA	4" CAL MIN (3" DBH)
	QV	QUERCUS VIRGINIANA	6" CAL MIN (4" DBH)
	QV2	QUERCUS VIRGINIANA	5" CAL MIN (4" DBH)
	QV3	QUERCUS VIRGINIANA	4" CAL MIN (3" DBH)
	QV4	QUERCUS VIRGINIANA	3" CAL MIN (2" DBH)
UNDERSTORY TREES			
	EA	ELAEOCARPUS APICULATUS	3" CAL MIN
	EH	ILEX X ATTENUATA 'EAGLESTON'	3" CAL MIN
	LM	LAGERSTROEMIA X 'NATCHEZ'	8" CAL. TOT.
SYMBOL	**CODE**	**BOTANICAL NAME**	
SHRUBS			
	HC	HAMELIA PATENS 'FIREFLY'	
	MC2	MUHLENBERGIA CAPILLARIS	
	SV	SCHEFFLERA ARBORICOLA 'VARIEGATA'	
	VO	VIBURNUM OBOVATUM 'SCHILLERS DWARF'	
SHRUB AREAS			
	MC4	MUHLENBERGIA CAPILLARIS	
	TFL	TRIPSACUM FLORIDANA	
GROUND COVERS			
	MS	MIMOSA STRIGILLOSA	
	TM	TRACHELOSPERMUM ASIATICUM 'MINIMA'	
	TV	VERBENA TAMPENSIS	
	ZP	ZAMIA PUMILA	
SOD			
	SOD B	PASPALUM NOTATUM 'ARGENTINE'	

KEY MAP:

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PHONE: (407) 898-1511
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JOHN T. GRIFFIN III
FLORIDA LICENSE NUMBER
66667700
10/27/2025

KHA PROJECT 240418000
DATE 10/27/2025
SCALE AS SHOWN
DESIGNED BY JM
DRAWN BY JM
CHECKED BY JTG

LANDSCAPE PLAN

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER
L1.07

Plotted By: Maria Jose Sierra Bre | DELAND TECH PARK | Layout: L1.07 | October 27, 2025 - 10:11:39am | K:\ORL_Civil\194900-Deland Tech Park\CADD\COS\ET\SheetSet\L1.00A LANDSCAPE PLANS.dwg
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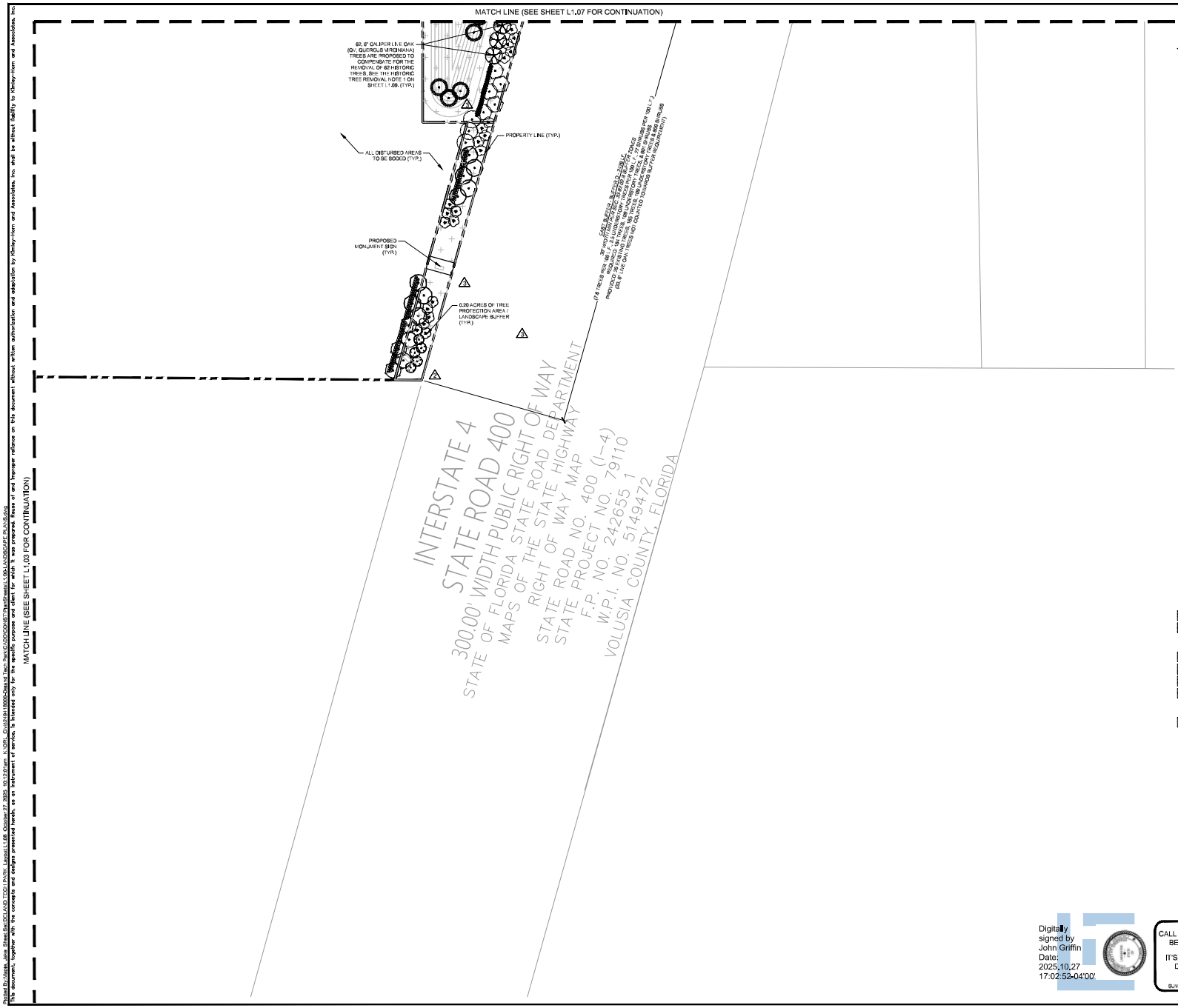
MATCH LINE (SEE SHEET L1.07 FOR CONTINUATION)
62, 8" CALIPER LIVE OAK (QV, QUERCUS VIRGINIANA) TREES ARE PROPOSED TO COMPENSATE FOR THE REMOVAL OF 62 HISTORIC TREES, SEE THE HISTORIC TREE REMOVAL NOTE 1 ON SHEET L1.09. (TYP.)
PROPERTY LINE (TYP.)
ALL DISTURBED AREAS TO BE SODDED (TYP.)
PROPOSED MONUMENT SIGN (TYP.)
0.20 ACRES OF TREE PROTECTION AREA / LANDSCAPE BUFFER (TYP.)
TREE BARRIER BUFFER ZONE
(8) HIGH-QUALITY TREES, 100' LONG @ 1 PER 100 LF
(1) MEDIUM-QUALITY TREE, 100' LONG @ 1 PER 100 LF
(4) LOW-QUALITY TREES, 100' LONG @ 1 PER 100 LF
PROVIDED SCREENING = 13 TREES, 100' LONG
(13 TREES PER 100 LF)

PLANT SCHEDULE

SYMBOL	CODE	QTY	COMMON NAME	BOTANICAL NAME	CONT	CAL	SIZE
TREES							
	EP	5	PROTECT IN PLACE EXISTING PALM TO REMAIN	EXISTING PALM TREE TO REMAIN	-	EXISTING	EXISTING
	EX	53	PROTECT IN PLACE EXISTING TO REMAIN	EXISTING TREE TO REMAIN	-	EXISTING	EXISTING
	SS	33	SABAL PALM STRAIGHT, SLICK, SINGLE LEADER, FL #1	SABAL PALMETTO	FG	-	12' CT
CANOPY TREE							
	AF	40	FLORIDA FLAME RED MAPLE STRAIGHT, SINGLE LEADER, FL #1	ACER RUBRUM 'FLORIDA FLAME'	100 GAL	5" CAL MIN (4" DBH)	15' HT., 8' SPR.
	AF2	10	FLORIDA FLAME RED MAPLE STRAIGHT, SINGLE LEADER, FL #1	ACER RUBRUM 'FLORIDA FLAME'	45 GAL	3" CAL MIN (2" DBH)	12' HT., 5' SPR.
	BC2	103	TAXODIUM DISTICHUM STRAIGHT, SINGLE LEADER, FL #1	BALD CYPRESS	45 GAL	3" CAL MIN (2" DBH)	12' HT., 5' SPR.
	BC3	91	TAXODIUM DISTICHUM STRAIGHT, SINGLE LEADER, FL #1	BALD CYPRESS	100 GAL	4" CAL MIN (3" DBH)	12' HT., 6' SPR.
	DE	44	ULMUS PARVIFOLIA 'DRAKE' STRAIGHT, SINGLE LEADER, FL #1	DRAKE ELM	100 GAL	5" CAL MIN (4" DBH)	14' HT., 5' SPR.
	DE2	11	ULMUS PARVIFOLIA 'DRAKE' STRAIGHT, SINGLE LEADER, FL #1	DRAKE ELM	45 GAL	3" CAL MIN (2" DBH)	12' HT., 5' SPR.
	DE3	21	ULMUS PARVIFOLIA 'DRAKE' STRAIGHT, SINGLE LEADER, FL #1	DRAKE ELM	100 GAL	4" CAL MIN (3" DBH)	12' HT., 6' SPR.
	LP2	24	SOUTHERN SLASH PINE STRAIGHT, SINGLE LEADER, FL #1	PINUS ELLIOTTII DENSA'	45 GAL	3" CAL MIN (2" DBH)	12' HT., 5' SPR.
	MG	22	SOUTHERN MAGNOLIA STRAIGHT, SINGLE LEADER, FL #1	MAGNOLIA GRANDIFLORA	100 GAL	5" CAL MIN (4" DBH)	15' HT., 8' SPR.
	MG2	35	SOUTHERN MAGNOLIA STRAIGHT, SINGLE LEADER, FL #1	MAGNOLIA GRANDIFLORA	100 GAL	4" CAL MIN (3" DBH)	12' HT., 6' SPR.
	QV	62	LIVE OAK STRAIGHT, SINGLE LEADER, FL #1	QUERCUS VIRGINIANA	200 GAL	6" CAL MIN (4" DBH)	18' HT., 10' SPR.
	QV2	27	LIVE OAK STRAIGHT, SINGLE LEADER, FL #1	QUERCUS VIRGINIANA	100 GAL	5" CAL MIN (4" DBH)	15' HT., 8' SPR.
	QV3	53	LIVE OAK STRAIGHT, SINGLE LEADER, FL #1	QUERCUS VIRGINIANA	100 GAL	4" CAL MIN (3" DBH)	12' HT., 6' SPR.
	QV4	16	LIVE OAK STRAIGHT, SINGLE LEADER, FL #1	QUERCUS VIRGINIANA	45 GAL	3" CAL MIN (2" DBH)	12' HT., 5' SPR.
UNDERSTORY TREES							
	EA	62	JAPANESE BLUEBERRY TREE STANDARD, SINGLE LEADER, STRAIGHT, FL #1	ELAEOCARPUS APICULATUS	25 GAL	2" CAL MIN	6' HT., 3' SPR
	EH	59	EAGLESTON HOLLY STANDARD, FULL TO BASE, STRAIGHT, FL #1	ILEX X ATTENUATA 'EAGLESTON'	25 GAL	2" CAL MIN	6' HT., 3' SPR
	LM	121	NATCHEZ CRAPE MYRTLE 3 TRUNK MIN, FULL, FL #1	LAGERSTROEMIA X 'NATCHEZ'	100 GAL	5" CAL. TOT.	12' HT., 7' SPR.
SYMBOL	**CODE**	**QTY**	**COMMON NAME**	**BOTANICAL NAME**	**CONT**	**SIZE**	**SPACING**
SHRUBS							
	HC	1,109	DWARF FIREBUSH FULL, FLP1	HAMELIA PATENS 'FIREFLY'	3 GAL	18" FULL	36" OC
	MC2	78	PINK MUHLY GRASS FULL, FLP1	MUHLENBERGIA CAPILLARIS	3 GAL	24" FULL	36" OC
	SV	171	DWARF VARIEGATED SCHEFFLERA FULL, FL #1	SCHEFFLERA ARBORICOLA 'VARIEGATA'	3 GAL	18" FULL	30" OC
	VO	153	DWARF WALTERS VIBURNUM FULL, FL #1	VIBURNUM OBOVATUM 'SCHILLERS DWARF'	7 GAL	24" FULL	36" OC
SHRUB AREAS							
	MC4	505	PINK MUHLY GRASS FULL	MUHLENBERGIA CAPILLARIS	3 GAL	18" FULL	36" OC
	TFL	3,285	DWARF FAKAHATCHEE GRASS FULL	TRIPSACUM FLORIDANA	3 GAL	20" FULL	30" OC
GROUND COVERS							
	MS	77	SUNSHINE MIMOSA FULL	MIMOSA STRIGILLOSA	1 GAL	12" HT. MIN.	18" OC
	TM	1,004	MINIMA ASIATIC JASMINE FULL	TRACHELOSPERMUM ASIATICUM 'MINIMA'	1 GAL	8" FULL	18" OC
	TV	1,261	TAMPA VERVAIN VERBENA FULL	VERBENA TAMPENSIS	1 GAL	12" HT. MIN.	18" OC
	ZP	2,105	COONTIE CYCAD FULL	ZAMIA PUMILA	1 GAL	12" FULL	18" OC
SOD							
	SOD B	60,632 SF	ARGENTINE BAHIAGRASS 100% INSECT DISEASE FREE, LAID TIGHT, ROLLED	PASPALUM NOTATUM 'ARGENTINE'	SOD	-	-

LANDSCAPE CALCULATIONS

PER "CITY OF DELAND" LAND DEVELOPMENT CODE

	REQUIRED	PROVIDED
WEST BUFFER - 497 LF BUFFER STANDARD "D" - 40' WIDTH MIN *SECTION 33-92.02.B & 33-36.05.C* *EMERGING GATEWAY DISTRICT*	40' WIDTH MIN BUFFER FOR : 497 LF *7.2 (4" DBH + 14' HT) CANOPY / 100 LF = 36 CANOPY* 4 UNDERSTORY / 100 LF = 20 UNDERSTORY 30 SHRUBS / 100 LF = 149 SHRUBS	40' WIDTH BUFFER FOR : 497 LF 33 CANOPY TREES (4" DBH + 14' HT MIN) + 4 EXISTING TREES 20 UNDERSTORY 6 PALM TREES 157 SHRUBS
SOUTH WEST BUFFER - 1387 LF BUFFER STANDARD "D" - 40' WIDTH MIN *SECTION 33-92.02.B*	40' WIDTH MIN BUFFER FOR : 1387 LF *7.2 (4" DBH) CANOPY / 100 LF = 100 CANOPY* 4 UNDERSTORY / 100 LF = 55 UNDERSTORY 30 SHRUBS / 100 LF = 416 SHRUBS	40' WIDTH BUFFER FOR : 1387 LF 100 CANOPY TREES (4" DBH) 57 UNDERSTORY 12 PALM TREES 420 SHRUBS
NORTH EAST BUFFER - 969 LF BUFFER STANDARD "B" - 20 WIDTH MIN *SECTION 33-92.02.B*	20' WIDTH MIN BUFFER FOR : 969 LF *4.8 (3" DBH) CANOPY / 100 LF = 39 CANOPY* 1.3 UNDERSTORY / 100 LF = 13 UNDERSTORY 12 SHRUBS / 100 LF = 116 SHRUBS	20' WIDTH BUFFER FOR : 969 LF 34 CANOPY TREES (3" DBH) + 4 EXISTING TREES 13 UNDERSTORY 129 SHRUBS
EAST BUFFER - 2426 LF BUFFER STANDARD "D" - 30' WIDTH MIN *SECTION 33-92.02.B*	30' WIDTH MIN BUFFER FOR : 2426 LF *7.6 (3" DBH) CANOPY / 100 LF = 184 CANOPY* 4.3 UNDERSTORY / 100 LF = 109 UNDERSTORY 33 SHRUBS / 100 LF = 801 SHRUBS	30' WIDTH BUFFER FOR : 2426 LF 165 CANOPY TREES (3" DBH) + 20 EXISTING TREES 109 UNDERSTORY 809 SHRUBS
MINIMUM TREE PROTECTION AREA COVERAGE 1 TREE PER 2,500 SQFT *SECTION 33-57.07.B.6*	=22.34 ACRES OF TPA (973,131 SQFT) 973,131 / 2500 = 390 TREES REQUIRED	645 TREES PROVIDED WITHIN TPA AREAS 53 PRESERVED TREES 592 PROPOSED TREES

HISTORIC TREE REMOVAL NOTE:
PER TREE ADVISORY COMMITTEE MEETING DATED MAY 13, 2025

1. IN ACCORDANCE WITH THE REPLACEMENT REQUIREMENTS, 62 TREES, EACH WITH A 6-INCH CALIPER, SHALL BE PLANTED TO COMPENSATE FOR THE REMOVAL OF 62 HISTORIC TREES AS SHOWN ON THE DELAND TECH PARK TREE MITIGATION PLANS.
2. IN ADDITION, PARCELS NORTH OF CASSADAGA, REFERENCED AS "THE TREE BANK" (810600000092, 810603080140, 810603080110, 810603080080, 810603080010, 810603070004, AND 810603060040) ARE TO BE DESIGNATED AS A TREE PROTECTION AREA TO AID IN THE MITIGATION OF THE REMOVAL OF 62 HISTORIC TREES.

NATIVE TREES AND SHRUBS TO BE PLANTED IN TREE BANK:

IN ORDER TO INCREASE THE DIVERSITY OF NATIVE TREES AND SHRUBS IN THE TREE BANK, CONVERT THE EXISTING GRASS AREA TO FOREST AND ADD RESILIENCY TO THE TREE BANK, THE FOLLOWING SPECIES WILL BE PLANTED OVER THE NEXT THREE YEAR PERIOD BY DENISON PROPERTIES, INC.

- SWEETBAY (MAGNOLIA VIRGINIANA)
- CAROLINA LAUREL CHERRY (PRUNUS CAROLINIANA)
- CHICKASAW PLUM (PRUNUS ANGUSTIFOLIA)
- PERSIMMON (DIOSPYROS VIRGINIANA)
- MYRTLE-LEAVED DAHOON (ILEX MYRTIFOLIA)
- FRINGE TREE (CHIONANTHUS VIRGINICUS)
- EASTERN/SOUTHERN RED CEDAR (JUNIPERUS VIRGINIANA/SLICICOLA)

IN ADDITION, LONGLEAF PINES WILL BE ENCOURAGED TO RESEED IN THE TREE BANK, ESPECIALLY IN THE EXISTING, GRASS OPEN AREA. THIS OPEN AREA WILL BE DISTURBED BY MECHANICAL TURNING OF THE EXISTING TURF TO ALLOW FOR SUCH RESEEDING.

DELAND TECH PARK PD - TREE BANK. MARCH 6, 2025

TREE BANK PLANTING REQUIREMENTS TO BE PROVIDED BY OTHERS. KIMLEY HORN AND ASSOCIATES INC. NOT RESPONSIBLE FOR REQUIREMENTS LISTED UNDER 'NATIVE TREES AND SHRUBS TO BE PLANTED' THAT ARE TO BE PLANTED IN TREE BANK NOTE LISTED ABOVE ON SHEET L1.09 OF DELAND TECH PARK PERMITTED SET.

TREE CALCULATION TABLE :	
TOTAL TREE REPLACEMENT INCHES REQUIRED TO MEET PD	
TREE REPLACEMENT	2,800.0
PROPOSED INCHES:	2,932
SITE DEFICIENT TREE INCHES TO BE PAID:	0
TOTAL INCHES TO PAY INTO THE CITY'S REPLACEMENT RESERVE ACCOUNT (AT $75 PER TREE):	0

TREE CALIPER COUNT TOTALS			
TREE	COUNT	CALC.	TOTAL INCHES
3" caliper			
AF2	10		
BC2	103		
DE2	11		
LP2	24		
QV4	16		
TOTAL	164	164X 3	492
4" caliper			
BC3	91		
DE3	21		
MG2	35		
QV3	53		
TOTAL	200	200 X 4	796
5" caliper			
AF	40		
DE	44		
MG	22		
QV2	27		
TOTAL	133	133 X 5	665
Palm			
SS	33	33 x 4	132
Understory			
EA (2")	62	62 x 2	124
EH (2")	59	59 x 2	118
LM (5" tot)	121	121 x 5	605
TOTAL PROPOSED CALIPER INCHES:			2932

NOTE:

PER PD, APPLICANT TO PAY MONETARY SUM NO MORE THAN 2,800 INCHES TO CITY'S TREE REPLACEMENT RESERVE (TO BE PAID WITHIN 30 DAYS FOLLOWING APPROVAL OF THE SITE AND DEVELOPMENT PLAN FOR THE FIRST INDUSTRIAL OR COMMERCIAL BUILDING)

LANDSCAPE NOTES:

1. ALL LANDSCAPE MATERIAL TO BE FLORIDA GRADE #1 OR BETTER QUALITY
2. ALL LANDSCAPED AREAS ARE TO RECEIVE A MINIMUM OF 4" OF TOPSOIL.
3. ALL PLANT MATERIAL SHALL BE HEALTHY, VIGOROUS, AND FREE OF PESTS AND DISEASE.
4. ALL MATERIALS ARE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT BEFORE, DURING, AND AFTER INSTALLATION.
5. ALL TREES MUST BE GUYED OR STAKED AS SHOWN IN THE DETAILS.
6. ALL PLANTING AREAS SHALL BE COMPLETELY MULCHED AS SPECIFIED.
7. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES AND SHALL AVOID DAMAGE TO ALL UTILITIES DURING THE COURSE OF THE WORK. LOCATIONS OF EXISTING BURIED UTILITY LINES SHOWN ON THE PLANS ARE BASED UPON BEST AVAILABLE INFORMATION AND ARE TO BE CONSIDERED APPROXIMATE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR 1) TO VERIFY THE LOCATIONS OF UTILITY LINES ADJACENT TO THE WORK AREA 2) TO PROTECT ALL UTILITY LINES DURING THE CONSTRUCTION PERIOD 3) TO REPAIR ANY AND ALL DAMAGE TO UTILITIES, STRUCTURES, SITE APPURTENANCES, ETC. WHICH OCCURS AS A RESULT OF THE CONSTRUCTION.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL QUANTITIES SHOWN ON THESE PLANS BEFORE PRICING THE WORK.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR DELIVERY SCHEDULE AND PROTECTION BETWEEN DELIVERY AND PLANTING TO MAINTAIN HEALTHY PLANT CONDITIONS.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FULLY MAINTAINING (INCLUDING BUT NOT LIMITED TO: WATERING, SPRAYING, MULCHING, FERTILIZING, ETC.) ALL OF THE PLANT MATERIALS AND LAWN FOR THE WARRANTY PERIOD.
11. ANY PLANT MATERIAL WHICH IS DISEASED, DISTRESSED, DEAD, OR REJECTED (PRIOR TO SUBSTANTIAL COMPLETION) SHALL BE PROMPTLY REMOVED FROM THE SITE AND REPLACED WITH MATERIAL OF THE SAME SPECIES, QUANTITY, AND SIZE AND MEETING ALL PLANT LIST SPECIFICATIONS.
12. THE CONTRACTOR SHALL COMPLETELY GUARANTEE ALL PLANT MATERIAL FOR WARRANTY PERIOD, THE CONTRACTOR SHALL PROMPTLY MAKE ALL REPLACEMENTS DURING THE NORMAL PLANTING SEASON.
13. STANDARDS SET FORTH IN "AMERICAN STANDARD FOR NURSERY STOCK" REPRESENT GUIDELINE SPECIFICATIONS ONLY AND SHALL CONSTITUTE MINIMUM QUALITY REQUIREMENTS FOR PLANT MATERIAL.
14. ALL LANDSCAPING SHALL BE INSTALLED ACCORDING TO SOUND NURSERY PRACTICES, AND SHALL BE FLORIDA NO. 1 OR BETTER AS GIVEN IN "GRADES AND STANDARDS FOR NURSERY PLANTS, PARTS I AND II, STATE OF FLORIDA, DEPARTMENT OF AGRICULTURE.
15. ALL INVASIVE / EXOTIC SPECIES AND PROHIBITED TREE SPECIES SHALL BE REMOVED FROM SITE, INCLUDING ROOT BALLS TO THE EXTENT POSSIBLE WITH NO DAMAGE TO ADJACENT EXISTING TREES.
16. ALL LANDSCAPE AREAS WILL BE PROVIDED WITH PERMANENT AUTOMATIC IRRIGATION SYSTEM.
17. TREE SUPPORT MATERIALS ARE TO BE REMOVED FROM EACH TREE ONCE IT IS "ESTABLISHED" (AS APPROVED BY THE LANDSCAPE ARCHITECT).
18. ALL PLANT SPECIFICATIONS IN THE PLANT SCHEDULE SHALL BE CONSIDERED THE MINIMUM ALLOWABLE SPECIFICATIONS. CONTRACTOR SHALL PROCURE PLANT MATERIALS AND UPSIZE AS NECESSARY TO MEET THE MOST STRINGENT SPECIFICATION.
19. ALL PLANTED LANDSCAPE AREAS TO HAVE 3" DEEP DESIGNER BROWN HARDWOOD MULCH TO FULLY COVER DRIP IRRIGATION & AMENDED SOILS. REPAIR AS NEEDED DURING CONSTRUCTION. SUBMIT ALTERNATIVE MULCH SPECIFICATION FOR LANDSCAPE ARCHITECT APPROVAL.

NO.	DATE	BY
1	10/7/24	JOR
2	07/10/25	JOR
3	08/05/25	JOR
4	10/24/25	JOR

REVISIONS
1 REVISED PER CITY COMMENTS
2 REVISED PER CITY COMMENTS
3 REVISED PER CITY COMMENTS
4 REVISED PER CITY COMMENTS

Kimley»Horn
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200 S. ORANGE AVE., SUITE 600, ORLANDO, FL 32801
PHONE: (407) 898-1511
WWW.KIMLEY-HORN.COM CA- 00000696

Digitally signed by John Griffin
Date: 2025.10.27 17:03:49-04'00'

KHA PROJECT 249418000
DATE 10/27/2025
SCALE AS SHOWN
DESIGNED BY JM
DRAWN BY JM
CHECKED BY JTG

LANDSCAPE SCHEDULE AND CALCULATIONS

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER L1.09

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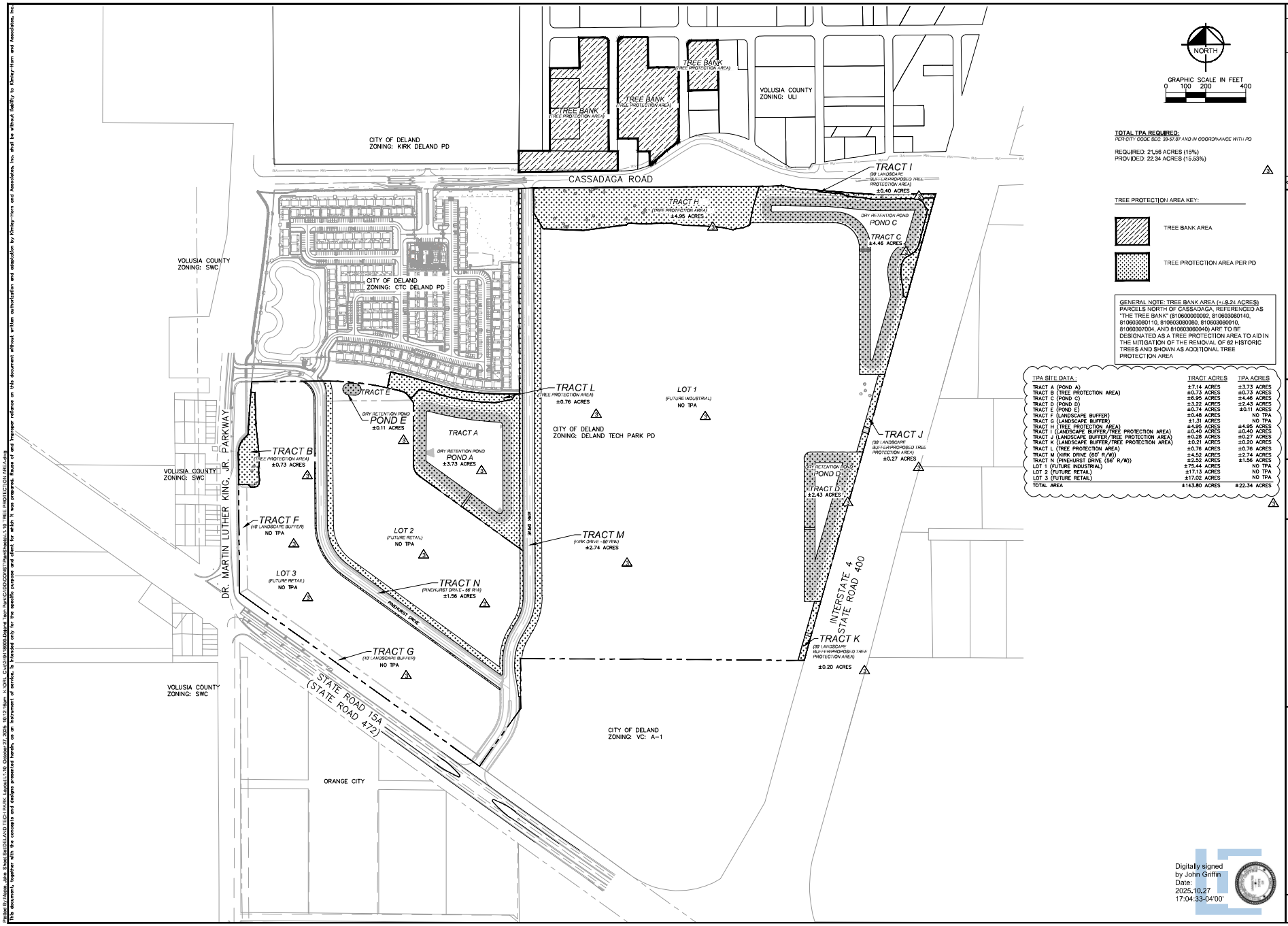

TOTAL TPA REQUIRED:
PER CITY CODE SEC. 33-57.07 AND IN COORDINANCE WITH PD

REQUIRED: 21.56 ACRES (15%)
PROVIDED: 22.34 ACRES (15.53%)

TREE PROTECTION AREA KEY:

TREE BANK AREA

TREE PROTECTION AREA PER PD

GENERAL NOTE: TREE BANK AREA (+/-9.24 ACRES)
PARCELS NORTH OF CASSADAGA, REFERENCED AS "THE TREE BANK" (810600000092, 810603080140, 810603080110, 810603080080, 810603080010, 810603070004, AND 810603060040) ARE TO BE DESIGNATED AS A TREE PROTECTION AREA TO AID IN THE MITIGATION OF THE REMOVAL OF 62 HISTORIC TREES AND SHOWN AS ADDITIONAL TREE PROTECTION AREA

TPA SITE DATA:	TRACT ACRES	TPA ACRES
TRACT A (POND A)	±7.14 ACRES	±3.73 ACRES
TRACT B (TREE PROTECTION AREA)	±0.73 ACRES	±0.73 ACRES
TRACT C (POND C)	±6.95 ACRES	±4.46 ACRES
TRACT D (POND D)	±3.22 ACRES	±2.43 ACRES
TRACT E (POND E)	±0.74 ACRES	±0.11 ACRES
TRACT F (LANDSCAPE BUFFER)	±0.48 ACRES	NO TPA
TRACT G (LANDSCAPE BUFFER)	±1.31 ACRES	NO TPA
TRACT H (TREE PROTECTION AREA)	±4.95 ACRES	±4.95 ACRES
TRACT I (LANDSCAPE BUFFER/TREE PROTECTION AREA)	±0.40 ACRES	±0.40 ACRES
TRACT J (LANDSCAPE BUFFER/TREE PROTECTION AREA)	±0.28 ACRES	±0.27 ACRES
TRACT K (LANDSCAPE BUFFER/TREE PROTECTION AREA)	±0.21 ACRES	±0.20 ACRES
TRACT L (TREE PROTECTION AREA)	±0.76 ACRES	±0.76 ACRES
TRACT M (KIRK DRIVE (80' R/W))	±4.52 ACRES	±2.74 ACRES
TRACT N (PINEHURST DRIVE (56' R/W))	±2.52 ACRES	±1.56 ACRES
LOT 1 (FUTURE INDUSTRIAL)	±75.44 ACRES	NO TPA
LOT 2 (FUTURE RETAIL)	±17.13 ACRES	NO TPA
LOT 3 (FUTURE RETAIL)	±17.02 ACRES	NO TPA
TOTAL AREA	±143.80 ACRES	±22.34 ACRES

No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/7/24	JDR
2	REVISED PER CITY COMMENTS	07/10/25	JDR
3	REVISED PER CITY COMMENTS	09/03/25	JDR
4	REVISED PER CITY COMMENTS	10/24/25	JDR

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
200 S. ORANGE AVENUE, SUITE 800, ORLANDO, FL 32801
PHONE: (407) 898-1511
WWW.KIMLEY-HORN.COM CA-0000696

JOHN T. GRIFFIN III
FLORIDA LICENSE NUMBER
66667000
10/27/2025

KHA PROJECT
240418000
DATE
9/26/2025
SCALE AS SHOWN
DESIGNED BY JM
DRAWN BY JM
CHECKED BY JTG

OVERALL TREE PROTECTION AREA EXHIBIT

DELAND TECH PARK

FLORIDA

CITY OF DELAND

SHEET NUMBER
L1.10

Digitally signed by John Griffin
Date: 2025.10.27 17:04:33-04'00'

Plotted By: Maria Jose Sanz Sol DELAND TECH PARK Layout L1.10 October 27, 2025, 10:12:16am K:\ORL_Civil\240418000\Deland Tech Park\CADD\COMSET\SheetSheets\L1.10 TREE PROTECTION AREA.dwg
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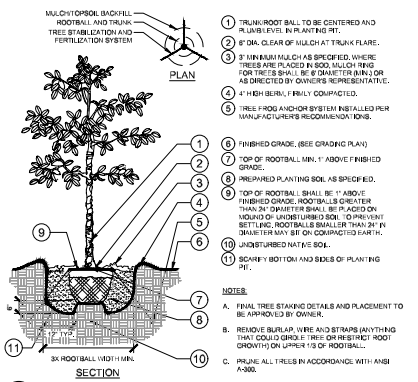
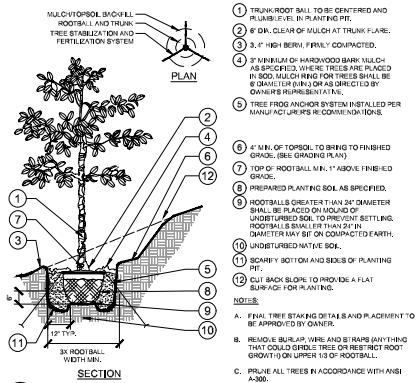


1. TRUNK/ROOT BALL TO BE CENTERED AND PLUMB/LEVEL IN PLANTING PIT.
2. 6" DIA. CLEAR OF MULCH AT TRUNK FLARE.
3. 3" MINIMUM MULCH AS SPECIFIED, WHERE TREES ARE PLACED IN SOD, MULCH RING FOR TREES SHALL BE 4' DIAMETER (MIN.) OR AS DIRECTED BY OWNER'S REPRESENTATIVE.
4. 4" HIGH BERM, FIRMLY COMPACTED.
5. TREE FROG ANCHOR SYSTEM INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
6. FINISHED GRADE, (SEE GRADING PLAN)
7. TOP OF ROOTBALL MIN. 1" ABOVE FINISHED GRADE.
8. PREPARED PLANTING SOIL AS SPECIFIED.
9. TOP OF ROOTBALL SHALL BE 1" ABOVE FINISHED GRADE. ROOTBALLS GREATER THAN 24" DIAMETER SHALL BE PLACED ON MOUND OF UNDISTURBED SOIL TO PREVENT SETTLING. ROOTBALLS SMALLER THAN 24" IN DIAMETER MAY SIT ON COMPACTED EARTH.
10. UNDISTURBED NATIVE SOIL.
11. SCARIFY BOTTOM AND SIDES OF PLANTING PIT.

NOTES:
A. FINAL TREE STAKING DETAILS AND PLACEMENT TO BE APPROVED BY OWNER.
B. REMOVE BURLAP, WIRE AND STRAPS (ANYTHING THAT COULD GIRDLE TREE OR RESTRICT ROOT GROWTH) ON UPPER 1/3 OF ROOTBALL.
C. PRUNE ALL TREES IN ACCORDANCE WITH ANSI A-300.

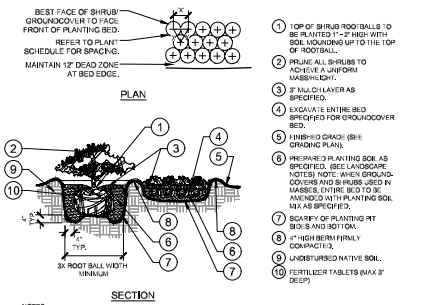
1 L1.50 TREE PLANTING
SECTION / PLAN NTS



1. TRUNK/ROOT BALL TO BE CENTERED AND PLUMB/LEVEL IN PLANTING PIT.
2. 6" DIA. CLEAR OF MULCH AT TRUNK FLARE.
3. 3..4" HIGH BERM, FIRMLY COMPACTED.
4. 3" MINIMUM OF HARDWOOD BARK MULCH AS SPECIFIED, WHERE TREES ARE PLACED IN SOD, MULCH RING FOR TREES SHALL BE 4' DIAMETER (MIN.) OR AS DIRECTED BY OWNER'S REPRESENTATIVE.
5. TREE FROG ANCHOR SYSTEM INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
6. 4" MIN. OF TOPSOIL TO BRING TO FINISHED GRADE. (SEE GRADING PLAN)
7. TOP OF ROOTBALL MIN. 1" ABOVE FINISHED GRADE.
8. PREPARED PLANTING SOIL AS SPECIFIED.
9. ROOTBALLS GREATER THAN 24" DIAMETER SHALL BE PLACED ON MOUND OF UNDISTURBED SOIL TO PREVENT SETTLING. ROOTBALLS SMALLER THAN 24" IN DIAMETER MAY SIT ON COMPACTED EARTH.
10. UNDISTURBED NATIVE SOIL.
11. SCARIFY BOTTOM AND SIDES OF PLANTING PIT.
12. CUT BACK SLOPE TO PROVIDE A FLAT SURFACE FOR PLANTING.

NOTES:
A. FINAL TREE STAKING DETAILS AND PLACEMENT TO BE APPROVED BY OWNER.
B. REMOVE BURLAP, WIRE AND STRAPS (ANYTHING THAT COULD GIRDLE TREE OR RESTRICT ROOT GROWTH) ON UPPER 1/3 OF ROOTBALL.
C. PRUNE ALL TREES IN ACCORDANCE WITH ANSI A-300.

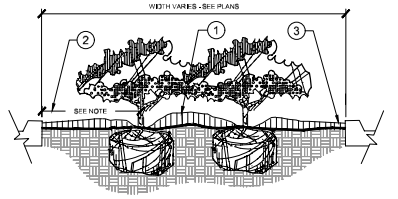
2 L1.50 TREE PLANTING ON A SLOPE
SECTION / PLAN NTS



1. TOP OF SHRUB ROOTBALLS TO BE PLANTED 1"-2" HIGH WITH SOIL MOUNDING UP TO THE TOP OF ROOTBALL.
2. PRUNE ALL SHRUBS TO ACHIEVE A UNIFORM MASS/HEIGHT.
3. 3" MULCH LAYER AS SPECIFIED.
4. EXCAVATE ENTIRE BED SPECIFIED FOR GROUNDCOVER BED.
5. FINISHED GRADE (SEE GRADING PLAN).
6. PREPARED PLANTING SOIL AS SPECIFIED. (SEE LANDSCAPE NOTES) NOTE: WHEN GROUNDCOVERS AND SHRUBS USED IN MASSES, ENTIRE BED TO BE AMENDED WITH PLANTING SOIL MIX AS SPECIFIED.
7. SCARIFY OF PLANTING PIT SIDES AND BOTTOM.
8. 4" HIGH BERM FIRMLY COMPACTED.
9. UNDISTURBED NATIVE SOIL.
10. FERTILIZER TABLETS (MAX 3" DEEP)

NOTES:
A. CONTRACTOR SHALL ASSURE PERCOLATION OF ALL PLANTING PITS PRIOR TO INSTALLATION.
B. WHEN SHRUBS ARE PRUNED IN MASSES, PRUNE ALL SHRUBS TO ACHIEVE UNIFORM MASS / HEIGHT.
C. ALL SHRUBS AND GROUNDCOVERS SHALL BE PLUMB VERTICALLY, UNLESS OTHERWISE DIRECTED BY OWNERS REPRESENTATIVE.

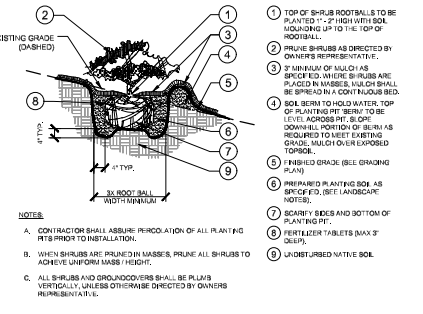
3 L1.50 SHRUB/GROUNDCOVER PLANTING
SECTION / PLAN NTS



1. CROWN ISLANDS @ 6:1 SLOPES (OR AS SPECIFIED ON THE LANDSCAPE PLANS).
2. CLEAR ZONE: 36" MIN. FROM BACK OF CURB TO CENTER OF NEAREST SHRUB, CLEAR ZONE SHALL CONTAIN 3" CONTINUOUS MULCH OR TURF, SEE PLANS.
3. 2" MIN VERTICAL CLEARANCE, TOP OF CURB TO TOP OF MULCH.

NOTES:
A. EXCAVATE A CONTINUOUS 24" DEEP PIT (FROM TOP OF CURB) FOR ENTIRE LENGTH AND WIDTH OF ISLAND & BACKFILL WITH APPROVED PLANTING MIX.
B. PROTECT AND RETAIN ALL CURBS AND BASE. COMPACTED SUBGRADE TO REMAIN FOR STRUCTURAL SUPPORT OF CURB SYSTEM (TYP).
C. ALL ISLANDS SHALL UTILIZE POOR DRAINAGE DETAIL WHEN PERCOLATION RATES ARE 2" PER HOUR OR LESS.

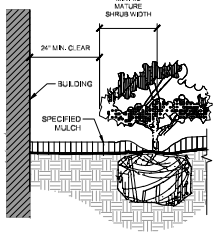
4 L1.50 PLANTED PARKING LOT ISLANDS/MEDIANS
SECTION NTS



1. TOP OF SHRUB ROOTBALLS TO BE PLANTED 1"-2" HIGH WITH SOIL MOUNDING UP TO THE TOP OF ROOTBALL.
2. PRUNE SHRUBS AS DIRECTED BY OWNER'S REPRESENTATIVE.
3. 3" MINIMUM OF MULCH AS SPECIFIED. WHERE SHRUBS ARE PLACED IN MASSES, MULCH SHALL BE SPREAD IN A CONTINUOUS BED.
4. SOIL BERM TO HOLD WATER. TOP OF PLANTING PIT 'BERM' TO BE LEVEL ACROSS PIT, SLOPE DOWN ALL PORTION OF BERM AS REQUIRED TO MEET EXISTING GRADE. MULCH OVER EXPOSED TOPSOIL.
5. FINISHED GRADE (SEE GRADING PLAN)
6. PREPARED PLANTING SOIL AS SPECIFIED, (SEE LANDSCAPE NOTES).
7. SCARIFY SIDES AND BOTTOM OF PLANTING PIT.
8. FERTILIZER TABLETS (MAX 3" DEEP).
9. UNDISTURBED NATIVE SOIL.

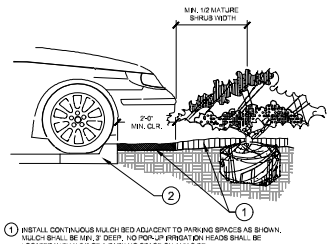
NOTES:
A. CONTRACTOR SHALL ASSURE PERCOLATION OF ALL PLANTING PITS PRIOR TO INSTALLATION.
B. WHEN SHRUBS ARE PRUNED IN MASSES, PRUNE ALL SHRUBS TO ACHIEVE UNIFORM MASS / HEIGHT.
C. ALL SHRUBS AND GROUNDCOVERS SHALL BE PLUMB VERTICALLY, UNLESS OTHERWISE DIRECTED BY OWNERS REPRESENTATIVE.

5 L1.50 SHRUB/GROUNDCOVER PLANTING ON A SLOPE
SECTION NTS



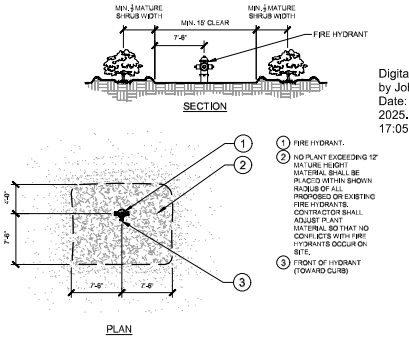
NOTES:
1. CLEAR ZONE: 36" MIN. FROM BUILDING TO CENTER OF NEAREST SHRUB.
2. INSTALL SPECIFIED MULCH: 24" MIN. FROM BUILDING, SPECIFIED MULCH TO BE INSTALLED AT A DEPTH OF 3" (MIN.)

6 L1.50 PLANTINGS ADJACENT TO BUILDINGS
SECTION NTS



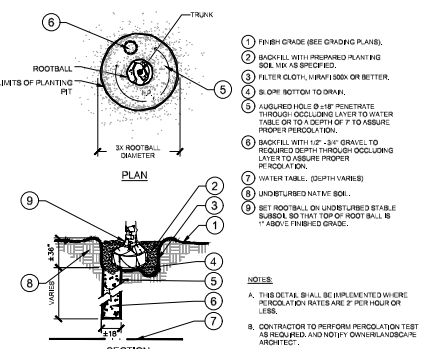
1. INSTALL CONTINUOUS MULCH BED ADJACENT TO PARKING SPACES AS SHOWN, MULCH SHALL BE MIN. 3" DEEP. NO POP-UP IRRIGATION HEADS SHALL BE LOCATED WITHIN 24" OF A PARKING SPACE ON ANY SIDE.
2. CURB / PARKING LOT EDGE.

7 L1.50 PARKING SPACE/CURB PLANTING
SECTION NTS



1. FIRE HYDRANT.
2. NO PLANT EXCEEDING 12" MATURE HEIGHT. MATERIAL SHALL BE PLACED WITHIN SHOWN RADIUS OF ALL PROPOSED OR EXISTING FIRE HYDRANTS. CONTRACTOR SHALL ADJUST PLANT MATERIAL SO THAT NO CONFLICTS WITH FIRE HYDRANTS OCCUR ON SITE.
3. FRONT OF HYDRANT (TOWARD CURB)

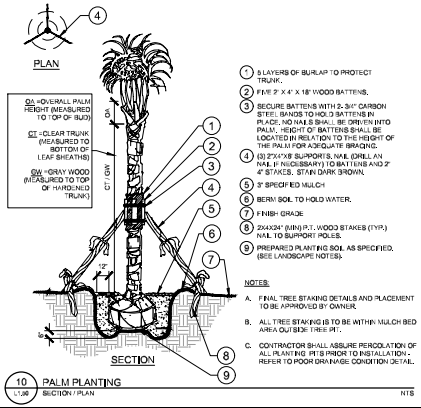
8 L1.50 SHRUB PLANTING AT FIRE HYDRANT
SECTION / PLAN NTS



1. FINISH GRADE (SEE GRADING PLANS).
2. BACKFILL WITH PREPARED PLANTING SOIL MIX AS SPECIFIED.
3. FILTER CLOTH, MIRAFI 500X OR BETTER.
4. SLOPE BOTTOM TO DRAIN.
5. AUGURED HOLE Ø 18" PENETRATE THROUGH CLOGGING LAYER TO WATER TABLE OR TO A DEPTH OF 7' TO ASSURE PROPER PERCOLATION.
6. BACKFILL WITH 1/2" - 3/4" GRAVEL TO REQUIRED DEPTH THROUGH OCCLUDING LAYER TO ASSURE PROPER PERCOLATION.
7. WATER TABLE. (DEPTH VARIES)
8. UNDISTURBED NATIVE SOIL.
9. SET ROOTBALL ON UNDISTURBED STABLE SUBSOIL SO THAT TOP OF ROOT BALL IS 1" ABOVE FINISHED GRADE.

NOTES:
A. THIS DETAIL SHALL BE IMPLEMENTED WHERE PERCOLATION RATES ARE 2" PER HOUR OR LESS.
B. CONTRACTOR TO PERFORM PERCOLATION TEST AS REQUIRED, AND NOTIFY OWNER/LANDSCAPE ARCHITECT.
C. SEE TYPICAL TREE PLANTING DETAIL THIS SHEET FOR PLANT STAKING.

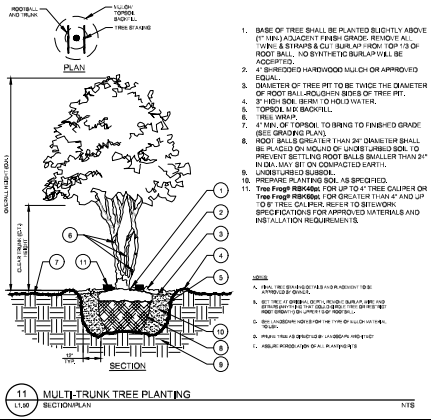
9 L1.50 POOR DRAINAGE CONDITION
SECTION / PLAN NTS



1. 5 LAYERS OF BURLAP TO PROTECT TRUNK.
2. FIVE 3" X 4" X 18" WOOD BATTENS.
3. SECURE BATTENS WITH 2- 3/4" CARBON STEEL BANDS TO HOLD BATTENS IN PLACE, NO NAILS SHALL BE DRIVEN INTO PALM, HEIGHT OF BATTENS SHALL BE LOCATED IN RELATION TO THE HEIGHT OF THE PALM FOR ADEQUATE BRACING.
4. (3) 2"X4"X8' SUPPORTS, NAIL (DRILL AN NAIL IF NECESSARY) TO BATTENS AND 2' 4" STAKES. STAIN DARK BROWN.
5. 3" SPECIFIED MULCH
6. BERM SOIL TO HOLD WATER.
7. FINISH GRADE
8. 2X4X24" (MIN) P.T. WOOD STAKES (TYP.) NAIL TO SUPPORT POLES.
9. PREPARED PLANTING SOIL AS SPECIFIED. (SEE LANDSCAPE NOTES).

NOTES:
A. FINAL TREE STAKING DETAILS AND PLACEMENT TO BE APPROVED BY OWNER.
B. ALL TREE STAKING IS TO BE WITHIN MULCH BED AREA OUT SIDE TREE PIT.
C. CONTRACTOR SHALL ASSURE PERCOLATION OF ALL PLANTING PITS PRIOR TO INSTALLATION - REFER TO POOR DRAINAGE CONDITION DETAIL.

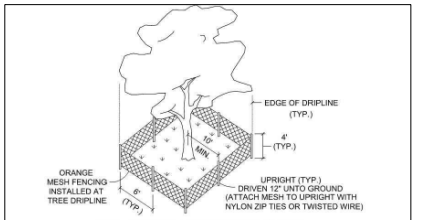
10 L1.50 PALM PLANTING
SECTION / PLAN NTS



1. BASE OF TREE SHALL BE PLANTED SLIGHTLY ABOVE (1" MIN.) ADJACENT FINISH GRADE. REMOVE ALL TWINE & STRAPS & CUT BURLAP FROM TOP 1/3 OF ROOT BALL. NO SYNTHETIC BURLAP WILL BE ACCEPTED.
2. 4" SHREDDED HARDWOOD MULCH OR APPROVED EQUAL.
3. DIAMETER OF TREE PIT TO BE TWICE THE DIAMETER OF ROOT BALL-ROUGHEN SIDES OF TREE PIT.
4. 3" HIGH SOIL BERM TO HOLD WATER.
5. TOPSOIL MIX BACKFILL.
6. TREE WRAP.
7. 4" MIN. OF TOPSOIL TO BRING TO FINISHED GRADE (SEE GRADING PLAN).
8. ROOT BALLS GREATER THAN 24" DIAMETER SHALL BE PLACED ON MOUND OF UNDISTURBED SOIL TO PREVENT SETTLING ROOT BALLS SMALLER THAN 24" IN DIA. MAY SIT ON COMPACTED EARTH.
9. UNDISTURBED SUBSOIL.
10. PREPARE PLANTING SOIL AS SPECIFIED.
11. **Tree Frog® RBK40pt.** FOR UP TO 4" TREE CALIPER OR **Tree Frog® RBK60pt.** FOR GREATER THAN 4" AND UP TO 6" TREE CALIPER, REFER TO SITEWORK SPECIFICATIONS FOR APPROVED MATERIALS AND INSTALLATION REQUIREMENTS.

NOTES:
A. FINAL TREE STAKING DETAILS AND PLACEMENT TO BE APPROVED BY OWNER.
B. SET TREE TO ENSURE ROOT FLARE IS VISIBLE AND AT OR SLIGHTLY ABOVE FINISHED GRADE. DO NOT SET TREE TOO DEEP. ENSURE TOP OF ROOTBALL IS VISIBLE.
C. SOIL AMENDMENTS SHOULD BE THE TYPE OF SOIL ON SITE WHEN POSSIBLE.
D. PRUNE TREE AS APPROVED BY LANDSCAPE ARCHITECT.
E. ASSURE PERCOLATION OF ALL PLANTING PITS

11 L1.50 MULTI-TRUNK TREE PLANTING
SECTION/PLAN NTS



TYP. CITY TREE BARRICADE DETAIL
N.T.S.

TREE BARRICADES ARE REQUIRED AROUND ALL TREES WHICH HAVE BEEN DESIGNATED ON THE SITE PLAN TO BE RETAINED AND PROTECTED. PRIOR TO ANY CLEARING OR CONSTRUCTION ACTIVITY OCCURING ON THE SITE, TREE BARRICADES SHALL BE CONSTRUCTED BY THE CONTRACTOR AND APPROVED BY BY THE CITY. TREE BARRICADES SHALL BE PLACED AT THE EDGE OF THE DRIPLINE OR A MINIMUM OF 10' FROM THE TRUNK OF THE TREE, WHICH EVER IS GREATER.

FOR THE BARRIER THE CITY RECOMMENDS SAFETY BARRICADE FENCING.

NOTE: EXISTING TREES IN LANDSCAPE BUFFER SHALL ALSO BE PROTECTED.

12 L0.50 STANDARD TREE BARRICADE
ELEVATION NTS

No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/7/24	JDR
2	REVISED PER CITY COMMENTS	07/10/25	JDR
3	REVISED PER CITY COMMENTS	08/05/25	JDR
4	REVISED PER CITY COMMENTS	10/24/25	JDR

Kimley»Horn

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200 S. ORANGE AVE., SUITE 2000, ORLANDO, FL 32801
PHONE: (407) 898-1511
WWW.KIMLEY-HORN.COM CA- 00000696

Digitally signed by John Griffin
Date: 2025.10.27 17:05:17-04'00'

KHA PROJECT 240418000
DATE 10/27/2025
SCALE AS SHOWN
DESIGNED BY JM
DRAWN BY JM
CHECKED BY JTG

DELAND TECH PARK LANDSCAPE DETAILS

CITY OF DELAND FLORIDA

SHEET NUMBER L1.50

Plotted By: Hardy, Jake Steve Bell
DELAND TECH PARK - Layout L1.50 - October 27, 2025 10:12:19am K:\ORL_Civil\194189000\Planning\Tech Park\CADD\COMSET\SheetSheets\L1.00 LANDSCAPE DETAILS.dwg
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GENERAL LANDSCAPE SPECIFICATIONS AND NOTES

A. SCOPE OF WORK

1. THE WORK CONSISTS OF: FURNISHING ALL LABOR, MATERIALS, EQUIPMENT, TOOLS, TRANSPORTATION, AND ANY OTHER APPURTENANCES NECESSARY FOR THE COMPLETION OF THIS PROJECT AS SHOWN ON THE DRAWINGS, AS INCLUDED IN THE PLANT LIST, AND AS SPECIFIED HEREIN.

2. WORK SHALL INCLUDE MAINTENANCE AND WATERING OF ALL CONTRACT PLANTING AREAS UNTIL CERTIFICATION OF ACCEPTANCE BY THE OWNER.

B. PROTECTION OF EXISTING STRUCTURES

1. ALL EXISTING BUILDINGS, WALKS, WALLS, PAVING, PIPING, OTHER SITE CONSTRUCTION ITEMS, AND PLANTING ALREADY COMPLETED OR ESTABLISHED AND DESIGNATED TO REMAIN SHALL BE PROTECTED FROM DAMAGE BY THE CONTRACTOR UNLESS OTHERWISE SPECIFIED. ALL DAMAGE RESULTING FROM NEGLIGENCE SHALL BE REPAIRED OR REPLACED TO THE SATISFACTION OF THE OWNER, AT NO COST TO THE OWNER.

2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL NECESSARY BMP DEVICES ACCORDING TO ALL REGULATORY AGENCY'S STANDARDS THROUGH THE DURATION OF ALL CONSTRUCTION ACTIVITIES.

3. THE CONTRACTOR SHALL SUBMIT A DETAILED PROJECT SPECIFIC WORK ZONE TRAFFIC CONTROL PLAN UNLESS THE WORK REQUIRES NOTHING MORE THAN A DIRECT APPLICATION OF FDOT DESIGN STANDARDS, INDEX 600. IF A DIRECT APPLICATION OF INDEX 600 IS PROPOSED, THE CONTRACTOR SHALL SUBMIT IN WRITING A STATEMENT INDICATING THE STANDARD INDEX AND PAGE NUMBER NO LESS THAN 10 BUSINESS DAYS PRIOR TO START OF CONSTRUCTION. WHEN A DIRECT APPLICATION OF FDOT STANDARD INDEX 600 IS NOT ACCEPTABLE A PROJECT SPECIFIC WORK ZONE TRAFFIC CONTROL PLAN SHALL BE PREPARED BY A FLORIDA PROFESSIONAL ENGINEER WHO HAS SUCCESSFULLY COMPLETED ADVANCED TRAINING IN MAINTENANCE OF TRAFFIC, AS DERIVED BY FDOT FOR APPROVAL BY THE COUNTY ENGINEER'S REPRESENTATIVE.

4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UTILITIES, WHETHER PUBLIC OR PRIVATE, PRIOR TO EXCAVATION. THE INFORMATION AND DATA SHOWN WITH RESPECT TO EXISTING UNDERGROUND FACILITIES AT OR CONTIGUOUS TO THE SITE IS APPROXIMATE AND BASED ON INFORMATION FURNISHED BY THE OWNER OF SUCH UNDERGROUND FACILITIES OR ON PHYSICAL APPURTENANCES OBSERVED IN THE FIELD. THE OWNER AND DESIGN PROFESSIONAL SHALL NOT BE RESPONSIBLE FOR THE ACCURACY AND COMPLETENESS OF ANY SUCH INFORMATION OR DATA. THE CONTRACTOR SHALL HAVE FULL RESPONSIBILITY FOR REVIEWING AND CHECKING ALL SUCH INFORMATION AND DATA, LOCATING ALL UNDERGROUND FACILITIES DURING CONSTRUCTION, THE SAFETY AND PROTECTION THEREOF, REPAIRING ANY DAMAGE THERETO RESULTING FROM THE WORK, THE COST OF ALL WHICH SHALL BE CONSIDERED AS HAVING BEEN INCLUDED IN THE CONTRACT PRICE. THE CONTRACTOR SHALL NOTIFY ANY AFFECTED UTILITY COMPANIES OR AGENCIES IN WRITING AT LEAST 48 HOURS PRIOR TO BEGINNING CONSTRUCTION.

C. PROTECTION OF EXISTING PLANT MATERIALS

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL UNAUTHORIZED CUTTING OR DAMAGE TO TREES AND SHRUBS EXISTING OR OTHERWISE, CAUSED BY CARELESS EQUIPMENT OPERATION, MATERIAL STOCKPILING, ETC., THIS SHALL INCLUDE COMPACTION BY DRIVING OR PARKING INSIDE THE DRIP-LINE AND SPILLING OIL, GASOLINE, OR OTHER DELETERIOUS MATERIALS WITHIN THE DRIP-LINE. NO MATERIALS SHALL BE BURNED ON SITE. EXISTING TREES KILLED OR DAMAGED SO THAT THEY ARE UNSIGHTLY AND/OR UNHEALTHY SHALL BE REPLACED AT THE COST TO THE CONTRACTOR OF THREE HUNDRED DOLLARS ($300) PER CALIPER INCH ON AN ESCALATING SCALE WHICH ADDS AN ADDITIONAL TWENTY (20) PERCENT PER INCH OVER FOUR (4) INCHES CALIPER AS FIXED AND AGREED LIQUIDATED DAMAGES. CALIPER SHALL BE MEASURED SIX (6) INCHES ABOVE GROUND LEVEL FOR TREES UP TO AND INCLUDING FOUR (4) INCHES IN CALIPER AND TWELVE (12) INCHES ABOVE GROUND LEVEL FOR TREES OVER FOUR (4) INCHES IN CALIPER.

2. SEE TREE MITIGATION PLAN AND NOTES, IF APPLICABLE.

D. MATERIALS

1. GENERAL

MATERIAL SAMPLES LISTED BELOW SHALL BE SUBMITTED FOR APPROVAL, ON SITE OR AS DETERMINED BY THE OWNER, UPON APPROVAL, DELIVERY OF MATERIALS MAY COMMENCE.

MATERIAL	SAMPLE SIZE
MULCH	ONE (1) CUBIC FOOT
TOPSOIL MIX	ONE (1) CUBIC FOOT
PLANTS	ONE (1) OF EACH VARIETY (OR TAGGED IN NURSERY)

2. PLANT MATERIALS

a. PLANT SPECIES AND SIZE SHALL CONFORM TO THOSE INDICATED ON THE DRAWINGS. ALL NURSERY STOCK SHALL BE IN ACCORDANCE WITH GRADES AND STANDARDS FOR NURSERY PLANTS, LATEST EDITION, PUBLISHED BY THE FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES. ALL PLANTS SHALL BE FLORIDA GRADE NO. 1 OR BETTER AS DETERMINED BY THE FLORIDA DIVISION OF PLANT INDUSTRY. ALL PLANTS SHALL BE HEALTHY, VIGOROUS, SOUND, WELL-BRANCHED, AND FREE OF DISEASE AND INSECTS, INSECT EGGS AND LARVAE AND SHALL HAVE ADEQUATE ROOT SYSTEMS. TREES FOR PLANTING IN ROWS SHALL BE UNIFORM IN SIZE AND SHAPE. ALL MATERIALS SHALL BE SUBJECT TO APPROVAL BY THE OWNER. WHERE ANY REQUIREMENTS ARE OMITTED FROM THE PLANT LIST, THE PLANTS FURNISHED SHALL BE NORMAL FOR THE VARIETY. PLANTS SHALL BE PRUNED PRIOR TO DELIVERY ONLY WITH APPROVAL FROM OWNER OR OWNER'S REPRESENTATIVE. NO SUBSTITUTIONS SHALL BE MADE WITHOUT WRITTEN PERMISSION FROM THE OWNER'S REPRESENTATIVE AND APPROVAL FROM THE CITY FORESTER.

b. MEASUREMENTS: THE HEIGHT AND/OR WIDTH OF TREES SHALL BE MEASURED FROM THE GROUND OR ACROSS THE NORMAL SPREAD OF BRANCHES WITH THE PLANTS IN THEIR NORMAL POSITION. THIS MEASUREMENT SHALL NOT INCLUDE THE IMMEDIATE TERMINAL GROWTH. PLANTS LARGER IN SIZE THAN THOSE SPECIFIED IN THE PLANT LIST MAY BE USED IF APPROVED BY THE OWNER. IF THE USE OF LARGER PLANTS IS APPROVED, THE BALL SIZE AND SPREAD OF ROOTS SHALL BE INCREASED PROPORTIONATELY WITH THE PLANT.

c. INSPECTION: PLANTS SHALL BE SUBJECT TO INSPECTION AND APPROVAL AT THE PLACE OF GROWTH, OR UPON DELIVERY TO THE SITE, AS DETERMINED BY THE OWNER, FOR QUALITY, SIZE, AND VARIETY. SUCH APPROVAL SHALL NOT IMPAIR THE RIGHT OF INSPECTION AND REJECTION AT THE SITE DURING PROGRESS OF THE WORK OR AFTER COMPLETION FOR SIZE AND CONDITION OF ROOT BALLS OR ROOTS, LATENT DEFECTS OR INJURIES. REJECTED PLANTS SHALL BE REMOVED IMMEDIATELY FROM THE SITE. NOTICE REQUESTING INSPECTION SHALL BE SUBMITTED IN WRITING BY THE CONTRACTOR AT LEAST ONE (1) WEEK PRIOR TO ANTICIPATED DATE.

E. SOIL MIXTURE (PLANTING MEDIUM, PLANTING MIX, TOPSOIL MIX)

1. CONTRACTOR SHALL TEST EXISTING SOIL AND AMEND AS NECESSARY IN ACCORDANCE WITH THE GUIDELINES BELOW:

2. SOIL MIXTURE (PLANTING MEDIUM FOR PLANT PITS) SHALL CONSIST OF TWO PARTS OF TOPSOIL AND ONE PART SAND, AS DESCRIBED BELOW. CONTRACTOR TO SUBMIT TOPSOIL AND PH TESTING RESULTS OF SOIL MIXTURE FOR OWNER'S REPRESENTATIVE APPROVAL PRIOR TO PLANT INSTALLATION OPERATIONS COMMENCE.

a. TOPSOIL FOR USE IN PREPARING SOIL MIXTURE FOR BACKFILLING PLANT PITS SHALL BE FERTILE, FRIABLE, AND OF A LOAMY CHARACTER, REASONABLY FREE OF SUBSOIL, CLAY LUMPS, BRUSH, WEEDS AND OTHER LITTER, FREE OF ROOTS, STUMPS, STONES LARGER THAN 2" IN ANY DIRECTION, AND OTHER EXTRANEOUS OR TOXIC MATTER HARMFUL TO PLANT GROWTH. IT SHALL CONTAIN THREE (3) TO FIVE (5) PERCENT DECOMPOSED ORGANIC MATTER AND HAVE A PH BETWEEN 6.5 AND 7.0.

b. SAND SHALL BE COARSE, CLEAN, WELL-DRAINING, NATIVE SAND.

2. TREES SHALL BE PLANTED IN THE EXISTING NATIVE SOIL ON SITE, UNLESS DETERMINED TO BE UNSUITABLE - AT WHICH POINT THE CONTRACTOR SHALL CONTACT OWNER'S REPRESENTATIVE TO DISCUSS ALTERNATE RECOMMENDATION PRIOR TO PLANTING.

F. WATER

1. WATER NECESSARY FOR PLANTING AND MAINTENANCE SHALL BE OF SATISFACTORY QUALITY TO SUSTAIN ADEQUATE PLANT GROWTH AND SHALL NOT CONTAIN HARMFUL, NATURAL OR MANMADE ELEMENTS DETRIMENTAL TO PLANTS. WATER MEETING THE ABOVE STANDARD SHALL BE OBTAINED ON THE SITE FROM THE OWNER, IF AVAILABLE, AND THE CONTRACTOR SHALL BE RESPONSIBLE TO MAKE ARRANGEMENTS FOR ITS USE BY HIS TANKS, HOSES, SPRINKLERS, ETC... IF SUCH WATER IS NOT AVAILABLE AT THE SITE, THE CONTRACTOR SHALL PROVIDE SATISFACTORY WATER FROM SOURCES OFF THE SITE AT NO ADDITIONAL COST TO THE OWNER.

*WATERING/IRRIGATION RESTRICTIONS MAY APPLY - REFER TO PROPERTY'S JURISDICTIONAL AUTHORITY.

G. FERTILIZER

CONTRACTOR SHALL PROVIDE FERTILIZER APPLICATION SCHEDULE TO OWNER, AS APPLICABLE TO SOIL TYPE, PLANT INSTALLATION TYPE, AND SITE'S PROPOSED USE. SUGGESTED FERTILIZER TYPES SHALL BE ORGANIC OR OTHERWISE NATURALLY-DERIVED.

*FERTILIZER RESTRICTIONS MAY APPLY - REFER TO PROPERTY'S JURISDICTIONAL AUTHORITY.

H. MULCH

1. MULCH MATERIAL SHALL BE MOISTENED AT THE TIME OF APPLICATION TO PREVENT WIND DISPLACEMENT, AND APPLIED AT A DEPTH OF THREE (3) INCHES. CLEAR MULCH FROM EACH PLANT'S CROWN (BASE). MULCH SHALL BE "FLORIMULCH," EUCALYPTUS MULCH, OR SIMILAR SUSTAINABLY HARVESTED MULCH UNLESS SPECIFIED OTHERWISE.

2. PROVIDE A THREE (3) INCH MINIMUM LAYER OF SPECIFIED MULCH OVER THE ENTIRE AREA OF EACH SHRUB BED, GROUND COVER, VINE BED, AND TREE PIT (@ MINIMUM) PLANTED UNDER THIS CONTRACT.

I. DIGGING AND HANDLING

1. PROTECT ROOTS OR ROOT BALLS OF PLANTS AT ALL TIMES FROM SUN, DRYING WINDS, WATER AND FREEZING, AS NECESSARY UNTIL PLANTING. PLANT MATERIALS SHALL BE ADEQUATELY PACKED TO PREVENT DAMAGE DURING TRANSIT. TREES TRANSPORTED MORE THAN TEN (10) MILES OR WHICH ARE NOT PLANTED WITHIN THREE (3) DAYS OF DELIVERY TO THE SITE SHALL BE SPRAYED WITH AN ANTITRANSPIRANT PRODUCT ("WILTPRUF" OR EQUAL) TO MINIMIZE TRANSPIRATIONAL WATER LOSS.

2. BALLED AND BURLAPPED (B&B), AND FIELD GROWN (FG) PLANTS SHALL BE DUG WITH FIRM, NATURAL BALLS OF SOIL OF SUFFICIENT SIZE TO ENCOMPASS THE FIBROUS AND FEEDING ROOTS OF THE PLANTS. NO PLANTS MOVED WITH A ROOT BALL SHALL BE PLANTED IF THE BALL IS CRACKED OR BROKEN. PLANTS SHALL NOT BE HANDLED BY STEMS.

3. PLANTS MARKED "BR" IN THE PLANT LIST SHALL BE DUG WITH BARE ROOTS. CARE SHALL BE EXERCISED THAT THE ROOTS DO NOT DRY OUT DURING TRANSPORTATION AND PRIOR TO PLANTING.

4. PROTECTION OF PALMS: ONLY A MINIMUM OF FRONDS SHALL BE REMOVED FROM THE CROWN OF THE PALM TREES TO FACILITATE MOVING AND HANDLING. CLEAR TRUNK (CT) SHALL BE AS SPECIFIED AFTER THE MINIMUM OF FRONDS HAVE BEEN REMOVED. ALL PALMS SHALL BE BRACED PER PALM PLANTING DETAIL.

5. EXCAVATION OF TREE PITS SHALL BE PERFORMED USING EXTREME CARE TO AVOID DAMAGE TO SURFACE AND SUBSURFACE ELEMENTS SUCH AS UTILITIES OR HARDSCAPE ELEMENTS, FOOTERS AND PREPARED SUB-BASES.

J. CONTAINER GROWN STOCK

1. ALL CONTAINER GROWN MATERIAL SHALL BE HEALTHY, VIGOROUS, WELL-ROOTED PLANTS ESTABLISHED IN THE CONTAINER IN WHICH THEY ARE SOLD, THE PLANTS SHALL HAVE TOPS WHICH ARE OF GOOD QUALITY AND ARE IN A HEALTHY GROWING CONDITION.

2. AN ESTABLISHED CONTAINER GROWN PLANT SHALL BE TRANSPLANTED INTO A CONTAINER AND GROWN IN THAT CONTAINER SUFFICIENTLY LONG ENOUGH FOR THE NEW FIBROUS ROOTS TO HAVE DEVELOPED SO THAT THE ROOT MASS WILL RETAIN ITS SHAPE AND HOLD TOGETHER WHEN REMOVED FROM THE CONTAINER. CONTAINER GROWN STOCK SHALL NOT BE HANDLED BY THEIR STEMS.

3. ROOT BOUND PLANTS ARE NOT ACCEPTABLE AND WILL BE REJECTED.

4. RPC- "ROOTS PLUS GROWER" CONTAINER PRODUCTS SHALL BE USED WHERE SPECIFIED.

K. COLLECTED STOCK

WHEN THE USE OF COLLECTED STOCK IS PERMITTED AS INDICATED BY THE OWNER OR OWNER'S REPRESENTATIVE, THE MINIMUM SIZES OF ROOTBALLS SHALL BE EQUAL TO THAT SPECIFIED FOR THE NEXT LARGER SIZE OF NURSERY GROWN STOCK OF THE SAME VARIETY.

L. NATIVE STOCK

PLANTS COLLECTED FROM WILD OR NATIVE STANDS SHALL BE CONSIDERED NURSERY GROWN WHEN THEY HAVE BEEN SUCCESSFULLY RE-ESTABLISHED IN A NURSERY ROW AND GROWN UNDER REGULAR NURSERY CULTURAL PRACTICES FOR A MINIMUM OF TWO (2) GROWING SEASONS AND HAVE ATTAINED ADEQUATE ROOT AND TOP GROWTH TO INDICATE FULL RECOVERY FROM TRANSPLANTING INTO THE NURSERY ROW.

M. MATERIALS LIST

QUANTITIES NECESSARY TO COMPLETE THE WORK ON THE DRAWINGS SHALL BE FURNISHED BY THE CONTRACTOR. QUANTITY ESTIMATES HAVE BEEN MADE CAREFULLY, BUT THE LANDSCAPE ARCHITECT OR OWNER ASSUMES NO LIABILITY FOR OMISSIONS OR ERRORS. SHOULD A DISCREPANCY OCCUR BETWEEN THE PLANS AND THE PLANT LIST QUANTITY, THE OWNER'S REPRESENTATIVE SHALL BE NOTIFIED FOR CLARIFICATION PRIOR TO BIDDING OR INSTALLATION. ALL DIMENSIONS AND/OR SIZES SPECIFIED SHALL BE THE MINIMUM ACCEPTABLE SIZE.

N. FINE GRADING

1. FINE GRADING UNDER THIS CONTRACT SHALL CONSIST OF FINAL FINISHED GRADING OF LAWN AND PLANTING AREAS THAT HAVE BEEN ROUGH GRADED BY OTHERS. BERMING AS SHOWN ON THE DRAWINGS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, UNLESS OTHERWISE NOTED.

2. THE CONTRACTOR SHALL FINE GRADE THE LAWN AND PLANTING AREAS TO BRING THE ROUGH GRADE UP TO FINAL FINISHED GRADE ALLOWING FOR THICKNESS OF SOD AND/OR MULCH DEPTH. CONTRACTOR SHALL FINE GRADE BY HAND AND/OR WITH ALL EQUIPMENT NECESSARY INCLUDING A GRADING TRACTOR WITH FRONT-END LOADER FOR TRANSPORTING SOIL WITHIN THE SITE.

3. ALL PLANTING AREAS SHALL BE GRADED AND MAINTAINED FOR POSITIVE DRAINAGE TO SURFACE/SUBSURFACE STORM DRAIN SYSTEMS, AREAS ADJACENT TO BUILDINGS SHALL SLOPE AWAY FROM THE BUILDINGS, REFER TO CIVIL ENGINEER'S PLANS FOR FINAL GRADES, IF APPLICABLE.

O. PLANTING PROCEDURES

1. CLEANING UP BEFORE COMMENCING WORK: THE CONTRACTOR SHALL CLEAN WORK AND SURROUNDING AREAS OF ALL RUBBISH OR OBJECTIONABLE MATTER ONLY. ALL MORTAR, CEMENT, AND TOXIC MATERIAL SHALL BE REMOVED FROM THE SURFACE OF ALL PLANT BEDS. THESE MATERIALS SHALL NOT BE MIXED WITH THE SOIL. SHOULD THE CONTRACTOR FIND SUCH SOIL CONDITIONS BENEATH THE SOIL WHICH WILL IN ANY WAY ADVERSELY AFFECT THE PLANT GROWTH, HE SHALL IMMEDIATELY CALL IT TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE. FAILURE TO DO SO BEFORE PLANTING SHALL MAKE THE CORRECTIVE MEASURES THE RESPONSIBILITY OF THE CONTRACTOR.

2. VERIFY LOCATIONS OF ALL UTILITIES, CONDUITS, SUPPLY LINES AND CABLES, INCLUDING BUT NOT LIMITED TO: ELECTRIC, GAS (LINES AND TANKS), WATER, SANITARY SEWER, STORMWATER SYSTEMS, CABLE, AND TELEPHONE. PROPERLY MAINTAIN AND PROTECT EXISTING UTILITIES. CALL SUNSHINE STATE ONE CALL OF FLORIDA, INC. (811) TO LOCATE UTILITIES AT LEAST 48 HOURS PRIOR TO CONSTRUCTION.

3. SUBGRADE EXCAVATION: CONTRACTOR IS RESPONSIBLE TO REMOVE ALL EXISTING AND IMPORTED LIMEROCK AND LIMEROCK SUB-BASE FROM ALL LANDSCAPE PLANTING AREAS TO A MINIMUM DEPTH OF 36" OR TO NATIVE SOIL. CONTRACTOR IS RESPONSIBLE TO BACKFILL THESE PLANTING AREAS TO ROUGH FINISHED GRADE WITH CLEAN TOPSOIL FROM AN ON-SITE SOURCE OR AN IMPORTED SOURCE. IF LIMEROCK OR OTHER ADVERSE CONDITIONS OCCUR IN PLANTED AREAS AFTER 36" DEEP EXCAVATION BY THE CONTRACTOR, AND POSITIVE DRAINAGE CAN NOT BE ACHIEVED, CONTRACTOR SHALL UTILIZE POOR DRAINAGE CONDITION PLANTING DETAIL.

4. FURNISH NURSERY'S CERTIFICATE OF COMPLIANCE WITH ALL REQUIREMENTS AS SPECIFIED HEREIN. INSPECT AND SELECT PLANT MATERIALS BEFORE PLANTS ARE DUG AT NURSERY OR GROWING SITE.

5. COMPLY WITH APPLICABLE FEDERAL, STATE, COUNTY, AND LOCAL REGULATIONS GOVERNING LANDSCAPE MATERIALS AND WORK. CONFORM TO ACCEPTED HORTICULTURAL PRACTICES AS USED IN THE TRADE, UPON ARRIVAL AT THE SITE, PLANTS SHALL BE THOROUGHLY WATERED AND PROPERLY MAINTAINED UNTIL PLANTED. PLANTS STORED ON-SITE SHALL NOT REMAIN UNPLANTED OR APPROPRIATELY HEALED IN FOR A PERIOD EXCEEDING TWENTY-FOUR (24) HOURS. AT ALL TIMES WORKMANLIKE METHODS CUSTOMARY IN GOOD HORTICULTURAL PRACTICES SHALL BE EXERCISED.

6. THE WORK SHALL BE COORDINATED WITH OTHER TRADES TO PREVENT CONFLICTS. COORDINATE PLANTING WITH IRRIGATION WORK TO ASSURE AVAILABILITY OF WATER AND PROPER LOCATION OF IRRIGATION APPURTENANCES AND PLANTS.

7. ALL PLANTING PITS SHALL BE EXCAVATED TO SIZE AND DEPTH IN ACCORDANCE WITH THE USA STANDARD FOR NURSERY STOCK Z60.1, UNLESS SHOWN OTHERWISE ON THE DRAWINGS, AND BACK FILLED WITH THE PREPARED PLANTING SOIL MIXTURE AS SPECIFIED IN SECTION E. TEST ALL TREE PITS WITH WATER BEFORE PLANTING TO ASSURE PROPER DRAINAGE PERCOLATION IS AVAILABLE. NO ALLOWANCE WILL BE MADE FOR COST PLANTS DUE TO IMPROPER DRAINAGE. IF POOR DRAINAGE EXISTS, UTILIZE "POOR DRAINAGE CONDITION" PLANTING DETAIL. TREES SHALL BE SET PLUMB AND HELD IN POSITION UNTIL THE PLANTING MIXTURE HAS BEEN FLUSHED INTO PLACE WITH A SLOW, FULL HOSE STREAM. ALL PLANTING SHALL BE PERFORMED BY PERSONNEL FAMILIAR WITH PLANTING PROCEDURES AND UNDER THE SUPERVISION OF A QUALIFIED LANDSCAPE FOREMAN. PROPER "JETTING IN" SHALL BE ASSURED TO ELIMINATE AIR POCKETS AROUND THE ROOTS. "JET STICK" OR EQUAL IS RECOMMENDED.

8. TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO BUILDINGS AND BUILDING STRUCTURES WHILE INSTALLING TREES.

9. SOIL MIXTURE SHALL BE AS SPECIFIED IN SECTION E OF THESE SPECIFICATIONS.

10. TREES AND SHRUBS SHALL BE SET STRAIGHT AT AN ELEVATION THAT, AFTER SETTLEMENT, THE PLANT CROWN WILL STAND ONE (1) TO TWO (2) INCHES ABOVE GRADE. EACH PLANT SHALL BE SET IN THE CENTER OF THE PIT. PLANTING SOIL MIXTURE SHALL BE BACK FILLED, THOROUGHLY TAMPED AROUND THE BALL AND SETTLED BY WATER (AFTER TAMPING).

11. AMEND PINE AND OAK PLANT PITS WITH ECTOMYCORRHIZAL SOIL APPLICATION PER MANUFACTURER'S RECOMMENDATION. ALL OTHER PLANT PITS SHALL BE AMENDED WITH ENDOMYCORRHIZAL SOIL APPLICATION PER MANUFACTURER'S RECOMMENDATION. PROVIDE PRODUCT INFORMATION SUBMITTAL PRIOR TO INOCULATION.

12. FILL HOLE WITH SOIL MIXTURE, MAKING CERTAIN ALL SOIL IS SATURATED. TO DO THIS, FILL HOLE WITH WATER AND ALLOW TO SOAK MINIMUM TWENTY (20) MINUTES, STIRRING IF NECESSARY TO GET SOIL THOROUGHLY WET. PACK LIGHTLY WITH FEET, ADD MORE WET SOIL MIXTURE. DO NOT COVER TOP OF BALL WITH SOIL MIXTURE. ALL BURLAP, ROPE, WIRES, BASKETS, ETC.,. SHALL BE REMOVED FROM THE SIDES AND TOPS OF BALLS, BUT NO BURLAP SHALL BE PULLED FROM UNDERNEATH.

13. TREES SHALL BE PRUNED, AT THE DIRECTION OF THE OWNER OR OWNER'S REPRESENTATIVE, TO PRESERVE THE NATURAL CHARACTER OF THE PLANT. ALL SOFT WOOD OR SUCKER GROWTH AND ALL BROKEN OR BADLY DAMAGED BRANCHES SHALL BE REMOVED WITH A CLEAN CUT. ALL PRUNING TO BE PERFORMED BY CERTIFIED ARBORIST, IN ACCORDANCE WITH ANSI A-300.

14. SHRUBS AND GROUND COVER PLANTS SHALL BE EVENLY SPACED IN ACCORDANCE WITH THE DRAWINGS AND AS INDICATED ON THE PLANT LIST. MATERIALS INSTALLED SHALL MEET MINIMUM SPECIMEN REQUIREMENTS OR QUANTITIES SHOW ON PLANS, WHICHEVER IS GREATER. CULTIVATE ALL PLANTING AREAS TO A MINIMUM DEPTH OF 6", REMOVE AND DISPOSE ALL DEBRIS, MIX TOP 4" THE PLANTING SOIL MIXTURE AS SPECIFIED IN SECTION E. THOROUGHLY WATER ALL PLANTS AFTER INSTALLATION.

15. TREE GUYING AND BRACING SHALL BE INSTALLED BY THE CONTRACTOR IN ACCORDANCE WITH THE PLANS TO INSURE STABILITY AND MAINTAIN TREES IN AN UPRIGHT POSITION. IF THE CONTRACTOR AND OWNER DECIDE TO WAIVE THE TREE GUYING AND BRACING, THE OWNER SHALL NOTIFY THE PROJECT LANDSCAPE ARCHITECT IN WRITING AND AGREE TO INDEMNIFY AND HOLD HARMLESS THE PROJECT LANDSCAPE ARCHITECT IN THE EVENT UNSUPPORTED TREES PLANTED UNDER THIS CONTRACT FALL AND DAMAGE PERSON OR PROPERTY.

16. ALL PLANT BEDS SHALL BE KEPT FREE OF NOXIOUS WEEDS UNTIL FINAL ACCEPTANCE OF WORK. IF DIRECTED BY THE OWNER, "ROUND-UP" SHALL BE APPLIED FOR WEED CONTROL BY QUALIFIED PERSONNEL TO ALL PLANTING AREAS IN SPOT APPLICATIONS PER MANUFACTURER'S PRECAUTIONS AND SPECIFICATIONS, PRIOR TO FINAL INSPECTION, TREAT ALL PLANTING BEDS WITH AN APPROVED PRE-EMERGENT HERBICIDE AT AN APPLICATION RATE RECOMMENDED BY THE MANUFACTURER. (AS ALLOWED BY JURISDICTIONAL AUTHORITY)

P. LAWN SODDING

1. THE WORK CONSISTS OF LAWN BED PREPARATION, SOIL PREPARATION, AND SODDING COMPLETE, IN STRICT ACCORDANCE WITH THE SPECIFICATIONS AND THE APPLICABLE DRAWINGS TO PRODUCE A TURF GRASS LAWN ACCEPTABLE TO THE OWNER.

2. ALL AREAS THAT ARE TO BE SODDED SHALL BE CLEARED OF ANY ROUGH GRASS, WEEDS, AND DEBRIS BY MEANS OF A SOD CUTTER TO A DEPTH OF THREE (3) INCHES, AND THE GROUND BROUGHT TO AN EVEN GRADE. THE ENTIRE SURFACE SHALL BE ROLLED WITH A ROLLER WEIGHING NOT MORE THAN ONE-HUNDRED (100) POUNDS PER FOOT OF WIDTH. DURING THE ROLLING, ALL DEPRESSIONS CAUSED BY SETTLEMENT SHALL BE FILLED WITH ADDITIONAL SOIL, AND THE SURFACE SHALL BE REGRADED AND ROLLED UNTIL PRESENTING A SMOOTH AND EVEN FINISH TO THE REQUIRED GRADE.

3. PREPARE LOOSE SOD FOUR (4) INCHES DEEP, HAND RAKE UNTIL ALL BUMPS AND DEPRESSIONS ARE REMOVED, WET PREPARED AREA THOROUGHLY.

4. SODDING

a. THE CONTRACTOR SHALL SOD ALL AREAS THAT ARE NOT PAVED OR PLANTED AS DESIGNATED ON THE DRAWINGS WITHIN THE CONTRACT LIMITS, UNLESS SPECIFICALLY NOTED OTHERWISE.

b. THE SOD SHALL BE CERTIFIED TO MEET FLORIDA STATE PLANT BOARD SPECIFICATIONS, ABSOLUTELY TRUE TO VARIETAL TYPE, AND FREE FROM WEEDS, FUNGUS, INSECTS AND DISEASE OF ANY KIND.

c. SOD PANELS SHALL BE LAID TIGHTLY TOGETHER SO AS TO MAKE A SOLID SODDED LAWN AREA. SOD SHALL BE LAID UNIFORMLY AGAINST THE EDGES OF ALL CURBS AND OTHER HARDSCAPE ELEMENTS, PAVED AND PLANTED AREAS, ADJACENT TO BUILDINGS, A 2-INCH STONE MULCH STRIP SHALL BE PROVIDED, IMMEDIATELY FOLLOWING SOD LAYING, THE LAWN AREAS SHALL BE ROLLED WITH A LAWN ROLLER CUSTOMARILY USED FOR SUCH PURPOSES, AND THEN THOROUGHLY IRRIGATED. IF, IN THE OPINION OF THE OWNER, TOP-DRESSING IS NECESSARY AFTER ROLLING TO FILL THE VOIDS BETWEEN THE SOD PANELS AND TO EVEN OUT INCONSISTENCIES IN THE SOD, CLEAN SAND, AS APPROVED BY THE OWNER'S REPRESENTATIVE, SHALL BE UNIFORMLY SPREAD OVER THE ENTIRE SURFACE OF THE SOD AND THOROUGHLY WATERED IN, FERTILIZE INSTALLED SOD AS ALLOWED BY PROPERTY'S JURISDICTIONAL AUTHORITY.

5. DURING DELIVERY, PRIOR TO, AND DURING THE PLANTING OF THE LAWN AREAS, THE SOD PANELS SHALL AT ALL TIMES BE PROTECTED FROM EXCESSIVE DRYING AND UNNECESSARY EXPOSURE OF THE ROOTS TO THE SUN. ALL SOD SHALL BE STACKED SO AS NOT TO BE DAMAGED BY SWEATING OR EXCESSIVE HEAT AND MOISTURE.

6. LAWN MAINTENANCE

a. WITHIN THE CONTRACT LIMITS, THE CONTRACTOR SHALL PRODUCE A DENSE, WELL ESTABLISHED LAWN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR AND RE-SODDING OF ALL ERODED, SUNKEN OR BARE SPOTS (LARGER THAN 12"x12") UNTIL CERTIFICATION OF ACCEPTANCE BY THE OWNER'S REPRESENTATIVE. REPAIRED SODDING SHALL BE ACCOMPLISHED AS IN THE ORIGINAL WORK (INCLUDING REGRADING IF NECESSARY).

b. CONTRACTOR RESPONSIBLE FOR ESTABLISHING AND MAINTAINING SOD LAWN UNTIL ACCEPTANCE BY THE OWNERS REPRESENTATIVE. PRIOR TO AND UPON ACCEPTANCE, CONTRACTOR TO PROVIDE WATERING/IRRIGATION SCHEDULE TO OWNER, OBSERVE ALL APPLICABLE WATERING RESTRICTIONS AS SET FORTH BY THE PROPERTY'S JURISDICTIONAL AUTHORITY.

Q. CLEANUP

UPON COMPLETION OF ALL PLANTING WORK AND BEFORE FINAL ACCEPTANCE, THE CONTRACTOR SHALL REMOVE ALL MATERIAL, EQUIPMENT, AND DEBRIS RESULTING FROM HIS WORK. ALL PAVED AREAS SHALL BE CLEANED AND THE SITE LEFT IN A NEAT AND ACCEPTABLE CONDITION AS APPROVED BY THE OWNER'S REPRESENTATIVE.

R. PLANT MATERIAL MAINTENANCE

ALL PLANTS AND PLANTING INCLUDED UNDER THIS CONTRACT SHALL BE MAINTAINED BY WATERING, CULTIVATING, SPRAYING, AND ALL OTHER OPERATIONS (SUCH AS RE-STAKING OR REPAIRING GUY SUPPORTS) NECESSARY TO INSURE A HEALTHY PLANT CONDITION BY THE CONTRACTOR UNTIL CERTIFICATION OF ACCEPTANCE BY THE OWNER'S REPRESENTATIVE.

S. FINAL INSPECTION AND ACCEPTANCE OF WORK

FINAL INSPECTION AT THE END OF THE WARRANTY PERIOD SHALL BE ON PLANT ING, CONSTRUCTION AND ALL OTHER INCIDENTAL WORK PERTAINING TO THIS CONTRACT, ANY REPLACEMENT AT THIS TIME SHALL ALSO BE SUBJECT TO THE SAME ONE (1) YEAR WARRANTY AS SPECIFIED BY THE LANDSCAPE ARCHITECT OR OWNER IN WRITING) BEGINNING WITH THE TIME OF REPLACEMENT AND ENDING WITH THE SAME INSPECTION AND ACCEPTANCE HEREIN DESCRIBED.

T. WARRANTY

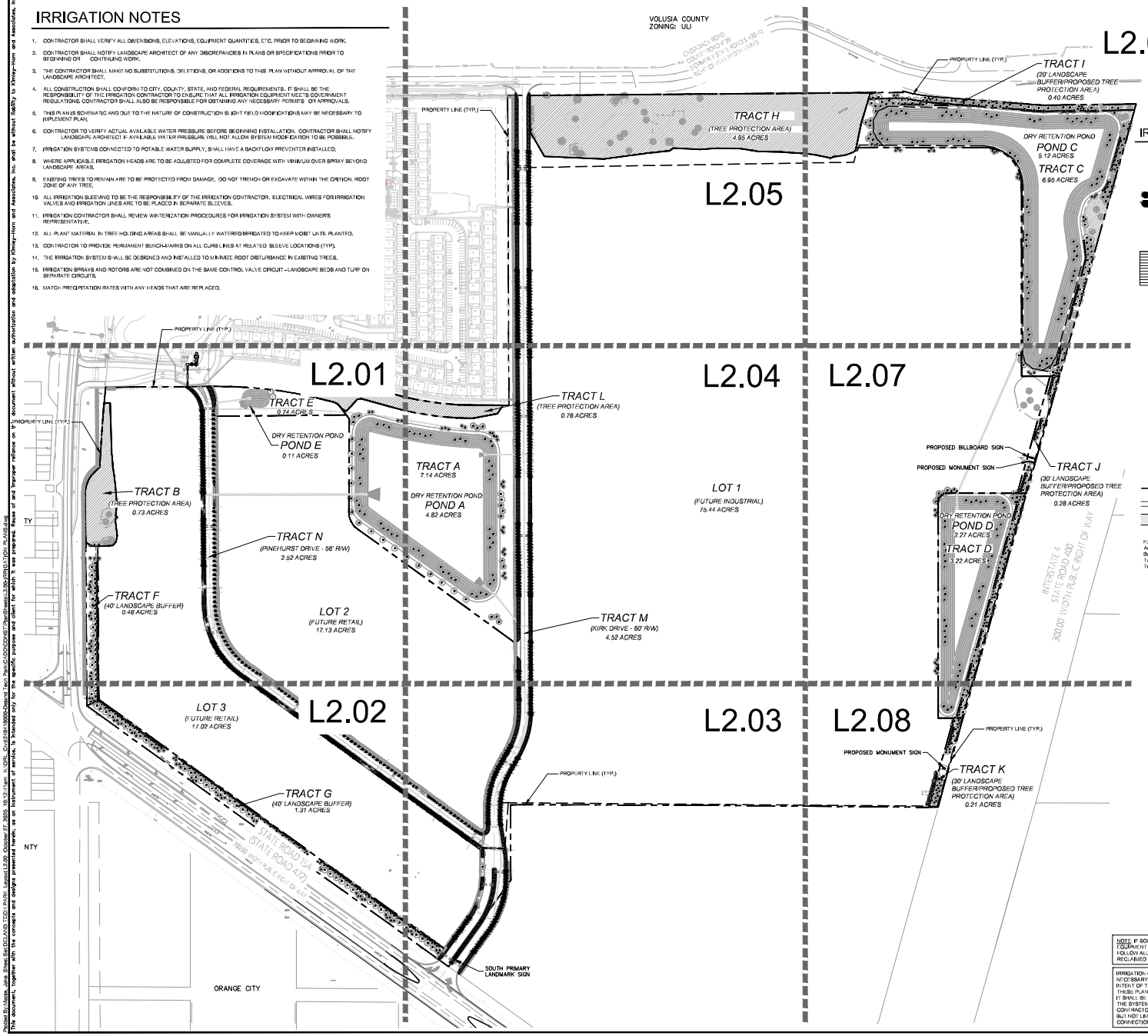
1. THE LIFE AND SATISFACTORY CONDITION OF ALL PLANT MATERIAL INSTALLED (INCLUDING SOD) BY THE LANDSCAPE CONTRACTOR SHALL BE WARRANTED BY THE CONTRACTOR FOR A MINIMUM OF ONE (1) CALENDAR YEAR COMMENCING AT THE TIME OF CERTIFICATION OF ACCEPTANCE BY THE OWNER'S REPRESENTATIVE.

2. ANY PLANT NOT FOUND IN A HEALTHY GROWING CONDITION AT THE END OF THE WARRANTY PERIOD SHALL BE REMOVED FROM THE SITE AND REPLACED AS SOON AS WEATHER CONDITIONS PERMIT. ALL REPLACEMENTS SHALL BE PLANTS OF THE SAME KIND AND SIZE AS SPECIFIED IN THE PLANT LIST. THEY SHALL BE FURNISHED PLANTED AND MULCHED AS SPECIFIED AT NO ADDITIONAL COST TO THE OWNER.

3. IN THE EVENT THE OWNER DOES NOT CONTRACT WITH THE CONTRACTOR FOR LANDSCAPE AND IRRIGATION MAINTENANCE, THE CONTRACTOR SHOULD VISIT THE PROJECT SITE PERIODICALLY DURING THE ONE (1) YEAR WARRANTY PERIOD TO EVALUATE MAINTENANCE PROCEDURES BEING PERFORMED BY THE OWNER. CONTRACTOR SHALL NOTIFY THE OWNER IN WRITING

IRRIGATION NOTES

1. CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, EQUIPMENT QUANTITIES, ETC. PRIOR TO BEGINNING WORK.
2. CONTRACTOR SHALL NOTIFY LANDSCAPE ARCHITECT OF ANY DISCREPANCIES IN PLANS OR SPECIFICATIONS PRIOR TO BEGINNING OR CONTINUING WORK.
3. THE CONTRACTOR SHALL MAKE NO SUBSTITUTIONS, DELETIONS, OR ADDITIONS TO THIS PLAN WITHOUT APPROVAL OF THE LANDSCAPE ARCHITECT.
4. ALL CONSTRUCTION SHALL CONFORM TO CITY, COUNTY, STATE, AND FEDERAL REQUIREMENTS. IT SHALL BE THE RESPONSIBILITY OF THE IRRIGATION CONTRACTOR TO ENSURE THAT ALL IRRIGATION EQUIPMENT MEETS GOVERNMENT REGULATIONS. CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR OBTAINING ANY NECESSARY PERMITS OR APPROVALS.
5. THIS PLAN IS SCHEMATIC AND DUE TO THE NATURE OF CONSTRUCTION SLIGHT FIELD MODIFICATIONS MAY BE NECESSARY TO IMPLEMENT PLAN.
6. CONTRACTOR TO VERIFY ACTUAL AVAILABLE WATER PRESSURE BEFORE BEGINNING INSTALLATION. CONTRACTOR SHALL NOTIFY LANDSCAPE ARCHITECT IF AVAILABLE WATER PRESSURE WILL NOT ALLOW SYSTEM MODIFICATION TO BE POSSIBLE.
7. IRRIGATION SYSTEMS CONNECTED TO POTABLE WATER SUPPLY, SHALL HAVE A BACKFLOW PREVENTER INSTALLED.
8. WHERE APPLICABLE IRRIGATION HEADS ARE TO BE ADJUSTED FOR COMPLETE COVERAGE WITH MINIMUM OVER SPRAY BEYOND LANDSCAPE AREAS.
9. EXISTING TREES TO REMAIN ARE TO BE PROTECTED FROM DAMAGE. DO NOT TRENCH OR EXCAVATE WITHIN THE CRITICAL ROOT ZONE OF ANY TREE.
10. ALL IRRIGATION SLEEVING TO BE THE RESPONSIBILITY OF THE IRRIGATION CONTRACTOR. ELECTRICAL WIRES FOR IRRIGATION VALVES AND IRRIGATION LINES ARE TO BE PLACED IN SEPARATE SLEEVES.
11. IRRIGATION CONTRACTOR SHALL REVIEW WINTERIZATION PROCEDURES FOR IRRIGATION SYSTEM WITH OWNERS REPRESENTATIVE.
12. ALL PLANT MATERIAL IN TREE HOLDING AREAS SHALL BE MANUALLY WATERED/IRRIGATED TO KEEP MOIST UNTIL PLANTED.
13. CONTRACTOR TO PROVIDE PERMANENT BENCH-MARKS ON ALL CURB LINES AT RELATED SLEEVE LOCATIONS (TYP.).
14. THE IRRIGATION SYSTEM SHALL BE DESIGNED AND INSTALLED TO MINIMIZE ROOT DISTURBANCE IN EXISTING TREES.
15. IRRIGATION SPRAYS AND ROTORS ARE NOT COMBINED ON THE SAME CONTROL VALVE CIRCUIT - LANDSCAPE BEDS AND TURF ON SEPARATE CIRCUITS.
16. MATCH PRECIPITATION RATES WITH ANY HEADS THAT ARE REPLACED.



IRRIGATION SCHEDULE

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY	PSI
EST LCS RCS CST SST	RAIN BIRD 1804-U-PRS-AP 15 STRIP SERIES TURF SPRAY 4IN. POP-UP SPRINKLER WITH CO-MOLDED WIPER SEAL, 1/2IN. NPT FEMALE THREADED INLET, PRESSURE REGULATING, WITH NON-POTABLE PURPLE CAP.	110	30
08HE-AWN 10HE-AWN 08HE-ANR 10HE-ANR	RAIN BIRD 1804-U-PRS-AP HE-AWN SERIES TURF SPRAY 4IN. POP-UP SPRINKLER WITH CO-MOLDED WIPER SEAL, 1/2IN. NPT FEMALE THREADED INLET, PRESSURE REGULATING, WITH NON-POTABLE PURPLE CAP.	975	30
1401 1402 1404 1406	RAIN BIRD 1806-NP-1400 FLOOD 1401 FLOOD BUBBLER 6.0" POP-UP WITH NON-POTABLE PURPLE CAP	831	20

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY
	AREA TO RECEIVE DRIPLINE RAIN BIRD XFD-06-I-24-P XFD ON-SURFACE PRESSURE COMPENSATING LANDSCAPE DRIPLINE, 0.6 GPH EMITTERS AT 12" O.C. DRIPLINE LATERALS SPACED AT 12" APART, WITH EMITTERS OFFSET FOR TRIANGULAR PATTERN, UV RESISTANT. SPECIFY XF INSERT FITTINGS. PIPE TO BE PURPLE IN COLOR.	48,626 LF

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY
MCV	RAIN BIRD PESB-PRS-D 1-1/2" 1IN., 1-1/2IN., 2IN. PLASTIC INDUSTRIAL MASTER VALVES. LOW FLOW OPERATING CAPABILITY. GLOBE CONFIGURATION, WITH PRESSURE REGULATING MODULE, AND SCRUBBER TECHNOLOGY FOR RELIABLE PERFORMANCE IN DIRTY WATER IRRIGATION APPLICATIONS.	1
BF	FEBCO 825Y 1" REDUCED PRESSURE BACKFLOW PREVENTER	1
C	RAIN BIRD ESP-LXM/M-LXMMSS 60 STATION, 3-WIRE CONTROLLER W/ SMART VALVE TECHNOLOGY, (1) ESP-LXM 60-STATION, INDOOR/OUTDOOR, PLASTIC WALL-MOUNT ENCLOSURE, INSTALLED IN LXMMSS STAINLESS STEEL WALL-MOUNTED CABINET. SYSTEM REQUIREMENTS: RAIN BIRD LXMV-XXX INTEGRATED VALVE MODULES & 24-VAC, 3A POWER SUPPLY, UBS-PWR ELECTRIC CABLE PVB/2/3 & RAIN BIRD WCS6 DRY SPLICES ONLY, GROUND SYSTEM W/ (X) LXMSD SURGE DEVICE IN RAIN BIRD ROUND VALVE BOXES, INSTALL PER MANUFACTURERS RECOMMENDATIONS.	1
RSD	RAIN BIRD WR2-RFS WIRELESS RAIN FREEZE SENSOR.	1
FS	RAIN BIRD FS-100-P 1IN. FLOW SENSOR, PLASTIC PVC MODEL. SUGGESTED OPERATING RANGE 5.4 GPM TO 54 GPM. SIZE FOR FLOW NOT ACCORDING TO PIPE SIZE. RAIN BIRD COMPATIBLE CONTROLLERS: ESP-LXIVM[P] [LXD] LXMEP[P]	MES, OR CONTROLLERS ACCEPTING CUSTOM K-FACTOR AND OFFSET. INSTALL IN RAIN BIRD VALVE BOX	1
M	WATER METER 2"	1
	IRRIGATION MAINLINE: PVC SCHEDULE 40	10,685 LF
	PIPE SLEEVE: PVC SCHEDULE 40 - LATERALS	1,168 LF
	PIPE SLEEVE: PVC SCHEDULE 40 - MAINLINE	438.0 LF

FLOW TOTALS
Area for Drip/mic: 483.7
Bubbler: 316.8
Turf Spray: 969.2
Total: 1,798 GPM

NOTE: IF SOURCE TO BE RECLAIMED (NON-POTABLE) ALL EQUIPMENT TO BE INDICATED AS SUCH AND PURPLE IN COLOR. FOLLOW ALL LOCAL JURISDICTION STANDARDS FOR RECLAIMED IRRIGATION SYSTEMS.

IRRIGATION CONTRACTOR IS RESPONSIBLE FOR PERFORMING ALL NECESSARY MODIFICATIONS REQUIRED TO MEET THE SCHEMATIC INTENT OF THESE PLANS PRIOR TO SUBMITTING PROPOSAL. THESE PLANS OUTLINE THE OVERALL LAYOUT THE SYSTEM AND IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ZONE THE SYSTEM ACCORDINGLY BASED ON FLOW AND PRESSURE AVAILABLE. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE FOLLOWING BUT NOT LIMITED TO AVAILABLE FLOW, AVAILABLE PRESSURE, CONNECTION ASSEMBLY, CAPACITY OF THE SYSTEM.

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IT'S THE LAW! DIAL 811
Know what's below. Call before you dig.
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No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/7/25	JOR
2	REVISED PER CITY COMMENTS	07/10/25	JOR
3	REVISED PER CITY COMMENTS	08/05/25	JOR
4	REVISED PER CITY COMMENTS	10/24/25	JOR

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200 S. ORANGE AVENUE, SUITE 1511, ORLANDO, FL 32801
PHONE: (407) 898-1511
WWW.KIMLEY-HORN.COM CA- 00000696

Digitally signed by John Griffin
Date: 2025.10.27 17:10:56-04'00'

KHA PROJECT 249418000
DATE 10/27/2025
SCALE AS SHOWN
DESIGNED BY JM
DRAWN BY JM
CHECKED BY JTG

DELAND TECH PARK
CITY OF DELAND FLORIDA

OVERALL IRRIGATION PLAN

SHEET NUMBER L2.00

Plotted By: Hardy, Jake Steve Set: DELAND TECH PARK Layout: L2.00 October 27, 2025, 10:12:13am K:\ORL_Civil\249418000-Orchard Tech Park\CADD\COGES\SheetSheets\L2.00-IRRIGATION PLANS.dwg
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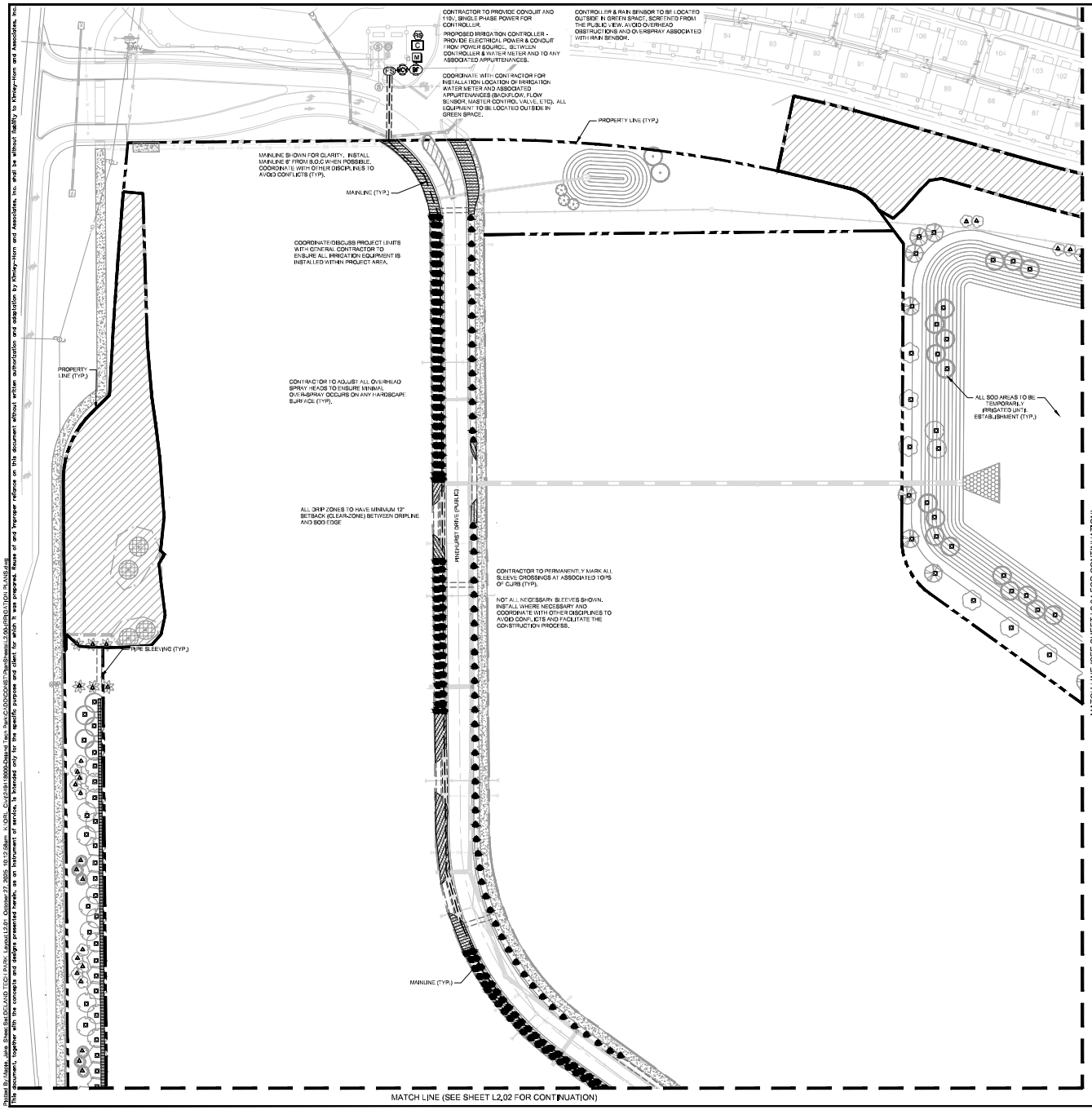


FLOW TOTALS
Area for Drip: 483.2
Bubbler: 348.8
Turf Spray: 968.2
Total: 1,798 GPM

NORTH

GRAPHIC SCALE IN FEET
0 25 50 100

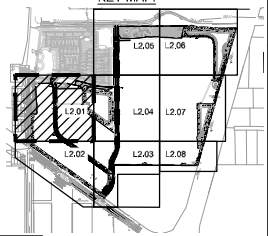
IRRIGATION SCHEDULE

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY	PSI
CST LCS RCS CST SST	RAIN BIRD 1804-I-PRS-ASP-15 STRIP SERIES TURF SPRAY 4IN, POP-UP SPRINKLER WITH CO-MOLDED WIPER SEAL, 1/2IN, NPT FEMALE THREADED INLET, PRESSURE REGULATING, WITH NON POTABLE PURPLE CAP.	110	30
08-HEVAN 10-HEVAN 12-HEVAN	RAIN BIRD 1804-I-PRS-ASP-HEVAN SERIES TURF SPRAY 4IN, POP-UP SPRINKLER WITH CO-MOLDED WIPER SEAL, 1/2IN, NPT FEMALE THREADED INLET, PRESSURE REGULATING, WITH NON POTABLE PURPLE CAP.	975	30
1401 1402 1404 1406	RAIN BIRD 1806-NR-1400 FLOOD 1401 FLOOD BUBBLER 6.0" POP-UP WITH NON-POTABLE PURPLE CAP	831	20

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY
	AREA TO RECEIVE DRIPLINE RAIN BIRD XFD-06-24AP XFD ON-SURFACE PRESSURE COMPENSATING LANDSCAPE DRIPLINE, 0.6 GPH EMITTERS AT 12" O.C. DRIPLINE LATERALS SPACED AT 12" APART, WITH EMITTERS OFFSET FOR TRIANGULAR PATTERN, UV RESISTANT. SPECIFY XF INSERT FITTINGS. PIPE TO BE PURPLE IN COLOR.	48,626 LF

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY
MV	RAIN BIRD PESB-PRS-D 1-1/2" 1IN, 1-10PH, 2IN, PLASTIC INDUSTRIAL MASTER VALVES, LOW FLOW OPERATING CAPABILITY, GLOBE CONFIGURATION, WITH PRESSURE REGULATING MODULE, AND SCRUBBER TECHNOLOGY FOR RELIABLE PERFORMANCE IN DIRTY WATER IRRIGATION APPLICATIONS.	1
BF	FEBCO 825Y 1" REDUCED PRESSURE BACKFLOW PREVENTER	1
C	RAIN BIRD ESP-LXM-M-LXMMSS 60 STATION, 2-WIRE CONTROLLER W/ SMART VALVE TECHNOLOGY, (1) ESP-LXM 60-STATION, INDOOR/OUTDOOR, PLASTIC WALL-MOUNT ENCLOSURE, INSTALLED IN LXMMSS STAINLESS STEEL WALL-MOUNTED CABINET, SYSTEM REQUIREMENTS: RAIN BIRD LXMM-XXX INTEGRATED VALVE MODULES & 24-VAC DIVERSUS USB, PAGE ELEC RIC CABLE P/0720 & RAIN BIRD WCW DRY SPLICES ONLY, GROUND SYSTEM W (X) LXMSD SURGE DEVICE IN RAIN BIRD ROUND VALVE BOXES, INSTALL PER MANUFACTURERS RECOMMENDATIONS.	1
RS	RAIN BIRD WR2-RFS WIRELESS RAIN/FREEZE SENSOR.	1
FS	RAIN BIRD HS-100-I 1IN, FLOW SENSOR, PLASTIC PVC MODEL, SUGGESTED OPERATING RANGE 8.4 GPM TO 84 GPM, SIZE FOR FLOW NOT ACCORDING TO PIPE SIZE. RAIN BIRD COMPATIBLE CONTROLLERS: ESP-LXIVM[P] [LXD] LXMESP[] [MES], OR CONTROLLERS ACCEPTING CUSTOM K-FACTOR AND OFFSET. INSTALL IN RAIN BIRD VALVE BOX	1
M	WATER METER 2"	1
	IRRIGATION MAINLINE: PVC SCHEDULE 40	10,585 LF
	PIPE SLEEVE: PVC SCHEDULE 40 - LATERALS	1,168 LF
	PIPE SLEEVE: PVC SCHEDULE 40 - MAINLINE	438.0 LF

KEY MAP:



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IRRIGATION CONTRACTOR IS RESPONSIBLE FOR PERFORMING ALL NECESSARY MODIFICATIONS REQUIRED TO MEET THE SCHEMATIC INTENT OF THESE PLANS PRIOR TO SUBMITTING PROPOSAL. THESE PLANS OUTLINE THE OVERALL LAYOUT THE SYSTEM AND IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ZONE THE SYSTEM ACCORDINGLY BASED ON FLOW AND PRESSURE AVAILABLE. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE FOLLOWING BUT NOT LIMITED TO AVAILABLE FLOW, AVAILABLE PRESSURE, CONNECTION ASSEMBLY, CAPACITY OF THE SYSTEM.

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200 S. ORANGE AVENUE, SUITE 600, ORLANDO, FL 32801
PHONE: (407) 898-1511
WWW.KIMLEY-HORN.COM CA-0000006696

Digitally signed by John Griffin
Date: 2025.10.27 17:10:58-04'00'

KHA PROJECT 249418000
DATE 10/27/2025
SCALE AS SHOWN
DESIGNED BY JM
DRAWN BY JM
CHECKED BY JTG

DELAND TECH PARK
CITY OF DELAND FLORIDA

IRRIGATION PLAN

SHEET NUMBER L2.01

Plotted By: Hardy, Jake Steve Bel DELAND TECH PARK Layout: L2.01 October 27, 2025, 10:12:58am K:\ORL_Civil\249418000-Deland Tech Park-CLOD\CO\SET\SheetSet\L2.00-IRRIGATION PLANS.dwg
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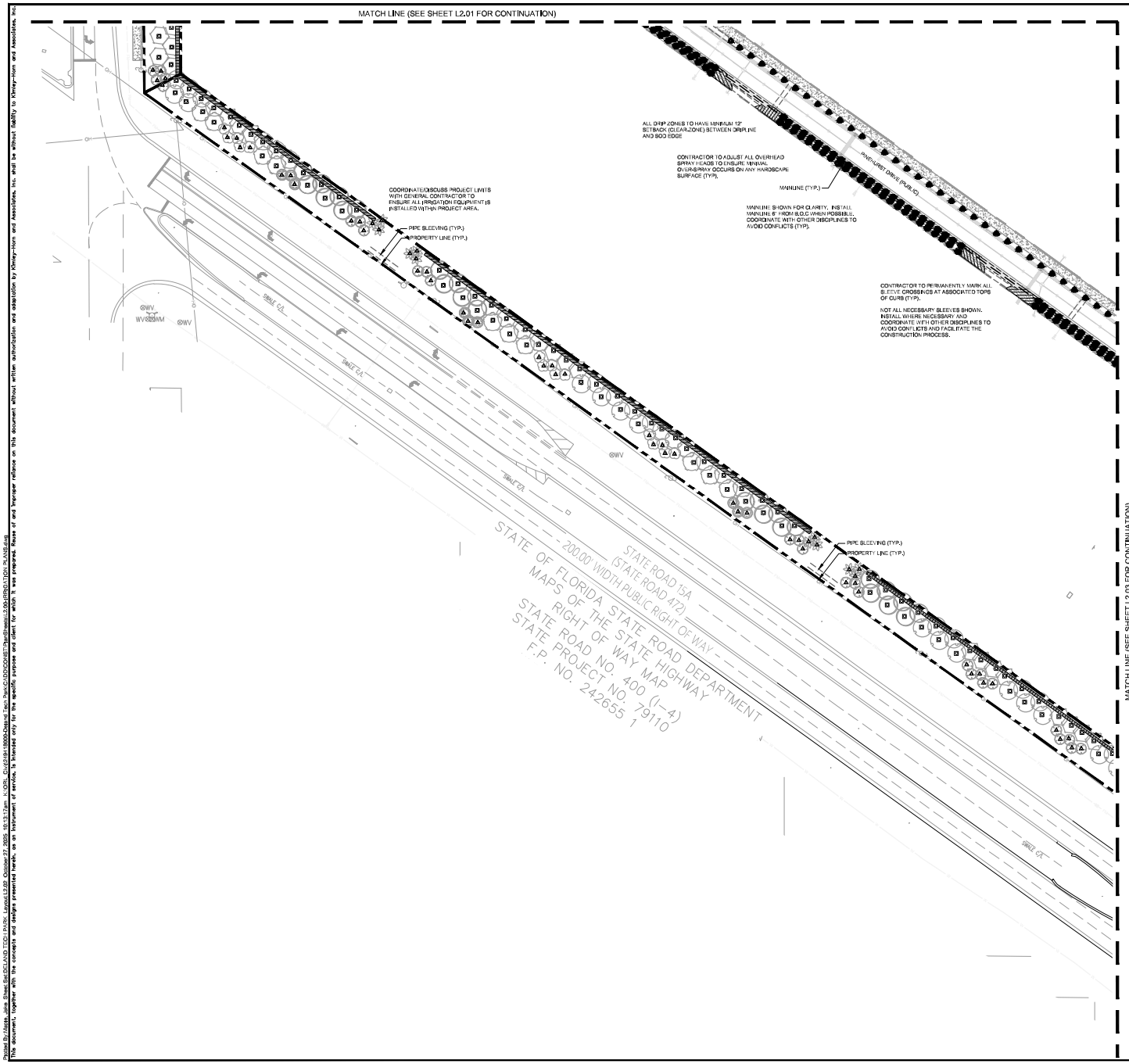
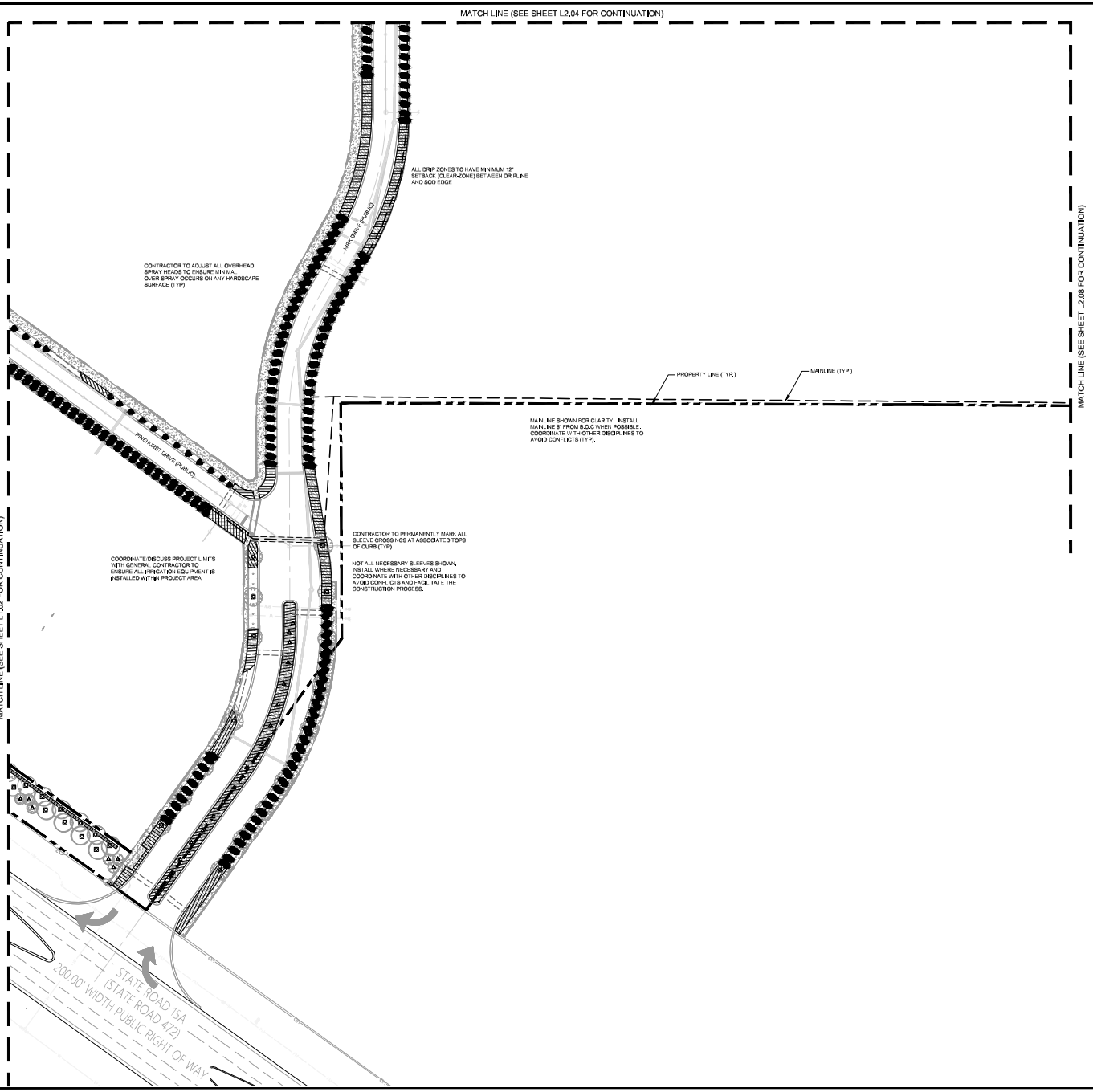

MATCH LINE (SEE SHEET L2.01 FOR CONTINUATION)
MATCH LINE (SEE SHEET L2.03 FOR CONTINUATION)
COORDINATE W/SCUBS PROJECT LIMITS WITH GENERAL CONTRACTOR TO ENSURE ALL IRRIGATION EQUIPMENT IS INSTALLED WITHIN PROJECT AREA.
PIPE SLEEVING (TYP.)
PROPERTY LINE (TYP.)
ALL DRIP ZONES TO HAVE MINIMUM 12" SETBACK (CLEAR-ZONE) BETWEEN DRIPLINE AND SOD EDGE
CONTRACTOR TO ADJUST ALL OVERHEAD SPRAY HEADS TO ENSURE MINIMAL OVER-SPRAY OCCURS ON ANY HARDSCAPE SURFACE (TYP.).
MAINLINE (TYP.)
PINE-LAND DRIVE (PUBLIC)
MAINLINE SHOWN FOR CLARITY. INSTALL MAINLINE 6' FROM B.O.C WHEN POSSIBLE. COORDINATE WITH OTHER DISCIPLINES TO AVOID CONFLICTS (TYP).
CONTRACTOR TO PERMANENTLY MARK ALL SLEEVE CROSSINGS AT ASSOCIATED TOPS OF CURB (TYP.).
NOT ALL NECESSARY SLEEVES SHOWN. INSTALL WHERE NECESSARY AND COORDINATE WITH OTHER DISCIPLINES TO AVOID CONFLICTS AND FACILITATE THE CONSTRUCTION PROCESS.
PIPE SLEEVING (TYP.)
PROPERTY LINE (TYP.)
STATE OF FLORIDA STATE ROAD DEPARTMENT
MAPS OF THE STATE HIGHWAY
RIGHT OF WAY MAP
STATE ROAD NO. 400 (I-4)
STATE PROJECT NO. 79110
F.P. NO. 242655 1
STATE ROAD 15A
(STATE ROAD 472)
200.00' WIDTH PUBLIC RIGHT OF WAY
SWALE EA.
SWALE EA.
SWALE EA.



NORTH

GRAPHIC SCALE IN FEET
0 25 50 100

IRRIGATION SCHEDULE

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY	PSI
CST LCS RCS CST SST	RAIN BIRD 1804-J-PRS-A/P 15 STRIP SERIES TURF SPRAY 4IN, POP-UP SPRINKLER WITH CO-MOLDED WIPER SEAL, 1/2IN, NPT FEMALE THREADED INLET, PRESSURE REGULATING, WITH NON POTABLE PURPLE CAP.	110	30
08-HEAVAN 10-HEAVAN 12-HEAVAN 15-HEAVAN	RAIN BIRD 1804-J-PRS-A/P HEAVAN SERIES TURF SPRAY 4IN, POP-UP SPRINKLER WITH CO-MOLDED WIPER SEAL, 1/2IN, NPT FEMALE THREADED INLET, PRESSURE REGULATING, WITH NON POTABLE PURPLE CAP.	975	30
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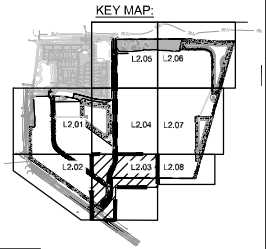
SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY
	AREA TO RECEIVE DRIPLINE RAIN BIRD XFD-06-24AP XFD ON-SURFACE PRESSURE COMPENSATING LANDSCAPE DRIPLINE, 0.6 GPH EMITTERS AT 12" O.C. DRIPLINE LATERALS SPACED AT 12" APART, WITH EMITTERS OFFSET FOR TRIANGULAR PATTERN, UV RESISTANT. SPECIFY XF INSERT FITTINGS. PIPE TO BE PURPLE IN COLOR.	48,626 LF

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY
MCV	RAIN BIRD PESB-PRS-D 1-1/2" 1IN, 1-1/2IN, 2IN, PLASTIC INDUSTRIAL MASTER VALVES, LOW FLOW OPERATING CAPABILITY, GLOBE CONFIGURATION, WITH PRESSURE REGULATING MODULE, AND SCRUBBER TECHNOLOGY FOR RELIABLE PERFORMANCE IN DIRTY WATER IRRIGATION APPLICATIONS.	1
BF	FEBCO 825Y 1" REDUCED PRESSURE BACKFLOW PREVENTER	1
C	RAIN BIRD ESP-LXM/M-LXMMSS 60 STATION, 2-WIRE CONTROLLER W/ SMART VALVE TECHNOLOGY, (1) ESP-LXM/M 60-STATION, INDOOR/OUTDOOR, PLASTIC WALL-MOUNT ENCLOSURE, INSTALLED IN LXMMSS STAINLESS STEEL WALL-MOUNTED CABINET, SYSTEM REQUIREMENTS: RAIN BIRD LXMM-XXX INTEGRATED VALVE MODULES & 24-VAC DIVERGIL UBI, PAIGE ELEC RIC CABLE PVB720 & RAIN BIRD WCW DRY SPLICES ONLY, GROUND SYSTEM W (X) LXMSD SURGE DEVICE IN RAIN BIRD ROUND VALVE BOXES, INSTALL PER MANUFACTURERS RECOMMENDATIONS.	1
RS	RAIN BIRD WR2-RFS WIRELESS RAIN FREEZE SENSOR.	1
FS	RAIN BIRD HS-100-I 1IN, FLOW SENSOR, PLASTIC PVC MODEL, SUGGESTED OPERATING RANGE 8.4 GPM TO 84 GPM, SIZE FOR FLOW NOT ACCORDING TO PIPE SIZE. RAIN BIRD COMPATIBLE CONTROLLERS: ESP-LXIVM[P] [LXD] LXME[P] [ME3, OR CONTROLLERS ACCEPTING CUSTOM K-FACTOR AND OFFSET. INSTALL IN RAIN BIRD VALVE BOX	1
M	WATER METER 2"	1
	IRRIGATION MAINLINE: PVC SCHEDULE 40	10,585 LF
	PIPE SLEEVE: PVC SCHEDULE 40 - LATERALS	1,168 LF
	PIPE SLEEVE: PVC SCHEDULE 40 - MAINLINE	438.0 LF

FLOW TOTALS
Area for Dripline: 483.2
Bubbler: 316.8
Turf Spray: 968.2
Total: 1,768 GPM

KEY MAP:



NOTE: IF SOURCE TO BE RECLAIMED (NON-POTABLE) ALL EQUIPMENT TO BE INDICATED AS SUCH AND PURPLE IN COLOR. FOLLOW ALL LOCAL JURISDICTION STANDARDS FOR RECLAIMED IRRIGATION SYSTEMS.

IRRIGATION CONTRACTOR IS RESPONSIBLE FOR PERFORMING ALL NECESSARY MODIFICATIONS REQUIRED TO MEET THE SCHEMATIC INTENT OF THESE PLANS PRIOR TO SUBMITTING PROPOSAL. THESE PLANS OUTLINE THE OVERALL LAYOUT THE SYSTEM AND IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ZONE THE SYSTEM ACCORDINGLY BASED ON FLOW AND PRESSURE AVAILABLE. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE FOLLOWING BUT NOT LIMITED TO AVAILABLE FLOW, AVAILABLE PRESSURE, CONNECTION ASSEMBLY, CAPACITY OF THE SYSTEM.

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DATE 10/27/2025
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DELAND TECH PARK
FLORIDA
CITY OF DELAND

IRRIGATION PLAN

SHEET NUMBER
L2.03

Plotted By: Hardy, Jake Steve Bell DELAND TECH PARK Layout L2.03 - October 27, 2025 10:13:33am K:\ORL_Civil\248418000-Deland Tech Park\CADD\COMSET\SheetSheets\L2.03_IRRIGATION PLANS.dwg
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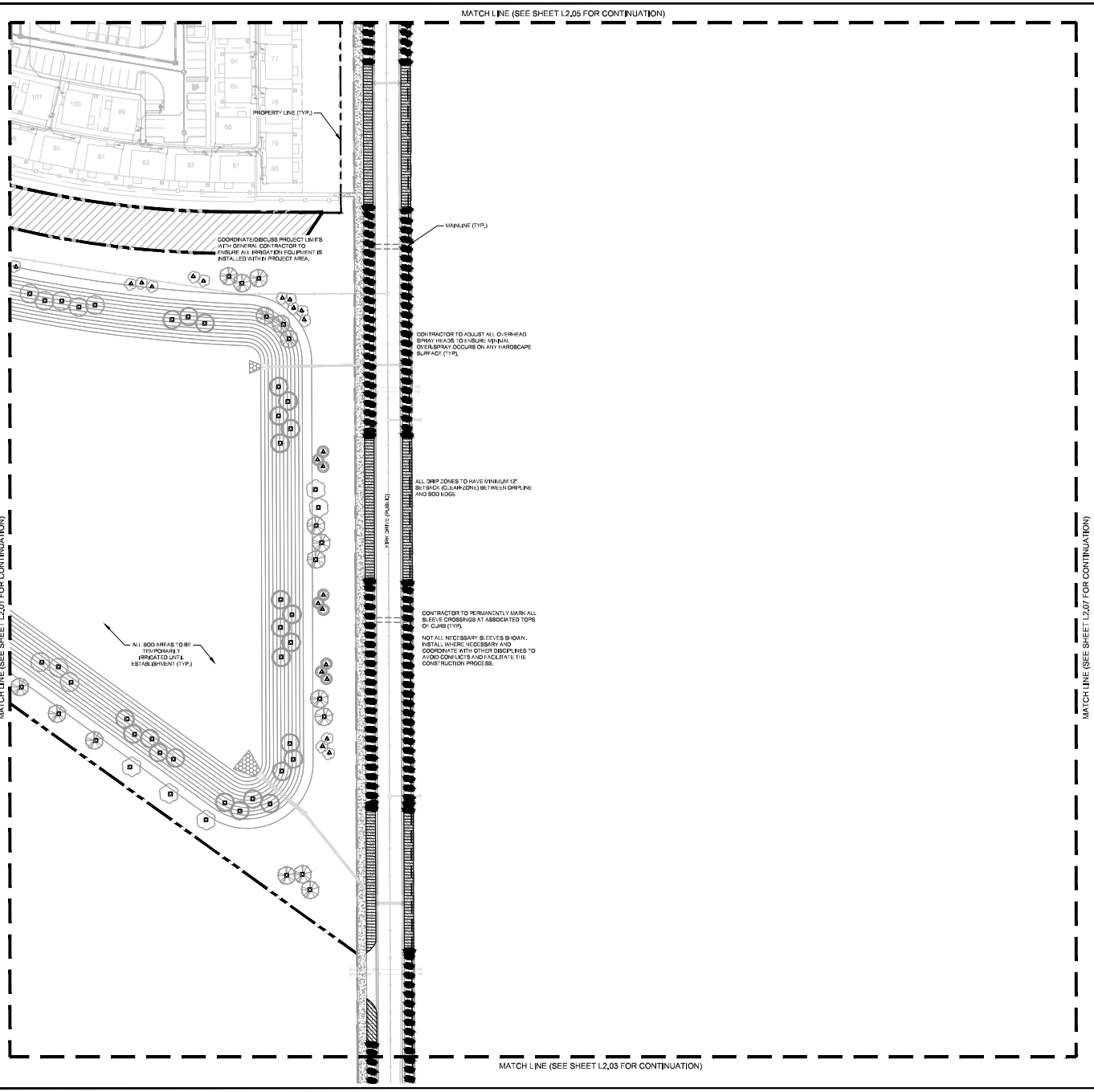


NORTH

GRAPHIC SCALE IN FEET
0 25 50 100

IRRIGATION SCHEDULE

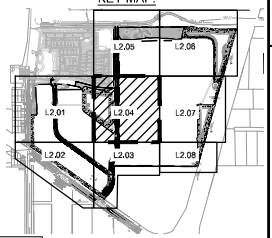
SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY	PSI
CST LCS RCS CST SST	RAIN BIRD 1804-I-PRS-A/P 15 STRIP SERIES TURF SPRAY 4IN, POP-UP SPRINKLER WITH CO-MOLDED WIPER SEAL, 1/2IN, NPT FEMALE THREADED INLET, PRESSURE REGULATING, WITH NON POTABLE PURPLE CAP.	110	30
08-HEVAN 10-HEVAN 12-HEVAN 15-HEVAN	RAIN BIRD 1804-I-PRS-A/P HEVAN SERIES TURF SPRAY 4IN, POP-UP SPRINKLER WITH CO-MOLDED WIPER SEAL, 1/2IN, NPT FEMALE THREADED INLET, PRESSURE REGULATING, WITH NON POTABLE PURPLE CAP.	975	30
1401 1402 1404 1406	RAIN BIRD 1806-NP-1400 FLOOD 1401 FLOOD BUBBLER 6.0" POP-UP WITH NON-POTABLE PURPLE CAP	831	20

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY
	AREA TO RECEIVE DRIPLINE RAIN BIRD XFD-06-24AP XFD ON-SURFACE PRESSURE COMPENSATING LANDSCAPE DRIPLINE, 0.6 GPH EMITTERS AT 12" O.C. DRIPLINE LATERALS SPACED AT 12" APART, WITH EMITTERS OFFSET FOR TRIANGULAR PATTERN, UV RESISTANT. SPECIFY XF INSERT FITTINGS. PIPE TO BE PURPLE IN COLOR.	48,626 LF

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY
MCV	RAIN BIRD PESB-PRS-D 1-1/2" 1IN., 1-10PH., 2IN. PLASTIC INDUSTRIAL MASTER VALVES, LOW FLOW OPERATING CAPABILITY, GLOBE CONFIGURATION, WITH PRESSURE REGULATING MODULE, AND SCRUBBER TECHNOLOGY FOR RELIABLE PERFORMANCE IN DIRTY WATER IRRIGATION APPLICATIONS.	1
BF	FEBCO 825Y 1" REDUCED PRESSURE BACKFLOW PREVENTER	1
C	RAIN BIRD ESP-LXMSMMBS 60 STATION, 2-WIRE CONTROLLER W/ SMART VALVE TECHNOLOGY, (1) ESP-LXMSM 60-STATION, INDOOR/OUTDOOR, PLASTIC WALL-MOUNT ENCLOSURE, INSTALLED IN LXMSMS STAINLESS STEEL WALL-MOUNTED CABINET, SYSTEM REQUIREMENTS: RAIN BIRD LXMM-XXX INTEGRATED VALVE MODULES & 2-WIRE DRIVEOUL UBI, PAIGE ELEC RIC CABLE PW2/20 & RAIN BIRD WC2B DRY SPLICES ONLY, GROUND SYSTEM W (X) LXIVMSD SURGE DEVICE IN RAIN BIRD ROUND VALVE BOXES, INSTALL PER MANUFACTURERS RECOMMENDATIONS.	1
RSD	RAIN BIRD WR2-RFS WIRELESS RAIN/FREEZE SENSOR.	1
FS	RAIN BIRD HS-100-I 1IN, FLOW SENSOR, PLASTIC PVC MODEL, SUGGESTED OPERATING RANGE 8.4 GPM TO 84 GPM, SIZE FOR FLOW NOT ACCORDING TO PIPE SIZE, RAIN BIRD COMPATIBLE CONTROLLERS: ESP-LXIVM[P] [LXD] LXMESP] [MES, OR CONTROLLERS ACCEPTING CUSTOM K-FACTOR AND OFFSET. INSTALL IN RAIN BIRD VALVE BOX	1
M	WATER METER 2"	1
	IRRIGATION MAINLINE: PVC SCHEDULE 40	10,585 LF
	PIPE SLEEVE: PVC SCHEDULE 40 - LATERALS	1,168 LF
	PIPE SLEEVE: PVC SCHEDULE 40 - MAINLINE	438.0 LF

FLOW TOTALS
Area for Dripline: 483.2
Bubbler: 316.8
Turf Spray: 968.2
Total: 1,768 GPM

KEY MAP:



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DELAND TECH PARK
FLORIDA

IRRIGATION PLAN

CITY OF DELAND

SHEET NUMBER
L2.04

Plotted By: Hardy, Jake Steve Bel DELAND TECH PARK - Layout 1 2:54 - October 27, 2025 10:13:53am K:\ORL_Civil\248418000\Deland Tech Park\CADD\CONSET\SheetSheets\L2.04_IRRIGATION PLAN.dwg
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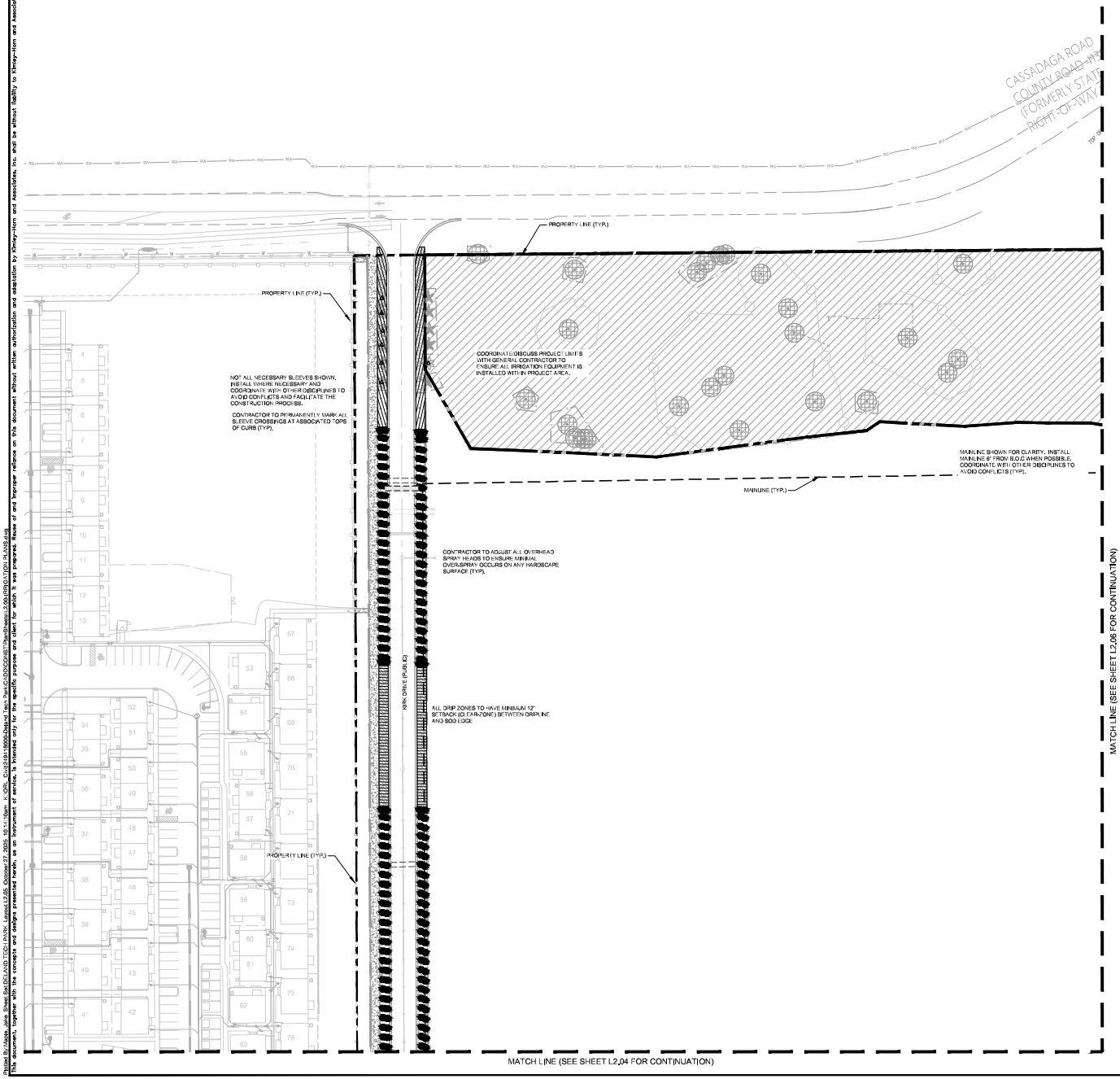


NORTH

GRAPHIC SCALE IN FEET
0 25 50 100

IRRIGATION SCHEDULE

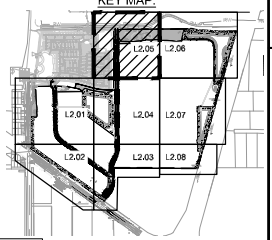
SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY	PSI
CST LCS RCS CST SST	RAIN BIRD 1804-J-PRS-NP 15 STRIP SERIES TURF SPRAY 4IN. POP-UP SPRINKLER WITH CO-MOLDED WIPER SEAL, 1/2IN. NPT FEMALE THREADED INLET, PRESSURE REGULATING, WITH NON POTABLE PURPLE CAP.	110	30
08-HEVAN 10-HEVAN 08-HES-VAN 10-HES-VAN	RAIN BIRD 1804-J-PRS-NP HEVAN SERIES TURF SPRAY 4IN. POP-UP SPRINKLER WITH CO-MOLDED WIPER SEAL, 1/2IN. NPT FEMALE THREADED INLET, PRESSURE REGULATING, WITH NON POTABLE PURPLE CAP.	975	30
1401 1402 1404 1406	RAIN BIRD 1806-NP-1400 FLOOD 1401 FLOOD BUBBLER 6.0" POP-UP WITH NON-POTABLE PURPLE CAP	831	20

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY
	AREA TO RECEIVE DRIPLINE RAIN BIRD XFD-06-24NP XFD ON-SURFACE PRESSURE COMPENSATING LANDSCAPE DRIPLINE, 0.6 GPH EMITTERS AT 12" O.C. DRIPLINE LATERALS SPACED AT 12" APART, WITH EMITTERS OFFSET FOR TRIANGULAR PATTERN, UV RESISTANT. SPECIFY XF INSERT FITTINGS. PIPE TO BE PURPLE IN COLOR.	48,626 LF

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY
MCV	RAIN BIRD PESB-PRS-D 1-1/2" 1IN., 1-1/2IN., 2IN. PLASTIC INDUSTRIAL MASTER VALVES, LOW FLOW OPERATING CAPABILITY, GLOBE CONFIGURATION, WITH PRESSURE REGULATING MODULE, AND SCRUBBER TECHNOLOGY FOR RELIABLE PERFORMANCE IN DIRTY WATER IRRIGATION APPLICATIONS.	1
BF	FEBCO 825Y 1" REDUCED PRESSURE BACKFLOW PREVENTER	1
C	RAIN BIRD ESP-LXMM-LXMMSS 60 STATION, 2-WIRE CONTROLLER W/ SMART VALVE TECHNOLOGY. (1) ESP-LXMM 60-STATION, INDOOR/OUTDOOR, PLASTIC WALL-MOUNT ENCLOSURE, INSTALLED IN LXMMSS STAINLESS STEEL WALL-MOUNTED CABINET. SYSTEM REQUIREMENTS: RAIN BIRD LXMM-XXX INTEGRATED VALVE MODULES & 2-WIRE DECODER, UBS-PRBS ELECTRICAL PIGTAIL PWP20 & RAIN BIRD WCW DRY SPLICES ONLY. GROUND SYSTEM W (X) LXMSD SURGE DEVICE IN RAIN BIRD ROUND VALVE BOXES, INSTALL PER MANUFACTURERS RECOMMENDATIONS.	1
RS	RAIN BIRD WR2-RFS WIRELESS RAIN FREEZE SENSOR.	1
FS	RAIN BIRD FS-100-I 1IN. FLOW SENSOR, PLASTIC PVC MODEL. SUGGESTED OPERATING RANGE 5.4 GPM TO 94 GPM. SIZE FOR FLOW NOT ACCORDING TO PIPE SIZE. RAIN BIRD COMPATIBLE CONTROLLERS: ESP-LXIVM(P) [LXD] LXMESP] [MES], OR CONTROLLERS ACCEPTING CUSTOM K-FACTOR AND OFFSET. INSTALL IN RAIN BIRD VALVE BOX	1
M	WATER METER 2"	1
	IRRIGATION MAINLINE: PVC SCHEDULE 40	10,585 LF
	PIPE SLEEVE: PVC SCHEDULE 40 - LATERALS	1,168 LF
	PIPE SLEEVE: PVC SCHEDULE 40 - MAINLINE	438.0 LF

FLOW TOTALS
Area for Dripline: 483.2
Bubbler: 316.8
Turf Spray: 968.2
Total: 1,768 GPM

KEY MAP:



NOTE: IF SOURCE TO BE RECLAIMED (NON-POTABLE) ALL EQUIPMENT TO BE INDICATED AS SUCH AND PURPLE IN COLOR. FOLLOW ALL LOCAL JURISDICTION STANDARDS FOR RECLAIMED IRRIGATION SYSTEMS.

IRRIGATION CONTRACTOR IS RESPONSIBLE FOR PERFORMING ALL NECESSARY MODIFICATIONS REQUIRED TO MEET THE SCHEMATIC INTENT OF THESE PLANS PRIOR TO SUBMITTING PROPOSAL. THESE PLANS OUTLINE THE OVERALL LAYOUT THE SYSTEM AND IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ZONE THE SYSTEM ACCORDINGLY BASED ON FLOW AND PRESSURE AVAILABLE. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE FOLLOWING BUT NOT LIMITED TO AVAILABLE FLOW, AVAILABLE PRESSURE, CONNECTION ASSEMBLY, CAPACITY OF THE SYSTEM.

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KHA PROJECT 248418000
DATE 10/27/2025
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DRAWN BY JM
CHECKED BY JTG

DELAND TECH PARK
CITY OF DELAND FLORIDA

IRRIGATION PLAN

SHEET NUMBER L2.05

Plotted By: Hardy, Jake Steve Bell DELAND TECH PARK Layout: L2.05 October 27, 2025 10:14:18am K:\ORL_Civil\248418000-Deland Tech Park\CADD\COS\ES\Plan Sheets\L2.05_IRRIGATION PLAN.dwg
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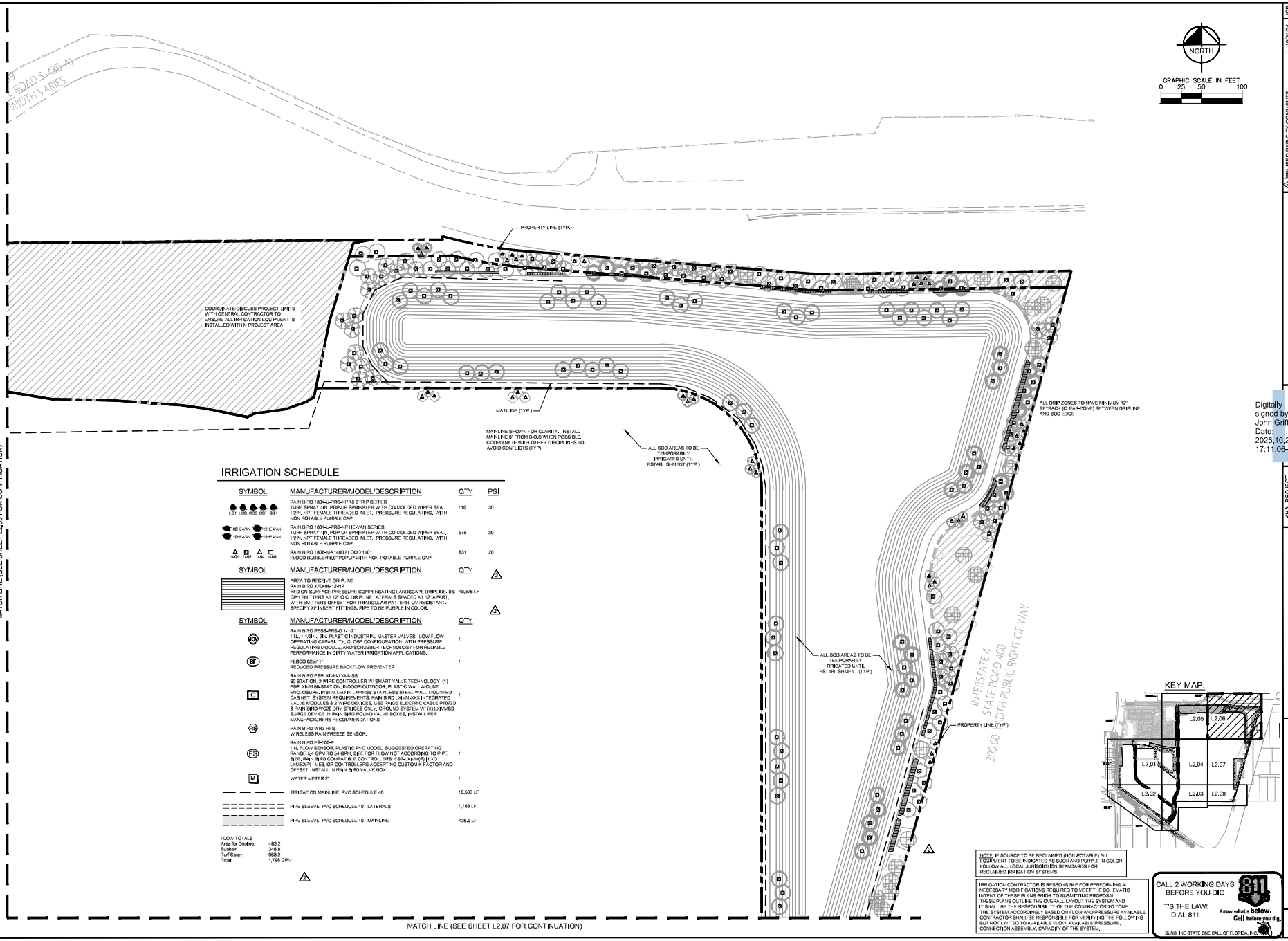

IRRIGATION SCHEDULE

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY	PSI
ES1 LCS HCS CS1 SS1	RAIN BIRD 1804-LPRS-NP 15 STRIP SERIES TURF SPRAY 4IN, POP-UP SPRINKLER WITH CO-MOLDED WIPER SEAL, 1/2IN, NPT FEMALE THREADED INLET, PRESSURE REGULATING, WITH NON POTABLE PURPLE CAP.	110	30
08HEAN 12HEAN 10HFAN 15HFAN	RAIN BIRD 1804-LPRS-NP HE-VAN SERIES TURF SPRAY 4IN, POP-UP SPRINKLER WITH CO-MOLDED WIPER SEAL, 1/2IN, NPT FEMALE THREADED INLET, PRESSURE REGULATING, WITH NON POTABLE PURPLE CAP.	975	30
1401 1402 1404 1408	RAIN BIRD 1806-NP-1400 FLOOD 1401 FLOOD BUBBLER 6.0" POP-UP WITH NON-POTABLE PURPLE CAP	831	20

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY
	AREA TO RECEIVE DRIPLINE RAIN BIRD XFD-06-12-NP XFD ON-SURFACE PRESSURE COMPENSATING LANDSCAPE DRIPLINE, 0.6 GPH EMITTERS AT 12" O.C. DRIPLINE LATERALS SPACED AT 12" APART, WITH BUTTERFLY OFFSET FOR TRIANGULAR PATTERN. UV RESISTANT. SPECIFY XF INSERT FITTINGS. PIPE TO BE PURPLE IN COLOR.	48,676 LF

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY
RPZ	RAIN BIRD PESB-PRS-D 1-1/2" 1IN., 1-1/2IN., 2IN. PLASTIC INDUSTRIAL MASTER VALVES. LOW FLOW OPERATING CAPABILITY, CLOSE CONFIGURATION, WITH PRESSURE REGULATING MODULE, AND SCRUBBER TECHNOLOGY FOR RELIABLE PERFORMANCE IN DIRTY WATER IRRIGATION APPLICATIONS.	1
BF	FEBCO 825Y 1" REDUCED PRESSURE BACKFLOW PREVENTER	1
C	RAIN BIRD ESP-LXIVM-LXMMSS 60 STATION, 2-WIRE CONTROLLER W/ SMART VALVE TECHNOLOGY, (1) ESP-LXIVM 60-STATION, INDOOR/OUTDOOR, PLASTIC WALL-MOUNT ENCLOSURE, INSTALLED IN LXMMSS STAINLESS STEEL WALL-MOUNTED CABINET, SYSTEM REQUIREMENTS: RAIN BIRD LXIVM-MAXX INTEGRATED VALVE MODULES & 2-WIRE DEVICES, USE PAIGE ELECTRIC CABLE P70720 & RAIN BIRD WCB DRY SPLICE ONLY, GROUND SYSTEM W (4) LXIVMSD SURGE DEVICE IN RAIN BIRD ROUND VALVE BOXES, INSTALL PER MANUFACTURERS RECOMMENDATIONS.	1
RS	RAIN BIRD WRS-RFS WIRELESS RAIN FREEZE SENSOR.	1
FS	RAIN BIRD FS-100-P 1IN. FLOW SENSOR, PLASTIC PVC MODEL, SUGGESTED OPERATING RANGE 5.4 GPM TO 54 GPM, SIZE FOR FLOW NOT ACCORDING TO PIPE SIZE, RAIN BIRD COMPATIBLE CONTROLLERS: ESP-LXI(M)(P) [LXD] LXMSE(P) [LXE], OR CONTROLLERS ACCEPTING CUSTOM K-FACTOR AND OFFSET, INSTALL IN RAIN BIRD VALVE BOX	1
M	WATER METER 2"	1
	IRRIGATION MAINLINE: PVC SCHEDULE 40	10,585 LF
	PIPE SLEEVE: PVC SCHEDULE 40 - LATERALS	1,168 LF
	PIPE SLEEVE: PVC SCHEDULE 40 - MAINLINE	436.0 LF

FLOW TOTALS
Area for Drip/mc: 483.2
Bubbler 346.8
Turf Spray: 668.2
Total: 1,798 GPM

KEY MAP:

NOTE: IF SOURCE TO BE RECLAIMED (NON-POTABLE) ALL EQUIPMENT TO BE INDICATED AS SUCH AND PURPLE IN COLOR. FOLLOW ALL LOCAL JURISDICTION STANDARDS FOR RECLAIMED IRRIGATION SYSTEMS.

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3	REVISED PER CITY COMMENTS	08/05/25	JDR
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DRAWN BY JM
CHECKED BY JTG

DELAND TECH PARK
CITY OF DELAND FLORIDA

IRRIGATION PLAN

SHEET NUMBER L2.06

Plotted By: Hardy, Jake Steve Bell DELAND TECH PARK Layout L2.06 October 27, 2025 10:11:58am K:\ORL_Civil\248418000\Design\Tech Park\CADD\CONSET\SheetSet\L2.06 IRRIGATION PLAN.dwg
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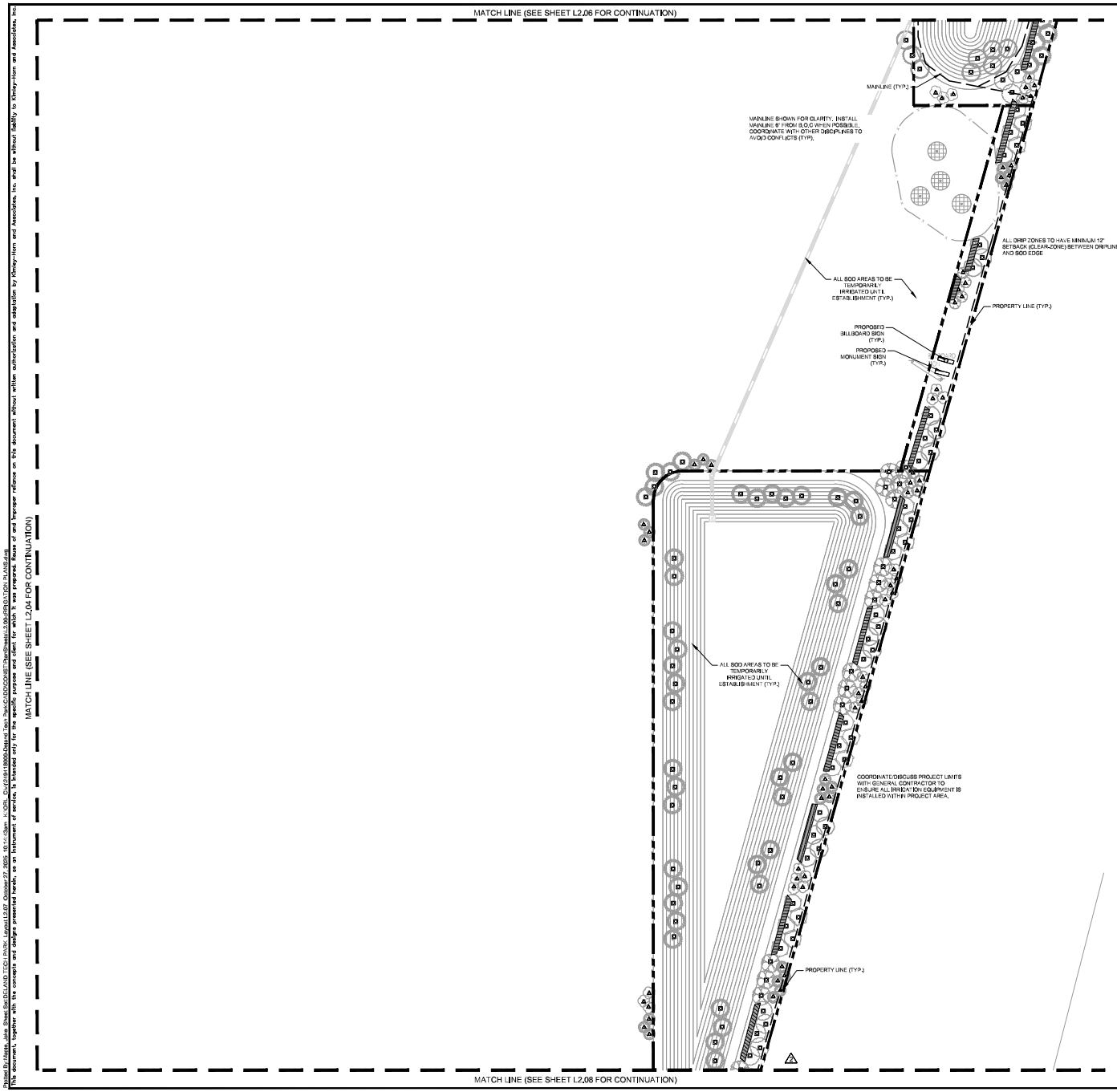


NORTH

GRAPHIC SCALE IN FEET
0 25 50 100

IRRIGATION SCHEDULE

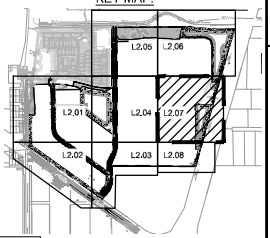
SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY	PSI
CST LCS RCS CST SST	RAIN BIRD 1804-J-PRS-A/P 15 STRIP SERIES TURF SPRAY 4IN, POP-UP SPRINKLER WITH CO-MOLDED WIPER SEAL, 1/2IN, NPT FEMALE THREADED INLET, PRESSURE REGULATING, WITH NON POTABLE PURPLE CAP.	110	30
08HEVAN 10HEVAN 08HEVAN 10HEVAN	RAIN BIRD 1804-J-PRS-A/P HEVAN SERIES TURF SPRAY 4IN, POP-UP SPRINKLER WITH CO-MOLDED WIPER SEAL, 1/2IN, NPT FEMALE THREADED INLET, PRESSURE REGULATING, WITH NON POTABLE PURPLE CAP.	975	30
1401 1402 1404 1406	RAIN BIRD 1806-NR-1400 FLOOD 1401 FLOOD BUBBLER 6.0" POPUP WITH NON-POTABLE PURPLE CAP	831	20

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY
	AREA TO RECEIVE DRIPLINE RAIN BIRD XFD-06-24AP XFD ON-SURFACE PRESSURE COMPENSATING LANDSCAPE DRIPLINE, 0.6 GPH EMITTERS AT 12" O.C. DRIPLINE LATERALS SPACED AT 12" APART, WITH EMITTERS OFFSET FOR TRIANGULAR PATTERN, UV RESISTANT. SPECIFY XF INSERT FITTINGS. PIPE TO BE PURPLE IN COLOR.	48,626 LF

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY
MCV	RAIN BIRD PESB-PRS-D 1-1/2" 1IN., 1-10PH., 2IN. PLASTIC INDUSTRIAL MASTER VALVES, LOW FLOW OPERATING CAPABILITY, GLOBE CONFIGURATION, WITH PRESSURE REGULATING MODULE, AND SCRUBBER TECHNOLOGY FOR RELIABLE PERFORMANCE IN DIRTY WATER IRRIGATION APPLICATIONS.	1
BF	FEBCO 825Y 1" REDUCED PRESSURE BACKFLOW PREVENTER	1
C	RAIN BIRD ESP-LXM/M-LXMMSS 60 STATION, 2-WIRE CONTROLLER W/ SMART VALVE TECHNOLOGY, (1) ESP-LXM 60-STATION, INDOOR/OUTDOOR, PLASTIC WALL-MOUNT ENCLOSURE, INSTALLED IN LXMMSS STAINLESS STEEL WALL-MOUNTED CABINET, SYSTEM REQUIREMENTS: RAIN BIRD LXMM-XXX INTEGRATED VALVE MODULES & 2-WIRE DECODER, UBS PAGE ELECTRIC CABLE PVB/2D & RAIN BIRD WCB2 DRY SPLICES ONLY, GROUND SYSTEM W (X) LXIVMSD SURGE DEVICE IN RAIN BIRD ROUND VALVE BOXES, INSTALL PER MANUFACTURERS RECOMMENDATIONS.	1
RS	RAIN BIRD WR2-RFS WIRELESS RAIN/FREEZE SENSOR.	1
FS	RAIN BIRD FS-100-I 1IN, FLOW SENSOR, PLASTIC PVC MODEL, SUGGESTED OPERATING RANGE 0.4 GPM TO 34 GPM, SIZE FOR FLOW NOT ACCORDING TO PIPE SIZE, RAIN BIRD COMPATIBLE CONTROLLERS ESP-LXIVM[P] [LXD] LXMEP[P] [MES], OR CONTROLLERS ACCEPTING CUSTOM K-FACTOR AND OFFSET, INSTALL IN RAIN BIRD VALVE BOX	1
M	WATER METER 2"	1
	IRRIGATION MAINLINE: PVC SCHEDULE 40	10,585 LF
	PIPE SLEEVE: PVC SCHEDULE 40 - LATERALS	1,168 LF
	PIPE SLEEVE: PVC SCHEDULE 40 - MAINLINE	438.0 LF

FLOW TOTALS
Area for Dripline: 483.2
Bubbler: 316.8
Turf Spray: 968.2
Total: 1,768 GPM

KEY MAP:



NOTE: IF SOURCE TO BE RECLAIMED (NON-POTABLE) ALL EQUIPMENT TO BE INDICATED AS SUCH AND PURPLE IN COLOR. FOLLOW ALL LOCAL JURISDICTION STANDARDS FOR RECLAIMED IRRIGATION SYSTEMS.

IRRIGATION CONTRACTOR IS RESPONSIBLE FOR PERFORMING ALL NECESSARY MODIFICATIONS REQUIRED TO MEET THE SCHEMATIC INTENT OF THESE PLANS PRIOR TO SUBMITTING PROPOSAL. THESE PLANS OUTLINE THE OVERALL LAYOUT THE SYSTEM AND IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ZONE THE SYSTEM ACCORDINGLY BASED ON FLOW AND PRESSURE AVAILABLE. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE FOLLOWING BUT NOT LIMITED TO AVAILABLE FLOW, AVAILABLE PRESSURE, CONNECTION ASSEMBLY, CAPACITY OF THE SYSTEM.

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1	REVISED PER CITY COMMENTS	10/7/24	JDR
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PHONE: (407) 898-1511
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Date: 2025.10.27 17:11:07-04'00'

KHA PROJECT 248418000
DATE 10/27/2025
SCALE AS SHOWN
DESIGNED BY JM
DRAWN BY JM
CHECKED BY JTG

DELAND TECH PARK
FLORIDA
CITY OF DELAND

IRRIGATION PLAN

SHEET NUMBER
L2.07

Plotted By: Hardy, Jake Steve Bar DELAND TECH PARK - Layout L2.07 - October 27, 2025 10:14:03am K:\ORL_Civil\248418000\Deland Tech Park\CADD\COMSET\SheetSheets\L2.00 IRRIGATION PLANS.dwg
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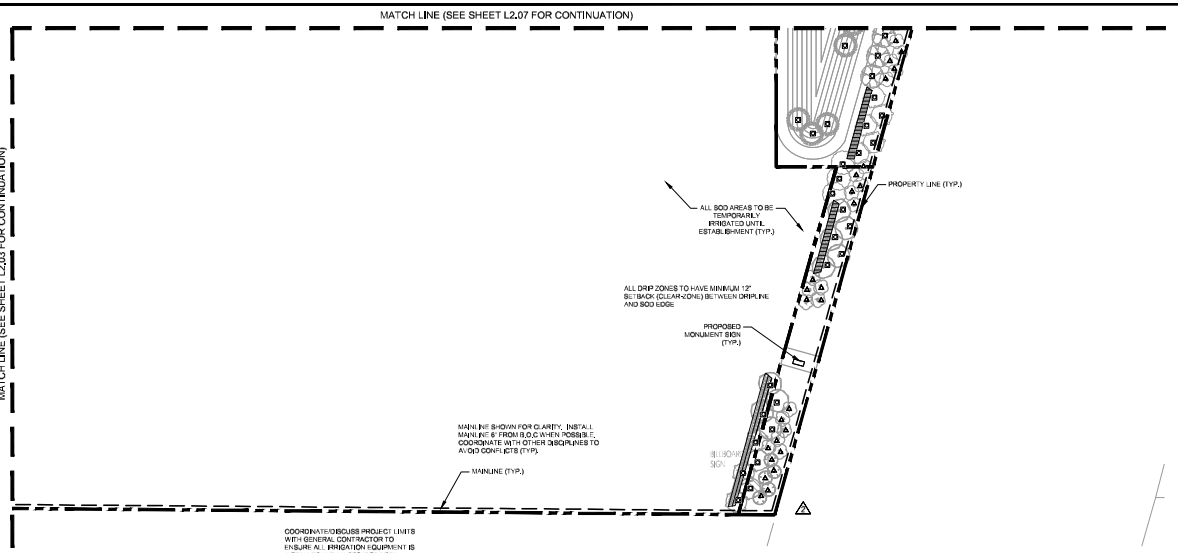

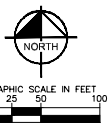

IRRIGATION SCHEDULE

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY	PSI
CST LCS RCS CST SST	RAIN BIRD 1804-LJ-PRS-A/P 15 STRIP SERIES TURF SPRAY 4IN. POP-UP SPRINKLER WITH CO-MOLDED WIPER SEAL, 1/2IN. NPT FEMALE THREADED INLET, PRESSURE REGULATING, WITH NON POTABLE PURPLE CAP.	110	30
08HEVAN 10HEVAN 15HEVAN	RAIN BIRD 1804-LJ-PRS-A/P HEVAN SERIES TURF SPRAY 4IN. POP-UP SPRINKLER WITH CO-MOLDED WIPER SEAL, 1/2IN. NPT FEMALE THREADED INLET, PRESSURE REGULATING, WITH NON POTABLE PURPLE CAP.	975	30
1401 1402 1404 1406	RAIN BIRD 1806-NR-1400 FLOOD 1401 FLOOD BUBBLER 6.0" POP-UP WITH NON-POTABLE PURPLE CAP	831	20

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY
	AREA TO RECEIVE DRIPLINE RAIN BIRD XFD-06-24AP XFD ON-SURFACE PRESSURE COMPENSATING LANDSCAPE DRIPLINE, 0.6 GPH EMITTERS AT 12" O.C. DRIPLINE LATERALS SPACED AT 12" APART, WITH EMITTERS OFFSET FOR TRIANGULAR PATTERN, UV RESISTANT. SPECIFY XF INSERT FITTINGS. PIPE TO BE PURPLE IN COLOR.	48,626 LF

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY
MCV	RAIN BIRD PESB-PRS-D 1-1/2" 1IN., 1-10PSI, 2IN. PLASTIC INDUSTRIAL MASTER VALVES, LOW FLOW OPERATING CAPABILITY, GLOBE CONFIGURATION, WITH PRESSURE REGULATING MODULE, AND SCRUBBER TECHNOLOGY FOR RELIABLE PERFORMANCE IN DIRTY WATER IRRIGATION APPLICATIONS.	1
BF	FEBCO 825Y 1" REDUCED PRESSURE BACKFLOW PREVENTER	1
C	RAIN BIRD ESP-LXM/M-LXMMSS 60 STATION, 2-WIRE CONTROLLER W/ SMART VALVE TECHNOLOGY, (1) ESP-LXM 60-STATION, INDOOR/OUTDOOR, PLASTIC WALL-MOUNT ENCLOSURE, INSTALLED IN LXMMSS STAINLESS STEEL WALL-MOUNTED CABINET, SYSTEM REQUIREMENTS: RAIN BIRD LXMM-XXXX INTEGRATED VALVE MODULES & 24-VAC DIVIDUAL USE PAIR ELECTRICABLE FWD/2D & RAIN BIRD WCB2 DRY SPLICES ONLY, GROUND SYSTEM W/ (X) LXIVMSD SURGE DEVICE IN RAIN BIRD ROUND VALVE BOXES, INSTALL PER MANUFACTURERS RECOMMENDATIONS.	1
RS	RAIN BIRD WR2-RFS WIRELESS RAIN/FREEZE SENSOR.	1
FS	RAIN BIRD FS-100-I 1IN, FLOW SENSOR, PLASTIC PVC MODEL, SUGGESTED OPERATING RANGE 0.4 GPM TO 34 GPM, SIZE FOR FLOW NOT ACCORDING TO PIPE SIZE, RAIN BIRD COMPATIBLE CONTROLLERS: ESP-LXIVM[P] [LXD] LXMESP] [MES], OR CONTROLLERS ACCEPTING CUSTOM K-FACTOR AND OFFSET, INSTALL IN RAIN BIRD VALVE BOX	1
M	WATER METER 2"	1
	IRRIGATION MAINLINE: PVC SCHEDULE 40	10,585 LF
	PIPE SLEEVE: PVC SCHEDULE 40 - LATERALS	1,168 LF
	PIPE SLEEVE: PVC SCHEDULE 40 - MAINLINE	438.0 LF

FLOW TOTALS
Area for Dripline: 483.2
Bubbler: 316.8
Turf Spray: 968.2
Total: 1,768 GPM

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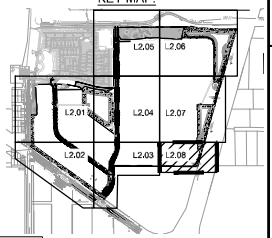

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KHA PROJECT 248418000
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DESIGNED BY JM
DRAWN BY JM
CHECKED BY JTG

DELAND TECH PARK
FLORIDA

IRRIGATION PLAN

CITY OF DELAND

SHEET NUMBER L2.08

Plotted By: Hardy, Jake Steve Bar:DELAND TECH PARK- Layout:L2.08 October 27, 2025, 10:14:58am K:\ORL_Civil\248418000-Deland Tech Park-CLOD\CGS\ET\SheetSet\L2.08-IRRIGATION PLAN.dwg
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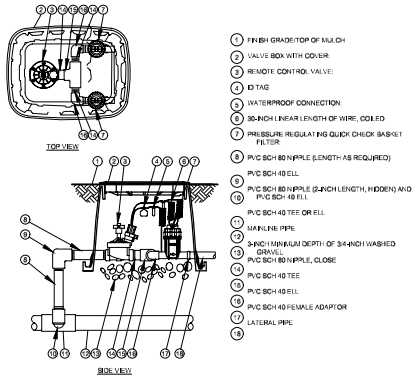
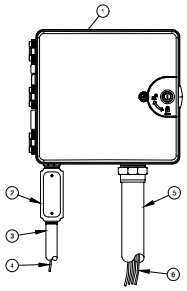


1. FINISH GRADE/TOP OF MULCH
2. VALVE BOX WITH COVER
3. REMOTE CONTROL VALVE
4. ID TAG
5. WATERPROOF CONNECTION
6. 36-INCH LINEAR LENGTH OF WIRE, COILED
7. PRESSURE REGULATING QUICK CHECK BASKET FILTER
8. PVC SCH 80 NIPPLE (LENGTH AS REQUIRED)
9. PVC SCH 40 ELL
10. PVC SCH 80 NIPPLE (2-INCH LENGTH, HIDDEN) AND PVC SCH 40 ELL
11. PVC SCH 40 TEE OR ELL
12. MAINLINE PIPE
13. 3-INCH MINIMUM DEPTH OF 3/4-INCH WASHED GRAVEL
14. PVC SCH 80 NIPPLE, CLOSE
15. PVC SCH 40 TEE
16. PVC SCH 40 ELL
17. PVC SCH 40 FEMALE ADAPTOR
18. LATERAL PIPE

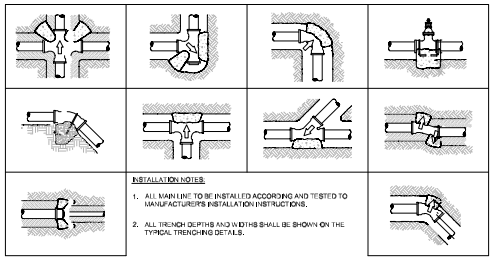
1 L2.50 COMMERCIAL CONTROL DRIP ZONE VALVE KIT
SECTION / PLAN NTS



1. IRRIGATION CONTROLLER: CONTROLLER (OWNER TO SPECIFY WALL MOUNT OR STAINLESS STEEL, PEDESTAL MOUNT). INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
2. JUNCTION BOX
3. 1-INCH CONDUIT AND FITTINGS TO POWER SUPPLY
4. POWER SUPPLY WIRE
5. 2-INCH CONDUIT AND FITTINGS FOR STATION WIRES
6. WIRES TO REMOTE CONTROL VALVES

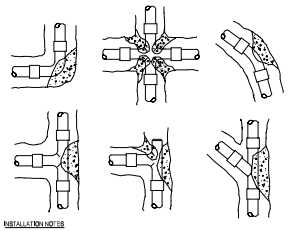
NOTES:
1. FOR EASE OF INSTALLATION INTO A CONTROLLER WITH MORE THAN 24 STATIONS, INSTALL A JUNCTION BOX AT THE BASE OF CONTROLLER AND TRANSITION LARGER VALVE AND COMMON WIRES FROM FIELD TO 18 AWG MULTI CONDUCTOR WIRE TO BE USED IN CONTROLLER.
2. USE STEEL CONDUIT FOR ABOVE GRADE AND SCH 40 PVC CONDUIT FOR BELOW GRADE CONDITIONS.
3. PROVIDE PROPER GROUNDING COMPONENTS TO ACHIEVE GROUND RESISTANCE OF 10 OHMS OR LESS.

2 L2.50 TYPICAL CONTROLLER
ELEVATION NTS



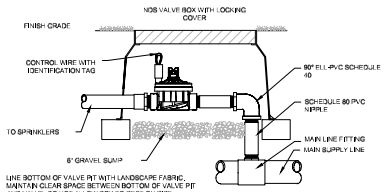
INSTALLATION NOTES:
1. ALL MAIN LINE TO BE INSTALLED ACCORDING AND TESTED TO MANUFACTURER'S INSTALLATION INSTRUCTIONS.
2. ALL TRENCH DEPTHS AND WIDTHS SHALL BE SHOWN ON THE TYPICAL TRENCHING DETAILS.

3 L2.50 TYPICAL THRUST BLOCK
SECTION NTS



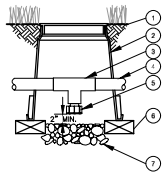
INSTALLATION NOTES:
1. 3000 PSI CONCRETE OR BETTER IS TO BE USED FOR THRUST BLOCKS.
2. FOR 45/90° FITTINGS, MINIMUM OF 2 CUBIC FEET OF CONCRETE TO BE USED.
3. FOR 22-1/2° FITTINGS, MINIMUM OF 0.5 CUBIC FEET OF CONCRETE TO BE USED.
4. FOR TEES, MINIMUM OF 2 CUBIC FEET OF CONCRETE TO BE USED, THRUST BLOCKS REQUIRED FOR IRRIGATION MAINLINE 2 1/2" AND LARGER.

4 L2.50 THRUST BLOCK REINFORCEMENT
SECTION NTS



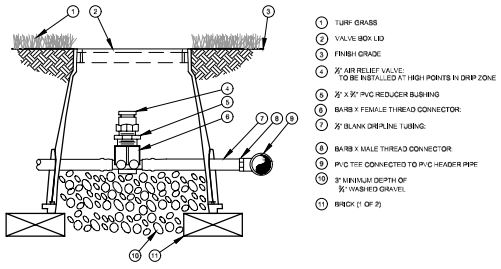
LINE BOTTOM OF VALVE PIT WITH LANDSCAPE FABRIC. MAINTAIN CLEAR SPACE BETWEEN BOTTOM OF VALVE PIT AND VALVE. DO NOT ALLOW BOX TO REST ON PIPE.

5 L2.50 TYPICAL CONTROL VALVE
SECTION NTS



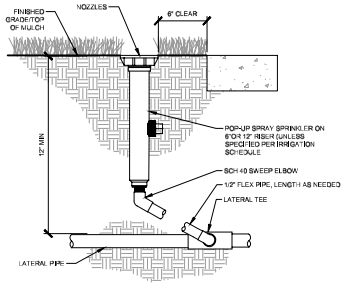
1. FINISH GRADE/TOP OF MULCH
2. VALVE BOX WITH COVER:
3. PVC SCH 40 TEE
4. PVC LATERAL PIPE
5. FILTERED DRAIN VALVE:
6. BRICK (1 OF 2)
7. 6-INCH MINIMUM DEPTH OF 3/4-INCH WASHED GRAVEL

6 L2.50 DRAIN VALVE
SECTION NTS

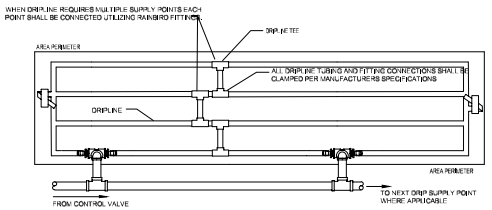


1. TURF GRASS
2. VALVE BOX LID
3. FINISH GRADE
4. ½" AIR RELIEF VALVE: TO BE INSTALLED AT HIGH POINTS IN DRIP ZONE
5. ½" X ¾" PVC REDUCER BUSHING
6. BARB X FEMALE THREAD CONNECTOR:
7. ½" BLANK DRIPLINE TUBING:
8. BARB X MALE THREAD CONNECTOR
9. PVC TEE CONNECTED TO PVC HEADER PIPE
10. 3" MINIMUM DEPTH OF ¾" WASHED GRAVEL
11. BRICK (1 OF 2)

7 L2.50 AIR RELIEF VALVE IN XFS DRIP LINE
SECTION NTS



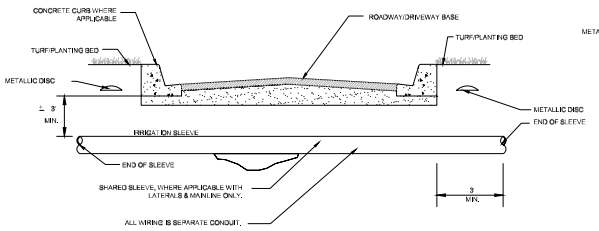
8 L2.50 TYPICAL IRRIGATION HEAD
SECTION NTS



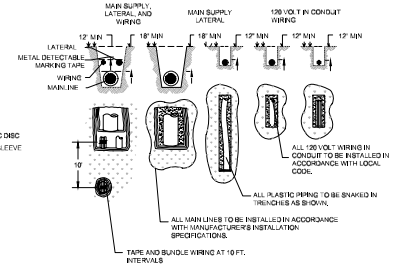
CONTRACTOR TO REFER TO IRRIGATION PLAN FOR LOCATION OF CONTROL VALVES THAT UTILIZE MULTIPLE DRIPLINE SUPPLY CONNECTIONS. IF NOT SHOWN, INSTALL WITHIN ADJACENT GREEN AREA NOT IN A HIGHLY VISIBLE AREA.

NOTE:
1. DRIP TUBING TO BE ROUTED IN THE PLANT MATERIAL BED WITH AT MAXIMUM LATERAL SPACING OF 18 INCHES.
2. DRIP TUBING TO BE INSTALLED IN A GRID PATTERN. DRIP TUBING SHALL NOT BE INSTALLED IN A LONG CONTINUOUS RUN.
3. CONTRACTOR TO REFER TO IRRIGATION PLAN FOR LOCATION OF CONTROL VALVES THAT UTILIZE MULTIPLE DRIPLINE SUPPLY CONNECTIONS (IF SHOWN).

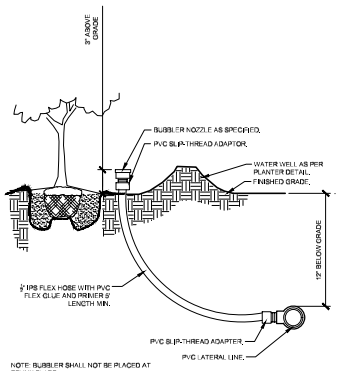
9 L2.50 TYPICAL DRIP LINE
PLAN NTS



10 L2.50 TYPICAL SLEEVING
SECTION NTS



11 L2.50 TYPICAL TRENCHING
SECTION / PLAN NTS



NOTE: BUBBLER SHALL NOT BE PLACED AT TRUNK FLARE.

12 L2.50 TYPICAL BUBBLER
SECTION NTS

No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/7/24	JDR
2	REVISED PER CITY COMMENTS	07/10/25	JDR
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Date: 2025.10.27 17:11:10-04'00'

KHA PROJECT 249418000
DATE 10/27/2025
SCALE AS SHOWN
DESIGNED BY JM
DRAWN BY JM
CHECKED BY JTG

DELAND TECH PARK
CITY OF DELAND FLORIDA

IRRIGATION DETAILS

SHEET NUMBER L2.50

Plotted By: Hardy, Jake Steve Bar:DELAND TECH PARK Layout:L2.50 October 27, 2025, 10:15:05am K:\ORL_Civil\249418000\Drawing\Tech Plan\Civil\DOCS\DETSheets\L2.50-IRRIGATION DETAILS.dwg
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IRRIGATION SYSTEM NOTES:

1. THE IRRIGATION MAINLINE LAYOUT IS DIAGRAMMATIC. ANY CHANGES MADE IN THE IRRIGATION MAINLINE DUE TO FIELD CONDITIONS OR CONTRACTOR'S SUBMITTED DESIGN SHALL BE IN ACCORDANCE WITH THESE STANDARDS.
2. SET SPRAY HEADS 6" AND ROTORS 12' IN FROM BACK OF CURB OR 24" IF PAVEMENT HAS NO CURB.
3. IRRIGATION CONTRACTOR IS RESPONSIBLE FOR PERFORMING ALL NECESSARY MODIFICATIONS REQUIRED TO MEET THE SCHEMATIC INTENT OF THESE PLANS PRIOR TO SUBMITTING PROPOSAL. THESE PLANS OUTLINE THE OVERALL LAYOUT THE SYSTEM AND IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ZONE THE SYSTEM ACCORDINGLY BASED ON FLOW AND PRESSURE AVAILABLE. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE FOLLOWING BUT NOT LIMITED TO AVAILABLE FLOW, AVAILABLE PRESSURE, CONNECTION ASSEMBLY, CAPACITY OF THE SYSTEM.
4. CONTRACTOR TO PROVIDE NEW AUTOMATIC CONTROLLER FOR PROPOSED SYSTEM (NO BATTERY OPERATED CONTROLLERS ALLOWED). COORDINATE LOCATION WITH OWNER.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AUTOMATIC RAIN SENSOR. COORDINATE LOCATION W/ OWNER.
6. IRRIGATION SHALL NOT BE COMBINED ON A SINGLE ZONE AND SHALL BE ZONED ACCORDING TO IRRIGATION TYPE, PRECIPITATION RATE, AND THE SYSTEM'S AVAILABLE WATER / PRESSURE. CONTRACTOR TO SUBMIT SHOP DRAWINGS TO OWNER FOR REVIEW PRIOR TO INSTALLATION.
7. VERIFY LOCATIONS OF ALL UNDERGROUND UTILITIES PRIOR TO INSTALLATION OF IRRIGATION SYSTEM. ALL UTILITIES AND STRUCTURES MAY NOT BE SHOWN ON THESE PLANS-CONTRACTOR SHALL FIELD VERIFY.
8. CONTRACTOR TO FIELD VERIFY ALL POINT OF CONNECTION SOURCE INFORMATION INCLUDING PSI AND GPM PRIOR TO CONSTRUCTION.
9. INSTALLATION OF WORK SHALL BE COORDINATED WITH OTHER CONTRACTORS IN SUCH A MANNER AS TO ALLOW FOR A SPEEDY AND ORDERLY COMPLETION OF ALL WORK ON-SITE.
10. CONTRACTOR SHALL COORDINATE WITH THE PLANTING PLAN FOR PLANTER BED AND TREE LOCATIONS TO ENSURE ALL PLANT MATERIAL IS COVERED BY 100% HEAD-TO-HEAD IRRIGATION.
11. CONTRACTOR SHALL PROVIDE "AS-BUILT" DRAWINGS OF THE FINAL INSTALLATION TO OWNER AT SUBSTANTIAL COMPLETION BEFORE RECEIVING FINAL PAYMENT.
12. PRODUCTS SHALL BE AS SPECIFIED OR APPROVED EQUAL.

PRE-APPROVED MANUFACTURERS:
1. TORO
2. HUNTER
3. RAINBIRD

13. IRRIGATION CONTRACTOR SHALL SECURE ANY AND ALL NECESSARY PERMITS FOR THE WORK PRIOR TO COMMENCEMENT OF HIS OPERATIONS ON-SITE. COPIES OF THE PERMITS SHALL BE SENT TO THE OWNER/GENERAL CONTRACTOR. WORK IN THE R.O.W. SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF LOCAL AND/OR STATE JURISDICTION.
14. LOCATE ALL IRRIGATION LINES WITHIN LANDSCAPED AREAS WHENEVER POSSIBLE. ALL LINES UNDER PAVEMENT MUST BE SLEEVED WITHIN SCH. 40 PVC 2x SIZE OF PIPE AND FREE OF STONES/DEBRIS. ALL VALVES SHALL BE LOCATED WITHIN LANDSCAPED AREAS.
15. MAINLINE SHALL NOT BE LOCATED WITHOUT PRIOR APPROVAL OF THE OWNER'S REPRESENTATIVE.
16. THE IRRIGATION CONTRACTOR SHALL BE DIRECTLY RESPONSIBLE FOR SLEEVING AND DIRECTIONAL BORES.
17. ALL SLEEVES UTILIZED BY THE IRRIGATION CONTRACTOR WHETHER INSTALLED BY HIM OR NOT, SHALL BE LOCATED ON THE "AS-BUILT" DRAWINGS. THE DEPTH BELOW FINISH GRADE, TO THE NEAREST FOOT OF EACH END OF THE SLEEVE SHALL BE NOTED AT EACH SLEEVE LOCATION ON THE "AS-BUILT" DRAWINGS. ALL SLEEVES ON PLAN FOR WALL PENETRATIONS AND UNDER SIDEWALKS SHALL BE SIZED TWO PIPE SIZES GREATER THAN THE PIPE IT CARRIES.
18. ALL PRESSURIZED MAINLINES AND LATERALS UNDER PAVEMENT SHALL BE WITHIN SCH. 40 PVC SLEEVES. WHERE ELECTRIC OR HYDRAULIC VALVE CONTROL LINES PASS THROUGH A SLEEVE WITH OTHER MAIN OR LATERAL LINES THEY SHALL BE CONTAINED WITHIN A SEPARATE, SMALLER CONDUIT.
19. NUMBER THE TOP OF ALL VALVE BOX LIDS WITH MINIMUM 1" HEIGHT BLACK LETTERS TO CORRESPOND TO AUTOMATIC AND GATE VALVE DESIGNATIONS. ALL HOSE BIBB VALVE BOXES SHALL BE LABELED IN A SIMILAR MANNER WITH THE DESIGNATION "HB". LETTER OUTSIDE OF TIME CLOCK CABINETS TO CORRESPOND WITH IRRIGATION CLOCK PROGRAM DESIGNATION.
20. THE IRRIGATION CONTRACTOR SHALL INSTALL A COLOR CODED METAL DETECTABLE MARKING TAPE WHICH CLEARLY NOTES "CAUTION: IRRIGATION LINE BURIED BELOW." THE TAPE SHALL BE INSTALLED THE FULL LENGTH OF THE IRRIGATION MAINLINE.
21. ELECTRIC SERVICE TO THE CONTROLLER SHALL BE PROVIDED BY THE GENERAL CONTRACTOR.
22. ALL 24 VAC WIRING FROM DECODER TO VALVE SHALL BE OF DIRECT BURIAL COPPER WIRE. MAXIMUM LENGTH OF WIRE FROM DECODER TO VALVE SHALL NOT EXCEED 400 FEET. AS FOLLOWS:
    CONTROL WIRES - #14
    COMMON WIRES - #14
23. ALL VALVES, SPLICES WITHIN CONTROL LINES, AND QUICK COUPLERS SHALL BE LOCATED WITHIN NDS VALVE BOXES AS FOLLOWS:
    - RECTANGULAR 12"X17" HEAVY DUTY BOX, (PURPLE COVER FOR REUSE TO BE PROVIDED WHERE APPROPRIATE).
24. ALL IRRIGATION HEADS/DRIP TUBING SHALL BE LOCATED ONE (1) FOOT FROM BACK OF CURB WHEN NEXT TO A ROADWAY. (THIS SHALL NOT INCLUDE PARKING AREAS OR DRIVE AISLES).
25. HEADS, LATERALS, EMITTERS, AND VALVES ARE NOT SHOWN, BUT ARE NECESSARY FOR A FULLY FUNCTIONING IRRIGATION SYSTEM.
26. LOCATE ALL VALVES IN PLANTING BEDS WITH A MINIMUM OF 3-0" FROM BACK OF CURB OR EDGE OF PAVEMENT, UNLESS OTHERWISE NOTED. PIPE SIZES ON EITHER SIDE OF SECTION VALVES CONNECTING MAINLINE TO SECTION LATERAL SHALL BE ONE (1) PIPE SIZE LARGER THAN VALVE SIZE. WHERE MAINLINES RUN PARALLEL TO PAVEMENT OR CURBING, THE MAINLINE SHALL BE OFFSET 2'-0" FROM THE EDGE OF PAVEMENT OR CURB.
27. IRRIGATION ZONES SHALL BE SEPARATED FOR HIGH AND LOW WATER USE REQUIREMENTS AND OPERATED ON DIFFERENT WATERING CYCLES, BUBBLERS, DRIPLINE, AND SPRAY HEADS SHALL BE SEPARATED ON DIFFERENT VALVES. AT NO TIME SHALL MULTIPLE IRRIGATION HEAD TYPES BE LOCATED ON THE SAME VALVE.
28. ALL DRIP ZONES SHALL BE INSTALLED WITH A FLUSH VALVE AND AIR RELIEF VALVE, IN THE EVENT THAT A DRIP ZONE HAS MORE THAN ONE HIGH OR LOW POINT, MORE THAN ONE AIR RELIEF VALVE OR FLUSH VALVE WILL BE REQUIRED FOR THAT ZONE. DRIPLINE SHALL PROVIDE 0.9 GPH EMITTERS, 12" O.C. WITH 12" LINE SPACING AT A MINIMUM.
29. ALL WIRING FOR CONNECTION OF THE VALVES TO THE CONTROLLER SHALL FOLLOW MANUFACTURERS SPECIFICATIONS. IF REQUIRED, ALL WIRING FOR A TWO WIRE PATH SHALL BE WITH RED/BLUE TWISTED PAIR 14 AWG. ELECTRIC CONTROL LINES FROM THE DECODER TO THE SOLENOID VALVES SHALL BE TWISTED PAIR 18 AWG. ALL DECODERS SHALL BE GROUNDED EVERY 1,800 L.F. OR EVERY 10 DEVICES. ALL WIRE SHALL BE FURNISHED IN MINIMUM 2,500' REELS AND SPLICING SHALL BE MINIMIZED. BURY SPLICE KIT. ALL 24 VOLT WIRING SHALL BE DONE IN ACCORDANCE WITH EXISTING CODES. SPLICING SHALL BE IN VALVE BOXES OR CONTROLLERS ONLY. IRRIGATION SYSTEM CONTROL SHALL BE TWO WIRE PATH. CONTRACTOR SHALL FOLLOW ALL MANUFACTURER'S REQUIREMENTS FOR THIS INSTALLATION. TWO WIRE SYSTEM SHALL HAVE 2-WAY COMMUNICATIONS FIELD PROGRAMMABILITY, STATION SPECIFICATIONS AND INTEGRATED SURGE PROTECTION.
30. ALL CONTROL WIRE SHALL BE INSTALLED IN A 1 $\frac{1}{2}$" ELECTRICAL CONDUIT.
31. SMALLEST DIAMETER LATERAL PIPE SHALL BE 3/4".
32. IRRIGATION SYSTEM SHALL BE CAPABLE OF SUPPLYING AN AVERAGE OF 1.0" OF WATER PER WEEK WITHIN WATERING RESTRICTIONS AS APPLICABLE.
33. IRRIGATION SYSTEM SHALL NOT BE INSTALLED THROUGH EXISTING, OR PRESERVED PLANT COMMUNITIES. DO NOT TRENCH THROUGH EXISTING ROOT SYSTEMS OF ANY VEGETATION INTENDED TO BE PRESERVED.
34. CONTRACTOR TO MINIMIZE IRRIGATION OVERTHROW TO IMPERVIOUS AND NATURAL AREAS THROUGH FIELD ADJUSTMENTS TO INDIVIDUAL HEADS.
35. ALL AREAS DISTURBED DURING CONSTRUCTION SHALL BE RESTORED BY THE CONTRACTOR TO THE CONDITION DENOTED ON THE LANDSCAPE PLAN.
36. IRRIGATION PIPING INSTALLED UNDER ROADS AND SIDEWALKS SHALL BE IN SCHEDULE 40 PVC SLEEVING AT 2X THE PIPE SIZE. ALL SLEEVING SHALL BE FREE OF STONES AND DEBRIS.
37. IRRIGATION SOURCE TO BE EITHER WELL, POTABLE, OR NON-POTABLE WATER. IRRIGATION CONTRACTOR TO VERIFY SOURCE PRIOR TO DESIGN.
38. POINT OF CONNECTION TO BE DETERMINED BY OWNER. IRRIGATION SYSTEM CONNECTIONS TO THE LOCAL JURISDICTION SERVICE SHALL COMPLY WITH ALL APPLICABLE CODES.
39. IRRIGATION CONNECTION MAY REQUIRE BACKFLOW PREVENTION, VERIFY WITH LOCAL JURISDICTION.
40. IRRIGATION SYSTEM SHALL COMPLY WITH THE LOCAL JURISDICTION LAND DEVELOPMENT CODE.

1 / L2.51 TYPICAL SCHEMATIC IRRIGATION NOTES

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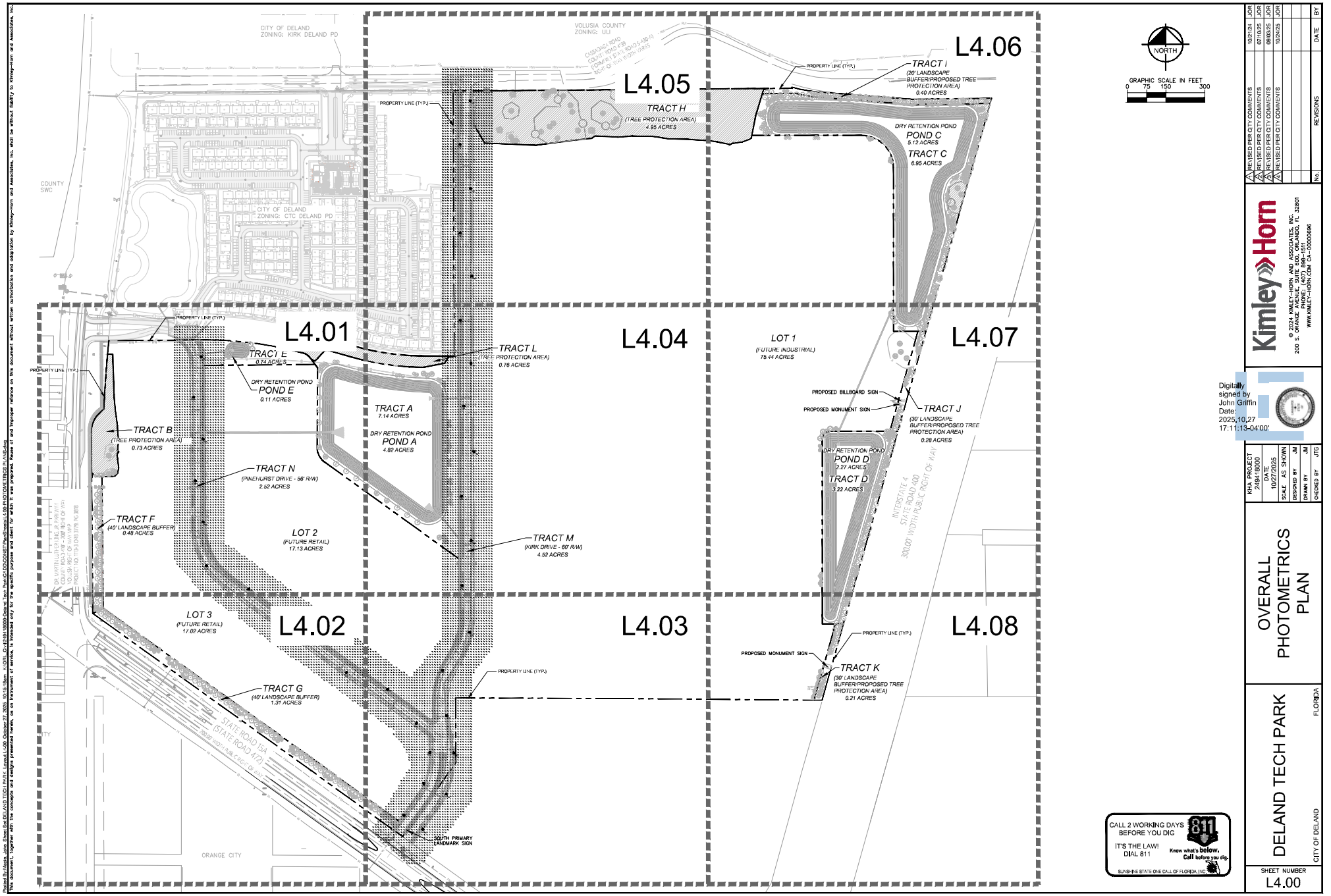
IRRIGATION SPECIFICATIONS

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER L2.51



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OVERALL PHOTOMETRICS PLAN

DELAND TECH PARK

CITY OF DELAND FLORIDA

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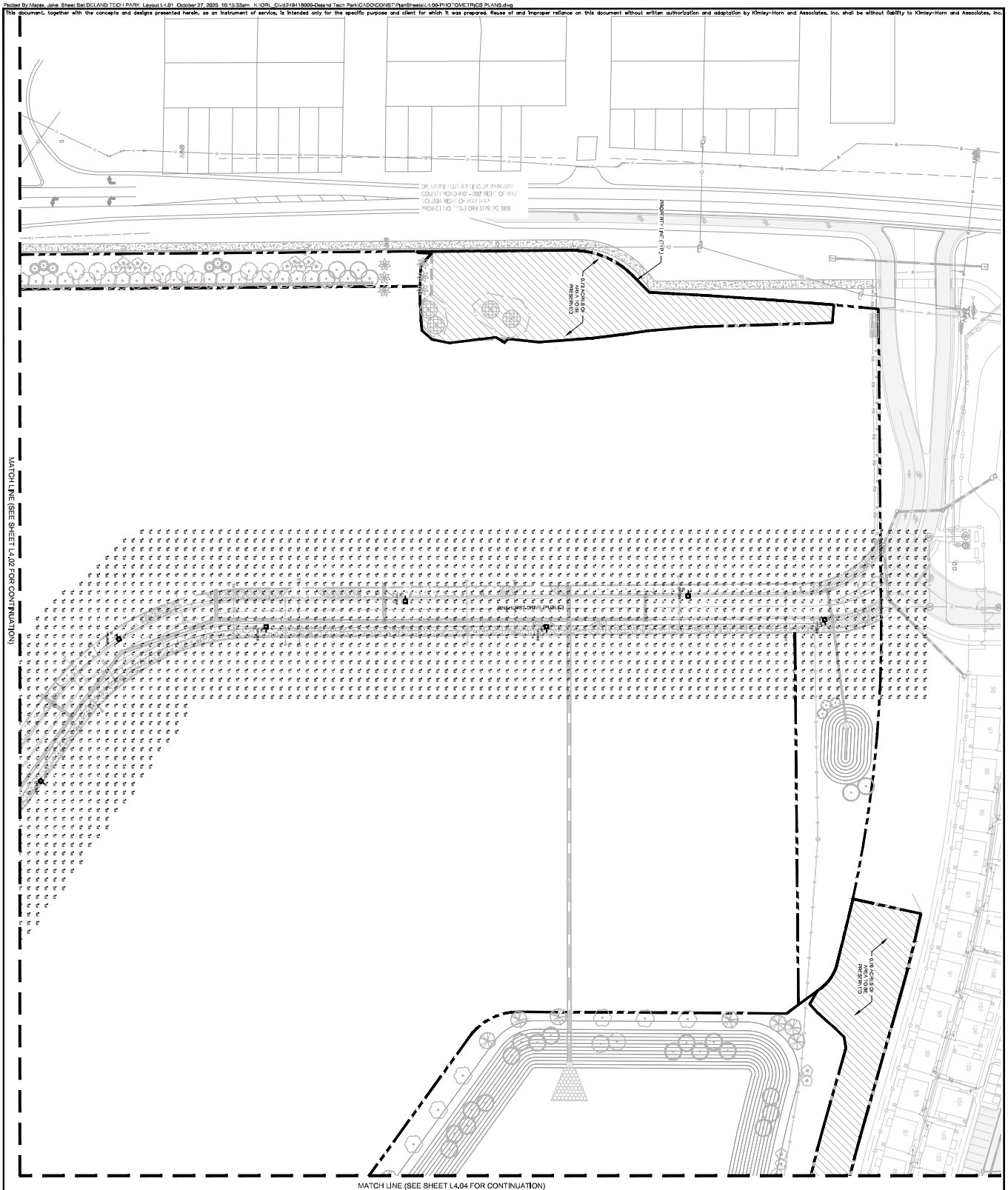

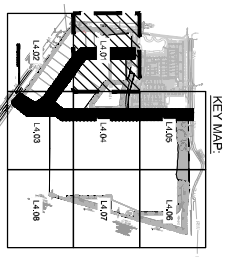

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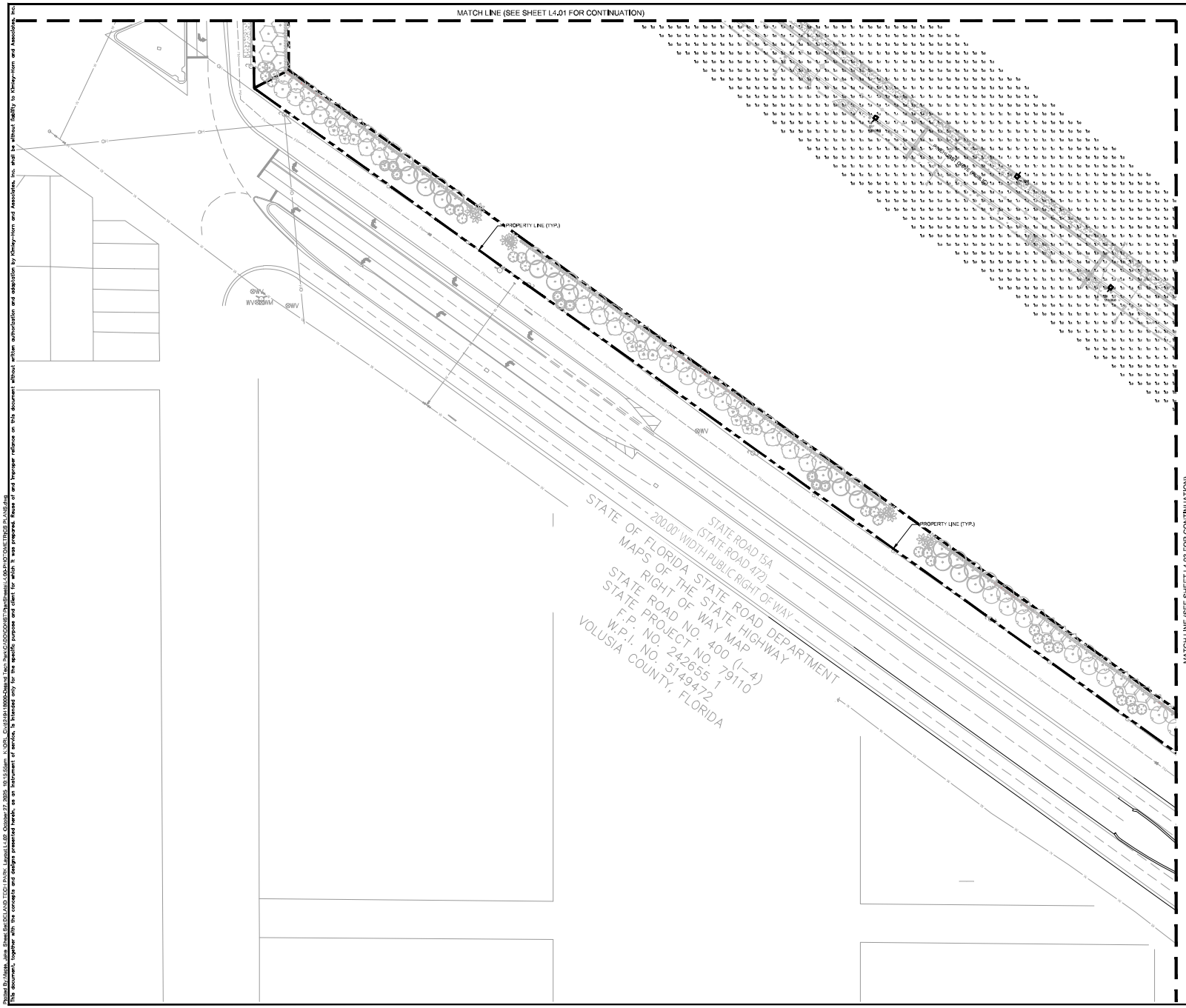

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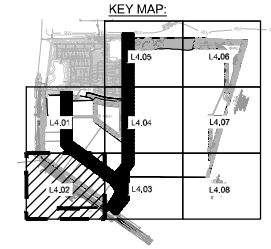

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DELAND TECH PARK
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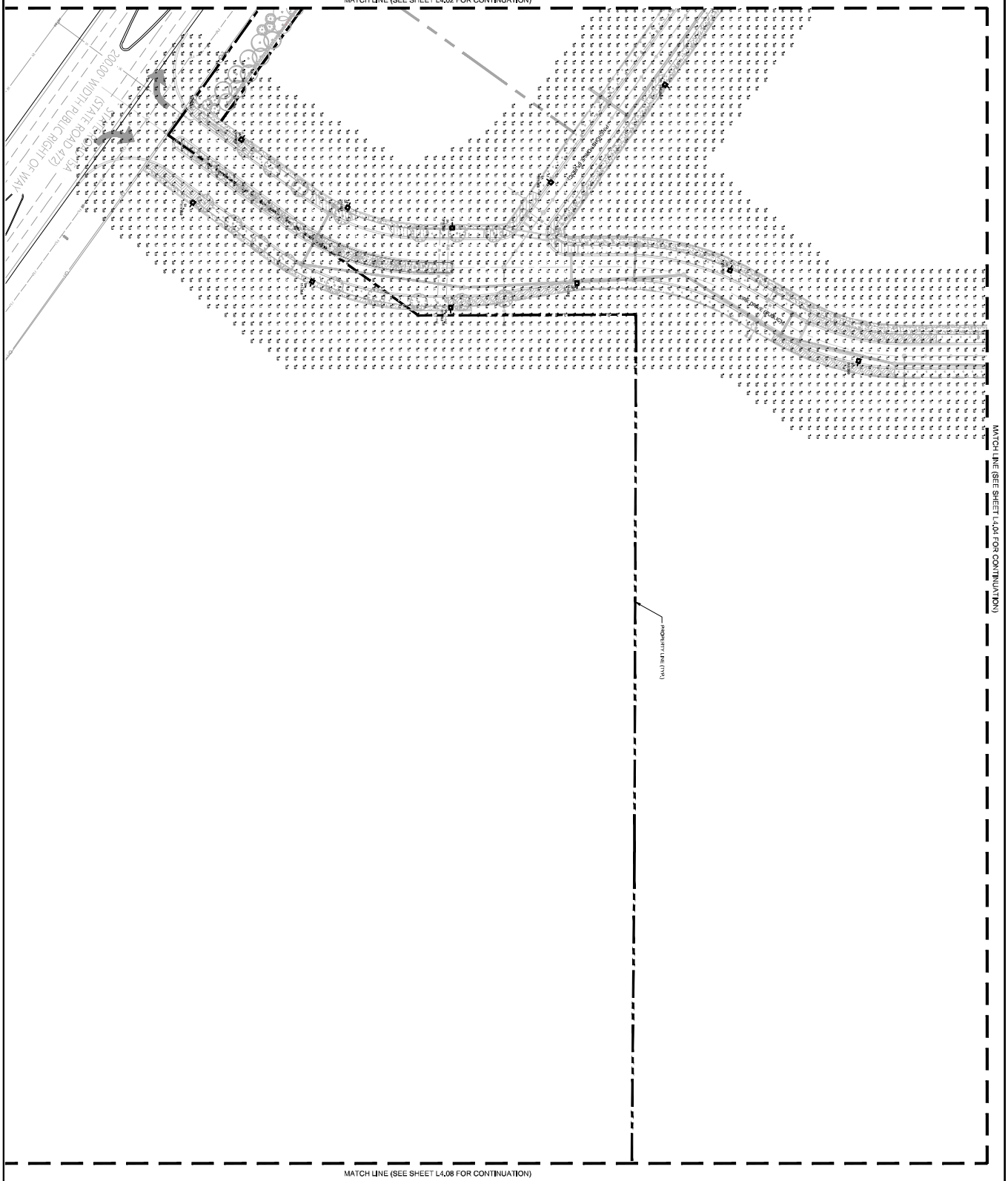

MATCH LINE (SEE SHEET L4.04 FOR CONTINUATION)

MATCH LINE (SEE SHEET L4.08 FOR CONTINUATION)

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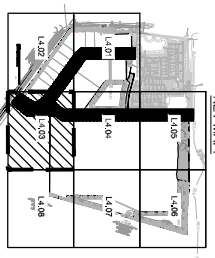

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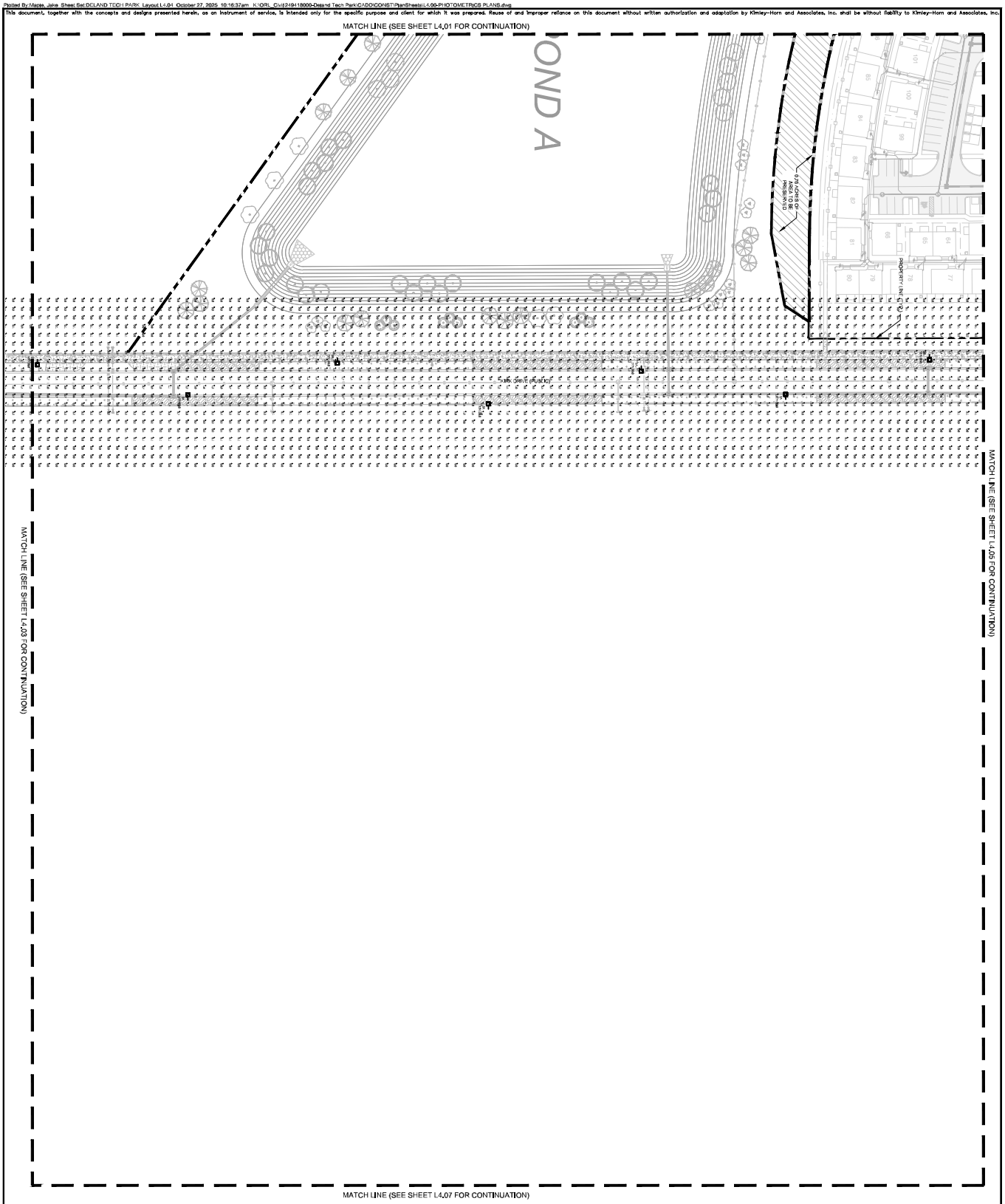

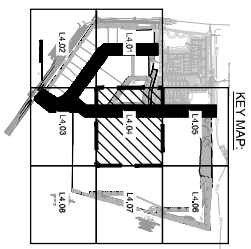

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DELAND TECH PARK
CITY OF DELAND FLORIDA

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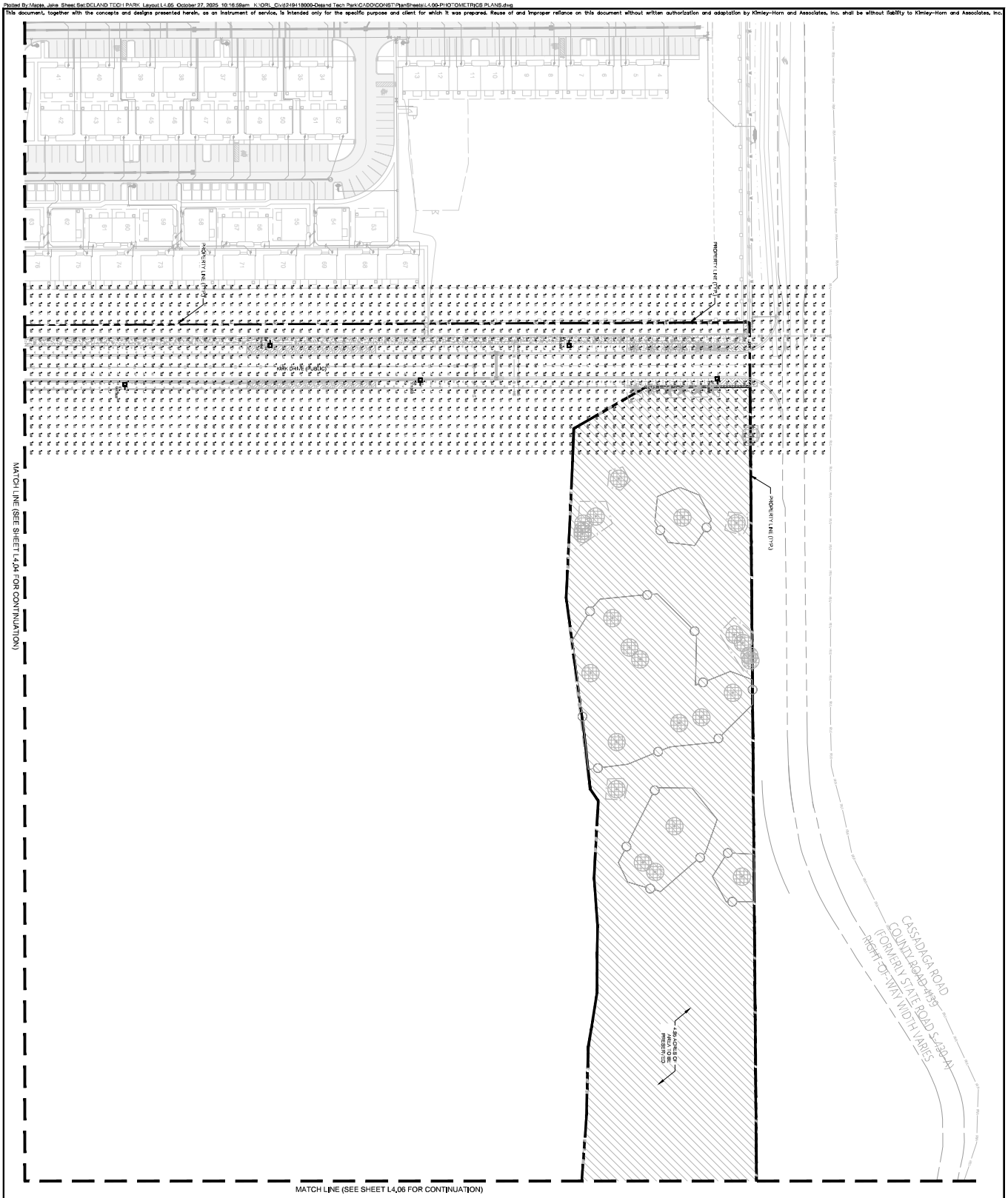

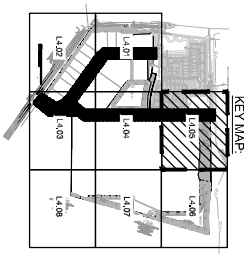

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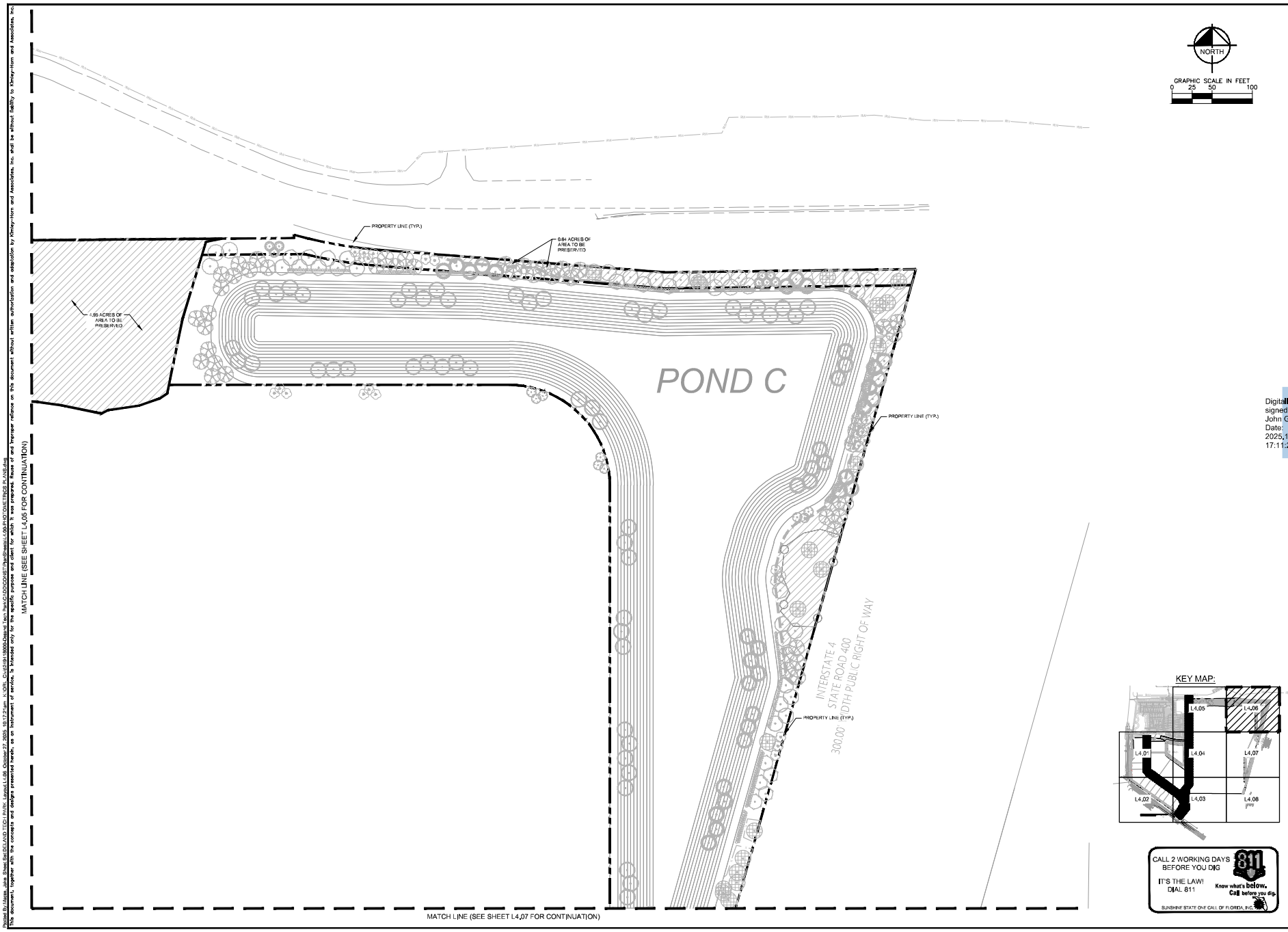

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SHEET NUMBER
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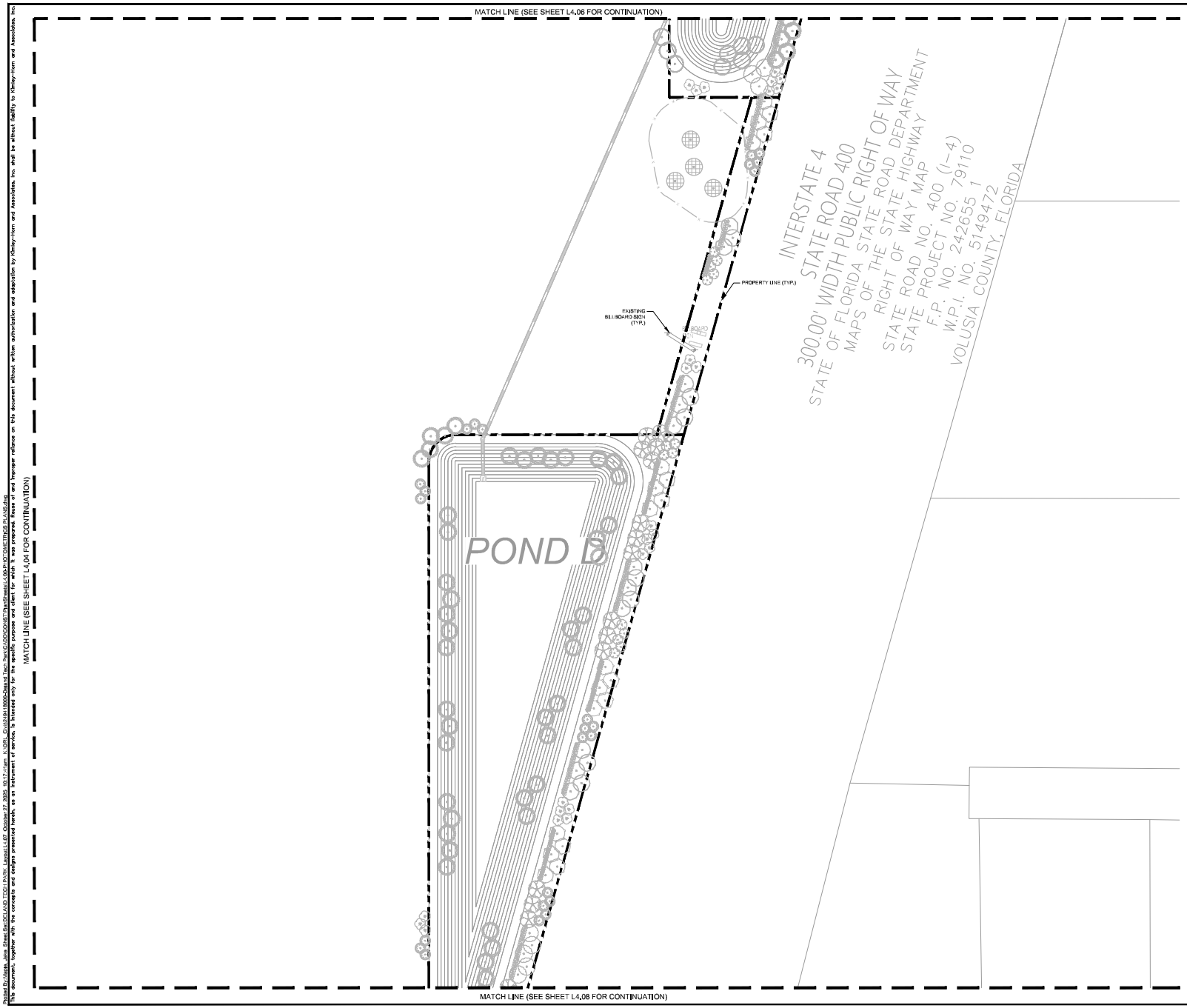

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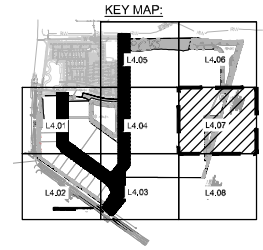

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2	REVISED PER CITY COMMENTS	07/10/25	JOR
3	REVISED PER CITY COMMENTS	09/03/25	JOR
4	REVISED PER CITY COMMENTS	10/24/25	JOR

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DATE 10/27/2025
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DESIGNED BY JM
DRAWN BY JM
CHECKED BY JTG

PHOTOMETRICS PLAN

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER
L4.07

Plotted By:Maria Jake Sheet Set:DELAND TECH PARK Layout:L4.07 October 27, 2025 10:17:41am K:\ORL_Civil\249418000-Deland Tech Park\CADD\CONST\PlanSheets\L4.06-PHOTOMETRICS PLANS.dwg
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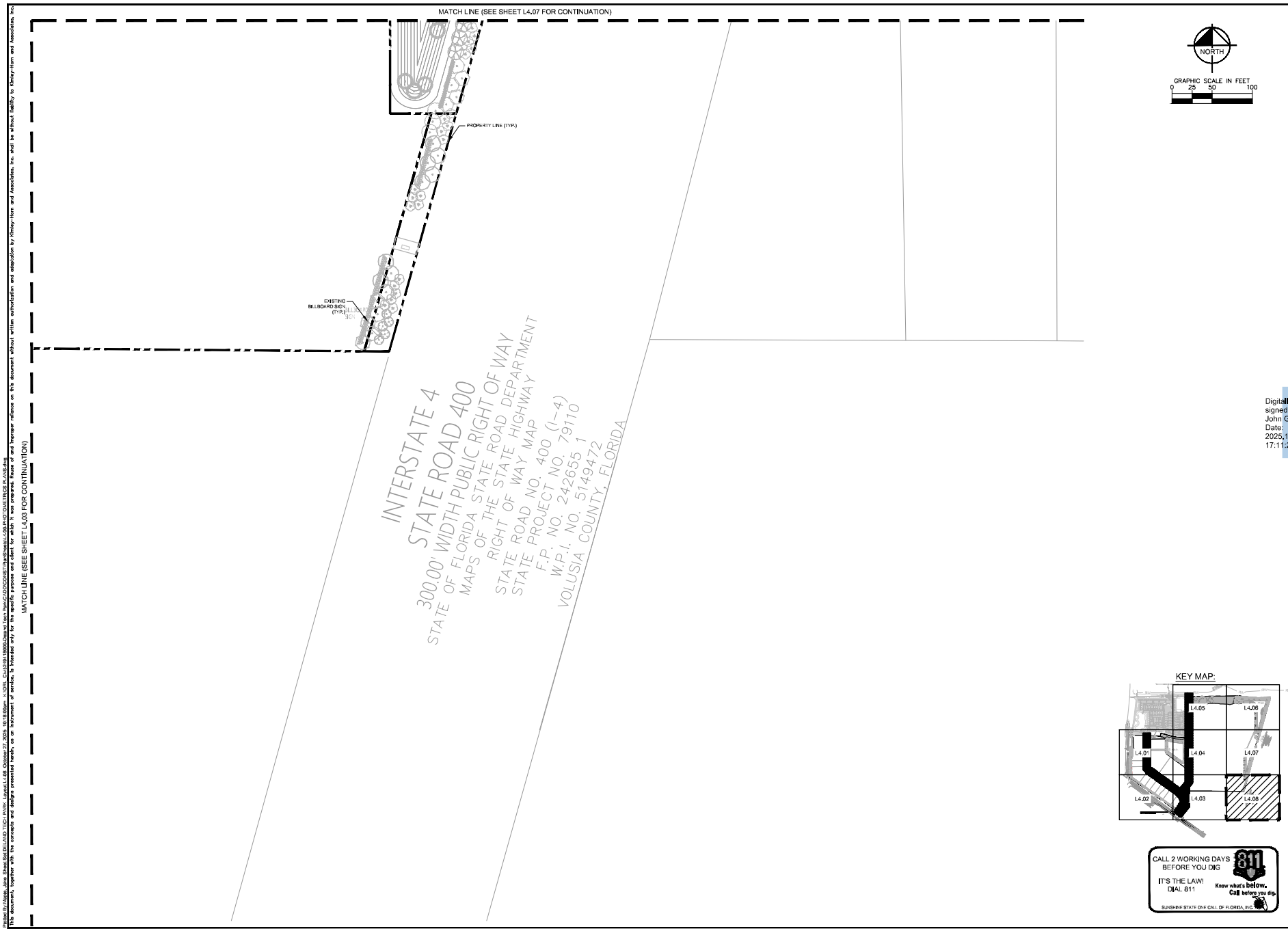

No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/21/24	JOR
2	REVISED PER CITY COMMENTS	07/10/25	JOR
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PHOTOMETRICS PLAN

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER
L4.08

Plotted By:Marie Jake Sheet Set:DELAND TECH PARK Layout:L4.08 October 27, 2025 10:18:00am K:\ORL_Civil\249418000-Deland Tech Park\CADD\CONST\PlanSheets\L4.08-PHOTOMETRICS PLANS.dwg
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Luminaire Schedule									
Symbol	Label	Qty	Arrangement	Description	LLF	Lum. Watts	Lum. Lumens	BUG Rating
—□	Sternberg Lighting	33	SA	Single	PT ML740 24L 40 T3 MD LDS1 CA SQA RD XX XX XX, PD, T MOUNTED @ 30FT AFG	1.000	87.3	10790	B2-U0-G2

Calculation Summary								
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
Totals	Illuminance	Fc	0.89	2.6	0.0	2.31	6.67

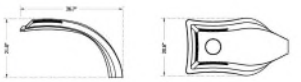
Specification Sheet

Millenia™
ML740 Large Tenon Mount

Project Name _____ Qty _____

Type _____ Catalog / Part Number _____





CCT - Color Temp (K)

2,700K 3,000K 3,500K 4,000K 5,000K

7 Year Warranty

Certifications

Description

The Millenia™ ML740 large vertical tenon mount luminaire is a breakthrough in modern area lighting technology. Its new world urban design transcends traditional lighting convention by seamlessly interweaving form and function to yet another level. Available with a myriad of options, the Millenia™ is perfect for commercial, institutional and municipal markets.
EPA: 2.2 (ft²) | WEIGHT: 40 LBS

Features

Mounting Configuration	**PT:** Post Top
Optional Control Receptacle	**RT:** 7-Pin control receptacle only
Optional Control	**PE:** Twist-Lock Photocontrol (120V-277V) **PER:** Twist-Lock Photocontrol (347V-480V) **SC:** Shorting Cap
Optional Fuse	**FHD:** Double Fuse and Holder
Optional House Side Shield	**HSS:** 120° House Side Shield **BLOC:** Back Light Optical Control
Optional Fixed Dimming Resistor Board	**FDRB:** Fixed Dimming Resistor Board

Physical

Fixture	**ML740:** Large Millenia Tenon Mount
Lens	**CA:** Clear Acrylic **SV1:** Flat Soft Vue Light Diffused Acrylic **SV2:** Flat Soft Vue Moderate Diffused Acrylic
Optional Pole Adapter	**SQA:** Square pole adapter for 4" square pole shafts
Finish	**DGM:** Urban Gun Metal Textured **UBT:** Urban Bronze Textured **USLT:** Urban Silver Textured **UWHT:** Urban White Textured **BKT:** Black Textured **UGM:** Urban Gun Metal Matte **UB:** Urban Bronze Matte **USL:** Urban Silver Matte **UWH:** Urban White Matte **CM:** Custom Match

Sternberg

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Date: 2025.10.27 17:11:26-04'00'

SSA — Square Straight Aluminum Pole — No Arm — 4-Bolt Base



Satin Aluminum or Powder Coated Finish per Customer Specification

C Butt Sq.	D Top Sq.	E Bolt Sq. Dia.	F Base Sq. Dia.	G Bolt Proj.	H Base Thk.
4	4	6.5 - 8.5	8.875	1.5	.75 x 17 x 3
5	5	10.5 - 11.5	11.25	2	.75 x 20 x 3
8	6	12 - 13	12.75	2.25	1 x 20 x 4
9.625	8.625	13 - 14	13.5	2.25	1 x 20 x 4

Dimensions in Inches

Pole
The pole shaft will be constructed of seamless extruded tube of 6063 Series Aluminum Alloy per the requirements of ASTM B221. The shaft assembly shall be full-length heat treated after base weld.

Base Style
4-Bolt Cast Aluminum Base Flange of Alloy 319-T6 with Aluminum Snap-In Bolt Covers.

Handhole
4"-6" Bolt Squares -
2" x 4" Handhole with square Lay-Style Aluminum Door and two (2) Stainless Steel Self-Tapping Attaching Screws. A Grounding Provision incorporating a tapped 1/4"-20NC Grounding Provision is provided opposite the Handhole.
8" - 9" Bolt Square -
3" x 5" Handhole with square Lay-Style Aluminum Door and two (2) Stainless Steel Self-Tapping Attaching Screws. A Grounding Provision incorporating a tapped 1/4"-20NC Grounding Provision is provided opposite the Handhole.

Anchorage
Anchorage kit will include four (4) L-shaped Steel Anchor Bolts conforming to ASTM F1554 Gr. 55. Ten inches (10") of threaded end will be galvanized per ASTM A153. Kits will contain four (4) Hex Nuts, four (4) Lock Washers, and four (4) Flat Washers (all components fabricated Steel). A bolt circle template will be provided.

Vibration Damper
If determined necessary by Hapco, a top mount, limit installed Pole Mast Vibration Damper will be provided. Customer specification of the damper is available.

Mounting Designation
Side Drill Mount
For Side Drill Mount applications specify luminaire type, quantity and orientation. A luminaire drilling template must be supplied at time of order.

Tenon Mount
For Tenon Mount applications specify both Tenon diameter (2.375", 2.875", 3.5", etc.) and length (6", 8", etc.)

FLORIDA BUILDING CODE GUIDE 2017 FBC EPEV

WARNING: Do not install light pole without luminaire.

No.	REVISIONS	DATE	BY
1	REVISED PER CITY COMMENTS	10/27/25	JDR
2	REVISED PER CITY COMMENTS	07/10/25	JDR
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KHA PROJECT 248418000
DATE 10/27/2025
SCALE AS SHOWN
DESIGNED BY AM
DRAWN BY AM
CHECKED BY JTG

PHOTOMETRICS SCHEDULE

DELAND TECH PARK

CITY OF DELAND FLORIDA

SHEET NUMBER L4.09

LONGLEAF FOUR
DeLand, Volusia County, FL

Biological Site Assessment Report

VHB Project No. 64054.00

Submitted to:

Mr. Harry "Mac" McNaught
Longleaf Four, LLC
320 North Meridian Street
Suite 700
Indianapolis, IN 46204

Submitted By:



225 E. Robinson Street, Suite 300
Landmark Center Two
Orlando, FL 32801
Ph: 407-839-4006

March 25, 2022

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INTRODUCTION

VHB conducted a biological site assessment on January 26 and March 15, 2022, to evaluate an approximately 141.16-acre property located along the east side of Dr. Martin Luther King Jr. Beltway, south of Cassadaga Road, west of Interstate 4, and north of CR 472 (**Exhibit 1**). More specifically, the site address is 1445 Cassadaga Road, Deland, Volusia County, Florida. The overall Project Area includes all or portions of Parcel ID Numbers listed below:

810600000060	810600000070	810600000071
810600000090	810600000100	810600000110
810600000091	810604000170	810600000122
	810600000124	

The approximate center of the project is located at longitude -81.153514°W, latitude 28.575182°N. The project comprises low density residential development, improved pastures and related agricultural activities, and undeveloped forested lands. Surrounding land uses include low density residential development and undeveloped forested lands. (**Exhibit 2**). The Client proposes to develop the property as light industrial/warehouse space with commercial/retail outparcels along SR 472. The overall purpose of the site assessment was to determine if wetlands occur on site and to evaluate the site for the occurrence or the potential for occurrence of protected species.

EXISTING ECOLOGICAL CONDITIONS

Soils

Based on the Natural Resources Conservation Service (NRCS) Soil Survey of Volusia County, four (4) soil types are mapped within the project as shown on **Exhibit 3**.

1- Apopka fine sand, 0 to 5 percent slopes (non-hydric)
4- Astatula fine sand, 0 to 8 percent slopes (non-hydric)
5- Astatula fine sand, 8 to 17 percent slopes (non-hydric)
63- Tavares fine sand, 0 to 5 percent slopes (non-hydric)

Hydric soil designations are based on the Hydric Soils of Florida Handbook (2007). Hydric soils are generally associated with wetlands while non-hydric soils are typically indicative of uplands.

Land Use

The project is characterized by a mixture of low density residential and rural structures, improved pastures, woodland pastures, and undeveloped forested areas (**Exhibit 4**). Designated land uses are classified and described using the Florida Department of Transportation (FDOT) Land Use, Cover and Forms Classification System (FLUCFCS), January 1999, and the Florida Natural Areas Inventory (FNAI) Natural Communities Guide, 2010. There are seven (7) FLUCFCS/FNAI classifications identified within the project. A description of each classification type is provided below.

Uplands

Low Density Residential (FLUCFCS 110) / Residential, Low Density (FNAI) (7.39 acres) – This land use includes several single-family homes that lie along Cassadaga Road. The area consists of maintained grass and gravel driveways with scattered hardwood trees.

Light Industrial (FLUCFCS 155) / Rural Structures (FNAI) (4.39 acres) – This land use includes rural structures containing heavy machinery and various construction supplies consistent with agricultural use. The structures are associated with a company that specializes in bridge rehabilitation and other marine construction. As such, industrial spoil piles were also visually observed. The remaining area consists of maintained grasses and gravel surfaces.

Improved Pasture (FLUCFCS 211) / Cropland/Pasture (FNAI) (48.04 acres) – The majority of the project is comprised of open pastures used for livestock grazing. Cattle and other livestock were observed throughout the area. This land use is dominated by bahiagrass (*Paspalum notatum*), with scattered slash pine (*Pinus elliottii*) and live oak (*Quercus virginiana*).

Woodland Pasture (FLUCFCS 213) / Mesic Flatwoods (FNAI) (11.86 acres) – This land use is associated with livestock grazing. The area has a canopy that is dominated by slash pine and live oak, with scattered laurel oak (*Quercus laurifolia*), red cedar (*Juniperus virginiana*), and black cherry (*Prunus serotina*). The understory includes bahiagrass, blackberry (*Rubus pensilvanicus*), muscadine (*Vitis rotundifolia*), and beggar-ticks (*Bidens laevis*).

Pine-Mesic Oak (FLUCFCS 414) / Mesic Hammock (FNAI) (11.12 acres) – This land use consists of undeveloped historical pine plantation that has been overtaken by laurel oak,

turkey oak (*Quercus laevis*), and cabbage palm (*Sabal palmetto*) with scattered hardwood species such as sweetgum (*Liquidambar styraciflua*) and red maple (*Acer rubrum*). The understory consists of saw palmetto (*Serenoa repens)* and muscadine.

Xeric Oak (FLUCFCS 421) / Xeric Hammock (FNAI) (32.75 acres) – This land use is undeveloped forested land which found on the west side of the property near CR 427. The area is dominated by scrub oak (*Quercus inopina*), but also contains live oak, laurel oak, and scattered slash pine in the canopy. The understory consists of turkey oak, saw palmetto, and reindeer moss (*Cladonia rangiferina*). The ground cover is sparse or covered with leaf litter.

Hardwood – Conifer Mixed (FLUCFCS 434) / Mixed Hardwood – Coniferous (FNAI) (25.61 acres) – This land use consists of undeveloped forested land with a mature canopy consisting of mature slash pine, with scattered laurel oak and cabbage palm. The understory consists of American holly (*Ilex opaca*), saw palmetto, muscadine, and toothpetal false reinorchid (*Habenaria floribunda*).

Protected Wildlife and Plant Species

The intent of the site assessment was to record any direct or indirect observations of protected species and record any habitats that could potentially be utilized by protected species. A review of publicly available GIS data was conducted to determine the potential for, or the occurrence of protected species listed by the Florida Fish and Wildlife Conservation Commission (FWC) or the US Fish and Wildlife Service (USFWS). **Exhibit 5** depicts the publicly available GIS data for several protected species in this region. The potential for site utilization of each protected species is provided below. Not all protected species are covered in this report. If there was no habitat or potential for occurrence, specific species may not be mentioned. Two protected species were observed within the project limits; potentially occupied gopher tortoise burrows and a sandhill crane were observed.

Federally Protected Species

The Everglade snail kite (*Rostrhamus sociabilis plumbeus*) is listed as Endangered by the USFWS, and the project falls within the consultation area for this species. The Everglade snail kite is primarily found in lowland freshwater marshes and in the shallow vegetated edges of lakes (natural and man-made) where they feed almost entirely on apple snails *(Pomacea* spp.). Freshwater marshes and shallow vegetated lakes are not present and therefore, impacts to Everglade snail kites are not anticipated.

The red cockaded woodpecker (*Picoides borealis*) is listed as Endangered, and the site falls within the USFWS consultation area for this species. This species depends on specialized habitat composed of mature longleaf, slash, and loblolly pine flatwoods. Slash pine communities located within the project contain trees that are associated with this species. Red cockaded woodpeckers typically prefer mature pine trees aged 30 years or greater with a typical size of 10 inches at Diameter Breast Height (DBH). During the site assessment, it was determined that the pines are mature and have an estimated age of 60 to 80 years old and an average of 20 to 23 inches at DBH. However, no red cockaded woodpeckers or cavities were observed during the site assessment and public records show no previous sightings in the surrounding areas. The likelihood of the species to occur is low but there is suitable foraging habitat present. Given that the project falls within the consultation area for the species, further consultation with USFWS is recommended to determine if additional species-specific surveys will be required to determine the presence or absence of the species on site.

The Florida scrub jay (*Aphelocoma coerulescens*) is listed as Threatened by USFWS. The site falls within the consultation area for this species and contains habitat types preferred by the Florida scrub jay, including improved pastures, woodland pastures, and xeric oak. According to USFWS's 2019 Draft Revised Recovery Plan for the Florida Scrub-Jay, optimal habitat requires oaks that are between four (4) and six (6) feet high, interspersed with numerous patches of bare sand or sparse herbaceous vegetation, a sand pine canopy of less the 15 percent and it must be greater than 984 ft from a forest edge. Currently, no optimal habitat exists onsite as oak trees currently exceed eight (8) feet with no open sandy areas. However, there is scrub jay habitat found on site that is considered sub-optimal since the canopy has grown dense due to fire suppression, and the pastures lack the presence of scrub oaks. In addition, Volusia County has classified the site as potential habitat. During the biological assessment, scrub jay calls were played, but no Florida scrub jays were documented or identified. This initial review does not constitute an official survey, however based on observations, the potential for scrub jays to inhabit this site is moderate to low, as scrub jays were previously known to inhabit property to the southeast (2005), with multiple sightings a mile south of the site ranging from 2015 to 2021. Due to the potential suitable habitat and the fact that the site is located within the consultation area, agency consultation and a species-specific survey using the required methodology will be required to determine the presence or absence of the species. According to USFWS, surveys may be conducted between March 1 through October 31 with ideal periods occurring in March, July, September, and October. Surveys should be carried out for a minimum of five (5) days on calm and clear

days one hour after sunrise before midday heat. If scrub jays are found, there are mitigation options available to meet agency requirements.

The wood stork (*Mycteria americana*) is listed as Threatened and consultation with the USFWS is required for any proposed work that impacts wood stork core foraging habitat (primarily shallow, non-forested wetlands and surface waters) within defined Core Foraging Areas (CFA). The project is located within the designated CFA and the closest known colony (Hontoon Island) is approximately 6.3 miles to the west. No wood storks were observed on or adjacent to the property. Additionally, there are no wetlands or suitable habitat for foraging or nesting by this species. Therefore, this project should have no effect on this species.

The eastern indigo snake (*Drymarchon corais couperi*) is listed as Threatened by the USFWS. No indigo snakes were detected during the site visit. Indigo snakes prefer xeric habitats, utilizing tortoise burrows and tree cavities for refuge. The project contains some xeric habitat, and several gopher tortoise burrows were observed. However, due to the inactivity of the burrows and limited size of surrounding xeric habitats, the likelihood of this species utilizing the site is low. In order to avoid impacts to this species the USFWS's Standard Protection Measures for the Eastern Indigo Snake should be followed during construction activities. By following these protection measures, according to the Eastern Indigo Snake Effect Determination Key established in a January 25, 2010, letter from USFWS, updated August 1, 2017, this project would have a "not likely to adversely affect" determination, and no further action will be required.

No federally protected plant species were observed during the assessment.

State Protected Species

The Florida sandhill crane (*Grus canadensis*) is listed as Threatened by the FWC. The sandhill crane prefers freshwater marshes, prairies, and pastures. Several sandhill cranes were observed foraging on site during the biological assessment; however, no nests were observed, and the site lacks nesting habitat (**Exhibit 6**). Additional surveys of the project should be conducted prior to construction to ensure that no sandhill cranes are utilizing the site for nesting. Nesting surveys are conducted between January and July. If an active sandhill crane nest is found, a 400-foot buffer from development activities must be maintained until the eggs have hatched and the chicks have vacated the area. Due to the absence of wetlands or surface waters, the likelihood of sandhill cranes nesting and occupying the area is low, however the likelihood of this species utilizing

the area for intermediate foraging is moderate to high. No adverse impacts to the sandhill crane are anticipated.

The Southeastern American kestrel (*Falco sparverius paulus*) is listed as Threatened by the FWC and potential, but sub-optimal, habitat exists onsite. While kestrels are known to utilize a wide range of habitat types, preferred habitat includes open pastures, fields, mesic flatwoods, and sandy flatwoods. These birds utilize open areas for foraging and often nest in abandoned woodpecker cavities, tree snags, or utility poles. No kestrels or suitable cavities/snags were observed onsite. However, the open pasture and maintained/low growing vegetation areas found in the woodland pasture may provide potential foraging and nesting habitat. Typically, if a project site contains less than 125 acres of defined potential habitat and kestrels are not observed, no additional surveys are required. As less than 125 acres of suitable habitat currently exists within the project, limited to the pasture areas, the project is not expected to adversely impact the kestrel. However, in the event that kestrels are observed on site in the future, transects surveys would be required. These surveys should be conducted from April to August to avoid observations of the non-protected, migratory subspecies. Surveys are to be conducted for six to eight days with four to seven days between each survey. If kestrels are found foraging but not nesting onsite, habitat protection and nest boxes are recommended. However, if kestrels are also nesting on site and the nest cannot be avoided, consultation with, and a permit from, FWC will be required.

According to FWC data, no wading bird rookeries are located within or immediately adjacent to the project. The closest recorded location of a breeding bird colony is mapped approximately 7.5 miles south. Due to this distance, and the lack of wetlands, no wading bird rookeries or breeding bird areas should be adversely affected.

The gopher tortoise (*Gopherus polyphemus*) is listed as Threatened by the FWC. Gopher tortoises prefer well-drained, sandy soils found in habitats such as longleaf pine, sandhills, xeric oak hammocks, scrub, pine flatwoods, dry prairies, and coastal dunes but are also found in urban areas, pastures, and abandoned orange groves. Four potentially occupied and one abandoned gopher tortoise burrow were identified within project limits (**Exhibit 6**). Gopher tortoise surveys are valid for 90 days and an additional 100% species specific survey should be conducted prior to construction to ensure that all tortoises have been accounted for. Any burrows that cannot be avoided by a 25-foot buffer, will require a permit from FWC to relocate the tortoises to an approved offsite recipient area or undeveloped and preserved onsite established recipient site area prior to any construction activities. Based on preliminary surveys, the population density is

not expected to exceed ten (10) burrows, therefore a 10 or Fewer Burrow Relocation permit from the FWC is anticipated. If all FWC guidelines are followed and the gopher tortoises are relocated, there should be no further impacts to the species.

No state protected plant species were observed during the assessment. There are no restrictions to the landowner due to the presence of any state-listed plant species unless sale of the plants is involved.

Other Protected Species

The southern bald eagle is not a listed species but is protected under the federal Bald and Golden Eagle Protection Act. Onsite and adjacent areas were visually scanned for the presence of bald eagle nest trees and no eagle nests were observed. In addition, the FWC Eagle Nest Locator and the Audubon Florida EagleWatch databases of known bald eagle nests were reviewed to determine if any active bald eagle nests are mapped in the vicinity. According to these databases, the nearest bald eagle nest (VO083) is mapped 2.6 miles east-southeast of project and was reported active in 2021. The USFWS indicates that all projects greater than 660 feet from a bald eagle nest tree do not need USFWS review. Given the distance of the mapped nest from the project area and provided no new nests are constructed closer to the project in the future, there should be no need for USFWS consultation as development will have no effect on the bald eagle.

The Florida black bear (*Ursus americanus floridanus*) has been de-listed from Florida's imperiled species list, though it still receives protection under the state's Florida Black Bear Conservation Rule; 68A- 4.009, F.A.C. This rule protects bears from intentional "take", which includes pursuing, hunting, molesting, capturing, or killing, or attempting those actions, whether or not such actions result in possession of the bear. The project does fall within the black bear's primary home range, which means bears are abundant in this area. According to FWC descriptions, the primary range is defined as an area that contains a core bear population, important habitat for bear movement, and evidence of reproduction. Long-term records for nuisance black bear reporting identify bears throughout the region (**Exhibit 5**). There are no FWC-established black bear best management practices for construction areas, but recommendations include temporarily halting operations until the bear has left the area and providing regular gaps in safety fences or other barriers to travel. Daily removal of trash from the site is also recommended. Intentional "take" should not occur as a result of this proposed project.

Thus, no adverse impacts to Florida black bears are anticipated and no further consultation with FWC is anticipated.

WETLANDS AND SURFACE WATERS

There are no wetlands or surface waters located within the project, and therefore this project will not require wetland permitting, though an Environmental Resource Permit (ERP) will be required from the St. Johns River Water Management District (SJRWMD) to ensure that the designed stormwater systems will comply with water quality standards.

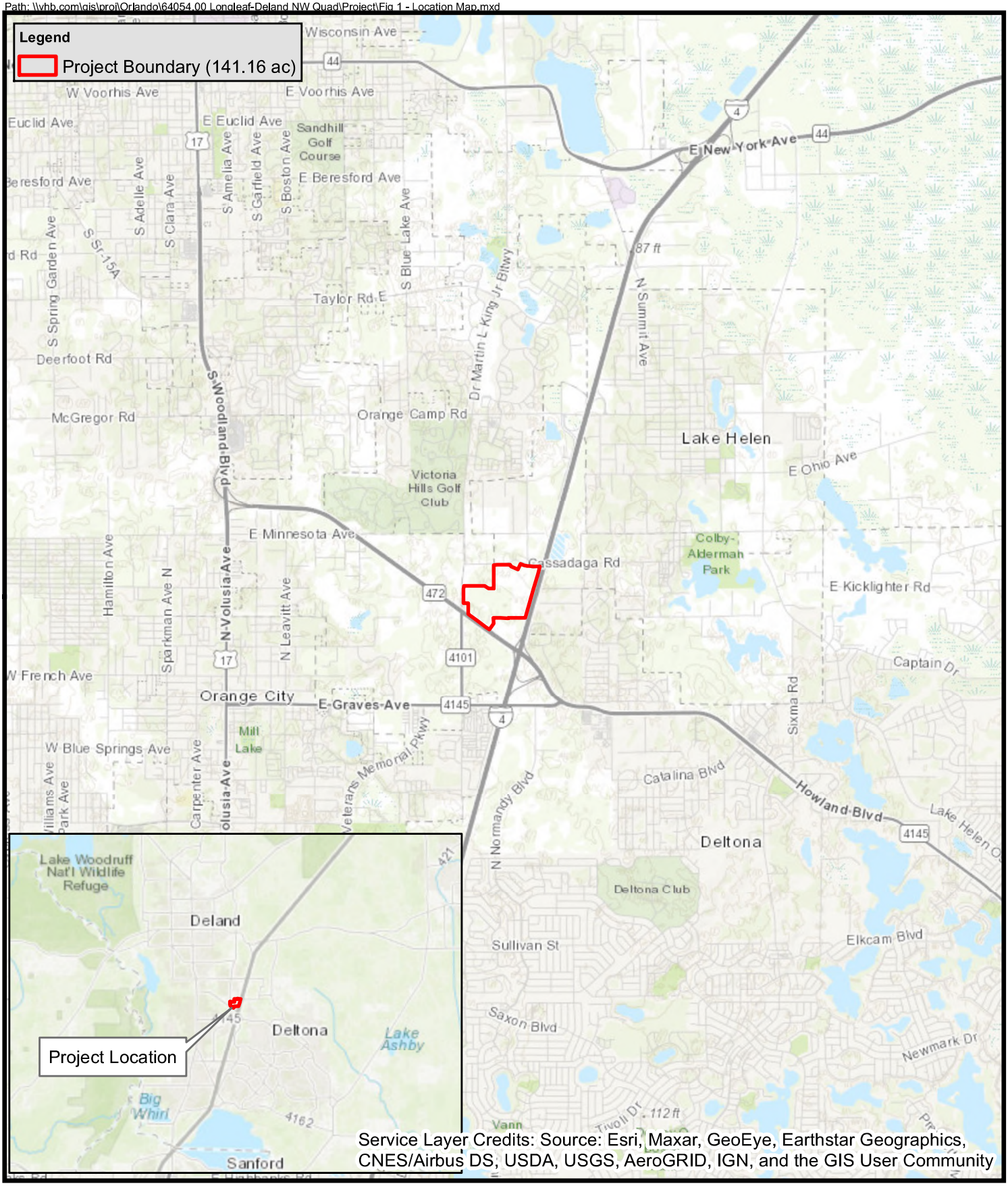
SUMMARY

This biological site assessment report provides an overview of site conditions and outlines sensitive natural resources/protected species which should be considered prior to project implementation. Protected species have been evaluated and the project falls within the USFWS consultation area for several species in which additional consultation and/or species-specific surveys are required or recommended:

- Florida scrub jay
- Red cockaded woodpecker
- Gopher tortoise

In addition, to comply with federal regulations, the Eastern Indigo Snake Standard Protection Measures should be followed during construction to alleviate the need for formal consultation with USFWS with respect to eastern indigo snakes. An additional nest survey for sandhill cranes should also be conducted prior to construction, if construction is to commence during the nesting season. In addition, if sandhill cranes are observed foraging in the area during construction, the contractors should cease work until the cranes have vacated the area. A 100% survey for gopher tortoises should be conducted prior to construction and a FWC 10 or Fewer Burrow Relocation permit should be obtained for relocation efforts to ensure there are no impacts to this species. In addition, recommendations for dealing with bears should also be considered. No federal or state protected plant species were observed during the field assessment. Wetland permitting is not required given that wetlands are not present onsite. However, the project will require an ERP permit from the SJRWMD for stormwater and water quality compliance.

Path: \\vhb.com\gis\proj\Orlando\64054.00 Longleaf-Deland NW Quad\Project\Fig 1 - Location Map.mxd



Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

225 East Robinson Street, Suite 300
Orlando, Florida 32801 | 407.839.4006

EXHIBIT 1: LOCATION MAP

Longleaf Four

DeLand, Volusia County

Date: March 2022

0 3,000 6,000 Feet N

Path: \\vhb.com\gis\proj\Orlando\64054.00 Longleaf-Deland NW Quad\Project\Fig 2 - Aerial Map.mxd



vhb
225 East Robinson Street, Suite 300
Orlando, Florida 32801 | 407.839.4006

0 450 900 Feet N

EXHIBIT 2: AERIAL MAP

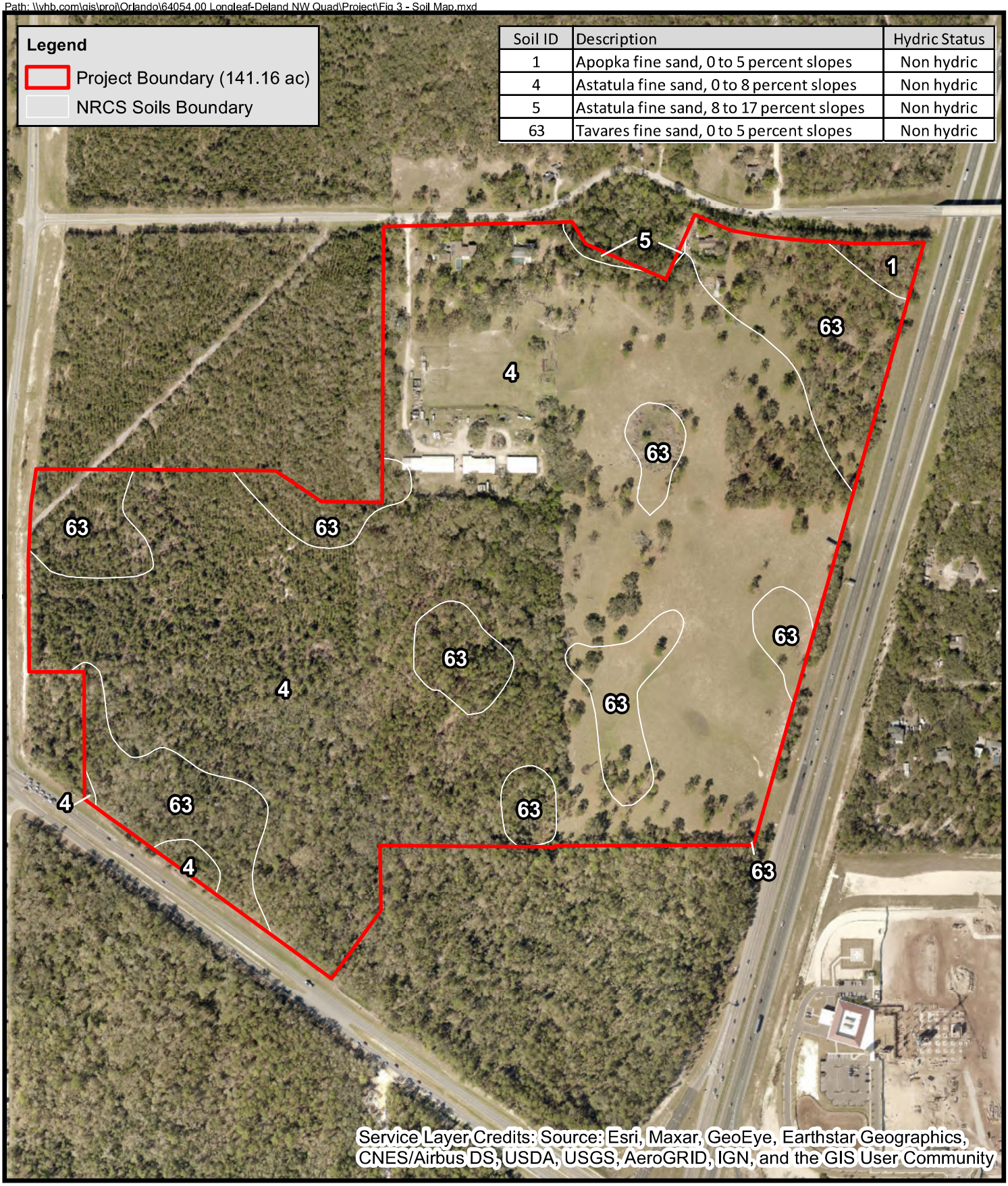
Longleaf Four

DeLand, Volusia County

Source:
2019 Aerial

Date: March 2022

Path: \\vhb.com\gis\proj\Orlando\64054.00 Longleaf-Deland NW Quad\Project\Fig 3 - Soil Map.mxd



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Orlando, Florida 32801 | 407.839.4006

Source:
Natural Resources Conservation Service GIS Data.

EXHIBIT 3: NRCS SOIL MAP

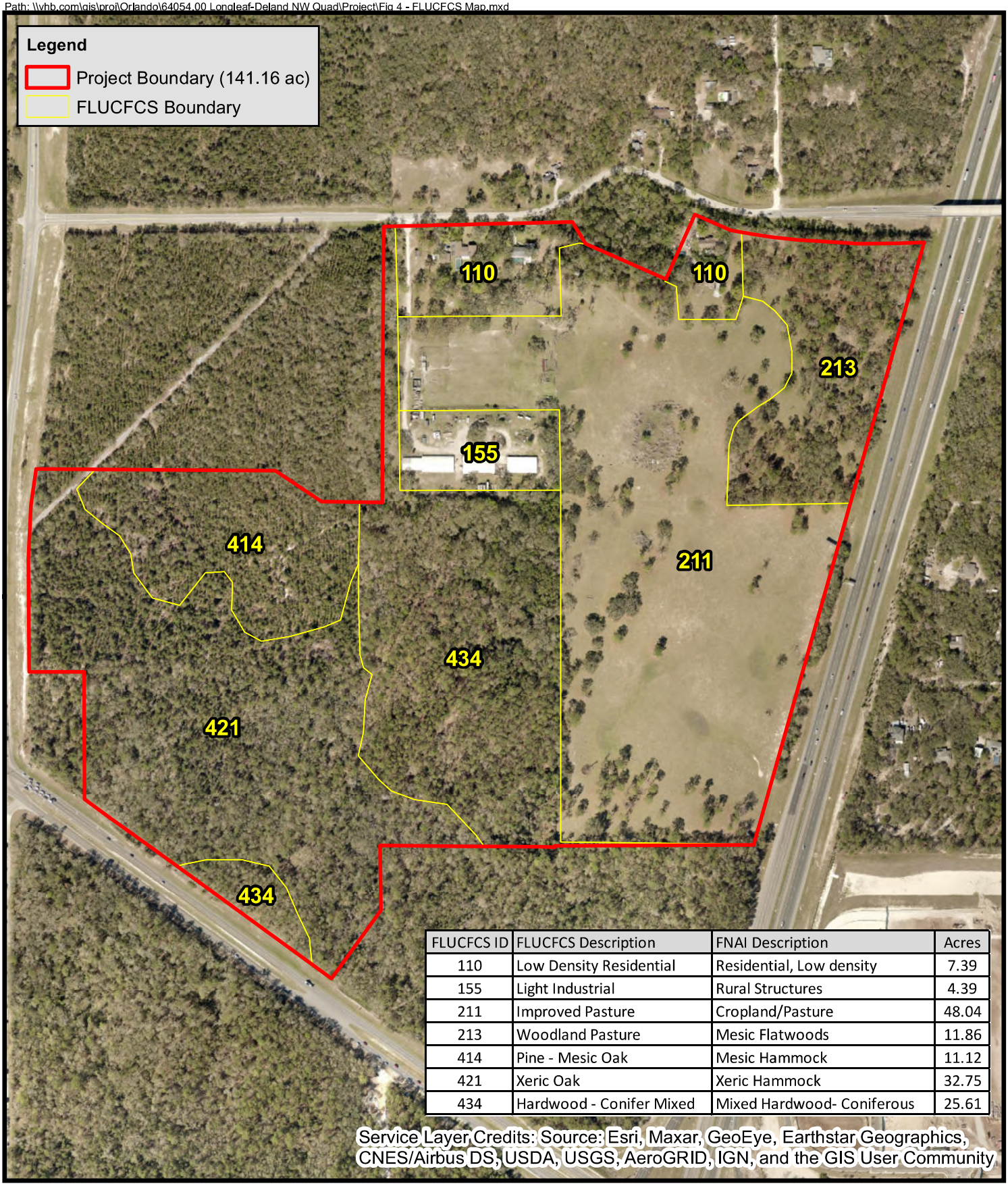
Longleaf Four

DeLand, Volusia County

Date: March 2022

0 250 500 Feet N

Path: \\vhb.com\gis\proj\Orlando\64054.00 Longleaf-Deland NW Quad\Project\Fig 4 - FLUCFCS Map.mxd



FLUCFCS ID	FLUCFCS Description	FNAI Description	Acres
110	Low Density Residential	Residential, Low density	7.39
155	Light Industrial	Rural Structures	4.39
211	Improved Pasture	Cropland/Pasture	48.04
213	Woodland Pasture	Mesic Flatwoods	11.86
414	Pine - Mesic Oak	Mesic Hammock	11.12
421	Xeric Oak	Xeric Hammock	32.75
434	Hardwood - Conifer Mixed	Mixed Hardwood- Coniferous	25.61

vhb
225 East Robinson Street, Suite 300
Orlando, Florida 32801 | 407.839.4006

Source:
FLUCFCS Boundary based on site visit by VHB Scientists (1/26/2022)

EXHIBIT 4: FLUCFCS MAP

Longleaf Four

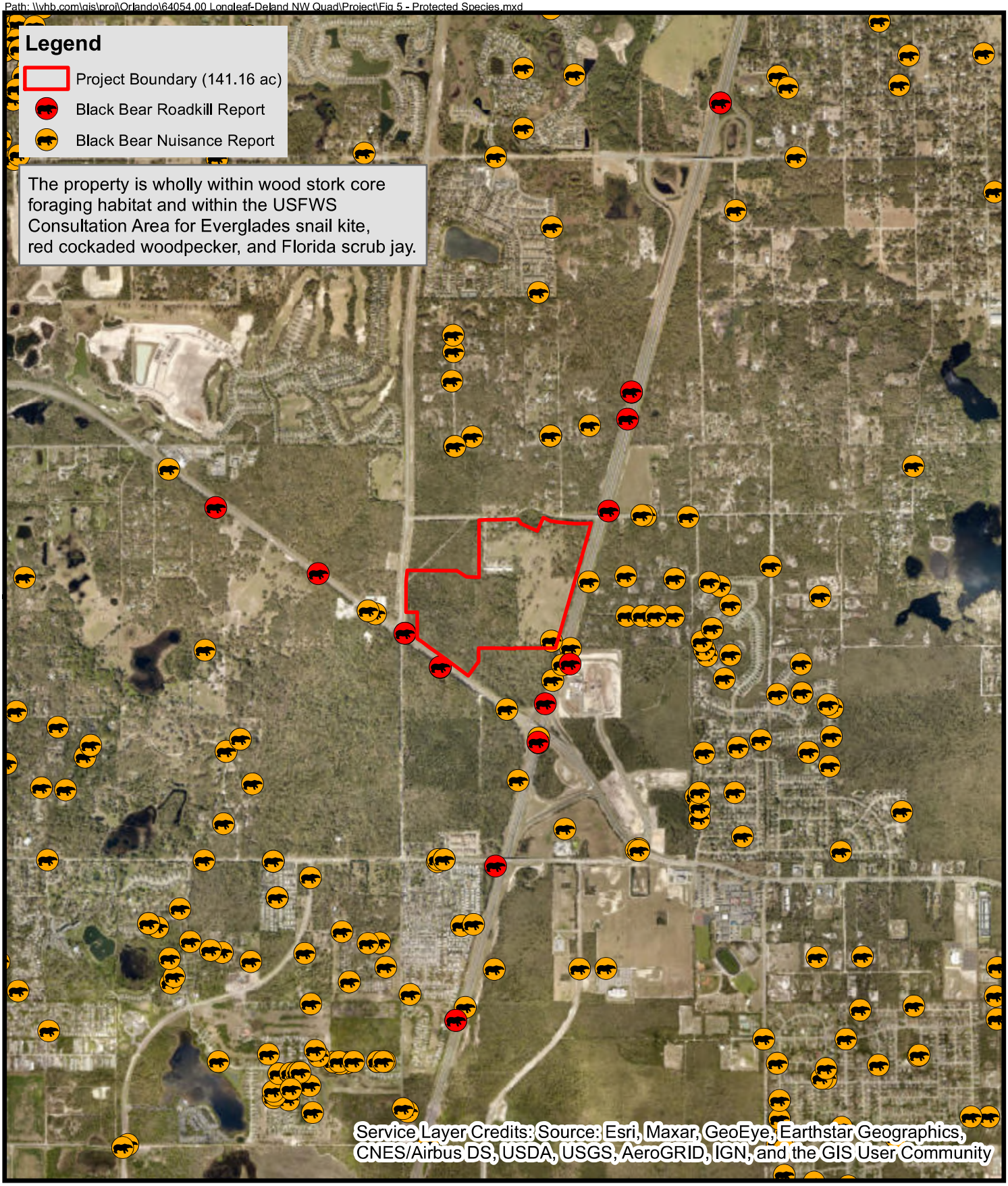
DeLand, Volusia County

Date: March 2022

0 250 500 Feet

N

Path: \\vhb.com\gis\proj\Orlando\64054.00 Longleaf-Deland NW Quad\Project\Fig 5 - Protected Species.mxd



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Orlando, Florida 32801 | 407.839.4006

Source:
USFWS GIS Data: Consultation Areas, Wood Stork CFA.
FWC GIS Data: Black Bear Reports

EXHIBIT 5: PROTECTED SPECIES MAP

Longleaf Four

DeLand, Volusia County

Date: March 2022

0 1,200 2,400 Feet

N

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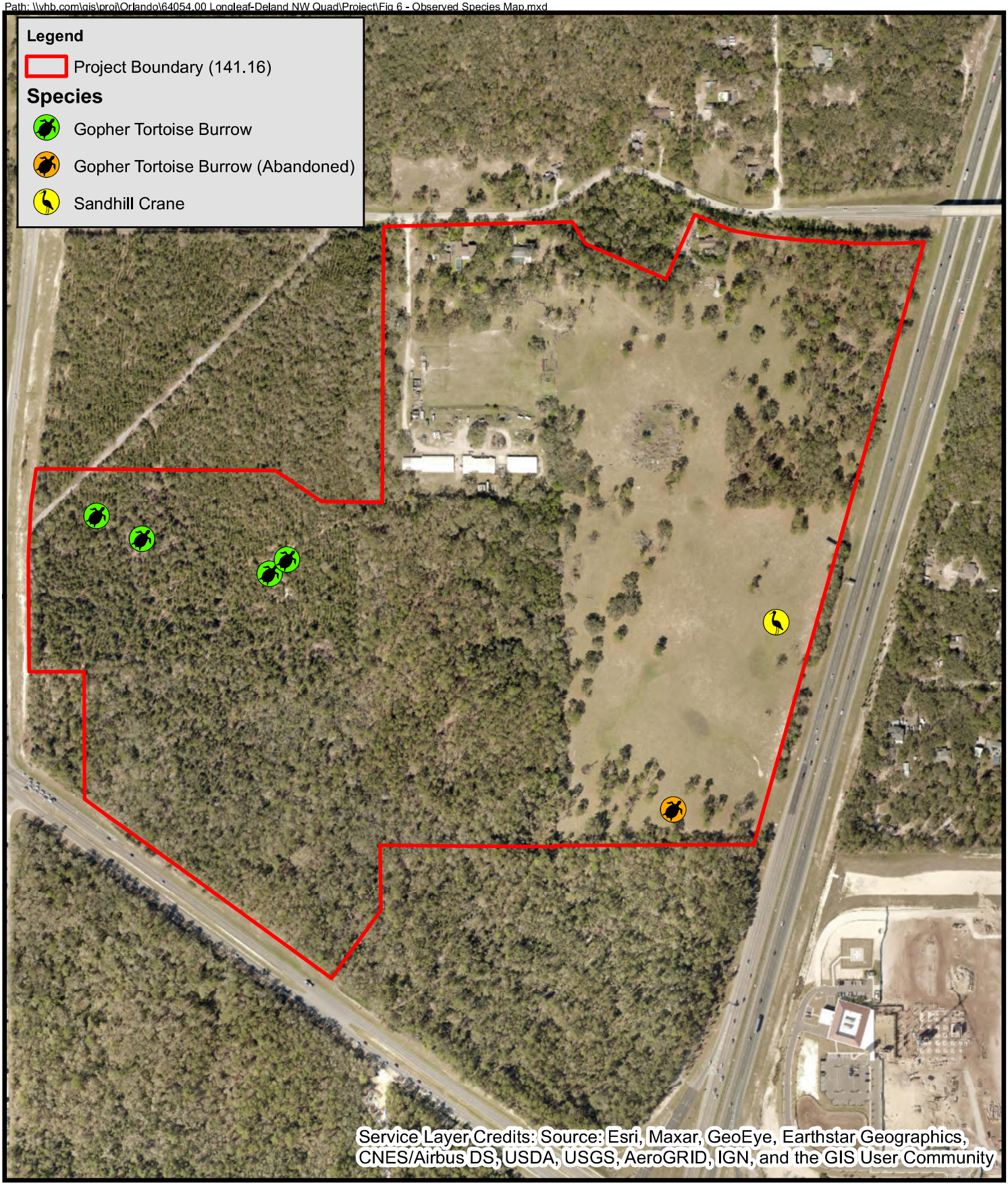

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EXHIBIT 6: OBSERVED SPECIES MAP

Longleaf Four

DeLand, Volusia County

Date: March 2022

0 250 500 Feet N

KITTELSON & ASSOCIATES

DELAND TECH PARK TRAFFIC IMPACT ANALYSIS

DELAND, FLORIDA

July 2023

PROFESSIONAL ENGINEER CERTIFICATE

I hereby certify that I am a registered professional engineer in the State of Florida, practicing with Kittelson & Associates, a corporation authorized to operate as a Professional Engineering business by the State of Florida Department of Professional Regulation, Board of Professional Engineers, and that I have approved the Traffic Impact Study for DeLand Tech Park in DeLand, Florida, dated July 2023.

PROJECT:	DeLand Tech Park
LOCATION:	DeLand, Florida
CLIENT:	Longleaf Four

I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of transportation engineering as applied through professional judgment and experience.

NAME:	Kok Wan Mah
P.E. NUMBER:	56739
DATE:	7/5/2023



Kok Wan Mah

Digitally signed by Kok Wan Mah
Date: 2023.07.06 09:56:07 -04'00'

The item has been digitally signed and sealed by Kok Wan Mah on the date adjacent to the seal.

PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

DeLand Tech Park Traffic Impact Analysis

DeLand, Florida

Prepared for:
Longleaf Four, LLC
320 North Meridian Street, Suite 700
Indianapolis, IN 46204

Prepared by:
Kittelson & Associates, Inc.
225 East Robinson Street, Suite 355
Orlando, FL 32801
407.540.0555

Project Manager:
Kok Wan Mah, P.E.
Associate Engineer

Project Principal:
Stephanie Shealey, P.E., PTOE, PTP
Senior Engineer

Project Number 28629

July 2023

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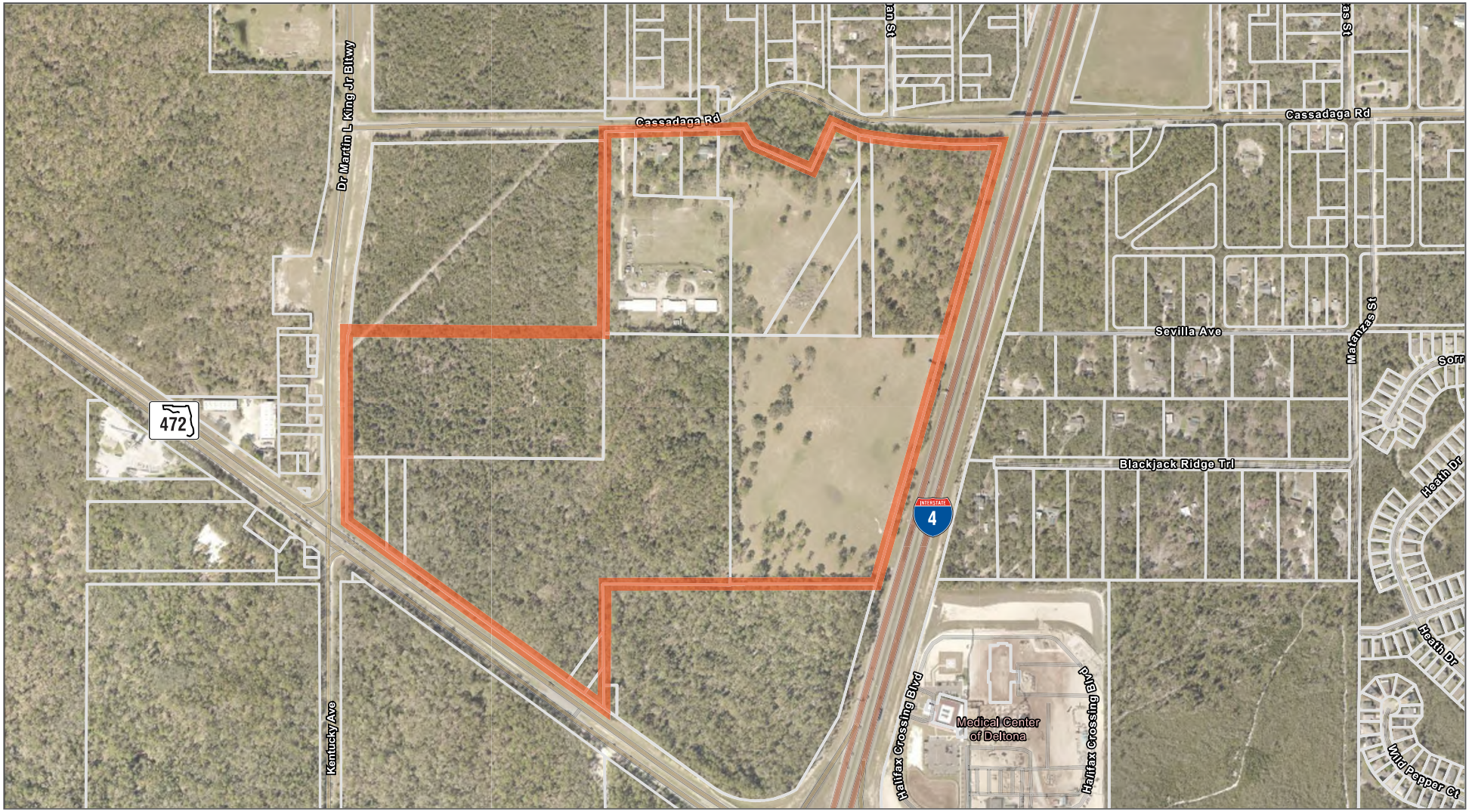
Section 1
Introduction

INTRODUCTION

Kittelson & Associates, Inc. has been retained by Longleaf Four, LLC to conduct a Traffic Impact Analysis (TIA) for the proposed DeLand Tech Park mixed-use commercial development. The project is located on the northwest quadrant of Interstate 4 and SR 472 in DeLand, Volusia County, Florida. The project location is illustrated on **Figure 1**. The site will have two full access driveways; one on Cassadaga Road and one on Dr Martin Luther King Jr Beltway. There will be one access driveway that will allow left-in, right-in, and right-out access on SR 472. Finally, there will be three right-in/right-out access driveways; two on SR 472, and one on Dr Martin Luther King Jr Beltway.The preliminary site plan is shown in **Figure 2**.

The purpose of this study is to evaluate the roadway capacity and operating conditions on the roadways and intersections likely to be impacted by traffic generated by the development to determine how impacts should be mitigated. The following analysis was prepared in accordance with the River to Sea Transportation Planning Organization (R2CTPO) TIA Guidelines and is consistent with the guidelines for the City of DeLand.

The analysis quantifies the trip generation for the expected trips for the proposed land uses, and analyzes the existing traffic conditions along area roadways surrounding the parcel and the projected future traffic conditions expected for the build condition. This document provides a detailed description of the study analysis and key findings. The TIA methodology can be found in **Appendix A**.



KITTELSON & ASSOCIATES

Deland Tech Park | Traffic Impact Analysis

Longleaf Four, LLC | Mac McNaught (c) 317-439-4577

FIGURE 1 **| Location Map**

PROJECT DESCRIPTION

The proposed development is located on the northwest quadrant of Interstate 4 and SR 472 in DeLand, Volusia County, Florida. The property consists of approximately 142.8 acres and will include 750 KSF of Industrial Park, 750 KSF of Warehouse, 240 KSF of General Retail, and a 16 fueling position Gas Station with Convenience Store. The site will have two full access driveways; one on Cassadaga Road and one on Dr Martin Luther King Jr Beltway. There will be one access driveway that will allow left-in, right-in, and right-out access on SR 472. Finally, there will be three right-in/right-out access driveways; two on SR 472, and one on Dr Martin Luther King Jr Beltway. A preliminary site plan is shown in **Figure 2**. Project build-out is anticipated for year 2027, and therefore the analysis in this study assumes a build-out year 2027 scenario.

TRIP GENERATION

Table 1 summarizes the Daily, AM, and PM peak hour trip generation for the proposed development based on equations contained in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition. The proposed development will consist of 750 KSF of Industrial Park, (ITE code 130), 750 KSF of Warehouse (ITE code 150), 240 KSF of General Retail, (ITE code 820), and a 16 fueling position Gas Station with Convenience Store, (ITE code 945). This represents a change from the original TIA that was submitted by VHB dated September 26, 2022, which included 1.5 million square feet of industrial park for the industrial use. Pass-by trips were calculated using the pass-by rate, given as 34% (PM) for General Retail land use, and 62% (AM) and 56% (PM) for Convenience Store/Gas Station land use as determined in the ITE Trip Generation Handbook, 3rd Edition. As shown in **Table 1**, the proposed development is expected to generate 16,191 new daily trips, 683 new AM peak hour trips, and 1,220 new PM peak hour trips for the buildout condition. This represents a reduction in trip generation due to the change in the type of industrial use being proposed for the site. The ITE Trip Generation summary sheets can be found in **Appendix B**.



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Deland Tech Park | Traffic Impact Analysis

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FIGURE 2 | **Preliminary Site Plan**

Table 1: Project Trip Generation

Land Use	ITE Code	Intensity		Daily		AM Peak Period						PM Peak Period						Pass-by %	
				Rate	Trip Ends	In		Out		Total		In		Out		Total			
						%	Trips	%	Trips	Rate	Trips	%	Trips	%	Trips	Rate	Trips	AM	PM
Industrial Park	130	750	KSF	3.37	2,528	81%	207	19%	48	0.34	255	22%	56	78%	199	0.34	255	0%	0%
Warehouse	150	750	KSF	1.63	1,223	77%	99	23%	29	0.17	128	28%	38	72%	97	0.18	135	0%	0%
Shopping Center (>150KSF)	820	240	KSF	37.01	8,882	62%	125	38%	77	0.84	202	48%	509	52%	551	4.42	1,060	0%	34%
Gas/Conv	945	16	Pumps	265.13	4,242	50%	129	50%	128	16.06	257	50%	147	50%	148	18.44	295	62%	56%
Internal Capture		Sub Total		-	16,875		560		282		842		750		995		1,745		
		0%	0%	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0		
		Total Passby		-	684	-	80	-	80	-	159	-	263	-	262	-	525		
Total				-	**16,191**		**481**		**203**		**683**		**487**		**733**		**1,220**		

TRIP DISTRIBUTION AND ASSIGNMENT

The distribution of site generated traffic is a function of population in surrounding areas, competing shopping opportunities, existing travel patterns, ease of access to the site, and traffic conditions on area roadways. The primary project traffic to and from the site will be distributed to the adjacent roadways and intersections based on the existing plus committed Central Florida Regional Planning Model (CFRPMv7) results, utilizing the existing and committed network. The model output is provided in **Figure 3** and **Appendix C**. It should be noted that the model distribution at the I-4 eastbound on ramps at SR 472 and Orange Camp Road were adjusted based on engineering judgment, as shown in **Appendix C**.

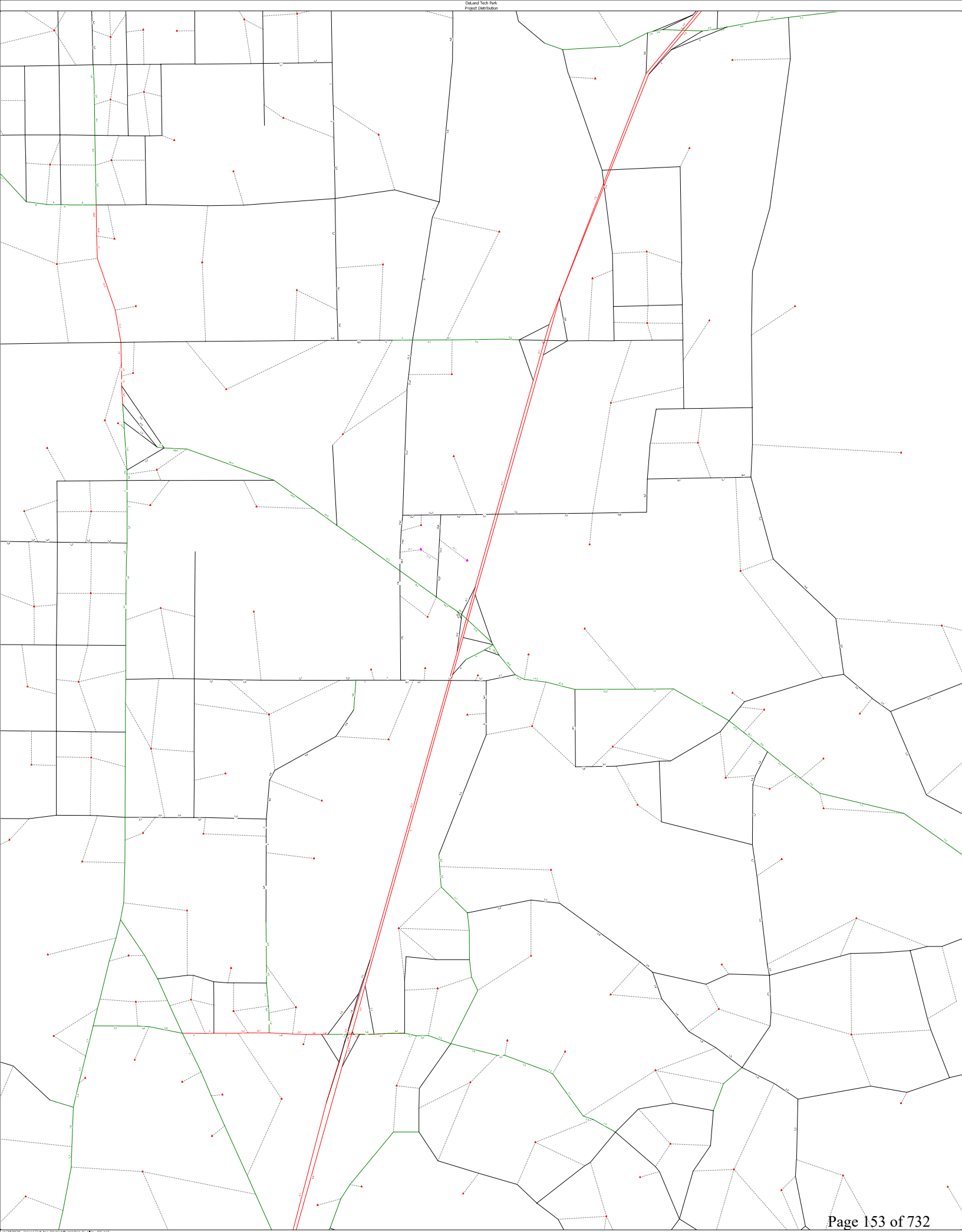


Figure 3: Project Distribution

(Licensed to Kittelson & Associates Inc)



Section 2
Existing Conditions

EXISTING CONDITIONS

Evaluation of the traffic impacts associated with the proposed development first requires an assessment of the existing roadway conditions in the vicinity of the site. The existing conditions section summarizes the existing transportation conditions including geometry and existing traffic control observed in the study area, collection of existing peak hour traffic volumes, and an assessment of the study area roadways and intersections.

STUDY AREA

The study area was determined using a test for significance similar to the one conducted in the methodology document (provided as **Appendix A**) The significance test was updated based on changes in the land uses on the site and model distribution used in the updated TIA. The updated significance test determined the candidate roadways and intersections to be analyzed within this study, with project trips included as representing the full buildout of the development.

Per the R2CTPO TIA Guidelines, the project's primary study area includes those roadway segments that provide direct access to the project, are within a 3-mile radius, and/or impacted by the project where the project's peak hour trips consume three percent (3%) or more of a roadway's two-way peak hour generalized service volume based on the adopted LOS and committed number of lanes. Major intersections along the significant segments, and roadway segments that have been designated as Critical and Near-Critical Roadway segments within a three (3) mile radius of the project shall be considered in the primary impact area. A more detailed table showing the project significance calculations is provided in **Appendix D**. The following roadway segments and intersections are included in the analysis:

Roadway Segments:

- W Volusia Beltway (Dr Martin Luther King Jr Beltway)
  - from SR 472 to Cassadaga Road
  - from Cassadaga Road to Orange Camp Road (Vested Near Critical roadway segment)
  - from Orange Camp Road to Taylor Road (Vested Near Critical roadway segment)
  - from Taylor Road to Beresford Avenue (Vested Near Critical roadway segment)
- W Volusia Beltway (Kentucky Avenue)
  - from Graves Avenue to SR 472
- W Volusia Beltway (Veteran's Memorial Parkway)
  - from Rhode Island Avenue to Graves Avenue (Vested Near Critical roadway segment)
- SR 472
  - from US 17/92 to CR 4101/ Dr Martin Luther King Jr Beltway
  - from CR 4101/ Dr Martin Luther King Jr Beltway to I-4
- Howland Boulevard
  - from I-4/SR 472 to Wolf Pack Run (Vested Critical roadway segment)
  - from Wolf Pack Run to Catalina Boulevard (Vested Critical roadway segment)
  - from Catalina Boulevard to Providence Boulevard (Vested Critical roadway segment)
- Cassadaga Road
  - from W Volusia Beltway to Macy Avenue
- Orange Camp Road
  - from Blue Lake Avenue to W Volusia Beltway (Dr Martin Luther King Jr Beltway) (Vested Near Critical roadway segment)
- Graves Avenue/CR 4145
  - from Veteran's Memorial Parkway to Kentucky Avenue (Critical roadway segment)
- Normandy Boulevard
  - from Graves Avenue to Rhode Island Avenue (Vested Critical roadway segment)

- Macy Avenue
    - from Ohio Street to Cassadaga Road
- Kicklighter Road
    - from Macy Avenue to Lake Helen-Osteen Road/Prevatt Avenue

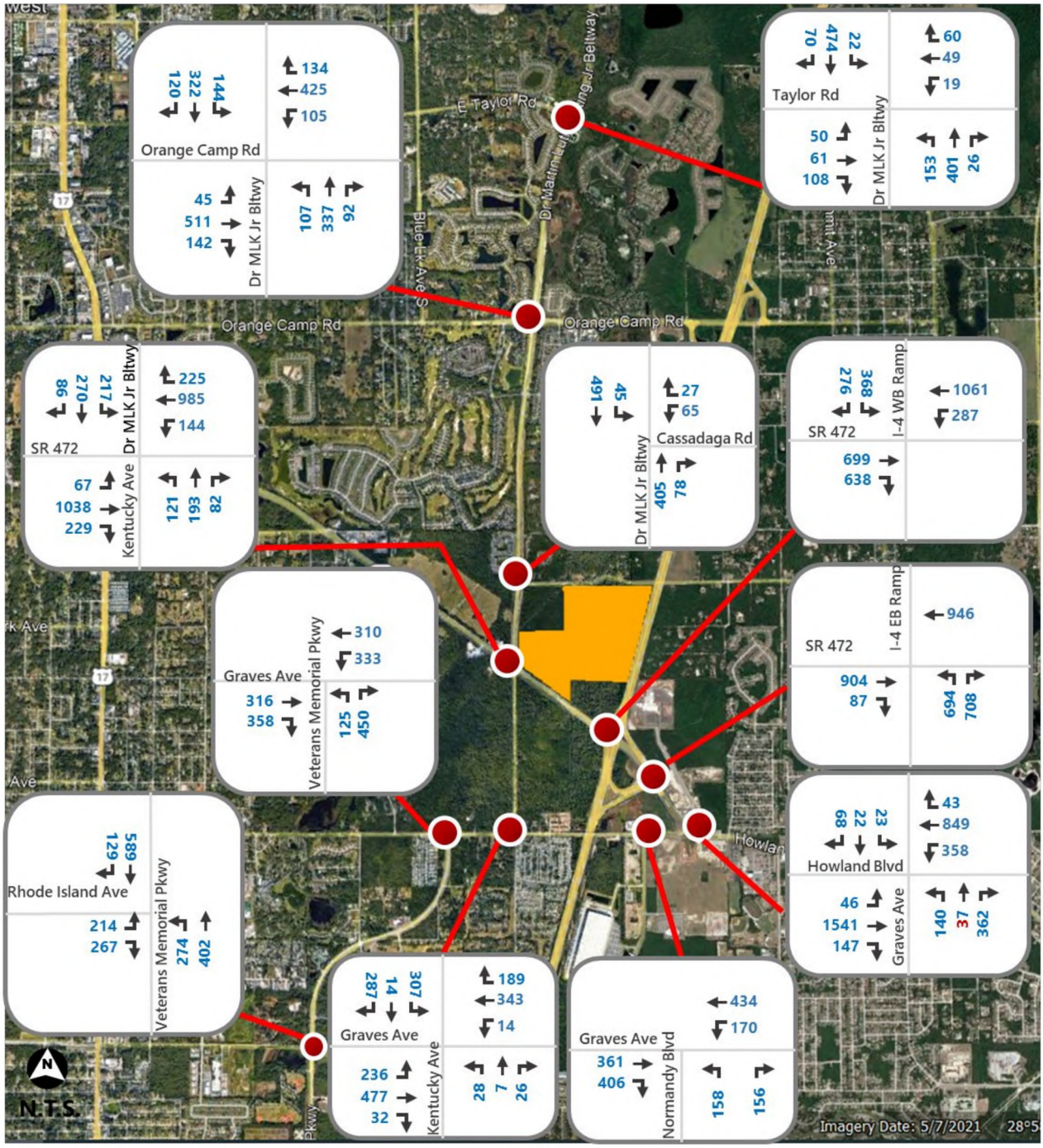
Intersections:

- SR 472 at Kentucky Avenue/Dr Martin Luther King Jr Beltway (July 26, 2022)
- Dr Martin Luther King Jr Beltway at Cassadaga Road (July 26, 2022)
- Dr Martin Luther King Jr Beltway at Orange Camp Road (July 26, 2022)
- Dr Martin Luther King Jr Beltway at Taylor Road (July 26, 2022)
- Kentucky Avenue at Graves Avenue (July 26, 2022)
- Veterans Memorial Parkway at Graves Avenue (July 26, 2022)
- Veterans Memorial Parkway at Rhode Island Avenue (July 26, 2022)
- SR 472 at I-4 WB Ramps (July 26, 2022)
- SR 472 at I-4 EB Ramps (July 26, 2022)
- Howland Boulevard at Graves Avenue/Halifax Crossing Boulevard (January 18, 2023)
- Normandy Boulevard at Graves Avenue (January 18, 2023)

Existing turning movement counts (TMCs) were collected on the dates listed above for the AM (7:00 to 9:00) and PM (4:00 to 6:00) peak hour periods at the 11) study intersections. A review of the collected peak hour traffic volumes indicated that the AM peak hour volumes are about 7 percent less than the PM peak hour volumes. Due to the retail nature of the proposed development, the site generated traffic volumes during the AM peak hour are 40 percent less than the PM peak hour. Since the PM peak hour is the critical time period, the PM peak hour traffic volumes are being evaluated in this study.

The existing TMCs were adjusted using the corresponding seasonal factor of 1.05 based on the 2021 data from FDOT's Florida Traffic Online (FTO) Web Application. Raw turning movement counts along with FDOT Peak Season Category Report are provided in **Appendix E**. **Figure 4** illustrates the seasonal factor adjusted existing PM peak hour traffic volumes. Heavy truck percentages were also calculated from the turning movement volumes and applied to each study intersection in each study period.

Figure 4: Existing PM Traffic Volumes



XX PM (Peak)

EXISTING ROADWAY CAPACITY ANALYSIS

To determine the operational conditions along the study area roadway segments, Kittelson conducted a roadway capacity analysis to help quantify the existing level of service (LOS) of the study roadways for the critical PM peak hour conditions. The LOS of a given roadway is related to prevailing traffic volumes and to capacity, which is defined as the maximum number of vehicles that can pass through a roadway section during a specific period of time. The capacity of a roadway is determined by a number of factors including composition of traffic (cars, buses, and trucks); roadway alignment; width and number of lanes; posted travel speeds and other variables.

The level of service and remaining capacity for each of the study roadways were determined based on Florida Traffic Online (FTO) 2021 counts for the growth rates and the Volusia County 2021 Average Annual Daily Traffic & Historical Counts for base year volumes. A comparison of the AADT roadway traffic volumes were made against the roadway capacities to determine the existing level of service. The existing roadway capacity analysis was performed for all roadways within the study area as shown in **Table 2**. The two-way peak-hour volumes for three roadway segments could not be determined using the Volusia County Average Annual Daily Traffic & Historical Counts database. Therefore, the AADT values were obtained using FTO for their respective years, and the K-factor was applied to obtain two-way peak-hour volumes.

In summary, most study roadway segments operate acceptably and are shown to have sufficient capacity under existing conditions. The only exception is Graves Avenue from Veteran's Memorial Parkway to Kentucky Avenue, which is designated as a Critical roadway with a volume to capacity (v/c) ratio of 1.01.

Table 2: Existing Roadway Capacity Analysis

Roadway	Segment	No. of Lanes	Critical/Near Critical	Adopted LOS	2-Way PM Capacity	2021 2-Way PM Volume	2021 PM V/C Ratio	Remaining PM Capacity	Over Capacity?
Dr Martin Luther King Jr Beltway	SR 472 to Cassadaga Rd.	2	None	E	1,540	1,050	0.68	490	No
	Cassadaga Rd. to Orange Camp Rd.	2	Vested Near Critical	E	1,540	1,000	0.65	540	No
	Orange Camp Rd. to Taylor Rd.	2	Vested Near Critical	E	1,540	1,050	0.68	490	No
	Taylor Rd. to Beresford Ave.	2	Vested Near Critical	E	1,540	770	0.50	770	No
Kentucky Avenue	Graves Ave. to SR 472	2	None	E	1,540	910	0.59	630	No
Veteran's Memorial Parkway	Rhode Island Ave. to Graves Ave.	2	Vested Near Critical	E	1,620	1,200	0.74	420	No
Cassadaga Road	W Volusia Beltway to Macy Ave	2	None	E	1020	260	0.25	760	No
Orange Camp Road	Blue Lake Ave. to Dr Martin Luther King Jr Bltwy.	2	Vested Near Critical	E	1,540	1,220	0.79	320	No
Graves Avenue	Veteran's Memorial Pkwy. to Kentucky Ave.	2	Critical	E	1,620	1,640	1.01	-20	Yes
Howland Boulevard	I-4/SR 472 to Wolf Pack Rn.	4	Vested Near Critical	E	3,410	2,500	0.73	910	No
	Wolf Pack Rn. to Catalina Blvd.	4	Vested Near Critical	E	3,410	2,310	0.68	1,100	No
	Catalina Blvd. to Providence Blvd.	4	Vested Near Critical	E	3,410	1,670	0.49	1,740	No

Table 2: Existing Roadway Capacity Analysis (Continued)

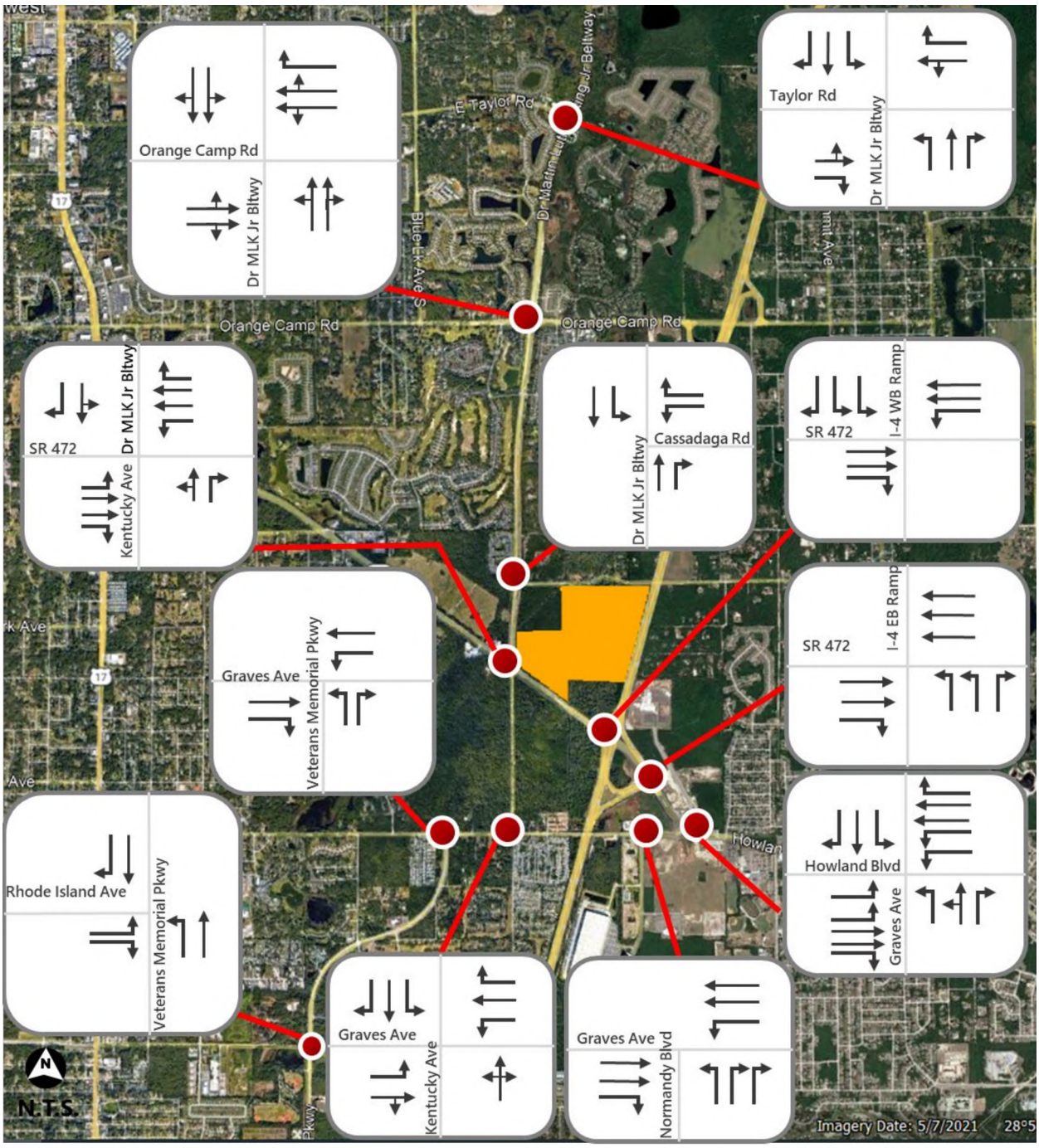
Roadway	Segment	No. of Lanes	Critical/Near Critical	Adopted LOS	2-Way PM Capacity	2021 2-Way PM Volume	2021 PM V/C Ratio	Remaining 2021 PM Capacity	Over Capacity?
SR 472	US 17/92 to Martin Luther King Jr Bltwy.	4	None	D	5,960	2,160	0.36	3,800	No
	Martin Luther King Jr Bltwy. to I-4	4	None	D	3,580	2,710	0.76	870	No
Macy Avenue	Ohio St. to Cassadaga Rd.	2	None	C	1,020	170	0.17	850	No
Kicklighter Road	Macy Ave. to Lake Helen-Osteen Rd./Prevatt Ave.	2	None	E	1,020	200	0.20	820	No
Normandy Blvd.	Graves Ave to Rhode Island Ave	2	Vested Critical	E	1,540	783	0.51	757	No

EXISTING INTERSECTION CAPACITY ANALYSIS

The existing intersections were evaluated using the methodology outlined in the Highway Capacity Manual and using Synchro 11 Software. The existing lane configurations are shown in **Figure 5**. Signal timings were provided by Volusia County and are shown in **Appendix F**. The intersection of Dr Martin Luther King Jr Beltway at Orange Camp Road was recently converted to a roundabout from a traffic signal and therefore this intersection was analyzed utilizing Sidra 9 Software. Due to HCM 6th Edition (HCM6) analysis limitations (expecting strict NEMA phasing), three of the 11 study intersections (SR 472 at Dr Martin Luther King Jr Beltway, Dr Martin Luther King Jr Beltway at Taylor Road, and Kentucky Ave at Graves Ave) were reported utilizing HCM 2000 instead of HCM6 in order to quantify the operational performance at the intersections. The results of the study area existing conditions intersection capacity analysis for the PM peak hour are shown in **Table 3**. The Synchro and Sidra analysis printouts can be found in **Appendix G**.

As shown in **Table 3**, all study area intersections are operating at an overall LOS of E or better. However, there were movements at the intersections of SR 472 at Kentucky Avenue/Dr Martin Luther King Jr Beltway, SR 472 at I-4 WB Ramps, and Howland Boulevard at Graves Avenue/Halifax Crossing Boulevard that operate at LOS F. The Howland Boulevard at Graves Avenue/Halifax Crossing Boulevard intersection also operates with two overcapacity movements.

Figure 5: Existing Lane Configurations



Existing Lane Configurations

Table 3: Existing Conditions Intersection Capacity Analysis

Intersection	Intersection Control Type	PM Peak Hour		
		v/c	Delay	LOS
SR 472 at Kentucky Ave./Dr Martin Luther King Jr Bltwy.	Signalized	0.99	71.0	E
Dr Martin Luther King Jr Bltwy.at Cassadaga Rd.	Signalized	0.54	10.0	A
Dr Martin Luther King Jr Bltwy.at Orange Camp Rd.	Roundabout	0.53	10.9	B
SR 472 at Taylor Rd.	Signalized	0.85	22.6	C
Kentucky Ave. at Graves Ave.	Signalized	0.73	31.5	C
Veteran's Memorial Pkwy. at Graves Ave.	Signalized	0.90	25.2	C
Veteran's Memorial Pkwy. at Rhode Island Ave.	Signalized	0.96	37.8	D
SR 472 at I-4 WB Ramps	Signalized	0.94	41.4	D
SR 472 at I-4 EB Ramps	Signalized	0.89	20.9	C
Howland Blvd. at Graves Ave./Halifax Crossing Blvd.	Signalized	1.02	38.9	D
Normandy Blvd. at Graves Ave.	Signalized	0.70	12.4	B

Note: The operational results presented for each intersection represent the worst movement v/c ratio and overall intersection delay and LOS.



Section 3
Future Conditions

FUTURE CONDITIONS

To determine the impacts of the site-generated traffic volumes on the surrounding roadways and study intersections, future traffic conditions were analyzed. The future background volumes were determined based on an application of the Volusia County growth methodology provided in **Appendix H**.

Historical growth rates were determined by considering linear, exponential, and decaying exponential traffic volume growth on each study segment. The vested trips in the Volusia County and Orange City databases were accounted for (when a roadway segment was in both databases, whichever database had the higher volume was used). Several TIAs were obtained for nearby developments and the vested trips in those TIAs were used instead of what was shown in the vested trip databases. TIAs for the following approved or committed developments were included for background traffic:

- BTR DeLand
- Kirk Subdivision/Canopy Terrace
- The Crossings
- North Kentucky Distribution Center
- Parc Hill
- Park Lake Estates

The historical growth rate and vested trips for each segment are shown in **Table 4**, which were then used to calculate 2027 future background PM segment volumes. These sources were also used to calculate the 2027 future background PM peak hour turning movement volumes, as illustrated in **Figure 6**. The FDOT traffic trends analysis worksheets are attached in **Appendix H.** Vested trip information is attached as **Appendix I**. The intersection volume derivation is documented in **Appendix J**.

Additionally, the anticipated number of trips generated from the proposed DeLand Tech Park development were calculated based on the trip generation rates/equations obtained from the ITE Trip Generation Manual, 11th Edition (see **Table 1**) and distributed to the roadways and intersections based on the site layout and model distribution. The 2027 buildout future roadway volumes are shown in **Table 5**. The project trip turning movements are illustrated in **Figure 7** and **Figure 8** and 2027 future buildout PM peak hour turning movement volumes are illustrated in **Figure 9** and **Figure 10**.

Table 4: Historical Growth Rates and Vested Traffic

Roadway	Segment	2021 2-Way PM Volume	Historical Growth Rate Selected	Historical Growth Rate Type	Historical Volume Growth	Vested Trips	Volume Growth Method	Reason	Total Background Growth	2027 2-Way PM Background Volume
Dr Martin Luther King Jr Beltway	SR 472 to Cassadaga Rd.	1,050	3.27%	Linear	206	474	Vested Only	See note[1]	474	1,524
	Cassadaga Rd. to Orange Camp Rd.	1,000	2.53%	Linear	152	533	Historical + Vested	Default growth method	685	1,685
	Orange Camp Rd. to Taylor Rd.	1,050	2.00%	Exponential	132	452	Historical + Vested	Default growth method	584	1,634
	Taylor Rd. to Beresford Ave.	770	1.00%	Linear	46	609	Historical + Vested	Default growth method	655	1,425
Kentucky Avenue	Graves Ave. to SR 472	910	3.27%	Linear	179	579	Vested Only	See note[1]	579	1,489
Veteran's Memorial Parkway	Rhode Island Ave. to Graves Ave.	1,200	4.91%	Linear	354	366	Vested Only	See note[1]	366	1,566
Cassadaga Road	W Volusia Beltway to Macy Ave	260	2.00%	Linear	31	17	Historical + Vested	Default growth method	48	308
Orange Camp Road	Blue Lake Ave. to Dr Martin Luther King Jr Bltwy.	1,220	5.37%	Exponential	450	237	Historical Only	See note[2]	450	1,670

[1] Historical growth rate>3%. Vested trips are higher than historical growth rate volume.
[2] Historical growth rate>3%. Historical growth rate volume is higher than vested trips.

Table 4: Historical Growth Rates and Vested Traffic (Continued)

Roadway	Segment	2021 2-Way PM Volume	Historical Growth Rate Selected	Historical Growth Rate Type	Historical Volume Growth	Vested Trips	Volume Growth Method	Reason	Total Background Growth	2027 2-Way PM Background Volume
Graves Avenue	Veteran's Memorial Pkwy. to Kentucky Ave.	1,640	3.22%	Exponential	343	563	Vested Only	See note[1]	563	2,203
Howland Boulevard	I-4/SR 472 to Wolf Pack Rn.	2,500	1.00%	Decaying Exponential	154	926	Historical + Vested	Default growth method	1,080	3,580
	Wolf Pack Rn. to Catalina Blvd.	2,310	2.00%	Linear	277	720	Historical + Vested	Default growth method	997	3,307
	Catalina Blvd. to Providence Blvd.	1,670	2.00%	Linear	200	466	Historical + Vested	Default growth method	666	2,336
SR 472	US 17/92 to Martin Luther King Jr Bltwy.	2,160	6.73%	Exponential	1033	129	Historical Only	See note[2]	1033	3,193
	Martin Luther King Jr Bltwy. to I-4	2,710	1.00%	Decaying Exponential	167	589	Historical + Vested	Default growth method	756	3,466
Macy Avenue	Ohio St. to Cassadaga Rd.	170	2.00%	Linear	20	3	Historical + Vested	Default growth method	23	193
Kicklighter Road	Macy Ave. to Lake Helen-Osteen Rd./Prevatt Ave.	200	5.14%	Decaying Exponential	70	0	Historical Only	See note[2]	70	270

[1] Historical growth rate>3%. Vested trips are higher than historical growth rate volume.
[2] Historical growth rate>3%. Historical growth rate volume is higher than vested trips.

Table 4: Historical Growth Rates and Vested Traffic (Continued)

Roadway	Segment	2021 2-Way PM Volume	Historical Growth Rate Selected	Historical Growth Rate Type	Historical Volume Growth	Vested Trips	Volume Growth Method	Reason	Total Background Growth	2027 2-Way PM Background Volume
Normandy Blvd.	Graves Ave. to Rhode Island Ave.	783	10.52%	Decaying Exponential	644	764	Vested Only	See note[1]	764	1,547

[1] Historical growth rate>3%. Vested trips are higher than historical growth rate volume.
[2] Historical growth rate>3%. Historical growth rate volume is higher than vested trips.

Figure 6: Background Year 2027 Traffic Volumes

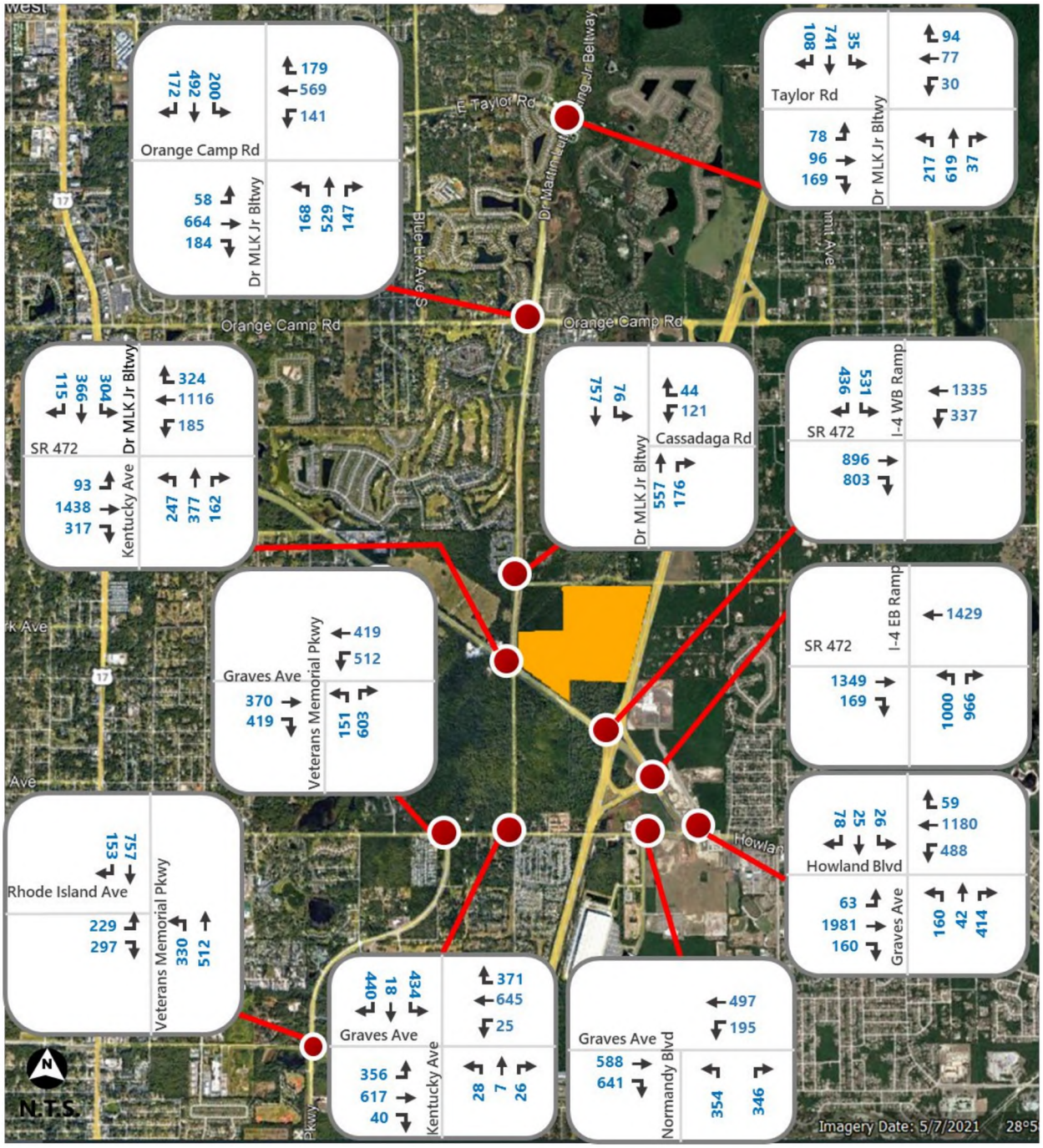
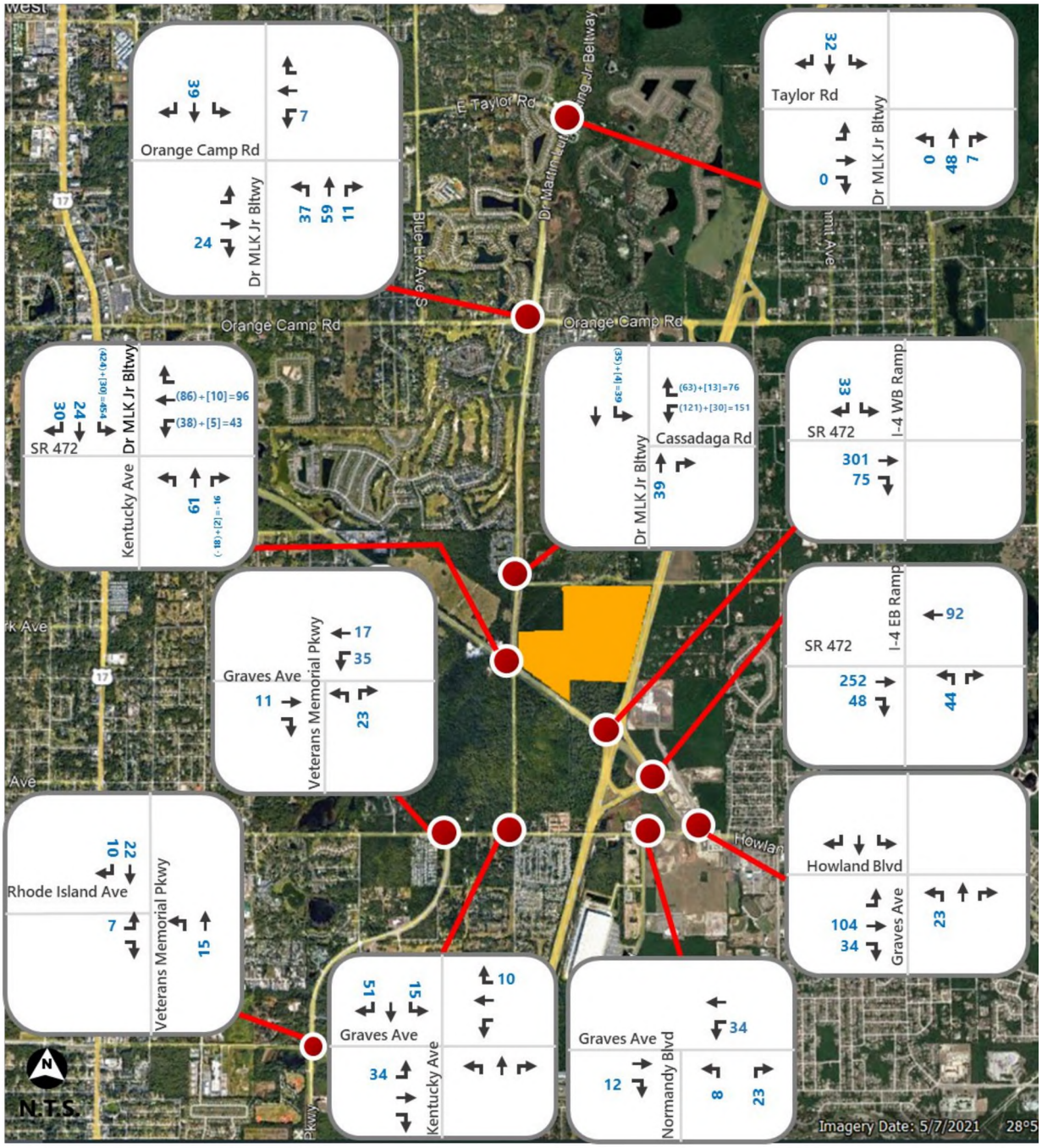


Table 5: Future Buildout Roadway Volumes

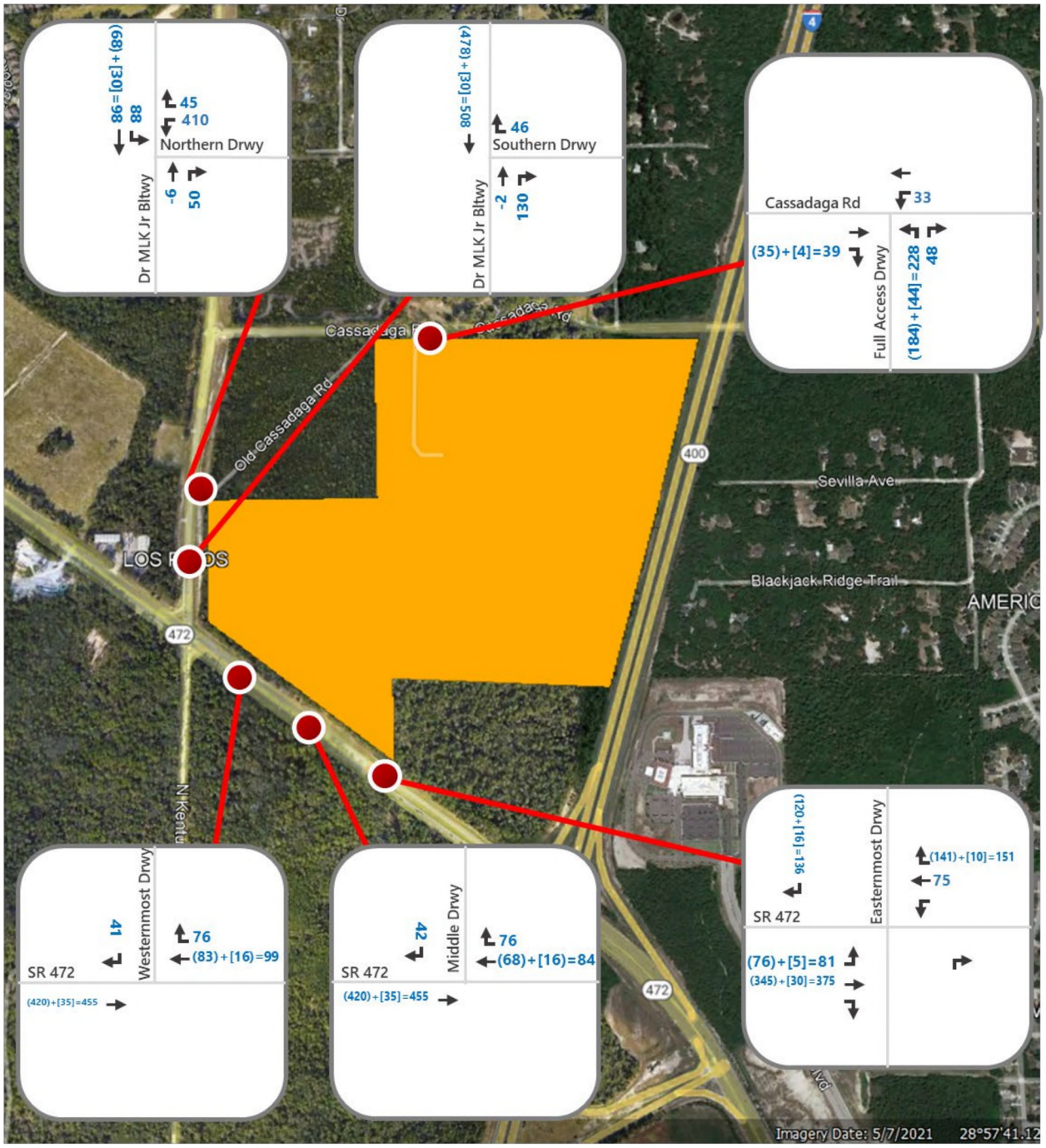
Roadway	Segment	2027 2-Way PM Background Volume	Model Distribution	Buildout Trips	2027 2-Way PM Buildout Volume
Dr Martin Luther King Jr Beltway	SR 472 to Cassadaga Rd.	1,524	16.25%	198	1,722
	Cassadaga Rd. to Orange Camp Rd.	1,685	21.30%	260	1,945
	Orange Camp Rd. to Taylor Rd.	1,634	7.50%	92	1,726
	Taylor Rd. to Beresford Ave.	1,425	6.60%	81	1,506
Kentucky Avenue	Graves Ave. to SR 472	1,489	9.10%	111	1,600
Veteran's Memorial Parkway	Rhode Island Ave. to Graves Ave.	1,566	4.60%	56	1,622
Cassadaga Road	Dr. Martin Luther King Jr Bltwy. to Macy Ave.	308	9.80%	120	428
Orange Camp Road	Blue Lake Ave. to Dr Martin Luther King Jr Bltwy.	1,670	4.80%	59	1,729
Graves Avenue	Veteran's Memorial Pkwy. to Kentucky Ave.	2,203	7.00%	85	2,288
Howland Boulevard	I-4/SR 472 to Wolf Pack Rn.	3,580	15.28%	186	3,766
	Wolf Pack Rn. to Catalina Blvd.	3,307	11.60%	142	3,449
	Catalina Blvd. to Providence Blvd.	2,336	10.07%	123	2,459
SR 472	US 17/92 to Martin Luther King Jr Bltwy.	3,193	16.74%	204	3,397
	Martin Luther King Jr Bltwy. to I-4	3,466	26.40%	322	3,788
Macy Avenue	Ohio St. to Cassadaga Rd.	193	6.60%	81	274
Kicklighter Road	Macy Ave. to Lake Helen-Osteen Rd./Prevatt Ave.	270	5.60%	68	338
Normandy Blvd.	Graves Ave. to Rhode Island Ave.	1,547	5.65%	69	1,616

Figure 7: Project Traffic Volumes at Study Area Intersections



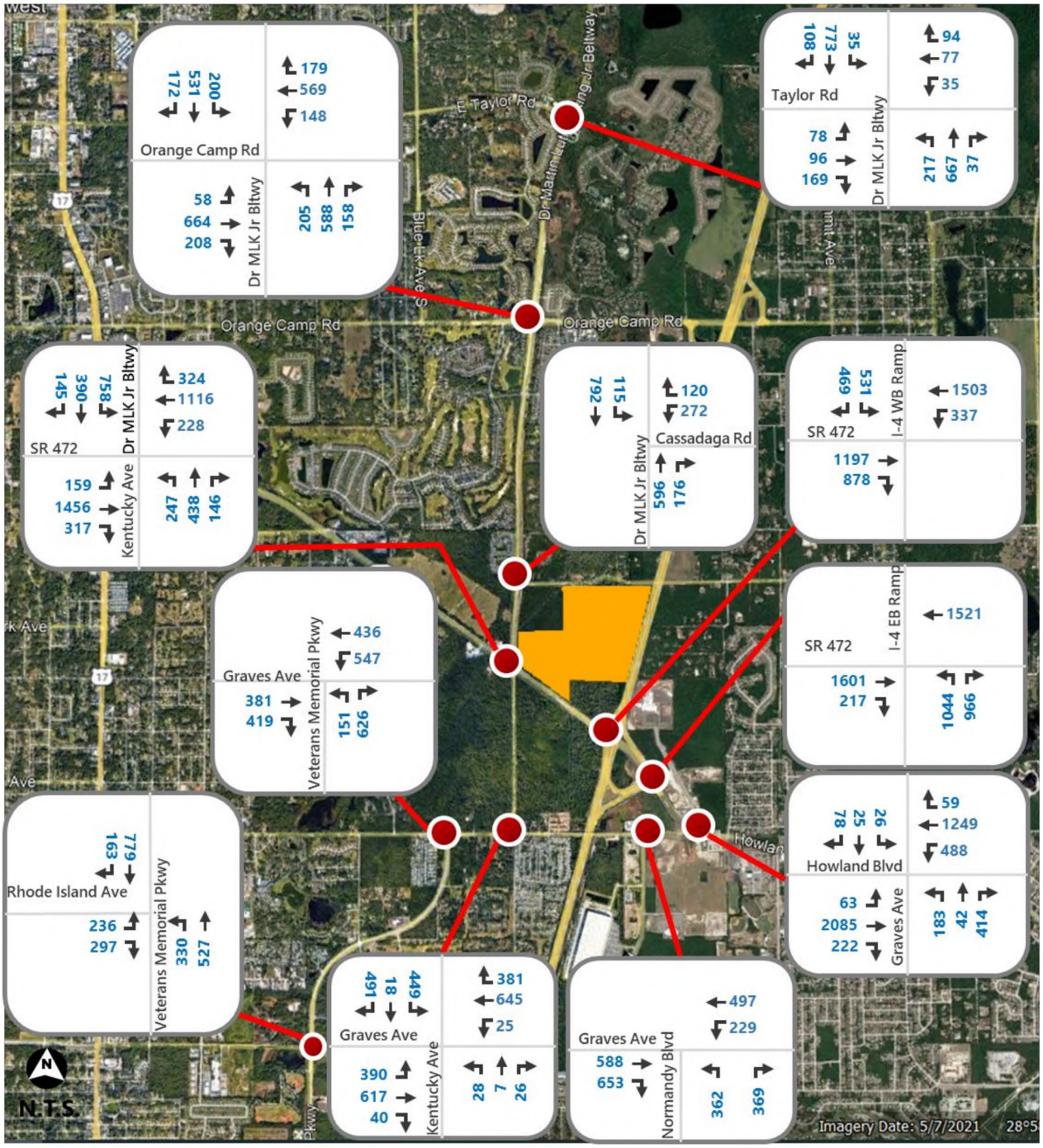
(XX) Passenger Vehicle Trips
[XX] Truck Trips
XX Total Trips

Figure 8: Project Traffic Driveway Volumes



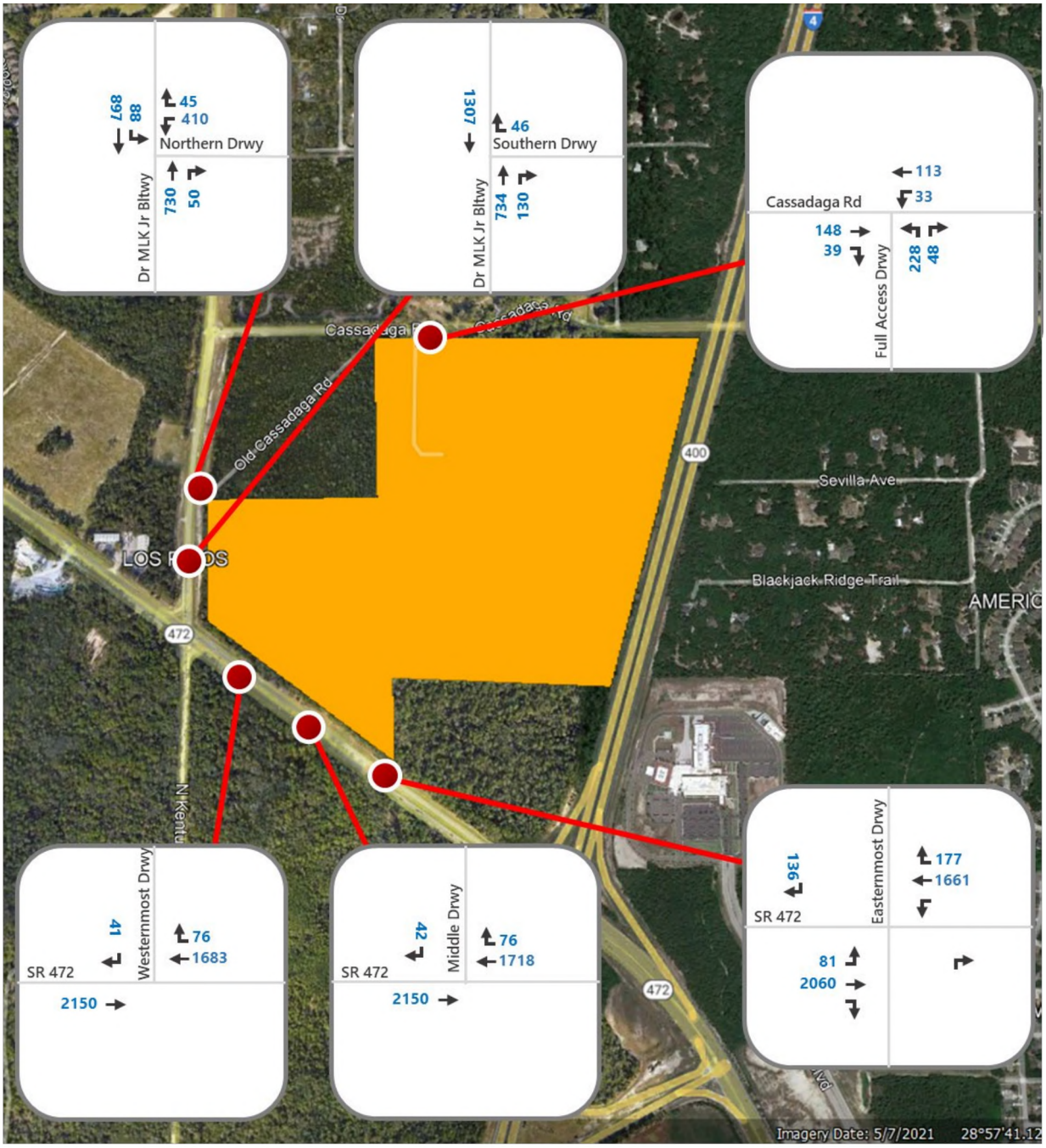
(XX) Passenger Vehicle Trips
[XX] Truck Trips
XX Total Trips

Figure 9: 2027 Future Buildout Traffic Volumes at Study Area Intersections



XX PM (Peak)

Figure 10: 2027 Future Buildout Driveway Volumes



XX PM (Peak)

YEAR 2027 FUTURE BACKGROUND ROADWAY CAPACITY ANALYSIS

The PM peak hour 2027 future background capacity analysis for the study area roadways is shown in **Table 6**. This scenario includes planned, programmed, and/or committed roadway capacity improvements within the area of influence of the project scheduled for construction as identified in the Volusia County and FDOT Five Year Work Program. Documentation of these improvements is provided in **Appendix K**. The following are those improvements:

- Graves Avenue from Veteran's Memorial Parkway to Kentucky Avenue – Add a left-turn lane onto Graves Avenue and a second westbound left turn lane at the Graves Avenue at Veteran's Memorial Parkway intersection
- Dr Martin Luther King Jr Beltway and Cassadaga Road intersection - Install traffic signal

There is also an ongoing study regarding potential improvements at the I-4 & SR 472 interchange. The study recommendations have not yet been finalized but further coordination may be needed to address any roadway changes associated with the results of the interchange study.

As seen in **Table 6**, the analysis concludes that several roadway segments for future conditions operate over capacity as a result from background traffic conditions. These segments include:

- Dr Martin Luther King Jr Beltway
    - From Cassadaga Road to Orange Camp Road
    - From Orange Camp Road to Taylor Road
- Orange Camp Road
    - From Blue Lake Avenue to Dr Martin Luther King Jr Beltway
- Graves Avenue
    - From Veteran's Memorial Parkway to Kentucky Avenue
- Howland Boulevard
    - From I-4/SR 472 to Wolf Pack Run
- Normandy Boulevard
    - From Graves Avenue to Rhode Island Avenue

Table 6: Year 2027 Future Background Roadway Capacity Analysis

Roadway	Segment	No. of Lanes	Critical/Near Critical	Adopted LOS	2-Way PM Capacity	2027 2-Way PM Volume	2027 PM V/C Ratio	Remaining 2027 PM Capacity	Over Capacity?
Dr Martin Luther King Jr Beltway	SR 472 to Cassadaga Rd.	2	None	E	1,540	1,524	0.99	16	No
	Cassadaga Rd. to Orange Camp Rd.	2	Vested Near Critical	E	1,540	1,685	1.09	-145	Yes
	Orange Camp Rd. to Taylor Rd.	2	Vested Near Critical	E	1,540	1,634	1.06	-94	Yes
	Taylor Rd. to Beresford Ave.	2	Vested Near Critical	E	1,540	1,425	0.93	115	No
Kentucky Avenue	Graves Ave. to SR 472	2	None	E	1,540	1,489	0.97	51	No
Veteran's Memorial Parkway	Rhode Island Ave. to Graves Ave.	2	Vested Near Critical	E	1,620	1,566	0.97	54	No
Cassadaga Road	W Volusia Beltway to Macy Ave	2	None	E	1,020	308	0.30	712	No
Orange Camp Road	Blue Lake Ave. to Dr Martin Luther King Jr Bltwy.	2	Vested Near Critical	E	1,540	1,670	1.08	-130	Yes
Graves Avenue	Veteran's Memorial Pkwy. to Kentucky Ave.	2	Critical	E	1,620	2,203	1.36	-583	Yes
Howland Boulevard	I-4/SR 472 to Wolf Pack Rn.	4	Vested Near Critical	E	3,410	3,580	1.05	-170	Yes
	Wolf Pack Rn. to Catalina Blvd.	4	Vested Near Critical	E	3,410	3,307	0.97	103	No
	Catalina Blvd. to Providence Blvd.	4	Vested Near Critical	E	3,410	2,336	0.69	1,074	No

Table 6: Year 2027 Future Background Roadway Capacity Analysis (Continued)

Roadway	Segment	No. of Lanes	Critical/Near Critical	Adopted LOS	2-Way PM Capacity	2027 2-Way PM Volume	2027 PM V/C Ratio	Remaining 2027 PM Capacity	Over Capacity?
SR 472	US 17/92 to Martin Luther King Jr Bltwy.	4	None	D	5,960	3,193	0.54	2,767	No
	Martin Luther King Jr Bltwy. to I-4	4	None	D	3,580	3,466	0.97	114	No
Macy Avenue	Ohio St. to Cassadaga Rd.	2	None	C	1,020	193	0.19	827	No
Kicklighter Road	Macy Ave. to Lake Helen-Osteen Rd./Prevatt Ave.	2	None	E	1,020	270	0.26	750	No
Normandy Blvd.	Graves Ave to Rhode Island Ave	2	Vested Critical	E	1,540	1,547	1.00	-7	Yes

YEAR 2027 FUTURE BACKGROUND INTERSECTION CAPACITY ANALYSIS

The background intersection lane configurations are shown in **Figure 11**. The results of the intersection capacity analysis for the PM peak hour are shown in **Table 7**. The analysis reflects the v/c ratios, delays per turning movement (in seconds), and the operating LOS. shows that under future background conditions (does not include project traffic), the study intersections are projected to operate with an overall LOS of E or better with the exception of:

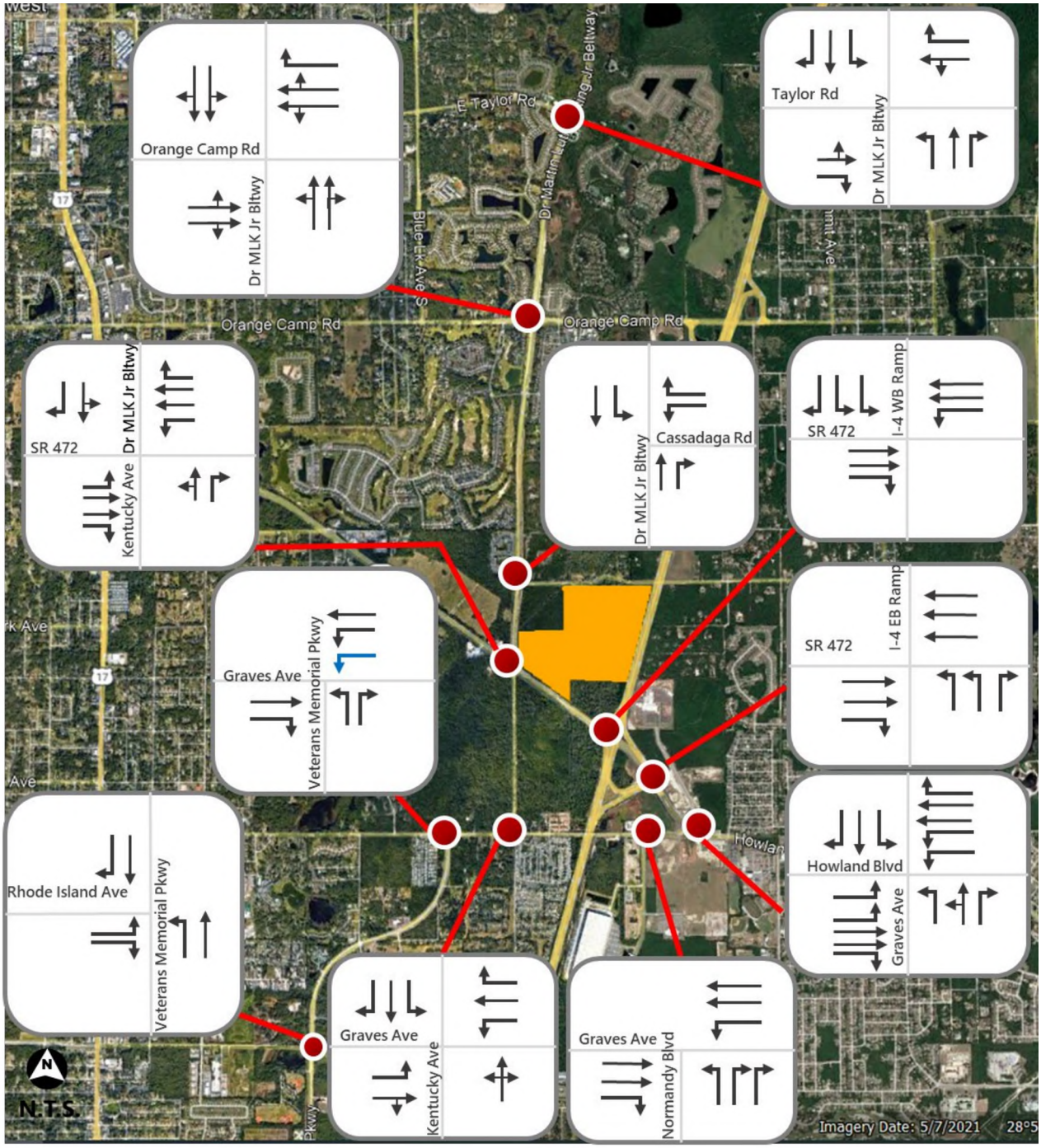
- SR 472 at Dr Martin Luther King Jr Beltway

In addition, the following intersections operate with overcapacity movements:

- SR 472 at Dr Martin Luther King Jr Beltway
- Kentucky Avenue at Graves Avenue
- Howland Boulevard at Graves Avenue/Halifax Crossing Boulevard

Additional background improvements will be further evaluated and analyzed in the following sections to determine the potential improvements to accommodate the projected future background traffic volumes. The future background conditions Synchro and Sidra intersection report printouts are provided in **Appendix L**.

Figure 11: Background Lane Configurations



Existing Lane Configurations

Background Lane Configurations

Table 7: Year 2027 Future Background Intersection Capacity Analysis

Intersection	Intersection Control Type	PM Peak Hour		
		v/c	Delay	LOS
SR 472 at Kentucky Ave./Dr Martin Luther King Jr Bltwy.	Signalized	1.93	170.6	F
Dr Martin Luther King Jr Bltwy.at Cassadaga Rd.	Signalized	0.73	15.8	B
Dr Martin Luther King Jr Bltwy.at Orange Camp Rd.	Roundabout	0.92	36.5	D
SR 472 at Taylor Rd.	Signalized	0.99	44.7	D
Kentucky Ave. at Graves Ave.	Signalized	1.28	75.8	E
Veteran's Memorial Pkwy. at Graves Ave.	Signalized	0.98	36.2	D
Veteran's Memorial Pkwy. at Rhode Island Ave.	Signalized	1.42	85.3	F
SR 472 at I-4 WB Ramps	Signalized	0.90	38.4	D
SR 472 at I-4 EB Ramps	Signalized	0.94	24.5	C
Howland Blvd. at Graves Ave./Halifax Crossing Blvd.	Signalized	1.17	71.7	E
Normandy Blvd. at Graves Ave.	Signalized	0.92	26.8	C

Note: The operational results presented for each intersection represent the worst movement v/c ratio and overall intersection delay and LOS.

YEAR 2027 FUTURE BACKGROUND ROADWAY CAPACITY ANALYSIS (WITH BACKGROUND RELATED IMPROVEMENTS)

Based on the future background roadway capacity analysis, it is recommended that the following roadway segments be widened to enhance operations and increase capacity to better accommodate future background traffic volumes:

- Widen the following roadway segments from two to four lanes:
  - Dr Martin Luther King Kr Beltway:
    - From Cassadaga Road to Orange Camp Road
    - From Orange Camp Road to Taylor Road
  - Orange Camp Road:
    - From Blue Lake Avenue to Martin Luther King Jr Beltway
  - Graves Avenue
    - From Veteran's Memorial Parkway to Kentucky Avenue
- Widen the following roadway segments from four to six lanes:
  - Normandy Boulevard
    - From Graves Avenue to Rhode Island Avenue

The PM peak hour 2027 future background capacity analysis for the study area roadways with addition of the background related improvements can be found in **Table 8**. As seen in the table all study area roadways are anticipated to operate acceptable conditions under the year 2027 future background PM peak hour conditions with the addition of background related improvements.

Table 8: Year 2027 Future Background Roadway Capacity Analysis (With Background Improvements)

Roadway	Segment	No. of Lanes	Critical/Near Critical	Adopted LOS	2-Way PM Capacity	2027 2-Way PM Volume	2027 PM V/C Ratio	Remaining 2027 PM Capacity	Over Capacity?
Dr Martin Luther King Jr Beltway	Cassadaga Rd. to Orange Camp Rd.	4	Vested Near Critical	E	3,410	1,685	0.49	1,725	No
Dr Martin Luther King Jr Beltway	Orange Camp Rd. to Taylor Rd.	4	Vested Near Critical	E	3,410	1,634	0.48	1,776	No
Orange Camp Road	Blue Lake Ave. to Dr Martin Luther King Jr Bltwy.	4	Vested Near Critical	E	3,410	1,670	0.49	1,740	No
Graves Avenue	Veteran's Memorial Pkwy. to Kentucky Ave.	4	Critical	E	3,410	2,203	0.65	1,207	No
Howland Boulevard	I-4/SR 472 to Wolf Pack Rn.	6	Vested Near Critical	E	5,390	3,580	0.66	1,810	No
Normandy Blvd.	Graves Ave. to Rhode Island Ave.	4	Vested Critical	E	3,410	1,547	0.45	1,863	No

YEAR 2027 FUTURE BACKGROUND INTERSECTION CAPACITY ANALYSIS (WITH BACKGROUND RELATED IMPROVMENTS)

The background intersection lane configurations are shown in **Figure 12**. To help improve operations at the intersections showing an overall LOS F or overcapacity movements under the year 2027 PM peak hour future background conditions, the following background related improvements are recommended:

- SR 472 at Kentucky Avenue/Dr Martin Luther King Jr Beltway
  - Add one additional eastbound through lane (v/c ratio is 0.97 on east leg of intersection)
  - Add one additional westbound through lane (v/c ratio is 0.97 on east leg of intersection)
  - Add exclusive northbound left turn lane
  - Use protected/permitted phasing for northbound/southbound left turn movements
  - Optimize signal timings/splits (eliminate the split phase operation)
- Kentucky Avenue at Graves Avenue
  - Add one additional eastbound through lane (v/c ratio is 1.36 on west leg of intersection in background condition)
  - Add one additional southbound left turn lane
  - Add overlap phasing on the southbound right turn movement
  - Optimize signal timings/splits)
- Veteran's Memorial Parkway at Rhode Island Avenue
  - Add southbound shared through-right lane and remove exclusive southbound right turn lane. There is an acceleration lane on the south leg of this intersection that can be converted to a second receiving lane.
- Howland Boulevard at Graves Avenue/Halifax Crossing Boulevard
  - Add one additional eastbound through lane (v/c ratio is 1.05 on both legs of intersection)
  - Add one additional westbound through lane (v/c ratio is 1.05 on both legs of intersection)

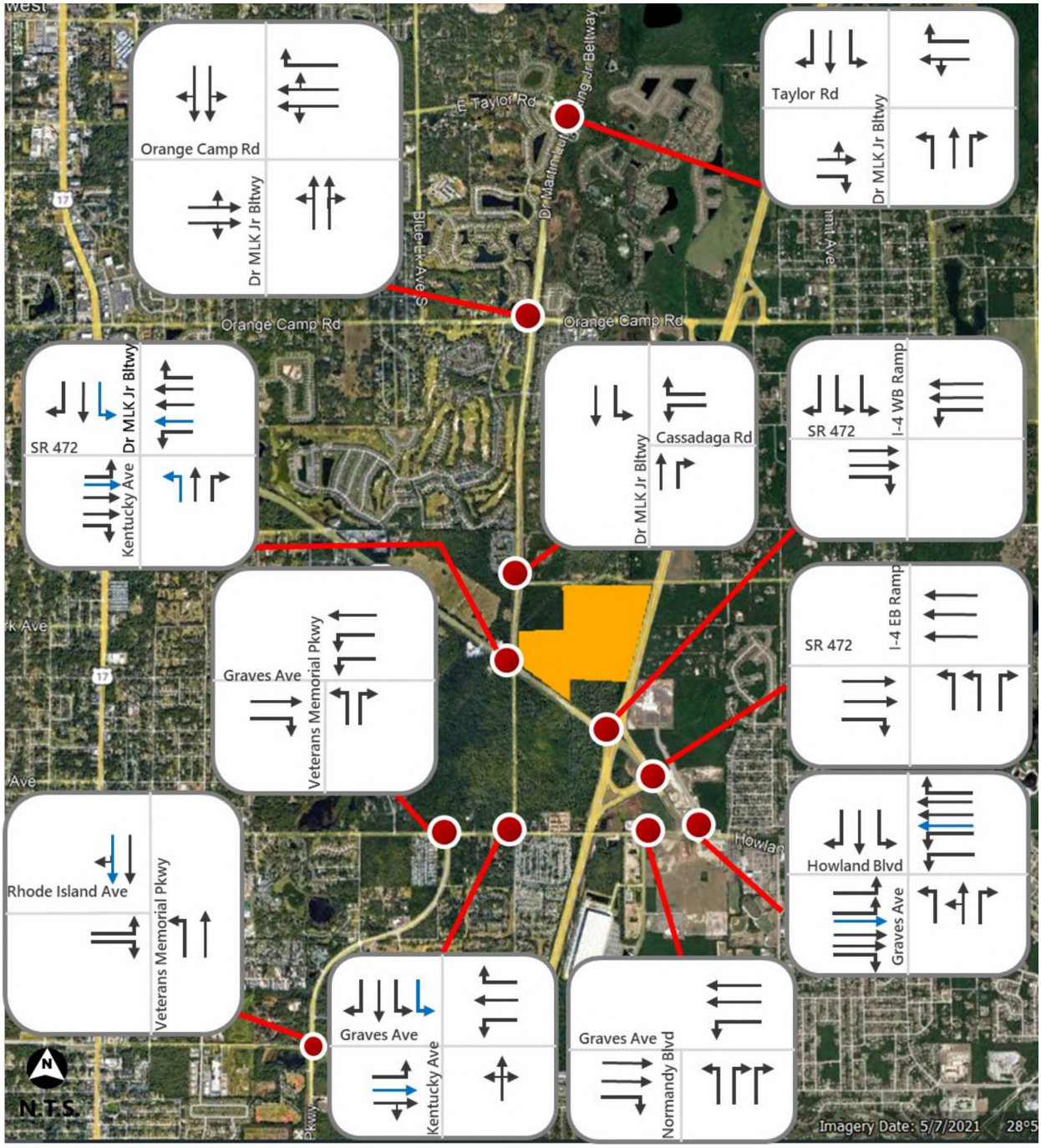
With the above recommended improvements, these intersections are expected to operate at an overall LOS E or better and no overcapacity movements. The results of the improved background conditions are presented in **Table 9** and the Synchro intersection report printouts are provided in **Appendix M**.

Table 9: Year 2027 Future Background Intersection Capacity Analysis (With Background Improvements)

Intersection	Intersection Control Type	PM Peak Hour		
		v/c	Delay	LOS
SR 472 at Kentucky Ave./Dr Martin Luther King Jr Bltwy.	Signalized	0.98	58.2	E
Kentucky Ave. at Graves Ave.	Signalized	0.93	42.0	D
Veteran's Memorial Pkwy. at Rhode Island Ave.	Signalized	0.92	38.2	D
Howland Blvd. at Graves Ave./Halifax Crossing Blvd.	Signalized	0.94	39.6	D

Note: The operational results presented for each intersection represent the worst movement v/c ratio and overall intersection delay and LOS.

Figure 12: Background Improvements Lane Configurations



Background Lane Configurations

Improvement Lane Configurations

YEAR 2027 BUILDOUT ROADWAY CAPACITY ANALYSIS (WITH BACKGROUND RELATED IMPROVEMENTS)

The PM peak hour 2027 future buildout (background + project traffic) capacity analysis for the study area roadways with addition of the background related improvements can be found in **Table 10.** The analysis concludes that several roadway segments operate over capacity because of buildout traffic conditions. These segments include:

Dr Martin Luther King Jr Beltway:
  - From SR472 to Cassadaga Road
- Kentucky Avenue:
  - From Graves Avenue to SR 472
- Howland Boulevard:
  - From Wolf Pack Run to Catalina Boulevard
- SR 472:
  - From Martin Luther King Jr Beltway to I-4

Table 10: Year 2027 Buildout Roadway Capacity Analysis (With Background Improvements)

Roadway	Segment	No. of Lanes	Critical/Near Critical	Adopted LOS	2-Way PM Capacity	2027 2-Way PM Volume	2027 PM V/C Ratio	Remaining 2027 PM Capacity	Over Capacity?
Dr Martin Luther King Jr Beltway	SR 472 to Cassadaga Rd.	2	None	E	1,540	1,722	1.12	-182	Yes
	Cassadaga Rd. to Orange Camp Rd.	4	Vested Near Critical	E	3,410	1,945	0.57	1,465	No
	Orange Camp Rd. to Taylor Rd.	4	Vested Near Critical	E	3,410	1,726	0.51	1,684	No
	Taylor Rd. to Beresford Ave.	2	Vested Near Critical	E	1,540	1,506	0.98	34	No
Kentucky Avenue	Graves Ave. to SR 472	2	None	E	1,540	1,600	1.04	-60	Yes
Veteran's Memorial Parkway	Rhode Island Ave. to Graves Ave.	2	Vested Near Critical	E	1,620	1,622	1.00	-2	No
Cassadaga Road	W Volusia Beltway to Macy Ave	2	None	E	1,020	428	0.42	592	No
Orange Camp Road	Blue Lake Ave. to Dr Martin Luther King Jr Bltwy.	4	Vested Near Critical	E	3,410	1,787	0.52	1,623	No
Graves Avenue	Veteran's Memorial Pkwy. to Kentucky Ave.	4	Vested Critical	E	3,410	2,288	0.67	1,122	No
Howland Boulevard	I-4/SR 472 to Wolf Pack Rn.	6	None	D	5,390	3,766	0.70	1,624	No
	Wolf Pack Rn. to Catalina Blvd.	4	Critical	E	3,410	3,449	1.01	-39	Yes
	Catalina Blvd. to Providence Blvd.	6	Vested Near Critical	E	3,410	2,459	0.72	951	No

Table 10: Year 2027 Buildout Roadway Capacity Analysis (With Background Improvements) (Continued)

Roadway	Segment	No. of Lanes	Critical/Near Critical	Adopted LOS	2-Way PM Capacity	2027 2-Way PM Volume	2027 PM V/C Ratio	Remaining 2027 PM Capacity	Over Capacity?
SR 472	US 17/92 to Martin Luther King Jr Bltwy.	4	None	D	5,960	3,397	0.57	2,563	No
	Martin Luther King Jr Bltwy. to I-4	4	None	D	3,580	3,788	1.06	-208	Yes
Macy Avenue	Ohio St. to Cassadaga Rd.	2	None	C	1,020	274	0.27	746	No
Kicklighter Road	Macy Ave. to Lake Helen-Osteen Rd./Prevatt Ave.	2	None	E	1,020	338	0.33	682	No
Normandy Blvd.	Graves Ave to Rhode Island Ave	4	Vested Critical	E	3,410	1,616	0.47	1,794	No

YEAR 2027 BUILDOUT INTERSECTION CAPACITY ANALYSIS (WITH BACKGROUND RELATED IMPROVEMENTS)

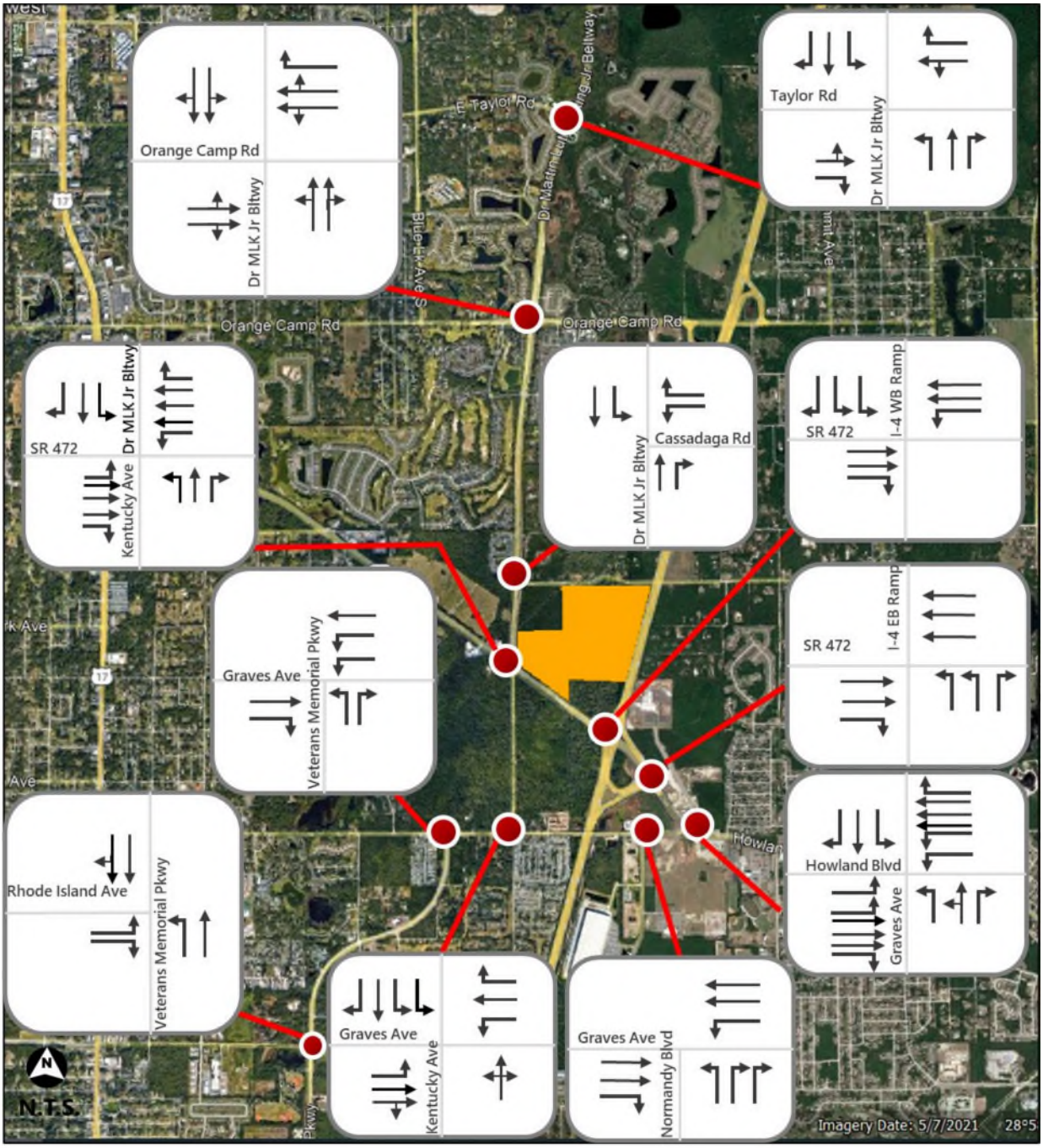
The buildout intersection lane configurations are shown in **Figure 13** and **Figure 14**. The results of the intersection capacity analysis for the PM peak hour under buildout future conditions with background improvements are shown in **Table 11**. The analysis reflects the v/c ratios, delays per turning movement (in seconds), and the operating LOS. Several new intersections were analyzed in the buildout condition including:

- SR 472
    - One stop controlled directional opening intersection
    - Two stop-controlled right-in right-out intersections
- Dr Martin Luther King Jr Beltway
    - One stop-controlled right-in right-out intersection
    - One signalized intersection
- Cassadaga Road
    - One stop-controlled full access intersection

A shown in **Table 11**, SR 472 at Dr Martin Luther King Jr Beltway is expected to operate with an overall intersection LOS of F and overcapacity movements. The remaining intersections operate at LOS E or better and without overcapacity movements.

Additional buildout improvements will be further evaluated and analyzed in the following sections to determine the potential improvements to accommodate the projected buildout traffic volumes. The future buildout conditions Synchro and Sidra intersection report printouts are provided in **Appendix N**.

Figure 13: Buildout Lane Configurations



Background with Improvements Lane Configurations

Figure 14: Buildout Lane Configurations at Site Driveways

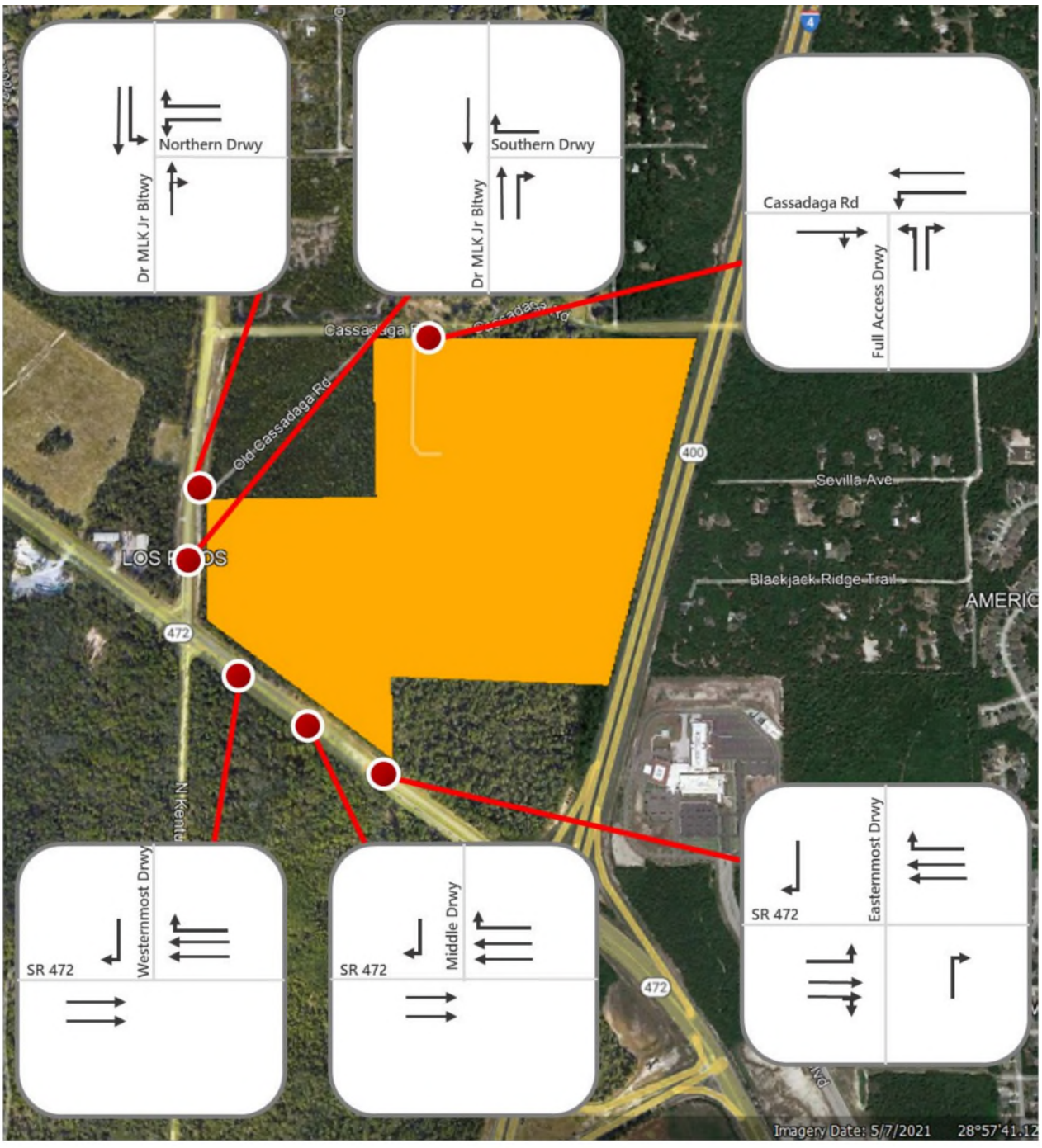


Table 11: Year 2027 Build Intersection Capacity Analysis (With Background Improvements)

Intersection	Intersection Control Type	PM Peak Hour		
		v/c	Delay	LOS
SR 472 at Kentucky Ave./Dr Martin Luther King Jr Bltwy.	Signalized	1.55	171.9	F
Dr Martin Luther King Jr Bltwy.at Cassadaga Rd.	Signalized	0.81	25.0	C
Dr Martin Luther King Jr Bltwy.at Orange Camp Rd.	Signalized	0.99	51.5	D
SR 472 at Taylor Rd.	Signalized	0.96	44.8	D
Kentucky Ave. at Graves Ave.	Signalized	0.95	46.4	D
Veteran's Memorial Pkwy. at Graves Ave.	Signalized	0.99	41.7	D
Veteran's Memorial Pkwy. at Rhode Island Ave.	Signalized	0.92	40.7	D
SR 472 at I-4 WB Ramps	Signalized	0.93	39.9	D
SR 472 at I-4 EB Ramps	Signalized	0.95	24.6	C
Howland Blvd. at Graves Ave./Halifax Crossing Blvd.	Signalized	0.94	38.9	D
Normandy Blvd. at Graves Ave.	Signalized	0.93	29.4	C
SR 472 at Eastern Driveway	Unsignalized	0.48	27.9	D
SR 472 at Middle Driveway	Unsignalized	0.16	20.0	C
SR 472 at Western Driveway	Unsignalized	0.15	19.5	C
Dr. Martin Luther Jr Bltwy. at Southern Driveway	Unsignalized	0.12	15.2	C
Dr. Martin Luther Jr Bltwy. at Northern Driveway	Signalized	0.85	15.2	B
Cassadaga Rd. at Project Driveway	Unsignalized	0.38	14.0	B

Note: The operational results presented for signalized intersections and roundabouts represent the worst movement v/c ratio and overall intersection delay and LOS. The operational results presented for unsignalized intersections represented the worst movement v/c ratio, delay, and LOS.

YEAR 2027 BUILDOUT ROADWAY CAPACITY ANALYSIS (WITH BACKGROUND AND PROJECT IMPROVEMENTS)

Based on the future buildout roadway capacity analysis, it is recommended that the following roadway segments be widened to enhance operations and increase capacity to better accommodate future buildout traffic volumes:

- Widen the following roadway segments from two to four lanes:
  - Dr Martin Luther King Kr Beltway:
    - From SR 472 to Cassadaga Road
  - Kentucky Avenue:
    - From Graves Avenue to SR 472
- Widen the following roadway segments from four to six lanes:
  - Howland Boulevard:
    - From Wolf Pack Run to Catalina Boulevard
  - SR 472:
    - From Martin Luther King Jr Beltway to I-4

The PM peak hour 2027 future buildout capacity analysis for the study area roadways with addition of the buildout related improvements can be found in **Table 12**. As seen in the table all study area roadways are anticipated to operate acceptable conditions under the year 2027 future buildout PM peak hour conditions with the addition of buildout related improvements.

Table 12: Year 2027 Future Buildout Roadway Capacity Analysis (With Buildout Improvements)

Roadway	Segment	No. of Lanes	Critical/Near Critical	Adopted LOS	2-Way PM Capacity	2027 2-Way PM Volume	2027 PM V/C Ratio	Remaining 2027 PM Capacity	Over Capacity?
Dr Martin Luther King Jr Beltway	SR 472 to Cassadaga Rd.	4	None	E	3,410	1,722	0.50	1,688	No
Kentucky Avenue	Graves Ave. to SR 472	4	None	E	3,410	1,600	0.47	1,810	No
Howland Boulevard	Wolf Pack Rn. to Catalina Blvd.	6	Vested Near Critical	E	5,390	3,449	0.64	1,941	No
SR 472	Martin Luther King Jr Bltwy. to I-4	6	None	D	5,390	3,788	0.70	1,602	No

YEAR 2027 BUILDOUT INTERSECTION CAPACITY ANALYSIS (WITH BACKGROUND AND PROJECT IMPROVEMENTS)

The buildout intersection lane configurations are shown with associated improvements in **Figure 15** and **Figure 16**. To help improve operations at the intersections showing an overall LOS F or overcapacity movements under the year 2027 PM peak hour future buildout conditions, the following buildout related improvements are recommended:

- SR 472 at Kentucky Avenue/Dr Martin Luther King Jr Beltway
  - Add one additional northbound through lane (this is also a proposed roadway improvement for Kentucky Avenue)
  - Add one additional southbound through lane (this is also a proposed roadway improvement for Dr Martin Luther King Jr Beltway)
  - Add a second southbound left turn lane
  - Add a second westbound left turn lane
  - Add protected phasing on northbound and southbound left turn movements
  - Add permitted-protected phasing on eastbound and westbound right turn movements
  - Optimize signal timings/splits
- Dr. Martin Luther Jr Beltway at Southern Driveway
  - Add one northbound and southbound through lane
- Dr. Martin Luther Jr Beltway at Northern Driveway
  - Add one northbound and southbound through lane
- Dr. Martin Luther Jr Beltway at Cassadaga Road
  - The exclusive northbound right turn lane will now be served directly by the second northbound lane.
  - The second southbound through lane will start on the south side of this intersection.

With the above recommended improvements, these intersections are expected to operate at an overall LOS E or better and no overcapacity movements. The results of the improved buildout conditions are presented in **Table 13** and the Synchro intersection report printouts are provided in **Appendix O**.

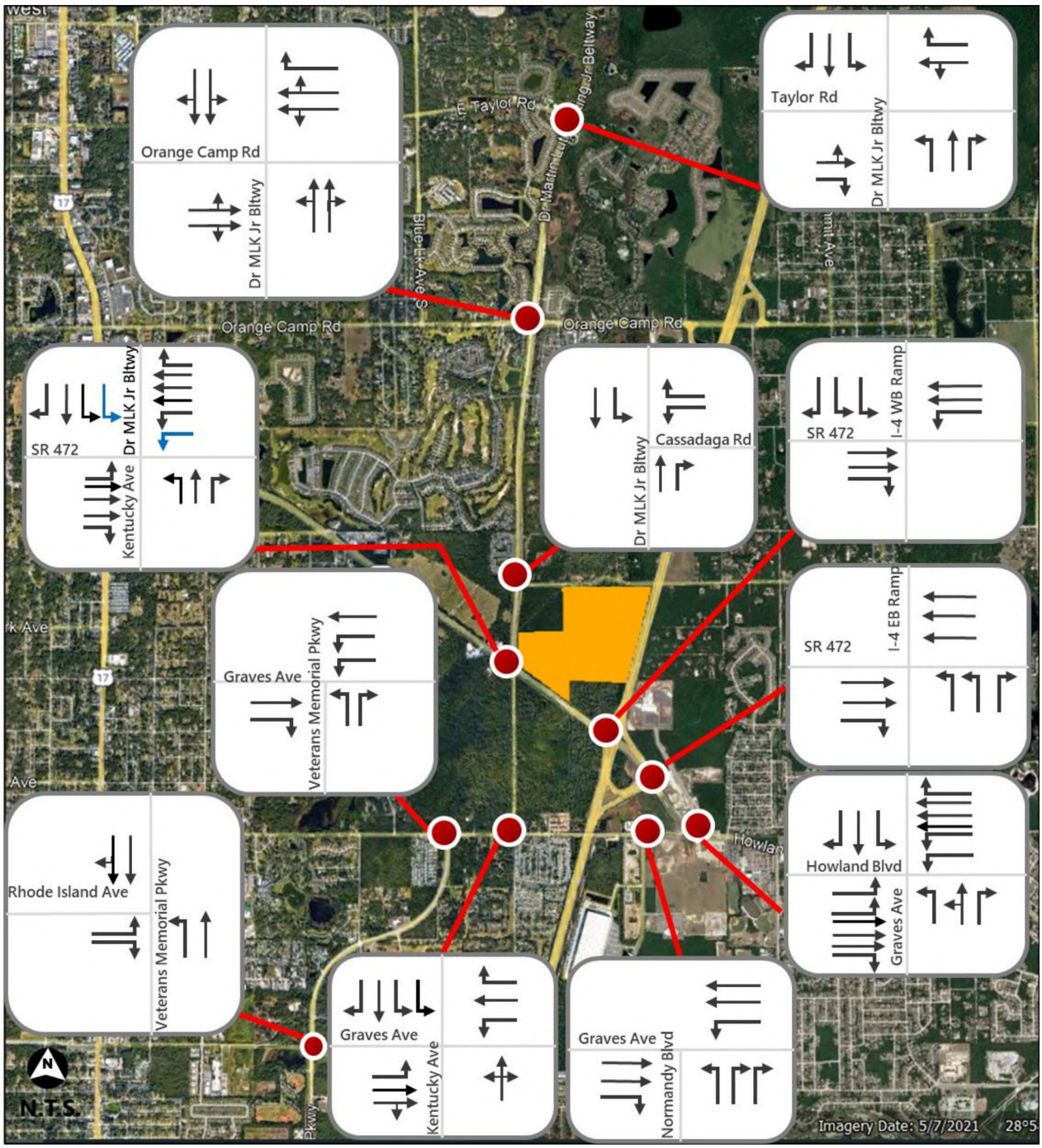
It should be noted that the SR 472 intersection improvements are needed under the assumption that the main driveway for the site on SR 472 has restricted access, not allowing for left turns out of the site. This results in all traffic exiting the project and desiring to head east on SR 472 to be stacked in the southbound left turn at the intersection of SR 472 and Dr Martin Luther King Jr Beltway. An ICE analysis and signal warrant analysis are being conducted to support a full access connection on SR 472.

Table 13: Year 2027 Buildout Intersection Capacity Analysis (With Buildout Improvements)

Intersection	Intersection Control Type	PM Peak Hour		
		v/c	Delay	LOS
SR 472 at Kentucky Ave./Dr Martin Luther King Jr Bltwy.	Signalized	0.96	70.3	E
Dr. Martin Luther Jr Bltwy. at Southern Driveway	Unsignalized	0.08	11.3	B
Dr. Martin Luther Jr Bltwy. at Northern Driveway	Signalized	0.79	9.5	A
Dr. Martin Luther Jr Bltwy. at Cassadaga Road	Signalized	0.76	24.1	C

Note: The operational results presented for each intersection represent the worst movement v/c ratio and overall intersection delay and LOS. The operational results presented for unsignalized intersections represented the worst movement v/c ratio, delay, and LOS.

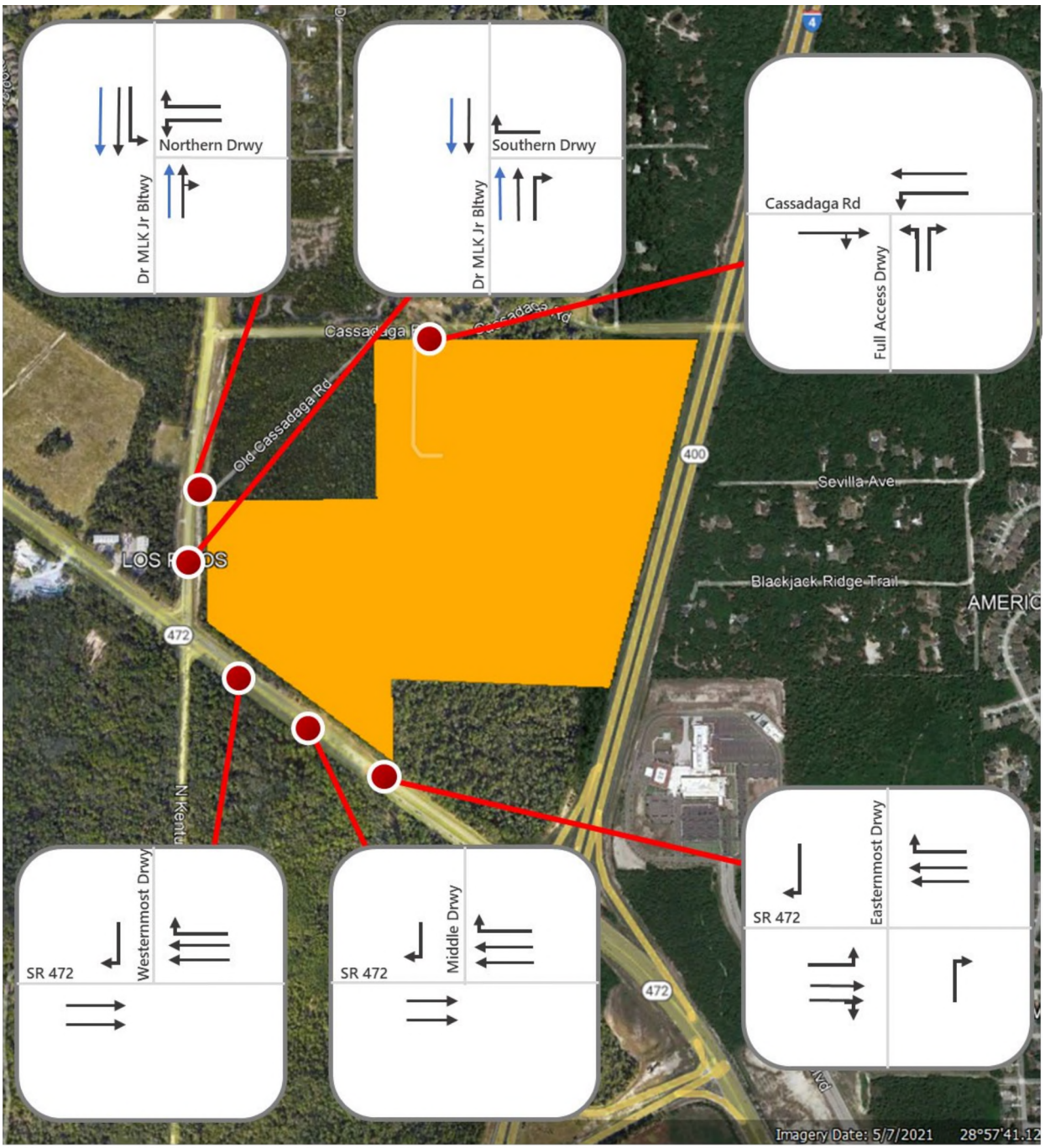
Figure 15: Buildout Improvements Lane Configurations



Buildout Lane Configurations

Buildout with Improvements Lane Configurations

Figure 16: Buildout Improvements Lane Configurations at Site Driveways



Buildout Lane Configurations

Buildout with Improvements Lane Configurations

INTERSECTION TURN LANE AND QUEUE ANALYSIS

As previously indicated, the site will have two full access driveways: one on Cassadaga Road and one on Dr Martin Luther King Jr Beltway. There will be one directional opening on SR 472 and three right-in/right-out access driveways: two on SR 472 and one on Dr Martin Luther King Jr Beltway.

Table 14 shows the project driveways where an exclusive turn lane is needed per the Volusia County Land Development Code (LDC), as shown in Section 72-619 (e) (5) a. 2. This portion of the Volusia County Land Development Code states that a right turn lane shall be provided when the speed limit equals or exceeds 35 miles per hour or if the development will generate 100 or more right-turn movements during the peak hour. Since each of the right turn movements considered in **Table 14** are located on roadways meeting the speed threshold, an exclusive right-turn lane is warranted in each location.

Table 14: Turn Lane Analysis

Intersection	Turning Movement	Exclusive Lane Needed?	Reason
SR 472 at East Driveway	Westbound Right	Yes	LDC speed threshold met.
SR 472 at Middle Driveway	Westbound Right	Yes	LDC speed threshold met.
SR 472 at West Driveway	Westbound Right	Yes	LDC speed threshold met.
Dr Martin Luther King Jr Beltway at South Driveway	Northbound Right	Yes	LDC speed threshold met.
Dr Martin Luther King Jr Beltway at North Driveway	Northbound Right	Yes	LDC speed threshold met.
Cassadaga Road at Project Driveway	Eastbound Right	Yes	LDC speed threshold met.

A queueing analysis was also conducted for the existing study intersections to determine the impacts of the project development on intersection queueing in the study area. **Table 15** shows the queueing results for the existing, background, and buildout conditions at these intersections. An indication is provided for whether the lane length is exceeded in the existing, background, or buildout condition. Only two intersections have a turning movement where a turn lane deficiency is caused by the buildout condition:

- SR 472 at Kentucky Avenue/Dr Martin Luther King Jr Beltway: Eastbound right turn lane
- Veteran's Memorial Parkway at Rhode Island Avenue: Eastbound left turn lane

The required deceleration length is determined from the FDOT Design Manual Exhibit 212-1for State roads and the Volusia County LDC for County roads. **Appendix P** shows these deceleration length standards. Design speed (posted speed plus five) was used for FDOT intersections, while posted speed was used for the Volusia County standards.

Table 15: Intersection Queue Analysis

Intersection	Movement	Speed	Total Existing Lane Length (ft)	Required Deceleration (ft)	Existing Conditions Analysis			2027 Future Background Conditions Analysis			2027 Future Buildout Conditions Analysis			Cause for Deficiency
					95th % Queue (ft)	Total Required Turn Lane Length (ft)	Lane Length Def (ft)	95th % Queue (ft)	Total Required Turn Lane Length (ft)	Lane Length Deficiency (ft)	95th % Queue (ft)	Total Required Turn Lane Length (ft)	Lane Length Deficiency (ft)	
SR 472 at Kentucky Ave./Dr Martin Luther King Jr Bltwy.	EBL	55	510	405	125	630	120	200	605	95	475	880	370	Existing
	EBR	55	535	405	75	480	0	100	505	0	425	830	295	Buildout
	WBL	55	530	405	325	730	200	400	805	275	675	1080	550	Existing
	WBR	55	535	405	150	555	20	125	530	0	450	855	320	Existing
	NBL	45	715[1]	290	0	0	0	0	0	0	425	715	0	N/A
	NBR	45	515	290	0	0	0	0	290	0	0	290	0	N/A
	SBL	55	270	405	350	755	485	550	955	685	2100	2505	2235	Existing
	SBR	55	370	405	0	405	35	0	405	35	0	405	35	Existing
Dr Martin Luther King Jr Bltwy. at Cassadaga Rd.	WBL	35	285	155	75	230	0	150	305	20	350	505	220	Background
	WBR	35	285	155	25	180	0	50	205	0	75	230	0	N/A
	NBR	55	250	455	50	505	255	100	555	305	125	580	330	Existing
	SBL	55	265	455	25	480	215	50	505	240	75	530	265	Existing
Dr Martin Luther King Jr Bltwy. at Taylor Rd.	EBR	50	305	385	75	460	155	200	585	280	225	610	305	Existing
	NBL	55	485	455	75	530	45	200	655	170	250	705	220	Existing
	NBR	55	485	455	25	480	0	25	480	0	25	480	0	N/A
	SBL	55	485	455	25	480	0	25	480	0	25	480	0	N/A
	SBR	55	525	455	50	505	0	75	530	5	75	530	5	Background
Kentucky Ave. at Graves Ave.	EBL	45	200	240	225	465	265	700	940	740	650	890	690	Existing
	WBL	45	235	240	50	290	55	50	290	55	50	290	55	Existing
	WBR	45	450	240	75	315	0	250	490	40	425	665	215	Background
	SBL	45	340	240	400	640	300	625	865	525	350	590	250	Existing
	SBR	45	195	240	75	315	120	125	365	170	600	840	645	Existing
Veteran's Memorial Pkwy. at Graves Ave.	EBR	45	525	240	225	465	0	350	590	65	350	590	65	Background
	WBL	45	285	240	175	415	130	200	440	155	225	465	180	Existing
	NBR	50	1110	385	325	710	0	575	960	0	600	985	0	N/A

[1] This turn lane is added in the background improvements section. The total length was determined by adding the required deceleration length to the buildout 95th percentile queue length.

Table 15: Intersection Queue Analysis (Continued)

Intersection	Movement	Speed	Total Existing Lane Length (ft)	Required Deceleration (ft)	Existing Conditions Analysis			2027 Future Background Conditions Analysis			2027 Future Buildout Conditions Analysis			Cause for Deficiency
					95th % Queue (ft)	Total Required Turn Lane Length (ft)	Lane Length Def (ft)	95th % Queue (ft)	Total Required Turn Lane Length (ft)	Lane Length Deficiency (ft)	95th % Queue (ft)	Total Required Turn Lane Length (ft)	Lane Length Deficiency (ft)	
Veteran's Memorial Pkwy. at Rhode Island Ave.	EBL	40	440	185	225	410	0	250	435	0	375	560	120	Buildout
	NBL	50	400	385	275	660	260	725	1110	710	325	710	310	Existing
	SBR	50	385	385	100	485	100	125	510	125	0	385	0	Existing
Howland Blvd. at Graves Ave./Halifax Crossing Blvd.	EBL	50	340	350	25	375	35	25	375	35	25	375	35	Existing
	EBR	50	390	350	125	475	85	175	525	135	225	575	185	Existing
	WBL	45	555	290	300	590	35	425	715	160	425	715	160	Existing
	WBR	45	735	290	25	315	0	50	340	0	50	340	0	N/A
	NBL	35	280	155	225	380	100	275	430	150	200	355	75	Existing
	SBL	35	185	155	50	205	20	50	205	20	50	205	20	Existing
Normandy Blvd. at Graves Ave.	EBR	45	555	240	175	415	0	550	790	235	600	840	285	Background
	WBL	35	760	155	50	205	0	100	255	0	125	280	0	N/A
	NBL	45	575	240	100	340	0	375	615	40	425	665	90	Background
	NBR	45	575	240	100	340	0	350	590	15	375	615	40	Background

Table 16 shows the queueing results for the buildout condition at the project driveways. The total lane lengths were determined based on the queueing results determined in the buildout condition.

Table 16: Driveway Queue Analysis

Intersection	Movement	Speed	Total Lane Length	Required Deceleration (ft)	95th % Queue (ft)	Total Required Turn Lane Length (ft)	Lane Length Deficiency (ft)
SR 472 at Eastern Driveway	EBL	55	475	405	50	455	0
	WBR	55	475	405	0	405	0
SR 472 at Middle Driveway	WBR	55	475	405	0	405	0
SR 472 at Western Driveway	WBR	55	475	405	0	405	0
Dr. Martin Luther Jr Bltwy. at Southern Driveway	NBR	55	475	455	0	455	0
Dr. Martin Luther Jr Bltwy. at Northern Driveway	SBL	55	530	455	50	530	0
	NBR	55	500	455	25	480	0
Cassadaga Rd. at Project Driveway	WBL	35	200	155	25	180	0
	EBR	55	200	155	0	155	0

PROPORTIONATE SHARE CALCULATIONS

As part of the buildout condition, several improvements were recommended. Proportionate share calculations were made for each project-related improvements and are shown in **Table 17** and **Table 18**. The total proportionate share amount including roadway and intersection improvements is approximately $4.1 million. Additional details are provided in **Appendix Q**.

Table 17: Proportionate Share Calculations -Roadways

Roadway	Segment	Improvement	Total Improvement Cost	Proportionate Share
Dr Martin Luther King Jr Beltway	SR 472 to Cassadaga Road	Widen 2 to 4 lanes, rural	$1,303,851.78	$138,054.89
Kentucky Avenue	Graves Ave. to SR 472	Widen 2 to 4 lanes, rural	$2,575,107.27	$152,853.96
Howland Boulevard	Wolf Pack Rn. to Catalina Blvd.	Widen 4 to 6 lanes, rural	$4,415,149.06	$316,642.00
SR 472	Martin Luther King Jr Bltwy. to I-4	Widen 4 to 6 lanes, urban	$3,930,971.28	$699,321.96
Total				**$1,306,872.82**

Table 18: Proportionate Share Calculations -Intersections

Intersection	Improvement	Total Improvement Cost/ Proportionate Share
SR 472 at Kentucky Avenue/Dr Martin Luther King Jr Beltway	Add second southbound left turn lane	$705,520.49
	Add second westbound left turn lane	$565,118.40
	Extend eastbound left turn lane	$193,052.87
	Extend eastbound right turn lane	$202,547.08
	Extend westbound left turn lane	$193,052.87
	Extend westbound right turn lane	$219,712.09
	Optimize signal timings	$4,000.00
Dr Martin Luther King Jr Beltway at Cassadaga Road	Extend northbound right turn lane	$17,165.01
	Extend southbound left turn lane	$17,550.26
Dr Martin Luther King Jr Beltway at Taylor Road	Extend eastbound right turn lane	$17,165.01
	Extend northbound left turn lane	$35,100.52
Kentucky Avenue at Graves Avenue	Extend westbound right turn lane	$120,155.05
	Extend southbound right turn lane	$326,135.13
Veteran's Memorial Parkway at Graves Avenue	Extend westbound left turn lane	$17,550.26
Veteran's Memorial Parkway at Rhode Island Avenue	Extend eastbound left turn lane	$84,241.25
Howland Boulevard at Graves Avenue/Halifax Crossing Boulevard	Extend eastbound right turn lane	$34,330.01
Normandy Boulevard at Graves Avenue	Extend eastbound right turn lane	$34,330.01
	Extend northbound left turn lane	$35,100.52
	Extend northbound right turn lane	$17,165.01
Total		**$2,838,991.82**

MULTIMODAL ASSESSMENT

A multimodal assessment was conducted to determine existing and proposed alternate modes of transportation within the immediate project study area. The following is a summary of transit, pedestrian, and bicycle facilities:

TRANSIT

Transit services within Volusia County are provided by Votran. There are no Votran bus routes on any of the adjacent roadways to the project site including SR 472, Dr Martin Luther King Jr Beltway, and Cassadaga Road, nor are there any bus stops available within a quarter-mile walking distance from the site.

PEDESTRIAN FACILTIES

There is existing sidewalk on the north side of SR 472, adjacent to the site. This 750-foot section of sidewalk extends from approximately 550 feet east of the eastern median opening on SR 472 to the I-4 westbound off-ramp.

There is no existing sidewalk on either side of Dr Martin Luther King Jr Beltway, south of Cassadaga Road to SR 472. However, there is sidewalk along the east side of Dr Martin Luther King Jr Beltway, north of Cassadaga Road and connecting to the existing sidewalk further north on Martin Luther King Jr Beltway. This connection thus provides sidewalk along the entire 1.25-mile stretch from Cassadaga Road to Orange Camp Road.

There is no sidewalk on either side of Cassadaga Road adjacent to the development. There are also no trails near the site.

The development is expected to connect to the existing sidewalk network but the specific locations of sidewalk installation have not yet been determined. The City of DeLand will be working with the developer on the provisions of sidewalks for the site and will be included in the Developer's Agreement.

BICYCLE FACILTIES

There are existing bicycle lanes along SR 472, however, there are no bicycle lanes adjacent to the site along Dr Martin Luther King Jr Beltway and Cassadaga Road.



Section 4
Conclusions

CONCLUSIONS

This traffic analysis has been prepared to evaluate the traffic impacts associated with the proposed DeLand Tech Park development to be located north of SR 472, east of Dr Martin Luther King Jr Beltway, and south of Cassadaga Road in support of obtaining concurrency through the City of DeLand.

The following is a summary of the study findings:

Trip Generation

- The proposed development is expected to generate 16,191 new daily trips, 683 new AM peak hour trips, and 1,220 new PM peak hour trips.

Proposed Access

- The site will have two full access driveways; one on Cassadaga Road and one on Dr Martin Luther King Jr Beltway. There will be one access driveway that will allow left-in, right-in, and right-out access on SR 472. Finally, there will be three right-in/right-out access driveways; two on SR 472, and one on Dr Martin Luther King Jr Beltway.

Existing Conditions

- All study roadway segments operate acceptably and are shown to have sufficient capacity under existing conditions with the exception of Graves Avenue from Veterans Memorial Parkway to Kentucky Avenue which is designated as a Critical roadway with a volume to capacity (v/c) ratio of 1.01.
- All intersections are operating at an overall LOS of E or better. However, there were movements at the intersections of SR 472 at Kentucky Avenue/Dr Martin Luther King Jr Beltway, SR 472 at I-4 WB Ramps, and Howland Boulevard at Graves Avenue/Halifax Crossing Boulevard that operate at LOS F. The Howland Boulevard at Graves Avenue/Halifax Crossing Boulevard intersection also operates with two overcapacity movements.

Background Conditions

- Several roadway segments for future conditions operate over capacity as a result from background traffic conditions. These segments include:
    - Dr Martin Luther King Jr Beltway
        - From Cassadaga Road to Orange Camp Road
        - From Orange Camp Road to Taylor Road
    - Orange Camp Road
        - From Blue Lake Avenue to Dr Martin Luther King Jr Beltway
    - Graves Avenue
        - From Veteran's Memorial Parkway to Kentucky Avenue
    - Howland Boulevard
        - From I-4/SR 472 to Wolf Pack Run
    - Normandy Boulevard
        - From Graves Avenue to Rhode Island Avenue
- It is recommended that the following roadway segments be widened due to deficiencies identified in the background traffic conditions in order to enhance operations and increase capacity in an effort to better accommodate future traffic conditions:
    - Widen the following roadway segments from two to four lanes:
        - Dr Martin Luther King Kr Beltway:
            - From Cassadaga Road to Orange Camp Road

        - From Orange Camp Road to Taylor Road
    - Orange Camp Road:
        - From Blue Lake Avenue to Martin Luther King Jr Beltway
    - Graves Avenue
        - From Veteran's Memorial Parkway to Kentucky Avenue
  - Widen the following roadway segments from four to six lanes:
    - Normandy Boulevard
        - From Graves Avenue to Rhode Island Avenue
- Under future background conditions, study intersections are projected to operate with an overall LOS of E or better with the exception of SR 472 at Dr Martin Luther King Jr Beltway. In addition, the following intersections operate with overcapacity movements:
  - SR 472 at Dr Martin Luther King Jr Beltway
  - Kentucky Avenue at Graves Avenue
  - Howland Boulevard at Graves Avenue/Halifax Crossing Boulevard
- To help improve operations at the intersections showing an overall LOS F or overcapacity movements under the year 2027 PM peak hour future background conditions, the following background related improvements are recommended:
  - SR 472 at Kentucky Avenue/Dr Martin Luther King Jr Beltway
    - Add one additional eastbound through lane (v/c ratio is 0.97 on east leg of intersection)
    - Add one additional westbound through lane (v/c ratio is 0.97 on east leg of intersection)
    - Add exclusive northbound left turn lane
    - Use protected/permitted phasing for northbound/southbound left turn movements
    - Optimize signal timings/splits (eliminate the split phase operation)
  - Kentucky Avenue at Graves Avenue
    - Add one additional eastbound through lane (v/c ratio is 1.36 on west leg of intersection in background condition)
    - Add one additional southbound left turn lane
    - Add overlap phasing on the southbound right turn movement
    - Optimize signal timings/splits)
  - Howland Boulevard at Graves Avenue/Halifax Crossing Boulevard
    - Add one additional eastbound through lane (v/c ratio is 1.05 on both legs of intersection)
    - Add one additional westbound through lane (v/c ratio is 1.05 on both legs of intersection)

Buildout Conditions

- The analysis concludes that several roadway segments operate over capacity as a result of buildout traffic conditions. These segments include:
  - Dr Martin Luther King Jr Beltway:
    - From SR472 to Cassadaga Road
  - Kentucky Avenue:
    - From Graves Avenue to SR 472
  - Howland Boulevard:
    - From Wolf Pack Run to Catalina Boulevard
  - SR 472:
    - From Martin Luther King Jr Beltway to I-4
- Based on the future buildout roadway capacity analysis, it is recommended that the following roadway segments be widened to enhance operations and increase capacity to better accommodate future buildout traffic volumes:
  - Widen the following roadway segments from two to four lanes:
    - Dr Martin Luther King Kr Beltway:

        - From SR 472 to Cassadaga Road
    - Kentucky Avenue:
        - From Graves Avenue to SR 472
- Widen the following roadway segments from four to six lanes:
    - Howland Boulevard:
        - From Wolf Pack Run to Catalina Boulevard
    - SR 472:
        - From Martin Luther King Jr Beltway to I-4

- Under future background improved roadway conditions SR 472 at Dr Martin Luther King Jr Beltway is expected to operate with an overall intersection LOS of F and overcapacity movements. The remaining intersections operate at LOS E or better and without overcapacity movements. The following is recommended to help improve operations at the intersection of SR 472 and Kentucky Avenue/Dr Martin Luther King Jr Beltway, which will improve operations to LOS E without overcapacity movements:

    - Add one additional northbound through lane (this is also a proposed roadway improvement for Kentucky Avenue)
    - Add one additional southbound through lane (this is also a proposed roadway improvement for Dr Martin Luther King Jr Beltway)
    - Add a second southbound left turn lane
    - Add a second westbound left turn lane
    - Add protected phasing on northbound and southbound left turn movements
    - Add permitted-protected phasing on eastbound and westbound right turn movements
    - Optimize signal timings/splits

    The list above show the minimum improvements that are needed to satisfy the deficiencies under the assumption that the main driveway for the site on SR 472 is restricted access, not allowing for left turns out of the site. This results in all traffic existing the project and desiring to head east on SR 472 to be stacked in the southbound left turn at the intersection of SR 472 and Dr Martin Luther King Jr Beltway. An ICE analysis and signal warrant analysis are being conducted to support a full access connection on SR 472.

- Several other intersection improvements are recommended so that the buildout condition performs acceptably, including:

    - Dr. Martin Luther Jr Beltway at Southern Driveway
        - Add one northbound and southbound through lane
    - Dr. Martin Luther Jr Beltway at Northern Driveway
        - Add one northbound and southbound through lane
    - Dr. Martin Luther Jr Beltway at Cassadaga Road
        - The exclusive northbound right turn lane will now be served directly by the second northbound lane.
        - The second southbound through lane will start on the south side of this intersection.

Turn Lane Analysis

- Per the turn lane analyses at the project access driveways the following turn lanes are recommended:
    - SR 472 at east right-in/right-out/left-in driveway
        - Dedicated 455-foot westbound right turn lane
        - Dedicated 455-foot eastbound left turn lane
    - SR 472 middle right-in/right-out driveway
        - Dedicated 455-foot westbound right turn lane
    - SR 472 at west driveway

        - Dedicated 455-foot westbound right turn lane
    - Dr Martin Luther King Jr Beltway at southern right-in/right-out driveway
        - Dedicated 505-foot northbound right turn lane
    - Dr Martin Luther King Jr Beltway at northern full access driveway (signal)
        - Dedicated 505-foot southbound left-turn lane
        - Dedicated 480-foot northbound right-turn lane
    - Cassadaga Road at project driveway
        - Dedicated 180-foot westbound left-turn lane
        - Dedicated 155-foot eastbound right-turn lane

With regards to off-site improvements the applicant will work with the City of DeLand, Volusia County , and the FDOT to determine which intersection improvements identified within this traffic study are feasible for proportionate share as outlined in the Florida Statues and local code. These improvements have been recommended to address future conditions deficiencies. The recommended improvements eligible for proportionate share or capacity improvement projects, the estimated improvement costs, and the proportionate share contribution should be negotiated with the review agencies once the TIA has been accepted and approved. The future conditions were analyzed for both the no-build and build scenarios.

Should full access be granted for the main driveway on SR 472, the intersection of SR 472 at Dr Martin Luther King Jr Beltway will be reevaluated to determine an updated set of improvements needed.

Appendix A:
TIA Methodology

To: Mr. Mike Holmes
Planning Director
City of DeLand

Date: 9/7/2022

Memorandum

Project #: 64054.01

From: Sergio Narea, P.E.
Transportation Engineer
VHB
225 E. Robinson St., Suite 300
Orlando, FL 32801

Re: Longleaf Four, LLC – DeLand Tech Park, DeLand
Traffic Study Methodology Statement

CC: Harry "Mac" McNaught
Kok Wan Mah, P.E. (VHB)
Kendall Story (City of DeLand)
John Prowell P.E. (VHB)
Mark Watts (Cobb Cole)

Purpose:

The purpose of this document is to outline the proposed methodology for the Traffic Impact Analysis (TIA) of the DeLand Tech Park mixed-use commercial development per the requirements set forth in the River to Sea Transportation Planning Organization (R2CTPO) TIA Guidelines. The TIA is divided into the following sections:

1. Introduction
2. Site Location and Access
3. Primary Impact Area / Significance Levels
4. Development Traffic Conditions
5. Trip Generation Estimate
6. Trip Distribution & Assignment
7. Data Collection / Existing Conditions
8. Minimum Acceptable Level of Service
9. Traffic Report

1. Introduction:

The following memorandum provides the proposed methodology to evaluate the traffic impacts of the proposed DeLand Tech Park mixed-use commercial development located on the northwest quadrant of Interstate 4 and SR 472 in DeLand, Volusia County, Florida. For this study, the development will be analyzed for a YR 2027 scenario. The property consists of approximately 142.8 acres and will include 1,500 KSF of Industrial Park, 240 KSF of General Retail and a 16 fueling position Gas Station with Convenience Store. The methodology was prepared in accordance with the River to Sea Transportation Planning Organization (R2CTPO) TIA Guidelines and consistent with the guidelines for the City of DeLand. The TIA will evaluate the transportation impacts within the study area to determine how impacts should be mitigated.

2. Site Location and Access

The proposed development is located on the north side of SR 472 and on the east side of Dr Martin Luther King Jr Beltway in DeLand, Florida (see ***Figure 1***). The City of DeLand, Volusia County, and Florida Department of Transportation (FDOT) will be reviewing the TIA. The site will have three (3) full access driveways; one (1) at Cassadaga Road, one (1) at SR 472, and one (1) (left in and right-in/right-out access) on Dr Martin Luther King Jr Beltway. Additionally, there will be three (3) right-in/right-out access driveways; two (2) on SR 472, and one (1) on Dr Martin Luther King Jr Beltway. A preliminary site plan is shown in ***Figure 2***.



DELAND TECH PARK - AERIAL PHOTO

VOLUSIA COUNTY | FLORIDA

Longleaf Four, LLC, Mac McNaught (c)317-439-4577

0' 250' 500'

NOTE: THE INFORMATION PROVIDED ON THIS DOCUMENT SHOULD BE TREATED AS CONCEPTUAL ONLY AND IS SUBJECT TO CHANGE © 2022 VHB

FEBRUARY 15, 2022



DELAND TECH PARK - PRELIMINARY SITE PLAN

VOLUSIA COUNTY | FLORIDA

Longleaf Four, LLC, Mac McNaught (c)317-439-4577

0' 250' 500'

vhb

NOTE: THE INFORMATION PROVIDED ON THIS DOCUMENT SHOULD BE TREATED AS CONCEPTUAL ONLY AND IS SUBJECT TO CHANGE © 2022 VHB

A-4

JUNE 20, 2022

Memorandum

3. Development Traffic Conditions

The project is proposed to be evaluated for the existing year of 2022 and for future project build out year of 2027. The development traffic conditions are to be developed by adding the development traffic (project traffic) to the future background traffic. The background traffic volumes are proposed to be generated for the year of 2027 by using historical traffic growth rates obtained from the latest Volusia County AADT spreadsheet for the study roadways.

In addition, any approved or committed developments will be incorporated into this analysis as background traffic. VHB is respectfully requesting that the any committed development programs be provided by the City and/or County as part of the pre-application process.

4. Trip Generation Estimate

The proposed development will include 1,500 KSF of Industrial Park, ITE Code 130, 240 KSF of General Retail, ITE Code 820, and a 16 fueling position Gas Station with Convenience Store, ITE Code 945. The project traffic volumes for the proposed development will be generated using the trip generation rates and formulas outlined in the *Institute of Transportation Engineers (ITE) Trip Generation Manual (11th Edition)*. Pass-by trips were calculated using the pass-by rate, given as 34% (PM) for General Retail land use, and 62% (AM) and 56% (PM) for Convenience Store/Gas Station land use. ***Table 1*** is an estimation of the daily, AM peak-hour, and PM peak-hour volumes.

Table 1: Summary of Trip Generation

Land Use	ITE Code	Intensity	Daily Trip Ends	AM Peak Period In Trips	AM Peak Period Out Trips	AM Peak Period Total	PM Peak Period In Trips	PM Peak Period Out Trips	PM Peak Period Total	Passby % AM	Passby % PM
Industrial Park	130	1,500 KSF	5,055	413	97	510	112	398	510	0%	0%
Shopping Center (>150 KSF)	820	240 KSF	8,882	125	77	202	509	551	1,060	0%	34%
Gas/Conv	945	16 Pumps	4,242	129	128	257	148	147	295	62%	56%
		Sub Total	18,179	667	302	969	769	1,096	1,865		
Internal Capture		0% 0%	0	0	0	0	0	0	0		
		Total Passby	684	80	80	159	263	263	525		
Total			**17,495**	**588**	**223**	**810**	**507**	**834**	**1,340**		

5. Primary Impact Area

Consistent with R2CTPO TIA Guidelines, impacted segments will include all roadway segments to which the site has direct connections, that are impacted by the proposed project to within three percent or greater of the peak-hour two-way adopted level of service (LOS) capacity, major intersections along the significant segments, and roadway segments that have been designated as "critical" or "near critical" within the site traffic influenced segments. Critical and near critical roadways are defined by Volusia County as roadways with a volume to capacity (v/c) ratio that is equal to or greater than 1.0 and 0.90, respectively. The 3-mile critical and near critical roadway segments within the area are shown in the Critical/Near-Critical Roadway Map provided in the ***Appendix***. The test for segments that are significantly impacted is shown in ***Table 2***.

Memorandum

6. Trip Distribution & Assignment

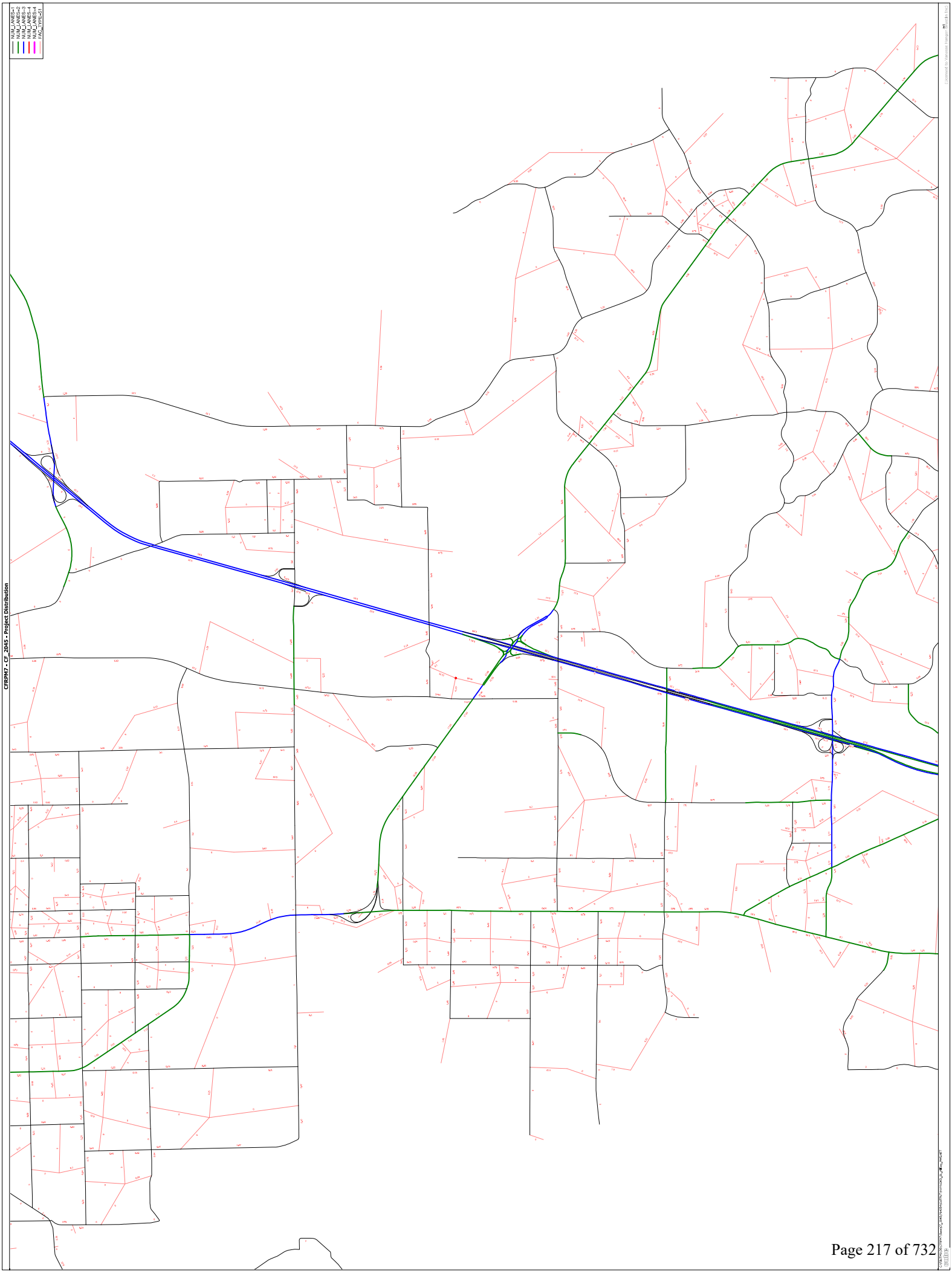
The project traffic will be distributed to the adjacent roadways and intersections based on the YR 2045 Central Florida Regional Planning Model (CFRPMv7) results, utilizing the existing and committed network. The distribution can be found on ***Figure 3***.

Memorandum

Table 2: Project Significance

Roadway	No. of Lanes	Critical / Near-Critical	Level of Service		2027 Project Traffic		Impact of LOS	3% Significant?
			Adopted LOS	MSV	Trips	Dist%		
W Volusia Beltway (Dr MLK Jr)								
SR 472 to Cassadaga Road	2	Vested Near Critical	E	1,540	328	24.42%	21.3%	Yes
Cassadaga Road to Orange Camp Road	2	Vested Near Critical	E	1,540	368	27.41%	23.9%	Yes
Orange Camp Road to Taylor Road	2	Vested Near Critical	E	1,540	118	8.78%	7.7%	Yes
Taylor Road to Beresford Ave Ext	2	Vested Near Critical	E	1,540	92	6.83%	6.0%	Yes
W Volusia Beltway (Kentucky Ave)								
Graves Ave to SR 472	2	Vested Near Critical	E	1,540	134	9.98%	8.7%	Yes
W Volusia Beltway (Veteran's Memorial Pkwy)								
Saxon Blvd to Harley Strickland Blvd	4	None	E	3,410	18	1.30%	0.5%	No
Harley Strickland Blvd to Rhode Island Ave	2	Critical	E	1,540	42	3.10%	2.7%	No
Rhode Island Ave to Graves Ave	2	Vested Critical	E	1,620	68	5.04%	4.2%	Yes
SR 472								
US 17/92 to CR 4101/MLK Blvd	4	None	D	5,900	237	17.63%	4.0%	Yes
CR 4101/MLK Blvd to I-4	4	None	D	3,580	473	35.23%	13.2%	Yes
Howland Blvd								
I-4/SR 472 to Wolf Pack Run	4	None	E	3,410	172	12.77%	5.0%	Yes
Wolf Pack Run to Catalina Blvd	4	None	E	3,410	124	9.20%	3.6%	Yes
Catalina Blvd to Providence Blvd	4	None	E	3,410	100	7.44%	2.9%	No
Cassadaga Rd								
W Volusia Beltway to Macy Ave	2	None	E	1,230	127	9.46%	10.3%	Yes
I-4								
Saxon Blvd to SR 472	6	None	D	10,060	210	15.61%	2.1%	No
SR 472 to Orange Camp Rd	6	None	D	10,060	92	6.86%	0.9%	No
Orange Camp Rd to SR 44	6	None	E	10,060	244	18.14%	2.4%	No
Orange Camp Road								
US 17/92 to Princeton	2	Vested Critical	E	1,270	0	0.00%	0.0%	No
Princeton to Blue Lake Ave	2	Vested Near Critical	E	1,540	23	1.69%	1.5%	No
Blue Lake Ave to W Volusia Bltwy (Dr MLK Jr)	2	Vested Near Critical	E	1,540	88	6.55%	5.7%	Yes
W Volusia Bltwy (Dr MLK Jr) to I-4	2	Vested Critical	E	1,540	160	11.89%	10.4%	Yes
Taylor Rd								
US 17/92 to Stratford Dr	2	None	E	1,020	2	0.10%	0.2%	No
Stratford Dr to Blue Lake Ave	2	None	E	1,540	7	0.51%	0.5%	No
Blue Lake Ave to Martin Luther King Bltwy	2	None	E	1,230	10	0.69%	0.8%	No
US 17/92								
Rhode Island Ave to Graves Ave	4	None	D	3,580	8	0.59%	0.2%	No
Graves Ave to New York Ave	4	None	D	3,580	21	1.54%	0.6%	No
New York Ave to SR 472	4	None	D	3,580	46	3.38%	1.3%	No
SR 472 to SR 15A/Taylor Rd	6	Near Critical	D	5,390	176	13.06%	3.3%	Yes
Rhode Island Ave								
US 17/92 to Veteran's Memorial Pkwy	2	None	E	1,230	19	1.41%	1.5%	No
Graves Ave/CR 4145								
US 17/92 to Leavitt Ave	2	None	E	1,330	12	0.83%	0.9%	No
Leavitt Ave to Veteran's Memorial Pkwy	2	None	E	1,020	40	2.92%	3.9%	Yes
Veteran's Memorial Pkwy to Kentucky Ave	2	Critical	E	1,620	107	7.93%	6.6%	Yes
Kentucky Ave to Howland Blvd	2	Near Critical	E	1,620	28	2.07%	1.7%	No
Normandy Blvd								
Graves to Rhode Island Ave	2	None	D	1,150	41	3.03%	3.6%	Yes
Rhode Island Ave to Elkcam Blvd	2	None	D	2,630	29	2.16%	1.1%	No
Blue Lake Ave								
Orange Camp Road to Taylor Road	2	None	E	1,540	56	4.11%	3.6%	Yes
Taylor Road to Beresford Ave	2	None	E	1,230	49	3.60%	4.0%	Yes

Source:
VHB, Inc.
Notes:
*Data from 2019 Volusia County AADT and Historical Counts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NUM_LANES-2
NUM_LANES-3
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NUM_LANES-5
MAZ_Proj-1
CFRPM7 - CF_2045 - Project Distribution

Memorandum

7. Data Collection / Existing Conditions

Daily and PM peak-hour traffic counts will be assembled for the study roadway segments and intersections to establish existing traffic conditions. Roadway counts for all study roadways will be identified using the data within the latest *Volusia County AADT spreadsheet*. Intersection turning movement counts will be collected for study intersections with a seasonal factor adjustment applied. The existing condition analysis will evaluate the current capacity of the study roadways identified within the Primary Impact Area. For the purposes of this study, VHB proposes to evaluate the roadway traffic volumes of the following roadway segments:

- W Volusia Beltway (Dr MLK Jr)
    - from SR 472 to Cassadaga Road (Vested Near Critical roadway segment)
    - from Cassadaga Road to Orange Camp Road (Vested Near Critical roadway segment)
    - from Orange Camp Road to Taylor Road (Vested Near Critical roadway segment)
- W Volusia Beltway (Veteran's Memorial Parkway)
    - from Graves Avenue to SR 472 (Vested Critical roadway segment)
- W Volusia Beltway (Veteran's Memorial Parkway)
    - from Harley Strickland Blvd to Rhode Island Avenue (Critical roadway segment)
    - from Rhode Island Avenue to Graves Avenue (Vested Critical roadway segment)
- Orange Camp Road
    - from US 17/92 to Princeton (Vested Critical roadway segment)
    - from Princeton to Blue Lake Avenue (Vested Near Critical roadway segment)
    - from Blue Lake Avenue to W Volusia Beltway (Dr MLK Jr) (Vested Near Critical roadway segment)
    - from W Volusia Beltway (Dr MLK Jr) to I-4 (Vested Critical roadway segment)
- US 17/92 – from SR 472 to SR 15A/Taylor Road (Near Critical roadway segment)
- Graves Avenue/CR 4145
    - from Veteran's Memorial Parkway to Kentucky Avenue (Critical roadway segment)
    - from Kentucky Avenue to Howland Boulevard (Near Critical roadway segment)
- Howland Boulevard – from I-4/SR 472 to Wolf Pack Run
- Taylor Road – from US 17/92 to Stratford Drive
- SR 472 – from CR 4101/MLK Boulevard to I-4
- Blue Lake Avenue – from Taylor Road to Beresford Avenue

In addition, the following intersections will be analyzed using Synchro 11 and in accordance with the *Highway Capacity Manual* methodology:

- SR 472 at Kentucky Avenue/Dr Martin Luther King Jr Beltway
- Dr Martin Luther King Jr Beltway at Cassadaga Road
- Dr Martin Luther King Jr Beltway at Orange Camp Road
- Dr Martin Luther King Jr Beltway at Taylor Road
- Kentucky Avenue at Graves Avenue
- Veterans Memorial Parkway at Graves Avenue
- Veterans Memorial Parkway at Rhode Island Avenue
- SR 472 at I4 WB Ramps
- SR 472 at I4 EB Ramp
- SR 472 at Project Driveways
- W Volusia Beltway (Dr MLK Jr) at Project Driveways

Memorandum

- Cassadaga Road at Project Driveway

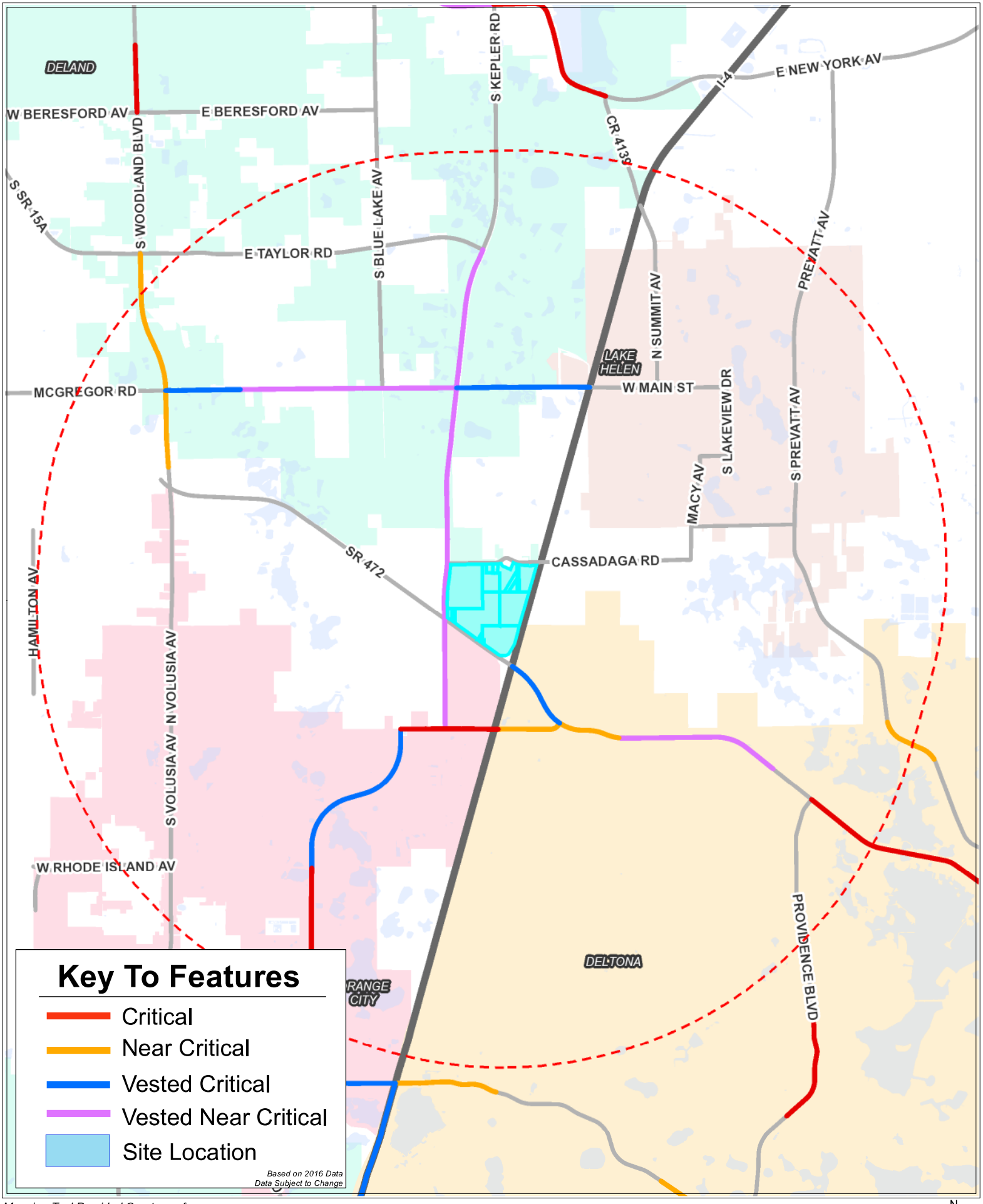
An alternate mode analysis will be conducted to analyze any transit stops within ¼ mile of the site, provisions for sidewalks adjacent to public roads within the limits of the site, sidewalk connectivity between parcels, provisions for any bicycle amenities, such as bike racks or lockers, and identification to any schools within 2-mile of the site.

8. Minimum Acceptable Level of Service

The level of service capacities will be derived from the FDOT Generalized LOS Tables and adopted standards used in this concurrency evaluation are consistent with the latest Volusia County AADT spreadsheet.

9. Traffic Report

As a result of the trip generation, trip distribution, and trip assignment previously mentioned, VHB will evaluate the adjacent transportation system to determine the necessary improvements and timing requirements to accommodate the project for the existing year 2022, background year 2027 traffic conditions, and the build-out year 2027 traffic conditions. The future background volumes will be determined based on the highest of existing plus vested traffic or existing with an applied historical growth (minimum 2% growth rate). The assessment of roadway segments and intersection conditions will be conducted for the AM and PM peak-hour conditions. In addition to the level of service and delay reported for intersections, a queue length evaluation will also be conducted for exclusive turn lane needs at project driveways to determine the warrant and length of any turn lanes. All improvements funded for construction within the first three years of the Volusia County and FDOT five-year work programs will be considered in the analysis in addition to the Volusia County Capital Improvement Program (CIP) and the River to Sea TPO Transportation Improvement Program (TIP). The findings of the study will be documented in the traffic report. The traffic report will summarize study procedures, analyses performed, and recommendations, including exhibits to show existing, background, and future with project traffic volumes. Impacts resulting from project traffic will be identified with recommendations to mitigate adverse segments and intersection lane groups.



Mapping Tool Provided Courtesy of Volusia County Public Works and is a graphic representation only.

Date 05/19/2022

3 mile Critical/Near Critical Roadway Buffer

DeLand Tech Park

N W E S

A-11

1 inch = 5,303 feet

Appendix B:
ITE Trip Generation Summary Sheets

Industrial Park
(130)

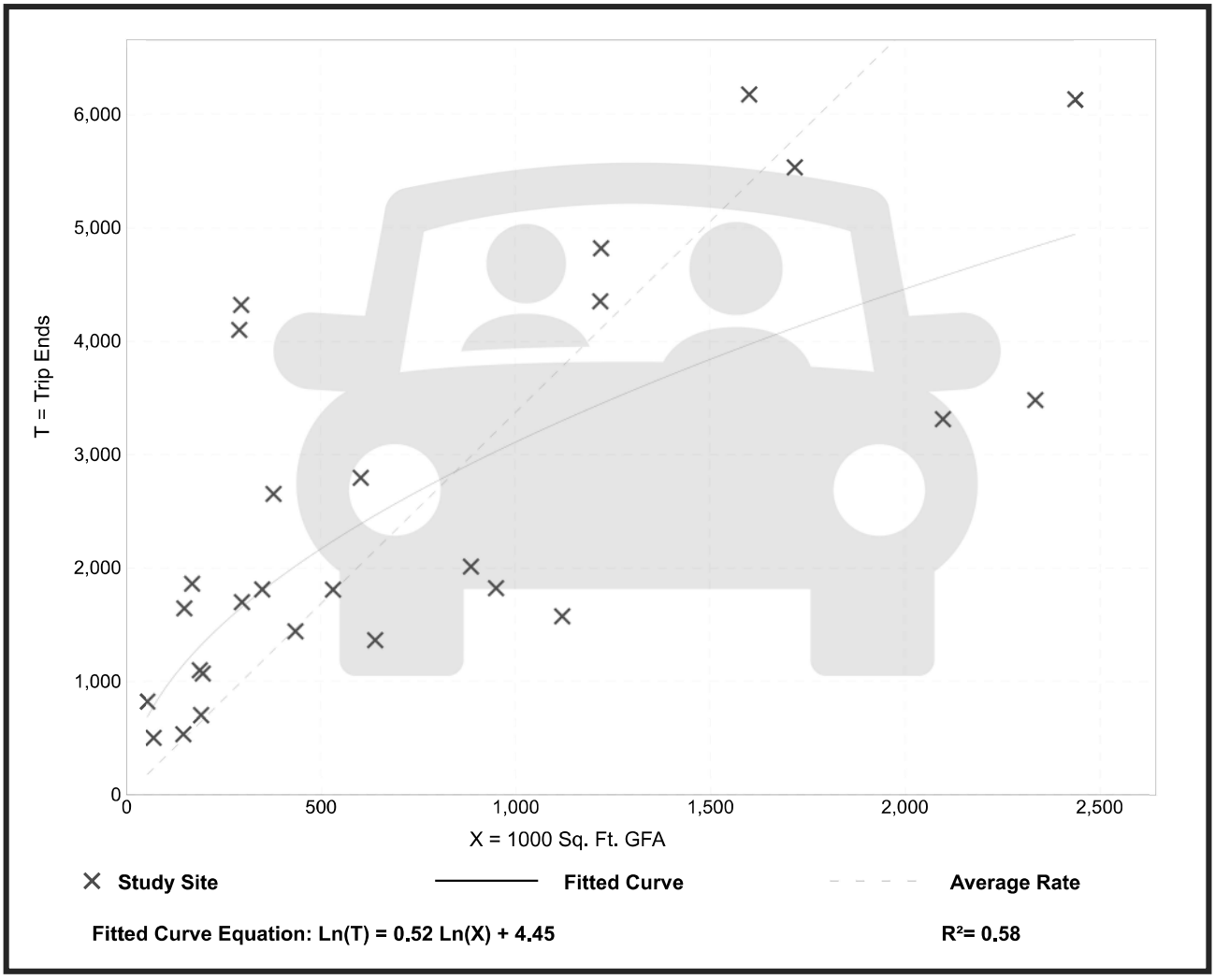
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 27
Avg. 1000 Sq. Ft. GFA: 762
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
3.37	1.41 - 14.98	2.60

Data Plot and Equation



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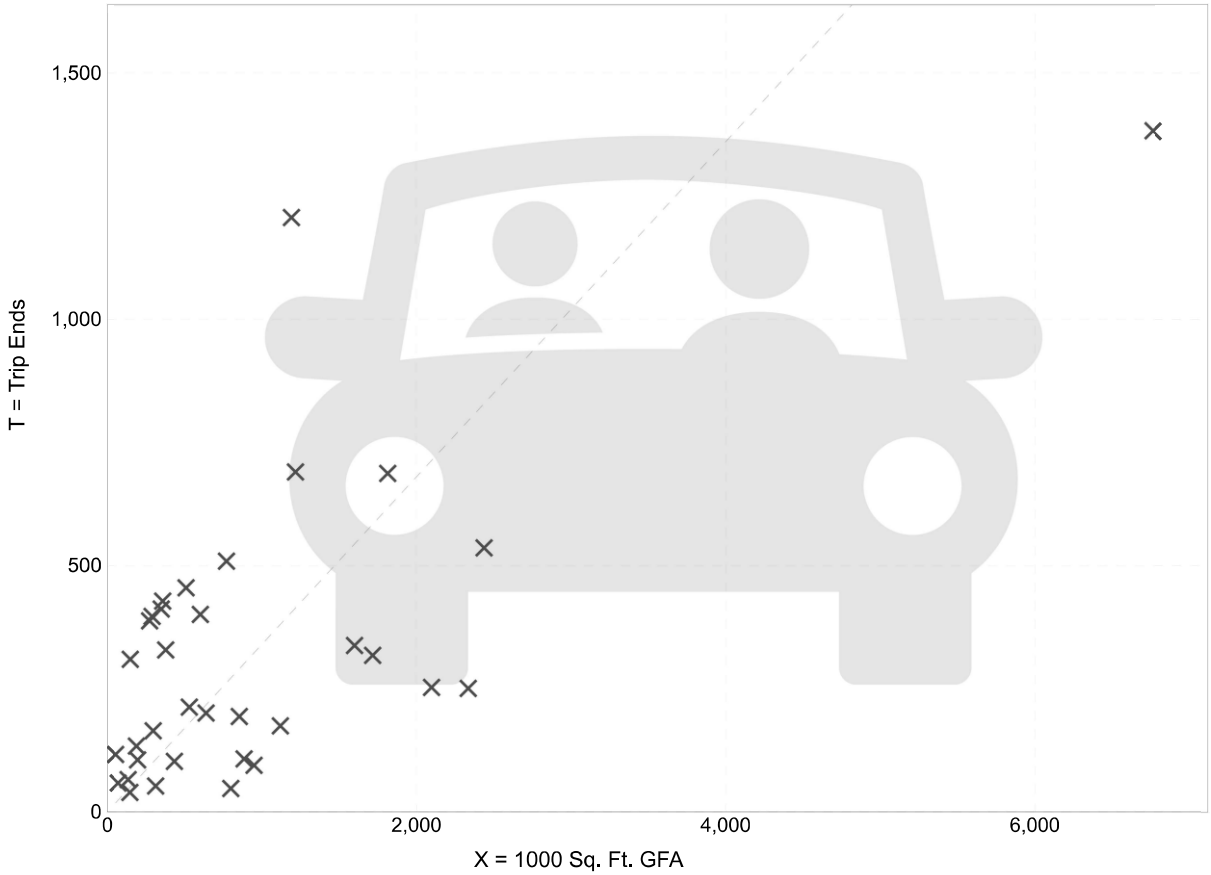
Industrial Park
(130)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 34
Avg. 1000 Sq. Ft. GFA: 956
Directional Distribution: 81% entering, 19% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.34	0.06 - 2.13	0.33

Data Plot and Equation



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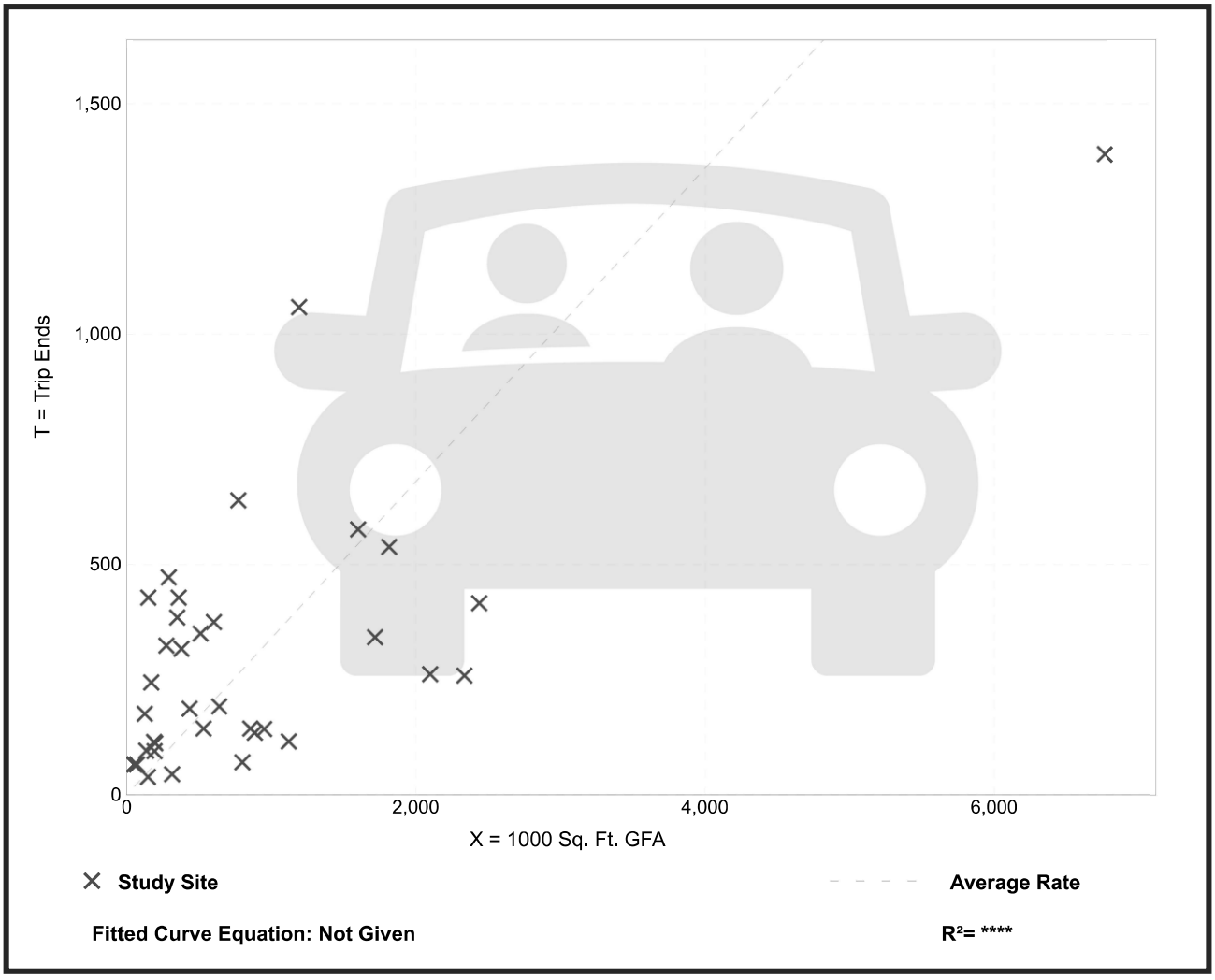
Industrial Park
(130)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 35
Avg. 1000 Sq. Ft. GFA: 899
Directional Distribution: 22% entering, 78% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.34	0.09 - 2.85	0.36

Data Plot and Equation



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Warehousing
(150)

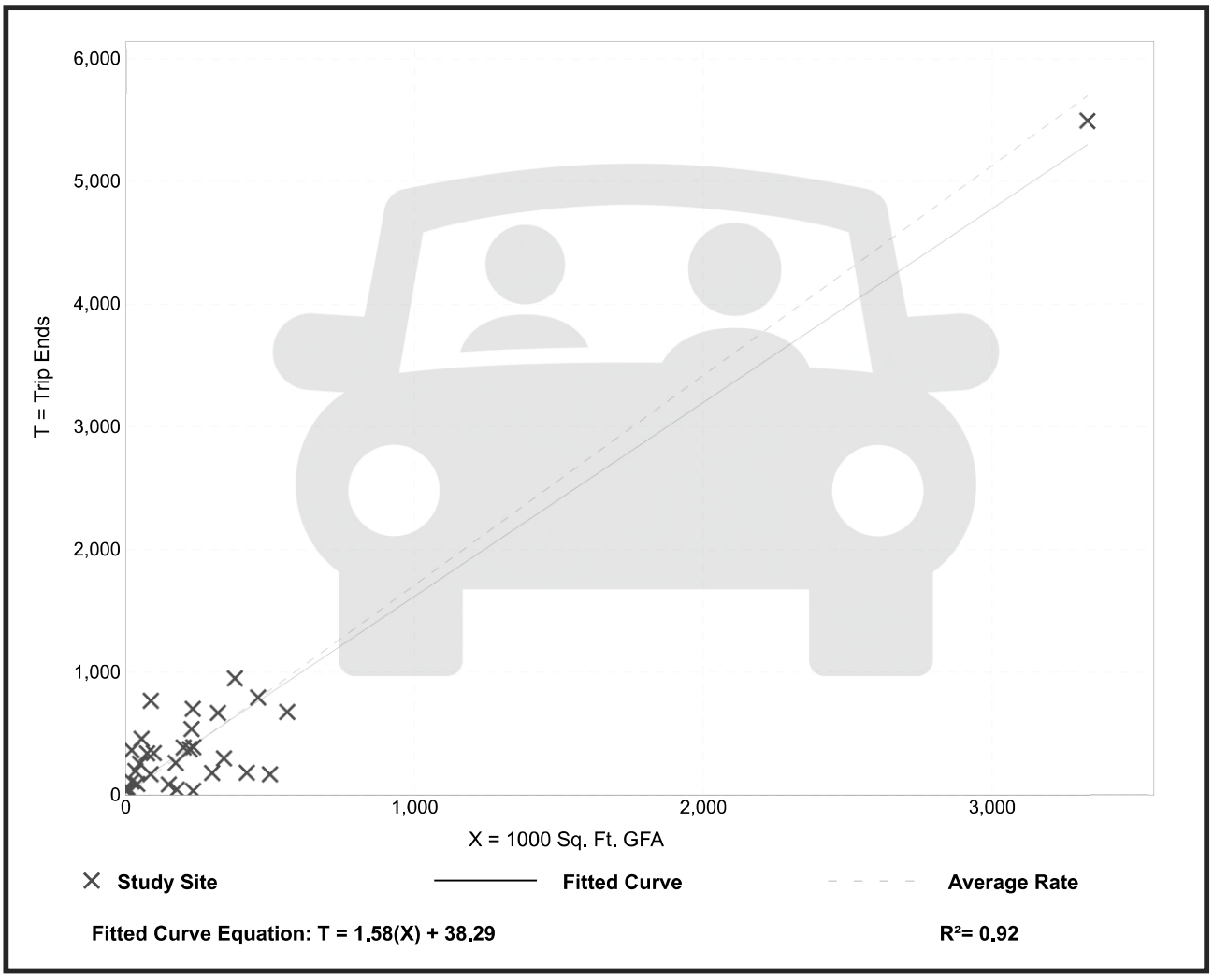
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 31
Avg. 1000 Sq. Ft. GFA: 292
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.71	0.15 - 16.93	1.48

Data Plot and Equation



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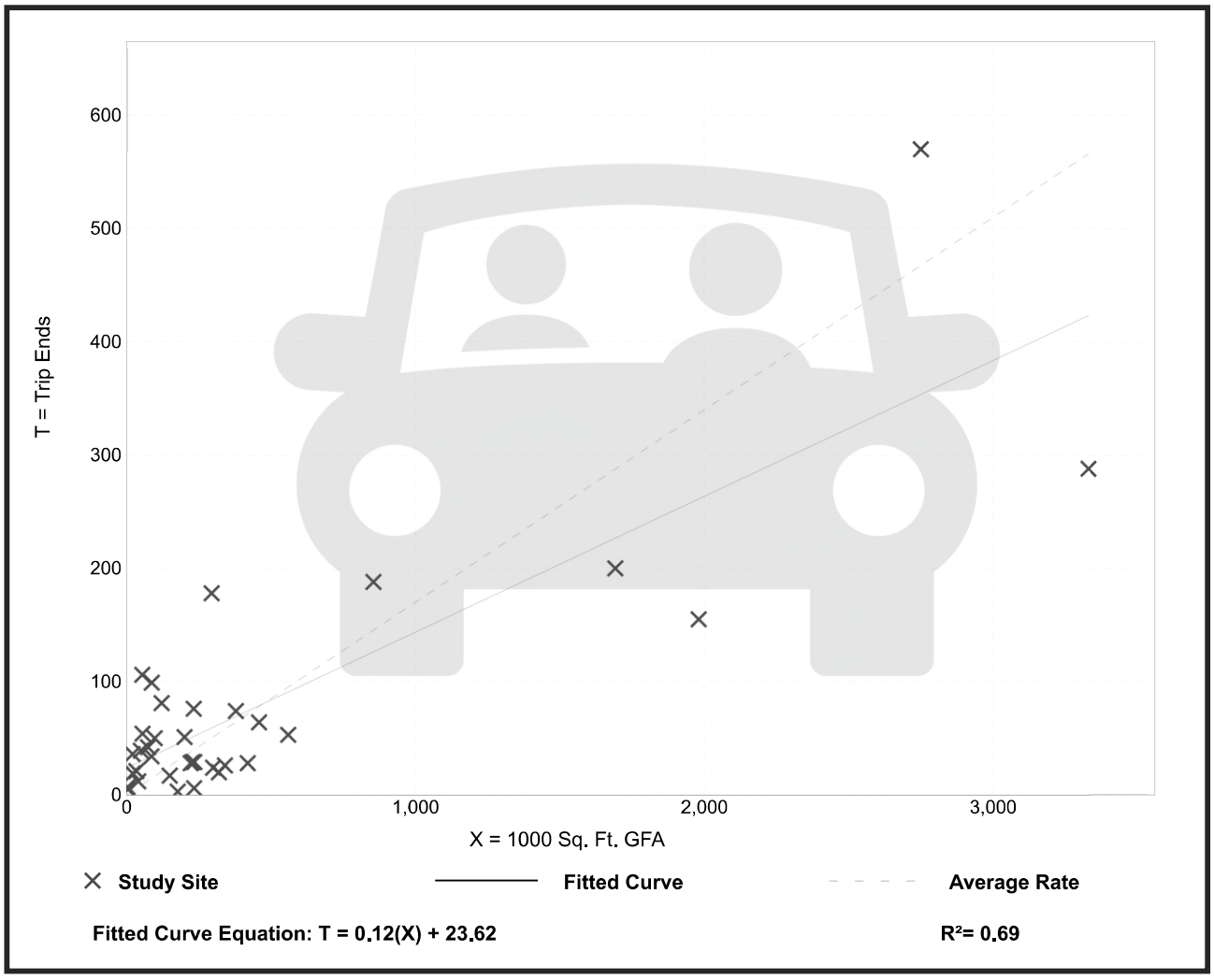
Warehousing
(150)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 36
Avg. 1000 Sq. Ft. GFA: 448
Directional Distribution: 77% entering, 23% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.17	0.02 - 1.93	0.19

Data Plot and Equation



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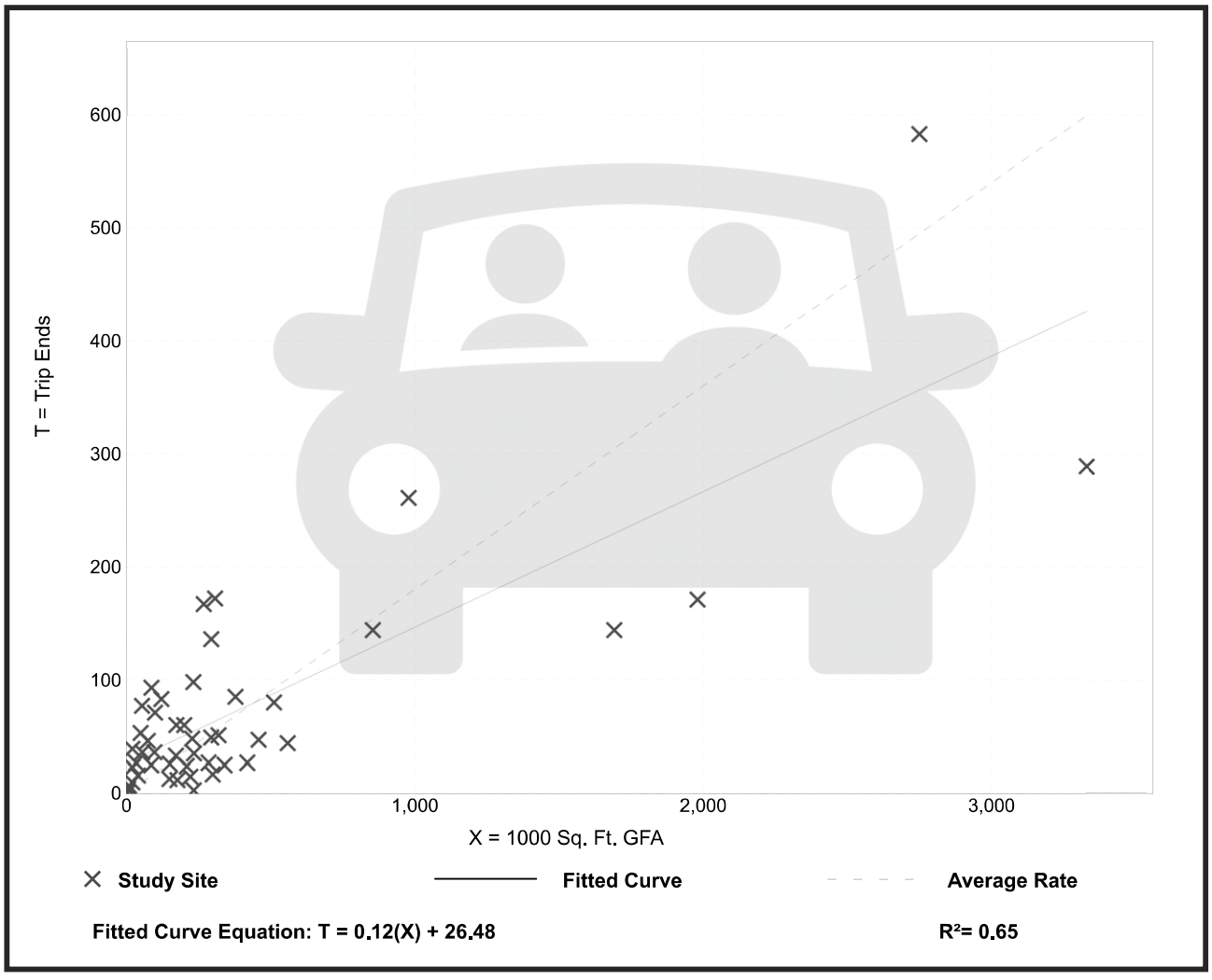
Warehousing
(150)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 49
Avg. 1000 Sq. Ft. GFA: 400
Directional Distribution: 28% entering, 72% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.18	0.01 - 1.80	0.18

Data Plot and Equation



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Shopping Center (>150k)
(820)

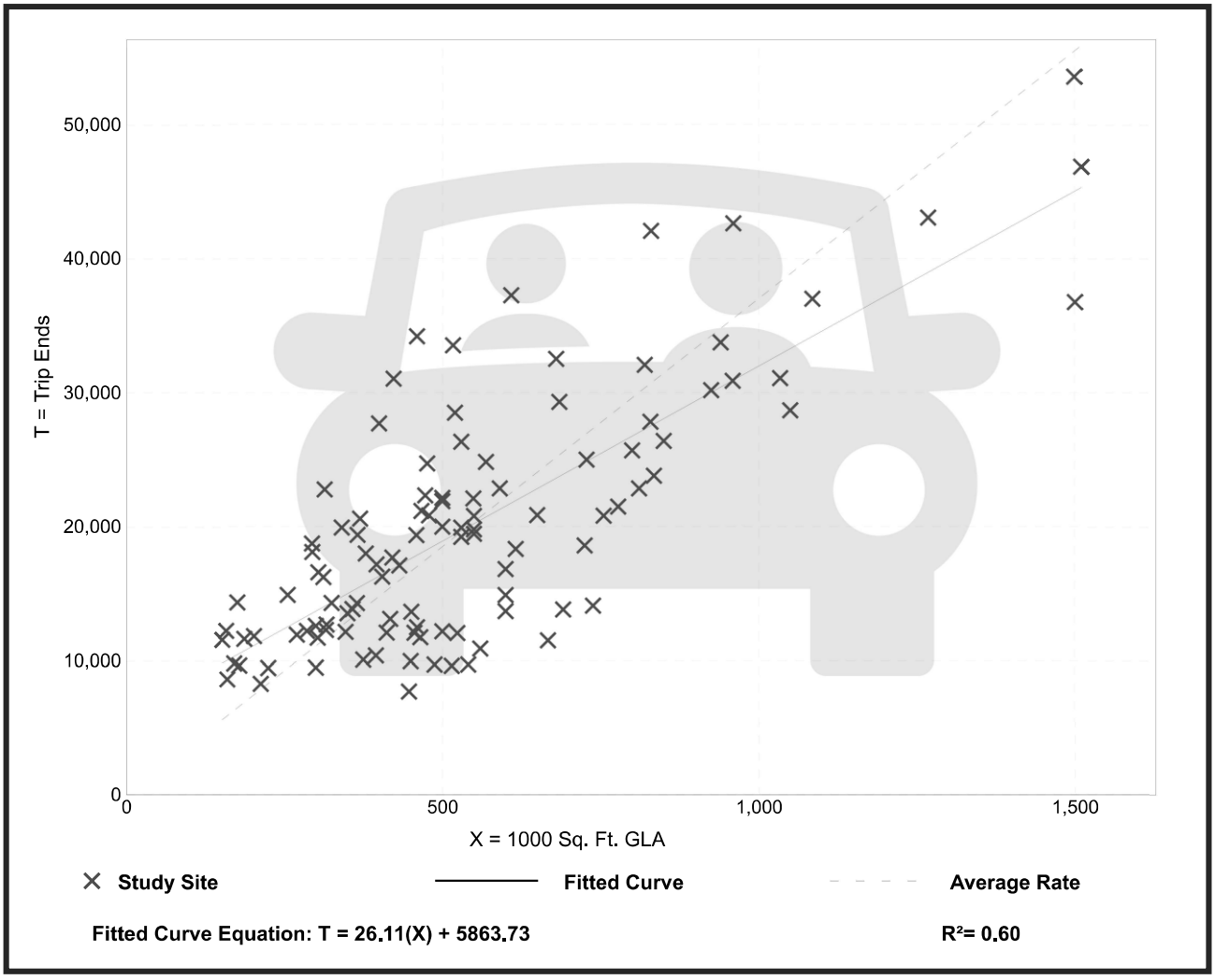
Vehicle Trip Ends vs: **1000 Sq. Ft. GLA**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 108
Avg. 1000 Sq. Ft. GLA: 538
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
37.01	17.27 - 81.53	12.79

Data Plot and Equation



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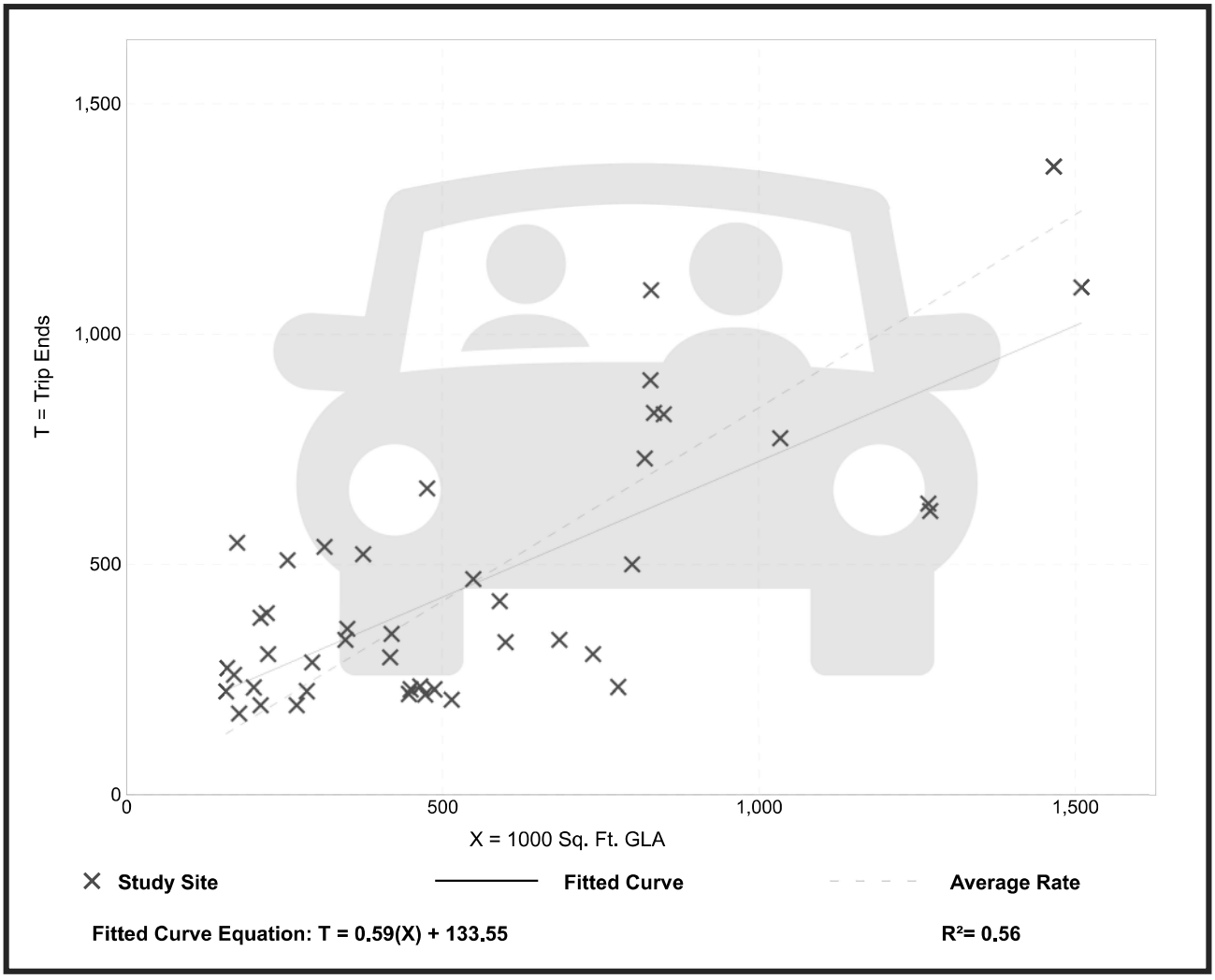
Shopping Center (>150k)
(820)

Vehicle Trip Ends vs: **1000 Sq. Ft. GLA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 44
Avg. 1000 Sq. Ft. GLA: 546
Directional Distribution: 62% entering, 38% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
0.84	0.30 - 3.11	0.42

Data Plot and Equation



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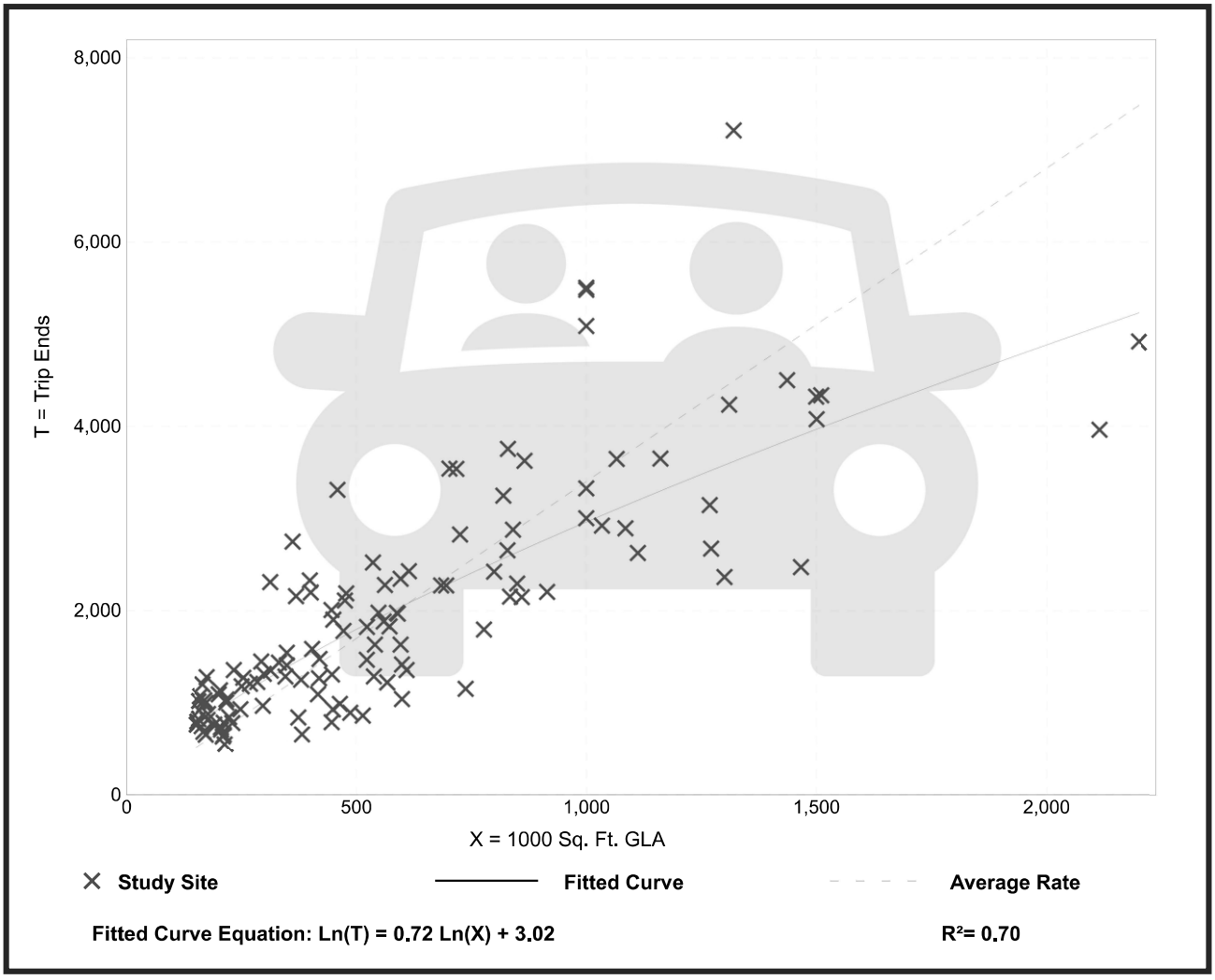
Shopping Center (>150k)
(820)

Vehicle Trip Ends vs: **1000 Sq. Ft. GLA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 126
Avg. 1000 Sq. Ft. GLA: 581
Directional Distribution: 48% entering, 52% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
3.40	1.57 - 7.58	1.26

Data Plot and Equation



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Convenience Store/Gas Station - GFA (2-4k)
(945)

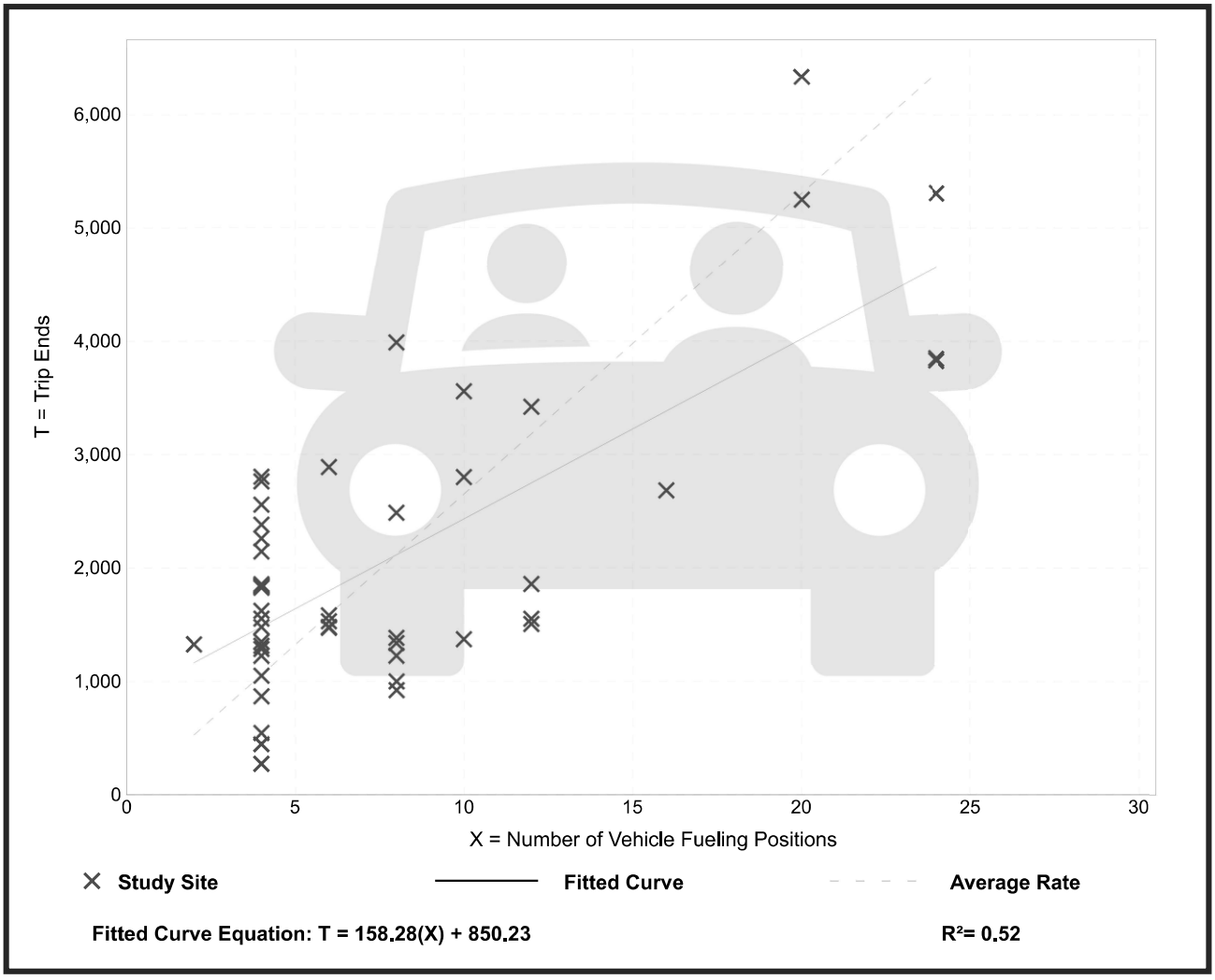
Vehicle Trip Ends vs: Vehicle Fueling Positions
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 48
Avg. Num. of Vehicle Fueling Positions: 8
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Vehicle Fueling Position

Average Rate	Range of Rates	Standard Deviation
265.12	68.50 - 701.00	142.37

Data Plot and Equation



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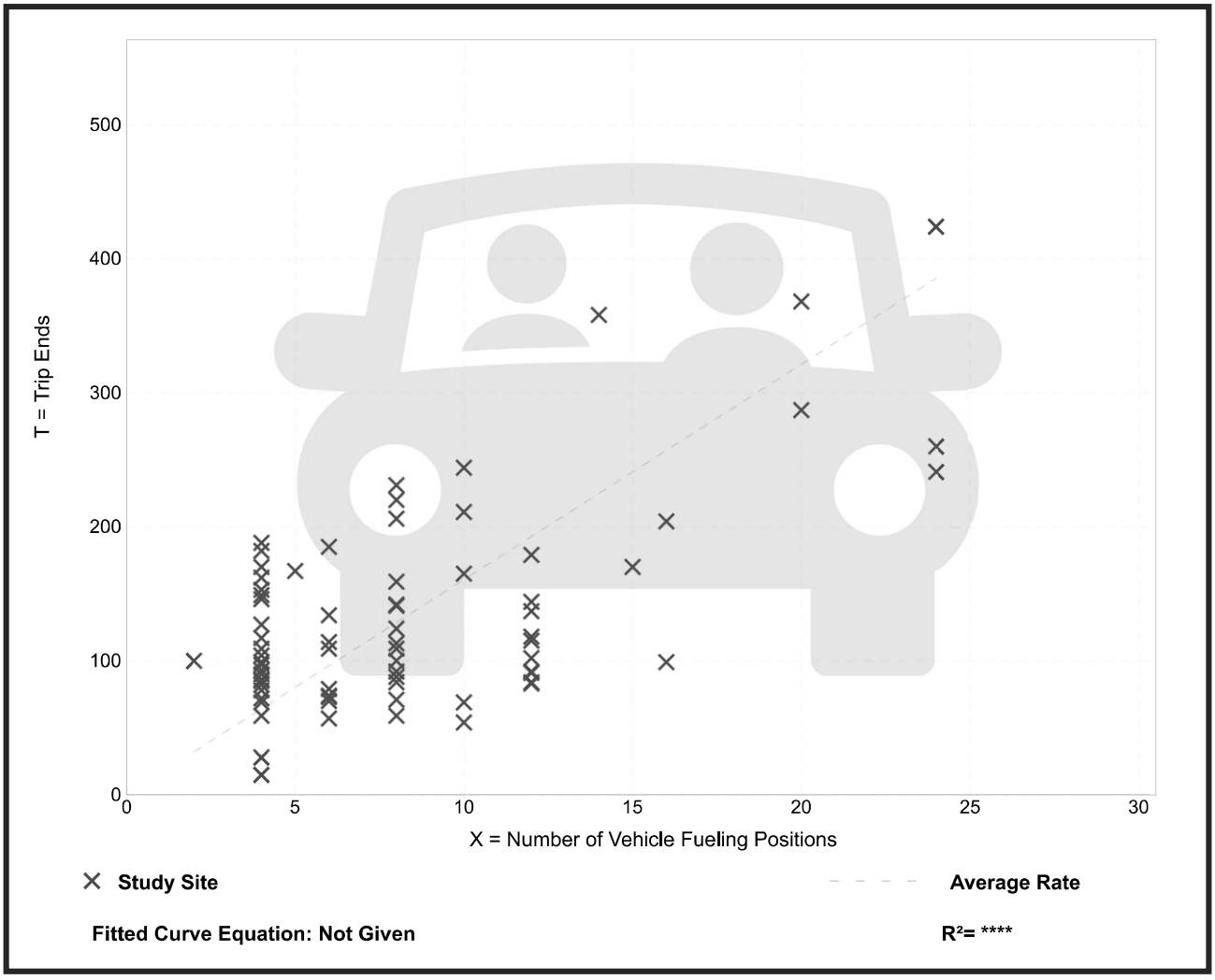
Convenience Store/Gas Station - GFA (2-4k)
(945)

Vehicle Trip Ends vs: **Vehicle Fueling Positions**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 76
Avg. Num. of Vehicle Fueling Positions: 8
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Vehicle Fueling Position

Average Rate	Range of Rates	Standard Deviation
16.06	3.75 - 50.00	8.79

Data Plot and Equation



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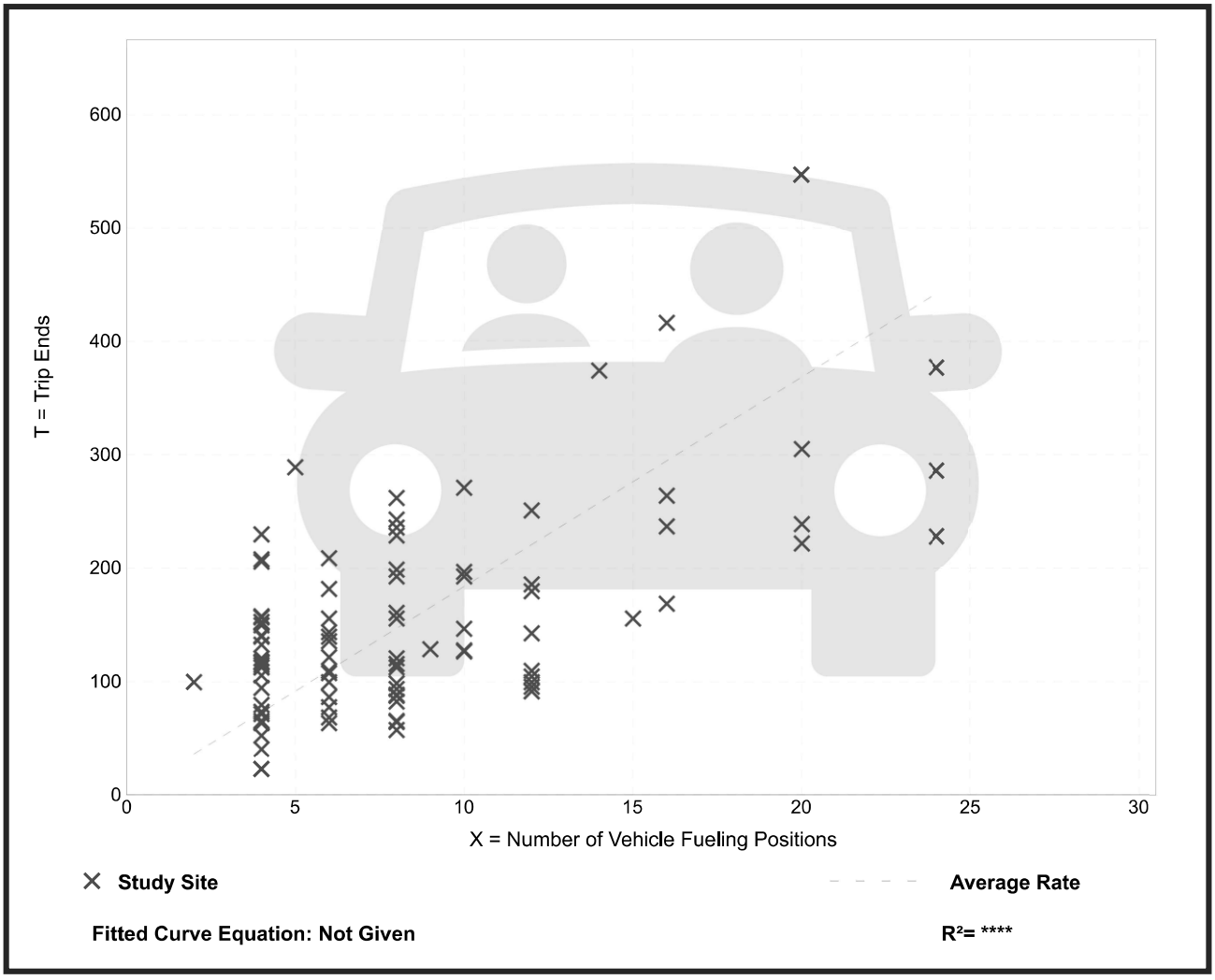
Convenience Store/Gas Station - GFA (2-4k)
(945)

Vehicle Trip Ends vs: **Vehicle Fueling Positions**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 93
Avg. Num. of Vehicle Fueling Positions: 8
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Vehicle Fueling Position

Average Rate	Range of Rates	Standard Deviation
18.42	5.75 - 57.80	10.16

Data Plot and Equation



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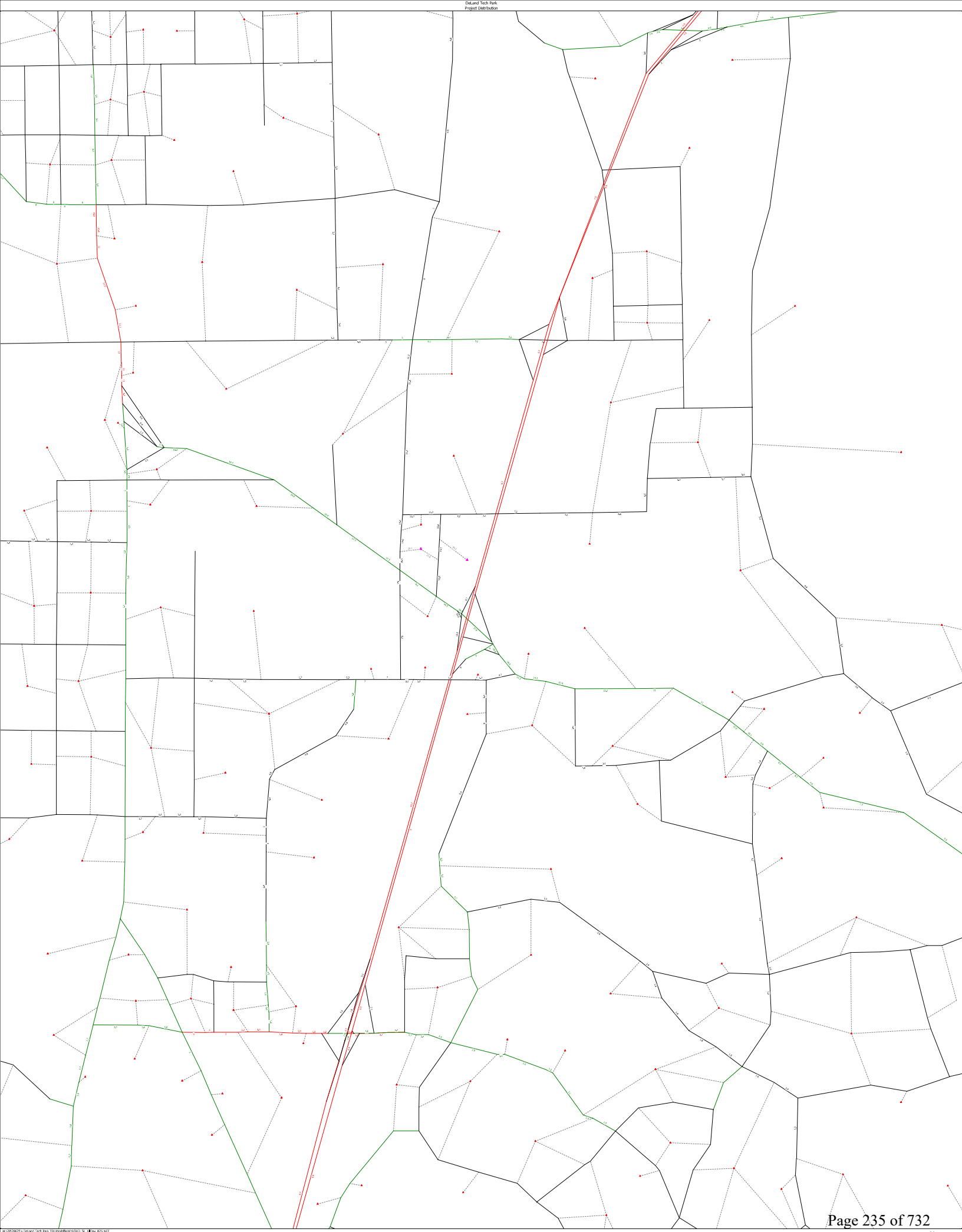
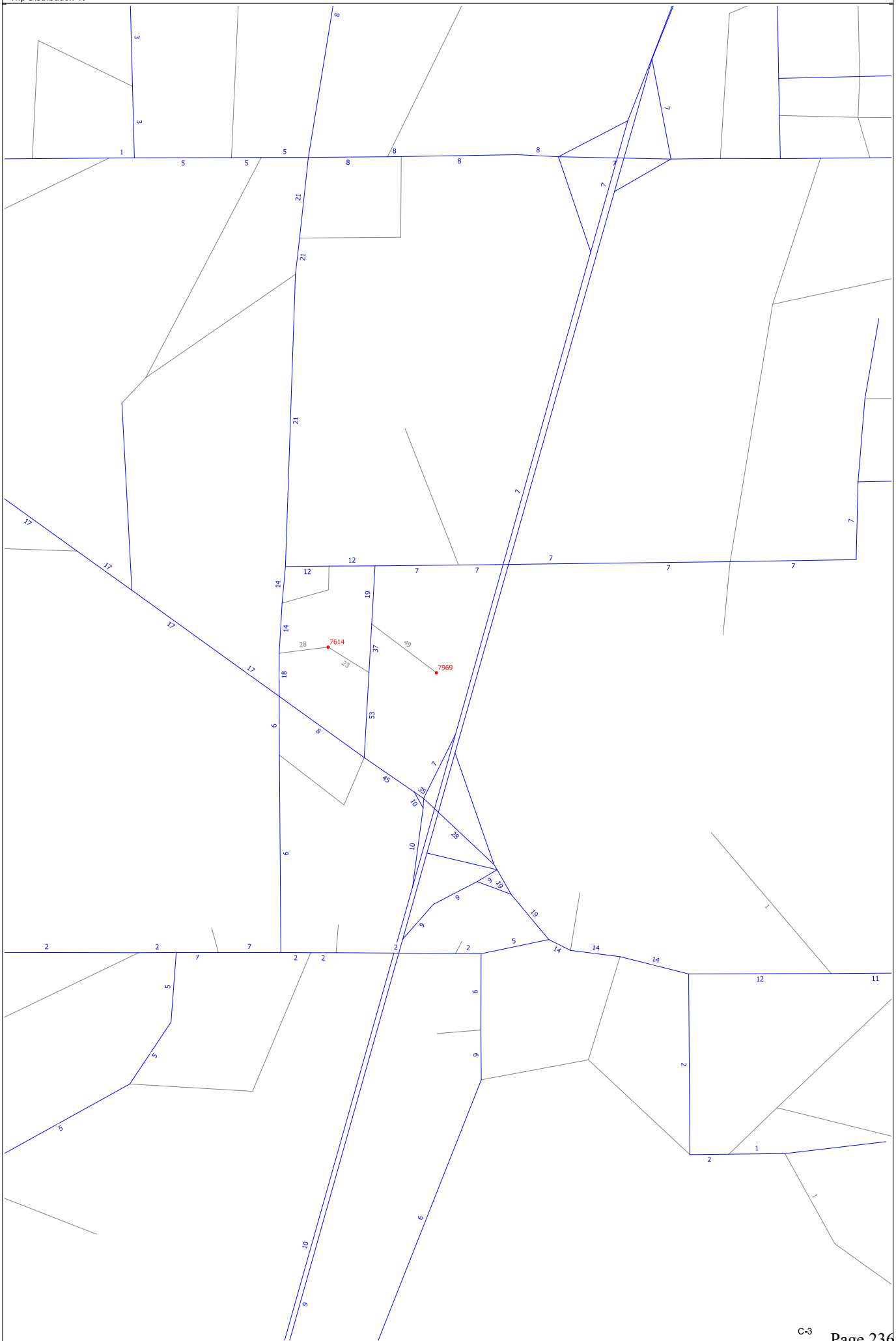
Appendix C:
CFRPM Travel Demand Model Plot



(Licensed to Kittelson & Associates Inc)



cube
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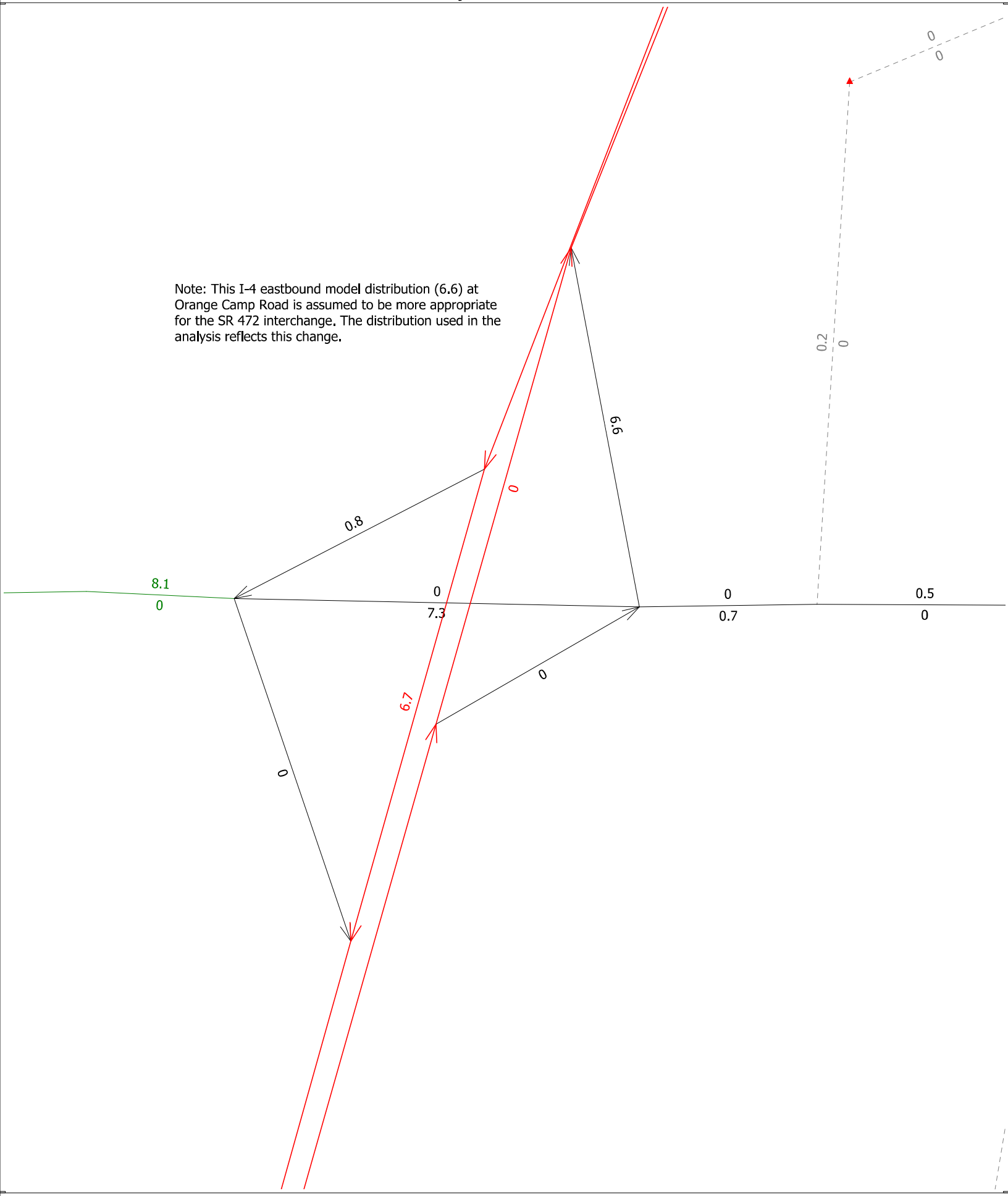

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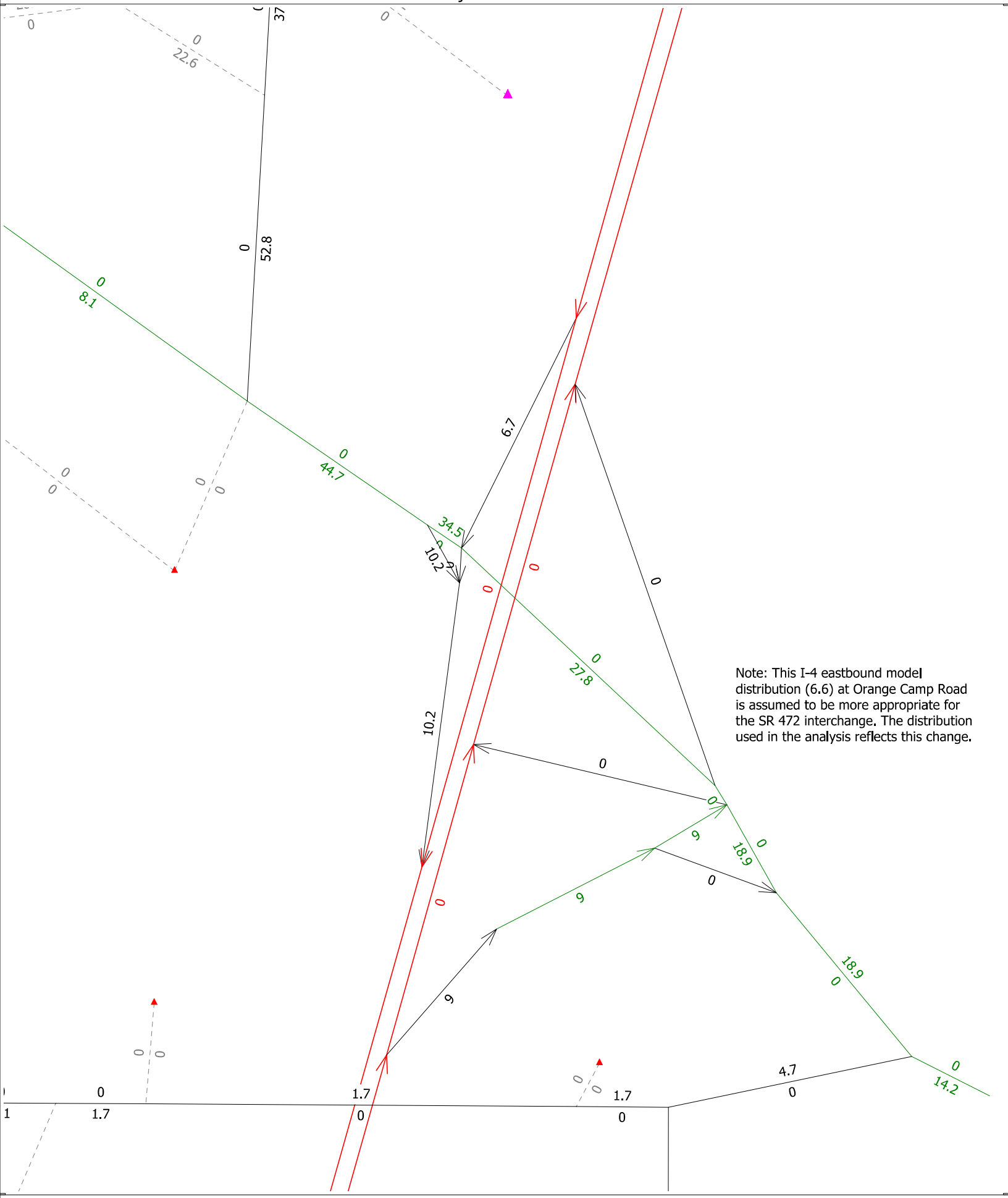

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Appendix D:
Updated Project Significance Test

Updated Project Significance

Roadway / Segment	# Lanes	isting Critical - Near Criti	LOS OS Standar	MSV	2027 Project Traffic Trips	Dist%	Impact of LOS	3% Significant?
Dr Martin Luther King Jr Beltway								
SR 472 to Cassadaga Rd.	2	None	E	1540	199	16.25%	12.9%	Yes
Cassadaga Rd. to Orange Camp Rd.	2	Vested Near Critical	E	1540	260	21.30%	16.9%	Yes
Orange Camp Rd. to Taylor Rd.	2	Vested Near Critical	E	1540	92	7.50%	6.0%	Yes
Taylor Rd. to Beresford Ave.	2	Vested Near Critical	E	1540	81	6.60%	5.3%	Yes
Kentucky Avenue								
Graves Ave. to SR 472	2	None	E	1540	112	9.10%	7.3%	Yes
Veteran's Memorial Parkway								
Saxon Blvd to Harley Strickland Blvd	4	None	E	3410	20	1.60%	0.6%	No
Harley Strickland Blvd. to Rhode Island Ave.	2	Vested Critical	E	1540	33	2.70%	2.1%	No
Rhode Island Ave. to Graves Ave.	2	Vested Near Critical	E	1620	57	4.60%	3.5%	Yes
SR 472								
US 17/92 to Martin Luther King Jr Bltwy.	4	None	D	5960	205	16.74%	3.4%	Yes
Martin Luther King Jr Bltwy. to I-4	4	None	D	3580	323	26.40%	9.0%	Yes
Howland Boulevard								
I-4/SR 472 to Wolf Pack Rn.	4	Vested Near Critical	E	3410	187	15.28%	5.5%	Yes
Wolf Pack Rn. to Catalina Blvd.	4	Vested Near Critical	E	3410	142	11.60%	4.2%	Yes
Catalina Blvd. to Providence Blvd.	4	Vested Near Critical	E	3410	123	10.07%	3.6%	Yes
Cassadaga Road								
Dr. Martin Luther King Jr Bltwy. to Macy Ave.	2	None	E	1020	100	8.15%	9.8%	Yes
I-4								
Saxon Blvd. to SR 472	6	None	D	10,510	118	9.60%	1.1%	No
SR 472 to Orange Camp Rd.	6	None	D	10,510	82	6.70%	0.8%	No
Orange Camp Rd. to SR 44	6	None	D	10,510	87	7.05%	0.8%	No
Orange Camp Road								
US 17/92 to Princeton Rd.	2	Near Critical	E	1270	0	0.00%	0.0%	No
Princeton Rd. to Blue Lake Ave.	2	None	E	1540	16	1.30%	1.0%	No
Blue Lake Ave. to Dr Martin Luther King Jr Bltwy.	2	Vested Near Critical	E	1540	59	4.80%	3.8%	Yes
Dr Martin Luther King Jr Bltwy. to I-4	4	Vested Critical	E	3410	99	8.10%	2.90%	No
Taylor Rd								
US 17/92 to Stratford Dr.	2	None	E	1020	0	0.00%	0.0%	No
Stratford Dr. to Blue Lake Ave.	2	None	E	1540	0	0.00%	0.0%	No
Blue Lake Ave to Dr Martin Luther King Jr Bltwy.	2	None	E	1230	0	0.00%	0.0%	No
US 17/92								
Rhode Island Ave. to Graves Ave.	4	None	D	3580	0	0.00%	0.0%	No
Graves Ave. to New York Ave.	4	None	D	3580	16	1.30%	0.4%	No
New York Ave. to SR 472	4	None	D	3580	36	2.95%	1.0%	No
SR 472 to Taylor Rd. (SR 15A)	6	None	D	5390	144	11.78%	2.67%	No
Rhode Island Ave								
US 17/92 to Veteran's Memorial Pkwy.	2	None	E	1,020	17	1.35%	1.7%	No
Graves Avenue								
Leavitt Ave. to Veteran's Memorial Pkwy.	2	None	E	1,020	23	1.83%	2.3%	No
Veteran's Memorial Pkwy. to Kentucky Ave.	2	Critical	E	1,620	86	7.00%	5.3%	Yes
Kentucky Ave. to Normandy Blvd.	2	Vested Critical	E	1,620	24	1.90%	1.5%	No
Normandy Blvd. to Howland Blvd.	4	Vested Near Critical	E	2,740	58	4.70%	2.1%	No
Normandy Blvd.								
Graves Ave. to Rhode Island Ave.	2	Vested Critical	E	1,540	87	7.10%	5.6%	Yes
Rhode Island Ave. to Elkcam Blvd.	4	Vested Critical	E	2,740	65	5.30%	2.4%	No
Blue Lake Avenue								
Orange Camp Rd. to Taylor Rd.	2	None	E	1540	40	3.20%	2.6%	No
Taylor Rd. to Beresford Ave.	2	None	E	1230	30	2.40%	2.4%	No
Macy Avenue								
Ohio St. to Cassadaga Rd.	2	None	C	1,020	81	6.60%	7.9%	Yes
Ohio Avenue								
Macy Ave. to Lakeview Dr.	2	None	C	1,020	0	0.00%	0.0%	No
Kicklighter Road								
Macy Ave. to Lake Helen-Osteen Rd./Prevatt Ave.	2	None	E	1,020	69	5.60%	6.8%	Yes
Prevatt Avenue								
Kicklighter Rd. to Lake Pearl Dr.	2	None	C	1540	0	0.00%	0.0%	No
Lake Pearl Dr. to SR 44	2	None	E	1540	0	0.00%	0.0%	No

Appendix E:
Raw Turning Movement Counts and Peak Season Factor Category Report

Raw Turning Movement Counts

DE TRAFFIC

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(386) 341-4186
SR 472 at Dr MLK Blvd
Volusia County, Fl

File Name : 01 SR 472 at MLK
Site Code : 0000000
Start Date : 7/26/2022
Page No : 1

Groups Printed- Automobiles - Commercial

	Dr Martin Luther King Jr Southbound					SR 472 Westbound					Kentucky Ave Northbound					SR 472 Eastbound					
Start Time	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Int. Total
07:00 AM	38	30	7	3	78	11	178	24	9	222	35	29	10	6	80	10	225	20	8	263	643
07:15 AM	43	35	10	4	92	21	206	42	11	280	42	52	12	8	114	13	259	26	10	308	794
07:30 AM	36	86	10	5	137	25	236	35	8	304	35	44	19	4	102	17	240	34	8	299	842
07:45 AM	44	79	8	6	137	18	289	43	5	355	29	34	19	5	87	17	235	43	11	306	885
Total	161	230	35	18	444	75	909	144	33	1161	141	159	60	23	383	57	959	123	37	1176	3164
08:00 AM	35	79	12	4	130	19	259	25	7	310	25	27	15	4	71	20	232	26	9	287	798
08:15 AM	51	67	18	8	144	19	207	36	10	272	31	24	17	6	78	17	218	30	10	275	769
08:30 AM	43	53	17	9	122	21	209	26	8	264	25	28	16	11	80	11	230	25	16	282	748
08:45 AM	36	44	13	6	99	14	194	24	7	239	29	35	12	13	89	15	208	17	11	251	678
Total	165	243	60	27	495	73	869	111	32	1085	110	114	60	34	318	63	888	98	46	1095	2993
04:00 PM	35	63	10	6	114	19	204	43	13	279	26	43	12	4	85	13	220	24	6	263	741
04:15 PM	43	73	13	4	133	28	228	35	6	297	30	53	20	6	109	17	256	42	4	319	858
04:30 PM	51	47	12	5	115	39	192	43	4	278	35	43	11	2	91	17	228	35	17	297	781
04:45 PM	44	63	10	8	125	44	256	52	5	357	26	35	17	5	83	19	258	41	11	329	894
Total	173	246	45	23	487	130	880	173	28	1211	117	174	60	17	368	66	962	142	38	1208	3274
05:00 PM	63	69	15	4	151	35	220	42	8	305	28	53	15	4	100	17	245	52	16	330	886
05:15 PM	44	58	18	6	126	30	217	53	8	308	25	44	17	1	87	12	247	42	13	314	835
05:30 PM	56	67	15	6	144	28	245	36	10	319	36	52	11	8	107	16	239	35	8	298	868
05:45 PM	43	57	14	4	118	27	239	42	11	319	27	34	17	7	85	14	222	52	6	294	816
Total	206	251	62	20	539	120	921	173	37	1251	116	183	60	20	379	59	953	181	43	1236	3405
Grand Total	705	970	202	88	1965	398	3579	601	130	4708	484	630	240	94	1448	245	3762	544	164	4715	12836
Apprch %	35.9	49.4	10.3	4.5		8.5	76	12.8	2.8		33.4	43.5	16.6	6.5		5.2	79.8	11.5	3.5		
Total %	5.5	7.6	1.6	0.7	15.3	3.1	27.9	4.7	1	36.7	3.8	4.9	1.9	0.7	11.3	1.9	29.3	4.2	1.3	36.7	
Automobiles	683	942	183	88	1896	374	3476	584	130	4564	466	614	228	94	1402	229	3642	529	164	4564	12426
% Automobiles	96.9	97.1	90.6	100	96.5	94	97.1	97.2	100	96.9	96.3	97.5	95	100	96.8	93.5	96.8	97.2	100	96.8	96.8
Commercial	22	28	19	0	69	24	103	17	0	144	18	16	12	0	46	16	120	15	0	151	410
% Commercial	3.1	2.9	9.4	0	3.5	6	2.9	2.8	0	3.1	3.7	2.5	5	0	3.2	6.5	3.2	2.8	0	3.2	3.2

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	Dr Martin Luther King Jr Southbound					SR 472 Westbound					Kentucky Ave Northbound					SR 472 Eastbound					
Start Time	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	43	35	10	4	92	21	206	42	11	280	42	52	12	8	114	13	259	26	10	308	794
07:30 AM	36	86	10	5	137	25	236	35	8	304	35	44	19	4	102	17	240	34	8	299	842
07:45 AM	44	79	8	6	137	18	289	43	5	355	29	34	19	5	87	17	235	43	11	306	885
08:00 AM	35	79	12	4	130	19	259	25	7	310	25	27	15	4	71	20	232	26	9	287	798
Total Volume	158	279	40	19	496	83	990	145	31	1249	131	157	65	21	374	67	966	129	38	1200	3319
% App. Total	31.9	56.2	8.1	3.8		6.6	79.3	11.6	2.5		35	42	17.4	5.6		5.6	80.5	10.8	3.2		
PHF	.898	.811	.833	.792	.905	.830	.856	.843	.705	.880	.780	.755	.855	.656	.820	.838	.932	.750	.864	.974	.938
Automobiles	150	268	35	19	472	78	950	140	31	1199	128	153	62	21	364	62	926	123	38	1149	3184
% Automobiles	94.9	96.1	87.5	100	95.2	94.0	96.0	96.6	100	96.0	97.7	97.5	95.4	100	97.3	92.5	95.9	95.3	100	95.8	95.9
Commercial	8	11	5	0	24	5	40	5	0	50	3	4	3	0	10	5	40	6	0	51	135
% Commercial	5.1	3.9	12.5	0	4.8	6.0	4.0	3.4	0	4.0	2.3	2.5	4.6	0	2.7	7.5	4.1	4.7	0	4.3	4.1

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Start Date : 7/26/2022
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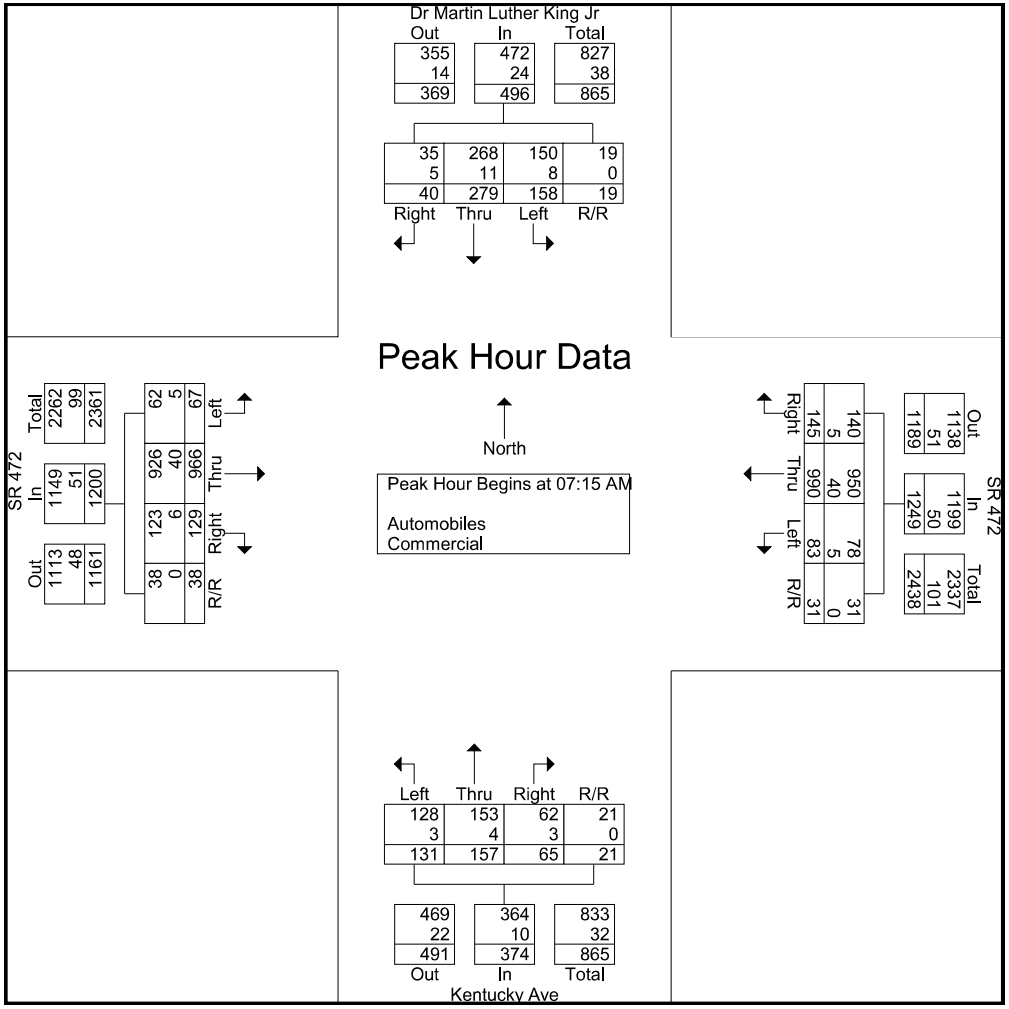

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SR 472 at Dr MLK Blvd
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File Name : 04 SR 472 at MLK
Site Code : 0000000
Start Date : 7/26/2022
Page No : 4

	Dr Martin Luther King Jr Southbound					SR 472 Westbound					Kentucky Ave Northbound					SR 472 Eastbound					
Start Time	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	44	63	10	8	125	44	256	52	5	357	26	35	17	5	83	19	258	41	11	329	894
05:00 PM	63	69	15	4	151	35	220	42	8	305	28	53	15	4	100	17	245	52	16	330	886
05:15 PM	44	58	18	6	126	30	217	53	8	308	25	44	17	1	87	12	247	42	13	314	835
05:30 PM	56	67	15	6	144	28	245	36	10	319	36	52	11	8	107	16	239	35	8	298	868
Total Volume	207	257	58	24	546	137	938	183	31	1289	115	184	60	18	377	64	989	170	48	1271	3483
% App. Total	37.9	47.1	10.6	4.4		10.6	72.8	14.2	2.4		30.5	48.8	15.9	4.8		5	77.8	13.4	3.8		
PHF	.821	.931	.806	.750	.904	.778	.916	.863	.775	.903	.799	.868	.882	.563	.881	.842	.958	.817	.750	.963	.974
Automobiles	201	252	54	24	531	130	924	179	31	1264	110	180	59	18	367	61	970	168	48	1247	3409
% Automobiles	97.1	98.1	93.1	100	97.3	94.9	98.5	97.8	100	98.1	95.7	97.8	98.3	100	97.3	95.3	98.1	98.8	100	98.1	97.9
Commercial	6	5	4	0	15	7	14	4	0	25	5	4	1	0	10	3	19	2	0	24	74
% Commercial	2.9	1.9	6.9	0	2.7	5.1	1.5	2.2	0	1.9	4.3	2.2	1.7	0	2.7	4.7	1.9	1.2	0	1.9	2.1

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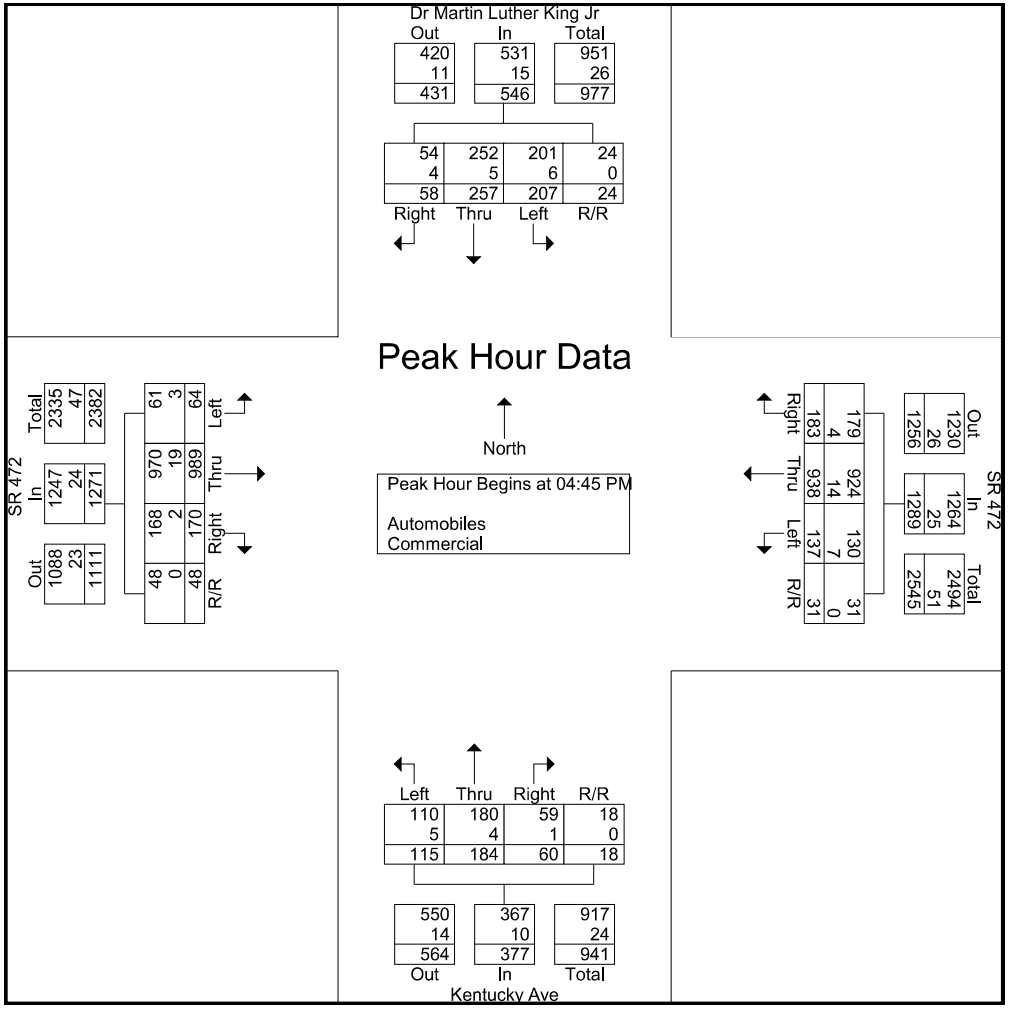

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Groups Printed- Peds

	Dr Martin Luther King Jr Southbound				SR 472 Westbound				Kentucky Ave Northbound				SR 472 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0		
Total %																	

DE TRAFFIC

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Dr MLK Blvd at Cassadaga Rd
Volusia County, Fl

File Name : 05 MLK at Cassa
Site Code : 00000015
Start Date : 7/26/2022
Page No : 1

Groups Printed- Automobiles - Commercial

	Dr Martin Luther King Jr Southbound				Cassadaga Rd Westbound				Dr Martin Luther King Jr Northbound				N/A Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	4	67	0	71	7	0	4	11	0	67	4	71	0	0	0	0	153
07:15 AM	7	77	0	84	8	0	7	15	0	103	6	109	0	0	0	0	208
07:30 AM	3	132	0	135	15	0	7	22	0	102	1	103	0	0	0	0	260
07:45 AM	2	120	0	122	9	0	10	19	0	98	3	101	0	0	0	0	242
Total	16	396	0	412	39	0	28	67	0	370	14	384	0	0	0	0	863
08:00 AM	8	122	0	130	11	0	5	16	0	75	7	82	0	0	0	0	228
08:15 AM	10	125	0	135	9	0	7	16	0	83	4	87	0	0	0	0	238
08:30 AM	7	107	0	114	8	0	5	13	0	69	8	77	0	0	0	0	204
08:45 AM	8	91	0	99	7	0	6	13	0	75	8	83	0	0	0	0	195
Total	33	445	0	478	35	0	23	58	0	302	27	329	0	0	0	0	865
04:00 PM	10	105	0	115	14	0	7	21	0	103	24	127	0	0	0	0	263
04:15 PM	13	118	0	131	15	0	2	17	0	102	16	118	0	0	0	0	266
04:30 PM	7	107	0	114	14	0	6	20	0	91	19	110	0	0	0	0	244
04:45 PM	9	107	0	116	11	0	8	19	0	102	11	113	0	0	0	0	248
Total	39	437	0	476	54	0	23	77	0	398	70	468	0	0	0	0	1021
05:00 PM	11	131	0	142	16	0	5	21	0	104	20	124	0	0	0	0	287
05:15 PM	14	106	0	120	17	0	8	25	0	97	24	121	0	0	0	0	266
05:30 PM	9	124	0	133	18	0	5	23	0	83	19	102	0	0	0	0	258
05:45 PM	9	101	0	110	14	0	6	20	0	77	17	94	0	0	0	0	224
Total	43	462	0	505	65	0	24	89	0	361	80	441	0	0	0	0	1035
Grand Total	131	1740	0	1871	193	0	98	291	0	1431	191	1622	0	0	0	0	3784
Apprch %	7	93	0		66.3	0	33.7		0	88.2	11.8		0	0	0		
Total %	3.5	46	0	49.4	5.1	0	2.6	7.7	0	37.8	5	42.9	0	0	0	0	
Automobiles	123	1668	0	1791	187	0	91	278	0	1389	180	1569	0	0	0	0	3638
% Automobiles	93.9	95.9	0	95.7	96.9	0	92.9	95.5	0	97.1	94.2	96.7	0	0	0	0	96.1
Commercial	8	72	0	80	6	0	7	13	0	42	11	53	0	0	0	0	146
% Commercial	6.1	4.1	0	4.3	3.1	0	7.1	4.5	0	2.9	5.8	3.3	0	0	0	0	3.9

DE TRAFFIC

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(386) 341-4186
Dr MLK Blvd at Cassadaga Rd
Volusia County, Fl

File Name : 05 MLK at Cassa
Site Code : 00000015
Start Date : 7/26/2022
Page No : 2

	Dr Martin Luther King Jr Southbound				Cassadaga Rd Westbound				Dr Martin Luther King Jr Northbound				N/A Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	3	132	0	135	15	0	7	22	0	102	1	103	0	0	0	0	260
07:45 AM	2	120	0	122	9	0	10	19	0	98	3	101	0	0	0	0	242
08:00 AM	8	122	0	130	11	0	5	16	0	75	7	82	0	0	0	0	228
08:15 AM	10	125	0	135	9	0	7	16	0	83	4	87	0	0	0	0	238
Total Volume	23	499	0	522	44	0	29	73	0	358	15	373	0	0	0	0	968
% App. Total	4.4	95.6	0		60.3	0	39.7		0	96	4		0	0	0		
PHF	.575	.945	.000	.967	.733	.000	.725	.830	.000	.877	.536	.905	.000	.000	.000	.000	.931
Automobiles	19	480	0	499	43	0	26	69	0	345	14	359	0	0	0	0	927
% Automobiles	82.6	96.2	0	95.6	97.7	0	89.7	94.5	0	96.4	93.3	96.2	0	0	0	0	95.8
Commercial	4	19	0	23	1	0	3	4	0	13	1	14	0	0	0	0	41
% Commercial	17.4	3.8	0	4.4	2.3	0	10.3	5.5	0	3.6	6.7	3.8	0	0	0	0	4.2

DE TRAFFIC

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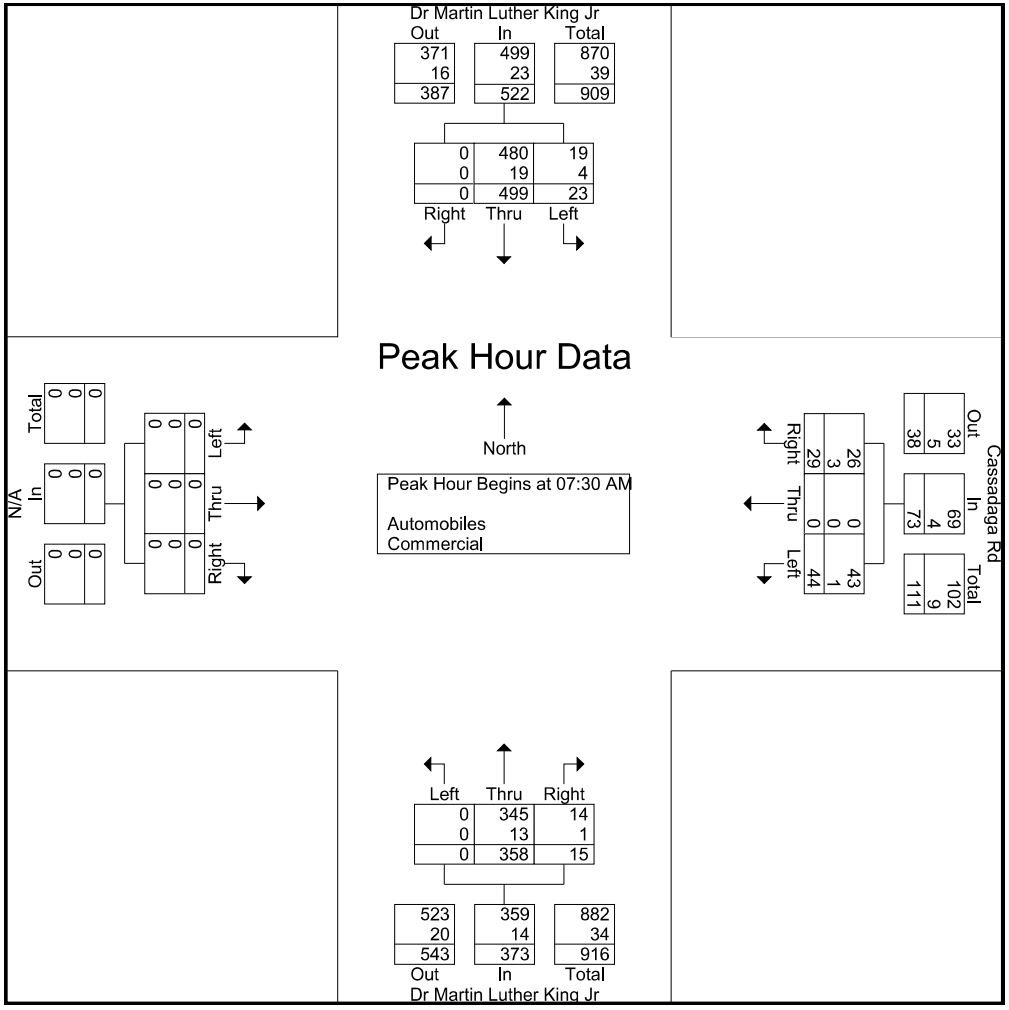
(386) 341-4186
Dr MLK Blvd at Cassadaga Rd
Volusia County, Fl

File Name : 05 MLK at Cassa
Site Code : 00000015
Start Date : 7/26/2022
Page No : 3



DE TRAFFIC

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(386) 341-4186
Dr MLK Blvd at Cassadaga Rd
Volusia County, Fl

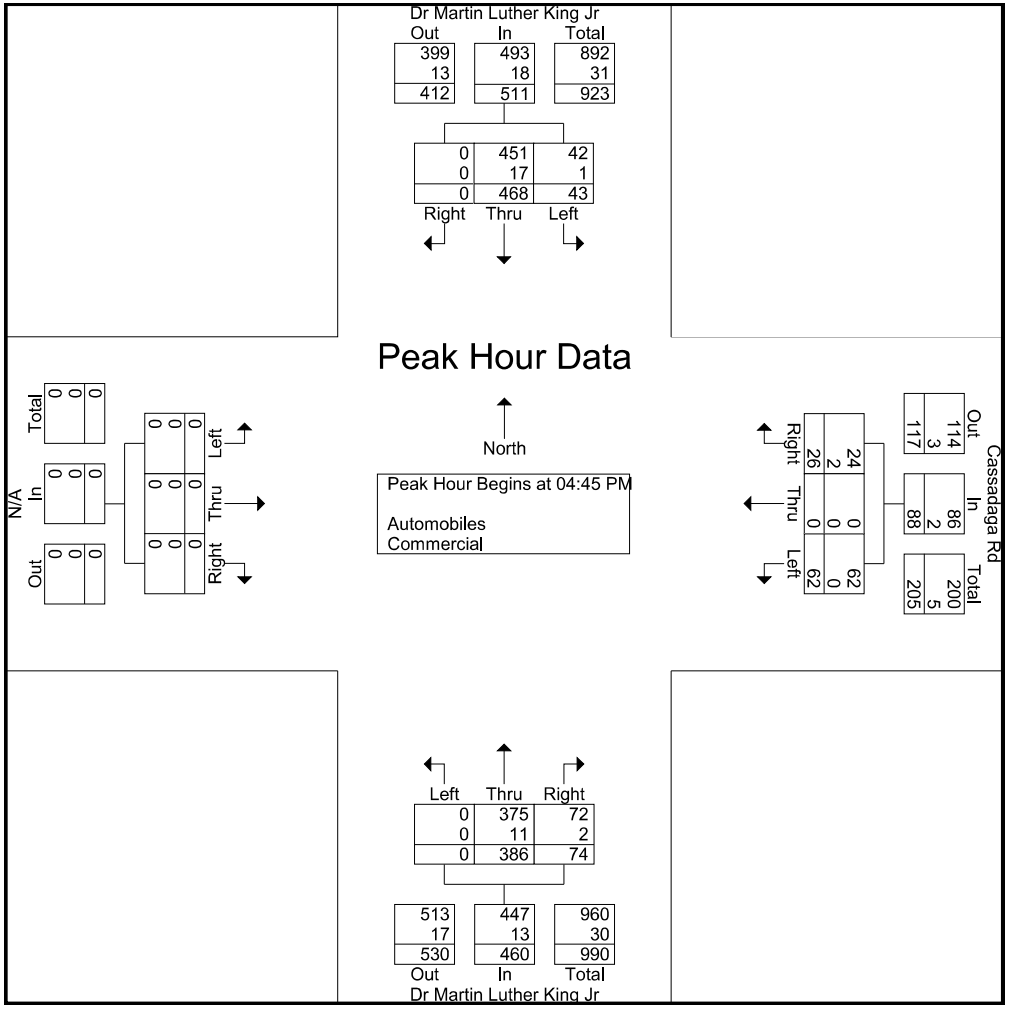
File Name : 05 MLK at Cassa
Site Code : 00000015
Start Date : 7/26/2022
Page No : 4

	Dr Martin Luther King Jr Southbound				Cassadaga Rd Westbound				Dr Martin Luther King Jr Northbound				N/A Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	9	107	0	116	11	0	8	19	0	102	11	113	0	0	0	0	248
05:00 PM	11	131	0	142	16	0	5	21	0	104	20	124	0	0	0	0	287
05:15 PM	14	106	0	120	17	0	8	25	0	97	24	121	0	0	0	0	266
05:30 PM	9	124	0	133	18	0	5	23	0	83	19	102	0	0	0	0	258
Total Volume	43	468	0	511	62	0	26	88	0	386	74	460	0	0	0	0	1059
% App. Total	8.4	91.6	0		70.5	0	29.5		0	83.9	16.1		0	0	0		
PHF	.768	.893	.000	.900	.861	.000	.813	.880	.000	.928	.771	.927	.000	.000	.000	.000	.922
Automobiles	42	451	0	493	62	0	24	86	0	375	72	447	0	0	0	0	1026
% Automobiles	97.7	96.4	0	96.5	100	0	92.3	97.7	0	97.2	97.3	97.2	0	0	0	0	96.9
Commercial	1	17	0	18	0	0	2	2	0	11	2	13	0	0	0	0	33
% Commercial	2.3	3.6	0	3.5	0	0	7.7	2.3	0	2.8	2.7	2.8	0	0	0	0	3.1

DE TRAFFIC

detraffic.com
(386) 341-4186
Dr MLK Blvd at Cassadaga Rd
Volusia County, Fl

File Name : 05 MLK at Cassa
Site Code : 00000015
Start Date : 7/26/2022
Page No : 5



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(386) 341-4186
Dr MLK Blvd at Cassadaga Rd
Volusia County, Fl

File Name : 05 MLK at Cassa
Site Code : 00000015
Start Date : 7/26/2022
Page No : 6

Groups Printed- Peds

	Dr Martin Luther King Jr Southbound				Cassadaga Rd Westbound				Dr Martin Luther King Jr Northbound				N/A Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0		
Total %																	

DE TRAFFIC

detraffic.com
(386) 341-4186
Dr MLK Jr at Orange Camp Rd
Volusia County, Fl

File Name : 06 MLK at Orange
Site Code : 00000001
Start Date : 7/26/2022
Page No : 1

Groups Printed- Autpomobiles - Commercial

	Dr Martin Luther King Jr Southbound				Orange Camp Rd Westbound				Dr Martin Luther King Jr Northbound				Orange Camp Rd Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	49	55	11	115	6	55	44	105	22	59	8	89	6	110	15	131	440
07:15 AM	45	74	13	132	4	61	38	103	19	83	18	120	6	98	20	124	479
07:30 AM	34	97	12	143	9	57	23	89	12	78	11	101	5	111	35	151	484
07:45 AM	44	87	19	150	7	46	34	87	21	56	17	94	5	103	26	134	465
Total	172	313	55	540	26	219	139	384	74	276	54	404	22	422	96	540	1868
08:00 AM	35	95	12	142	12	37	26	75	17	63	18	98	4	116	25	145	460
08:15 AM	42	75	18	135	16	44	17	77	18	59	18	95	6	107	36	149	456
08:30 AM	37	89	18	144	13	37	34	84	26	46	19	91	5	114	26	145	464
08:45 AM	30	78	14	122	9	45	27	81	19	60	14	93	6	104	34	144	440
Total	144	337	62	543	50	163	104	317	80	228	69	377	21	441	121	583	1820
04:00 PM	30	73	27	130	13	118	15	146	22	95	11	128	13	119	36	168	572
04:15 PM	42	64	32	138	27	90	60	177	26	89	16	131	14	98	40	152	598
04:30 PM	25	76	35	136	25	87	42	154	22	85	24	131	4	117	34	155	576
04:45 PM	35	67	26	128	21	99	34	154	19	76	24	119	11	115	42	168	569
Total	132	280	120	532	86	394	151	631	89	345	75	509	42	449	152	643	2315
05:00 PM	42	84	26	152	24	104	28	156	27	83	16	126	13	135	25	173	607
05:15 PM	35	80	27	142	30	115	24	169	34	77	24	135	15	120	34	169	615
05:30 PM	25	69	34	128	29	88	36	153	24	77	16	117	17	107	42	166	564
05:45 PM	25	57	27	109	29	95	27	151	16	62	11	89	11	105	52	168	517
Total	127	290	114	531	112	402	115	629	101	299	67	467	56	467	153	676	2303
Grand Total	575	1220	351	2146	274	1178	509	1961	344	1148	265	1757	141	1779	522	2442	8306
Apprch %	26.8	56.8	16.4		14	60.1	26		19.6	65.3	15.1		5.8	72.9	21.4		
Total %	6.9	14.7	4.2	25.8	3.3	14.2	6.1	23.6	4.1	13.8	3.2	21.2	1.7	21.4	6.3	29.4	
Autpomobiles	554	1175	336	2065	264	1138	493	1895	332	1113	260	1705	132	1732	513	2377	8042
% Autpomobiles	96.3	96.3	95.7	96.2	96.4	96.6	96.9	96.6	96.5	97	98.1	97	93.6	97.4	98.3	97.3	96.8
Commercial	21	45	15	81	10	40	16	66	12	35	5	52	9	47	9	65	264
% Commercial	3.7	3.7	4.3	3.8	3.6	3.4	3.1	3.4	3.5	3	1.9	3	6.4	2.6	1.7	2.7	3.2

DE TRAFFIC

detraffic.com
(386) 341-4186
Dr MLK Jr at Orange Camp Rd
Volusia County, Fl

File Name : 06 MLK at Orange
Site Code : 00000001
Start Date : 7/26/2022
Page No : 2

	Dr Martin Luther King Jr Southbound				Orange Camp Rd Westbound				Dr Martin Luther King Jr Northbound				Orange Camp Rd Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	45	74	13	132	4	61	38	103	19	83	18	120	6	98	20	124	479
07:30 AM	34	97	12	143	9	57	23	89	12	78	11	101	5	111	35	151	484
07:45 AM	44	87	19	150	7	46	34	87	21	56	17	94	5	103	26	134	465
08:00 AM	35	95	12	142	12	37	26	75	17	63	18	98	4	116	25	145	460
Total Volume	158	353	56	567	32	201	121	354	69	280	64	413	20	428	106	554	1888
% App. Total	27.9	62.3	9.9		9	56.8	34.2		16.7	67.8	15.5		3.6	77.3	19.1		
PHF	.878	.910	.737	.945	.667	.824	.796	.859	.821	.843	.889	.860	.833	.922	.757	.917	.975
Autpomobiles	152	342	52	546	30	183	119	332	64	271	61	396	20	427	104	551	1825
% Autpomobiles	96.2	96.9	92.9	96.3	93.8	91.0	98.3	93.8	92.8	96.8	95.3	95.9	100	99.8	98.1	99.5	96.7
Commercial	6	11	4	21	2	18	2	22	5	9	3	17	0	1	2	3	63
% Commercial	3.8	3.1	7.1	3.7	6.3	9.0	1.7	6.2	7.2	3.2	4.7	4.1	0	0.2	1.9	0.5	3.3

DE TRAFFIC

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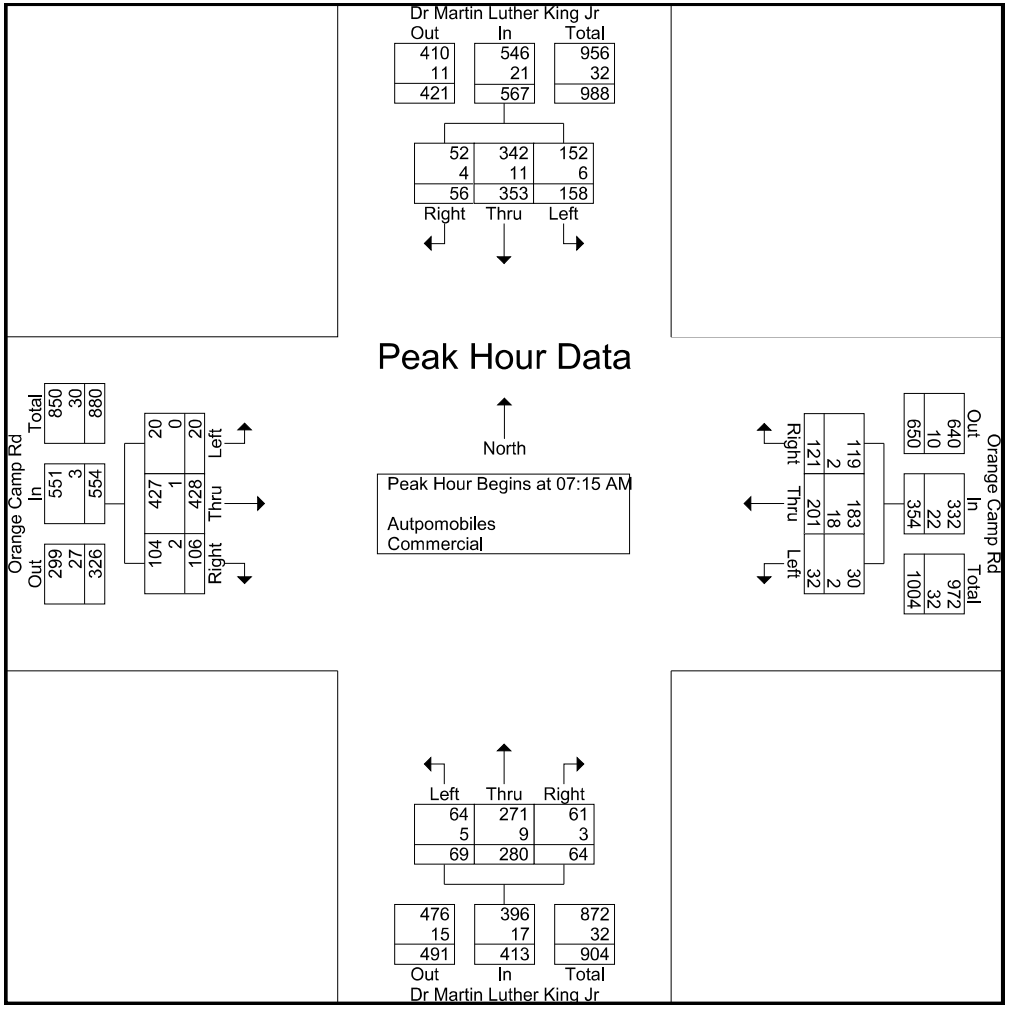
(386) 341-4186
Dr MLK Jr at Orange Camp Rd
Volusia County, Fl

File Name : 06 MLK at Orange
Site Code : 00000001
Start Date : 7/26/2022
Page No : 3



DE TRAFFIC

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(386) 341-4186
Dr MLK Jr at Orange Camp Rd
Volusia County, Fl

File Name : 06 MLK at Orange
Site Code : 00000001
Start Date : 7/26/2022
Page No : 4

	Dr Martin Luther King Jr Southbound				Orange Camp Rd Westbound				Dr Martin Luther King Jr Northbound				Orange Camp Rd Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	25	76	35	136	25	87	42	154	22	85	24	131	4	117	34	155	576
04:45 PM	35	67	26	128	21	99	34	154	19	76	24	119	11	115	42	168	569
05:00 PM	42	84	26	152	24	104	28	156	27	83	16	126	13	135	25	173	607
05:15 PM	35	80	27	142	30	115	24	169	34	77	24	135	15	120	34	169	615
Total Volume	137	307	114	558	100	405	128	633	102	321	88	511	43	487	135	665	2367
% App. Total	24.6	55	20.4		15.8	64	20.2		20	62.8	17.2		6.5	73.2	20.3		
PHF	.815	.914	.814	.918	.833	.880	.762	.936	.750	.944	.917	.946	.717	.902	.804	.961	.962
Autpomobiles	133	290	110	533	95	402	125	622	101	317	88	506	40	464	133	637	2298
% Autpomobiles	97.1	94.5	96.5	95.5	95.0	99.3	97.7	98.3	99.0	98.8	100	99.0	93.0	95.3	98.5	95.8	97.1
Commercial	4	17	4	25	5	3	3	11	1	4	0	5	3	23	2	28	69
% Commercial	2.9	5.5	3.5	4.5	5.0	0.7	2.3	1.7	1.0	1.2	0	1.0	7.0	4.7	1.5	4.2	2.9

DE TRAFFIC

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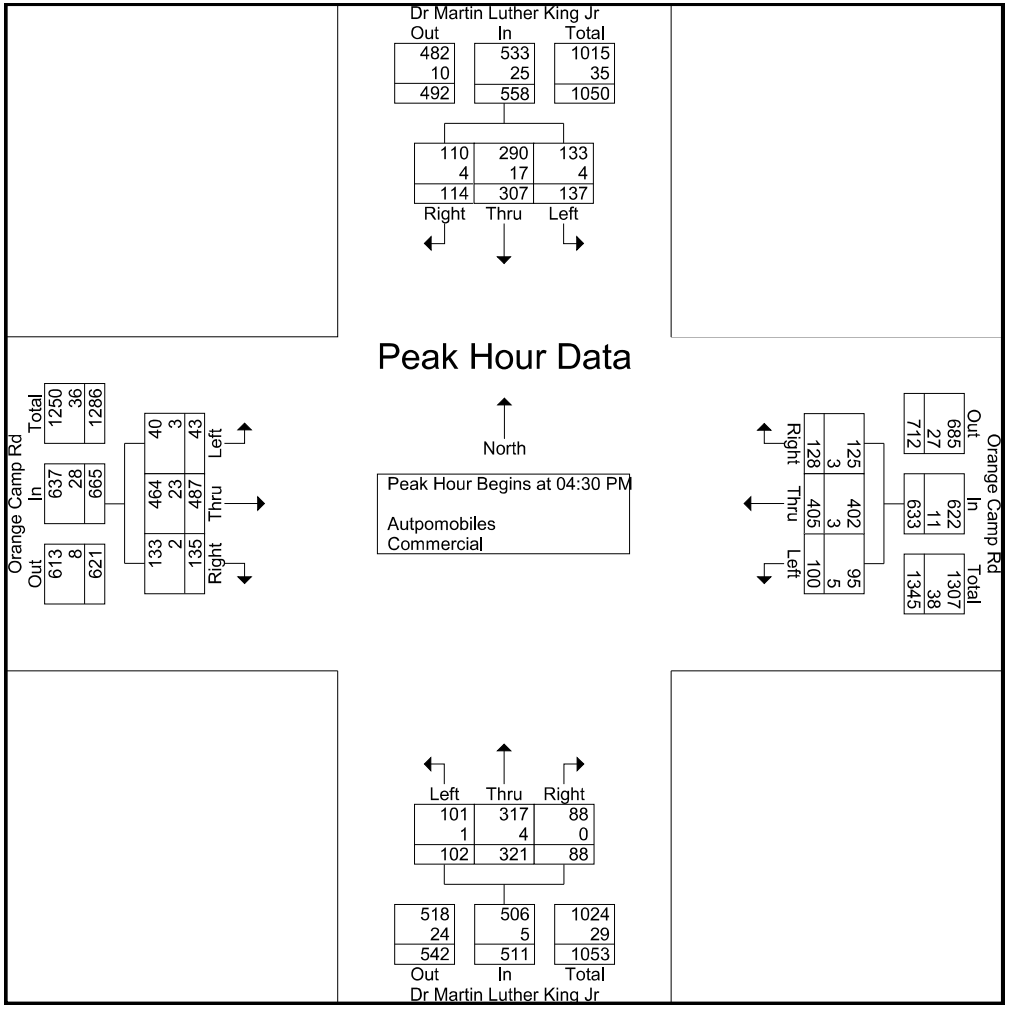
(386) 341-4186
Dr MLK Jr at Orange Camp Rd
Volusia County, Fl

File Name : 06 MLK at Orange
Site Code : 00000001
Start Date : 7/26/2022
Page No : 5



DE TRAFFIC

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(386) 341-4186
Dr MLK Jr at Orange Camp Rd
Volusia County, Fl

File Name : 06 MLK at Orange
Site Code : 00000001
Start Date : 7/26/2022
Page No : 6

Groups Printed- Peds

	Dr Martin Luther King Jr Southbound				Orange Camp Rd Westbound				Dr Martin Luther King Jr Northbound				Orange Camp Rd Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0		
Total %																	

DE TRAFFIC

detraffic.com
(386) 341-4186
Dr MLK Jr at E Taylor Rd/Victoria Gardens Dr
Volusia County, Fl

File Name : 07 Veterans at Taylor
Site Code : 00000007
Start Date : 7/26/2022
Page No : 1

Groups Printed- Automobiles - Commercial

	Dr Martin Luther King Jr Southbound					Victoria Gardens Dr Westbound					Dr Martin Luther King Jr Northbound					E Taylor Rd Eastbound					
Start Time	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Int. Total
07:00 AM	3	77	6	2	88	7	11	20	0	38	19	84	5	0	108	9	3	27	5	44	278
07:15 AM	7	88	11	1	107	9	16	24	1	50	24	101	4	1	130	13	4	35	10	62	349
07:30 AM	4	97	16	2	119	4	17	19	1	41	34	81	7	0	122	19	6	42	6	73	355
07:45 AM	8	101	15	3	127	9	16	17	0	42	28	88	4	2	122	18	4	34	11	67	358
Total	22	363	48	8	441	29	60	80	2	171	105	354	20	3	482	59	17	138	32	246	1340
08:00 AM	5	105	16	1	127	4	17	27	0	48	20	73	7	1	101	20	8	42	4	74	350
08:15 AM	8	105	12	6	131	6	11	24	0	41	24	56	16	0	96	17	4	29	6	56	324
08:30 AM	7	102	13	3	125	4	10	19	0	33	34	37	11	2	84	11	8	34	4	57	299
08:45 AM	8	82	16	3	109	6	9	22	1	38	26	62	6	0	94	13	7	29	3	52	293
Total	28	394	57	13	492	20	47	92	1	160	104	228	40	3	375	61	27	134	17	239	1266
04:00 PM	5	88	16	0	109	5	6	11	0	22	44	75	6	0	125	10	18	39	3	70	326
04:15 PM	5	115	16	1	137	3	12	16	0	31	44	101	9	1	155	13	14	27	4	58	381
04:30 PM	7	110	14	3	134	6	11	11	1	29	41	97	4	0	142	11	11	19	2	43	348
04:45 PM	4	107	11	2	124	4	16	13	1	34	34	89	5	2	130	16	16	25	3	60	348
Total	21	420	57	6	504	18	45	51	2	116	163	362	24	3	552	50	59	110	12	231	1403
05:00 PM	5	119	20	0	144	5	8	13	2	28	27	95	4	0	126	8	17	19	4	48	346
05:15 PM	5	116	17	2	140	4	8	13	3	28	41	72	5	0	118	11	16	24	2	53	339
05:30 PM	4	105	16	0	125	7	7	6	1	21	34	91	4	3	132	9	6	19	3	37	315
05:45 PM	7	85	11	2	105	6	8	11	2	27	26	72	6	2	106	10	8	25	4	47	285
Total	21	425	64	4	514	22	31	43	8	104	128	330	19	5	482	38	47	87	13	185	1285
Grand Total	92	1602	226	31	1951	89	183	266	13	551	500	1274	103	14	1891	208	150	469	74	901	5294
Apprch %	4.7	82.1	11.6	1.6		16.2	33.2	48.3	2.4		26.4	67.4	5.4	0.7		23.1	16.6	52.1	8.2		
Total %	1.7	30.3	4.3	0.6	36.9	1.7	3.5	5	0.2	10.4	9.4	24.1	1.9	0.3	35.7	3.9	2.8	8.9	1.4	17	
Automobiles	86	1527	221	31	1865	85	182	264	13	544	497	1211	101	14	1823	200	150	456	74	880	5112
% Automobiles	93.5	95.3	97.8	100	95.6	95.5	99.5	99.2	100	98.7	99.4	95.1	98.1	100	96.4	96.2	100	97.2	100	97.7	96.6
Commercial	6	75	5	0	86	4	1	2	0	7	3	63	2	0	68	8	0	13	0	21	182
% Commercial	6.5	4.7	2.2	0	4.4	4.5	0.5	0.8	0	1.3	0.6	4.9	1.9	0	3.6	3.8	0	2.8	0	2.3	3.4

DE TRAFFIC

detraffic.com
(386) 341-4186
Dr MLK Jr at E Taylor Rd/Victoria Gardens Dr
Volusia County, Fl

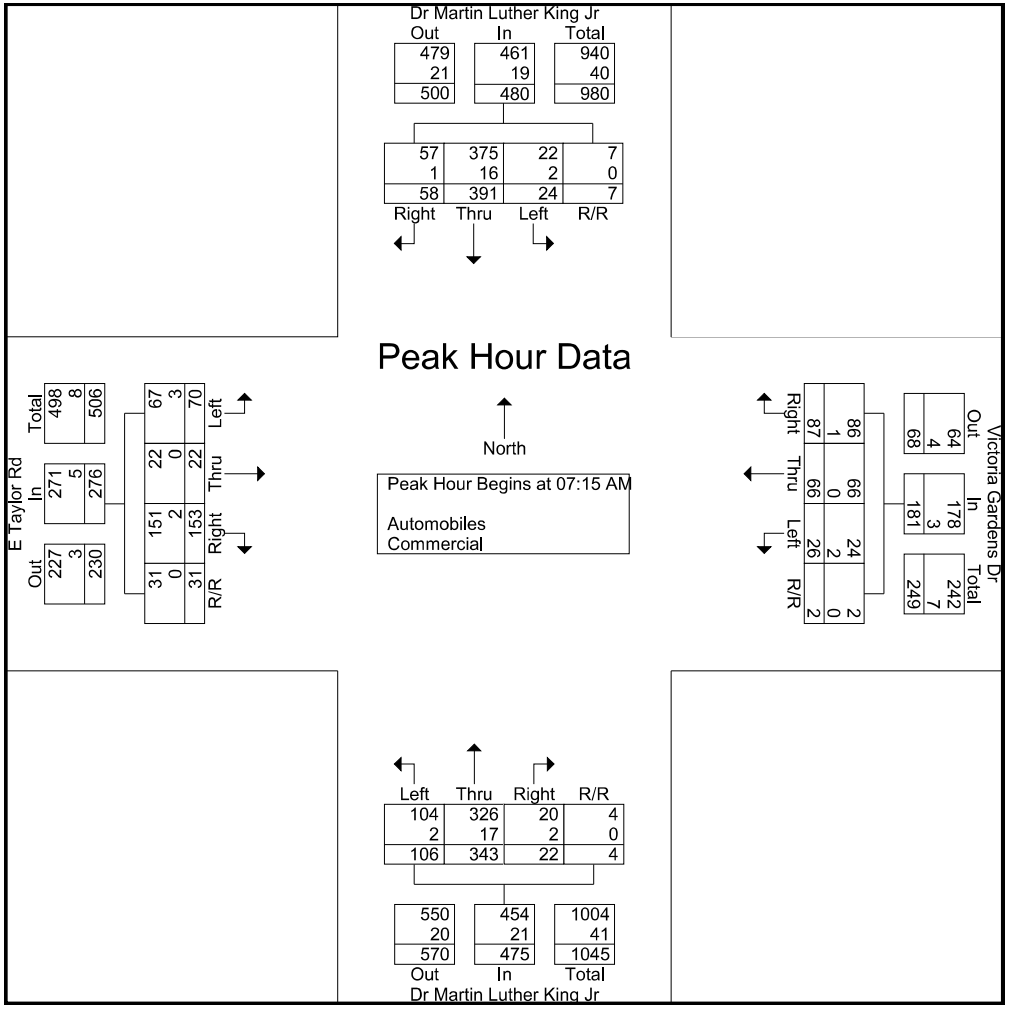
File Name : 07 Veterans at Taylor
Site Code : 00000007
Start Date : 7/26/2022
Page No : 2

	Dr Martin Luther King Jr Southbound					Victoria Gardens Dr Westbound					Dr Martin Luther King Jr Northbound					E Taylor Rd Eastbound					
Start Time	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	7	88	11	1	107	9	16	24	1	50	24	101	4	1	130	13	4	35	10	62	349
07:30 AM	4	97	16	2	119	4	17	19	1	41	34	81	7	0	122	19	6	42	6	73	355
07:45 AM	8	101	15	3	127	9	16	17	0	42	28	88	4	2	122	18	4	34	11	67	358
08:00 AM	5	105	16	1	127	4	17	27	0	48	20	73	7	1	101	20	8	42	4	74	350
Total Volume	24	391	58	7	480	26	66	87	2	181	106	343	22	4	475	70	22	153	31	276	1412
% App. Total	5	81.5	12.1	1.5		14.4	36.5	48.1	1.1		22.3	72.2	4.6	0.8		25.4	8	55.4	11.2		
PHF	.750	.931	.906	.583	.945	.722	.971	.806	.500	.905	.779	.849	.786	.500	.913	.875	.688	.911	.705	.932	.986
Automobiles	22	375	57	7	461	24	66	86	2	178	104	326	20	4	454	67	22	151	31	271	1364
% Automobiles	91.7	95.9	98.3	100	96.0	92.3	100	98.9	100	98.3	98.1	95.0	90.9	100	95.6	95.7	100	98.7	100	98.2	96.6
Commercial	2	16	1	0	19	2	0	1	0	3	2	17	2	0	21	3	0	2	0	5	48
% Commercial	8.3	4.1	1.7	0	4.0	7.7	0	1.1	0	1.7	1.9	5.0	9.1	0	4.4	4.3	0	1.3	0	1.8	3.4

DE TRAFFIC

detraffic.com
(386) 341-4186
Dr MLK Jr at E Taylor Rd/Victoria Gardens Dr
Volusia County, Fl

File Name : 07 Veterans at Taylor
Site Code : 00000007
Start Date : 7/26/2022
Page No : 3



DE TRAFFIC

detraffic.com
(386) 341-4186
Dr MLK Jr at E Taylor Rd/Victoria Gardens Dr
Volusia County, Fl

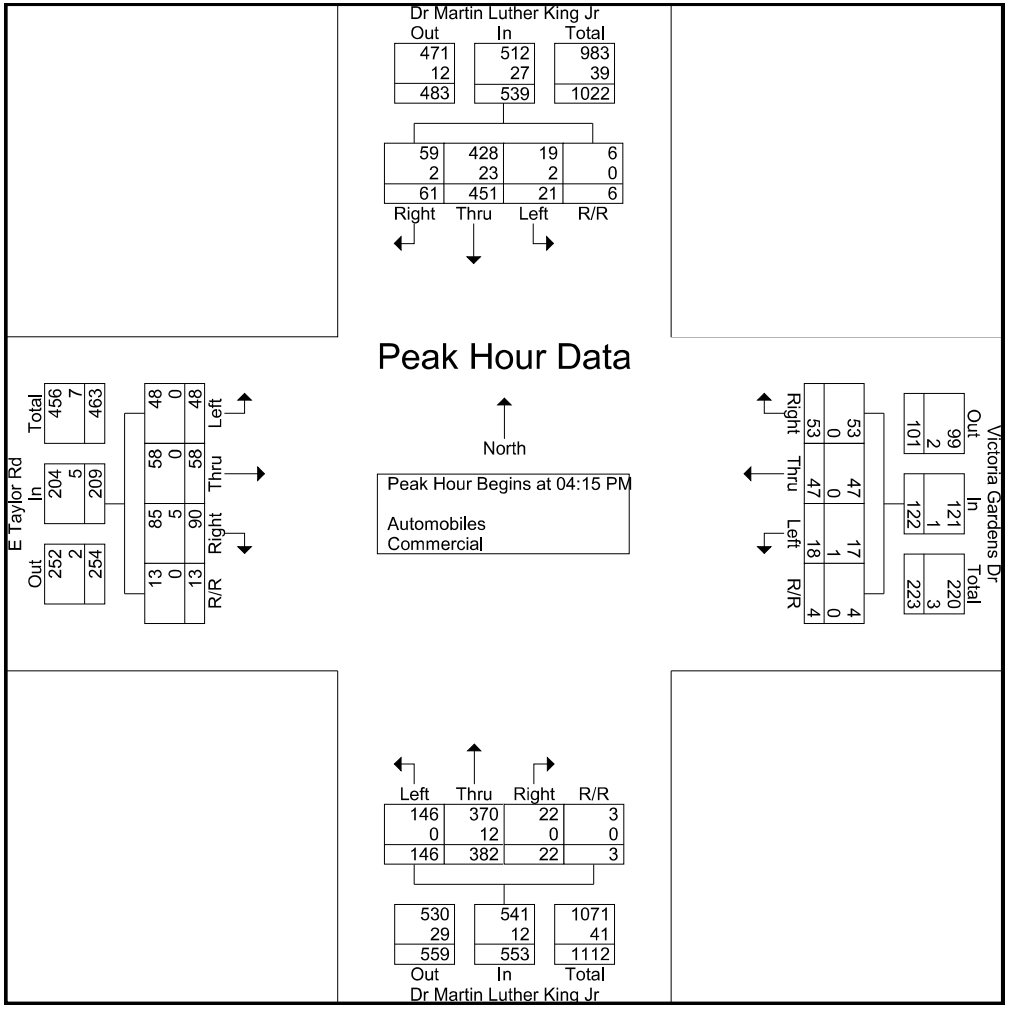
File Name : 07 Veterans at Taylor
Site Code : 00000007
Start Date : 7/26/2022
Page No : 4

	Dr Martin Luther King Jr Southbound					Victoria Gardens Dr Westbound					Dr Martin Luther King Jr Northbound					E Taylor Rd Eastbound					
Start Time	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	5	115	16	1	137	3	12	16	0	31	44	101	9	1	155	13	14	27	4	58	381
04:30 PM	7	110	14	3	134	6	11	11	1	29	41	97	4	0	142	11	11	19	2	43	348
04:45 PM	4	107	11	2	124	4	16	13	1	34	34	89	5	2	130	16	16	25	3	60	348
05:00 PM	5	119	20	0	144	5	8	13	2	28	27	95	4	0	126	8	17	19	4	48	346
Total Volume	21	451	61	6	539	18	47	53	4	122	146	382	22	3	553	48	58	90	13	209	1423
% App. Total	3.9	83.7	11.3	1.1		14.8	38.5	43.4	3.3		26.4	69.1	4	0.5		23	27.8	43.1	6.2		
PHF	.750	.947	.763	.500	.936	.750	.734	.828	.500	.897	.830	.946	.611	.375	.892	.750	.853	.833	.813	.871	.934
Automobiles	19	428	59	6	512	17	47	53	4	121	146	370	22	3	541	48	58	85	13	204	1378
% Automobiles	90.5	94.9	96.7	100	95.0	94.4	100	100	100	99.2	100	96.9	100	100	97.8	100	100	94.4	100	97.6	96.8
Commercial	2	23	2	0	27	1	0	0	0	1	0	12	0	0	12	0	0	5	0	5	45
% Commercial	9.5	5.1	3.3	0	5.0	5.6	0	0	0	0.8	0	3.1	0	0	2.2	0	0	5.6	0	2.4	3.2

DE TRAFFIC

detraffic.com
(386) 341-4186
Dr MLK Jr at E Taylor Rd/Victoria Gardens Dr
Volusia County, Fl

File Name : 07 Veterans at Taylor
Site Code : 00000007
Start Date : 7/26/2022
Page No : 5



DE TRAFFIC

detraffic.com
(386) 341-4186
Dr MLK Jr at E Taylor Rd/Victoria Gardens Dr
Volusia County, Fl

File Name : 07 Veterans at Taylor
Site Code : 00000007
Start Date : 7/26/2022
Page No : 6

Groups Printed- Peds

	Dr Martin Luther King Jr Southbound					Victoria Gardens Dr Westbound					Dr Martin Luther King Jr Northbound					E Taylor Rd Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
Total %																					

DE TRAFFIC

detraffic.com
(386) 341-4186
Kentucky Ave at E. Graves Ave
Volusia County, Fl

File Name : 03 Kentucky at Graves
Site Code : 00000003
Start Date : 7/26/2022
Page No : 1

Groups Printed- Automobiles - Commercial

	Kentucky Ave Southbound					E. Graves Ave Westbound					Kentucky Ave Northbound					E. Graves Ave Eastbound					
Start Time	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Int. Total
07:00 AM	21	3	29	9	62	1	73	36	9	119	3	3	0	0	6	22	35	2	0	59	246
07:15 AM	36	2	38	11	87	1	98	43	8	150	2	6	2	1	11	34	53	3	1	91	339
07:30 AM	64	3	66	8	141	1	91	52	13	157	2	5	2	2	11	52	67	0	0	119	428
07:45 AM	64	2	57	13	136	0	121	32	5	158	4	4	3	0	11	44	66	2	1	113	418
Total	185	10	190	41	426	3	383	163	35	584	11	18	7	3	39	152	221	7	2	382	1431
08:00 AM	57	2	44	18	121	2	103	42	2	149	4	4	2	1	11	34	54	2	0	90	371
08:15 AM	58	2	34	16	110	1	100	36	5	142	6	2	1	0	9	43	75	0	1	119	380
08:30 AM	55	4	26	13	98	0	104	42	4	150	4	3	3	2	12	35	66	1	0	102	362
08:45 AM	36	3	35	11	85	2	103	36	3	144	3	4	1	3	11	46	44	2	0	92	332
Total	206	11	139	58	414	5	410	156	14	585	17	13	7	6	43	158	239	5	1	403	1445
04:00 PM	62	2	43	11	118	7	51	26	5	89	7	4	2	1	14	41	81	7	0	129	350
04:15 PM	73	2	54	16	145	3	64	43	3	113	3	2	2	1	8	53	101	3	0	157	423
04:30 PM	74	1	46	13	134	4	93	41	2	140	7	2	2	3	14	57	131	6	1	195	483
04:45 PM	61	2	62	8	133	4	73	34	2	113	7	1	3	4	15	51	114	6	0	171	432
Total	270	7	205	48	530	18	281	144	12	455	24	9	9	9	51	202	427	22	1	652	1688
05:00 PM	76	5	73	7	161	2	83	52	4	141	4	2	5	1	12	63	108	8	0	179	493
05:15 PM	81	5	56	8	150	3	78	43	2	126	9	2	5	2	18	54	101	7	2	164	458
05:30 PM	77	4	43	10	134	5	67	42	4	118	7	3	6	2	18	58	82	8	1	149	419
05:45 PM	73	6	37	13	129	5	72	34	6	117	7	2	4	2	15	61	88	7	0	156	417
Total	307	20	209	38	574	15	300	171	16	502	27	9	20	7	63	236	379	30	3	648	1787
Grand Total	968	48	743	185	1944	41	1374	634	77	2126	79	49	43	25	196	748	1266	64	7	2085	6351
Apprch %	49.8	2.5	38.2	9.5		1.9	64.6	29.8	3.6		40.3	25	21.9	12.8		35.9	60.7	3.1	0.3		
Total %	15.2	0.8	11.7	2.9	30.6	0.6	21.6	10	1.2	33.5	1.2	0.8	0.7	0.4	3.1	11.8	19.9	1	0.1	32.8	
Automobiles	948	47	721	185	1901	37	1356	622	76	2091	75	47	39	24	185	741	1229	62	7	2039	6216
% Automobiles	97.9	97.9	97	100	97.8	90.2	98.7	98.1	98.7	98.4	94.9	95.9	90.7	96	94.4	99.1	97.1	96.9	100	97.8	97.9
Commercial	20	1	22	0	43	4	18	12	1	35	4	2	4	1	11	7	37	2	0	46	135
% Commercial	2.1	2.1	3	0	2.2	9.8	1.3	1.9	1.3	1.6	5.1	4.1	9.3	4	5.6	0.9	2.9	3.1	0	2.2	2.1

DE TRAFFIC

detraffic.com
(386) 341-4186
Kentucky Ave at E. Graves Ave
Volusia County, Fl

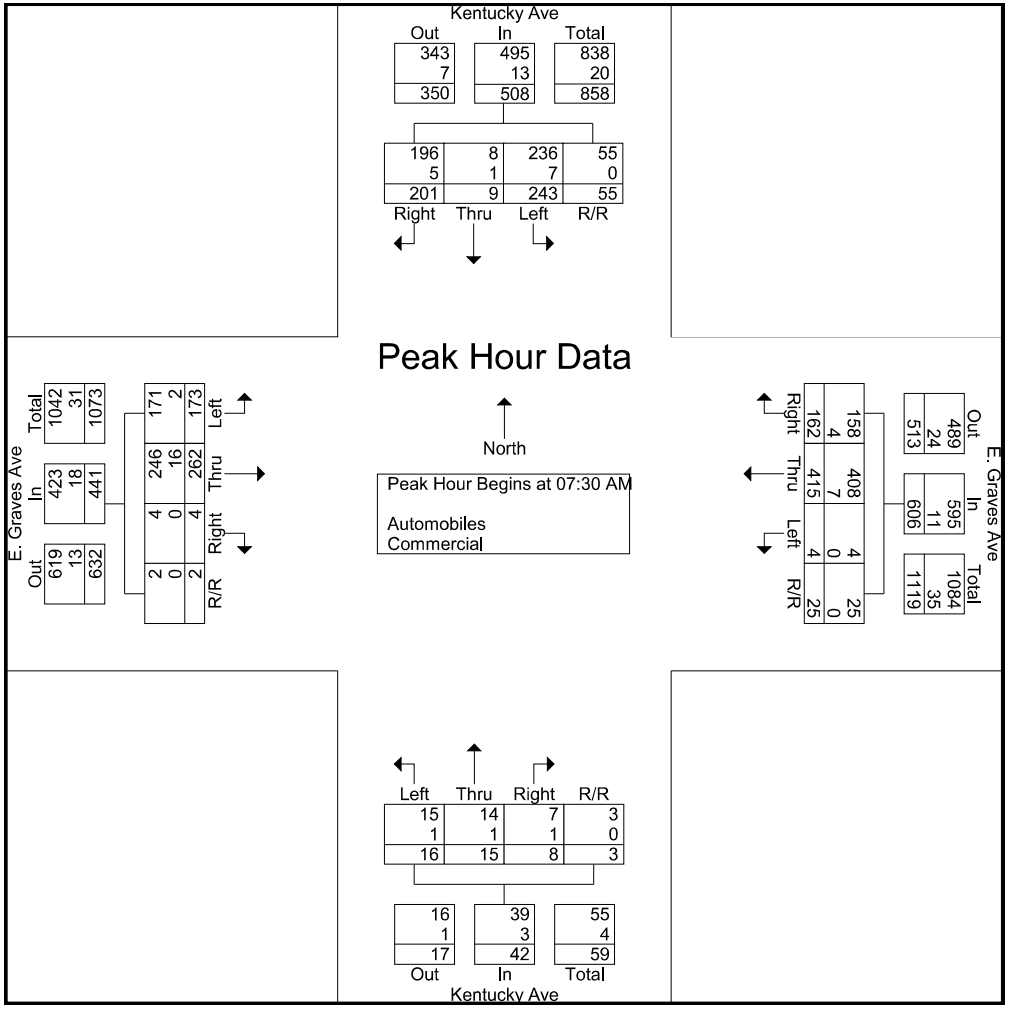
File Name : 03 Kentucky at Graves
Site Code : 00000003
Start Date : 7/26/2022
Page No : 2

	Kentucky Ave Southbound					E. Graves Ave Westbound					Kentucky Ave Northbound					E. Graves Ave Eastbound					
Start Time	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	64	3	66	8	141	1	91	52	13	157	2	5	2	2	11	52	67	0	0	119	428
07:45 AM	64	2	57	13	136	0	121	32	5	158	4	4	3	0	11	44	66	2	1	113	418
08:00 AM	57	2	44	18	121	2	103	42	2	149	4	4	2	1	11	34	54	2	0	90	371
08:15 AM	58	2	34	16	110	1	100	36	5	142	6	2	1	0	9	43	75	0	1	119	380
Total Volume	243	9	201	55	508	4	415	162	25	606	16	15	8	3	42	173	262	4	2	441	1597
% App. Total	47.8	1.8	39.6	10.8		0.7	68.5	26.7	4.1		38.1	35.7	19	7.1		39.2	59.4	0.9	0.5		
PHF	.949	.750	.761	.764	.901	.500	.857	.779	.481	.959	.667	.750	.667	.375	.955	.832	.873	.500	.500	.926	.933
Automobiles	236	8	196	55	495	4	408	158	25	595	15	14	7	3	39	171	246	4	2	423	1552
% Automobiles	97.1	88.9	97.5	100	97.4	100	98.3	97.5	100	98.2	93.8	93.3	87.5	100	92.9	98.8	93.9	100	100	95.9	97.2
Commercial	7	1	5	0	13	0	7	4	0	11	1	1	1	0	3	2	16	0	0	18	45
% Commercial	2.9	11.1	2.5	0	2.6	0	1.7	2.5	0	1.8	6.3	6.7	12.5	0	7.1	1.2	6.1	0	0	4.1	2.8

DE TRAFFIC

detraffic.com
(386) 341-4186
Kentucky Ave at E. Graves Ave
Volusia County, Fl

File Name : 03 Kentucky at Graves
Site Code : 00000003
Start Date : 7/26/2022
Page No : 3



DE TRAFFIC

detraffic.com
(386) 341-4186
Kentucky Ave at E. Graves Ave
Volusia County, Fl

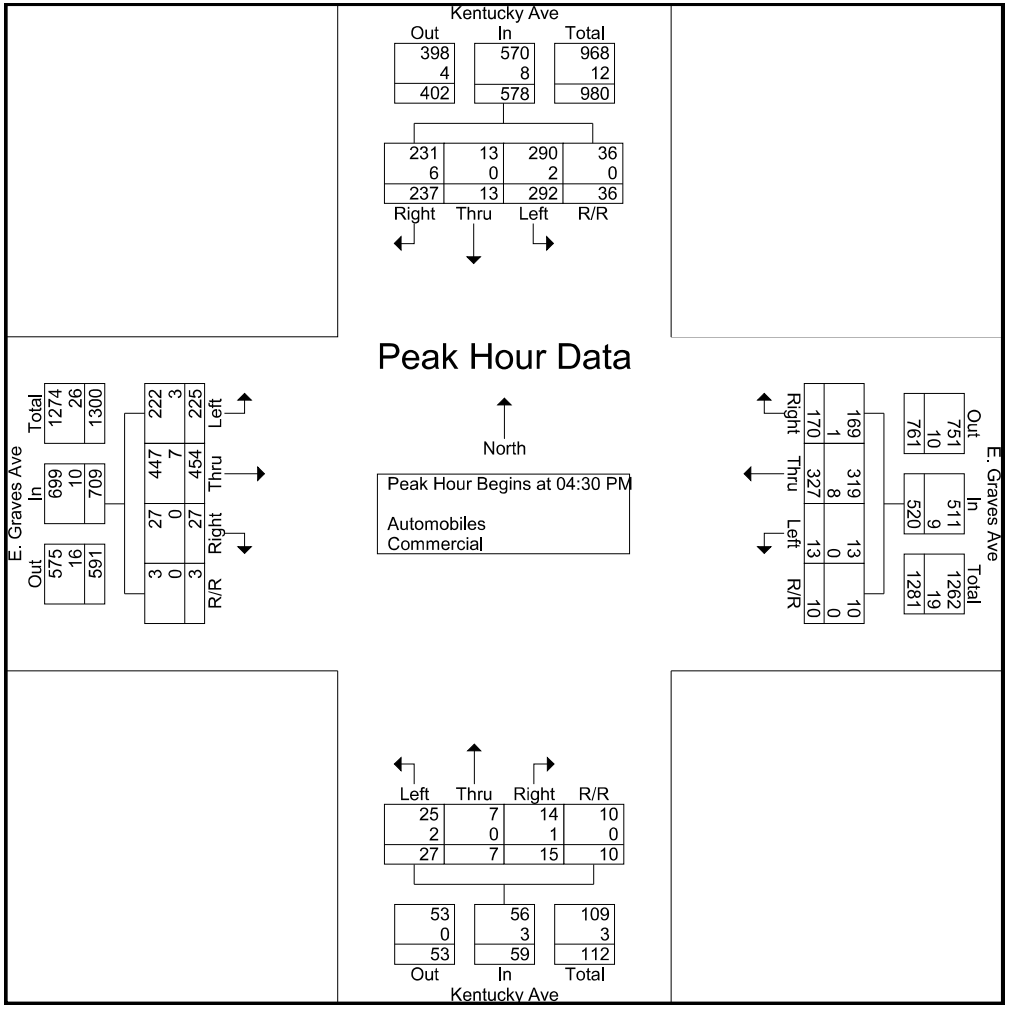
File Name : 03 Kentucky at Graves
Site Code : 00000003
Start Date : 7/26/2022
Page No : 4

	Kentucky Ave Southbound					E. Graves Ave Westbound					Kentucky Ave Northbound					E. Graves Ave Eastbound					
Start Time	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	74	1	46	13	134	4	93	41	2	140	7	2	2	3	14	57	131	6	1	195	483
04:45 PM	61	2	62	8	133	4	73	34	2	113	7	1	3	4	15	51	114	6	0	171	432
05:00 PM	76	5	73	7	161	2	83	52	4	141	4	2	5	1	12	63	108	8	0	179	493
05:15 PM	81	5	56	8	150	3	78	43	2	126	9	2	5	2	18	54	101	7	2	164	458
Total Volume	292	13	237	36	578	13	327	170	10	520	27	7	15	10	59	225	454	27	3	709	1866
% App. Total	50.5	2.2	41	6.2		2.5	62.9	32.7	1.9		45.8	11.9	25.4	16.9		31.7	64	3.8	0.4		
PHF	.901	.650	.812	.692	.898	.813	.879	.817	.625	.922	.750	.875	.750	.625	.819	.893	.866	.844	.375	.909	.946
Automobiles	290	13	231	36	570	13	319	169	10	511	25	7	14	10	56	222	447	27	3	699	1836
% Automobiles	99.3	100	97.5	100	98.6	100	97.6	99.4	100	98.3	92.6	100	93.3	100	94.9	98.7	98.5	100	100	98.6	98.4
Commercial	2	0	6	0	8	0	8	1	0	9	2	0	1	0	3	3	7	0	0	10	30
% Commercial	0.7	0	2.5	0	1.4	0	2.4	0.6	0	1.7	7.4	0	6.7	0	5.1	1.3	1.5	0	0	1.4	1.6

DE TRAFFIC

detraffic.com
(386) 341-4186
Kentucky Ave at E. Graves Ave
Volusia County, Fl

File Name : 03 Kentucky at Graves
Site Code : 00000003
Start Date : 7/26/2022
Page No : 5



DE TRAFFIC

detraffic.com
(386) 341-4186
Kentucky Ave at E. Graves Ave
Volusia County, Fl

File Name : 03 Kentucky at Graves
Site Code : 00000003
Start Date : 7/26/2022
Page No : 6

Groups Printed- Peds

	Kentucky Ave Southbound					E. Graves Ave Westbound					Kentucky Ave Northbound					E. Graves Ave Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:30 AM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
05:15 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2	2	3
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Total	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	3	3	4
Grand Total	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	4	4	6
Apprch %	0	0	0	0		0	0	0	100		0	0	0	0		0	0	0	100		
Total %	0	0	0	0	0	0	0	0	33.3	33.3	0	0	0	0	0	0	0	0	66.7	66.7	

DE TRAFFIC

detraffic.com
(386) 341-4186
Veterans Memorial Pkwy at E. Graves Ave
Volusia County, Fl

File Name : 02 Veterans at Graves
Site Code : 00000002
Start Date : 7/26/2022
Page No : 1

Groups Printed- Automobiles - Commercial

	N/A Southbound					E. Graves Ave Westbound					Veterans Memorial Pkwy Northbound					E. Graves Ave Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Int. Total
07:00 AM	0	0	0	0	0	69	54	0	0	123	6	0	24	9	39	0	55	11	3	69	231
07:15 AM	0	0	0	0	0	85	63	0	0	148	12	0	42	8	62	0	63	20	4	87	297
07:30 AM	0	0	0	0	0	77	72	0	0	149	19	0	45	4	68	0	78	17	6	101	318
07:45 AM	0	0	0	0	0	87	76	0	0	163	19	0	35	11	65	0	69	18	8	95	323
Total	0	0	0	0	0	318	265	0	0	583	56	0	146	32	234	0	265	66	21	352	1169
08:00 AM	0	0	0	0	0	81	75	0	0	156	20	0	53	6	79	0	58	19	7	84	319
08:15 AM	0	0	0	0	0	84	70	0	0	154	19	0	45	4	68	0	68	16	8	92	314
08:30 AM	0	0	0	0	0	78	78	0	0	156	18	0	52	2	72	0	47	16	10	73	301
08:45 AM	0	0	0	0	0	66	69	0	0	135	19	0	36	3	58	0	58	11	9	78	271
Total	0	0	0	0	0	309	292	0	0	601	76	0	186	15	277	0	231	62	34	327	1205
04:00 PM	0	0	0	0	0	62	63	0	0	125	21	0	66	6	93	0	59	42	9	110	328
04:15 PM	0	0	0	0	0	75	56	0	0	131	31	0	79	9	119	0	79	51	6	136	386
04:30 PM	0	0	0	0	0	82	72	0	0	154	24	0	100	16	140	0	74	76	11	161	455
04:45 PM	0	0	0	0	0	78	81	0	0	159	36	0	85	6	127	0	81	84	9	174	460
Total	0	0	0	0	0	297	272	0	0	569	112	0	330	37	479	0	293	253	35	581	1629
05:00 PM	0	0	0	0	0	81	73	0	0	154	32	0	104	16	152	0	78	65	8	151	457
05:15 PM	0	0	0	0	0	76	69	0	0	145	27	0	89	13	129	0	68	75	13	156	430
05:30 PM	0	0	0	0	0	67	56	0	0	123	25	0	73	19	117	0	74	81	5	160	400
05:45 PM	0	0	0	0	0	74	47	0	0	121	19	0	88	13	120	0	58	75	6	139	380
Total	0	0	0	0	0	298	245	0	0	543	103	0	354	61	518	0	278	296	32	606	1667
Grand Total	0	0	0	0	0	1222	1074	0	0	2296	347	0	1016	145	1508	0	1067	677	122	1866	5670
Apprch %	0	0	0	0		53.2	46.8	0	0		23	0	67.4	9.6		0	57.2	36.3	6.5		
Total %	0	0	0	0	0	21.6	18.9	0	0	40.5	6.1	0	17.9	2.6	26.6	0	18.8	11.9	2.2	32.9	
Automobiles	0	0	0	0	0	1202	1057	0	0	2259	338	0	987	145	1470	0	1043	674	122	1839	5568
% Automobiles	0	0	0	0	0	98.4	98.4	0	0	98.4	97.4	0	97.1	100	97.5	0	97.8	99.6	100	98.6	98.2
Commercial	0	0	0	0	0	20	17	0	0	37	9	0	29	0	38	0	24	3	0	27	102
% Commercial	0	0	0	0	0	1.6	1.6	0	0	1.6	2.6	0	2.9	0	2.5	0	2.2	0.4	0	1.4	1.8

DE TRAFFIC

detraffic.com
(386) 341-4186
Veterans Memorial Pkwy at E. Graves Ave
Volusia County, Fl

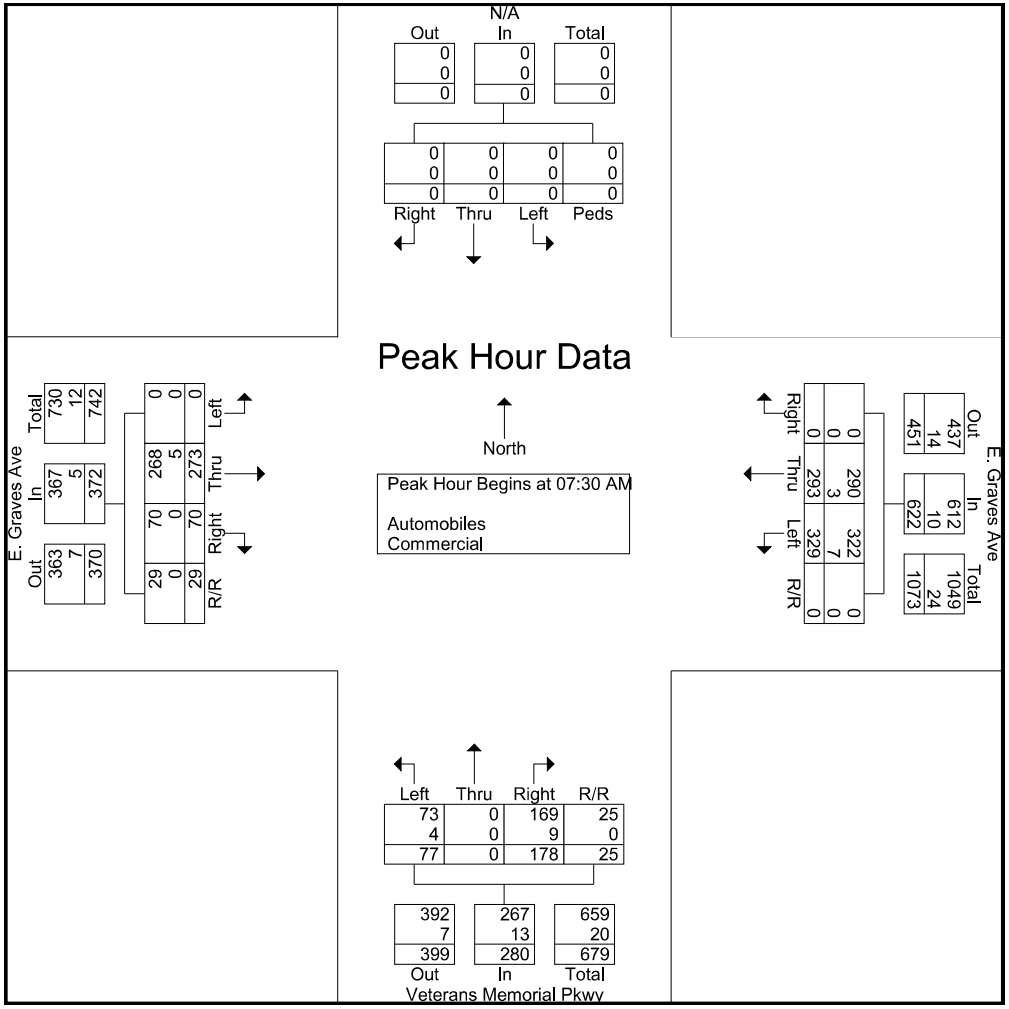
File Name : 02 Veterans at Graves
Site Code : 00000002
Start Date : 7/26/2022
Page No : 2

	N/A Southbound					E. Graves Ave Westbound					Veterans Memorial Pkwy Northbound					E. Graves Ave Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	0	0	0	0	77	72	0	0	149	19	0	45	4	68	0	78	17	6	101	318
07:45 AM	0	0	0	0	0	87	76	0	0	163	19	0	35	11	65	0	69	18	8	95	323
08:00 AM	0	0	0	0	0	81	75	0	0	156	20	0	53	6	79	0	58	19	7	84	319
08:15 AM	0	0	0	0	0	84	70	0	0	154	19	0	45	4	68	0	68	16	8	92	314
Total Volume	0	0	0	0	0	329	293	0	0	622	77	0	178	25	280	0	273	70	29	372	1274
% App. Total	0	0	0	0		52.9	47.1	0	0		27.5	0	63.6	8.9		0	73.4	18.8	7.8		
PHF	.000	.000	.000	.000	.000	.945	.964	.000	.000	.954	.963	.000	.840	.568	.886	.000	.875	.921	.906	.921	.986
Automobiles	0	0	0	0	0	322	290	0	0	612	73	0	169	25	267	0	268	70	29	367	1246
% Automobiles	0	0	0	0	0	97.9	99.0	0	0	98.4	94.8	0	94.9	100	95.4	0	98.2	100	100	98.7	97.8
Commercial	0	0	0	0	0	7	3	0	0	10	4	0	9	0	13	0	5	0	0	5	28
% Commercial	0	0	0	0	0	2.1	1.0	0	0	1.6	5.2	0	5.1	0	4.6	0	1.8	0	0	1.3	2.2

DE TRAFFIC

detraffic.com
(386) 341-4186
Veterans Memorial Pkwy at E. Graves Ave
Volusia County, Fl

File Name : 02 Veterans at Graves
Site Code : 00000002
Start Date : 7/26/2022
Page No : 3



DE TRAFFIC

detraffic.com
(386) 341-4186
Veterans Memorial Pkwy at E. Graves Ave
Volusia County, Fl

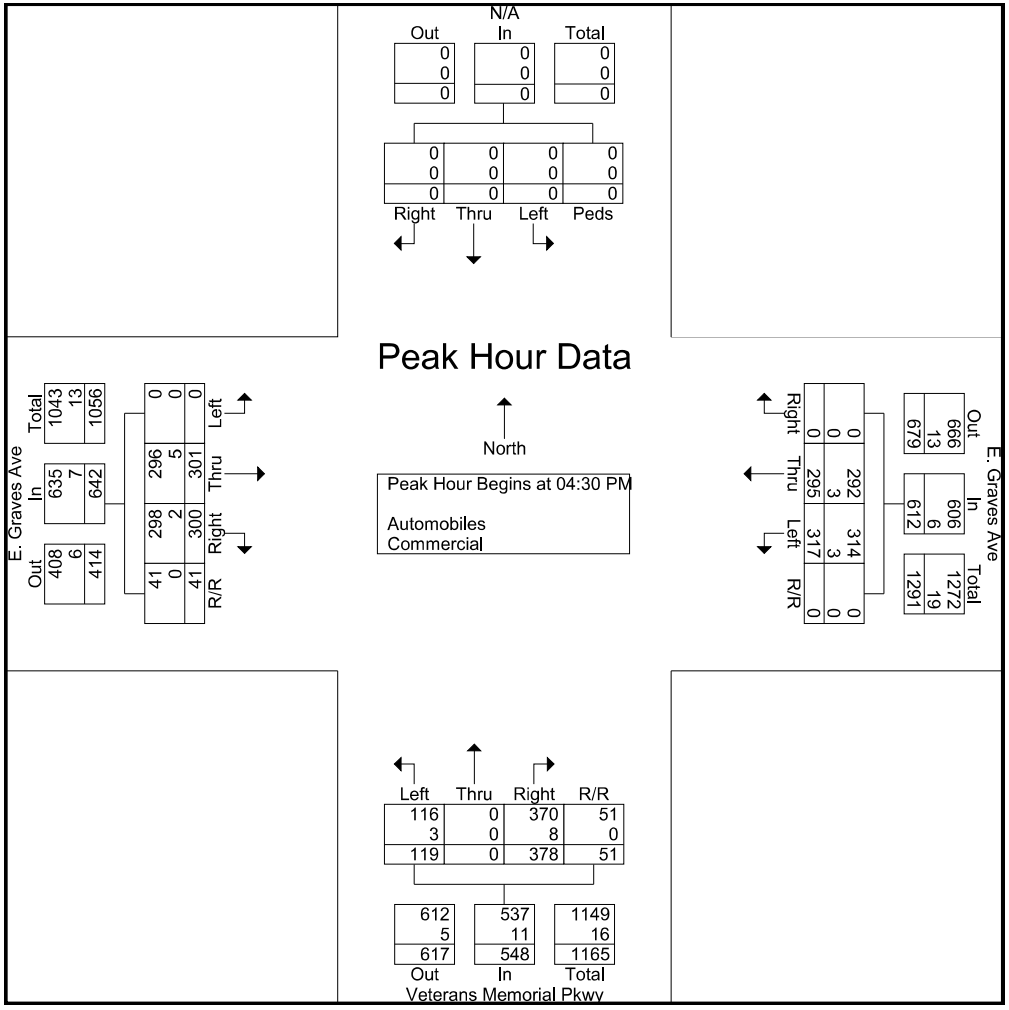
File Name : 02 Veterans at Graves
Site Code : 00000002
Start Date : 7/26/2022
Page No : 4

	N/A Southbound					E. Graves Ave Westbound					Veterans Memorial Pkwy Northbound					E. Graves Ave Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	0	0	0	0	82	72	0	0	154	24	0	100	16	140	0	74	76	11	161	455
04:45 PM	0	0	0	0	0	78	81	0	0	159	36	0	85	6	127	0	81	84	9	174	460
05:00 PM	0	0	0	0	0	81	73	0	0	154	32	0	104	16	152	0	78	65	8	151	457
05:15 PM	0	0	0	0	0	76	69	0	0	145	27	0	89	13	129	0	68	75	13	156	430
Total Volume	0	0	0	0	0	317	295	0	0	612	119	0	378	51	548	0	301	300	41	642	1802
% App. Total	0	0	0	0		51.8	48.2	0	0		21.7	0	69	9.3		0	46.9	46.7	6.4		
PHF	.000	.000	.000	.000	.000	.966	.910	.000	.000	.962	.826	.000	.909	.797	.901	.000	.929	.893	.788	.922	.979
Automobiles	0	0	0	0	0	314	292	0	0	606	116	0	370	51	537	0	296	298	41	635	1778
% Automobiles	0	0	0	0	0	99.1	99.0	0	0	99.0	97.5	0	97.9	100	98.0	0	98.3	99.3	100	98.9	98.7
Commercial	0	0	0	0	0	3	3	0	0	6	3	0	8	0	11	0	5	2	0	7	24
% Commercial	0	0	0	0	0	0.9	1.0	0	0	1.0	2.5	0	2.1	0	2.0	0	1.7	0.7	0	1.1	1.3

DE TRAFFIC

detraffic.com
(386) 341-4186
Veterans Memorial Pkwy at E. Graves Ave
Volusia County, Fl

File Name : 02 Veterans at Graves
Site Code : 00000002
Start Date : 7/26/2022
Page No : 5



DE TRAFFIC

detraffic.com
(386) 341-4186
Veterans Memorial Pkwy at E. Graves Ave
Volusia County, Fl

File Name : 02 Veterans at Graves
Site Code : 00000002
Start Date : 7/26/2022
Page No : 6

Groups Printed- Peds

	N/A Southbound					E. Graves Ave Westbound					Veterans Memorial Pkwy Northbound					E. Graves Ave Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:45 AM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	2
Total	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	2
05:15 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	2
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
Total	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	3	3	4
Grand Total	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	4	4	6
Apprch %	0	0	0	0		0	0	0	100		0	0	0	0		0	0	0	100		
Total %	0	0	0	0	0	0	0	0	33.3	33.3	0	0	0	0	0	0	0	0	66.7	66.7	

DE TRAFFIC

detraffic.com
(386) 341-4186
Veterans Memorial Pkwy at E. Rhode Island Ave
Volusia County, Fl

File Name : 01 Veterans at Rhode
Site Code : 00000001
Start Date : 7/26/2022
Page No : 1

Groups Printed- Automobiles - Commercial

	Veterans Memorial Pkwy Southbound					N/A Westbound					Veterans Memorial Pkwy Northbound					E Rhode Island Ave Eastbound					
Start Time	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	R/R	App. Total	Int. Total
07:00 AM	0	63	22	3	88	0	0	0	0	0	35	36	0	0	71	12	0	39	16	67	226
07:15 AM	0	91	19	4	114	0	0	0	0	0	31	55	0	0	86	19	0	29	18	66	266
07:30 AM	0	75	24	5	104	0	0	0	0	0	35	45	0	0	80	26	0	35	11	72	256
07:45 AM	0	90	35	8	133	0	0	0	0	0	30	36	0	0	66	35	0	43	8	86	285
Total	0	319	100	20	439	0	0	0	0	0	131	172	0	0	303	92	0	146	53	291	1033
08:00 AM	0	92	25	4	121	0	0	0	0	0	35	53	0	0	88	29	0	52	6	87	296
08:15 AM	0	86	24	2	112	0	0	0	0	0	29	48	0	0	77	26	0	45	9	80	269
08:30 AM	0	78	20	3	101	0	0	0	0	0	25	55	0	0	80	29	0	54	8	91	272
08:45 AM	0	84	22	4	110	0	0	0	0	0	41	38	0	0	79	25	0	35	6	66	255
Total	0	340	91	13	444	0	0	0	0	0	130	194	0	0	324	109	0	186	29	324	1092
04:00 PM	0	84	21	6	111	0	0	0	0	0	52	73	0	0	125	28	0	35	12	75	311
04:15 PM	0	105	31	4	140	0	0	0	0	0	43	83	0	0	126	34	0	42	11	87	353
04:30 PM	0	151	16	3	170	0	0	0	0	0	36	100	0	0	136	41	0	53	8	102	408
04:45 PM	0	145	24	2	171	0	0	0	0	0	52	92	0	0	144	36	0	44	7	87	402
Total	0	485	92	15	592	0	0	0	0	0	183	348	0	0	531	139	0	174	38	351	1474
05:00 PM	0	155	26	6	187	0	0	0	0	0	86	119	0	0	205	55	0	56	8	119	511
05:15 PM	0	139	24	5	168	0	0	0	0	0	76	87	0	0	163	56	0	64	10	130	461
05:30 PM	0	123	27	4	154	0	0	0	0	0	54	85	0	0	139	50	0	55	9	114	407
05:45 PM	0	144	25	6	175	0	0	0	0	0	45	92	0	0	137	43	0	44	8	95	407
Total	0	561	102	21	684	0	0	0	0	0	261	383	0	0	644	204	0	219	35	458	1786
Grand Total	0	1705	385	69	2159	0	0	0	0	0	705	1097	0	0	1802	544	0	725	155	1424	5385
Apprch %	0	79	17.8	3.2		0	0	0	0		39.1	60.9	0	0		38.2	0	50.9	10.9		
Total %	0	31.7	7.1	1.3	40.1	0	0	0	0	0	13.1	20.4	0	0	33.5	10.1	0	13.5	2.9	26.4	
Automobiles	0	1649	380	69	2098	0	0	0	0	0	684	1046	0	0	1730	529	0	704	155	1388	5216
% Automobiles	0	96.7	98.7	100	97.2	0	0	0	0	0	97	95.4	0	0	96	97.2	0	97.1	100	97.5	96.9
Commercial	0	56	5	0	61	0	0	0	0	0	21	51	0	0	72	15	0	21	0	36	169
% Commercial	0	3.3	1.3	0	2.8	0	0	0	0	0	3	4.6	0	0	4	2.8	0	2.9	0	2.5	3.1

DE TRAFFIC

detraffic.com
(386) 341-4186
Veterans Memorial Pkwy at E. Rhode Island Ave
Volusia County, Fl

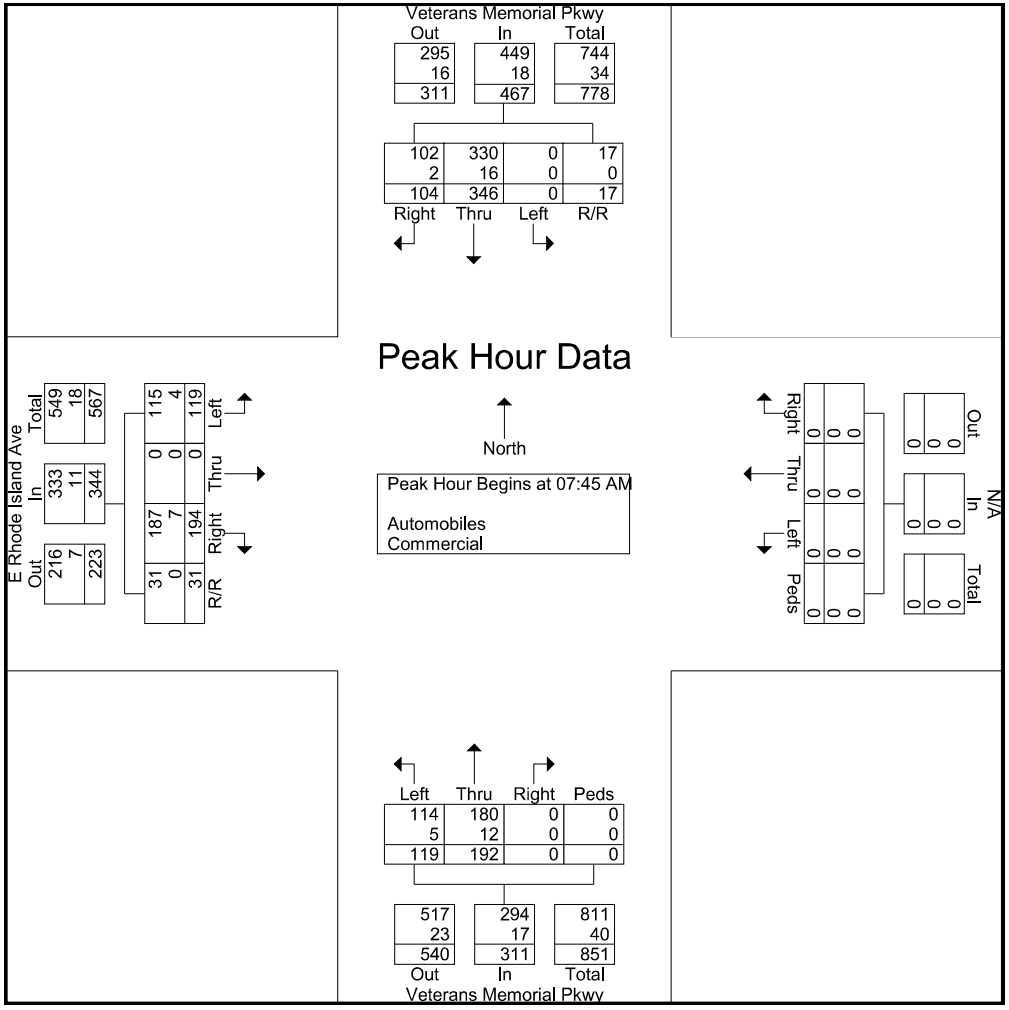
File Name : 01 Veterans at Rhode
Site Code : 00000001
Start Date : 7/26/2022
Page No : 2

	Veterans Memorial Pkwy Southbound					N/A Westbound					Veterans Memorial Pkwy Northbound					E Rhode Island Ave Eastbound					
Start Time	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	R/R	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	90	35	8	133	0	0	0	0	0	30	36	0	0	66	35	0	43	8	86	285
08:00 AM	0	92	25	4	121	0	0	0	0	0	35	53	0	0	88	29	0	52	6	87	296
08:15 AM	0	86	24	2	112	0	0	0	0	0	29	48	0	0	77	26	0	45	9	80	269
08:30 AM	0	78	20	3	101	0	0	0	0	0	25	55	0	0	80	29	0	54	8	91	272
Total Volume	0	346	104	17	467	0	0	0	0	0	119	192	0	0	311	119	0	194	31	344	1122
% App. Total	0	74.1	22.3	3.6		0	0	0	0		38.3	61.7	0	0		34.6	0	56.4	9		
PHF	.000	.940	.743	.531	.878	.000	.000	.000	.000	.000	.850	.873	.000	.000	.884	.850	.000	.898	.861	.945	.948
Automobiles	0	330	102	17	449	0	0	0	0	0	114	180	0	0	294	115	0	187	31	333	1076
% Automobiles	0	95.4	98.1	100	96.1	0	0	0	0	0	95.8	93.8	0	0	94.5	96.6	0	96.4	100	96.8	95.9
Commercial	0	16	2	0	18	0	0	0	0	0	5	12	0	0	17	4	0	7	0	11	46
% Commercial	0	4.6	1.9	0	3.9	0	0	0	0	0	4.2	6.3	0	0	5.5	3.4	0	3.6	0	3.2	4.1

DE TRAFFIC

detraffic.com
(386) 341-4186
Veterans Memorial Pkwy at E. Rhode Island Ave
Volusia County, Fl

File Name : 01 Veterans at Rhode
Site Code : 00000001
Start Date : 7/26/2022
Page No : 3



DE TRAFFIC

detraffic.com
(386) 341-4186
Veterans Memorial Pkwy at E. Rhode Island Ave
Volusia County, Fl

File Name : 01 Veterans at Rhode
Site Code : 00000001
Start Date : 7/26/2022
Page No : 4

	Veterans Memorial Pkwy Southbound					N/A Westbound					Veterans Memorial Pkwy Northbound					E Rhode Island Ave Eastbound					
Start Time	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	R/R	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	155	26	6	187	0	0	0	0	0	86	119	0	0	205	55	0	56	8	119	511
05:15 PM	0	139	24	5	168	0	0	0	0	0	76	87	0	0	163	56	0	64	10	130	461
05:30 PM	0	123	27	4	154	0	0	0	0	0	54	85	0	0	139	50	0	55	9	114	407
05:45 PM	0	144	25	6	175	0	0	0	0	0	45	92	0	0	137	43	0	44	8	95	407
Total Volume	0	561	102	21	684	0	0	0	0	0	261	383	0	0	644	204	0	219	35	458	1786
% App. Total	0	82	14.9	3.1		0	0	0	0		40.5	59.5	0	0		44.5	0	47.8	7.6		
PHF	.000	.905	.944	.875	.914	.000	.000	.000	.000	.000	.759	.805	.000	.000	.785	.911	.000	.855	.875	.881	.874
Automobiles	0	545	100	21	666	0	0	0	0	0	254	366	0	0	620	200	0	214	35	449	1735
% Automobiles	0	97.1	98.0	100	97.4	0	0	0	0	0	97.3	95.6	0	0	96.3	98.0	0	97.7	100	98.0	97.1
Commercial	0	16	2	0	18	0	0	0	0	0	7	17	0	0	24	4	0	5	0	9	51
% Commercial	0	2.9	2.0	0	2.6	0	0	0	0	0	2.7	4.4	0	0	3.7	2.0	0	2.3	0	2.0	2.9

DE TRAFFIC

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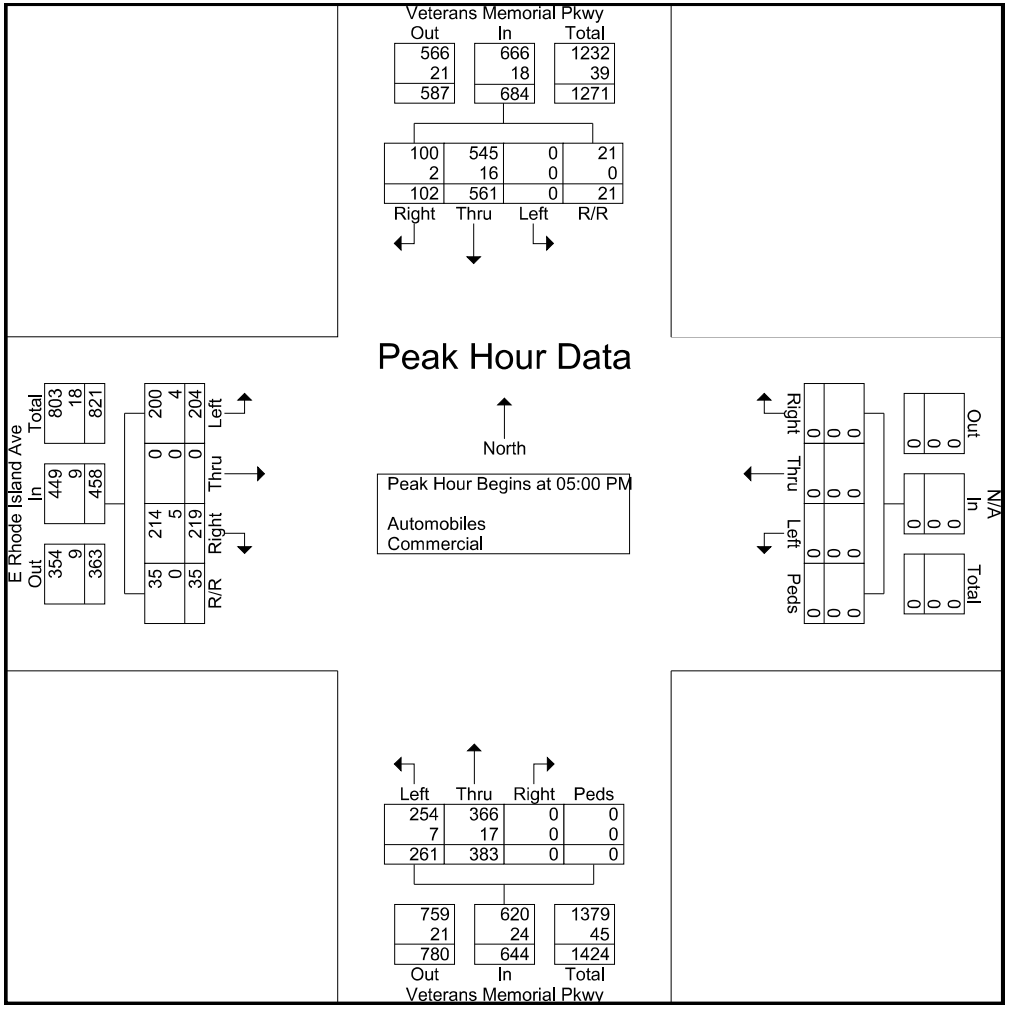
(386) 341-4186
Veterans Memorial Pkwy at E. Rhode Island Ave
Volusia County, Fl

File Name : 01 Veterans at Rhode
Site Code : 00000001
Start Date : 7/26/2022
Page No : 5



DE TRAFFIC

detraffic.com
(386) 341-4186
Veterans Memorial Pkwy at E. Rhode Island Ave
Volusia County, Fl

File Name : 01 Veterans at Rhode
Site Code : 00000001
Start Date : 7/26/2022
Page No : 6

Groups Printed- Peds

	Veterans Memorial Pkwy Southbound				N/A Westbound				Veterans Memorial Pkwy Northbound				E Rhode Island Ave Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0		
Total %																	

DE TRAFFIC

detraffic.com
(386) 341-4186
I-4 WB Ramp at SR 472
Volusia County, Fl

File Name : 08 i4 wb at 472
Site Code : 00000008
Start Date : 7/27/2022
Page No : 1

Groups Printed- Automobiles - Commercial

	I-4 WB Ramp Southbound					SR 472 Westbound				N/A Northbound				SR 472 Eastbound				
Start Time	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	52	0	95	9	156	229	154	0	383	0	0	0	0	0	102	171	273	812
07:15 AM	43	0	117	11	171	248	128	0	376	0	0	0	0	0	97	228	325	872
07:30 AM	66	0	126	16	208	216	119	0	335	0	0	0	0	0	106	217	323	866
07:45 AM	82	0	131	18	231	183	169	0	352	0	0	0	0	0	65	169	234	817
Total	243	0	469	54	766	876	570	0	1446	0	0	0	0	0	370	785	1155	3367
08:00 AM	72	0	115	13	200	145	144	0	289	0	0	0	0	0	83	143	226	715
08:15 AM	53	0	122	8	183	143	159	0	302	0	0	0	0	0	106	155	261	746
08:30 AM	63	0	105	17	185	111	151	0	262	0	0	0	0	0	75	112	187	634
08:45 AM	47	0	98	13	158	117	117	0	234	0	0	0	0	0	90	138	228	620
Total	235	0	440	51	726	516	571	0	1087	0	0	0	0	0	354	548	902	2715
04:00 PM	76	0	61	9	146	82	276	0	358	0	0	0	0	0	142	167	309	813
04:15 PM	76	0	62	6	144	69	249	0	318	0	0	0	0	0	118	140	258	720
04:30 PM	80	0	43	8	131	89	227	0	316	0	0	0	0	0	119	161	280	727
04:45 PM	77	0	50	6	133	63	236	0	299	0	0	0	0	0	164	148	312	744
Total	309	0	216	29	554	303	988	0	1291	0	0	0	0	0	543	616	1159	3004
05:00 PM	79	0	45	4	128	69	251	0	320	0	0	0	0	0	171	147	318	766
05:15 PM	96	0	70	3	169	56	262	0	318	0	0	0	0	0	162	170	332	819
05:30 PM	98	0	79	6	183	85	261	0	346	0	0	0	0	0	169	143	312	841
05:45 PM	124	0	67	4	195	56	205	0	261	0	0	0	0	0	137	110	247	703
Total	397	0	261	17	675	266	979	0	1245	0	0	0	0	0	639	570	1209	3129
Grand Total	1184	0	1386	151	2721	1961	3108	0	5069	0	0	0	0	0	1906	2519	4425	12215
Apprch %	43.5	0	50.9	5.5		38.7	61.3	0		0	0	0		0	43.1	56.9		
Total %	9.7	0	11.3	1.2	22.3	16.1	25.4	0	41.5	0	0	0	0	0	15.6	20.6	36.2	
Automobiles	1159	0	1349	151	2659	1917	3041	0	4958	0	0	0	0	0	1871	2477	4348	11965
% Automobiles	97.9	0	97.3	100	97.7	97.8	97.8	0	97.8	0	0	0	0	0	98.2	98.3	98.3	98
Commercial	25	0	37	0	62	44	67	0	111	0	0	0	0	0	35	42	77	250
% Commercial	2.1	0	2.7	0	2.3	2.2	2.2	0	2.2	0	0	0	0	0	1.8	1.7	1.7	2

DE TRAFFIC

detraffic.com
(386) 341-4186
I-4 WB Ramp at SR 472
Volusia County, FI

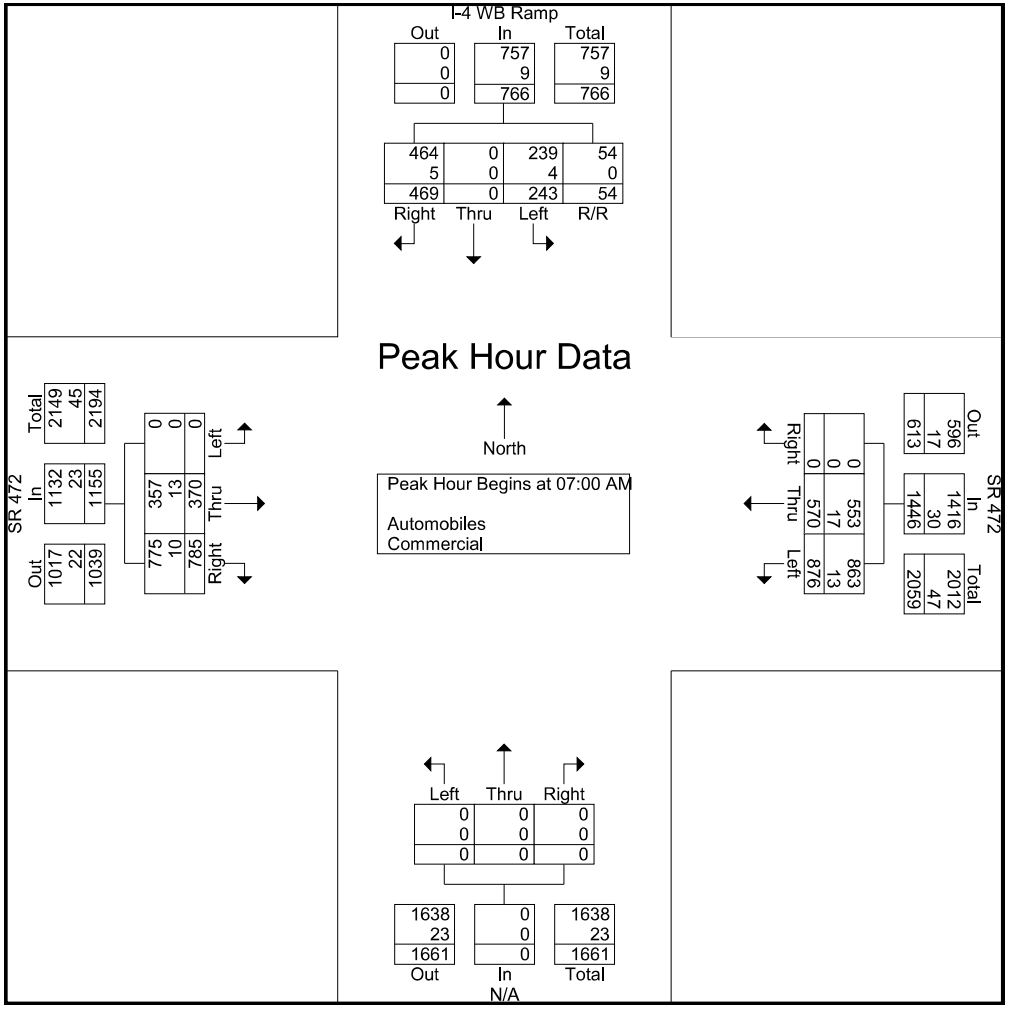
File Name : 08 i4 wb at 472
Site Code : 00000008
Start Date : 7/27/2022
Page No : 2

	I-4 WB Ramp Southbound					SR 472 Westbound				N/A Northbound				SR 472 Eastbound				
Start Time	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 07:00 AM																		
07:00 AM	52	0	95	9	156	229	154	0	383	0	0	0	0	0	102	171	273	812
07:15 AM	43	0	117	11	171	248	128	0	376	0	0	0	0	0	97	228	325	872
07:30 AM	66	0	126	16	208	216	119	0	335	0	0	0	0	0	106	217	323	866
07:45 AM	82	0	131	18	231	183	169	0	352	0	0	0	0	0	65	169	234	817
Total Volume	243	0	469	54	766	876	570	0	1446	0	0	0	0	0	370	785	1155	3367
% App. Total	31.7	0	61.2	7		60.6	39.4	0		0	0	0		0	32	68		
PHF	.741	.000	.895	.750	.829	.883	.843	.000	.944	.000	.000	.000	.000	.000	.873	.861	.888	.965
Automobiles	239	0	464	54	757	863	553	0	1416	0	0	0	0	0	357	775	1132	3305
% Automobiles	98.4	0	98.9	100	98.8	98.5	97.0	0	97.9	0	0	0	0	0	96.5	98.7	98.0	98.2
Commercial	4	0	5	0	9	13	17	0	30	0	0	0	0	0	13	10	23	62
% Commercial	1.6	0	1.1	0	1.2	1.5	3.0	0	2.1	0	0	0	0	0	3.5	1.3	2.0	1.8

DE TRAFFIC

detraffic.com
(386) 341-4186
I-4 WB Ramp at SR 472
Volusia County, Fl

File Name : 08 i4 wb at 472
Site Code : 00000008
Start Date : 7/27/2022
Page No : 3



DE TRAFFIC

detraffic.com
(386) 341-4186
I-4 WB Ramp at SR 472
Volusia County, Fl

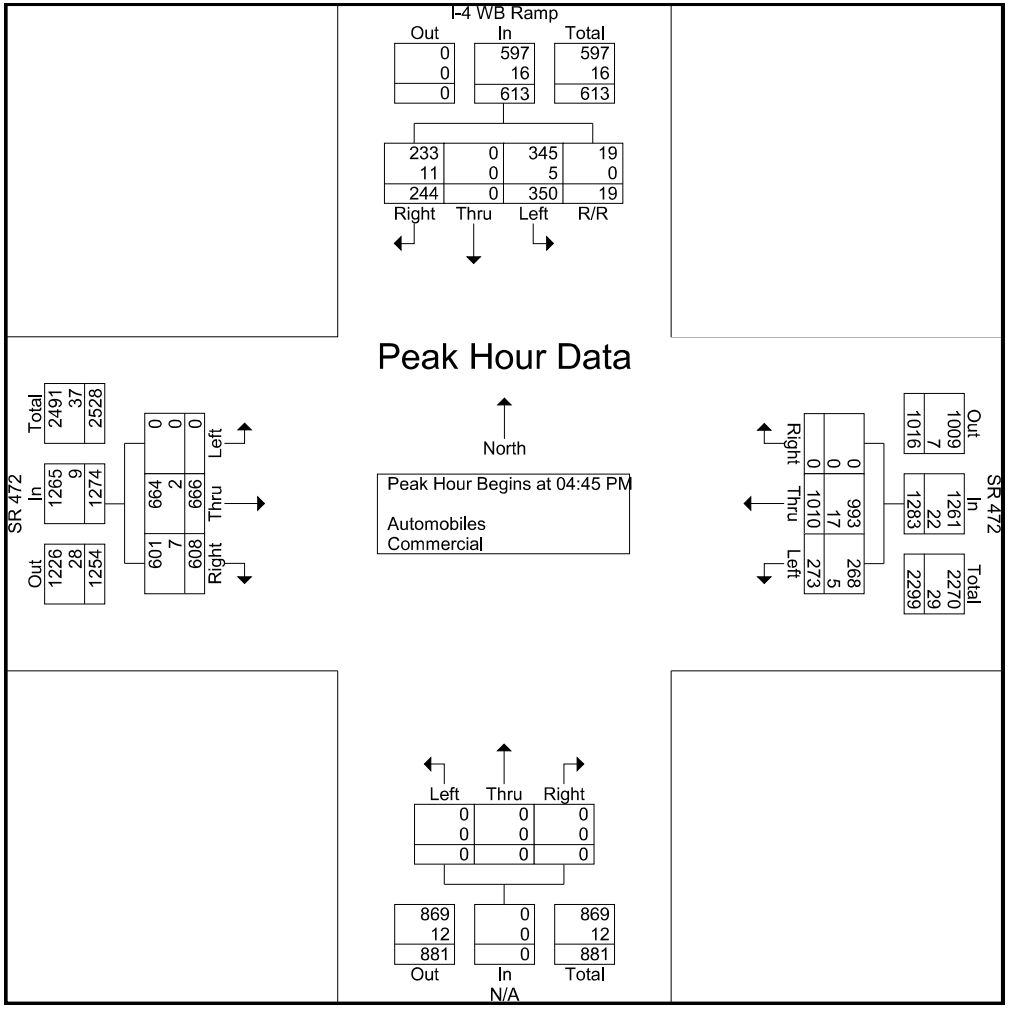
File Name : 08 i4 wb at 472
Site Code : 00000008
Start Date : 7/27/2022
Page No : 4

	I-4 WB Ramp Southbound					SR 472 Westbound				N/A Northbound				SR 472 Eastbound				
Start Time	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 04:45 PM																		
04:45 PM	77	0	50	6	133	63	236	0	299	0	0	0	0	0	164	148	312	744
05:00 PM	79	0	45	4	128	69	251	0	320	0	0	0	0	0	171	147	318	766
05:15 PM	96	0	70	3	169	56	262	0	318	0	0	0	0	0	162	170	332	819
05:30 PM	98	0	79	6	183	85	261	0	346	0	0	0	0	0	169	143	312	841
Total Volume	350	0	244	19	613	273	1010	0	1283	0	0	0	0	0	666	608	1274	3170
% App. Total	57.1	0	39.8	3.1		21.3	78.7	0		0	0	0		0	52.3	47.7		
PHF	.893	.000	.772	.792	.837	.803	.964	.000	.927	.000	.000	.000	.000	.000	.974	.894	.959	.942
Automobiles	345	0	233	19	597	268	993	0	1261	0	0	0	0	0	664	601	1265	3123
% Automobiles	98.6	0	95.5	100	97.4	98.2	98.3	0	98.3	0	0	0	0	0	99.7	98.8	99.3	98.5
Commercial	5	0	11	0	16	5	17	0	22	0	0	0	0	0	2	7	9	47
% Commercial	1.4	0	4.5	0	2.6	1.8	1.7	0	1.7	0	0	0	0	0	0.3	1.2	0.7	1.5

DE TRAFFIC

detraffic.com
(386) 341-4186
I-4 WB Ramp at SR 472
Volusia County, Fl

File Name : 08 i4 wb at 472
Site Code : 00000008
Start Date : 7/27/2022
Page No : 5



DE TRAFFIC

detraffic.com
(386) 341-4186
I-4 WB Ramp at SR 472
Volusia County, Fl

File Name : 08 I4 WB at 472
Site Code : 00000008
Start Date : 7/27/2022
Page No : 6

Groups Printed- Peds

	I-4 WB Ramp Southbound					SR 472 Westbound					N/A Northbound					SR 472 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	R/R	App. Total	Int. Total
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
Total %																					

DE TRAFFIC

detraffic.com
(386) 341-4186
I-4 EB Ramp at SR 472
Volusia County, Fl

File Name : 09 i4 eb at 472
Site Code : 00000002
Start Date : 7/27/2022
Page No : 1

Groups Printed- Automobiles - Commercial

	N/A Southbound				SR 472 Westbound				I-4 EB Ramp Northbound				SR 472 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	259	0	259	109	0	57	166	0	118	29	147	572
07:15 AM	0	0	0	0	0	417	0	417	129	0	43	172	0	99	46	145	734
07:30 AM	0	0	0	0	0	457	0	457	156	0	59	215	0	129	36	165	837
07:45 AM	0	0	0	0	0	362	0	362	152	0	65	217	0	112	40	152	731
Total	0	0	0	0	0	1495	0	1495	546	0	224	770	0	458	151	609	2874
08:00 AM	0	0	0	0	0	356	0	356	153	0	55	208	0	133	26	159	723
08:15 AM	0	0	0	0	0	336	0	336	111	0	58	169	0	122	35	157	662
08:30 AM	0	0	0	0	0	310	0	310	119	0	68	187	0	103	35	138	635
08:45 AM	0	0	0	0	0	230	0	230	116	0	73	189	0	108	17	125	544
Total	0	0	0	0	0	1232	0	1232	499	0	254	753	0	466	113	579	2564
04:00 PM	0	0	0	0	0	203	0	203	180	0	125	305	0	218	9	227	735
04:15 PM	0	0	0	0	0	223	0	223	152	0	182	334	0	189	17	206	763
04:30 PM	0	0	0	0	0	224	0	224	153	0	165	318	0	199	12	211	753
04:45 PM	0	0	0	0	0	191	0	191	183	0	152	335	0	217	16	233	759
Total	0	0	0	0	0	841	0	841	668	0	624	1292	0	823	54	877	3010
05:00 PM	0	0	0	0	0	228	0	228	169	0	142	311	0	203	25	228	767
05:15 PM	0	0	0	0	0	201	0	201	183	0	163	346	0	237	14	251	798
05:30 PM	0	0	0	0	0	247	0	247	139	0	166	305	0	216	19	235	787
05:45 PM	0	0	0	0	0	225	0	225	170	0	203	373	0	205	25	230	828
Total	0	0	0	0	0	901	0	901	661	0	674	1335	0	861	83	944	3180
Grand Total	0	0	0	0	0	4469	0	4469	2374	0	1776	4150	0	2608	401	3009	11628
Apprch %	0	0	0		0	100	0		57.2	0	42.8		0	86.7	13.3		
Total %	0	0	0	0	0	38.4	0	38.4	20.4	0	15.3	35.7	0	22.4	3.4	25.9	
Automobiles	0	0	0	0	0	4324	0	4324	2289	0	1687	3976	0	2576	378	2954	11254
% Automobiles	0	0	0	0	0	96.8	0	96.8	96.4	0	95	95.8	0	98.8	94.3	98.2	96.8
Commercial	0	0	0	0	0	145	0	145	85	0	89	174	0	32	23	55	374
% Commercial	0	0	0	0	0	3.2	0	3.2	3.6	0	5	4.2	0	1.2	5.7	1.8	3.2

DE TRAFFIC

detraffic.com
(386) 341-4186
I-4 EB Ramp at SR 472
Volusia County, FI

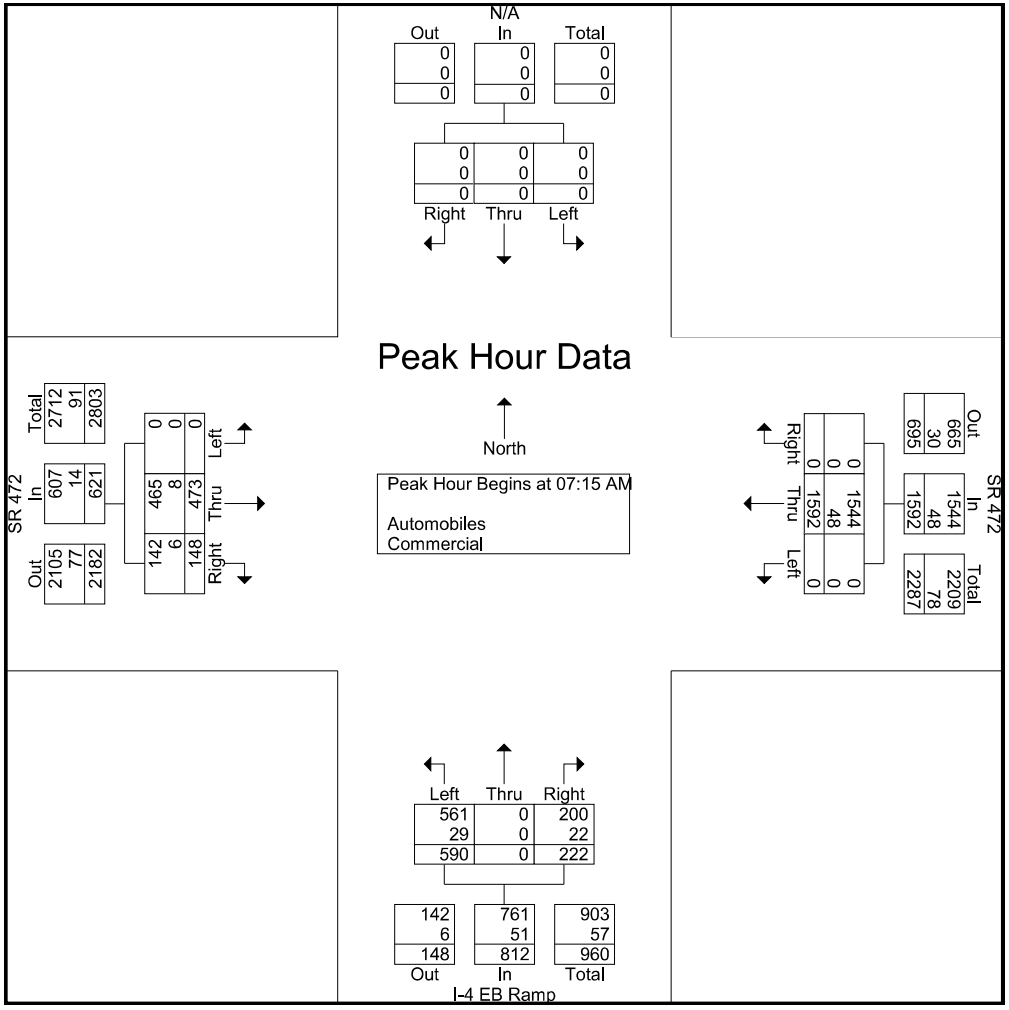
File Name : 09 i4 eb at 472
Site Code : 00000002
Start Date : 7/27/2022
Page No : 2

	N/A Southbound				SR 472 Westbound				I-4 EB Ramp Northbound				SR 472 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	0	0	0	417	0	417	129	0	43	172	0	99	46	145	734
07:30 AM	0	0	0	0	0	457	0	457	156	0	59	215	0	129	36	165	837
07:45 AM	0	0	0	0	0	362	0	362	152	0	65	217	0	112	40	152	731
08:00 AM	0	0	0	0	0	356	0	356	153	0	55	208	0	133	26	159	723
Total Volume	0	0	0	0	0	1592	0	1592	590	0	222	812	0	473	148	621	3025
% App. Total	0	0	0		0	100	0		72.7	0	27.3		0	76.2	23.8		
PHF	.000	.000	.000	.000	.000	.871	.000	.871	.946	.000	.854	.935	.000	.889	.804	.941	.904
Automobiles	0	0	0	0	0	1544	0	1544	561	0	200	761	0	465	142	607	2912
% Automobiles	0	0	0	0	0	97.0	0	97.0	95.1	0	90.1	93.7	0	98.3	95.9	97.7	96.3
Commercial	0	0	0	0	0	48	0	48	29	0	22	51	0	8	6	14	113
% Commercial	0	0	0	0	0	3.0	0	3.0	4.9	0	9.9	6.3	0	1.7	4.1	2.3	3.7

DE TRAFFIC

detraffic.com
(386) 341-4186
I-4 EB Ramp at SR 472
Volusia County, Fl

File Name : 09 i4 eb at 472
Site Code : 00000002
Start Date : 7/27/2022
Page No : 3



DE TRAFFIC

detraffic.com
(386) 341-4186
I-4 EB Ramp at SR 472
Volusia County, FI

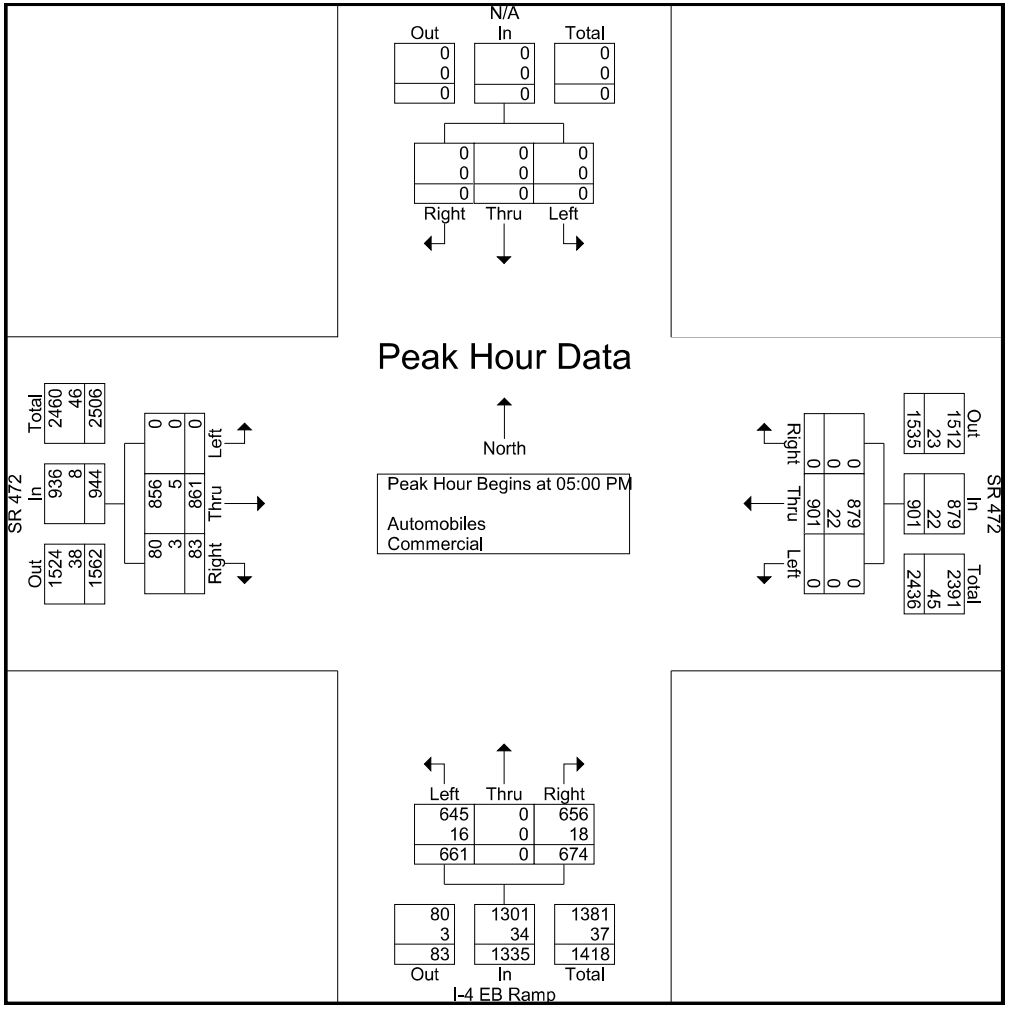
File Name : 09 i4 eb at 472
Site Code : 00000002
Start Date : 7/27/2022
Page No : 4

	N/A Southbound				SR 472 Westbound				I-4 EB Ramp Northbound				SR 472 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	228	0	228	169	0	142	311	0	203	25	228	767
05:15 PM	0	0	0	0	0	201	0	201	183	0	163	346	0	237	14	251	798
05:30 PM	0	0	0	0	0	247	0	247	139	0	166	305	0	216	19	235	787
05:45 PM	0	0	0	0	0	225	0	225	170	0	203	373	0	205	25	230	828
Total Volume	0	0	0	0	0	901	0	901	661	0	674	1335	0	861	83	944	3180
% App. Total	0	0	0		0	100	0		49.5	0	50.5		0	91.2	8.8		
PHF	.000	.000	.000	.000	.000	.912	.000	.912	.903	.000	.830	.895	.000	.908	.830	.940	.960
Automobiles	0	0	0	0	0	879	0	879	645	0	656	1301	0	856	80	936	3116
% Automobiles	0	0	0	0	0	97.6	0	97.6	97.6	0	97.3	97.5	0	99.4	96.4	99.2	98.0
Commercial	0	0	0	0	0	22	0	22	16	0	18	34	0	5	3	8	64
% Commercial	0	0	0	0	0	2.4	0	2.4	2.4	0	2.7	2.5	0	0.6	3.6	0.8	2.0

DE TRAFFIC

detraffic.com
(386) 341-4186
I-4 EB Ramp at SR 472
Volusia County, Fl

File Name : 09 i4 eb at 472
Site Code : 00000002
Start Date : 7/27/2022
Page No : 5



DE TRAFFIC

detraffic.com
(386) 341-4186
I-4 EB Ramp at SR 472
Volusia County, Fl

File Name : 09 i4 eb at 472
Site Code : 00000002
Start Date : 7/27/2022
Page No : 6

Groups Printed- Peds

	N/A Southbound				SR 472 Westbound				I-4 EB Ramp Northbound				SR 472 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0		
Total %																	

DE TRAFFIC

detraffic.com
(386) 341-4186
Graves Ave/Halifax Crossing Blvd at Howland Blvd
Volusia County, Fl

File Name : Graves at 472
Site Code : 00000004
Start Date : 1/18/2023
Page No : 1

Groups Printed- Automobiles - Commercial

	Halifax Crossing Blvd Southbound					Howland Blvd Westbound					Graves Ave Northbound				Howland Blvd Eastbound					
Start Time	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	R/R	App. Total	Int. Total
07:00 AM	5	6	7	0	18	78	320	10	2	410	35	5	39	79	3	127	14	3	147	654
07:15 AM	3	1	9	1	14	85	326	13	3	427	53	6	46	105	6	136	12	5	159	705
07:30 AM	4	4	6	1	15	118	383	11	3	515	45	5	52	102	4	176	23	3	206	838
07:45 AM	6	3	9	2	20	95	377	9	3	484	62	6	62	130	8	158	19	9	194	828
Total	18	14	31	4	67	376	1406	43	11	1836	195	22	199	416	21	597	68	20	706	3025
08:00 AM	6	2	12	1	21	78	364	13	4	459	54	7	56	117	11	165	35	9	220	817
08:15 AM	4	1	16	0	21	85	291	16	2	394	54	4	69	127	9	143	28	8	188	730
08:30 AM	2	1	14	1	18	79	274	13	6	372	43	4	89	136	8	135	30	4	177	703
08:45 AM	6	2	11	0	19	69	226	6	4	305	37	3	75	115	7	114	13	9	143	582
Total	18	6	53	2	79	311	1155	48	16	1530	188	18	289	495	35	557	106	30	728	2832
04:00 PM	13	3	6	2	24	63	158	6	6	233	25	7	58	90	9	281	20	3	313	660
04:15 PM	9	4	8	3	24	75	180	6	6	267	38	4	83	125	7	330	25	7	369	785
04:30 PM	6	6	11	1	24	82	169	4	6	261	31	5	92	128	9	361	34	8	412	825
04:45 PM	5	4	20	3	32	78	178	9	6	271	37	8	97	142	9	377	29	4	419	864
Total	33	17	45	9	104	298	685	25	24	1032	131	24	330	485	34	1349	108	22	1513	3134
05:00 PM	6	8	13	0	27	85	202	4	4	295	31	9	83	123	10	383	28	9	430	875
05:15 PM	4	4	12	3	23	98	221	6	4	329	43	9	87	139	11	360	27	9	407	898
05:30 PM	7	5	10	4	26	80	208	4	4	296	22	9	78	109	14	348	26	8	396	827
05:45 PM	7	6	8	2	23	103	199	6	6	314	27	8	67	102	11	330	65	11	417	856
Total	24	23	43	9	99	366	830	20	18	1234	123	35	315	473	46	1421	146	37	1650	3456
Grand Total	93	60	172	24	349	1351	4076	136	69	5632	637	99	1133	1869	136	3924	428	109	4597	12447
Apprch %	26.6	17.2	49.3	6.9		24	72.4	2.4	1.2		34.1	5.3	60.6		3	85.4	9.3	2.4		
Total %	0.7	0.5	1.4	0.2	2.8	10.9	32.7	1.1	0.6	45.2	5.1	0.8	9.1	15	1.1	31.5	3.4	0.9	36.9	
Automobiles	89	60	163	22	334	1314	4035	134	69	5552	608	91	1117	1816	132	3889	409	106	4536	12238
% Automobiles	95.7	100	94.8	91.7	95.7	97.3	99	98.5	100	98.6	95.4	91.9	98.6	97.2	97.1	99.1	95.6	97.2	98.7	98.3
Commercial	4	0	9	2	15	37	41	2	0	80	29	8	16	53	4	35	19	3	61	209
% Commercial	4.3	0	5.2	8.3	4.3	2.7	1	1.5	0	1.4	4.6	8.1	1.4	2.8	2.9	0.9	4.4	2.8	1.3	1.7

DE TRAFFIC

detraffic.com
(386) 341-4186
Graves Ave/Halifax Crossing Blvd at Howland Blvd
Volusia County, Fl

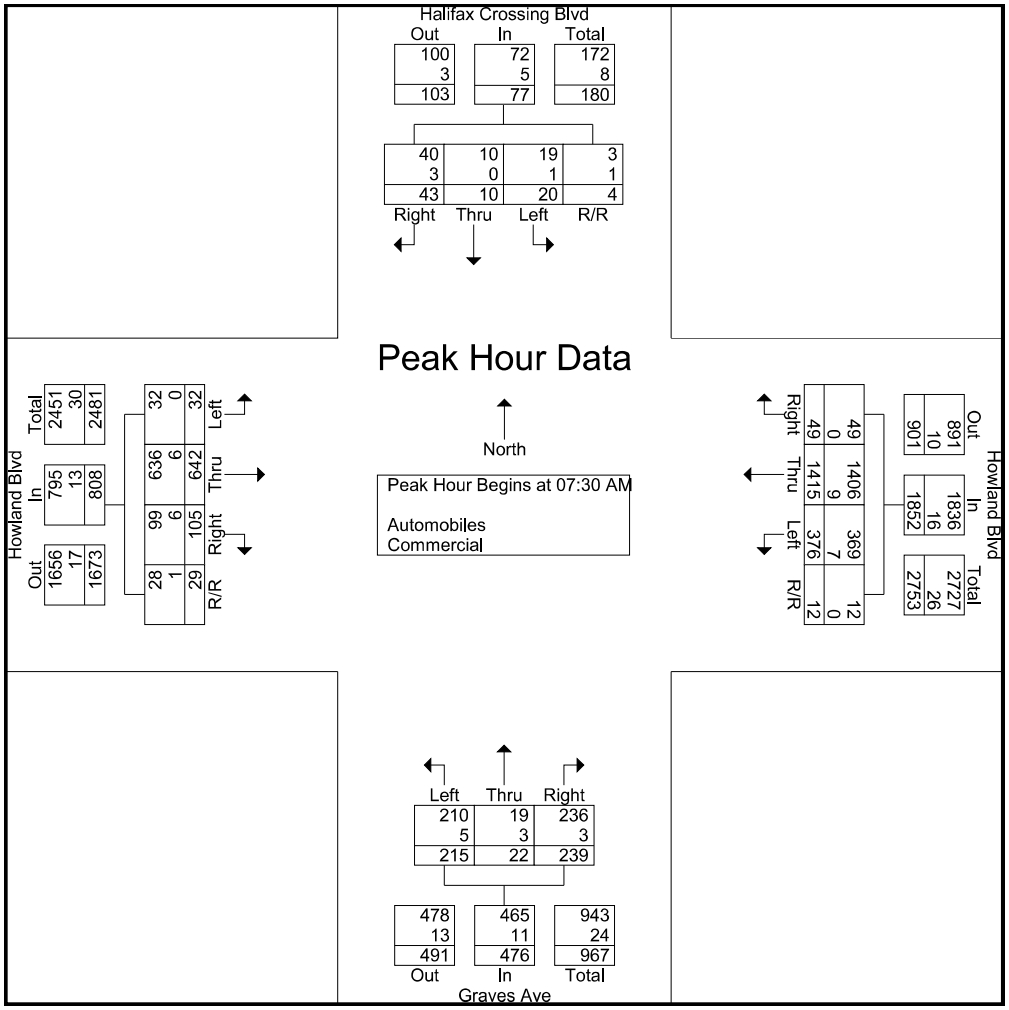
File Name : Graves at 472
Site Code : 00000004
Start Date : 1/18/2023
Page No : 2

	Halifax Crossing Blvd Southbound					Howland Blvd Westbound					Graves Ave Northbound				Howland Blvd Eastbound					
Start Time	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	R/R	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																				
Peak Hour for Entire Intersection Begins at 07:30 AM																				
07:30 AM	4	4	6	1	15	118	383	11	3	515	45	5	52	102	4	176	23	3	206	838
07:45 AM	6	3	9	2	20	95	377	9	3	484	62	6	62	130	8	158	19	9	194	828
08:00 AM	6	2	12	1	21	78	364	13	4	459	54	7	56	117	11	165	35	9	220	817
08:15 AM	4	1	16	0	21	85	291	16	2	394	54	4	69	127	9	143	28	8	188	730
Total Volume	20	10	43	4	77	376	1415	49	12	1852	215	22	239	476	32	642	105	29	808	3213
% App. Total	26	13	55.8	5.2		20.3	76.4	2.6	0.6		45.2	4.6	50.2		4	79.5	13	3.6		
PHF	.833	.625	.672	.500	.917	.797	.924	.766	.750	.899	.867	.786	.866	.915	.727	.912	.750	.806	.918	.959
Automobiles	19	10	40	3	72	369	1406	49	12	1836	210	19	236	465	32	636	99	28	795	3168
% Automobiles	95.0	100	93.0	75.0	93.5	98.1	99.4	100	100	99.1	97.7	86.4	98.7	97.7	100	99.1	94.3	96.6	98.4	98.6
Commercial	1	0	3	1	5	7	9	0	0	16	5	3	3	11	0	6	6	1	13	45
% Commercial	5.0	0	7.0	25.0	6.5	1.9	0.6	0	0	0.9	2.3	13.6	1.3	2.3	0	0.9	5.7	3.4	1.6	1.4

DE TRAFFIC

detraffic.com
(386) 341-4186
Graves Ave/Halifax Crossing Blvd at Howland Blvd
Volusia County, Fl

File Name : Graves at 472
Site Code : 00000004
Start Date : 1/18/2023
Page No : 3



DE TRAFFIC

detraffic.com
(386) 341-4186
Graves Ave/Halifax Crossing Blvd at Howland Blvd
Volusia County, Fl

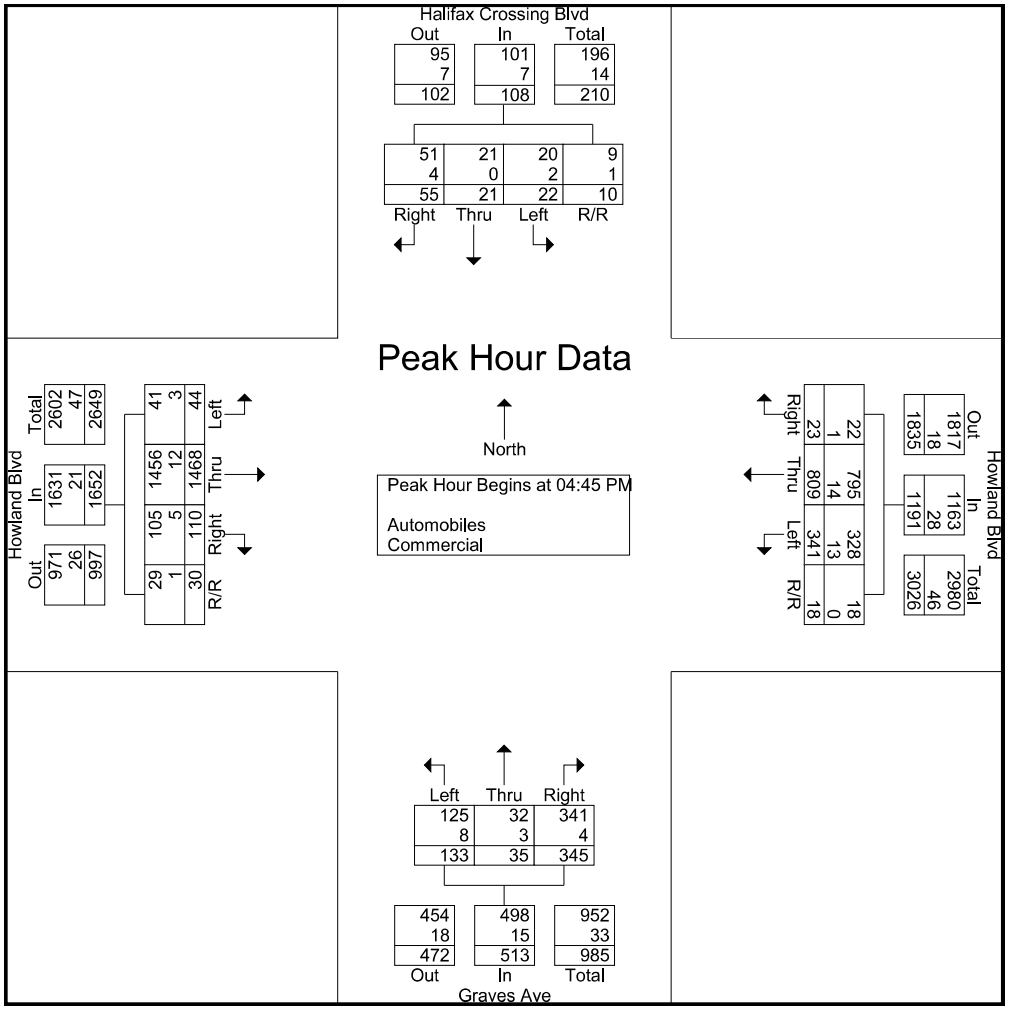
File Name : Graves at 472
Site Code : 00000004
Start Date : 1/18/2023
Page No : 4

	Halifax Crossing Blvd Southbound					Howland Blvd Westbound					Graves Ave Northbound				Howland Blvd Eastbound					
Start Time	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	R/R	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																				
Peak Hour for Entire Intersection Begins at 04:45 PM																				
04:45 PM	5	4	20	3	32	78	178	9	6	271	37	8	97	142	9	377	29	4	419	864
05:00 PM	6	8	13	0	27	85	202	4	4	295	31	9	83	123	10	383	28	9	430	875
05:15 PM	4	4	12	3	23	98	221	6	4	329	43	9	87	139	11	360	27	9	407	898
05:30 PM	7	5	10	4	26	80	208	4	4	296	22	9	78	109	14	348	26	8	396	827
Total Volume	22	21	55	10	108	341	809	23	18	1191	133	35	345	513	44	1468	110	30	1652	3464
% App. Total	20.4	19.4	50.9	9.3		28.6	67.9	1.9	1.5		25.9	6.8	67.3		2.7	88.9	6.7	1.8		
PHF	.786	.656	.688	.625	.844	.870	.915	.639	.750	.905	.773	.972	.889	.903	.786	.958	.948	.833	.960	.964
Automobiles	20	21	51	9	101	328	795	22	18	1163	125	32	341	498	41	1456	105	29	1631	3393
% Automobiles	90.9	100	92.7	90.0	93.5	96.2	98.3	95.7	100	97.6	94.0	91.4	98.8	97.1	93.2	99.2	95.5	96.7	98.7	98.0
Commercial	2	0	4	1	7	13	14	1	0	28	8	3	4	15	3	12	5	1	21	71
% Commercial	9.1	0	7.3	10.0	6.5	3.8	1.7	4.3	0	2.4	6.0	8.6	1.2	2.9	6.8	0.8	4.5	3.3	1.3	2.0

DE TRAFFIC

detraffic.com
(386) 341-4186
Graves Ave/Halifax Crossing Blvd at Howland Blvd
Volusia County, Fl

File Name : Graves at 472
Site Code : 00000004
Start Date : 1/18/2023
Page No : 5



DE TRAFFIC

detraffic.com
(386) 341-4186
Graves Ave/Halifax Crossing Blvd at Howland Blvd
Volusia County, Fl

File Name : Graves at 472
Site Code : 00000004
Start Date : 1/18/2023
Page No : 6

Groups Printed- Peds

	Halifax Crossing Blvd Southbound					Howland Blvd Westbound					Graves Ave Northbound					Howland Blvd Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
Total %																					

DE TRAFFIC

detraffic.com
(386) 341-4186
Normandy Blvd at Graves Ave
Volusia County, Fl

File Name : normandy at graves
Site Code : 00000003
Start Date : 1/18/2023
Page No : 1

Groups Printed- Automobiles - Commercial

	N/A Southbound				Graves Ave Westbound				Normandy Blvd Northbound					Graves Ave Eastbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Int. Total
07:00 AM	0	0	0	0	35	67	0	102	47	0	35	6	88	0	64	30	5	99	289
07:15 AM	0	0	0	0	43	79	0	122	62	0	41	8	111	0	78	36	8	122	355
07:30 AM	0	0	0	0	34	86	0	120	82	0	35	3	120	0	77	42	10	129	369
07:45 AM	0	0	0	0	29	95	0	124	78	0	41	5	124	0	69	29	4	102	350
Total	0	0	0	0	141	327	0	468	269	0	152	22	443	0	288	137	27	452	1363
08:00 AM	0	0	0	0	26	77	0	103	85	0	35	5	125	0	87	33	8	128	356
08:15 AM	0	0	0	0	28	65	0	93	77	0	45	3	125	0	96	33	6	135	353
08:30 AM	0	0	0	0	27	77	0	104	72	0	30	7	109	0	86	33	2	121	334
08:45 AM	0	0	0	0	41	67	0	108	80	0	36	7	123	0	69	34	7	110	341
Total	0	0	0	0	122	286	0	408	314	0	146	22	482	0	338	133	23	494	1384
04:00 PM	0	0	0	0	22	77	0	99	25	0	31	6	62	0	93	77	6	176	337
04:15 PM	0	0	0	0	19	83	0	102	36	0	36	4	76	0	77	84	5	166	344
04:30 PM	0	0	0	0	27	94	0	121	31	0	44	2	77	0	103	80	10	193	391
04:45 PM	0	0	0	0	45	85	0	130	35	0	38	4	77	0	85	103	4	192	399
Total	0	0	0	0	113	339	0	452	127	0	149	16	292	0	358	344	25	727	1471
05:00 PM	0	0	0	0	36	97	0	133	41	0	31	3	75	0	78	90	5	173	381
05:15 PM	0	0	0	0	43	103	0	146	36	0	35	3	74	0	96	98	4	198	418
05:30 PM	0	0	0	0	38	128	0	166	38	0	30	5	73	0	85	77	6	168	407
05:45 PM	0	0	0	0	36	104	0	140	29	0	28	3	60	0	71	82	9	162	362
Total	0	0	0	0	153	432	0	585	144	0	124	14	282	0	330	347	24	701	1568
Grand Total	0	0	0	0	529	1384	0	1913	854	0	571	74	1499	0	1314	961	99	2374	5786
Apprch %	0	0	0		27.7	72.3	0		57	0	38.1	4.9		0	55.3	40.5	4.2		
Total %	0	0	0	0	9.1	23.9	0	33.1	14.8	0	9.9	1.3	25.9	0	22.7	16.6	1.7	41	
Automobiles	0	0	0	0	500	1357	0	1857	831	0	547	65	1443	0	1290	921	82	2293	5593
% Automobiles	0	0	0	0	94.5	98	0	97.1	97.3	0	95.8	87.8	96.3	0	98.2	95.8	82.8	96.6	96.7
Commercial	0	0	0	0	29	27	0	56	23	0	24	9	56	0	24	40	17	81	193
% Commercial	0	0	0	0	5.5	2	0	2.9	2.7	0	4.2	12.2	3.7	0	1.8	4.2	17.2	3.4	3.3

DE TRAFFIC

detraffic.com
(386) 341-4186
Normandy Blvd at Graves Ave
Volusia County, Fl

File Name : normandy at graves
Site Code : 00000003
Start Date : 1/18/2023
Page No : 2

	N/A Southbound				Graves Ave Westbound				Normandy Blvd Northbound					Graves Ave Eastbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 07:15 AM																			
07:15 AM	0	0	0	0	43	79	0	122	62	0	41	8	111	0	78	36	8	122	355
07:30 AM	0	0	0	0	34	86	0	120	82	0	35	3	120	0	77	42	10	129	369
07:45 AM	0	0	0	0	29	95	0	124	78	0	41	5	124	0	69	29	4	102	350
08:00 AM	0	0	0	0	26	77	0	103	85	0	35	5	125	0	87	33	8	128	356
Total Volume	0	0	0	0	132	337	0	469	307	0	152	21	480	0	311	140	30	481	1430
% App. Total	0	0	0		28.1	71.9	0		64	0	31.7	4.4		0	64.7	29.1	6.2		
PHF	.000	.000	.000	.000	.767	.887	.000	.946	.903	.000	.927	.656	.960	.000	.894	.833	.750	.932	.969
Automobiles	0	0	0	0	127	331	0	458	301	0	150	19	470	0	303	131	25	459	1387
% Automobiles	0	0	0	0	96.2	98.2	0	97.7	98.0	0	98.7	90.5	97.9	0	97.4	93.6	83.3	95.4	97.0
Commercial	0	0	0	0	5	6	0	11	6	0	2	2	10	0	8	9	5	22	43
% Commercial	0	0	0	0	3.8	1.8	0	2.3	2.0	0	1.3	9.5	2.1	0	2.6	6.4	16.7	4.6	3.0

DE TRAFFIC

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(386) 341-4186
Normandy Blvd at Graves Ave
Volusia County, Fl

File Name : normandy at graves
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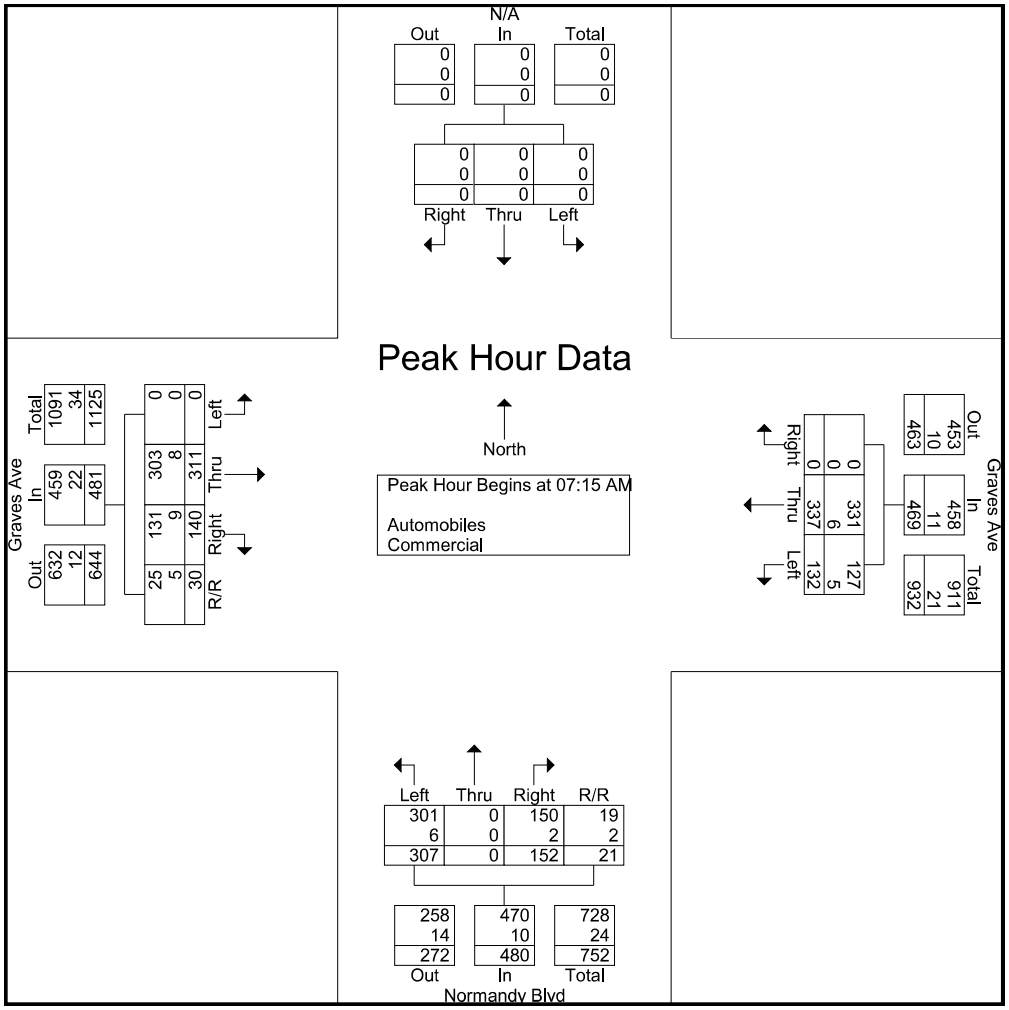
Page No : 3



DE TRAFFIC

detraffic.com
(386) 341-4186
Normandy Blvd at Graves Ave
Volusia County, Fl

File Name : normandy at graves
Site Code : 00000003
Start Date : 1/18/2023
Page No : 4

	N/A Southbound				Graves Ave Westbound				Normandy Blvd Northbound					Graves Ave Eastbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	R/R	App. Total	Left	Thru	Right	R/R	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 04:45 PM																			
04:45 PM	0	0	0	0	45	85	0	130	35	0	38	4	77	0	85	103	4	192	399
05:00 PM	0	0	0	0	36	97	0	133	41	0	31	3	75	0	78	90	5	173	381
05:15 PM	0	0	0	0	43	103	0	146	36	0	35	3	74	0	96	98	4	198	418
05:30 PM	0	0	0	0	38	128	0	166	38	0	30	5	73	0	85	77	6	168	407
Total Volume	0	0	0	0	162	413	0	575	150	0	134	15	299	0	344	368	19	731	1605
% App. Total	0	0	0		28.2	71.8	0		50.2	0	44.8	5		0	47.1	50.3	2.6		
PHF	.000	.000	.000	.000	.900	.807	.000	.866	.915	.000	.882	.750	.971	.000	.896	.893	.792	.923	.960
Automobiles	0	0	0	0	152	407	0	559	144	0	125	11	280	0	340	359	13	712	1551
% Automobiles	0	0	0	0	93.8	98.5	0	97.2	96.0	0	93.3	73.3	93.6	0	98.8	97.6	68.4	97.4	96.6
Commercial	0	0	0	0	10	6	0	16	6	0	9	4	19	0	4	9	6	19	54
% Commercial	0	0	0	0	6.2	1.5	0	2.8	4.0	0	6.7	26.7	6.4	0	1.2	2.4	31.6	2.6	3.4

DE TRAFFIC

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(386) 341-4186
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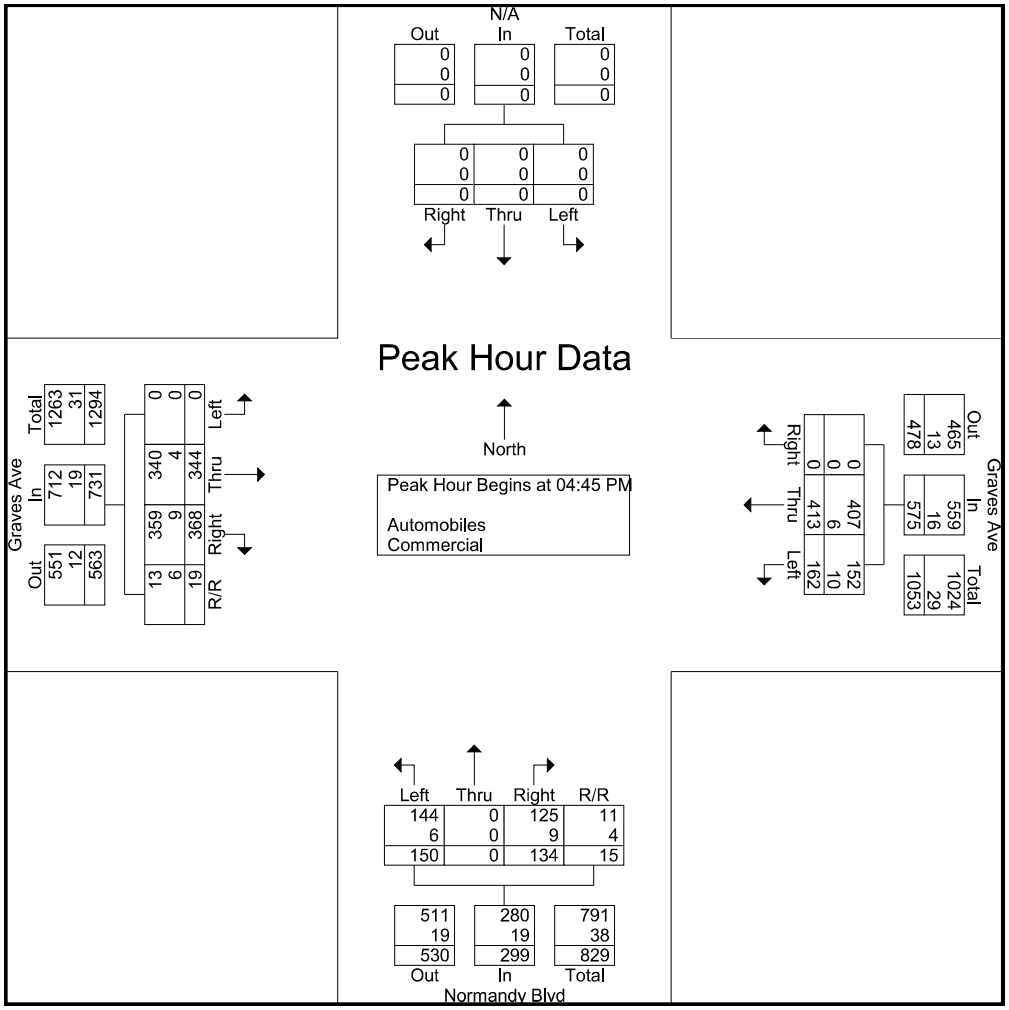


DE TRAFFIC

detraffic.com
(386) 341-4186
Normandy Blvd at Graves Ave
Volusia County, Fl

File Name : normandy at graves
Site Code : 00000003
Start Date : 1/18/2023
Page No : 6

Groups Printed- Peds

	N/A Southbound					Graves Ave Westbound					Normandy Blvd Northbound					Graves Ave Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
Total %																					



NB Approach



SB Approach



EB Approach



WB Approach

de traffic	Graves Ave/Halifax Crossing Blvd at Howland Blvd	Volusia County
	www.de-traffic.com	Project Number: K&A-02 / Sheet Number: 3
	299 McGregor Rd. DeLand Fl. 32720	



NB Approach



EB Approach



WB Approach

de traffic	Normandy Blvd at Graves Ave	Volusia County
	www.de-traffic.com	Project Number: K&A-02 / Sheet Number: 4
	299 McGregor Rd. DeLand Fl. 32720	

Peak Season Factor Category Report

2021 PEAK SEASON FACTOR CATEGORY REPORT - REPORT TYPE: ALL
CATEGORY: 7900 VOLUSIA COUNTYWIDE

MOCF: 0.97

WEEK	DATES	SF	PSCF
1	01/01/2021 - 01/02/2021	1.01	1.04
2	01/03/2021 - 01/09/2021	1.04	1.07
3	01/10/2021 - 01/16/2021	1.06	1.09
4	01/17/2021 - 01/23/2021	1.05	1.08
5	01/24/2021 - 01/30/2021	1.04	1.07
6	01/31/2021 - 02/06/2021	1.03	1.06
7	02/07/2021 - 02/13/2021	1.02	1.05
8	02/14/2021 - 02/20/2021	1.00	1.03
9	02/21/2021 - 02/27/2021	0.99	1.02
*10	02/28/2021 - 03/06/2021	0.97	1.00
*11	03/07/2021 - 03/13/2021	0.95	0.98
*12	03/14/2021 - 03/20/2021	0.94	0.97
*13	03/21/2021 - 03/27/2021	0.95	0.98
*14	03/28/2021 - 04/03/2021	0.95	0.98
*15	04/04/2021 - 04/10/2021	0.96	0.99
*16	04/11/2021 - 04/17/2021	0.97	1.00
*17	04/18/2021 - 04/24/2021	0.98	1.01
*18	04/25/2021 - 05/01/2021	0.98	1.01
*19	05/02/2021 - 05/08/2021	0.98	1.01
*20	05/09/2021 - 05/15/2021	0.99	1.02
*21	05/16/2021 - 05/22/2021	0.99	1.02
*22	05/23/2021 - 05/29/2021	0.99	1.02
23	05/30/2021 - 06/05/2021	0.99	1.02
24	06/06/2021 - 06/12/2021	1.00	1.03
25	06/13/2021 - 06/19/2021	1.00	1.03
26	06/20/2021 - 06/26/2021	1.01	1.04
27	06/27/2021 - 07/03/2021	1.02	1.05
28	07/04/2021 - 07/10/2021	1.04	1.07
29	07/11/2021 - 07/17/2021	1.05	1.08
30	07/18/2021 - 07/24/2021	1.05	1.08
31	07/25/2021 - 07/31/2021	1.05	1.08
32	08/01/2021 - 08/07/2021	1.05	1.08
33	08/08/2021 - 08/14/2021	1.05	1.08
34	08/15/2021 - 08/21/2021	1.05	1.08
35	08/22/2021 - 08/28/2021	1.05	1.08
36	08/29/2021 - 09/04/2021	1.04	1.07
37	09/05/2021 - 09/11/2021	1.04	1.07
38	09/12/2021 - 09/18/2021	1.03	1.06
39	09/19/2021 - 09/25/2021	1.02	1.05
40	09/26/2021 - 10/02/2021	1.00	1.03
41	10/03/2021 - 10/09/2021	0.99	1.02
42	10/10/2021 - 10/16/2021	0.98	1.01
43	10/17/2021 - 10/23/2021	0.98	1.01
44	10/24/2021 - 10/30/2021	0.99	1.02
45	10/31/2021 - 11/06/2021	0.99	1.02
46	11/07/2021 - 11/13/2021	1.00	1.03
47	11/14/2021 - 11/20/2021	1.00	1.03
48	11/21/2021 - 11/27/2021	1.00	1.03
49	11/28/2021 - 12/04/2021	1.01	1.04
50	12/05/2021 - 12/11/2021	1.01	1.04
51	12/12/2021 - 12/18/2021	1.01	1.04
52	12/19/2021 - 12/25/2021	1.04	1.07
53	12/26/2021 - 12/31/2021	1.06	1.09

* PEAK SEASON

08-MAR-2022 12:36:28 830UPD 5_7900_PKSEASON.TXT

Appendix F:
Signal Timings

COUNTY OF VOLUSIA TRAFFIC SIGNAL TIMING SHEET

LOCATION: SR 472 @ CR 4101 (MLK Beltway)
Orange City

FREE: [ ]

DATE: 5/16/2022

SIGNAL #: 222

CO-ORD: [X]

Design By: Sean Castello

NETWORK #: OC/Deltona Area Network # 90

Controller Timing Chart

PHASE	1	2	3	4	5	6	7	8
DIRECTION	EBL	WB	SB	NB	WBL	EB		
TURN TYPE	PROT	-	SPLIT LEAD	SPLIT LAG	PROT	-		
MIN GREEN	5	17	7	7	5	17		
EXTENSION	3	4	4	4	3	4		
YELLOW	5.5	5.5	5.6	5.5	5.5	5.5		
RED CLR	2.8	2.8	3.8	3.3	2.8	2.8		
WALK								
PED CLR								
MAX 1	25	60	35	35	35	60		
MAX 2								
MAX 3		-		-		-		
DYM MAX		90		35		90		
DYM STP		10		10		10		
RECALL		MIN		-		MIN		
DETECTOR	NON-LOCK	LOCK	NON-LOCK	NON-LOCK	NON-LOCK	LOCK		
FLASH	RED	YELLOW	RED	RED	RED	YELLOW		

COORDINATION TIMINGS

PATTERN	1	2	3	4	5	6	7	8
CYCLE	150	130	150	-	-	-	-	-
OFFSET	93	99	0	-	-	-	-	-

PHASE	1	2	3	4	5	6	7	8
PATTERN 1	19	57	37	37	19	57		
PATTERN 2	19	43	31	37	19	43		
PATTERN 3	19	59	35	37	20	58		
PATTERN 4	-	-	-	-	-	-	-	-
PATTERN 5	-	-	-	-	-	-	-	-
PATTERN 6	-	-	-	-	-	-	-	-
PATTERN 7	-	-	-	-	-	-	-	-

Controller IP		Switch IP		Camera IP	
Controller Gateway		Switch Gateway		Camera Gateway	

REMARKS:

Pattern #1	2	1	4	3	Pat #2	1	2	3	4	Pat #3	1	2	4	3		
Seq #4	5	6			Seq #5	6	5			Seq #7	6	5				

COUNTY OF VOLUSIA TRAFFIC SIGNAL TIMING SHEET

LOCATION: SR 472 @ CR 4101 (MLK Beltway)
Orange City

FREE: [ ]

DATE: 5/16/2022

SIGNAL #: 222

CO-ORD: [X]

Design By: Sean Castello

NETWORK #: OC/Deltona Area Network # 90

TIME OF DAY SCHEDULE

BASE DAY		1	2	3	4	5	6	7	Crosswalk Length
MON #1	TIME	06:30-09:00	09:00-16:00	16:00-18:15	18:15-00:00				
	PATTERN	PATTERN #1	PATTERN #2	PATTERN #3	FREE				P2
TUES #1	TIME	06:30-09:00	09:00-16:00	16:00-18:15	18:15-00:00				
	PATTERN	PATTERN #1	PATTERN #2	PATTERN #3	FREE				
WED #1	TIME	06:30-09:00	09:00-16:00	16:00-18:15	18:15-00:00				
	PATTERN	PATTERN #1	PATTERN #2	PATTERN #3	FREE				P4
THU #1	TIME	06:30-09:00	09:00-16:00	16:00-18:15	18:15-00:00				
	PATTERN	PATTERN #1	PATTERN #2	PATTERN #3	FREE				
FRI #1	TIME	06:30-09:00	09:00-16:00	16:00-18:15	18:15-00:00				
	PATTERN	PATTERN #1	PATTERN #2	PATTERN #3	FREE				P6
SAT #2	TIME	00:00-00:00							
	PATTERN	FREE							
SUN #2	TIME	00:00-00:00							
	PATTERN	FREE							P8

CONTROLLER TYPE		CONDITION OF OVERHEAD	GOOD	PROGRAM NUMBER	
Econolite ASC/3		OVERHEAD STREET NAMES	NO		
PHASES:	8Φ	ILLUMINATED STREET NAMES	YES	02.62.00	SIGNAL OWNER
CABINET TYPE	V	PRE-EMPTION	YES	Controller IP Address	FDOT
CABINET DATE	03/2008	PRE-EMPTION TYPE	INFRARED		LED: YES

REMARKS:

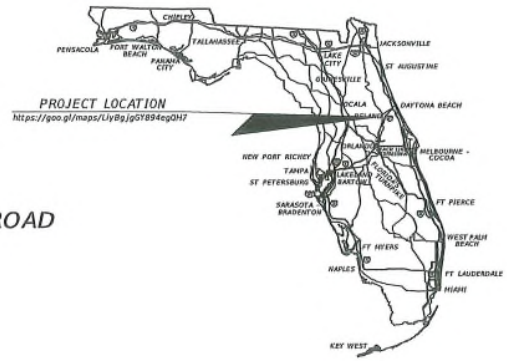
Seq #4					Seq #5					Seq #7				
	2	1	4	3		1	2	3	4		1	2	4	3
	5	6				6	5				6	5		

Received 11/11/2021

Volusia County
FLORIDA

VOLUSIA COUNTY, FLORIDA
PUBLIC WORKS DEPARTMENT

CONSTRUCTION PLANS



DR. MARTIN LUTHER KING JR. BELTWAY AND CASSADAGA ROAD

SIGNALIZATION PLANS

SIGNAL NO. 471

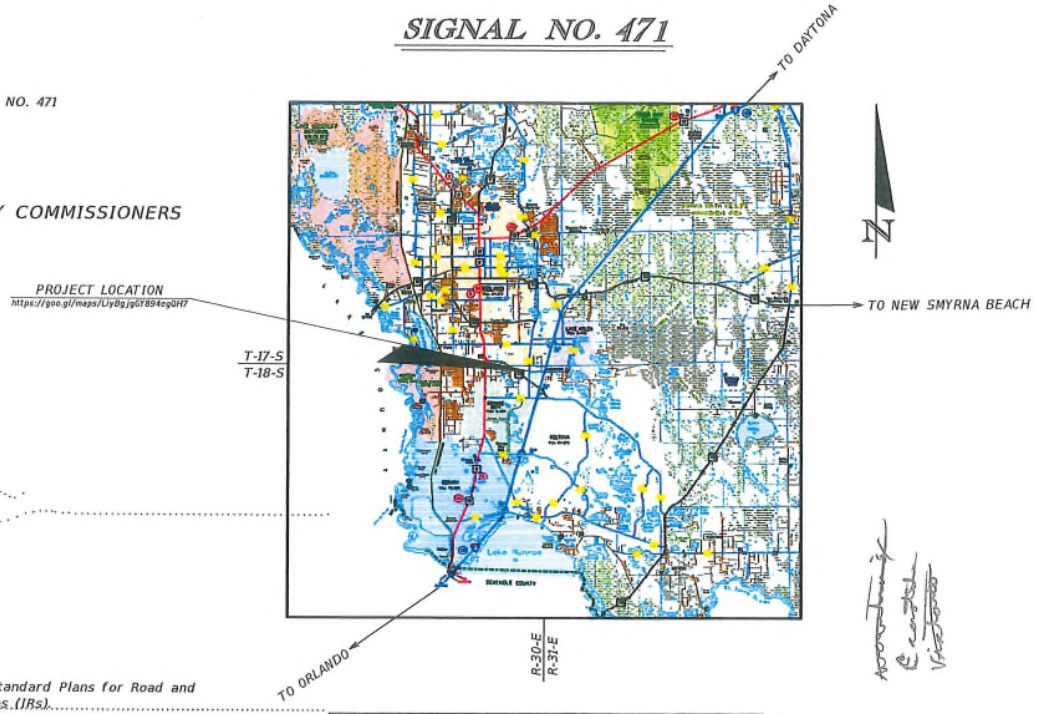
INDEX OF SIGNALIZATION PLANS

SHEET NO.	SHEET DESCRIPTION
T-1	KEY SHEET
T-2	SIGNATURE SHEET
T-3	TABULATION OF QUANTITIES
T-4 - T-5	GENERAL NOTES
T-6	SIGNALIZATION PLAN - SIGNAL NO. 471
T-7	CORNER CLIPS
T-8	STRAIN POLE SCHEDULE
T-9	GUIDESIGN WORKSHEET
B-1	SPT BORING SHEET

VOLUSIA COUNTY BOARD OF COUNTY COMMISSIONERS

COUNTY CHAIR - JEFF BROWER
AT-LARGE REPRESENTATIVE - BEN JOHNSON
COUNTY MANAGER - GEORGE RECKTENWALD

DISTRICT 1	BARBARA GIRTMAN
DISTRICT 2	BILLIE WHEELER
DISTRICT 3	DANNY ROBINS
DISTRICT 4	HEATHER POST
DISTRICT 5	DR. FRED LOWRY



GOVERNING STANDARD PLANS:

Florida Department of Transportation, FY2021/22 Standard Plans for Road and Bridge Construction and applicable Interim Revisions (IRs).

Standard Plans for Road Construction and associated IRs are available at the following website: http://www.fdot.gov/design/standardplans

APPLICABLE IRs: N/A

Standard Plans for Bridge Construction are included in the Structures Plans Component

GOVERNING STANDARD SPECIFICATIONS:

Florida Department of Transportation, July 2021 Standard Specifications for Road and Bridge Construction at the following website: http://www.fdot.gov/programmanagement/Implemented/SpecBooks

FINAL SUBMITTAL
11/08/2021

2021-P-USE-0554

SIGNALIZATION SHOP DRAWINGS
TO BE SUBMITTED TO:
JEREMY M. CROWE, PE 77064
TRAFFIC & MOBILITY CONSULTANTS LLC
3101 MAGUIRE BLVD
SUITE 265
ORLANDO, FL 32803

PLANS PREPARED BY:

TMC
Traffic & Mobility Consultants

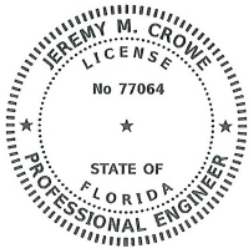
TRAFFIC & MOBILITY CONSULTANTS LLC
3101 MAGUIRE BLVD
SUITE 265
ORLANDO, FL 32803
(407) 531-5332
CERTIFICATE OF AUTHORIZATION NO.: 30024

NOTE: THE SCALE OF THESE PLANS MAY HAVE CHANGES DUE TO REPRODUCTION

ENGINEER OF RECORD: JEREMY M CROWE, PE
P.E. NO.: 77064

TMC PROJECT NO.	FISCAL YEAR	SHEET NO.
20147.3	22	T-1

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.



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SIGNED AND SEALED BY:

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THE SIGNATURE MUST BE VERIFIED
IN THE ELECTRONIC DOCUMENTS.

JEREMY M. CROWE, P.E.
P.E. LICENSE NUMBER 77064
TRAFFIC & MOBILITY CONSULTANTS LLC.
3101 MAGUIRE BLVD, SUITE 265
ORLANDO, FL. 32803
CERTIFICATE OF AUTHORIZATION 30024

THE ABOVE NAMED PROFESSIONAL ENGINEER SHALL BE RESPONSIBLE FOR THE
FOLLOWING SHEETS IN ACCORDANCE WITH RULE 61G15-23.004, F.A.C.

SHEET NO.	SHEET DESCRIPTION
T-1	KEY SHEET
T-2	SIGNATURE SHEET
T-3	TABULATION OF QUANTITIES
T-4 THRU T-5	GENERAL NOTES
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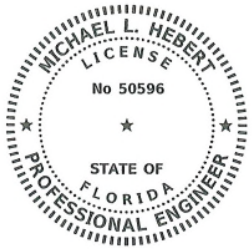
T-7	CORNER CLIPS
T-9	GUIDESIGN WORKSHEET



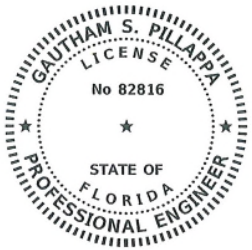
THIS ITEM HAS BEEN DIGITALLY
SIGNED AND SEALED BY:

PRINTED COPIES OF THIS DOCUMENT ARE
NOT CONSIDERED SIGNED AND SEALED.
THE SIGNATURE MUST BE VERIFIED
IN THE ELECTRONIC DOCUMENTS.

MICHAEL L. HEBERT, P.E.
P.E. LICENSE NUMBER 50596
FBT-FLORIDA BRIDGE AND TRANSPORTATION, INC.
633 DARTMOUTH STREET
ORLANDO, FL. 32804
CERTIFICATE OF AUTHORIZATION 26379

THE ABOVE NAMED PROFESSIONAL ENGINEER SHALL BE RESPONSIBLE FOR THE
FOLLOWING SHEETS IN ACCORDANCE WITH RULE 61G15-23.004, F.A.C.

SHEET NO.	SHEET DESCRIPTION
T-2	SIGNATURE SHEET
T-8	STRAIN POLE SCHEDULE



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SIGNED AND SEALED BY:

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IN THE ELECTRONIC DOCUMENTS.

GAUTHAM S. PILLAPPA, P.E.
P.E. LICENSE NUMBER 82816
GEO-TECHNOLOGY ASSOCIATES, INC.
4617 PARKBREEZE COURT
ORLANDO, FL. 32808
CERTIFICATE OF AUTHORIZATION 35088

THE ABOVE NAMED PROFESSIONAL ENGINEER SHALL BE RESPONSIBLE FOR THE
FOLLOWING SHEETS IN ACCORDANCE WITH RULE 61G15-23.004, F.A.C.

SHEET NO.	SHEET DESCRIPTION
T-2	SIGNATURE SHEET
B-1	SPT BORING SHEET

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

TRAFFIC & MOBILITY CONSULTANTS LLC
3101 MAGUIRE BLVD, SUITE 265
ORLANDO, FL 32803
OFFICE: (407) 531-5332
FAX: (407) 531-5331
JEREMY M. CROWE, P.E. 77064
CERTIFICATE OF AUTHORIZATION: 30024

Volusia County

SIGNATURE SHEET

SHEET NO.
T-2

TABULATION OF QUANTITIES

PAY ITEM NO.	DESCRIPTION	UNIT	SHEET NUMBERS T-6 PLAN	T-6 FINAL													TOTAL THIS SHEET PLAN	TOTAL THIS SHEET FINAL	GRAND TOTAL PLAN	GRAND TOTAL FINAL
630-2-11	CONDUIT, FURNISH & INSTALL, OPEN TRENCH	LF	511														511		511	
632-7-1	SIGNAL CABLE- NEW OR RECONSTRUCTED INTERSECTION, FURNISH & INSTALL	PI	1														1		1	
634-4-153	SPAN WIRE ASSEMBLY, FURNISH & INSTALL, TWO POINT, BOX OR DROP BOX	PI	1														1		1	
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	EA	29														29		29	
639-1-122	ELECTRICAL POWER SERVICE, F&I, UNDERGROUND, METER PURCHASED BY CONTRACTOR FROM POWER COMPANY	AS	1														1		1	
639-2-1	ELECTRICAL SERVICE WIRE, FURNISH & INSTALL	LF	151														151		151	
639-3-11	ELECTRICAL SERVICE DISCONNECT, F&I, POLE	EA	2														2		2	
641-2-12	PRESTRESSED CONCRETE POLE, F&I, TYPE P-II SERVICE POLE	EA	2														2		2	
641-2-18	PRESTRESSED CONCRETE POLE, F&I, TYPE P-VIII	EA	4														4		4	
646-1-11	ALUMINIUM SIGNALS POLE, FURNISH & INSTALL PEDESTAL	EA	8														8		8	
650-1-14	VEHICULAR TRAFFIC SIGNAL, FURNISH & INSTALL ALUMINUM, 3 SECTION, 1 WAY	AS	6														6		6	
650-1-16	VEHICULAR TRAFFIC SIGNAL, FURNISH & INSTALL ALUMINUM, 4 SECTION, 1 WAY	AS	1														1		1	
653-1-11	PEDESTRIAN SIGNAL, FURNISH & INSTALL LED COUNTDOWN 1 WAY	AS	8														8		8	
660-3-11	VEHICLE DETECTION SYSTEM- MICROWAVE, FURNISH & INSTALL CABINET EQUIPMENT, WAVETRONIX	EA	1														1		1	
660-3-12	VEHICLE DETECTION SYSTEM- MICROWAVE, FURNISH & INSTALL ABOVE GROUND EQUIPMENT	EA	6														6		6	
663-1-121	SIGNAL PRIORITY AND PREEMPTION SYSTEM, FURNISH & INSTALL, GPS, CABINET ELECTRONICS	EA	1														1		1	
663-1-122	SIGNAL PRIORITY AND PREEMPTION SYSTEM, FURNISH AND INSTALL, GPS, DETECTOR	EA	3														3		3	
665-1-11	PEDESTRIAN DETECTOR, FURNISH & INSTALL STANDARD	EA	8														8		8	
670-5-112	TRAFFIC CONTROLLER ASSEMBLY, FURNISH & INSTALL NEMA 2 PREEMPTION (ECONOLITE WITH UPS & 4G WIRELESS)	AS	1														1		1	
684-1-1	MANAGED FIELD ETHERNET SWITCH, LAYER 2, FURNISH & INSTALL	EA	1														1		1	
684-6-12	WIRELESS COMMUNICATION DEVICE, FURNISH & INSTALL ETHERNET SUBSCRIBER UNIT	EA	1														1		1	
685-1-11	UNINTERRUPTIBLE POWER SUPPLY, FURNISH AND INSTALL, LINE INTERACTIVE	EA	1														1		1	
700-5-22	INTERNALLY ILLUMINATED SIGN, FURNISH & INSTALL, OVERHEAD MOUNT, 12-18 SF	EA	4														4		4	
715-5-31	LUMINAIRE & BRACKET ARM, FURNISH & INSTALL NEW LUMINAIRE & ARM ON NEW STRAIN POLE, ALUMINIUM	EA	4														4		4	

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REVISIONS

DATE	DESCRIPTION	DATE	DESCRIPTION

TRAFFIC & MOBILITY CONSULTANTS LLC
3101 MAGUIRE BLVD, SUITE 265
ORLANDO, FL 32803
OFFICE: (407) 531-5332
FAX: (407) 531-5331
JEREMY M. CROWE, P.E. 77064
CERTIFICATE OF AUTHORIZATION: 30024

TABULATION OF QUANTITIES

SHEET NO. F-6 T-3

GENERAL NOTES:

1. THE CONTRACTOR SHALL NOTIFY VOLUSIA COUNTY TRAFFIC ENGINEERING AT LEAST TWO BUSINESS DAYS PRIOR TO BEGINNING WORK. NOTIFY TIM KARR, ALLEN CATES AND BILLY WHITE (386) 736-5968.
2. THE CONTRACTOR SHALL COORDINATE WORK SCHEDULE, COORDINATE TIMING AND AUTHORIZATION OF POWER SERVICE WITH VOLUSIA COUNTY TRAFFIC ENGINEERING. NOTIFY BOBBY MADDOX, TIM KARR, AND BILLY WHITE (386) 736-5968.
3. ANY ITEM NOT SPECIFICALLY ADDRESSED IN THESE PLANS, USE F.D.O.T. FY 2021-22 STANDARD PLANS AND JULY 2021 STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION. ALL MATERIALS AND HARDWARE SHALL BE PRE-APPROVED BY VOLUSIA COUNTY TRAFFIC ENGINEERING.
4. UNLESS OTHERWISE NOTED, ALL REMOVED EQUIPMENT SHALL BE DISPOSED OF BY THE CONTRACTOR IN AREAS PROVIDED BY THE CONTRACTOR.
5. THE CONTRACTOR SHALL NOTIFY SUNSHINE ONE-CALL 1-800-432-4770 AT LEAST TWO BUSINESS DAYS IN ADVANCE OF ANY EXCAVATION WORK WHICH WOULD OTHERWISE INTERFERE WITH ANY ABOVE GROUND OR BELOW GROUND UTILITIES. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR MAINTAINING CURRENT LOCATE TICKET THROUGHOUT THE DURATION OF THE WORK. THE COUNTY OF VOLUSIA IS NOT A MEMBER OF THE SUNSHINE ONE-CALL, FOR LOCATES CALL (386) 736-5968, VOLUSIA COUNTY TRAFFIC ENGINEERING TO REQUEST TO COMPLETE A LOCATE TICKET TO SCHEDULE THE LOCATE.
6. THE CONTRACTOR SHALL VERIFY COLOR CODES FOR SIGNAL CABLE WITH VOLUSIA COUNTY TRAFFIC ENGINEERING BEFORE ORDERING.
7. IT SHOULD BE NOTED THAT NO TEST BORINGS WERE MADE WHERE CONDUIT RUNS ARE TO BE INSTALLED BY JACKING, DIRECTIONAL BORING, OR TRENCHING. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO EXAMINE THE JOB SITE CONDITIONS BEFORE SUBMITTING A BID PROPOSAL.
8. A SIGNAL INSPECTION IS TO BE SCHEDULED WITH ALLEN CATES AND BILLY WHITE (VOLUSIA COUNTY TRAFFIC ENGINEERING) (386) 736-5968 10 DAYS PRIOR TO THE SIGNAL BEING PLACED INTO OPERATION.
9. AT THE TIME OF FINAL INSPECTION, THE CONTRACTOR SHALL PROVIDE TWO SETS OF CONSTRUCTION "AS-BUILT" PLANS: ONE TO VOLUSIA COUNTY TRAFFIC ENGINEERING AND ONE FOR THE TRAFFIC SIGNAL CONTROLLER CABINET.
10. THESE PLANS REFLECT CONDITIONS KNOWN DURING PLAN DEVELOPMENT. IN THE EVENT ACTUAL PHYSICAL CONDITIONS PREVENT THE APPLICATION OR THE PROGRESSION OF ANY WORK SPECIFIED IN THESE PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY AND PRIOR TO ANY FURTHER WORK ACTIVITY.
11. AT NO TIME IS THE CONTRACTOR TO CHANGE ANY SIGNAL TIMINGS. VOLUSIA COUNTY WILL MAINTAIN ALL SIGNAL TIMINGS BEFORE, DURING AND AFTER CONSTRUCTION. IF ANY TIMING CHANGES ARE MADE BY THE CONTRACTOR, A TIMING SHEET SHALL BE PLACED IN THE CONTROLLER CABINET WITH DATE AND TIME OF INSTALLING, ALONG WITH A CONTACT NUMBER.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING THE EXISTING POWER UTILITY TO DETERMINE IF A SERVICE PROCESSING FEE IS REQUIRED. IF REQUIRED, FEE SHALL BE INCLUDED AS PART OF PAYMENT FOR THE ELECTRICAL POWER SERVICE ASSEMBLY.
13. THE CONTRACTOR SHALL HAVE AN I.M.S.A. LEVEL II SIGNAL TECHNICIAN ON SITE THROUGH ALL PHASES OF CONSTRUCTION AND ON CALL WITH A TWO-HOUR MAX. RESPONSE TIME.
14. UNLESS OTHERWISE STATED, ELEVATIONS LISTED IN THESE PLANS WERE DERIVED FROM ROD READINGS.

SIGNS:

1. LED INTERNALLY ILLUMINATED STREET NAME SIGNS SHALL HAVE A SEPARATE POWER BREAKER, NOT LOCATED IN THE CONTROLLER CABINET.
2. LED INTERNALLY ILLUMINATED STREET NAME SIGNS SHALL BE SINGLE SIDED AND FACE MOUNTED ON THE PROPOSED HANGING ARMS.

SIGNALS:

1. BLACK POLYCARBONATE HOUSINGS ARE REQUIRED FOR VEHICULAR AND PEDESTRIAN SIGNAL HEAD ASSEMBLIES IN VOLUSIA COUNTY. ALL VEHICLE SIGNAL DISPLAYS SHALL BE LED. ALL SIGNAL HEADS SHALL INCLUDE TUNNEL VISORS AND BACKPLATES WITH REFLECTIVE BORDERS.
2. ALL SIGNAL ASSEMBLES SHALL HAVE A VERTICAL CLEARANCE OF 17.5' MINIMUM AND 19.0' MAXIMUM FROM THE BOTTOM OF THE ASSEMBLY TO THE ROAD.

POLES / PEDS/ CONTROLLER:

1. THE CONTRACTOR SHALL STAKE ALL POLE LOCATIONS PRIOR TO SETTING AND HAVE THE POLE LOCATIONS FIELD CHECKED BY VOLUSIA COUNTY TRAFFIC ENGINEERING. NOTIFY THOMAS EDWARDS (386) 736-5968 FOR FIELD CHECK AND POLE LOCATION APPROVAL.
2. ALL UNDERGROUND CONDUIT ENTRY HOLES ON SIGNAL POLES SHALL BE STUBBED OUT.
3. DUE TO THE CLOSE PROXIMITY OF UNDERGROUND UTILITIES, THE CONTRACTOR SHALL HAND DIG THE FIRST (4) FOUR FEET OF ANY POLE FOUNDATION.
4. NO POWER SERVICE EQUIPMENT WILL BE ALLOWED TO BE MOUNTED ON THE TRAFFIC SIGNAL CONTROLLER CABINET.
5. A MANUAL PUSH BUTTON CORD SHALL BE FURNISHED IN ALL TRAFFIC SIGNAL CONTROLLER CABINETS.
6. TWO SPARE CABINET CONDUITS SHALL BE STUBBED OUT AND CAPPED IN EACH TRAFFIC SIGNAL CABINET ENTRY PULL BOX.
7. THE CONTROLLER BASE SHALL BE A MONOLITHIC POUR WITH A 4" MINIMUM/ 8" MAXIMUM ABOVE FINISHED GRADE. THE SERVICE PAD SHALL BE A SEPARATE CONCRETE PAD WITH A MINIMUM OF 4" THICKNESS. PROVIDE A SEALED 1/2" EXPANSION JOINT BETWEEN THE SERVICE PAD AND CONTROLLER BASE.
8. THE PROPOSED CONTROLLER ASSEMBLY SHALL BE NEMA TS2 TYPE V1 CABINET WITH A TS2 TYPE 2 ECONO LITE CONTROLLER (COLBALT) (2100) AND SHALL INCLUDE BACKUP INTERNAL TIME-BASED COORDINATION. THE CONTROLLER ASSEMBLY SHALL ALSO INCLUDE CONNECTION TO A UPS ECONOLITE (1000-WATT DOUBLE CONVERSION) BACKUP SYSTEM TO BE INTERNAL TO THE CONTROLLER CABINET, EXPRESS SUPPLY 8042 V3 PLUS NETWORK SWITCH, INTERFACE PANEL, FIBER OPTIC TRANSCEIVER MODULE AND ALL NECESSARY EQUIPMENT FOR A COMPLETE OPERATIONAL AND ACCEPTABLE INSTALLATION (670-5-110). ALSO, CONTROLLER CABINETS SHALL REQUIRE A GENERATOR HOOKUP BOX EXTERNAL TO THE CABINET, WIC, OR FIBER ENCLOSURE AND ECONOLITE 4G WIRELESS FOR COMMUNICATION.
9. CONTRACTOR TO ENSURE THAT A 4FT. X 4FT. FLAT LANDING AREA IS ADJACENT TO ALL PED BUTTONS FOR PEDESTRIANS.
10. PEDESTRIAN HEADS SHALL BE COUNTDOWN LED MODULAR WITH INTERNATIONAL SYMBOLS.

LOOPS/ CONDUIT/ PULL BOXES/ VIDEO DETECTION:

1. ALL CONDUIT SHALL BE 2" MINIMUM DIAMETER UNLESS OTHERWISE SPECIFIED IN THE PLANS. ABOVEGROUND CONDUIT SHALL BE 2" RIGID GALVANIZED STEEL, UNLESS OTHERWISE INDICATED. UNDERGROUND CONDUIT SHALL BE SCHEDULE 40 BURIED AT 36" MINIMUM DEPTH, UNLESS OTHERWISE INDICATED.
2. SIDE STREET AND LEFT TURN DETECTION ZONES SHALL BE CENTERED IN THE LANE AND SHALL BE EXTENDED 5' BEYOND THE STOP BAR.
3. WHEN MULTIPLE RUNS OF CONDUIT ARE PLACED UNDER PAVEMENT BY DIRECTIONAL BORE, JACKING OR TRENCHING, ONLY ONE RUN IS PAID FOR AS DIRECTIONAL BORE. ADDITIONAL RUNS ARE TO BE PAID FOR AS UNDERGROUND CONDUIT.
4. AS DIRECTED BY THE PROJECT ENGINEER, THE CONTRACTOR SHALL ADJUST CONDUIT VERTICALLY TO AVOID ANY POSSIBLE CONFLICTS WITH UNDERGROUND UTILITIES.
5. PULL BOXES SHALL NOT BE LOCATED AT THE BOTTOM OF ANY DITCH OR RETENTION AREA/POND.
6. ALL ENDS OF CONDUITS IN PULL BOXES AND CABINETS SHALL BE SEALED WITH ELECTRICAL PUTTY AFTER WIRING IS COMPLETE.
7. TRAFFIC SIGNAL PULL BOXES SHALL BE COMPOSITE AND THE COVERS SHALL BE FDOT APPROVED OF NON-METALLIC CONSTRUCTION WITH RECESSED COVER LOGO "TRAFFIC SIGNALS" (QUAZITE 1324 BK., 1212BA OR EQUAL).
8. ALL PULL BOXES AND FIBER BOXES SHALL HAVE A CONCRETE APRON AROUND THE PULL BOX PER FDOT SPECIFICATIONS.

SIGNAL CABLE:

1. IF A CONTINUOUS RUN OF SIGNAL CABLE IS NOT POSSIBLE FROM THE CABINET TO THE SIGNAL HEAD, THEN A SPLICE WITH ORD WATERPROOF CONNECTORS SHALL BE USED AT THE HAND HOLE, NOT A TERMINAL STRIP - MARK PHASING ON WIRES.
2. THE PROPOSED SIGNAL CABLE SHALL INCLUDE SUFFICIENT CONDUCTORS FOR FUTURE LEFT TURN PHASES.

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

TMC Traffic & Mobility Consultants
TRAFFIC & MOBILITY CONSULTANTS LLC
3101 MAGUIRE BLVD, SUITE 265
ORLANDO, FL 32803
OFFICE: (407) 531-5332
FAX: (407) 531-5331
JEREMY N. CROWE, P.E. 77064
CERTIFICATE OF AUTHORIZATION: 30024

Volusia County

GENERAL NOTES

SHEET NO. F-7 T-4

POWER SERVICE:

1. THE MAIN SERVICE DISCONNECT ENCLOSURE AND THE LOAD CENTER ENCLOSURE LOCATED ADJACENT TO THE CONTROLLER CABINET SHALL BE NEMA 3R OR BETTER RATED.
2. ABOVEGROUND CONDUIT USED FOR ELECTRIC SERVICE SHALL BE RIGID GALVANIZED STEEL OR RIGID ALUMINUM CONDUIT 2" MIN. FOR POWER SERVICE WIRES AND A 3/4" MIN. FOR GROUNDING ELECTRODE CONDUCTORS.
3. ANTI-CORROSIVE PASTE SHALL BE USED ON ALL ELECTRIC SERVICE CONNECTIONS.
4. ELECTRICAL SERVICE INSTALLATIONS MUST CONFORM WITH THE MOST RECENT VERSION OF THE NATIONAL ELECTRIC CODE (NEC), FDOT SPECIFICATIONS, AND POWER UTILITY COMPANY REQUIREMENTS.

UTILITIES:

1. THE LOCATION(S) OF THE UTILITIES SHOWN IN THE PLANS (INCLUDING THOSE VV, VH, VVH) ARE BASED ON LIMITED INVESTIGATION TECHNIQUES AND SHOULD BE CONSIDERED APPROXIMATE ONLY; THE VERIFIED LOCATIONS/ELEVATIONS APPLY ONLY AT THE POINT SHOWN. INTERPOLATIONS BETWEEN THESE POINTS HAVE NOT BEEN VERIFIED.
2. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING ANY UTILITY OWNER(S) THAT MAY OR MAY NOT BE A "SUNSHINE ONE-CALL" MEMBER IN ORDER TO COORDINATE UTILITY MARKING AND LOCATING AT A MINIMUM OF TWO DAYS PRIOR TO DIGGING. IT SHOULD BE NOTED THAT VOLUSIA COUNTY TRAFFIC ENGINEERING IS NOT A MEMBER OF "SUNSHINE ONE-CALL" AND THAT SEPARATE CONTACT WILL NEED TO BE MADE IN ORDER TO OBTAIN UTILITY LOCATE INFORMATION FOR VOLUSIA COUNTY TRAFFIC ENGINEERING FACILITIES.

BELOW IS A LIST OF UTILITY OWNERS NOTIFIED ON 06/08/2021:

COMPANY	CONTACT	TELEPHONE #
ATT	STEVE HAMER	813-888-8300
CENTURYLINK	BILL MCCLOUD	850-599-1444
CITY OF DELAND	RAYMOND BAHRAMI	386-626-7189
DUKE ENERGY	STEPHANIE OLMO	407-905-3376
FL PUBLIC UTILITIES	COLIN DUNN	386-785-4554
CENTURY LINK	NETWORK RELATIONS	877-366-8344
VOLUSIA COUNTY WATER & UTILITY SERVICE	EARL FARMER	251-753-8695
VOLUSIA COUNTY TRAFFIC ENGINEERING	ALLEN CATES	386-736-5968

VOLUSIA COUNTY USE PERMIT NOTES:

1. NOTIFY VOLUSIA COUNTY DEVELOPMENT ENGINEERING OFFICE AT (386) 736-5926 ONE BUSINESS DAY PRIOR TO BEGINNING ANY PERMITTED WORK BEFORE ANY CHANGES FROM APPROVED PLANS AND WHEN COMPLETED.
   A. ALL ROAD/LANE CLOSURES "ARE SEPARATE FROM THE PERMIT" AND REQUIRE PLAN REVIEW AND APPROVAL WITH 7 DAY ADVANCE NOTICE FROM VOLUSIA COUNTY TRAFFIC OPERATIONS AT (386) 239-6535 PRIOR TO ANY CLOSURES. MOT IS REQUIRED ON ALL PROJECTS.
   B. ALL TRAFFIC & PEDESTRIAN SIGNALS (& SURROUNDING AREAS), "ARE NOT" A MEMBER OF SUNSHINE ONE CALL. LOCATES MUST REQUESTED /LOCATED FROM VOLUSIA COUNTY TRAFFIC ENGINEERING AT (386) 736-5968.
   C. THE VOLUSIA COUNTY -STAMPED "APPROVED" PERMIT PLANS MUST BE ONSITE AT ALL TIMES.
   D. NO TRENCH/EXCAVATIONS SHALL BE LEFT OPEN OR UNATTENDED OVERNIGHT.
   E. SOD ALL DISTURBED AREAS.
   F. CONTRACTOR IS RESPONSIBLE FOR PRE/POST CONSTRUCTION VIDEO/PHOTOS OF EXISTING ROADWAYS, DRIVEWAYS, SIDEWAYS, DITCH SWALES, CULVERTS AND ABOVE GROUND UTILITIES.
2. OPERATIONS WITHIN THE COUNTY RIGHT-OF-WAY SHALL NORMALLY BE CONDUCTED FROM 7:00 AM TO 7:00 PM, MONDAY THROUGH FRIDAY. ANY DEVIATION FROM THESE HOURS REQUIRES PRIOR APPROVAL FROM THE COUNTY DEVELOPMENT ENGINEER. EMERGENCY REPAIRS ARE EXCLUDED FROM THIS TIME RESTRICTION.
3. ALL EXISTING SIDEWALKS WITHIN COUNTY RIGHT -OF-WAY SHALL EITHER REMAIN OPEN OR BE PROVIDED A TEMPORARY WALKWAY IN ACCORDANCE WITH THE CURRENT VERSION OF FLORIDA DEPARTMENT OF TRANSPORTATION STANDARD INDEX NO. 102-660. ANY DAMAGE TO SIDEWALKS SHALL BE REPAIRED AND/OR REPLACED IN LIKE KIND BY THE CONTRACTOR. NEW SIDEWALKS AND SECTIONS THROUGH DRIVEWAYS MUST BE AT LEAST A 1.5% CROSS SLOPE AND 2% MAXIMUM CROSS SLOPE PER ADA STANDARDS.
4. DRIVING OR STAGING OF CONSTRUCTION VEHICLES OR MATERIALS IS NOT PERMITTED WITHIN THE COUNTY RIGHT-OF-WAY OR ON PEDESTRIAN WALKWAYS AND PATHS. THERE SHALL BE NO OVERNIGHT CONSTRUCTION VEHICLE RELATED PARKING, CONSTRUCTION MATERIAL PLACEMENT, OR STORAGE OF ANY KIND PERMITTED WITHIN THE COUNTY RIGHT-OF-WAY.

PAY ITEM NOTES:

660-3-XX: VENDOR AND DEVICE CONTRACTOR ARE TO USE RADAR DETECTION PROVIDED BY WAVETRONIX AS APPROVED BY VOLUSIA COUNTY. RADAR DETECTOR SHALL BE POLE MOUNTED AND NOT SPAN MOUNTED.

665-1-11: THE PEDESTRIAN DETECTOR MUST INCLUDE THE FURNISHING AND INSTALLING OF THE FTP-68B-06 SIGNS.

670-5-112: THIS PAY ITEM INCLUDES BOTH THE CONTROLLER ELECTRONICS AND THE CABINET. THE CONTRACTOR MUST INSTALL AN ECONOLITE CONTROLLER WITH UPS AND 4G WIRELESS CAPABILITY.

700-5-22: ALL INTERNALLY ILLUMINATED SIGNS INCLUDE STREET NAME SIGN PANELS. THE CANTILEVER ARM AND ALL MOUNTING HARDWARE IS INCLUDED IN THE PAY ITEM. THE SUPPORT STRUCTURE (CONCRETE POLE) IS PAID SEPERATELY.

715-5-32: THIS PAY ITEM INCLUDES THE BRACKET ARM, LUMINAIRE WITH LAMP AND ALL NECESSARY MOUNTING HARDWARE AS PER THE PLANS AND INDEXES. THE CONTRACTOR MUST FURNISH AND INSTALL GE EVOLVE LED STREET LIGHT OR AN EQUIVALENT VENDOR AS APPROVED BY VOLUSIA COUNTY TRAFFIC ENGINEERING.

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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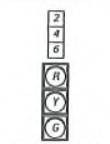
FAX: (407) 531-5331
JEREMY M. CROWE, P.E. 77064
CERTIFICATE OF AUTHORIZATION: 30074

Volusia County FLORIDA

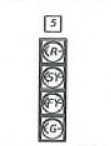
GENERAL NOTES

SHEET NO. F-8 T-5

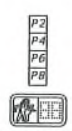
TRAFFIC SIGNAL HEAD DETAILS



3-SECT., 1-WAY
6 AS
650-1-14



4-SECT., 1-WAY
1 AS
650-1-16



PED. SIGNAL
COUNT-DOWN
1-SECT., 1-WAY
8 AS



FTP-68B-06
9"X18"
8 EA
(INCLUDED IN
665-1-11)

FUTURE TRAFFIC SIGNAL HEAD DETAILS

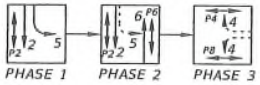


3-SECT., 1-WAY
2 AS



4-SECT., 1-WAY
3 AS

S.O.P. 2 (MOD)



PHASE 1 PHASE 2 PHASE 3



660-3-12 6 EA

INTERNALLY ILLUMINATED
OVERHEAD SIGNS (SINGLE-SIDED FACE MOUNTED)
N.T.S



700-5-22 2 EA



700-5-22 2 EA

RADAR DETECTION CONNECTION CHART

CAMERA DETECTION	DETECTION ZONE	DELAY TIME (SEC)	DETECTION ZONE DIMENSION
R1	DZ-2	-	6' X 330'
	DZ-5	-	6' X 40'
R2	DZ-6	-	6' X 40'
	DZ-6R	5	6' X 40'
R3	DZ-4R	5	6' X 330'
	DZ-4	-	6' X 40'
R4	DZ-6	-	6' X 330'
R5	DZ-5	-	6' X 40'
	DZ-2	-	6' X 40'
R6	DZ-4R	5	6' X 40'
	DZ-4	-	6' X 40'

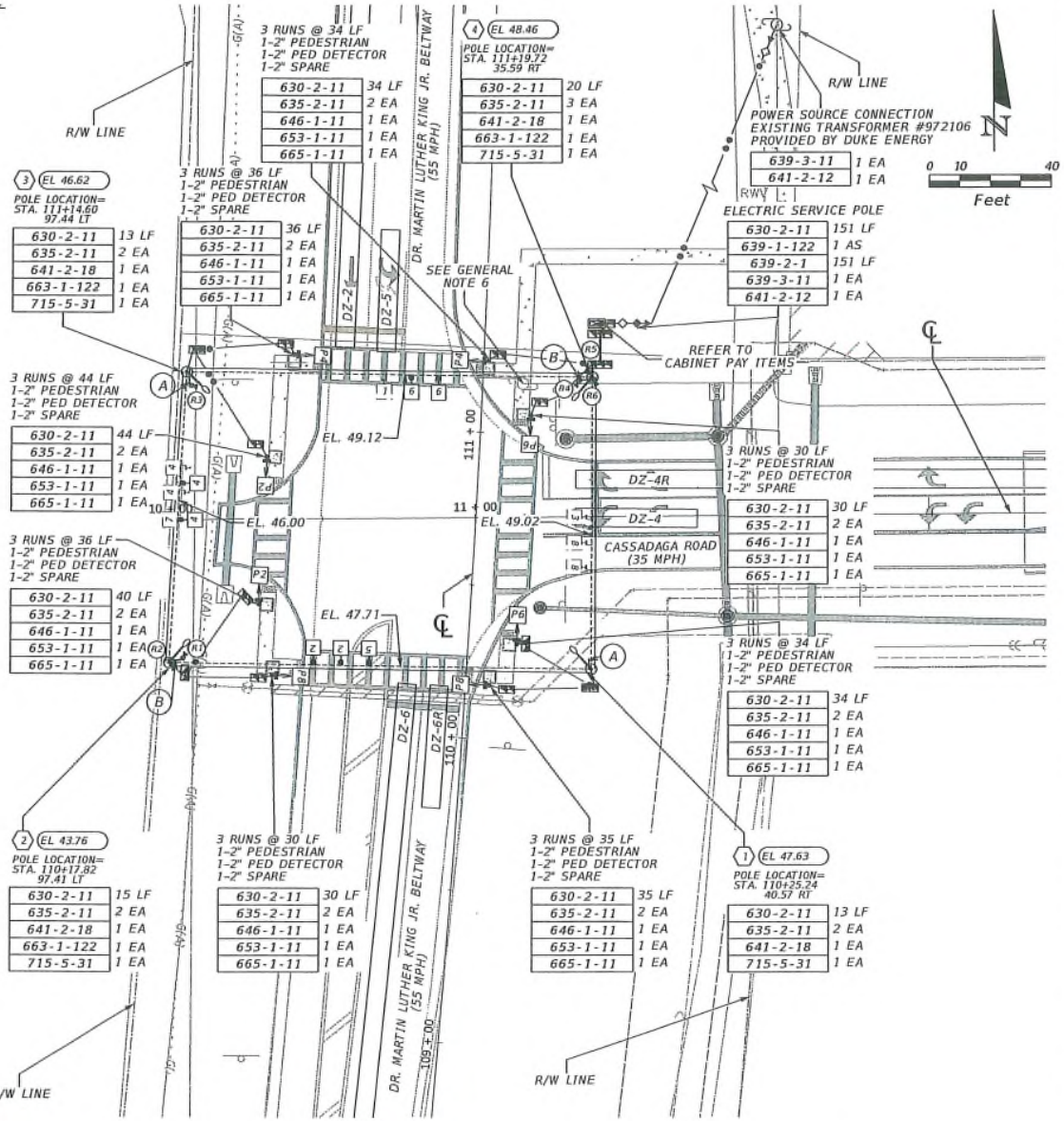
SIZE AND PLACEMENT OF RADAR DETECTION ZONES ARE INITIAL AND MAY REQUIRE FIELD ADJUSTING AS DIRECTED BY PROJECT ENGINEER

CONTROLLER TIMINGS

TIMING FUNCTION / DIRECTION		SBT	WBL/WBR	SBL	NBT	PED
	MOVEMENT NUMBER	2	4	5	6	P8
TIMING FUNCTION	MINIMUM GREEN	10	7	5	10	-
	EXTENSION	3.0	3.0	3.0	3.0	-
	MAXIMUM GREEN 1	70	50	30	70	-
	MAXIMUM GREEN 2	-	-	-	-	-
	YELLOW CLEARANCE	5.5	4.0	5.5	5.5	-
	ALL RED	2.0	2.8	2.0	2.0	-
	PEDESTRIAN WALK	7	7	-	7	7
	PED. CLEARANCE	9	15	-	17	17
	RECALL	MIN	-	-	MIN	-
	FLASH	Y	R	R	Y	-

CABINET PAY ITEMS
7 RUNS @ 16 LF
1-2" GROUND
1-2" LIGHTING
1-2" PEDESTRIAN
1-2" PED DETECTOR
1-2" RADAR
1-2" SIGNAL
1-2" SPARE

630-2-11	16 LF
632-7-1	1 PI
634-4-153	1 PI
635-2-11	4 EA
660-3-11	1 EA
663-1-121	1 EA
670-5-112	1 AS
684-1-1	1 EA
684-6-12	1 EA
685-1-11	1 EA



GENERAL NOTES

1. THE MAJOR STREET IS DR. MARTIN LUTHER KING JR. BELTWAY (SPEED LIMIT 55 MPH). THE MINOR STREET IS CASSADAGA ROAD (SPEED LIMIT 35 MPH). THE MAJOR STREET MOVEMENTS ARE 2,5 AND 6, AND THE MINOR STREET MOVEMENT IS 4.
2. DURING FLASH OPERATION, MOVEMENTS 4 AND 5 SHALL FLASH RED, MOVEMENTS 2 AND 6 SHALL FLASH YELLOW.
3. CONTRACTOR TO COORDINATE WITH POWER COMPANY FOR CONNECTION TO POWER SERVICE.
4. THE FUTURE SIGNAL HEAD PLACEMENT FOR THE MAJOR STREET (MOVEMENT 1) AND MINOR STREET (MOVEMENTS 3,7 & 8) TO BE INSTALLED UPON CONSTRUCTION OF THE WEST LEG OF THE INTERSECTION.
5. THE FUTURE LANE CONFIGURATION FOR THE NEW WEST LEG (MOVEMENTS 3 & 8) WAS ASSUMED TO MIRROR CASSADAGA ROAD (EXCLUSIVE LEFT AND A SHARED THROUGH AND RIGHT LANE).
6. PEDESTRIAN SIGNALS OF THE NORTHWEST AND SOUTHWEST CORNERS TO BE ADJUSTED UPON CONSTRUCTION OF THE WEST LEG OF THE INTERSECTION.
7. EXISTING SOLAR STREET LIGHT REMOVAL BY DUKE ENERGY AT THE TIME OF CONSTRUCTION. EXISTING STREET LIGHT TO REMAIN ENERGIZED UNTIL THE NEW LIGHTS ARE OPERATIONAL.
8. MOVEMENT P8 IS TO OVERLAP WITH MOVEMENT P4.
9. MOVEMENT 5 SHALL OMIT THE FLASHING YELLOW PHASE WHILE MOVEMENT P6 IS ACTIVE.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

TMC Traffic & Mobility Consultants
TRAFFIC & MOBILITY CONSULTANTS LLC
3101 MAGUIRE BLVD, SUITE 265
ORLANDO, FL 32803
OFFICE: (407) 331-5332
FAX: (407) 331-5331
JEREMY N. CROWE, P.E. 77064
CERTIFICATE OF AUTHORIZATION: 30024

Volusia County

SIGNALIZATION PLAN

SIGNAL NO. 471

SHEET NO. F-9 / T-6

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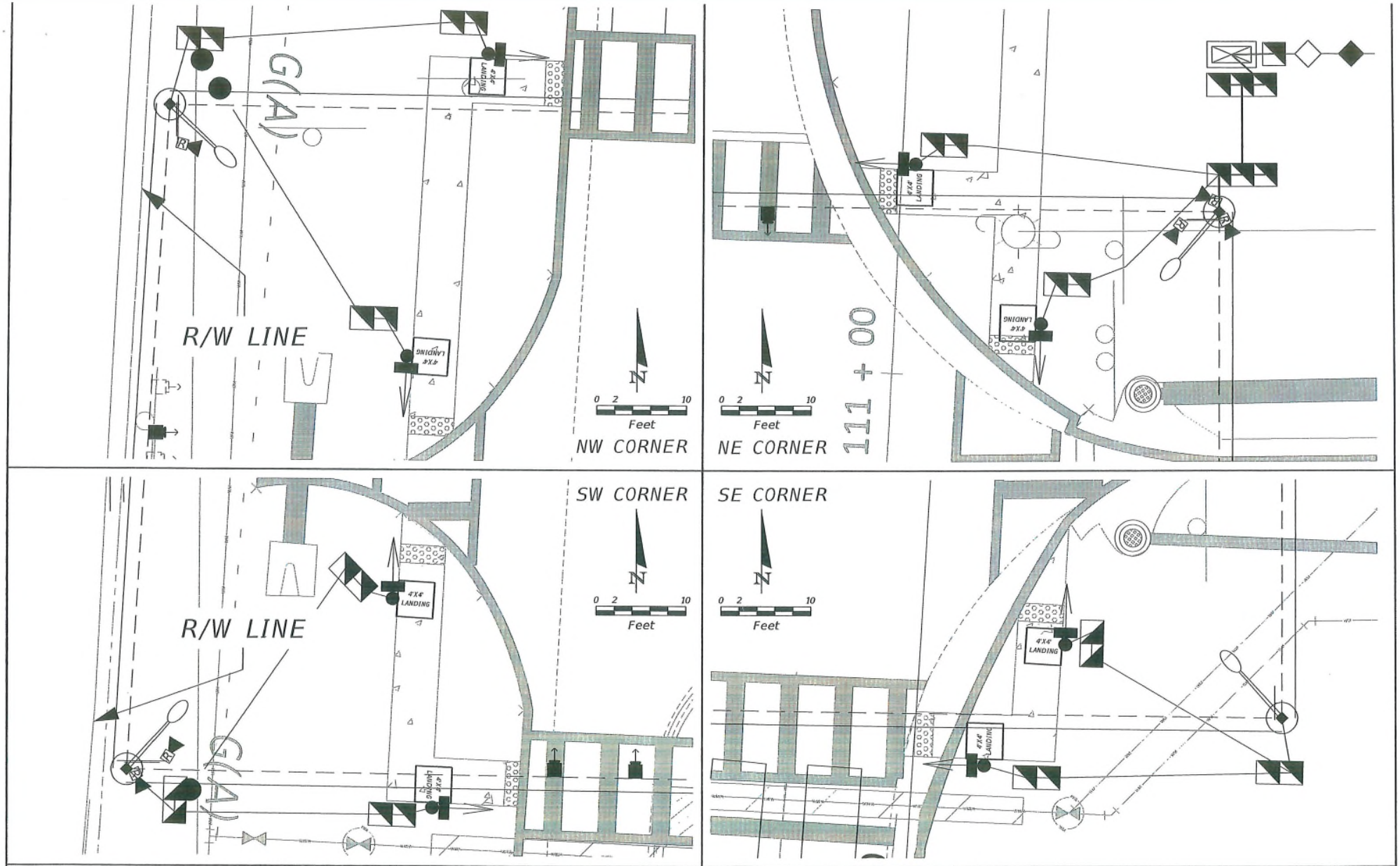

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

TRAFFIC & MOBILITY CONSULTANTS LLC
3101 MAGUIRE BLVD, SUITE 265
ORLANDO, FL 32803
OFFICE: (407) 531-5332
FAX: (407) 531-5331
JEREMY M. CROWE, P.E. 77064
CERTIFICATE OF AUTHORIZATION- 30024

Volusia County

CORNER CLIPS

SHEET NO. E-10 T-7

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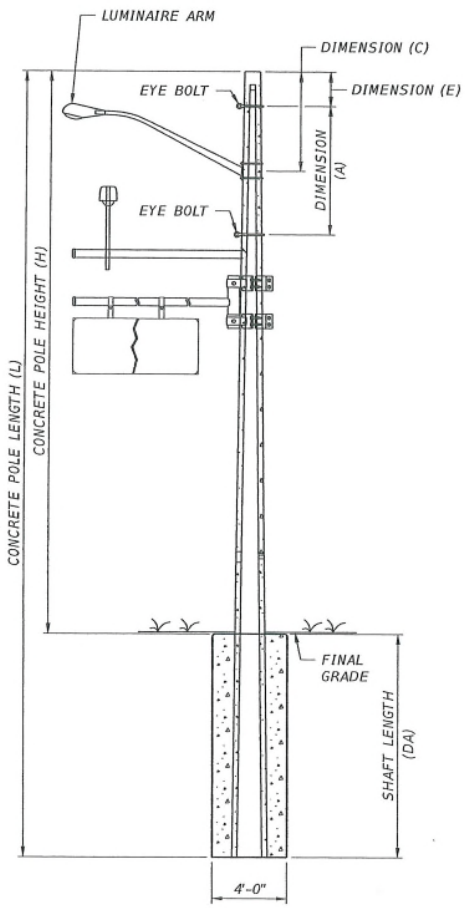
STRAIN POLE SCHEDULE

ID NO.	SHEET NO.	POLE LOCATION		FINAL GRADE ELEVATION	CROWN ELEVATION	POLE TYPE	POLE LENGTH (L)	POLE HEIGHT (H)	DIMENSION (A)	DIMENSION (C)	DIMENSION (E)	SHAFT LENGTH (DA)
		STATION	OFFSET									
1	T-6	110+25.24	40.57' RT	47.63	47.71	P-VIII	50.00	33.07	6.53	4.27	1.00	16.93
2	T-6	110+17.82	97.41' LT	43.76	46.00	P-VIII	54.00	36.94	6.53	4.27	1.00	17.06
3	T-6	111+14.60	97.44' LT	46.62	49.12	P-VIII	52.00	35.03	6.53	4.27	1.00	16.97
4	T-6	111+19.72	35.59' RT	48.46	49.02	P-VIII	50.00	33.19	6.53	4.27	1.00	16.81



CONCRETE STRAIN POLE DIMENSIONS
TYPES P-III THROUGH P-VIII

NOTES:

1. SIGNED AND SEALED CALCULATIONS AND SHOP DRAWINGS FOR THE LUMINAIRE ARM ATTACHMENT TO THE POLE DETAILS MUST BE PROVIDED. THE DRAWINGS AND CALCULATIONS MUST BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF FLORIDA. LUMINAIRE ATTACHMENT MUST BE THROUGH BOLTED.
2. WORK THIS SHEET WITH INDEX 641-010.
3. MESSENGER AND CATENARY WIRE DIAMETER SHALL BE 1/2".
4. DESIGN OF THE STRAIN POLES, WIRES, AND FOUNDATIONS ARE BASED ON A DESIGN WIND SPEED OF 140 MPH, IN ACCORDANCE WITH THE JANUARY 2021 FDOT STRUCTURES MANUAL.
5. DESIGN OF THE FOUNDATIONS IS BASED ON BORINGS TAKEN 08/03/21, SEALED BY GEO-TECHOLOGY ASSOCIATES, INC. THE FOLLOWING ASSUMED SOIL PROPERTIES ARE USED IN DESIGN:
   SOIL TYPE = COHESIONLESS
   SOIL LAYER THICKNESS = 30 FT.
   SOIL FRICTION ANGLE = 30 DEG. (POLE 1), 29 DEG. (POLES 2-4).
   SOIL EFFECTIVE UNIT WEIGHT = 50 PCF (POLES 1-4).
   SOIL SPT N-VALUE = 13 BLOWS/FT (POLE 1), 5 BLOWS/FT (POLES 2-3), 6 BLOWS/FT (POLE 4).
   DESIGN WATER TABLE IS 0 FT. BELOW SURFACE

Designed By : ADB 09-21
Drawn By : BSW 08-21

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REVISIONS

DATE	DESCRIPTION	DATE	DESCRIPTION

MICHAEL L. HEBERT, P.E.
P.E. LICENSE NUMBER 50596
FBT-FLORIDA BRIDGE AND TRANSPORTATION, INC.
633 DARTMOUTH STREET
ORLANDO, FL 32804
(407) 513-9709

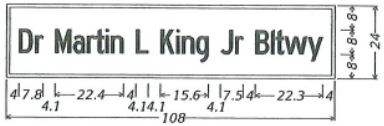
Volusia County
FLORIDA

STRAIN POLE SCHEDULE

SHEET NO.
T-8

SIGN NUMBER	A
QUANTITY	2
WIDTH	9'-0"
HEIGHT	2'-0"
BORDER WIDTH	1"
BORDER RADII	0"
BACKGROUND COLOR	3M EC GREEN
LEGEND & BORDER COLOR	3M 490T WHITE
STATION(S)	N/A

NOTES:
1. SIGNS SHALL BE SINGLE SIDED AND FACE MOUNTED ON CANTILEVER ARMS

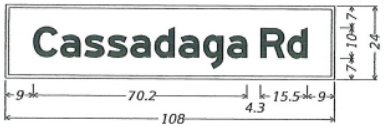


0" Radius, 1.0" Border, White on Green;
"Dr Martin L King Jr Bltwy", C 2K specified length;
Table of distances between letter and object lefts

	D	r	M	a	r	t	i	n	L	
4.0	5.2	6.7	5.9	4.5	2.8	3.3	1.8	8.1	4.1	
		K	i	n	g	J	r			
	4.1	5.0	1.9	4.6	8.2	4.9	2.6			
		B	l	t	w	y				
	4.0	5.1	1.6	3.0	7.6	5.0	4.0			

SIGN NUMBER	B
QUANTITY	2
WIDTH	9'-0"
HEIGHT	2'-0"
BORDER WIDTH	1"
BORDER RADII	0"
BACKGROUND COLOR	3M EC GREEN
LEGEND & BORDER COLOR	3M 490T WHITE
STATION(S)	N/A

NOTES:
1. SIGNS SHALL BE SINGLE SIDED AND FACE MOUNTED ON CANTILEVER ARMS



0" Radius, 1.0" Border, White on Green;
"Cassadaga Rd", E Mod 2K specified length;
Table of distances between letter and object lefts

	C	a	s	s	a	d	a	g	a	R	d	
9.0	8.9	7.9	7.4	7.6	7.9	8.0	7.9	8.0	10.9	8.9	6.6	9.0

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REVISIONS

DATE	DESCRIPTION	DATE	DESCRIPTION

TMC Traffic & Mobility Consultants

TRAFFIC & MOBILITY CONSULTANTS LLC
3101 MAGUIRE BLVD, SUITE 265
ORLANDO, FL 32803
OFFICE: (407) 531-5332
FAX: (407) 531-5331
JEREMY M. CROWE, P.E. 77064
CERTIFICATE OF AUTHORIZATION: 30024

Volusia County FLORIDA

GUIDESIGN WORKSHEET

SHEET NO. E-12 T-9

LOG OF BORING NO. MA-01

SAMPLE NUMBER	N (blows/Ft.)	DEPTH (Ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
S-1	5	0	SP		Brown, dry, loose, fine Poorly Graded SAND, trace Organics.	
S-2	5				Same, Light Brown	
S-3	4				Same, Brown	
S-4	25	6			Same, medium dense	
S-5	19					
S-6	10	12			Same, loose	
S-7	16	18	SP-SM		Brown to Orange, moist, medium dense, fine Poorly Graded SAND with Silt.	
S-8	10	24			Same, Light Gray, loose	M/C = 15% F/C = 26%
S-9	15	30			Same, Brown to Light Brown, medium dense	

Boring terminated at 30 feet.

LOG OF BORING NO. MA-02

SAMPLE NUMBER	N (blows/Ft.)	DEPTH (Ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
S-1	14	0	SP-SM		Brown, dry, medium dense, fine Poorly Graded SAND with Silt, trace Organics.	
S-2	17		SP		Brown, dry, medium dense, fine Poorly Graded SAND, trace Organics.	
S-3	6	6			Same, loose	
S-4	3				Same, very loose	
S-5	5				Same, loose	
S-6	8	12	SC		Brown, dry, loose, Clayey SAND.	M/C = 18% F/C = 34%
S-7	10	18	SP		Light Gray, dry, loose, Poorly Graded SAND.	
S-8	11	24	SP-SM		Gray to Orange, dry, medium dense, fine Poorly Graded SAND with Silt.	
S-9	26	30				

Boring terminated at 30 feet.

LOG OF BORING NO. MA-03

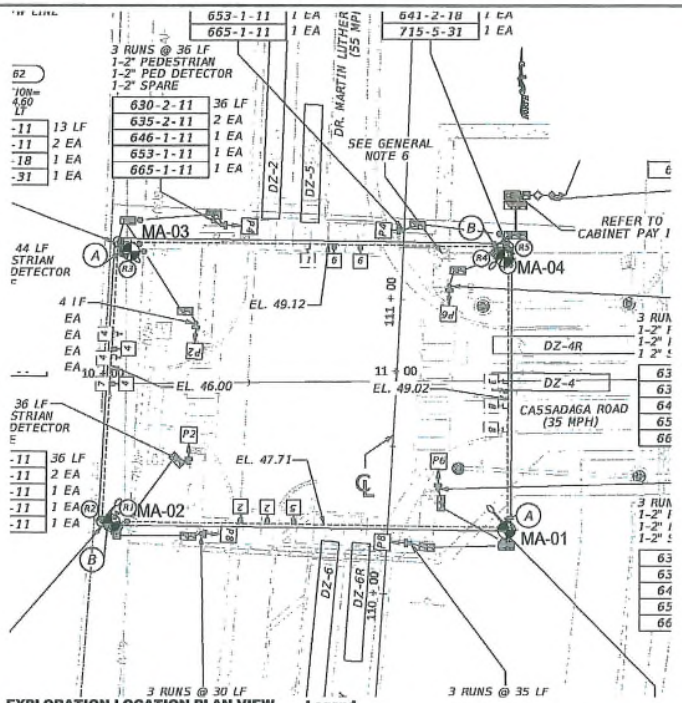
SAMPLE NUMBER	N (blows/Ft.)	DEPTH (Ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
S-1	10	0	SP-SM		Brown, dry, loose, fine Poorly Graded SAND with Silt, trace Asphalt Fragments and Organics.	
S-2	14		SP		Brown, dry, medium dense, fine Poorly Graded SAND, trace Organics.	
S-3	8				Same, Light Brown, loose	
S-4	4	6			Same, very loose	
S-5	4					M/C = 3% F/C = 1%
S-6	9	12	SP-SM		Brown to Orange, moist, loose, fine Poorly Graded SAND with Silt.	
S-7	9	18	SP		Light Gray, moist, loose, fine Poorly Graded SAND.	
S-8	10	24	SP-SM		Gray to Orange, moist, loose, fine Poorly Graded SAND with Silt.	
S-9	24	30			Same, medium dense	

Boring terminated at 30 feet.

LOG OF BORING NO. MA-04

SAMPLE NUMBER	N (blows/Ft.)	DEPTH (Ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
S-1	5	0	SP		Brown, dry, loose, fine Poorly Graded SAND, trace Organics.	
S-2	5				Same, Light Brown to Brown	
S-3	7					M/C = 9% F/C = 1%
S-4	22	6			Same, medium dense	
S-5	19					
S-6	10	12			Same, loose	
S-7	13	18	SP-SM		Brown to Orange, dry, medium dense, Poorly Graded SAND with Silt.	
S-8	11	24			Same, Light Gray	
S-9	14	30			Same, Brown to Light Gray	

Boring terminated at 30 feet.



EXPLORATION LOCATION PLAN VIEW

Scale: 1" = 20'

Base image was adapted from the Signalization Plan, Signal No. 471, undated, and prepared by Traffic & Mobility Consultants, LLC (Original scale 1" = 40').

Legend

MA-01 Identification and approximate location of Standard Penetration Test (SPT) boring performed by Geo-Technology Associates, Inc. (GTA) subcontractor in August of 2021.

Notes

1. Exploration locations were selected by GTA and staked in the field by AWK Consulting Engineers, Inc. using an instrumented survey. Exploration locations should be considered accurate only to the degree implied by the method used.

Key to Boring Logs

M/C NATURAL MOISTURE CONTENT (%)

F/C FINES CONTENT (%)

SP USCS GROUP SYMBOL BASED ON VISUAL OBSERVATION AND LABORATORY TEST

SAND AND SANDY SOILS	CLEAN SANDS (LESS THAN 15% PASSING THE NO. 200 SIEVE)	SW	Well-Graded SAND
		SP	Poorly Graded SAND
MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINES (MORE THAN 15% PASSING THE NO. 200 SIEVE)	SM	Silty SAND
		SC	Clayey SAND

COARSE-GRAINED SOILS (GRAVEL AND SAND)

DESIGNATION	BLOWS PER FOOT (BPF) N
VERY LOOSE	0-4
LOOSE	5-10
MEDIUM DENSE	11-30
DENSE	31-50
VERY DENSE	>50

NOTE: "N" VALUE DETERMINED AS PER ASTM D 1586

GEO-TECHNOLOGY ASSOCIATES, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
4617 PARKBREEZE COURT
ORLANDO, FLORIDA 32808
(321) 482-4239
www.gteeng.com
© Geo-Technology Associates, Inc.

SHEET NO. B-1

STRAIN POLES
MLK BELTWAY & CASSADAGA ROAD
VOLUSIA COUNTY, FLORIDA

SPT BORING SHEET

F-13

PROJECT: 31211343 | DATE: OCTOBER 2021 | SCALE: AS SHOWN | DRAWN BY: YMR | REVIEW BY: GSP | FIGURE: 2

COUNTY OF VOLUSIA TRAFFIC SIGNAL TIMING SHEET

LOCATION: CR 4101 & Taylor Road
DeLand
ISOLATED: X
DATE: 5/10/2022

SIGNAL #: 446
CO-ORD:
Design By: M. Tobin

System #:

Controller Timing Chart

PHASE	1	2	3	4	5	6	7	8	
DIRECTION	SBL	NB	-	WB	NBL	SB	WBL	EB	
TURN TYPE	PERM/PROT	-	-	-	PERM/PROT	-	PERM/PROT	-	
MIN GREEN	7	17		7	7	17	7	7	
EXTENSION	3	3		3.5	3	3	3	3.5	
CLEARANCE	3.0	5.5		4.0	3.0	5.5	4.0	4.0	
ALL RED	2.0	2.0		2.5	2.0	2.0	2.0	2.5	
WALK	-	-		-	-	-	-	-	
FDW	-	-		-	-	-	-	-	
MAX 1	25	45		30	25	45	20	30	
MAX 2									
DYM MAX				-					
DYM Stp				-					
RECALL	-	MIN		-	-	MIN	-		
DETECTOR	NON-LOCK	LOCK		NON-LOCK	NON-LOCK	LOCK	NON-LOCK	NON-LOCK	
FLASH	YELLOW	YELLOW		RED	YELLOW	YELLOW	YELLOW	RED	
SET	-	2		-	-	2			
CLEAR	-	2		-	-	2			

BASE DAY		1	2	3	4	5	6	7
	TIME	00:01-00:00						
MON #1	PLAN	FREE						
	TIME	00:01-00:00						
TUES#1	PLAN	FREE						
	TIME	00:01-00:00						
WED #1	PLAN	FREE						
	TIME	00:01-00:00						
THU #1	PLAN	FREE						
	TIME	00:01-00:00						
FRI #1	PLAN	FREE						
	TIME	00:01-00:00						
SAT #2	PLAN	FREE						
	TIME	00:01-00:00						
SUN #3	PLAN	FREE						

Crosswalk Length
P2
-
P4
-
P6
-
P8
-

CONTROLLER TYPE		CONDITION OF OVERHEAD	New	PROM NUMBER	SIGNAL OWNER
ASC/3		OVERHEAD STREET NAMES	NO		COUNTY
PHASES:	8Φ	ILLUMINATED STREET NAMES	YES	ECONOLITE 2.62.0	LED YES
CABINET TYPE	V	PRE-EMPTION	NO	IP ADDRESS	
CABINET DATE	6/2015	PRE-EMPTION TYPE	N/A		

REMARKS:

Speed Limit 50 MPH----Taylor R
Speed Limit 55 MPH----MLK Beltway

1	2	3	4
5	6		8

COUNTY OF VOLUSIA TRAFFIC SIGNAL TIMING SHEET

LOCATION: Graves Avenue & CR 4101-Kentucky Av
Orange City
ISOLATED: X
DATE: 10/15/2018

SIGNAL #: 229
CO-ORD:
Design By: Sean Castello

System #: -

Controller Timing Chart

PHASE	1	2	3	4	5	6	7	8
DIRECTION	-	EB	SB	NB	EBL	WB	-	-
TURN TYPE	-	-	SPLIT LEAD	SPLIT LAG	PERM/PROT	-	-	-
MIN GREEN		11	7	7	5	11		
EXTENSION		4	3	3	3	4		
CLEARANCE		5.0	5.0	4.0	4.0	5.0		
ALL RED		2.0	2.0	3.0	2.0	2.0		
WALK		-	-		-			
FDW		-	-		-			
MAX 1		50	50	20	20	50		
MAX 2		-	-	-	-	-		
MAX 3		-	-	-	60	-		
ADJUST		-	-	-	10	-		
RECALL		MIN	-	-	-	MIN		
DETECTOR		LOCK	NON-LOCK	NON-LOCK	NON-LOCK	LOCK		
FLASH		YELLOW	RED	RED	-	YELLOW		
SET		-	-	-		-		
CLEAR		-	-	-		-		

BASE DAY		1	2	3	4	5	6	7
MON #1	TIME	00:01-00:00						
	PLAN	FREE						
TUES#1	TIME	00:01-00:00						
	PLAN	FREE						
WED #1	TIME	00:01-00:00						
	PLAN	FREE						
THU #1	TIME	00:01-00:00						
	PLAN	FREE						
FRI #1	TIME	00:01-00:00						
	PLAN	FREE						
SAT #1	TIME	00:01-00:00						
	PLAN	FREE						
SUN #1	TIME	00:01-00:00						
	PLAN	FREE						

Crosswalk Length
P2
-
P4
-
P6
-
P8
-

CONTROLLER TYPE		CONDITION OF OVERHEAD	New - 2011	PROM NUMBER	SIGNAL OWNER
1880 EL		OVERHEAD STREET NAMES	YES		
PHASES:	8Φ	ILLUMINATED STREET NAMES	NO		
CABINET TYPE	V	PRE-EMPTION	NO	IP ADDRESS	County
CABINET DATE	2017	PRE-EMPTION TYPE	N/A	-	LED YES

REMARKS:

	2	3 & 6R 4
5 & 3R	6	

COUNTY OF VOLUSIA TRAFFIC SIGNAL TIMING SHEET

LOCATION: Graves Ave. @ Veterans Memorial Pkwy
Deltona

FREE: X

DATE: 2/15/2017

SIGNAL #: 350

CO-ORD:

Design By: M. Tobin

NETWORK #: Deltona Area Network # 90

Controller Timing Chart

PHASE	1	2	3	4	5	6	7	8	
DIRECTION	WBL	EB				WB		NB	
TURN TYPE	PERM/PROT	-				-		-	
MIN GREEN	7	11				11		7	
EXTENSION	3	4				4		3	
YELLOW	4.5	4.5				4.5		5.0	
RED CLR	2.5	2.5				2.5		2.0	
WALK		7						7	
PED CLR		27						16	
MAX 1	20	30				30		25	
MAX 2									
MAX 3		-				-			
DYM MAX	35								
DYM STP	10								
RECALL		MIN				MIN			
DETECTOR	NON-LOCK	LOCK				LOCK		NON-LOCK	
FLASH	-	YELLOW				YELLOW		RED	

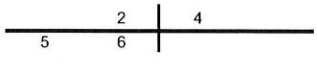
COORDINATION TIMINGS

PATTERN	1	2	3	4	5	6	7	8	
CYCLE				-	-	-	-	-	
OFFSET				-	-	-	-	-	

PHASE	1	2	3	4	5	6	7	8	
PATTERN 1									
PATTERN 2									
PATTERN 3									
PATTERN 4	-	-	-	-	-	-	-	-	
PATTERN 5	-	-	-	-	-	-	-	-	
PATTERN 6	-	-	-	-	-	-	-	-	
PATTERN 7	-	-	-	-	-	-	-	-	

Controller IP		Switch IP		Camera IP	
Controller Gateway		Switch Gateway		Camera Gateway	

REMARKS:



COUNTY OF VOLUSIA TRAFFIC SIGNAL TIMING SHEET

LOCATION: Veterans Memorial Pkwy & Rhode Island Blvd
Orange City ISOLATED: X DATE: 7/14/2017

SIGNAL #: 375 CO-ORD: Design By: M. Tobin

System #: -

Controller Timing Chart

PHASE	1	2	3	4	5	OLA	7	8	
DIRECTION	NBL	SB	-	EB	-	NB	-	-	
TURN TYPE	PERM/PROT	-	-	-	-	-	-	-	
MIN GREEN	5	11		7		11			
EXTENSION	3	4		3		4			
CLEARANCE	5.5	5.5		3.5		5.5			
ALL RED	3.0	3.0		3.0		3.0			
WALK	-	7		7		7			
FDW	-	20		18		20			
MAX 1	15	35		20		35			
MAX 2	-	-		-		-			
MAX 3	-	60		-		-			
ADJUST	-	10		-		-			
RECALL	-	MIN		-		MIN			
DETECTOR	NON-LOCK	LOCK		NON-LOCK		LOCK			
FLASH	-	YELLOW		RED		YELLOW			
SET	-	1		-		-			
CLEAR	-	2		-		-			

BASE DAY		1	2	3	4	5	6	7
MON #1	TIME	00:00-00:00						
	PLAN	FREE						
TUES#1	TIME	00:00-00:00						
	PLAN	FREE						
WED #1	TIME	00:00-00:00						
	PLAN	FREE						
THU #1	TIME	00:00-00:00						
	PLAN	FREE						
FRI #1	TIME	00:00-00:00						
	PLAN	FREE						
SAT #2	TIME	00:00-00:00						
	PLAN	FREE						
SUN #3	TIME	00:00-00:00						
	PLAN	FREE						

Crosswalk Length
P2
70 Feet
P4
63 Feet
P6
-
P8
-
SIGNAL OWNER
County
LED YES

CONTROLLER TYPE		CONDITION OF OVERHEAD	Fair	PROM NUMBER
1880 EL		OVERHEAD STREET NAMES	NO	
PHASES:	4Φ	ILLUMINATED STREET NAMES	NO	92R09
CABINET TYPE	V	PRE-EMPTION	NO	IP ADDRESS
CABINET DATE	05/1998	PRE-EMPTION TYPE	N/A	-

REMARKS:

1 2 4
OLA

VOLUSIA COUNTY TRAFFIC ENGINEERING
SYSTEM INVENTORY

Volusia County
FLORIDA

Switch IP.# _____
Controller IP.# -
Camera IP # _____

DATE: 7/14/2017 DESIGNED BY: M. Tobin

LOCATION: ans Memorial Pkwy & Rhode Islan(
CITY: Orange City SIGNAL ID NO: 375 SYSTEM ID: -

CONTROLLER TIME CHART

TP# XX

MVMNT	MIN	EXT	CLR	A.R.	WALK	FDW	MAX1	MAX2	MAX3	ADJST	REC	DET	FL	SET	CLR
1	5	3	5.5	3	-	-	15	-	-	-	-	NL	-	-	-
2	11	4	5.5	3	7	20	35	-	60	10	MIN	L	Y	1	2
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	7	3	3.5	3	7	18	20	-	-	-	-	NL	R	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	11	4	5.5	3	7	20	35	-	-	-	MIN	L	Y	-	-
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CO-ORDINATION

PLAN	C1/S1	C2/S1	C3/S1	C4/S1	C5/S1	C6/S1		
CYCLE								
OFF 1								
OFF 2								
OFF 3								
OFF 4								
OFF 5								
PERM	10%	10%	10%	10%	10%	10%	10%	10%

PHASE SPLITS (seconds)

CY/SP	C1/S1	C2/S1	C3/S1	C4/S1	C5/S1	C6/S1		
PH 1	-	-	-	-	-	-		
PH 2	-	-	-	-	-	-		
PH 3	-	-	-	-	-	-		
PH 4	-	-	-	-	-	-		
PH 5	-	-	-	-	-	-		
PH 6	-	-	-	-	-	-		
PH 7	-	-	-	-	-	-		
PH 8	-	-	-	-	-	-		

1	2	4
	OLA	

BASE DAY		1	2	3	4	5	6	7	8	9	10	11	
	TIME	00:00-00:00											
MON #1	PLAN	FREE											
	TIME	00:00-00:00											
TUES#1	PLAN	FREE											
	TIME	00:00-00:00											
WED #1	PLAN	FREE											
	TIME	00:00-00:00											
THU #1	PLAN	FREE											
	TIME	00:00-00:00											
FRI #1	PLAN	FREE											
	TIME	00:00-00:00											
SAT #2	PLAN	FREE											
	TIME	00:00-00:00											
SUN #3	PLAN	FREE											

COUNTY OF VOLUSIA TRAFFIC SIGNAL TIMING SHEET

LOCATION: Howland Blvd @ I 4 EB RAMP
Deltona

FREE: [ ]

DATE: 5/10/2022

SIGNAL #: 359

CO-ORD: [X]

Design By: Sean Castello

NETWORK #: Deltona Area Network # 90

Controller Timing Chart

PHASE	1	2	3	4	5	6	7	8	
DIRECTION		WB		NB		EB			
TURN TYPE		-		SPLIT LEAD		-			
MIN GREEN		17		7		17			
EXTENSION		4		3		4			
YELLOW		5.5		4.8		5.5			
RED CLR		2.0		2.4		2.0			
WALK						0			
PED CLR									
MAX 1		40		25		60			
MAX 2									
MAX 3		-		-		-			
DYM MAX									
DYM STP									
RECALL		MIN		-		MIN			
DETECTOR		LOCK		NON-LOCK		LOCK			
FLASH		YELLOW		RED		YELLOW			

COORDINATION TIMINGS

PATTERN	1	2	3	4	5	6	7	8	
CYCLE	150	130	150	-	-	-	-	-	
OFFSET	74	84	73	-	-	-	-	-	

PHASE	1	2	3	4	5	6	7	8	
PATTERN 1		96		54		96		54	
PATTERN 2		72		58		72		58	
PATTERN 3		91		59		91		59	
PATTERN 4	-	-	-	-	-	-	-	-	
PATTERN 5	-	-	-	-	-	-	-	-	
PATTERN 6	-	-	-	-	-	-	-	-	
PATTERN 7	-	-	-	-	-	-	-	-	

Controller IP		Switch IP		Camera IP	
Controller Gateway		Switch Gateway		Camera Gateway	

REMARKS:

	2	4	8
5	6		

COUNTY OF VOLUSIA TRAFFIC SIGNAL TIMING SHEET

LOCATION: Howland Blvd @ I 4 EB RAMP
Deltona

FREE: [ ]

DATE: 5/10/2022

SIGNAL #: 359

CO-ORD: [X]

Design By: Sean Castello

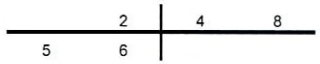
NETWORK #: Deltona Area Network # 90

TIME OF DAY SCHEDULE

BASE DAY		1	2	3	4	5	6	7	Crosswalk Length
	TIME	06:30-09:00	09:00-15:30	15:30-18:15	18:15-00:00				
MON #1	PATTERN	PATTERN #1	PATTERN #2	PATTERN #3	FREE				P2
	TIME	06:30-09:00	09:00-15:30	15:30-18:15	18:15-00:00				
TUES #1	PATTERN	PATTERN #1	PATTERN #2	PATTERN #3	FREE				86
	TIME	06:30-09:00	09:00-15:30	15:30-18:15	18:15-00:00				
WED #1	PATTERN	PATTERN #1	PATTERN #2	PATTERN #3	FREE				P4
	TIME	06:30-09:00	09:00-15:30	15:30-18:15	18:15-00:00				
THU #1	PATTERN	PATTERN #1	PATTERN #2	PATTERN #3	FREE				
	TIME	06:30-09:00	09:00-15:30	15:30-18:15	18:15-00:00				
FRI #1	PATTERN	PATTERN #1	PATTERN #2	PATTERN #3	FREE				P6
	TIME	00:00-00:00							
SAT #2	PATTERN	FREE							
	TIME	00:00-00:00							
SUN #2	PATTERN	FREE							P8

CONTROLLER TYPE		CONDITION OF OVERHEAD	GOOD	PROGRAM NUMBER	
Econolite ASC/3		OVERHEAD STREET NAMES	NO		
PHASES:	8Φ	ILLUMINATED STREET NAMES	YES	02.62.00	SIGNAL OWNER
CABINET TYPE	V	PRE-EMPTION	YES	Controller IP Address	FDOT
CABINET DATE	03/2008	PRE-EMPTION TYPE	INFRARED		LED YES

REMARKS:



COUNTY OF VOLUSIA TRAFFIC SIGNAL TIMING SHEET

LOCATION: Howland Blvd @ I 4 WB RAMP
Deltona

FREE: [ ]

DATE: 5/10/2022

SIGNAL #: 358

CO-ORD: [X]

Design By: Sean Castello

NETWORK #: Deltona Area Network # 90

Controller Timing Chart

PHASE	1	2	3	4	5	6	7	8	
DIRECTION		WB			WBL	EB		SB	
TURN TYPE		-			PROT	-		-	
MIN GREEN		17			6	17		7	
EXTENSION		3			3	3		3	
YELLOW		5.1			5.1	5.1		5.1	
RED CLR		2.0			2.0	2.0		2.9	
WALK		7							
PED CLR		20							
MAX 1		40			25	40		25	
MAX 2									
MAX 3		-				-			
DYM MAX					60				
DYM STP					10				
RECALL		MIN				MIN			
DETECTOR		LOCK			LOCK	LOCK		NON-LOCK	
FLASH		YELLOW			RED	YELLOW		RED	

COORDINATION TIMINGS

PATTERN	1	2	3	4	5	6	7	8	
CYCLE	150	130	150	-	-	-	-	-	
OFFSET	138	11	38	-	-	-	-	-	

PHASE	1	2	3	4	5	6	7	8	
PATTERN 1		120	30		80	40		30	
PATTERN 2		101	29		43	58		29	
PATTERN 3		111	39		45	66		39	
PATTERN 4	-	-	-	-	-	-	-	-	
PATTERN 5	-	-	-	-	-	-	-	-	
PATTERN 6	-	-	-	-	-	-	-	-	
PATTERN 7	-	-	-	-	-	-	-	-	

Controller IP		Switch IP		Camera IP		
Controller Gateway		Switch Gateway		Camera Gateway		

REMARKS:

PATTERNS 2,3 FREE
SEQ #1: 5 6 | 2 8

PATTERN 1
SEQ #5: 6 5 | 2 8

COUNTY OF VOLUSIA TRAFFIC SIGNAL TIMING SHEET

LOCATION: Howland Blvd @ I 4 WB RAMP
Deltona

FREE: [ ]

DATE: 5/10/2022

SIGNAL #: 358

CO-ORD: [X]

Design By: Sean Castello

Volusia County FLORIDA

NETWORK #: Deltona Area Network # 90

TIME OF DAY SCHEDULE

BASE DAY		1	2	3	4	5	6	7	Crosswalk Length
	TIME	06:30-09:00	09:00-16:00	16:00-18:15	18:15-00:00				
MON #1	PATTERN	PATTERN #1	PATTERN #2	PATTERN #3	FREE				P2
	TIME	06:30-09:00	09:00-16:00	16:00-18:15	18:15-00:00				
TUES #1	PATTERN	PATTERN #1	PATTERN #2	PATTERN #3	FREE				66
	TIME	06:30-09:00	09:00-16:00	16:00-18:15	18:15-00:00				
WED #1	PATTERN	PATTERN #1	PATTERN #2	PATTERN #3	FREE				P4
	TIME	06:30-09:00	09:00-16:00	16:00-18:15	18:15-00:00				
THU #1	PATTERN	PATTERN #1	PATTERN #2	PATTERN #3	FREE				
	TIME	06:30-09:00	09:00-16:00	16:00-18:15	18:15-00:00				
FRI #1	PATTERN	PATTERN #1	PATTERN #2	PATTERN #3	FREE				P6
	TIME	00:00-00:00							
SAT #2	PATTERN	FREE							
	TIME	00:00-00:00							
SUN #2	PATTERN	FREE							P8

CONTROLLER TYPE		CONDITION OF OVERHEAD	GOOD	PROGRAM NUMBER	
Econolite ASC/3		OVERHEAD STREET NAMES	NO		
PHASES:	8Φ	ILLUMINATED STREET NAMES	YES	02.62.00	SIGNAL OWNER
CABINET TYPE	V	PRE-EMPTION	YES	Controller IP Address	FDOT
CABINET DATE	03/2008	PRE-EMPTION TYPE	INFRARED		LED YES

REMARKS:

PATTERNS 1, 2, FREE			2	8
SEQ #1	5	6		

PATTERN 3			2	8
SEQ #5	6	5		

COUNTY OF VOLUSIA TRAFFIC SIGNAL TIMING SHEET

LOCATION: Howland Blvd @ Graves Ave.
Deltona

FREE: [ ]

DATE: 5/10/2022

SIGNAL #: 360

CO-ORD: [X]

Design By: Sean Castello

NETWORK #: Deltona Area Network # 90

Controller Timing Chart

PHASE	1	2	3	4	5	6	7	8	
DIRECTION	EBL	WB	-	NB	WBL	EB	-	SB	
TURN TYPE	PERM/PROT	-	-	SPLIT LEAD	PROT	-	-	SPLIT LAG	
MIN GREEN	7	17		7	5	17		7	
EXTENSION	3	4		3	3	4		3	
YELLOW	5.0	5.5		5.0	5.0	5.5		5.0	
RED CLR	2.0	2.0		3.0	2.0	2.0		2.5	
WALK		9				7			
PED CLR		23							
MAX 1	20	60		30	30	60		20	
MAX 2									
MAX 3		-		-		-			
DYM MAX									
DYM STP									
RECALL		MIN		-		MIN			
DETECTOR	NON-LOCK	LOCK		NON-LOCK	NON-LOCK	LOCK		NON-LOCK	
FLASH	-	YELLOW		RED	-	YELLOW		RED	

COORDINATION TIMINGS

PATTERN	1	2	3	4	5	6	7	8	
CYCLE	150	130	150	-	-	-	-	-	
OFFSET	82	80	89	-	-	-	-	-	

PHASE	1	2	3	4	5	6	7	8	
PATTERN 1	25	79		30	54	40		16	
PATTERN 2	25	59		30	34	50		16	
PATTERN 3	14	104		18	34	76		14	
PATTERN 4	-	-	-	-	-	-	-	-	
PATTERN 5	-	-	-	-	-	-	-	-	
PATTERN 6	-	-	-	-	-	-	-	-	
PATTERN 7	-	-	-	-	-	-	-	-	

Controller IP		Switch IP		Camera IP	
Controller Gateway		Switch Gateway		Camera Gateway	

REMARKS:
Pattern #3, Sequence #2 by TOD

Pattern #1 & 2: 1 2 4 8 / 5 6

Pattern #3: 2 1 4 8 / 5 6

COUNTY OF VOLUSIA TRAFFIC SIGNAL TIMING SHEET

LOCATION: Graves Ave. @ Normandy Blvd.
Deltona

FREE: X

DATE: 5/19/2017

SIGNAL #: 347

CO-ORD:

Design By: M. Tobin

NETWORK #: Deltona Area Network # 90

Controller Timing Chart

PHASE	1	2	3	4	5	6	7	8	
DIRECTION		WB		NB	WBL	EB			
TURN TYPE		-		-	PERM/PROT	-			
MIN GREEN		12		7	5	12			
EXTENSION		4		3	3	4			
YELLOW		5.0		4.0	5.0	5.0			
RED CLR		2.0		2.0	2.0	2.0			
WALK						7			
PED CLR									
MAX 1		45		25	20	45			
MAX 2									
MAX 3		-		-		-			
DYM MAX		90				90			
DYM STP		10				10			
RECALL		MIN		-		MIN			
DETECTOR		LOCK		NON-LOCK	NON-LOCK	LOCK			
FLASH		YELLOW		RED	-	YELLOW			

COORDINATION TIMINGS

PATTERN	1	2	3	4	5	6	7	8	
CYCLE				-	-	-	-	-	
OFFSET				-	-	-	-	-	

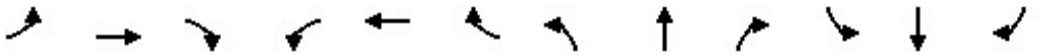
PHASE	1	2	3	4	5	6	7	8	
PATTERN 1									
PATTERN 2									
PATTERN 3									
PATTERN 4	-	-	-	-	-	-	-	-	
PATTERN 5	-	-	-	-	-	-	-	-	
PATTERN 6	-	-	-	-	-	-	-	-	
PATTERN 7	-	-	-	-	-	-	-	-	

Controller IP		Switch IP		Camera IP	
Controller Gateway		Switch Gateway		Camera Gateway	

REMARKS:
Omit Phase 5 when Phase 6 is active

	2	4
5	6	

Appendix G:
Existing Conditions Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	1038	229	144	985	225	121	193	82	217	270	86
Future Volume (vph)	67	1038	229	144	985	225	121	193	82	217	270	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.3	8.3	8.3	8.3	8.3	8.3		8.8	8.8	9.4	9.4	9.4
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1719	3539	1599	1719	3539	1583		1814	1583	1752	1863	1509
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1719	3539	1599	1719	3539	1583		1814	1583	1752	1863	1509
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	69	1070	236	148	1015	232	125	199	85	224	278	89
RTOR Reduction (vph)	0	0	159	0	0	149	0	0	69	0	0	74
Lane Group Flow (vph)	69	1070	77	148	1015	83	0	324	16	224	278	15
Heavy Vehicles (%)	5%	2%	1%	5%	2%	2%	4%	2%	2%	3%	2%	7%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases			6			2			4			3
Actuated Green, G (s)	8.3	49.1	49.1	13.1	53.9	53.9		28.1	28.1	24.9	24.9	24.9
Effective Green, g (s)	8.3	49.1	49.1	13.1	53.9	53.9		28.1	28.1	24.9	24.9	24.9
Actuated g/C Ratio	0.06	0.33	0.33	0.09	0.36	0.36		0.19	0.19	0.17	0.17	0.17
Clearance Time (s)	8.3	8.3	8.3	8.3	8.3	8.3		8.8	8.8	9.4	9.4	9.4
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	95	1158	523	150	1271	568		339	296	290	309	250
v/s Ratio Prot	0.04	c0.30		c0.09	c0.29			c0.18		0.13	c0.15	
v/s Ratio Perm			0.05			0.05			0.01			0.01
v/c Ratio	0.73	0.92	0.15	0.99	0.80	0.15		0.96	0.05	0.77	0.90	0.06
Uniform Delay, d1	69.7	48.7	35.7	68.4	43.2	32.5		60.3	50.0	59.8	61.3	52.7
Progression Factor	1.00	1.00	1.00	1.15	1.14	3.74		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	23.9	13.5	0.6	64.8	4.7	0.5		37.2	0.1	12.7	27.5	0.1
Delay (s)	93.6	62.2	36.3	143.4	54.1	122.1		97.5	50.1	72.5	88.8	52.8
Level of Service	F	E	D	F	D	F		F	D	E	F	D
Approach Delay (s)		59.3			74.9			87.7			77.2	
Approach LOS		E			E			F			E	

Intersection Summary			
HCM 2000 Control Delay	71.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	34.8
Intersection Capacity Utilization	96.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	69	1070	236	148	1015	232	324	85	224	278	89
v/c Ratio	0.62	0.92	0.35	0.99	0.77	0.32	0.95	0.20	0.77	0.90	0.23
Control Delay	91.9	62.2	5.5	140.3	53.8	16.2	97.7	1.0	77.9	92.6	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.9	62.2	5.5	140.3	53.8	16.2	97.7	1.0	77.9	92.6	1.4
Queue Length 50th (ft)	67	528	0	~168	380	42	317	0	211	269	0
Queue Length 95th (ft)	122	#656	61	m#316	592	137	#510	0	#328	#430	0
Internal Link Dist (ft)		900			559		708			484	
Turn Bay Length (ft)	465		485	460		485		550	180		230
Base Capacity (vph)	122	1172	687	150	1310	731	341	433	299	317	392
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.91	0.34	0.99	0.77	0.32	0.95	0.20	0.75	0.88	0.23

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	65	27	405	78	45	491
Future Volume (vph)	65	27	405	78	45	491
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8	7.5	7.5	7.5	7.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	1495	1845	1568	1770	1827
Flt Permitted	0.95	1.00	1.00	1.00	0.35	1.00
Satd. Flow (perm)	1805	1495	1845	1568	648	1827
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	71	29	440	85	49	534
RTOR Reduction (vph)	0	26	0	26	0	0
Lane Group Flow (vph)	71	3	440	59	49	534
Heavy Vehicles (%)	0%	8%	3%	3%	2%	4%
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		6		5	2
Permitted Phases		4		6	2	
Actuated Green, G (s)	6.7	6.7	26.1	26.1	37.8	37.8
Effective Green, g (s)	6.7	6.7	26.1	26.1	37.8	37.8
Actuated g/C Ratio	0.11	0.11	0.44	0.44	0.64	0.64
Clearance Time (s)	6.8	6.8	7.5	7.5	7.5	7.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	205	170	818	696	496	1174
v/s Ratio Prot	c0.04		c0.24		0.01	c0.29
v/s Ratio Perm		0.00		0.04	0.06	
v/c Ratio	0.35	0.02	0.54	0.09	0.10	0.45
Uniform Delay, d1	24.0	23.1	11.9	9.5	4.9	5.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	0.0	0.7	0.1	0.1	0.3
Delay (s)	25.1	23.2	12.6	9.5	4.9	5.6
Level of Service	C	C	B	A	A	A
Approach Delay (s)	24.5		12.1			5.5
Approach LOS	C		B			A

Intersection Summary			
HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	58.8	Sum of lost time (s)	21.8
Intersection Capacity Utilization	49.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	71	29	440	85	49	534
v/c Ratio	0.24	0.11	0.45	0.10	0.09	0.43
Control Delay	25.6	11.6	16.1	8.0	5.2	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.6	11.6	16.1	8.0	5.2	7.5
Queue Length 50th (ft)	21	0	125	9	6	87
Queue Length 95th (ft)	61	21	237	36	18	166
Internal Link Dist (ft)	1320		791			656
Turn Bay Length (ft)	180			145	125	
Base Capacity (vph)	1595	1325	1845	1568	1093	1827
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.02	0.24	0.05	0.04	0.29

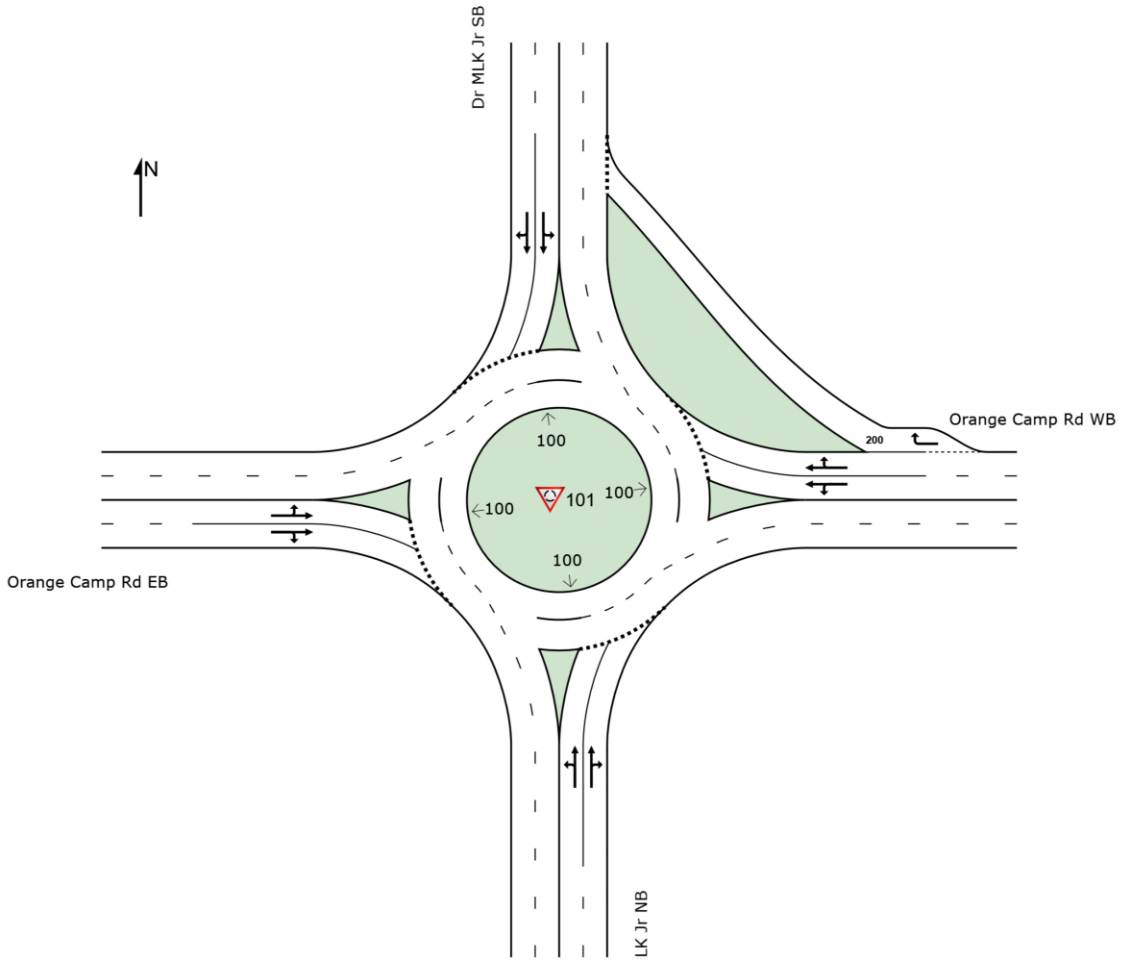
Intersection Summary

SITE LAYOUT

Site: 101 [2022 Existing PM Peak Hour Conditions (Site Folder: General)]

Existing Roundabout
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [2022 Existing PM Peak Hour Conditions (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Existing Roundabout
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Dr MLK Jr NB															
3	L2	All MCs	116	1.0	116	1.0	0.433	12.0	LOS B	2.2	54.7	0.70	0.73	0.93	29.4
8	T1	All MCs	366	1.0	366	1.0	0.433	11.5	LOS B	2.2	55.1	0.69	0.71	0.92	30.6
18	R2	All MCs	100	0.0	100	0.0	0.433	10.8	LOS B	2.2	55.1	0.68	0.70	0.91	30.9
Approach			583	0.8	583	0.8	0.433	11.5	LOS B	2.2	55.1	0.69	0.71	0.92	30.4
East: Orange Camp Rd WB															
1	L2	All MCs	109	5.0	109	5.0	0.331	8.8	LOS A	1.4	35.5	0.59	0.49	0.59	30.7
6	T1	All MCs	443	1.0	443	1.0	0.331	7.9	LOS A	1.4	35.6	0.58	0.47	0.58	32.2
16	R2	All MCs	140	2.0	140	2.0	0.145	5.1	LOS A	0.5	13.8	0.45	0.34	0.45	33.5
Approach			692	1.8	692	1.8	0.331	7.4	LOS A	1.4	35.6	0.56	0.45	0.56	32.2
North: Dr MLK Jr SB															
7	L2	All MCs	157	3.0	157	3.0	0.460	11.8	LOS B	2.4	63.1	0.69	0.71	0.96	29.1
4	T1	All MCs	350	6.0	350	6.0	0.460	12.0	LOS B	2.4	63.1	0.68	0.69	0.95	30.3
14	R2	All MCs	130	4.0	130	4.0	0.460	11.2	LOS B	2.4	62.5	0.67	0.68	0.94	30.6
Approach			637	4.9	637	4.9	0.460	11.8	LOS B	2.4	63.1	0.68	0.69	0.95	30.0
West: Orange Camp Rd EB															
5	L2	All MCs	49	7.0	49	7.0	0.527	13.9	LOS B	3.2	83.5	0.72	0.76	1.08	29.2
2	T1	All MCs	555	5.0	555	5.0	0.527	13.1	LOS B	3.3	84.6	0.71	0.74	1.07	30.1
12	R2	All MCs	154	2.0	154	2.0	0.527	12.0	LOS B	3.3	84.6	0.70	0.73	1.05	30.2
Approach			759	4.5	759	4.5	0.527	13.0	LOS B	3.3	84.6	0.71	0.74	1.07	30.1
All Vehicles			2670	3.1	2670	3.1	0.527	10.9	LOS B	3.3	84.6	0.66	0.65	0.87	30.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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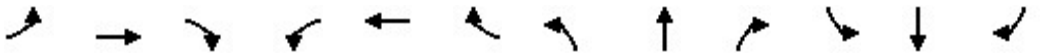
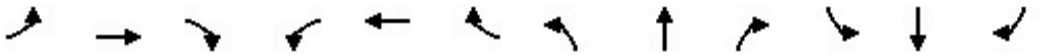


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	61	108	19	49	60	153	401	26	22	474	70
Future Volume (veh/h)	50	61	108	19	49	60	153	401	26	22	474	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1811	1811	1900	1900	1900	1856	1900	1752	1826	1856
Adj Flow Rate, veh/h	54	66	83	20	53	65	165	431	24	24	510	67
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	6	6	0	0	0	3	0	10	5	3
Cap, veh/h	84	102	154	49	129	153	350	733	636	354	603	519
Arrive On Green	0.10	0.10	0.10	0.09	0.09	0.09	0.10	0.40	0.40	0.04	0.33	0.33
Sat Flow, veh/h	836	1022	1535	514	1361	1610	1810	1856	1610	1668	1826	1572
Grp Volume(v), veh/h	120	0	83	73	0	65	165	431	24	24	510	67
Grp Sat Flow(s),veh/h/ln	1858	0	1535	1874	0	1610	1810	1856	1610	1668	1826	1572
Q Serve(g_s), s	4.3	0.0	3.5	2.5	0.0	2.6	3.8	12.5	0.6	0.6	17.8	2.0
Cycle Q Clear(g_c), s	4.3	0.0	3.5	2.5	0.0	2.6	3.8	12.5	0.6	0.6	17.8	2.0
Prop In Lane	0.45		1.00	0.27		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	186	0	154	178	0	153	350	733	636	354	603	519
V/C Ratio(X)	0.65	0.00	0.54	0.41	0.00	0.43	0.47	0.59	0.04	0.07	0.85	0.13
Avail Cap(c_a), veh/h	489	0	404	493	0	423	641	1369	1188	462	1054	907
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.6	0.0	29.3	29.2	0.0	29.2	14.6	16.3	12.7	14.4	21.3	16.0
Incr Delay (d2), s/veh	4.5	0.0	3.5	1.8	0.0	2.3	1.0	0.8	0.0	0.1	3.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.5	0.0	2.4	2.2	0.0	1.8	2.2	7.8	0.3	0.4	11.0	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.1	0.0	32.8	31.0	0.0	31.5	15.6	17.1	12.7	14.5	24.7	16.1
LnGrp LOS	C	A	C	C	A	C	B	B	B	B	C	B
Approach Vol, veh/h		203			138			620			601	
Approach Delay, s/veh		33.6			31.2			16.5			23.3	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.6	34.5		13.0	12.0	30.1		13.4				
Change Period (Y+Rc), s	5.0	7.5		6.5	5.0	7.5		6.5				
Max Green Setting (Gmax), s	7.0	50.5		18.0	18.0	39.5		18.0				
Max Q Clear Time (g_c+I1), s	2.6	14.5		4.6	5.8	19.8		6.3				
Green Ext Time (p_c), s	0.0	2.4		0.5	0.3	2.8		0.7				

Intersection Summary			
HCM 6th Ctrl Delay		22.6	
HCM 6th LOS		C	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	236	477	32	14	343	189	28	7	26	307	14	287
Future Volume (vph)	236	477	32	14	343	189	28	7	26	307	14	287
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	7.0		7.0	7.0	7.0		7.0		7.0	7.0	7.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85		0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98		0.95	1.00	1.00
Satd. Flow (prot)	1787	1847		1805	1863	1599		1647		1787	1900	1568
Flt Permitted	0.26	1.00		0.46	1.00	1.00		0.98		0.95	1.00	1.00
Satd. Flow (perm)	492	1847		882	1863	1599		1647		1787	1900	1568
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	248	502	34	15	361	199	29	7	27	323	15	302
RTOR Reduction (vph)	0	2	0	0	0	144	0	17	0	0	0	227
Lane Group Flow (vph)	248	534	0	15	361	55	0	46	0	323	15	75
Heavy Vehicles (%)	1%	2%	0%	0%	2%	1%	7%	0%	7%	1%	0%	3%
Turn Type	pm+pt	NA		Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2			6		4	4		3	3	
Permitted Phases	2			6		6						3
Actuated Green, G (s)	54.5	54.5		30.4	30.4	30.4		7.2		27.3	27.3	27.3
Effective Green, g (s)	54.5	54.5		30.4	30.4	30.4		7.2		27.3	27.3	27.3
Actuated g/C Ratio	0.50	0.50		0.28	0.28	0.28		0.07		0.25	0.25	0.25
Clearance Time (s)	6.0	7.0		7.0	7.0	7.0		7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.0	4.0		4.0	4.0	4.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	456	915		243	514	441		107		443	471	389
v/s Ratio Prot	0.09	c0.29			c0.19			c0.03		c0.18	0.01	
v/s Ratio Perm	0.18			0.02		0.03						0.05
v/c Ratio	0.54	0.58		0.06	0.70	0.12		0.43		0.73	0.03	0.19
Uniform Delay, d1	18.4	19.7		29.3	35.7	29.8		49.4		38.0	31.3	32.6
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	1.3	1.1		0.1	4.6	0.2		2.8		5.9	0.0	0.2
Delay (s)	19.7	20.8		29.4	40.4	30.0		52.2		43.9	31.4	32.9
Level of Service	B	C		C	D	C		D		D	C	C
Approach Delay (s)		20.5			36.5			52.2			38.4	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	31.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	27.0
Intersection Capacity Utilization	77.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	248	536	15	361	199	63	323	15	302
v/c Ratio	0.54	0.58	0.06	0.71	0.34	0.39	0.73	0.03	0.49
Control Delay	22.7	25.0	35.4	47.3	6.6	50.4	50.9	36.4	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.7	25.0	35.4	47.3	6.6	50.4	50.9	36.4	7.2
Queue Length 50th (ft)	101	268	8	241	0	32	217	8	0
Queue Length 95th (ft)	207	504	29	420	59	93	388	30	73
Internal Link Dist (ft)		965		1007		975		1049	
Turn Bay Length (ft)	165		165		320		260		115
Base Capacity (vph)	509	1316	442	935	902	345	897	954	937
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.41	0.03	0.39	0.22	0.18	0.36	0.02	0.32

Intersection Summary



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	316	358	333	310	125	450
Future Volume (veh/h)	316	358	333	310	125	450
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1885	1885	1885	1856	1870
Adj Flow Rate, veh/h	322	323	340	316	128	407
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	1	1	1	3	2
Cap, veh/h	493	421	480	986	505	453
Arrive On Green	0.26	0.26	0.16	0.52	0.29	0.29
Sat Flow, veh/h	1870	1598	1795	1885	1767	1585
Grp Volume(v), veh/h	322	323	340	316	128	407
Grp Sat Flow(s),veh/h/ln	1870	1598	1795	1885	1767	1585
Q Serve(g_s), s	11.2	13.7	9.3	7.0	4.1	18.1
Cycle Q Clear(g_c), s	11.2	13.7	9.3	7.0	4.1	18.1
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	493	421	480	986	505	453
V/C Ratio(X)	0.65	0.77	0.71	0.32	0.25	0.90
Avail Cap(c_a), veh/h	766	655	676	1467	603	541
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.0	24.9	15.5	10.0	20.1	25.1
Incr Delay (d2), s/veh	2.1	4.2	2.0	0.3	0.3	15.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.3	8.8	6.2	4.3	2.7	12.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	26.1	29.1	17.5	10.3	20.4	41.0
LnGrp LOS	C	C	B	B	C	D
Approach Vol, veh/h	645			656	535	
Approach Delay, s/veh	27.6			14.0	36.1	
Approach LOS	C			B	D	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	19.0	26.3				45.3	27.9
Change Period (Y+Rc), s	7.0	7.0				7.0	7.0
Max Green Setting (Gmax), s	20.0	30.0				57.0	25.0
Max Q Clear Time (g_c+I1), s	11.3	15.7				9.0	20.1
Green Ext Time (p_c), s	0.7	3.6				2.7	0.9

Intersection Summary	
HCM 6th Ctrl Delay	25.2
HCM 6th LOS	C

Notes

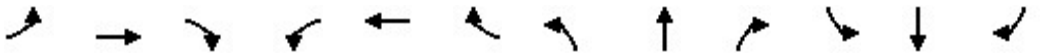
User approved pedestrian interval to be less than phase max green.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	214	267	274	402	589	129
Future Volume (veh/h)	214	267	274	402	589	129
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1856	1841	1856	1870
Adj Flow Rate, veh/h	246	307	315	462	677	148
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	3	4	3	2
Cap, veh/h	392	349	349	1135	704	602
Arrive On Green	0.22	0.22	0.14	0.62	0.38	0.38
Sat Flow, veh/h	1781	1585	1767	1841	1856	1585
Grp Volume(v), veh/h	246	307	315	462	677	148
Grp Sat Flow(s),veh/h/ln	1781	1585	1767	1841	1856	1585
Q Serve(g_s), s	11.5	17.2	11.1	11.8	32.8	5.9
Cycle Q Clear(g_c), s	11.5	17.2	11.1	11.8	32.8	5.9
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	392	349	349	1135	704	602
V/C Ratio(X)	0.63	0.88	0.90	0.41	0.96	0.25
Avail Cap(c_a), veh/h	484	431	382	1171	706	603
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.5	34.7	24.3	9.0	27.9	19.5
Incr Delay (d2), s/veh	1.8	16.1	22.6	0.3	24.7	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.6	12.5	10.3	6.8	24.6	3.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	34.2	50.8	46.9	9.3	52.5	19.8
LnGrp LOS	C	D	D	A	D	B
Approach Vol, veh/h	553			777	825	
Approach Delay, s/veh	43.4			24.6	46.6	
Approach LOS	D			C	D	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	21.8	43.4		26.7		65.2
Change Period (Y+Rc), s	8.5	8.5		6.5		8.5
Max Green Setting (Gmax), s	15.0	35.0		25.0		58.5
Max Q Clear Time (g_c+I1), s	13.1	34.8		19.2		13.8
Green Ext Time (p_c), s	0.2	0.1		1.0		4.2

Intersection Summary		
HCM 6th Ctrl Delay		37.8
HCM 6th LOS		D



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	699	638	287	1061	0	0	0	0	368	0	276
Future Volume (veh/h)	0	699	638	287	1061	0	0	0	0	368	0	276
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1900	1885	1870	1870	0				1885	0	1826
Adj Flow Rate, veh/h	0	744	0	305	1129	0				391	0	294
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94				0.94	0.94	0.94
Percent Heavy Veh, %	0	0	1	2	2	0				1	0	5
Cap, veh/h	0	874		726	2477	0				705	0	313
Arrive On Green	0.00	0.24	0.00	0.41	0.70	0.00				0.20	0.00	0.20
Sat Flow, veh/h	0	3705	1598	1781	3647	0				3483	0	1547
Grp Volume(v), veh/h	0	744	0	305	1129	0				391	0	294
Grp Sat Flow(s),veh/h/ln	0	1805	1598	1781	1777	0				1742	0	1547
Q Serve(g_s), s	0.0	29.5	0.0	18.4	21.2	0.0				15.1	0.0	28.1
Cycle Q Clear(g_c), s	0.0	29.5	0.0	18.4	21.2	0.0				15.1	0.0	28.1
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	874		726	2477	0				705	0	313
V/C Ratio(X)	0.00	0.85		0.42	0.46	0.00				0.55	0.00	0.94
Avail Cap(c_a), veh/h	0	1418		726	2477	0				720	0	320
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.84	0.84	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	54.3	0.0	31.8	10.1	0.0				53.7	0.0	58.9
Incr Delay (d2), s/veh	0.0	10.2	0.0	0.3	0.5	0.0				0.9	0.0	34.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	20.4	0.0	11.9	11.6	0.0				11.0	0.0	20.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	64.5	0.0	32.1	10.6	0.0				54.6	0.0	93.1
LnGrp LOS	A	E		C	B	A				D	A	F
Approach Vol, veh/h		744			1434						685	
Approach Delay, s/veh		64.5			15.2						71.2	
Approach LOS		E			B						E	

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		111.6			68.2	43.4		38.4				
Change Period (Y+Rc), s		7.1			7.1	7.1		8.0				
Max Green Setting (Gmax), s		103.9			37.9	58.9		31.0				
Max Q Clear Time (g_c+I1), s		23.2			20.4	31.5		30.1				
Green Ext Time (p_c), s		9.5			0.8	4.8		0.3				

Intersection Summary												
HCM 6th Ctrl Delay			41.4									
HCM 6th LOS			D									

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	904	87	0	946	694	708
Future Volume (veh/h)	904	87	0	946	694	708
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1885	1841	0	1870	1870	1856
Adj Flow Rate, veh/h	942	0	0	985	723	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	4	0	2	2	3
Cap, veh/h	2393		0	3411	809	
Arrive On Green	1.00	0.00	0.00	0.67	0.23	0.00
Sat Flow, veh/h	3676	1560	0	5443	3456	1572
Grp Volume(v), veh/h	942	0	0	985	723	0
Grp Sat Flow(s),veh/h/ln	1791	1560	0	1702	1728	1572
Q Serve(g_s), s	0.0	0.0	0.0	11.9	30.4	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	11.9	30.4	0.0
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2393		0	3411	809	
V/C Ratio(X)	0.39		0.00	0.29	0.89	
Avail Cap(c_a), veh/h	2393		0	3411	1193	
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.84	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	10.2	55.6	0.0
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.2	6.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.2	0.0	0.0	7.5	20.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.4	0.0	0.0	10.5	62.0	0.0
LnGrp LOS	A		A	B	E	
Approach Vol, veh/h	942			985	723	
Approach Delay, s/veh	0.4			10.5	62.0	
Approach LOS	A			B	E	

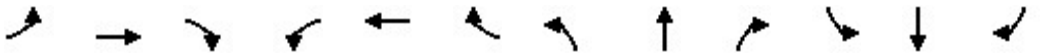
Timer - Assigned Phs	2		4		6
Phs Duration (G+Y+Rc), s	107.7		42.3		107.7
Change Period (Y+Rc), s	7.5		* 7.2		7.5
Max Green Setting (Gmax), s	83.5		* 52		83.5
Max Q Clear Time (g_c+I1), s	13.9		32.4		2.0
Green Ext Time (p_c), s	11.7		2.7		11.3

Intersection Summary	
HCM 6th Ctrl Delay	20.9
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	1541	147	358	849	43	140	37	362	23	22	68
Future Volume (veh/h)	46	1541	147	358	849	43	140	37	362	23	22	68
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1885	1826	1841	1870	1841	1811	1767	1885	1767	1900	1796
Adj Flow Rate, veh/h	48	1605	153	373	884	45	92	114	0	24	23	71
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	7	1	5	4	2	4	6	9	1	9	0	7
Cap, veh/h	829	2018	872	431	2309	1013	109	112		79	89	71
Arrive On Green	0.04	0.56	0.56	0.13	0.65	0.65	0.06	0.06	0.00	0.05	0.05	0.05
Sat Flow, veh/h	3319	3582	1547	3401	3554	1560	1725	1767	1598	1682	1900	1522
Grp Volume(v), veh/h	48	1605	153	373	884	45	92	114	0	24	23	71
Grp Sat Flow(s),veh/h/ln	1659	1791	1547	1700	1777	1560	1725	1767	1598	1682	1900	1522
Q Serve(g_s), s	0.9	53.2	7.2	16.1	17.4	1.6	7.9	9.5	0.0	2.1	1.8	7.0
Cycle Q Clear(g_c), s	0.9	53.2	7.2	16.1	17.4	1.6	7.9	9.5	0.0	2.1	1.8	7.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	829	2018	872	431	2309	1013	109	112		79	89	71
V/C Ratio(X)	0.06	0.80	0.18	0.87	0.38	0.04	0.84	1.02		0.31	0.26	1.00
Avail Cap(c_a), veh/h	850	2018	872	612	2309	1013	109	112		79	89	71
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.0	25.9	15.9	64.2	12.3	9.5	69.5	70.3	0.0	69.1	69.0	71.5
Incr Delay (d2), s/veh	0.0	3.3	0.4	9.1	0.5	0.1	41.7	90.2	0.0	2.2	1.5	106.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.6	29.6	4.6	11.9	10.9	1.0	8.3	11.5	0.0	1.7	1.6	8.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.1	29.3	16.3	73.3	12.7	9.6	111.2	160.5	0.0	71.3	70.5	178.1
LnGrp LOS	B	C	B	E	B	A	F	F		E	E	F
Approach Vol, veh/h		1806			1302			206			118	
Approach Delay, s/veh		27.7			30.0			138.5			135.4	
Approach LOS		C			C			F			F	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.1	104.9		17.5	26.0	92.0		14.5				
Change Period (Y+Rc), s	7.0	7.5		8.0	7.0	7.5		7.5				
Max Green Setting (Gmax), s	7.0	96.5		9.5	27.0	68.5		7.0				
Max Q Clear Time (g_c+I1), s	2.9	19.4		11.5	18.1	55.2		9.0				
Green Ext Time (p_c), s	0.0	11.0		0.0	0.9	10.6		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		38.9
HCM 6th LOS		D

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	361	406	170	434	158	156
Future Volume (veh/h)	361	406	170	434	158	156
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1885	1885	1811	1870	1841	1796
Adj Flow Rate, veh/h	376	423	177	452	165	162
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	6	2	4	7
Cap, veh/h	1361	607	502	2159	253	387
Arrive On Green	0.38	0.38	0.09	0.61	0.14	0.14
Sat Flow, veh/h	3676	1598	1725	3647	1753	2679
Grp Volume(v), veh/h	376	423	177	452	165	162
Grp Sat Flow(s),veh/h/ln	1791	1598	1725	1777	1753	1340
Q Serve(g_s), s	3.8	11.7	2.9	3.0	4.7	2.9
Cycle Q Clear(g_c), s	3.8	11.7	2.9	3.0	4.7	2.9
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1361	607	502	2159	253	387
V/C Ratio(X)	0.28	0.70	0.35	0.21	0.65	0.42
Avail Cap(c_a), veh/h	3077	1372	998	3053	837	1279
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.2	13.7	7.4	4.6	21.2	20.4
Incr Delay (d2), s/veh	0.2	2.1	0.4	0.1	2.8	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.1	6.3	1.5	1.2	3.3	4.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	11.4	15.8	7.8	4.7	24.0	21.1
LnGrp LOS	B	B	A	A	C	C
Approach Vol, veh/h	799			629	327	
Approach Delay, s/veh	13.7			5.6	22.6	
Approach LOS	B			A	C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		38.8		13.6	11.9	26.9
Change Period (Y+Rc), s		7.0		6.0	7.0	7.0
Max Green Setting (Gmax), s		45.0		25.0	20.0	45.0
Max Q Clear Time (g_c+I1), s		5.0		6.7	4.9	13.7
Green Ext Time (p_c), s		4.6		1.0	0.4	6.2

Intersection Summary	
HCM 6th Ctrl Delay	12.4
HCM 6th LOS	B

Appendix H:
Traffic Trends

Dr Martin Luther King Jr Beltway

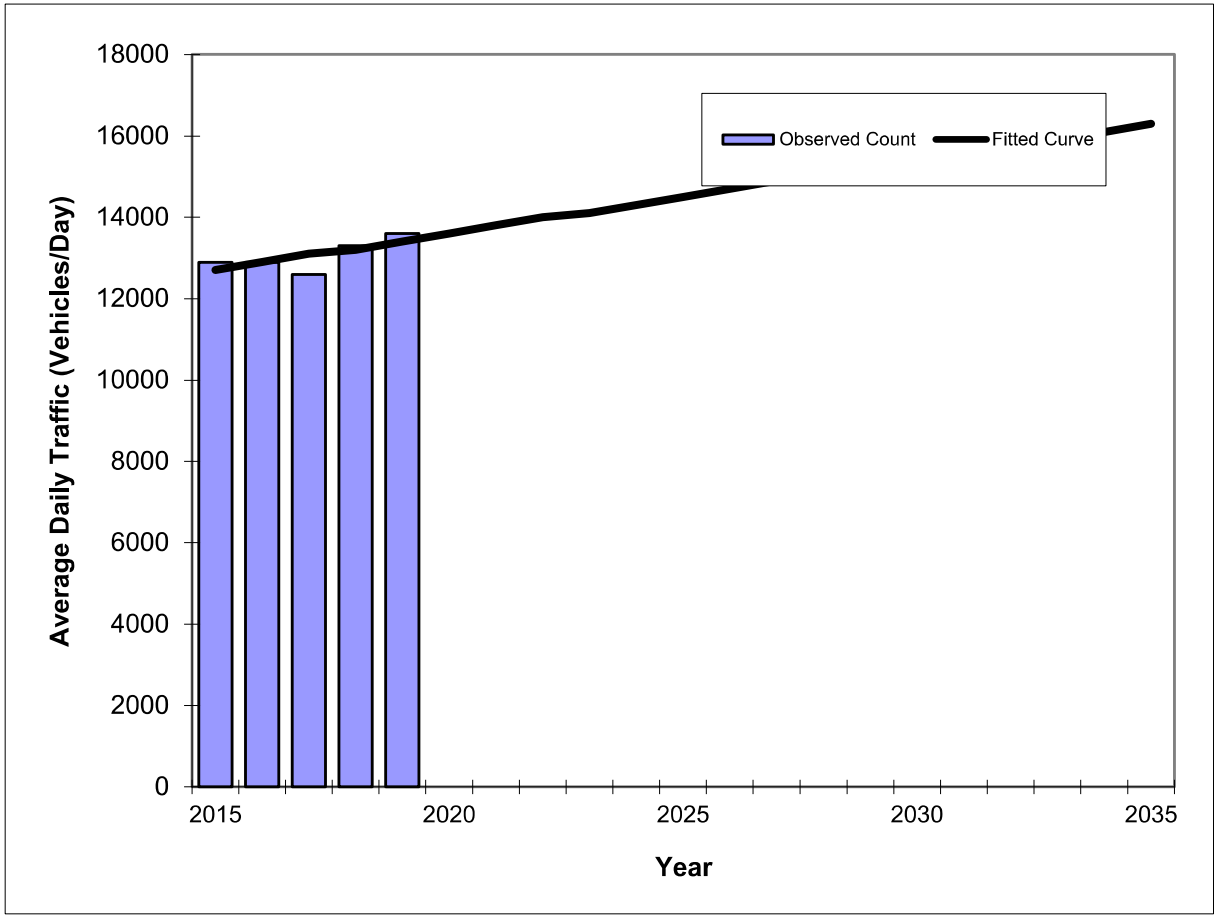
Five Year Trends

Traffic Trends - V03.a

DR ML KING JR BLTWY -- SR 472 to Cassadaga Rd

FIN#	1234
Location	1

County:	Volusia (79)
Station #:	0
Highway:	DR ML KING JR BLTWY



Year	Traffic (ADT/AADT) Count*	Trend**
2015	12900	12700
2016	12900	12900
2017	12600	13100
2018	13300	13200
2019	13600	13400
2022 Opening Year Trend		
2022	N/A	14000
2024 Mid-Year Trend		
2024	N/A	14300
2027 Design Year Trend		
2027	N/A	14900
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	180
Trend R-squared:	52.94%
Trend Annual Historic Growth Rate:	1.38%
Trend Growth Rate (2019 to Design Year):	1.40%
Printed:	15-Nov-22

Straight Line Growth Option

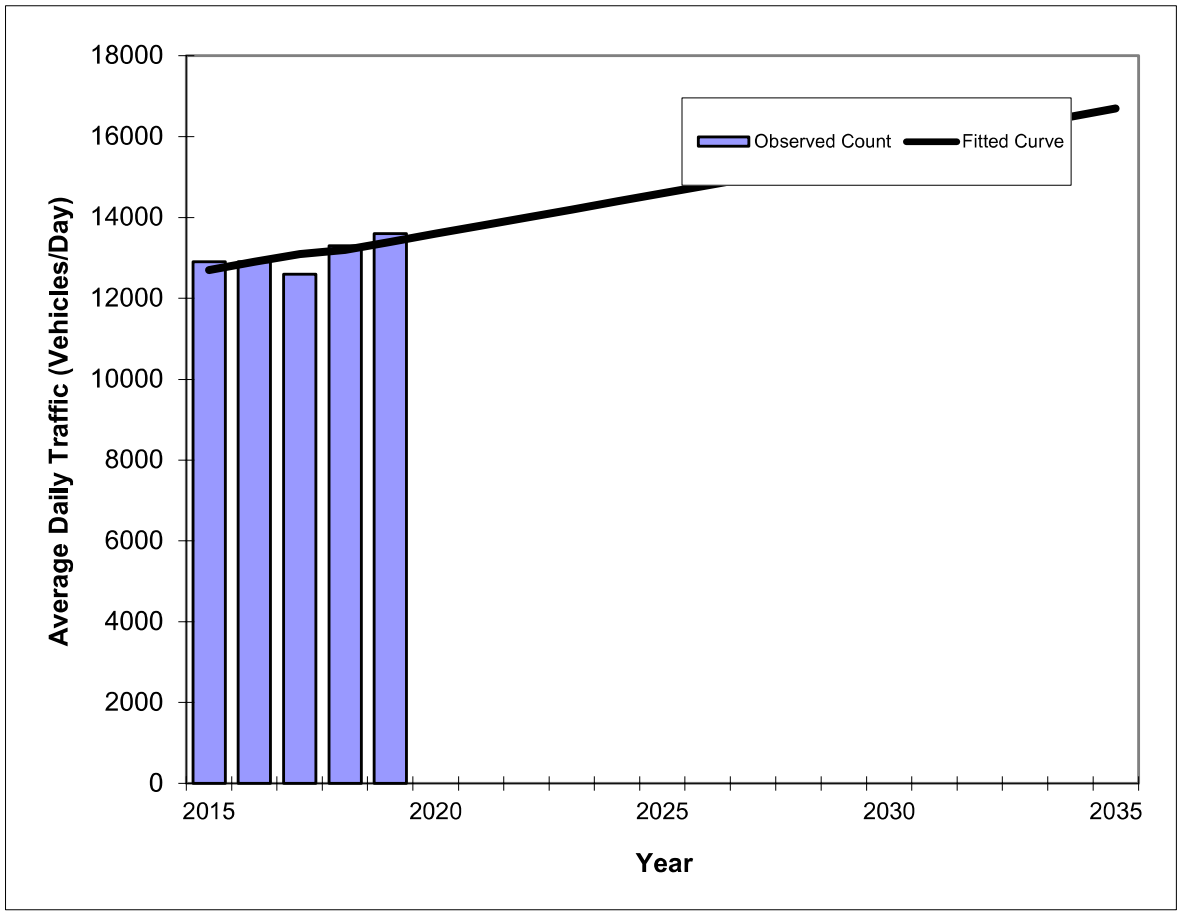
***Axle-Adjusted**

Traffic Trends - V03.a

DR ML KING JR BLTWY -- SR 472 to Cassadaga Rd

FIN#	1234
Location	1

County:	Volusia (79)
Station #:	0
Highway:	DR ML KING JR BLTWY



Year	Traffic (ADT/AADT) Count*	Trend**
2015	12900	12700
2016	12900	12900
2017	12600	13100
2018	13300	13200
2019	13600	13400
2022 Opening Year Trend		
2022	N/A	14000
2024 Mid-Year Trend		
2024	N/A	14400
2027 Design Year Trend		
2027	N/A	15000
TRANPLAN Forecasts/Trends		

Trend R-squared:	52.09%
Compounded Annual Historic Growth Rate:	1.35%
Compounded Growth Rate (2019 to Design Year):	1.42%
Printed:	18-Jan-23

Exponential Growth Option

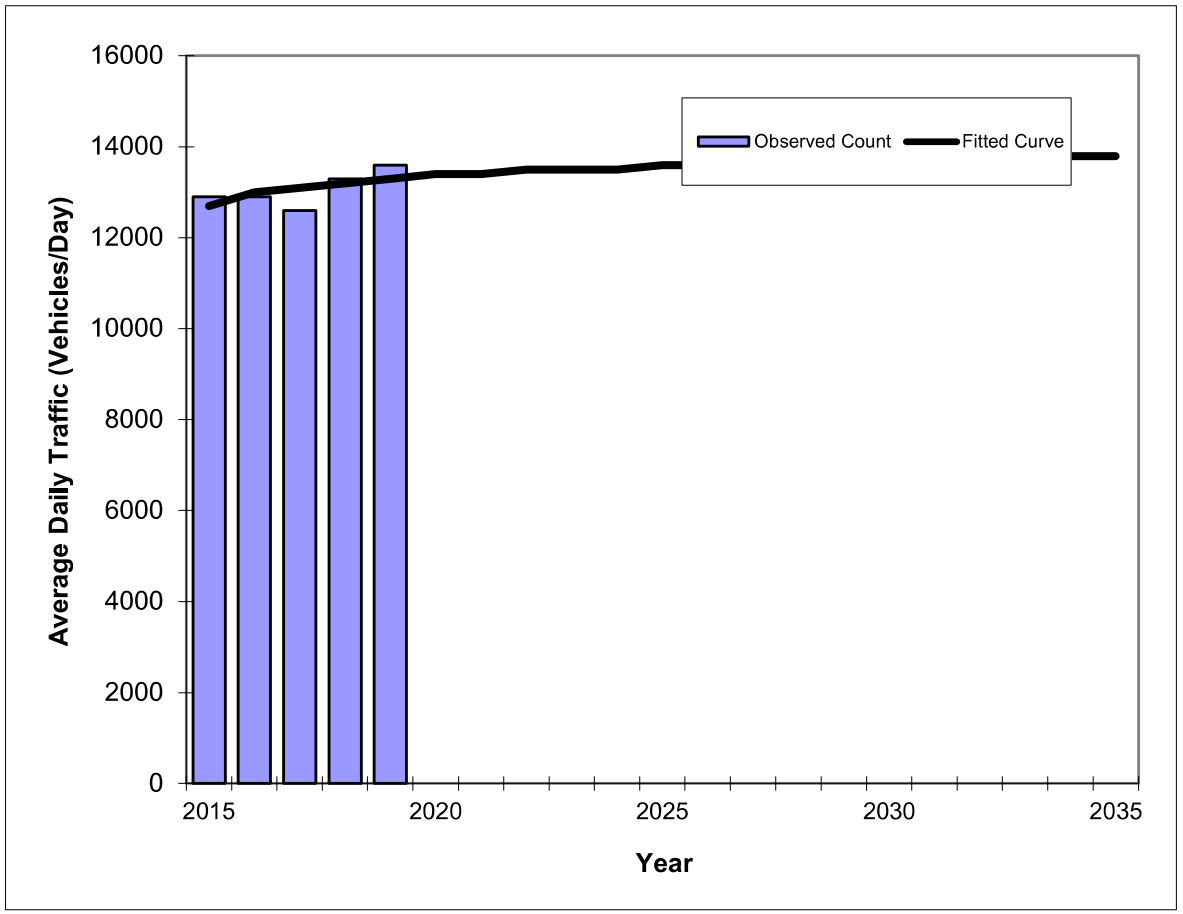
***Axle-Adjusted**

Traffic Trends - V03.a

DR ML KING JR BLTWY -- SR 472 to Cassadaga Rd

FIN#	1234
Location	1

County:	Volusia (79)
Station #:	0
Highway:	DR ML KING JR BLTWY



Year	Traffic (ADT/AADT) Count*	Trend**
2015	12900	12700
2016	12900	13000
2017	12600	13100
2018	13300	13200
2019	13600	13300
2022 Opening Year Trend		
2022	N/A	13500
2024 Mid-Year Trend		
2024	N/A	13500
2027 Design Year Trend		
2027	N/A	13600
TRANPLAN Forecasts/Trends		

Trend R-squared:	34.68%
Compounded Annual Historic Growth Rate:	1.16%
Compounded Growth Rate (2019 to Design Year):	0.28%
Printed:	18-Jan-23

Decaying Exponential Growth Option

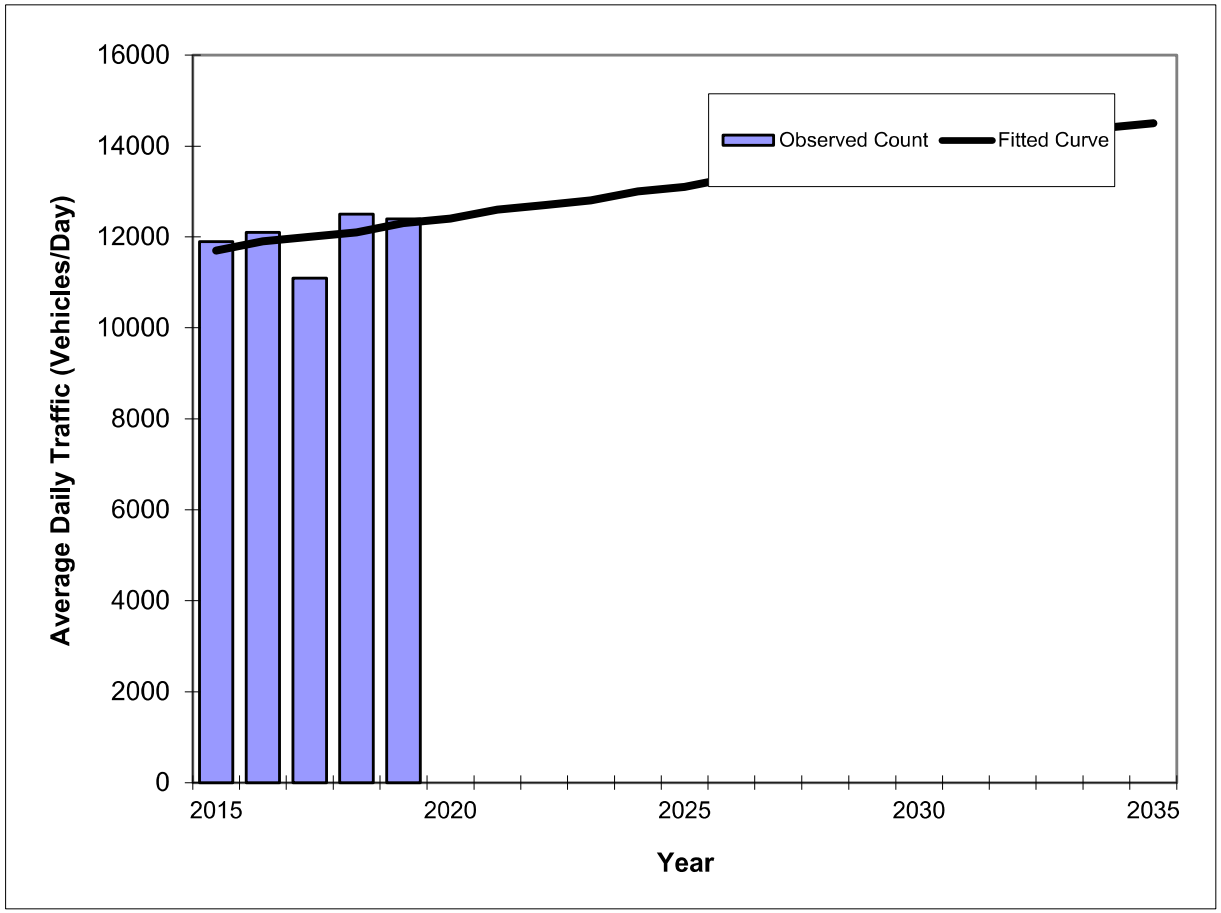
***Axle-Adjusted**

Traffic Trends - V03.a

DR ML KING JR BLTWY -- Cassadaga to Orange Camp

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	DR ML KING JR BLTWY



Year	Traffic (ADT/AADT) Count*	Trend**
2015	11900	11700
2016	12100	11900
2017	11100	12000
2018	12500	12100
2019	12400	12300
2027 Opening Year Trend		
2027	N/A	13400
2033 Mid-Year Trend		
2033	N/A	14200
2034 Design Year Trend		
2034	N/A	14400
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	140
Trend R-squared:	15.81%
Trend Annual Historic Growth Rate:	1.28%
Trend Growth Rate (2019 to Design Year):	1.14%
Printed:	15-Nov-22
Straight Line Growth Option	

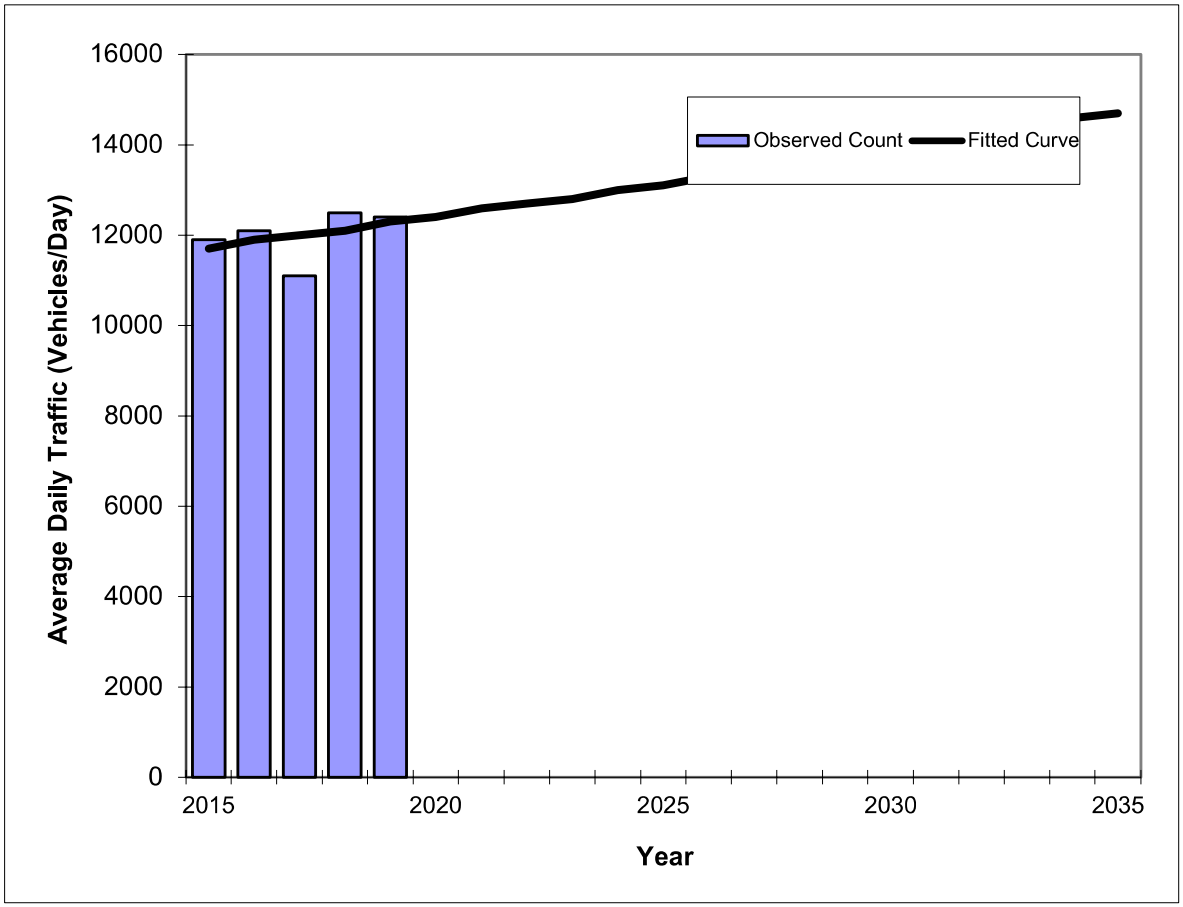
***Axle-Adjusted**

Traffic Trends - V03.a

DR ML KING JR BLTWY -- Cassadaga to Orange Camp

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	DR ML KING JR BLTWY



Year	Traffic (ADT/AADT) Count*	Trend**
2015	11900	11700
2016	12100	11900
2017	11100	12000
2018	12500	12100
2019	12400	12300
2027 Opening Year Trend		
2027	N/A	13400
2033 Mid-Year Trend		
2033	N/A	14400
2034 Design Year Trend		
2034	N/A	14600
TRANPLAN Forecasts/Trends		

Trend R-squared:	14.73%
Compounded Annual Historic Growth Rate:	1.26%
Compounded Growth Rate (2019 to Design Year):	1.15%
Printed:	18-Jan-23

Exponential Growth Option

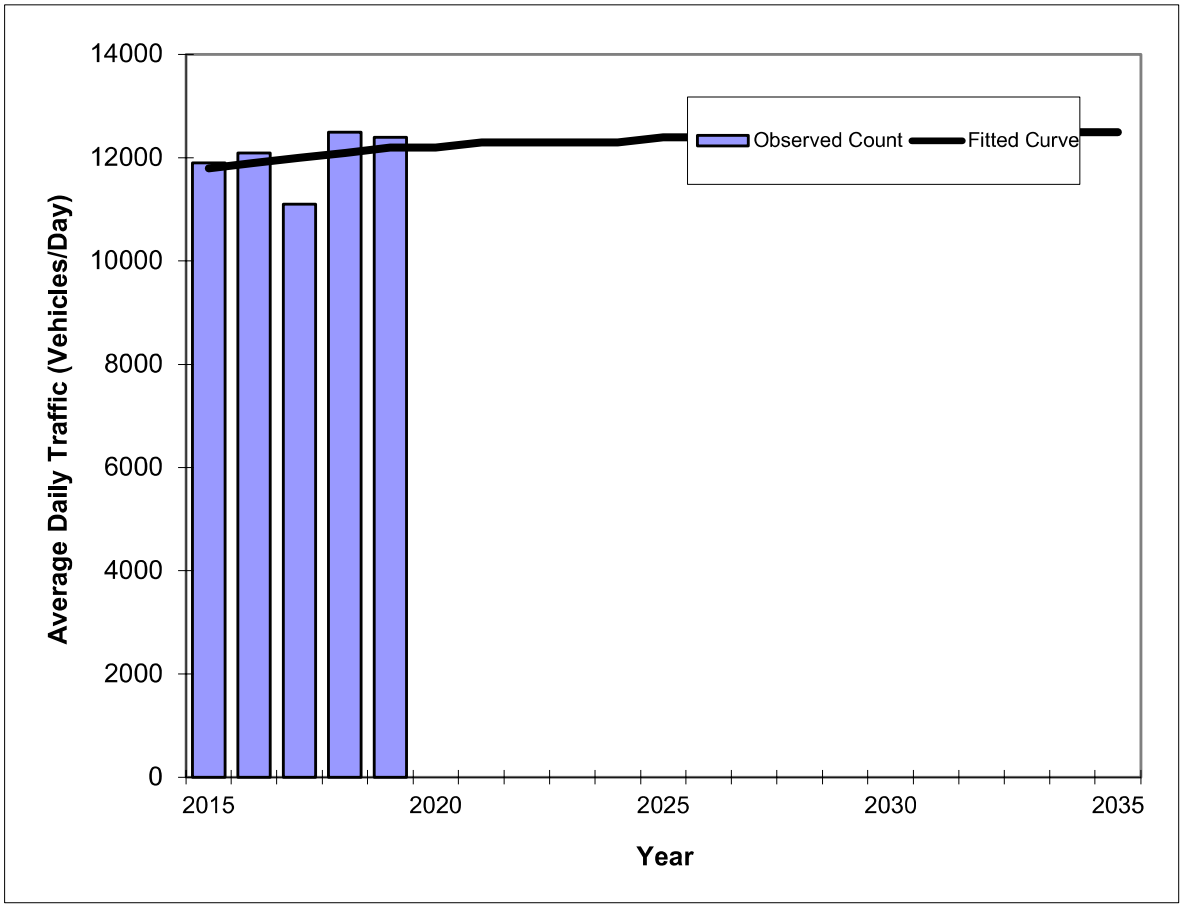
***Axle-Adjusted**

Traffic Trends - V03.a

DR ML KING JR BLTWY -- Cassadaga to Orange Camp

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	DR ML KING JR BLTWY



Year	Traffic (ADT/AADT) Count*	Trend**
2015	11900	11800
2016	12100	11900
2017	11100	12000
2018	12500	12100
2019	12400	12200
2027 Opening Year Trend		
2027	N/A	12400
2033 Mid-Year Trend		
2033	N/A	12500
2034 Design Year Trend		
2034	N/A	12500
TRANPLAN Forecasts/Trends		

Trend R-squared:	8.70%
Compounded Annual Historic Growth Rate:	0.84%
Compounded Growth Rate (2019 to Design Year):	0.16%
Printed:	7-Feb-23

Decaying Exponential Growth Option

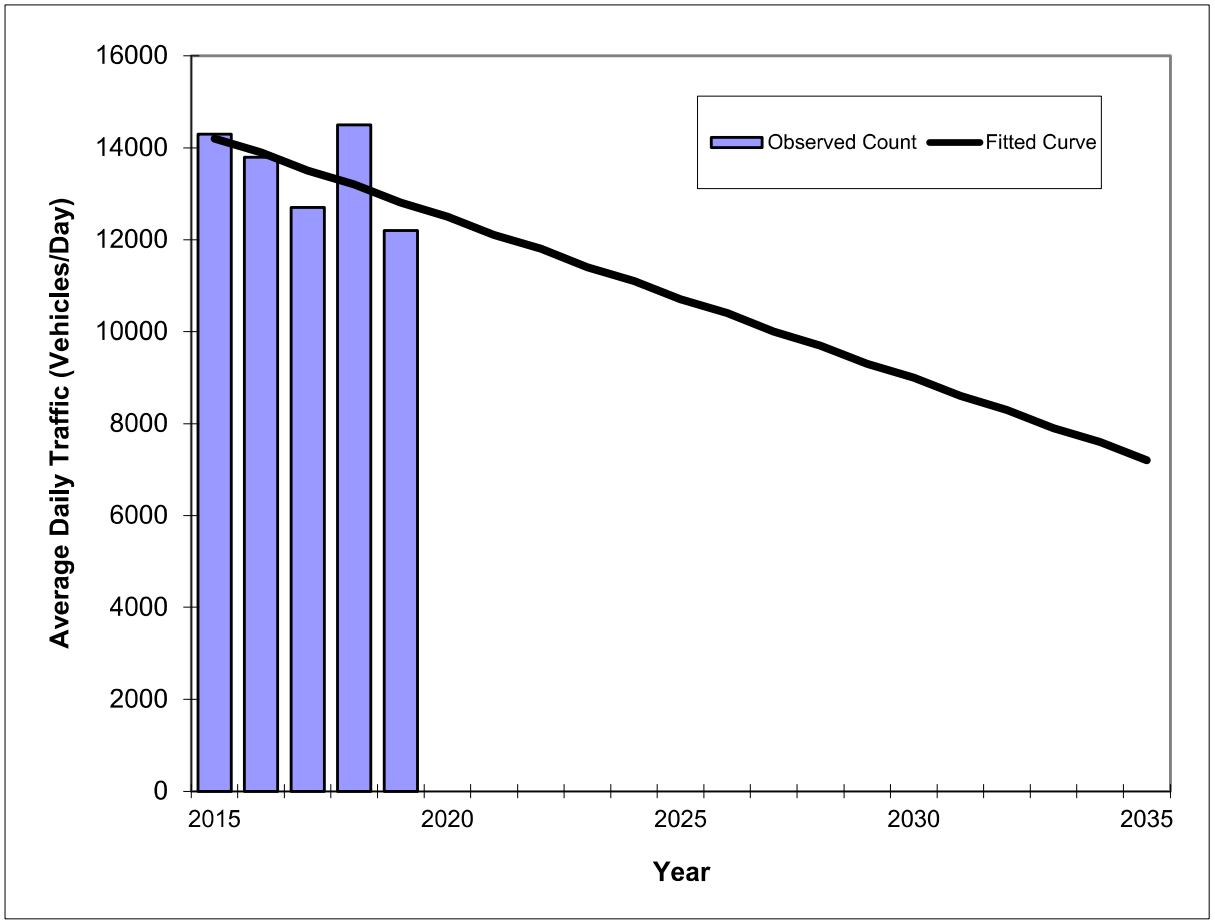
***Axle-Adjusted**

Traffic Trends - V03.a

DR ML KING JR BLTWY -- Orange Camp Rd to Taylor Rd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	DR ML KING JR BLTWY



Year	Traffic (ADT/AADT) Count*	Trend**
2015	14300	14200
2016	13800	13900
2017	12700	13500
2018	14500	13200
2019	12200	12800
2027 Opening Year Trend		
2027	N/A	10000
2033 Mid-Year Trend		
2033	N/A	7900
2034 Design Year Trend		
2034	N/A	7600
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

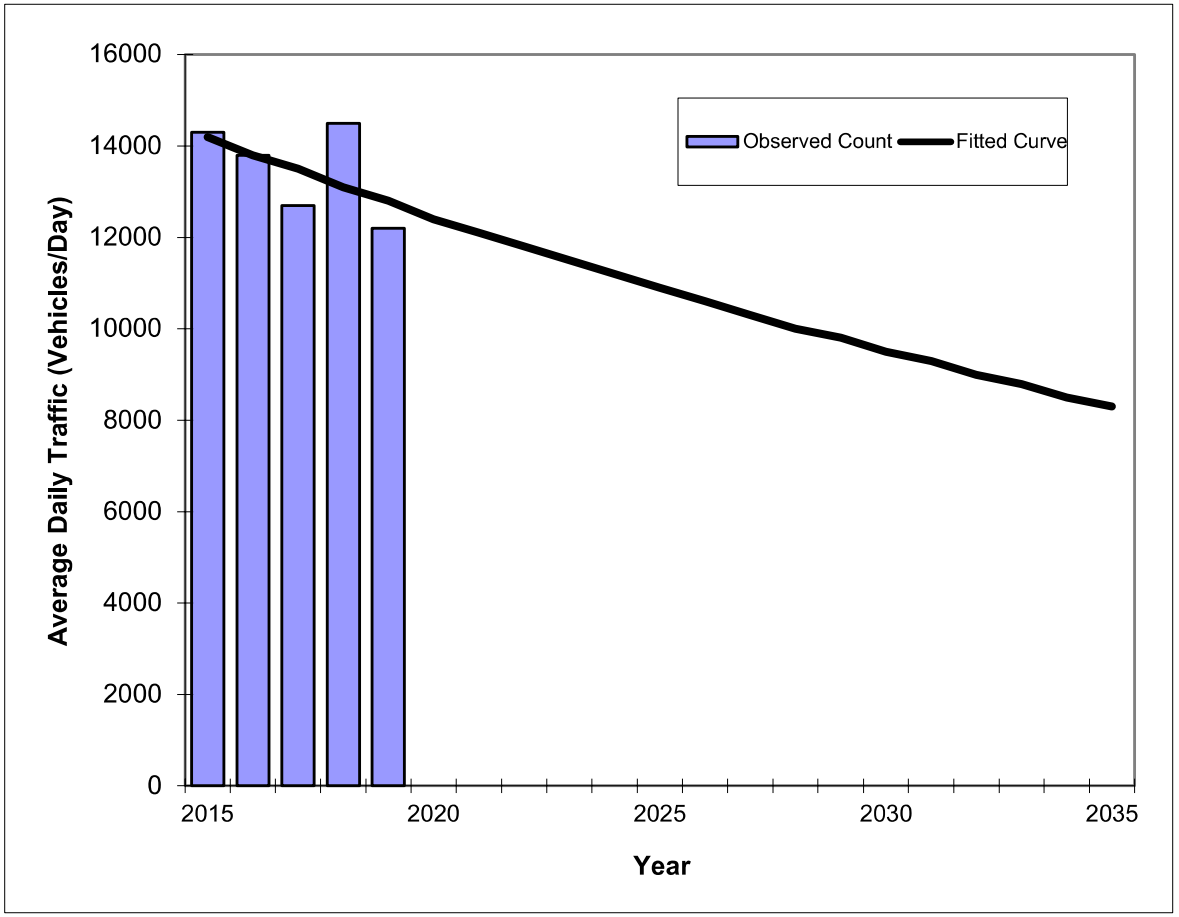
** Annual Trend Increase:	-350
Trend R-squared:	30.17%
Trend Annual Historic Growth Rate:	-2.46%
Trend Growth Rate (2019 to Design Year):	-2.71%
Printed:	15-Nov-22
Straight Line Growth Option	

Traffic Trends - V03.a

DR ML KING JR BLTWY -- Orange Camp Rd to Taylor Rd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	DR ML KING JR BLTWY



Year	Traffic (ADT/AADT) Count*	Trend**
2015	14300	14200
2016	13800	13800
2017	12700	13500
2018	14500	13100
2019	12200	12800
2027 Opening Year Trend		
2027	N/A	10300
2033 Mid-Year Trend		
2033	N/A	8800
2034 Design Year Trend		
2034	N/A	8500
TRANPLAN Forecasts/Trends		

Trend R-squared:	31.46%
Compounded Annual Historic Growth Rate:	-2.56%
Compounded Growth Rate (2019 to Design Year):	-2.69%
Printed:	18-Jan-23

Exponential Growth Option

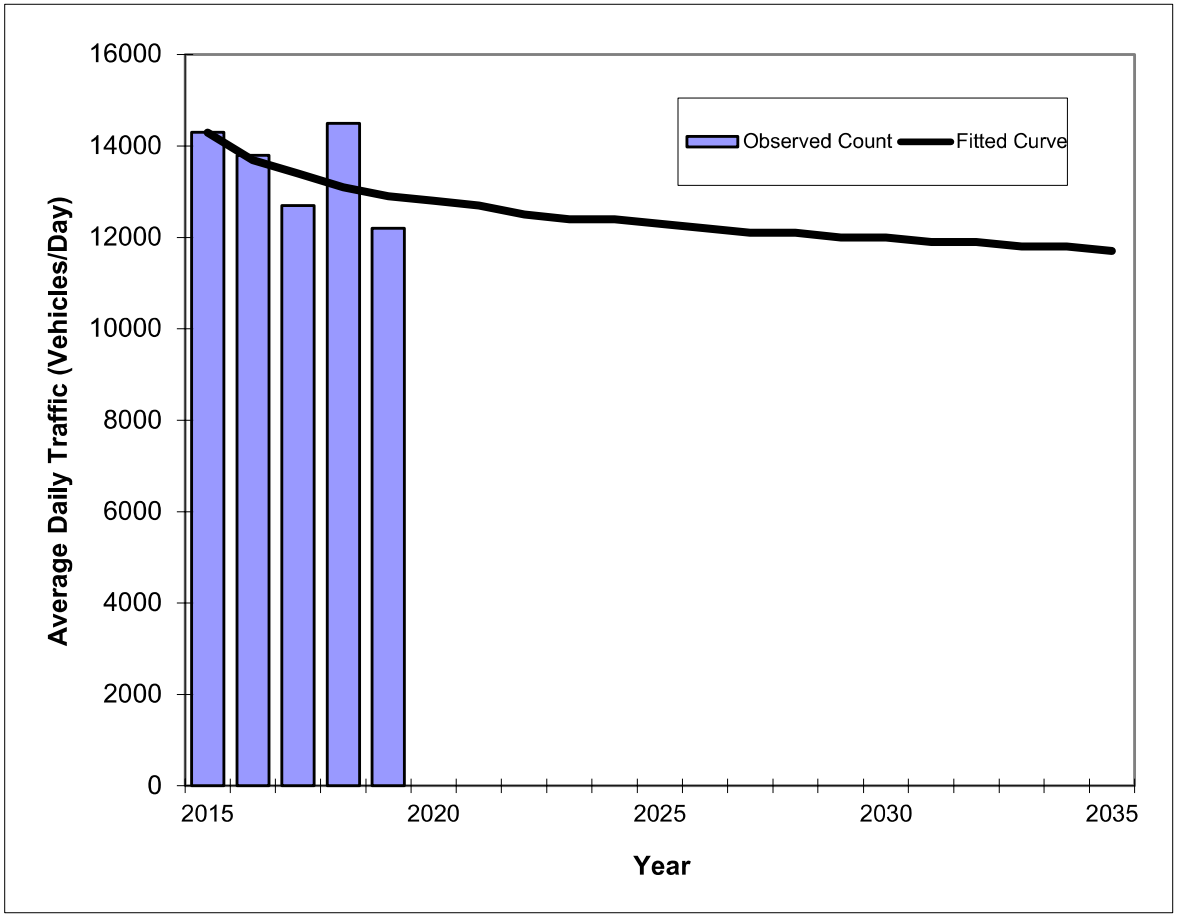
***Axle-Adjusted**

Traffic Trends - V03.a

DR ML KING JR BLTWY -- Orange Camp Rd to Taylor Rd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	DR ML KING JR BLTWY



Year	Traffic (ADT/AADT) Count*	Trend**
2015	14300	14300
2016	13800	13700
2017	12700	13400
2018	14500	13100
2019	12200	12900
2027 Opening Year Trend		
2027	N/A	12100
2033 Mid-Year Trend		
2033	N/A	11800
2034 Design Year Trend		
2034	N/A	11800
TRANPLAN Forecasts/Trends		

Trend R-squared:	28.91%
Compounded Annual Historic Growth Rate:	-2.54%
Compounded Growth Rate (2019 to Design Year):	-0.59%
Printed:	18-Jan-23

Decaying Exponential Growth Option

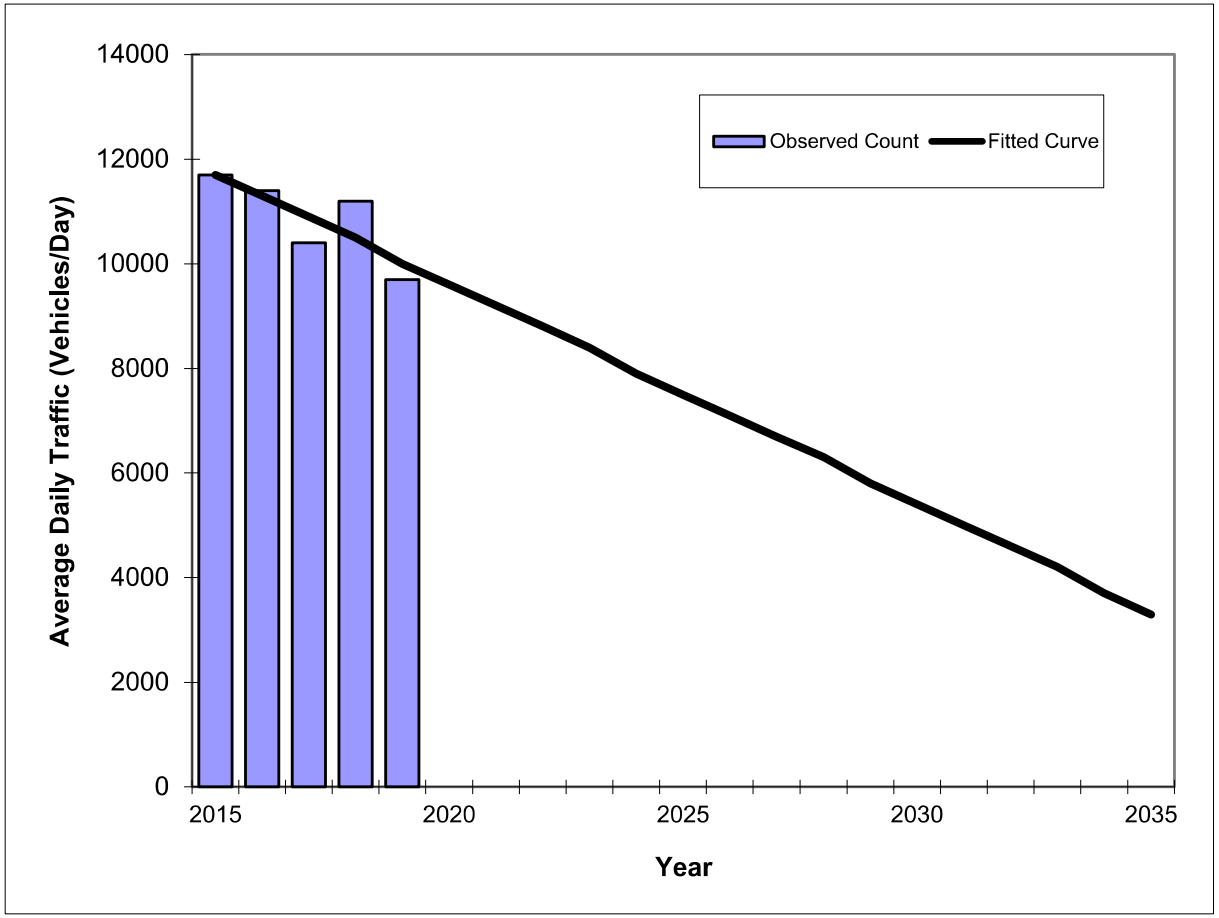
***Axle-Adjusted**

Traffic Trends - V03.a

DR ML KING JR BLTWY -- Taylor Rd to Beresford Ave

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	DR ML KING JR BLTWY



Year	Traffic (ADT/AADT) Count*	Trend**
2015	11700	11700
2016	11400	11300
2017	10400	10900
2018	11200	10500
2019	9700	10000
2027 Opening Year Trend		
2027	N/A	6700
2033 Mid-Year Trend		
2033	N/A	4200
2034 Design Year Trend		
2034	N/A	3700
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	-420
Trend R-squared:	66.12%
Trend Annual Historic Growth Rate:	-3.63%
Trend Growth Rate (2019 to Design Year):	-4.20%
Printed:	15-Nov-22

Straight Line Growth Option

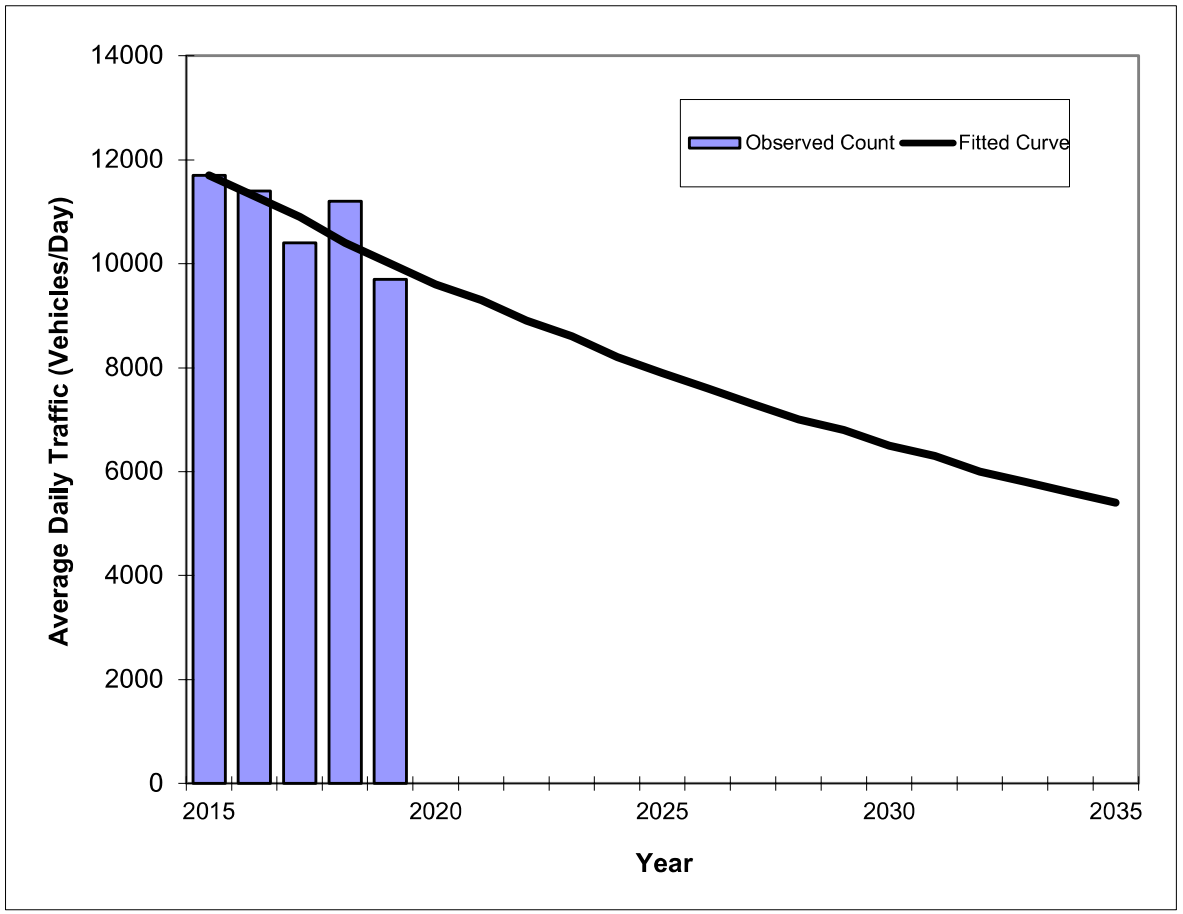
***Axle-Adjusted**

Traffic Trends - V03.a

DR ML KING JR BLTWY -- Taylor Rd to Beresford Ave

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	DR ML KING JR BLTWY



Year	Traffic (ADT/AADT) Count*	Trend**
2015	11700	11700
2016	11400	11300
2017	10400	10900
2018	11200	10400
2019	9700	10000
2027 Opening Year Trend		
2027	N/A	7300
2033 Mid-Year Trend		
2033	N/A	5800
2034 Design Year Trend		
2034	N/A	5600
TRANPLAN Forecasts/Trends		

Trend R-squared:	65.63%
Compounded Annual Historic Growth Rate:	-3.85%
Compounded Growth Rate (2019 to Design Year):	-3.79%
Printed:	18-Jan-23

Exponential Growth Option

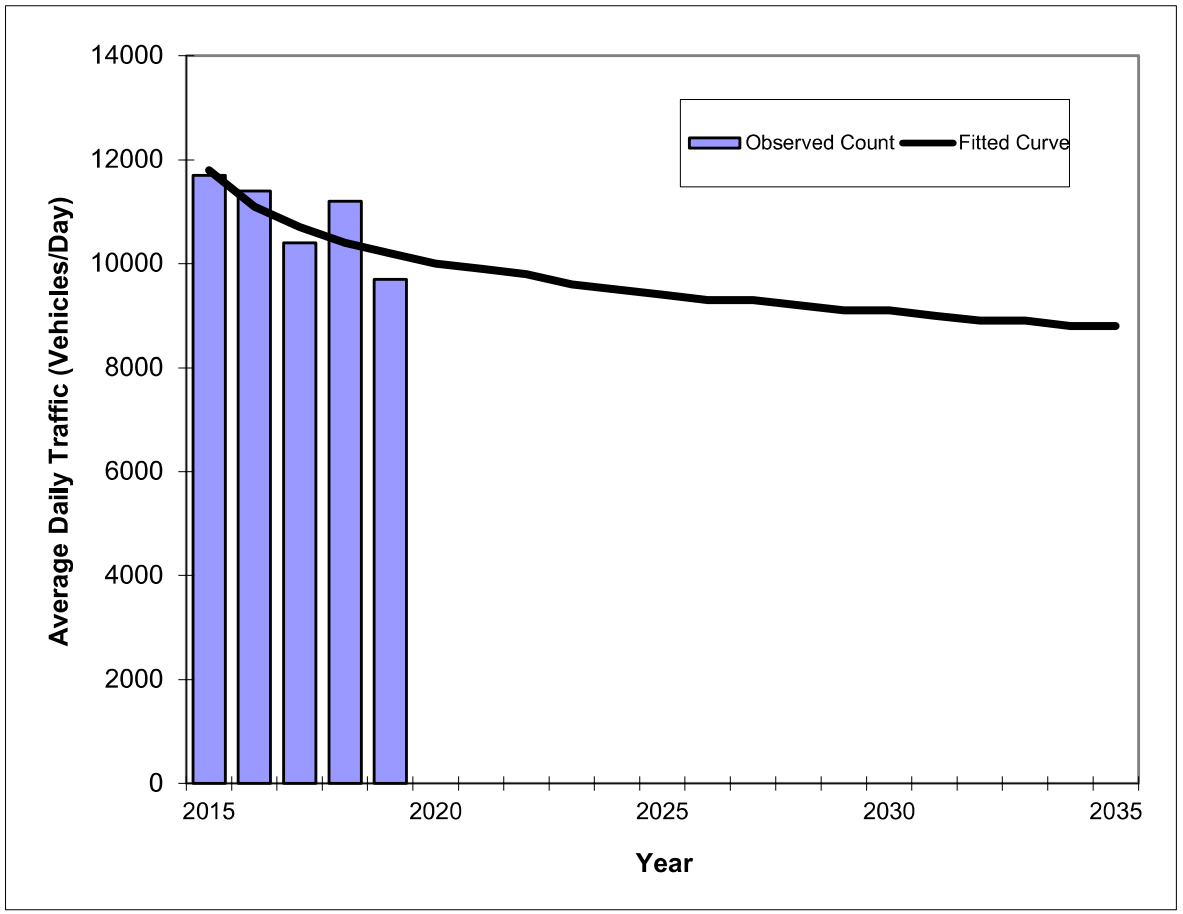
***Axle-Adjusted**

Traffic Trends - V03.a

DR ML KING JR BLTWY -- Taylor Rd to Beresford Ave

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	DR ML KING JR BLTWY



Year	Traffic (ADT/AADT) Count*	Trend**
2015	11700	11800
2016	11400	11100
2017	10400	10700
2018	11200	10400
2019	9700	10200
2027 Opening Year Trend		
2027	N/A	9300
2033 Mid-Year Trend		
2033	N/A	8900
2034 Design Year Trend		
2034	N/A	8800
TRANPLAN Forecasts/Trends		

Trend R-squared:	61.07%
Compounded Annual Historic Growth Rate:	-3.58%
Compounded Growth Rate (2019 to Design Year):	-0.98%
Printed:	7-Feb-23

Decaying Exponential Growth Option

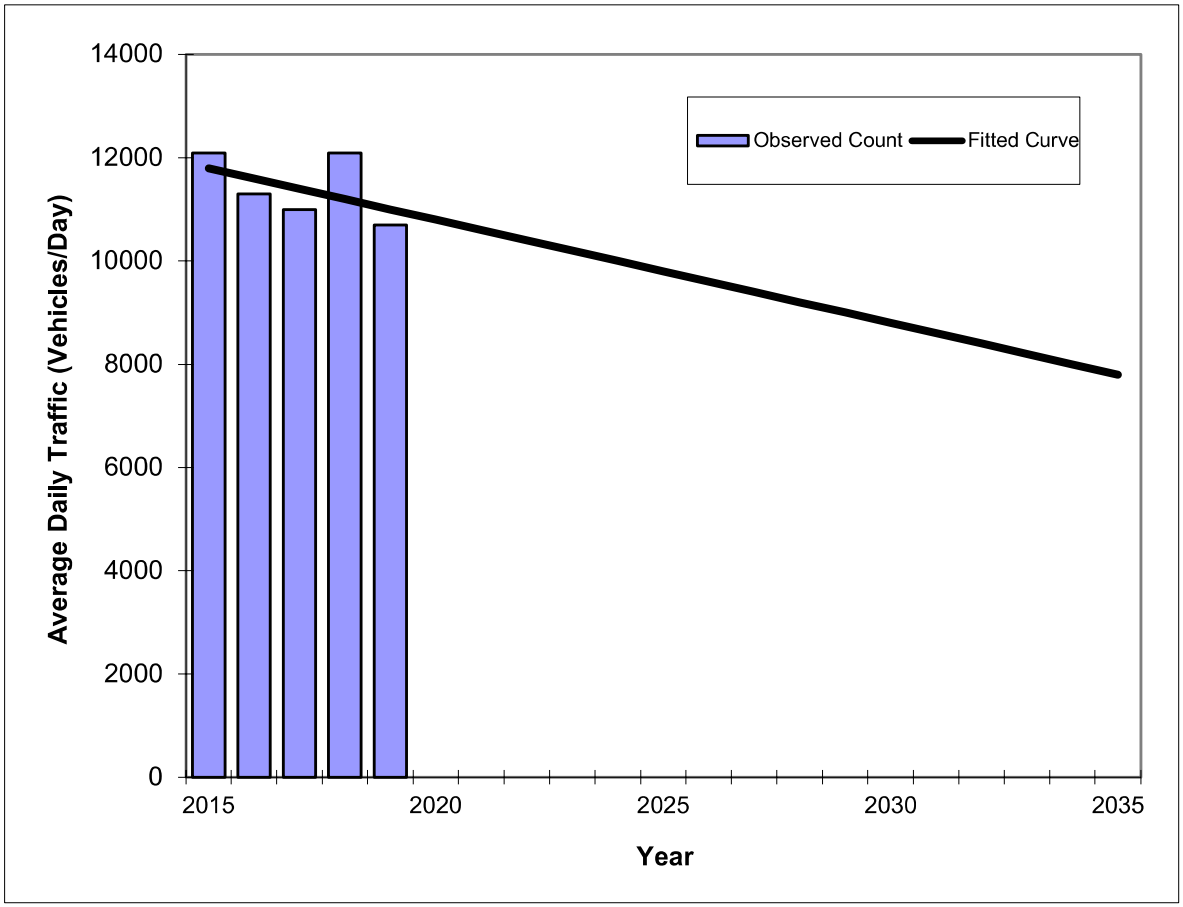
***Axle-Adjusted**

Traffic Trends - V03.a

KEPLER RD -- Beresford Ave to SR 44

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	KEPLER RD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	12100	11800
2016	11300	11600
2017	11000	11400
2018	12100	11200
2019	10700	11000
2027 Opening Year Trend		
2027	N/A	9400
2033 Mid-Year Trend		
2033	N/A	8200
2034 Design Year Trend		
2034	N/A	8000
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	-200
Trend R-squared:	24.51%
Trend Annual Historic Growth Rate:	-1.69%
Trend Growth Rate (2019 to Design Year):	-1.82%
Printed:	19-Jan-23

Straight Line Growth Option

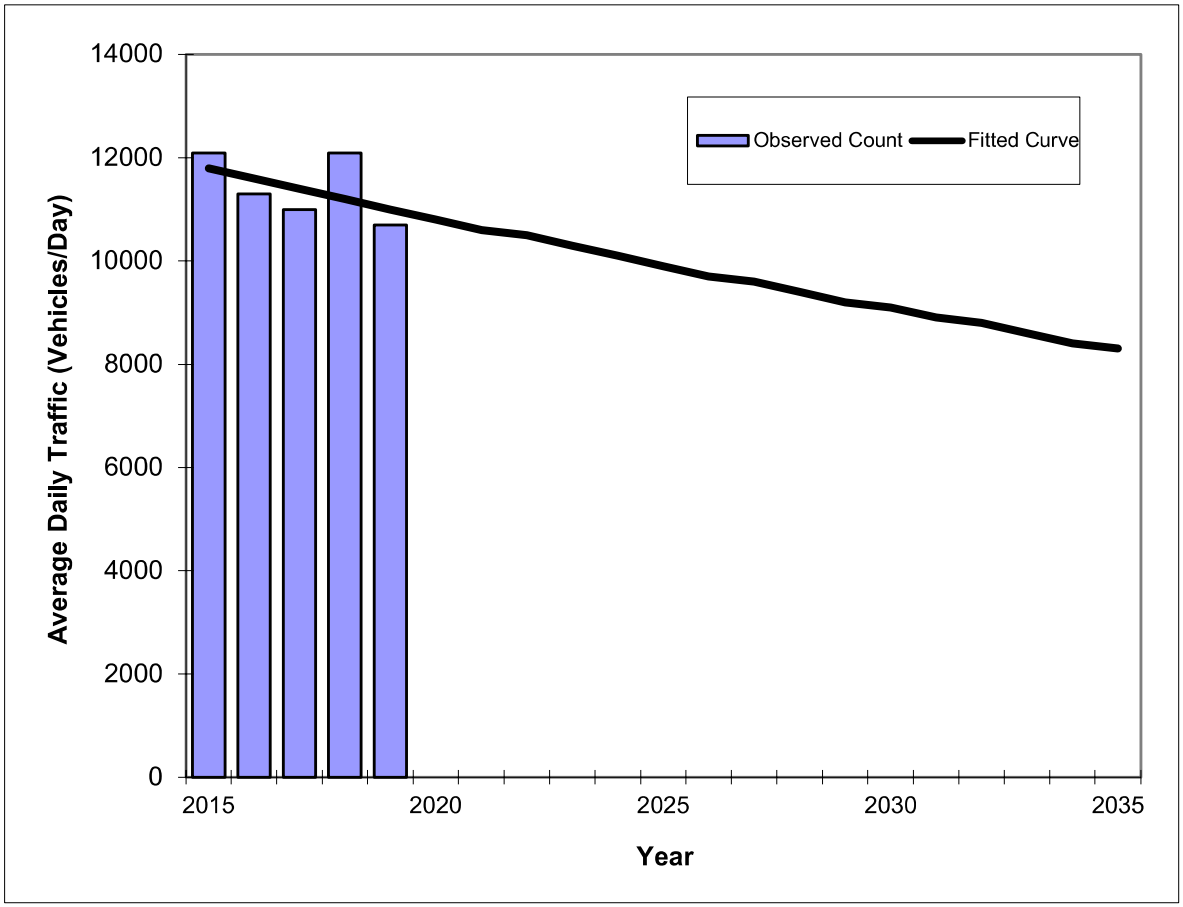
***Axle-Adjusted**

Traffic Trends - V03.a

KEPLER RD -- Beresford Ave to SR 44

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	KEPLER RD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	12100	11800
2016	11300	11600
2017	11000	11400
2018	12100	11200
2019	10700	11000
2027 Opening Year Trend		
2027	N/A	9600
2033 Mid-Year Trend		
2033	N/A	8600
2034 Design Year Trend		
2034	N/A	8400
TRANPLAN Forecasts/Trends		

Trend R-squared:	25.32%
Compounded Annual Historic Growth Rate:	-1.74%
Compounded Growth Rate (2019 to Design Year):	-1.78%
Printed:	19-Jan-23

Exponential Growth Option

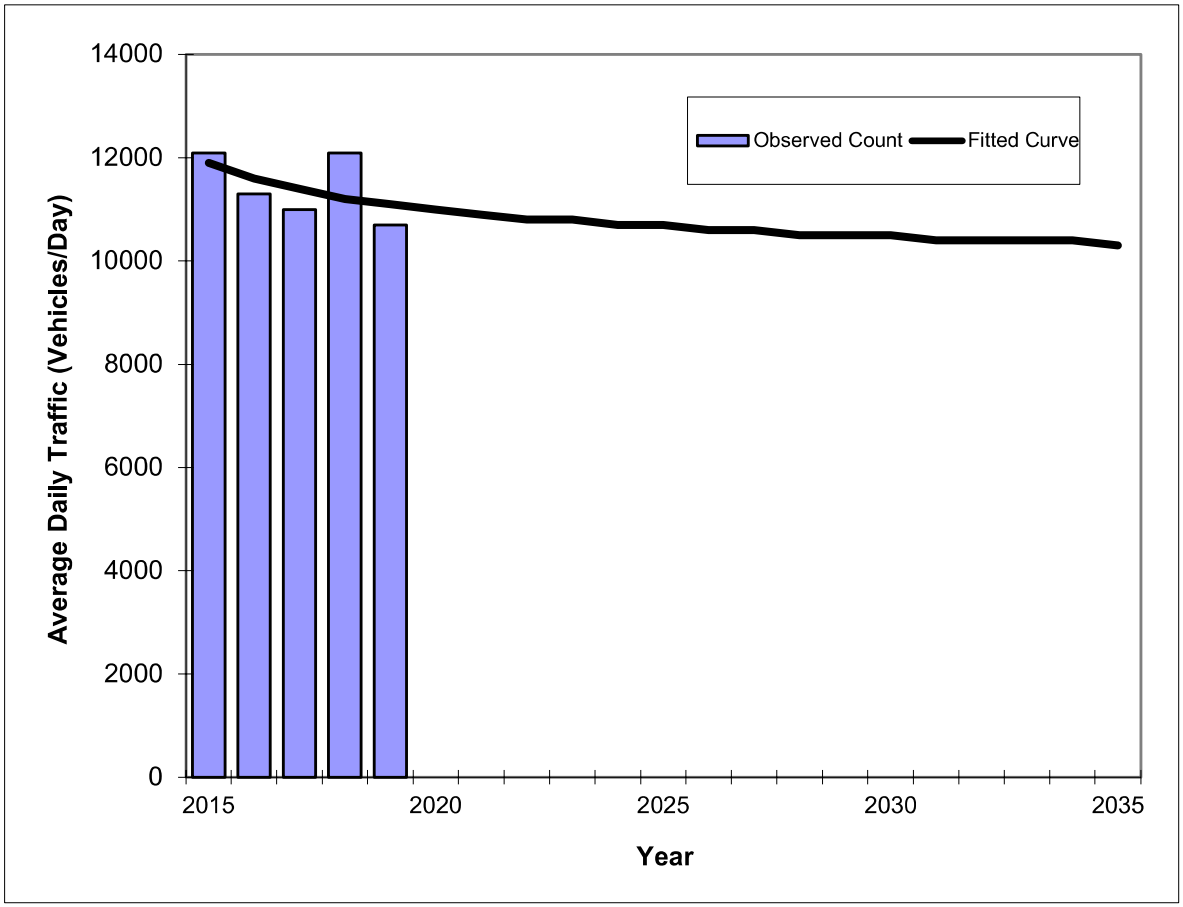
***Axle-Adjusted**

Traffic Trends - V03.a

KEPLER RD -- Beresford Ave to SR 44

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	KEPLER RD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	12100	11900
2016	11300	11600
2017	11000	11400
2018	12100	11200
2019	10700	11100
2027 Opening Year Trend		
2027	N/A	10600
2033 Mid-Year Trend		
2033	N/A	10400
2034 Design Year Trend		
2034	N/A	10400
TRANPLAN Forecasts/Trends		

Trend R-squared:	27.82%
Compounded Annual Historic Growth Rate:	-1.72%
Compounded Growth Rate (2019 to Design Year):	-0.43%
Printed:	19-Jan-23

Decaying Exponential Growth Option

***Axle-Adjusted**

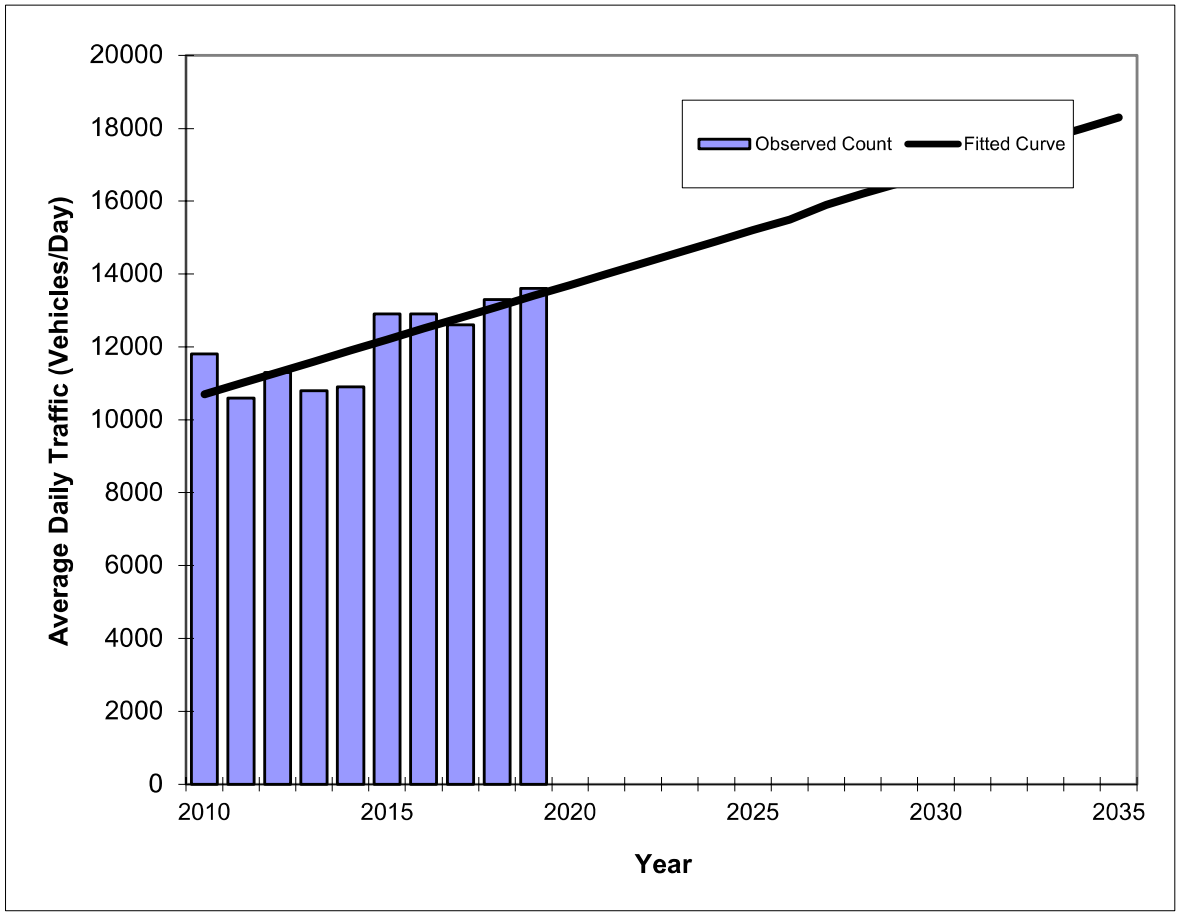
Ten Year Trends

Traffic Trends - V03.a

DR ML KING JR BLTWY -- SR 472 to Cassadaga Rd

FIN#	1234
Location	1

County:	Volusia (79)
Station #:	0
Highway:	DR ML KING JR BLTWY



Year	Traffic (ADT/AADT) Count*	Trend**
2010	11800	10700
2011	10600	11000
2012	11300	11300
2013	10800	11600
2014	10900	11900
2015	12900	12200
2016	12900	12500
2017	12600	12800
2018	13300	13100
2019	13600	13400
2022 Opening Year Trend		
2022	N/A	14300
2024 Mid-Year Trend		
2024	N/A	14900
2027 Design Year Trend		
2027	N/A	15900
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	302
Trend R-squared:	66.65%
Trend Annual Historic Growth Rate:	2.80%
Trend Growth Rate (2019 to Design Year):	2.33%
Printed:	18-Jan-23
Straight Line Growth Option	

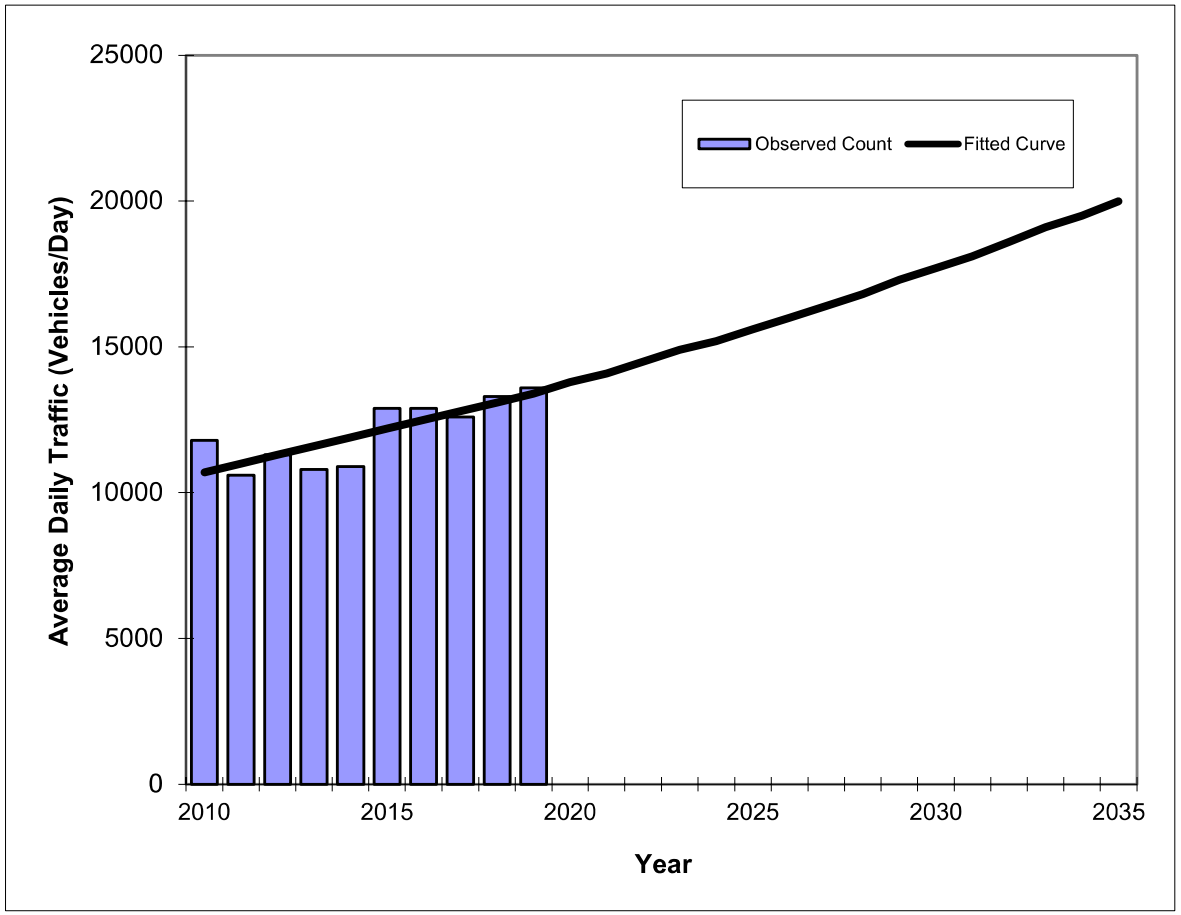
***Axle-Adjusted**

Traffic Trends - V03.a

DR ML KING JR BLTWY -- SR 472 to Cassadaga Rd

FIN#	1234
Location	1

County:	Volusia (79)
Station #:	0
Highway:	DR ML KING JR BLTWY



Year	Traffic (ADT/AADT) Count*	Trend**
2010	11800	10700
2011	10600	11000
2012	11300	11300
2013	10800	11600
2014	10900	11900
2015	12900	12200
2016	12900	12500
2017	12600	12800
2018	13300	13100
2019	13600	13400
2022 Opening Year Trend		
2022	N/A	14500
2024 Mid-Year Trend		
2024	N/A	15200
2027 Design Year Trend		
2027	N/A	16400
TRANPLAN Forecasts/Trends		

Trend R-squared:	65.13%
Compounded Annual Historic Growth Rate:	2.53%
Compounded Growth Rate (2019 to Design Year):	2.56%
Printed:	18-Jan-23

Exponential Growth Option

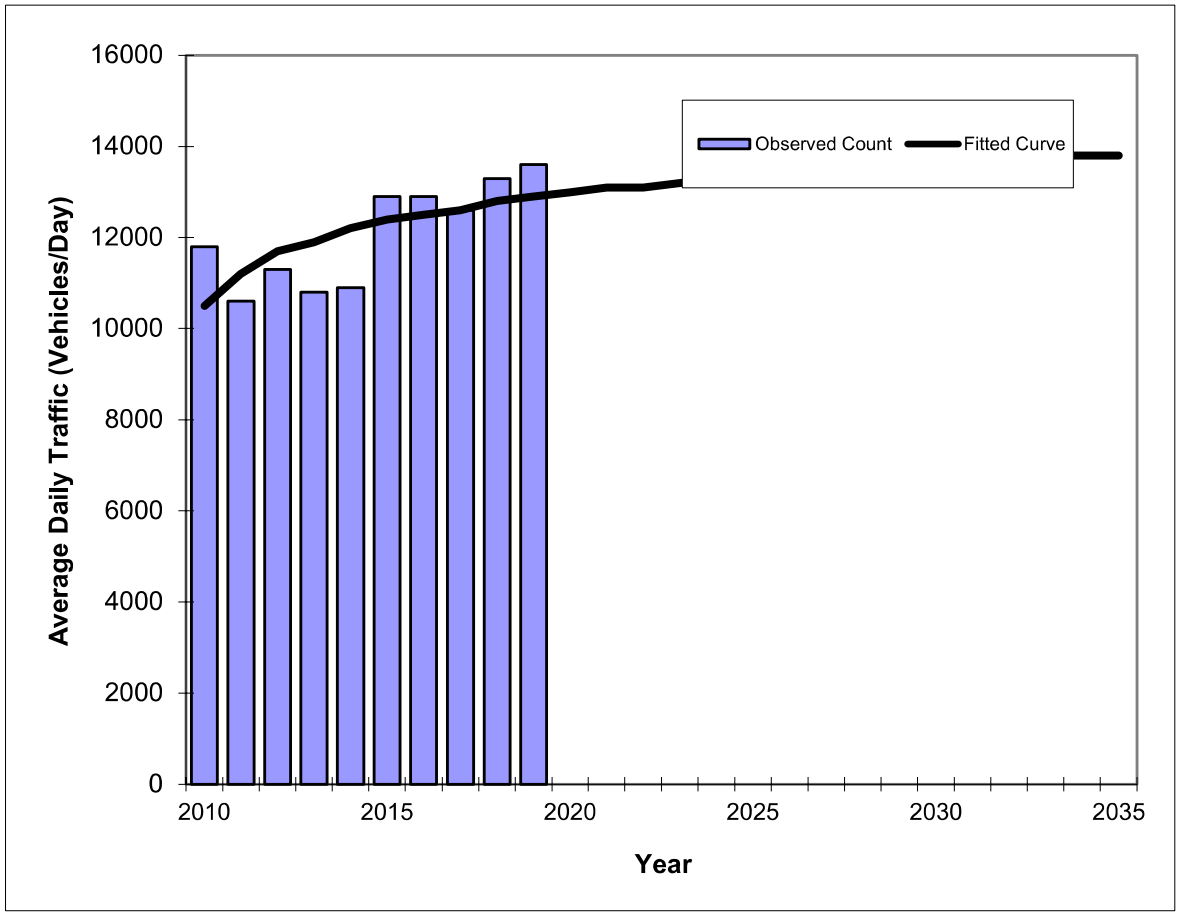
***Axle-Adjusted**

Traffic Trends - V03.a

DR ML KING JR BLTWY -- SR 472 to Cassadaga Rd

FIN#	1234
Location	1

County:	Volusia (79)
Station #:	0
Highway:	DR ML KING JR BLTWY



Year	Traffic (ADT/AADT) Count*	Trend**
2010	11800	10500
2011	10600	11200
2012	11300	11700
2013	10800	11900
2014	10900	12200
2015	12900	12400
2016	12900	12500
2017	12600	12600
2018	13300	12800
2019	13600	12900
2022 Opening Year Trend		
2022	N/A	13100
2024 Mid-Year Trend		
2024	N/A	13300
2027 Design Year Trend		
2027	N/A	13500
TRANPLAN Forecasts/Trends		

Trend R-squared:	44.24%
Compounded Annual Historic Growth Rate:	2.31%
Compounded Growth Rate (2019 to Design Year):	0.57%
Printed:	18-Jan-23

Decaying Exponential Growth Option

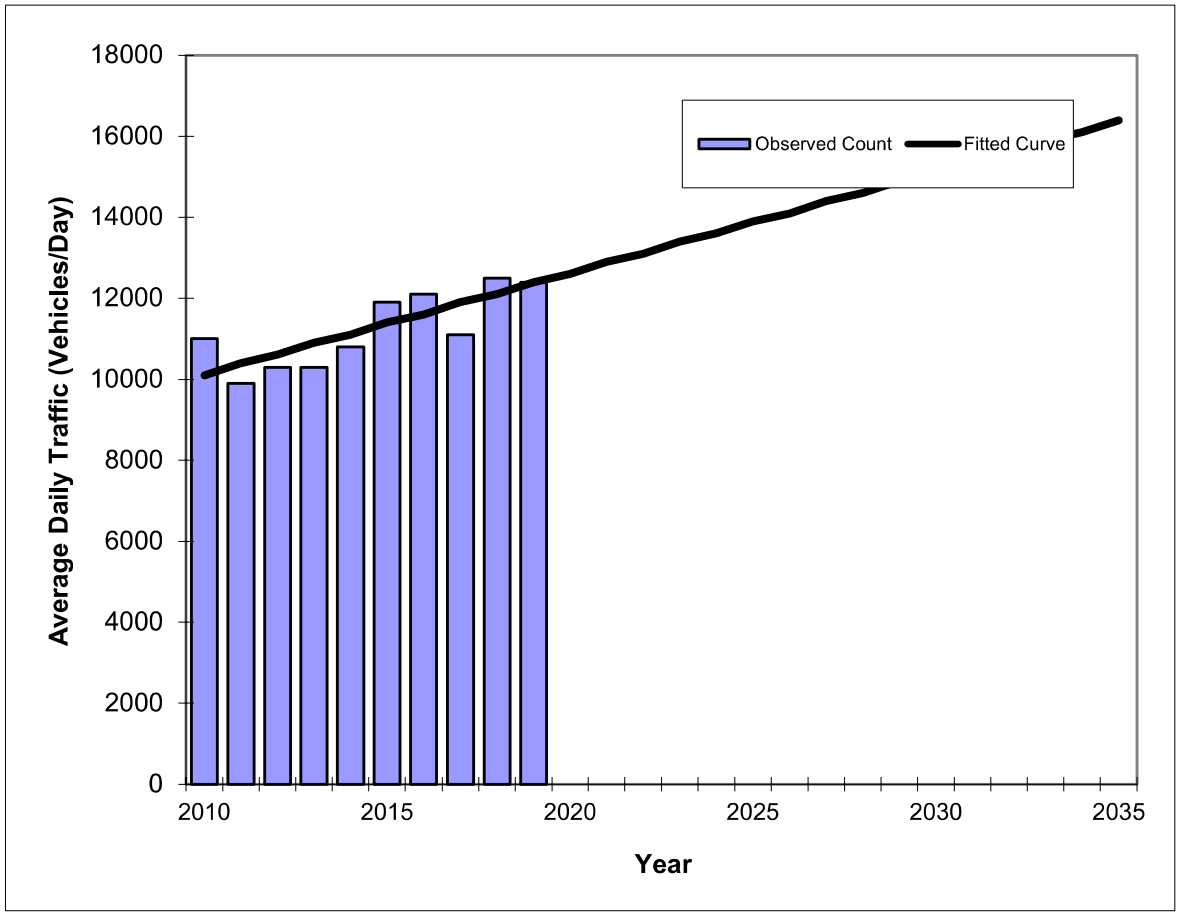
***Axle-Adjusted**

Traffic Trends - V03.a

DR ML KING JR BLTWY -- Cassadaga Rd to Orange Camp Rd

FIN#	1234
Location	1

County:	Volusia (79)
Station #:	0
Highway:	DR ML KING JR BLTWY



Year	Traffic (ADT/AADT) Count*	Trend**
2010	11000	10100
2011	9900	10400
2012	10300	10600
2013	10300	10900
2014	10800	11100
2015	11900	11400
2016	12100	11600
2017	11100	11900
2018	12500	12100
2019	12400	12400
2022 Opening Year Trend		
2022	N/A	13100
2024 Mid-Year Trend		
2024	N/A	13600
2027 Design Year Trend		
2027	N/A	14400
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	250
Trend R-squared:	65.09%
Trend Annual Historic Growth Rate:	2.53%
Trend Growth Rate (2019 to Design Year):	2.02%
Printed:	18-Jan-23
Straight Line Growth Option	

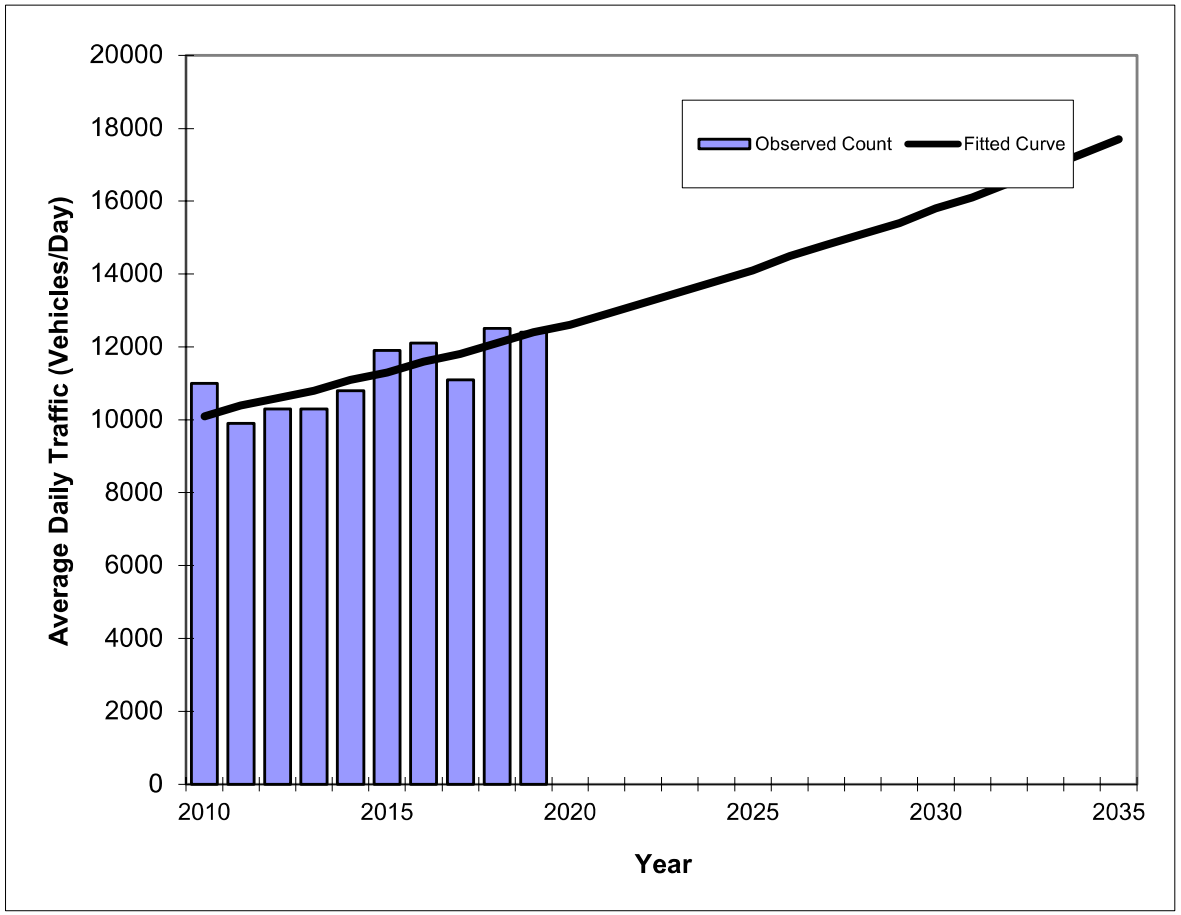
***Axle-Adjusted**

Traffic Trends - V03.a

DR ML KING JR BLTWY -- Cassadaga Rd to Orange Camp Rd

FIN#	1234
Location	1

County:	Volusia (79)
Station #:	0
Highway:	DR ML KING JR BLTWY



Year	Traffic (ADT/AADT) Count*	Trend**
2010	11000	10100
2011	9900	10400
2012	10300	10600
2013	10300	10800
2014	10800	11100
2015	11900	11300
2016	12100	11600
2017	11100	11800
2018	12500	12100
2019	12400	12400
2022 Opening Year Trend		
2022	N/A	13200
2024 Mid-Year Trend		
2024	N/A	13800
2027 Design Year Trend		
2027	N/A	14800
TRANPLAN Forecasts/Trends		

Trend R-squared:	64.55%
Compounded Annual Historic Growth Rate:	2.31%
Compounded Growth Rate (2019 to Design Year):	2.24%
Printed:	18-Jan-23

Exponential Growth Option

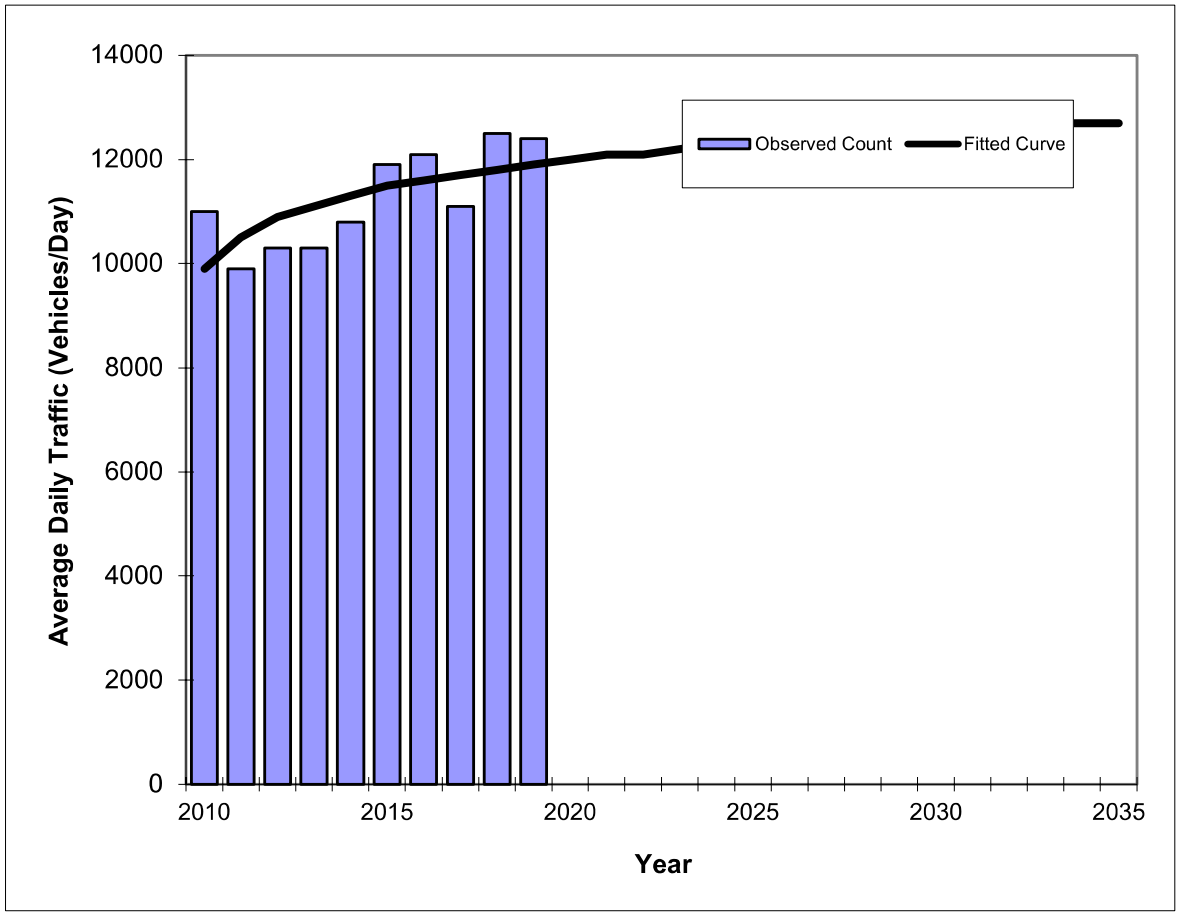
***Axle-Adjusted**

Traffic Trends - V03.a

DR ML KING JR BLTWY -- Cassadaga Rd to Orange Camp Rd

FIN#	1234
Location	1

County:	Volusia (79)
Station #:	0
Highway:	DR ML KING JR BLTWY



Year	Traffic (ADT/AADT) Count*	Trend**
2010	11000	9900
2011	9900	10500
2012	10300	10900
2013	10300	11100
2014	10800	11300
2015	11900	11500
2016	12100	11600
2017	11100	11700
2018	12500	11800
2019	12400	11900
2022 Opening Year Trend		
2022	N/A	12100
2024 Mid-Year Trend		
2024	N/A	12300
2027 Design Year Trend		
2027	N/A	12400
TRANPLAN Forecasts/Trends		

Trend R-squared:	45.56%
Compounded Annual Historic Growth Rate:	2.07%
Compounded Growth Rate (2019 to Design Year):	0.52%
Printed:	19-Jan-23

Decaying Exponential Growth Option

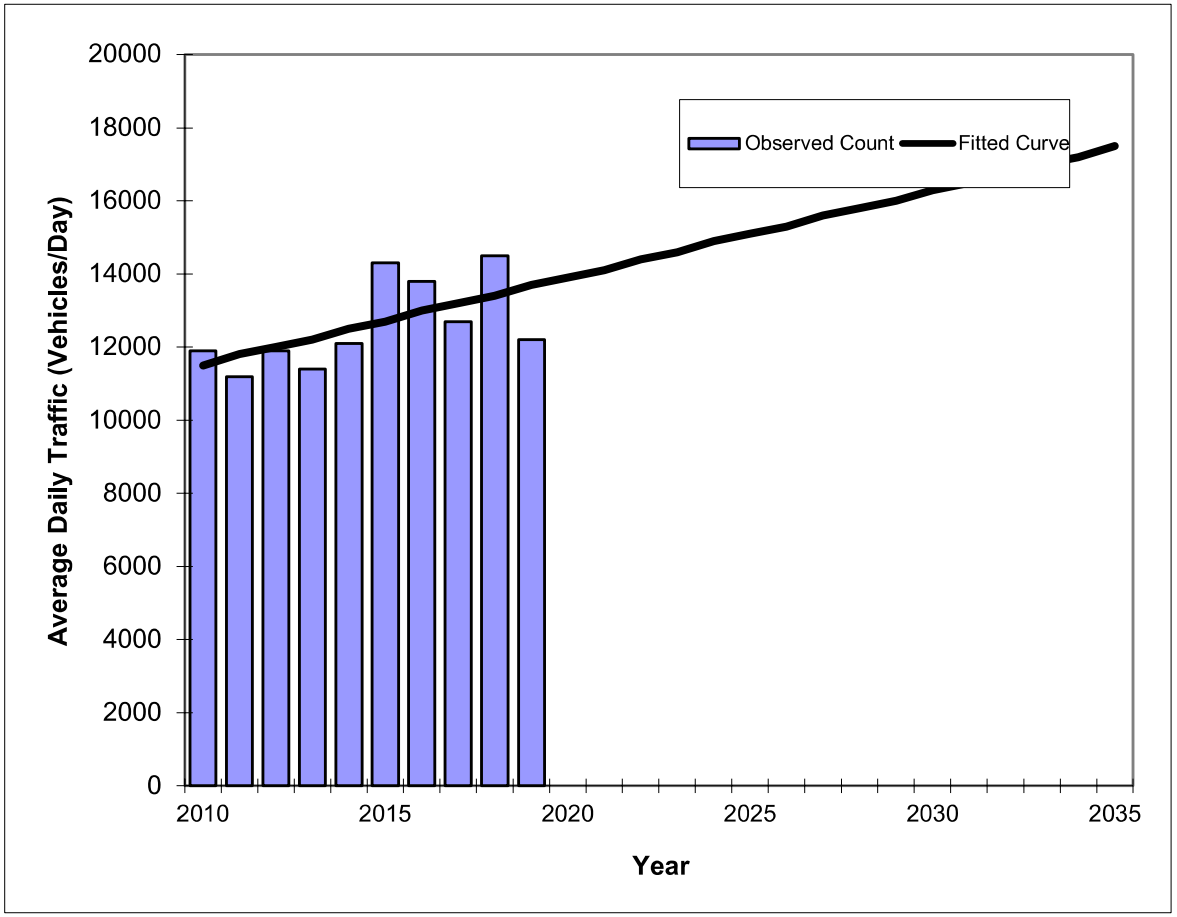
***Axle-Adjusted**

Traffic Trends - V03.a

DR ML KING JR BLTWY -- Orange Camp Rd to Taylor Rd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	DR ML KING JR BLTWY



Year	Traffic (ADT/AADT) Count*	Trend**
2010	11900	11500
2011	11200	11800
2012	11900	12000
2013	11400	12200
2014	12100	12500
2015	14300	12700
2016	13800	13000
2017	12700	13200
2018	14500	13400
2019	12200	13700
2027 Opening Year Trend		
2027	N/A	15600
2033 Mid-Year Trend		
2033	N/A	17000
2034 Design Year Trend		
2034	N/A	17200
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

** Annual Trend Increase:	238
Trend R-squared:	36.55%
Trend Annual Historic Growth Rate:	2.13%
Trend Growth Rate (2019 to Design Year):	1.70%
Printed:	19-Jan-23

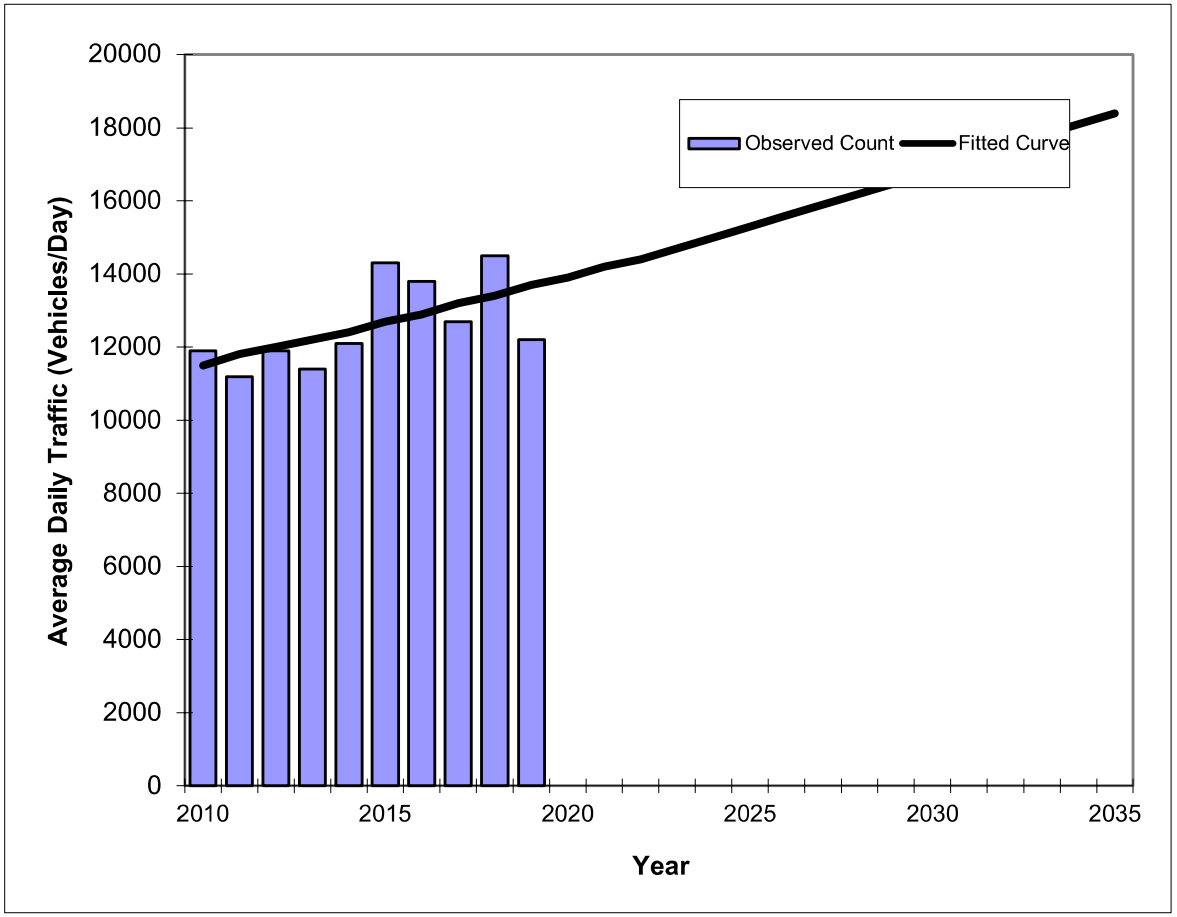
Straight Line Growth Option

Traffic Trends - V03.a

DR ML KING JR BLTWY -- Orange Camp Rd to Taylor Rd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	DR ML KING JR BLTWY



Year	Traffic (ADT/AADT) Count*	Trend**
2010	11900	11500
2011	11200	11800
2012	11900	12000
2013	11400	12200
2014	12100	12400
2015	14300	12700
2016	13800	12900
2017	12700	13200
2018	14500	13400
2019	12200	13700
2027 Opening Year Trend		
2027	N/A	15900
2033 Mid-Year Trend		
2033	N/A	17800
2034 Design Year Trend		
2034	N/A	18100
TRANPLAN Forecasts/Trends		

Trend R-squared:	37.74%
Compounded Annual Historic Growth Rate:	1.96%
Compounded Growth Rate (2019 to Design Year):	1.87%
Printed:	19-Jan-23

Exponential Growth Option

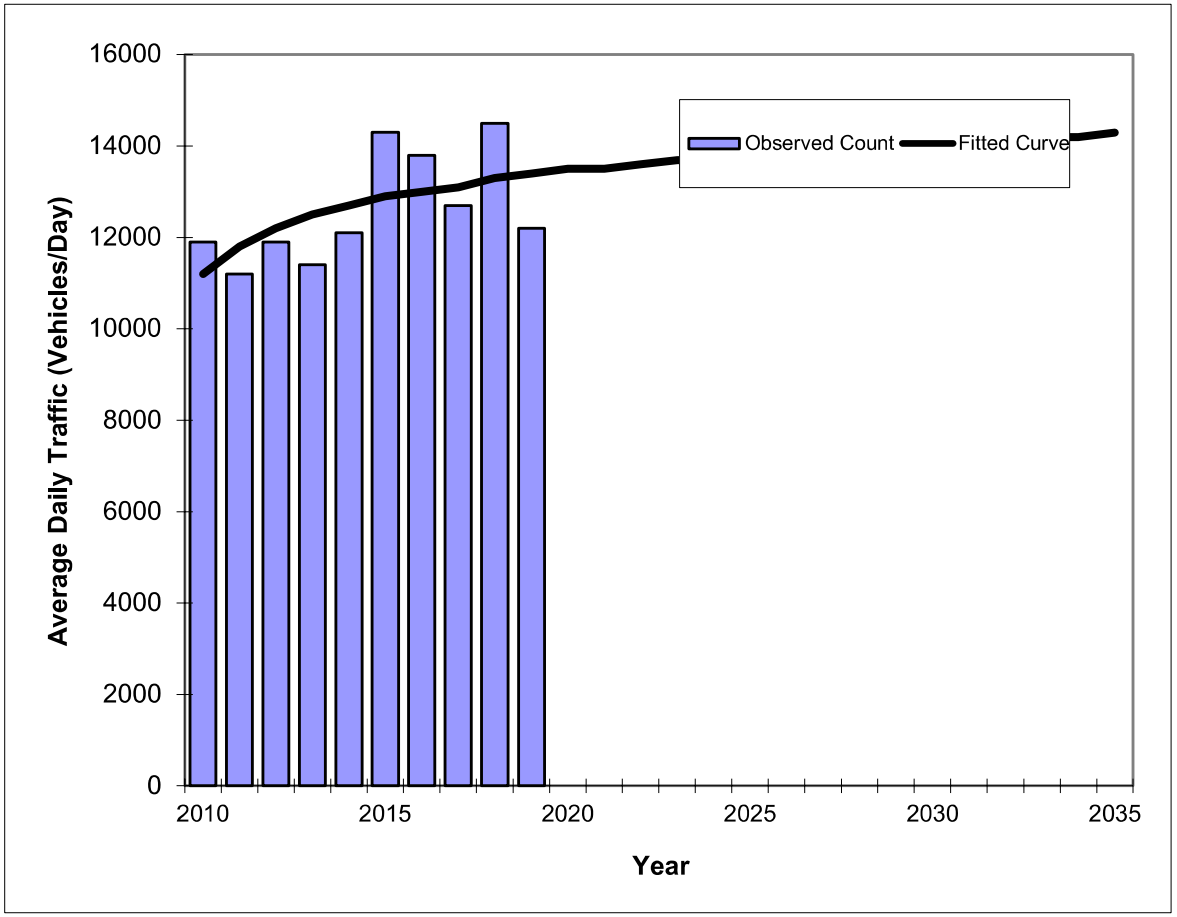
***Axle-Adjusted**

Traffic Trends - V03.a

DR ML KING JR BLTWY -- Orange Camp Rd to Taylor Rd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	DR ML KING JR BLTWY



Year	Traffic (ADT/AADT) Count*	Trend**
2010	11900	11200
2011	11200	11800
2012	11900	12200
2013	11400	12500
2014	12100	12700
2015	14300	12900
2016	13800	13000
2017	12700	13100
2018	14500	13300
2019	12200	13400
2027 Opening Year Trend		
2027	N/A	13900
2033 Mid-Year Trend		
2033	N/A	14200
2034 Design Year Trend		
2034	N/A	14200
TRANPLAN Forecasts/Trends		

Trend R-squared:	34.87%
Compounded Annual Historic Growth Rate:	2.01%
Compounded Growth Rate (2019 to Design Year):	0.39%
Printed:	19-Jan-23

Decaying Exponential Growth Option

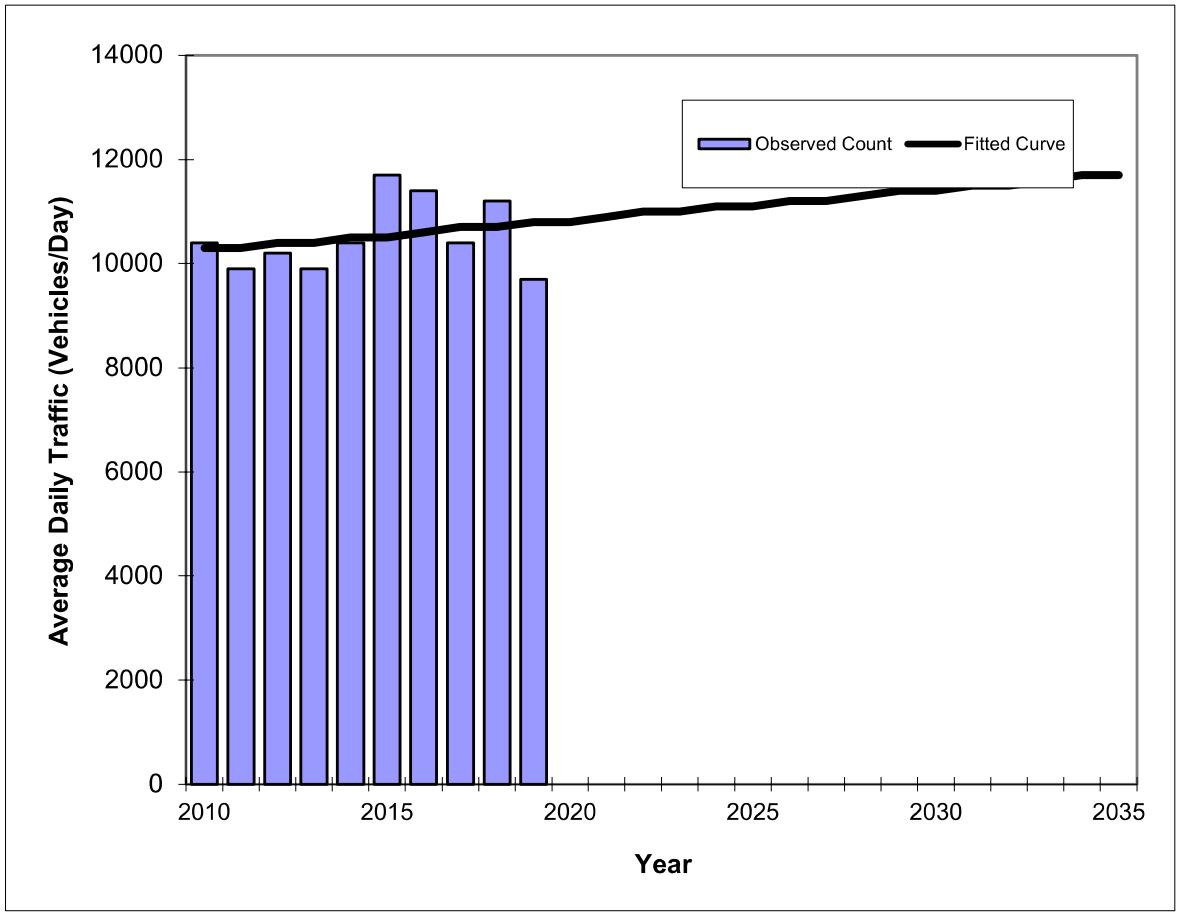
***Axle-Adjusted**

Traffic Trends - V03.a

DR ML KING JR BLTWY -- Taylor Rd to Beresford Ave

FIN#	1234
Location	1

County:	Volusia (79)
Station #:	0
Highway:	DR ML KING JR BLTWY



Year	Traffic (ADT/AADT) Count*	Trend**
2010	10400	10300
2011	9900	10300
2012	10200	10400
2013	9900	10400
2014	10400	10500
2015	11700	10500
2016	11400	10600
2017	10400	10700
2018	11200	10700
2019	9700	10800
2022 Opening Year Trend		
2022	N/A	11000
2024 Mid-Year Trend		
2024	N/A	11100
2027 Design Year Trend		
2027	N/A	11200
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

**** Annual Trend Increase:**	58
Trend R-squared:	6.62%
Trend Annual Historic Growth Rate:	0.54%
Trend Growth Rate (2019 to Design Year):	0.46%
Printed:	19-Jan-23

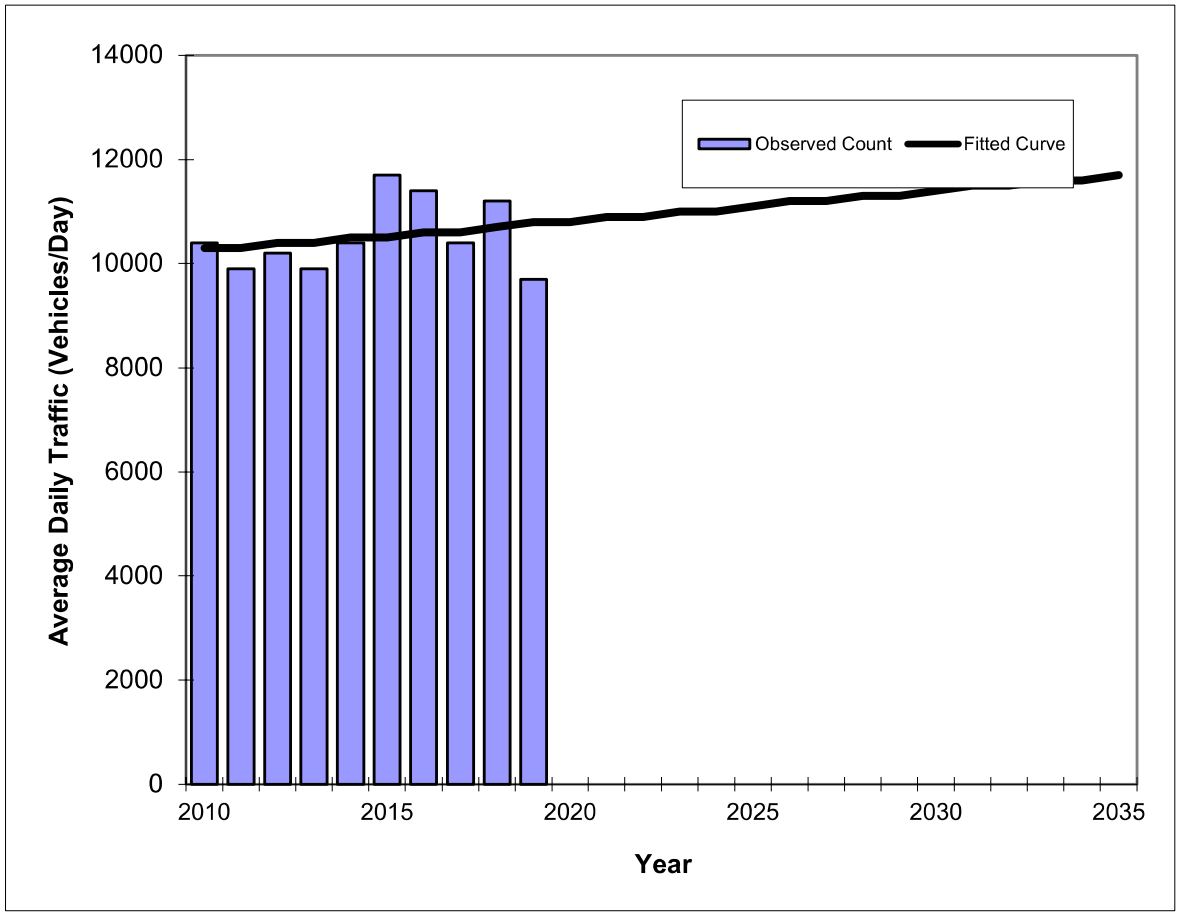
Straight Line Growth Option

Traffic Trends - V03.a

DR ML KING JR BLTWY -- Taylor Rd to Beresford Ave

FIN#	1234
Location	1

County:	Volusia (79)
Station #:	0
Highway:	DR ML KING JR BLTWY



Year	Traffic (ADT/AADT) Count*	Trend**
2010	10400	10300
2011	9900	10300
2012	10200	10400
2013	9900	10400
2014	10400	10500
2015	11700	10500
2016	11400	10600
2017	10400	10600
2018	11200	10700
2019	9700	10800
2022 Opening Year Trend		
2022	N/A	10900
2024 Mid-Year Trend		
2024	N/A	11000
2027 Design Year Trend		
2027	N/A	11200
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

Trend R-squared:	6.27%
Compounded Annual Historic Growth Rate:	0.53%
Compounded Growth Rate (2019 to Design Year):	0.46%
Printed:	19-Jan-23

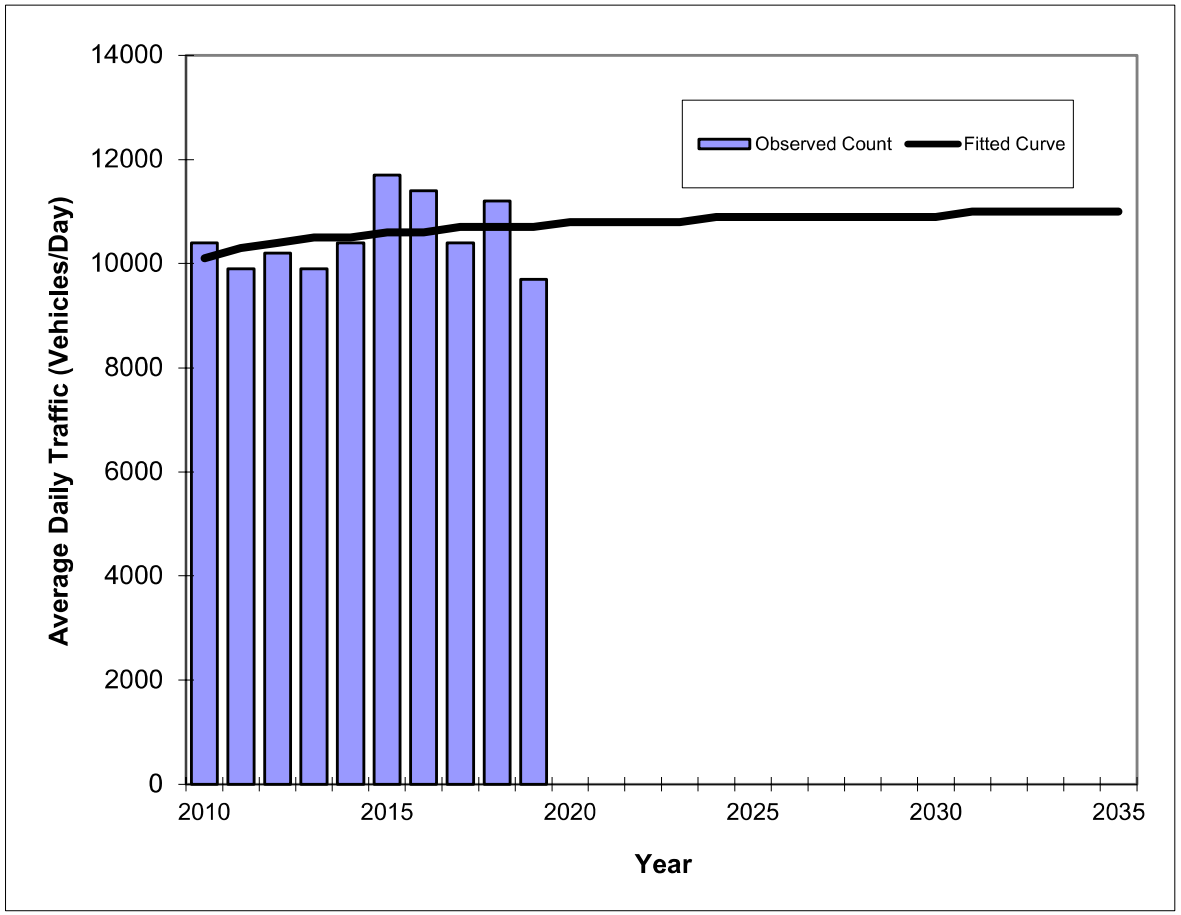
Exponential Growth Option

Traffic Trends - V03.a

DR ML KING JR BLTWY -- Taylor Rd to Beresford Ave

FIN#	1234
Location	1

County:	Volusia (79)
Station #:	0
Highway:	DR ML KING JR BLTWY



Year	Traffic (ADT/AADT) Count*	Trend**
2010	10400	10100
2011	9900	10300
2012	10200	10400
2013	9900	10500
2014	10400	10500
2015	11700	10600
2016	11400	10600
2017	10400	10700
2018	11200	10700
2019	9700	10700
2022 Opening Year Trend		
2022	N/A	10800
2024 Mid-Year Trend		
2024	N/A	10900
2027 Design Year Trend		
2027	N/A	10900
TRANPLAN Forecasts/Trends		

Trend R-squared:	8.93%
Compounded Annual Historic Growth Rate:	0.64%
Compounded Growth Rate (2019 to Design Year):	0.23%
Printed:	19-Jan-23

Decaying Exponential Growth Option

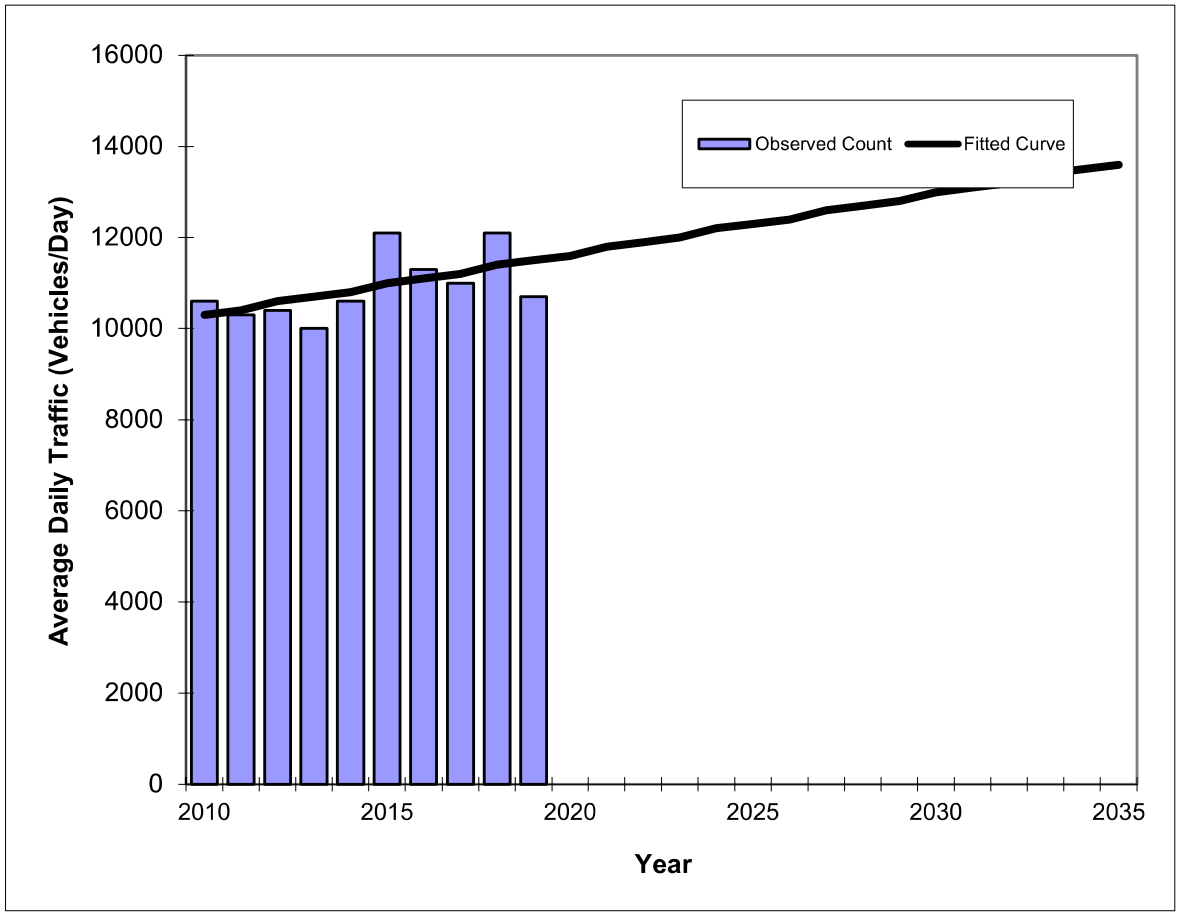
***Axle-Adjusted**

Traffic Trends - V03.a

KEPLER RD -- Beresford Ave to SR 44

FIN#	1234
Location	1

County:	Volusia (79)
Station #:	0
Highway:	KEPLER RD



Year	Traffic (ADT/AADT) Count*	Trend**
2010	10600	10300
2011	10300	10400
2012	10400	10600
2013	10000	10700
2014	10600	10800
2015	12100	11000
2016	11300	11100
2017	11000	11200
2018	12100	11400
2019	10700	11500
2022 Opening Year Trend		
2022	N/A	11900
2024 Mid-Year Trend		
2024	N/A	12200
2027 Design Year Trend		
2027	N/A	12600
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

** Annual Trend Increase:	133
Trend R-squared:	31.00%
Trend Annual Historic Growth Rate:	1.29%
Trend Growth Rate (2019 to Design Year):	1.20%
Printed:	19-Jan-23

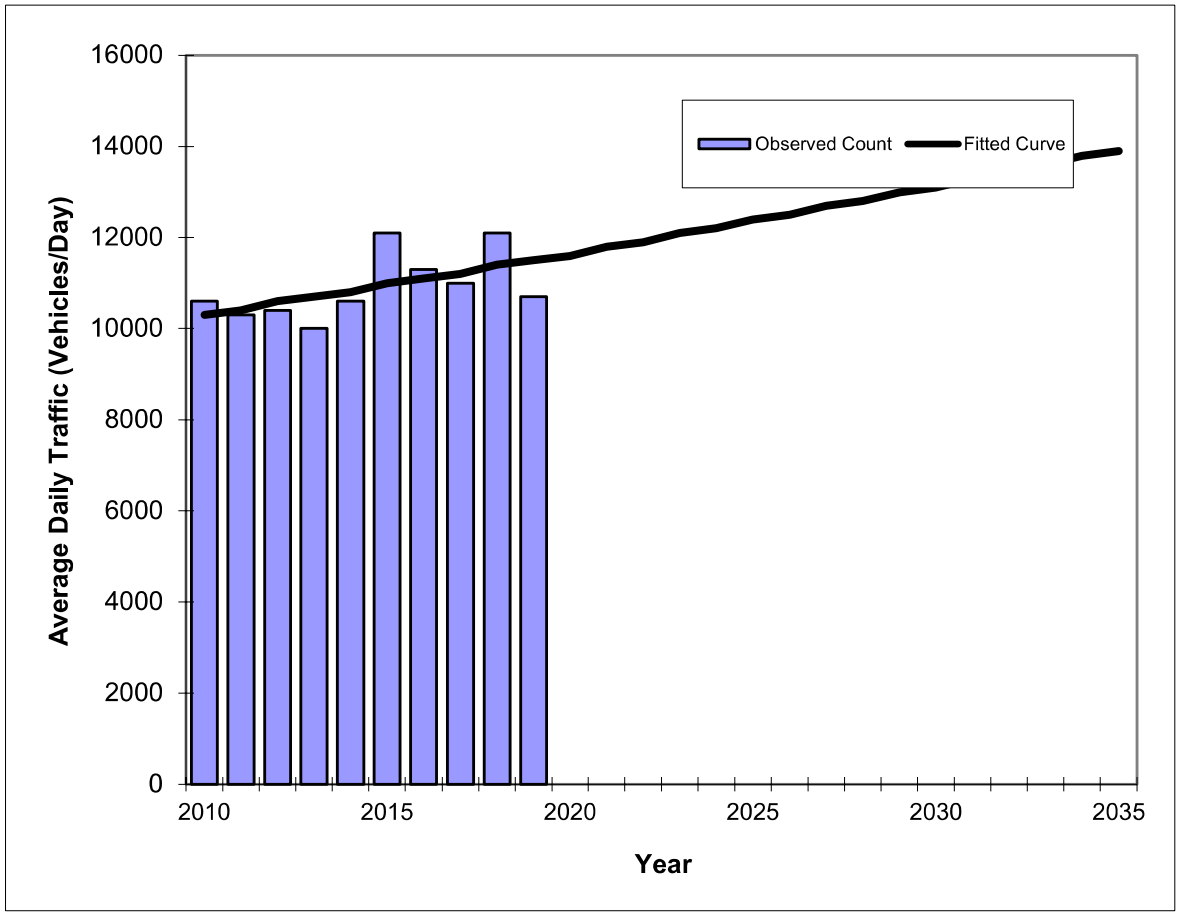
Straight Line Growth Option

Traffic Trends - V03.a

KEPLER RD -- Beresford Ave to SR 44

FIN#	1234
Location	1

County:	Volusia (79)
Station #:	0
Highway:	KEPLER RD



Year	Traffic (ADT/AADT) Count*	Trend**
2010	10600	10300
2011	10300	10400
2012	10400	10600
2013	10000	10700
2014	10600	10800
2015	12100	11000
2016	11300	11100
2017	11000	11200
2018	12100	11400
2019	10700	11500
2022 Opening Year Trend		
2022	N/A	11900
2024 Mid-Year Trend		
2024	N/A	12200
2027 Design Year Trend		
2027	N/A	12700
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

Trend R-squared:	31.68%
Compounded Annual Historic Growth Rate:	1.23%
Compounded Growth Rate (2019 to Design Year):	1.25%
Printed:	19-Jan-23

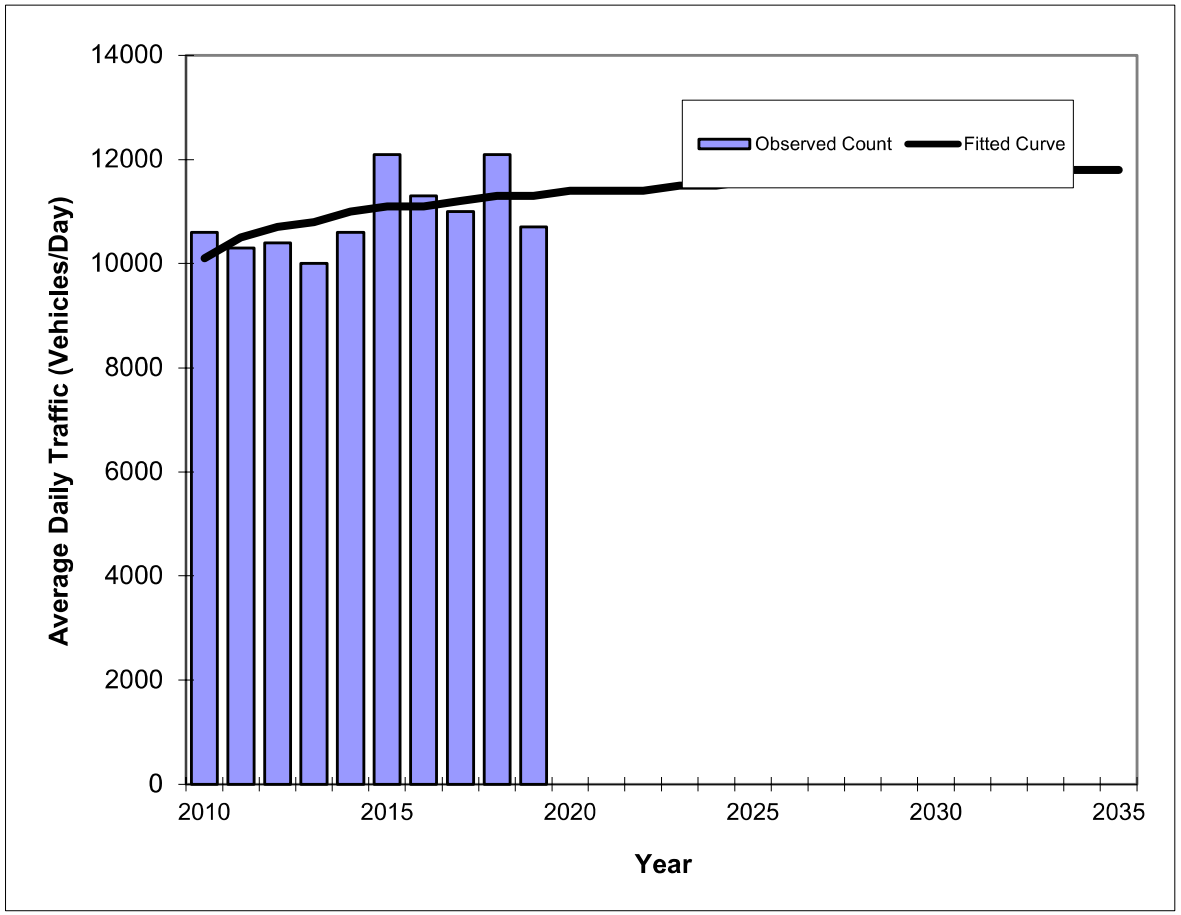
Exponential Growth Option

Traffic Trends - V03.a

KEPLER RD -- Beresford Ave to SR 44

FIN#	1234
Location	1

County:	Volusia (79)
Station #:	0
Highway:	KEPLER RD



Year	Traffic (ADT/AADT) Count*	Trend**
2010	10600	10100
2011	10300	10500
2012	10400	10700
2013	10000	10800
2014	10600	11000
2015	12100	11100
2016	11300	11100
2017	11000	11200
2018	12100	11300
2019	10700	11300
2022 Opening Year Trend		
2022	N/A	11400
2024 Mid-Year Trend		
2024	N/A	11500
2027 Design Year Trend		
2027	N/A	11600
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

Trend R-squared:	26.81%
Compounded Annual Historic Growth Rate:	1.26%
Compounded Growth Rate (2019 to Design Year):	0.33%
Printed:	19-Jan-23

Decaying Exponential Growth Option

Kentucky Avenue

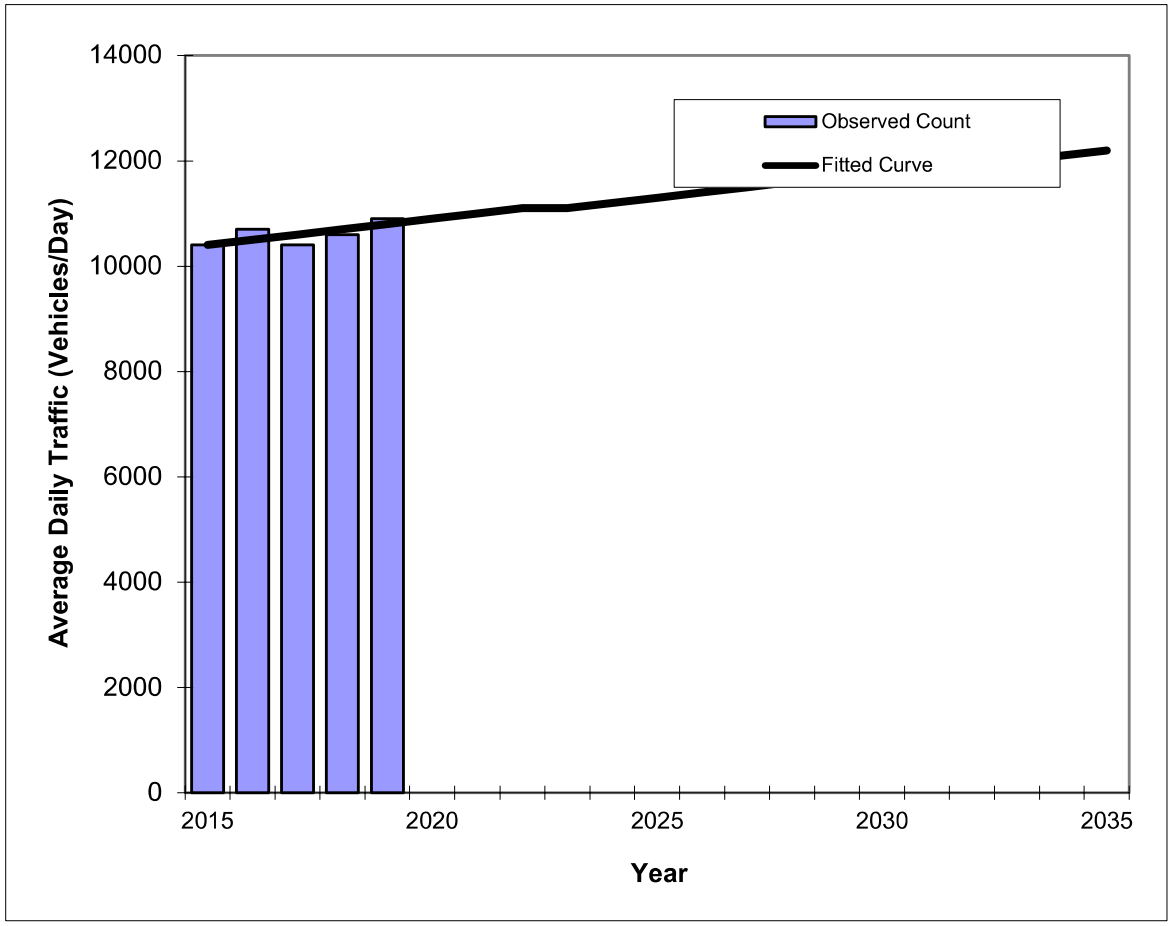
Five Year Trends

Traffic Trends - V03.a

KENTUCKY AVE -- Graves Ave to SR 472

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	KENTUCKY AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2015	10400	10400
2016	10700	10500
2017	10400	10600
2018	10600	10700
2019	10900	10800
2027 Opening Year Trend		
2027	N/A	11500
2033 Mid-Year Trend		
2033	N/A	12000
2034 Design Year Trend		
2034	N/A	12100
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	90
Trend R-squared:	45.00%
Trend Annual Historic Growth Rate:	0.96%
Trend Growth Rate (2019 to Design Year):	0.80%
Printed:	18-Jan-23

Straight Line Growth Option

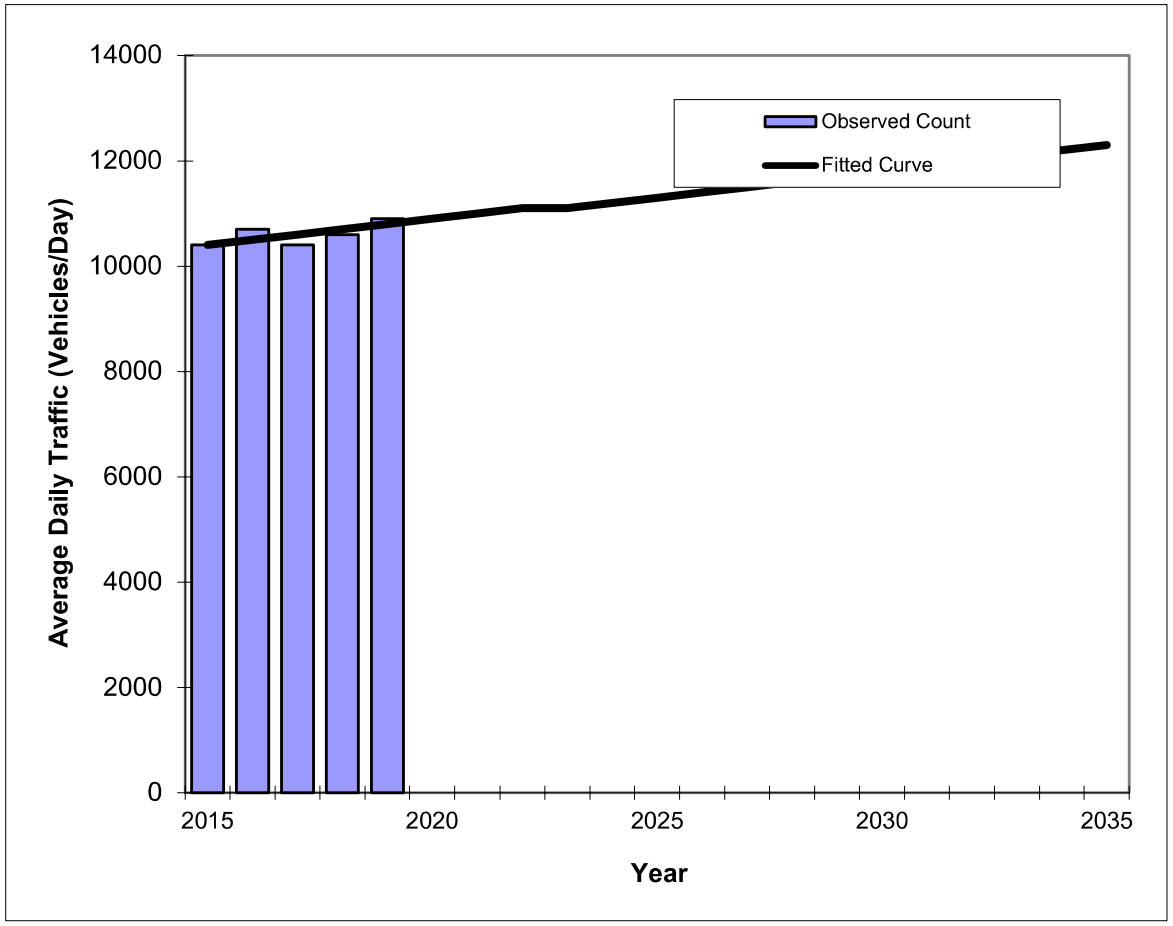
***Axle-Adjusted**

Traffic Trends - V03.a

KENTUCKY AVE -- Graves Ave to SR 472

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	KENTUCKY AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2015	10400	10400
2016	10700	10500
2017	10400	10600
2018	10600	10700
2019	10900	10800
2027 Opening Year Trend		
2027	N/A	11500
2033 Mid-Year Trend		
2033	N/A	12100
2034 Design Year Trend		
2034	N/A	12200
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

Trend R-squared:	44.86%
Compounded Annual Historic Growth Rate:	0.95%
Compounded Growth Rate (2019 to Design Year):	0.82%
Printed:	18-Jan-23

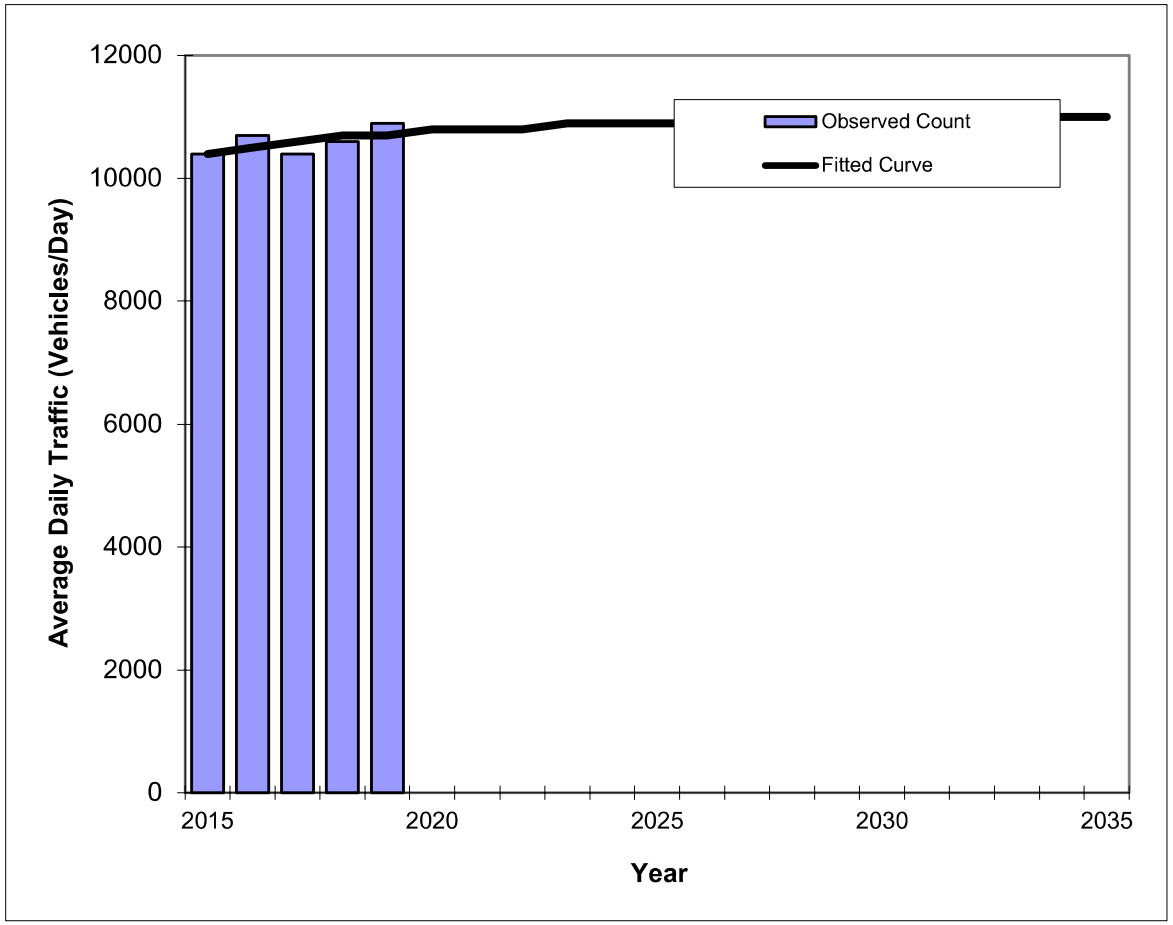
Exponential Growth Option

Traffic Trends - V03.a

KENTUCKY AVE -- Graves Ave to SR 472

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	KENTUCKY AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2015	10400	10400
2016	10700	10500
2017	10400	10600
2018	10600	10700
2019	10900	10700
2027 Opening Year Trend		
2027	N/A	10900
2033 Mid-Year Trend		
2033	N/A	11000
2034 Design Year Trend		
2034	N/A	11000
TRANPLAN Forecasts/Trends		

Trend R-squared:	38.00%
Compounded Annual Historic Growth Rate:	0.71%
Compounded Growth Rate (2019 to Design Year):	0.18%
Printed:	18-Jan-23

Decaying Exponential Growth Option

***Axle-Adjusted**

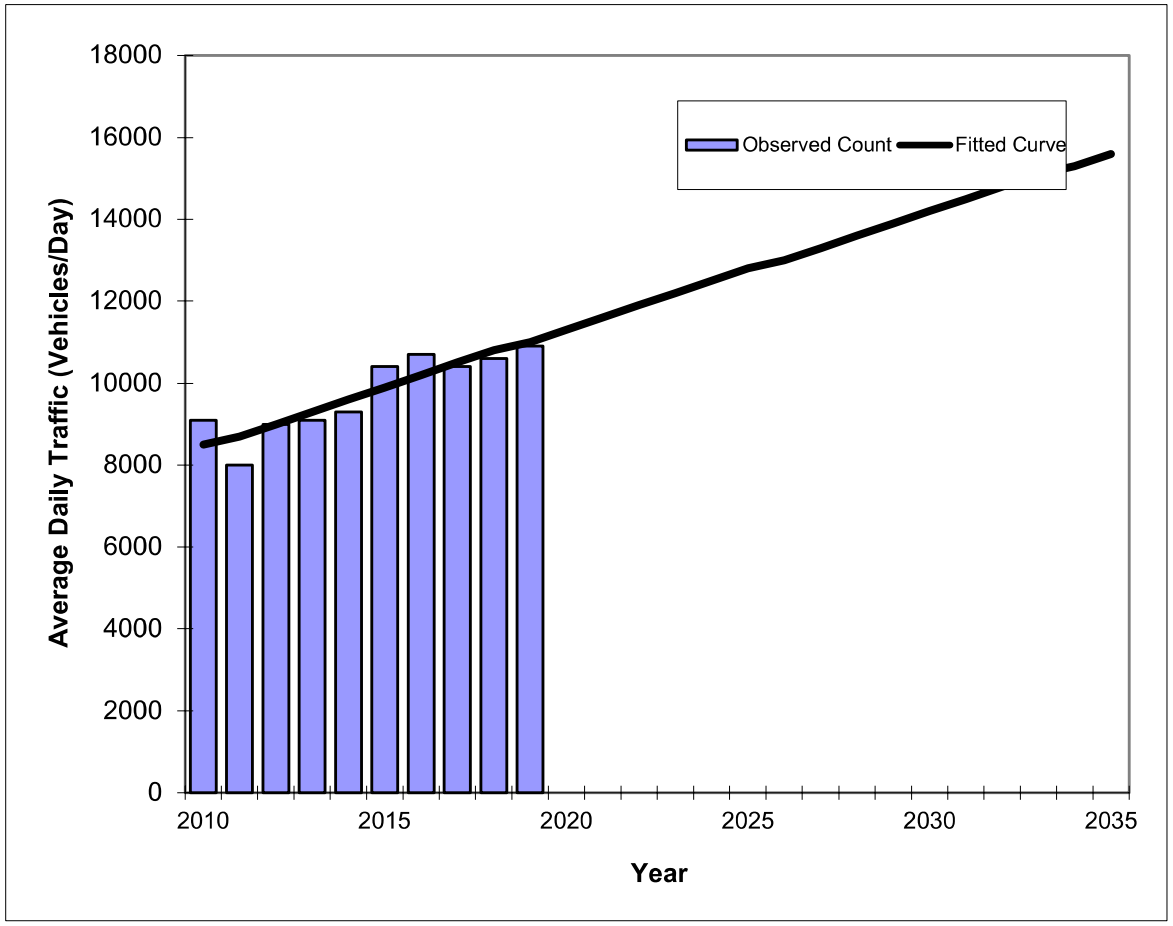
Ten Year Trends

Traffic Trends - V03.a

KENTUCKY AVE -- Graves Ave to SR 472

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	KENTUCKY AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2010	9100	8500
2011	8000	8700
2012	9000	9000
2013	9100	9300
2014	9300	9600
2015	10400	9900
2016	10700	10200
2017	10400	10500
2018	10600	10800
2019	10900	11000
2027 Opening Year Trend		
2027	N/A	13300
2033 Mid-Year Trend		
2033	N/A	15100
2034 Design Year Trend		
2034	N/A	15300
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

** Annual Trend Increase:	287
Trend R-squared:	80.09%
Trend Annual Historic Growth Rate:	3.27%
Trend Growth Rate (2019 to Design Year):	2.61%
Printed:	19-Jan-23

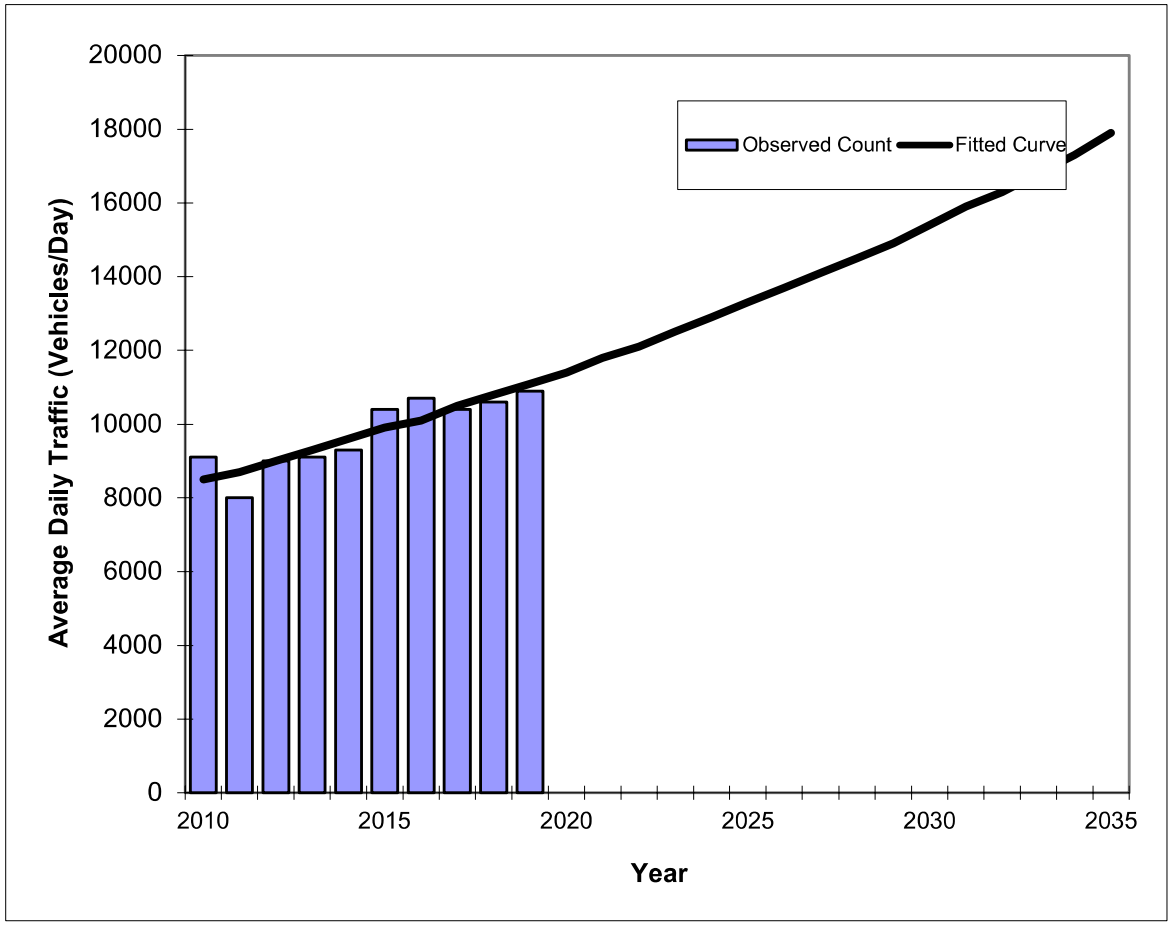
Straight Line Growth Option

Traffic Trends - V03.a

KENTUCKY AVE -- Graves Ave to SR 472

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	KENTUCKY AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2010	9100	8500
2011	8000	8700
2012	9000	9000
2013	9100	9300
2014	9300	9600
2015	10400	9900
2016	10700	10100
2017	10400	10500
2018	10600	10800
2019	10900	11100
2027 Opening Year Trend		
2027	N/A	14100
2033 Mid-Year Trend		
2033	N/A	16800
2034 Design Year Trend		
2034	N/A	17300
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

Trend R-squared:	78.31%
Compounded Annual Historic Growth Rate:	3.01%
Compounded Growth Rate (2019 to Design Year):	3.00%
Printed:	19-Jan-23

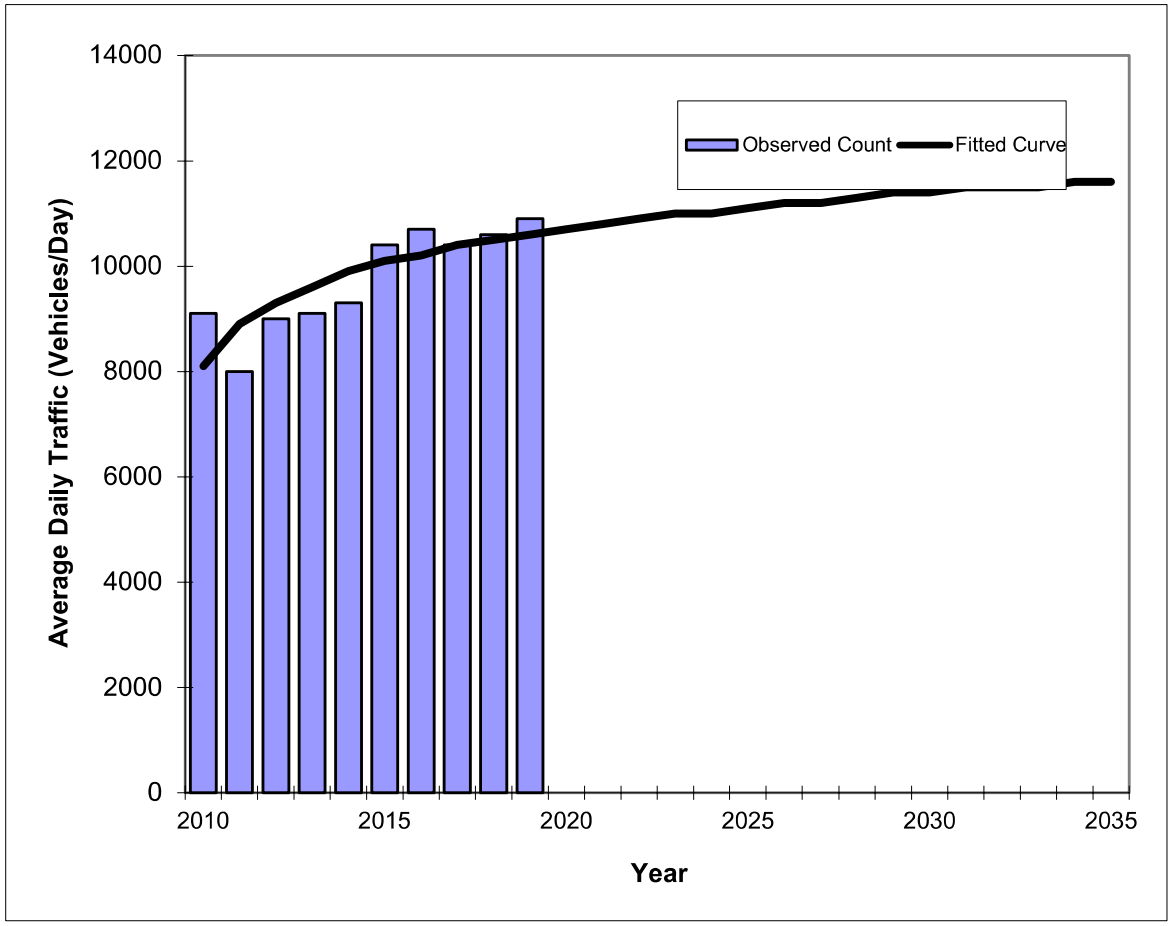
Exponential Growth Option

Traffic Trends - V03.a

KENTUCKY AVE -- Graves Ave to SR 472

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	KENTUCKY AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2010	9100	8100
2011	8000	8900
2012	9000	9300
2013	9100	9600
2014	9300	9900
2015	10400	10100
2016	10700	10200
2017	10400	10400
2018	10600	10500
2019	10900	10600
2027 Opening Year Trend		
2027	N/A	11200
2033 Mid-Year Trend		
2033	N/A	11500
2034 Design Year Trend		
2034	N/A	11600
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

Trend R-squared:	66.52%
Compounded Annual Historic Growth Rate:	3.03%
Compounded Growth Rate (2019 to Design Year):	0.60%
Printed:	19-Jan-23

Decaying Exponential Growth Option

Veteran's Memorial Parkway

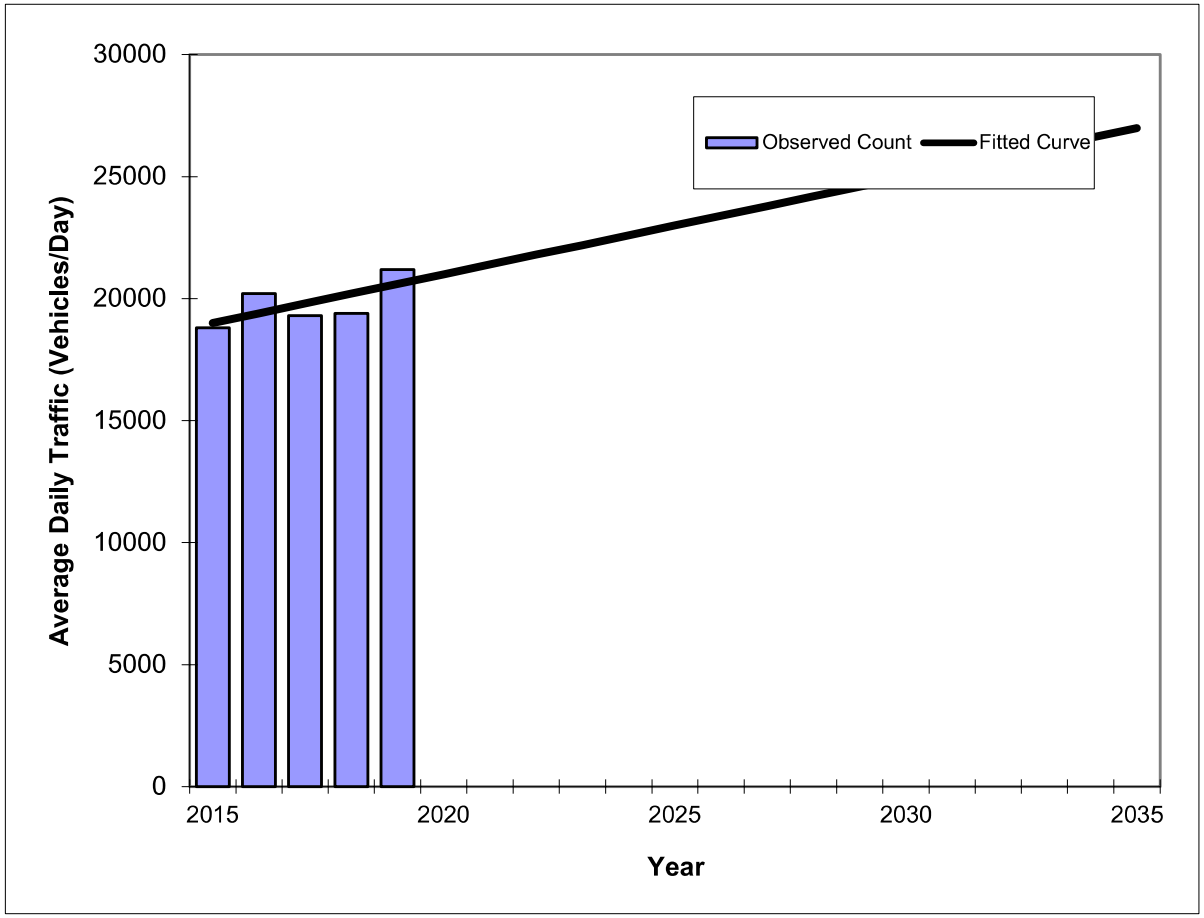
Five Year Trends

Traffic Trends - V03.a

VETERANS MEM PRKWY -- Harley Strickland Blvd to Rhode Island Ave

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	VETERANS MEM PRKWY



Year	Traffic (ADT/AADT) Count*	Trend**
2015	18800	19000
2016	20200	19400
2017	19300	19800
2018	19400	20200
2019	21200	20600
2027 Opening Year Trend		
2027	N/A	23800
2033 Mid-Year Trend		
2033	N/A	26200
2034 Design Year Trend		
2034	N/A	26600
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	400
Trend R-squared:	45.35%
Trend Annual Historic Growth Rate:	2.11%
Trend Growth Rate (2019 to Design Year):	1.94%
Printed:	20-Jan-23
Straight Line Growth Option	

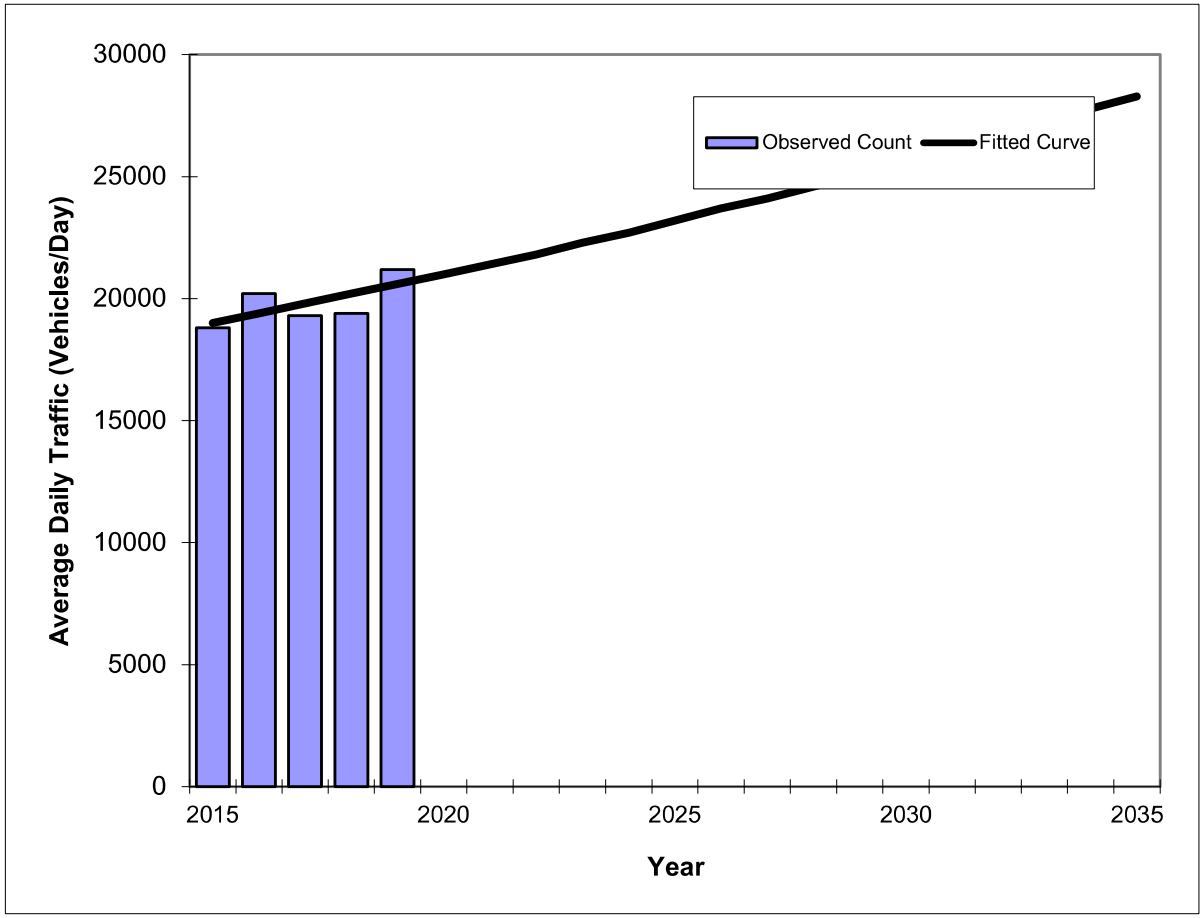
***Axle-Adjusted**

Traffic Trends - V03.a

VETERANS MEM PRKWY -- Harley Strickland Blvd to Rhode Island Ave

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	VETERANS MEM PRKWY



Year	Traffic (ADT/AADT) Count*	Trend**
2015	18800	19000
2016	20200	19400
2017	19300	19800
2018	19400	20200
2019	21200	20600
2027 Opening Year Trend		
2027	N/A	24100
2033 Mid-Year Trend		
2033	N/A	27200
2034 Design Year Trend		
2034	N/A	27800
TRANPLAN Forecasts/Trends		

Trend R-squared:	45.37%
Compounded Annual Historic Growth Rate:	2.04%
Compounded Growth Rate (2019 to Design Year):	2.02%
Printed:	20-Jan-23

Exponential Growth Option

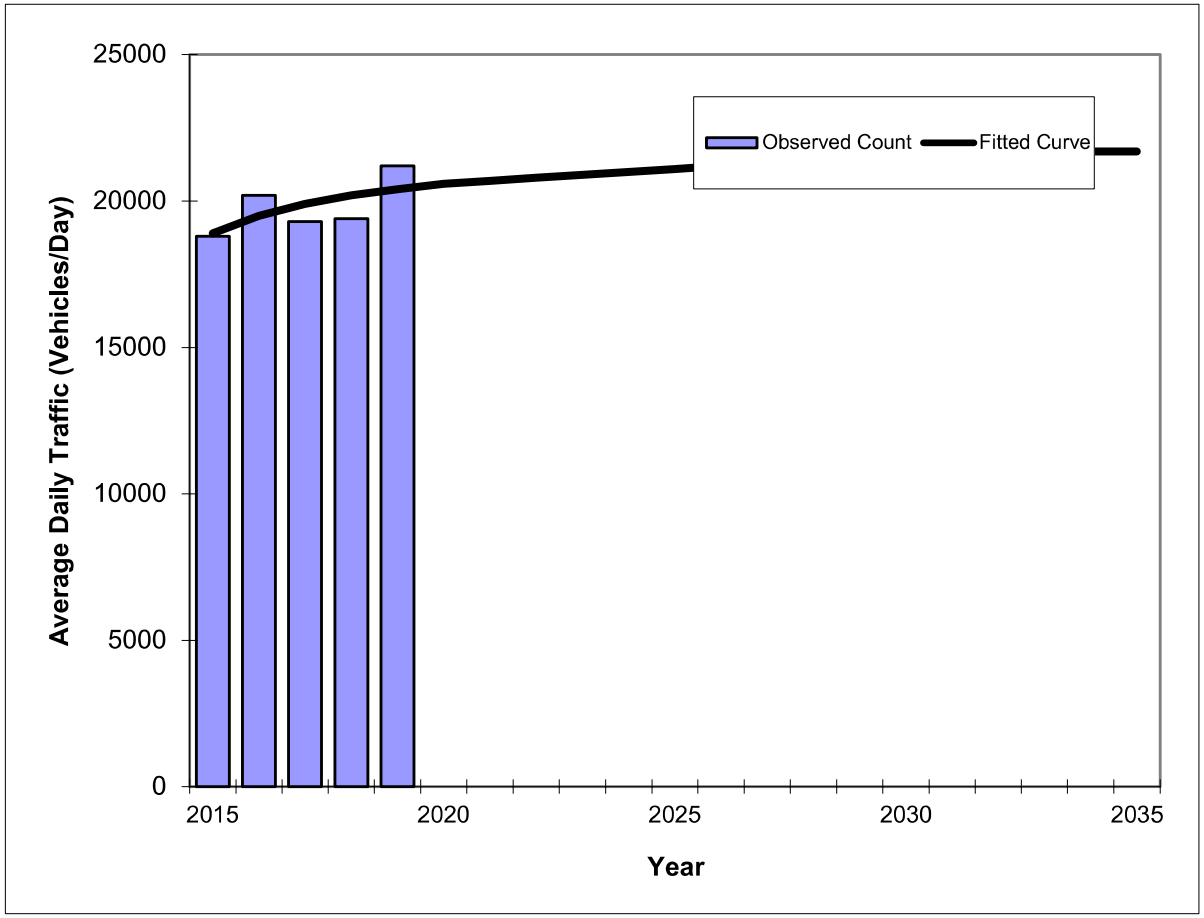
***Axle-Adjusted**

Traffic Trends - V03.a

VETERANS MEM PRKWY -- Harley Strickland Blvd to Rhode Island Ave

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	VETERANS MEM PRKWY



Year	Traffic (ADT/AADT) Count*	Trend**
2015	18800	18900
2016	20200	19500
2017	19300	19900
2018	19400	20200
2019	21200	20400
2027 Opening Year Trend		
2027	N/A	21300
2033 Mid-Year Trend		
2033	N/A	21700
2034 Design Year Trend		
2034	N/A	21700
TRANPLAN Forecasts/Trends		

Trend R-squared:	40.67%
Compounded Annual Historic Growth Rate:	1.93%
Compounded Growth Rate (2019 to Design Year):	0.41%
Printed:	20-Jan-23

Decaying Exponential Growth Option

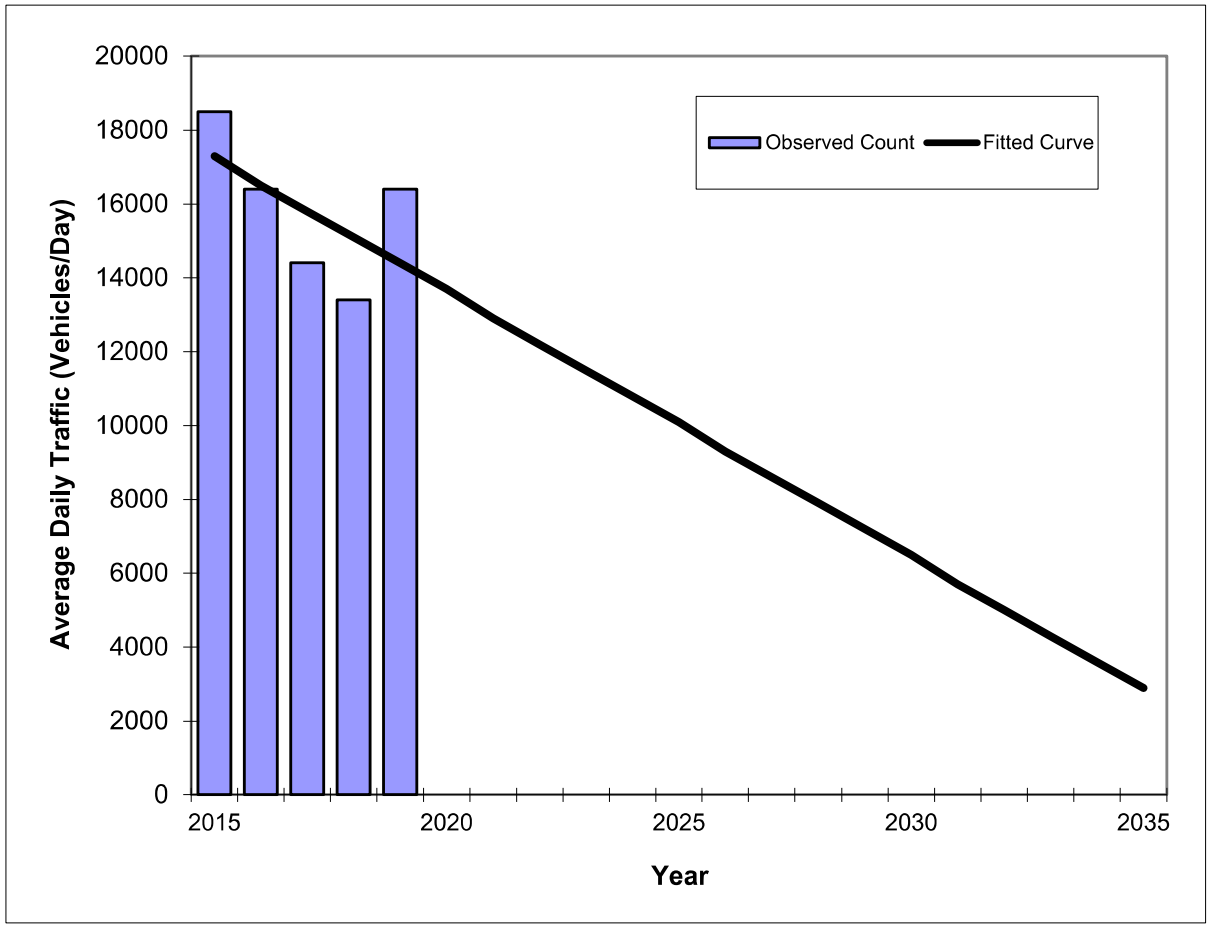
***Axle-Adjusted**

Traffic Trends - V03.a

VETERANS MEM PRKWY -- Rhode Island Ave to Graves Ave

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	VETERANS MEM PRKWY



Year	Traffic (ADT/AADT) Count*	Trend**
2015	18500	17300
2016	16400	16500
2017	14400	15800
2018	13400	15100
2019	16400	14400
2027 Opening Year Trend		
2027	N/A	8600
2033 Mid-Year Trend		
2033	N/A	4300
2034 Design Year Trend		
2034	N/A	3600
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

**** Annual Trend Increase:**	-720
Trend R-squared:	32.96%
Trend Annual Historic Growth Rate:	-4.19%
Trend Growth Rate (2019 to Design Year):	-5.00%
Printed:	15-Nov-22

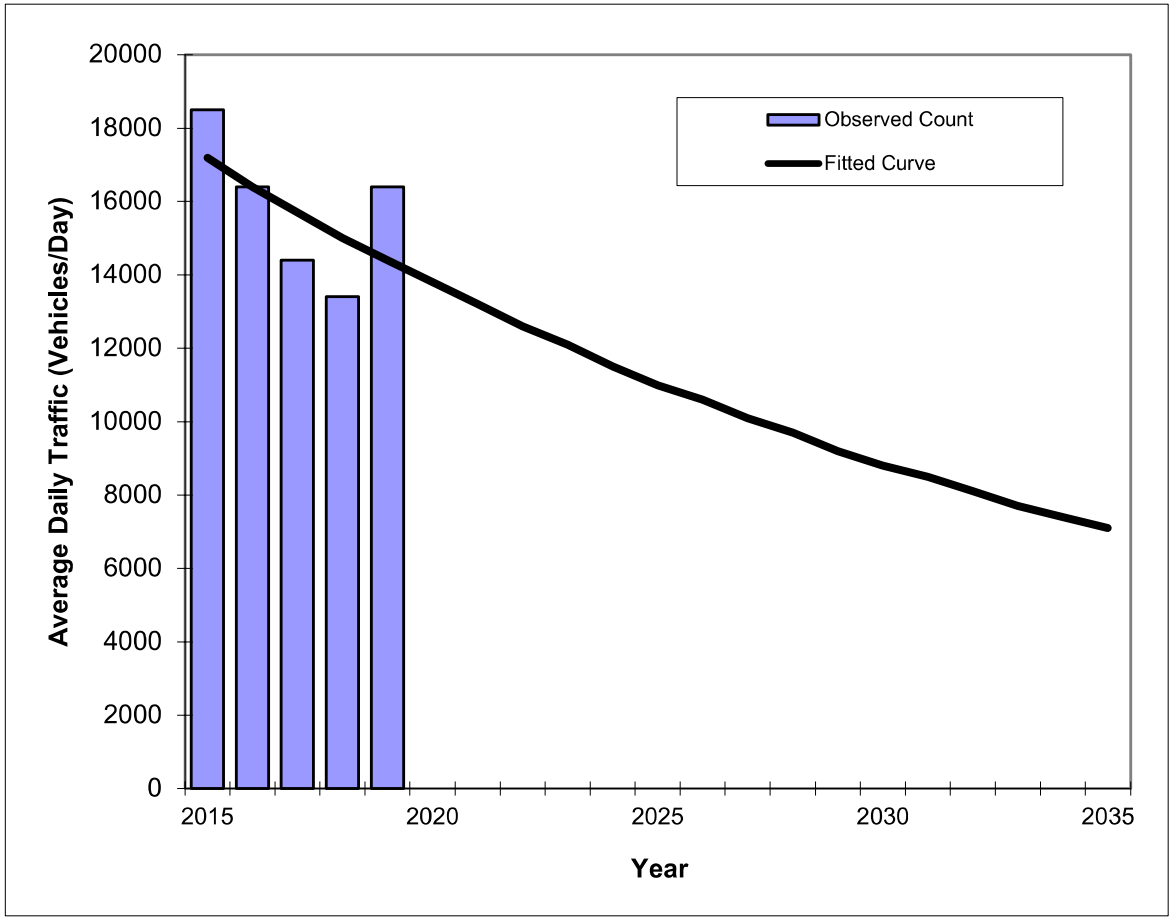
Straight Line Growth Option

Traffic Trends - V03.a

VETERANS MEM PRKWY -- Rhode Island Ave to Graves Ave

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	VETERANS MEM PRKWY



Year	Traffic (ADT/AADT) Count*	Trend**
2015	18500	17200
2016	16400	16400
2017	14400	15700
2018	13400	15000
2019	16400	14400
2027 Opening Year Trend		
2027	N/A	10100
2033 Mid-Year Trend		
2033	N/A	7700
2034 Design Year Trend		
2034	N/A	7400
TRANPLAN Forecasts/Trends		

Trend R-squared:	31.01%
Compounded Annual Historic Growth Rate:	-4.34%
Compounded Growth Rate (2019 to Design Year):	-4.34%
Printed:	18-Jan-23

Exponential Growth Option

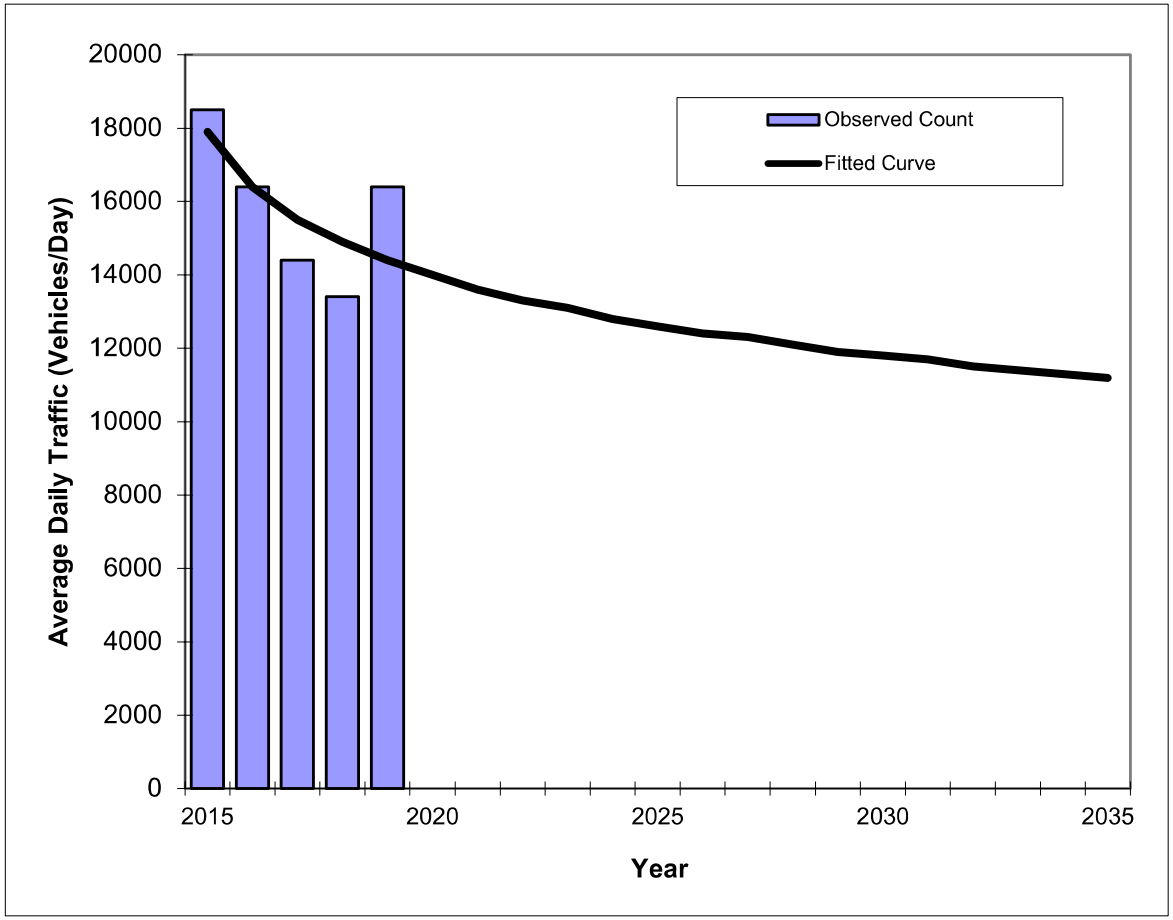
***Axle-Adjusted**

Traffic Trends - V03.a

VETERANS MEM PRKWY -- Rhode Island Ave to Graves Ave

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	VETERANS MEM PRKWY



Year	Traffic (ADT/AADT) Count*	Trend**
2015	18500	17900
2016	16400	16400
2017	14400	15500
2018	13400	14900
2019	16400	14400
2027 Opening Year Trend		
2027	N/A	12300
2033 Mid-Year Trend		
2033	N/A	11400
2034 Design Year Trend		
2034	N/A	11300
TRANPLAN Forecasts/Trends		

Trend R-squared:	50.42%
Compounded Annual Historic Growth Rate:	-5.29%
Compounded Growth Rate (2019 to Design Year):	-1.60%
Printed:	18-Jan-23

Decaying Exponential Growth Option

***Axle-Adjusted**

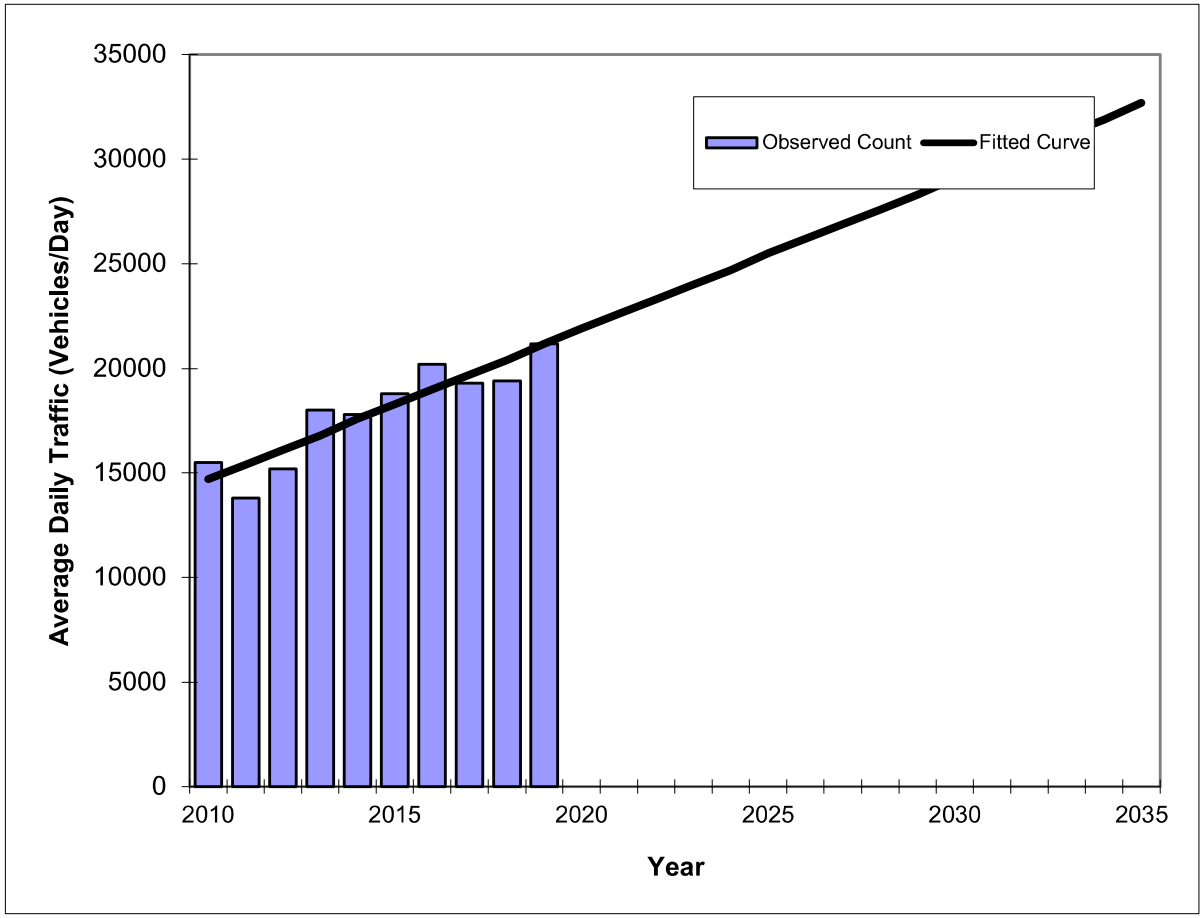
Ten Year Trends

Traffic Trends - V03.a

VETERANS MEM PRKWY -- Harley Strickland Blvd to Rhode Island Ave

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	VETERANS MEM PRKWY



Year	Traffic (ADT/AADT) Count*	Trend**
2010	15500	14700
2011	13800	15400
2012	15200	16100
2013	18000	16800
2014	17800	17600
2015	18800	18300
2016	20200	19000
2017	19300	19700
2018	19400	20400
2019	21200	21200
2027 Opening Year Trend		
2027	N/A	26900
2033 Mid-Year Trend		
2033	N/A	31200
2034 Design Year Trend		
2034	N/A	31900
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

**** Annual Trend Increase:**	719
Trend R-squared:	83.45%
Trend Annual Historic Growth Rate:	4.91%
Trend Growth Rate (2019 to Design Year):	3.36%
Printed:	20-Jan-23

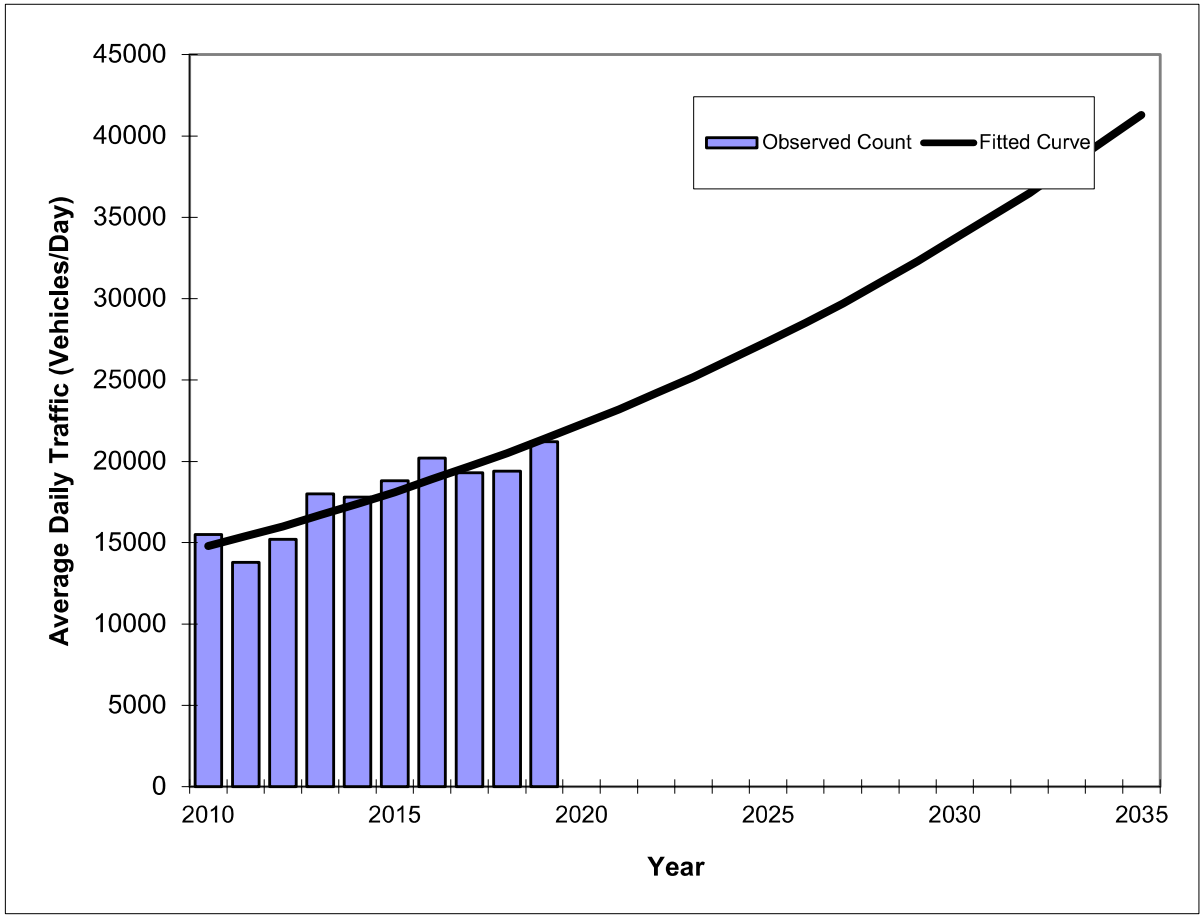
Straight Line Growth Option

Traffic Trends - V03.a

VETERANS MEM PRKWY -- Harley Strickland Blvd to Rhode Island Ave

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	VETERANS MEM PRKWY



Year	Traffic (ADT/AADT) Count*	Trend**
2010	15500	14800
2011	13800	15400
2012	15200	16000
2013	18000	16700
2014	17800	17400
2015	18800	18100
2016	20200	18900
2017	19300	19700
2018	19400	20500
2019	21200	21400
2027 Opening Year Trend		
2027	N/A	29700
2033 Mid-Year Trend		
2033	N/A	38100
2034 Design Year Trend		
2034	N/A	39700
TRANPLAN Forecasts/Trends		

Trend R-squared:	81.19%
Compounded Annual Historic Growth Rate:	4.18%
Compounded Growth Rate (2019 to Design Year):	4.21%
Printed:	20-Jan-23

Exponential Growth Option

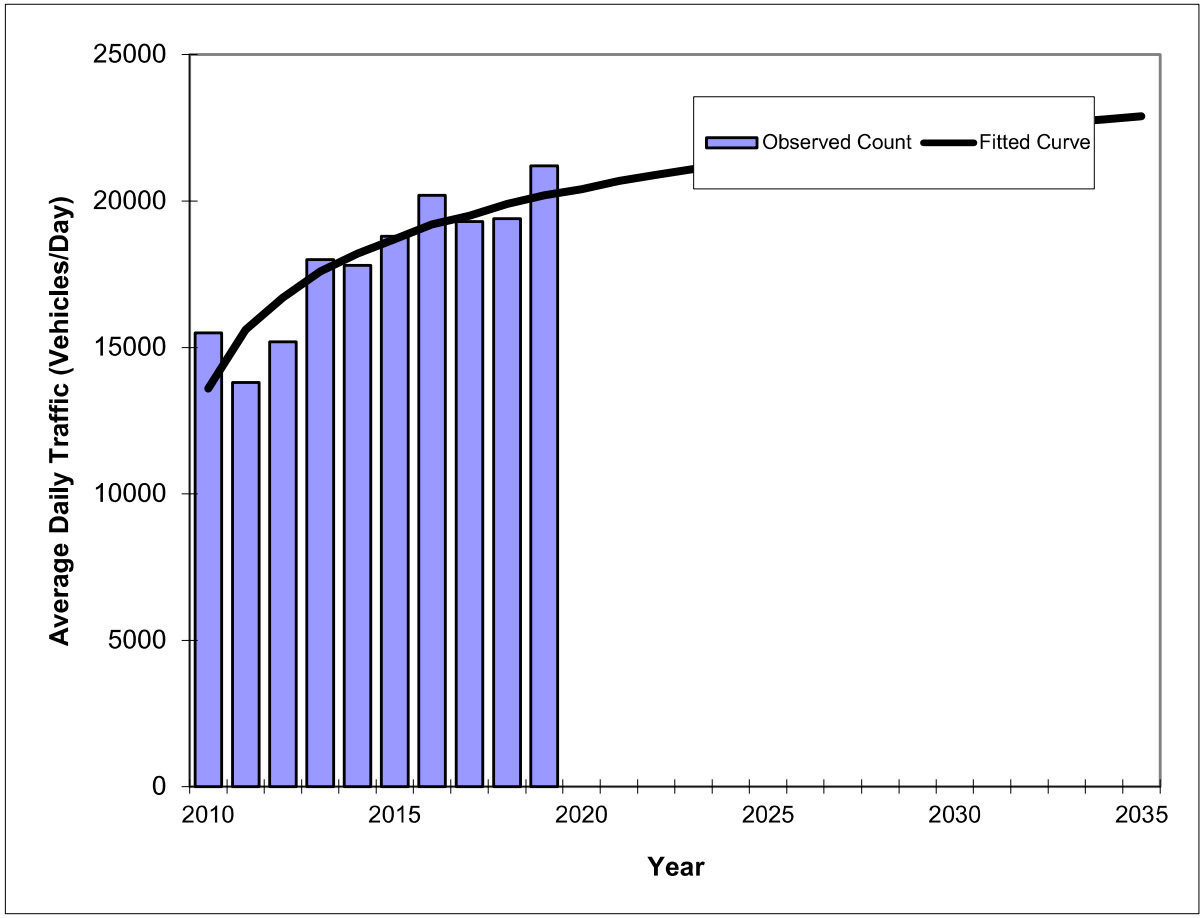
***Axle-Adjusted**

Traffic Trends - V03.a

VETERANS MEM PRKWY -- Harley Strickland Blvd to Rhode Island Ave

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	VETERANS MEM PRKWY



Year	Traffic (ADT/AADT) Count*	Trend**
2010	15500	13600
2011	13800	15600
2012	15200	16700
2013	18000	17600
2014	17800	18200
2015	18800	18700
2016	20200	19200
2017	19300	19500
2018	19400	19900
2019	21200	20200
2027 Opening Year Trend		
2027	N/A	21800
2033 Mid-Year Trend		
2033	N/A	22700
2034 Design Year Trend		
2034	N/A	22800
TRANPLAN Forecasts/Trends		

Trend R-squared:	76.67%
Compounded Annual Historic Growth Rate:	4.49%
Compounded Growth Rate (2019 to Design Year):	0.81%
Printed:	20-Jan-23

Decaying Exponential Growth Option

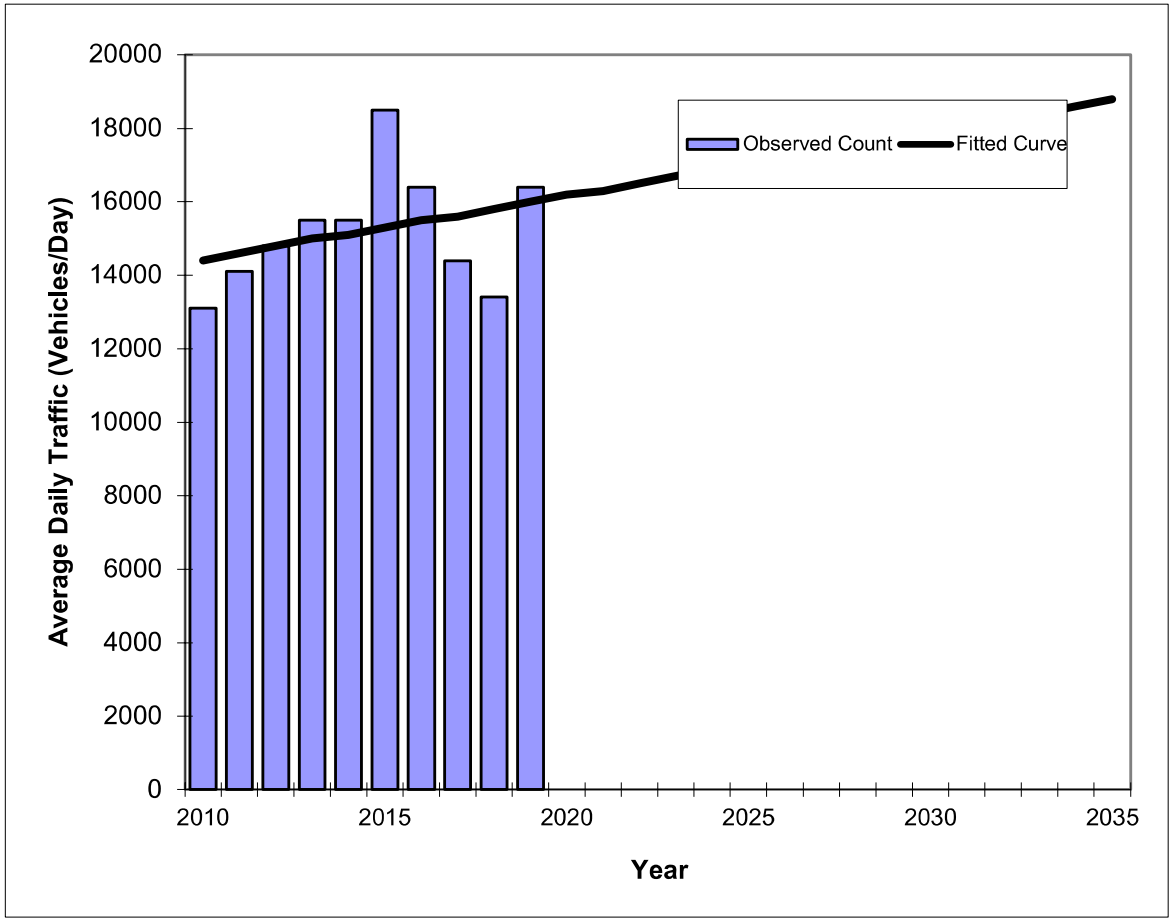
***Axle-Adjusted**

Traffic Trends - V03.a

VETERANS MEM PRKWY -- Rhode Island Ave to Graves Ave

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	VETERANS MEM PRKWY



Year	Traffic (ADT/AADT) Count*	Trend**
2010	13100	14400
2011	14100	14600
2012	14800	14800
2013	15500	15000
2014	15500	15100
2015	18500	15300
2016	16400	15500
2017	14400	15600
2018	13400	15800
2019	16400	16000
2027 Opening Year Trend		
2027	N/A	17400
2033 Mid-Year Trend		
2033	N/A	18400
2034 Design Year Trend		
2034	N/A	18600
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

** Annual Trend Increase:	173
Trend R-squared:	10.43%
Trend Annual Historic Growth Rate:	1.23%
Trend Growth Rate (2019 to Design Year):	1.08%
Printed:	19-Jan-23

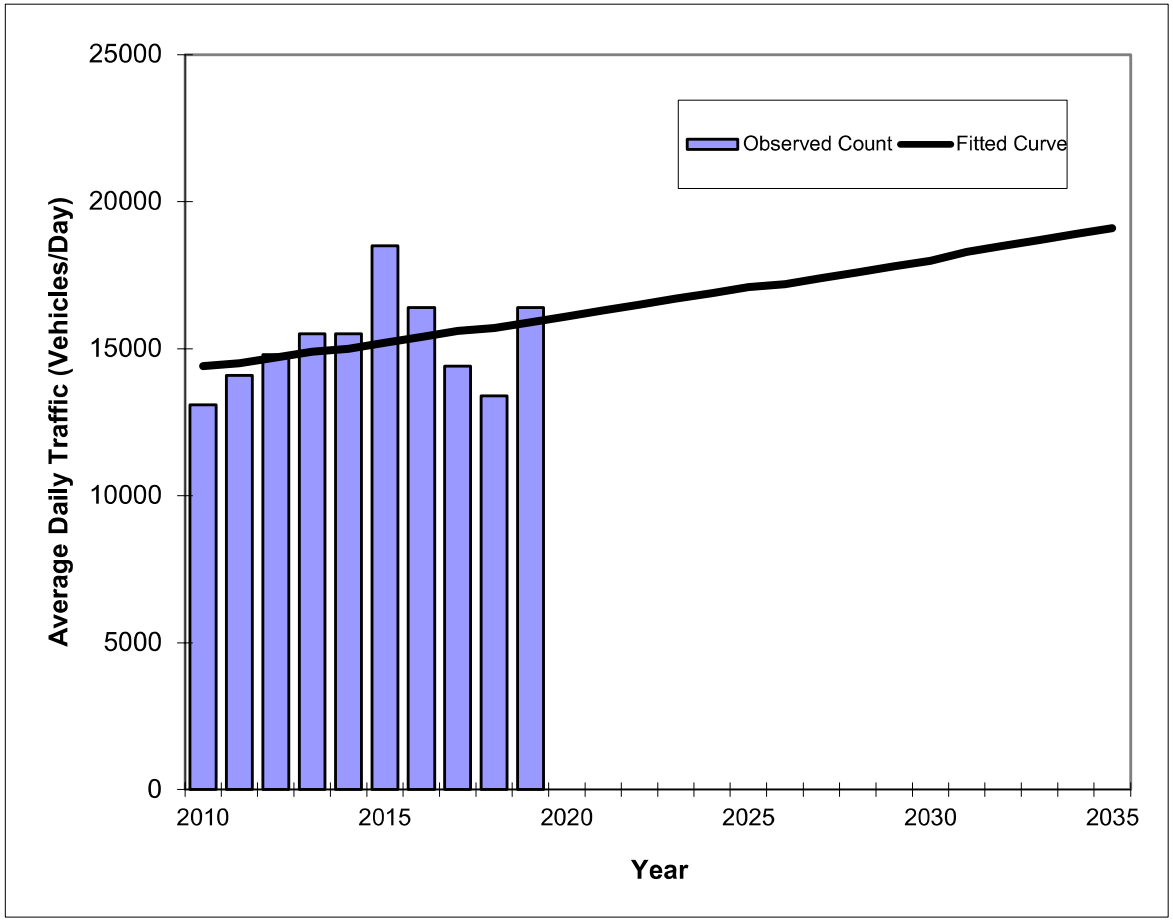
Straight Line Growth Option

Traffic Trends - V03.a

VETERANS MEM PRKWY -- Rhode Island Ave to Graves Ave

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	VETERANS MEM PRKWY



Year	Traffic (ADT/AADT) Count*	Trend**
2010	13100	14400
2011	14100	14500
2012	14800	14700
2013	15500	14900
2014	15500	15000
2015	18500	15200
2016	16400	15400
2017	14400	15600
2018	13400	15700
2019	16400	15900
2027 Opening Year Trend		
2027	N/A	17400
2033 Mid-Year Trend		
2033	N/A	18700
2034 Design Year Trend		
2034	N/A	18900
TRANPLAN Forecasts/Trends		

Trend R-squared:	10.87%
Compounded Annual Historic Growth Rate:	1.11%
Compounded Growth Rate (2019 to Design Year):	1.16%
Printed:	19-Jan-23

Exponential Growth Option

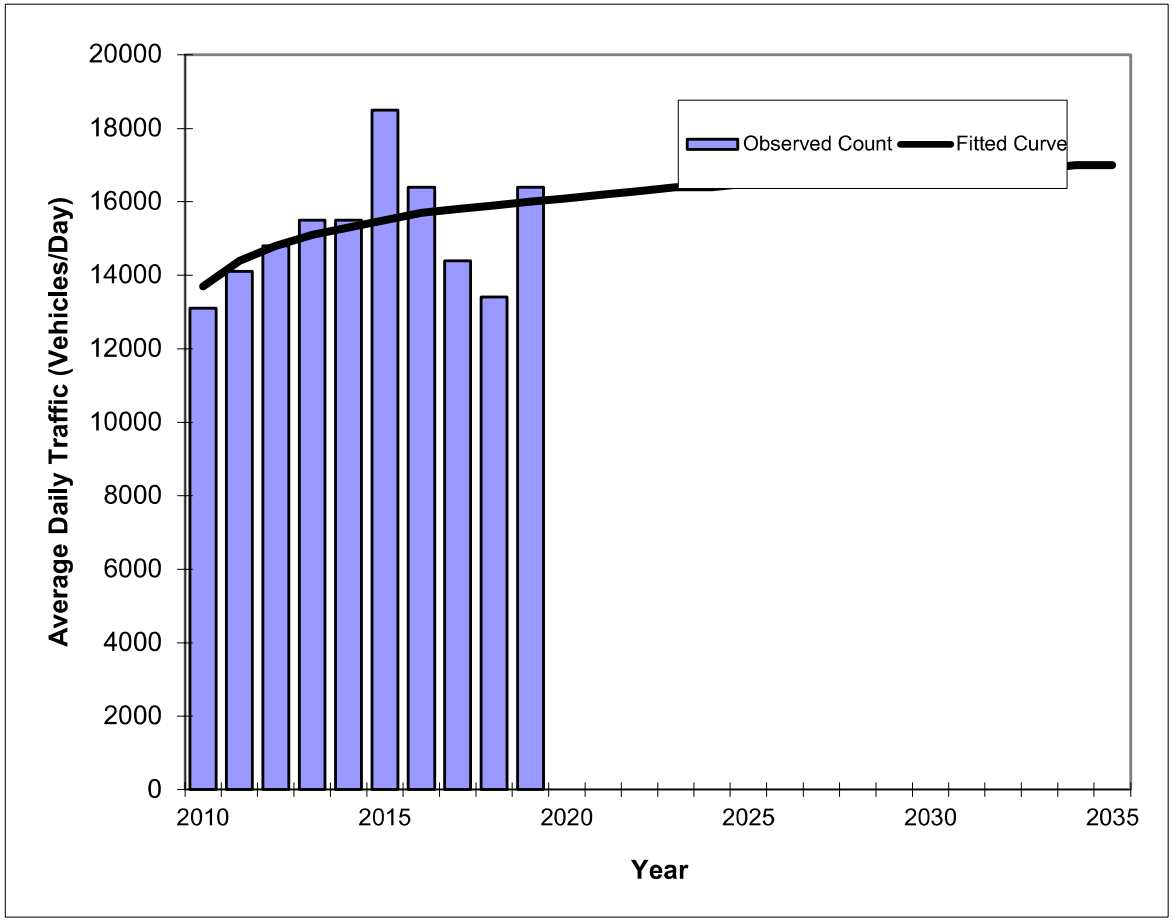
***Axle-Adjusted**

Traffic Trends - V03.a

VETERANS MEM PRKWY -- Rhode Island Ave to Graves Ave

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	VETERANS MEM PRKWY



Year	Traffic (ADT/AADT) Count*	Trend**
2010	13100	13700
2011	14100	14400
2012	14800	14800
2013	15500	15100
2014	15500	15300
2015	18500	15500
2016	16400	15700
2017	14400	15800
2018	13400	15900
2019	16400	16000
2027 Opening Year Trend		
2027	N/A	16600
2033 Mid-Year Trend		
2033	N/A	16900
2034 Design Year Trend		
2034	N/A	17000
TRANPLAN Forecasts/Trends		

Trend R-squared:	21.36%
Compounded Annual Historic Growth Rate:	1.74%
Compounded Growth Rate (2019 to Design Year):	0.40%
Printed:	19-Jan-23

Decaying Exponential Growth Option

***Axle-Adjusted**

Cassadaga Road

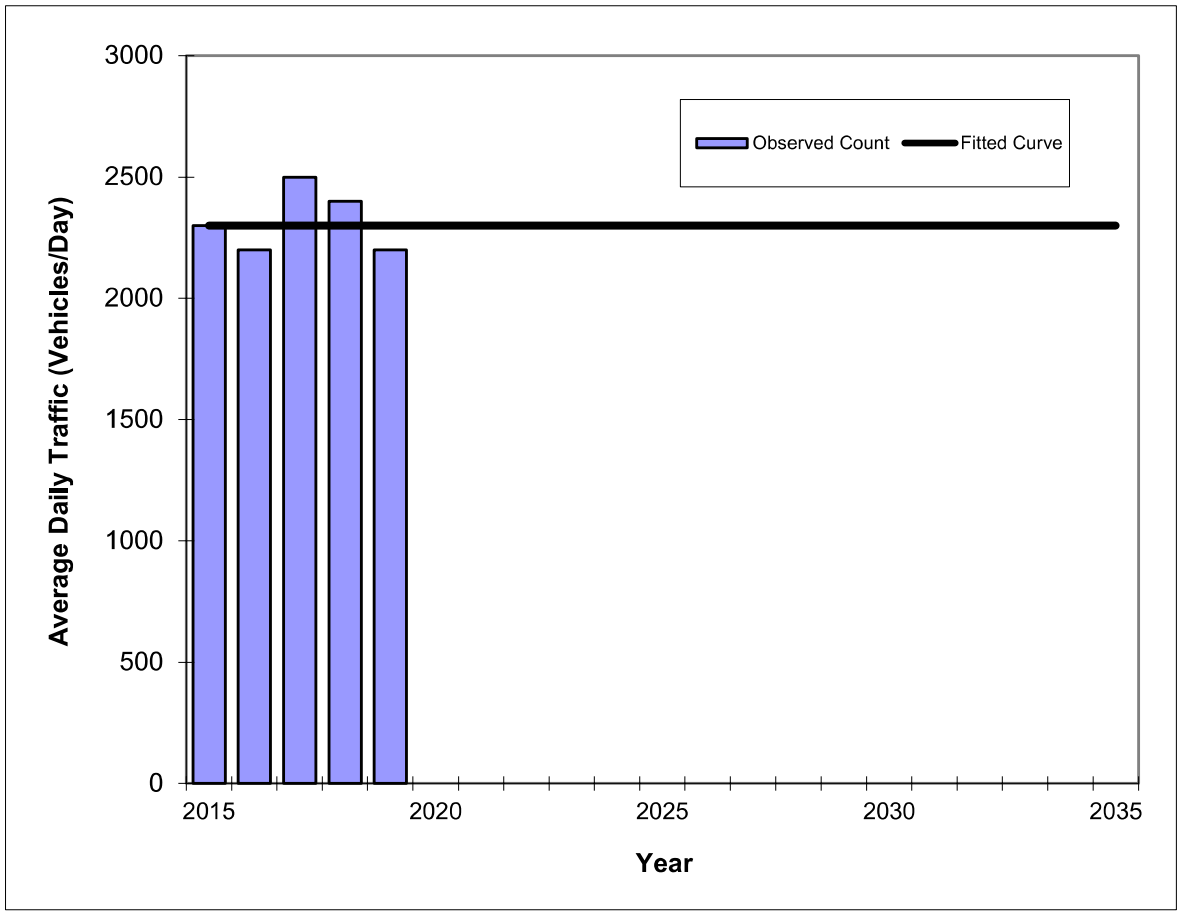
Five Year Trends

Traffic Trends - V03.a

CASSADAGA RD -- W Volusia Bltwy to Macy Ave

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	CASSADAGA RD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	2300	2300
2016	2200	2300
2017	2500	2300
2018	2400	2300
2019	2200	2300
2022 Opening Year Trend		
2022	N/A	2300
2024 Mid-Year Trend		
2024	N/A	2300
2027 Design Year Trend		
2027	N/A	2300
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	0
Trend R-squared:	0.00%
Trend Annual Historic Growth Rate:	0.00%
Trend Growth Rate (2019 to Design Year):	0.00%
Printed:	11-Jan-23

Straight Line Growth Option

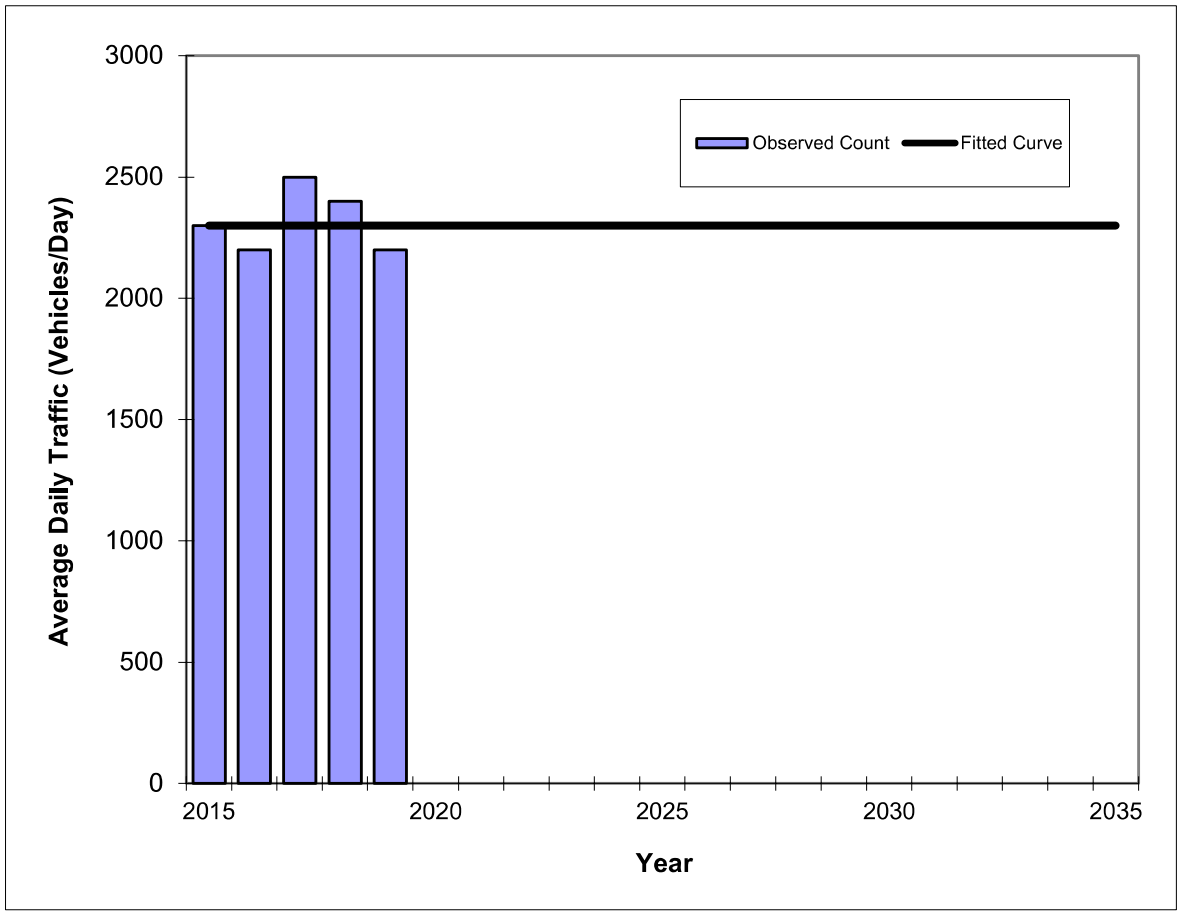
***Axle-Adjusted**

Traffic Trends - V03.a

CASSADAGA RD -- W Volusia Bltwy to Macy Ave

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	CASSADAGA RD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	2300	2300
2016	2200	2300
2017	2500	2300
2018	2400	2300
2019	2200	2300
2022 Opening Year Trend		
2022	N/A	2300
2024 Mid-Year Trend		
2024	N/A	2300
2027 Design Year Trend		
2027	N/A	2300
TRANPLAN Forecasts/Trends		

Trend R-squared:	0.00%
Compounded Annual Historic Growth Rate:	0.00%
Compounded Growth Rate (2019 to Design Year):	0.00%
Printed:	18-Jan-23

Exponential Growth Option

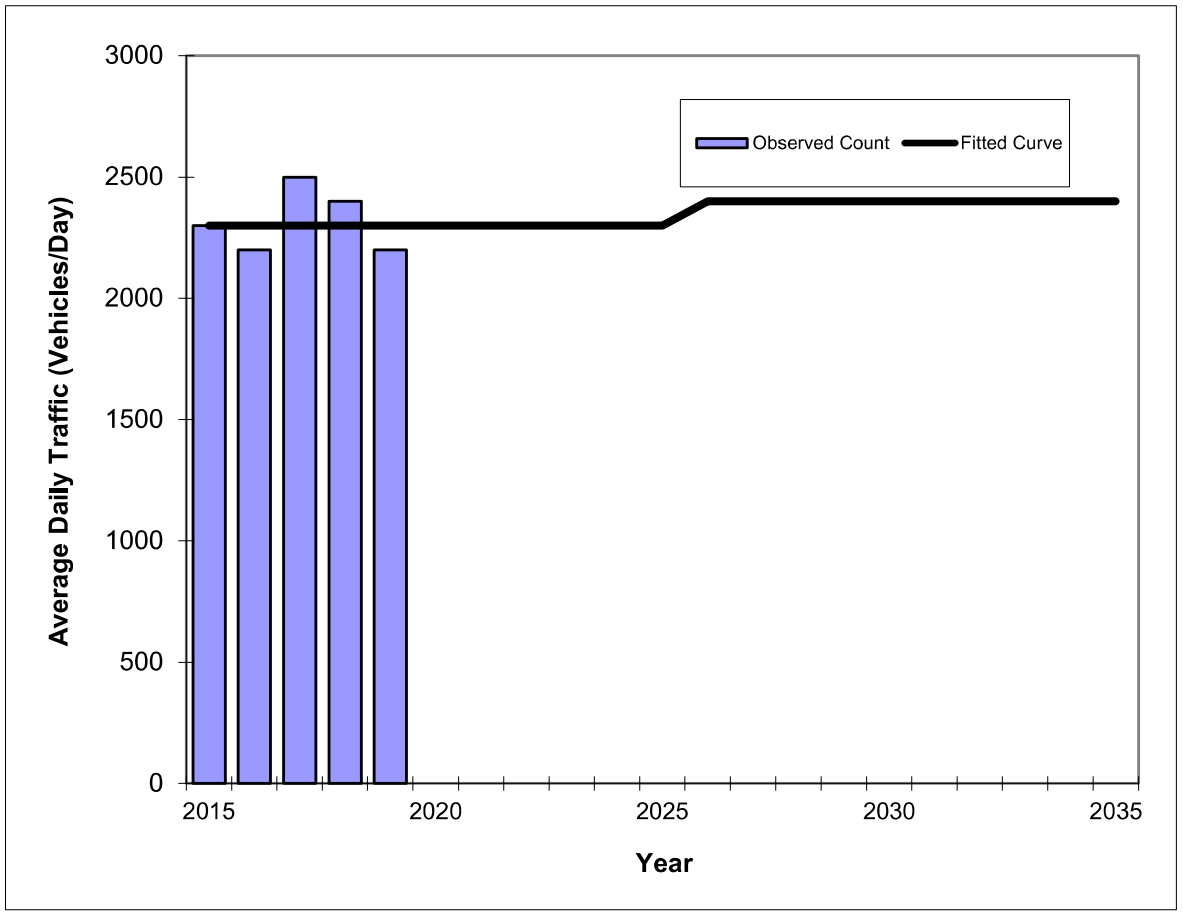
***Axle-Adjusted**

Traffic Trends - V03.a

CASSADAGA RD -- W Volusia Bltwy to Macy Ave

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	CASSADAGA RD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	2300	2300
2016	2200	2300
2017	2500	2300
2018	2400	2300
2019	2200	2300
2022 Opening Year Trend		
2022	N/A	2300
2024 Mid-Year Trend		
2024	N/A	2300
2027 Design Year Trend		
2027	N/A	2400
TRANPLAN Forecasts/Trends		

Trend R-squared:	0.95%
Compounded Annual Historic Growth Rate:	0.00%
Compounded Growth Rate (2019 to Design Year):	0.53%
Printed:	18-Jan-23

Decaying Exponential Growth Option

***Axle-Adjusted**

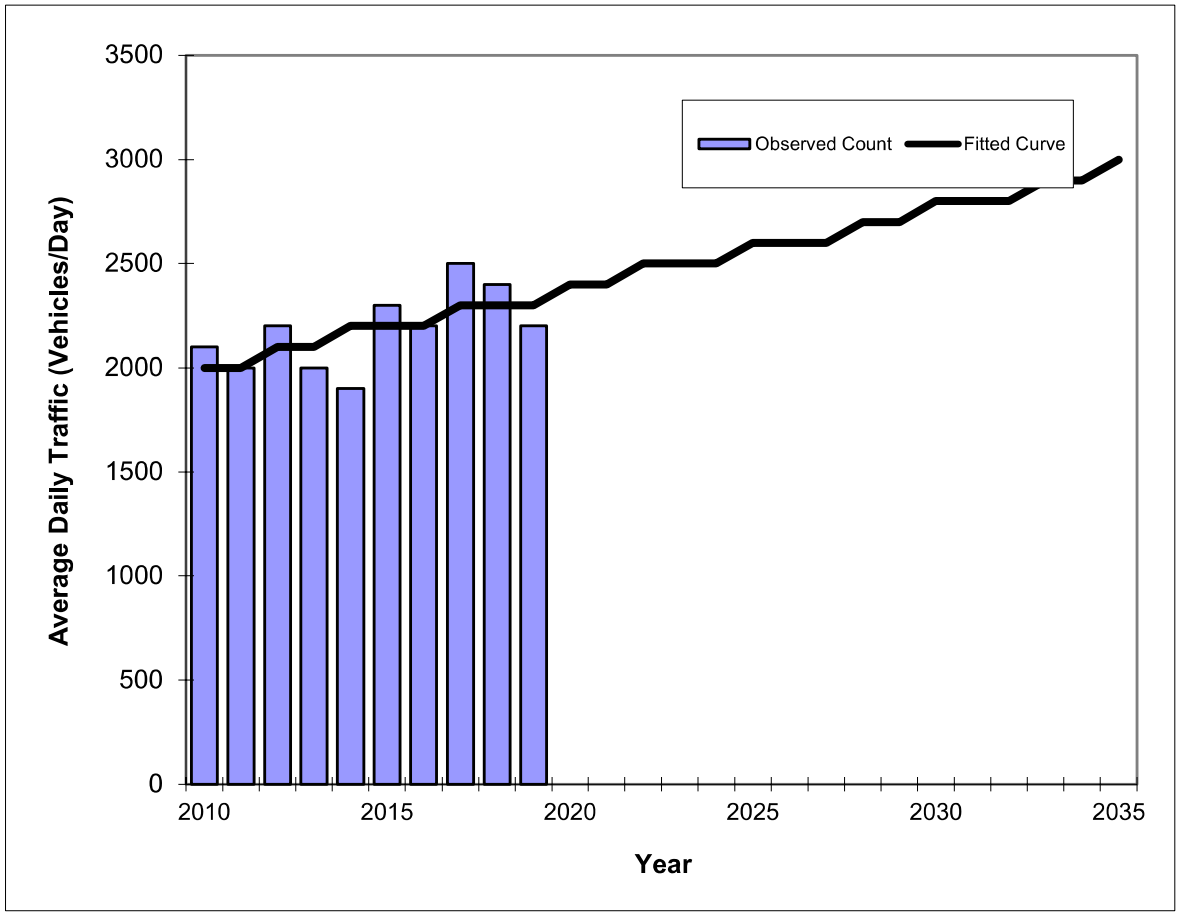
Ten Year Trends

Traffic Trends - V03.a

CASSADAGA RD -- W Volusia Bltwy to Macy Ave

FIN#	1234
Location	1

County:	Volusia (79)
Station #:	0
Highway:	CASSADAGA RD



Year	Traffic (ADT/AADT) Count*	Trend**
2010	2100	2000
2011	2000	2000
2012	2200	2100
2013	2000	2100
2014	1900	2200
2015	2300	2200
2016	2200	2200
2017	2500	2300
2018	2400	2300
2019	2200	2300
2022 Opening Year Trend		
2022	N/A	2500
2024 Mid-Year Trend		
2024	N/A	2500
2027 Design Year Trend		
2027	N/A	2600
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

**** Annual Trend Increase:**	38
Trend R-squared:	36.86%
Trend Annual Historic Growth Rate:	1.67%
Trend Growth Rate (2019 to Design Year):	1.63%
Printed:	19-Jan-23

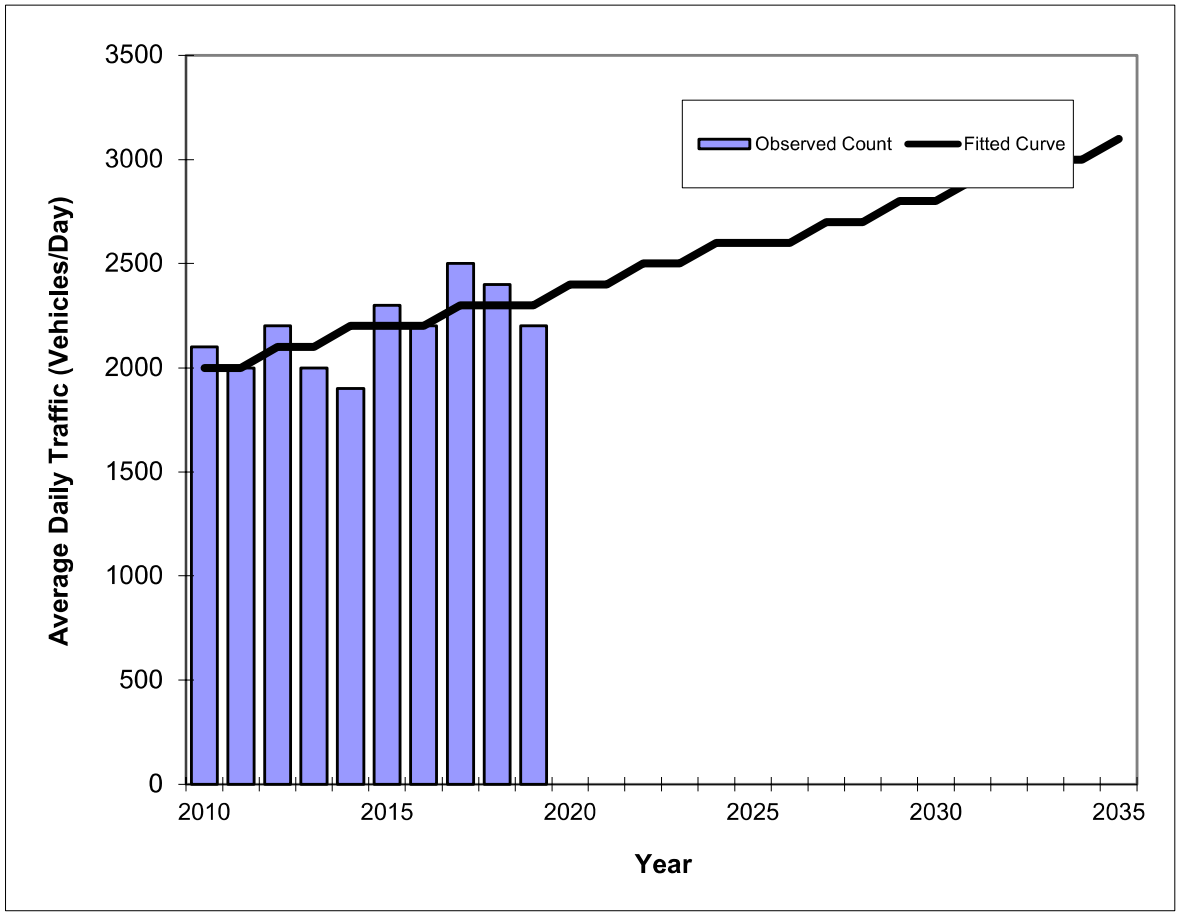
Straight Line Growth Option

Traffic Trends - V03.a

CASSADAGA RD -- W Volusia Bltwy to Macy Ave

FIN#	1234
Location	1

County:	Volusia (79)
Station #:	0
Highway:	CASSADAGA RD



Year	Traffic (ADT/AADT) Count*	Trend**
2010	2100	2000
2011	2000	2000
2012	2200	2100
2013	2000	2100
2014	1900	2200
2015	2300	2200
2016	2200	2200
2017	2500	2300
2018	2400	2300
2019	2200	2300
2022 Opening Year Trend		
2022	N/A	2500
2024 Mid-Year Trend		
2024	N/A	2600
2027 Design Year Trend		
2027	N/A	2700
TRANPLAN Forecasts/Trends		

Trend R-squared:	36.19%
Compounded Annual Historic Growth Rate:	1.57%
Compounded Growth Rate (2019 to Design Year):	2.02%
Printed:	19-Jan-23

Exponential Growth Option

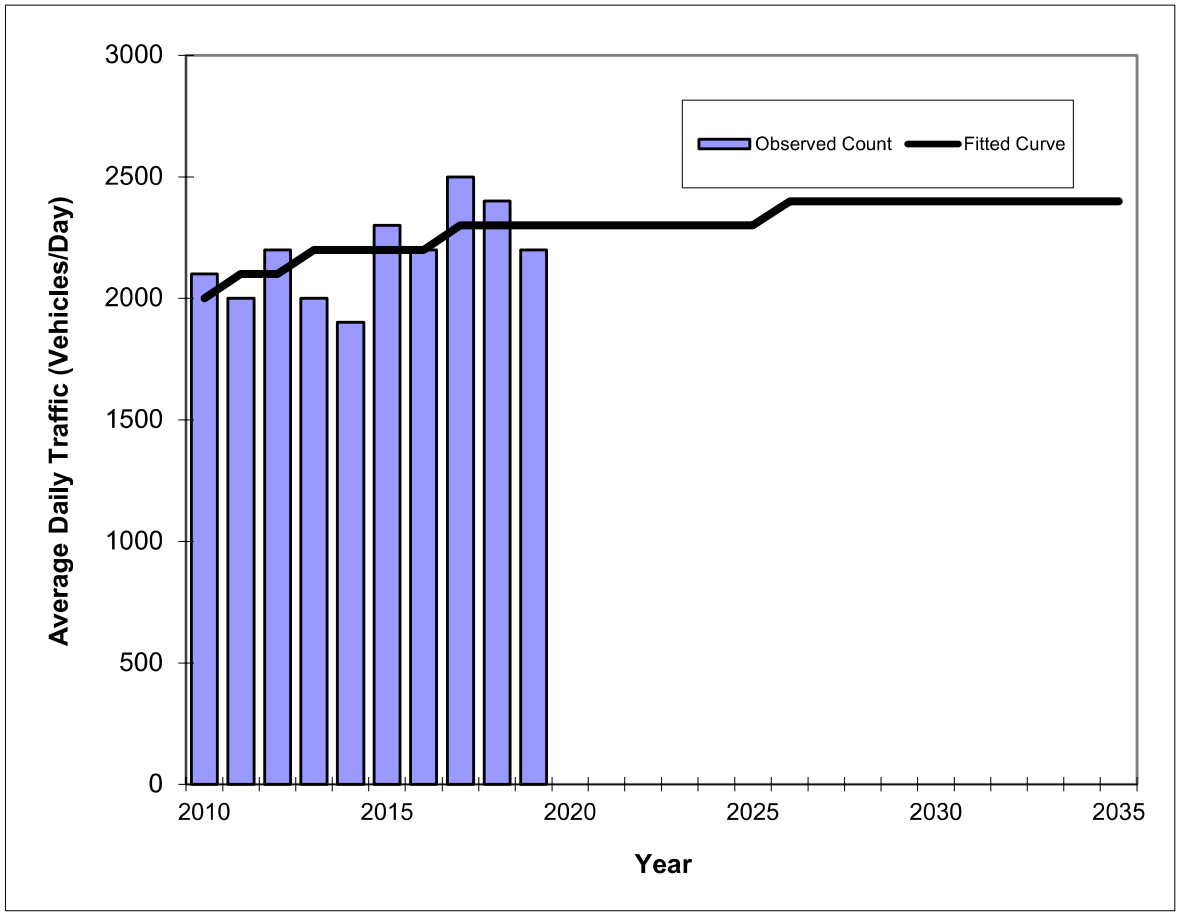
***Axle-Adjusted**

Traffic Trends - V03.a

CASSADAGA RD -- W Volusia Bltwy to Macy Ave

FIN#	1234
Location	1

County:	Volusia (79)
Station #:	0
Highway:	CASSADAGA RD



Year	Traffic (ADT/AADT) Count*	Trend**
2010	2100	2000
2011	2000	2100
2012	2200	2100
2013	2000	2200
2014	1900	2200
2015	2300	2200
2016	2200	2200
2017	2500	2300
2018	2400	2300
2019	2200	2300
2022 Opening Year Trend		
2022	N/A	2300
2024 Mid-Year Trend		
2024	N/A	2300
2027 Design Year Trend		
2027	N/A	2400
TRANPLAN Forecasts/Trends		

Trend R-squared:	27.29%
Compounded Annual Historic Growth Rate:	1.57%
Compounded Growth Rate (2019 to Design Year):	0.53%
Printed:	19-Jan-23

Decaying Exponential Growth Option

***Axle-Adjusted**

Orange Camp Road

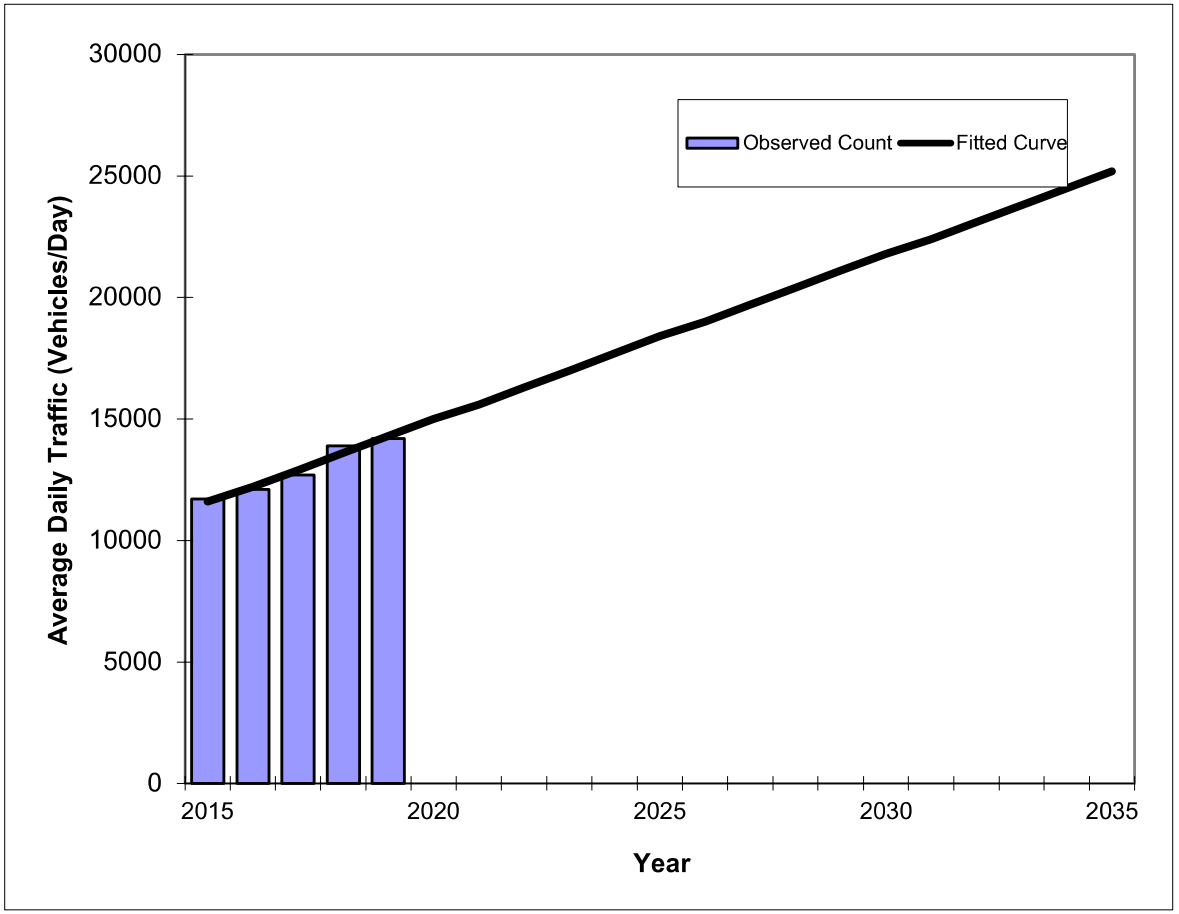
Five Year Trends

Traffic Trends - V03.a

ORANGE CAMP RD -- Blue Lake Ave to W Volusia Bltwy

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	ORANGE CAMP RD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	11700	11600
2016	12100	12200
2017	12700	12900
2018	13900	13600
2019	14200	14300
2027 Opening Year Trend		
2027	N/A	19700
2033 Mid-Year Trend		
2033	N/A	23800
2034 Design Year Trend		
2034	N/A	24500
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

**** Annual Trend Increase:**	680
Trend R-squared:	96.17%
Trend Annual Historic Growth Rate:	5.82%
Trend Growth Rate (2019 to Design Year):	4.76%
Printed:	18-Jan-23

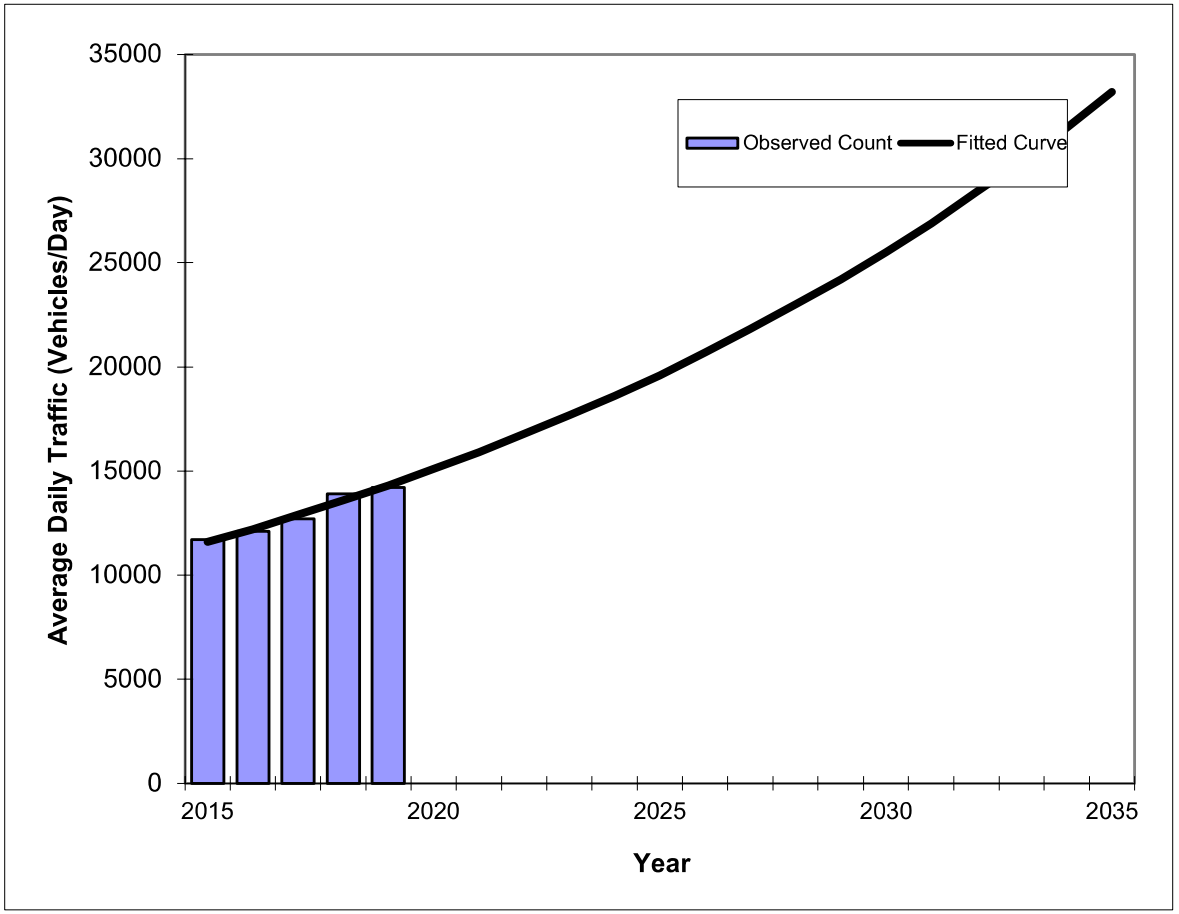
Straight Line Growth Option

Traffic Trends - V03.a

ORANGE CAMP RD -- Blue Lake Ave to W Volusia Bltwy

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	ORANGE CAMP RD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	11700	11600
2016	12100	12200
2017	12700	12900
2018	13900	13600
2019	14200	14300
2027 Opening Year Trend		
2027	N/A	21800
2033 Mid-Year Trend		
2033	N/A	29900
2034 Design Year Trend		
2034	N/A	31500
TRANPLAN Forecasts/Trends		

Trend R-squared:	96.53%
Compounded Annual Historic Growth Rate:	5.37%
Compounded Growth Rate (2019 to Design Year):	5.41%
Printed:	18-Jan-23

Exponential Growth Option

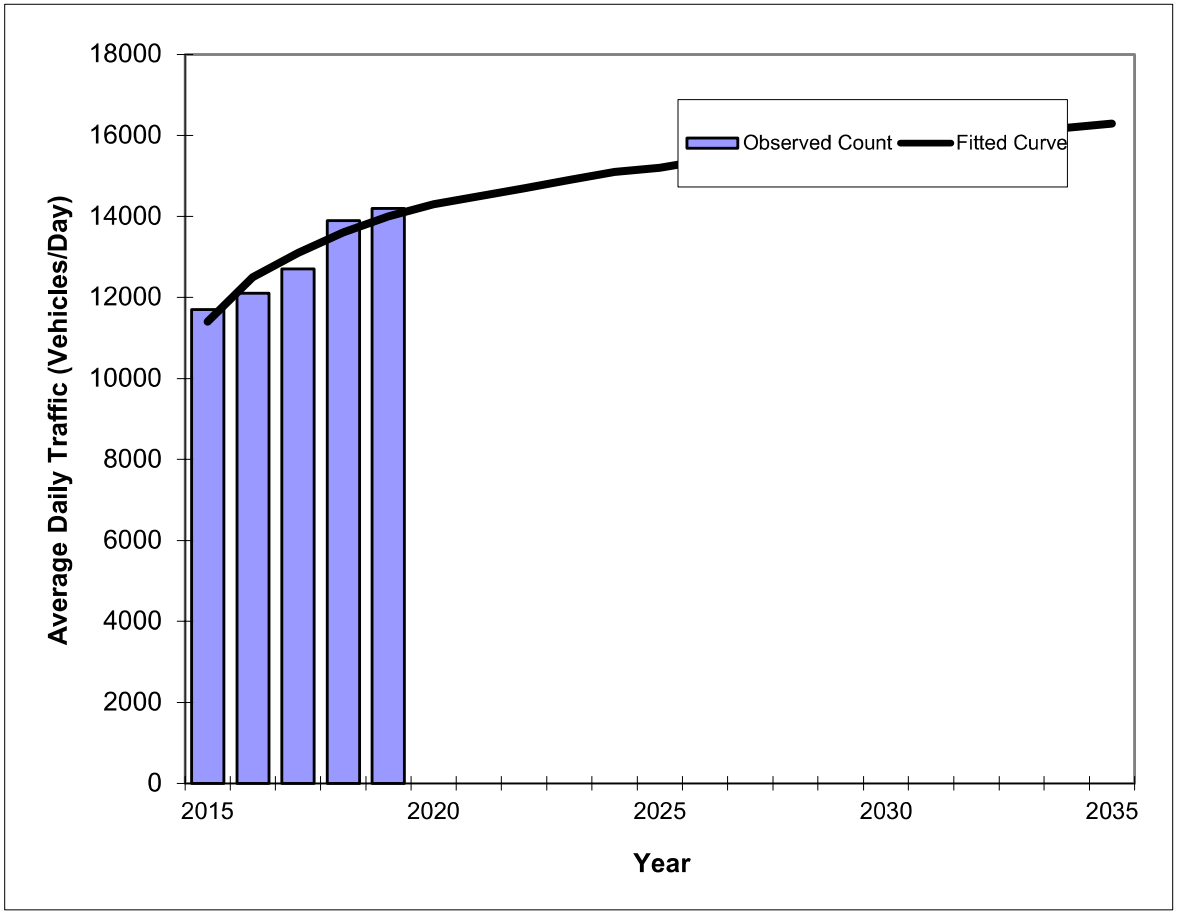
***Axle-Adjusted**

Traffic Trends - V03.a

ORANGE CAMP RD -- Blue Lake Ave to W Volusia Bltwy

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	ORANGE CAMP RD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	11700	11400
2016	12100	12500
2017	12700	13100
2018	13900	13600
2019	14200	14000
2027 Opening Year Trend		
2027	N/A	15500
2033 Mid-Year Trend		
2033	N/A	16100
2034 Design Year Trend		
2034	N/A	16200
TRANPLAN Forecasts/Trends		

Trend R-squared:	87.61%
Compounded Annual Historic Growth Rate:	5.27%
Compounded Growth Rate (2019 to Design Year):	0.98%
Printed:	18-Jan-23

Decaying Exponential Growth Option

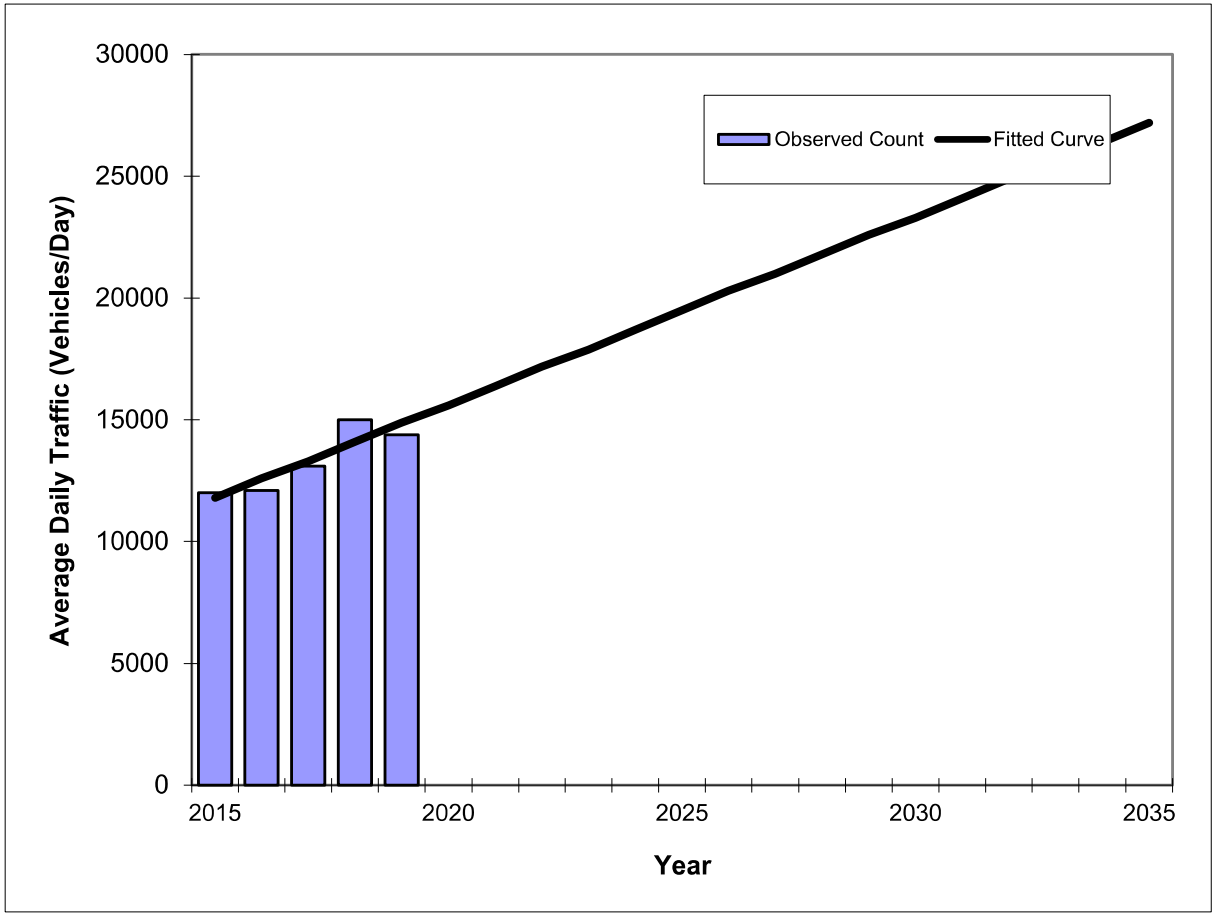
***Axle-Adjusted**

Traffic Trends - V03.a

ORANGE CAMP RD -- W Volusia Bltwy to I-4

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	ORANGE CAMP RD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	12000	11800
2016	12100	12600
2017	13100	13300
2018	15000	14100
2019	14400	14900
2027 Opening Year Trend		
2027	N/A	21000
2033 Mid-Year Trend		
2033	N/A	25600
2034 Design Year Trend		
2034	N/A	26400
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	770
Trend R-squared:	81.58%
Trend Annual Historic Growth Rate:	6.57%
Trend Growth Rate (2019 to Design Year):	5.15%
Printed:	15-Nov-22

Straight Line Growth Option

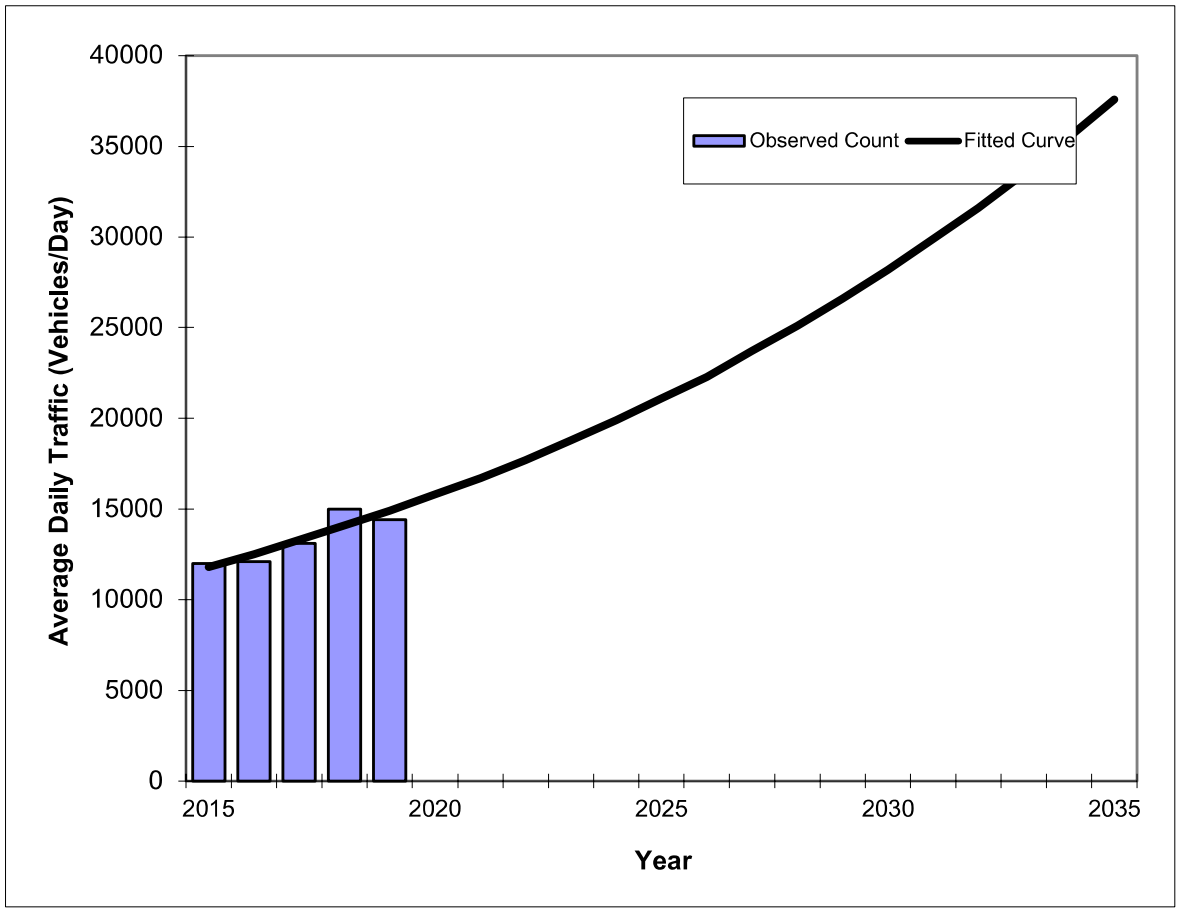
***Axle-Adjusted**

Traffic Trends - V03.a

ORANGE CAMP RD -- W Volusia Bltwy to I-4

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	ORANGE CAMP RD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	12000	11800
2016	12100	12500
2017	13100	13300
2018	15000	14100
2019	14400	14900
2027 Opening Year Trend		
2027	N/A	23700
2033 Mid-Year Trend		
2033	N/A	33500
2034 Design Year Trend		
2034	N/A	35500
TRANPLAN Forecasts/Trends		

Trend R-squared:	82.91%
Compounded Annual Historic Growth Rate:	6.00%
Compounded Growth Rate (2019 to Design Year):	5.96%
Printed:	18-Jan-23

Exponential Growth Option

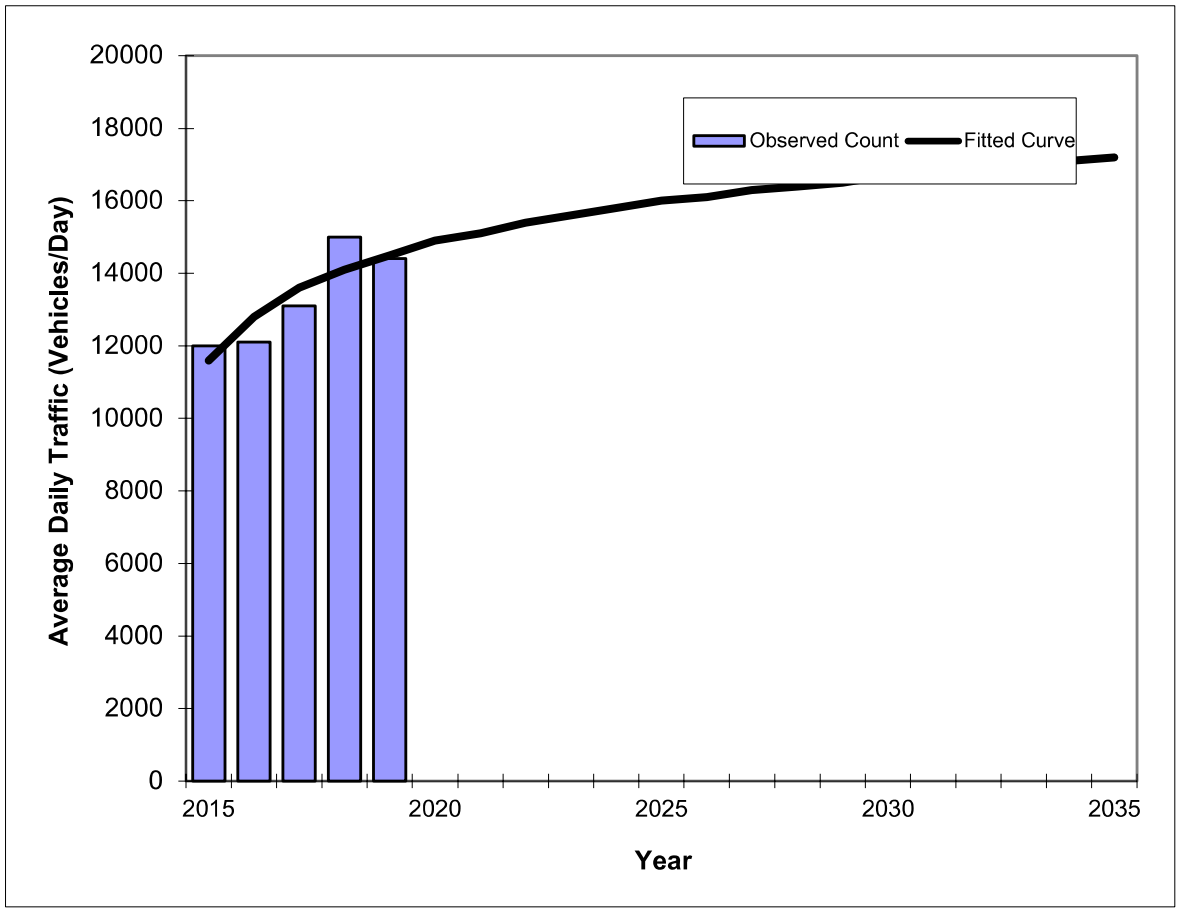
***Axle-Adjusted**

Traffic Trends - V03.a

ORANGE CAMP RD -- W Volusia Bltwy to I-4

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	ORANGE CAMP RD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	12000	11600
2016	12100	12800
2017	13100	13600
2018	15000	14100
2019	14400	14500
2027 Opening Year Trend		
2027	N/A	16300
2033 Mid-Year Trend		
2033	N/A	17000
2034 Design Year Trend		
2034	N/A	17100
TRANPLAN Forecasts/Trends		

Trend R-squared:	75.62%
Compounded Annual Historic Growth Rate:	5.74%
Compounded Growth Rate (2019 to Design Year):	1.11%
Printed:	18-Jan-23

Decaying Exponential Growth Option

***Axle-Adjusted**

US 17/92

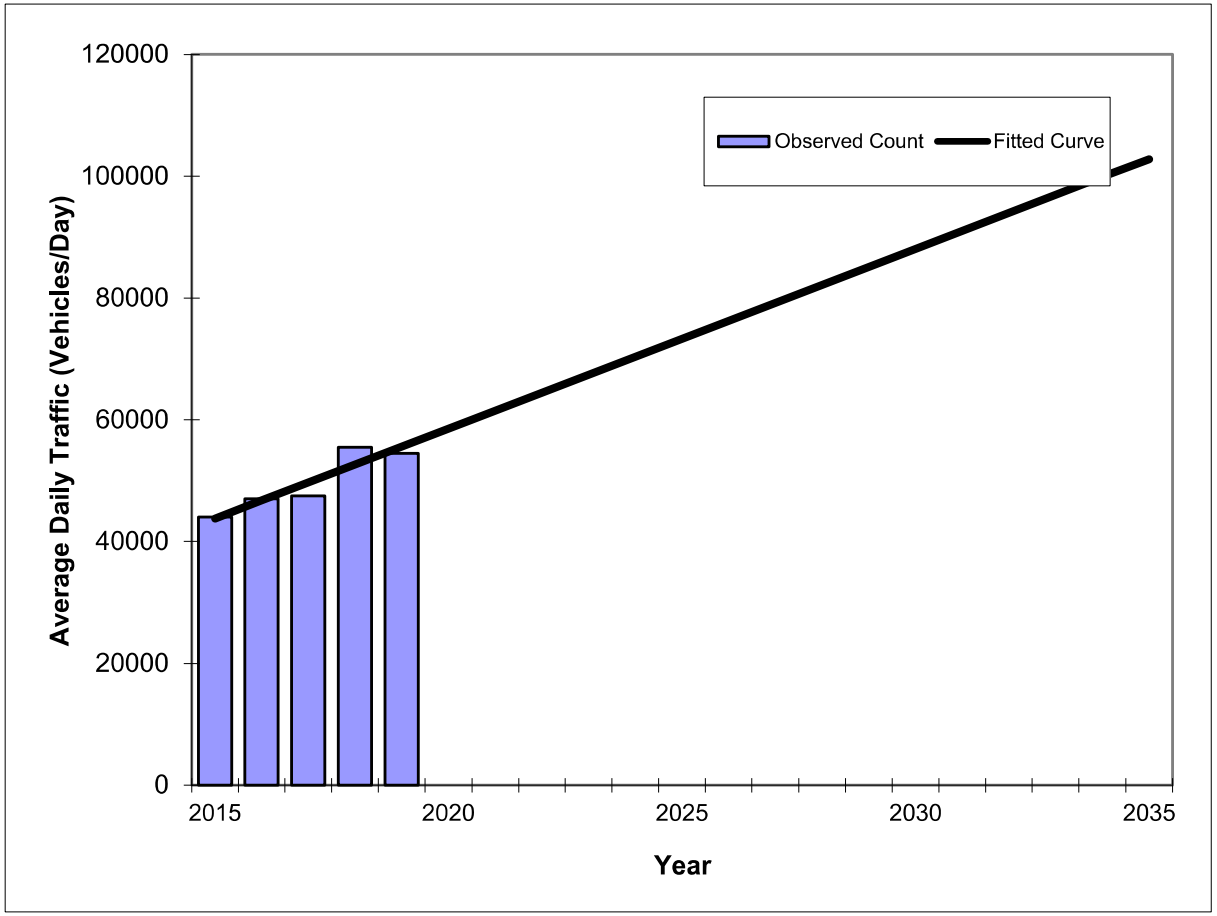
Five Year Trends

Traffic Trends - V03.a

US 17/92 -- SR 472 to Taylor Rd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	US 17/92



Year	Traffic (ADT/AADT) Count*	Trend**
2015	44000	43800
2016	47000	46800
2017	47500	49700
2018	55500	52700
2019	54500	55600
2027 Opening Year Trend		
2027	N/A	79200
2033 Mid-Year Trend		
2033	N/A	96900
2034 Design Year Trend		
2034	N/A	99900
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	2,950
Trend R-squared:	85.91%
Trend Annual Historic Growth Rate:	6.74%
Trend Growth Rate (2019 to Design Year):	5.31%
Printed:	15-Nov-22
Straight Line Growth Option	

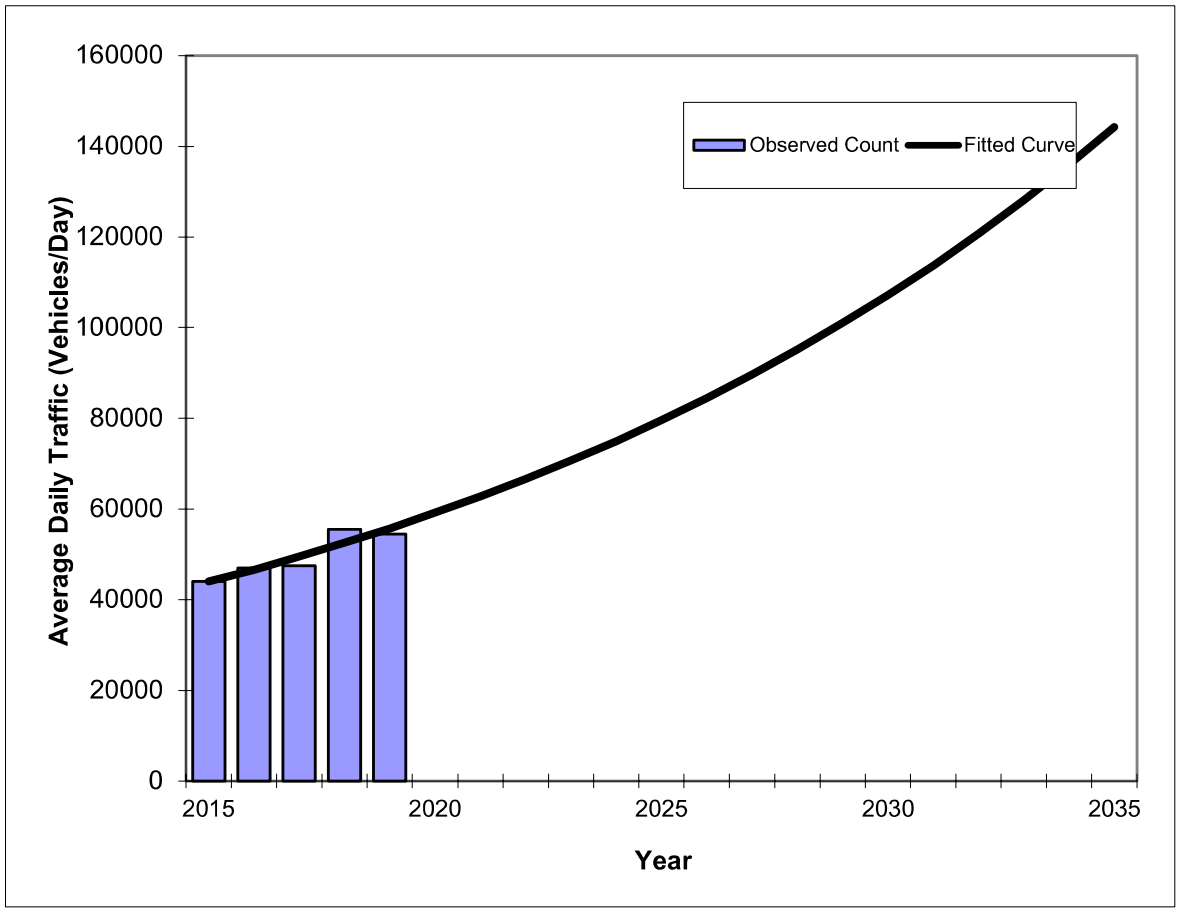
***Axle-Adjusted**

Traffic Trends - V03.a

US 17/92 -- SR 472 to Taylor Rd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	US 17/92



Year	Traffic (ADT/AADT) Count*	Trend**
2015	44000	44000
2016	47000	46600
2017	47500	49500
2018	55500	52500
2019	54500	55700
2027 Opening Year Trend		
2027	N/A	89700
2033 Mid-Year Trend		
2033	N/A	128100
2034 Design Year Trend		
2034	N/A	135900
TRANPLAN Forecasts/Trends		

Trend R-squared:	86.96%
Compounded Annual Historic Growth Rate:	6.07%
Compounded Growth Rate (2019 to Design Year):	6.13%
Printed:	18-Jan-23

Exponential Growth Option

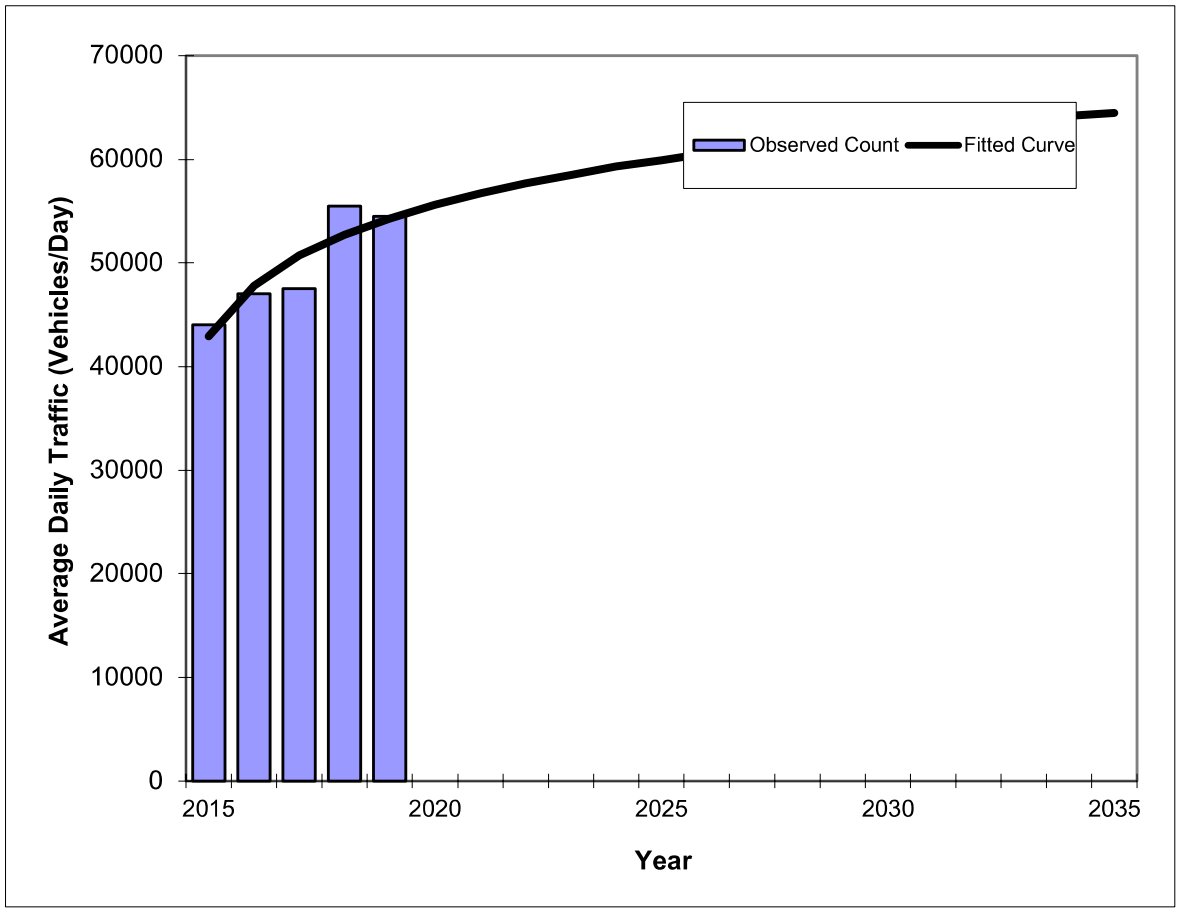
***Axle-Adjusted**

Traffic Trends - V03.a

US 17/92 -- SR 472 to Taylor Rd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	US 17/92



Year	Traffic (ADT/AADT) Count*	Trend**
2015	44000	42900
2016	47000	47800
2017	47500	50700
2018	55500	52700
2019	54500	54300
2027 Opening Year Trend		
2027	N/A	61100
2033 Mid-Year Trend		
2033	N/A	63800
2034 Design Year Trend		
2034	N/A	64200
TRANPLAN Forecasts/Trends		

Trend R-squared:	80.50%
Compounded Annual Historic Growth Rate:	6.07%
Compounded Growth Rate (2019 to Design Year):	1.12%
Printed:	18-Jan-23

Decaying Exponential Growth Option

***Axle-Adjusted**

Graves Avenue

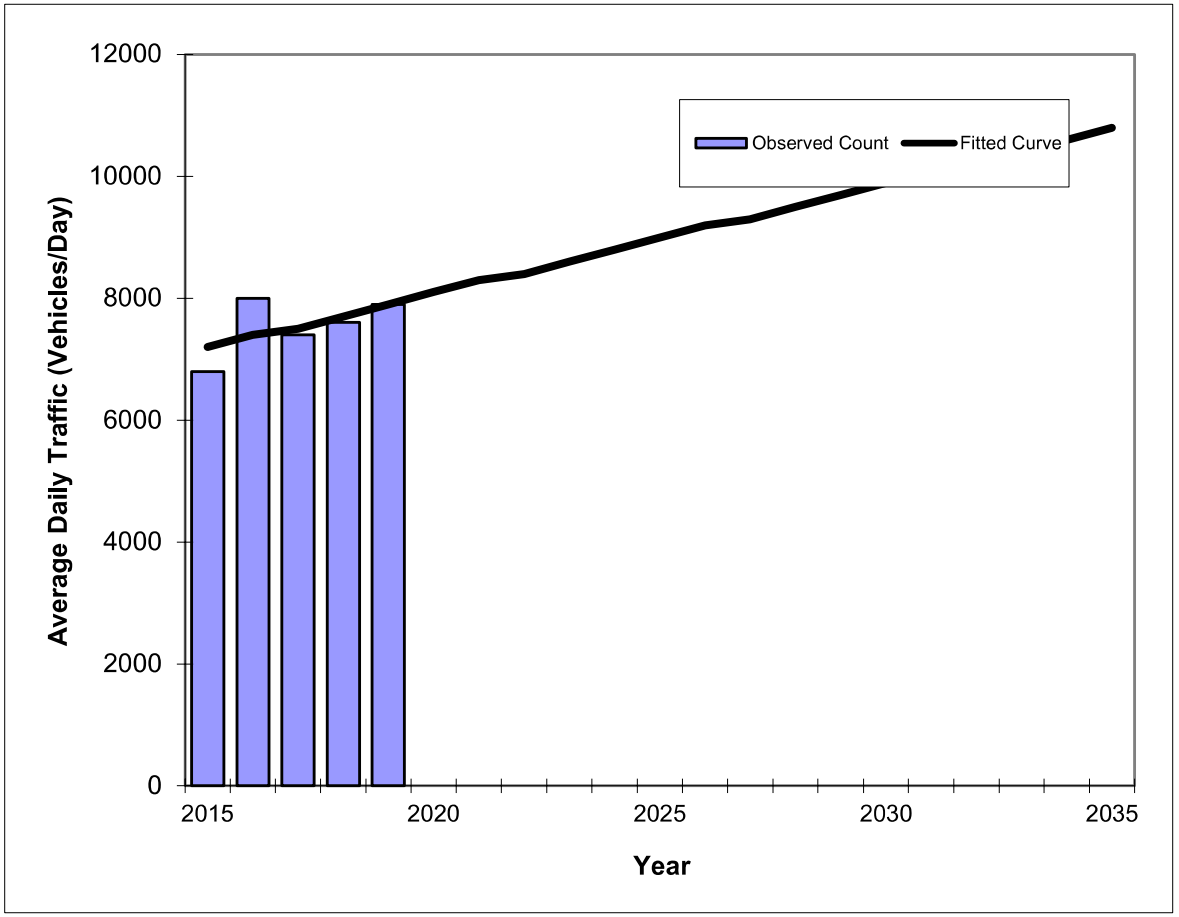
Five Year Trends

Traffic Trends - V03.a

GRAVES AVE -- Leavitt Ave to Veteran's Memorial Pkwy

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	GRAVES AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2015	6800	7200
2016	8000	7400
2017	7400	7500
2018	7600	7700
2019	7900	7900
2027 Opening Year Trend		
2027	N/A	9300
2033 Mid-Year Trend		
2033	N/A	10400
2034 Design Year Trend		
2034	N/A	10600
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	180
Trend R-squared:	35.53%
Trend Annual Historic Growth Rate:	2.43%
Trend Growth Rate (2019 to Design Year):	2.28%
Printed:	26-Jan-23

Straight Line Growth Option

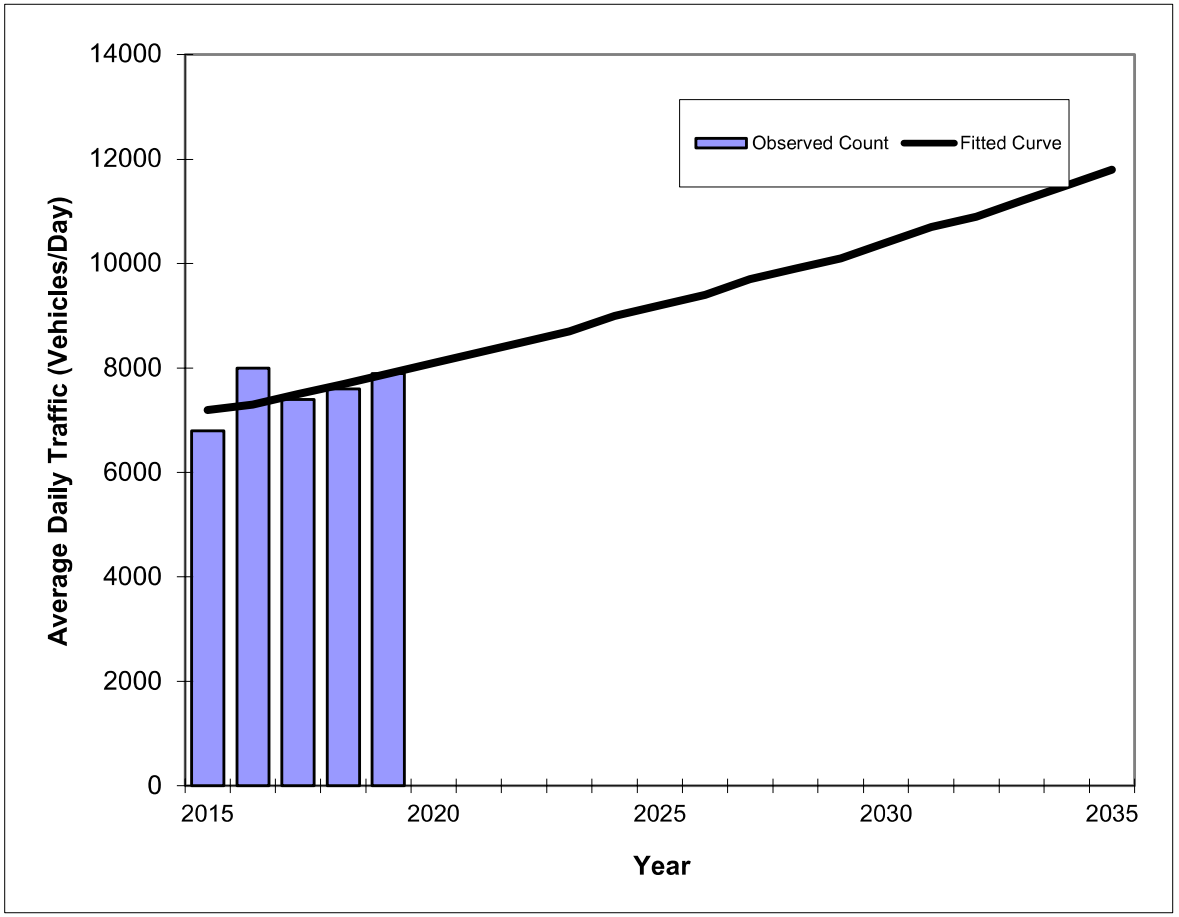
***Axle-Adjusted**

Traffic Trends - V03.a

GRAVES AVE -- Leavitt Ave to Veteran's Memorial Pkwy

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	GRAVES AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2015	6800	7200
2016	8000	7300
2017	7400	7500
2018	7600	7700
2019	7900	7900
2027 Opening Year Trend		
2027	N/A	9700
2033 Mid-Year Trend		
2033	N/A	11200
2034 Design Year Trend		
2034	N/A	11500
TRANPLAN Forecasts/Trends		

Trend R-squared:	36.89%
Compounded Annual Historic Growth Rate:	2.35%
Compounded Growth Rate (2019 to Design Year):	2.53%
Printed:	26-Jan-23

Exponential Growth Option

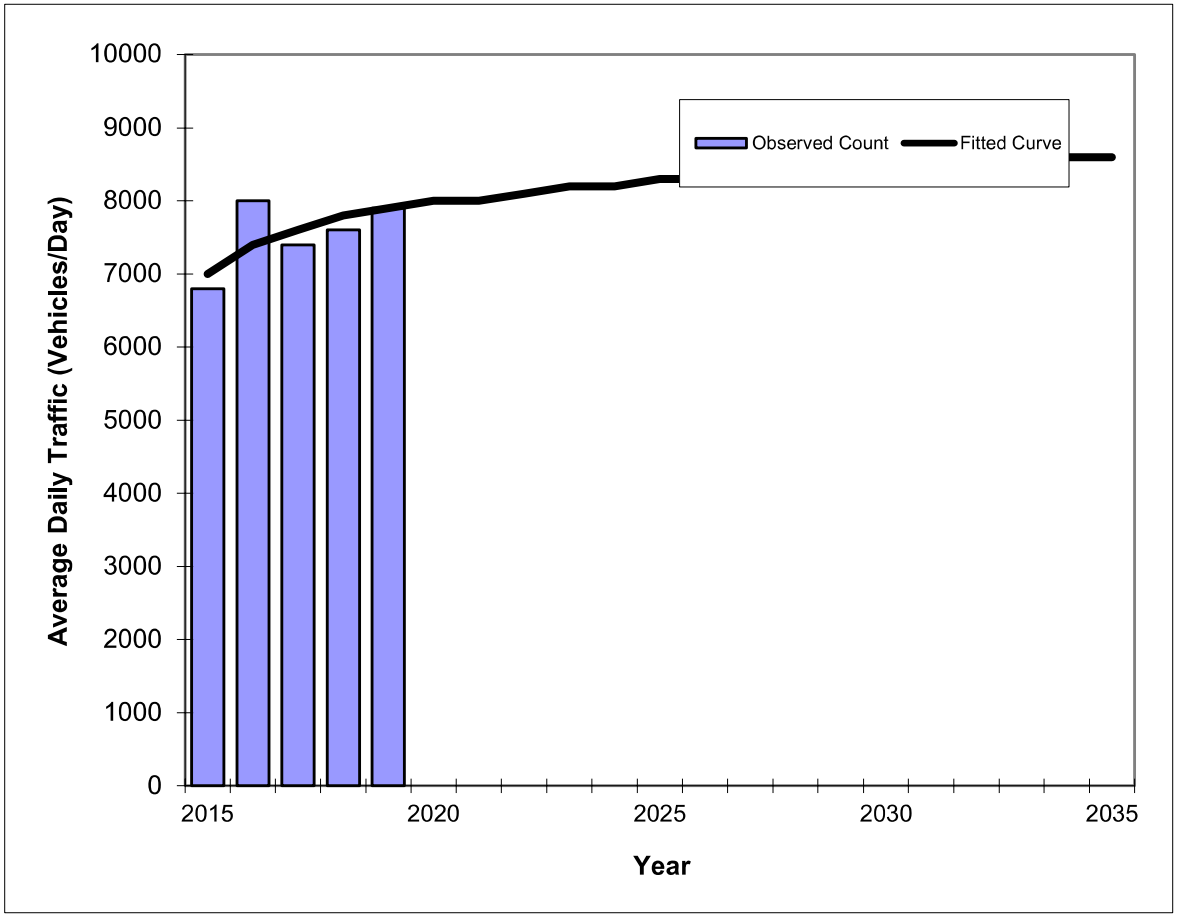
***Axle-Adjusted**

Traffic Trends - V03.a

GRAVES AVE -- Leavitt Ave to Veteran's Memorial Pkwy

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	GRAVES AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2015	6800	7000
2016	8000	7400
2017	7400	7600
2018	7600	7800
2019	7900	7900
2027 Opening Year Trend		
2027	N/A	8400
2033 Mid-Year Trend		
2033	N/A	8600
2034 Design Year Trend		
2034	N/A	8600
TRANPLAN Forecasts/Trends		

Trend R-squared:	46.49%
Compounded Annual Historic Growth Rate:	3.07%
Compounded Growth Rate (2019 to Design Year):	0.57%
Printed:	26-Jan-23

Decaying Exponential Growth Option

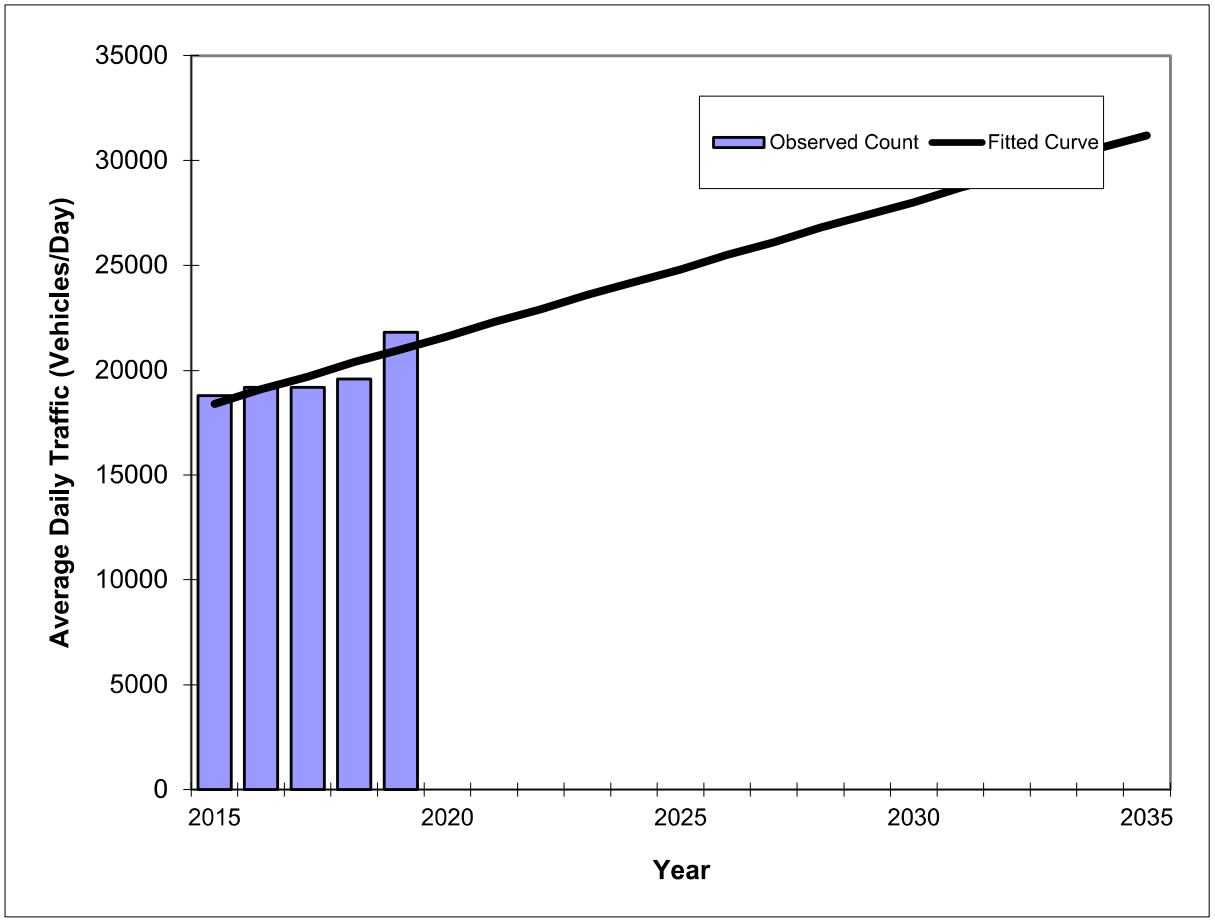
***Axle-Adjusted**

Traffic Trends - V03.a

GRAVES AVE -- Veteran's Memorial Pkwy to Kentucky Ave

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	GRAVES AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2015	18800	18400
2016	19200	19100
2017	19200	19700
2018	19600	20400
2019	21800	21000
2027 Opening Year Trend		
2027	N/A	26100
2033 Mid-Year Trend		
2033	N/A	30000
2034 Design Year Trend		
2034	N/A	30600
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	640
Trend R-squared:	71.51%
Trend Annual Historic Growth Rate:	3.53%
Trend Growth Rate (2019 to Design Year):	3.05%
Printed:	15-Nov-22
Straight Line Growth Option	

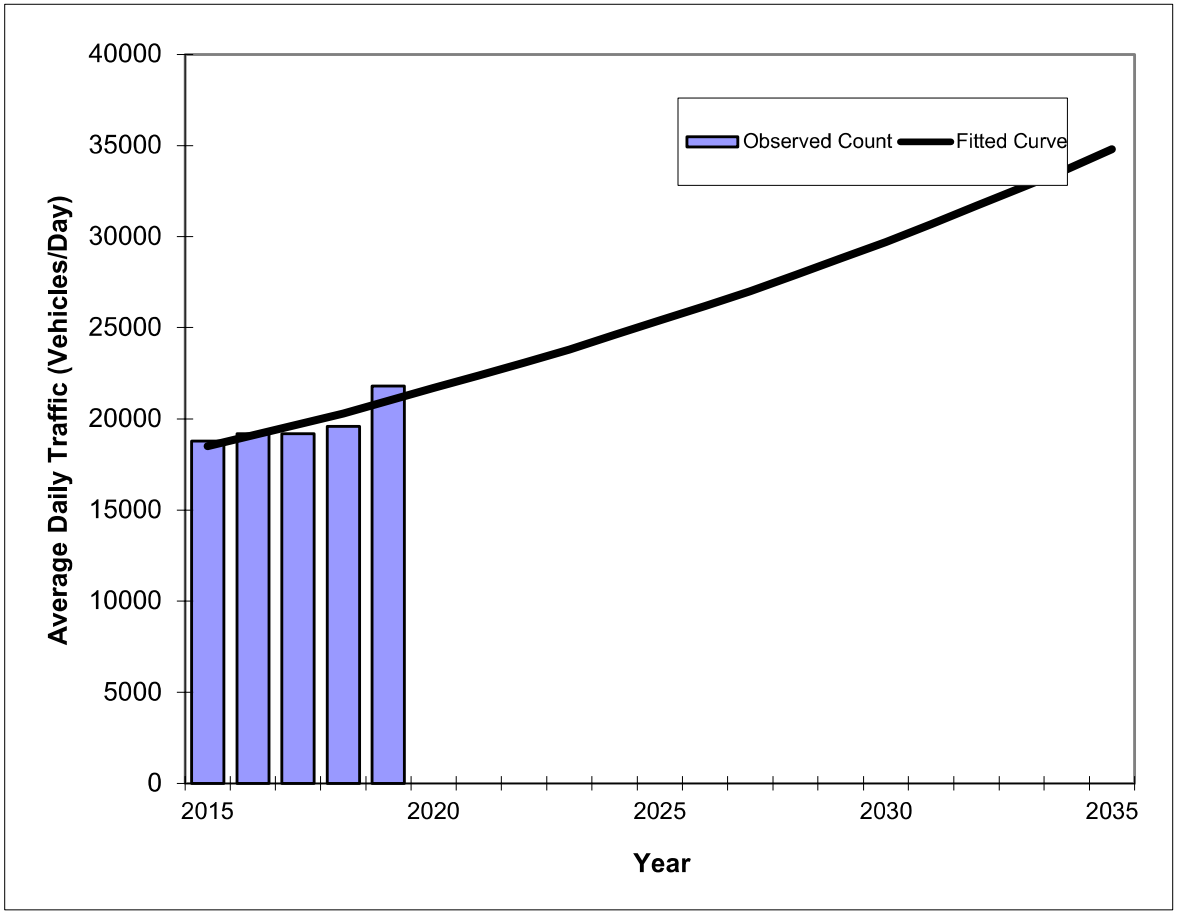
***Axle-Adjusted**

Traffic Trends - V03.a

GRAVES AVE -- Veteran's Memorial Pkwy to Kentucky Ave

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	GRAVES AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2015	18800	18500
2016	19200	19100
2017	19200	19700
2018	19600	20300
2019	21800	21000
2027 Opening Year Trend		
2027	N/A	27000
2033 Mid-Year Trend		
2033	N/A	32700
2034 Design Year Trend		
2034	N/A	33700
TRANPLAN Forecasts/Trends		

Trend R-squared:	72.73%
Compounded Annual Historic Growth Rate:	3.22%
Compounded Growth Rate (2019 to Design Year):	3.20%
Printed:	18-Jan-23

Exponential Growth Option

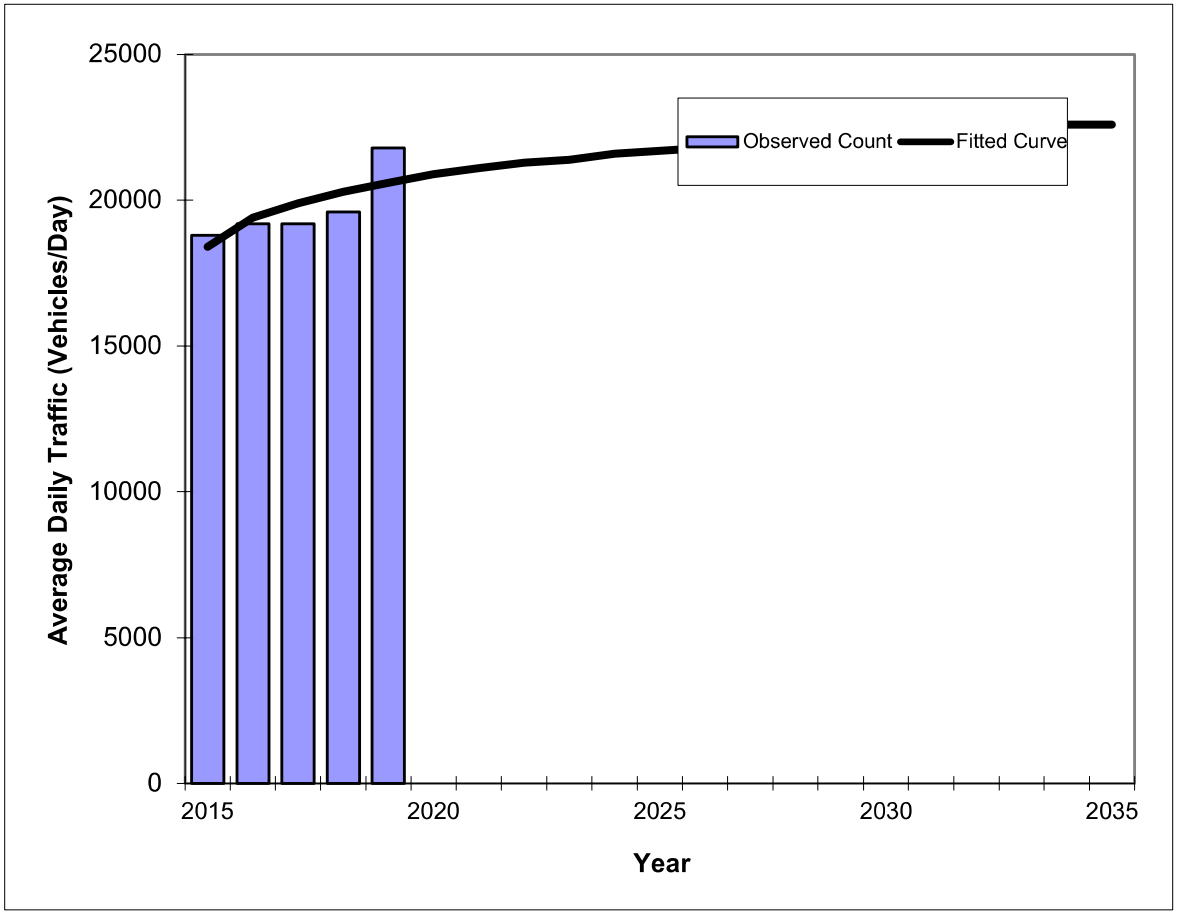
***Axle-Adjusted**

Traffic Trends - V03.a

GRAVES AVE -- Veteran's Memorial Pkwy to Kentucky Ave

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	GRAVES AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2015	18800	18400
2016	19200	19400
2017	19200	19900
2018	19600	20300
2019	21800	20600
2027 Opening Year Trend		
2027	N/A	22000
2033 Mid-Year Trend		
2033	N/A	22500
2034 Design Year Trend		
2034	N/A	22600
TRANPLAN Forecasts/Trends		

Trend R-squared:	54.69%
Compounded Annual Historic Growth Rate:	2.86%
Compounded Growth Rate (2019 to Design Year):	0.62%
Printed:	18-Jan-23

Decaying Exponential Growth Option

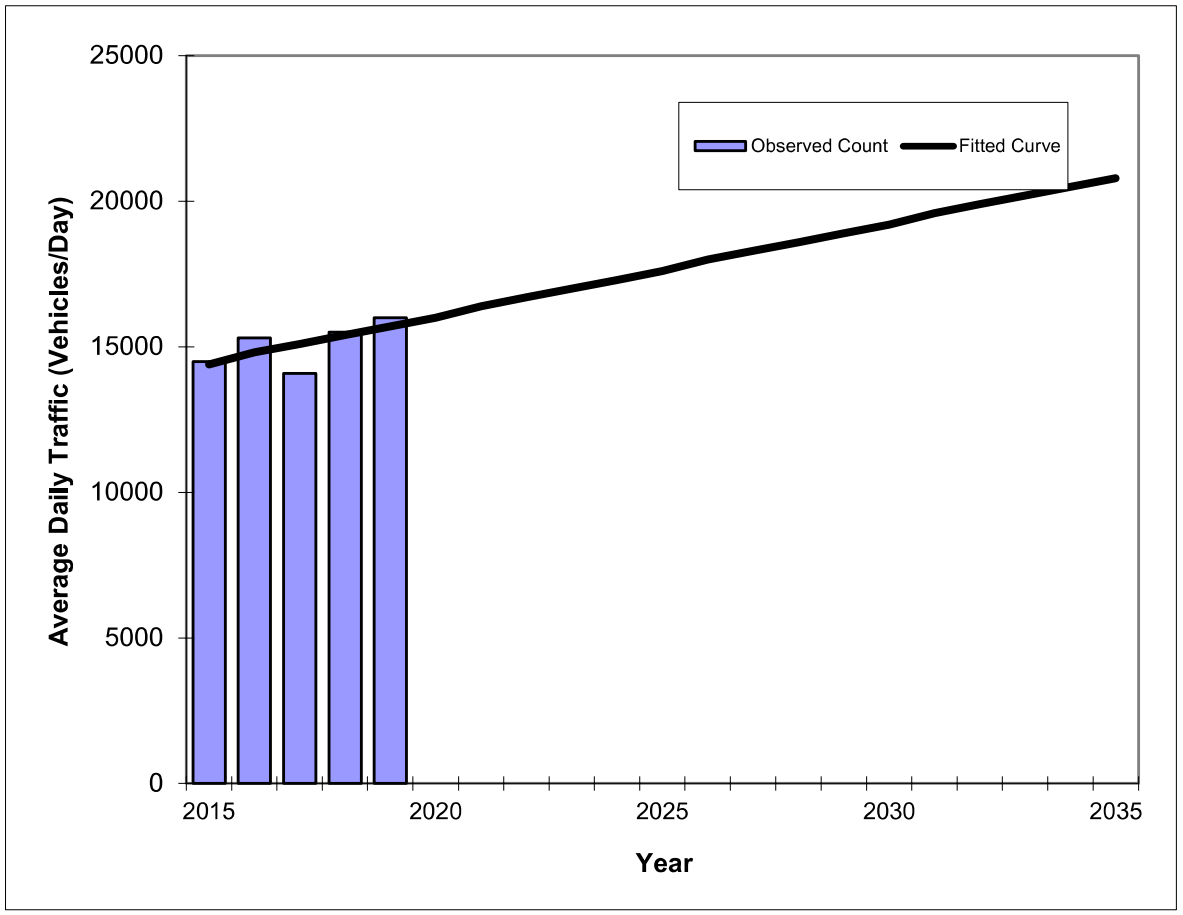
***Axle-Adjusted**

Traffic Trends - V03.a

GRAVES AVE -- Kentucky Ave to Normandy Blvd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	GRAVES AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2015	14500	14400
2016	15300	14800
2017	14100	15100
2018	15500	15400
2019	16000	15700
2027 Opening Year Trend		
2027	N/A	18300
2033 Mid-Year Trend		
2033	N/A	20200
2034 Design Year Trend		
2034	N/A	20500
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

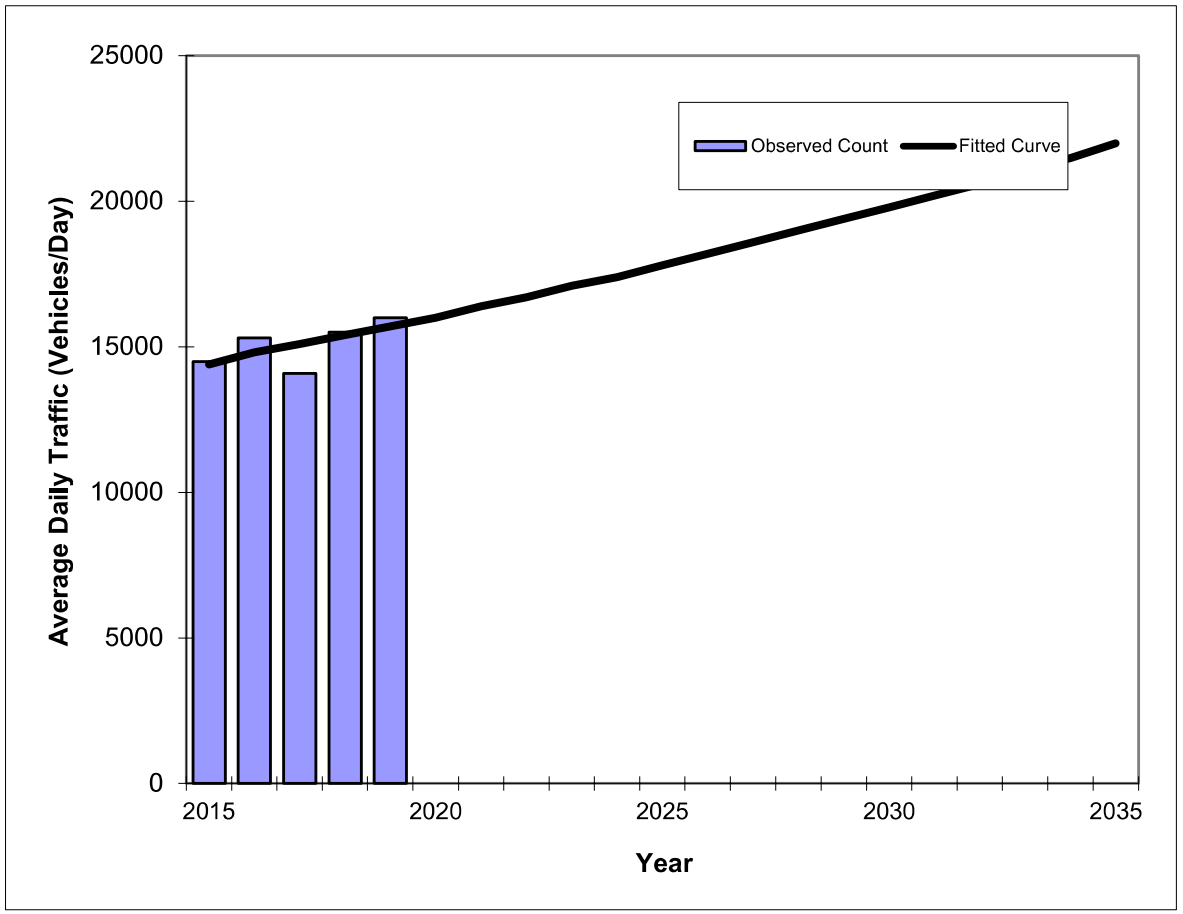
**** Annual Trend Increase:**	320
Trend R-squared:	43.24%
Trend Annual Historic Growth Rate:	2.26%
Trend Growth Rate (2019 to Design Year):	2.04%
Printed:	26-Jan-23
Straight Line Growth Option	

Traffic Trends - V03.a

GRAVES AVE -- Kentucky Ave to Normandy Blvd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	GRAVES AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2015	14500	14400
2016	15300	14800
2017	14100	15100
2018	15500	15400
2019	16000	15700
2027 Opening Year Trend		
2027	N/A	18600
2033 Mid-Year Trend		
2033	N/A	21100
2034 Design Year Trend		
2034	N/A	21500
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

Trend R-squared:	41.87%
Compounded Annual Historic Growth Rate:	2.18%
Compounded Growth Rate (2019 to Design Year):	2.12%
Printed:	26-Jan-23

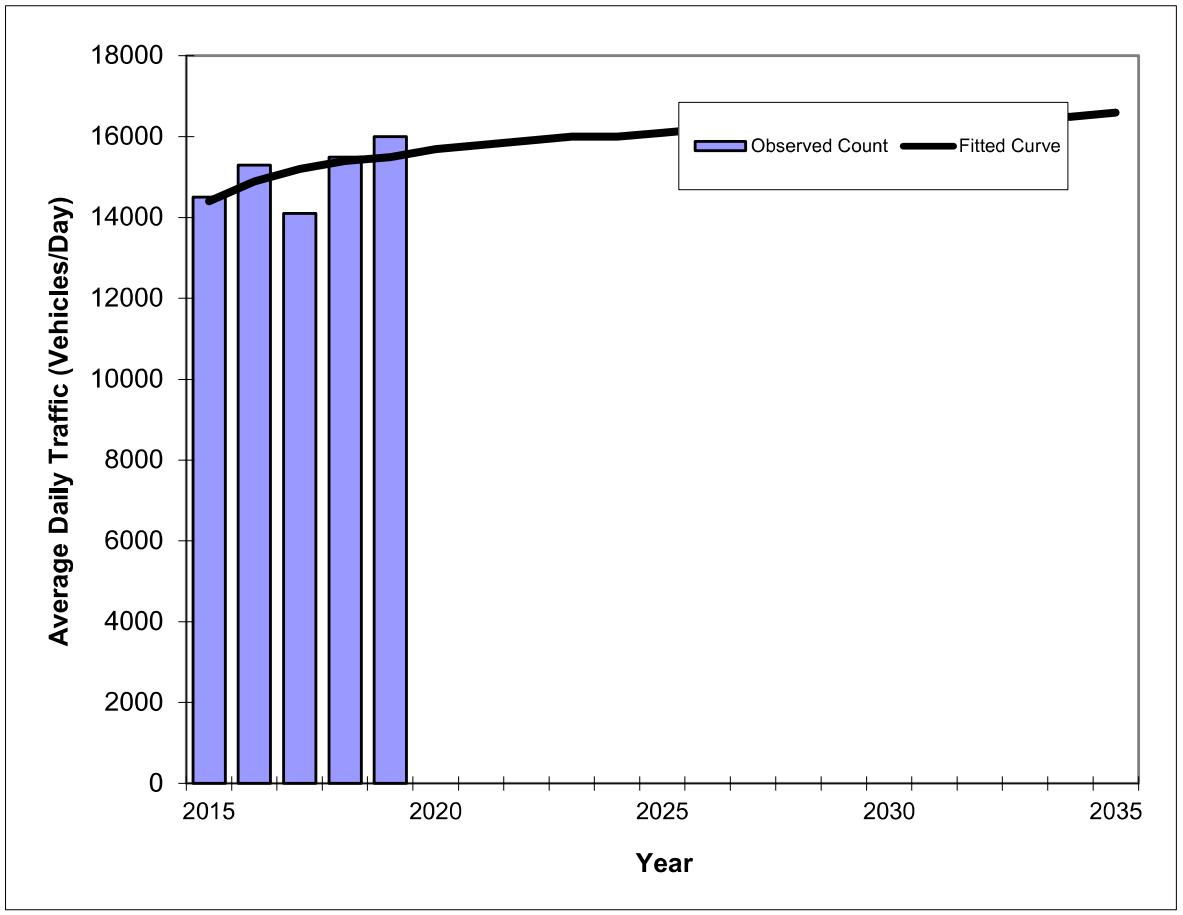
Exponential Growth Option

Traffic Trends - V03.a

GRAVES AVE -- Kentucky Ave to Normandy Blvd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	GRAVES AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2015	14500	14400
2016	15300	14900
2017	14100	15200
2018	15500	15400
2019	16000	15500
2027 Opening Year Trend		
2027	N/A	16200
2033 Mid-Year Trend		
2033	N/A	16500
2034 Design Year Trend		
2034	N/A	16500
TRANPLAN Forecasts/Trends		

Trend R-squared:	33.90%
Compounded Annual Historic Growth Rate:	1.86%
Compounded Growth Rate (2019 to Design Year):	0.42%
Printed:	26-Jan-23

Decaying Exponential Growth Option

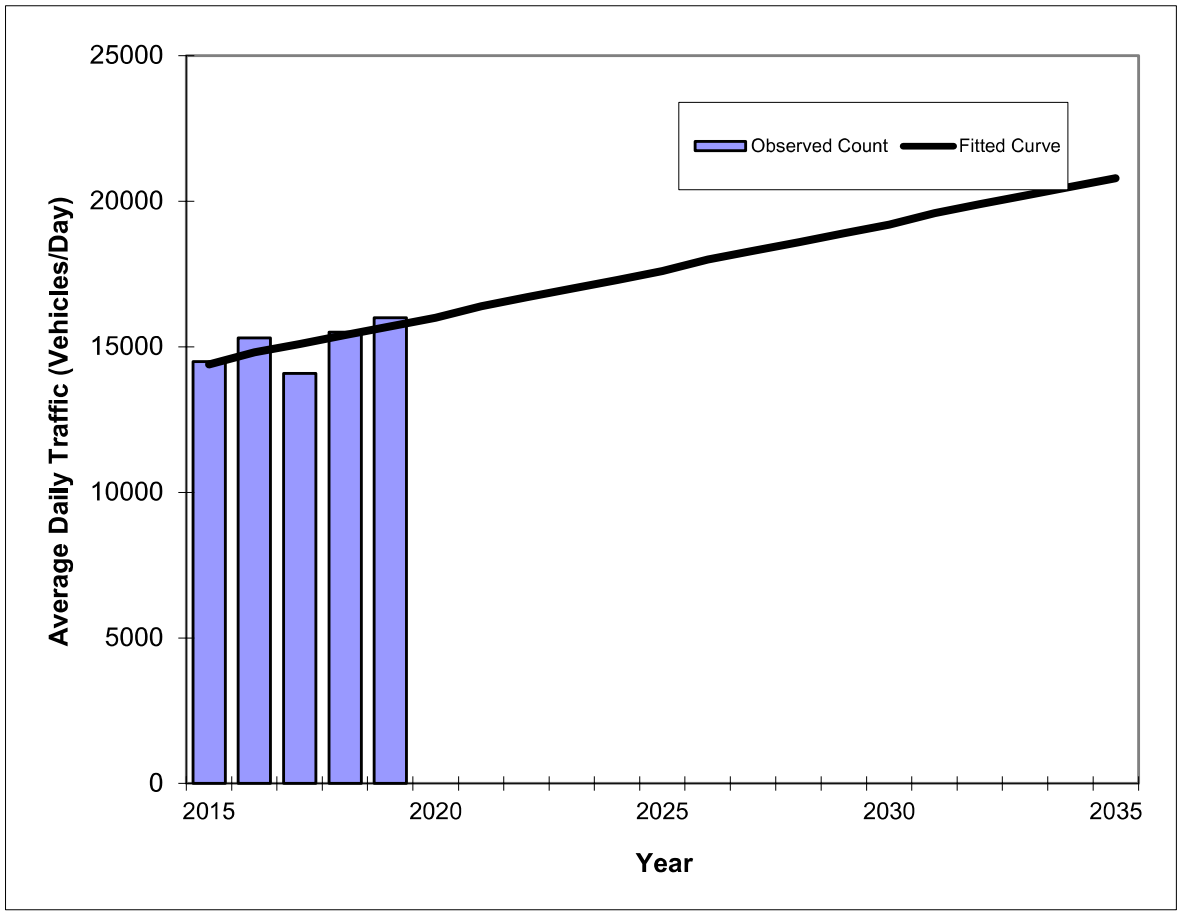
***Axle-Adjusted**

Traffic Trends - V03.a

GRAVES AVE -- Normandy Blvd to Howland Blvd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	GRAVES AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2015	14500	14400
2016	15300	14800
2017	14100	15100
2018	15500	15400
2019	16000	15700
2027 Opening Year Trend		
2027	N/A	18300
2033 Mid-Year Trend		
2033	N/A	20200
2034 Design Year Trend		
2034	N/A	20500
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

**** Annual Trend Increase:**	320
Trend R-squared:	43.24%
Trend Annual Historic Growth Rate:	2.26%
Trend Growth Rate (2019 to Design Year):	2.04%
Printed:	26-Jan-23

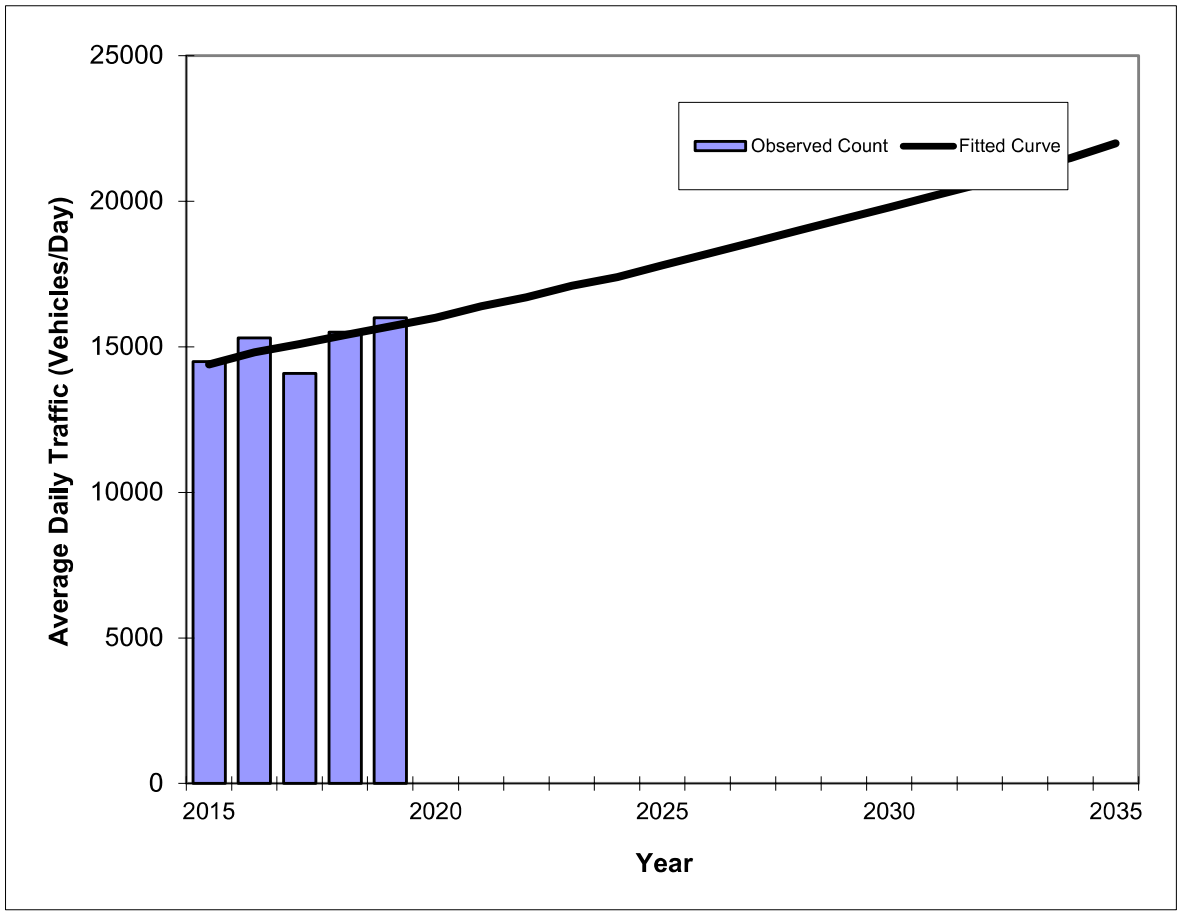
Straight Line Growth Option

Traffic Trends - V03.a

GRAVES AVE -- Normandy Blvd to Howland Blvd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	GRAVES AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2015	14500	14400
2016	15300	14800
2017	14100	15100
2018	15500	15400
2019	16000	15700
2027 Opening Year Trend		
2027	N/A	18600
2033 Mid-Year Trend		
2033	N/A	21100
2034 Design Year Trend		
2034	N/A	21500
TRANPLAN Forecasts/Trends		

Trend R-squared:	41.87%
Compounded Annual Historic Growth Rate:	2.18%
Compounded Growth Rate (2019 to Design Year):	2.12%
Printed:	26-Jan-23

Exponential Growth Option

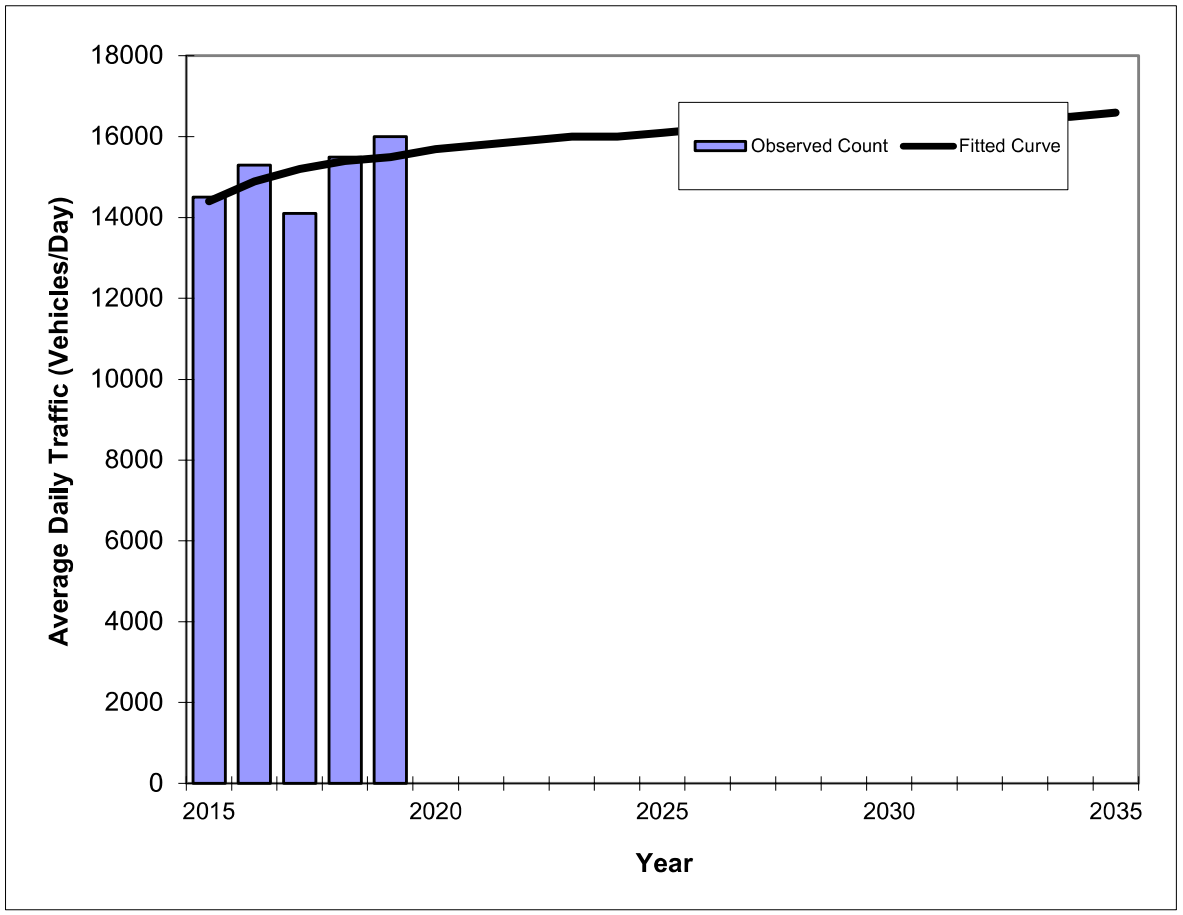
***Axle-Adjusted**

Traffic Trends - V03.a

GRAVES AVE -- Normandy Blvd to Howland Blvd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	GRAVES AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2015	14500	14400
2016	15300	14900
2017	14100	15200
2018	15500	15400
2019	16000	15500
2027 Opening Year Trend		
2027	N/A	16200
2033 Mid-Year Trend		
2033	N/A	16500
2034 Design Year Trend		
2034	N/A	16500
TRANPLAN Forecasts/Trends		

Trend R-squared:	33.90%
Compounded Annual Historic Growth Rate:	1.86%
Compounded Growth Rate (2019 to Design Year):	0.42%
Printed:	26-Jan-23

Decaying Exponential Growth Option

***Axle-Adjusted**

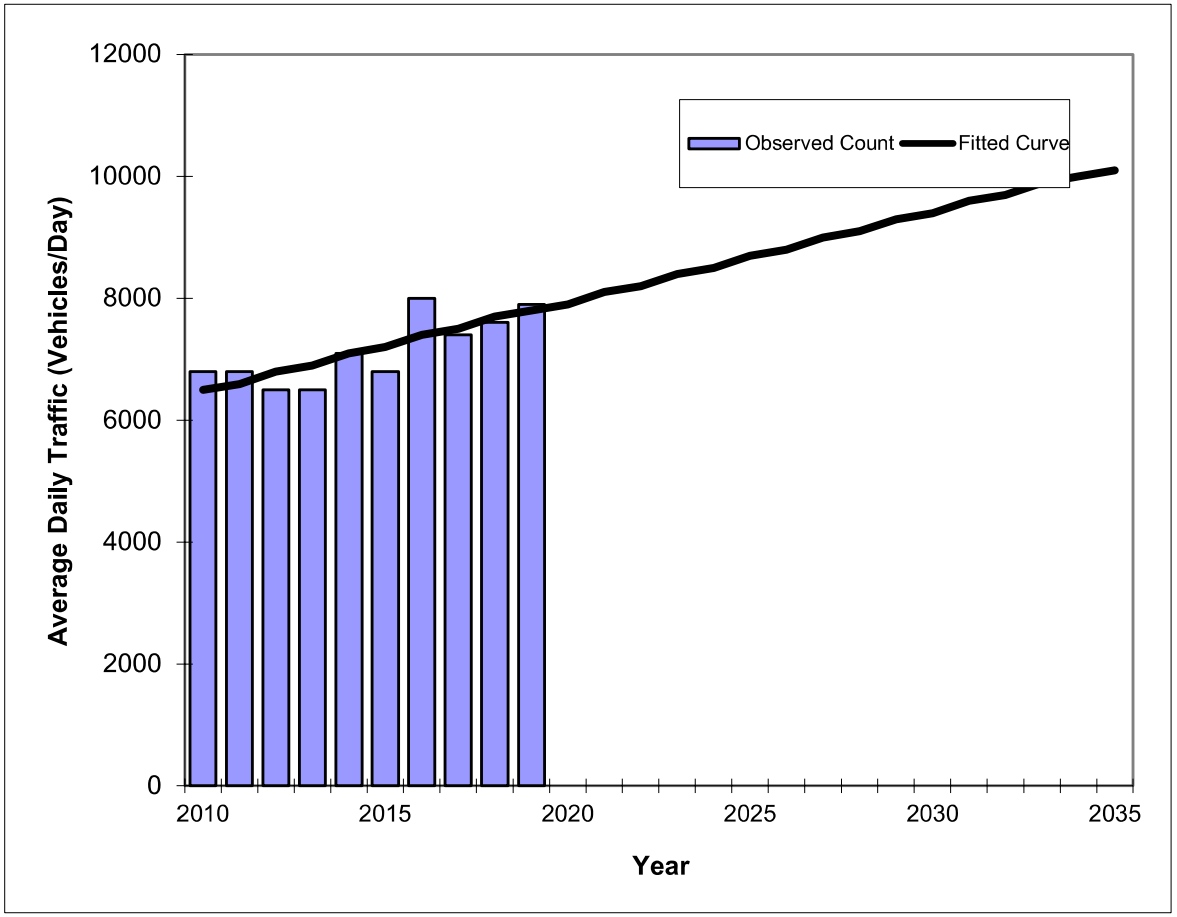
Ten Year Trends

Traffic Trends - V03.a

GRAVES AVE -- Leavitt Ave to Veteran's Memorial Pkwy

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	GRAVES AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2010	6800	6500
2011	6800	6600
2012	6500	6800
2013	6500	6900
2014	7100	7100
2015	6800	7200
2016	8000	7400
2017	7400	7500
2018	7600	7700
2019	7900	7800
2027 Opening Year Trend		
2027	N/A	9000
2033 Mid-Year Trend		
2033	N/A	9900
2034 Design Year Trend		
2034	N/A	10000
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	147
Trend R-squared:	64.21%
Trend Annual Historic Growth Rate:	2.22%
Trend Growth Rate (2019 to Design Year):	1.88%
Printed:	26-Jan-23

Straight Line Growth Option

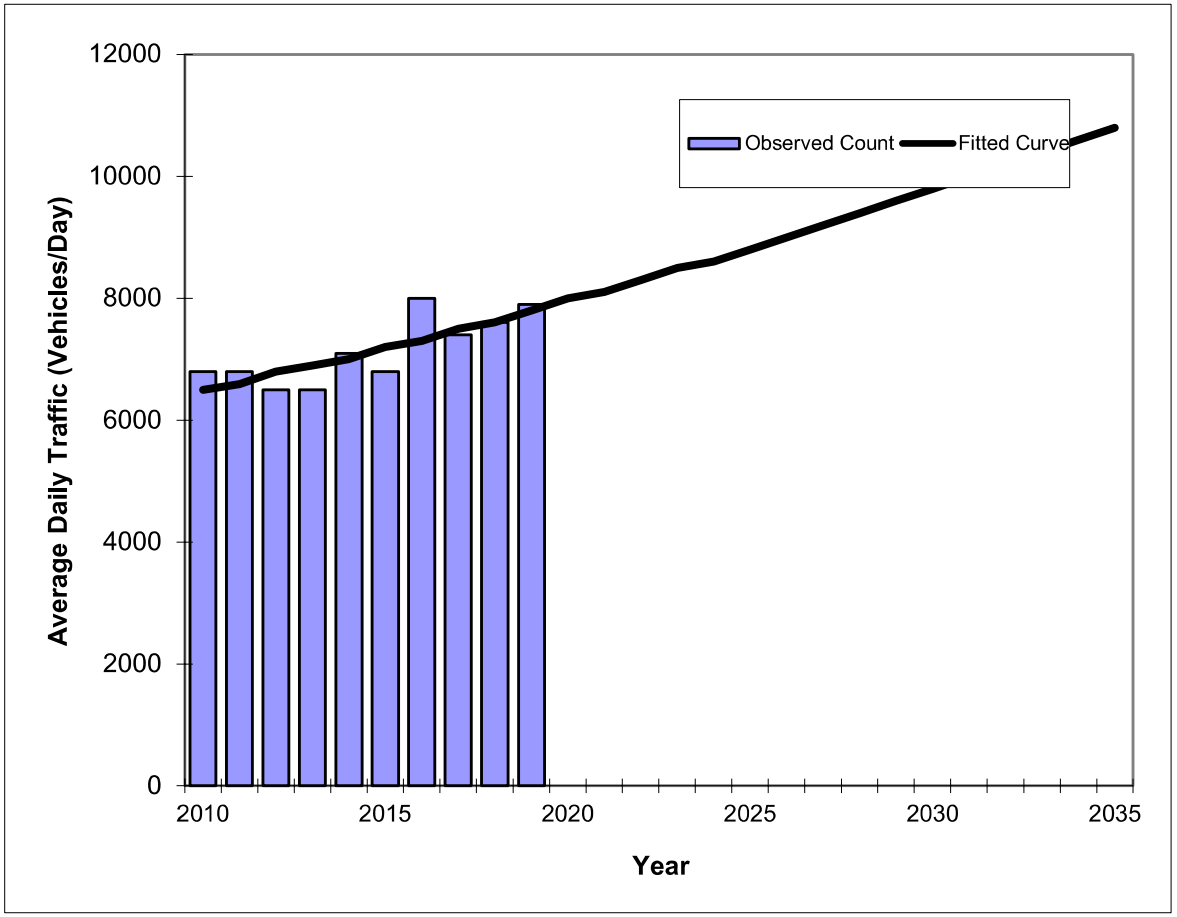
***Axle-Adjusted**

Traffic Trends - V03.a

GRAVES AVE -- Leavitt Ave to Veteran's Memorial Pkwy

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	GRAVES AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2010	6800	6500
2011	6800	6600
2012	6500	6800
2013	6500	6900
2014	7100	7000
2015	6800	7200
2016	8000	7300
2017	7400	7500
2018	7600	7600
2019	7900	7800
2027 Opening Year Trend		
2027	N/A	9200
2033 Mid-Year Trend		
2033	N/A	10400
2034 Design Year Trend		
2034	N/A	10600
TRANPLAN Forecasts/Trends		

Trend R-squared:	64.30%
Compounded Annual Historic Growth Rate:	2.05%
Compounded Growth Rate (2019 to Design Year):	2.07%
Printed:	26-Jan-23

Exponential Growth Option

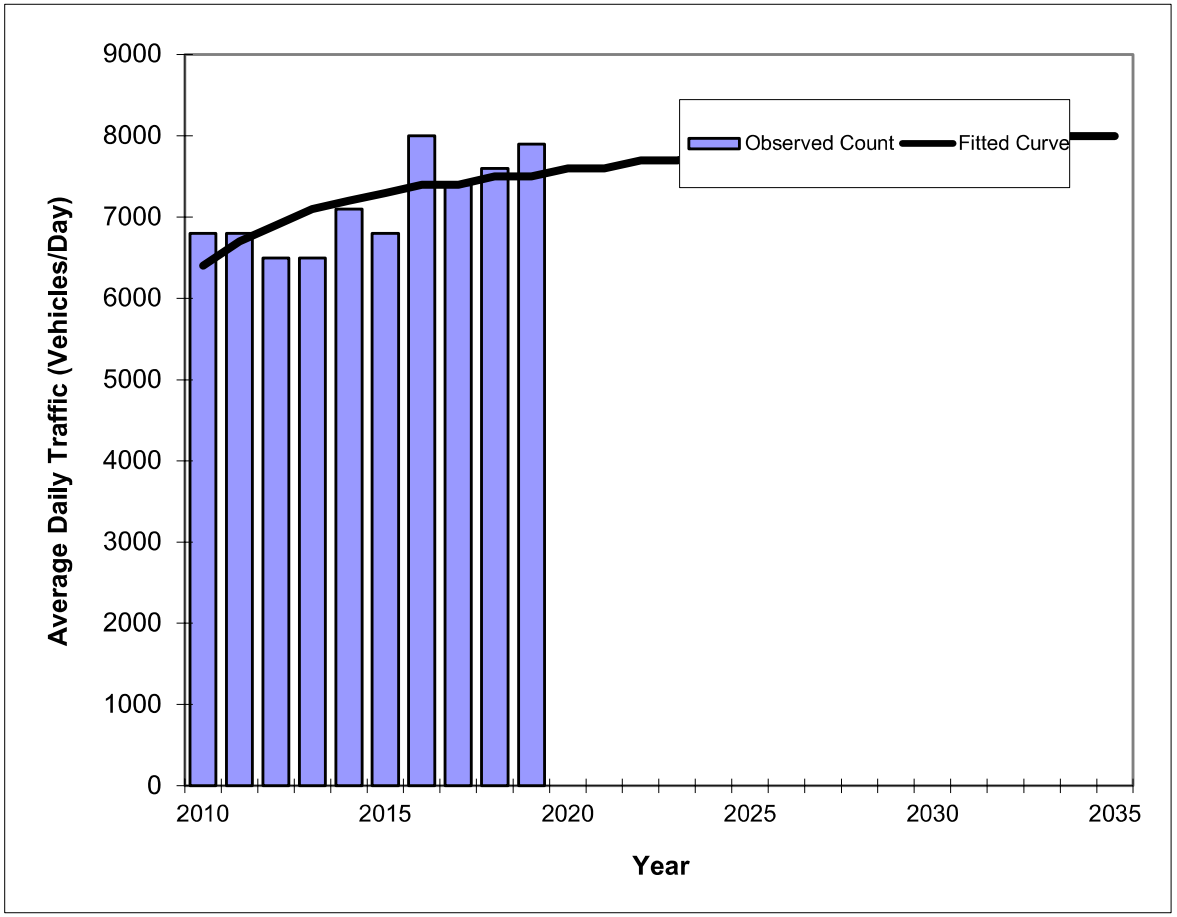
***Axle-Adjusted**

Traffic Trends - V03.a

GRAVES AVE -- Leavitt Ave to Veteran's Memorial Pkwy

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	GRAVES AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2010	6800	6400
2011	6800	6700
2012	6500	6900
2013	6500	7100
2014	7100	7200
2015	6800	7300
2016	8000	7400
2017	7400	7400
2018	7600	7500
2019	7900	7500
2027 Opening Year Trend		
2027	N/A	7800
2033 Mid-Year Trend		
2033	N/A	8000
2034 Design Year Trend		
2034	N/A	8000
TRANPLAN Forecasts/Trends		

Trend R-squared:	45.84%
Compounded Annual Historic Growth Rate:	1.78%
Compounded Growth Rate (2019 to Design Year):	0.43%
Printed:	26-Jan-23

Decaying Exponential Growth Option

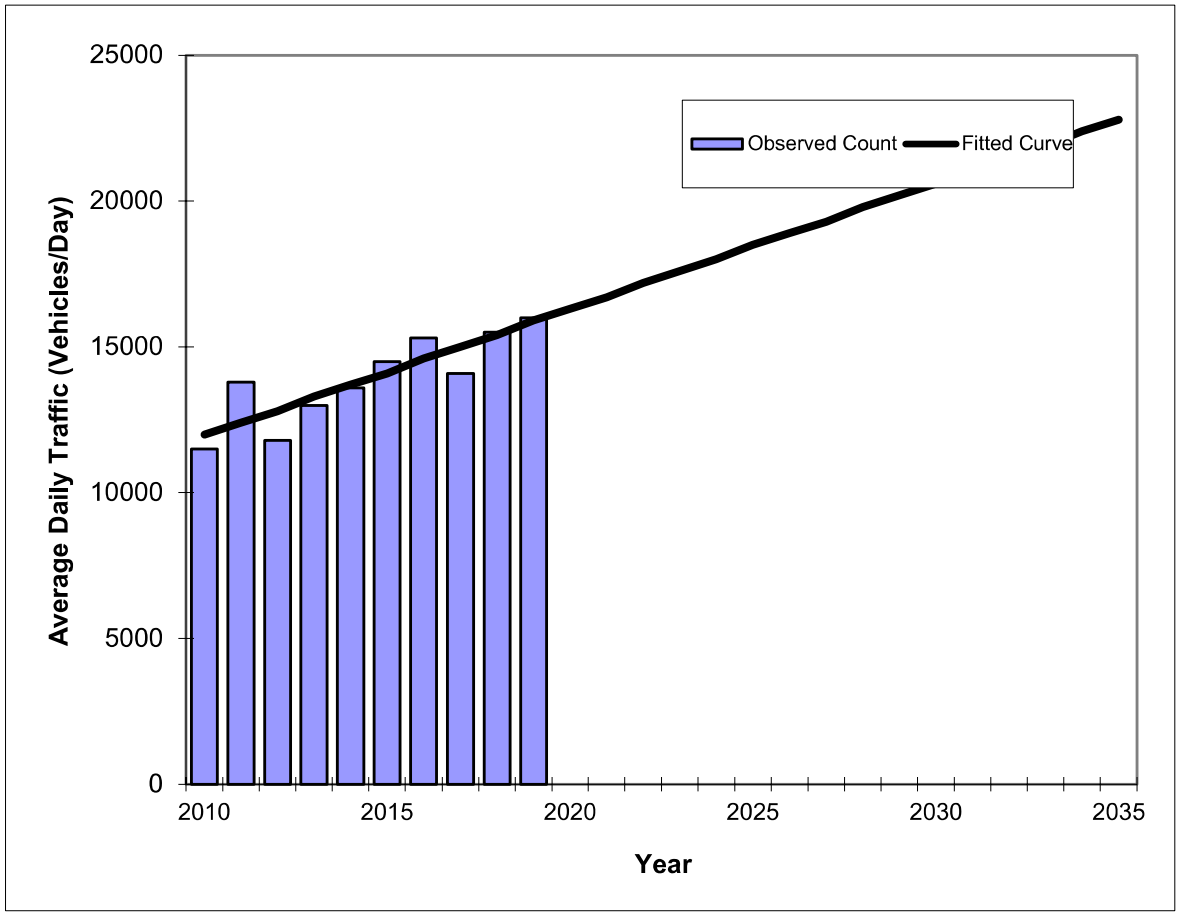
***Axle-Adjusted**

Traffic Trends - V03.a

GRAVES AVE -- Kentucky Ave to Normandy Blvd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	GRAVES AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2010	11500	12000
2011	13800	12400
2012	11800	12800
2013	13000	13300
2014	13600	13700
2015	14500	14100
2016	15300	14600
2017	14100	15000
2018	15500	15400
2019	16000	15900
2027 Opening Year Trend		
2027	N/A	19300
2033 Mid-Year Trend		
2033	N/A	21900
2034 Design Year Trend		
2034	N/A	22400
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	435
Trend R-squared:	76.33%
Trend Annual Historic Growth Rate:	3.61%
Trend Growth Rate (2019 to Design Year):	2.73%
Printed:	26-Jan-23
Straight Line Growth Option	

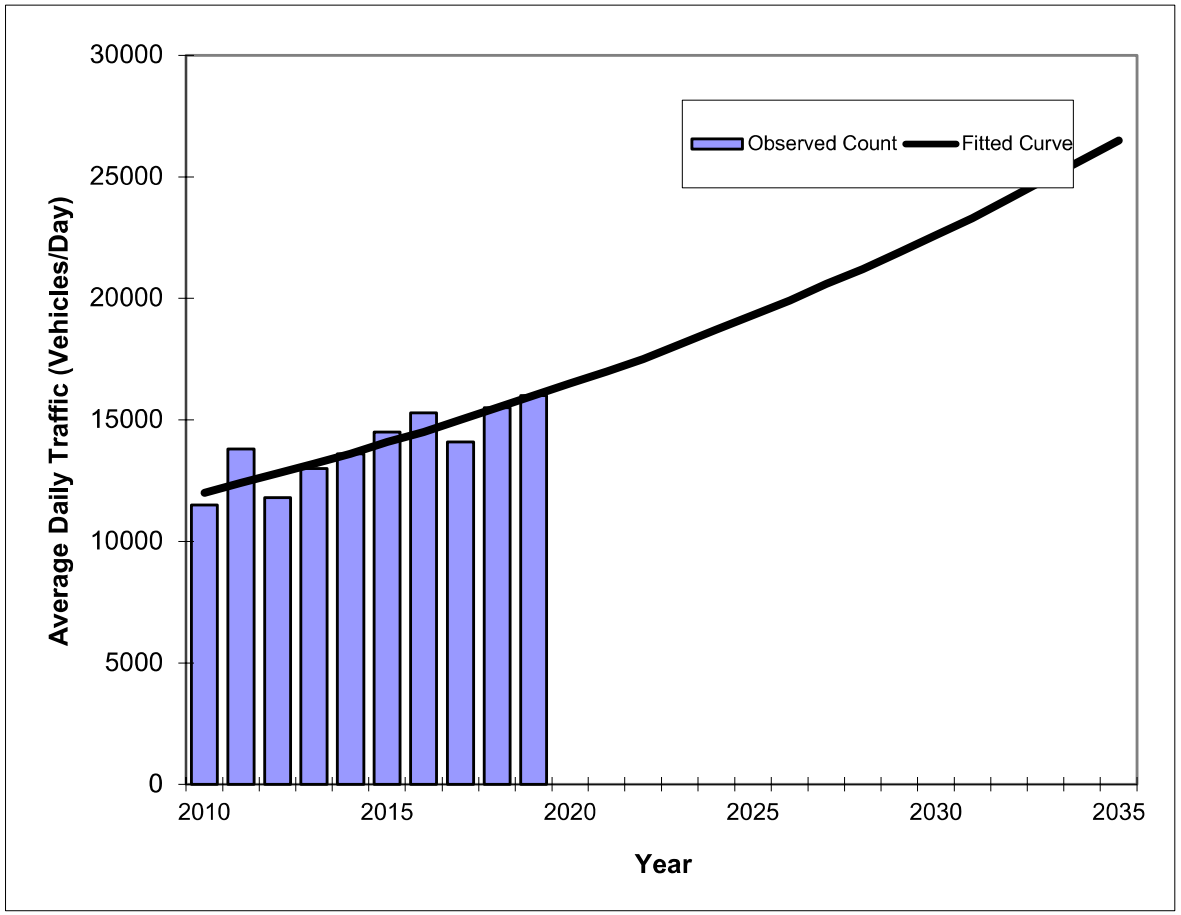
***Axle-Adjusted**

Traffic Trends - V03.a

GRAVES AVE -- Kentucky Ave to Normandy Blvd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	GRAVES AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2010	11500	12000
2011	13800	12400
2012	11800	12800
2013	13000	13200
2014	13600	13600
2015	14500	14100
2016	15300	14500
2017	14100	15000
2018	15500	15500
2019	16000	16000
2027 Opening Year Trend		
2027	N/A	20600
2033 Mid-Year Trend		
2033	N/A	24900
2034 Design Year Trend		
2034	N/A	25700
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

Trend R-squared:	75.03%
Compounded Annual Historic Growth Rate:	3.25%
Compounded Growth Rate (2019 to Design Year):	3.21%
Printed:	26-Jan-23

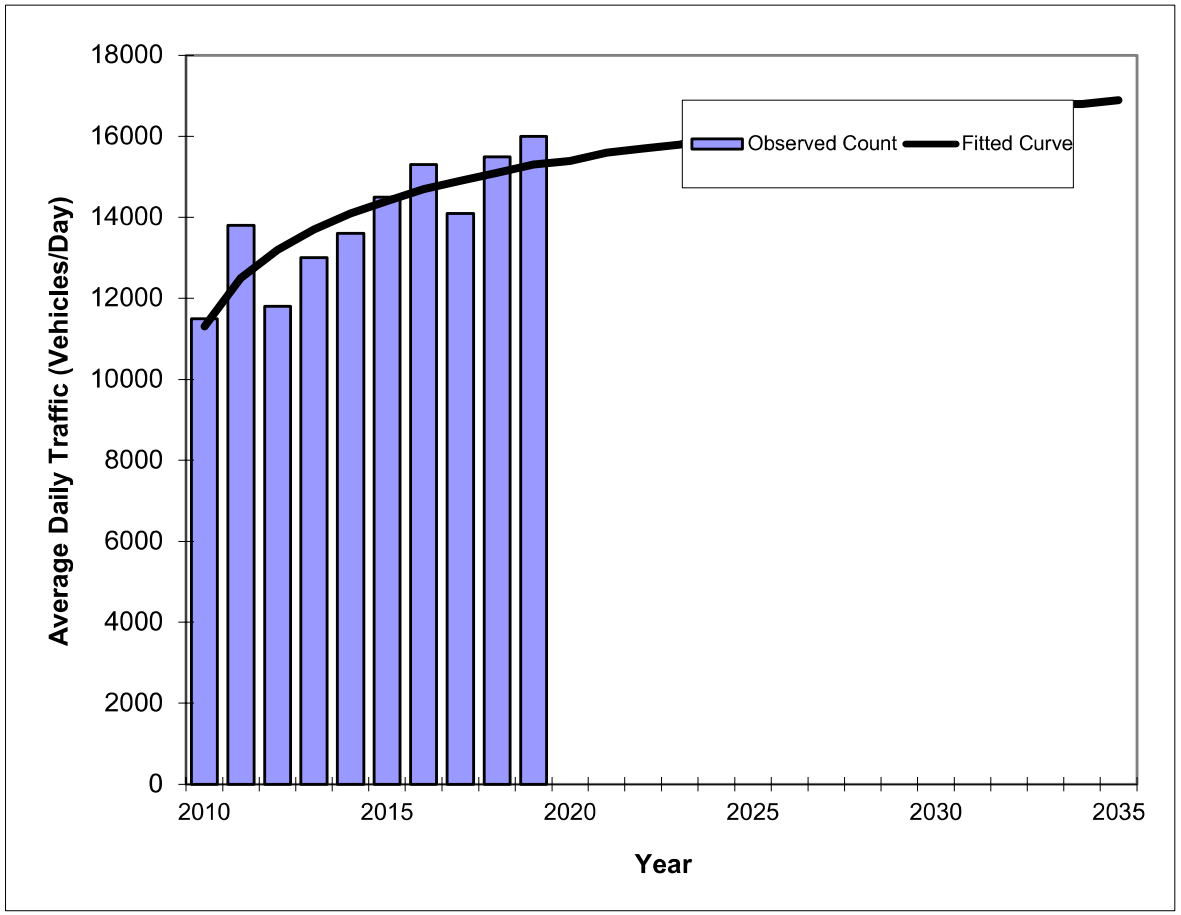
Exponential Growth Option

Traffic Trends - V03.a

GRAVES AVE -- Kentucky Ave to Normandy Blvd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	GRAVES AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2010	11500	11300
2011	13800	12500
2012	11800	13200
2013	13000	13700
2014	13600	14100
2015	14500	14400
2016	15300	14700
2017	14100	14900
2018	15500	15100
2019	16000	15300
2027 Opening Year Trend		
2027	N/A	16300
2033 Mid-Year Trend		
2033	N/A	16800
2034 Design Year Trend		
2034	N/A	16800
TRANPLAN Forecasts/Trends		

Trend R-squared:	69.94%
Compounded Annual Historic Growth Rate:	3.42%
Compounded Growth Rate (2019 to Design Year):	0.63%
Printed:	7-Feb-23

Decaying Exponential Growth Option

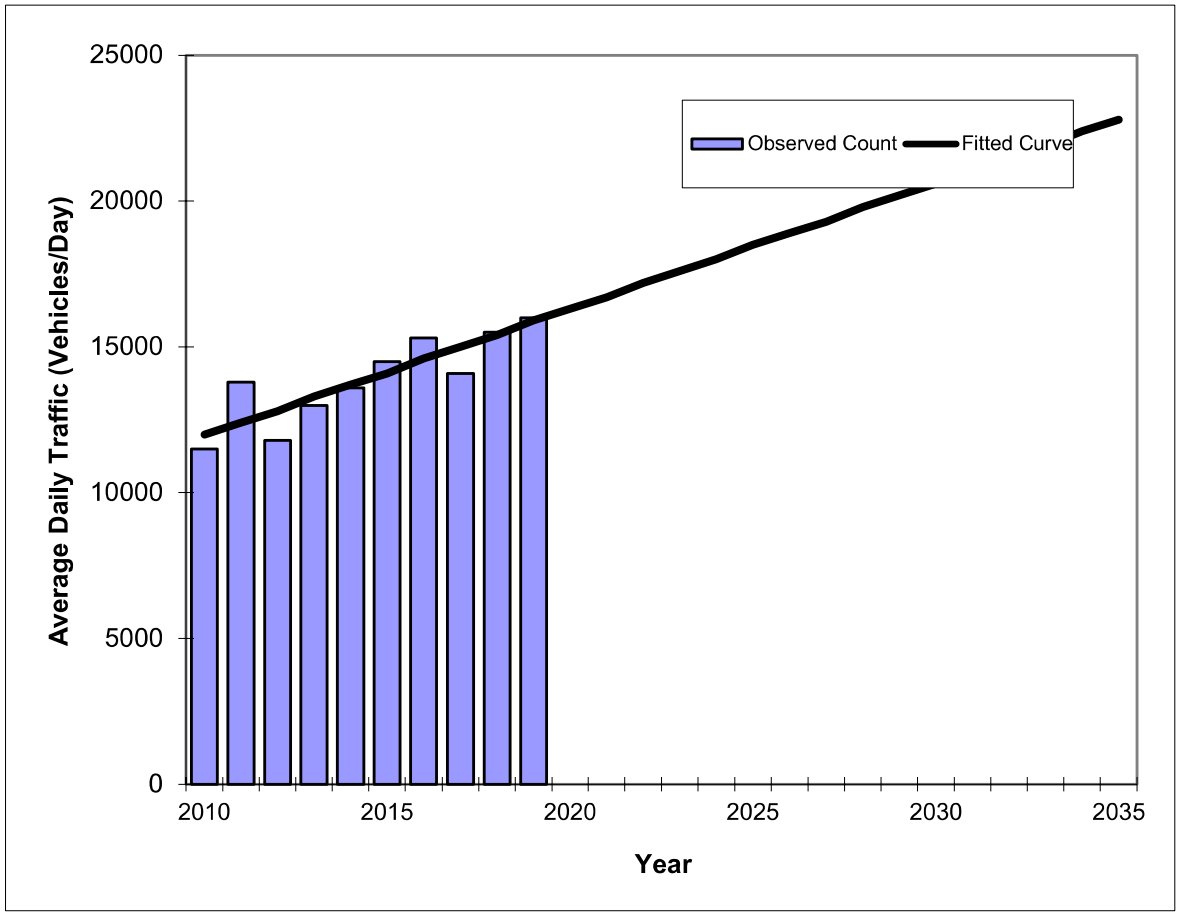
***Axle-Adjusted**

Traffic Trends - V03.a

GRAVES AVE -- Normandy Blvd to Howland Blvd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	GRAVES AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2010	11500	12000
2011	13800	12400
2012	11800	12800
2013	13000	13300
2014	13600	13700
2015	14500	14100
2016	15300	14600
2017	14100	15000
2018	15500	15400
2019	16000	15900
2027 Opening Year Trend		
2027	N/A	19300
2033 Mid-Year Trend		
2033	N/A	21900
2034 Design Year Trend		
2034	N/A	22400
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

** Annual Trend Increase:	435
Trend R-squared:	76.33%
Trend Annual Historic Growth Rate:	3.61%
Trend Growth Rate (2019 to Design Year):	2.73%
Printed:	26-Jan-23

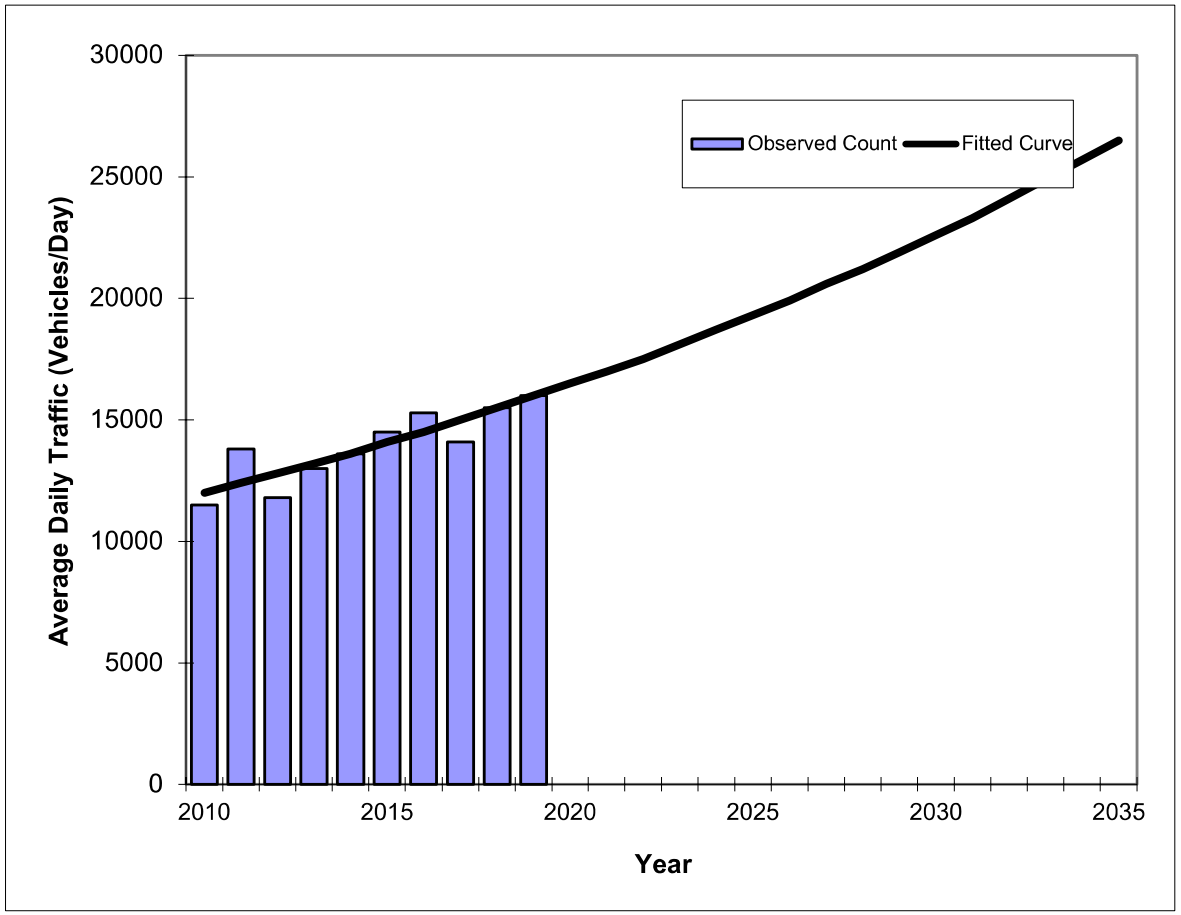
Straight Line Growth Option

Traffic Trends - V03.a

GRAVES AVE -- Normandy Blvd to Howland Blvd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	GRAVES AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2010	11500	12000
2011	13800	12400
2012	11800	12800
2013	13000	13200
2014	13600	13600
2015	14500	14100
2016	15300	14500
2017	14100	15000
2018	15500	15500
2019	16000	16000
2027 Opening Year Trend		
2027	N/A	20600
2033 Mid-Year Trend		
2033	N/A	24900
2034 Design Year Trend		
2034	N/A	25700
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

Trend R-squared:	75.03%
Compounded Annual Historic Growth Rate:	3.25%
Compounded Growth Rate (2019 to Design Year):	3.21%
Printed:	26-Jan-23

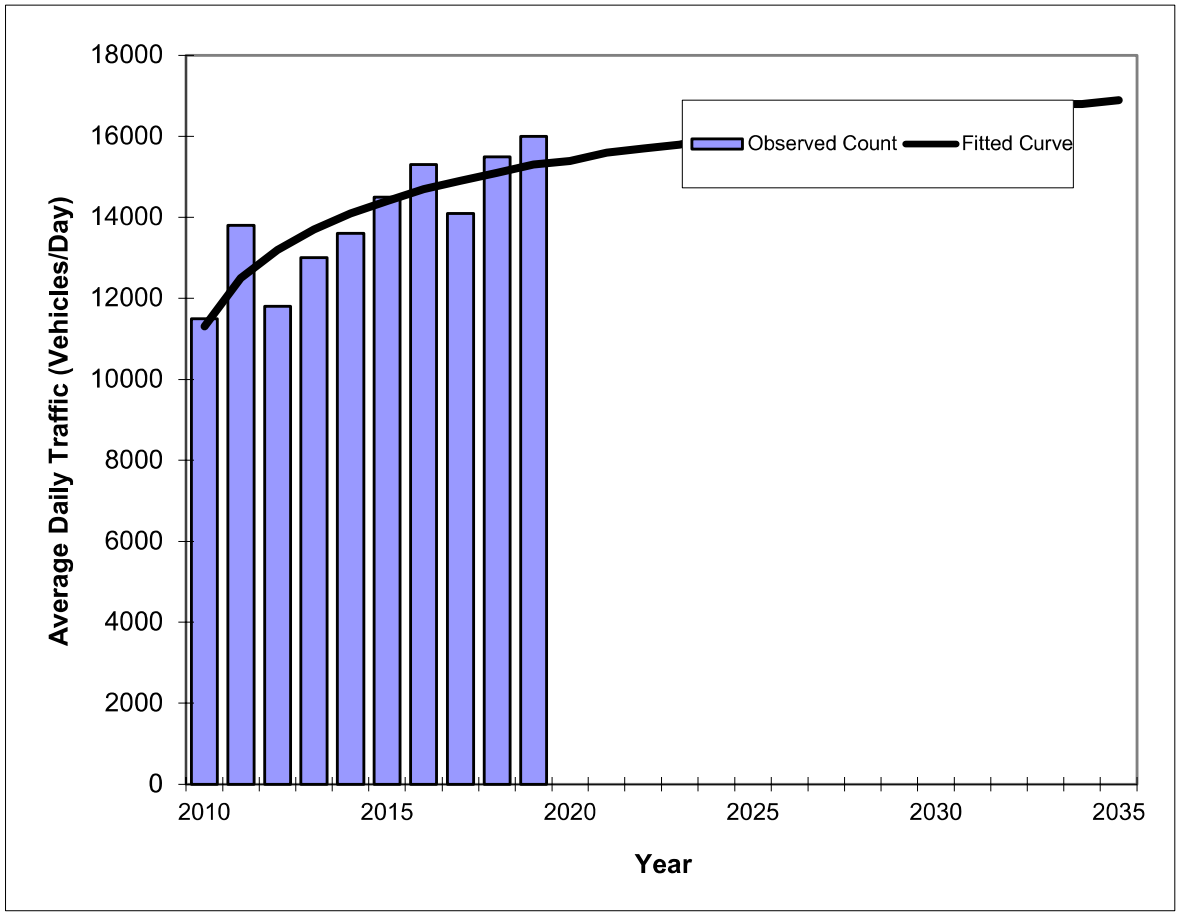
Exponential Growth Option

Traffic Trends - V03.a

GRAVES AVE -- Normandy Blvd to Howland Blvd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	GRAVES AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2010	11500	11300
2011	13800	12500
2012	11800	13200
2013	13000	13700
2014	13600	14100
2015	14500	14400
2016	15300	14700
2017	14100	14900
2018	15500	15100
2019	16000	15300
2027 Opening Year Trend		
2027	N/A	16300
2033 Mid-Year Trend		
2033	N/A	16800
2034 Design Year Trend		
2034	N/A	16800
TRANPLAN Forecasts/Trends		

Trend R-squared:	69.94%
Compounded Annual Historic Growth Rate:	3.42%
Compounded Growth Rate (2019 to Design Year):	0.63%
Printed:	26-Jan-23

Decaying Exponential Growth Option

***Axle-Adjusted**

Howland Boulevard

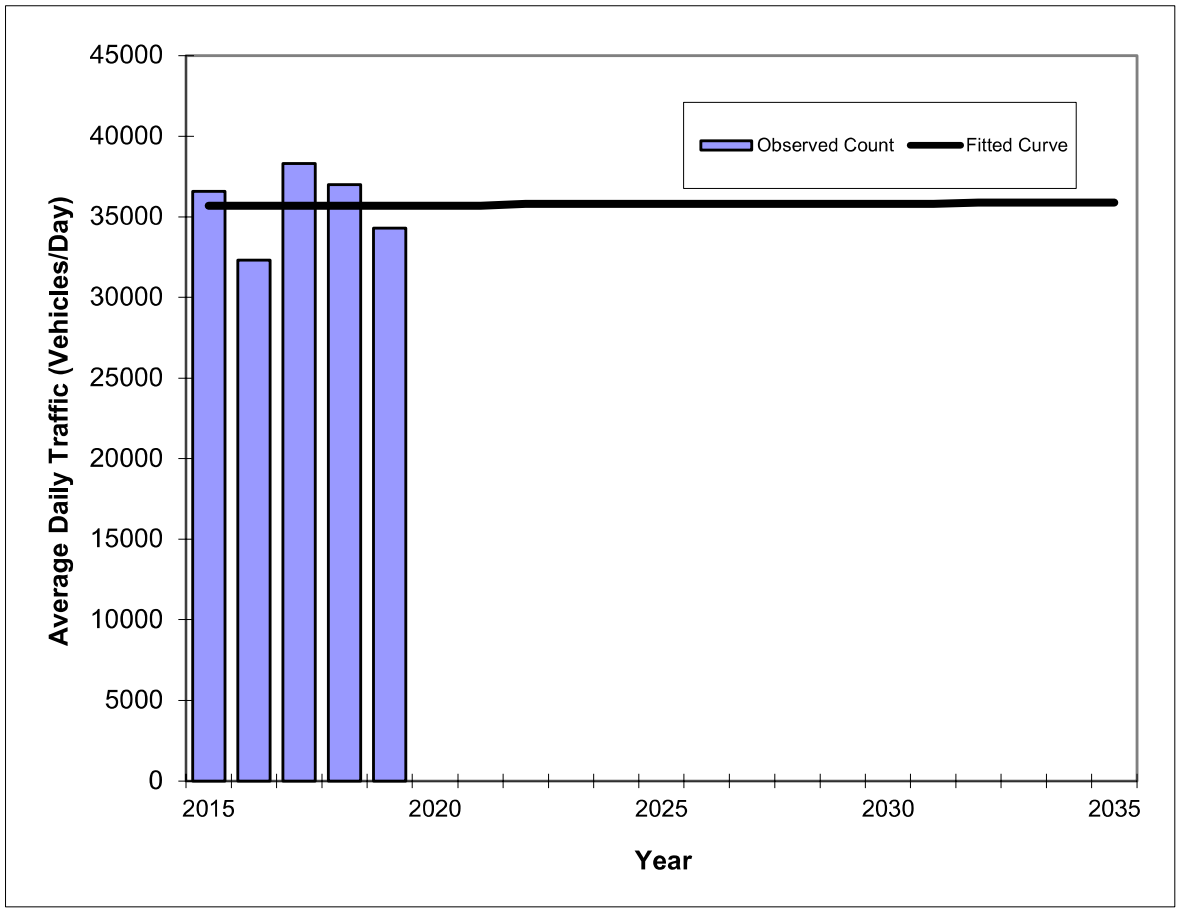
Five Year Trends

Traffic Trends - V03.a

HOWLAND BLVD -- I-4 to Wolf Pack Run

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	HOWLAND BLVD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	36600	35700
2016	32300	35700
2017	38300	35700
2018	37000	35700
2019	34300	35700
2027 Opening Year Trend		
2027	N/A	35800
2033 Mid-Year Trend		
2033	N/A	35900
2034 Design Year Trend		
2034	N/A	35900
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	10
Trend R-squared:	0.00%
Trend Annual Historic Growth Rate:	0.00%
Trend Growth Rate (2019 to Design Year):	0.04%
Printed:	7-Feb-23

Straight Line Growth Option

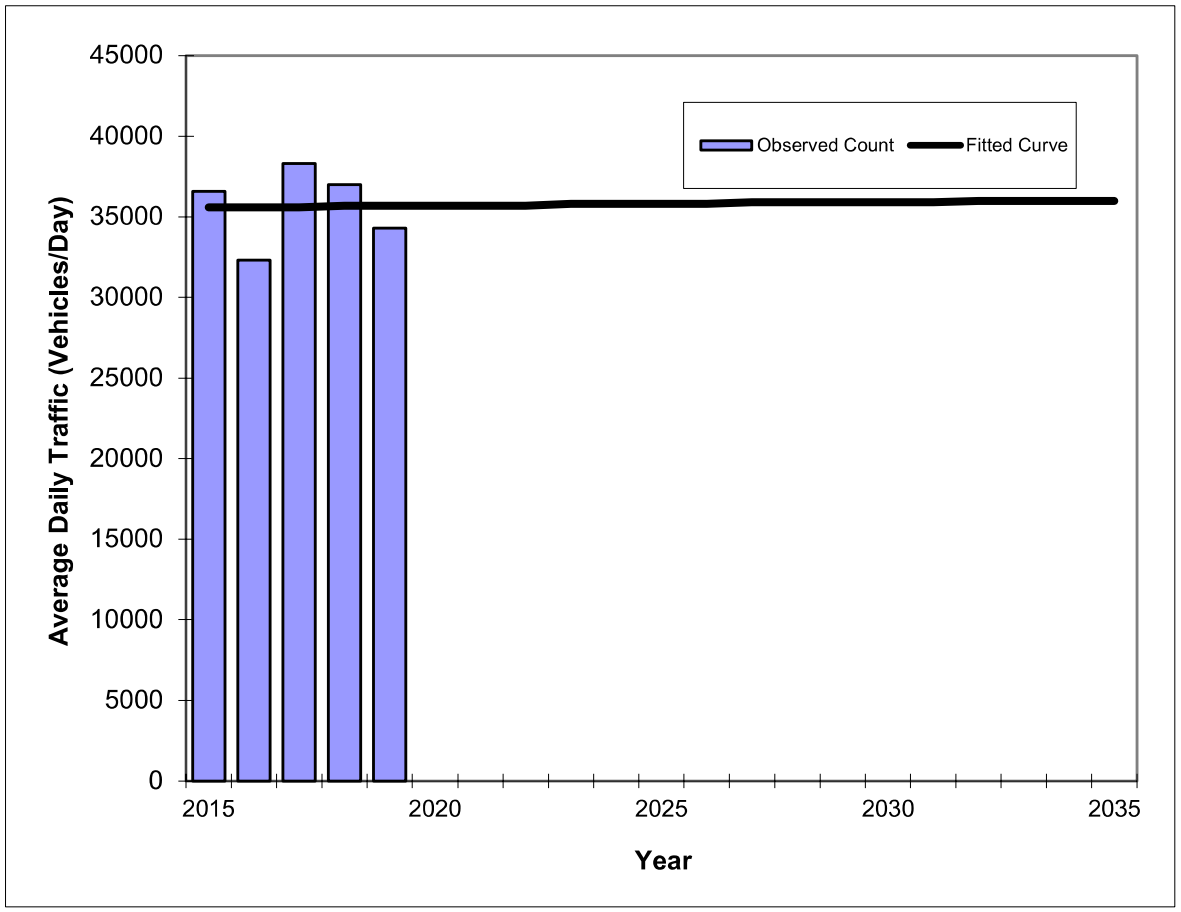
***Axle-Adjusted**

Traffic Trends - V03.a

HOWLAND BLVD -- I-4 to Wolf Pack Run

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	HOWLAND BLVD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	36600	35600
2016	32300	35600
2017	38300	35600
2018	37000	35700
2019	34300	35700
2027 Opening Year Trend		
2027	N/A	35900
2033 Mid-Year Trend		
2033	N/A	36000
2034 Design Year Trend		
2034	N/A	36000
TRANPLAN Forecasts/Trends		

Trend R-squared:	0.02%
Compounded Annual Historic Growth Rate:	0.07%
Compounded Growth Rate (2019 to Design Year):	0.06%
Printed:	7-Feb-23

Exponential Growth Option

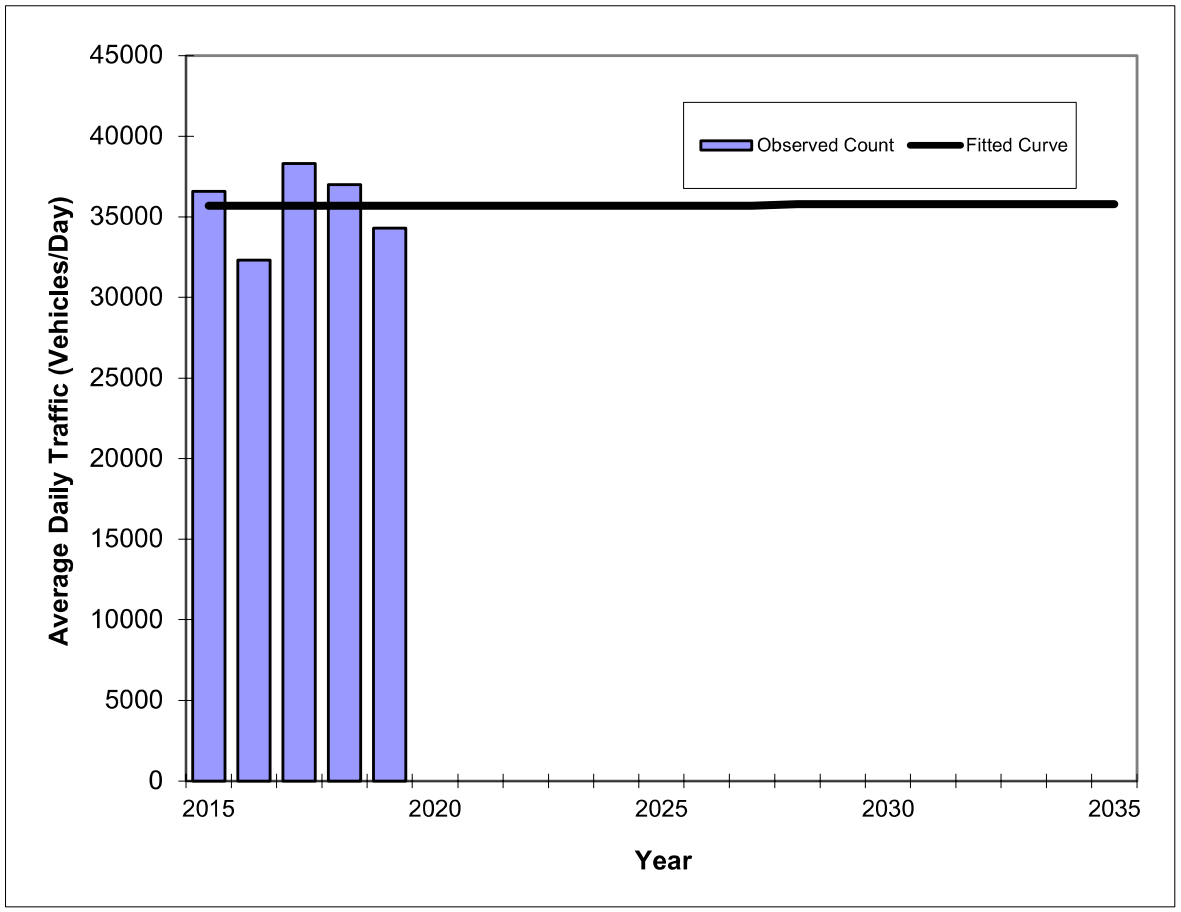
***Axle-Adjusted**

Traffic Trends - V03.a

HOWLAND BLVD -- I-4 to Wolf Pack Run

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	HOWLAND BLVD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	36600	35700
2016	32300	35700
2017	38300	35700
2018	37000	35700
2019	34300	35700
2027 Opening Year Trend		
2027	N/A	35700
2033 Mid-Year Trend		
2033	N/A	35800
2034 Design Year Trend		
2034	N/A	35800
TRANPLAN Forecasts/Trends		

Trend R-squared:	0.01%
Compounded Annual Historic Growth Rate:	0.00%
Compounded Growth Rate (2019 to Design Year):	0.02%
Printed:	7-Feb-23

Decaying Exponential Growth Option

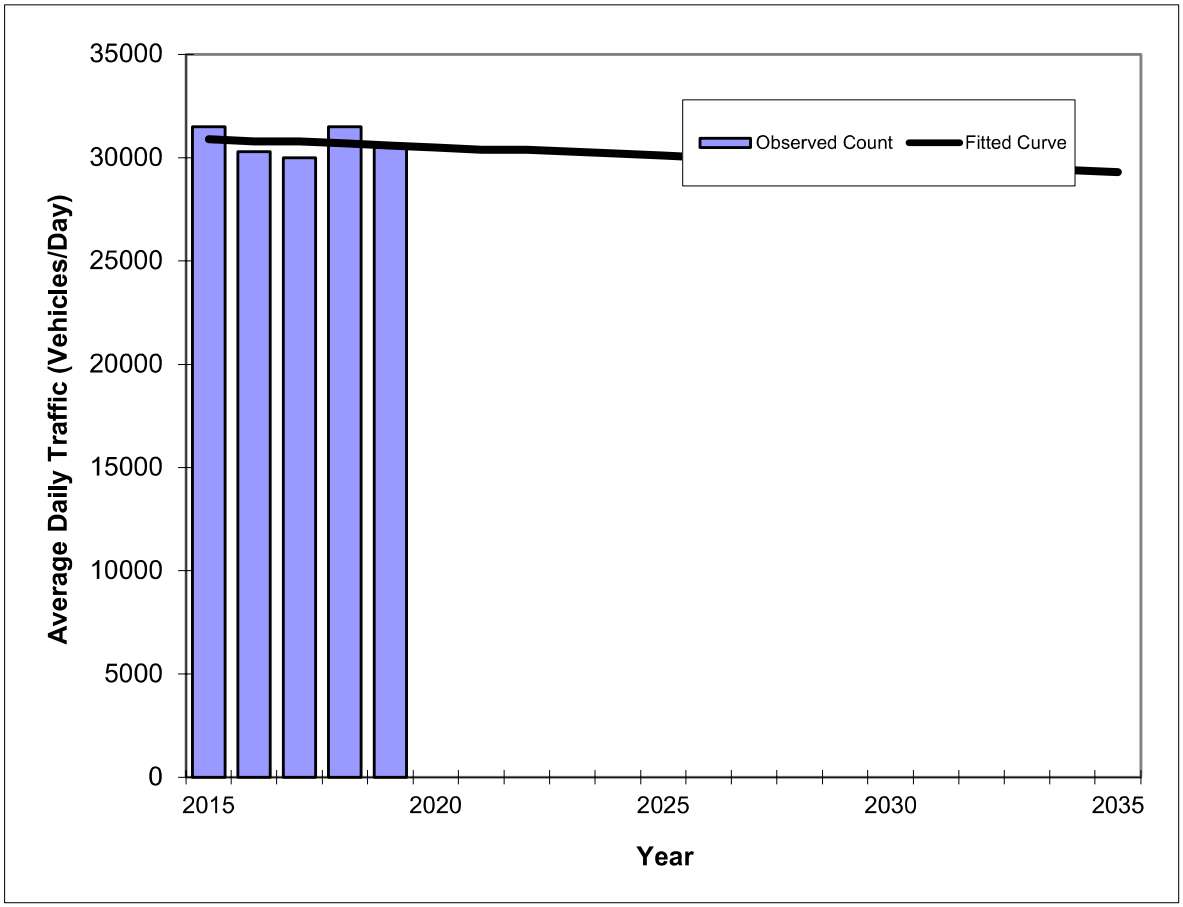
***Axle-Adjusted**

Traffic Trends - V03.a

HOWLAND BOULEVARD -- Wolf Pack Run to Catalina Blvd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	HOWLAND BOULEVARD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	31500	30900
2016	30300	30800
2017	30000	30800
2018	31500	30700
2019	30500	30600
2027 Opening Year Trend		
2027	N/A	30000
2033 Mid-Year Trend		
2033	N/A	29500
2034 Design Year Trend		
2034	N/A	29400
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	-80
Trend R-squared:	3.28%
Trend Annual Historic Growth Rate:	-0.24%
Trend Growth Rate (2019 to Design Year):	-0.26%
Printed:	7-Feb-23
Straight Line Growth Option	

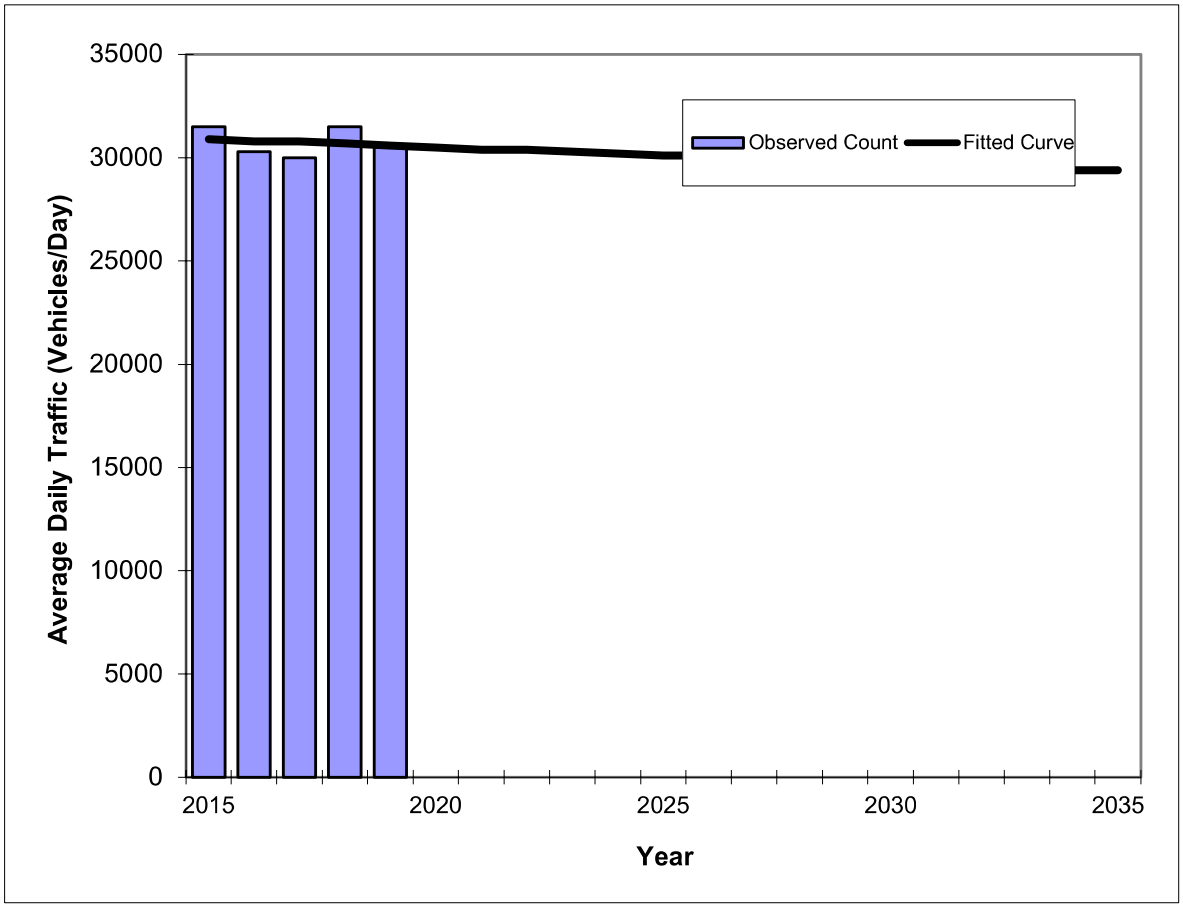
***Axle-Adjusted**

Traffic Trends - V03.a

HOWLAND BOULEVARD -- Wolf Pack Run to Catalina Blvd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	HOWLAND BOULEVARD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	31500	30900
2016	30300	30800
2017	30000	30800
2018	31500	30700
2019	30500	30600
2027 Opening Year Trend		
2027	N/A	30000
2033 Mid-Year Trend		
2033	N/A	29500
2034 Design Year Trend		
2034	N/A	29400
TRANPLAN Forecasts/Trends		

Trend R-squared:	3.21%
Compounded Annual Historic Growth Rate:	-0.24%
Compounded Growth Rate (2019 to Design Year):	-0.27%
Printed:	18-Jan-23

Exponential Growth Option

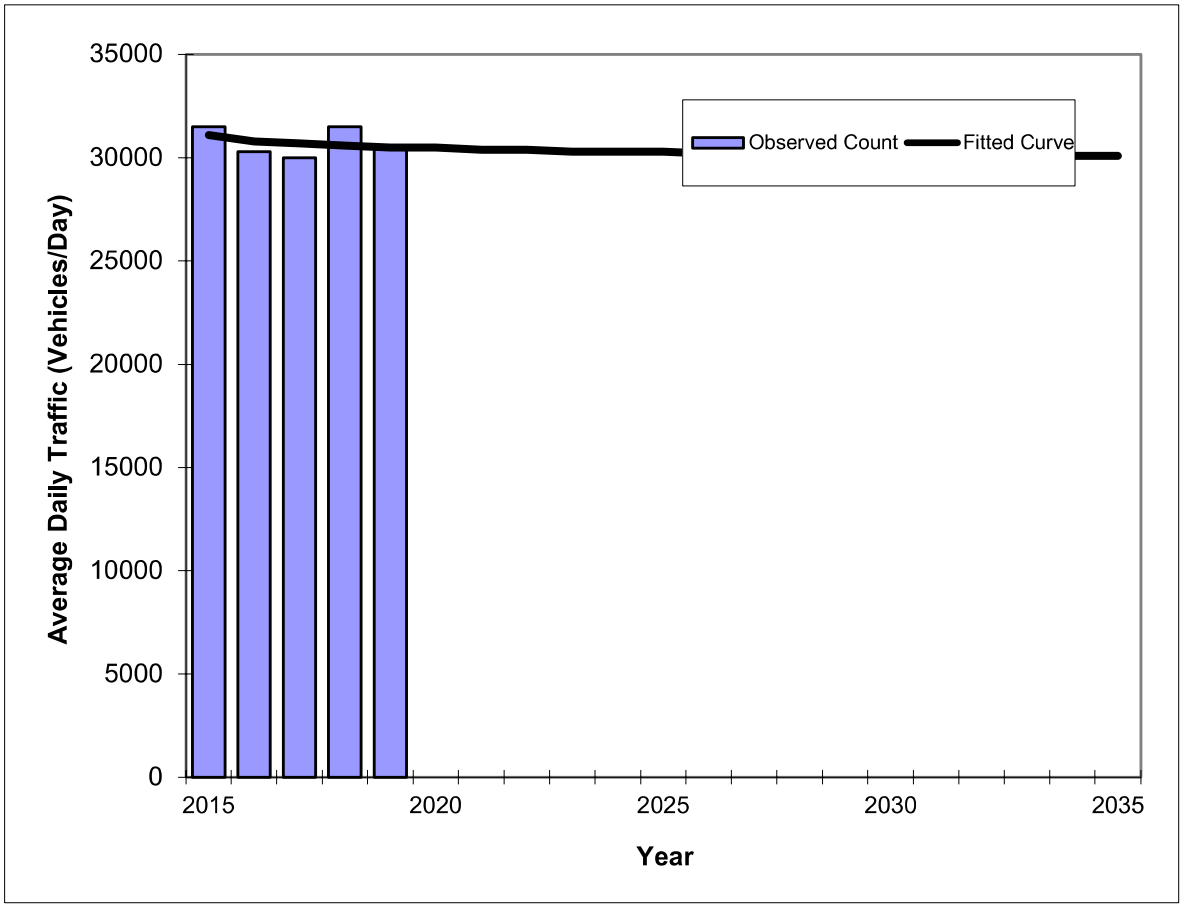
***Axle-Adjusted**

Traffic Trends - V03.a

HOWLAND BOULEVARD -- Wolf Pack Run to Catalina Blvd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	HOWLAND BOULEVARD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	31500	31100
2016	30300	30800
2017	30000	30700
2018	31500	30600
2019	30500	30500
2027 Opening Year Trend		
2027	N/A	30200
2033 Mid-Year Trend		
2033	N/A	30100
2034 Design Year Trend		
2034	N/A	30100
TRANPLAN Forecasts/Trends		

Trend R-squared:	9.47%
Compounded Annual Historic Growth Rate:	-0.49%
Compounded Growth Rate (2019 to Design Year):	-0.09%
Printed:	18-Jan-23

Decaying Exponential Growth Option

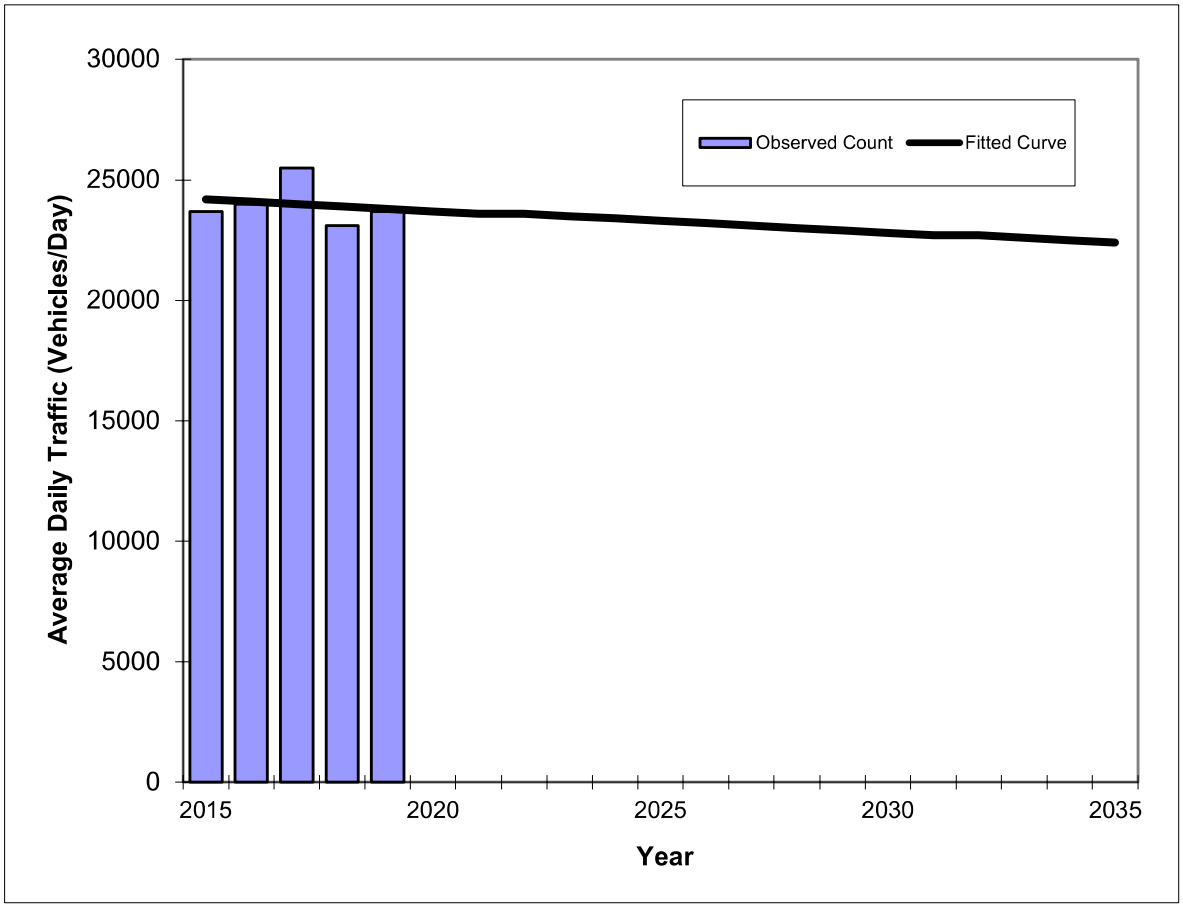
***Axle-Adjusted**

Traffic Trends - V03.a

HOWLAND BOULEVARD -- Catalina Blvd to Providence Blvd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	HOWLAND BOULEVARD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	23700	24200
2016	24000	24100
2017	25500	24000
2018	23100	23900
2019	23700	23800
2027 Opening Year Trend		
2027	N/A	23100
2033 Mid-Year Trend		
2033	N/A	22600
2034 Design Year Trend		
2034	N/A	22500
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	-90
Trend R-squared:	2.50%
Trend Annual Historic Growth Rate:	-0.41%
Trend Growth Rate (2019 to Design Year):	-0.36%
Printed:	7-Feb-23
Straight Line Growth Option	

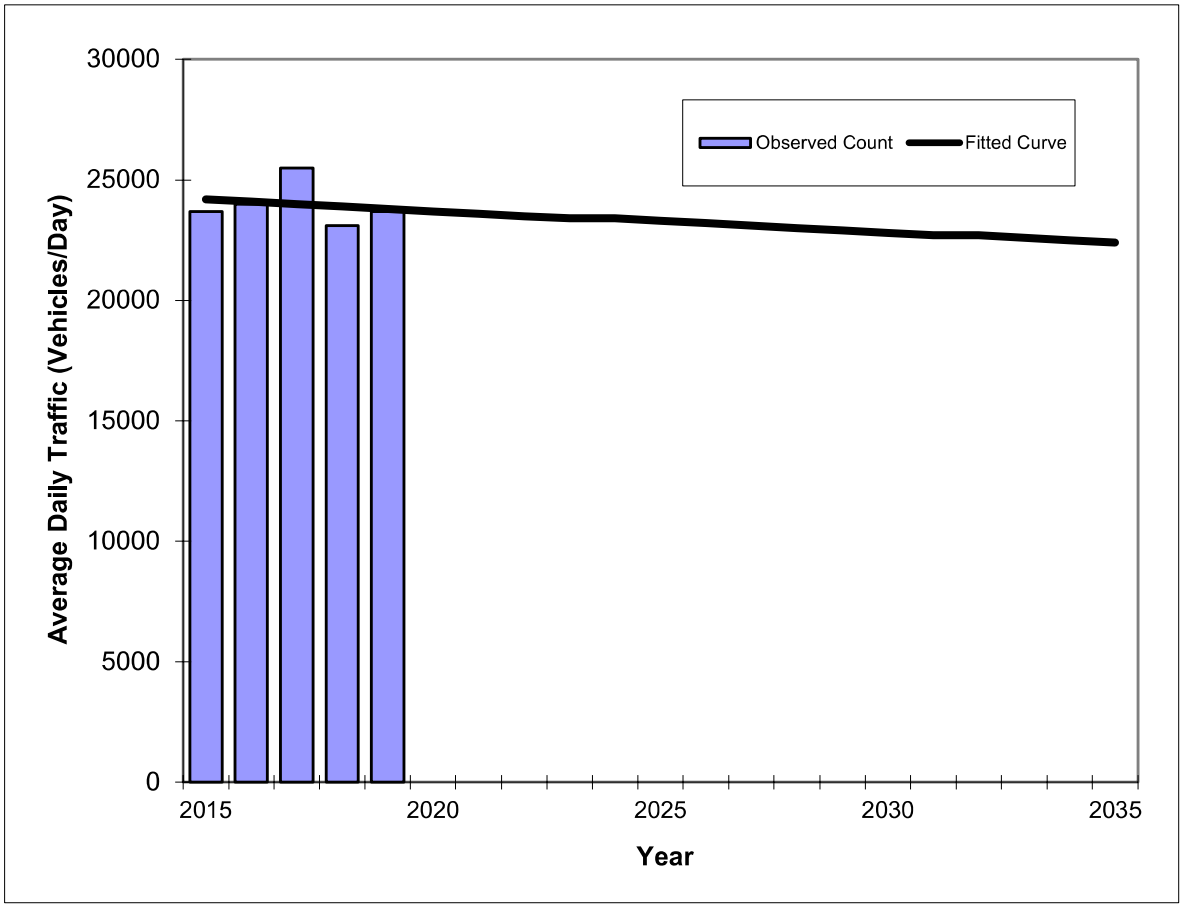
***Axle-Adjusted**

Traffic Trends - V03.a

HOWLAND BOULEVARD -- Catalina Blvd to Providence Blvd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	HOWLAND BOULEVARD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	23700	24200
2016	24000	24100
2017	25500	24000
2018	23100	23900
2019	23700	23800
2027 Opening Year Trend		
2027	N/A	23100
2033 Mid-Year Trend		
2033	N/A	22600
2034 Design Year Trend		
2034	N/A	22500
TRANPLAN Forecasts/Trends		

Trend R-squared:	2.68%
Compounded Annual Historic Growth Rate:	-0.42%
Compounded Growth Rate (2019 to Design Year):	-0.37%
Printed:	7-Feb-23

Exponential Growth Option

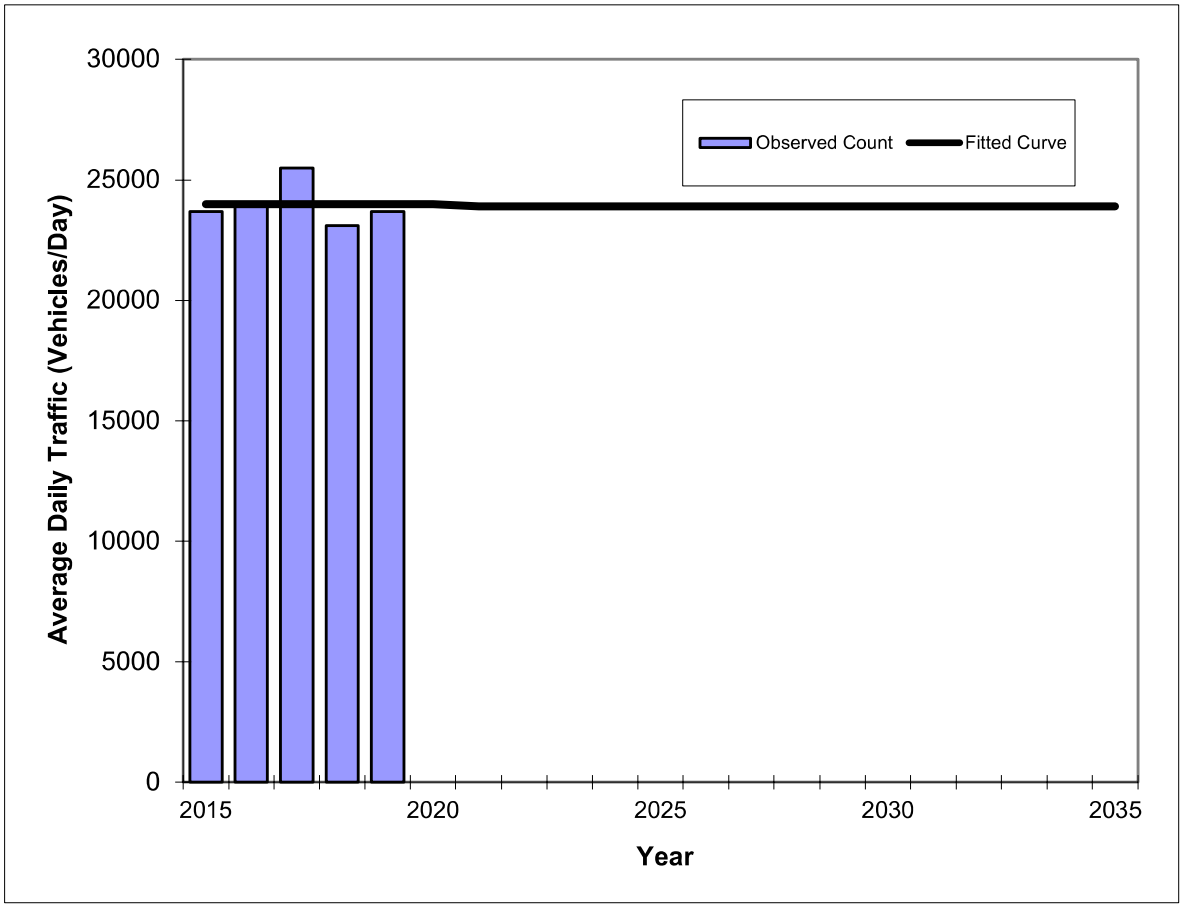
***Axle-Adjusted**

Traffic Trends - V03.a

HOWLAND BOULEVARD -- Catalina Blvd to Providence Blvd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	HOWLAND BOULEVARD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	23700	24000
2016	24000	24000
2017	25500	24000
2018	23100	24000
2019	23700	24000
2027 Opening Year Trend		
2027	N/A	23900
2033 Mid-Year Trend		
2033	N/A	23900
2034 Design Year Trend		
2034	N/A	23900
TRANPLAN Forecasts/Trends		

Trend R-squared:	0.13%
Compounded Annual Historic Growth Rate:	0.00%
Compounded Growth Rate (2019 to Design Year):	-0.03%
Printed:	7-Feb-23

Decaying Exponential Growth Option

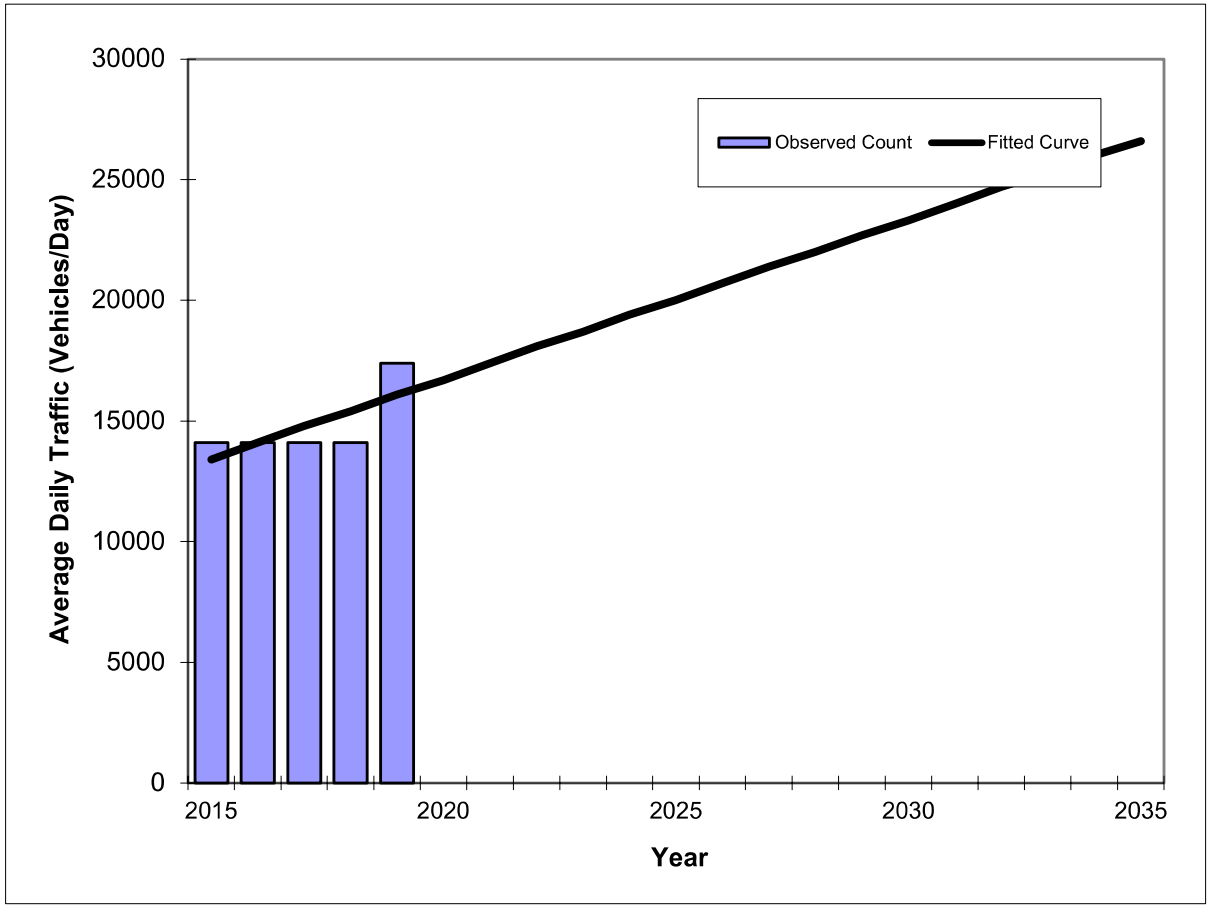
***Axle-Adjusted**

Traffic Trends - V03.a

HOWLAND BOULEVARD -- Providence Blvd to Elkcam Blvd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	HOWLAND BOULEVARD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	14100	13400
2016	14100	14100
2017	14100	14800
2018	14100	15400
2019	17400	16100
2027 Opening Year Trend		
2027	N/A	21400
2033 Mid-Year Trend		
2033	N/A	25300
2034 Design Year Trend		
2034	N/A	26000
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	660
Trend R-squared:	50.00%
Trend Annual Historic Growth Rate:	5.04%
Trend Growth Rate (2019 to Design Year):	4.10%
Printed:	20-Jan-23
Straight Line Growth Option	

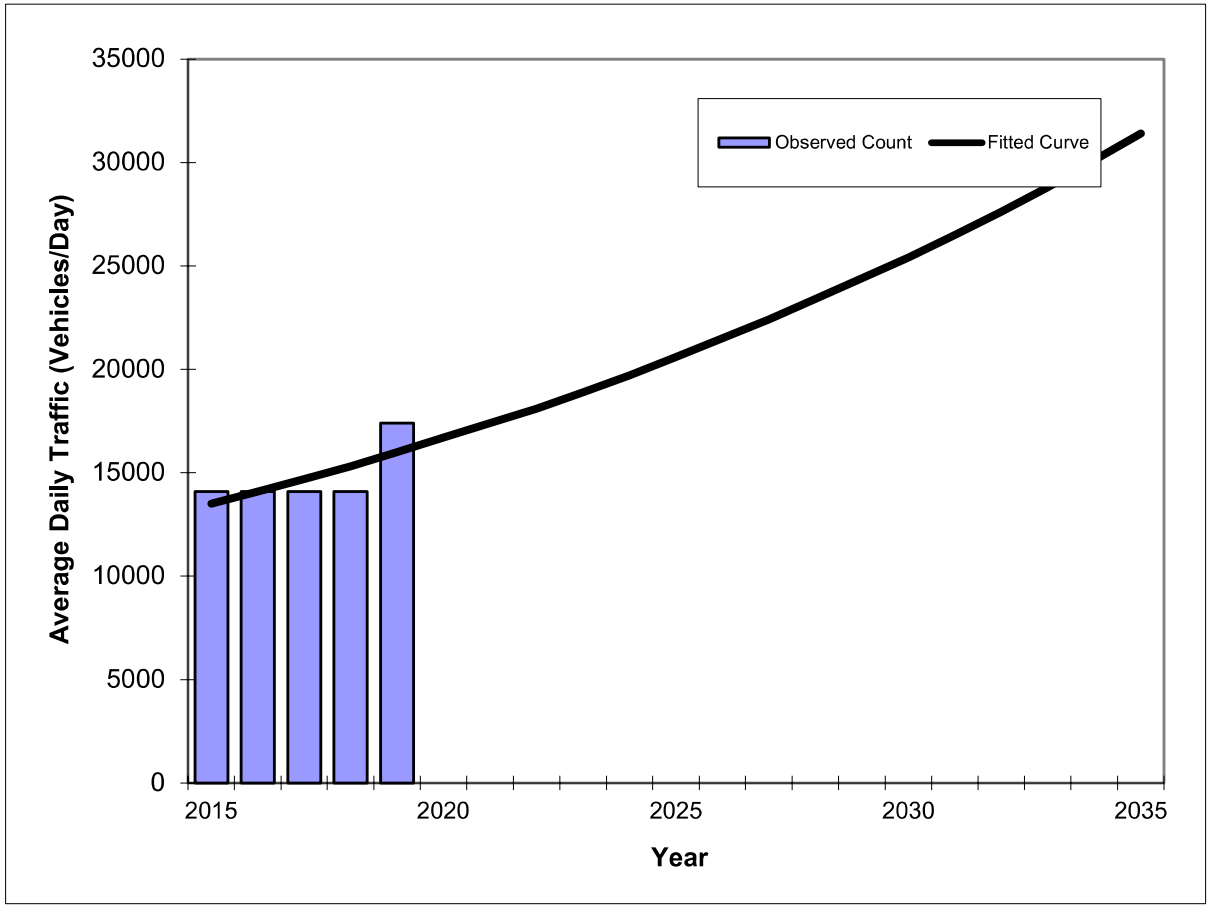
***Axle-Adjusted**

Traffic Trends - V03.a

HOWLAND BOULEVARD -- Providence Blvd to Elkcam Blvd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	HOWLAND BOULEVARD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	14100	13500
2016	14100	14100
2017	14100	14700
2018	14100	15300
2019	17400	16000
2027 Opening Year Trend		
2027	N/A	22400
2033 Mid-Year Trend		
2033	N/A	28800
2034 Design Year Trend		
2034	N/A	30100
TRANPLAN Forecasts/Trends		

Trend R-squared:	50.00%
Compounded Annual Historic Growth Rate:	4.34%
Compounded Growth Rate (2019 to Design Year):	4.30%
Printed:	20-Jan-23

Exponential Growth Option

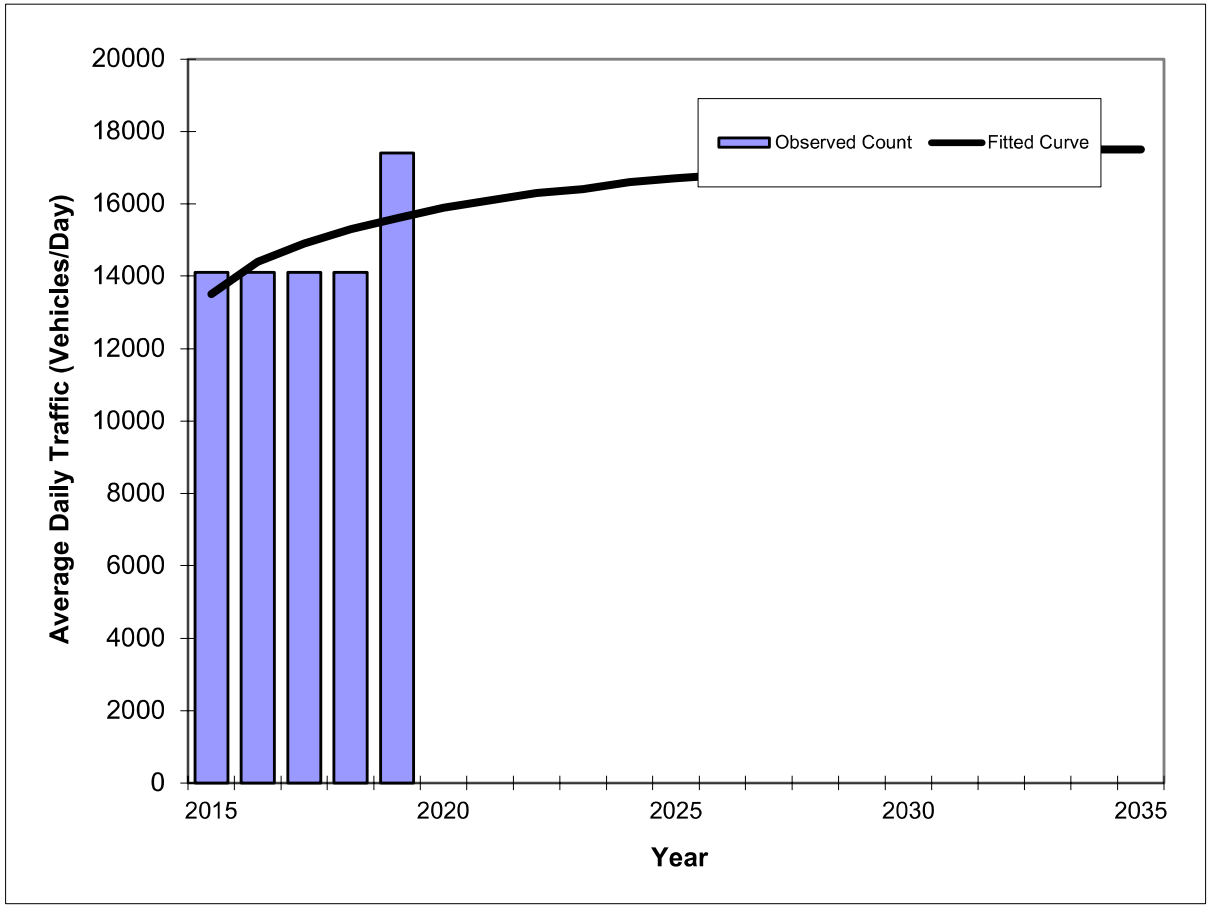
***Axle-Adjusted**

Traffic Trends - V03.a

HOWLAND BOULEVARD -- Providence Blvd to Elkcam Blvd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	HOWLAND BOULEVARD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	14100	13500
2016	14100	14400
2017	14100	14900
2018	14100	15300
2019	17400	15600
2027 Opening Year Trend		
2027	N/A	16900
2033 Mid-Year Trend		
2033	N/A	17400
2034 Design Year Trend		
2034	N/A	17500
TRANPLAN Forecasts/Trends		

Trend R-squared:	32.89%
Compounded Annual Historic Growth Rate:	3.68%
Compounded Growth Rate (2019 to Design Year):	0.77%
Printed:	20-Jan-23

Decaying Exponential Growth Option

***Axle-Adjusted**

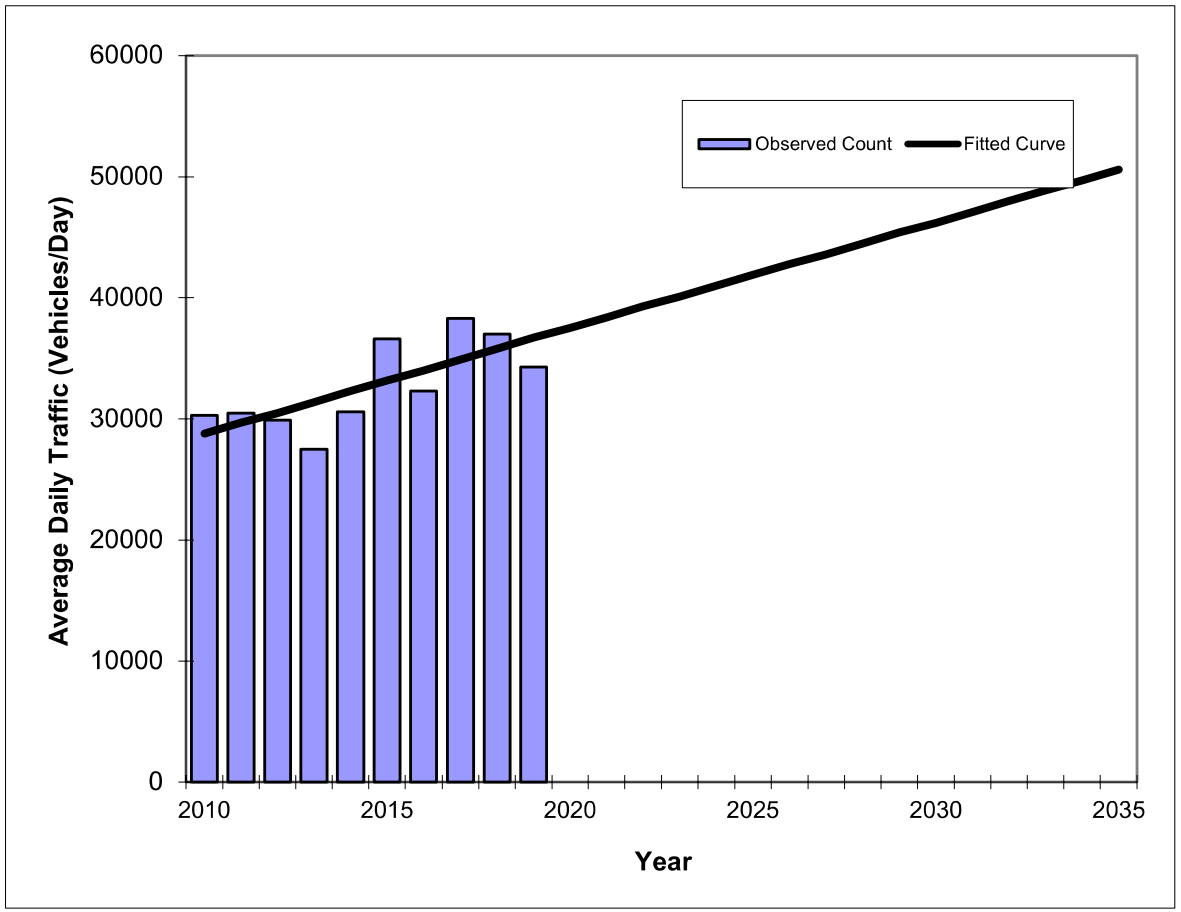
Ten Year Trends

Traffic Trends - V03.a

HOWLAND BLVD -- I-4 to Wolf Pack Run

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	HOWLAND BLVD



Year	Traffic (ADT/AADT) Count*	Trend**
2010	30300	28800
2011	30500	29700
2012	29900	30500
2013	27500	31400
2014	30600	32300
2015	36600	33200
2016	32300	34000
2017	38300	34900
2018	37000	35800
2019	34300	36700
2027 Opening Year Trend		
2027	N/A	43600
2033 Mid-Year Trend		
2033	N/A	48900
2034 Design Year Trend		
2034	N/A	49700
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

** Annual Trend Increase:	872
Trend R-squared:	53.33%
Trend Annual Historic Growth Rate:	3.05%
Trend Growth Rate (2019 to Design Year):	2.36%
Printed:	7-Feb-23

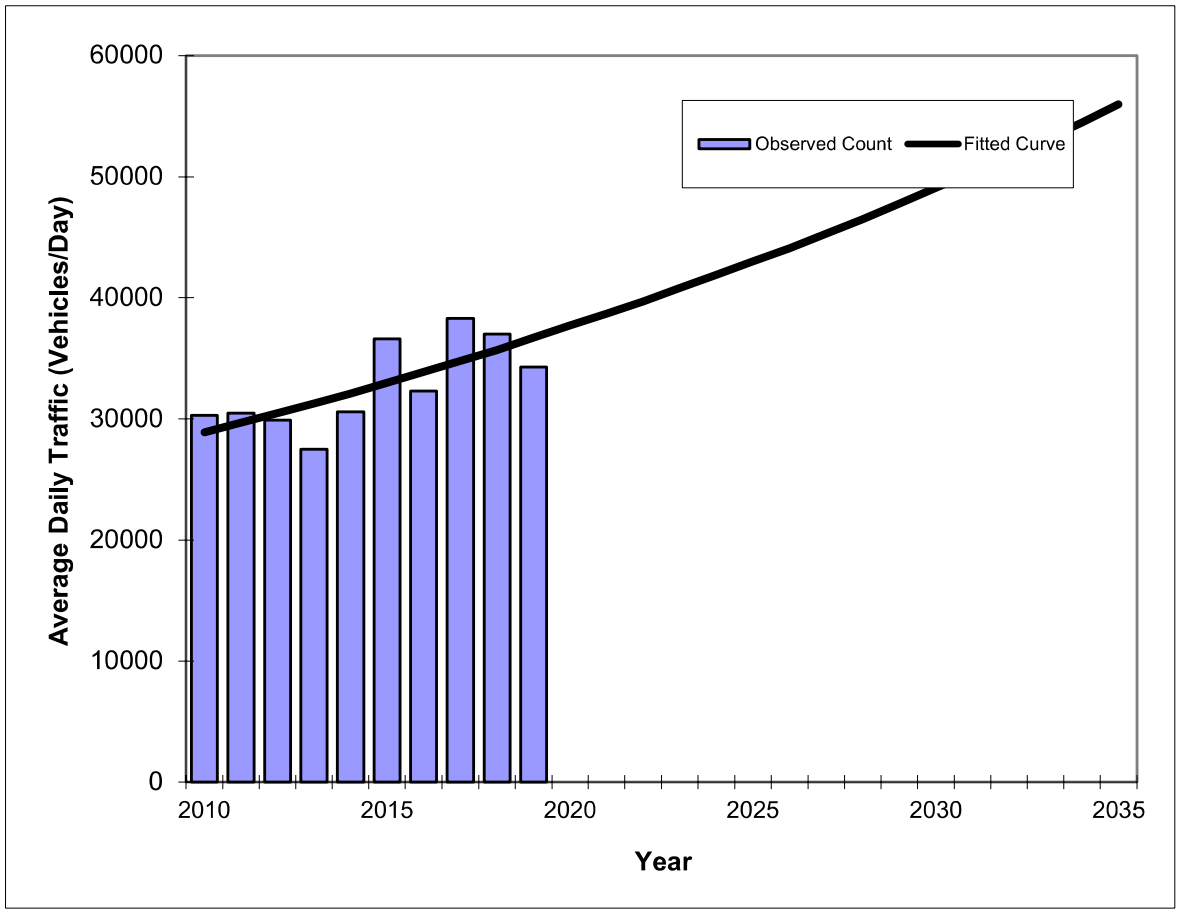
Straight Line Growth Option

Traffic Trends - V03.a

HOWLAND BLVD -- I-4 to Wolf Pack Run

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	HOWLAND BLVD



Year	Traffic (ADT/AADT) Count*	Trend**
2010	30300	28900
2011	30500	29700
2012	29900	30500
2013	27500	31300
2014	30600	32100
2015	36600	33000
2016	32300	33900
2017	38300	34800
2018	37000	35700
2019	34300	36700
2027 Opening Year Trend		
2027	N/A	45300
2033 Mid-Year Trend		
2033	N/A	53100
2034 Design Year Trend		
2034	N/A	54500
TRANPLAN Forecasts/Trends		

Trend R-squared:	53.41%
Compounded Annual Historic Growth Rate:	2.69%
Compounded Growth Rate (2019 to Design Year):	2.67%
Printed:	7-Feb-23

Exponential Growth Option

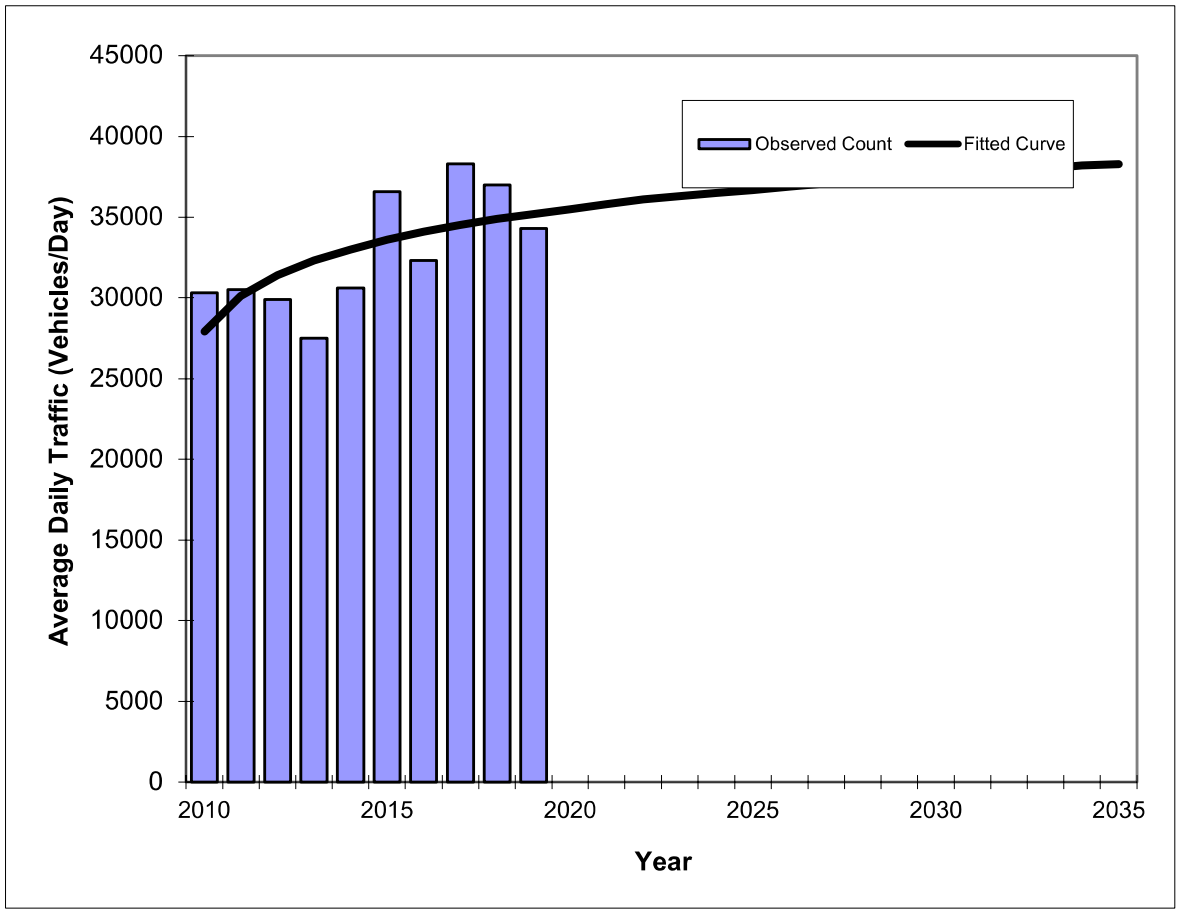
***Axle-Adjusted**

Traffic Trends - V03.a

HOWLAND BLVD -- I-4 to Wolf Pack Run

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	HOWLAND BLVD



Year	Traffic (ADT/AADT) Count*	Trend**
2010	30300	27900
2011	30500	30100
2012	29900	31400
2013	27500	32300
2014	30600	33000
2015	36600	33600
2016	32300	34100
2017	38300	34500
2018	37000	34900
2019	34300	35200
2027 Opening Year Trend		
2027	N/A	37100
2033 Mid-Year Trend		
2033	N/A	38000
2034 Design Year Trend		
2034	N/A	38200
TRANPLAN Forecasts/Trends		

Trend R-squared:	41.38%
Compounded Annual Historic Growth Rate:	2.62%
Compounded Growth Rate (2019 to Design Year):	0.55%
Printed:	7-Feb-23

Decaying Exponential Growth Option

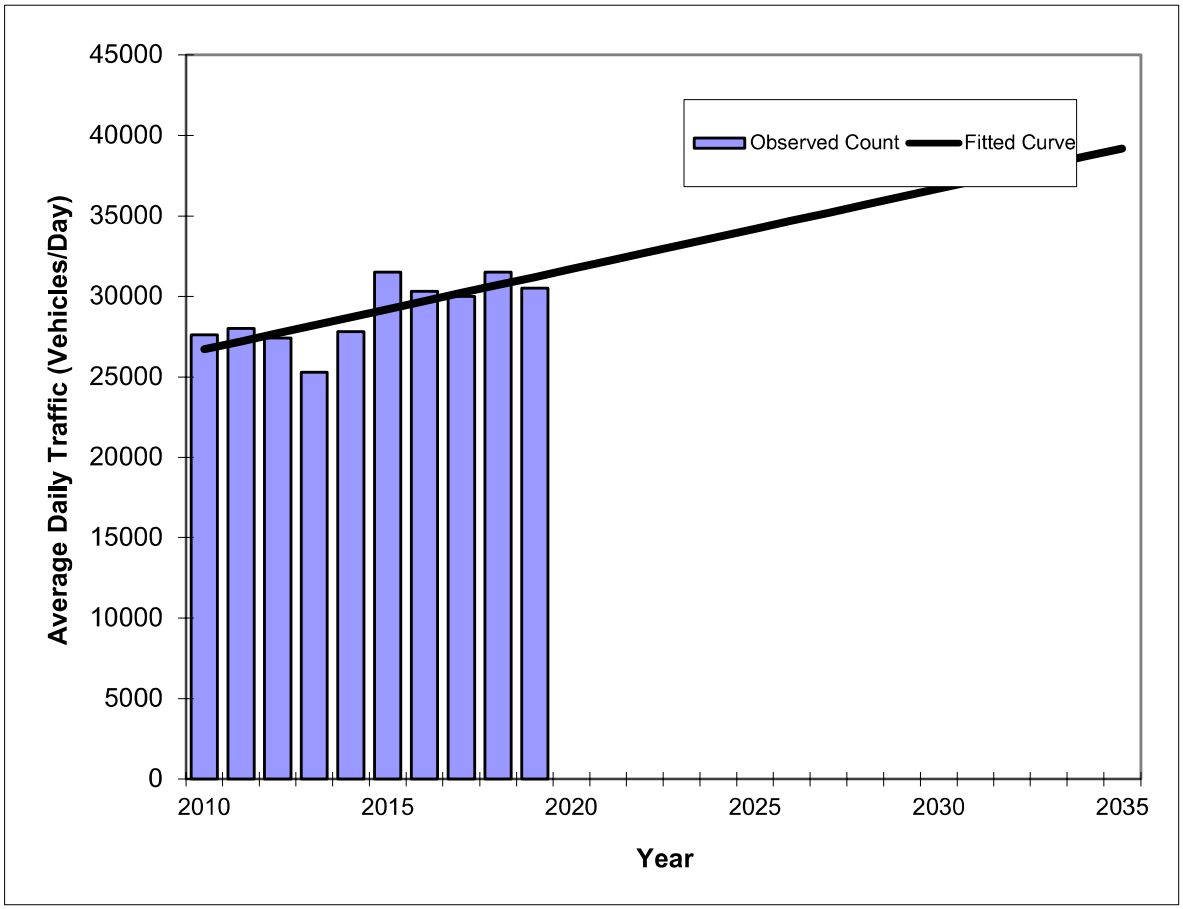
***Axle-Adjusted**

Traffic Trends - V03.a

HOWLAND BOULEVARD -- Wolf Pack Run to Catalina Blvd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	HOWLAND BOULEVARD



Year	Traffic (ADT/AADT) Count*	Trend**
2010	27600	26700
2011	28000	27200
2012	27400	27700
2013	25300	28200
2014	27800	28700
2015	31500	29200
2016	30300	29700
2017	30000	30200
2018	31500	30700
2019	30500	31200
2027 Opening Year Trend		
2027	N/A	35200
2033 Mid-Year Trend		
2033	N/A	38200
2034 Design Year Trend		
2034	N/A	38700
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

** Annual Trend Increase:	499
Trend R-squared:	53.89%
Trend Annual Historic Growth Rate:	1.87%
Trend Growth Rate (2019 to Design Year):	1.60%
Printed:	7-Feb-23

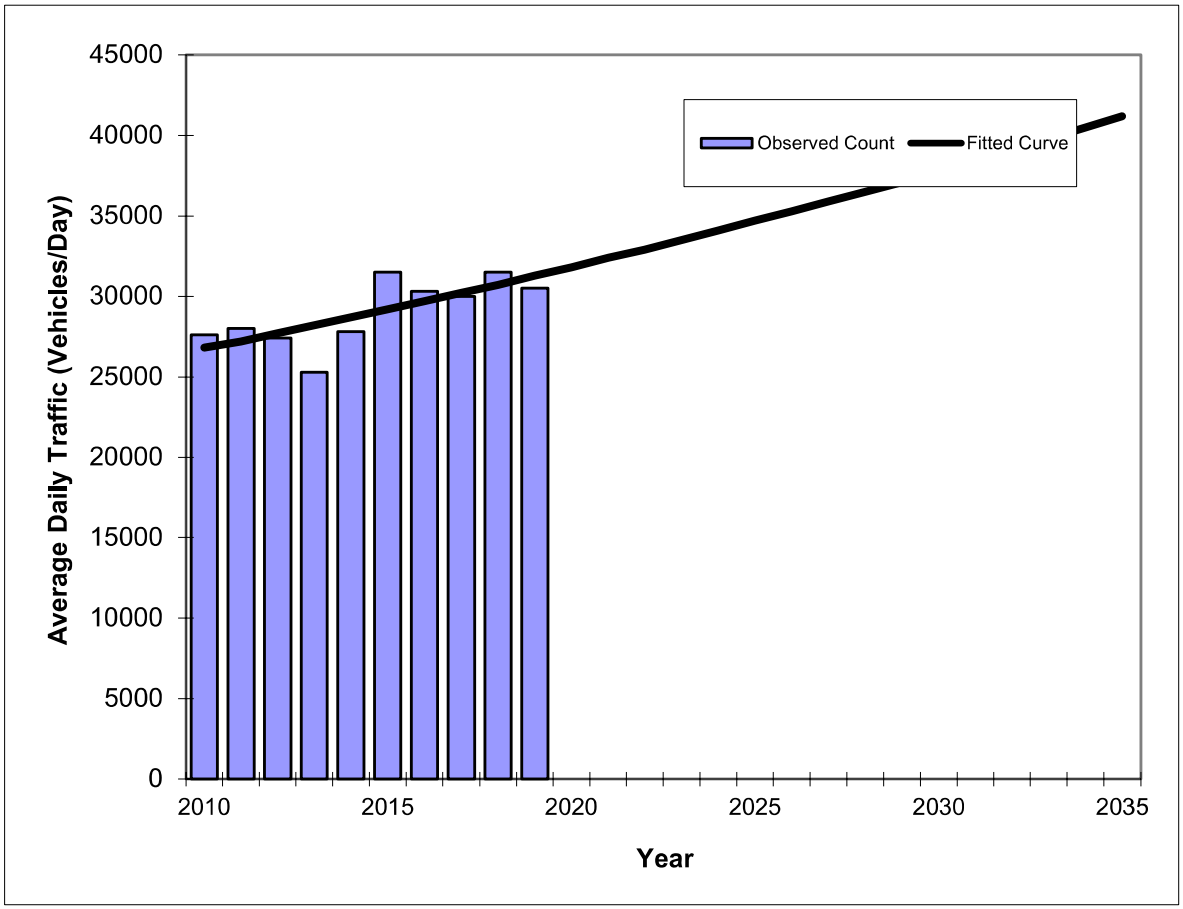
Straight Line Growth Option

Traffic Trends - V03.a

HOWLAND BOULEVARD -- Wolf Pack Run to Catalina Blvd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	HOWLAND BOULEVARD



Year	Traffic (ADT/AADT) Count*	Trend**
2010	27600	26800
2011	28000	27200
2012	27400	27700
2013	25300	28200
2014	27800	28700
2015	31500	29200
2016	30300	29700
2017	30000	30200
2018	31500	30700
2019	30500	31300
2027 Opening Year Trend		
2027	N/A	35900
2033 Mid-Year Trend		
2033	N/A	39800
2034 Design Year Trend		
2034	N/A	40500
TRANPLAN Forecasts/Trends		

Trend R-squared:	52.63%
Compounded Annual Historic Growth Rate:	1.74%
Compounded Growth Rate (2019 to Design Year):	1.73%
Printed:	7-Feb-23

Exponential Growth Option

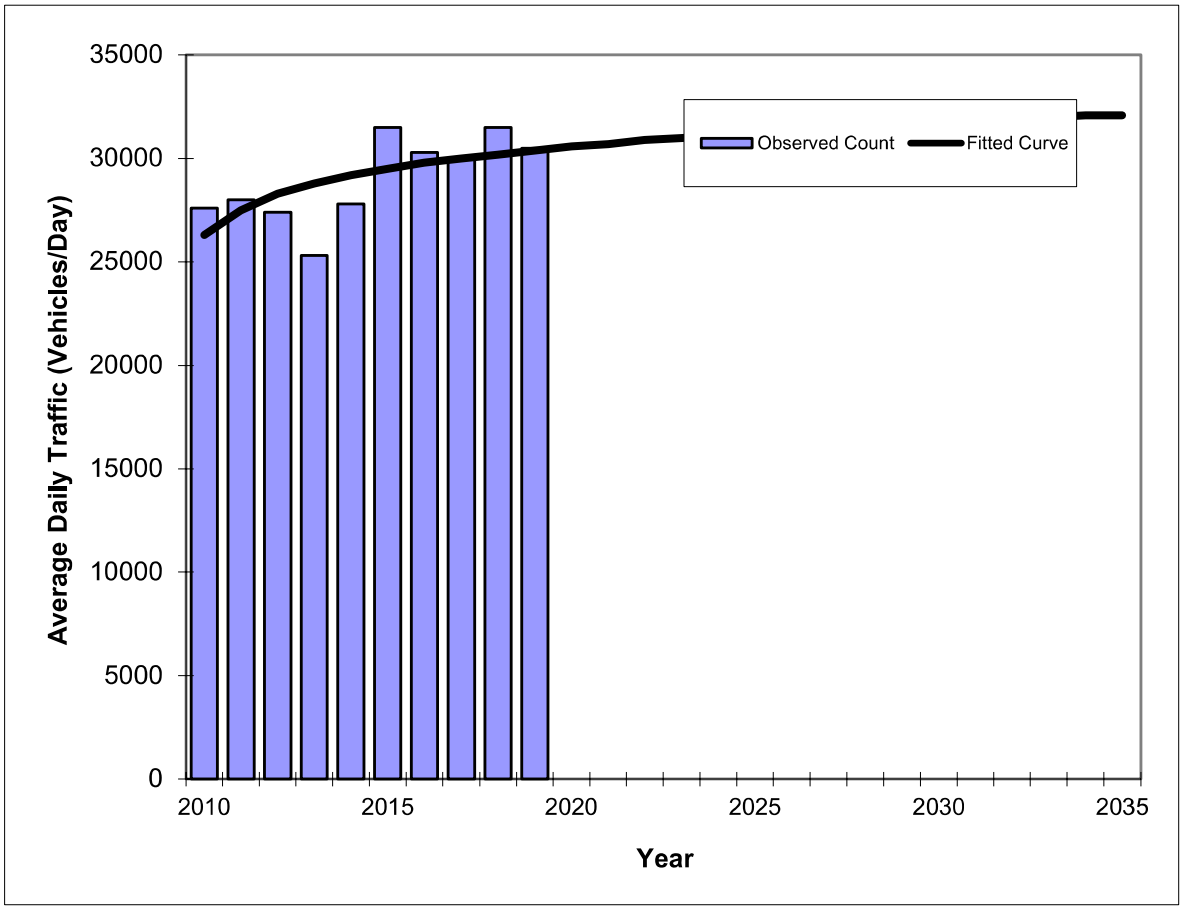
***Axle-Adjusted**

Traffic Trends - V03.a

HOWLAND BOULEVARD -- Wolf Pack Run to Catalina Blvd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	HOWLAND BOULEVARD



Year	Traffic (ADT/AADT) Count*	Trend**
2010	27600	26300
2011	28000	27500
2012	27400	28300
2013	25300	28800
2014	27800	29200
2015	31500	29500
2016	30300	29800
2017	30000	30000
2018	31500	30200
2019	30500	30400
2027 Opening Year Trend		
2027	N/A	31500
2033 Mid-Year Trend		
2033	N/A	32000
2034 Design Year Trend		
2034	N/A	32100
TRANPLAN Forecasts/Trends		

Trend R-squared:	40.86%
Compounded Annual Historic Growth Rate:	1.62%
Compounded Growth Rate (2019 to Design Year):	0.36%
Printed:	7-Feb-23

Decaying Exponential Growth Option

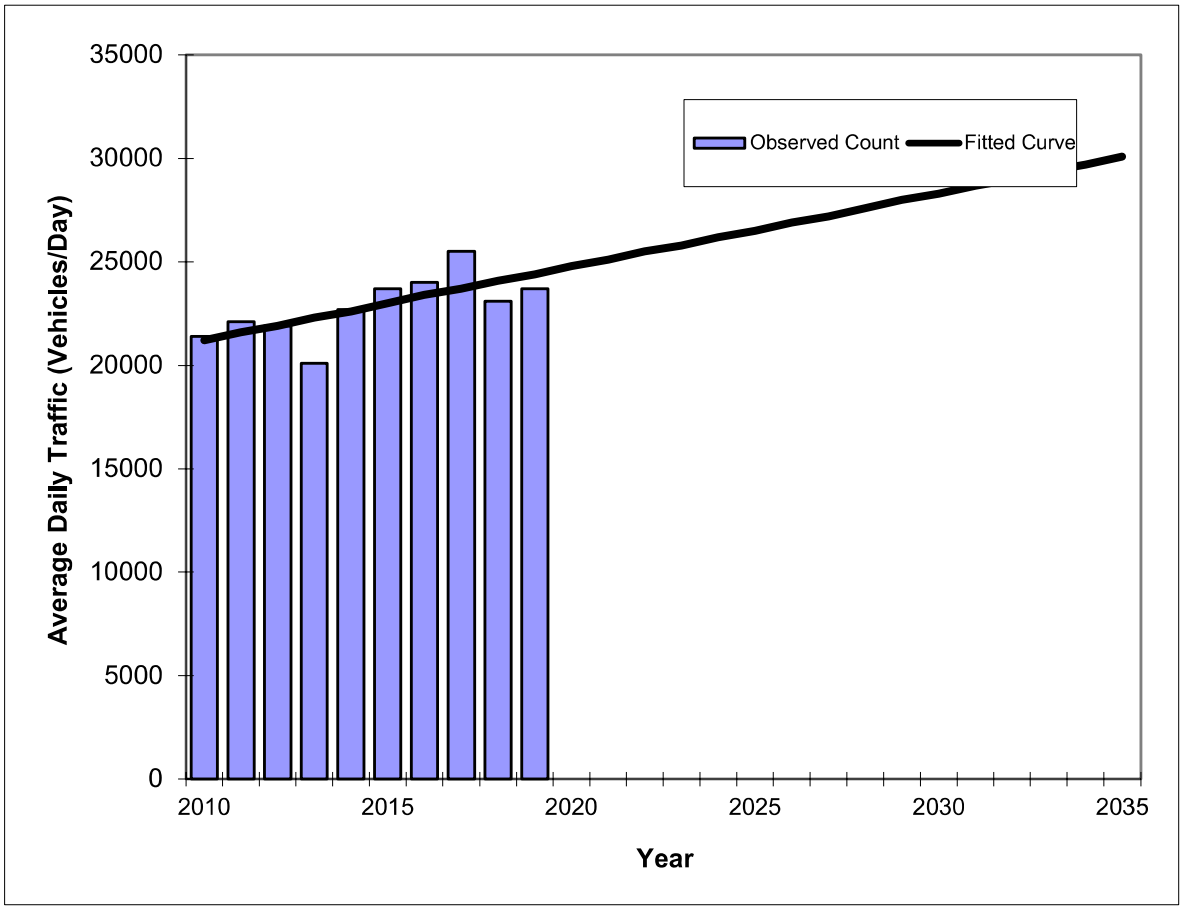
***Axle-Adjusted**

Traffic Trends - V03.a

HOWLAND BOULEVARD -- Catalina Blvd to Providence Blvd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	HOWLAND BOULEVARD



Year	Traffic (ADT/AADT) Count*	Trend**
2010	21400	21200
2011	22100	21600
2012	21900	21900
2013	20100	22300
2014	22700	22600
2015	23700	23000
2016	24000	23400
2017	25500	23700
2018	23100	24100
2019	23700	24400
2027 Opening Year Trend		
2027	N/A	27200
2033 Mid-Year Trend		
2033	N/A	29400
2034 Design Year Trend		
2034	N/A	29700
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	354
Trend R-squared:	49.22%
Trend Annual Historic Growth Rate:	1.68%
Trend Growth Rate (2019 to Design Year):	1.45%
Printed:	19-Jan-23
Straight Line Growth Option	

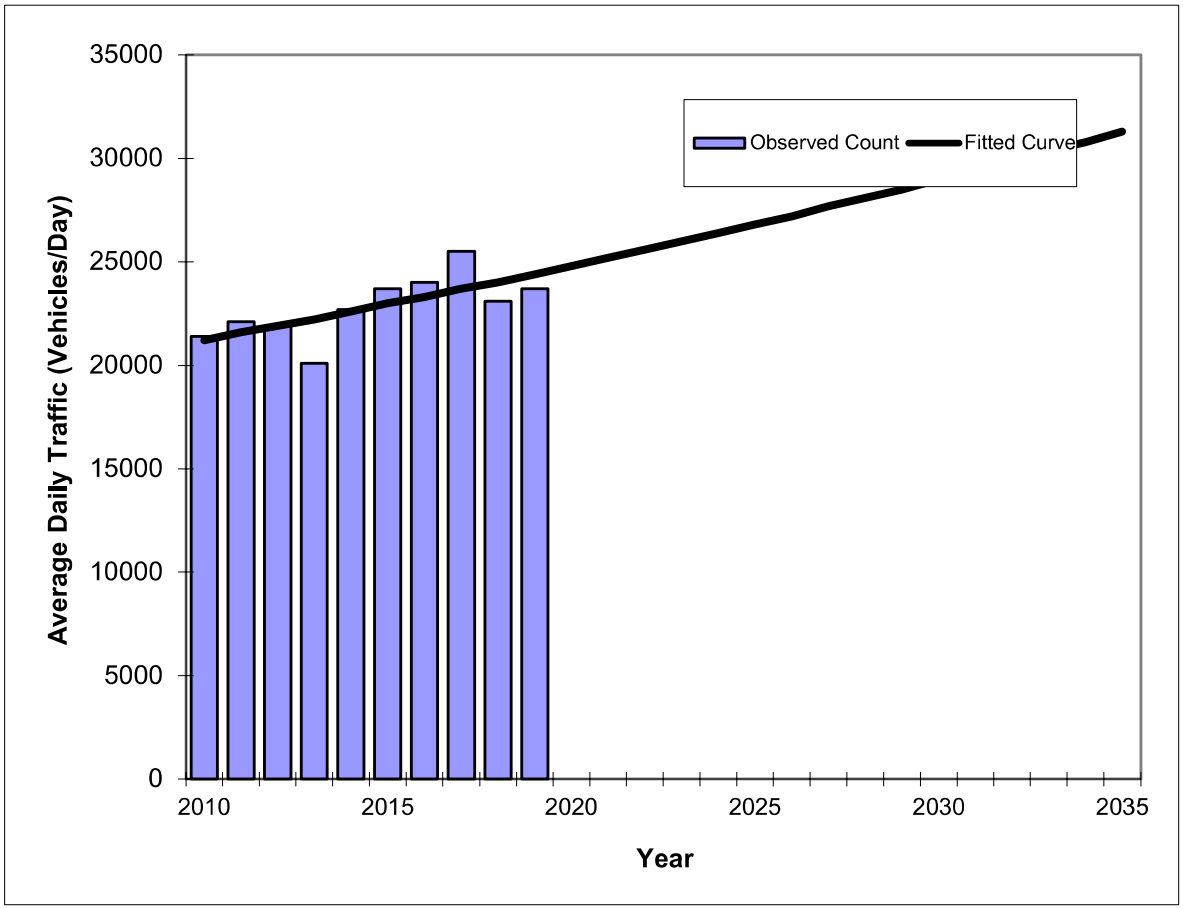
***Axle-Adjusted**

Traffic Trends - V03.a

HOWLAND BOULEVARD -- Catalina Blvd to Providence Blvd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	HOWLAND BOULEVARD



Year	Traffic (ADT/AADT) Count*	Trend**
2010	21400	21200
2011	22100	21600
2012	21900	21900
2013	20100	22200
2014	22700	22600
2015	23700	23000
2016	24000	23300
2017	25500	23700
2018	23100	24000
2019	23700	24400
2027 Opening Year Trend		
2027	N/A	27700
2033 Mid-Year Trend		
2033	N/A	30400
2034 Design Year Trend		
2034	N/A	30800
TRANPLAN Forecasts/Trends		

Trend R-squared:	48.82%
Compounded Annual Historic Growth Rate:	1.57%
Compounded Growth Rate (2019 to Design Year):	1.56%
Printed:	19-Jan-23

Exponential Growth Option

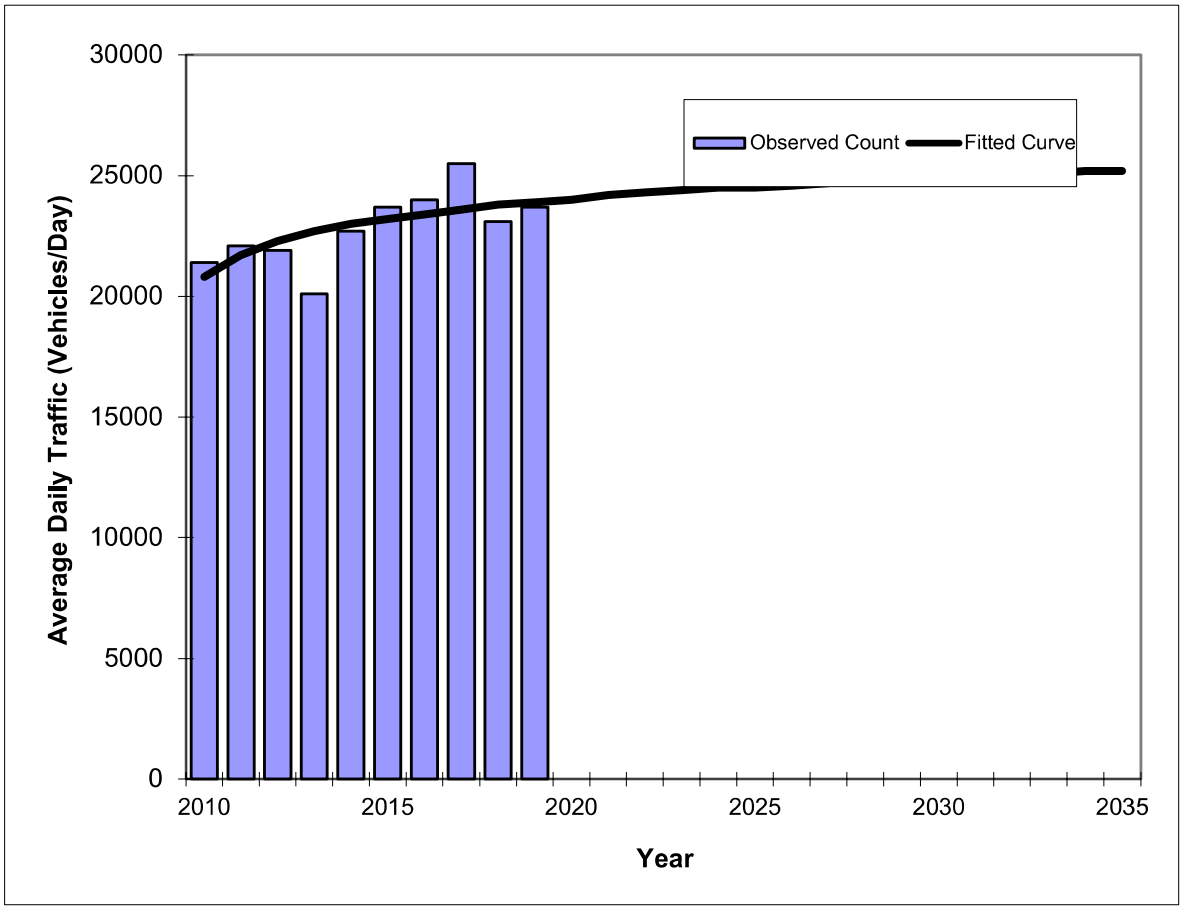
***Axle-Adjusted**

Traffic Trends - V03.a

HOWLAND BOULEVARD -- Catalina Blvd to Providence Blvd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	HOWLAND BOULEVARD



Year	Traffic (ADT/AADT) Count*	Trend**
2010	21400	20800
2011	22100	21700
2012	21900	22300
2013	20100	22700
2014	22700	23000
2015	23700	23200
2016	24000	23400
2017	25500	23600
2018	23100	23800
2019	23700	23900
2027 Opening Year Trend		
2027	N/A	24700
2033 Mid-Year Trend		
2033	N/A	25100
2034 Design Year Trend		
2034	N/A	25200
TRANPLAN Forecasts/Trends		

Trend R-squared:	43.08%
Compounded Annual Historic Growth Rate:	1.56%
Compounded Growth Rate (2019 to Design Year):	0.35%
Printed:	19-Jan-23

Decaying Exponential Growth Option

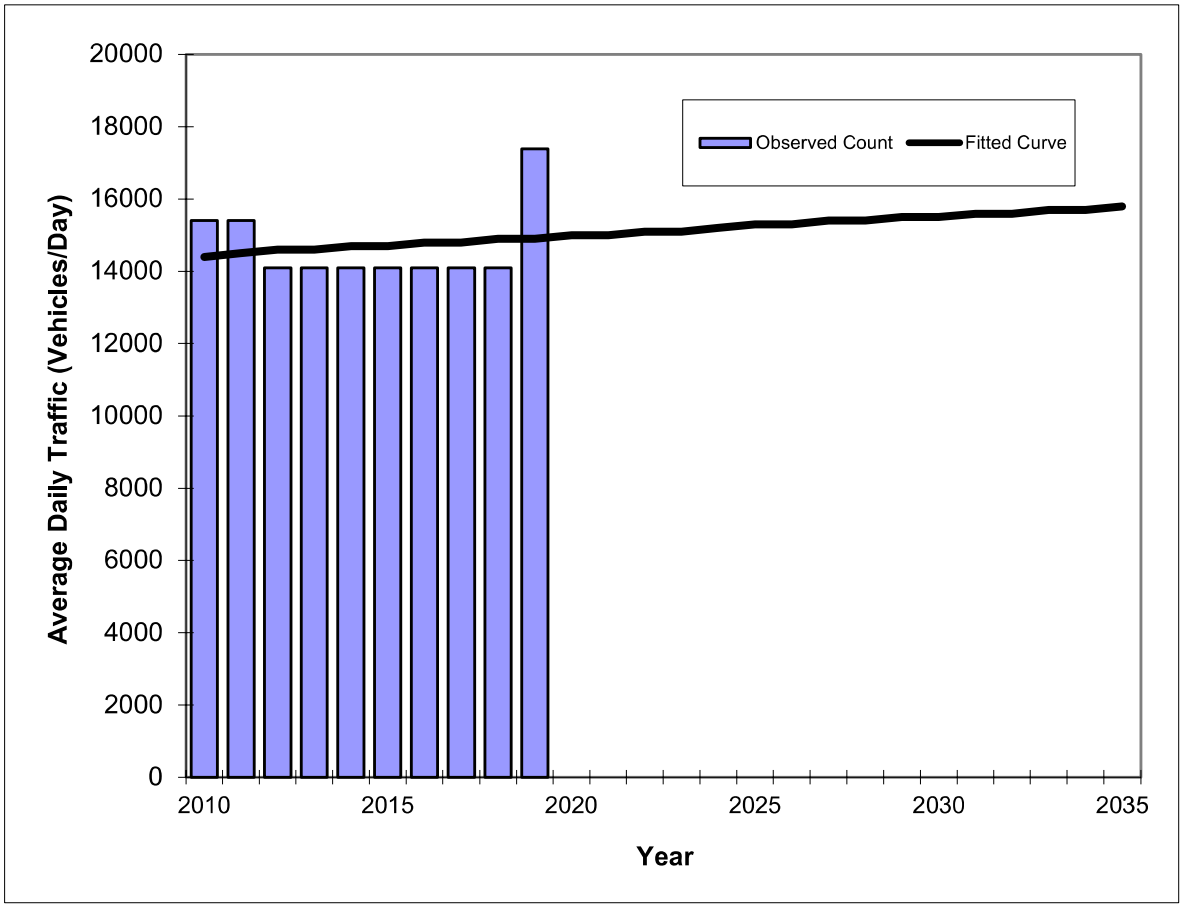
***Axle-Adjusted**

Traffic Trends - V03.a

HOWLAND BOULEVARD -- Providence Blvd to Elkcam Blvd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	HOWLAND BOULEVARD



Year	Traffic (ADT/AADT) Count*	Trend**
2010	15400	14400
2011	15400	14500
2012	14100	14600
2013	14100	14600
2014	14100	14700
2015	14100	14700
2016	14100	14800
2017	14100	14800
2018	14100	14900
2019	17400	14900
2027 Opening Year Trend		
2027	N/A	15400
2033 Mid-Year Trend		
2033	N/A	15700
2034 Design Year Trend		
2034	N/A	15700
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	54
Trend R-squared:	2.22%
Trend Annual Historic Growth Rate:	0.39%
Trend Growth Rate (2019 to Design Year):	0.36%
Printed:	7-Feb-23

Straight Line Growth Option

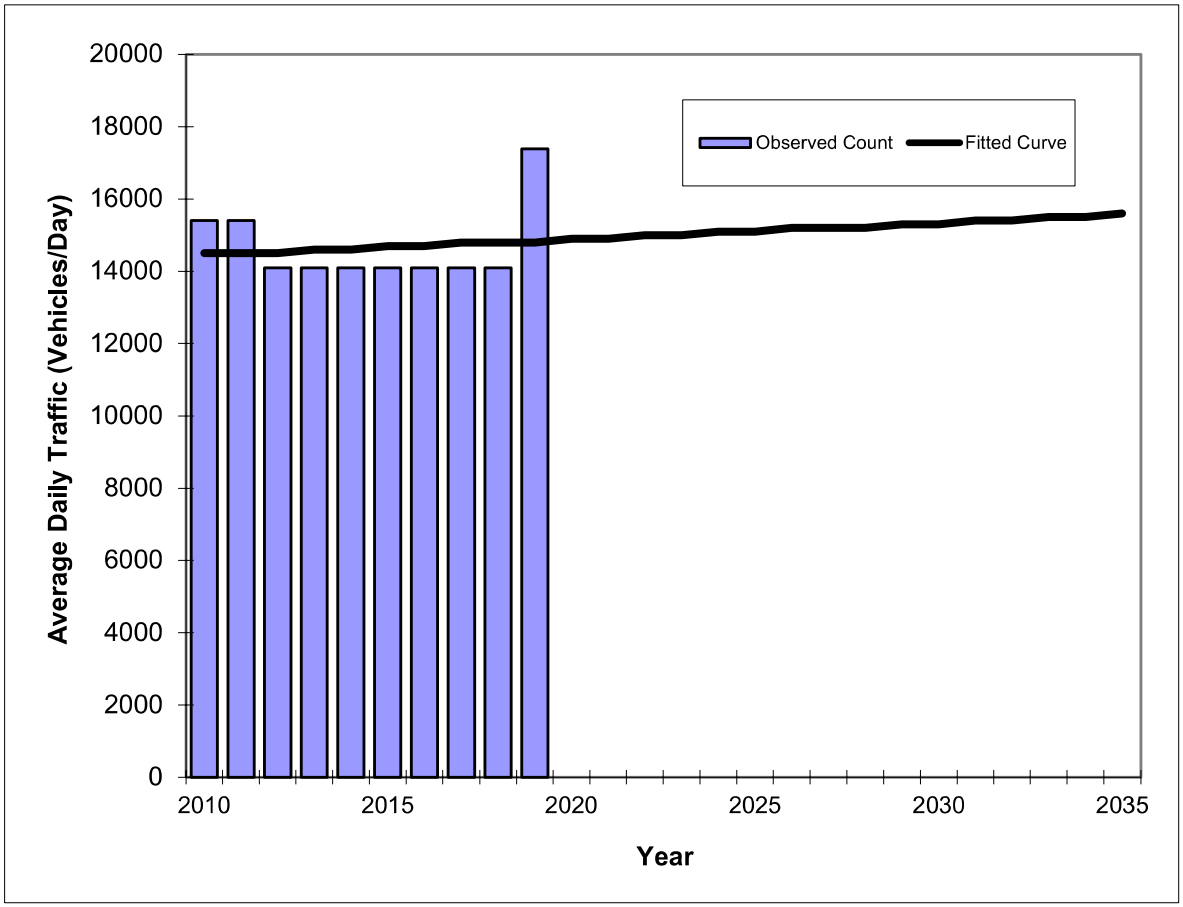
***Axle-Adjusted**

Traffic Trends - V03.a

HOWLAND BOULEVARD -- Providence Blvd to Elkcam Blvd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	HOWLAND BOULEVARD



Year	Traffic (ADT/AADT) Count*	Trend**
2010	15400	14500
2011	15400	14500
2012	14100	14500
2013	14100	14600
2014	14100	14600
2015	14100	14700
2016	14100	14700
2017	14100	14800
2018	14100	14800
2019	17400	14800
2027 Opening Year Trend		
2027	N/A	15200
2033 Mid-Year Trend		
2033	N/A	15500
2034 Design Year Trend		
2034	N/A	15500
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

Trend R-squared:	1.57%
Compounded Annual Historic Growth Rate:	0.23%
Compounded Growth Rate (2019 to Design Year):	0.31%
Printed:	7-Feb-23

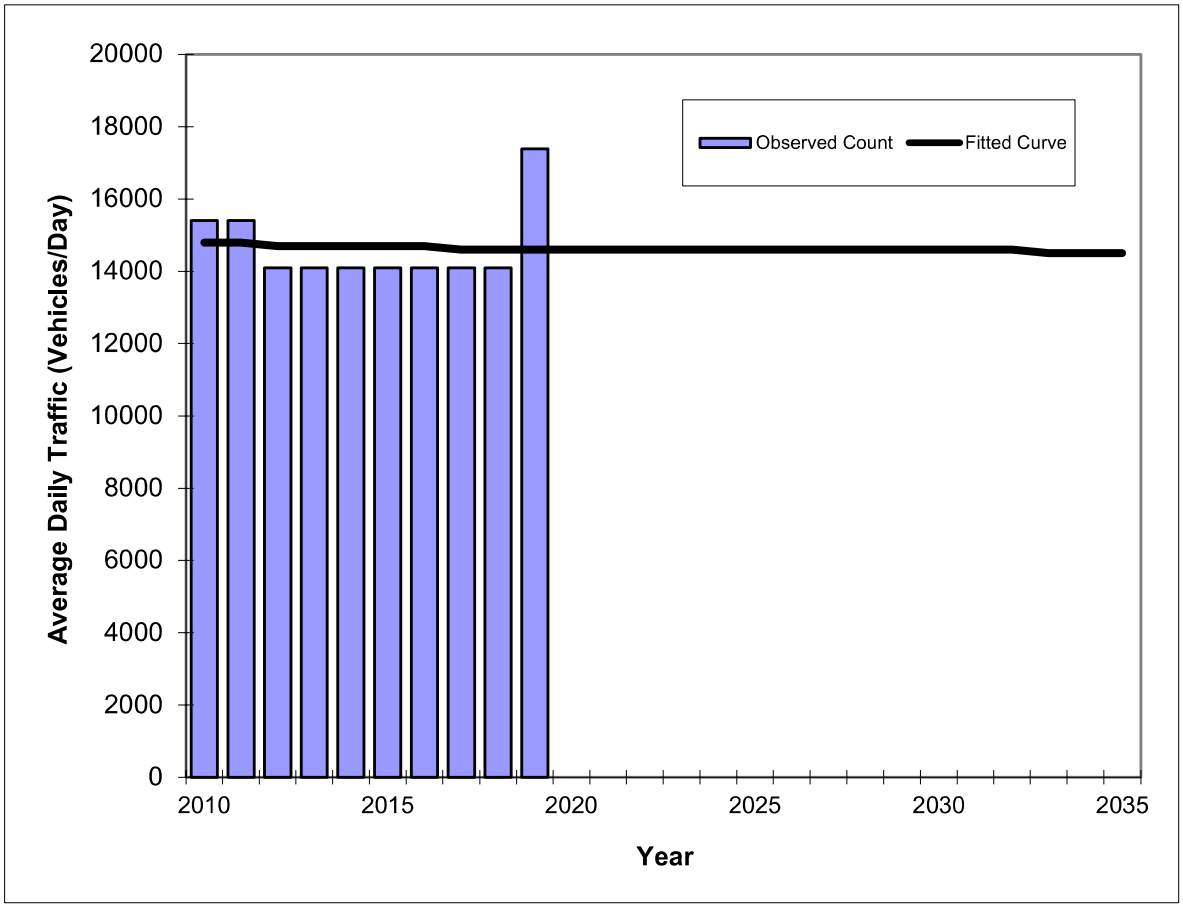
Exponential Growth Option

Traffic Trends - V03.a

HOWLAND BOULEVARD -- Providence Blvd to Elkcam Blvd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	HOWLAND BOULEVARD



Year	Traffic (ADT/AADT) Count*	Trend**
2010	15400	14800
2011	15400	14800
2012	14100	14700
2013	14100	14700
2014	14100	14700
2015	14100	14700
2016	14100	14700
2017	14100	14600
2018	14100	14600
2019	17400	14600
2027 Opening Year Trend		
2027	N/A	14600
2033 Mid-Year Trend		
2033	N/A	14500
2034 Design Year Trend		
2034	N/A	14500
TRANPLAN Forecasts/Trends		

Trend R-squared:	0.33%
Compounded Annual Historic Growth Rate:	-0.15%
Compounded Growth Rate (2019 to Design Year):	-0.05%
Printed:	7-Feb-23

Decaying Exponential Growth Option

***Axle-Adjusted**

SR 472

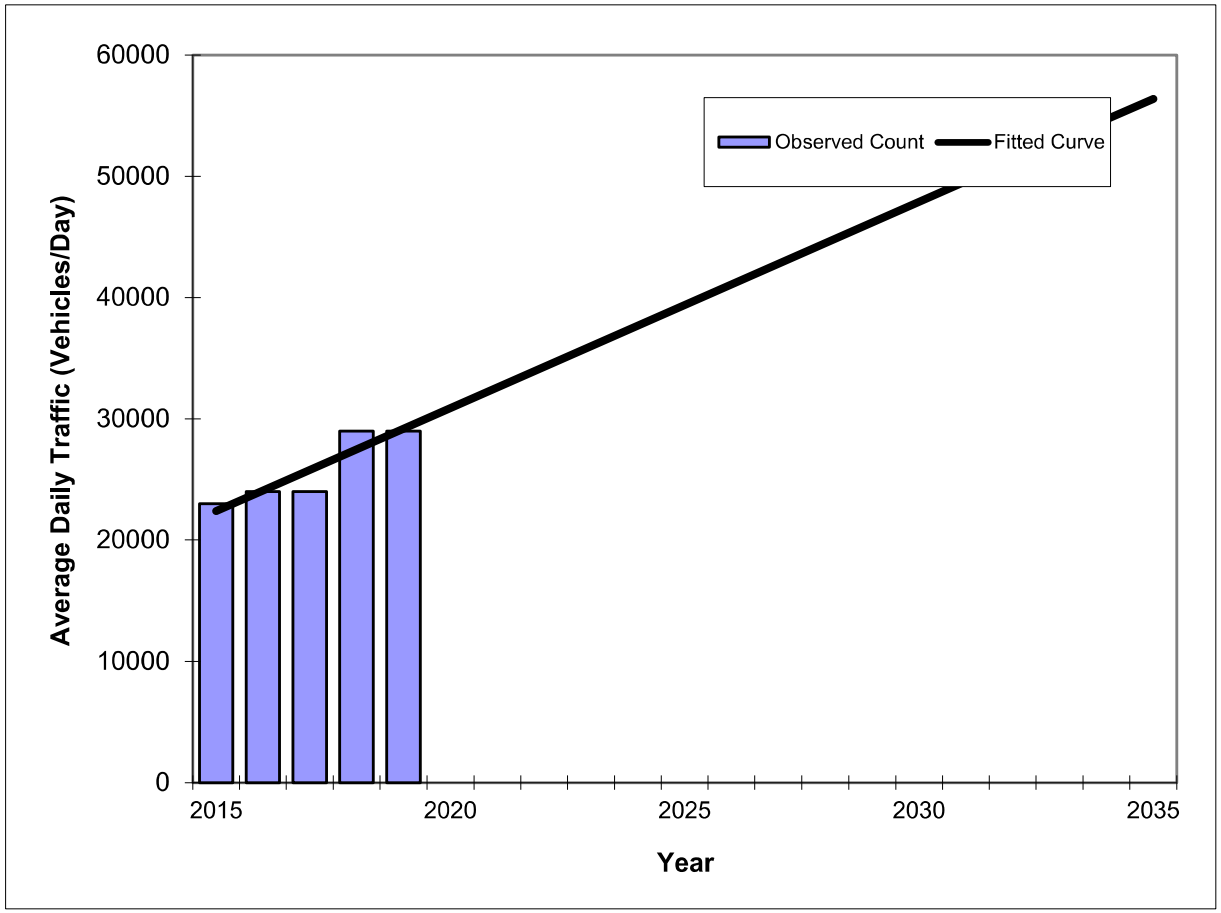
Five Year Trends

Traffic Trends - V03.a

SR 472 -- US 17-92 to MLK

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	SR 472



Year	Traffic (ADT/AADT) Count*	Trend**
2015	23000	22400
2016	24000	24100
2017	24000	25800
2018	29000	27500
2019	29000	29200
2027 Opening Year Trend		
2027	N/A	42800
2033 Mid-Year Trend		
2033	N/A	53000
2034 Design Year Trend		
2034	N/A	54700
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	1,700
Trend R-squared:	83.05%
Trend Annual Historic Growth Rate:	7.59%
Trend Growth Rate (2019 to Design Year):	5.82%
Printed:	15-Nov-22

Straight Line Growth Option

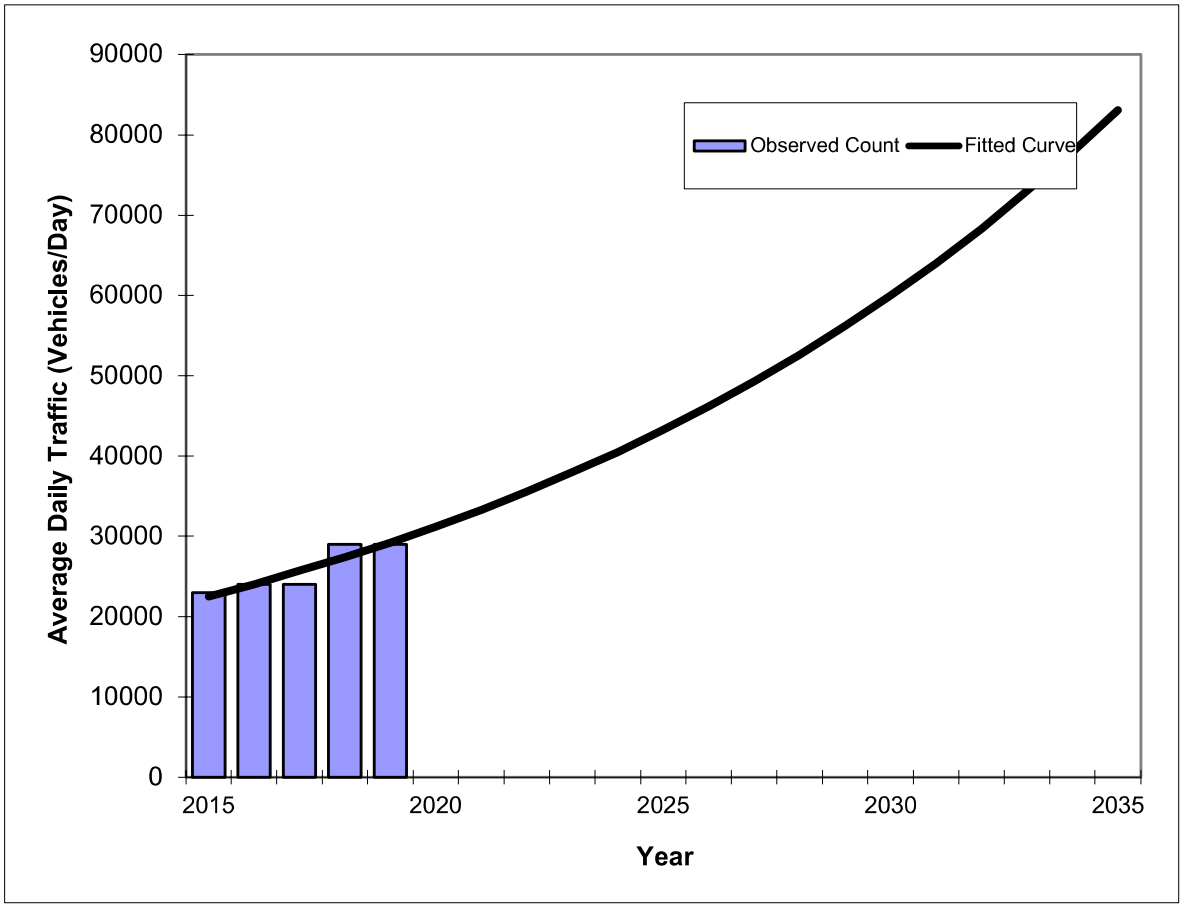
***Axle-Adjusted**

Traffic Trends - V03.a

SR 472 -- US 17-92 to MLK

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	SR 472



Year	Traffic (ADT/AADT) Count*	Trend**
2015	23000	22500
2016	24000	24000
2017	24000	25700
2018	29000	27400
2019	29000	29200
2027 Opening Year Trend		
2027	N/A	49300
2033 Mid-Year Trend		
2033	N/A	73000
2034 Design Year Trend		
2034	N/A	77900
TRANPLAN Forecasts/Trends		

Trend R-squared:	83.79%
Compounded Annual Historic Growth Rate:	6.73%
Compounded Growth Rate (2019 to Design Year):	6.76%
Printed:	18-Jan-23

Exponential Growth Option

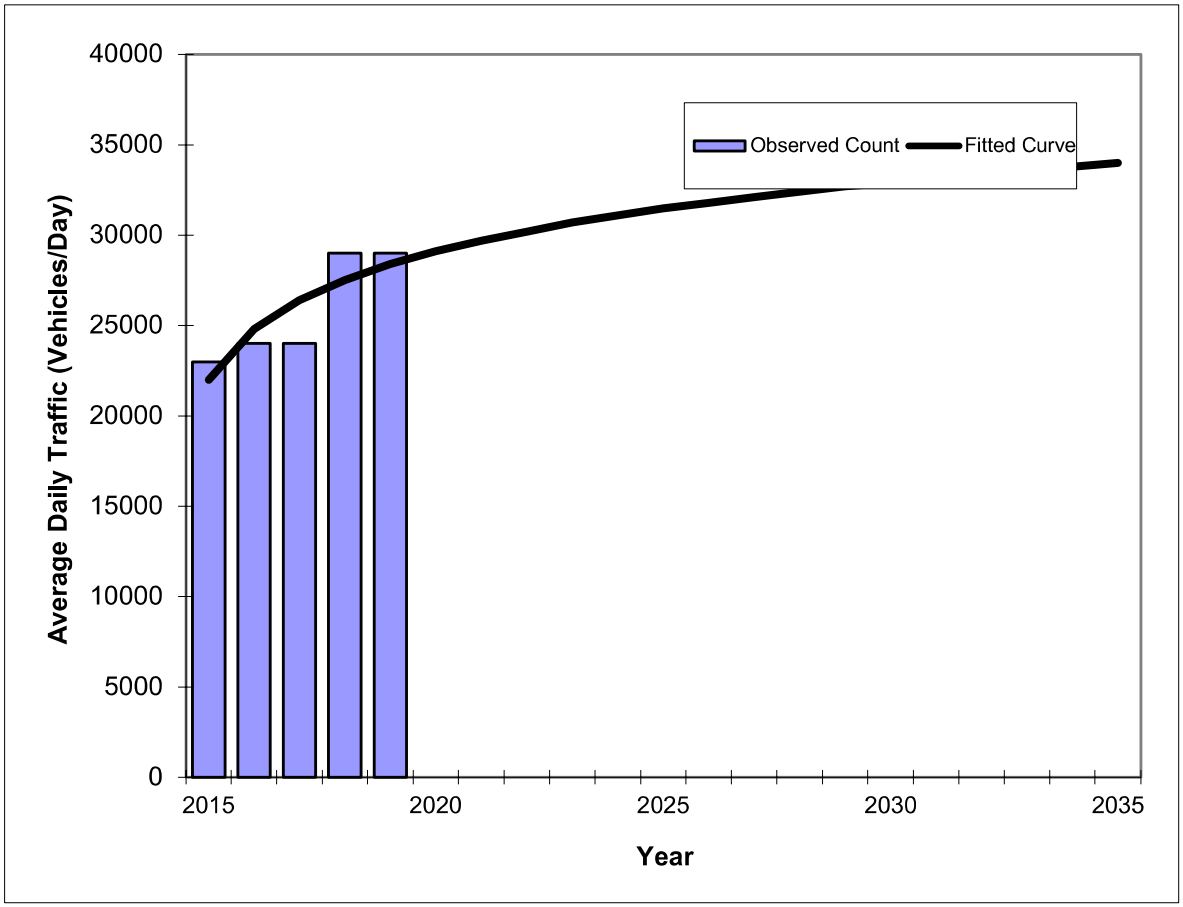
***Axle-Adjusted**

Traffic Trends - V03.a

SR 472 -- US 17-92 to MLK

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	SR 472



Year	Traffic (ADT/AADT) Count*	Trend**
2015	23000	22000
2016	24000	24800
2017	24000	26400
2018	29000	27500
2019	29000	28400
2027 Opening Year Trend		
2027	N/A	32100
2033 Mid-Year Trend		
2033	N/A	33600
2034 Design Year Trend		
2034	N/A	33800
TRANPLAN Forecasts/Trends		

Trend R-squared:	71.98%
Compounded Annual Historic Growth Rate:	6.59%
Compounded Growth Rate (2019 to Design Year):	1.17%
Printed:	18-Jan-23

Decaying Exponential Growth Option

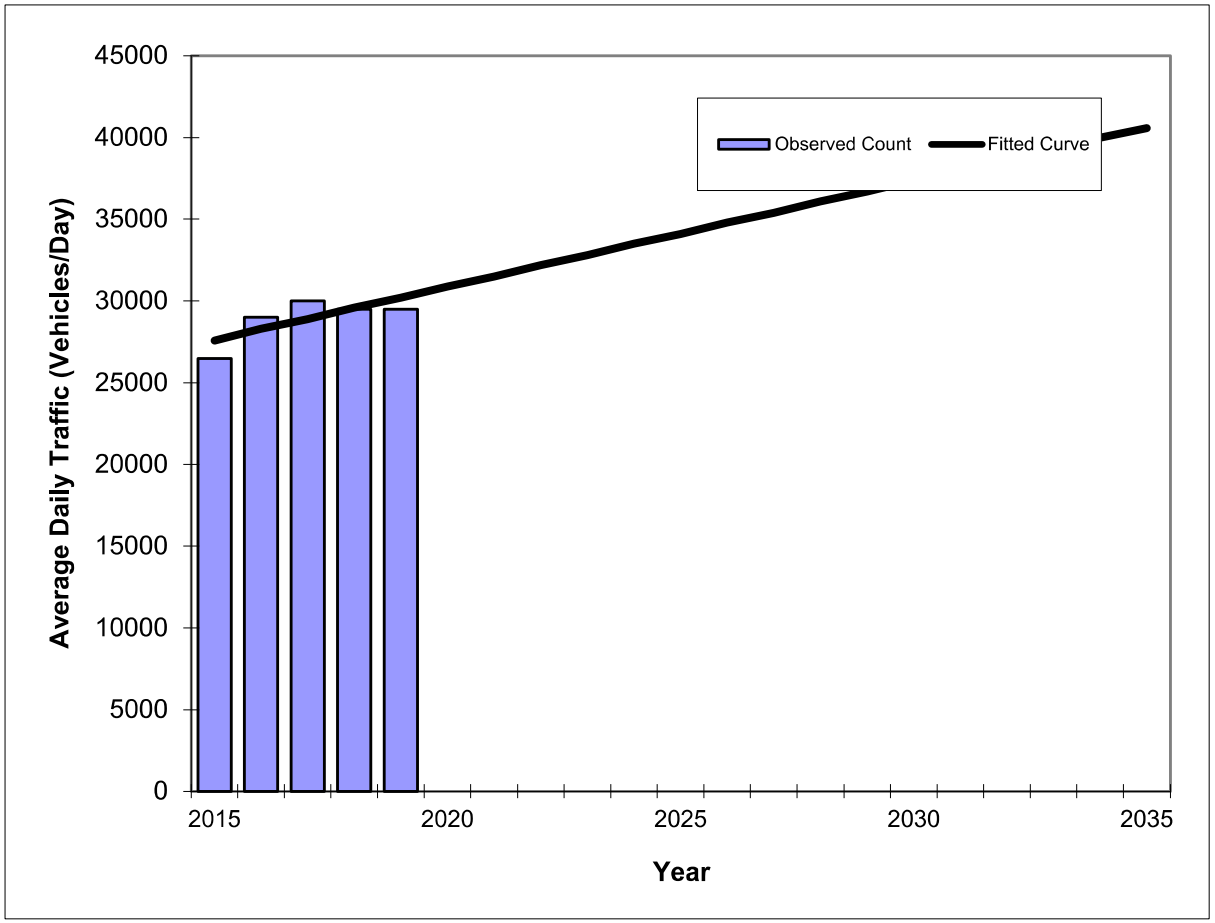
***Axle-Adjusted**

Traffic Trends - V03.a

SR 472 -- CR 4101/MLK Blvd to I-4

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	SR 472



Year	Traffic (ADT/AADT) Count*	Trend**
2015	26500	27600
2016	29000	28300
2017	30000	28900
2018	29500	29600
2019	29500	30200
2022 Opening Year Trend		
2022	N/A	32200
2024 Mid-Year Trend		
2024	N/A	33500
2027 Design Year Trend		
2027	N/A	35400
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	650
Trend R-squared:	54.87%
Trend Annual Historic Growth Rate:	2.36%
Trend Growth Rate (2019 to Design Year):	2.15%
Printed:	15-Nov-22
Straight Line Growth Option	

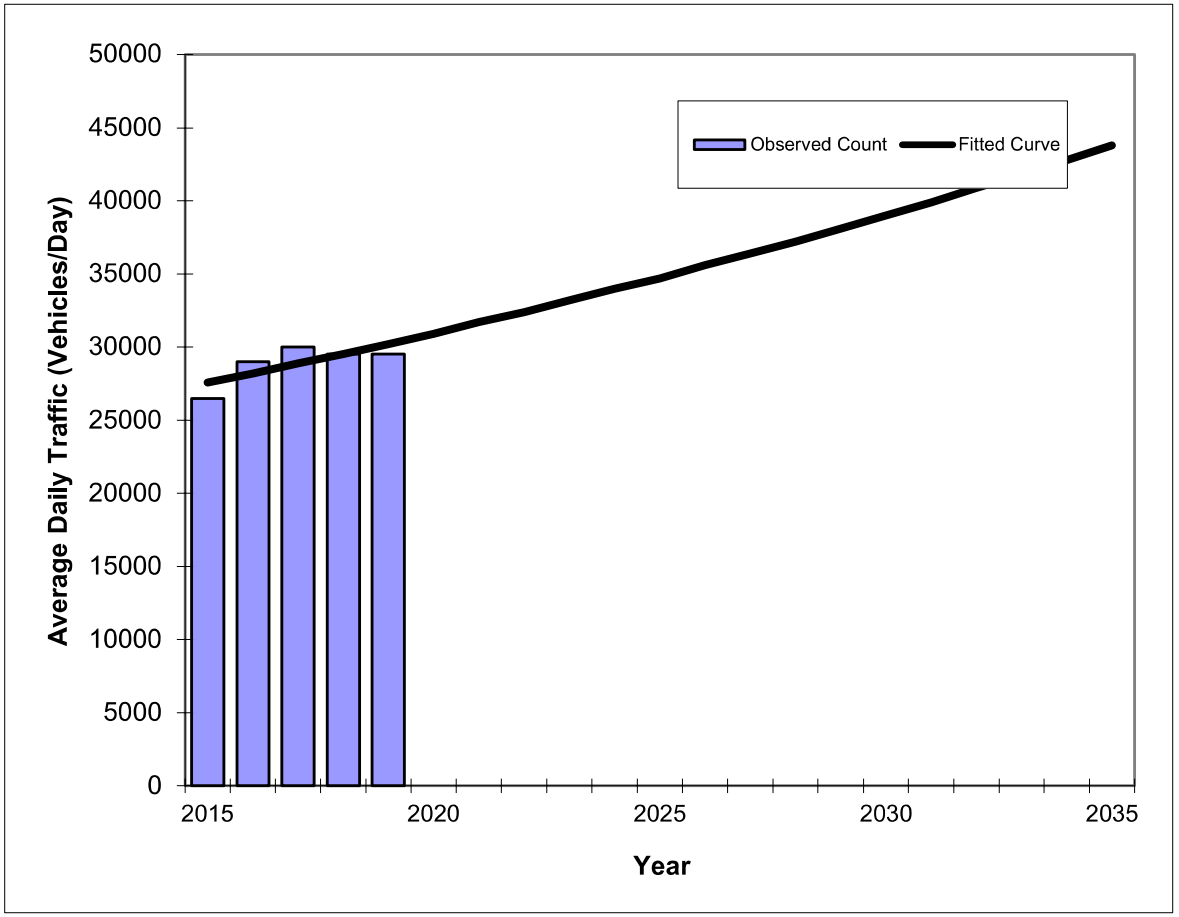
***Axle-Adjusted**

Traffic Trends - V03.a

SR 472 -- CR 4101/MLK Blvd to I-4

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	SR 472



Year	Traffic (ADT/AADT) Count*	Trend**
2015	26500	27600
2016	29000	28200
2017	30000	28900
2018	29500	29500
2019	29500	30200
2022 Opening Year Trend		
2022	N/A	32400
2024 Mid-Year Trend		
2024	N/A	34000
2027 Design Year Trend		
2027	N/A	36400
TRANPLAN Forecasts/Trends		

Trend R-squared:	54.93%
Compounded Annual Historic Growth Rate:	2.28%
Compounded Growth Rate (2019 to Design Year):	2.36%
Printed:	18-Jan-23

Exponential Growth Option

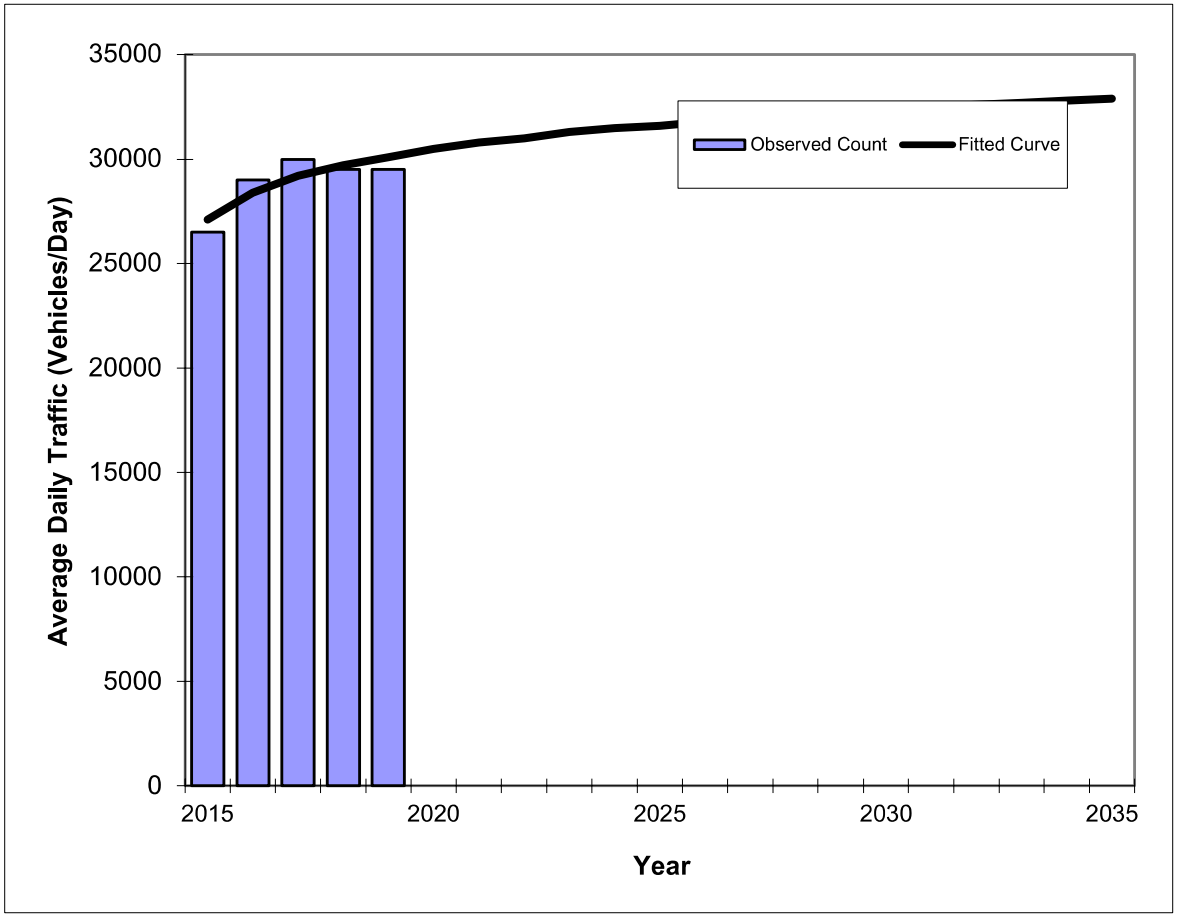
***Axle-Adjusted**

Traffic Trends - V03.a

SR 472 -- CR 4101/MLK Blvd to I-4

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	SR 472



Year	Traffic (ADT/AADT) Count*	Trend**
2015	26500	27100
2016	29000	28400
2017	30000	29200
2018	29500	29700
2019	29500	30100
2022 Opening Year Trend		
2022	N/A	31000
2024 Mid-Year Trend		
2024	N/A	31500
2027 Design Year Trend		
2027	N/A	32000
TRANPLAN Forecasts/Trends		

Trend R-squared:	76.03%
Compounded Annual Historic Growth Rate:	2.66%
Compounded Growth Rate (2019 to Design Year):	0.77%
Printed:	18-Jan-23

Decaying Exponential Growth Option

***Axle-Adjusted**

Macy Avenue

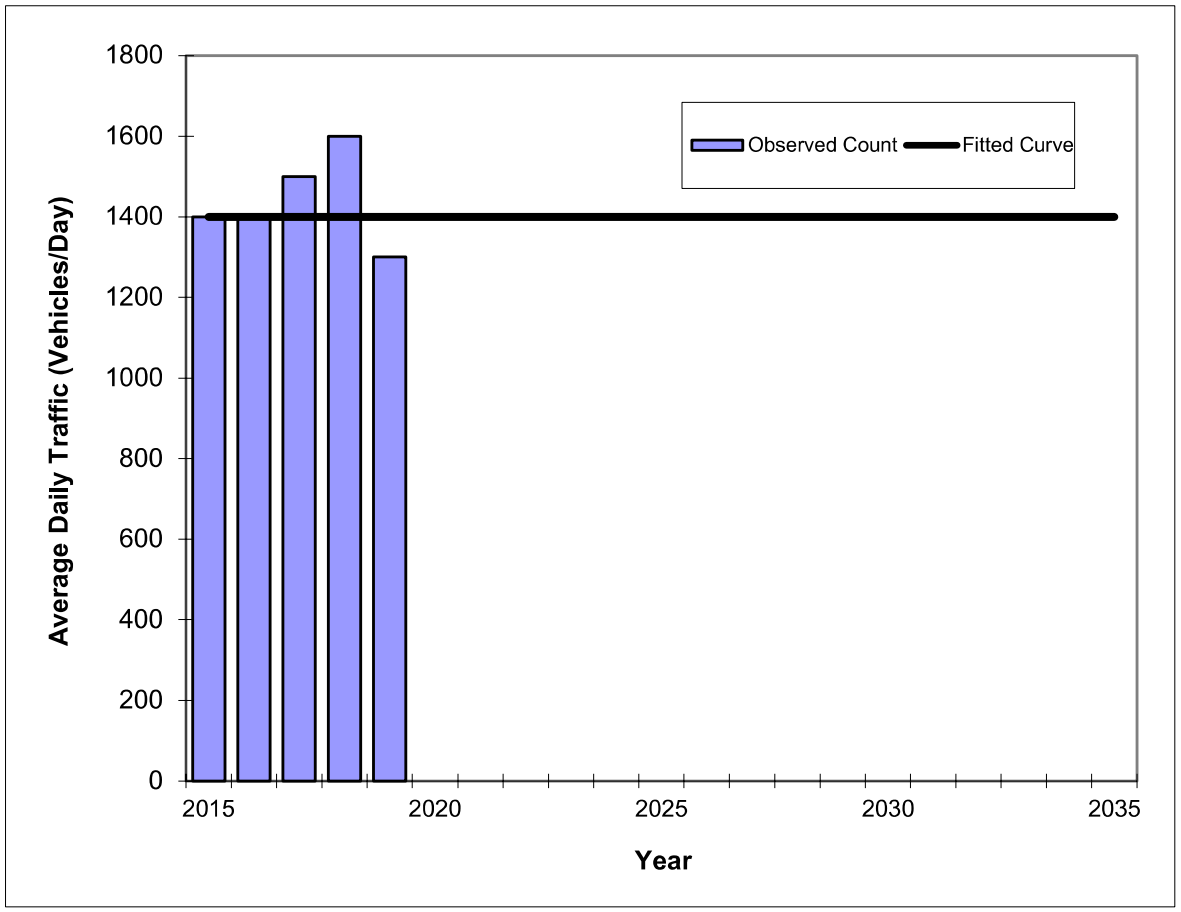
Five Year Trends

Traffic Trends - V03.a

MACY AVE -- Ohio St to Cassadaga Rd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	MACY AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2015	1400	1400
2016	1400	1400
2017	1500	1400
2018	1600	1400
2019	1300	1400
2027 Opening Year Trend		
2027	N/A	1400
2033 Mid-Year Trend		
2033	N/A	1400
2034 Design Year Trend		
2034	N/A	1400
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	0
Trend R-squared:	0.00%
Trend Annual Historic Growth Rate:	0.00%
Trend Growth Rate (2019 to Design Year):	0.00%
Printed:	18-Jan-23

Straight Line Growth Option

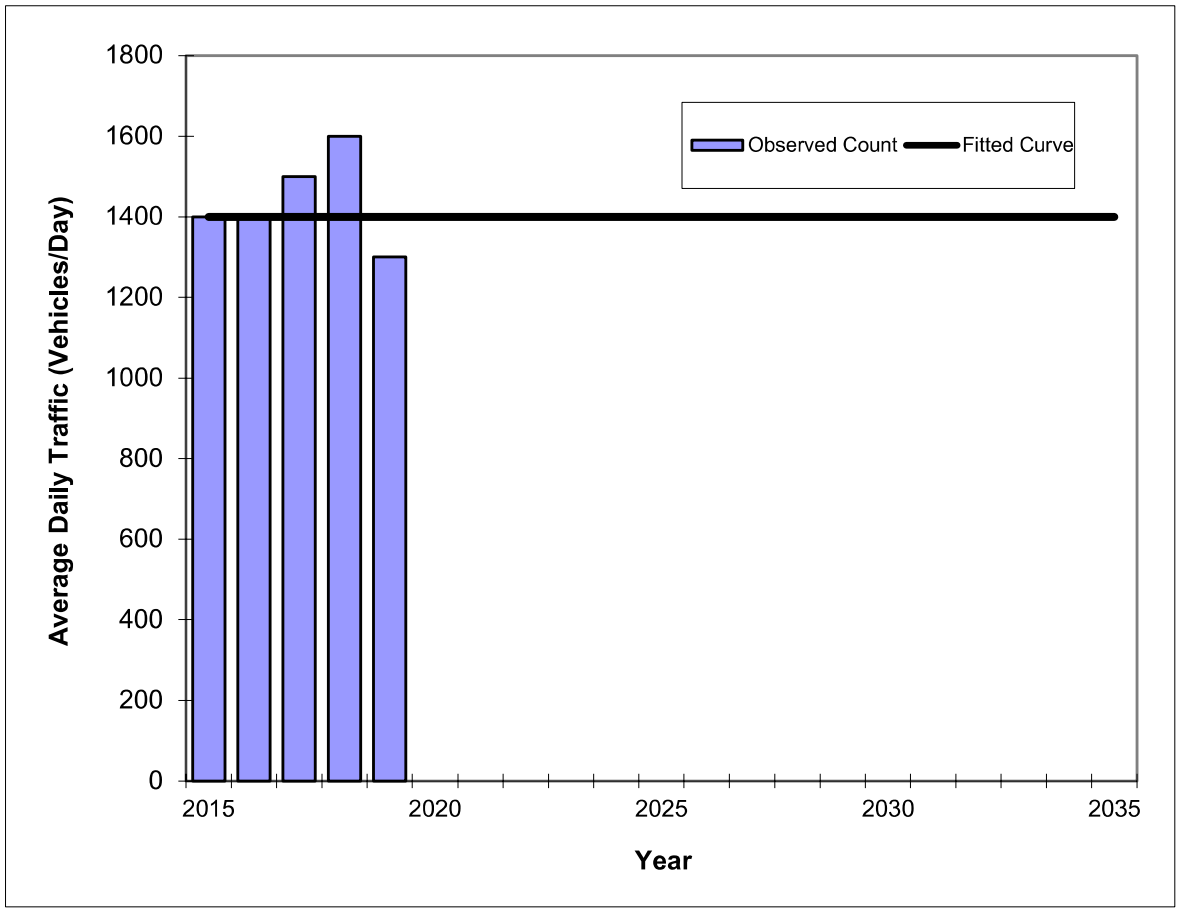
***Axle-Adjusted**

Traffic Trends - V03.a

MACY AVE -- Ohio St to Cassadaga Rd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	MACY AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2015	1400	1400
2016	1400	1400
2017	1500	1400
2018	1600	1400
2019	1300	1400
2027 Opening Year Trend		
2027	N/A	1400
2033 Mid-Year Trend		
2033	N/A	1400
2034 Design Year Trend		
2034	N/A	1400
TRANPLAN Forecasts/Trends		

Trend R-squared:	0.09%
Compounded Annual Historic Growth Rate:	0.00%
Compounded Growth Rate (2019 to Design Year):	0.00%
Printed:	18-Jan-23

Exponential Growth Option

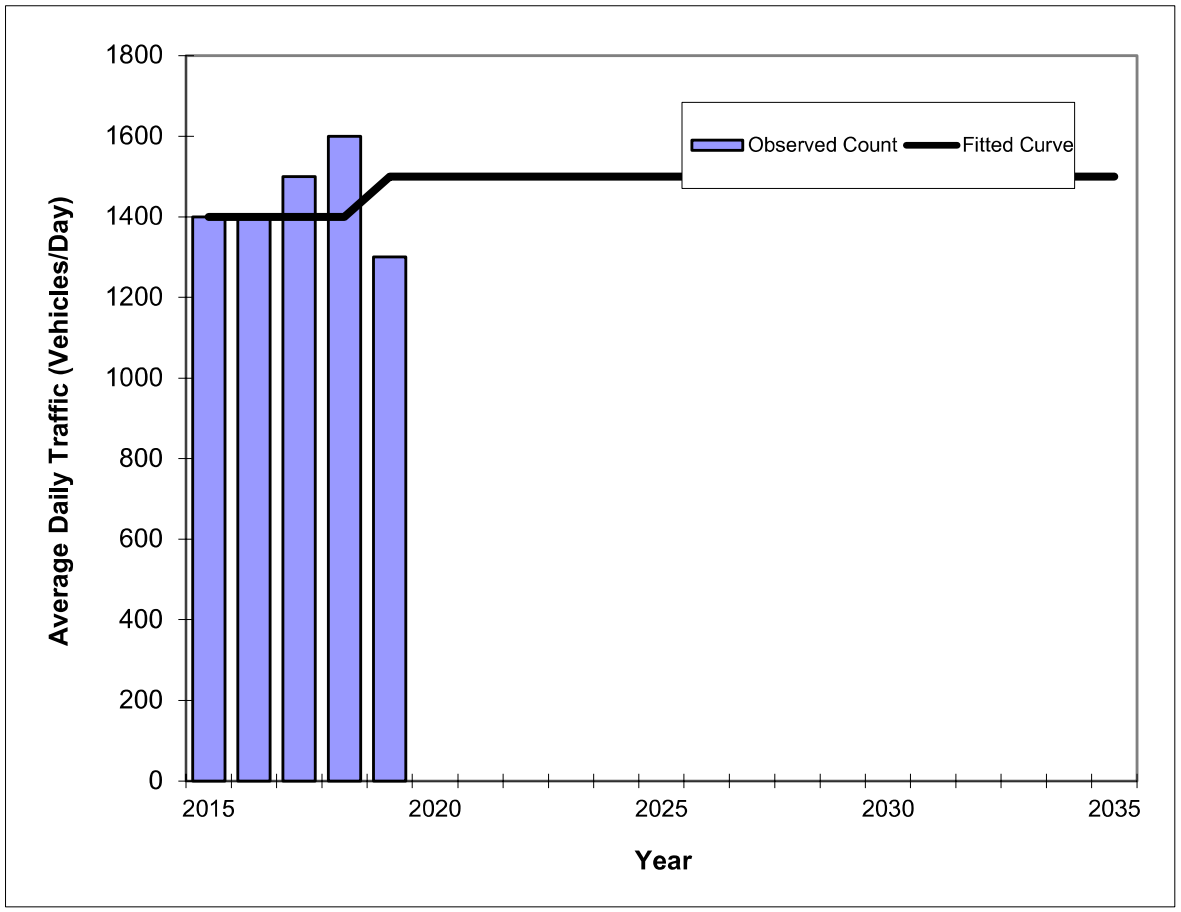
***Axle-Adjusted**

Traffic Trends - V03.a

MACY AVE -- Ohio St to Cassadaga Rd

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	MACY AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2015	1400	1400
2016	1400	1400
2017	1500	1400
2018	1600	1400
2019	1300	1500
2027 Opening Year Trend		
2027	N/A	1500
2033 Mid-Year Trend		
2033	N/A	1500
2034 Design Year Trend		
2034	N/A	1500
TRANPLAN Forecasts/Trends		

Trend R-squared:	1.43%
Compounded Annual Historic Growth Rate:	1.74%
Compounded Growth Rate (2019 to Design Year):	0.00%
Printed:	18-Jan-23

Decaying Exponential Growth Option

***Axle-Adjusted**

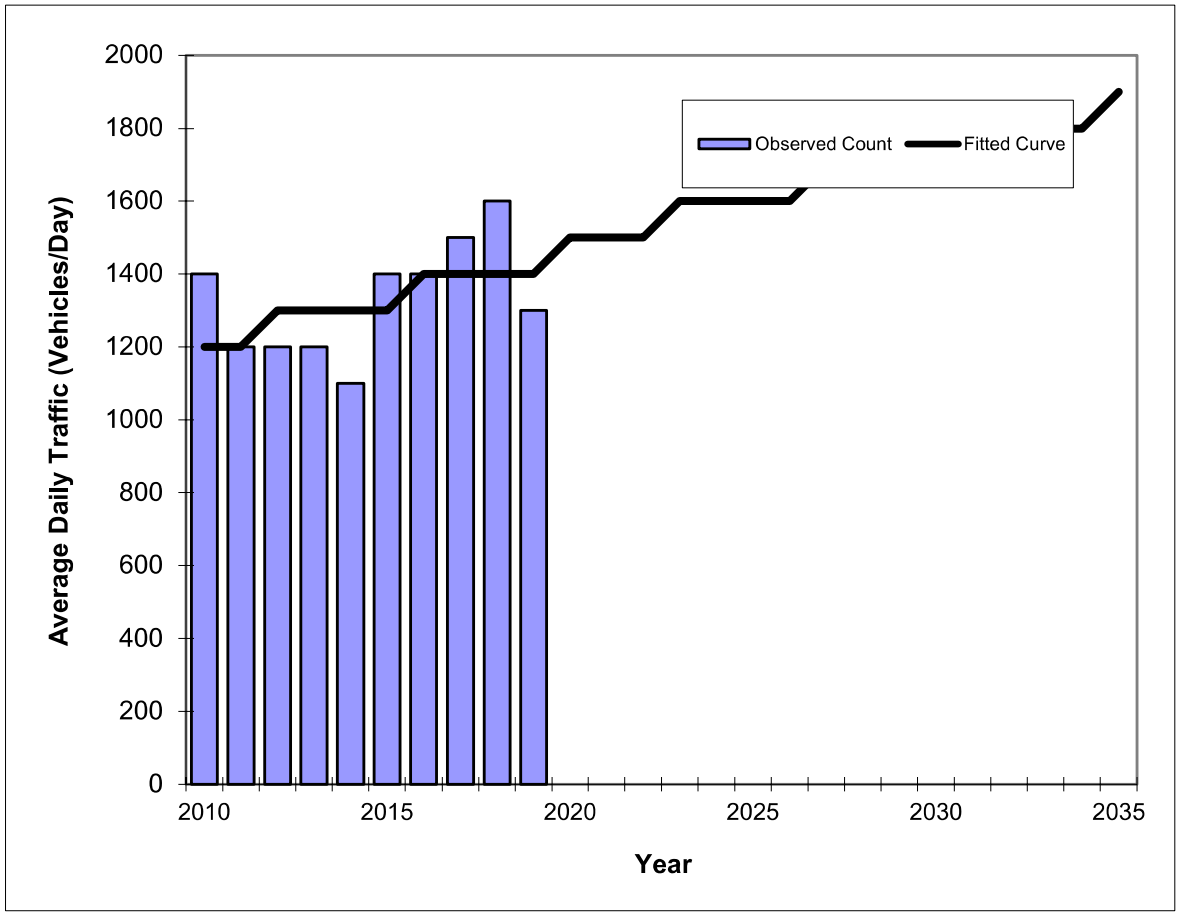
Ten Year Trends

Traffic Trends - V03.a

MACY AVE -- Ohio St to Cassadaga Rd

FIN#	1234
Location	1

County:	Volusia (79)
Station #:	0
Highway:	MACY AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2010	1400	1200
2011	1200	1200
2012	1200	1300
2013	1200	1300
2014	1100	1300
2015	1400	1300
2016	1400	1400
2017	1500	1400
2018	1600	1400
2019	1300	1400
2022 Opening Year Trend		
2022	N/A	1500
2024 Mid-Year Trend		
2024	N/A	1600
2027 Design Year Trend		
2027	N/A	1700
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	26
Trend R-squared:	25.35%
Trend Annual Historic Growth Rate:	1.85%
Trend Growth Rate (2019 to Design Year):	2.68%
Printed:	19-Jan-23

Straight Line Growth Option

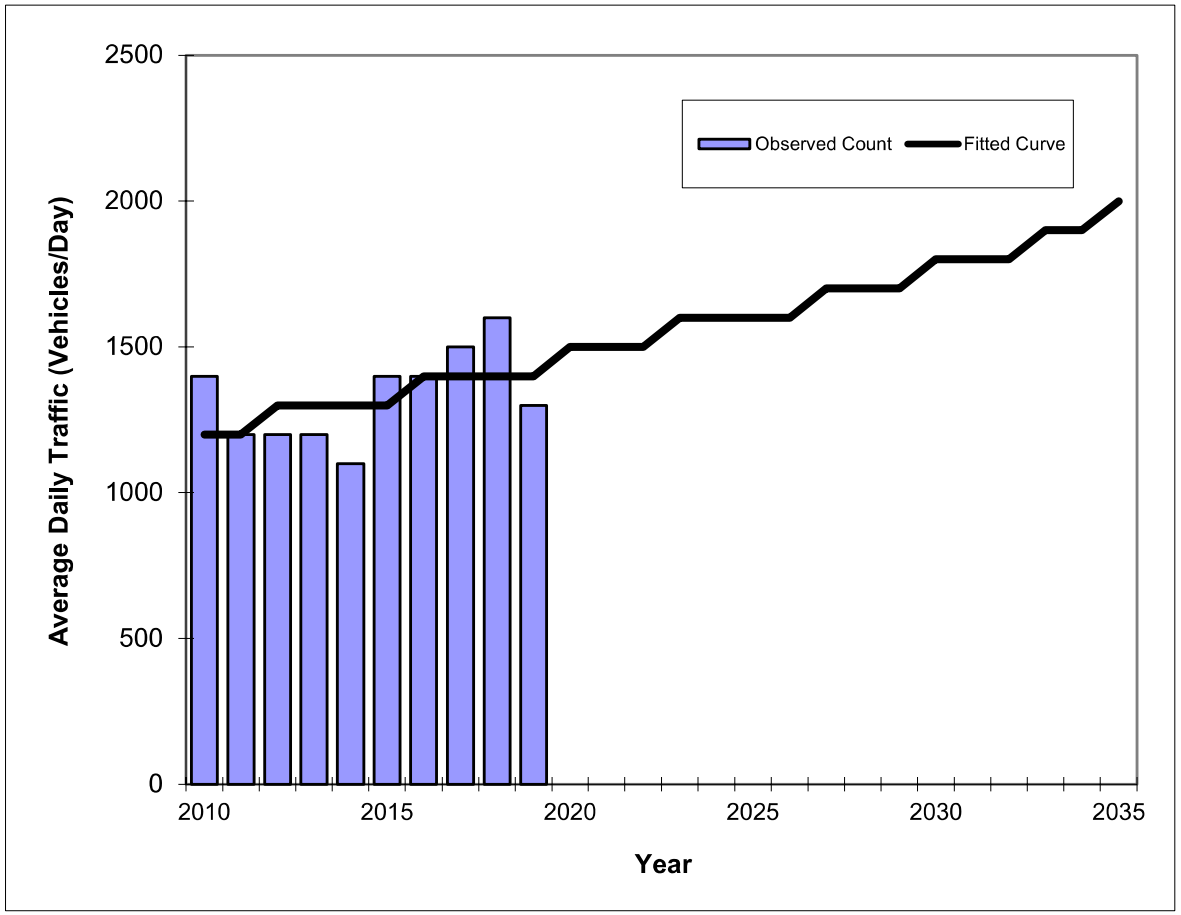
***Axle-Adjusted**

Traffic Trends - V03.a

MACY AVE -- Ohio St to Cassadaga Rd

FIN#	1234
Location	1

County:	Volusia (79)
Station #:	0
Highway:	MACY AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2010	1400	1200
2011	1200	1200
2012	1200	1300
2013	1200	1300
2014	1100	1300
2015	1400	1300
2016	1400	1400
2017	1500	1400
2018	1600	1400
2019	1300	1400
2022 Opening Year Trend		
2022	N/A	1500
2024 Mid-Year Trend		
2024	N/A	1600
2027 Design Year Trend		
2027	N/A	1700
TRANPLAN Forecasts/Trends		

Trend R-squared:	24.41%
Compounded Annual Historic Growth Rate:	1.73%
Compounded Growth Rate (2019 to Design Year):	2.46%
Printed:	19-Jan-23

Exponential Growth Option

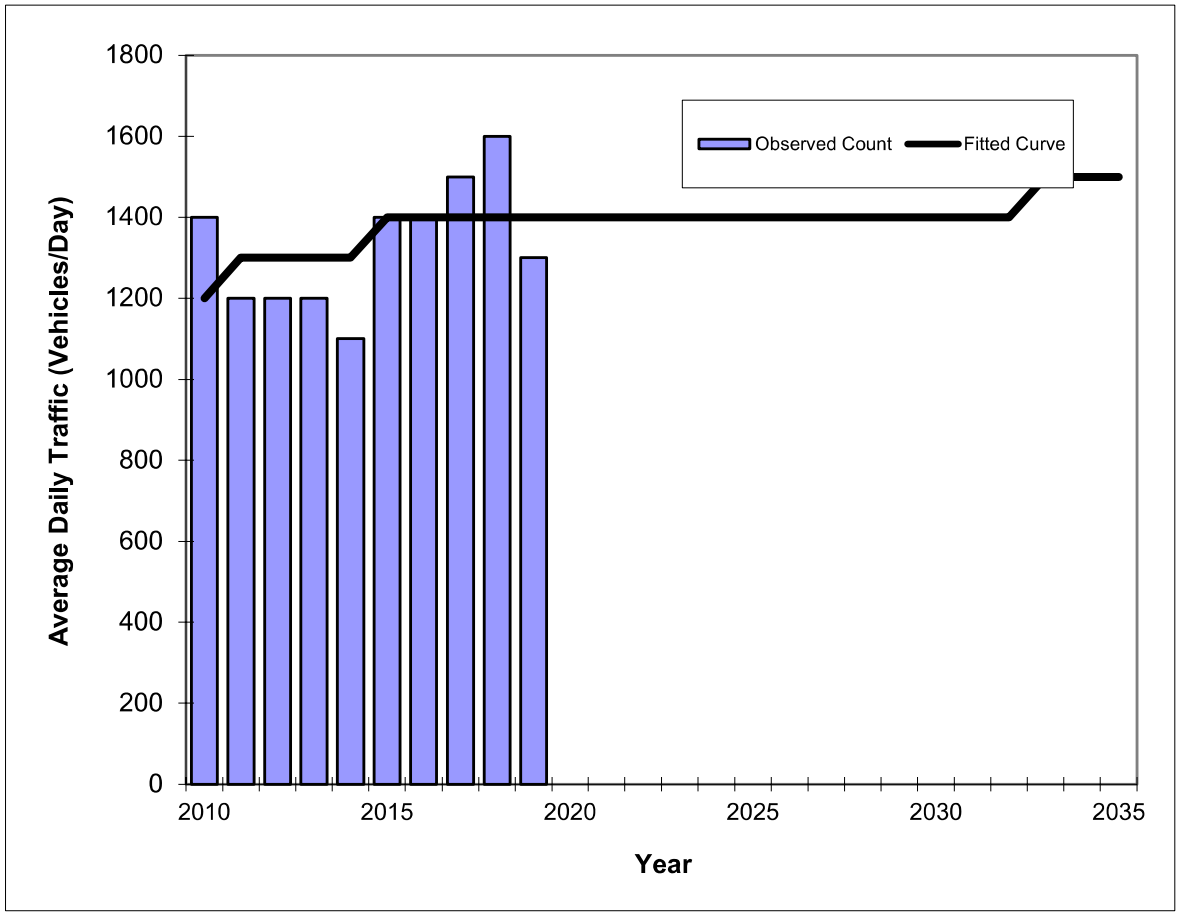
***Axle-Adjusted**

Traffic Trends - V03.a

MACY AVE -- Ohio St to Cassadaga Rd

FIN#	1234
Location	1

County:	Volusia (79)
Station #:	0
Highway:	MACY AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2010	1400	1200
2011	1200	1300
2012	1200	1300
2013	1200	1300
2014	1100	1300
2015	1400	1400
2016	1400	1400
2017	1500	1400
2018	1600	1400
2019	1300	1400
2022 Opening Year Trend		
2022	N/A	1400
2024 Mid-Year Trend		
2024	N/A	1400
2027 Design Year Trend		
2027	N/A	1400
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

Trend R-squared:	11.86%
Compounded Annual Historic Growth Rate:	1.73%
Compounded Growth Rate (2019 to Design Year):	0.00%
Printed:	19-Jan-23

Decaying Exponential Growth Option

Kicklighter Road

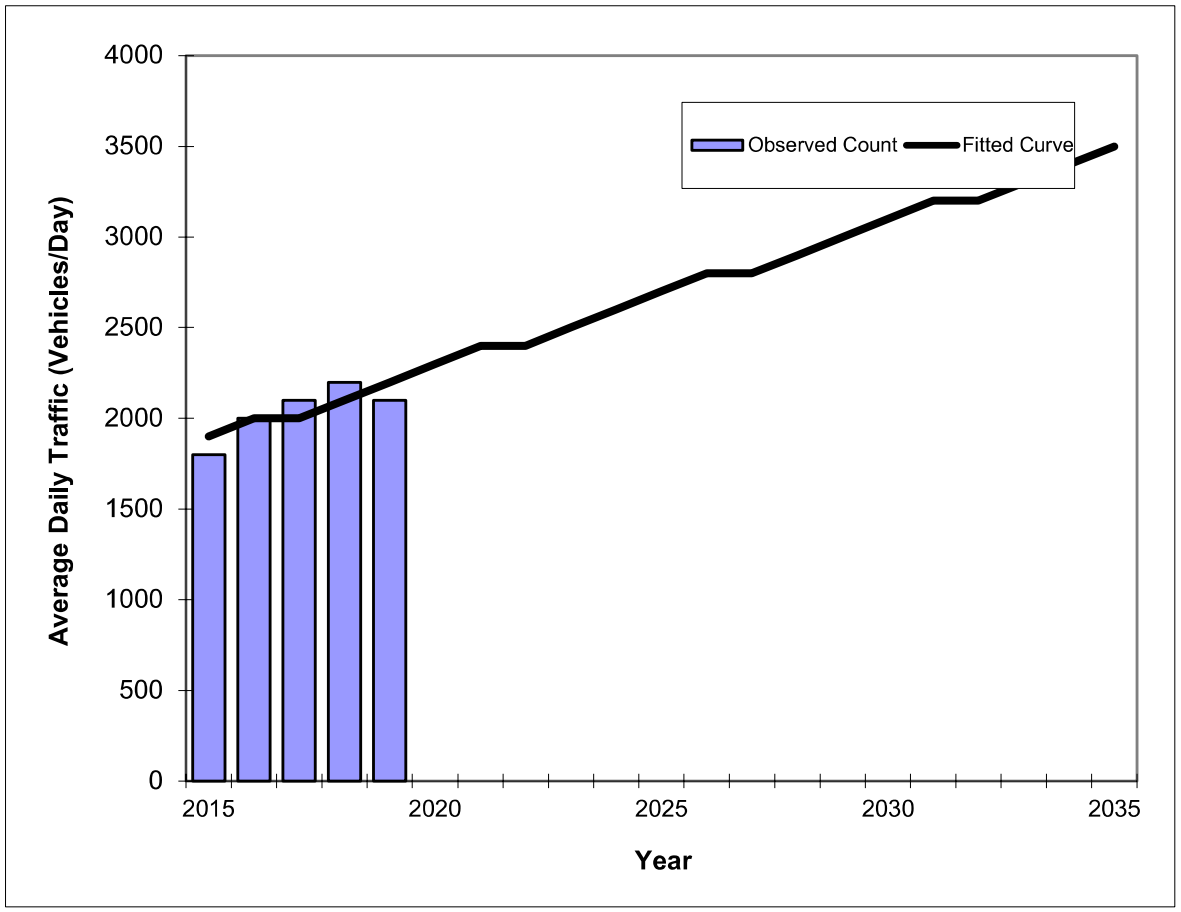
Five Year Trends

Traffic Trends - V03.a

KICKLIGHTER RD -- Macy Ave to Lake Helen-Osteen/Prevatt

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	KICKLIGHTER RD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	1800	1900
2016	2000	2000
2017	2100	2000
2018	2200	2100
2019	2100	2200
2027 Opening Year Trend		
2027	N/A	2800
2033 Mid-Year Trend		
2033	N/A	3300
2034 Design Year Trend		
2034	N/A	3400
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	80
Trend R-squared:	69.57%
Trend Annual Historic Growth Rate:	3.95%
Trend Growth Rate (2019 to Design Year):	3.64%
Printed:	18-Jan-23
Straight Line Growth Option	

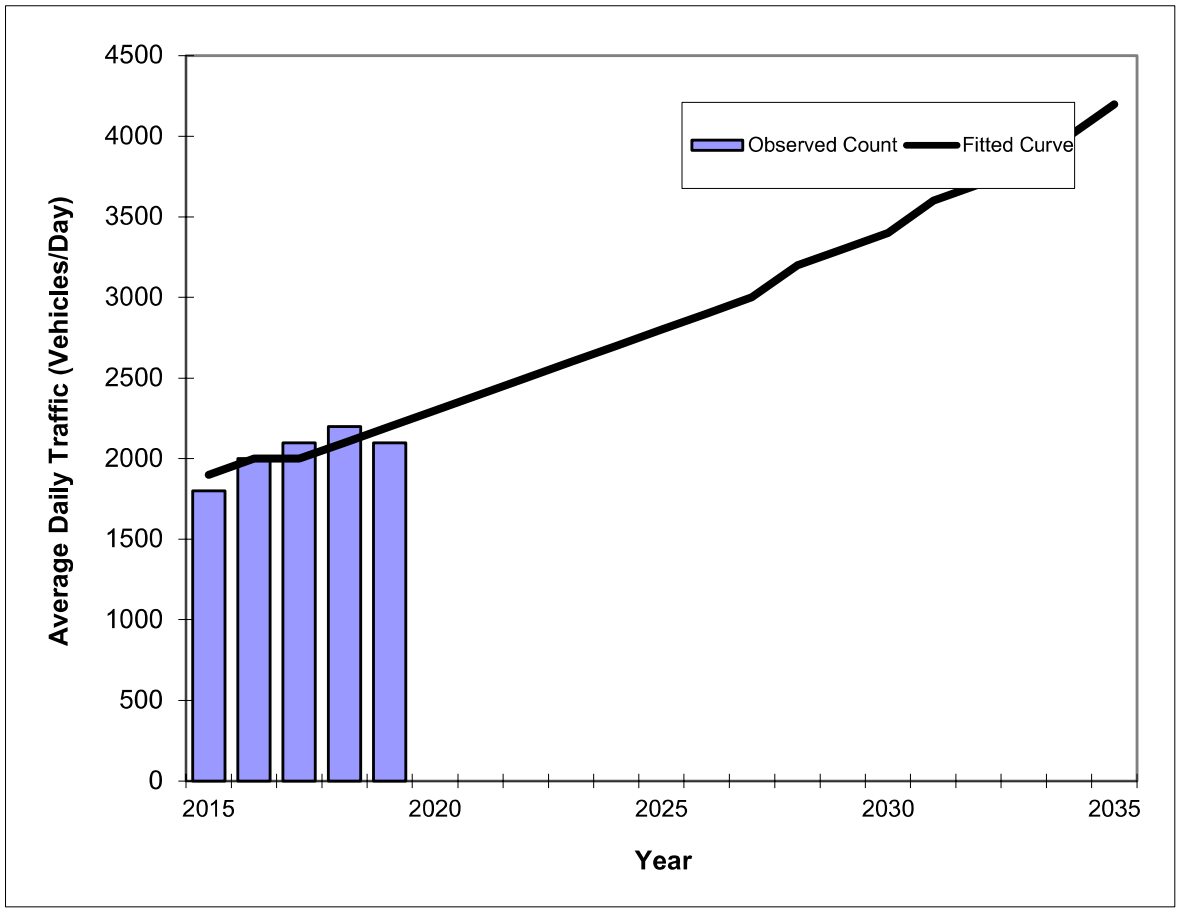
***Axle-Adjusted**

Traffic Trends - V03.a

KICKLIGHTER RD -- Macy Ave to Lake Helen-Osteen/Prevatt

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	KICKLIGHTER RD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	1800	1900
2016	2000	2000
2017	2100	2000
2018	2200	2100
2019	2100	2200
2027 Opening Year Trend		
2027	N/A	3000
2033 Mid-Year Trend		
2033	N/A	3900
2034 Design Year Trend		
2034	N/A	4000
TRANPLAN Forecasts/Trends		

Trend R-squared:	69.58%
Compounded Annual Historic Growth Rate:	3.73%
Compounded Growth Rate (2019 to Design Year):	4.07%
Printed:	18-Jan-23

Exponential Growth Option

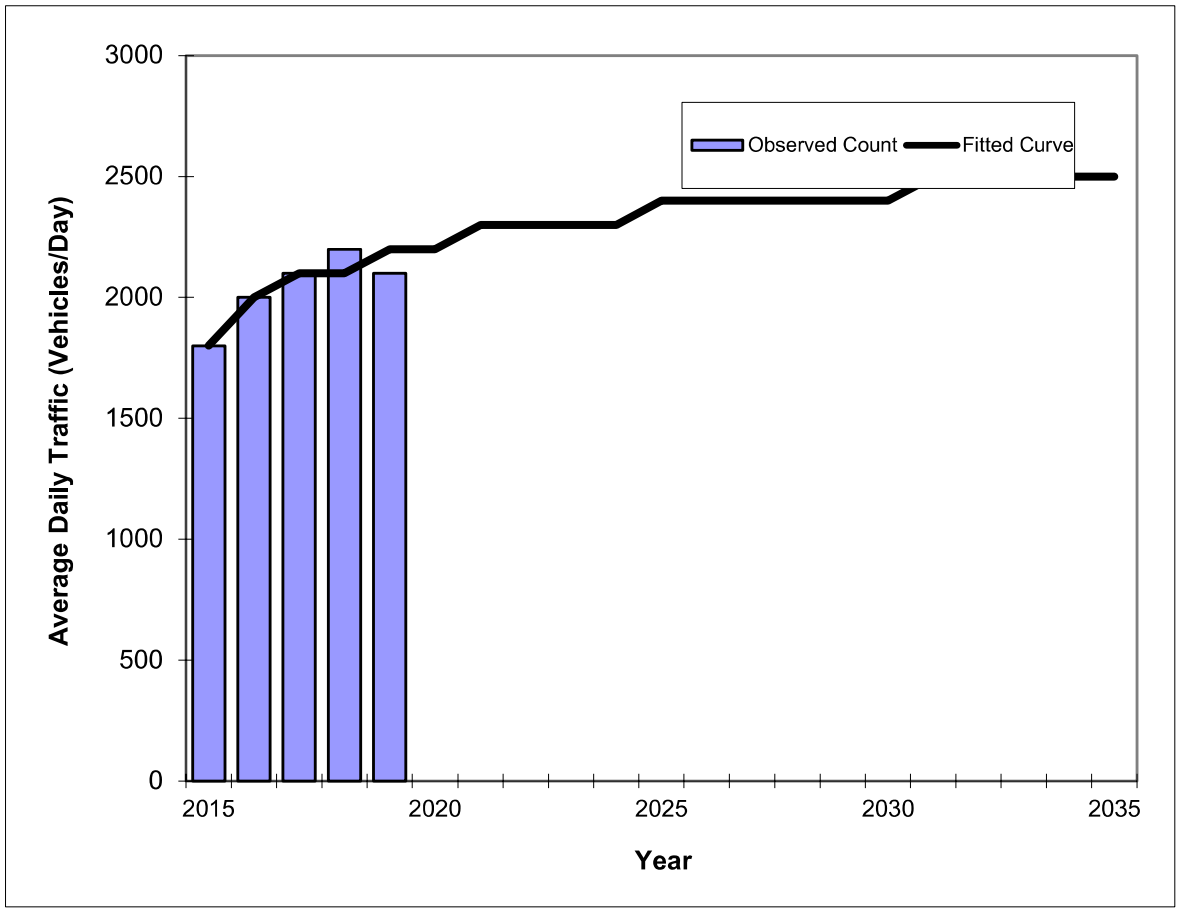
***Axle-Adjusted**

Traffic Trends - V03.a

KICKLIGHTER RD -- Macy Ave to Lake Helen-Osteen/Prevatt

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	KICKLIGHTER RD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	1800	1800
2016	2000	2000
2017	2100	2100
2018	2200	2100
2019	2100	2200
2027 Opening Year Trend		
2027	N/A	2400
2033 Mid-Year Trend		
2033	N/A	2500
2034 Design Year Trend		
2034	N/A	2500
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

Trend R-squared:	85.54%
Compounded Annual Historic Growth Rate:	5.14%
Compounded Growth Rate (2019 to Design Year):	0.86%
Printed:	18-Jan-23

Decaying Exponential Growth Option

I-4

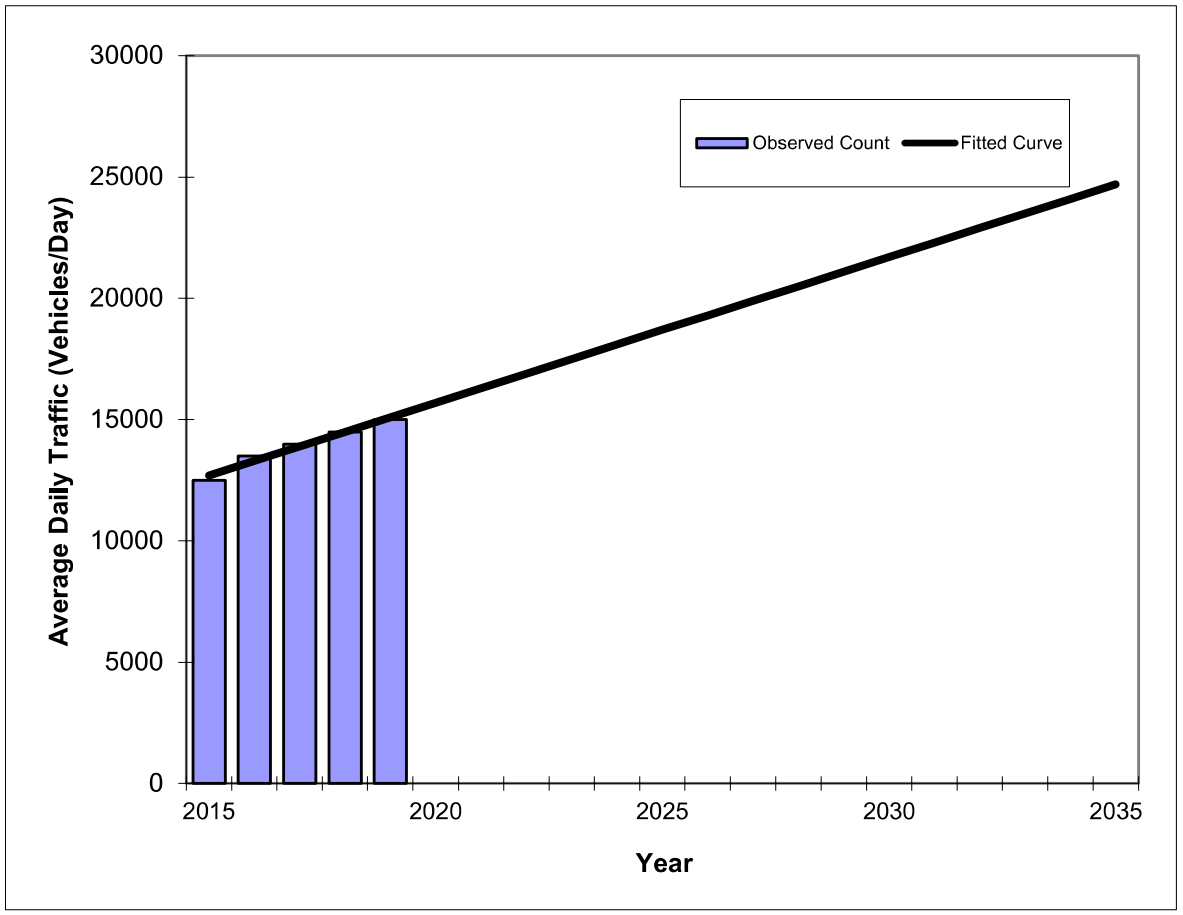
Five Year Trends

Traffic Trends - V03.a

I-4 -- SR 472 EB Off Ramp

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	I-4



Year	Traffic (ADT/AADT) Count*	Trend**
2015	12500	12700
2016	13500	13300
2017	14000	13900
2018	14500	14500
2019	15000	15100
2022 Opening Year Trend		
2022	N/A	16900
2024 Mid-Year Trend		
2024	N/A	18100
2027 Design Year Trend		
2027	N/A	19900
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	600
Trend R-squared:	97.30%
Trend Annual Historic Growth Rate:	4.72%
Trend Growth Rate (2019 to Design Year):	3.97%
Printed:	30-Jan-23

Straight Line Growth Option

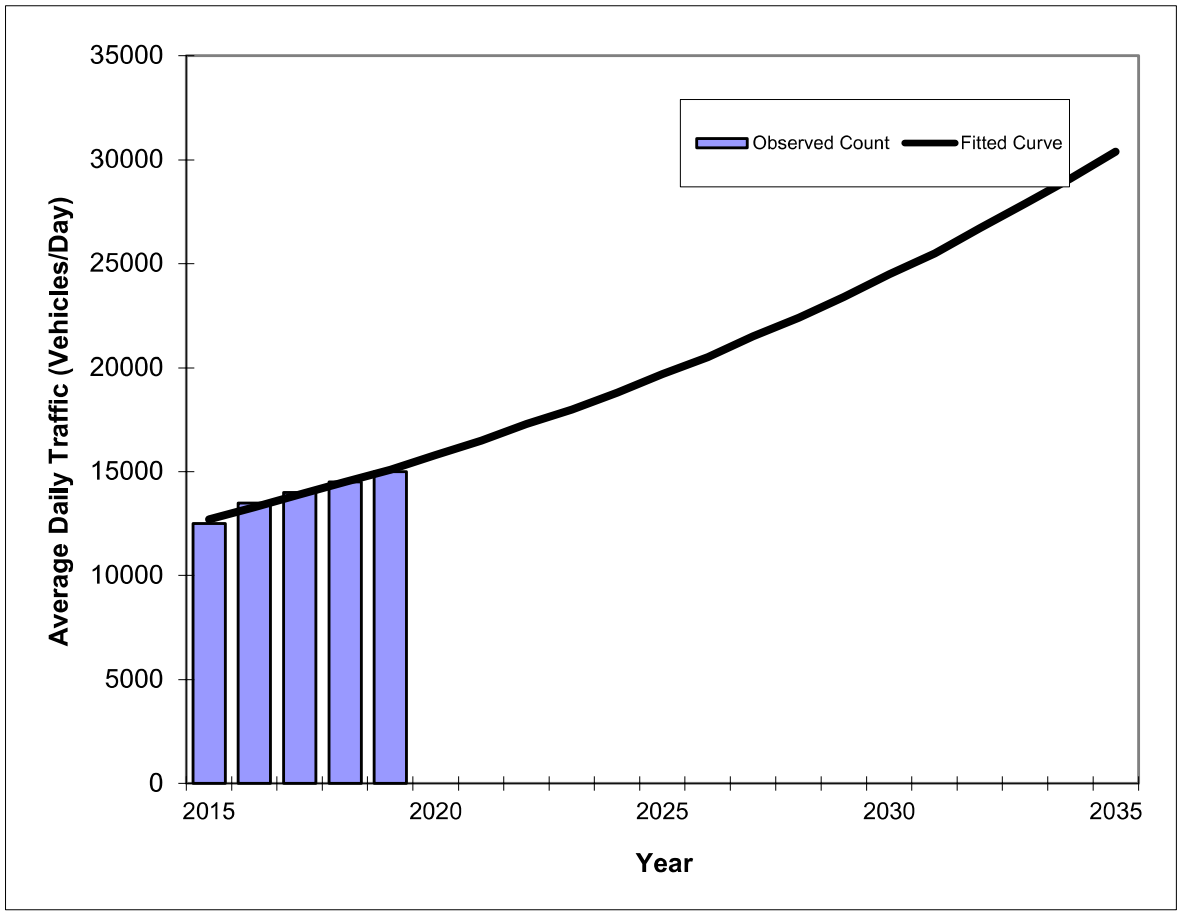
***Axle-Adjusted**

Traffic Trends - V03.a

I-4 -- SR 472 EB Off Ramp

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	I-4



Year	Traffic (ADT/AADT) Count*	Trend**
2015	12500	12700
2016	13500	13300
2017	14000	13900
2018	14500	14500
2019	15000	15100
2022 Opening Year Trend		
2022	N/A	17300
2024 Mid-Year Trend		
2024	N/A	18800
2027 Design Year Trend		
2027	N/A	21500
TRANPLAN Forecasts/Trends		

Trend R-squared:	96.34%
Compounded Annual Historic Growth Rate:	4.42%
Compounded Growth Rate (2019 to Design Year):	4.52%
Printed:	30-Jan-23

Exponential Growth Option

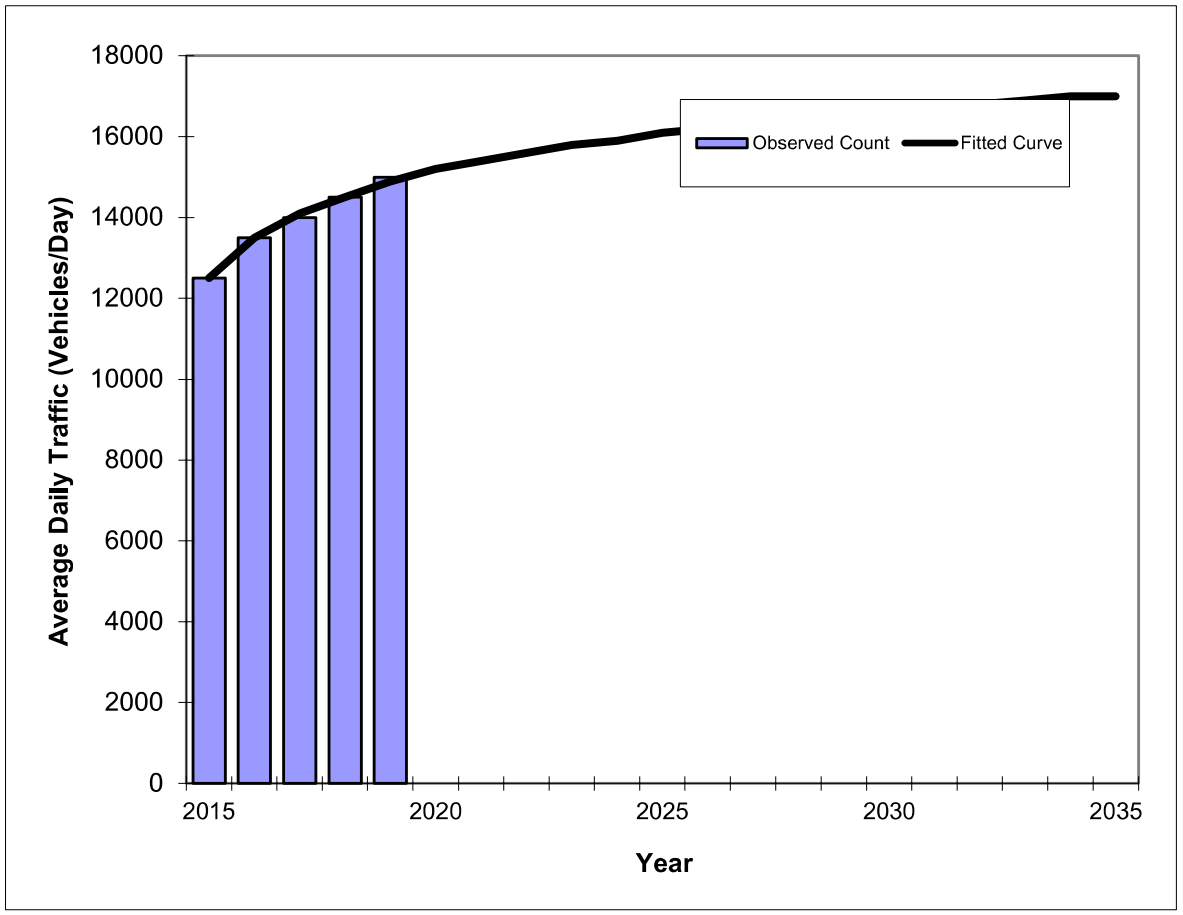
***Axle-Adjusted**

Traffic Trends - V03.a

I-4 -- SR 472 EB Off Ramp

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	I-4



Year	Traffic (ADT/AADT) Count*	Trend**
2015	12500	12500
2016	13500	13500
2017	14000	14100
2018	14500	14500
2019	15000	14900
2022 Opening Year Trend		
2022	N/A	15600
2024 Mid-Year Trend		
2024	N/A	15900
2027 Design Year Trend		
2027	N/A	16300
TRANPLAN Forecasts/Trends		

Trend R-squared:	99.18%
Compounded Annual Historic Growth Rate:	4.49%
Compounded Growth Rate (2019 to Design Year):	1.13%
Printed:	30-Jan-23

Decaying Exponential Growth Option

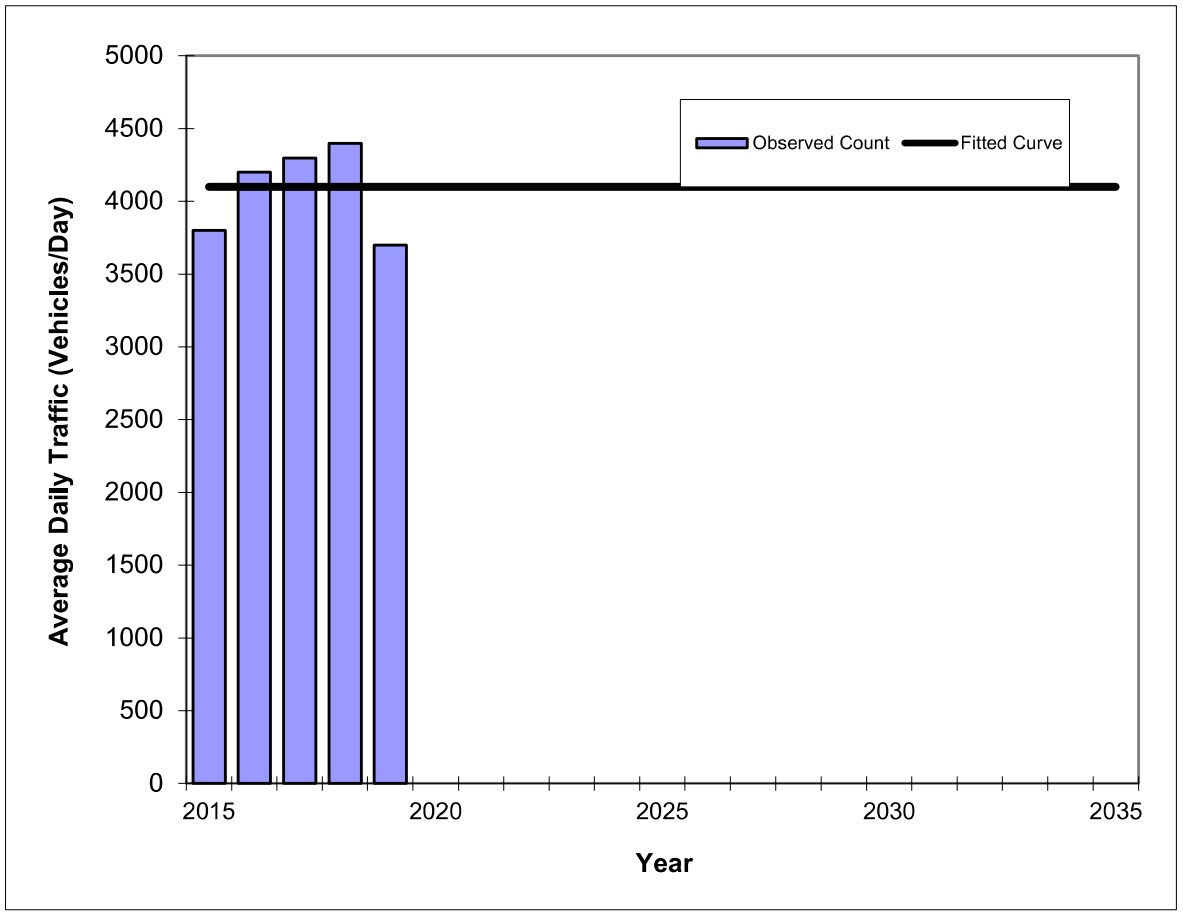
***Axle-Adjusted**

Traffic Trends - V03.a

I-4 -- SR 472 WB Off Ramp

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	I-4



Year	Traffic (ADT/AADT) Count*	Trend**
2015	3800	4100
2016	4200	4100
2017	4300	4100
2018	4400	4100
2019	3700	4100
2022 Opening Year Trend		
2022	N/A	4100
2024 Mid-Year Trend		
2024	N/A	4100
2027 Design Year Trend		
2027	N/A	4100
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

**** Annual Trend Increase:**	0
Trend R-squared:	0.00%
Trend Annual Historic Growth Rate:	0.00%
Trend Growth Rate (2019 to Design Year):	0.00%
Printed:	30-Jan-23

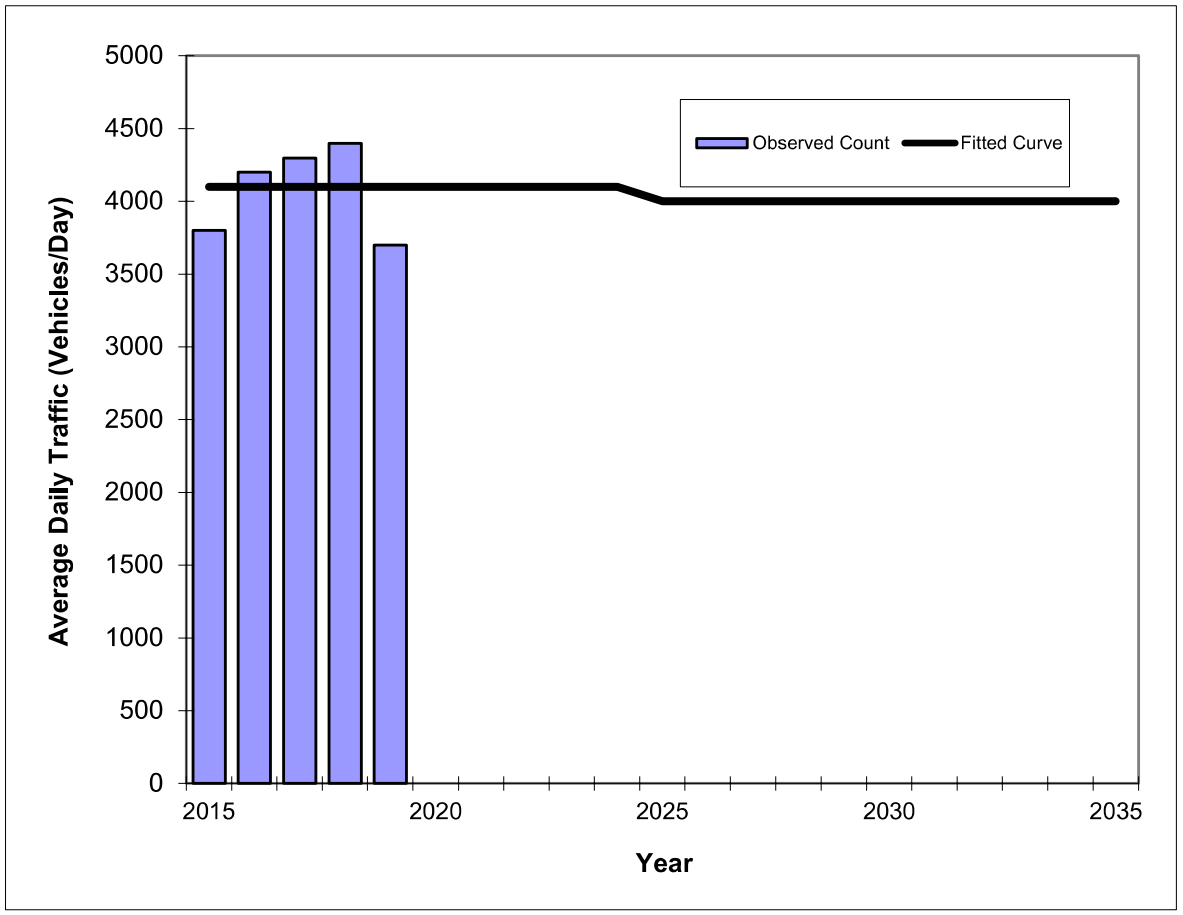
Straight Line Growth Option

Traffic Trends - V03.a

I-4 -- SR 472 WB Off Ramp

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	I-4



Year	Traffic (ADT/AADT) Count*	Trend**
2015	3800	4100
2016	4200	4100
2017	4300	4100
2018	4400	4100
2019	3700	4100
2022 Opening Year Trend		
2022	N/A	4100
2024 Mid-Year Trend		
2024	N/A	4100
2027 Design Year Trend		
2027	N/A	4000
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

Trend R-squared:	0.02%
Compounded Annual Historic Growth Rate:	0.00%
Compounded Growth Rate (2019 to Design Year):	-0.31%
Printed:	30-Jan-23

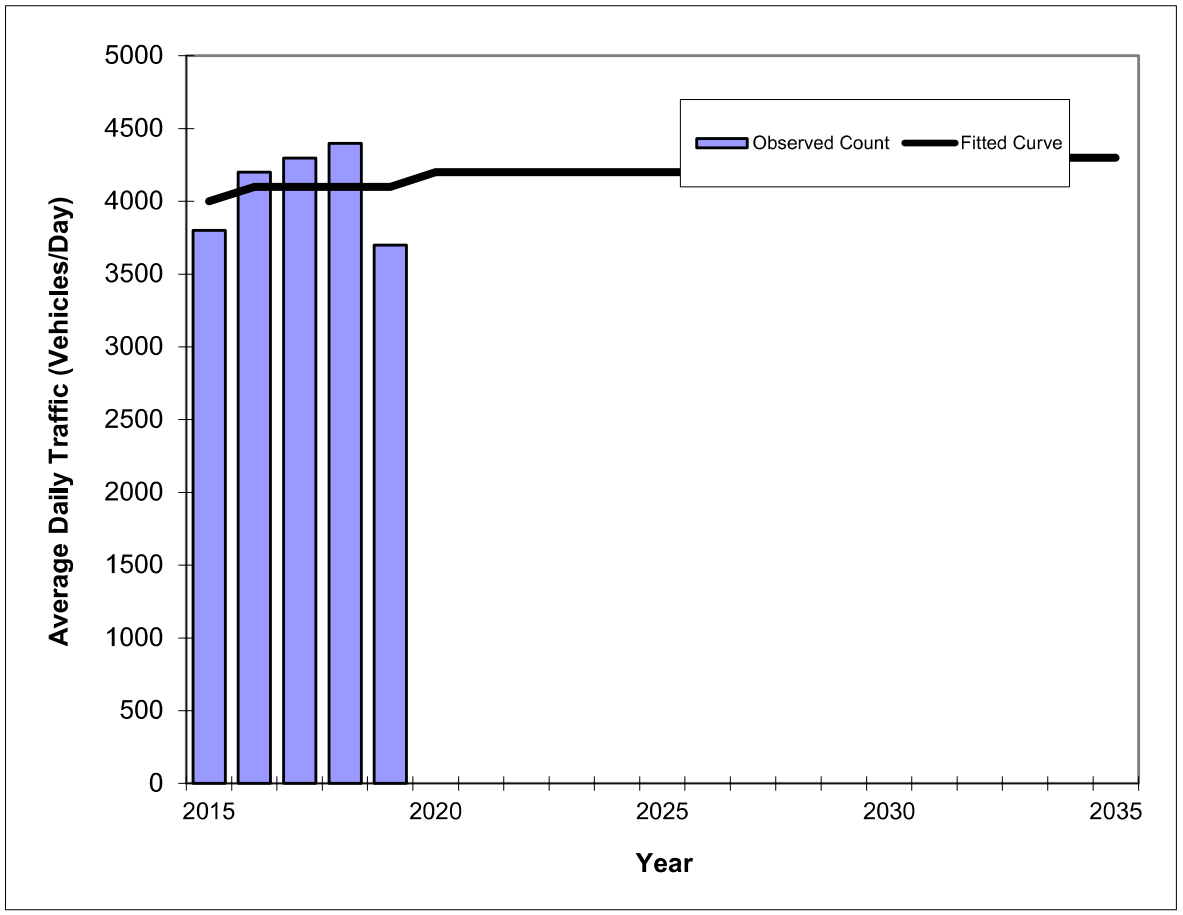
Exponential Growth Option

Traffic Trends - V03.a

I-4 -- SR 472 WB Off Ramp

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	I-4



Year	Traffic (ADT/AADT) Count*	Trend**
2015	3800	4000
2016	4200	4100
2017	4300	4100
2018	4400	4100
2019	3700	4100
2022 Opening Year Trend		
2022	N/A	4200
2024 Mid-Year Trend		
2024	N/A	4200
2027 Design Year Trend		
2027	N/A	4200
TRANPLAN Forecasts/Trends		

Trend R-squared:	3.93%
Compounded Annual Historic Growth Rate:	0.62%
Compounded Growth Rate (2019 to Design Year):	0.30%
Printed:	30-Jan-23

Decaying Exponential Growth Option

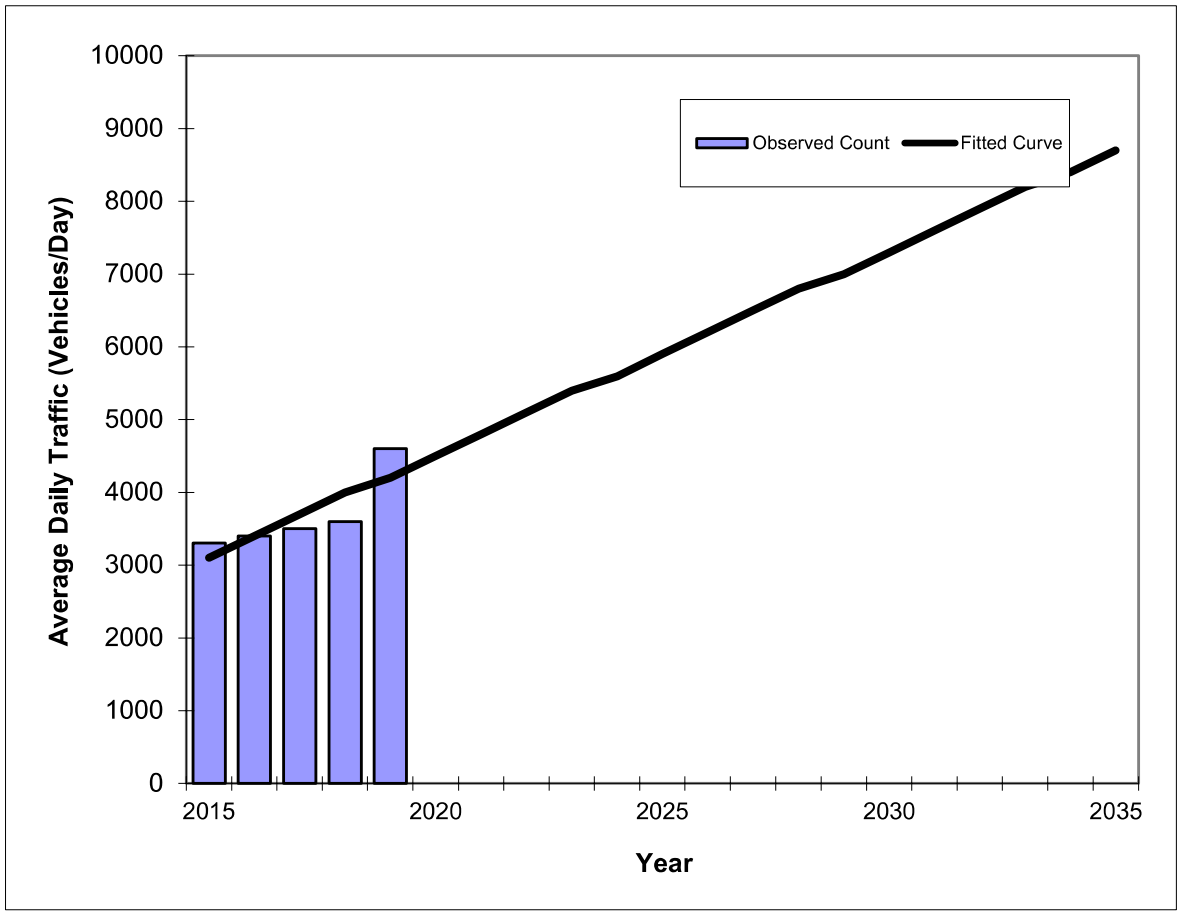
***Axle-Adjusted**

Traffic Trends - V03.a

I-4 -- Orange Camp EB Off Ramp

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	I-4



Year	Traffic (ADT/AADT) Count*	Trend**
2015	3300	3100
2016	3400	3400
2017	3500	3700
2018	3600	4000
2019	4600	4200
2022 Opening Year Trend		
2022	N/A	5100
2024 Mid-Year Trend		
2024	N/A	5600
2027 Design Year Trend		
2027	N/A	6500
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	280
Trend R-squared:	70.76%
Trend Annual Historic Growth Rate:	8.87%
Trend Growth Rate (2019 to Design Year):	6.85%
Printed:	31-Jan-23

Straight Line Growth Option

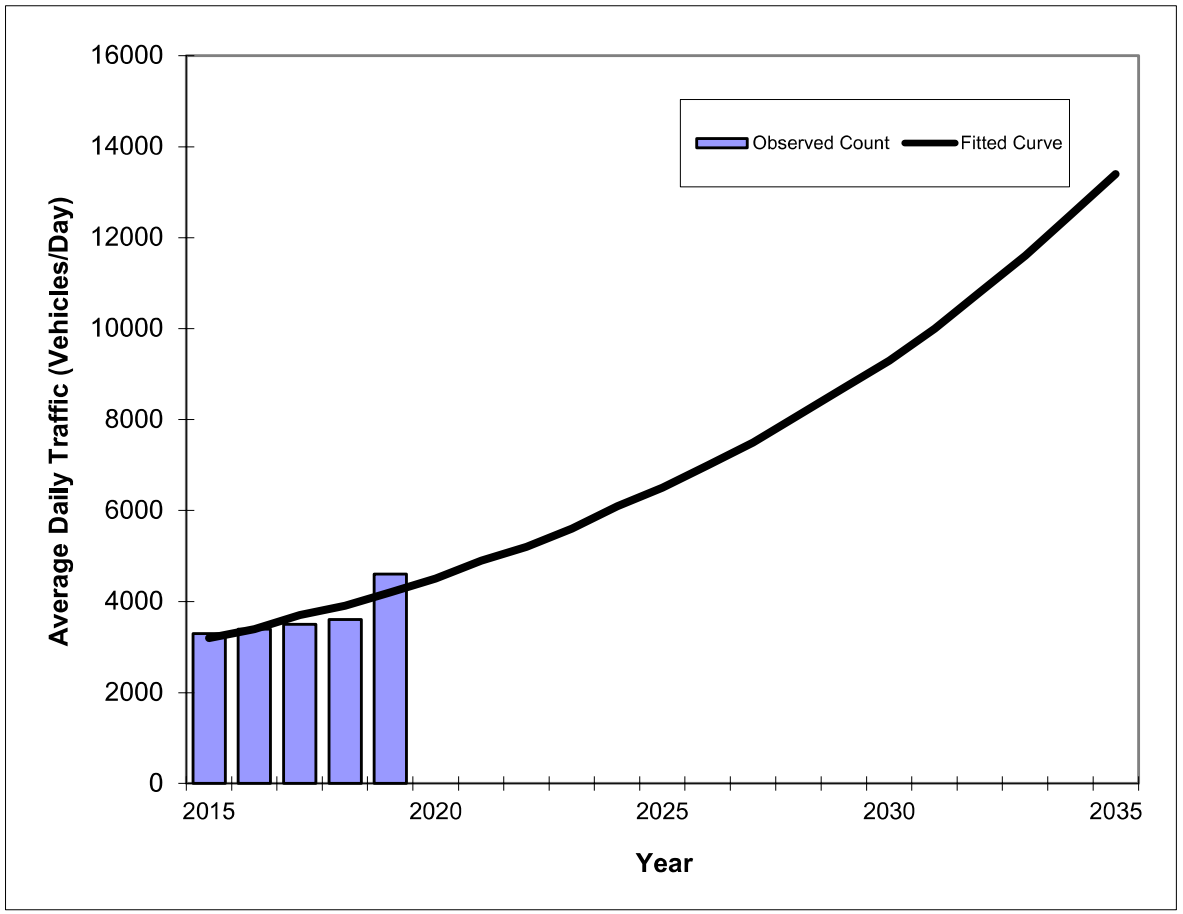
***Axle-Adjusted**

Traffic Trends - V03.a

I-4 -- Orange Camp EB Off Ramp

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	I-4



Year	Traffic (ADT/AADT) Count*	Trend**
2015	3300	3200
2016	3400	3400
2017	3500	3700
2018	3600	3900
2019	4600	4200
2022 Opening Year Trend		
2022	N/A	5200
2024 Mid-Year Trend		
2024	N/A	6100
2027 Design Year Trend		
2027	N/A	7500
TRANPLAN Forecasts/Trends		

Trend R-squared:	73.66%
Compounded Annual Historic Growth Rate:	7.03%
Compounded Growth Rate (2019 to Design Year):	7.52%
Printed:	31-Jan-23

Exponential Growth Option

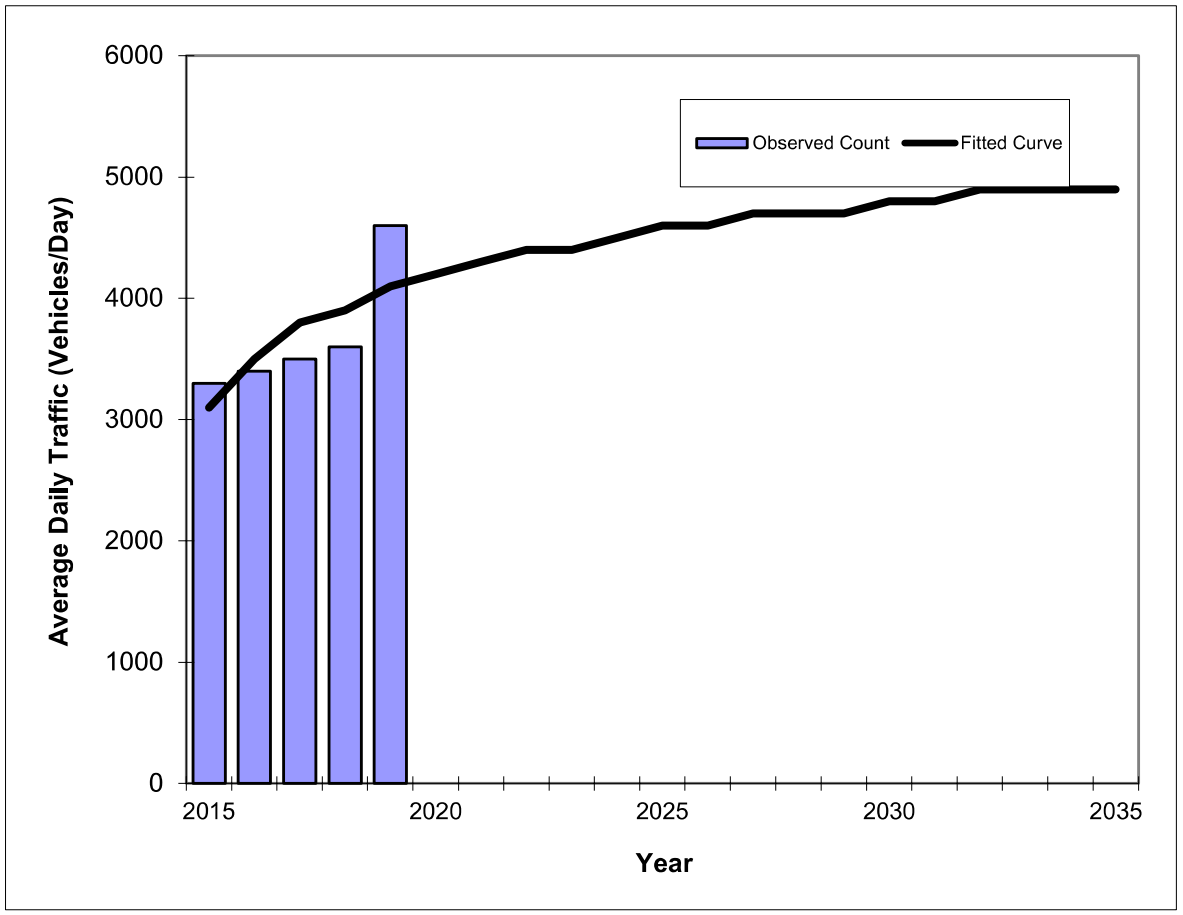
***Axle-Adjusted**

Traffic Trends - V03.a

I-4 -- Orange Camp EB Off Ramp

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	I-4



Year	Traffic (ADT/AADT) Count*	Trend**
2015	3300	3100
2016	3400	3500
2017	3500	3800
2018	3600	3900
2019	4600	4100
2022 Opening Year Trend		
2022	N/A	4400
2024 Mid-Year Trend		
2024	N/A	4500
2027 Design Year Trend		
2027	N/A	4700
TRANPLAN Forecasts/Trends		

Trend R-squared:	53.43%
Compounded Annual Historic Growth Rate:	7.24%
Compounded Growth Rate (2019 to Design Year):	1.72%
Printed:	31-Jan-23

Decaying Exponential Growth Option

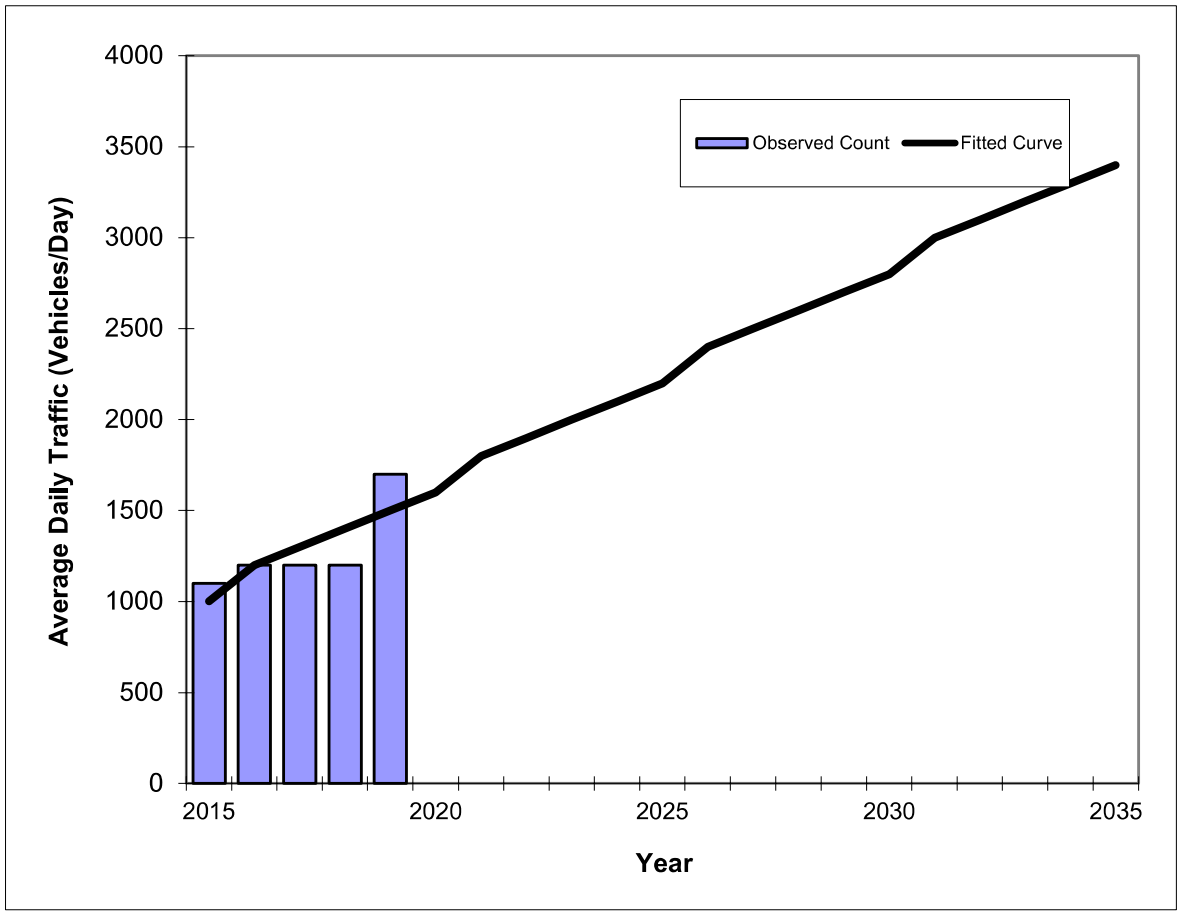
***Axle-Adjusted**

Traffic Trends - V03.a

I-4 -- Orange Camp WB Off Ramp

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	I-4



Year	Traffic (ADT/AADT) Count*	Trend**
2015	1100	1000
2016	1200	1200
2017	1200	1300
2018	1200	1400
2019	1700	1500
2022 Opening Year Trend		
2022	N/A	1900
2024 Mid-Year Trend		
2024	N/A	2100
2027 Design Year Trend		
2027	N/A	2500
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	120
Trend R-squared:	63.16%
Trend Annual Historic Growth Rate:	12.50%
Trend Growth Rate (2019 to Design Year):	8.33%
Printed:	31-Jan-23

Straight Line Growth Option

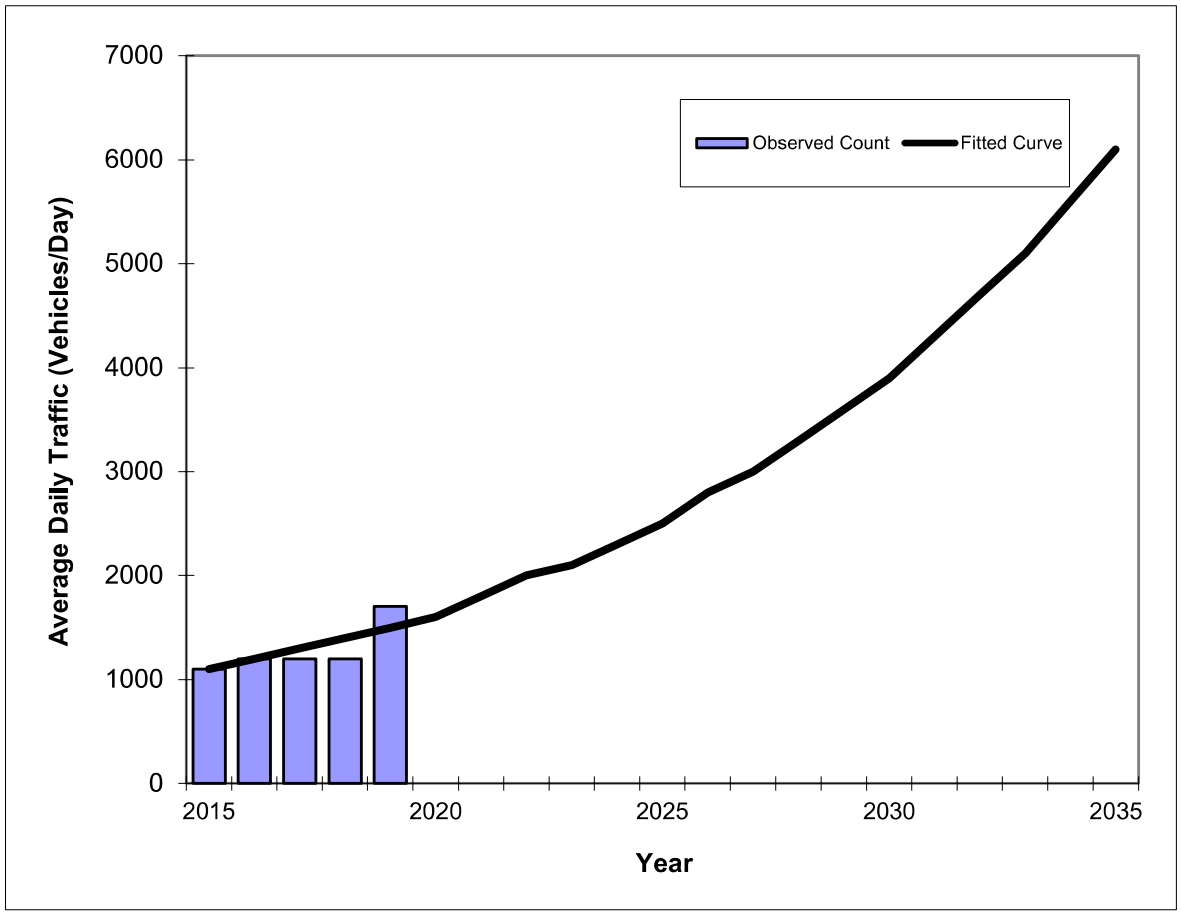
***Axle-Adjusted**

Traffic Trends - V03.a

I-4 -- Orange Camp WB Off Ramp

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	I-4



Year	Traffic (ADT/AADT) Count*	Trend**
2015	1100	1100
2016	1200	1200
2017	1200	1300
2018	1200	1400
2019	1700	1500
2022 Opening Year Trend		
2022	N/A	2000
2024 Mid-Year Trend		
2024	N/A	2300
2027 Design Year Trend		
2027	N/A	3000
TRANPLAN Forecasts/Trends		

Trend R-squared:	65.78%
Compounded Annual Historic Growth Rate:	8.06%
Compounded Growth Rate (2019 to Design Year):	9.05%
Printed:	31-Jan-23

Exponential Growth Option

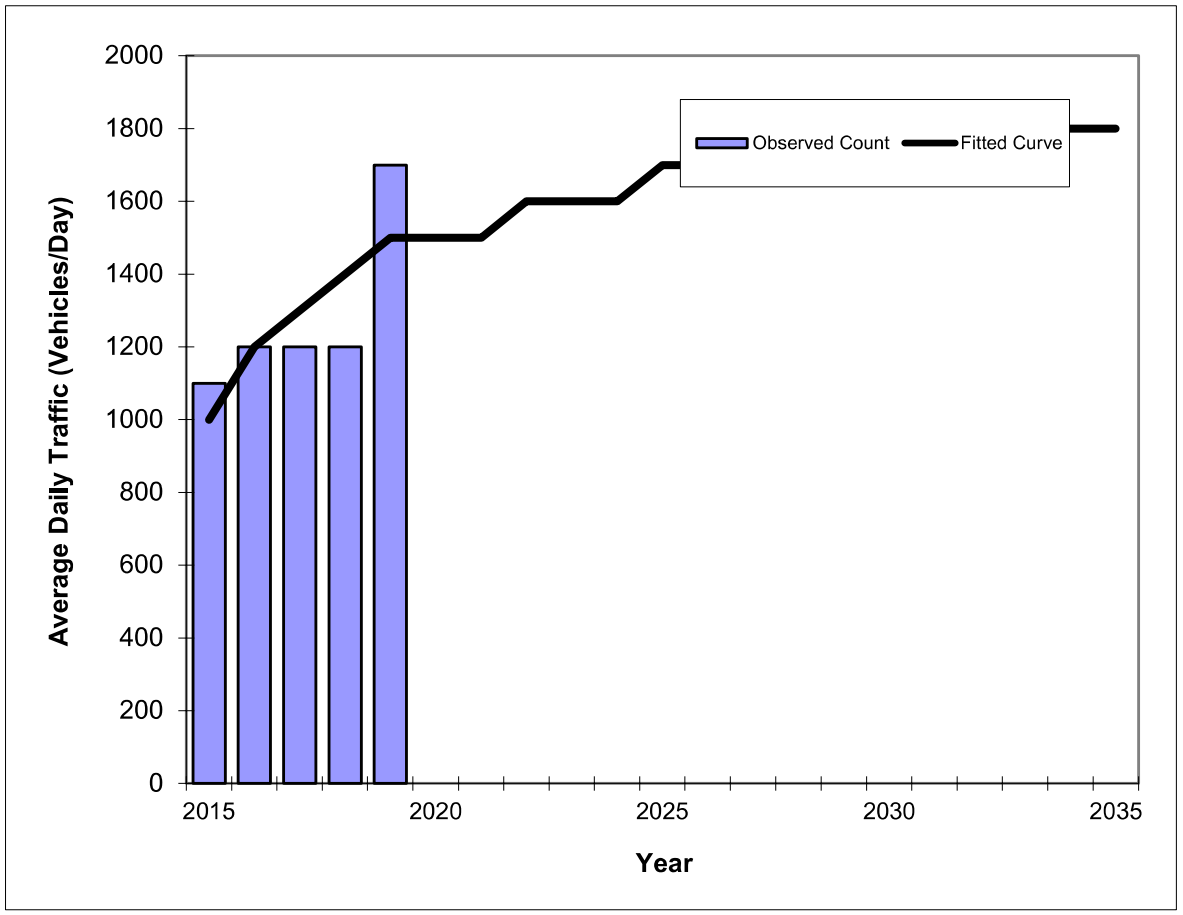
***Axle-Adjusted**

Traffic Trends - V03.a

I-4 -- Orange Camp WB Off Ramp

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	I-4



Year	Traffic (ADT/AADT) Count*	Trend**
2015	1100	1000
2016	1200	1200
2017	1200	1300
2018	1200	1400
2019	1700	1500
2022 Opening Year Trend		
2022	N/A	1600
2024 Mid-Year Trend		
2024	N/A	1600
2027 Design Year Trend		
2027	N/A	1700
TRANPLAN Forecasts/Trends		

Trend R-squared:	48.28%
Compounded Annual Historic Growth Rate:	10.67%
Compounded Growth Rate (2019 to Design Year):	1.58%
Printed:	31-Jan-23

Decaying Exponential Growth Option

***Axle-Adjusted**

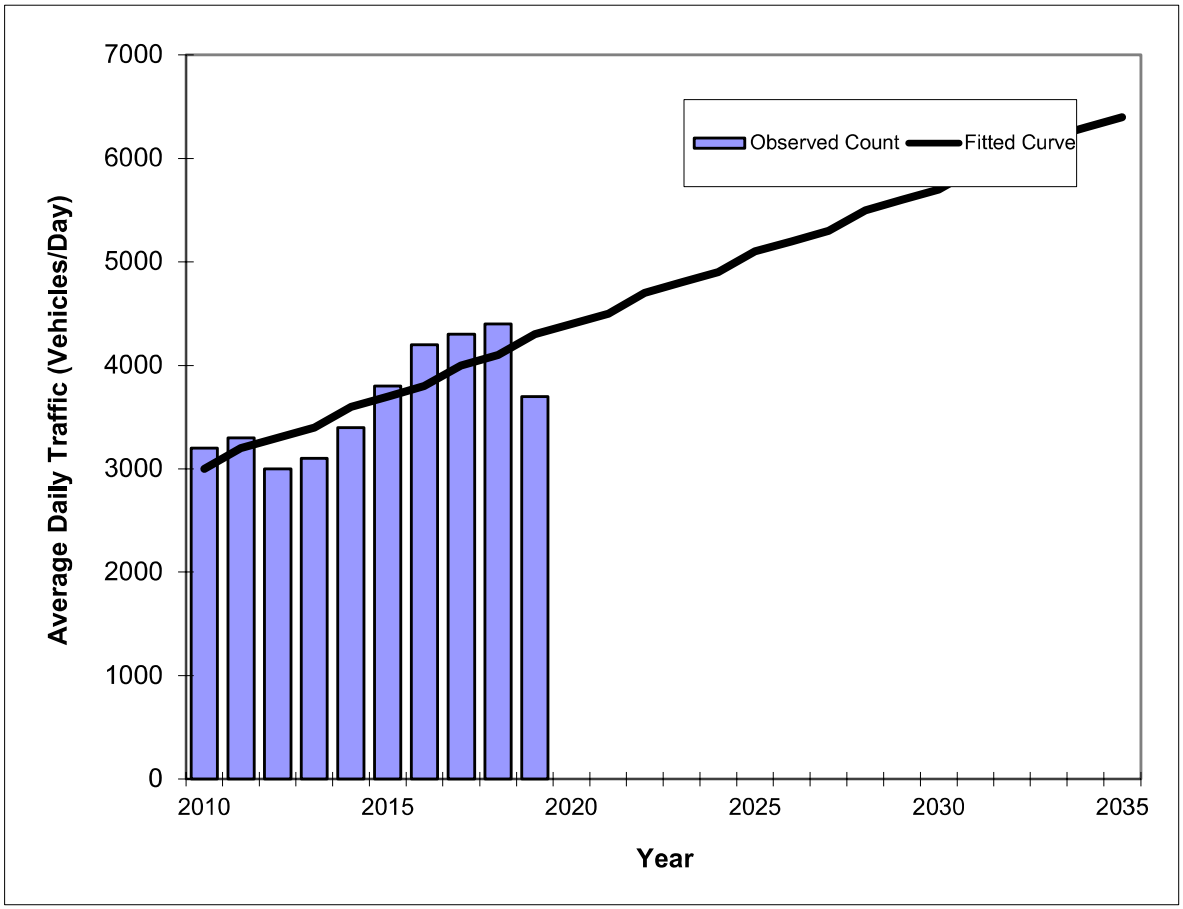
Ten Year Trends

Traffic Trends - V03.a

I-4 -- SR 472 WB Off Ramp

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	I-4



Year	Traffic (ADT/AADT) Count*	Trend**
2010	3200	3000
2011	3300	3200
2012	3000	3300
2013	3100	3400
2014	3400	3600
2015	3800	3700
2016	4200	3800
2017	4300	4000
2018	4400	4100
2019	3700	4300
2027 Opening Year Trend		
2027	N/A	5300
2033 Mid-Year Trend		
2033	N/A	6200
2034 Design Year Trend		
2034	N/A	6300
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	136
Trend R-squared:	62.73%
Trend Annual Historic Growth Rate:	4.81%
Trend Growth Rate (2019 to Design Year):	3.10%
Printed:	31-Jan-23
Straight Line Growth Option	

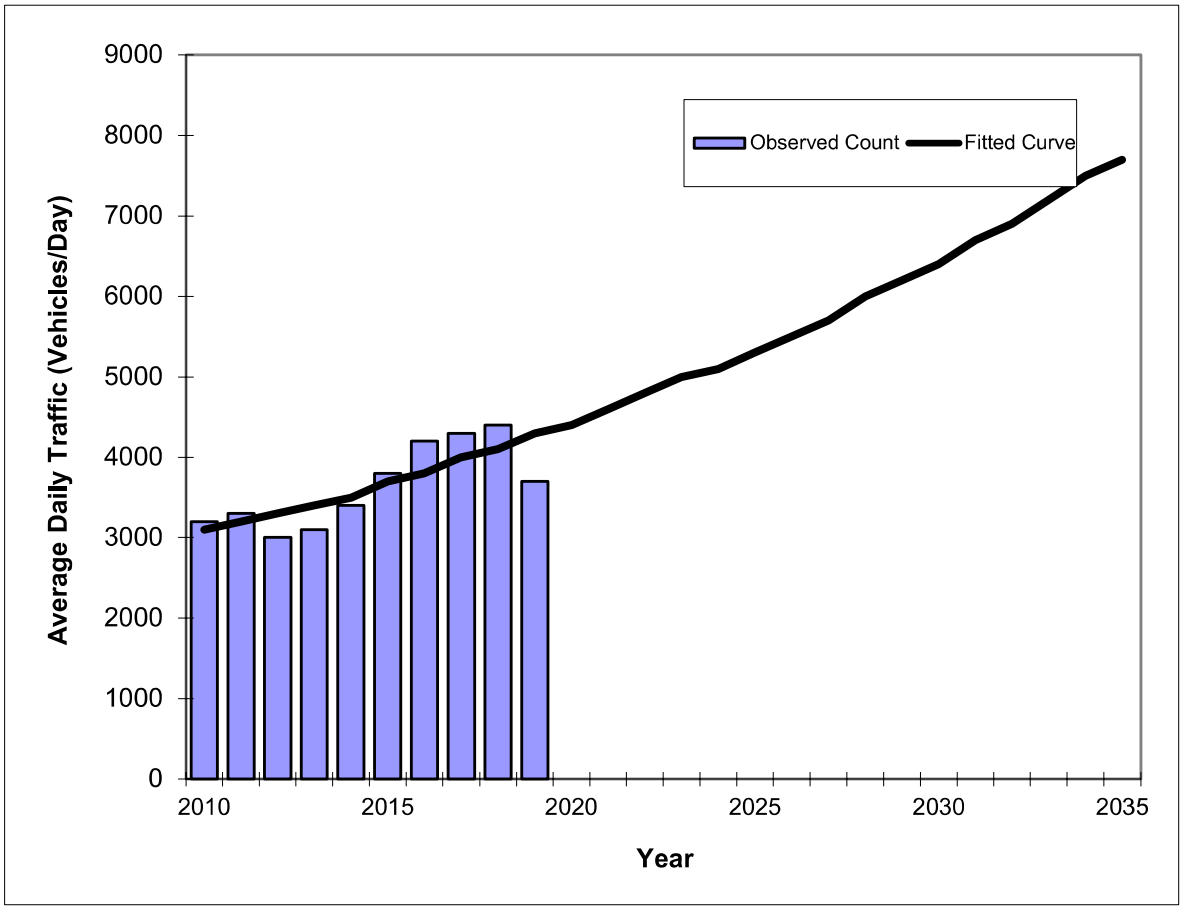
***Axle-Adjusted**

Traffic Trends - V03.a

I-4 -- SR 472 WB Off Ramp

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	I-4



Year	Traffic (ADT/AADT) Count*	Trend**
2010	3200	3100
2011	3300	3200
2012	3000	3300
2013	3100	3400
2014	3400	3500
2015	3800	3700
2016	4200	3800
2017	4300	4000
2018	4400	4100
2019	3700	4300
2027 Opening Year Trend		
2027	N/A	5700
2033 Mid-Year Trend		
2033	N/A	7200
2034 Design Year Trend		
2034	N/A	7500
TRANPLAN Forecasts/Trends		

Trend R-squared:	63.68%
Compounded Annual Historic Growth Rate:	3.70%
Compounded Growth Rate (2019 to Design Year):	3.78%
Printed:	31-Jan-23

Exponential Growth Option

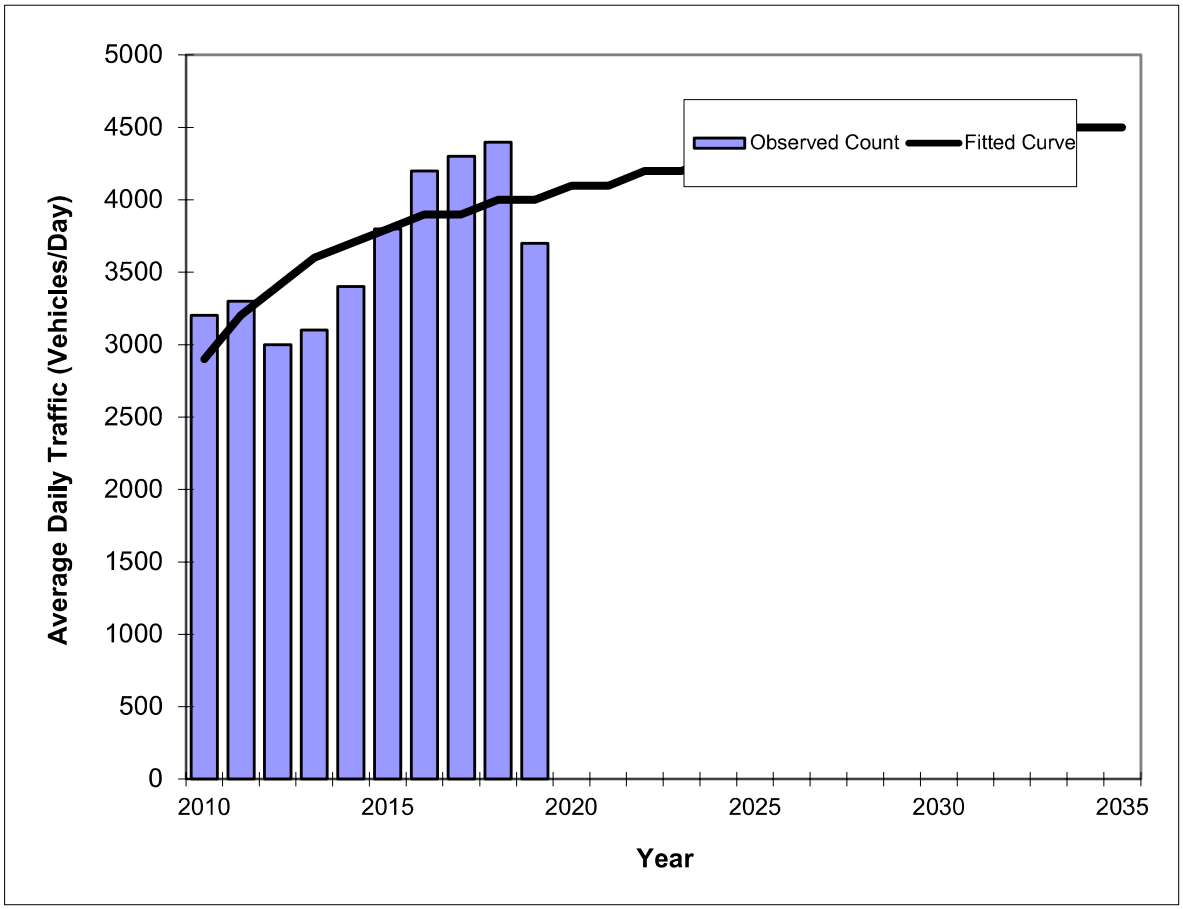
***Axle-Adjusted**

Traffic Trends - V03.a

I-4 -- SR 472 WB Off Ramp

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	I-4



Year	Traffic (ADT/AADT) Count*	Trend**
2010	3200	2900
2011	3300	3200
2012	3000	3400
2013	3100	3600
2014	3400	3700
2015	3800	3800
2016	4200	3900
2017	4300	3900
2018	4400	4000
2019	3700	4000
2027 Opening Year Trend		
2027	N/A	4300
2033 Mid-Year Trend		
2033	N/A	4500
2034 Design Year Trend		
2034	N/A	4500
TRANPLAN Forecasts/Trends		

Trend R-squared:	52.60%
Compounded Annual Historic Growth Rate:	3.64%
Compounded Growth Rate (2019 to Design Year):	0.79%
Printed:	31-Jan-23

Decaying Exponential Growth Option

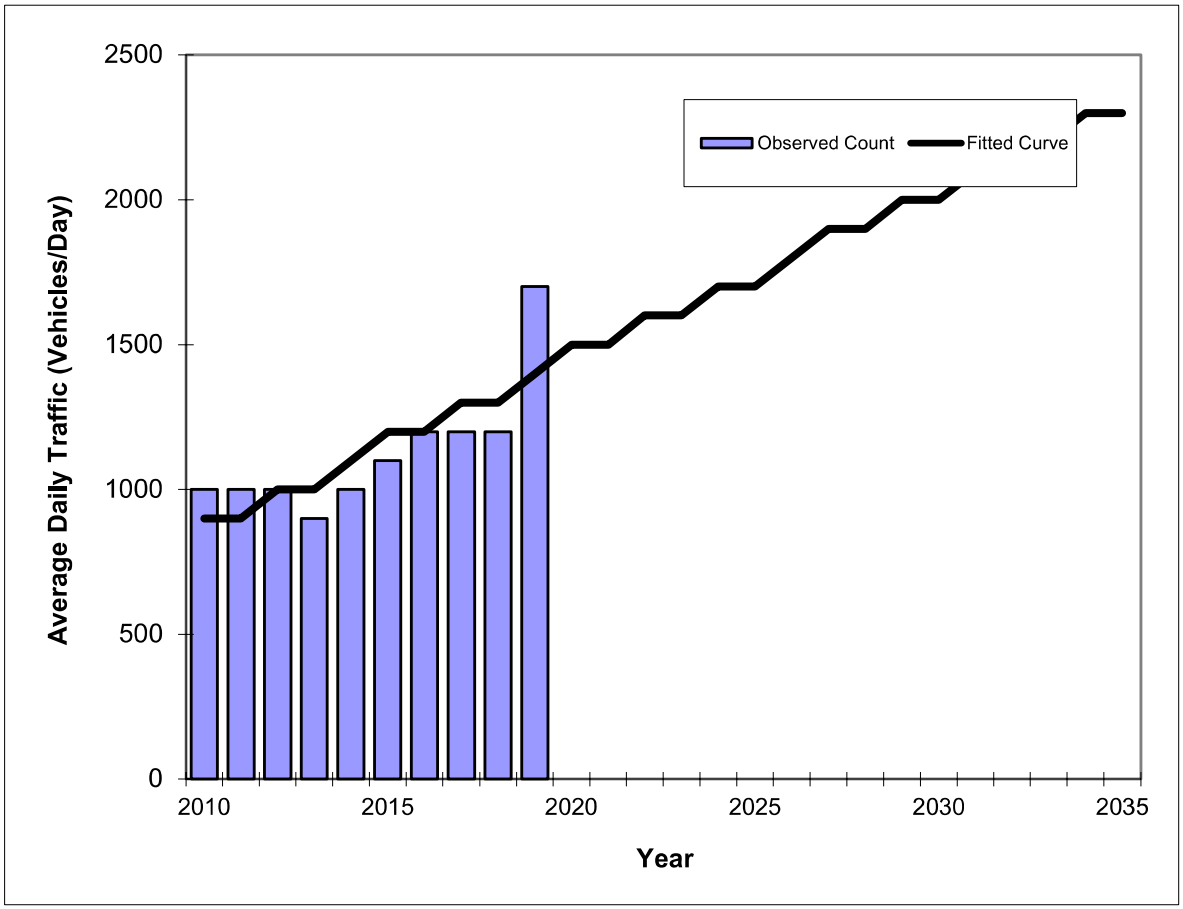
***Axle-Adjusted**

Traffic Trends - V03.a

I-4 -- Orange Camp WB Off Ramp

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	I-4



Year	Traffic (ADT/AADT) Count*	Trend**
2010	1000	900
2011	1000	900
2012	1000	1000
2013	900	1000
2014	1000	1100
2015	1100	1200
2016	1200	1200
2017	1200	1300
2018	1200	1300
2019	1700	1400
2027 Opening Year Trend		
2027	N/A	1900
2033 Mid-Year Trend		
2033	N/A	2200
2034 Design Year Trend		
2034	N/A	2300
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	59
Trend R-squared:	61.85%
Trend Annual Historic Growth Rate:	6.17%
Trend Growth Rate (2019 to Design Year):	4.29%
Printed:	31-Jan-23

Straight Line Growth Option

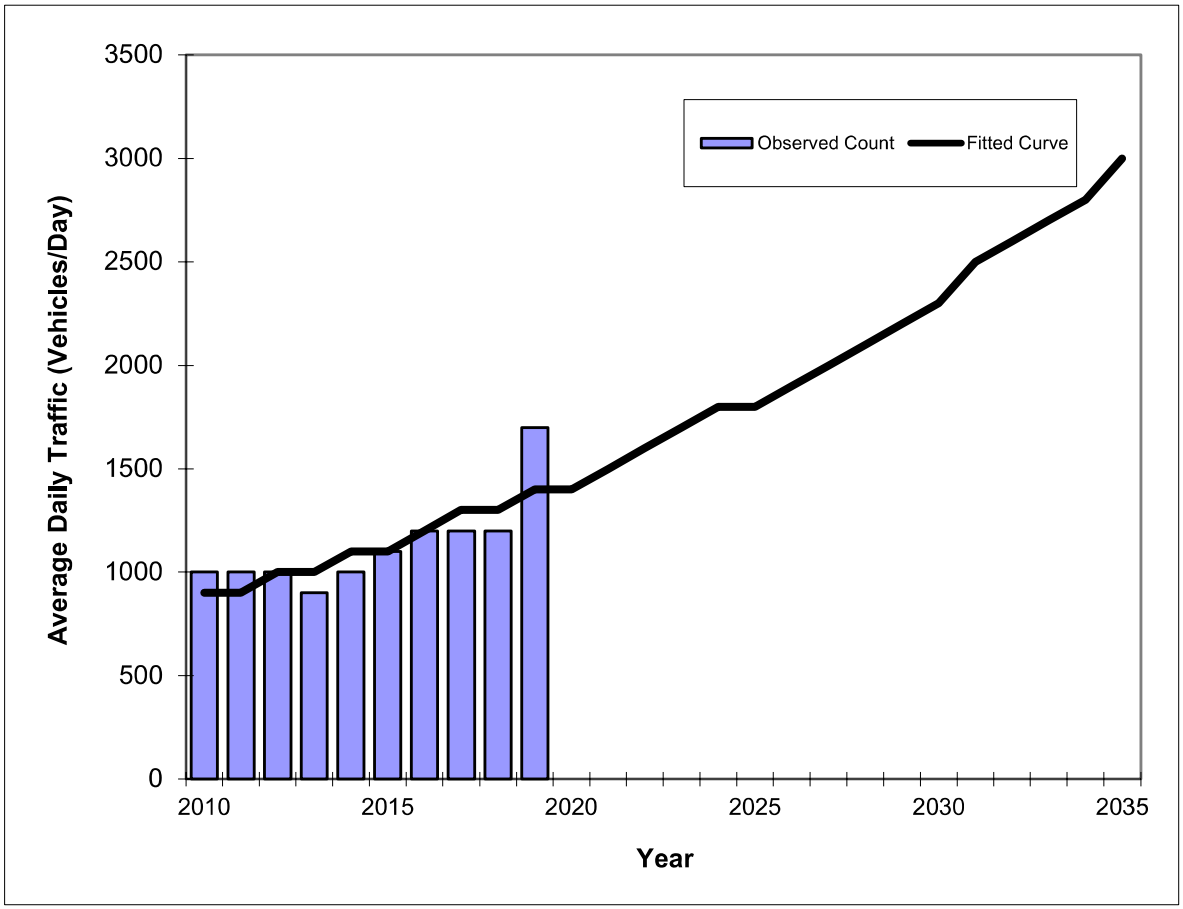
***Axle-Adjusted**

Traffic Trends - V03.a

I-4 -- Orange Camp WB Off Ramp

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	I-4



Year	Traffic (ADT/AADT) Count*	Trend**
2010	1000	900
2011	1000	900
2012	1000	1000
2013	900	1000
2014	1000	1100
2015	1100	1100
2016	1200	1200
2017	1200	1300
2018	1200	1300
2019	1700	1400
2027 Opening Year Trend		
2027	N/A	2000
2033 Mid-Year Trend		
2033	N/A	2700
2034 Design Year Trend		
2034	N/A	2800
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

Trend R-squared:	66.14%
Compounded Annual Historic Growth Rate:	5.03%
Compounded Growth Rate (2019 to Design Year):	4.73%
Printed:	31-Jan-23

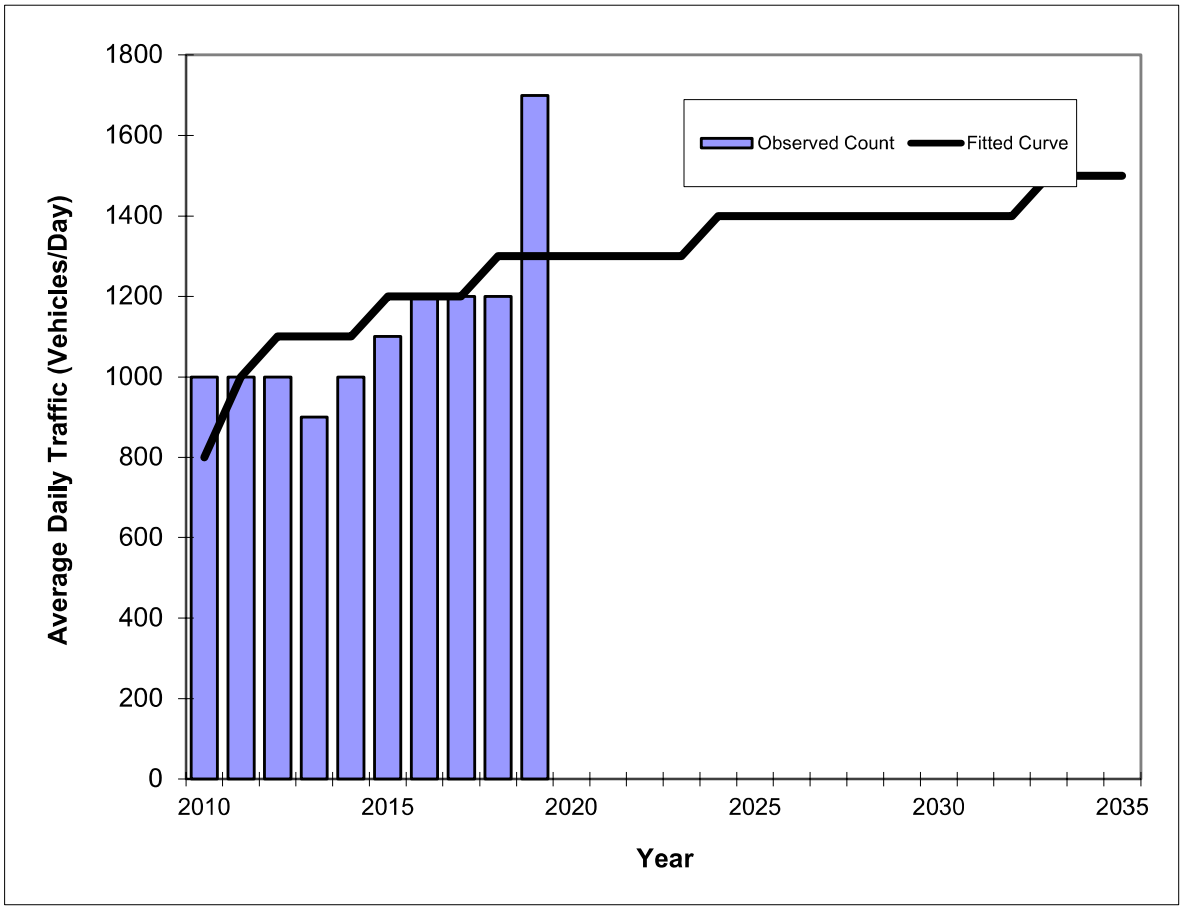
Exponential Growth Option

Traffic Trends - V03.a

I-4 -- Orange Camp WB Off Ramp

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	I-4



Year	Traffic (ADT/AADT) Count*	Trend**
2010	1000	800
2011	1000	1000
2012	1000	1100
2013	900	1100
2014	1000	1100
2015	1100	1200
2016	1200	1200
2017	1200	1200
2018	1200	1300
2019	1700	1300
2027 Opening Year Trend		
2027	N/A	1400
2033 Mid-Year Trend		
2033	N/A	1500
2034 Design Year Trend		
2034	N/A	1500
TRANPLAN Forecasts/Trends		

Trend R-squared:	39.07%
Compounded Annual Historic Growth Rate:	5.54%
Compounded Growth Rate (2019 to Design Year):	0.96%
Printed:	31-Jan-23

Decaying Exponential Growth Option

***Axle-Adjusted**

Taylor Road

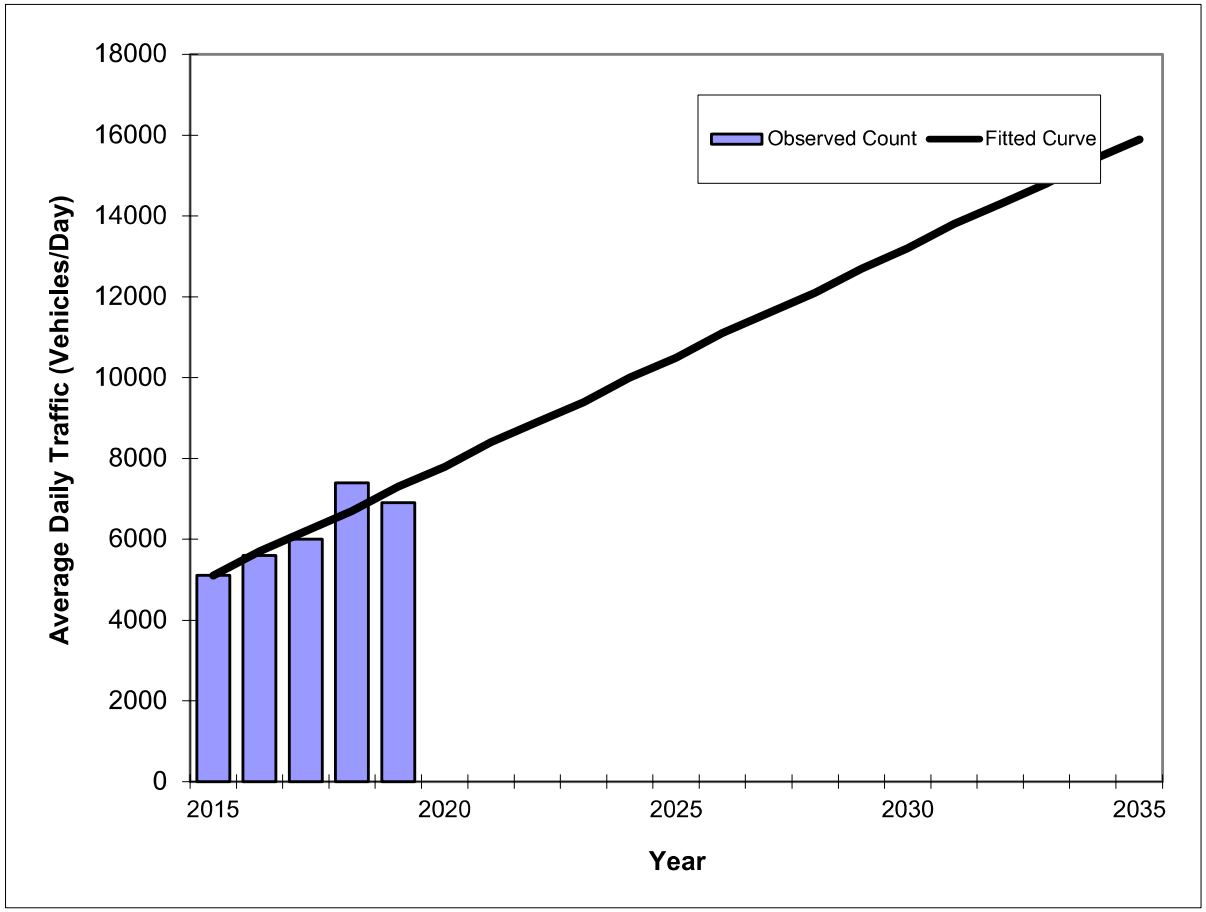
Five Year Trends

Traffic Trends - V03.a

TAYLOR RD -- Blue Lake Ave to MLK Blty

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	TAYLOR RD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	5100	5100
2016	5600	5700
2017	6000	6200
2018	7400	6700
2019	6900	7300
2027 Opening Year Trend		
2027	N/A	11600
2033 Mid-Year Trend		
2033	N/A	14800
2034 Design Year Trend		
2034	N/A	15400
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	540
Trend R-squared:	82.37%
Trend Annual Historic Growth Rate:	10.78%
Trend Growth Rate (2019 to Design Year):	7.40%
Printed:	25-Jan-23

Straight Line Growth Option

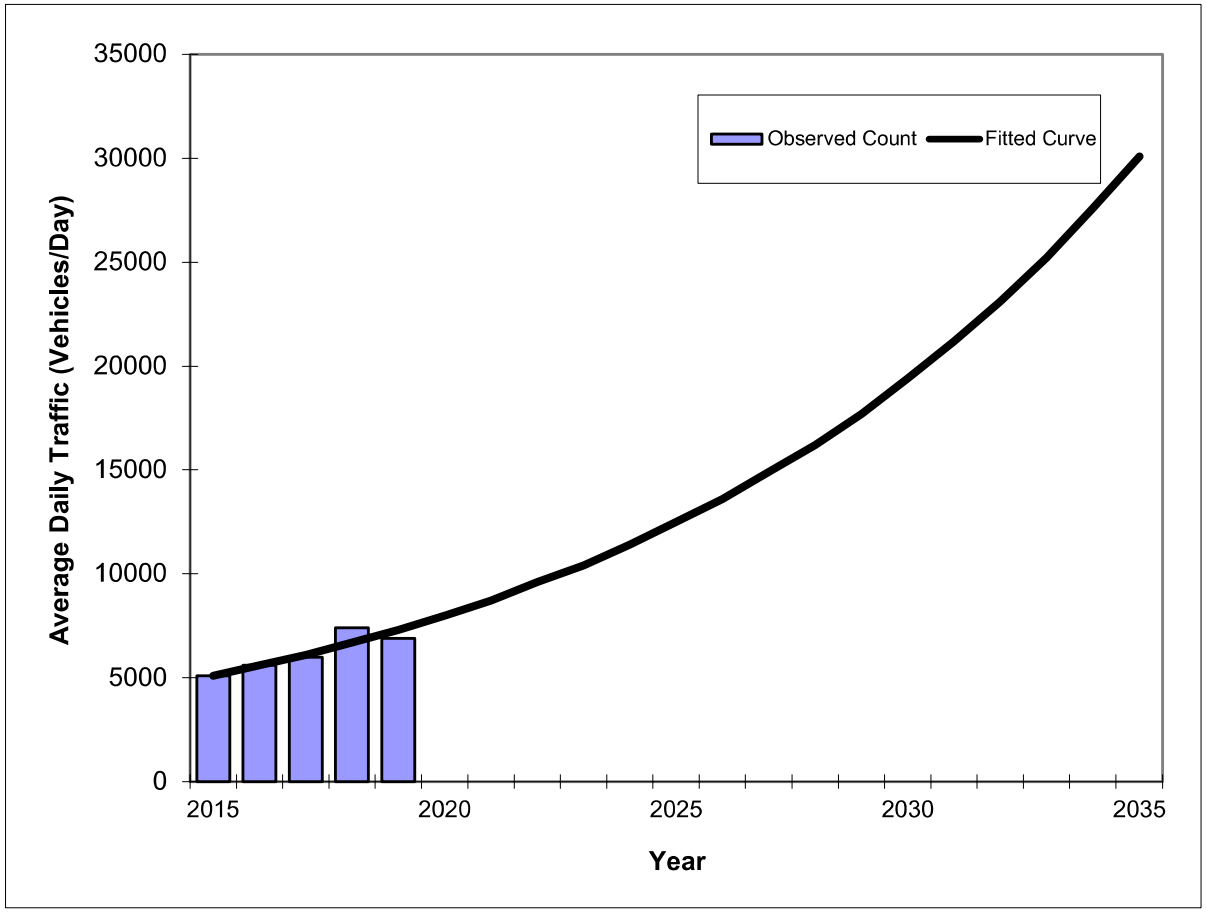
***Axle-Adjusted**

Traffic Trends - V03.a

TAYLOR RD -- Blue Lake Ave to MLK Blty

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	TAYLOR RD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	5100	5100
2016	5600	5600
2017	6000	6100
2018	7400	6700
2019	6900	7300
2027 Opening Year Trend		
2027	N/A	14900
2033 Mid-Year Trend		
2033	N/A	25200
2034 Design Year Trend		
2034	N/A	27600
TRANPLAN Forecasts/Trends		

Trend R-squared:	84.89%
Compounded Annual Historic Growth Rate:	9.38%
Compounded Growth Rate (2019 to Design Year):	9.27%
Printed:	25-Jan-23

Exponential Growth Option

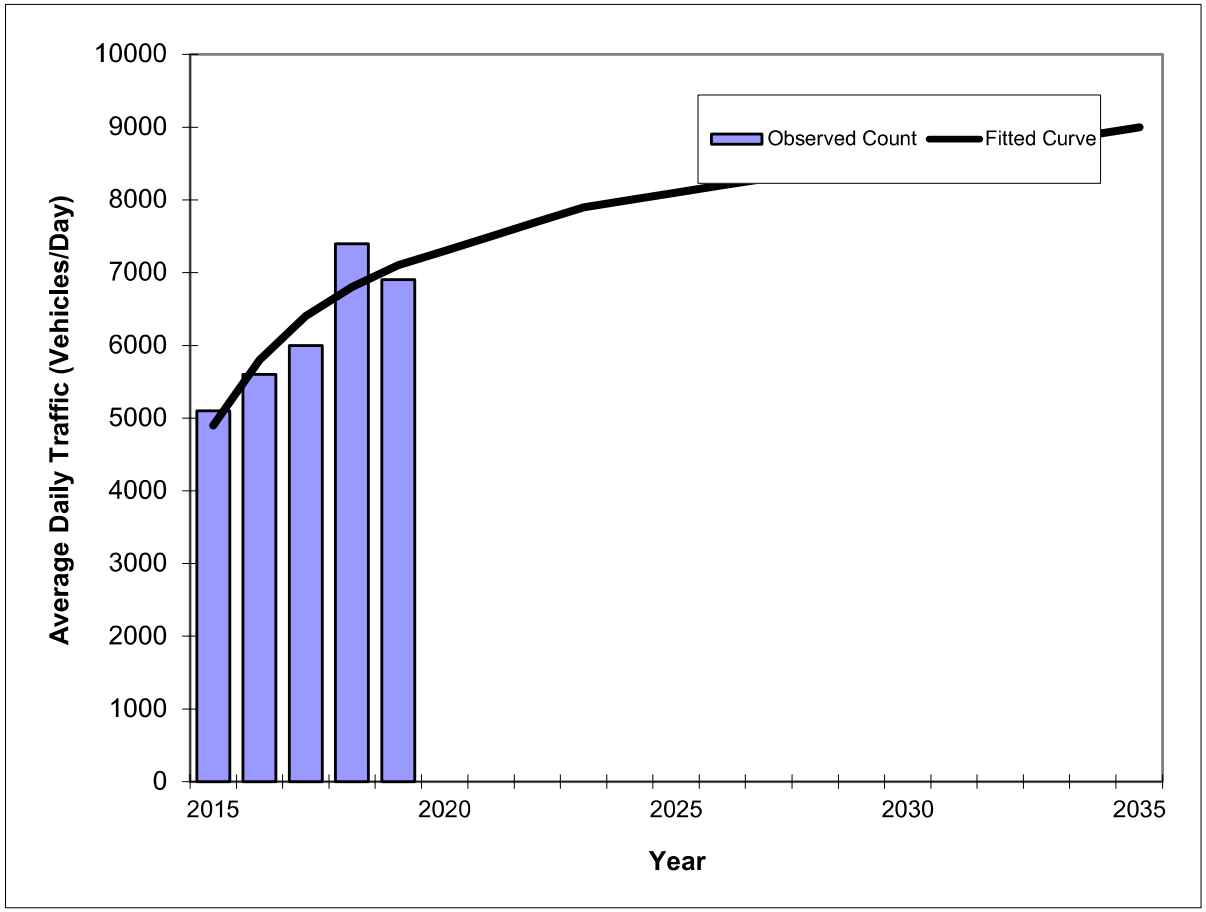
***Axle-Adjusted**

Traffic Trends - V03.a

TAYLOR RD -- Blue Lake Ave to MLK Blty

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	TAYLOR RD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	5100	4900
2016	5600	5800
2017	6000	6400
2018	7400	6800
2019	6900	7100
2027 Opening Year Trend		
2027	N/A	8300
2033 Mid-Year Trend		
2033	N/A	8800
2034 Design Year Trend		
2034	N/A	8900
TRANPLAN Forecasts/Trends		

Trend R-squared:	81.17%
Compounded Annual Historic Growth Rate:	9.71%
Compounded Growth Rate (2019 to Design Year):	1.52%
Printed:	25-Jan-23

Decaying Exponential Growth Option

***Axle-Adjusted**

Rhode Island Avenue

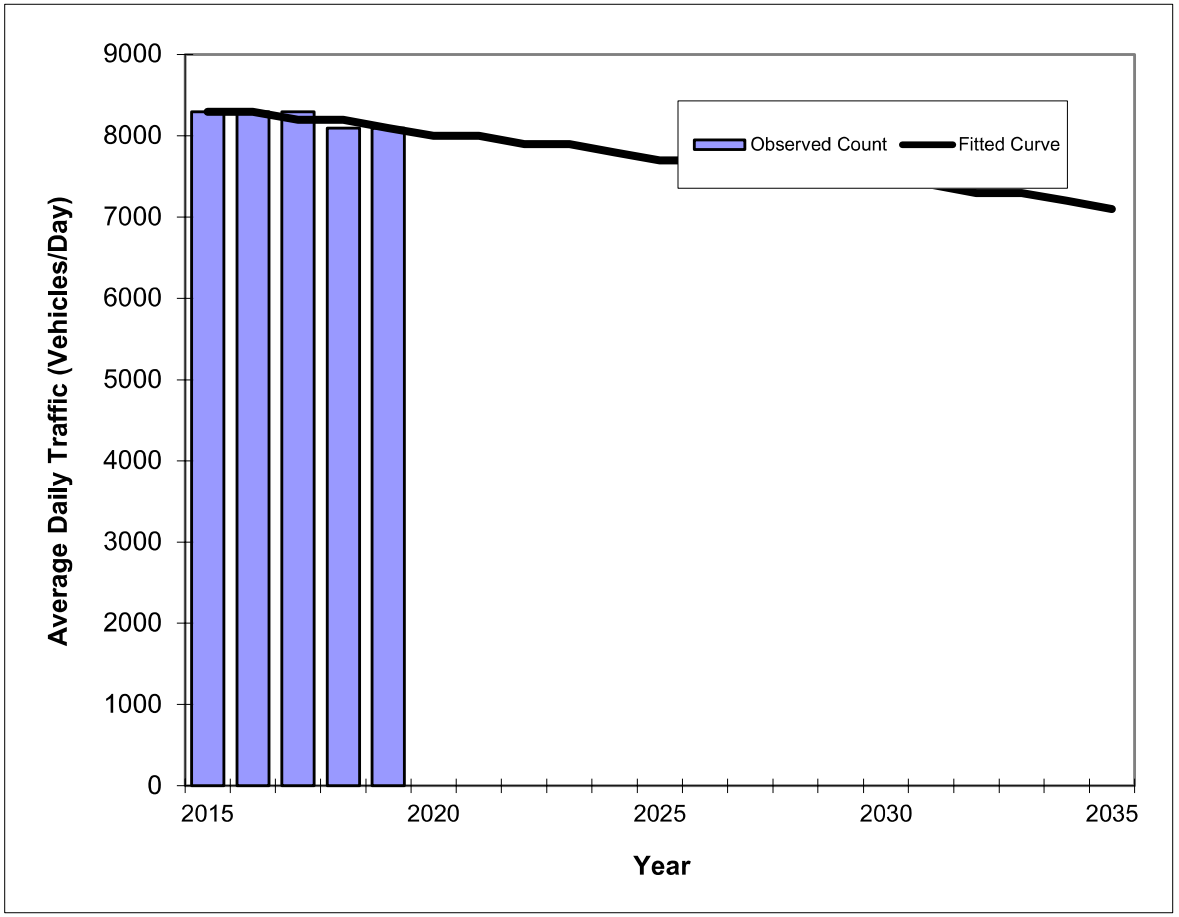
Five Year Trends

Traffic Trends - V03.a

RHODE ISLAND AVE -- US 17/92 to Veterans Pkwy.

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	RHODE ISLAND AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2015	8300	8300
2016	8300	8300
2017	8300	8200
2018	8100	8200
2019	8100	8100
2022 Opening Year Trend		
2022	N/A	7900
2024 Mid-Year Trend		
2024	N/A	7800
2027 Design Year Trend		
2027	N/A	7600
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	-60
Trend R-squared:	75.00%
Trend Annual Historic Growth Rate:	-0.60%
Trend Growth Rate (2019 to Design Year):	-0.77%
Printed:	7-Feb-23
Straight Line Growth Option	

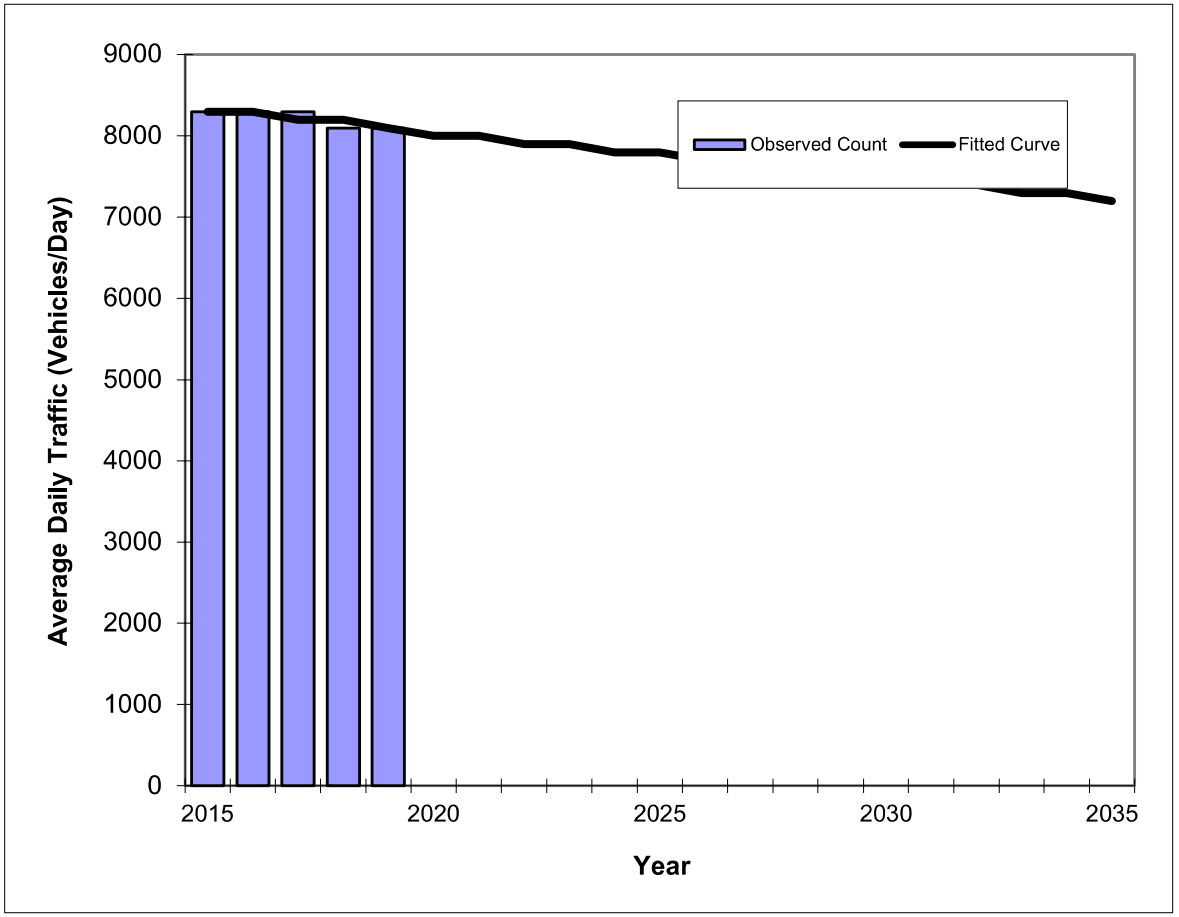
***Axle-Adjusted**

Traffic Trends - V03.a

RHODE ISLAND AVE -- US 17/92 to Veterans Pkwy.

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	RHODE ISLAND AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2015	8300	8300
2016	8300	8300
2017	8300	8200
2018	8100	8200
2019	8100	8100
2022 Opening Year Trend		
2022	N/A	7900
2024 Mid-Year Trend		
2024	N/A	7800
2027 Design Year Trend		
2027	N/A	7600
TRANPLAN Forecasts/Trends		

Trend R-squared:	75.00%
Compounded Annual Historic Growth Rate:	-0.61%
Compounded Growth Rate (2019 to Design Year):	-0.79%
Printed:	7-Feb-23

Exponential Growth Option

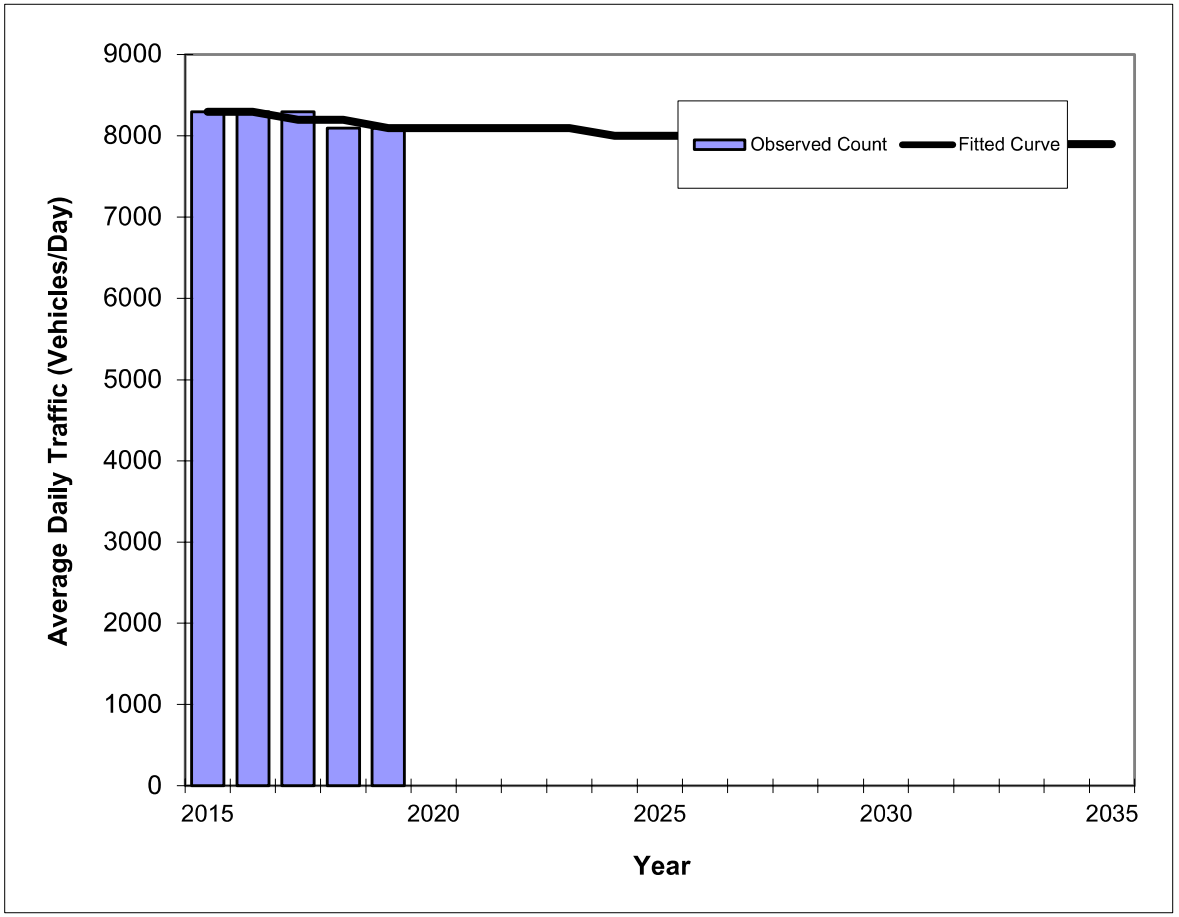
***Axle-Adjusted**

Traffic Trends - V03.a

RHODE ISLAND AVE -- US 17/92 to Veterans Pkwy.

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	RHODE ISLAND AVE



Year	Traffic (ADT/AADT) Count*	Trend**
2015	8300	8300
2016	8300	8300
2017	8300	8200
2018	8100	8200
2019	8100	8100
2022 Opening Year Trend		
2022	N/A	8100
2024 Mid-Year Trend		
2024	N/A	8000
2027 Design Year Trend		
2027	N/A	8000
TRANPLAN Forecasts/Trends		

Trend R-squared:	60.25%
Compounded Annual Historic Growth Rate:	-0.61%
Compounded Growth Rate (2019 to Design Year):	-0.16%
Printed:	7-Feb-23

Decaying Exponential Growth Option

***Axle-Adjusted**

Normandy Boulevard

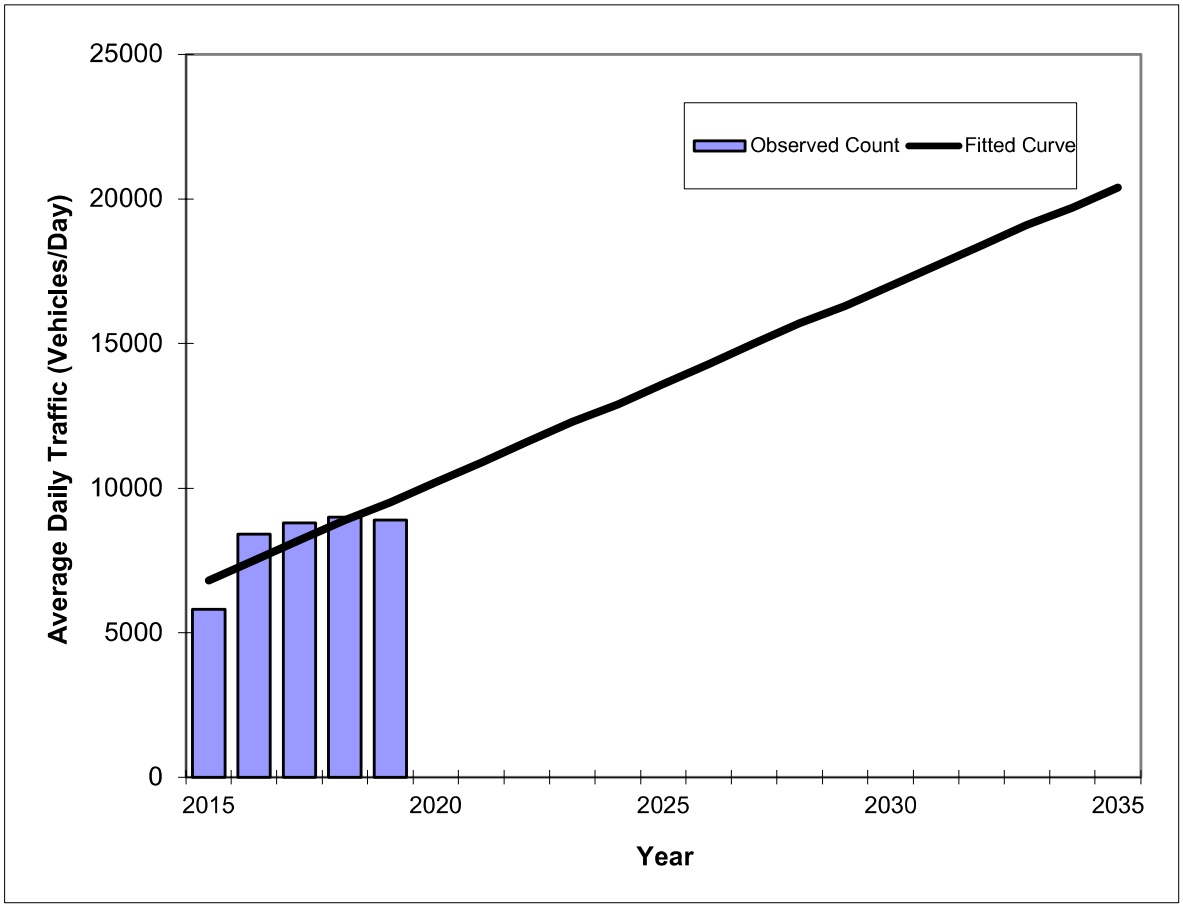
Five Year Trends

Traffic Trends - V03.a

NORMANDY BOULEVARD -- Graves Ave to Rhode Island Ave

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	NORMANDY BOULEVARD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	5800	6800
2016	8400	7500
2017	8800	8200
2018	9000	8900
2019	8900	9500
2027 Opening Year Trend		
2027	N/A	15000
2033 Mid-Year Trend		
2033	N/A	19100
2034 Design Year Trend		
2034	N/A	19700
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	680
Trend R-squared:	63.45%
Trend Annual Historic Growth Rate:	9.93%
Trend Growth Rate (2019 to Design Year):	7.16%
Printed:	18-Jan-23

Straight Line Growth Option

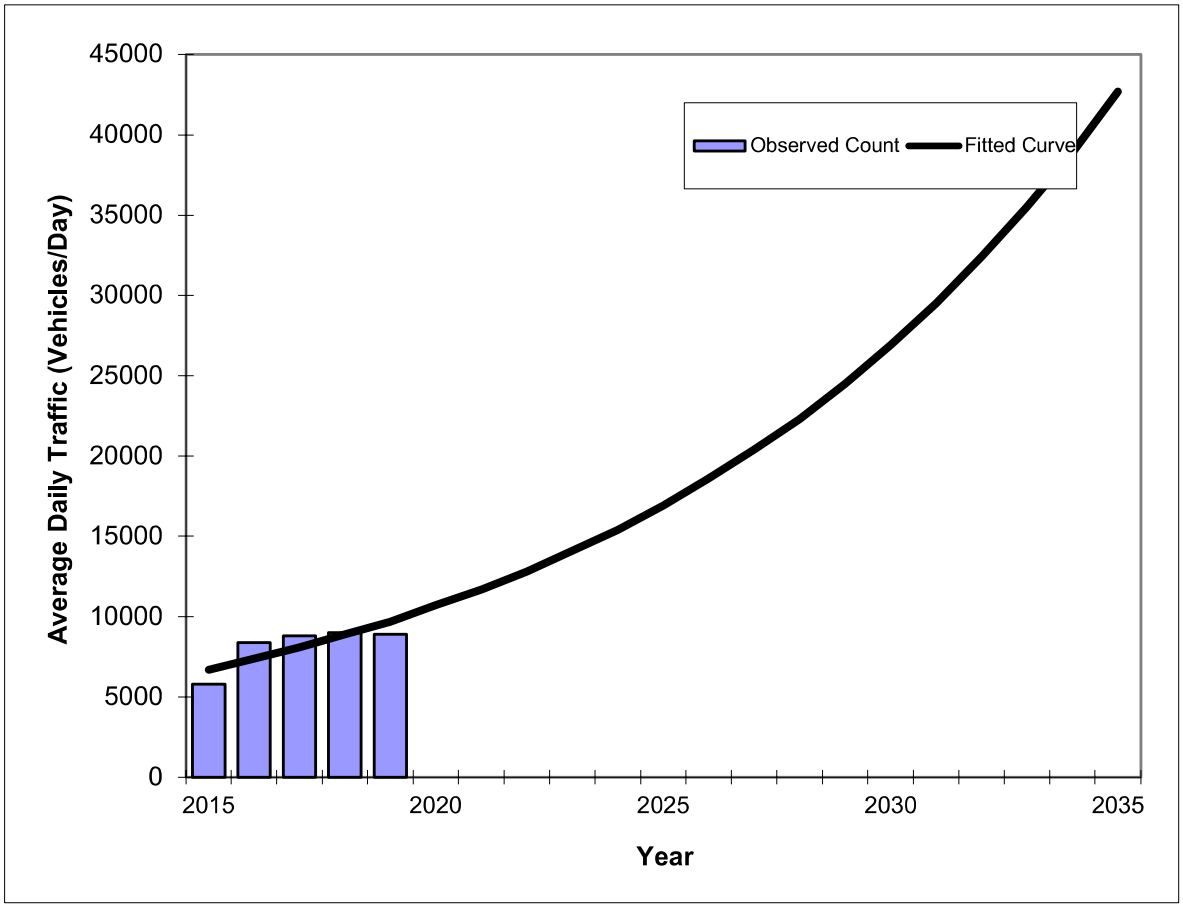
***Axle-Adjusted**

Traffic Trends - V03.a

NORMANDY BOULEVARD -- Graves Ave to Rhode Island Ave

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	NORMANDY BOULEVARD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	5800	6700
2016	8400	7400
2017	8800	8100
2018	9000	8900
2019	8900	9700
2027 Opening Year Trend		
2027	N/A	20400
2033 Mid-Year Trend		
2033	N/A	35500
2034 Design Year Trend		
2034	N/A	38900
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

Trend R-squared:	61.31%
Compounded Annual Historic Growth Rate:	9.69%
Compounded Growth Rate (2019 to Design Year):	9.70%
Printed:	18-Jan-23

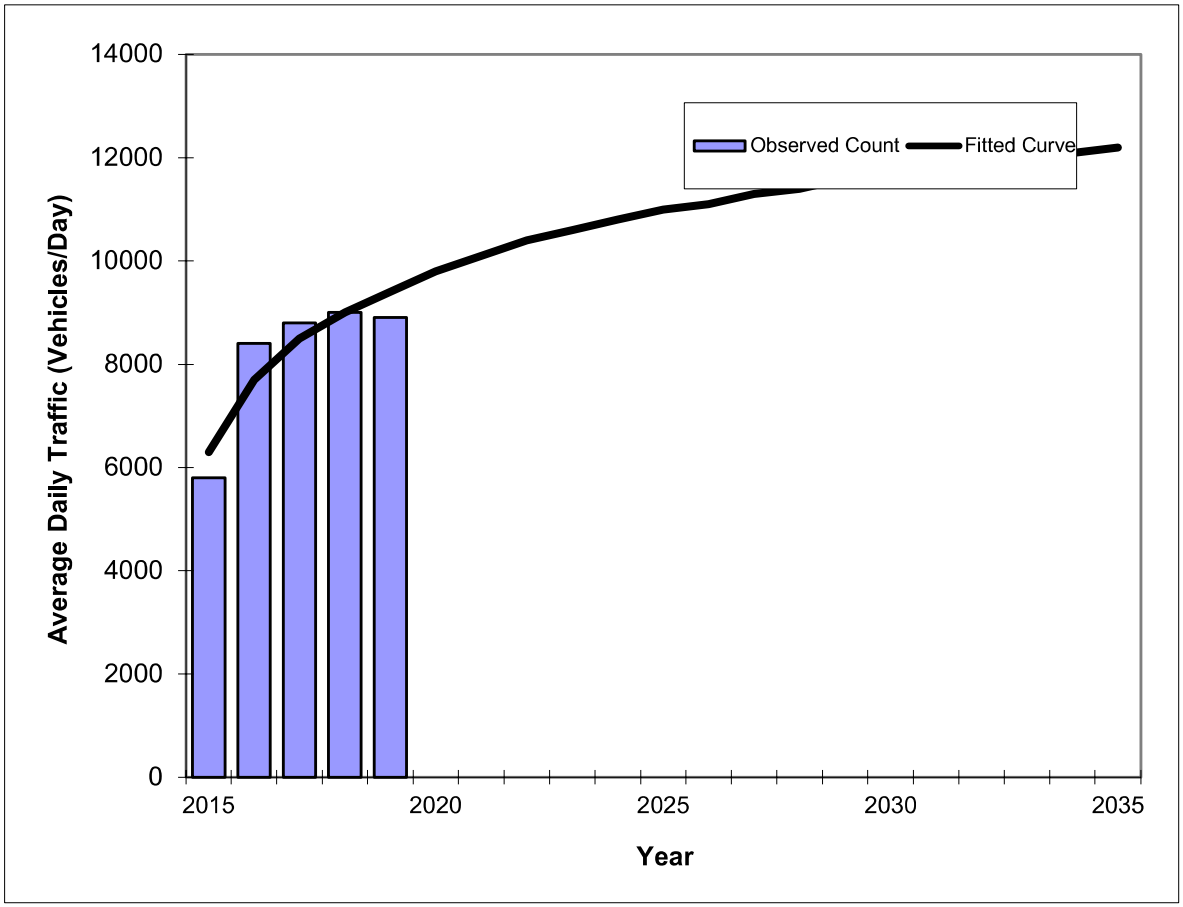
Exponential Growth Option

Traffic Trends - V03.a

NORMANDY BOULEVARD -- Graves Ave to Rhode Island Ave

FIN#	0
Location	1

County:	Volusia (79)
Station #:	0
Highway:	NORMANDY BOULEVARD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	5800	6300
2016	8400	7700
2017	8800	8500
2018	9000	9000
2019	8900	9400
2027 Opening Year Trend		
2027	N/A	11300
2033 Mid-Year Trend		
2033	N/A	12000
2034 Design Year Trend		
2034	N/A	12100
TRANPLAN Forecasts/Trends		

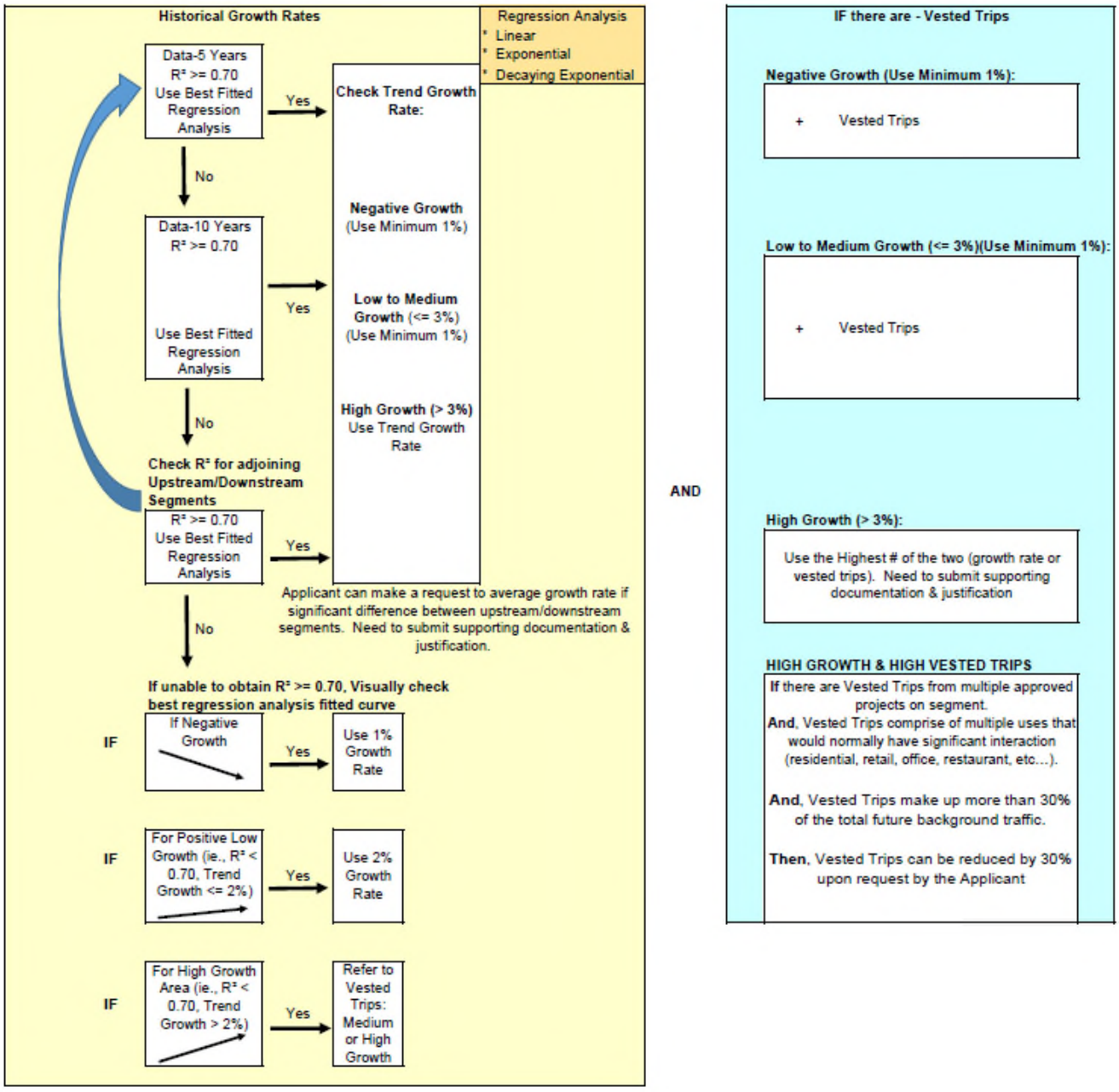
Trend R-squared:	83.17%
Compounded Annual Historic Growth Rate:	10.52%
Compounded Growth Rate (2019 to Design Year):	1.70%
Printed:	18-Jan-23

Decaying Exponential Growth Option

***Axle-Adjusted**

Volusia County Growth Rate Policy

Volusia County's Segment Growth Rates and Vested Trips Instructions Policy



Signed: _____ Date: _____

Jon E. Cheney, P.E.

July 2022 Update: Volusia County is no longer accepting exponential regression due to concerns regarding high numbers of vested trips and exponential trends potentially over-estimate future traffic. Decaying exponential and linear are still permitted. The County may consider an exception to allow exponential regression depending on a unique situation presented by the developer.

Historical Growth Rate Selection Summary

		5 Year TRENDs (2015-19)						10 Year TRENDs (2010-19)									
Roadway	Segment	Lin R^2	Lin Hist GR	Exp R^2	Exp Hist GR	Dec Exp R^2	Dec Exp Hist GR	Lin R^2	Lin Hist GR	Exp R^2	Exp Hist GR	Dec Exp R^2	Dec Exp Hist GR	Growth Rate Selection	Growth Rate Type	Growth Rate Method	Reason
	SR 472 to Cassadaga Rd.	52.94%	1.38%	52.09%	1.35%	34.68%	1.16%	66.65%	2.80%	65.13%	2.53%	44.24%	2.31%	3.27%	Linear	Adjacent Segment Trend	Using the growth rate for adjacent segment on Kentucky Ave that has a R2 value>.70 for the linear 10 year growth rate.
Dr Martin Luther King Jr Beltway	Cassadaga Rd. to Orange Camp Rd.	15.81%	1.28%	14.73%	1.26%	8.70%	0.84%	65.09%	2.53%	64.55%	2.31%	45.56%	2.07%	2.53%	Linear	General Segment Trend - High	This segment and adjacent segments don't have a growth rate with a R2>.70. Using ten year linear trend for a visual trend.
	Orange Camp Rd. to Taylor Rd.	30.17%	-2.46%	31.46%	-2.56%	28.91%	-2.54%	36.55%	2.13%	37.74%	1.96%	34.87%	2.01%	2.00%	Exponential	General Segment Trend - Low	This segment and adjacent segments don't have a growth rate with a R2>.70. Using 10 year exponential for a visual trend.
	Taylor Rd. to Beresford Ave.	66.12%	-3.63%	65.63%	-3.85%	61.07%	-3.58%	6.62%	0.54%	6.27%	0.53%	8.93%	0.64%	1.00%	Linear	General Trend - Negative	This segment and adjacent segments don't have a growth rate with a R2>.70. Using 5 year linear trend as a visual trend.
Kentucky Avenue	Graves Ave. to SR 472	45.00%	0.96%	44.86%	0.95%	38.00%	0.71%	80.09%	3.27%	78.31%	3.01%	66.52%	3.03%	3.27%	Linear	10 Year Segment Trend	10 year linear growth rate meets criteria.
Veteran's Memorial Par	Rhode Island Ave. to Graves Ave.	32.96%	-4.19%	31.01%	-4.34%	50.42%	-5.29%	10.43%	1.23%	10.87%	1.11%	21.36%	1.74%	4.91%	Linear	Adjacent Segment Trend	Using the adjacent segment on Veteran's Memorial Pkwy that has a R2 value>.70 for the linear 10 year growth rate.
Cassadaga Road	Dr. Martin Luther King Jr Bltwy. to Macy Ave.	0.00%	0.00%	0.00%	0.00%	0.95%	0.00%	36.86%	1.67%	36.19%	1.57%	27.29%	1.57%	2.00%	Linear	General Segment Trend - Low	This segment and adjacent segments don't have a growth rate with a R2>.70. Using 10 year linear as a visual trend.
Orange Camp Road	Blue Lake Ave. to Dr Martin Luther King Jr Bltwy.	96.17%	5.82%	96.53%	5.37%	87.61%	5.27%	-	-	-	-	-	-	5.37%	Exponential	5 Year Segment Trend	Five year exponential growth rate meets criteria.
Graves Avenue	Veteran's Memorial Pkwy. to Kentucky Ave.	71.51%	3.53%	72.73%	3.22%	54.69%	2.86%	-	-	-	-	-	-	3.22%	Exponential	5 Year Segment Trend	Five year exponential growth rate meets criteria.
	I-4/SR 472 to Wolf Pack Rn.	0.00%	0.00%	0.02%	0.07%	0.01%	0.00%	53.33%	3.05%	53.41%	2.69%	41.38%	2.62%	1.00%	Decaying Exponential	Adjacent Segment Trend	Using the adjacent segment on SR 472 that has a R2 value>.70 for the decaying exponential 5 year growth rate.
	Wolf Pack Rn. to Catalina Blvd.	3.28%	-0.24%	3.21%	-0.24%	9.47%	-0.49%	53.89%	1.87%	52.63%	1.74%	40.86%	1.62%	2.00%	Linear	General Segment Trend - Low	This segment and adjacent segments don't have a growth rate with a R2>.70. Using 10 year linear as a visual trend.
Howland Boulevard	Catalina Blvd. to Providence Blvd.	2.50%	-0.41%	2.68%	-0.42%	0.13%	0.00%	49.22%	1.68%	48.82%	1.57%	43.08%	1.56%	2.00%	Linear	General Segment Trend - Low	This segment and adjacent segments don't have a growth rate with a R2>.70. Using 10 year linear as a visual trend.
	US 17/92 to Martin Luther King Jr Bltwy.	83.05%	7.59%	83.79%	6.73%	71.98%	6.59%	-	-	-	-	-	-	6.73%	Exponential	5 Year Segment Trend	Five year exponential growth rate meets criteria.
SR 472	Martin Luther King Jr Bltwy. to I-4	54.87%	2.36%	54.93%	2.28%	76.03%	2.66%	-	-	-	-	-	-	1.00%	Decaying Exponential	5 Year Segment Trend	Five year decaying exponential growth rate meets criteria.
Macy Avenue	Ohio St. to Cassadaga Rd.	0.00%	0.00%	0.09%	0.00%	1.43%	1.74%	25.35%	1.85%	24.41%	1.73%	11.86%	1.73%	2.00%	Linear	General Segment Trend - Low	This segment and adjacent segments don't have a growth rate with a R2>.70. Using 10 year linear as a visual trend.
Kicklighter Road	Macy Ave. to Lake Helen-Osteen Rd./Prevatt Ave.	69.57%	3.95%	69.58%	3.73%	85.54%	5.14%	-	-	-	-	-	-	5.14%	Decaying Exponential	5 Year Segment Trend	Five year decaying exponential growth rate meets criteria.
Normandy Blvd.	Graves Ave. to Rhode Island Ave.	63.45%	9.93%	61.31%	9.69%	83.17%	10.52%	53.25%	6.15%	49.03%	4.81%	29.30%	4.25%	10.52%	Decaying Exponential	5 Year Segment Trend	Five year decaying exponential growth rate meets criteria.

Appendix I:
Vested Trip Information

BTR DeLand

Traffic & Mobility Consultants

MEMORANDUM

September 7, 2022

Re: TM BTR Deland
Traffic Impact Analysis Methodology
City of Deland, Volusia County, Florida
Project № 22012

This is an outline of the methodology for the Traffic Impact Analysis (TIA) for the above referenced project. In general, the TIA will conform to the methodology requirements and guidelines documented by the River to Sea Transportation Planning Organization (R2CTPO).

Project Description

The proposed development consists of 233 single-family attached units (horizontal apartments) with anticipated buildout year 2025. The site consists of parcel 810600000124, located on the southeast corner of the intersection of Cassadega Road and Dr. Martin Luther King Jr Beltway, in the City of Deland, Florida, as shown in **Figure 1.** The proposed development will be accessed via two (2) access driveways; one (1) on Cassadega Road and one (1) connecting to Dr. Martin Luther King Jr Beltway. A copy of the development plan is provided in the **Attachments.**

Trip Generation

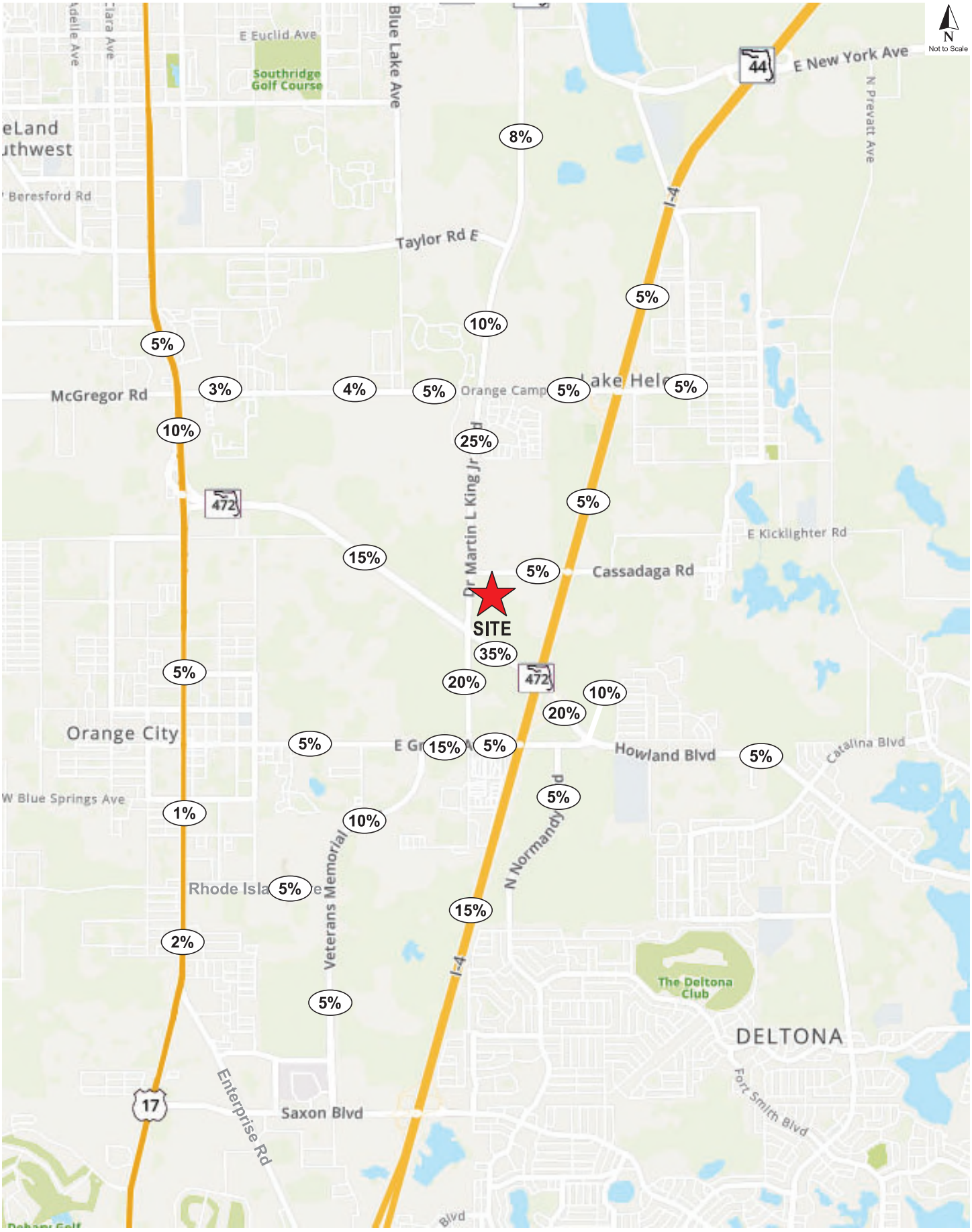
The trip generation analysis for the proposed development was conducted using the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, *11th Edition*. The trip generation calculation for the project is summarized in **Table 1.** Detailed trip generation sheets are provided in the **Attachments.**

Table 1
Trip Generation Calculation

ITE Code	Land Use	Size	Daily		AM Peak Hour				PM Peak Hour			
			Rate	Trips	Rate	Total	Enter	Exit	Rate	Total	Enter	Exit
220	Multifamily Residential	233 DU	6.73	1,569	0.41	95	23	72	0.52	121	76	45

Trip Generation analysis based on ITE Trip Generation Manual, 11th Edition.

The proposed development is projected to generate 1,569 new daily trips of which 95 trips occur during the AM peak hour and 121 trips occur during the PM peak hour. Per the R2CTPO traffic study guidelines, the proposed development is anticipated to generate more than 1,000 daily new trips; therefore, requires a TIA.



Project Trip Distribution
TM BTR Deland
22012

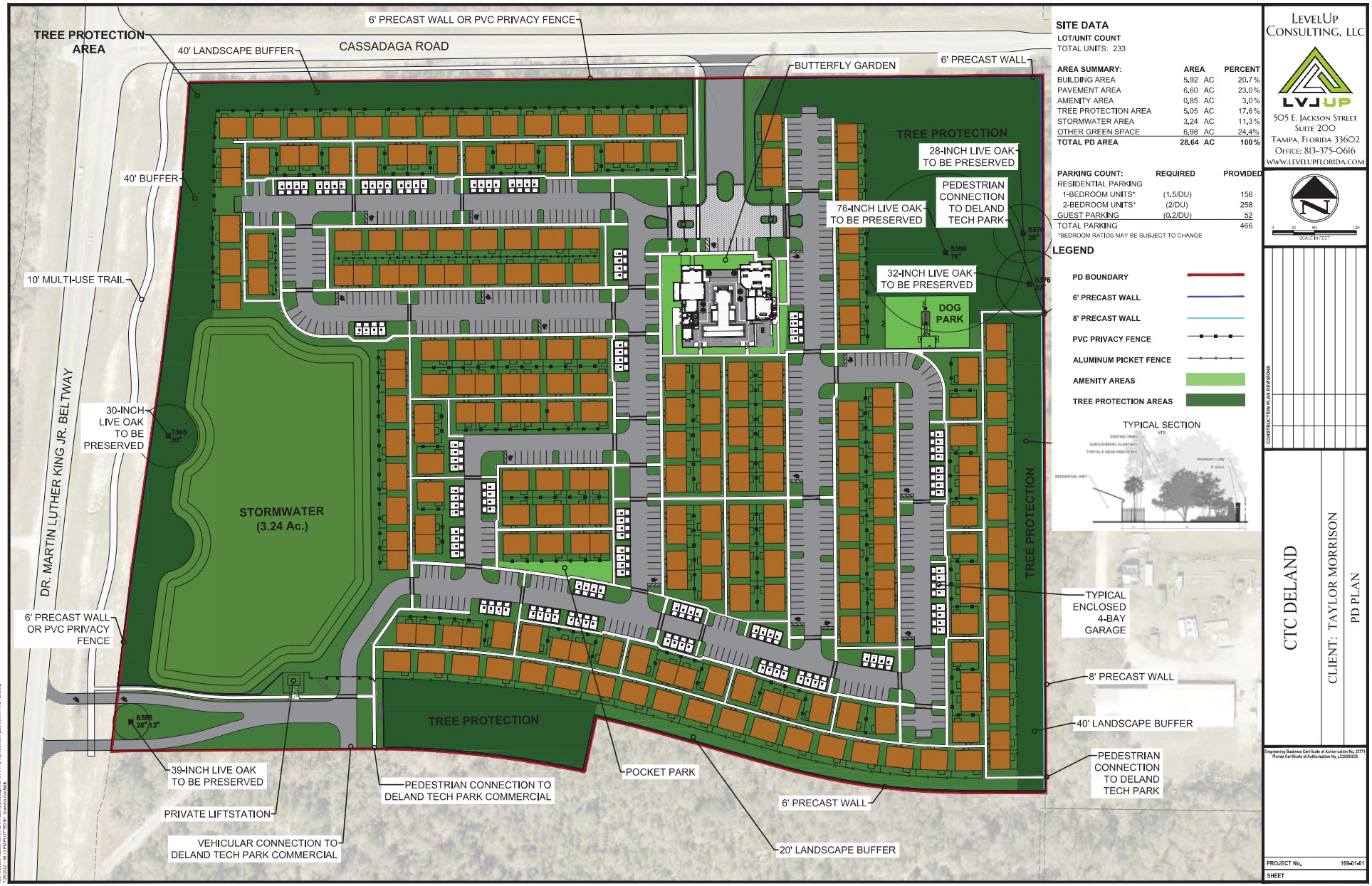
Figure **2**

I-4

Table 2
Study Area Significance Review

Roadway Segment	Count Stn #	A T	Function Class	# Lns	PK 2W Cap	Project Trips Dist	Trips	% Cap	Signif-icant?	C/NC VC/VNC?	In Study?
I-4											
Saxon Blvd to SR 472	1003	U	Prin-Art	6	10,060	15%	18	0.2%	NO	–	NO
SR 472 to Orange Camp Rd	485	U	Prin-Art	6	10,060	5%	6	0.1%	NO	–	NO
Orange Camp Rd to SR 44	497	U	Prin-Art	6	10,060	5%	6	0.1%	NO	–	NO
SR 472											
US 17 / 92 to CR 410 / MLK Blvd	472	U	Prin-Art	4	5,900	15%	18	0.3%	NO	–	NO
CR 410 / MLK Blvd to I-4 (end of state rd)	535	U	Prin-Art	4	3,580	35%	42	1.2%	NO	–	NO
US 17 / 92											
Enterprise Rd to Rhode Island Ave	444	U	Prin-Art	4	3,580	2%	2	0.1%	NO	–	NO
Rhode Island Ave to Graves Ave	5165	U	Prin-Art	4	3,580	1%	1	0.0%	NO	–	NO
Graves Ave to New York Ave	5166	U	Prin-Art	4	3,580	5%	6	0.2%	NO	–	NO
New York Ave to SR 472	445	U	Prin-Art	4	3,580	5%	6	0.2%	NO	–	NO
SR 472 to SR 15A / Taylor Rd	1004	U	Prin-Art	6	5,390	10%	12	0.2%	NO	NC	**YES**
Blue Lake Ave											
Orange Camp Rd to Taylor Rd	231	U	Maj-Coll	2	1,540	0%	0	0.0%	NO	–	NO
Taylor Rd to Beresford Ave	232	U	Maj-Coll	2	1,230	0%	0	0.0%	NO	–	NO
Cassadaga Rd											
W. Volusia Bltwy to Macy Ave	280	U	Maj-Coll	2	1,230	5%	6	0.5%	NO	–	NO
Graves Ave / CR 4145											
US 17 / 92 to Leavitt Ave	770	U	Maj-Coll	2	1,330	5%	6	0.5%	NO	–	NO
Leavitt Ave to Veteran's Memorial Pkwy	772	U	Maj-Coll	2	1,020	5%	6	0.6%	NO	–	NO
Veteran's Memorial Pkwy to Kentucky Ave	775	U	Min-Art	2	1,620	15%	18	1.1%	NO	C	**YES**
Kentucky Ave to Howland Blvd	900	U	Min-Art	2	1,620	5%	6	0.4%	NO	C	**YES**
Orange Camp Rd											
US 17 / 92 to Princeton	1380	U	Min-Art	2	1,270	3%	4	0.3%	NO	VC	**YES**
Princeton to Blue Lake Ave	1382	U	Min-Art	2	1,540	4%	5	0.3%	NO	VNC	**YES**
Blue Lake Ave to W Volusia Bltwy (Dr. MLK Jr)	1384	U	Min-Art	2	1,540	5%	6	0.4%	NO	VNC	**YES**
W Volusia Bltwy (Dr. MLK Jr) to I-4	1385	U	Min-Art	2	1,540	5%	6	0.4%	NO	VC	**YES**
Taylor Rd											
US 17 / 92 to Stratford Dr	1816	U	Min-Art	2	1,020	0%	0	0.0%	NO	–	NO
Stratford Dr to Blue Lake Ave	1818	U	Min-Art	2	1,540	0%	0	0.0%	NO	–	NO
Blue Lake Ave to Martin Luther King Bltwy	1819	U	Min-Art	2	1,230	0%	0	0.0%	NO	–	NO
W. Volusia Bltwy											
Saxon Blvd to Harley Strickland Blvd	1900	U	Min-Art	4	3,410	5%	6	0.2%	NO	C	**YES**
Harley Strickland Blvd to Rhode Island Ave	1901	U	Min-Art	2	1,540	5%	6	0.4%	NO	C	**YES**
Rhode Island Ave to Graves Ave	1902	U	Min-Art	2	1,620	10%	12	0.7%	NO	VC	**YES**
Graves Ave to SR 472	1030	U	Maj-Coll	2	1,540	20%	24	1.6%	NO	–	NO
SR 472 to Cassadaga Rd	1940	U	Min-Art	2	1,540	70%	85	5.5%	YES	–	**YES**
Cassadaga Rd to Orange Camp Rd	1942	U	Min-Art	2	1,540	25%	30	2.0%	NO	–	NO
Orange Camp Rd to Taylor Rd	1943	U	Min-Art	2	1,540	10%	12	0.8%	NO	–	NO
Taylor Rd to Beresford Ave Ext	1945	U	Min-Art	2	1,540	8%	10	0.6%	NO	–	NO

Source: Volusia County 2019 Average Annual Daily Traffic & Historical Counts
C/NC/VC/VNC=Critical/Near Critical and Vested Critical/Vested Near Critical from Volusia County Map



SITE DATA

LOT/UNIT COUNT
TOTAL UNITS: 233

AREA SUMMARY:	AREA		PERCENT
BUILDING AREA	5.92	AC	20.7%
PAVEMENT AREA	6.60	AC	23.0%
AMENITY AREA	0.85	AC	3.0%
TREE PROTECTION AREA	5.05	AC	17.6%
STORMWATER AREA	3.24	AC	11.3%
OTHER GREEN SPACE	6.98	AC	24.4%
TOTAL PD AREA	**28.64**	**AC**	**100%**

PARKING COUNT:	REQUIRED	PROVIDED
RESIDENTIAL PARKING		
1-BEDROOM UNITS*	(1.5/DU)	156
2-BEDROOM UNITS*	(2/DU)	258
GUEST PARKING	(0.2/DU)	52
TOTAL PARKING		466

*BEDROOM RATIOS MAY BE SUBJECT TO CHANGE

LEGEND

- PD BOUNDARY
- 6' PRECAST WALL
- 8' PRECAST WALL
- PVC PRIVACY FENCE
- ALUMINUM PICKET FENCE
- AMENITY AREAS
- TREE PROTECTION AREAS

TYPICAL SECTION

LEVELUP CONSULTING, LLC
505 E. JACKSON STREET
SUITE 200
TAMPA, FLORIDA 33602
OFFICE: 813-375-0616
WWW.LEVELUPFLORIDA.COM

SCALE IN FEET

CONSTRUCTION PLAN REVISIONS

CTC DELAND
CLIENT: TAYLOR MORRISON
PD PLAN

Engineering Business Certificate of Authorization No. 32711
Florida Certificate of Authorization No. LC26000209

PROJECT No. 169-01-01
SHEET

Kirk Subdivision/Canopy Terrace

KIRK SUBDIVISION
Project № 20147.2
April 2021

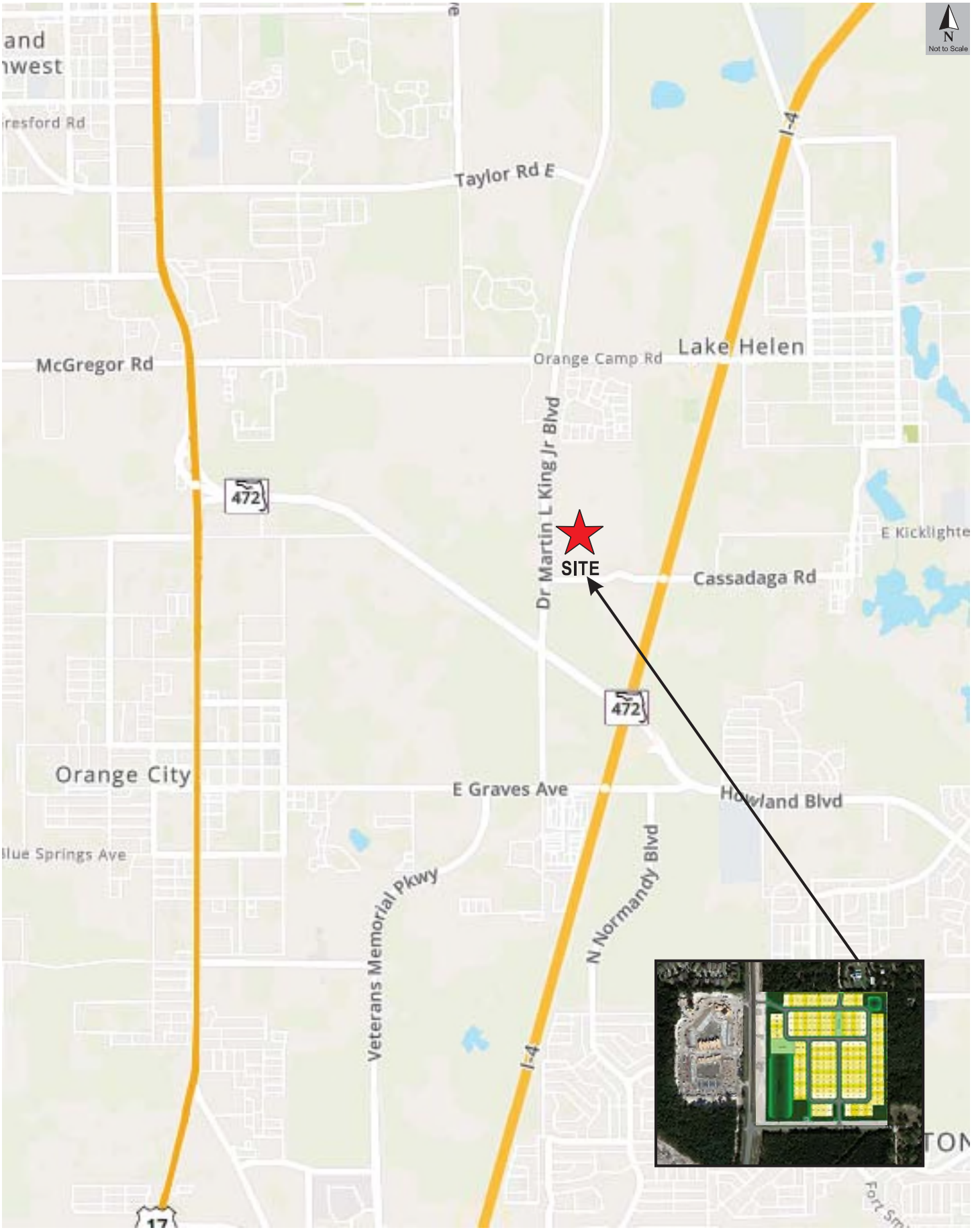
TRAFFIC IMPACT ANALYSIS
CITY OF DELAND
FLORIDA

Prepared by:

Traffic & Mobility Consultants
3101 Maguire Boulevard, Suite 265
Orlando, Florida 32803
www.trafficmobility.com
(407) 531-5332

Prepared for:

Pulte Group
4901 Vineland Road, Suite 460
Orlando, 32811



Site Location Map
Kirk Subdivision
20147.2

Figure 1

I-9

2.0 PROJECT TRAFFIC

2.1 Trip Generation

The trip generation of the proposed development was calculated using the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 10th Edition*. The trip generation for the project is summarized in **Table 1** and the ITE charts are provided in **Appendix C.**

Table 1
Trip Generation Analysis

ITE Code	Land Use	Size	Daily		AM Peak Hour				PM Peak Hour			
			Rate	Trips	Rate	Total	Enter	Exit	Rate	Total	Enter	Exit
210	Single Family Residential	140 DU	10.12	1,417	0.74	104	26	78	1.00	140	88	52

ITE Trip Generation Manual, 10th Edition
Regression Equation used to calculate rates when R^2 is greater than 0.75 and has more than 20 studies

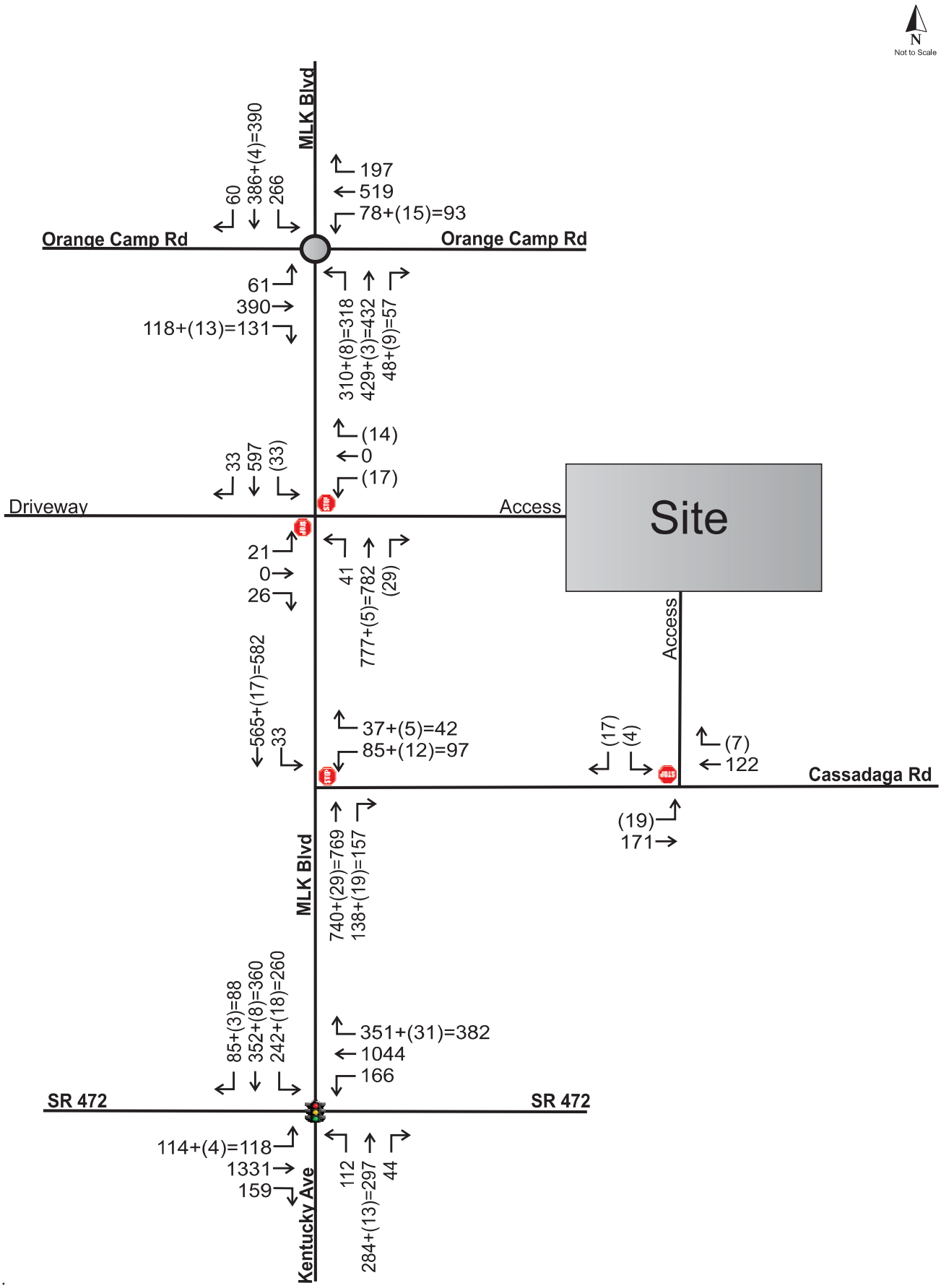
The proposed development is projected to generate 1,417 new daily trips, of which 104 trips will occur during the AM peak hour and 140 trips will occur during the PM peak hour.

2.2 Trip Distribution

A preliminary trip distribution pattern was developed using the Central Florida Regional Planning Model (CFRPM). The adopted model was modified to include a project specific Traffic Analysis Zone (TAZ) with the corresponding socio-economic data to reflect the proposed development. A Select Zone Analysis was executed for the project TAZ to determine the resultant trip distribution pattern on the surrounding transportation network. Manual adjustments of the model generated distribution pattern were applied to better reflect the local transportation network and prevailing travel patterns. The resulting trip distribution pattern is illustrated in **Figure 2** and the model output plots are included **Appendix D.**

Table 2
Study Area Determination

Road	Segment	Lns	LOS Std	PK 2W Cap	C/ NC?	Project Trips				
						Dist	Volume	Signif	y/n?	Study
US 17/92	Rhode Island Ave. to Graves Ave.	4	D	3,580		2%	3	0.08%	NO	NO
US 17/92	Graves Ave. to New York Ave.	4	D	3,580		2%	3	0.08%	NO	NO
US 17/92	New York Ave to SR 472	4	D	3,580		5%	7	0.20%	NO	NO
US 17/92	SR 472 to SR 15A/Taylor Rd.	6	D	5,390	NC	3%	4	0.07%	NO	**YES**
US 17/92	SR 15A/Taylor Rd. to Beresford Ave.	4	E	3,790		2%	3	0.08%	NO	NO
I-4	Saxon Blvd. to SR 472	6	D	10,060		25%	35	0.35%	NO	NO
I-4	SR 472 to Orange Camp Rd.	6	D	10,060		17%	24	0.24%	NO	NO
I-4	Orange Camp Rd. to SR 44	6	D	10,060		17%	24	0.24%	NO	NO
SR 472	US 17/92 to CR 4101/MLK Blvd	4	D	5,900		5%	7	0.12%	NO	NO
SR 472	CR 4101/MLK Blvd to I-4 (end of state road)	4	D	3,580		35%	49	1.37%	NO	NO
Blue Lake Ave.	Orange Camp Rd. to Taylor Rd.	2	E	1,540		5%	7	0.45%	NO	NO
Cassadaga Rd.	W. Volusia Bltwy. to Macy Ave.	2	E	1,230		8%	11	0.89%	NO	**YES**
Graves Av/CR 4145	US 17/92 to Leavitt Ave.	2	E	1,330		5%	7	0.53%	NO	NO
Graves Av/CR 4145	Leavitt Ave. to Veteran's Memorial Pkwy	2	E	1,020		5%	7	0.69%	NO	NO
Graves Av/CR 4145	Veteran's Memorial Pkwy. to Kentucky Ave.	2	E	1,620	C	5%	7	0.43%	NO	**YES**
Graves Av/CR 4145	Kentucky Ave. to Howland Blvd.	2	E	1,620	NC	5%	7	0.43%	NO	**YES**
Hill Ave.	Taylor Rd. to Beresford Ave.	2	E	1,020		5%	7	0.69%	NO	NO
Howland Blvd.	I-4/SR 472 to Wolf Pack Run	4	E	3,410	VC	5%	7	0.21%	NO	**YES**
Howland Blvd.	Wolf Pack Run to Catalina Blvd.	4	E	3,410	NC	4%	6	0.18%	NO	**YES**
Howland Blvd.	Catalina Blvd. to Providence Blvd.	4	E	3,410	VNC	3%	4	0.12%	NO	**YES**
Howland Blvd.	Providence Blvd. to Elkcam Blvd.	4	E	3,410		2%	3	0.09%	NO	NO
Macy Ave.	Ohio St. to Cassadaga Rd.	2	C	470		2%	3	0.64%	NO	NO
McGregor Rd.	Spring Garden Ave. to US17/92	2	E	1,230		3%	4	0.33%	NO	NO
Orange Camp Rd.	US 17/92 to Princeton	2	E	1,270	VC	5%	7	0.55%	NO	**YES**
Orange Camp Rd.	Princeton. to Blue Lake Ave.	2	E	1,540	VNC	10%	14	0.91%	NO	**YES**
Orange Camp Rd.	Blue Lake Ave. to W Volusia Bltwy. (Dr MLK Jr)	2	E	1,540	VNC	10%	14	0.91%	NO	**YES**
Orange Camp Rd.	W Volusia Bltwy. (Dr MLK Jr) to I-4	4	E	3,410		17%	24	0.70%	NO	NO
Summit Ave.	SR 44 to Main St.	2	E	1,230		1%	1	0.08%	NO	NO
Taylor Rd. (DL)	Stratford Dr. to Blue Lake Ave.	2	E	1,540		3%	4	0.26%	NO	NO
Taylor Rd. (DL)	Blue Lake Ave. to Martin Luther King Bltwy.	2	E	1,230		5%	7	0.57%	NO	NO
W. Volusia Bltwy (Veteran's Memorial Pkwy)	Harley Strickland Blvd. to Rhode Island Ave.	2	E	1,540	C	3%	4	0.26%	NO	**YES**
W. Volusia Bltwy (Veteran's Memorial Pkwy)	Rhode Island Ave. to Graves Ave.	2	E	1,620	VC	5%	7	0.43%	NO	**YES**
W. Volusia Bltwy (Kentucky Ave)	Graves Ave to SR 472	2	E	1,540	VNC	5%	7	0.45%	NO	**YES**
W. Volusia Bltwy (Dr MLK Jr)	SR 472 to Cassadaga Rd.	2	E	1,540	VNC	55%	77	5.00%	**YES**	**YES**
W. Volusia Bltwy (Dr MLK Jr)	Cassadaga Rd. to Orange Camp Rd.	2	E	1,540	VNC	37%	52	3.38%	**YES**	**YES**
W. Volusia Bltwy (Dr MLK Jr)	Orange Camp Rd. to Taylor Rd.	2	E	1,540	VNC	5%	7	0.45%	NO	**YES**
W. Volusia Bltwy (Dr MLK Jr)	Taylor Rd. to Beresford Ave. Ext.	2	E	1,540		4%	6	0.39%	NO	NO



Legend:
Background+(Project)=Total

Projected PM Peak Hour Intersection Volumes
Kirk Subdivision
20147.2

Figure 7

I-12



SITE DATA

LOT / UNIT COUNT:		
40' LOTS:	48	
50' LOTS:	76	
60' LOTS:	16	
TOTAL:	140 LOTS	
AREA SUMMARY:	**AREA**	**PERCENT**
SINGLE FAMILY LOT AREA:	19.25 AC	53%
INTERNAL RIGHT OF WAY:	5.85 AC	16%
FUTURE RIGHT OF WAY:	0.61 AC	1.69%
LIFT STATION TRACT:	0.04 AC	0.11%
OPEN SPACE:	10.41 AC	29%
10% USEABLE OPEN SPACE PROVIDED 3.62 AC (MIN)		
15% TREE PROTECTION AREA PROVIDED: 5.42 AC (MIN)		
TOTAL PD AREA	36.16 AC	100%

LOT SUMMARY

40' LOTS:	48
50' LOTS:	76
60' LOTS:	16
TOTAL:	140 LOTS

KELLY, COLLINS & GENTRY, INC.

PREPARED FOR: PULTE GROUP

PROJECT: KIRK SUBDIVISION

PD SKETCH PLAN

DRAWN: CPH
DESIGN: SGT
CHECKED: SMG
JOB NO.: 1481.000
DATE: 11/30/20

SHEET 1 OF 1

I-13

The Crossings

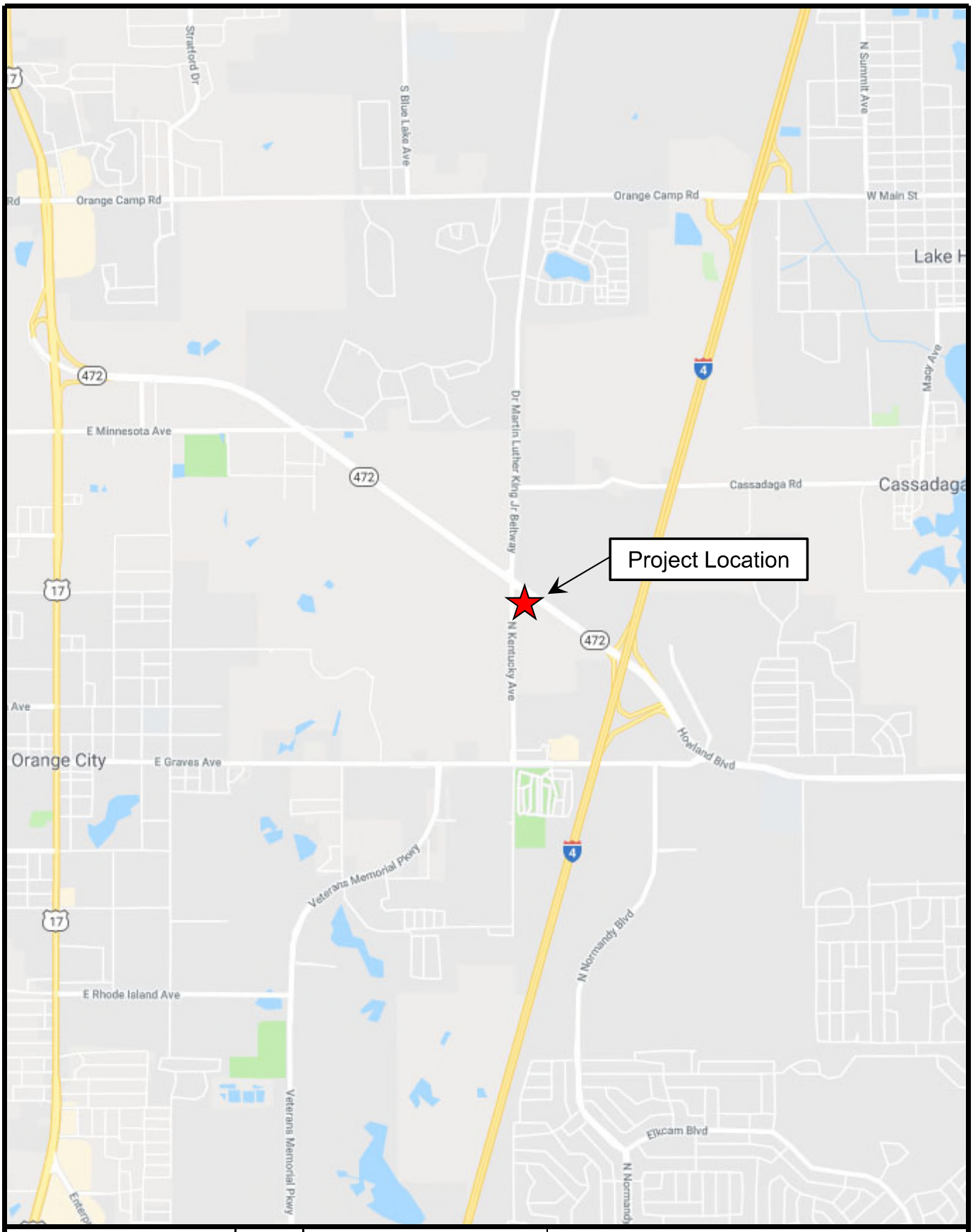
The Crossings
Orange City, Florida

Traffic Impact Analysis

Prepared for: Trycon Management Leasing, Inc.
By: LTG, Inc.

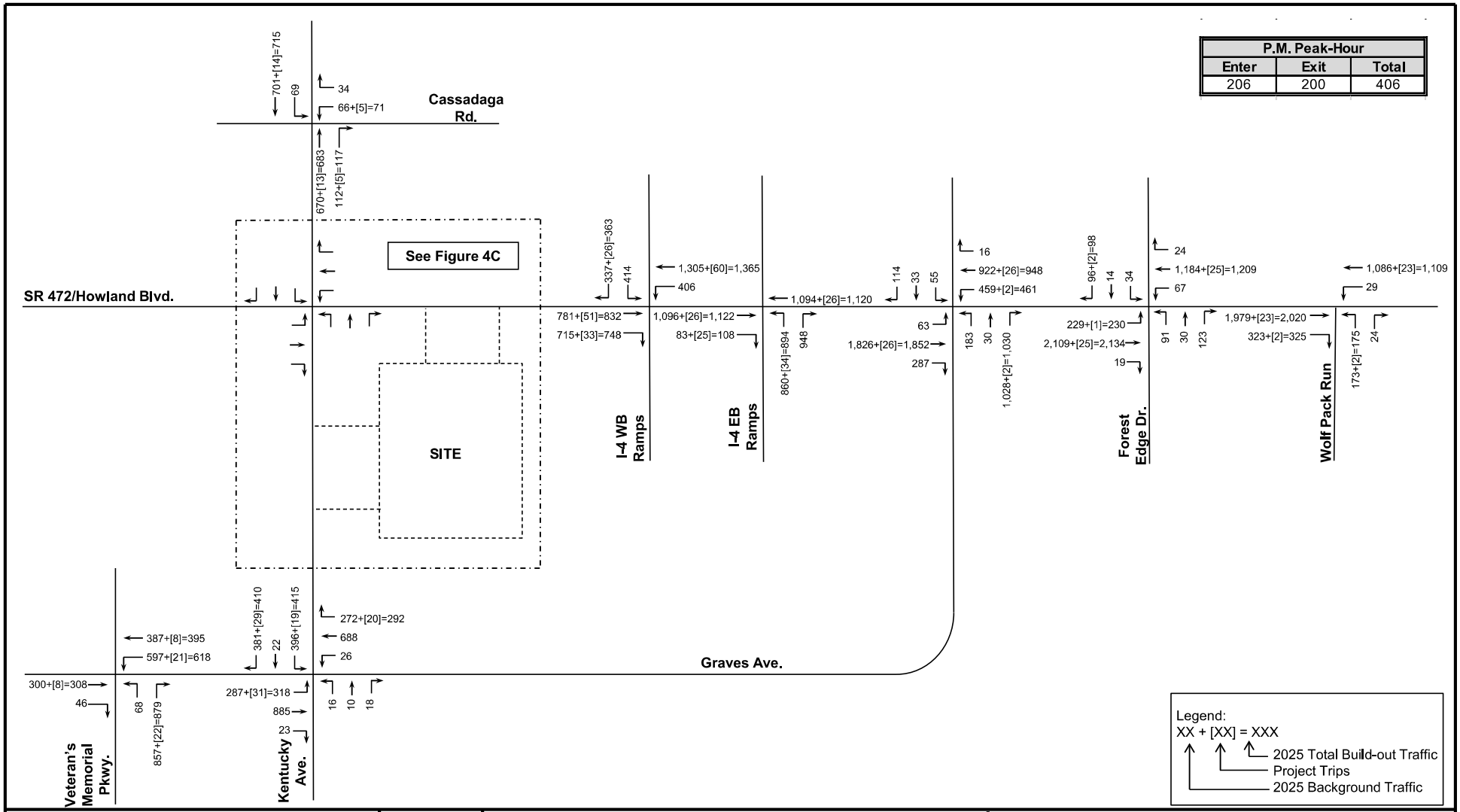
November 2020

LTG Engineering & Planning



West Volusia Crossings	N NTS	**Project Location Map**		LTG Engineering & Planning
		Project No.: 4888.05	Figure: 1	1450 W. Granada Blvd., Suite 2, Ormond Beach, Florida 32174 Telephone: 386.257.2571 Fax: 386.257.6996 EB# 0009227

I-16



West Volusia Crossings

N

NTS

2025 Build-Out
P.M. Peak-Hour Volumes

Project Number: 4888.05

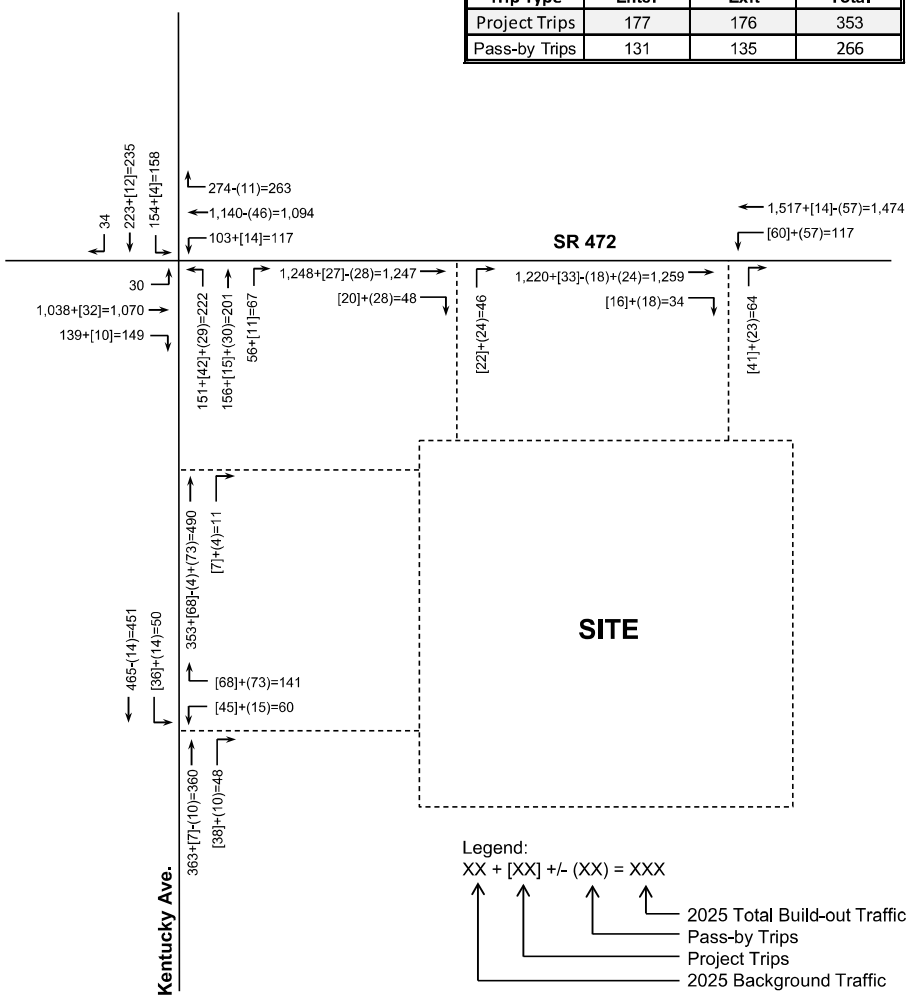
Figure 4B

LTG Engineering & Planning

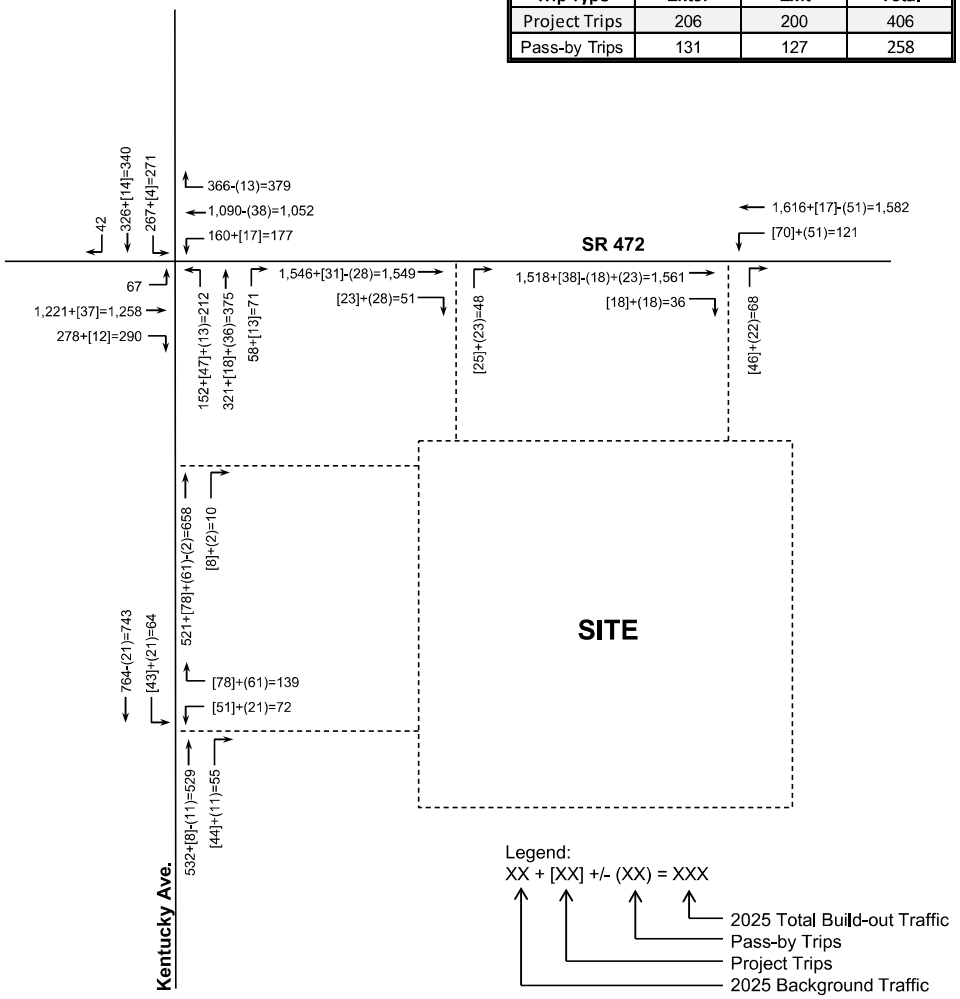
1450 W. Granada Blvd, Suite 2 – Ormond Beach, Florida 32174
Telephone: 386.257.2571 Fax: 386.257.6996 EB# 0009227

I-17

2025 AM Peak-Hour External Trips			
Trip Type	Enter	Exit	Total
Project Trips	177	176	353
Pass-by Trips	131	135	266



2025 PM Peak-Hour External Trips			
Trip Type	Enter	Exit	Total
Project Trips	206	200	406
Pass-by Trips	131	127	258



West Volusia Crossings

N

NTS

2025 Build-Out
A.M. and P.M. Peak-Hour Volumes

Project Number: 4888.05

Figure 4C

LTG Engineering & Planning
1450 W. Granada Blvd, Suite 2 – Ormond Beach, Florida 32174
Telephone: 386.257.2571 Fax: 386.257.6996 EB# 0009227

I-18

Table 14
2025 Build-Out P.M. Roadway Segment Analysis[1]
The Crossings

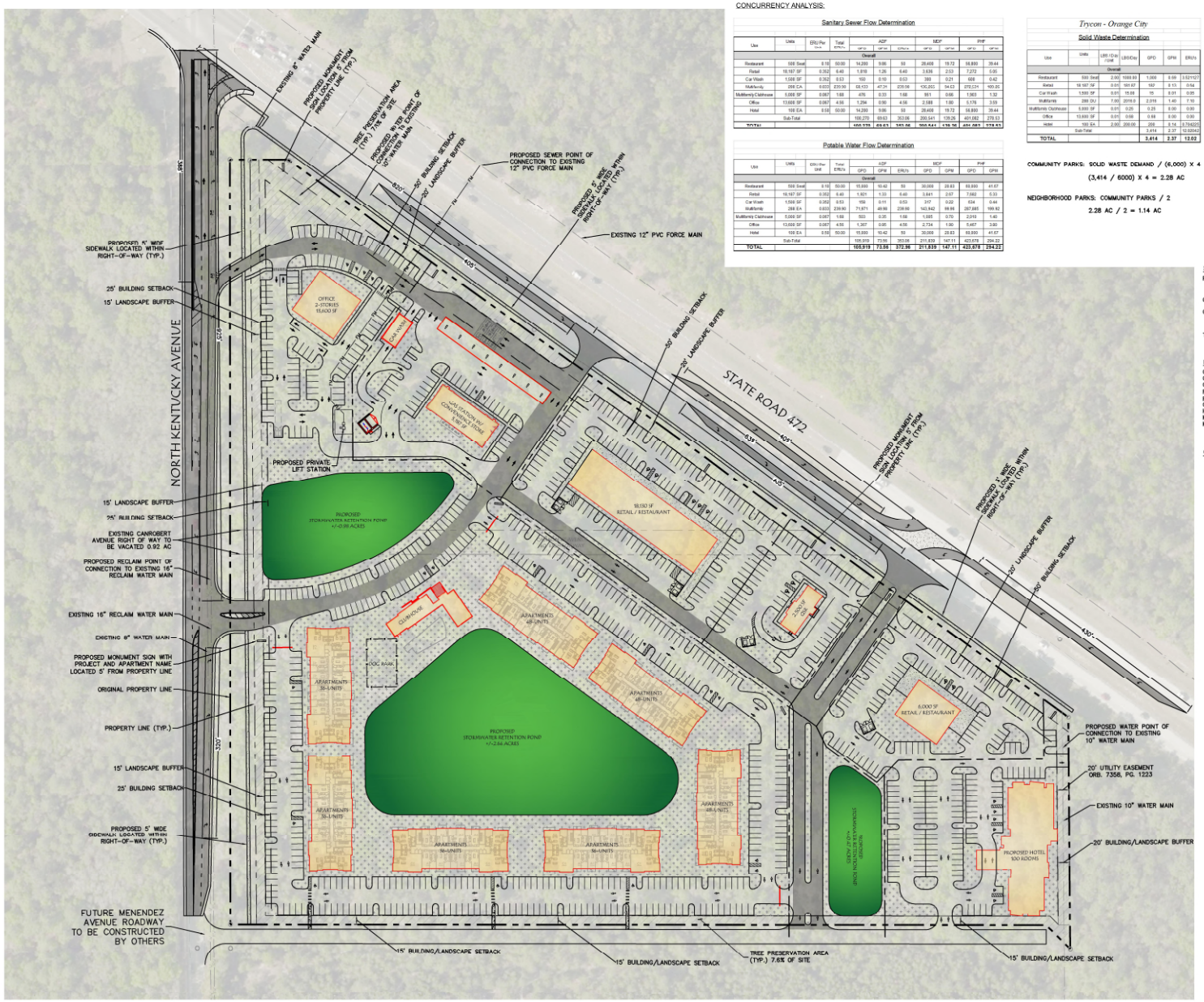
Roadway	Segment		No. of Lanes	Adopted LOS	Generalized Peak-Hour Two-Way Capacity	Existing Peak-Hour Two-Way Volume	2025 Growth Factor	Vested Trips	2025 Background Traffic	2025 Background PM Volume Exceed Adopted LOS?	Project Distribution	Project Trips	2025 Build-out Traffic	V/C Ratio	2025 Build-out Traffic Exceed Adopted LOS?
Catalina Blvd.	Howland Blvd.	Sixma Rd.	4	D	2,630	1,002	1.15	-	1,151	No	2.3%	9	1,160	0.44	No
	Sixma Rd.	Lake Helen-Osteen Rd.	2	D	960	856	1.15	-	983	Yes	1.7%	7	990	1.03	Yes
Graves Ave.	Veteran's Memorial Pkwy	Kentucky Ave.	3	E	2,000	1,600	-	424	2,024	Yes	14.6%	59	2,083	1.04	Yes
	Kentucky Ave.	Normandy Blvd.	2	E	1,620	1,400	-	771	2,171	Yes	9.6%	39	2,210	1.36	Yes
	Normandy Blvd.	Howland Blvd.	4	E	3,410	1,400	-	771	2,171	No	9.6%	39	2,210	0.65	No
Howland Blvd.	I-4/SR 472	Wolf Pack Run.	4	E	3,580	3,150	-	637	3,787	Yes	28.0%	114	3,901	1.09	Yes
	Wolf Pack Run	Catalina Blvd.	4	E	3,410	2,530	-	576	3,106	No	12.6%	51	3,157	0.93	No
	Providence Blvd.	Elkcam Blvd.	4	E	3,410	1,420	1.21	-	1,718	No	5.7%	23	1,741	0.51	No
Orange Camp Rd.	US 17-92	Princeton Ave.	2	E	1,270	1,160	1.32	-	1,532	Yes	1.0%	4	1,536	1.21	Yes
	Princeton Rd.	Blue Lake Ave.	2	E	1,540	1,060	1.31	-	1,386	No	0.7%	3	1,389	0.90	No
	Blue Lake Ave.	W Volusia Beltway.	2	E	1,540	1,270	1.34	-	1,700	Yes	2.6%	11	1,711	1.11	Yes
	W Volusia Beltway	I-4	4	E	3,410	1,390	1.24	-	1,718	No	2.3%	9	1,727	0.51	No
SR 472	W. Volusia Bltwy/CR 4101	I-4	4	D	3,580	2,655	1.20	-	3,191	No	42.0%	171	3,362	0.94	No
US 17/92	SR 15A/Taylor Rd.	SR 472	6	D	5,390	4,995	1.15	-	5,738	Yes	15.1%	61	5,799	1.08	Yes
W. Volusia Bltwy. (Dr. MLK Bltwy.)	Orange Camp Rd.	Cassadaga Rd.	2	E	1,540	1,010	-	378	1,388	No	6.7%	27	1,415	0.92	No
	Cassadaga Rd.	SR 472	2	E	1,540	1,080	-	246	1,326	No	8.8%	36	1,362	0.88	No
Kentucky Ave.	SR 472	Graves Ave.	2	E	1,540	950	-	254	1,204	No	25.5%	104	1,308	0.85	No
Veteran's Memorial Pkwy.	Rhode Island Ave.	Harley Strickland Blvd.	4	E	3,410	1,570	-	641	2,211	No	6.1%	25	2,236	0.66	No

[1]Includes improvements recommended in existing conditions, which are not currently funded for construction, with the exception of Howland Boulevard from Providence Boulevard to Elkcam Boulevard.

Table 15
2025 Build-Out P.M. Roadway Segment Analysis - Improved
The Crossings[1]

Roadway	Segment		No. of Lanes	Adopted LOS	Peak-Hour Two-Way Capacity	Existing Peak-Hour Two-Way Volume	Growth Factor	Vested Trips	Background Traffic	2025 Background Volume Exceed Adopted LOS?	Project Distribution	Project Trips	2025 Build-out Traffic	V/C Ratio	2025 Build-out Traffic Exceed Adopted LOS?
Catalina Blvd.	Sixma Rd.	Lake Helen-Osteen Rd.	4	D	2,630	856	1.15	-	983	No	1.7%	7	990	0.38	No
Graves Ave.	Veteran's Memorial Pkwy	Kentucky Ave.	4	E	3,410	1,600	-	424	2,024	No	14.6%	59	2,083	0.61	No
	Kentucky Ave.	Normandy Blvd.	4	E	3,410	1,400	-	771	2,171	No	9.6%	39	2,210	0.65	No
Howland Blvd.	I-4/SR 472	Wolf Pack Run.	6	E	5,390	3,150	-	637	3,787	No	28.0%	114	3,901	0.72	No
Orange Camp Rd.	US 17-92	Princeton Ave.	4	E	3,410	1,160	1.32	-	1,532	No	1.0%	4	1,536	0.45	No
	Blue Lake Ave.	W Volusia Beltway.	4	E	3,410	1,270	1.34	-	1,700	No	2.6%	11	1,711	0.50	No
US 17/92	SR 15A/Taylor Rd.	SR 472	8	D	7,210	4,995	1.15	-	5,738	No	15.1%	61	5,799	0.80	No

[1]Improved capacities were determined using the FDOT Generalized Service Tables and comparable capacities from Volusia County's AADT Table; Improvements not currently funded for construction.



CONCURRENCY ANALYSIS:

Sanitary Sewer Flow Determination

Use	Units	ERU Per Unit	Total ERU's	ADF GPD	ADF GPM	ERU's	MDF GPD	MDF GPM	PHF GPD	PHF GPM
Overall										
Restaurant	500 Seat	0.10	50.00	14,280	9.96	50	28,408	19.72	56,800	39.44
Retail	18,187 SF	0.352	6.40	1,810	1.26	6.40	3,636	2.53	7,272	5.05
Car Wash	1,500 SF	0.352	0.53	150	0.10	0.53	300	0.21	600	0.42
Multifamily	288 EA	0.833	239.90	68,133	47.31	239.98	136,265	94.63	272,531	189.26
Multifamily Clubhouse	5,000 SF	0.067	1.68	476	0.33	1.68	951	0.66	1,903	1.32
Office	13,600 SF	0.067	4.56	1,294	0.90	4.56	2,588	1.80	5,176	3.59
Hotel	100 EA	0.50	50.00	14,280	9.96	50	28,408	19.72	56,800	39.44
	Sub-Total			100,270	69.63	353.06	200,541	139.26	401,082	278.53
TOTAL				100,270	69.63	353.06	200,541	139.26	401,082	278.53

Potable Water Flow Determination

Use	Units	GPD / Per Unit	Total ERU's	ADF GPD	ADF GPM	ERU's	MDF GPD	MDF GPM	PHF GPD	PHF GPM
Overall										
Restaurant	500 Seat	0.10	50.00	15,000	10.42	50	30,000	20.83	60,000	41.67
Retail	18,187 SF	0.352	6.40	1,821	1.33	6.40	3,641	2.67	7,282	5.33
Car Wash	1,500 SF	0.352	0.53	158	0.11	0.53	317	0.22	634	0.44
Multifamily	288 EA	0.833	239.90	71,871	49.98	239.98	143,842	99.96	287,685	199.92
Multifamily Clubhouse	5,000 SF	0.067	1.68	503	0.35	1.68	1,005	0.70	2,010	1.40
Office	13,600 SF	0.067	4.56	1,367	0.95	4.56	2,734	1.90	5,467	3.80
Hotel	100 EA	0.50	50.00	15,000	10.42	50	30,000	20.83	60,000	41.67
	Sub-Total			105,919	73.56	353.06	211,839	147.11	423,078	294.22
TOTAL				105,919	73.56	372.96	211,839	147.11	423,078	294.22

Trycon - Orange City

Solid Waste Determination

Use	Units	LBS / Day / Unit	LBS/Day	GPD	GPM	ERU's
Overall						
Restaurant	500 Seat	2.00	1000.00	1,000	0.69	3.521127
Retail	18,187 SF	0.01	181.87	182	0.13	0.64
Car Wash	1,500 SF	0.01	15.00	15	0.01	0.05
Multifamily	288 DU	7.00	2016.0	2,016	1.40	7.10
Multifamily Clubhouse	5,000 SF	0.01	0.25	0.25	0.00	0.00
Office	13,600 SF	0.01	0.68	0.68	0.00	0.00
Hotel	100 EA	2.00	200.00	200	0.14	0.704225
	Sub-Total			3,414	2.37	12.02042
TOTAL				3,414	2.37	12.02

COMMUNITY PARKS: SOLID WASTE DEMAND / (6,000) X 4

(3,414 / 6000) X 4 = 2.28 AC

NEIGHBORHOOD PARKS: COMMUNITY PARKS / 2

2.28 AC / 2 = 1.14 AC

NORTH

GRAPHIC SCALE IN FEET
0 40 80 160

SITE DATA:

PROJECT AREA:
(COMBINED PARCELS 1 & 2) ±27.48 AC

COMMON OPEN SPACE REQUIRED: 8.24 AC (30.0%)

COMMON OPEN SPACE PROVIDED: ±9.90 AC (36.0%)
COMMON OPEN SPACE IS TO BE MAINTAINED BY PLANNED DEVELOPMENT

TREE PRESERVATION AREA: ±2.10 AC (7.6%)

DEVELOPMENT DENSITY:

CONVENIENCE STORE:	5,187 SF
CAR WASH:	1,500 SF
QUICK SERVICE RESTAURANT:	2,500 SF
RETAIL/RESTAURANT:	18,130 SF
RETAIL/RESTAURANT:	6,000 SF
OFFICE:	13,600 SF
HOTEL:	100 ROOMS
MULTIFAMILY APARTMENTS:	288 UNITS
MULTIFAMILY CLUBHOUSE:	5,000 SF

GENERAL NOTES:

1. POTABLE WATER IS SUPPLIED BY THE CITY OF ORANGE CITY.
2. RECLAIMED WATER IS SUPPLIED BY VOLUSIA COUNTY.
3. SANITARY SEWER TREATMENT/WASTEWATER DISPOSAL SHALL BE PROVIDED BY VOLUSIA COUNTY.
4. THE CURBS, CURB AND GUTTERS, CURBS AND GUTTER ENDINGS, CONCRETE SIDEWALKS, SIDEWALK CURB RAMPS, DETECTABLE WARNING, DRIVEWAYS, CROSSWALKS, STOP MARKINGS, SIGNS, STRIPING AND PAVEMENTS MARKINGS MUST COMPLY WITH THE FDOT STANDARDS.
5. THE CONTRACTOR MUST SUBMIT ONE SET OF AS-BUILT PLANS, SIGNED AND SEALED BY THE SURVEYOR OF RECORD, INCLUDING A CD IN AUTOCAD FORMAT, PDF AND CSV FILE TO THE PUBLIC WORKS DEPARTMENT AT THE CITY OF ORANGE CITY.
6. THE CONTRACTOR MUST REPAIR THE EXISTING ROAD, SIDEWALKS, CURBS, LANDSCAPING AND UTILITIES, IF IT IS DISTURBED BY THE CONSTRUCTION PROCESS.
7. CONSTRUCTION OF THE PROJECT MUST BE IN ACCORDANCE WITH THE CITY OF ORANGE CITY DESIGN STANDARDS AND SPECIFICATION MANUAL.

LEGEND

- PROPERTY LINE (TYP.)
- COMMON AREA ASPHALT PAVEMENT
- COMMON AREA OPEN SPACE
- TREE PRESERVATION AREA

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
189 S. ORANGE AVE., SUITE 1000, ORLANDO, FL 32801
PHONE: 407-898-1511
WWW.KIMLEY-HORN.COM CA 00000696

LICENSED PROFESSIONAL
BRINT A. LENZEN, P.E.
FLORIDA LICENSE NUMBER 78537
DATE: 10/9/2020

KHA PROJECT 149734003
DATE 10/9/2020
SCALE AS SHOWN
DESIGNED BY JCS
DRAWN BY JCS
CHECKED BY BAL

SITE PLAN

THE CROSSINGS

ORANGE CITY FLORIDA

SHEET NUMBER
PD-3

Drawing name: K:\ORL_Civil\149734003 --Orange City SR472\CAD\PD\PD-3.dwg Layout1 Oct 09, 2020 9:55am by Jarod.Stubbs

North Kentucky Distribution Center

North Kentucky Distribution Center

Traffic Impact Analysis

City of Orange City, FL

October 2022

Kimley»Horn

PROJECT TRIP GENERATION

Trip generation for the proposed development was calculated per procedures published in the Institute of Transportation Engineer's (ITE) *Trip Generation Manual, 11th Edition*. Land Use Code (LUC) 150 (Warehousing) was used to represent the proposed development. As the development's primary use will be the storage of materials, LUC 150 (Warehousing) is more appropriate to use than LUC 110 (General Light Industrial) which is defined by ITE as "a facility dedicated to light industrial activities such as printing, material testing, or assembly of data processing equipment". Truck trips were estimated using the appropriate fitted curve equation or average rate for LUC 150 that were published in the ITE *Trip Generation Manual.* The total car trips were calculated by subtracting the total truck trips from the total vehicle trips.

Table 1 summarizes the Daily, AM peak, and PM peak trip generation calculations for both truck and car trips. The resulting trip calculations indicate that the proposed development is anticipated to generate 1,037 total daily trips, 107 total AM peak hour trips (82 inbound and 25 outbound), and 114 total PM peak hour trips (32 inbound and 82 outbound) upon buildout. The trip generation potential of the proposed development was utilized to assess project impacts on the surrounding transportation network.

Table 1: Trip Generation Calculations

	Land Use	ITE LUC	Size	Units	Trip Rate[1]	Daily Trip Generation				
						Total	In[1]		Out[1]	
Daily	Warehousing	150	**632.240**	KSF	1.64	1,037	50%	519	50%	518
	Total Vehicle Trips Generated					**1,037**	**519**		**518**	
	Total Truck Trips[2]	*150*	*632*	*KSF*	*0.60*	*379*	*50%*	*190*	*50%*	*189*
	Total Car Trips[3]	*150*	*632*	*KSF*	*1.04*	*658*	*50%*	*329*	*50%*	*329*
	Land Use	**ITE LUC**	**Size**	**Units**	**Trip Rate[1]**	**AM Peak Hour Trip Generation**				
						Total	**In[1]**		**Out[1]**	
AM Peak Hour	Warehousing	150	**632.240**	KSF	0.17	107	77%	82	23%	25
	Total Vehicle Trips Generated					**107**	**82**		**25**	
	Total Truck Trips[2]	*150*	*632*	*KSF*	*0.02*	*13*	*52%*	*7*	*48%*	*6*
	Total Car Trips[3]	*150*	*632*	*KSF*	*0.15*	*94*	*80%*	*75*	*20%*	*19*
	Land Use	**ITE LUC**	**Size**	**Units**	**Trip Rate[1]**	**PM Peak Hour Trip Generation**				
						Total	**In[1]**		**Out[1]**	
PM Peak Hour	Warehousing	150	**632.240**	KSF	0.18	114	28%	32	72%	82
	Total Vehicle Trips Generated					**114**	**32**		**82**	
	Total Truck Trips[2]	*150*	*632*	*KSF*	*0.03*	*19*	*52%*	*10*	*48%*	*9*
	Total Car Trips[3]	*150*	*632*	*KSF*	*0.15*	*95*	*23%*	*22*	*77%*	*73*

Notes: [1] Vehicle trip rates and directional splits per data and procedures outlined in ITE Trip Generation Manual,11th Ed

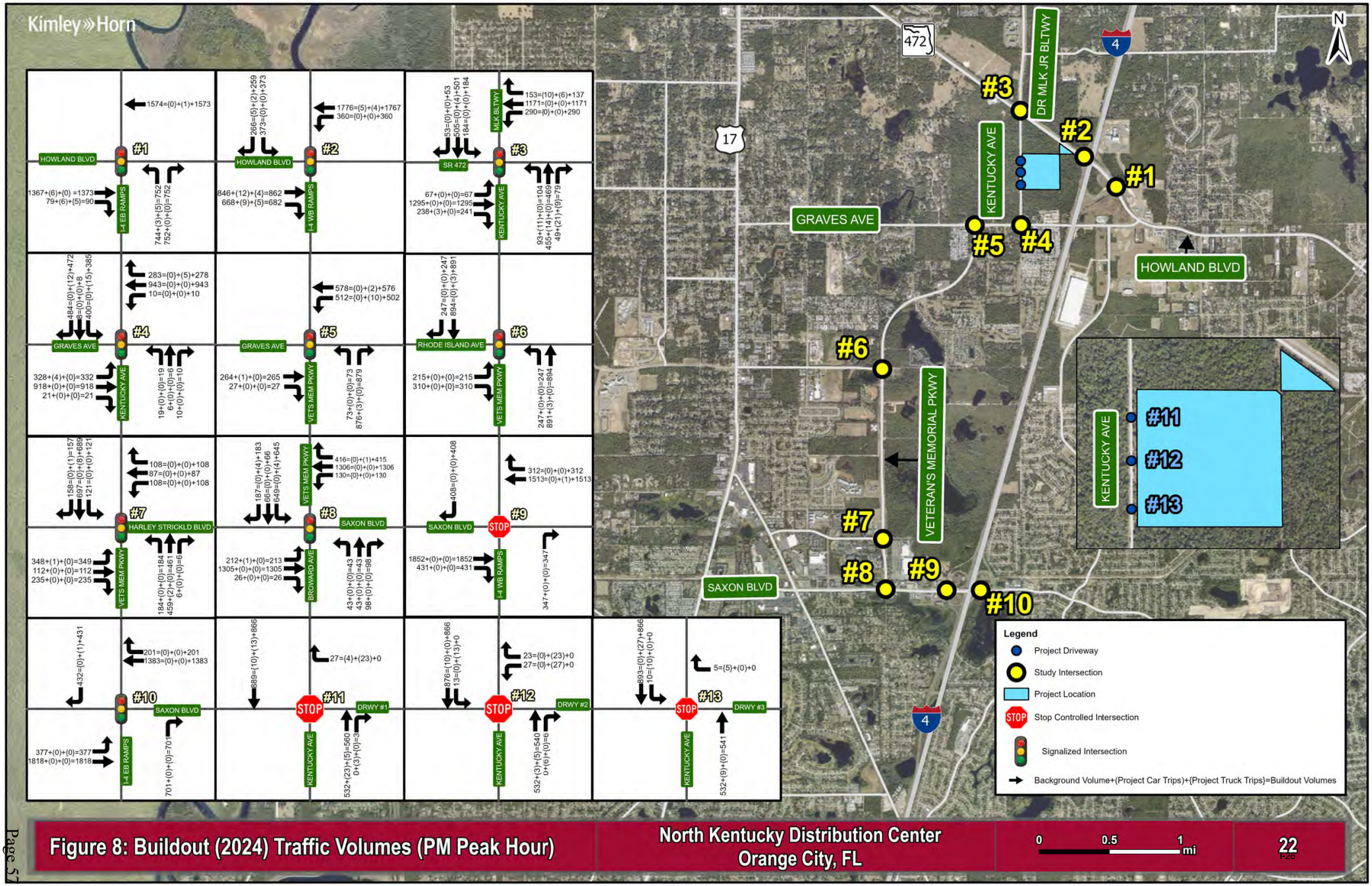
[2] Truck trip rates and directional splits per data and procedures outlined in ITE Trip Generation Manual,11th Ed

[3] Car trip volumes found by using the following formula: Total Vehicles Generated - Total Truck Trips

Table 4: Future Background (2024) and Buildout (2024) PM Peak Hour Roadway Segment Summary

Roadway		Adopted LOS [1]	Peak Hour Two-Way Maximum Service Volume [1]	Existing (2022) Peak Season Two-Way Peak Hour Volume	Applied Growth Rate [2]	Vested Trips	Future Background (2024) PM Peak Hour Conditions [3]			Improved Future Background (2024) PM Peak Hour Conditions				PM Peak Hour Project Traffic				Future Buildout (2024) PM Peak Hour Conditions [5]		
From	To						Two-Way Peak Hour Volume	v/c Ratio	LOS	Improved No. of Lanes	Improved MSV	v/c Ratio	LOS	% Project Distribution (Cars) [4]	Project Trips (Cars)	% Project Distribution (Trucks) [4]	Project Trips (Trucks)	Two-Way Peak Hour Volume	v/c Ratio	LOS
I-4																				
Dirksen Dr	Saxon Blvd	D	10,510	10,292	1%	480	10,978	1.04	F	8	13,390	0.82	D	8%	8	50%	10	10,996	0.82	D
US 17/92																				
SR 472	SR 15A / Taylor Rd	D	5,390	5,716	5.32%	85	6,409	1.19	F	8	7,210	0.89	C	14%	13	0%	0	6,422	0.89	C
Graves Avenue / CR 4145																				
Veteran's Memorial Pkwy	Kentucky Ave	E	1,620	1,656	1%	524	2,213	1.37	F	4	3,410	0.65	C	17%	16	0%	0	2,229	0.65	C
Kentucky Ave	Normandy Blvd	E	1,620	1,434	1%	1,175	2,638	1.63	F	4	3,410	0.77	C	21%	20	0%	0	2,658	0.78	C
Normandy Blvd	Howland Blvd	E	2,740	1,650	0%	1,175	2,825	1.03	F	6	5,120	0.55	C	15%	14	0%	0	2,839	0.55	C
Howland Blvd																				
I-4 / SR 472	Wolf Pack Run	E	3,410	2,555	1%	1,003	3,609	1.06	F	6	5,120	0.70	C	20%	19	0%	0	3,628	0.71	C
Wolf Pack Run	Catalina Blvd	E	3,410	2,333	1%	911	3,291	0.97	E					14%	13	0%	0	3,304	0.97	E
Providence Blvd	Elkcam Blvd [6]	E	3,410	1,121	1%	328	1,471	0.43	C					10%	10	0%	0	1,481	0.43	C
Lake Helen-Osteen Rd																				
Haulover Blvd	Catalina Blvd	E	1,230	1,101	1%	47	1,170	0.95	E					2%	2	0%	0	1,172	0.95	E
Orange Camp Rd																				
Princeton Rd	Blue Lake Ave	E	1,540	1,160	0%	188	1,348	0.88	C					1%	1	0%	0	1,349	0.88	C
Blue Lake Ave	W Volusia Bltwy (Dr MLK Jr)	E	1,540	1,210	0%	212	1,422	0.92	D					3%	3	0%	0	1,425	0.93	D
W Volusia Bltwy (Dr MLK Jr)	I-4 [7]	E	3,410	1,182	1%	357	1,563	0.46	C					7%	7	0%	0	1,570	0.46	C
Saxon Blvd																				
Veteran's Memorial Pkwy	FDOT Park & Ride	E	5,140	3,386	2%	344	3,865	0.75	C					5%	5	0%	0	3,870	0.75	C
FDOT Park & Ride	I-4	E	5,140	2,707	1%	346	3,107	0.60	C					5%	5	0%	0	3,112	0.61	C
W. Volusia Bltwy (Veteran's Memorial Pkwy)																				
Saxon Blvd	Harley Strickland Blvd	E	3,410	1,283	1%	0	1,309	0.38	C					10%	10	0%	0	1,319	0.39	C
Harley Strickland Blvd	Rhode Island Ave	E	1,540	1,535	1%	409	1,975	1.28	F	4	3,410	0.58	C	11%	10	0%	0	1,985	0.58	C
Rhode Island Ave	Graves Ave	E	1,620	1,212	1%	342	1,578	0.97	E					14%	13	0%	0	1,591	0.98	E
W. Volusia Bltwy (Veteran's Memorial Pkwy Extension / Kentucky Ave)																				
Graves Ave	SR 472	E	1,540	928	2%	370	1,335	0.87	C					54%	51	100%	19	1,405	0.91	D
W. Volusia Bltwy (Dr MLK Jr)																				
SR 472	Cassadaga Rd	E	1,540	1,061	2%	386	1,489	0.97	E					19%	18	0%	0	1,507	0.98	E
Cassadaga Rd	Orange Camp Rd	E	1,540	1,010	2%	466	1,516	0.98	E					16%	15	0%	0	1,531	0.99	E
Orange Camp Rd	Taylor Rd	E	1,540	1,051	2%	353	1,446	0.94	E					6%	6	0%	0	1,452	0.94	E

Notes:
1. Peak hour two-way service capacities and adopted level of service are based on the 2021 Volusia County Average Annual Daily Traffic & Historical Counts Report.
2. Applied growth rates were calculated based on historical annual average daily traffic volumes, in accordance with the approved methodology.
3. Future background (non-project) traffic volumes are the summation of the existing peak season volumes, background growth, and committed/vested trips.
4. The percent project traffic is the maximum across the segment.
5. Buildout project traffic volumes are the summation of future non-project traffic and project traffic.
6. Howland Boulevard from Providence Boulevard to Elkcam Boulevard is funded to be widened to four-lane section.
7. Orange Camp Road from west of W Volusia Beltway (Dr MLK Jr) to I-4 is funded to be widened to a four-lane section.


Kimley»Horn
HOWLAND BLVD
#1
I-4 EB RAMPS
1574=(0)+(1)+1573
1367+(6)+(0) =1373
79+(6)+(5)=90
744+(3)+(5)=752
752+(0)+(0)=752
#2
I-4 WB RAMPS
266=(5)+(2)+259
373=(0)+(0)+373
1776=(5)+(4)+1767
360=(0)+(0)+360
846+(12)+{4}=862
668+(9)+{5}=682
SR 472
MLK BLTWY
#3
KENTUCKY AVE
53=(0)+(0)+53
505=(0)+(4)+501
184=(0)+(0)+184
153=(10)+(6)+137
1171=(0)+(0)+1171
290=(0)+(0)+290
67+(0)+(0)=67
1295+(0)+(0)=1295
238+(3)+(0)=241
93+(11)+(0)=104
455+(14)+(0)=469
49+(21)+(9)=79
GRAVES AVE
#4
KENTUCKY AVE
484=(0)+(12)+472
83=(0)+(0)+8
400=(0)+(0)+(15)+385
283=(0)+(5)+278
943=(0)+(0)+943
10=(0)+(0)+10
328+(4)+{0}=332
918+(0)+{0}=918
21+(0)+{0}=21
19=(0)+(0)=19
6=(0)+(0)=6
10=(0)+(0)=10
#5
VETS MEM PKWY
578=(0)+(2)+576
512=(0)+(10)+502
264+(1)+{0}=265
27+(0)+{0}=27
73=(0)+(0)=73
876=(3)+(0)=879
RHODE ISLAND AVE
#6
VETS MEM PKWY
247=(0)+(0)+247
894=(0)+(3)+891
215+(0)+{0}=215
310+(0)+{0}=310
247=(0)+(0)=247
891=(3)+(0)=894
HARLEY STRICKLD BLVD
#7
VETS MEM PKWY
158=(0)+(1)=157
697=(0)+(8)+689
121=(0)+(0)+121
108=(0)+(0)+108
87=(0)+(0)+87
108=(0)+(0)+108
348+(1)+{0}=349
112+(0)+{0}=112
235+(0)+{0}=235
184=(0)+(0)=184
459+(2)+(0)=461
6=(0)+(0)=6
#8
BROWARD AVE
SAXON BLVD
VETS MEM PKWY
187=(0)+(4)+183
66=(0)+(0)+66
649=(0)+(4)+645
416=(0)+(1)+415
1306=(0)+(0)+1306
130=(0)+(0)+130
212+(1)+{0}=213
1305+(0)+{0}=1305
26+(0)+{0}=26
43=(0)+(0)=43
43=(0)+(0)=43
98=(0)+(0)=98
#9
I-4 WB RAMPS
SAXON BLVD
STOP
408=(0)+(0)+408
312=(0)+(0)+312
1513=(0)+(1)+1513
1852+(0)+{0}=1852
431+(0)+{0}=431
347=(0)+(0)=347
#10
I-4 EB RAMPS
SAXON BLVD
432=(0)+(1)+431
201=(0)+(0)+201
1383=(0)+(0)+1383
377+(0)+{0}=377
1818+(0)+{0}=1818
701+(0)+(0)=701
#11
KENTUCKY AVE
DRWY #1
STOP
889=(10)+(13)+866
27=(4)+(23)+0
532+(23)+{5}=560
0+(3)+{0}=3
#12
KENTUCKY AVE
DRWY #2
STOP
876=(10)+(0)+866
13=(0)+(13)+0
23=(0)+(23)+0
27=(0)+(27)+0
532+(3)+{5}=540
0+(6)+{0}=6
#13
KENTUCKY AVE
DRWY #3
STOP
893=(0)+(27)+866
10=(10)+(0)+0
5=(5)+(0)+0
532+(9)+{0}=541
472
17
4
DR MLK JR BLTWY
KENTUCKY AVE
GRAVES AVE
HOWLAND BLVD
VETERAN'S MEMORIAL PKWY
SAXON BLVD
#1
#2
#3
#4
#5
#6
#7
#8
#9
#10
#11
#12
#13
N
Legend
Project Driveway
Study Intersection
Project Location
STOP
Stop Controlled Intersection
Signalized Intersection
Background Volume+(Project Car Trips)+{Project Truck Trips}=Buildout Volumes
Figure 8: Buildout (2024) Traffic Volumes (PM Peak Hour)
North Kentucky Distribution Center
Orange City, FL
0
0.5
1
mi
22
I-26

This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

Drawing name: K:\ORL_Civil\249071000-Orange City DD\CADD\PD\PlanSheets\PD-3.dwg PD-3 Aug 18, 2022 5:54pm by Joe.Pellerin

Parc Hill

Parc Hill Mixed Use PUD
Orange City, Florida

Traffic Impact Analysis

Prepared for: G.L. Summitt Engineering, Inc.
By: Lassiter Transportation Group, Inc.
***Revised* October 2016**

Lassiter Transportation Group, Inc.
Engineering and Planning



No.	Intersection
1	Saxon Boulevard at Enterprise Road
2	Saxon Boulevard at Threadgill Place
3	Veterans Memorial Parkway at Saxon Blvd
4	Saxon Boulevard at I-4 Park and Ride
5	Saxon Boulevard at I-4 EB on Ramp
6	Saxon Boulevard at Finland Blvd
7	Saxon Boulevard at Normandy Boulevard
8	Harley Strickland Boulevard at Enterprise Road
9	Harley Strickland Boulevard at JR Street
10	Harley Strickland Boulevard at Threadgill Place
11	Harley Strickland Boulevard at Florida Hospital
12	Veterans Memorial Parkway at Harley Strickland Blvd
13	Enterprise Road at Grand Plaza Drive
14	US 17/92 at E. Roberts Street
15	US 17/92 at E. Iris Drive
16	Veterans Memorial Parkway at Rhode Island Avenue
17	Veterans Memorial Parkway at Graves Avenue
18	Graves Avenue at Kentucky Avenue

Parc Hill

N

NTS

Lassiter Transportation Group, Inc.
Engineering and Planning
1450 W. Granada Blvd, Suite 2 – Ormond Beach, Florida 32174
Telephone: 386.257.2571 Fax: 386.257.6996 EB#0009227

Location and Study Intersection Map

Project Number: 4136.02 I-30 1

Vested Traffic

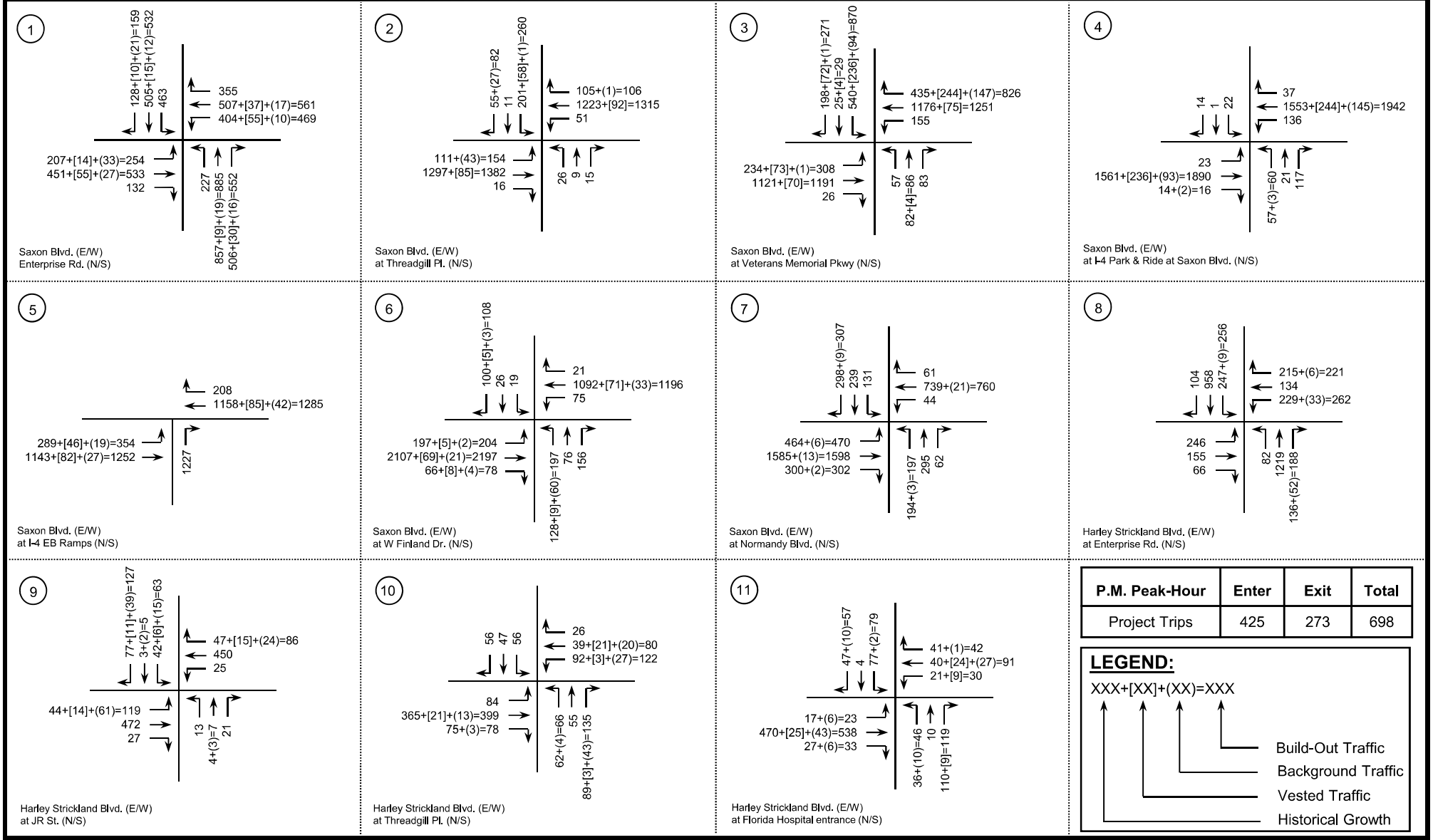
Due to approvals previously issued for developments within the immediate study area, the City of Orange City has requested that we also use vested traffic to determine the background traffic used in the analysis. The developments included in the vested traffic total include Sam's Club located on Veterans Memorial Parkway, Shadow Crossings Phase 2, and Delaware North Card Room. The total vested traffic used in the future background and build-out conditions is graphically depicted in Figure 5.

Trip Generation

The total trip generation for the development was determined using the trip generation rates contained in the *Institute of Transportation Engineers (ITE) 9th edition* of the Trip Generation Manual. Table 7 shows the total daily, a.m. and p.m. peak-hour trip generation for the proposed project.

Table 7
Daily, A.M. & P.M. Peak-Hour Total Trip Generation
Parc Hill Mixed Use PUD

Time Period	ITE Land Use	ITE LU Code	Trip Rate Equation	Units (X)		Total Trips	Percent Entering	Percent Exiting	Trips Entering	Trips Exiting
Daily	Single-Family Residential	210	Ln(T) = 0.92 Ln(X) + 2.72	370	DUs	3,500	50%	50%	1,750	1,750
	Apartments	220	T = 6.06 (X) + 123.56	400	DUs	2,548	50%	50%	1,274	1,274
	Specialty Retail	826	T = 44.32 (X)	25	ksf	1,108	50%	50%	554	554
	Assisted Living Facility	254	T= 1.61 (X) + 132.16	130	Beds	342	50%	50%	171	171
					Totals:	**7,498**			**3,749**	**3,749**
A.M. Peak-Hour	Single-Family Residential	210	T = 0.70 (X) + 9.74	370	DUs	269	25%	75%	67	202
	Apartments	220	T = 0.49 (X) + 3.73	400	DUs	200	20%	80%	40	160
	Specialty Retail	*826*	*T = 0.8 (p.m. peak-hour trips)*	25	ksf	65	50%	50%	33	33
	Assisted Living Facility	254	T= 0.18 (X)	130	Beds	24	68%	32%	16	8
					Totals:	**558**			**156**	**402**
P.M. Peak-Hour	Single-Family Residential	210	Ln(T) = 0.90 Ln(X) + 0.51	370	DUs	341	63%	37%	215	126
	Apartments	220	T = 0.55 (X) + 17.65	400	DUs	238	65%	35%	155	83
	Specialty Retail	826	T = 2.40 (X) + 21.48	25	ksf	81	44%	56%	36	45
	Assisted Living Facility	254	T= 0.29 (X)	130	Beds	38	50%	50%	19	19
					Totals:	**698**			**425**	**273**



P.M. Peak-Hour	Enter	Exit	Total
Project Trips	425	273	698

Parc Hill

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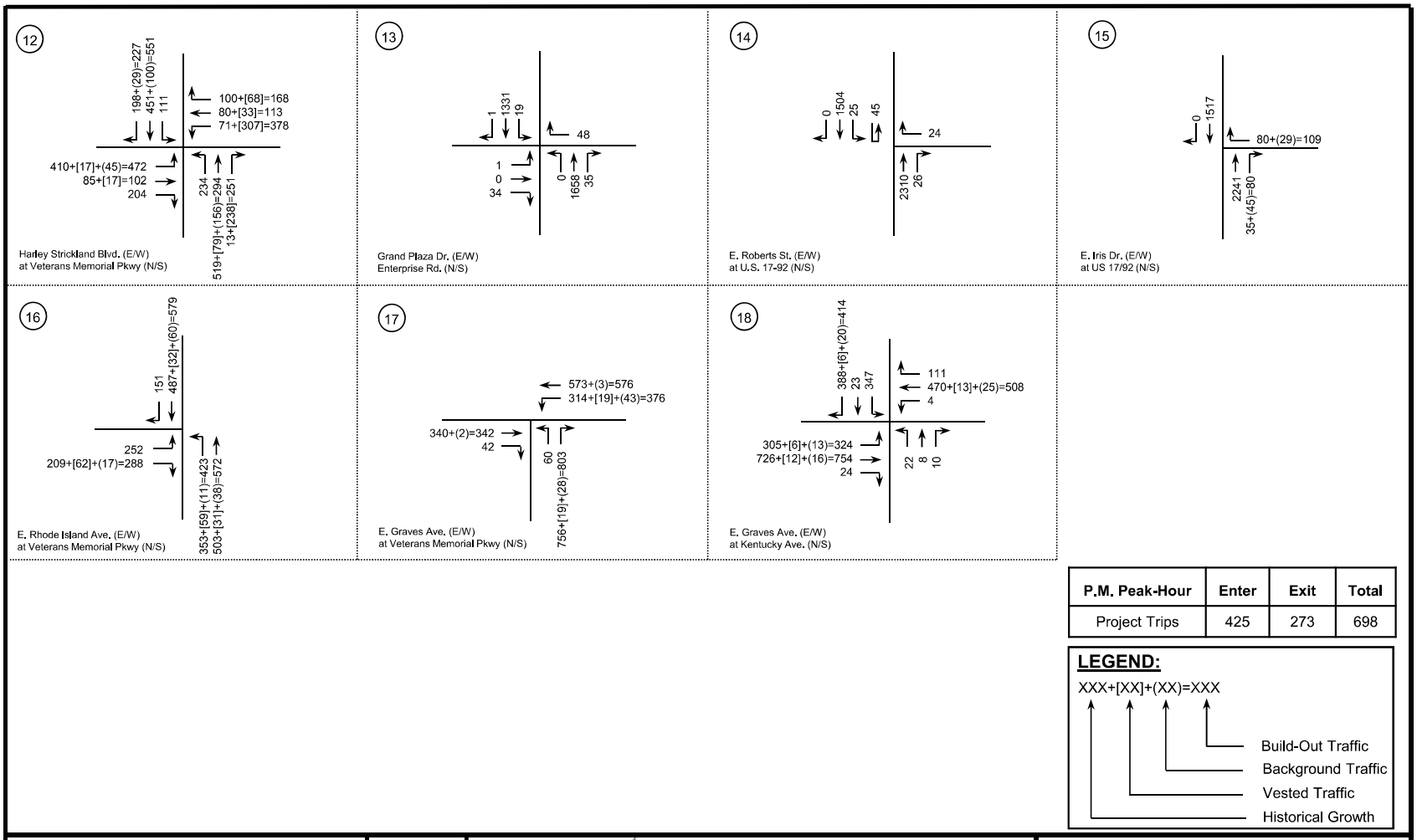
Lassiter Transportation Group, Inc.
Engineering and Planning
1450 W. Granada Blvd, Suite 2 – Ormond Beach, Florida 32174
Telephone: 386.257.2571 Fax: 386.257.6996 EB#0009227

2025 Build-Out Volumes
P.M. Peak-Hour
(including vested trips)

Project Number: 4136.02 I-32 4B



P.M. Peak-Hour	Enter	Exit	Total
Project Trips	425	273	698

LEGEND:

XXX+[XX]+(XX)=XXX

- Build-Out Traffic
- Background Traffic
- Vested Traffic
- Historical Growth

Parc Hill

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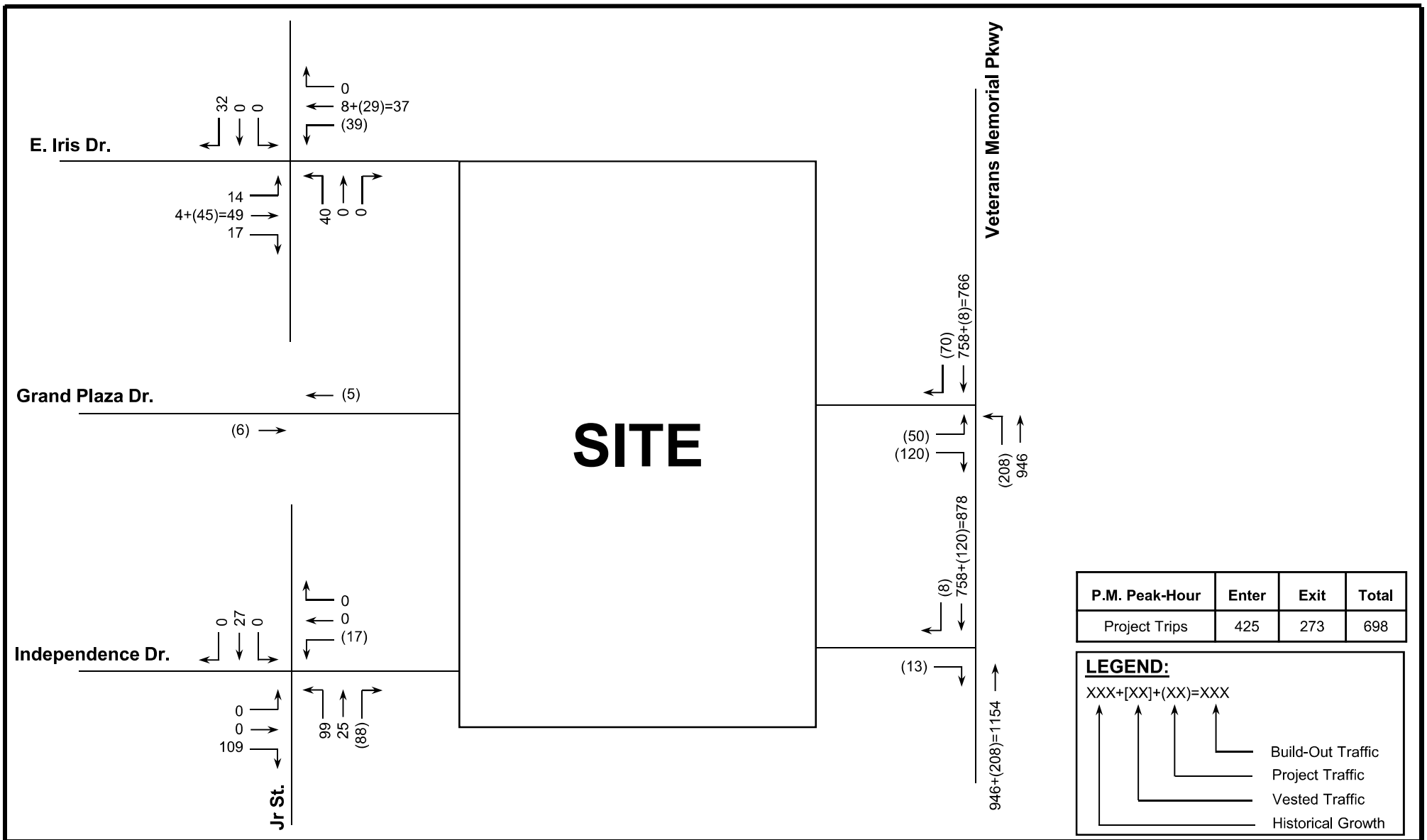
Lassiter Transportation Group, Inc.
Engineering and Planning
1450 W. Granada Blvd, Suite 2 – Ormond Beach, Florida 32174
Telephone: 386.257.2571 Fax: 386.257.6996 EB#0009227

2025 Build-Out Volumes
P.M. Peak-Hour
(including vested trips)

Project Number: 4136.02

4B



Parc Hill

N

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Engineering and Planning

1450 W. Granada Blvd, Suite 2 – Ormond Beach, Florida 32174
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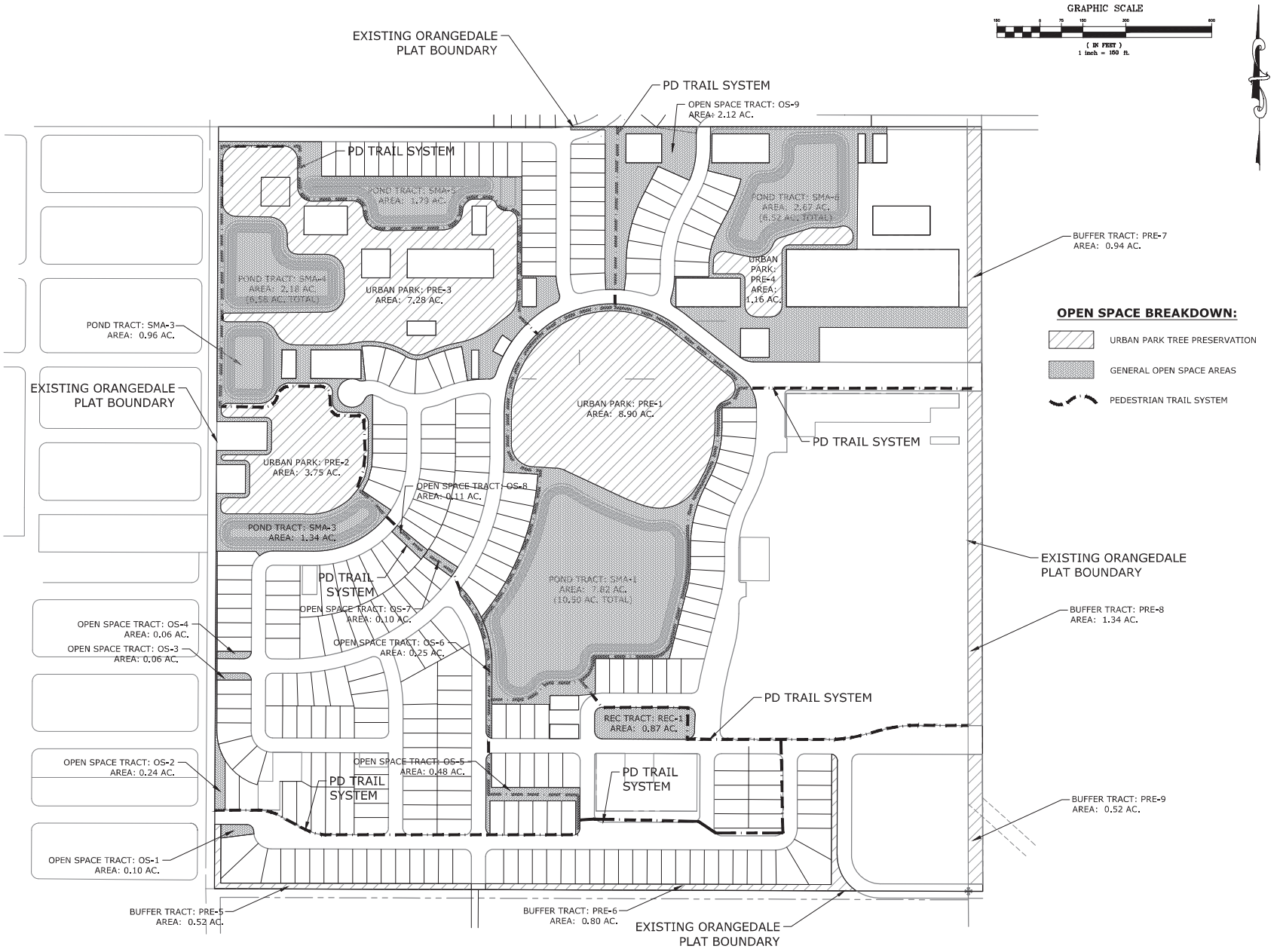
2025 Near-Site Build-Out Volumes
P.M. Peak-Hour

Project Number: 4136.02 I-34 4B

Table 17
2025 Build-Out P.M. Peak-Hour LOS – Roadway Segments – with Project Traffic
Parc Hill Mixed Use PUD

Roadway	Segment		Adopted LOS	Lanes	2015 AADT	Peak-Hour Two-Way Capacity	K-Factor	Existing Peak-Hour Two-Way Volume	Applied Growth Rate	Growth Factor	Background Peak-Hour Two-Way Volume	Vested Traffic	Future Peak-Hour Two-Way Volume	Project Distribution	Projects Trips	Build-Out Peak-Hour Two-Way Volume	V/C Ratio	Existing LOS
	From	To																
I-4	Dirksen Dr	Saxon Blvd	D	6	106,510	11,860	0.0997	10,619	1.00%	1.09	11,575	357	11,932	17.20%	120	12052	1.02	F
	Saxon Blvd	SR 472	D	6	92,500	11,860	0.0997	9,222	1.00%	1.09	10,052	189	10,241	7.10%	50	10291	0.87	D
	SR 472	Orange Camp Rd	D	6	80,500	11,860	0.0997	8,026	3.19%	1.29	10,353	189	10,542	7.10%	50	10592	0.89	D
Catalina Blvd	Howland Blvd	Sixma Rd	D	4	12,590	1,970	0.0997	1,255	1.00%	1.09	1,368	0	1,368	0.00%	0	1368	0.69	B
	Sixma Rd	Lake Helen-Osteen Rd	D	4	10,630	1,970	0.0997	1,060	1.00%	1.09	1,155	0	1,155	0.00%	0	1155	0.59	B
Dirksen Dr/Debary Ave	I-4	Deltona Blvd	E	6	31,470	4,130	0.0997	3,138	1.00%	1.09	3,420	0	3,420	0.2%	1	3421	0.83	D
	Providence Blvd	Garfield Rd	E	4	13,120	2,050	0.0997	1,308	1.00%	1.09	1,426	0	1,426	0.9%	6	1432	0.70	C
Elkcam Blvd	Providence Blvd	Montecito Ave	D	2	10,170	1,270	0.0997	1,014	1.00%	1.09	1,105	0	1,105	0.00%	0	1105	0.87	D
	Montecito Ave	Howland Blvd	D	2	10,230	1,270	0.0997	1,020	1.00%	1.09	1,112	0	1,112	0.00%	0	1112	0.88	D
Graves Ave	Veterans Memorial Pkwy	Kentucky Ave	E	4	18,780	3,222	0.0997	1,872	1.00%	1.09	2,041	38	2,079	10.70%	75	2154	0.67	B
Harley Strickland Blvd	Enterprise Rd	Veterans Memorial Pkwy	E	4	11,760	2,630	0.0997	1,172	1.00%	1.09	1,278	78	1,356	28.90%	202	1558	0.59	B
Howland Blvd	I-4/SR 472	Wolf Pack Run	E	6	36,570	4,850	0.0997	3646	1.00%	1.09	3,974	0	3,974			3974	0.82	D
	Providence Blvd	Elkcam Blvd	E	2	16,780	2,416	0.0997	1,673	1.00%	1.09	1,824	16	1,840	0.00%	0	1840	0.76	C
Kentucky Ave	Graves Ave	SR 472	E	2	9,320	1,540	0.0997	929	1.00%	1.09	1,013	12	1,025	4.80%	34	1058	0.69	B
Normandy Blvd	Saxon Blvd	Deltona Blvd	D	2	10,630	1,330	0.0997	1,060	1.00%	1.09	1,155	4	1,159	0.70%	5	1164	0.88	D
	Deltona Blvd	Tivoli Dr	D	3	10,100	1,330	0.0997	1,007	1.00%	1.09	1,098	6	1,104	0.70%	5	1108	0.83	D
Providence Blvd	Anderson Dr	Normandy Blvd	E	2	11,650	1,330	0.0997	1,162	1.00%	1.09	1,266	0	1,266	0.00%	0	1266	0.95	E
Saxon Blvd*	Veterans Memorial Pkwy	FDOT Park & Ride	E	6	34,640	4,280	0.0997	3,454	1.00%	1.09	3,764	625	4,389	34.60%	242	4631	1.08	**F**
	FDOT Park & Ride	I-4	E	6	40,100	3,410	0.0997	3,998	1.00%	1.09	4,358	501	4,859	34.00%	237	5096	1.49	**F**
	I-4	Finland Dr	E	6	40,540	4,851	0.0997	4,042	1.00%	1.09	4,406	167	4,573	9.80%	68	4641	0.96	**E**
	Finland Dr	Normandy Blvd	E	6	39,620	4,851	0.0997	3950	1.00%	1.09	4,306	0	4,306	9.80%	68	4374	0.90	**D**
Tivoli Dr	Saxon Blvd	Providence Blvd	D	4	12,360	1,970	0.0997	1,232	1.00%	1.09	1,343	0	1,343	0.00%	0	1343	0.68	B
Veterans Memorial Parkway	Graves Ave	Rhode Island Ave	E	4	15,510	3,222	0.0997	1,546	1.50%	1.135	1,755	184	1,939	14.00%	98	2037	0.63	B
	Rhode Island Ave	Harley Strickland Blvd	E	4	17,750	3,410	0.0997	1,770	1.00%	1.09	1,929	771	2,700	67.20%	469	3169	0.93	E
	Harley Strickland Blvd	Saxon Blvd	E	4	18,050	3,410	0.0997	1,800	1.00%	1.09	1,962	718	2,680	36.80%	257	2936	0.86	D



G L SUMMITT
ENGINEERING GROUP
Office: Lake Mary
3667 Simonton Place
Lake Mary, Florida 32746
phone: 407-323-9705
fax: 407-992-8650
www.GLSeng.com

Orange Dale Venture, LLC
3911 Orange Lake Dr.
Orlando, FL 32817
321-303-8093

Parc Hill
Planned Development
Orange City, Florida

PD Land Use Plans

PD Open Space & Mobility Plan

Plans not valid unless Signed, Dated and Sealed below:

GEOFFREY L. SUMMITT, P.E.
Date: June 27, 2016
FL Registration #58775
Certificate of Authorization #29665

Revisions

NO.	DATE	DESCRIPTION
1	11-8-16	Revised Per Orlando Springs DRC Comments
2		
3		
4		
5		
6		
7		
8		
9		
10		

SHEET NUMBER
5 OF 6
I-36

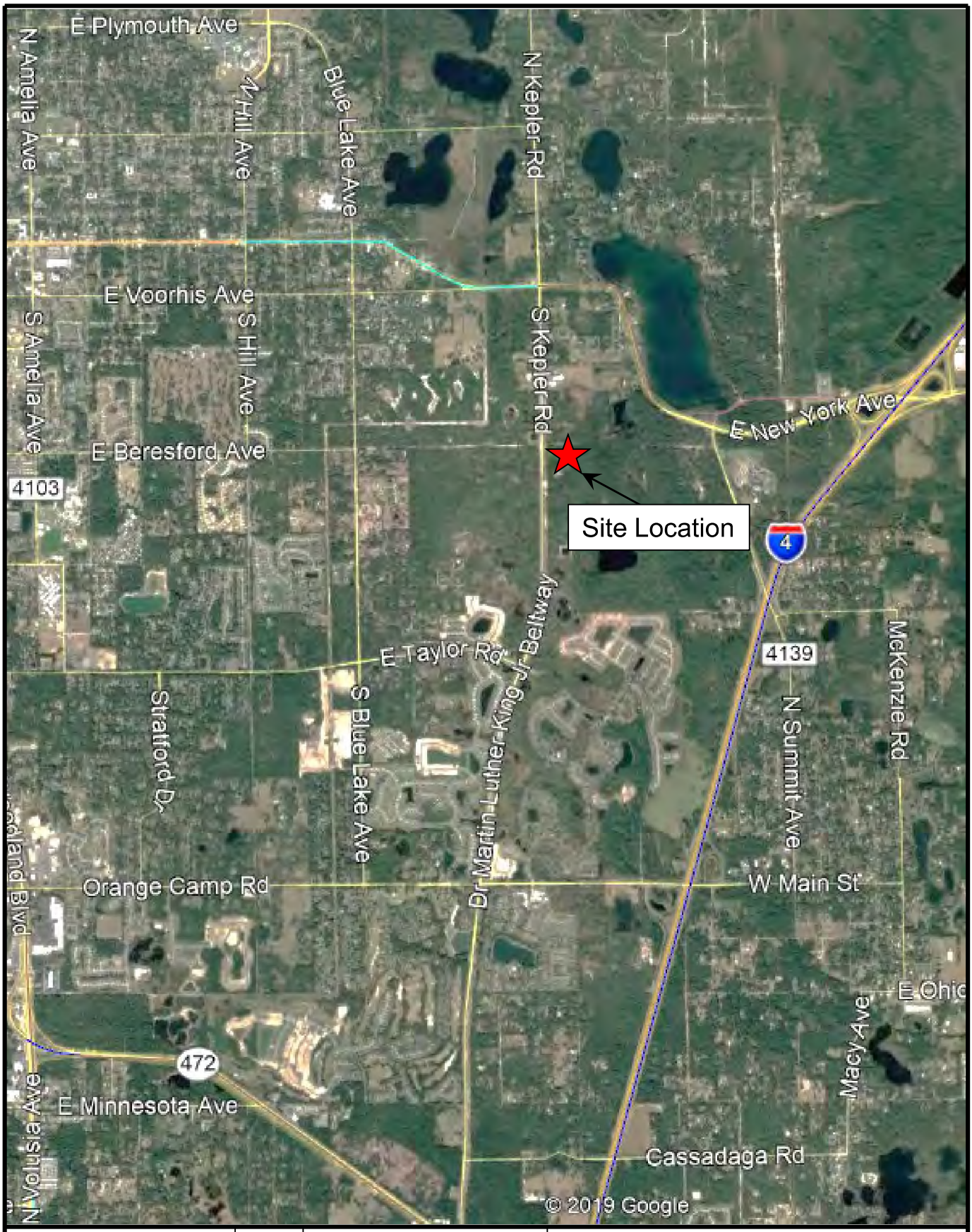
Park Lake Estates

Park Lake Estates
DeLand, Florida

Traffic Impact Analysis

Prepared for: DDC Management, LLC
By: LTG, Inc.
***Revised* September 2020**

LTG Engineering & Planning



Park Lakes Estates	N NTS	**Site Location**	LTG Engineering & Planning
		Project No.: 4817.32 Figure: 1	1450 W. Granada Blvd, Suite 2 – Ormond Beach, Florida 32174 Telephone: 386.257.2571 Fax: 386.257.6996 EB# 0009227

E-39

5

BUILD-OUT - FUTURE ROADWAY ANALYSIS

The study area intersections and roadway segments were analyzed based on the roadway conditions at the time of project build-out to determine potential impacts of project-generated trips and investigate mitigation requirements. The improvements recommended in background conditions have been included in the 2025 build-out analysis for those applicable intersections and roadway segments.

Build-Out Project Trip Generation

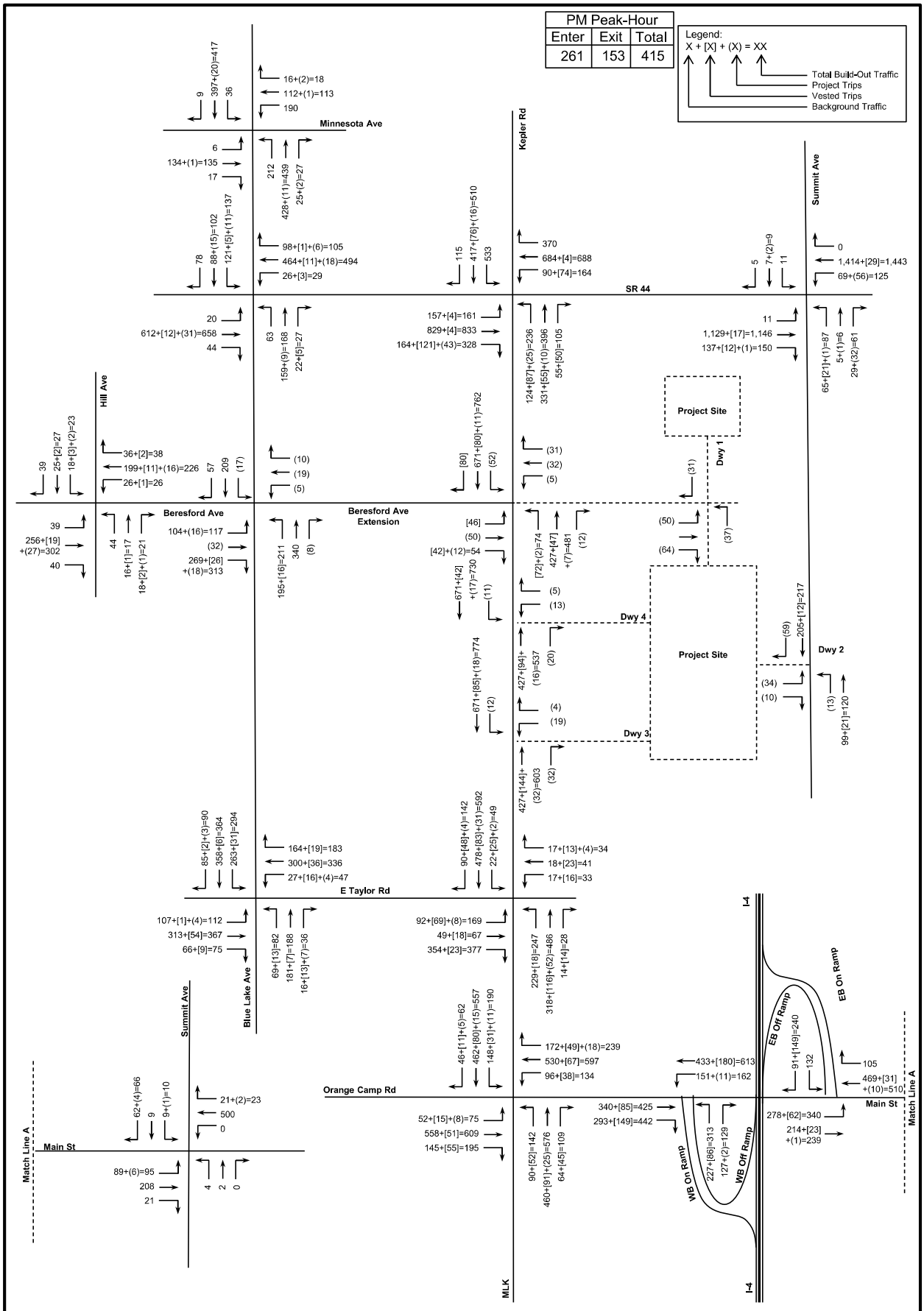
The trip generation for the development was determined using the Institute of Transportation Engineers (ITE) 10th Edition of the *Trip Generation Manual* and is presented in Table 11.

Table 11
Project Trip Generation
Park Lake Estates

Time Period	Land Use	ITE LUC	Trip Rate Equation	Quantity (X)		Percent Entering	Percent Exiting	Trips Entering	Trips Exiting	Total Trips (T)
Daily	Single Family Residential	210	Ln(T)=0.92Ln(X)+2.71	433	DU	50%	50%	2,002	2,002	4,004
AM Peak-Hour			T=0.71(X)+4.80			25%	75%	78	234	312
PM Peak-Hour			Ln(T)=0.96Ln(X)+0.20			63%	37%	261	153	415

2025 Project Trip Distribution

The process of determining the directional flow of traffic associated with a new development is called trip distribution. The Central Florida Regional Planning Model (CFRPM), version 6.1 was used to determine the primary project trip distribution and is presented in Figure 3. Using the trip distribution, the PM peak-hour project trips were assigned to the study area roadway network. Figures 4A and 4B graphically depict the 2025 total background traffic and 2025 build-out a.m. and p.m. peak-hour project trips at the study area intersections.



Park Lake Estates	N NTS	**2025 PM Build-out Volumes**	Project No.: 4817.32	Figure: 6

LTG Engineering & Planning
1450 W Granada Blvd., Suite 2, Ormond Beach, FL 32174
Telephone: 386.257.2571 * Fax: 386.257.6996 * EB# 0009227

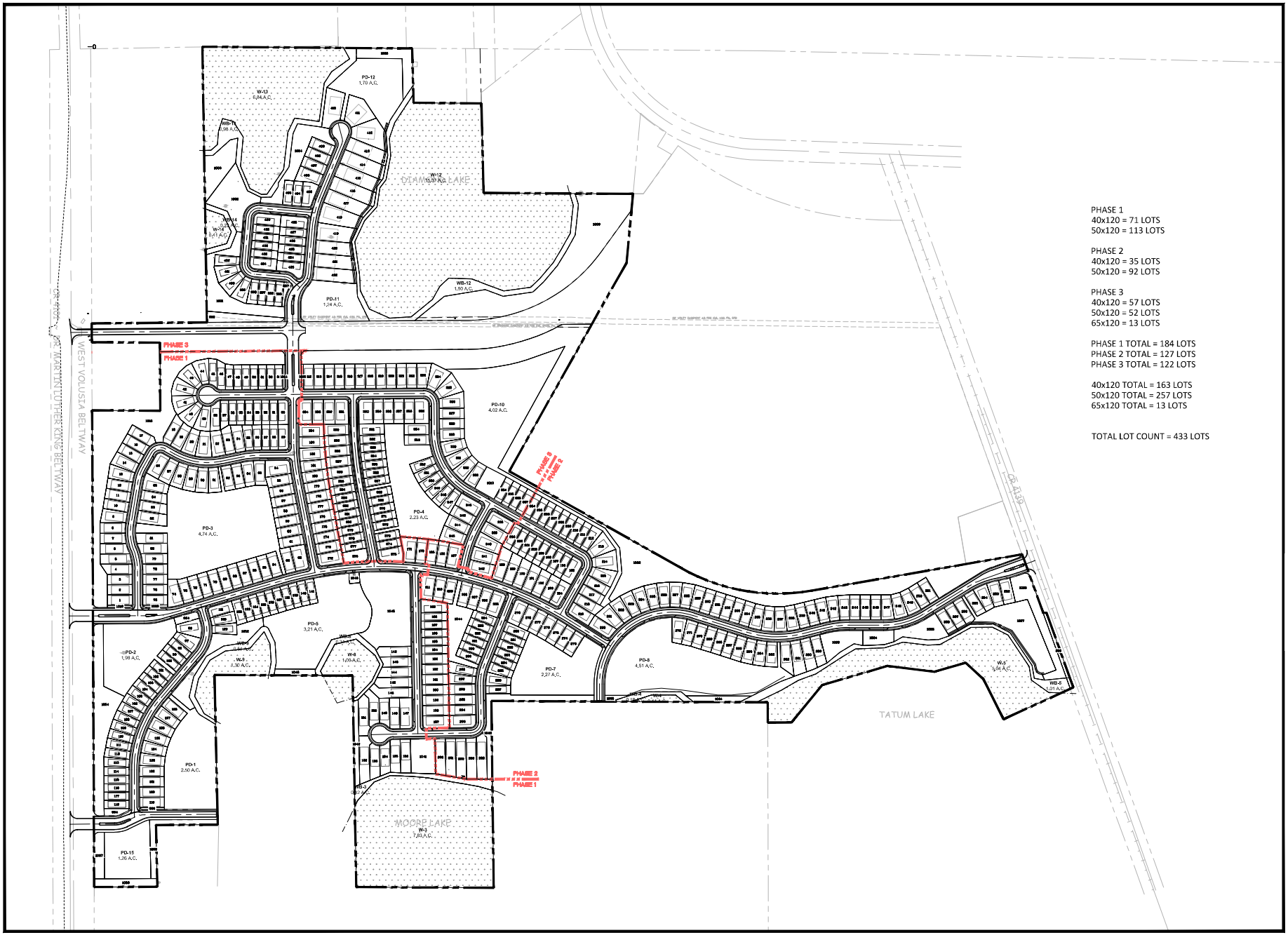
Table 15
Build-Out PM Peak-Hour LOS - Roadway Segments*
Park Lake Estates

Roadway	Segment		No. of Lanes	Adopted LOS	Peak-Hour Two-Way Capacity at Adopted LOS	Existing PM Peak-Hour Two-Way Volume	2025 Growth Factor	Vested Trips	2025 Background Traffic	Project Distribution	Project Trips	2025 Build-Out Traffic	2025 Build-Out Traffic Exceed Adopted LOS?
US 17/92	SR 472	SR 15A/Taylor Road	6	D	5,390	4,470	1.32	61	5,955	3.4%	14	5969	Yes
	Beresford Ave	Euclid Ave	2	D	1,480	1,406	1.12	75	1,650	0.0%	0	1650	Yes
	SR 44/New York Ave	Plymouth Ave	2	D	1,410	1,340	1.12	56	1,556	0.0%	0	1556	Yes
SR 44	Blue Lake Ave	Kepler Road	2	D	1,712	1,270	1.12	246	1,668	16.6%	69	1737	Yes
	Kepler Road	Summit Ave	2	D	1,712	1,510	1.12	130	1,821	0.4%	2	1823	Yes
Amelia Ave	Minnesota Ave	Plymouth Ave	2	E	1,270	900	1.06	0	954	0.9%	4	958	No
Beresford Ave	Hilll Ave	Blue Lake Ave	2	E	1,230	400	1.41	0	563	12.2%	51	614	No
Beresford Ave Ext	Blue Lake Ave	Volusia Bltwy/ Dr. MLK Bltway	2	E	1,230	0	1.06	240	240	21.9%	91	331	No
Blue Lake Ave	SR 15A/Taylor Road	Beresford Ave	2	E	1,230	830	1.66	167	1,547	3.1%	13	1560	Yes
	SR 44	Minnesota Ave	2	E	1,020	620	1.12	0	694	9.3%	39	733	No
	Minnesota Ave	Plymouth Ave	2	E	1,230	700	1.49	0	1,046	10.1%	42	1088	No
Orange Camp Road	US 17/92	Princeton Rd	2	E	1,270	1,240	1.29	229	1,832	3.4%	14	1846	Yes
	Princeton Rd	Blue Lake Ave	2	E	1,540	1,030	1.12	209	1,363	4.0%	17	1380	No
	Blue Lake Ave	W.Volusia Bltwy	2	E	1,540	1,210	1.29	238	1,795	3.0%	12	1807	Yes
	W. Volusia Bltwy	I-4	4	E	3,410	1,200	1.31	330	1,901	7.0%	29	1930	No
Summit Ave	SR 44/New York Ave	Main Street	2	E	1,230	290	1.06	0	307	22.5%	93	400	No
Taylor Rd.	Blue Lake Ave	W.Volusia Bltwy/ Dr. MLK Bltway	2	E	1,230	610	1.44	301	1,179	2.9%	12	1191	No
W. Volusia Bltwy/ Dr. MLK Bltwy	Cassadaga Road	Orange Camp Road	2	E	1,540	1,120	1.12	453	1,707	9.7%	40	1747	Yes
	Orange Camp Road	SR 15A/Taylor Road	2	E	1,540	960	1.12	217	1,292	19.8%	82	1374	No
	SR 15A/Taylor Road	Beresford Ave Ext.	2	E	1,540	780	1.12	257	1,131	24.7%	102	1233	No
W. Volusia Bltwy/ Kepler Road	Beresford Ave Ext.	SR 44/New York Ave	2	E	1,540	870	1.12	273	1,247	24.3%	101	1348	No
	SR 44/New York Ave	Minnesota Ave	2	E	1,540	1,440	1.18	70	1,770	6.3%	26	1796	Yes

Build-out Improved*

Roadway	Segment		No. of Lanes	Adopted LOS	Peak-Hour Two-Way Capacity at Adopted LOS	Existing PM Peak-Hour Two-Way Volume	2025 Growth Factor	Vested Trips	Background Traffic	Project Distribution	Project Trips	Build-Out Traffic	Build-Out Traffic Exceed Adopted LOS?
US 17/92	SR 472	SR 15A/Taylor Road	8	D	7,210	4,470	1.32	61	5,955	3.4%	14	5,969	No
	Beresford Ave	Euclid Ave	4	D	3,580	1,406	1.12	75	1,650	0.0%	0	1,650	No
	SR 44/New York Ave	Plymouth Ave	4	D	3,580	1,340	1.12	56	1,556	0.0%	0	1,556	No
SR 44	Blue Lake Ave	Kepler Road	4	D	3,580	1,270	1.12	246	1,668	16.6%	69	1,737	No
	Kepler Road	Summit Ave	4	D	3,580	1,510	1.12	130	1,821	0.4%	2	1,823	No
Blue Lake Ave	SR 15A/Taylor Road	Beresford Ave	4	E	3,222	830	1.66	167	1,547	3.1%	13	1,560	No
Orange Camp Road	US 17/92	Princeton Rd	4	E	3,410	1,240	1.29	229	1,832	3.4%	14	1,846	No
	Blue Lake Ave	W.Volusia Bltwy	4	E	3,410	1,210	1.29	238	1,795	3.0%	12	1,807	No
W. Volusia Bltwy/ Dr. MLK Bltwy	Cassadaga Road	Orange Camp Road	4	E	3,410	1,120	1.12	453	1,707	9.7%	40	1,747	No
W. Volusia Bltwy/ Kepler Road	SR 44/New York Ave	Minnesota Ave	4	E	3,580	1,440	1.18	70	1,770	6.3%	26	1,796	No

**Improved capacities were determined using the FDOT Generalized Service Tables and comparable capacities from Volusia County's AADT Table; Improvements not currently funded for construction.*



PHASE 1
40x120 = 71 LOTS
50x120 = 113 LOTS

PHASE 2
40x120 = 35 LOTS
50x120 = 92 LOTS

PHASE 3
40x120 = 57 LOTS
50x120 = 52 LOTS
65x120 = 13 LOTS

PHASE 1 TOTAL = 184 LOTS
PHASE 2 TOTAL = 127 LOTS
PHASE 3 TOTAL = 122 LOTS

40x120 TOTAL = 163 LOTS
50x120 TOTAL = 257 LOTS
65x120 TOTAL = 13 LOTS

TOTAL LOT COUNT = 433 LOTS

MADDEN
CIVIL ENGINEERS
431 E. Horatio Avenue
Suite 260
Maitland, Florida 32751
(407) 629-8330

PHASING PLAN
FOR
PARK LAKE ESTATES
CITY/COUNTY FLORIDA

CAP 5 DEVELOPMENT, LLC
1323 BROOKHAVEN DR
ORLANDO, FL 32803
(407) 924-2846

ENGINEER: CHADWICK MEMORHEAD
LICENSE No. 61781
STATE OF FLORIDA
PROFESSIONAL ENGINEER
CERTIFICATE OF AUTHORIZATION NO. EB-0007723

	DATE	REVISIONS
1		
2		
3		
4		
5		
6		
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8		
9		
10		
11		

JOB # 19040
DATE: 01-27-2020
SCALE: 1"=200'
DESIGNED BY: RJS
DRAWN BY: RJS
APPROVED BY: CBM

PH- 1

H:\Data\19040\Eng\Final\19040_XBASE.dwg January 27, 2020 12:37 PM

I-43

Volusia County Vested Trip Database

Roadway	Segment	2021PM Pk Hr (VCTE) (VCTE Staff note: R/D lost = HOT pk volumes based on daily V C proportion.)	Capacity	2020 Pure Hill (50% Removed)	SWAC Phase IA Trips 11,444 (removed 13% Integra Dunes)	Victoria Park Ph 2 Remaining Trips per city (reduced by 75%)	Victoria Park Ph 3 trips per city (0% removed)	Halifax Crossing-e BPUD (37% Removed)	Hawthorne Landing	Rivera Bella East Unit 8&9 REMOVED 50%	Ft Florida Commons	Riverbend 2868	Springview Unit 8 REMOVED 90%	Canterwood ALF	Vineland Reserve	Fernanda Place (85% removed)	Enterprise Osteen (Reflects only 189 units as vested)	Enterprise Osteen East	Lincoln Oaks 2019	133 S. Courtland Blvd	Doyle Road Tract	Reserve at Victoria 2019	Park Lake Estates 2020	Crosswinds 2020	Beresford Woods 2019	DeBary Town Center	I-4 / Kepler at SR 44 2019	Azalea Walk 2019 (20% removed)	Estates at Pelham Square 2019	Animal ER Critical Care 2019	Liberty Station, Orange City 2019	The Crossings, Orange City 2020	Eleah Estates 2022	Osteen Village PUD 2030 (see PUD trip tracker) 375 remaining not reflected on network	Deltona Village 2020/Mango Street	Portland Industrial 2020	Orange City Oncology 2025	Canopy Terrace/Kirk Subdivision	Grandview Gardens	Three Island Lake South	Village on Pelham Square	Oak Hammock Reserve	Deen River Estates	Circle K at SR 40/US 17	Total Vested Trips
I-4 Segments based on AADT V/C																																												
I-4	Saxon to SR 472	7505	10510	25	50	13	80	76																							115														*159*
I-4	SR 472 to Orange Camp	6640	10510	25	40	13	90	58																							115														*341*
I-4	Orange Camp to SR 44	7216	10510	0		8	45																								65														*118*
Graves Ave	Kirkman Rd to I-4	1420	1620	10	40		6	115																							33	143	44												*391*
Graves Ave	Kentucky to Normandy	1470	1620		80	1	9	352																								311	44	19	109											*923*
Graves Ave	Normandy Blvd to Howland Blvd	1390	2740		80	1	9	352																								311	44	19	175											*901*
Howland Blvd	I-4 to Wolf Pack Run	2320	3410		130	13		294							9															10	187	82	57	116							8					*908*
Howland Blvd	Wolf Pack Run to Catalina Blvd	2310	3410		119			238							10																152	133	25	98							8					*785*
Howland Blvd	Catalina Blvd to Providence Blvd	1670	3410		119			142							11																71	43		80												*456*
Howland Blvd	Providence Blvd to Elkcam	1140	1220				6	85							10																61	82		39							6					*289*
Orange Camp Rd-Blvd	17-92 to Princeton	1,150	1270	0	20	9	57														19	16		11							3	20				14										*164*
Orange Camp Rd	Princeton to Blue Lake Ave	1,160	1540	0	20	8	57														29	16	3	11							3	20				14						2				*173*
Orange Camp Rd	Blue Lake Ave to MLK	1,210	1560	0	20	11	80														20	16	4								3	20	2			21										*197*
Orange Camp Rd	MLK to I-4	1,170	1560		40	17	111														59	69	9								3	10	3			54										*355*
MLK	SR 44 to Beresford Rd ext	800	1560			2	12														254		4																							*272*
MLK	Beresford to Taylor Rd	760	1560			3	18														228	188	4													54										*495*
MLK	Taylor to Orange Camp	1020	1560			8	59														123	101	0													54										*345*
MLK	Orange Camp to Cassadaga Rd	990	1560	0	90	12	83														54	44	3							14	51	10			21										*382*
MLK	Cassadaga to SR 472	1040	1560	0	110	7	44																							16	61	13		20										*271*
Kentucky	SR 472 to Graves	910	1560																											67	162	10		31										*270*
VMP	Graves Ave to Rhode Island	1200	1620	69	90	1	10																							68	91	8		35										*332*
VMP	Rhode Island to Hartley Strickler	1490	1620	255	90	1	3																							35	20			23										*307*
SR 472	MLK to I-4	2710	3590																															46										*46*
US 17-92	Euclid Ave to SR 44	1157	1410			1	8																				1		2															*12*
US 17-92	SR 44 to Plymouth Ave	1406	1410			1	13																	3			1		5						62										*85*
US 17-92	Taylor Rd to SR 473	4771	5390																															53	46						33				*134*
Blue Lake Ave	Orange Camp to Taylor	530	1560			9	59																																						*68*
Blue Lake Ave	Taylor to Beresford	730	1230			9	79														42	33														31										*216*
Blue Lake Ave	Beresford to Veterns	530	1070			6	42																																						*48*
Blue Lake Ave	Veterns to SR 44	400	1020			5	40																																						*45*
Taylor Rd	Stratford to Blue Lake	700	1560			7	49																																						*56*
Taylor Rd	Blue Lake to MLK	610	1230			10	69														47	35	3			145																				*310*
Lake Helen Osteen	Catalina Blvd to Hanlover Blvd	1095	1230																																											*81*
Lake Helen Osteen	Hanlover Blvd to Elkcam Blvd	820	1230																												0										47					*47*
Normandy Blvd	Graves Ave to Rhode Island	787	1150																												570		13	181												*764*
Normandy Blvd	Rhode Island to Elkcam Blvd	636	2650																												447			60												*507*
Normandy Blvd	Elkcam Blvd to Saxon Blvd	599	2650																												305			33												*338*
Normandy Blvd	Saxon Blvd to Deltona Blvd	936	2650																												61															*61*

Orange City Vested Trip Database

Orange City Concurrency Management System (updated Jan.21, 2020)

2018 Roadway Trips and Capacity						Vested Project Peak Trips									
Roadway	Segment	PM Peak 2way Hour	PM Peak LOS Capacity	AADT	AADT Capacity	2020 Parc Hill	Sparkman 153 SFR (74 phase 1)	SWAC Phase IA Trips	WVRC-106 MF units	FL Hospital Bed Tower		Deltona Whouse	Crossings PUD 288 MF/100 Hotel/62K	Liberty St. PUD 175SFR	Total Vested Peak Trips
STATE ROADS															
I-4	Seminole to Dirksen	n/a	10060	114,000	111,800							36			
I-4	Dirksen to Saxon	n/a	10060	112,700	111,800	120	31	69	3			48			
I-4	Saxon to SR 472	n/a	10060	94,000	111,800	50	0	57	3			54		10	
I-4	SR 472 to Orange Cam	n/a	10060	74,000	111,800	50		46				37		12	
I-4	Orange Camp to SR 44	n/a	10060	79,000	111,800							21			
US 17-92	SR 472 to New York	2,423	3580	30,000	39800			34							34
US 17-92	New York to Graves	n/a	3580	29500	39800			23							23
US 17-92	Graves to Rhode island	2,592	3580	32,000	39800			23							23
US 17-92	Rhode Island to Enterp	2,633	3580	31,000	39800			11							11
US 17-92	Enterprise to Saxon	n/a	3580	22,000	39800										0
US 17-92	Saxon to DeBary Planta	2,791	3580	29,500	39,800										
SR 472	17/92- VMP	2,373	5900	29,000	65600			80						24	
SR 472	VMP to I-4	2,473	3580	29,500	39800			103				36	171	16	
COUNTY ROADS															
Graves Ave	VMP to Kentucky Ave	1600	1620	19,590	17900	75	9	46	3	15		72	59	33	
Graves Ave	Kentucky to Howland	1400	1620	15,520	17900			92				116	39	40	
Enterprise	17/92 to Harley	1,870	2740	23,760	30420			11							11
Enterprise	Harley to Saxon	1,510	3410	19,220	37970			23							23
Enterprise	Saxon to Highbanks	1,530	3410	19,820	37970			34							34
W. French	State park to Sparkmar	460	1,020	5,180	13,640										
Rhode Islar	Westside Pkwy to Spar	540	1330	8,030	14740		57								57
Rhode Islar	Sparkman to Carpente	720	1330	9,800	14740		112								112
Rhode Islar	Carpenter to 17/92	750	1330	9,390	14740		112								112
Rhode Islar	VMP to Normandy	0	0	0	13640										
Saxon	17/92 to Enterprise	1170	2,740	15,890	30,420			23							23
Saxon	Enterprise to VMP	1950	4,280	25,720	47,560			34						17	34
Saxon	VMP to FDOT Park n Ri	2660	4,280	34,090	47,560	242		57	14			33		19	
Saxon	Park n Ride to I-4	3260	3,410	44,320	37,970	237	37	57	14			33			
Westside P	Hamilton to French	240	1,020	2,690	13,640										
Westside P	French to DeBary Plant	0	0	0	13,640										
Kentucky	SR 472 to Graves	950	1,540	10,570	17050			92				96	104	67	
VMP	Graves Ave to Rhode Is	1120	1620	13,400	17900	98	3	103	4	24		54		48	
VMP	Rhode Island to Harley	1570	1540	19,420	17,900	469	22	92	4	30		12	25	35	
VMP	Harley to Saxon	1200	3410	14,650	37970				15	25				29	

CITY ROADS															
Roadway	Segment	PM Peak 2way Hour	PM Peak LOS Capacity	AADT	AADT Capacity	2020 Parc Hill	Sparkman 153 SFR (74 phase 1)	SWAC Phase IA Trips	WVRC-106 MF units	FL Hospital tower expansion		Deltona Whouse	Crossings	Liberty Station	Total Vested Trips
Harley Stri	Enterprise to VMP	n/a	1,270	12,400	14,040				24	29					53
Rhode Islar	17/92 to VMP	661	1,230	8,100	13,640			69				30			69
Leavitt	French to Graves														
Leavitt	Graves to Ohio														
Leavitt	Ohio to Rhode Island														
Wisconsin	17/92 to leavitt														
Graves	17/92 to leavitt	640	1,330	7,360	14,740			11				6		10	
Graves	leavitt to VMP	650	1,020	7,560	13,640			23				18		17	
W. French	Sparkman to 17-92	460	1,020	5,180	13,640										
W. Blue Sp	Sparkman to 17/92														

Total Vested Trips Summary

Vested Trip Summary

Roadway	Segment	CTC Development	Kirk Subdivision	The Crossings	North Kentucky Distribution Center	Parc Hill	Park Lake Estates	Database Source	Database Vested Trips	Total Vested Trips
Dr Martin Luther King Jr Beltway	SR 472 to Cassadaga Rd.	85	77	36	18	0	0	Volusia County	258	474
	Cassadaga Rd. to Orange Camp Rd.	30	52	27	15	0	40	Volusia County	369	533
	Orange Camp Rd. to Taylor Rd.	12	7	0	6	0	82	Volusia County	345	452
	Taylor Rd. to Beresford Ave.	10	6	0	0	0	102	Volusia County	491	609
Kentucky Avenue	Graves Ave. to SR 472	24	7	104	51	34	0	Orange City	359	579
Veteran's Memorial Par	Rhode Island Ave. to Graves Ave.	12	7	0	13	98	0	Orange City	236	366
Cassadaga Road	Dr. Martin Luther King Jr Bltwy. to Macy Ave.	6	11	0	0	0	0	Volusia County	0	17
Orange Camp Road	Blue Lake Ave. to Dr Martin Luther King Jr Bltwy.	6	14	11	3	0	12	Volusia County	191	237
Graves Avenue	Veteran's Memorial Pkwy. to Kentucky Ave.	18	7	59	16	75	0	Volusia County	388	563
	I-4/SR 472 to Wolf Pack Rn.	0	7	114	19	0	0	Volusia County	786	926
	Wolf Pack Rn. to Catalina Blvd.	0	6	51	13	0	0	Volusia County	650	720
Howland Boulevard	Catalina Blvd. to Providence Blvd.	0	4	0	0	0	0	Volusia County	423	466
	US 17/92 to Martin Luther King Jr Bltwy.	18	7	0	0	0	0	Orange City	104	129
SR 472	Martin Luther King Jr Bltwy. to I-4	43	49	171	0	0	0	Orange City	326	589
Macy Avenue	Ohio St. to Cassadaga Rd.	0	3	0	0	0	0	Volusia County	0	3
Kicklighter Road	Macy Ave. to Lake Helen-Osteen Rd./Prevatt Ave.	0	0	0	0	0	0	Volusia County	0	0
Normandy Blvd.	Graves Ave. to Rhode Island Ave.	0	0	0	0	0	0	Volusia County	764	764

Appendix J:
Volume Derivation Sheets

Future Turning Movement Volume Development

PM	Intersection		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	SR 472 at Kentucky Avenue/Dr Martin Luther King Jr Beltway	Raw Vol	115	184	78	207	257	82	64	989	218	137	938	214
		Seasonal Factor	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
		Adjusted Volume	121	193	82	217	270	86	67	1038	229	144	985	225
		Growth Rate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.7%	6.7%	6.7%	1.0%	1.0%	1.0%
		Growth Volume	0	0	0	0	0	0	26	400	88	7	50	11
		Vested Trips	126	184	80	87	96	29	0	0	0	34	81	88
		Future Background	247	377	162	304	366	115	93	1438	317	185	1116	324
		Industrial Park/Warehouse PV Trips			in	out				in		out	out	
					9.10%	51.30%				17.30%		9.10%	17.30%	
			0	0	7	121	0	0	0	13	0	22	41	0
		Industrial Park/Warehouse Truck Trips			in	out				in		out	out	
					9.10%	51.30%				17.30%		9.10%	17.30%	
			0	0	2	30	0	0	0	3	0	5	10	0
		Commercial + Gas/Conv Pass By		15.0%	-15.0%	30.0%			15.0%	-15.0%				
			0	39	-39	79	0	0	39	-39	0	0	0	0
		Commercial + Gas/Conv New Inbound Trips		5.5%	3.6%				6.9%	10.4%				
			0	22	14	0	0	0	27	41	0	0	0	0
		Commercial + Gas/Conv New Outbound Trips				51.3%	5.5%	6.90%				3.60%	10.40%	
			0	0	0	224	24	30	0	0	0	16	45	0
		Future Total	247	438	146	758	390	145	159	1456	317	228	1212	324
2	Dr Martin Luther King Jr Beltway at Cassadaga Road	Raw Vol	0	386	74	43	468	0	0	0	0	62	0	26
		Seasonal Factor	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
		Adjusted Volume	0	405	78	45	491	0	0	0	0	65	0	27
		Growth Rate	0.0%	0.0%	0.0%	2.5%	2.5%	2.5%	0.0%	0.0%	0.0%	2.0%	2.0%	2.0%
		Growth Volume	0	0	0	6	62	0	0	0	0	7	0	3
		Vested Trips	0	152	98	25	204	0	0	0	0	49	0	14
		Future Background	0	557	176	76	757	0	0	0	0	121	0	44
		Industrial Park/Warehouse PV Trips				in						out		out
						15.10%						51.30%		15.10%
			0	0	0	11	0	0	0	0	0	121	0	36
		Industrial Park/Warehouse Truck Trips				in						out		out
						22.30%						51.30%		22.30%
			0	0	0	4	0	0	0	0	0	30	0	13
		Commercial + Gas/Conv New Inbound Trips				6.2%	8.9%							
			0	0	0	24	35	0	0	0	0	0	0	0
		Commercial + Gas/Conv New Outbound Trips		8.90%										6.20%
			0	39	0	0	0	0	0	0	0	0	0	27
		Future Total	0	596	176	115	792	0	0	0	0	272	0	120
3	Dr Martin Luther King Jr Beltway at Orange Camp Road	Raw Vol	102	321	88	137	307	114	43	487	135	100	405	128
		Seasonal Factor	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
		Adjusted Volume	107	337	92	144	322	120	45	511	142	105	425	134
		Growth Rate	2.5%	2.5%	2.5%	2.0%	2.0%	2.0%	5.4%	5.4%	5.4%	6.0%	6.0%	6.0%
		Growth Volume	14	43	12	15	34	12	13	153	42	36	144	45
		Vested Trips	47	149	43	41	136	40	0	0	0	0	0	0
		Future Background	168	529	147	200	492	172	58	664	184	141	569	179
		Project Trips	37	59	11		39				24	7		
		Future Total	205	588	158	200	531	172	58	664	208	148	569	179

Future Turning Movement Volume Development

4	Dr Martin Luther King Jr Beltway at Taylor Road	Raw Vol	146	382	25	21	451	67	48	58	103	18	47	57
		Seasonal Factor	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
		Adjusted Volume	153	401	26	22	474	70	50	61	108	19	49	60
		Growth Rate	2.0%	2.0%	2.0%	1.0%	1.0%	1.0%	9.4%	9.4%	9.4%	9.4%	9.4%	9.4%
		Growth Volume	16	42	3	1	24	4	28	35	61	11	28	34
		Vested Trips	48	176	8	12	243	34	0	0	0	0	0	0
		Future Background	217	619	37	35	741	108	78	96	169	30	77	94
		Project Trips	0	48	7		32				0	5		
		Future Total	217	667	44	35	773	108	78	96	169	35	77	94
5	Kentucky Ave at Graves Avenue	Raw Vol	27	7	25	292	13	273	225	454	30	13	327	180
		Seasonal Factor	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
		Adjusted Volume	28	7	26	307	14	287	236	477	32	14	343	189
		Growth Rate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Growth Volume	0	0	0	0	0	0	0	0	0	0	0	0
		Vested Trips	0	0	0	127	4	153	120	140	8	11	302	182
		Future Background	28	7	26	434	18	440	356	617	40	25	645	371
		Project Trips				15		51	34					10
		Future Total	28	7	26	449	18	491	390	617	40	25	645	381
6	Veterans Memorial Parkway at Graves Avenue	Raw Vol	119	0	429	0	0	0	0	301	341	317	295	0
		Seasonal Factor	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
		Adjusted Volume	125	0	450	0	0	0	0	316	358	333	310	0
		Truck %	2.5%	0.0%	2.1%	0.0%	0.0%	0.0%	0.0%	1.7%	0.7%	0.9%	1.0%	0.0%
		Growth Rate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.2%	3.2%	3.2%	0.0%	0.0%	0.0%
		Growth Volume	0	0	0	0	0	0	0	54	61	0	0	0
		Vested Trips	26	0	153	0	0	0	0	0	0	179	109	0
		Future Background	151	0	603	0	0	0	0	370	419	512	419	0
		Project Trips			23					11		35	17	
		Future Total	151	0	626	0	0	0	0	381	419	547	436	0
7	Veterans Memorial Parkway at Rhode Island Avenue	Raw Vol	261	383	0	0	561	123	204	0	254	0	0	0
		Seasonal Factor	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
		Adjusted Volume	274	402	0	0	589	129	214	0	267	0	0	0
		Growth Rate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	1.0%	1.0%	0.0%	0.0%	0.0%
		Growth Volume	0	0	0	0	0	0	11	0	13	0	0	0
		Vested Trips	56	110	0	0	168	24	4	0	17	0	0	0
		Future Background	330	512	0	0	757	153	229	0	297	0	0	0
		Project Trips		15			22	10	7					
		Future Total	330	527	0	0	779	163	236	0	297	0	0	0
8	SR 472 at I-4 WB Ramps	Raw Vol	0	0	0	350	0	263	0	666	608	273	1010	0
		Seasonal Factor	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
		Adjusted Volume	0	0	0	368	0	276	0	699	638	287	1061	0
		Growth Rate	0.0%	0.0%	0.0%	3.7%	3.7%	3.7%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
		Growth Volume	0	0	0	73	0	55	0	36	33	15	54	0
		Vested Trips	0	0	0	90	0	105	0	161	132	35	220	0
		Future Background	0	0	0	531	0	436	0	896	803	337	1335	0
		Project Trips						33		301	75		168	
		Future Total	0	0	0	531	0	469	0	1197	878	337	1503	0

Future Turning Movement Volume Development

9	SR 472 at I-4 EB Ramps	Raw Vol	661	0	674	0	0	0	0	861	83	0	901	0
		Seasonal Factor	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
		Adjusted Volume	694	0	708	0	0	0	0	904	87	0	946	0
		Growth Rate	4.5%	4.5%	4.5%	0.0%	0.0%	0.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
		Growth Volume	170	0	174	0	0	0	0	46	4	0	48	0
		Vested Trips	136	0	84	0	0	0	0	399	78	0	435	0
		Future Background	1000	0	966	0	0	0	0	1349	169	0	1429	0
		Project Trips	44							252	48		92	
		Future Total	1044	0	966	0	0	0	0	1601	217	0	1521	0
12	Howland Boulevard at Graves Avenue/Halifax Crossing Boulevard	Raw Vol	133	35	345	22	21	65	44	1468	140	341	809	41
		Seasonal Factor	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
		Adjusted Volume	140	37	362	23	22	68	46	1541	147	358	849	43
		Growth Rate	3.6%	3.6%	3.6%	3.6%	3.6%	3.6%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
		Growth Volume	20	5	52	3	3	10	2	63	6	15	34	2
		Vested Trips	0	0	0	0	0	0	15	377	35	115	297	14
		Future Background	160	42	414	26	25	78	63	1981	188	488	1180	59
		Project Trips	23							104	34		69	
		Future Total	183	42	414	26	25	78	63	2085	222	488	1249	59
13	Normandy Boulevard at Graves Avenue	Raw Vol	150	0	149	0	0	0	0	344	387	162	413	0
		Seasonal Factor	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
		Adjusted Volume	158	0	156	0	0	0	0	361	406	170	434	0
		Growth Rate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.6%	3.6%	3.6%
		Growth Volume	0	0	0	0	0	0	0	0	0	25	63	0
		Vested Trips	196	0	190	0	0	0	0	227	235	0	0	0
		Future Background	354	0	346	0	0	0	0	588	641	195	497	0
		Project Trips	8		23						12	34		
		Future Total	362	0	369	0	0	0	0	588	653	229	497	0
14	SR 472 at Project Driveway (eastern driveway)	Raw Vol								1274			1273	
		Seasonal Factor	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
		Adjusted Volume	0	0	0	0	0	0	0	1338	0	0	1337	0
		Growth Rate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
		Growth Volume	0	0	0	0	0	0	0	68	0	0	68	0
		Vested Trips	0	0	68	0	0	0	0	279	36	121	181	0
		Future Background	0	0	68	0	0	0	0	1685	36	121	1586	0
		Industrial Park/Warehouse PV Trips						out	in	out				in
								26.40%	26.40%	51.30%				51.30%
			0	0	0	0	0	63	20	121	0	0	0	39
		Industrial Park/Warehouse Truck Trips						out	in	out				in
								26.40%	26.40%	51.30%				51.30%
			0	0	0	0	0	16	5	30	0	0	0	10
		Commercial + Gas/Conv Pass By						10.00%					-10.00%	10.00%
			0	0	0	0	0	26	0	0	0	0	-26	26
		Commercial + Gas/Conv New Inbound Trips							14.0%				25.6%	25.7%
			0	0	0	0	0	0	56	0	0	0	101	102
		Commercial + Gas/Conv New Outbound Trips						7.00%		51.30%				
			0	0	0	0	0	31	0	224	0	0	0	0
		Future Total	0	0	68	0	0	136	81	2060	36	121	1661	177

Future Turning Movement Volume Development

15	SR 472 at Project Driveway (middle driveway)	Raw Vol								1274			1273	
		Seasonal Factor	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
		Adjusted Volume	0	0	0	0	0	0	0	1338	0	0	1337	0
		Growth Rate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
		Growth Volume	0	0	0	0	0	0	0	67	0	0	67	0
		Vested Trips	0	0	0	0	0	0	0	290	0	0	181	0
		Future Background	0	0	0	0	0	0	0	1695	0	0	1584	0
		Industrial Park/Warehouse PV Trips								in			out	
										26.40%			26.40%	
			0	0	0	0	0	0	0	141	0	0	63	0
		Industrial Park/Warehouse Truck Trips								in			out	
										26.40%			26.40%	
			0	0	0	0	0	0	0	35	0	0	16	0
		Commercial + Gas/Conv Pass By						10.00%					-10.00%	10.00%
			0	0	0	0	0	26	0	0	0	0	-26	26
		Commercial + Gas/Conv New Inbound Trips								14.00%			12.80%	12.80%
			0	0	0	0	0	0	0	55	0	0	50	50
		Commercial + Gas/Conv New Outbound Trips						3.50%		51.30%			7.00%	
			0	0	0	0	0	16	0	224	0	0	31	0
		Future Total	0	0	0	0	0	42	0	2150	0	0	1718	76
16	SR 472 at Project Driveway (Westernmost Driveway)	Raw Vol								1274			1273	
		Seasonal Factor	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
		Adjusted Volume	0	0	0	0	0	0	0	1338	0	0	1337	0
		Growth Rate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
		Growth Volume	0	0	0	0	0	0	0	67	0	0	67	0
		Vested Trips	0	0	0	0	0	0	0	290	0	0	181	0
		Future Background	0	0	0	0	0	0	0	1695	0	0	1584	0
		Industrial Park/Warehouse PV Trips								in			out	
										26.40%			26.40%	
			0	0	0	0	0	0	0	141	0	0	63	0
		Industrial Park/Warehouse Truck Trips								in			out	
										26.40%			26.40%	
			0	0	0	0	0	0	0	35	0	0	16	0
		Commercial + Gas/Conv Pass By						10.00%					-10.00%	10.00%
			0	0	0	0	0	26	0	0	0	0	-26	26
		Commercial + Gas/Conv New Inbound Trips								14.00%				12.80%
			0	0	0	0	0	0	0	55	0	0	0	50
		Commercial + Gas/Conv New Outbound Trips						3.50%		51.30%			10.50%	
			0	0	0	0	0	15	0	224	0	0	46	0
		Future Total	0	0	0	0	0	41	0	2150	0	0	1683	76

Future Turning Movement Volume Development

17	Dr Martin Luther King Jr Beltway at Project Driveway (Southern Driveway)	Raw Vol		462			546								
		Seasonal Factor	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	
		Adjusted Volume	0	485	0	0	573	0	0	0	0	0	0	0	
		Growth Rate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
		Growth Volume	0	0	0	0	0	0	0	0	0	0	0	0	
		Vested Trips	0	251	0	0	226	0	0	0	0	0	0	0	
		Future Background	0	736	0	0	799	0	0	0	0	0	0	0	
		Industrial Park/Warehouse PV Trips					out								
							51.30%								
			0	0	0	0	121	0	0	0	0	0	0	0	
		Industrial Park/Warehouse Truck Trips					out								
							51.30%								
			0	0	0	0	30	0	0	0	0	0	0	0	
		Commercial + Gas/Conv Pass By		-10%	40%		30.00%							10%	
			0	-26	106	0	79	0	0	0	0	0	0	26	
		Commercial + Gas/Conv New Inbound Trips		6.20%	6.20%										
			0	24	24	0	0	0	0	0	0	0	0	0	
		Commercial + Gas/Conv New Outbound Trips					63.70%							4.50%	
			0	0	0	0	278	0	0	0	0	0	0	20	
		Future Total	0	734	130	0	1307	0	0	0	0	0	0	46	
18	Dr Martin Luther King Jr Beltway at Project Driveway (Northern Driveway)	Raw Vol		462			546								
		Seasonal Factor	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	
		Adjusted Volume	0	485	0	0	573	0	0	0	0	0	0	0	
		Growth Rate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%							
		Growth Volume	0	0	0	0	0	0	0	0	0	0	0	0	
		Vested Trips	0	251	0	0	226	0	0	0	0	0	0	0	
		Future Background	0	736	0	0	799	0	0	0	0	0	0	0	
		Industrial Park/Warehouse PV Trips					out								
							51.30%								
			0	0	0	0	121	0	0	0	0	0	0	0	
		Industrial Park/Warehouse Truck Trips					out								
							51.30%								
			0	0	0	0	30	0	0	0	0	0	0	0	
		Commercial + Gas/Conv Pass By		-10.00%	10.00%	20.00%	-20.00%					50.00%		10.00%	
			0	-26	26	53	-53	0	0	0	0	132	0	26	
		Commercial + Gas/Conv New Inbound Trips			6.20%	8.90%									
			0	0	24	35	0	0	0	0	0	0	0	0	
		Commercial + Gas/Conv New Outbound Trips		4.50%								63.70%		4.40%	
			0	20	0	0	0	0	0	0	0	278	0	19	
		Future Total	0	730	50	88	897	0	0	0	0	410	0	45	

Future Turning Movement Volume Development

19	Cassadaga Road at Project Driveway	Raw Vol								117			88	
		Seasonal Factor	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
		Adjusted Volume	0	0	0	0	0	0	0	123	0	0	92	0
		Growth Rate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
		Growth Volume	0	0	0	0	0	0	0	12	0	0	9	0
		Vested Trips	0	0	0	0	0	0	0	13	0	0	11	0
		Future Background	0	0	0	0	0	0	0	148	0	0	113	0
		Industrial Park/Warehouse PV Trips	out		out						in	in		
			66.40%		7.20%						15.10%	7.20%		
			157	0	17	0	0	0	0	0	11	5	0	0
		Industrial Park/Warehouse Truck Trips	out								in			
			73.60%								22.30%			
			44	0	0	0	0	0	0	0	4	0	0	0
		Commercial + Gas/Conv Pass By												
			0	0	0	0	0	0	0	0	0	0	0	0
		Commercial + Gas/Conv New Inbound									6.20%	7.20%		
		Trips	0	0	0	0	0	0	0	0	24	28	0	0
		Commercial + Gas/Conv New Outbound	6.20%		7.20%									
		Trips	27	0	31	0	0	0	0	0	0	0	0	0
		Future Total	228	0	48	0	0	0	0	148	39	33	113	0

Appendix K:
Planned and Programmed Improvements

COUNTY OF VOLUSIA

Graves Ave - Veteran's Memorial Pkwy to Kentucky Ave

Department: Public Works

Location: Orange City

CIP Category: Road Program

Account Number: 745-710-8132

Description / Justification

Volusia County received $168,145 in federal funding under the Local Agency Program (LAP) from the Florida Department of Transportation (FDOT) for the design of road safety improvements on Graves Avenue from Veterans Memorial Parkway to Kentucky Avenue. Per the recommendations of the Graves Avenue Safety Study prepared on behalf of the FDOT, the project will involve adding a dedicated left turn lane on Graves Avenue from the Veterans Memorial Parkway intersection to Kentucky Avenue intersection, adding a second left turn lane for westbound traffic on Graves turning south onto Veterans Memorial Parkway and extending the Kentucky Avenue southbound right turn lane on Graves Avenue.

This project is funded through FDOT's safety office as a safety improvement therefore, there is no local match required. However, due to additional improvements identified by county engineering staff, the design costs exceed the FDOT's budgeted amount and therefore the county will be responsible for up to $80,797. Anticipate construction bid process to start second quarter of fiscal year 2021-2022.

Project Reference

Council approved LAP grant for design 2/18/20
Council Approved Supplemental LAP Agreement for design 5/19/20
G1K75
FPN# 443545-1-38-01
Council awarded design contract to Dewberry 4/7/20

REVENUE SOURCE:

Budget Object Name	Prior Years	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26	Total Years 1-5	Total Amount
FL DOT	168,145	0	0	0	0	0	0	168,145
Gas Tax-Local Option	80,797	0	0	0	0	0	0	80,797
Grant Pending	0	951,000	0	0	0	0	951,000	951,000
Total Revenues:	**248,942**	**951,000**	**0**	**0**	**0**	**0**	**951,000**	**1,199,942**

CAPITAL IMPROVEMENT EXPENDITURE:

Budget Object Name	Prior Years	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26	Total Years 1-5	Total Amount
Construction Projects	0	951,000	0	0	0	0	951,000	951,000
Design	248,942	0	0	0	0	0	0	248,942
Total Expenditures:	**248,942**	**951,000**	**0**	**0**	**0**	**0**	**951,000**	**1,199,942**

COUNTY OF VOLUSIA

Orange Camp Rd - MLK Blvd to I-4

Department: Public Works

Location: DeLand

CIP Category: Road Program

Account Number: 103-790-8906

Description / Justification

Widen Orange Camp Road from two to four lanes from I-4 to west of Martin Luther King Jr. Parkway and widen Martin Luther King Jr. Parkway from two to four lanes for approximately 1,500 feet north and south of the intersection with Orange Camp Road. The signalized intersection of Orange Camp Road and Martin Luther King Jr. Parkway will be replaced with a roundabout to reduce traffic delays at the intersection. The widening is required due to the increase in traffic by nearby developments. Construction anticipated to be complete by third quarter fiscal year 2021-22.

Project Reference

Capital Project Sheet PW-ENG-5395

REVENUE SOURCE:

Budget Object Name	Prior Years	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26	Total Years 1-5	Total Amount
Bond Funded Road Program	5,703,646	0	0	0	0	0	0	5,703,646
City of DeLand	1,187,857	0	0	0	0	0	0	1,187,857
Gas Tax-Local Option	1,417,124	0	0	0	0	0	0	1,417,124
Proportionate Share	234,001	0	0	0	0	0	0	234,001
Road Impact Fees Z4/NW	4,217,747	0	0	0	0	0	0	4,217,747
Total Revenues:	**12,760,375**	**0**	**0**	**0**	**0**	**0**	**0**	**12,760,375**

CAPITAL IMPROVEMENT EXPENDITURE:

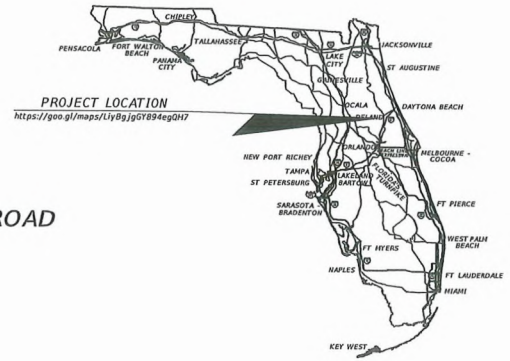
Budget Object Name	Prior Years	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26	Total Years 1-5	Total Amount
Construction Projects	5,629,778	5,300,000	0	0	0	0	5,300,000	10,929,778
Design	977,850	0	0	0	0	0	0	977,850
Right of Way	5,732	847,015	0	0	0	0	847,015	852,747
Total Expenditures:	**6,613,360**	**6,147,015**	**0**	**0**	**0**	**0**	**6,147,015**	**12,760,375**

Received 11/11/2021

Volusia County
FLORIDA

VOLUSIA COUNTY, FLORIDA
PUBLIC WORKS DEPARTMENT

CONSTRUCTION PLANS



DR. MARTIN LUTHER KING JR. BELTWAY AND CASSADAGA ROAD

SIGNALIZATION PLANS

SIGNAL NO. 471

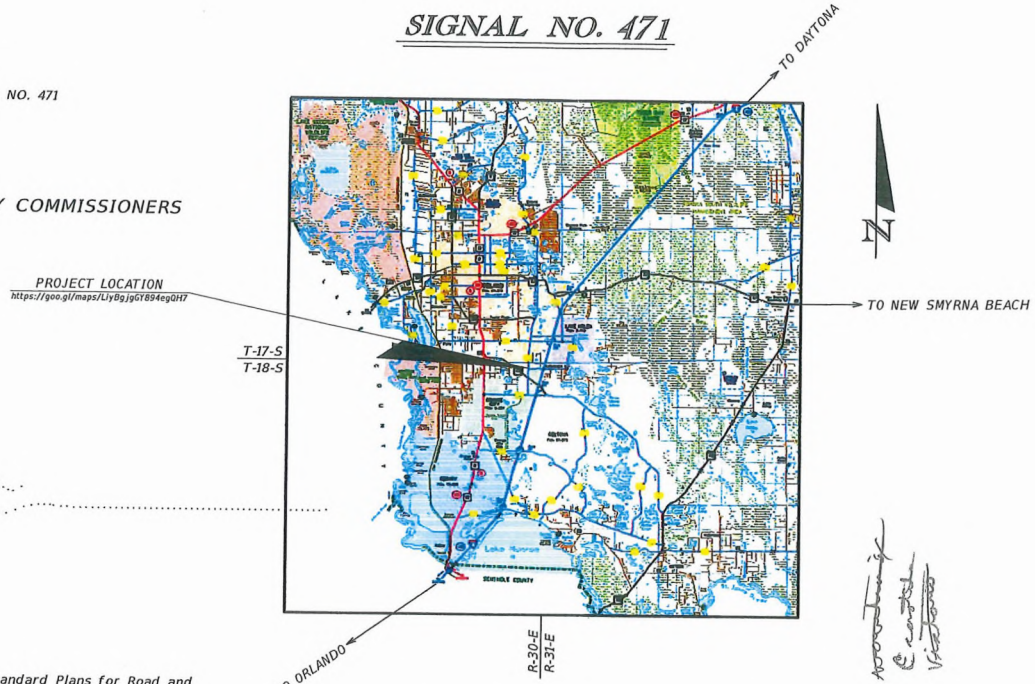
INDEX OF SIGNALIZATION PLANS

SHEET NO.	SHEET DESCRIPTION
T-1	KEY SHEET
T-2	SIGNATURE SHEET
T-3	TABULATION OF QUANTITIES
T-4 - T-5	GENERAL NOTES
T-6	SIGNALIZATION PLAN - SIGNAL NO. 471
T-7	CORNER CLIPS
T-8	STRAIN POLE SCHEDULE
T-9	GUIDESIGN WORKSHEET
B-1	SPT BORING SHEET

VOLUSIA COUNTY BOARD OF COUNTY COMMISSIONERS

COUNTY CHAIR - JEFF BROWER
AT-LARGE REPRESENTATIVE - BEN JOHNSON
COUNTY MANAGER - GEORGE RECKTENWALD

DISTRICT 1	BARBARA GIRTMAN
DISTRICT 2	BILLIE WHEELER
DISTRICT 3	DANNY ROBINS
DISTRICT 4	HEATHER POST
DISTRICT 5	DR. FRED LOWRY



SIGNALIZATION SHOP DRAWINGS
TO BE SUBMITTED TO:
JEREMY M. CROWE, PE 77064
TRAFFIC & MOBILITY CONSULTANTS LLC
3101 MAGUIRE BLVD
SUITE 265
ORLANDO, FL 32803

PLANS PREPARED BY:

TMC
Traffic & Mobility Consultants

TRAFFIC & MOBILITY CONSULTANTS LLC
3101 MAGUIRE BLVD
SUITE 265
ORLANDO, FL 32803
(407) 531-5332
CERTIFICATE OF AUTHORIZATION NO.: 30024

GOVERNING STANDARD PLANS:

Florida Department of Transportation, FY2021/22 Standard Plans for Road and Bridge Construction and applicable Interim Revisions (IRs).

Standard Plans for Road Construction and associated IRs are available at the following website: http://www.fdot.gov/design/standardplans

APPLICABLE IRs: N/A

Standard Plans for Bridge Construction are included in the Structures Plans Component

GOVERNING STANDARD SPECIFICATIONS:

Florida Department of Transportation, July 2021 Standard Specifications for Road and Bridge Construction at the following website:
http://www.fdot.gov/programmanagement/Implemented/SpecBooks

FINAL SUBMITTAL
11/08/2021

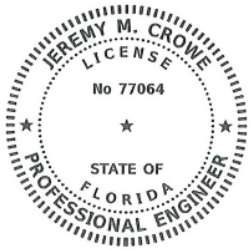
2021-P-USE-0554

NOTE: THE SCALE OF THESE PLANS MAY HAVE CHANGES DUE TO REPRODUCTION

ENGINEER OF RECORD: JEREMY M CROWE, PE
P.E. NO.: 77064

TMC PROJECT NO.	FISCAL YEAR	SHEET NO.
20147.3	22	K-4 T-1

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.



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JEREMY M. CROWE, P.E.
P.E. LICENSE NUMBER 77064
TRAFFIC & MOBILITY CONSULTANTS LLC.
3101 MAGUIRE BLVD, SUITE 265
ORLANDO, FL. 32803
CERTIFICATE OF AUTHORIZATION 30024

THE ABOVE NAMED PROFESSIONAL ENGINEER SHALL BE RESPONSIBLE FOR THE
FOLLOWING SHEETS IN ACCORDANCE WITH RULE 61G15-23.004, F.A.C.

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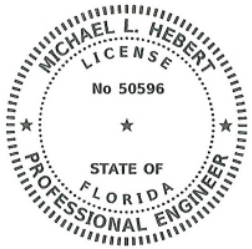

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MICHAEL L. HEBERT, P.E.
P.E. LICENSE NUMBER 50596
FBT-FLORIDA BRIDGE AND TRANSPORTATION, INC.
633 DARTMOUTH STREET
ORLANDO, FL. 32804
CERTIFICATE OF AUTHORIZATION 26379

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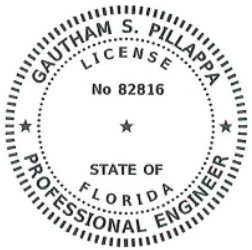
FOLLOWING SHEETS IN ACCORDANCE WITH RULE 61G15-23.004, F.A.C.

SHEET NO.	SHEET DESCRIPTION
T-2	SIGNATURE SHEET
T-8	STRAIN POLE SCHEDULE



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GAUTHAM S. PILLAPPA, P.E.
P.E. LICENSE NUMBER 82816
GEO-TECHNOLOGY ASSOCIATES, INC.
4617 PARKBREEZE COURT
ORLANDO, FL. 32808
CERTIFICATE OF AUTHORIZATION 35088

THE ABOVE NAMED PROFESSIONAL ENGINEER SHALL BE RESPONSIBLE FOR THE
FOLLOWING SHEETS IN ACCORDANCE WITH RULE 61G15-23.004, F.A.C.

SHEET NO.	SHEET DESCRIPTION
T-2	SIGNATURE SHEET
B-1	SPT BORING SHEET

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

TRAFFIC & MOBILITY CONSULTANTS LLC
3101 MAGUIRE BLVD, SUITE 265
ORLANDO, FL 32803
OFFICE: (407) 531-5332
FAX: (407) 531-5331
JEREMY M. CROWE, P.E. 77064
CERTIFICATE OF AUTHORIZATION: 30024

Volusia County

SIGNATURE SHEET

SHEET NO.
T-2

TABULATION OF QUANTITIES

PAY ITEM NO.	DESCRIPTION	UNIT	SHEET NUMBERS T-6 PLAN	T-6 FINAL	TOTAL THIS SHEET PLAN	TOTAL THIS SHEET FINAL	GRAND TOTAL PLAN	GRAND TOTAL FINAL
630-2-11	CONDUIT, FURNISH & INSTALL, OPEN TRENCH	LF	511		511		511	
632-7-1	SIGNAL CABLE- NEW OR RECONSTRUCTED INTERSECTION, FURNISH & INSTALL	PI	1		1		1	
634-4-153	SPAN WIRE ASSEMBLY, FURNISH & INSTALL, TWO POINT, BOX OR DROP BOX	PI	1		1		1	
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	EA	29		29		29	
639-1-122	ELECTRICAL POWER SERVICE, F&I, UNDERGROUND, METER PURCHASED BY CONTRACTOR FROM POWER COMPANY	AS	1		1		1	
639-2-1	ELECTRICAL SERVICE WIRE, FURNISH & INSTALL	LF	151		151		151	
639-3-11	ELECTRICAL SERVICE DISCONNECT, F&I, POLE	EA	2		2		2	
641-2-12	PRESTRESSED CONCRETE POLE, F&I, TYPE P-II SERVICE POLE	EA	2		2		2	
641-2-18	PRESTRESSED CONCRETE POLE, F&I, TYPE P-VIII	EA	4		4		4	
646-1-11	ALUMINIUM SIGNALS POLE, FURNISH & INSTALL PEDESTAL	EA	8		8		8	
650-1-14	VEHICULAR TRAFFIC SIGNAL, FURNISH & INSTALL ALUMINUM, 3 SECTION, 1 WAY	AS	6		6		6	
650-1-16	VEHICULAR TRAFFIC SIGNAL, FURNISH & INSTALL ALUMINUM, 4 SECTION, 1 WAY	AS	1		1		1	
653-1-11	PEDESTRIAN SIGNAL, FURNISH & INSTALL LED COUNTDOWN 1 WAY	AS	8		8		8	
660-3-11	VEHICLE DETECTION SYSTEM- MICROWAVE, FURNISH & INSTALL CABINET EQUIPMENT, WAVETRONIX	EA	1		1		1	
660-3-12	VEHICLE DETECTION SYSTEM- MICROWAVE, FURNISH & INSTALL ABOVE GROUND EQUIPMENT	EA	6		6		6	
663-1-121	SIGNAL PRIORITY AND PREEMPTION SYSTEM, FURNISH & INSTALL, GPS, CABINET ELECTRONICS	EA	1		1		1	
663-1-122	SIGNAL PRIORITY AND PREEMPTION SYSTEM, FURNISH AND INSTALL, GPS, DETECTOR	EA	3		3		3	
665-1-11	PEDESTRIAN DETECTOR, FURNISH & INSTALL STANDARD	EA	8		8		8	
670-5-112	TRAFFIC CONTROLLER ASSEMBLY, FURNISH & INSTALL NEMA 2 PREEMPTION (ECONOLITE WITH UPS & 4G WIRELESS)	AS	1		1		1	
684-1-1	MANAGED FIELD ETHERNET SWITCH, LAYER 2, FURNISH & INSTALL	EA	1		1		1	
684-6-12	WIRELESS COMMUNICATION DEVICE, FURNISH & INSTALL ETHERNET SUBSCRIBER UNIT	EA	1		1		1	
685-1-11	UNINTERRUPTIBLE POWER SUPPLY, FURNISH AND INSTALL, LINE INTERACTIVE	EA	1		1		1	
700-5-22	INTERNALLY ILLUMINATED SIGN, FURNISH & INSTALL, OVERHEAD MOUNT, 12-18 SF	EA	4		4		4	
715-5-31	LUMINAIRE & BRACKET ARM, FURNISH & INSTALL NEW LUMINAIRE & ARM ON NEW STRAIN POLE, ALUMINIUM	EA	4		4		4	

REVISIONS

DATE	DESCRIPTION	DATE	DESCRIPTION

TRAFFIC & MOBILITY CONSULTANTS LLC
3101 MAGUIRE BLVD, SUITE 265
ORLANDO, FL 32803
OFFICE: (407) 531-5332
FAX: (407) 531-5331
JEREMY M. CROWE, P.E. 77064
CERTIFICATE OF AUTHORIZATION: 30024

TMC Traffic & Mobility Consultants

Volusia County FLORIDA

TABULATION OF QUANTITIES

SHEET NO. K-6 T-3

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

GENERAL NOTES:

1. THE CONTRACTOR SHALL NOTIFY VOLUSIA COUNTY TRAFFIC ENGINEERING AT LEAST TWO BUSINESS DAYS PRIOR TO BEGINNING WORK. NOTIFY TIM KARR, ALLEN CATES AND BILLY WHITE (386) 736-5968.
2. THE CONTRACTOR SHALL COORDINATE WORK SCHEDULE, COORDINATE TIMING AND AUTHORIZATION OF POWER SERVICE WITH VOLUSIA COUNTY TRAFFIC ENGINEERING. NOTIFY BOBBY MADDOX, TIM KARR, AND BILLY WHITE (386) 736-5968.
3. ANY ITEM NOT SPECIFICALLY ADDRESSED IN THESE PLANS, USE F.D.O.T. FY 2021-22 STANDARD PLANS AND JULY 2021 STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION. ALL MATERIALS AND HARDWARE SHALL BE PRE-APPROVED BY VOLUSIA COUNTY TRAFFIC ENGINEERING.
4. UNLESS OTHERWISE NOTED, ALL REMOVED EQUIPMENT SHALL BE DISPOSED OF BY THE CONTRACTOR IN AREAS PROVIDED BY THE CONTRACTOR.
5. THE CONTRACTOR SHALL NOTIFY SUNSHINE ONE-CALL 1-800-432-4770 AT LEAST TWO BUSINESS DAYS IN ADVANCE OF ANY EXCAVATION WORK WHICH WOULD OTHERWISE INTERFERE WITH ANY ABOVE GROUND OR BELOW GROUND UTILITIES. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR MAINTAINING CURRENT LOCATE TICKET THROUGHOUT THE DURATION OF THE WORK. THE COUNTY OF VOLUSIA IS NOT A MEMBER OF THE SUNSHINE ONE-CALL, FOR LOCATES CALL (386) 736-5968, VOLUSIA COUNTY TRAFFIC ENGINEERING TO REQUEST TO COMPLETE A LOCATE TICKET TO SCHEDULE THE LOCATE.
6. THE CONTRACTOR SHALL VERIFY COLOR CODES FOR SIGNAL CABLE WITH VOLUSIA COUNTY TRAFFIC ENGINEERING BEFORE ORDERING.
7. IT SHOULD BE NOTED THAT NO TEST BORINGS WERE MADE WHERE CONDUIT RUNS ARE TO BE INSTALLED BY JACKING, DIRECTIONAL BORING, OR TRENCHING. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO EXAMINE THE JOB SITE CONDITIONS BEFORE SUBMITTING A BID PROPOSAL.
8. A SIGNAL INSPECTION IS TO BE SCHEDULED WITH ALLEN CATES AND BILLY WHITE (VOLUSIA COUNTY TRAFFIC ENGINEERING) (386) 736-5968 10 DAYS PRIOR TO THE SIGNAL BEING PLACED INTO OPERATION.
9. AT THE TIME OF FINAL INSPECTION, THE CONTRACTOR SHALL PROVIDE TWO SETS OF CONSTRUCTION "AS-BUILT" PLANS: ONE TO VOLUSIA COUNTY TRAFFIC ENGINEERING AND ONE FOR THE TRAFFIC SIGNAL CONTROLLER CABINET.
10. THESE PLANS REFLECT CONDITIONS KNOWN DURING PLAN DEVELOPMENT. IN THE EVENT ACTUAL PHYSICAL CONDITIONS PREVENT THE APPLICATION OR THE PROGRESSION OF ANY WORK SPECIFIED IN THESE PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY AND PRIOR TO ANY FURTHER WORK ACTIVITY.
11. AT NO TIME IS THE CONTRACTOR TO CHANGE ANY SIGNAL TIMINGS. VOLUSIA COUNTY WILL MAINTAIN ALL SIGNAL TIMINGS BEFORE, DURING AND AFTER CONSTRUCTION. IF ANY TIMING CHANGES ARE MADE BY THE CONTRACTOR, A TIMING SHEET SHALL BE PLACED IN THE CONTROLLER CABINET WITH DATE AND TIME OF INSTALLING, ALONG WITH A CONTACT NUMBER.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING THE EXISTING POWER UTILITY TO DETERMINE IF A SERVICE PROCESSING FEE IS REQUIRED. IF REQUIRED, FEE SHALL BE INCLUDED AS PART OF PAYMENT FOR THE ELECTRICAL POWER SERVICE ASSEMBLY.
13. THE CONTRACTOR SHALL HAVE AN I.M.S.A. LEVEL II SIGNAL TECHNICIAN ON SITE THROUGH ALL PHASES OF CONSTRUCTION AND ON CALL WITH A TWO-HOUR MAX. RESPONSE TIME.
14. UNLESS OTHERWISE STATED, ELEVATIONS LISTED IN THESE PLANS WERE DERIVED FROM ROD READINGS.

SIGNS:

1. LED INTERNALLY ILLUMINATED STREET NAME SIGNS SHALL HAVE A SEPARATE POWER BREAKER, NOT LOCATED IN THE CONTROLLER CABINET.
2. LED INTERNALLY ILLUMINATED STREET NAME SIGNS SHALL BE SINGLE SIDED AND FACE MOUNTED ON THE PROPOSED HANGING ARMS.

SIGNALS:

1. BLACK POLYCARBONATE HOUSINGS ARE REQUIRED FOR VEHICULAR AND PEDESTRIAN SIGNAL HEAD ASSEMBLIES IN VOLUSIA COUNTY. ALL VEHICLE SIGNAL DISPLAYS SHALL BE LED. ALL SIGNAL HEADS SHALL INCLUDE TUNNEL VISORS AND BACKPLATES WITH REFLECTIVE BORDERS.
2. ALL SIGNAL ASSEMBLES SHALL HAVE A VERTICAL CLEARANCE OF 17.5' MINIMUM AND 19.0' MAXIMUM FROM THE BOTTOM OF THE ASSEMBLY TO THE ROAD.

POLES / PEDS/ CONTROLLER:

1. THE CONTRACTOR SHALL STAKE ALL POLE LOCATIONS PRIOR TO SETTING AND HAVE THE POLE LOCATIONS FIELD CHECKED BY VOLUSIA COUNTY TRAFFIC ENGINEERING. NOTIFY THOMAS EDWARDS (386) 736-5968 FOR FIELD CHECK AND POLE LOCATION APPROVAL.
2. ALL UNDERGROUND CONDUIT ENTRY HOLES ON SIGNAL POLES SHALL BE STUBBED OUT.
3. DUE TO THE CLOSE PROXIMITY OF UNDERGROUND UTILITIES, THE CONTRACTOR SHALL HAND DIG THE FIRST (4) FOUR FEET OF ANY POLE FOUNDATION.
4. NO POWER SERVICE EQUIPMENT WILL BE ALLOWED TO BE MOUNTED ON THE TRAFFIC SIGNAL CONTROLLER CABINET.
5. A MANUAL PUSH BUTTON CORD SHALL BE FURNISHED IN ALL TRAFFIC SIGNAL CONTROLLER CABINETS.
6. TWO SPARE CABINET CONDUITS SHALL BE STUBBED OUT AND CAPPED IN EACH TRAFFIC SIGNAL CABINET ENTRY PULL BOX.
7. THE CONTROLLER BASE SHALL BE A MONOLITHIC POUR WITH A 4" MINIMUM/ 8" MAXIMUM ABOVE FINISHED GRADE. THE SERVICE PAD SHALL BE A SEPARATE CONCRETE PAD WITH A MINIMUM OF 4" THICKNESS. PROVIDE A SEALED 1/2" EXPANSION JOINT BETWEEN THE SERVICE PAD AND CONTROLLER BASE.
8. THE PROPOSED CONTROLLER ASSEMBLY SHALL BE NEMA TS2 TYPE V1 CABINET WITH A TS2 TYPE 2 ECONO LITE CONTROLLER (COLBALT) (2100) AND SHALL INCLUDE BACKUP INTERNAL TIME-BASED COORDINATION. THE CONTROLLER ASSEMBLY SHALL ALSO INCLUDE CONNECTION TO A UPS ECONOLITE (1000-WATT DOUBLE CONVERSION) BACKUP SYSTEM TO BE INTERNAL TO THE CONTROLLER CABINET, EXPRESS SUPPLY 8042 V3 PLUS NETWORK SWITCH, INTERFACE PANEL, FIBER OPTIC TRANSCEIVER MODULE AND ALL NECESSARY EQUIPMENT FOR A COMPLETE OPERATIONAL AND ACCEPTABLE INSTALLATION (670-5-110). ALSO, CONTROLLER CABINETS SHALL REQUIRE A GENERATOR HOOKUP BOX EXTERNAL TO THE CABINET, WIC, OR FIBER ENCLOSURE AND ECONOLITE 4G WIRELESS FOR COMMUNICATION.
9. CONTRACTOR TO ENSURE THAT A 4FT. X 4FT. FLAT LANDING AREA IS ADJACENT TO ALL PED BUTTONS FOR PEDESTRIANS.
10. PEDESTRIAN HEADS SHALL BE COUNTDOWN LED MODULAR WITH INTERNATIONAL SYMBOLS.

LOOPS/ CONDUIT/ PULL BOXES/ VIDEO DETECTION:

1. ALL CONDUIT SHALL BE 2" MINIMUM DIAMETER UNLESS OTHERWISE SPECIFIED IN THE PLANS. ABOVEGROUND CONDUIT SHALL BE 2" RIGID GALVANIZED STEEL, UNLESS OTHERWISE INDICATED. UNDERGROUND CONDUIT SHALL BE SCHEDULE 40 BURIED AT 36" MINIMUM DEPTH, UNLESS OTHERWISE INDICATED.
2. SIDE STREET AND LEFT TURN DETECTION ZONES SHALL BE CENTERED IN THE LANE AND SHALL BE EXTENDED 5' BEYOND THE STOP BAR.
3. WHEN MULTIPLE RUNS OF CONDUIT ARE PLACED UNDER PAVEMENT BY DIRECTIONAL BORE, JACKING OR TRENCHING, ONLY ONE RUN IS PAID FOR AS DIRECTIONAL BORE. ADDITIONAL RUNS ARE TO BE PAID FOR AS UNDERGROUND CONDUIT.
4. AS DIRECTED BY THE PROJECT ENGINEER, THE CONTRACTOR SHALL ADJUST CONDUIT VERTICALLY TO AVOID ANY POSSIBLE CONFLICTS WITH UNDERGROUND UTILITIES.
5. PULL BOXES SHALL NOT BE LOCATED AT THE BOTTOM OF ANY DITCH OR RETENTION AREA/POND.
6. ALL ENDS OF CONDUITS IN PULL BOXES AND CABINETS SHALL BE SEALED WITH ELECTRICAL PUTTY AFTER WIRING IS COMPLETE.
7. TRAFFIC SIGNAL PULL BOXES SHALL BE COMPOSITE AND THE COVERS SHALL BE FDOT APPROVED OF NON-METALLIC CONSTRUCTION WITH RECESSED COVER LOGO "TRAFFIC SIGNALS" (QUAZITE 1324 BK., 1212BA OR EQUAL).
8. ALL PULL BOXES AND FIBER BOXES SHALL HAVE A CONCRETE APRON AROUND THE PULL BOX PER FDOT SPECIFICATIONS.

SIGNAL CABLE:

1. IF A CONTINUOUS RUN OF SIGNAL CABLE IS NOT POSSIBLE FROM THE CABINET TO THE SIGNAL HEAD, THEN A SPLICE WITH ORD WATERPROOF CONNECTORS SHALL BE USED AT THE HAND HOLE, NOT A TERMINAL STRIP - MARK PHASING ON WIRES.
2. THE PROPOSED SIGNAL CABLE SHALL INCLUDE SUFFICIENT CONDUCTORS FOR FUTURE LEFT TURN PHASES.

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TRAFFIC & MOBILITY CONSULTANTS LLC
3101 MAGUIRE BLVD, SUITE 265
ORLANDO, FL 32803
OFFICE: (407) 531-5332
FAX: (407) 531-5331
JEREMY N. CROWE, P.E. 77064
CERTIFICATE OF AUTHORIZATION: 30024

Traffic & Mobility Consultants

Volusia County

GENERAL NOTES

SHEET NO. K-7 T-4

POWER SERVICE:

1. THE MAIN SERVICE DISCONNECT ENCLOSURE AND THE LOAD CENTER ENCLOSURE LOCATED ADJACENT TO THE CONTROLLER CABINET SHALL BE NEMA 3R OR BETTER RATED.
2. ABOVEGROUND CONDUIT USED FOR ELECTRIC SERVICE SHALL BE RIGID GALVANIZED STEEL OR RIGID ALUMINUM CONDUIT 2" MIN. FOR POWER SERVICE WIRES AND A 3/4" MIN. FOR GROUNDING ELECTRODE CONDUCTORS.
3. ANTI-CORROSIVE PASTE SHALL BE USED ON ALL ELECTRIC SERVICE CONNECTIONS.
4. ELECTRICAL SERVICE INSTALLATIONS MUST CONFORM WITH THE MOST RECENT VERSION OF THE NATIONAL ELECTRIC CODE (NEC), FDOT SPECIFICATIONS, AND POWER UTILITY COMPANY REQUIREMENTS.

UTILITIES:

1. THE LOCATION(S) OF THE UTILITIES SHOWN IN THE PLANS (INCLUDING THOSE VV, VH, VVH) ARE BASED ON LIMITED INVESTIGATION TECHNIQUES AND SHOULD BE CONSIDERED APPROXIMATE ONLY; THE VERIFIED LOCATIONS/ELEVATIONS APPLY ONLY AT THE POINT SHOWN. INTERPOLATIONS BETWEEN THESE POINTS HAVE NOT BEEN VERIFIED.
2. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING ANY UTILITY OWNER(S) THAT MAY OR MAY NOT BE A "SUNSHINE ONE-CALL" MEMBER IN ORDER TO COORDINATE UTILITY MARKING AND LOCATING AT A MINIMUM OF TWO DAYS PRIOR TO DIGGING. IT SHOULD BE NOTED THAT VOLUSIA COUNTY TRAFFIC ENGINEERING IS NOT A MEMBER OF "SUNSHINE ONE-CALL" AND THAT SEPARATE CONTACT WILL NEED TO BE MADE IN ORDER TO OBTAIN UTILITY LOCATE INFORMATION FOR VOLUSIA COUNTY TRAFFIC ENGINEERING FACILITIES.

BELOW IS A LIST OF UTILITY OWNERS NOTIFIED ON 06/08/2021:

COMPANY	CONTACT	TELEPHONE #
ATT	STEVE HAMER	813-888-8300
CENTURYLINK	BILL MCCLOUD	850-599-1444
CITY OF DELAND	RAYMOND BAHRAMI	386-626-7189
DUKE ENERGY	STEPHANIE OLMO	407-905-3376
FL PUBLIC UTILITIES	COLIN DUNN	386-785-4554
CENTURY LINK	NETWORK RELATIONS	877-366-8344
VOLUSIA COUNTY WATER & UTILITY SERVICE	EARL FARMER	251-753-8695
VOLUSIA COUNTY TRAFFIC ENGINEERING	ALLEN CATES	386-736-5968

VOLUSIA COUNTY USE PERMIT NOTES:

1. NOTIFY VOLUSIA COUNTY DEVELOPMENT ENGINEERING OFFICE AT (386) 736-5926 ONE BUSINESS DAY PRIOR TO BEGINNING ANY PERMITTED WORK BEFORE ANY CHANGES FROM APPROVED PLANS AND WHEN COMPLETED.
   A. ALL ROAD/LANE CLOSURES "ARE SEPARATE FROM THE PERMIT" AND REQUIRE PLAN REVIEW AND APPROVAL WITH 7 DAY ADVANCE NOTICE FROM VOLUSIA COUNTY TRAFFIC OPERATIONS AT (386) 239-6535 PRIOR TO ANY CLOSURES. MOT IS REQUIRED ON ALL PROJECTS.
   B. ALL TRAFFIC & PEDESTRIAN SIGNALS (& SURROUNDING AREAS), "ARE NOT" A MEMBER OF SUNSHINE ONE CALL. LOCATES MUST REQUESTED /LOCATED FROM VOLUSIA COUNTY TRAFFIC ENGINEERING AT (386) 736-5968.
   C. THE VOLUSIA COUNTY -STAMPED "APPROVED" PERMIT PLANS MUST BE ONSITE AT ALL TIMES.
   D. NO TRENCH/EXCAVATIONS SHALL BE LEFT OPEN OR UNATTENDED OVERNIGHT.
   E. SOD ALL DISTURBED AREAS.
   F. CONTRACTOR IS RESPONSIBLE FOR PRE/POST CONSTRUCTION VIDEO/PHOTOS OF EXISTING ROADWAYS, DRIVEWAYS, SIDEWAYS, DITCH SWALES, CULVERTS AND ABOVE GROUND UTILITIES.
2. OPERATIONS WITHIN THE COUNTY RIGHT-OF-WAY SHALL NORMALLY BE CONDUCTED FROM 7:00 AM TO 7:00 PM, MONDAY THROUGH FRIDAY. ANY DEVIATION FROM THESE HOURS REQUIRES PRIOR APPROVAL FROM THE COUNTY DEVELOPMENT ENGINEER. EMERGENCY REPAIRS ARE EXCLUDED FROM THIS TIME RESTRICTION.
3. ALL EXISTING SIDEWALKS WITHIN COUNTY RIGHT -OF-WAY SHALL EITHER REMAIN OPEN OR BE PROVIDED A TEMPORARY WALKWAY IN ACCORDANCE WITH THE CURRENT VERSION OF FLORIDA DEPARTMENT OF TRANSPORTATION STANDARD INDEX NO. 102-660. ANY DAMAGE TO SIDEWALKS SHALL BE REPAIRED AND/OR REPLACED IN LIKE KIND BY THE CONTRACTOR. NEW SIDEWALKS AND SECTIONS THROUGH DRIVEWAYS MUST BE AT LEAST A 1.5% CROSS SLOPE AND 2% MAXIMUM CROSS SLOPE PER ADA STANDARDS.
4. DRIVING OR STAGING OF CONSTRUCTION VEHICLES OR MATERIALS IS NOT PERMITTED WITHIN THE COUNTY RIGHT-OF-WAY OR ON PEDESTRIAN WALKWAYS AND PATHS. THERE SHALL BE NO OVERNIGHT CONSTRUCTION VEHICLE RELATED PARKING, CONSTRUCTION MATERIAL PLACEMENT, OR STORAGE OF ANY KIND PERMITTED WITHIN THE COUNTY RIGHT-OF-WAY.

PAY ITEM NOTES:

660-3-XX: VENDOR AND DEVICE CONTRACTOR ARE TO USE RADAR DETECTION PROVIDED BY WAVETRONIX AS APPROVED BY VOLUSIA COUNTY. RADAR DETECTOR SHALL BE POLE MOUNTED AND NOT SPAN MOUNTED.

665-1-11: THE PEDESTRIAN DETECTOR MUST INCLUDE THE FURNISHING AND INSTALLING OF THE FTP-68B-06 SIGNS.

670-5-112: THIS PAY ITEM INCLUDES BOTH THE CONTROLLER ELECTRONICS AND THE CABINET. THE CONTRACTOR MUST INSTALL AN ECONOLITE CONTROLLER WITH UPS AND 4G WIRELESS CAPABILITY.

700-5-22: ALL INTERNALLY ILLUMINATED SIGNS INCLUDE STREET NAME SIGN PANELS. THE CANTILEVER ARM AND ALL MOUNTING HARDWARE IS INCLUDED IN THE PAY ITEM. THE SUPPORT STRUCTURE (CONCRETE POLE) IS PAID SEPERATELY.

715-5-32: THIS PAY ITEM INCLUDES THE BRACKET ARM, LUMINAIRE WITH LAMP AND ALL NECESSARY MOUNTING HARDWARE AS PER THE PLANS AND INDEXES. THE CONTRACTOR MUST FURNISH AND INSTALL GE EVOLVE LED STREET LIGHT OR AN EQUIVALENT VENDOR AS APPROVED BY VOLUSIA COUNTY TRAFFIC ENGINEERING.

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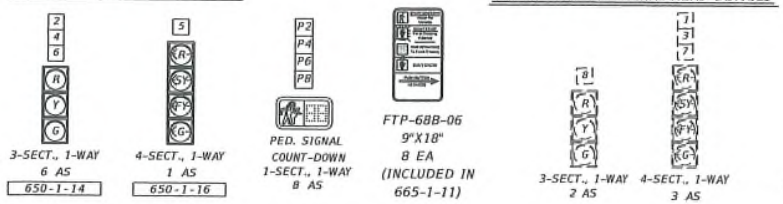
3101 MAGUIRE BLVD, SUITE 265
ORLANDO, FL 32803
OFFICE: (407) 531-5332
FAX: (407) 531-5331
JEREMY M. CROWE, P.E. 77064
CERTIFICATE OF AUTHORIZATION: 30074

GENERAL NOTES

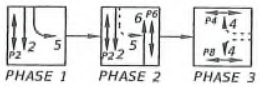
SHEET NO. K-8 1-5

TRAFFIC SIGNAL HEAD DETAILS



FUTURE TRAFFIC SIGNAL HEAD DETAILS

S.O.P. 2 (MOD)



R1 R2 R3 R4 R5 R6

660-3-12 6 EA

INTERNALLY ILLUMINATED
OVERHEAD SIGNS (SINGLE-SIDED FACE MOUNTED)
N.T.S

(A) Dr Martin L King Jr Bltwy
700-5-22 2 EA

(B) Cassadaga Rd
700-5-22 2 EA

CABINET PAY ITEMS
7 RUNS @ 16 LF
1-2" GROUND
1-2" LIGHTING
1-2" PEDESTRIAN
1-2" PED DETECTOR
1-2" RADAR
1-2" SIGNAL
1-2" SPARE

630-2-11	16 LF
632-7-1	1 PI
634-4-153	1 PI
635-2-11	4 EA
660-3-11	1 EA
663-1-121	1 EA
670-5-112	1 AS
684-1-1	1 EA
684-6-12	1 EA
685-1-11	1 EA

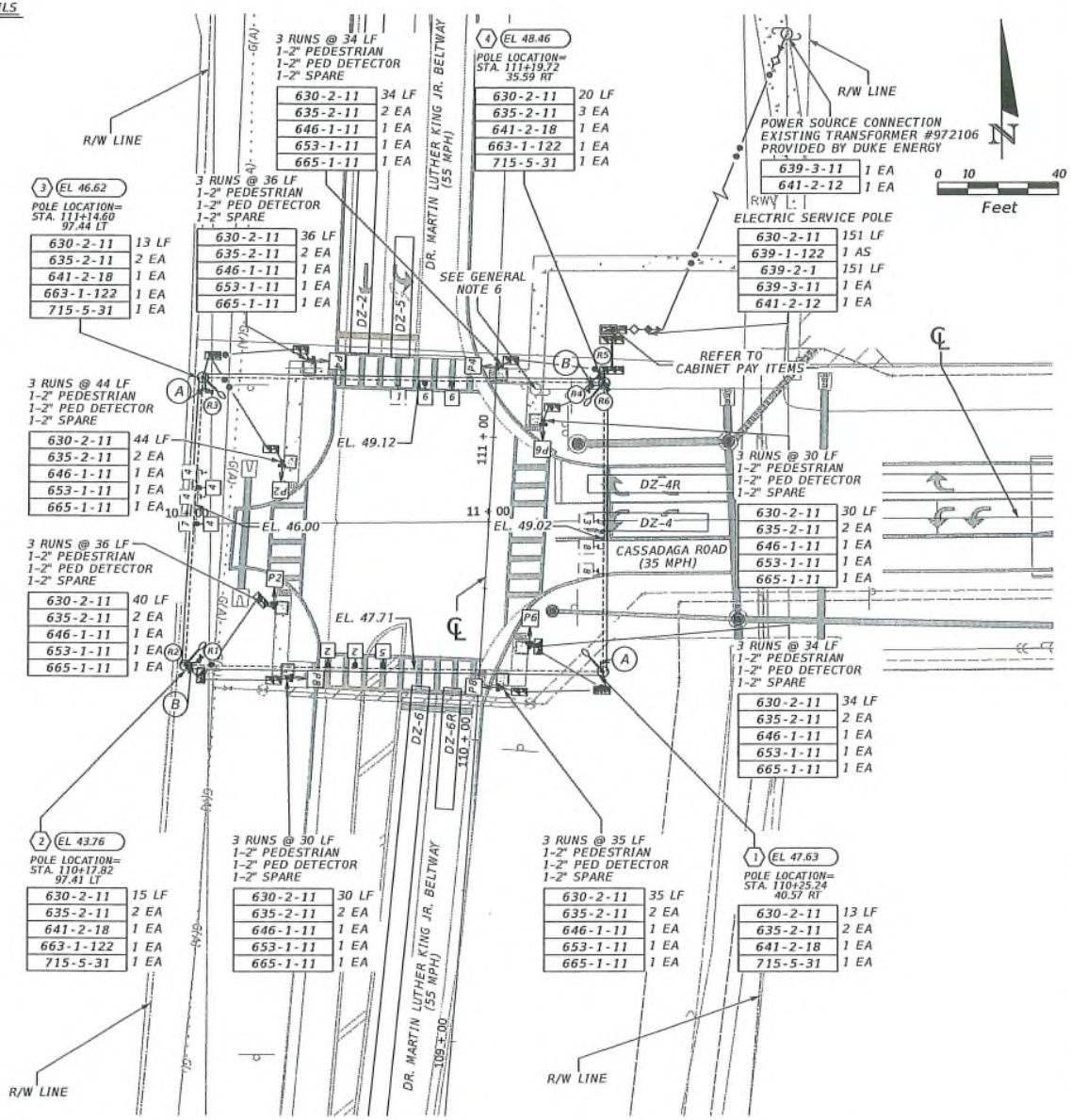
RADAR DETECTION CONNECTION CHART

CAMERA DETECTION	DETECTION ZONE	DELAY TIME (SEC)	DETECTION ZONE DIMENSION
R1	DZ-2	-	6' X 330'
	DZ-5	-	6' X 40'
R2	DZ-6	-	6' X 40'
	DZ-6R	5	6' X 40'
R3	DZ-4R	5	6' X 330'
	DZ-4	-	6' X 40'
R4	DZ-6	-	6' X 330'
R5	DZ-5	-	6' X 40'
	DZ-2	-	6' X 40'
R6	DZ-4R	5	6' X 40'
	DZ-4	-	6' X 40'

SIZE AND PLACEMENT OF RADAR DETECTION ZONES ARE INITIAL AND MAY REQUIRE FIELD ADJUSTING AS DIRECTED BY PROJECT ENGINEER

CONTROLLER TIMINGS

TIMING FUNCTION	DIRECTION	SBT	WBL/WBR	SBL	NBT	PED
	MOVEMENT NUMBER	2	4	5	6	P8
TIMING FUNCTION	MINIMUM GREEN	10	7	5	10	-
	EXTENSION	3.0	3.0	3.0	3.0	-
	MAXIMUM GREEN 1	70	50	30	70	-
	MAXIMUM GREEN 2	-	-	-	-	-
	YELLOW CLEARANCE	5.5	4.0	5.5	5.5	-
	ALL RED	2.0	2.8	2.0	2.0	-
	PEDESTRIAN WALK	7	7	-	7	7
	PED. CLEARANCE	9	15	-	17	17
	RECALL	MIN	-	-	MIN	-
	FLASH	Y	R	R	Y	-



GENERAL NOTES

1. THE MAJOR STREET IS DR. MARTIN LUTHER KING JR. BELTWAY (SPEED LIMIT 55 MPH). THE MINOR STREET IS CASSADAGA ROAD (SPEED LIMIT 35 MPH). THE MAJOR STREET MOVEMENTS ARE 2,5 AND 6, AND THE MINOR STREET MOVEMENT IS 4.
2. DURING FLASH OPERATION, MOVEMENTS 4 AND 5 SHALL FLASH RED, MOVEMENTS 2 AND 6 SHALL FLASH YELLOW.
3. CONTRACTOR TO COORDINATE WITH POWER COMPANY FOR CONNECTION TO POWER SERVICE.
4. THE FUTURE SIGNAL HEAD PLACEMENT FOR THE MAJOR STREET (MOVEMENT 1) AND MINOR STREET (MOVEMENTS 3,7 & 8) TO BE INSTALLED UPON CONSTRUCTION OF THE WEST LEG OF THE INTERSECTION.
5. THE FUTURE LANE CONFIGURATION FOR THE NEW WEST LEG (MOVEMENTS 3 & 8) WAS ASSUMED TO MIRROR CASSADAGA ROAD (EXCLUSIVE LEFT AND A SHARED THROUGH AND RIGHT LANE).
6. PEDESTRIAN SIGNALS OF THE NORTHWEST AND SOUTHWEST CORNERS TO BE ADJUSTED UPON CONSTRUCTION OF THE WEST LEG OF THE INTERSECTION.
7. EXISTING SOLAR STREET LIGHT REMOVAL BY DUKE ENERGY AT THE TIME OF CONSTRUCTION. EXISTING STREET LIGHT TO REMAIN ENERGIZED UNTIL THE NEW LIGHTS ARE OPERATIONAL.
8. MOVEMENT P8 IS TO OVERLAP WITH MOVEMENT P4.
9. MOVEMENT 5 SHALL OMIT THE FLASHING YELLOW PHASE WHILE MOVEMENT P6 IS ACTIVE.

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ORLANDO, FL 32803
OFFICE: (407) 331-5332
FAX: (407) 331-5331
JEREMY N. CROWE, P.E. 77064
CERTIFICATE OF AUTHORIZATION: 30024

Volusia County

SIGNALIZATION PLAN

SIGNAL NO. 471

SHEET NO. K-9 / 1-6

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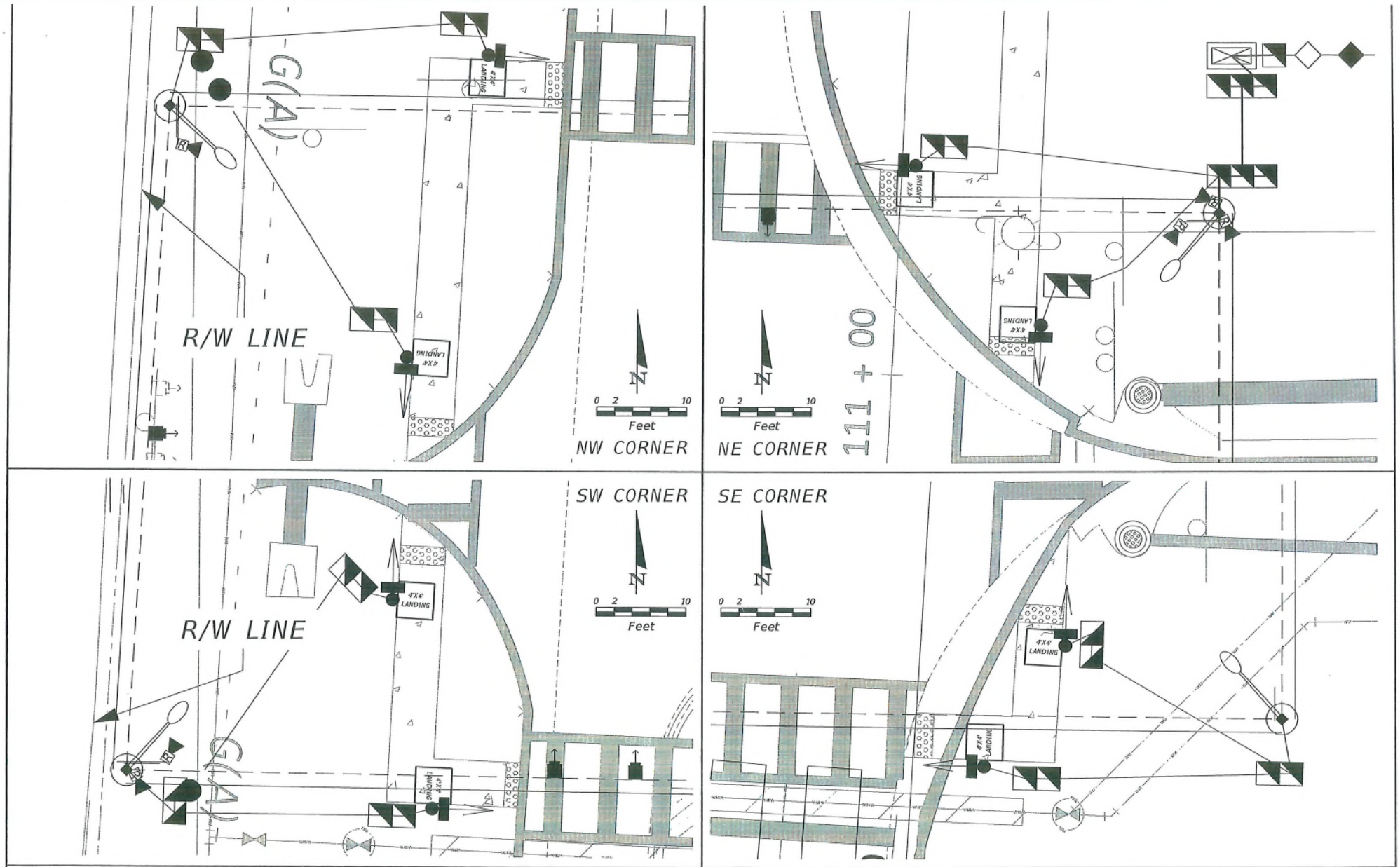

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OFFICE: (407) 531-5332
FAX: (407) 531-5331
JEREMY M. CROWE, P.E. 77064
CERTIFICATE OF AUTHORIZATION- 30024

Traffic & Mobility Consultants

Volusia County

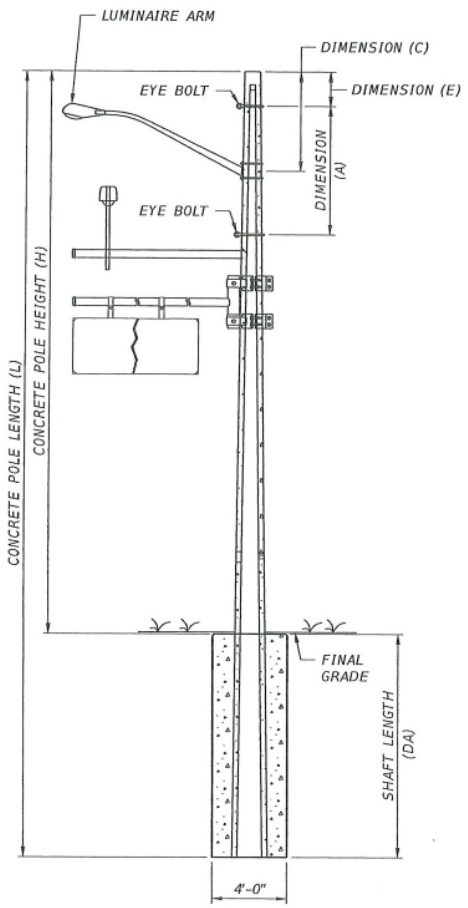
CORNER CLIPS

SHEET NO. K-10 T-7

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

STRAIN POLE SCHEDULE

ID NO.	SHEET NO.	POLE LOCATION		FINAL GRADE ELEVATION	CROWN ELEVATION	POLE TYPE	POLE LENGTH (L)	POLE HEIGHT (H)	DIMENSION (A)	DIMENSION (C)	DIMENSION (E)	SHAFT LENGTH (DA)
		STATION	OFFSET									
1	T-6	110+25.24	40.57' RT	47.63	47.71	P-VIII	50.00	33.07	6.53	4.27	1.00	16.93
2	T-6	110+17.82	97.41' LT	43.76	46.00	P-VIII	54.00	36.94	6.53	4.27	1.00	17.06
3	T-6	111+14.60	97.44' LT	46.62	49.12	P-VIII	52.00	35.03	6.53	4.27	1.00	16.97
4	T-6	111+19.72	35.59' RT	48.46	49.02	P-VIII	50.00	33.19	6.53	4.27	1.00	16.81



CONCRETE STRAIN POLE DIMENSIONS
TYPES P-III THROUGH P-VIII

NOTES:

1. SIGNED AND SEALED CALCULATIONS AND SHOP DRAWINGS FOR THE LUMINAIRE ARM ATTACHMENT TO THE POLE DETAILS MUST BE PROVIDED. THE DRAWINGS AND CALCULATIONS MUST BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF FLORIDA. LUMINAIRE ATTACHMENT MUST BE THROUGH BOLTED.
2. WORK THIS SHEET WITH INDEX 641-010.
3. MESSENGER AND CATENARY WIRE DIAMETER SHALL BE 1/2".
4. DESIGN OF THE STRAIN POLES, WIRES, AND FOUNDATIONS ARE BASED ON A DESIGN WIND SPEED OF 140 MPH, IN ACCORDANCE WITH THE JANUARY 2021 FDOT STRUCTURES MANUAL.
5. DESIGN OF THE FOUNDATIONS IS BASED ON BORINGS TAKEN 08/03/21, SEALED BY GEO-TECHOLOGY ASSOCIATES, INC. THE FOLLOWING ASSUMED SOIL PROPERTIES ARE USED IN DESIGN:
   SOIL TYPE = COHESIONLESS
   SOIL LAYER THICKNESS = 30 FT.
   SOIL FRICTION ANGLE = 30 DEG. (POLE 1), 29 DEG. (POLES 2-4).
   SOIL EFFECTIVE UNIT WEIGHT = 50 PCF (POLES 1-4).
   SOIL SPT N-VALUE = 13 BLOWS/FT (POLE 1), 5 BLOWS/FT (POLES 2-3), 6 BLOWS/FT (POLE 4).
   DESIGN WATER TABLE IS 0 FT. BELOW SURFACE

Designed By : ADB 09-21
Drawn By : BSW 08-21

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS

DATE	DESCRIPTION	DATE	DESCRIPTION

MICHAEL L. HEBERT, P.E.
P.E. LICENSE NUMBER 50596
FBT-FLORIDA BRIDGE AND TRANSPORTATION, INC.
633 DARTMOUTH STREET
ORLANDO, FL 32804
(407) 513-9709

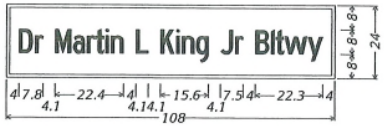
Volusia County
FLORIDA

STRAIN POLE SCHEDULE

SHEET NO.
T-8

SIGN NUMBER	A
QUANTITY	2
WIDTH	9'-0"
HEIGHT	2'-0"
BORDER WIDTH	1"
BORDER RADII	0"
BACKGROUND COLOR	3M EC GREEN
LEGEND & BORDER COLOR	3M 490T WHITE
STATION(S)	N/A

NOTES:
1. SIGNS SHALL BE SINGLE SIDED AND FACE MOUNTED ON CANTILEVER ARMS



0" Radius, 1.0" Border, White on Green;
"Dr Martin L King Jr Bltwy", C 2K specified length;
Table of distances between letter and object lefts

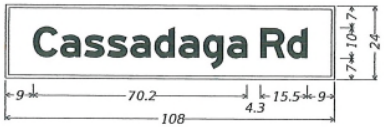
	D	r	M	a	r	t	i	n	L
4.0	5.2	6.7	5.9	4.5	2.8	3.3	1.8	8.1	4.1

	K	i	n	g	J	r
4.1	5.0	1.9	4.6	8.2	4.9	2.6

	B	l	t	w	y	
4.0	5.1	1.6	3.0	7.6	5.0	4.0

SIGN NUMBER	B
QUANTITY	2
WIDTH	9'-0"
HEIGHT	2'-0"
BORDER WIDTH	1"
BORDER RADII	0"
BACKGROUND COLOR	3M EC GREEN
LEGEND & BORDER COLOR	3M 490T WHITE
STATION(S)	N/A

NOTES:
1. SIGNS SHALL BE SINGLE SIDED AND FACE MOUNTED ON CANTILEVER ARMS



0" Radius, 1.0" Border, White on Green;
"Cassadaga Rd", E Mod 2K specified length;
Table of distances between letter and object lefts

	C	a	s	s	a	d	a	g	a	R	d	
9.0	8.9	7.9	7.4	7.6	7.9	8.0	7.9	8.0	10.9	8.9	6.6	9.0

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

TRAFFIC & MOBILITY CONSULTANTS LLC
3101 MAGUIRE BLVD, SUITE 265
ORLANDO, FL 32803
OFFICE: (407) 531-5332
FAX: (407) 531-5331
JEREMY M. CROWE, P.E. 77064
CERTIFICATE OF AUTHORIZATION: 30024

GUIDESIGN WORKSHEET

SHEET NO.
K-12
T-9

LOG OF BORING NO. MA-01

SAMPLE NUMBER	N (blows/Ft.)	DEPTH (Ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
S-1	5	0	SP		Brown, dry, loose, fine Poorly Graded SAND, trace Organics.	
S-2	5				Same, Light Brown	
S-3	4				Same, Brown	
S-4	25	6			Same, medium dense	
S-5	19					
S-6	10	12			Same, loose	
S-7	16	18	SP-SM		Brown to Orange, moist, medium dense, fine Poorly Graded SAND with Silt.	
S-8	10	24			Same, Light Gray, loose	M/C = 15% F/C = 26%
S-9	15	30			Same, Brown to Light Brown, medium dense	

Boring terminated at 30 feet.

LOG OF BORING NO. MA-02

SAMPLE NUMBER	N (blows/Ft.)	DEPTH (Ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
S-1	14	0	SP-SM		Brown, dry, medium dense, fine Poorly Graded SAND with Silt, trace Organics.	
S-2	17		SP		Brown, dry, medium dense, fine Poorly Graded SAND, trace Organics.	
S-3	6				Same, loose	
S-4	3	6			Same, very loose	
S-5	5				Same, loose	
S-6	8	12	SC		Brown, dry, loose, Clayey SAND.	M/C = 18% F/C = 34%
S-7	10	18	SP		Light Gray, dry, loose, Poorly Graded SAND.	
S-8	11	24	SP-SM		Gray to Orange, dry, medium dense, fine Poorly Graded SAND with Silt.	
S-9	26	30				

Boring terminated at 30 feet.

LOG OF BORING NO. MA-03

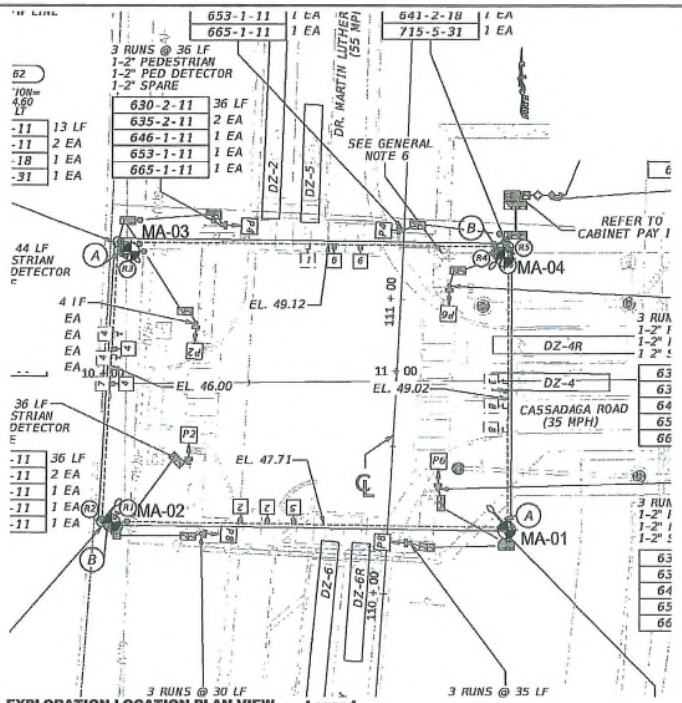
SAMPLE NUMBER	N (blows/Ft.)	DEPTH (Ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
S-1	10	0	SP-SM		Brown, dry, loose, fine Poorly Graded SAND with Silt, trace Asphalt Fragments and Organics.	
S-2	14		SP		Brown, dry, medium dense, fine Poorly Graded SAND, trace Organics.	
S-3	8				Same, Light Brown, loose	
S-4	4	6			Same, very loose	
S-5	4					M/C = 3% F/C = 1%
S-6	9	12	SP-SM		Brown to Orange, moist, loose, fine Poorly Graded SAND with Silt.	
S-7	9	18	SP		Light Gray, moist, loose, fine Poorly Graded SAND.	
S-8	10	24	SP-SM		Gray to Orange, moist, loose, fine Poorly Graded SAND with Silt.	
S-9	24	30			Same, medium dense	

Boring terminated at 30 feet.

LOG OF BORING NO. MA-04

SAMPLE NUMBER	N (blows/Ft.)	DEPTH (Ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
S-1	5	0	SP		Brown, dry, loose, fine Poorly Graded SAND, trace Organics.	
S-2	5				Same, Light Brown to Brown	
S-3	7					M/C = 9% F/C = 1%
S-4	22	6			Same, medium dense	
S-5	19					
S-6	10	12			Same, loose	
S-7	13	18	SP-SM		Brown to Orange, dry, medium dense, Poorly Graded SAND with Silt.	
S-8	11	24			Same, Light Gray	
S-9	14	30			Same, Brown to Light Gray	

Boring terminated at 30 feet.



EXPLORATION LOCATION PLAN VIEW

Scale: 1" = 20'

Base image was adapted from the Signalization Plan, Signal No. 471, undated, and prepared by Traffic & Mobility Consultants, LLC (Original scale 1" = 40').

Legend

MA-01 Identification and approximate location of Standard Penetration Test (SPT) boring performed by Geo-Technology Associates, Inc. (GTA) subcontractor in August of 2021.

Notes

1. Exploration locations were selected by GTA and staked in the field by AWK Consulting Engineers, Inc. using an instrumented survey. Exploration locations should be considered accurate only to the degree implied by the method used.

Key to Boring Logs

M/C NATURAL MOISTURE CONTENT (%)

F/C FINES CONTENT (%)

SP USCS GROUP SYMBOL BASED ON VISUAL OBSERVATION AND LABORATORY TEST

SAND AND SANDY SOILS	CLEAN SANDS (LESS THAN 15% PASSING THE NO. 200 SIEVE)	SW	Well-Graded SAND
		SP	Poorly Graded SAND
MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINES (MORE THAN 15% PASSING THE NO. 200 SIEVE)	SM	Silty SAND
		SC	Clayey SAND

COARSE-GRAINED SOILS (GRAVEL AND SAND)

DESIGNATION	BLOWS PER FOOT (BPF)
VERY LOOSE	0-4
LOOSE	5-10
MEDIUM DENSE	11-30
DENSE	31-50
VERY DENSE	>50

NOTE: "N" VALUE DETERMINED AS PER ASTM D 1586

GEO-TECHNOLOGY ASSOCIATES, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
4617 PARKBREEZE COURT
ORLANDO, FLORIDA 32808
(321) 482-4239
www.gtaeng.com

© Geo-Technology Associates, Inc.

SHEET NO. B-1

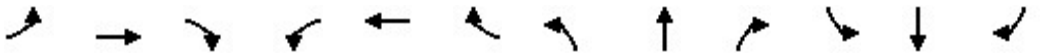
STRAIN POLES
MLK BELTWAY & CASSADAGA ROAD
VOLUSIA COUNTY, FLORIDA

SPT BORING SHEET

K-13

PROJECT: 31211343 | DATE: OCTOBER 2021 | SCALE: AS SHOWN | DRAWN BY: YMR | REVIEW BY: GSP | FIGURE: 2

Appendix L:
Background Conditions Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	1438	317	185	1116	324	247	377	162	304	366	115
Future Volume (vph)	93	1438	317	185	1116	324	247	377	162	304	366	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.3	8.3	8.3	8.3	8.3	8.3		8.8	8.8	9.4	9.4	9.4
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1719	3539	1599	1719	3539	1583		1813	1583	1752	1863	1509
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1719	3539	1599	1719	3539	1583		1813	1583	1752	1863	1509
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	98	1514	334	195	1175	341	260	397	171	320	385	121
RTOR Reduction (vph)	0	0	205	0	0	226	0	0	139	0	0	100
Lane Group Flow (vph)	98	1514	129	195	1175	115	0	657	32	320	385	21
Heavy Vehicles (%)	5%	2%	1%	5%	2%	2%	4%	2%	2%	3%	2%	7%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases			6			2			4			3
Actuated Green, G (s)	10.7	49.7	49.7	11.7	50.7	50.7		28.2	28.2	25.6	25.6	25.6
Effective Green, g (s)	10.7	49.7	49.7	11.7	50.7	50.7		28.2	28.2	25.6	25.6	25.6
Actuated g/C Ratio	0.07	0.33	0.33	0.08	0.34	0.34		0.19	0.19	0.17	0.17	0.17
Clearance Time (s)	8.3	8.3	8.3	8.3	8.3	8.3		8.8	8.8	9.4	9.4	9.4
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	122	1172	529	134	1196	535		340	297	299	317	257
v/s Ratio Prot	0.06	c0.43		0.11	c0.33			c0.36		0.18	c0.21	
v/s Ratio Perm			0.08			0.07			0.02			0.01
v/c Ratio	0.80	1.29	0.24	1.46	0.98	0.22		1.93	0.11	1.07	1.21	0.08
Uniform Delay, d1	68.6	50.1	36.5	69.2	49.2	35.4		60.9	50.5	62.2	62.2	52.3
Progression Factor	1.00	1.00	1.00	0.77	0.88	1.60		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	30.5	137.8	1.1	232.4	18.4	0.7		430.3	0.2	71.9	122.0	0.2
Delay (s)	99.1	187.9	37.6	285.3	61.7	57.5		491.2	50.7	134.1	184.2	52.5
Level of Service	F	F	D	F	E	E		F	D	F	F	D
Approach Delay (s)		157.7			86.4			400.2			145.5	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	170.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.45		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	34.8
Intersection Capacity Utilization	131.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	98	1514	334	195	1175	341	657	171	320	385	121
v/c Ratio	0.80	1.29	0.45	1.46	0.98	0.45	1.93	0.35	1.07	1.21	0.27
Control Delay	109.2	178.3	7.4	270.3	61.7	6.9	461.5	3.5	129.1	172.5	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	109.2	178.3	7.4	270.3	61.7	6.9	461.5	3.5	129.1	172.5	1.5
Queue Length 50th (ft)	96	~990	18	~261	629	84	~987	0	~346	~459	0
Queue Length 95th (ft)	#200	#1130	96	m#388	m#741	m101	#1233	16	#545	#669	0
Internal Link Dist (ft)		900			559		708			484	
Turn Bay Length (ft)	465		485	460		485		550	180		230
Base Capacity (vph)	122	1172	735	134	1196	760	340	482	299	317	442
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	1.29	0.45	1.46	0.98	0.45	1.93	0.35	1.07	1.21	0.27

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	121	44	557	176	76	757
Future Volume (vph)	121	44	557	176	76	757
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8	7.5	7.5	7.5	7.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	1495	1845	1568	1770	1827
Flt Permitted	0.95	1.00	1.00	1.00	0.21	1.00
Satd. Flow (perm)	1805	1495	1845	1568	396	1827
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	132	48	605	191	83	823
RTOR Reduction (vph)	0	40	0	42	0	0
Lane Group Flow (vph)	132	8	605	149	83	823
Heavy Vehicles (%)	0%	8%	3%	3%	2%	4%
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		6		5	2
Permitted Phases		4		6	2	
Actuated Green, G (s)	13.1	13.1	34.1	34.1	48.8	48.8
Effective Green, g (s)	13.1	13.1	34.1	34.1	48.8	48.8
Actuated g/C Ratio	0.17	0.17	0.45	0.45	0.64	0.64
Clearance Time (s)	6.8	6.8	7.5	7.5	7.5	7.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	310	257	825	701	383	1170
v/s Ratio Prot	c0.07		0.33		0.02	c0.45
v/s Ratio Perm		0.01		0.10	0.12	
v/c Ratio	0.43	0.03	0.73	0.21	0.22	0.70
Uniform Delay, d1	28.2	26.3	17.3	12.9	8.5	9.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	0.1	3.4	0.2	0.3	1.9
Delay (s)	29.1	26.3	20.7	13.0	8.8	10.9
Level of Service	C	C	C	B	A	B
Approach Delay (s)	28.4		18.9			10.7
Approach LOS	C		B			B

Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	76.2	Sum of lost time (s)	21.8
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	132	48	605	191	83	823
v/c Ratio	0.42	0.16	0.72	0.25	0.20	0.72
Control Delay	35.2	11.4	24.3	10.0	6.7	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.2	11.4	24.3	10.0	6.7	13.7
Queue Length 50th (ft)	54	0	233	32	13	218
Queue Length 95th (ft)	129	30	415	82	32	409
Internal Link Dist (ft)	1320		791			656
Turn Bay Length (ft)	180			145	125	
Base Capacity (vph)	1257	1055	1662	1420	822	1827
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.05	0.36	0.13	0.10	0.45

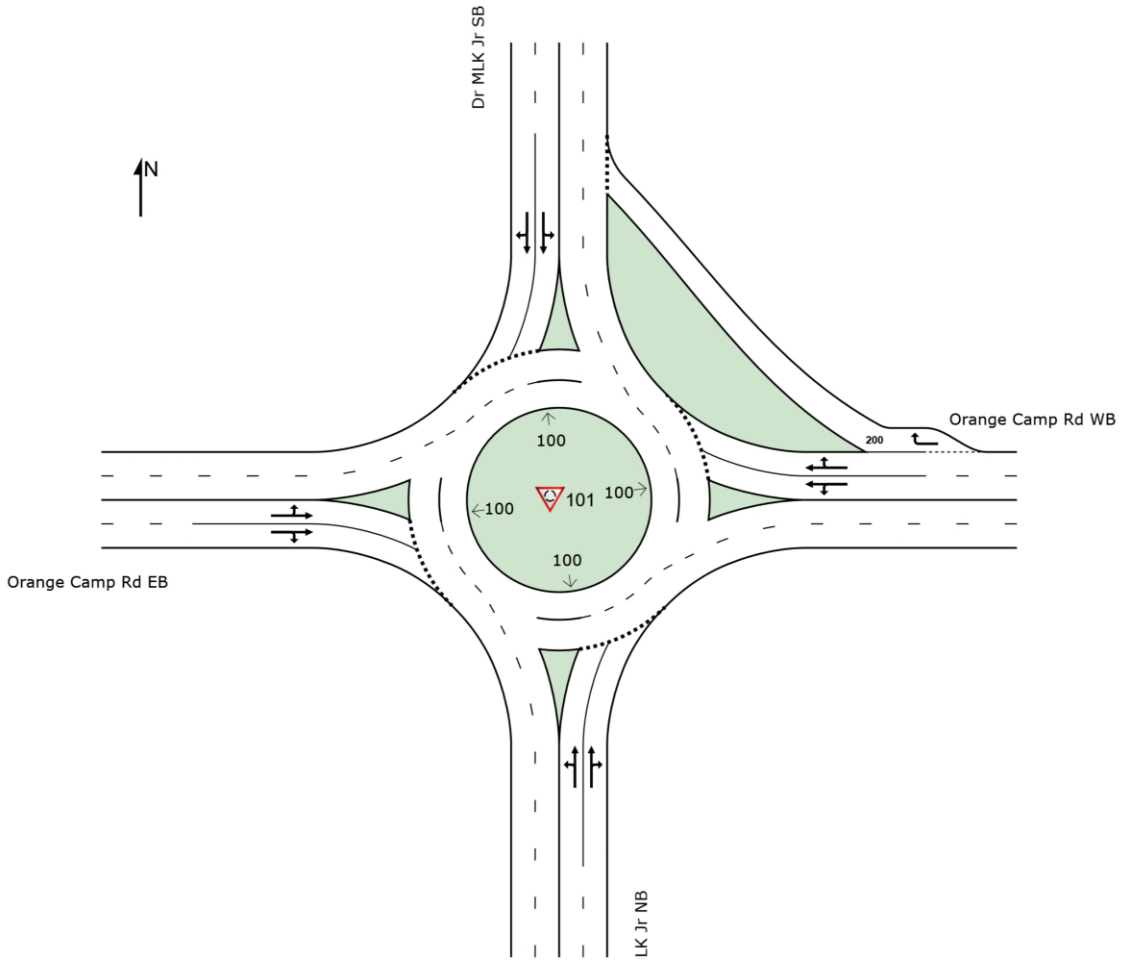
Intersection Summary

SITE LAYOUT

Site: 101 [2027 Future Buildout PM Peak Hour Conditions (Site Folder: General)]

Buildout Roundabout
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [2027 Future Background PM Peak Hour Conditions (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Future Background Roundabout
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Dr MLK Jr NB															
3	L2	All MCs	183	1.0	183	1.0	0.856	40.0	LOS D	7.8	195.8	0.92	1.29	2.20	21.7
8	T1	All MCs	575	1.0	575	1.0	0.856	38.1	LOS D	8.2	206.8	0.91	1.29	2.21	22.6
18	R2	All MCs	160	0.0	160	0.0	0.856	36.1	LOS D	8.2	206.8	0.91	1.29	2.21	22.9
Approach			917	0.8	917	0.8	0.856	38.1	LOS D	8.2	206.8	0.91	1.29	2.21	22.4
East: Orange Camp Rd WB															
1	L2	All MCs	153	5.0	153	5.0	0.605	18.4	LOS B	3.8	95.8	0.78	0.90	1.27	27.3
6	T1	All MCs	618	1.0	618	1.0	0.605	16.3	LOS B	4.0	99.7	0.78	0.88	1.25	28.7
16	R2	All MCs	195	2.0	195	2.0	0.248	7.3	LOS A	0.9	23.9	0.57	0.49	0.57	32.4
Approach			966	1.8	966	1.8	0.605	14.8	LOS B	4.0	99.7	0.74	0.80	1.12	29.1
North: Dr MLK Jr SB															
7	L2	All MCs	217	3.0	217	3.0	0.901	46.3	LOS D	9.7	251.6	0.94	1.45	2.67	20.3
4	T1	All MCs	535	6.0	535	6.0	0.901	46.0	LOS D	9.9	258.7	0.95	1.46	2.69	20.9
14	R2	All MCs	187	4.0	187	4.0	0.901	43.9	LOS D	9.9	258.7	0.95	1.47	2.71	21.2
Approach			939	4.9	939	4.9	0.901	45.6	LOS D	9.9	258.7	0.95	1.46	2.69	20.8
West: Orange Camp Rd EB															
5	L2	All MCs	63	7.0	63	7.0	0.919	50.5	LOS D	10.4	271.2	0.96	1.50	2.79	20.0
2	T1	All MCs	722	5.0	722	5.0	0.919	48.2	LOS D	11.2	289.9	0.96	1.50	2.81	20.6
12	R2	All MCs	200	2.0	200	2.0	0.919	45.0	LOS D	11.2	289.9	0.96	1.51	2.84	20.9
Approach			985	4.5	985	4.5	0.919	47.7	LOS D	11.2	289.9	0.96	1.50	2.82	20.6
All Vehicles			3808	3.0	3808	3.0	0.919	36.5	LOS D	11.2	289.9	0.89	1.26	2.21	22.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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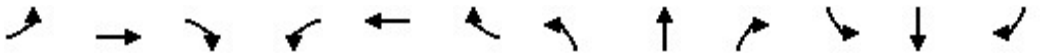
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	96	169	30	77	94	217	619	37	35	741	108
Future Volume (veh/h)	78	96	169	30	77	94	217	619	37	35	741	108
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1811	1811	1900	1900	1900	1856	1900	1752	1826	1856
Adj Flow Rate, veh/h	84	103	149	32	83	101	233	666	36	38	797	108
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	6	6	0	0	0	3	0	10	5	3
Cap, veh/h	104	128	191	45	118	140	263	930	807	298	806	694
Arrive On Green	0.12	0.12	0.12	0.09	0.09	0.09	0.10	0.50	0.50	0.04	0.44	0.44
Sat Flow, veh/h	835	1024	1535	521	1352	1610	1810	1856	1610	1668	1826	1572
Grp Volume(v), veh/h	187	0	149	115	0	101	233	666	36	38	797	108
Grp Sat Flow(s),veh/h/ln	1858	0	1535	1874	0	1610	1810	1856	1610	1668	1826	1572
Q Serve(g_s), s	10.3	0.0	9.9	6.3	0.0	6.4	9.0	29.4	1.2	1.3	45.5	4.3
Cycle Q Clear(g_c), s	10.3	0.0	9.9	6.3	0.0	6.4	9.0	29.4	1.2	1.3	45.5	4.3
Prop In Lane	0.45		1.00	0.28		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	232	0	191	163	0	140	263	930	807	298	806	694
V/C Ratio(X)	0.81	0.00	0.78	0.70	0.00	0.72	0.89	0.72	0.04	0.13	0.99	0.16
Avail Cap(c_a), veh/h	318	0	262	320	0	275	263	930	807	334	806	694
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.8	0.0	44.7	46.7	0.0	46.8	30.2	20.4	13.4	16.9	29.1	17.6
Incr Delay (d2), s/veh	11.3	0.0	10.8	6.5	0.0	8.1	28.2	2.6	0.0	0.2	28.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.0	0.0	7.5	5.8	0.0	5.0	7.8	17.3	0.7	0.8	31.8	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.1	0.0	55.4	53.3	0.0	54.9	58.4	23.1	13.4	17.1	57.8	17.7
LnGrp LOS	E	A	E	D	A	D	E	C	B	B	E	B
Approach Vol, veh/h		336			216			935			943	
Approach Delay, s/veh		55.8			54.0			31.5			51.6	
Approach LOS		E			D			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.7	60.3		15.7	16.0	54.0		19.6				
Change Period (Y+Rc), s	5.0	7.5		6.5	5.0	7.5		6.5				
Max Green Setting (Gmax), s	7.0	50.5		18.0	11.0	46.5		18.0				
Max Q Clear Time (g_c+I1), s	3.3	31.4		8.4	11.0	47.5		12.3				
Green Ext Time (p_c), s	0.0	3.8		0.8	0.0	0.0		0.8				

Intersection Summary			
HCM 6th Ctrl Delay		44.7	
HCM 6th LOS		D	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	356	617	40	25	645	371	28	7	26	434	18	440
Future Volume (vph)	356	617	40	25	645	371	28	7	26	434	18	440
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	7.0		7.0	7.0	7.0		7.0		7.0	7.0	7.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85		0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98		0.95	1.00	1.00
Satd. Flow (prot)	1787	1848		1805	1863	1599		1647		1787	1900	1568
Flt Permitted	0.07	1.00		0.31	1.00	1.00		0.98		0.95	1.00	1.00
Satd. Flow (perm)	133	1848		589	1863	1599		1647		1787	1900	1568
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	375	649	42	26	679	391	29	7	27	457	19	463
RTOR Reduction (vph)	0	1	0	0	0	162	0	17	0	0	0	320
Lane Group Flow (vph)	375	690	0	26	679	229	0	46	0	457	19	143
Heavy Vehicles (%)	1%	2%	0%	0%	2%	1%	7%	0%	7%	1%	0%	3%
Turn Type	pm+pt	NA		Perm	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2			6		4	4		3	3	
Permitted Phases	2			6		6						3
Actuated Green, G (s)	77.0	77.0		50.7	50.7	50.7		8.2		42.9	42.9	42.9
Effective Green, g (s)	77.0	77.0		50.7	50.7	50.7		8.2		42.9	42.9	42.9
Actuated g/C Ratio	0.52	0.52		0.34	0.34	0.34		0.05		0.29	0.29	0.29
Clearance Time (s)	6.0	7.0		7.0	7.0	7.0		7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.0	4.0		4.0	4.0	4.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	293	954		200	633	543		90		514	546	451
v/s Ratio Prot	c0.17	0.37			0.36			c0.03		c0.26	0.01	
v/s Ratio Perm	c0.49			0.04		0.14						0.09
v/c Ratio	1.28	0.72		0.13	1.07	0.42		0.51		0.89	0.03	0.32
Uniform Delay, d1	49.9	27.8		34.0	49.2	37.9		68.5		50.8	38.2	41.6
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	149.6	2.9		0.4	56.8	0.7		4.8		16.9	0.0	0.4
Delay (s)	199.5	30.7		34.4	106.0	38.6		73.3		67.8	38.2	42.0
Level of Service	F	C		C	F	D		E		E	D	D
Approach Delay (s)		90.1			80.3			73.3			54.5	
Approach LOS		F			F			E			D	

Intersection Summary			
HCM 2000 Control Delay	75.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	149.1	Sum of lost time (s)	27.0
Intersection Capacity Utilization	101.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	375	691	26	679	391	63	457	19	463
v/c Ratio	1.26	0.72	0.13	1.06	0.55	0.49	0.88	0.03	0.60
Control Delay	180.0	35.3	41.0	100.2	18.7	65.0	69.3	38.5	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	180.0	35.3	41.0	100.2	18.7	65.0	69.3	38.5	7.6
Queue Length 50th (ft)	~439	551	19	~787	118	45	430	13	10
Queue Length 95th (ft)	#693	785	48	#1103	245	99	#610	36	106
Internal Link Dist (ft)		965		1007		975		1049	
Turn Bay Length (ft)	165		165		320		260		115
Base Capacity (vph)	297	964	201	639	709	241	612	651	832
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.26	0.72	0.13	1.06	0.55	0.26	0.75	0.03	0.56

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	370	419	512	419	151	603
Future Volume (veh/h)	370	419	512	419	151	603
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1885	1885	1885	1856	1870
Adj Flow Rate, veh/h	389	398	539	441	159	581
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	1	1	3	2
Cap, veh/h	561	479	634	885	658	590
Arrive On Green	0.30	0.30	0.09	0.47	0.37	0.37
Sat Flow, veh/h	1870	1598	3483	1885	1767	1585
Grp Volume(v), veh/h	389	398	539	441	159	581
Grp Sat Flow(s),veh/h/ln	1870	1598	1742	1885	1767	1585
Q Serve(g_s), s	16.3	20.6	8.0	14.4	5.5	32.2
Cycle Q Clear(g_c), s	16.3	20.6	8.0	14.4	5.5	32.2
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	561	479	634	885	658	590
V/C Ratio(X)	0.69	0.83	0.85	0.50	0.24	0.98
Avail Cap(c_a), veh/h	718	613	634	1043	658	590
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.4	28.9	23.8	16.3	19.2	27.5
Incr Delay (d2), s/veh	2.6	8.5	10.7	0.6	0.2	32.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	11.5	13.1	7.8	9.5	3.7	22.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	30.0	37.4	34.5	16.9	19.4	60.4
LnGrp LOS	C	D	C	B	B	E
Approach Vol, veh/h	787			980	740	
Approach Delay, s/veh	33.7			26.6	51.6	
Approach LOS	C			C	D	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	15.0	33.6				48.6	40.0
Change Period (Y+Rc), s	7.0	7.0				7.0	7.0
Max Green Setting (Gmax), s	8.0	34.0				49.0	33.0
Max Q Clear Time (g_c+I1), s	10.0	22.6				16.4	34.2
Green Ext Time (p_c), s	0.0	4.0				3.9	0.0

Intersection Summary	
HCM 6th Ctrl Delay	36.2
HCM 6th LOS	D

Notes

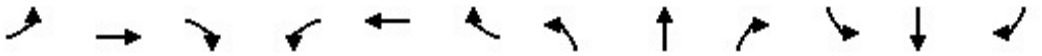
User approved pedestrian interval to be less than phase max green.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	229	297	330	512	757	153
Future Volume (veh/h)	229	297	330	512	757	153
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1856	1841	1856	1870
Adj Flow Rate, veh/h	263	341	379	589	870	176
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	3	4	3	2
Cap, veh/h	422	375	267	1118	761	650
Arrive On Green	0.24	0.24	0.11	0.61	0.41	0.41
Sat Flow, veh/h	1781	1585	1767	1841	1856	1585
Grp Volume(v), veh/h	263	341	379	589	870	176
Grp Sat Flow(s),veh/h/ln	1781	1585	1767	1841	1856	1585
Q Serve(g_s), s	12.7	20.1	10.5	17.8	39.5	7.1
Cycle Q Clear(g_c), s	12.7	20.1	10.5	17.8	39.5	7.1
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	422	375	267	1118	761	650
V/C Ratio(X)	0.62	0.91	1.42	0.53	1.14	0.27
Avail Cap(c_a), veh/h	462	411	267	1118	761	650
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.9	35.7	29.0	10.9	28.4	18.8
Incr Delay (d2), s/veh	2.3	22.5	208.3	0.6	79.7	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.4	14.9	28.5	10.0	45.7	4.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	35.2	58.2	237.4	11.5	108.1	19.2
LnGrp LOS	D	E	F	B	F	B
Approach Vol, veh/h	604			968	1046	
Approach Delay, s/veh	48.2			100.0	93.1	
Approach LOS	D			F	F	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	19.0	48.0		29.3		67.0
Change Period (Y+Rc), s	8.5	8.5		6.5		8.5
Max Green Setting (Gmax), s	10.5	39.5		25.0		58.5
Max Q Clear Time (g_c+I1), s	12.5	41.5		22.1		19.8
Green Ext Time (p_c), s	0.0	0.0		0.7		5.7

Intersection Summary		
HCM 6th Ctrl Delay		85.3
HCM 6th LOS		F



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	896	803	337	1335	0	0	0	0	531	0	436
Future Volume (veh/h)	0	896	803	337	1335	0	0	0	0	531	0	436
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1900	1885	1870	1870	0				1885	0	1826
Adj Flow Rate, veh/h	0	953	0	359	1420	0				565	0	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94				0.94	0.94	0.94
Percent Heavy Veh, %	0	0	1	2	2	0				1	0	5
Cap, veh/h	0	1092		659	2559	0				625	0	
Arrive On Green	0.00	0.30	0.00	0.37	0.72	0.00				0.18	0.00	0.00
Sat Flow, veh/h	0	3705	1598	1781	3647	0				3483	0	1547
Grp Volume(v), veh/h	0	953	0	359	1420	0				565	0	0
Grp Sat Flow(s),veh/h/ln	0	1805	1598	1781	1777	0				1742	0	1547
Q Serve(g_s), s	0.0	37.5	0.0	23.9	28.0	0.0				23.8	0.0	0.0
Cycle Q Clear(g_c), s	0.0	37.5	0.0	23.9	28.0	0.0				23.8	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1092		659	2559	0				625	0	
V/C Ratio(X)	0.00	0.87		0.54	0.56	0.00				0.90	0.00	
Avail Cap(c_a), veh/h	0	1418		659	2559	0				720	0	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.67	0.67	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	49.6	0.0	37.3	9.8	0.0				60.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	9.6	0.0	0.6	0.6	0.0				13.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	24.8	0.0	14.5	13.7	0.0				17.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	59.2	0.0	37.9	10.4	0.0				74.0	0.0	0.0
LnGrp LOS	A	E		D	B	A				E	A	
Approach Vol, veh/h		953			1779						565	
Approach Delay, s/veh		59.2			15.9						74.0	
Approach LOS		E			B						E	

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		115.1			62.6	52.5		34.9				
Change Period (Y+Rc), s		7.1			7.1	7.1		8.0				
Max Green Setting (Gmax), s		103.9			37.9	58.9		31.0				
Max Q Clear Time (g_c+I1), s		30.0			25.9	39.5		25.8				
Green Ext Time (p_c), s		14.1			0.8	5.9		1.1				

Intersection Summary		
HCM 6th Ctrl Delay		38.4
HCM 6th LOS		D

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1349	169	0	1429	1000	966
Future Volume (veh/h)	1349	169	0	1429	1000	966
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1885	1841	0	1870	1870	1856
Adj Flow Rate, veh/h	1420	0	0	1504	1053	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	4	0	2	2	3
Cap, veh/h	2069		0	2950	1121	
Arrive On Green	1.00	0.00	0.00	0.58	0.32	0.00
Sat Flow, veh/h	3676	1560	0	5443	3456	1572
Grp Volume(v), veh/h	1420	0	0	1504	1053	0
Grp Sat Flow(s),veh/h/ln	1791	1560	0	1702	1728	1572
Q Serve(g_s), s	0.0	0.0	0.0	26.4	44.4	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	26.4	44.4	0.0
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2069		0	2950	1121	
V/C Ratio(X)	0.69		0.00	0.51	0.94	
Avail Cap(c_a), veh/h	2069		0	2950	1193	
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.66	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	19.0	49.3	0.0
Incr Delay (d2), s/veh	1.2	0.0	0.0	0.6	13.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.6	0.0	0.0	15.2	28.8	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	1.2	0.0	0.0	19.6	62.9	0.0
LnGrp LOS	A		A	B	E	
Approach Vol, veh/h	1420			1504	1053	
Approach Delay, s/veh	1.2			19.6	62.9	
Approach LOS	A			B	E	

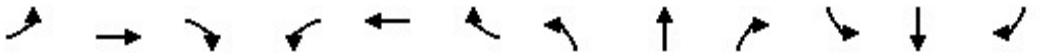
Timer - Assigned Phs	2	4	6
Phs Duration (G+Y+Rc), s	94.2	55.8	94.2
Change Period (Y+Rc), s	7.5	* 7.2	7.5
Max Green Setting (Gmax), s	83.5	* 52	83.5
Max Q Clear Time (g_c+I1), s	28.4	46.4	2.0
Green Ext Time (p_c), s	21.9	2.2	23.5

Intersection Summary	
HCM 6th Ctrl Delay	24.5
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	1981	188	488	1180	59	160	42	414	26	25	78
Future Volume (veh/h)	63	1981	188	488	1180	59	160	42	414	26	25	78
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1885	1826	1841	1870	1841	1811	1767	1885	1767	1900	1796
Adj Flow Rate, veh/h	66	2085	198	514	1242	62	106	131	0	27	26	82
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	1	5	4	2	4	6	9	1	9	0	7
Cap, veh/h	600	1878	811	563	2297	1008	109	112		79	89	71
Arrive On Green	0.04	0.52	0.52	0.17	0.65	0.65	0.06	0.06	0.00	0.05	0.05	0.05
Sat Flow, veh/h	3319	3582	1547	3401	3554	1560	1725	1767	1598	1682	1900	1522
Grp Volume(v), veh/h	66	2085	198	514	1242	62	106	131	0	27	26	82
Grp Sat Flow(s),veh/h/ln	1659	1791	1547	1700	1777	1560	1725	1767	1598	1682	1900	1522
Q Serve(g_s), s	1.3	78.7	10.5	22.3	28.5	2.2	9.2	9.5	0.0	2.3	2.0	7.0
Cycle Q Clear(g_c), s	1.3	78.7	10.5	22.3	28.5	2.2	9.2	9.5	0.0	2.3	2.0	7.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	600	1878	811	563	2297	1008	109	112		79	89	71
V/C Ratio(X)	0.11	1.11	0.24	0.91	0.54	0.06	0.97	1.17		0.34	0.29	1.15
Avail Cap(c_a), veh/h	610	1878	811	612	2297	1008	109	112		79	89	71
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.7	35.7	19.5	61.5	14.4	9.8	70.1	70.3	0.0	69.3	69.1	71.5
Incr Delay (d2), s/veh	0.1	57.8	0.7	17.3	0.9	0.1	76.4	138.2	0.0	2.6	1.8	154.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.9	63.0	6.8	16.2	16.4	1.4	10.5	14.1	0.0	1.9	1.8	10.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.7	93.5	20.2	78.8	15.3	9.9	146.5	208.5	0.0	71.8	70.9	226.1
LnGrp LOS	B	F	C	E	B	A	F	F		E	E	F
Approach Vol, veh/h		2349			1818			237			135	
Approach Delay, s/veh		85.1			33.1			180.8			165.4	
Approach LOS		F			C			F			F	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.6	104.4		17.5	31.8	86.2		14.5				
Change Period (Y+Rc), s	7.0	7.5		8.0	7.0	7.5		7.5				
Max Green Setting (Gmax), s	7.0	96.5		9.5	27.0	68.5		7.0				
Max Q Clear Time (g_c+I1), s	3.3	30.5		11.5	24.3	80.7		9.0				
Green Ext Time (p_c), s	0.0	19.1		0.0	0.6	0.0		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		71.7
HCM 6th LOS		E

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

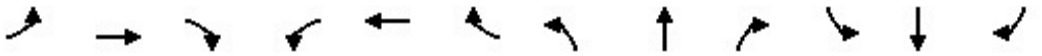


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	588	641	195	497	354	346
Future Volume (veh/h)	588	641	195	497	354	346
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1885	1885	1811	1870	1841	1796
Adj Flow Rate, veh/h	619	675	205	523	373	364
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	6	2	4	7
Cap, veh/h	1653	737	367	2207	419	640
Arrive On Green	0.46	0.46	0.08	0.62	0.24	0.24
Sat Flow, veh/h	3676	1598	1725	3647	1753	2679
Grp Volume(v), veh/h	619	675	205	523	373	364
Grp Sat Flow(s),veh/h/ln	1791	1598	1725	1777	1753	1340
Q Serve(g_s), s	10.5	36.6	5.4	6.1	19.1	11.1
Cycle Q Clear(g_c), s	10.5	36.6	5.4	6.1	19.1	11.1
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1653	737	367	2207	419	640
V/C Ratio(X)	0.37	0.92	0.56	0.24	0.89	0.57
Avail Cap(c_a), veh/h	1735	774	593	2207	472	721
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.3	23.3	11.5	7.8	34.2	31.1
Incr Delay (d2), s/veh	0.2	15.5	1.3	0.1	17.3	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.0	21.7	3.6	3.7	14.7	13.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	16.5	38.8	12.9	7.9	51.5	31.9
LnGrp LOS	B	D	B	A	D	C
Approach Vol, veh/h	1294			728	737	
Approach Delay, s/veh	28.1			9.3	41.8	
Approach LOS	C			A	D	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		64.7		28.2	14.8	49.9
Change Period (Y+Rc), s		7.0		6.0	7.0	7.0
Max Green Setting (Gmax), s		45.0		25.0	20.0	45.0
Max Q Clear Time (g_c+I1), s		8.1		21.1	7.4	38.6
Green Ext Time (p_c), s		5.4		1.1	0.4	4.3

Intersection Summary	
HCM 6th Ctrl Delay	26.8
HCM 6th LOS	C

Appendix M:
Background Improved Conditions Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	1438	317	185	1116	324	247	377	162	304	366	115
Future Volume (veh/h)	93	1438	317	185	1116	324	247	377	162	304	366	115
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1870	1885	1826	1870	1870	1841	1870	1870	1856	1870	1796
Adj Flow Rate, veh/h	98	1514	283	195	1175	308	260	397	0	320	385	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	5	2	1	5	2	2	4	2	2	3	2	7
Cap, veh/h	500	2331	729	205	1464	454	321	409		327	413	
Arrive On Green	0.29	0.46	0.46	0.12	0.29	0.29	0.16	0.22	0.00	0.16	0.22	0.00
Sat Flow, veh/h	1739	5106	1598	1739	5106	1585	1753	1870	1585	1767	1870	1522
Grp Volume(v), veh/h	98	1514	283	195	1175	308	260	397	0	320	385	0
Grp Sat Flow(s),veh/h/ln	1739	1702	1598	1739	1702	1585	1753	1870	1585	1767	1870	1522
Q Serve(g_s), s	6.4	34.4	17.6	16.7	32.0	25.8	21.6	31.6	0.0	23.0	30.3	0.0
Cycle Q Clear(g_c), s	6.4	34.4	17.6	16.7	32.0	25.8	21.6	31.6	0.0	23.0	30.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	500	2331	729	205	1464	454	321	409		327	413	
V/C Ratio(X)	0.20	0.65	0.39	0.95	0.80	0.68	0.81	0.97		0.98	0.93	
Avail Cap(c_a), veh/h	500	2331	729	205	1637	508	321	409		327	460	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	40.3	31.5	26.9	65.7	49.6	47.4	60.2	58.1	0.0	61.1	57.4	0.0
Incr Delay (d2), s/veh	0.2	1.4	1.6	48.7	4.7	7.9	14.8	36.9	0.0	43.7	24.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.8	19.7	11.0	15.1	19.8	16.2	16.1	25.9	0.0	22.2	23.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.5	32.9	28.5	114.4	54.3	55.3	75.1	95.0	0.0	104.8	82.1	0.0
LnGrp LOS	D	C	C	F	D	E	E	F		F	F	
Approach Vol, veh/h		1895			1678			657			705	
Approach Delay, s/veh		32.6			61.5			87.1			92.4	
Approach LOS		C			E			F			F	

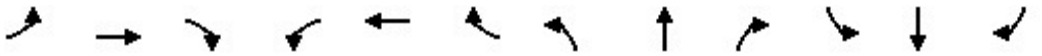
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	51.7	51.3	33.1	41.6	26.0	77.0	32.2	42.5
Change Period (Y+Rc), s	* 8.3	* 8.3	* 9.4	* 8.8	* 8.3	* 8.3	* 8.8	* 9.4
Max Green Setting (Gmax), s	* 12	* 48	* 23	* 33	* 18	* 42	* 23	* 37
Max Q Clear Time (g_c+I1), s	8.4	34.0	25.0	33.6	18.7	36.4	23.6	32.3
Green Ext Time (p_c), s	0.1	9.0	0.0	0.0	0.0	4.8	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	58.2
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	356	617	40	25	645	371	28	7	26	434	18	440
Future Volume (veh/h)	356	617	40	25	645	371	28	7	26	434	18	440
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1870	1900	1900	1870	1885	1796	1900	1796	1885	1900	1856
Adj Flow Rate, veh/h	375	649	39	26	679	380	29	7	16	457	19	403
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	2	0	0	2	1	7	0	7	1	0	3
Cap, veh/h	402	2133	128	365	770	658	41	10	23	649	354	565
Arrive On Green	0.17	0.63	0.63	0.41	0.41	0.41	0.04	0.04	0.04	0.19	0.19	0.19
Sat Flow, veh/h	1795	3406	204	766	1870	1598	978	236	540	3483	1900	1572
Grp Volume(v), veh/h	375	338	350	26	679	380	52	0	0	457	19	403
Grp Sat Flow(s),veh/h/ln	1795	1777	1834	766	1870	1598	1754	0	0	1742	1900	1572
Q Serve(g_s), s	22.4	12.7	12.8	3.0	48.6	26.6	4.2	0.0	0.0	17.8	1.2	27.0
Cycle Q Clear(g_c), s	22.4	12.7	12.8	3.0	48.6	26.6	4.2	0.0	0.0	17.8	1.2	27.0
Prop In Lane	1.00		0.11	1.00		1.00	0.56		0.31	1.00		1.00
Lane Grp Cap(c), veh/h	402	1113	1148	365	770	658	74	0	0	649	354	565
V/C Ratio(X)	0.93	0.30	0.30	0.07	0.88	0.58	0.70	0.00	0.00	0.70	0.05	0.71
Avail Cap(c_a), veh/h	487	1374	1418	441	956	816	85	0	0	649	354	565
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.4	12.5	12.5	26.0	39.4	32.9	68.4	0.0	0.0	55.2	48.4	39.9
Incr Delay (d2), s/veh	22.9	0.2	0.2	0.1	9.0	1.1	19.4	0.0	0.0	3.4	0.1	4.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	22.1	8.5	8.7	1.0	31.3	15.5	4.2	0.0	0.0	12.6	1.0	18.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.3	12.7	12.7	26.1	48.3	34.0	87.9	0.0	0.0	58.6	48.5	44.1
LnGrp LOS	E	B	B	C	D	C	F	A	A	E	D	D
Approach Vol, veh/h		1063			1085			52			879	
Approach Delay, s/veh		30.9			42.8			87.9			51.7	
Approach LOS		C			D			F			D	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		97.7		13.1	31.1	66.6		34.0				
Change Period (Y+Rc), s		7.0		7.0	6.0	7.0		7.0				
Max Green Setting (Gmax), s		112.0		7.0	32.0	74.0		27.0				
Max Q Clear Time (g_c+I1), s		14.8		6.2	24.4	50.6		29.0				
Green Ext Time (p_c), s		6.7		0.0	0.7	9.0		0.0				

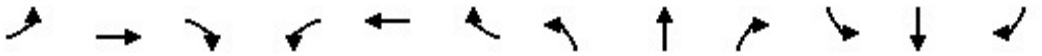
Intersection Summary												
HCM 6th Ctrl Delay			42.0									
HCM 6th LOS			D									



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	229	297	330	512	757	153
Future Volume (veh/h)	229	297	330	512	757	153
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1856	1841	1856	1870
Adj Flow Rate, veh/h	263	341	379	589	870	176
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	3	4	3	2
Cap, veh/h	426	379	414	1101	962	195
Arrive On Green	0.24	0.24	0.18	0.60	0.33	0.33
Sat Flow, veh/h	1781	1585	1767	1841	3014	591
Grp Volume(v), veh/h	263	341	379	589	525	521
Grp Sat Flow(s),veh/h/ln	1781	1585	1767	1841	1763	1749
Q Serve(g_s), s	12.1	19.2	14.0	17.4	26.2	26.2
Cycle Q Clear(g_c), s	12.1	19.2	14.0	17.4	26.2	26.2
Prop In Lane	1.00	1.00	1.00			0.34
Lane Grp Cap(c), veh/h	426	379	414	1101	580	576
V/C Ratio(X)	0.62	0.90	0.92	0.54	0.90	0.90
Avail Cap(c_a), veh/h	485	432	457	1166	600	596
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.3	34.0	23.3	11.0	29.5	29.5
Incr Delay (d2), s/veh	1.9	19.7	21.9	0.6	17.3	17.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.9	14.0	12.1	9.8	18.7	18.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	33.2	53.7	45.2	11.5	46.8	47.0
LnGrp LOS	C	D	D	B	D	D
Approach Vol, veh/h	604			968	1046	
Approach Delay, s/veh	44.8			24.7	46.9	
Approach LOS	D			C	D	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	24.8	38.9		28.6		63.6
Change Period (Y+Rc), s	8.5	8.5		6.5		8.5
Max Green Setting (Gmax), s	18.5	31.4		25.1		58.4
Max Q Clear Time (g_c+I1), s	16.0	28.2		21.2		19.4
Green Ext Time (p_c), s	0.3	2.1		0.8		5.7

Intersection Summary			
HCM 6th Ctrl Delay		38.2	
HCM 6th LOS		D	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	1981	188	488	1180	59	160	42	414	26	25	78
Future Volume (veh/h)	63	1981	188	488	1180	59	160	42	414	26	25	78
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1885	1826	1841	1870	1841	1811	1767	1885	1767	1900	1796
Adj Flow Rate, veh/h	66	2085	198	514	1242	62	106	131	0	27	26	82
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	1	5	4	2	4	6	9	1	9	0	7
Cap, veh/h	612	2492	749	544	3066	937	154	158		112	126	101
Arrive On Green	0.04	0.48	0.48	0.16	0.60	0.60	0.09	0.09	0.00	0.07	0.07	0.07
Sat Flow, veh/h	3319	5147	1547	3401	5106	1560	1725	1767	1598	1682	1900	1522
Grp Volume(v), veh/h	66	2085	198	514	1242	62	106	131	0	27	26	82
Grp Sat Flow(s),veh/h/ln	1659	1716	1547	1700	1702	1560	1725	1767	1598	1682	1900	1522
Q Serve(g_s), s	1.4	52.7	11.4	22.4	19.3	2.5	8.9	10.9	0.0	2.3	1.9	8.0
Cycle Q Clear(g_c), s	1.4	52.7	11.4	22.4	19.3	2.5	8.9	10.9	0.0	2.3	1.9	8.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	612	2492	749	544	3066	937	154	158		112	126	101
V/C Ratio(X)	0.11	0.84	0.26	0.94	0.41	0.07	0.69	0.83		0.24	0.21	0.81
Avail Cap(c_a), veh/h	622	2492	749	544	3066	937	218	224		123	139	112
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.1	33.6	22.9	62.3	15.8	12.5	66.3	67.2	0.0	66.4	66.3	69.1
Incr Delay (d2), s/veh	0.1	3.5	0.9	25.5	0.4	0.1	5.3	16.1	0.0	1.1	0.8	32.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.0	29.1	7.5	17.0	11.7	1.6	7.5	9.5	0.0	1.8	1.7	7.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.2	37.1	23.7	87.8	16.2	12.6	71.6	83.2	0.0	67.5	67.1	101.3
LnGrp LOS	B	D	C	F	B	B	E	F		E	E	F
Approach Vol, veh/h		2349			1818			237			135	
Approach Delay, s/veh		35.4			36.3			78.0			87.9	
Approach LOS		D			D			E			F	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.6	97.6		21.4	31.0	80.1		17.5				
Change Period (Y+Rc), s	7.0	7.5		8.0	7.0	7.5		7.5				
Max Green Setting (Gmax), s	7.0	83.0		19.0	24.0	66.0		11.0				
Max Q Clear Time (g_c+I1), s	3.4	21.3		12.9	24.4	54.7		10.0				
Green Ext Time (p_c), s	0.0	17.8		0.5	0.0	10.2		0.0				

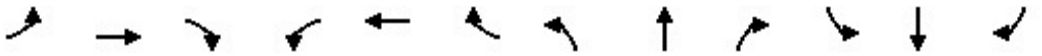
Intersection Summary		
HCM 6th Ctrl Delay		39.6
HCM 6th LOS		D

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Appendix N:
Buildout Conditions Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	159	1456	317	228	1212	324	247	438	146	758	390	145
Future Volume (veh/h)	159	1456	317	228	1212	324	247	438	146	758	390	145
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1870	1885	1826	1870	1870	1841	1870	1870	1856	1870	1796
Adj Flow Rate, veh/h	167	1533	283	240	1276	308	260	461	0	798	411	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	5	2	1	5	2	2	4	2	2	3	2	7
Cap, veh/h	124	1147	359	170	1283	398	328	339		515	534	
Arrive On Green	0.07	0.22	0.22	0.10	0.25	0.25	0.16	0.18	0.00	0.26	0.29	0.00
Sat Flow, veh/h	1739	5106	1598	1739	5106	1585	1753	1870	1585	1767	1870	1522
Grp Volume(v), veh/h	167	1533	283	240	1276	308	260	461	0	798	411	0
Grp Sat Flow(s),veh/h/ln	1739	1702	1598	1739	1702	1585	1753	1870	1585	1767	1870	1522
Q Serve(g_s), s	10.7	33.7	25.0	14.7	37.4	27.1	21.9	27.2	0.0	39.6	30.2	0.0
Cycle Q Clear(g_c), s	10.7	33.7	25.0	14.7	37.4	27.1	21.9	27.2	0.0	39.6	30.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	124	1147	359	170	1283	398	328	339		515	534	
V/C Ratio(X)	1.35	1.34	0.79	1.41	0.99	0.77	0.79	1.36		1.55	0.77	
Avail Cap(c_a), veh/h	124	1147	359	170	1283	398	332	339		515	591	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	69.6	58.2	54.8	67.7	56.0	52.2	62.1	61.4	0.0	53.4	49.1	0.0
Incr Delay (d2), s/veh	199.8	157.3	16.0	214.9	23.8	13.6	12.9	179.7	0.0	257.4	5.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	18.7	46.0	16.8	26.1	25.3	17.6	16.1	44.3	0.0	83.6	20.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	269.5	215.5	70.8	282.5	79.8	65.8	74.9	241.1	0.0	310.7	54.7	0.0
LnGrp LOS	F	F	E	F	E	E	E	F		F	D	
Approach Vol, veh/h		1983			1824			721			1209	
Approach Delay, s/veh		199.4			104.1			181.2			223.7	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	46.0	49.0	36.0	23.0	42.0	32.8	52.2
Change Period (Y+Rc), s	* 8.3	* 8.3	* 9.4	* 8.8	* 8.3	* 8.3	* 8.8	* 9.4
Max Green Setting (Gmax), s	* 11	* 38	* 40	* 27	* 15	* 34	* 24	* 47
Max Q Clear Time (g_c+I1), s	12.7	39.4	41.6	29.2	16.7	35.7	23.9	32.2
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8

Intersection Summary	
HCM 6th Ctrl Delay	171.9
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	272	120	596	176	115	792
Future Volume (vph)	272	120	596	176	115	792
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8	7.5	7.5	7.5	7.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	1495	1845	1568	1770	1827
Flt Permitted	0.95	1.00	1.00	1.00	0.16	1.00
Satd. Flow (perm)	1805	1495	1845	1568	292	1827
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	296	130	648	191	125	861
RTOR Reduction (vph)	0	98	0	40	0	0
Lane Group Flow (vph)	296	32	648	151	125	861
Heavy Vehicles (%)	0%	8%	3%	3%	2%	4%
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		6		5	2
Permitted Phases		4		6	2	
Actuated Green, G (s)	25.2	25.2	45.0	45.0	63.9	63.9
Effective Green, g (s)	25.2	25.2	45.0	45.0	63.9	63.9
Actuated g/C Ratio	0.24	0.24	0.44	0.44	0.62	0.62
Clearance Time (s)	6.8	6.8	7.5	7.5	7.5	7.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	439	364	802	682	343	1129
v/s Ratio Prot	c0.16		c0.35		0.04	c0.47
v/s Ratio Perm		0.02		0.10	0.18	
v/c Ratio	0.67	0.09	0.81	0.22	0.36	0.76
Uniform Delay, d1	35.4	30.2	25.4	18.2	14.3	14.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.1	0.1	6.0	0.2	0.7	3.1
Delay (s)	39.4	30.3	31.4	18.4	15.0	17.4
Level of Service	D	C	C	B	B	B
Approach Delay (s)	36.7		28.5			17.1
Approach LOS	D		C			B

Intersection Summary			
HCM 2000 Control Delay	25.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	103.4	Sum of lost time (s)	21.8
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	296	130	648	191	125	861
v/c Ratio	0.68	0.28	0.82	0.27	0.37	0.77
Control Delay	47.0	8.3	36.0	13.0	11.9	20.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.0	8.3	36.0	13.0	11.9	20.5
Queue Length 50th (ft)	175	0	363	47	31	378
Queue Length 95th (ft)	346	52	613	110	68	670
Internal Link Dist (ft)	1320		862			656
Turn Bay Length (ft)	180			145	125	
Base Capacity (vph)	912	820	1305	1130	627	1712
Starvation Cap Reductn	0	0	3	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.16	0.50	0.17	0.20	0.50

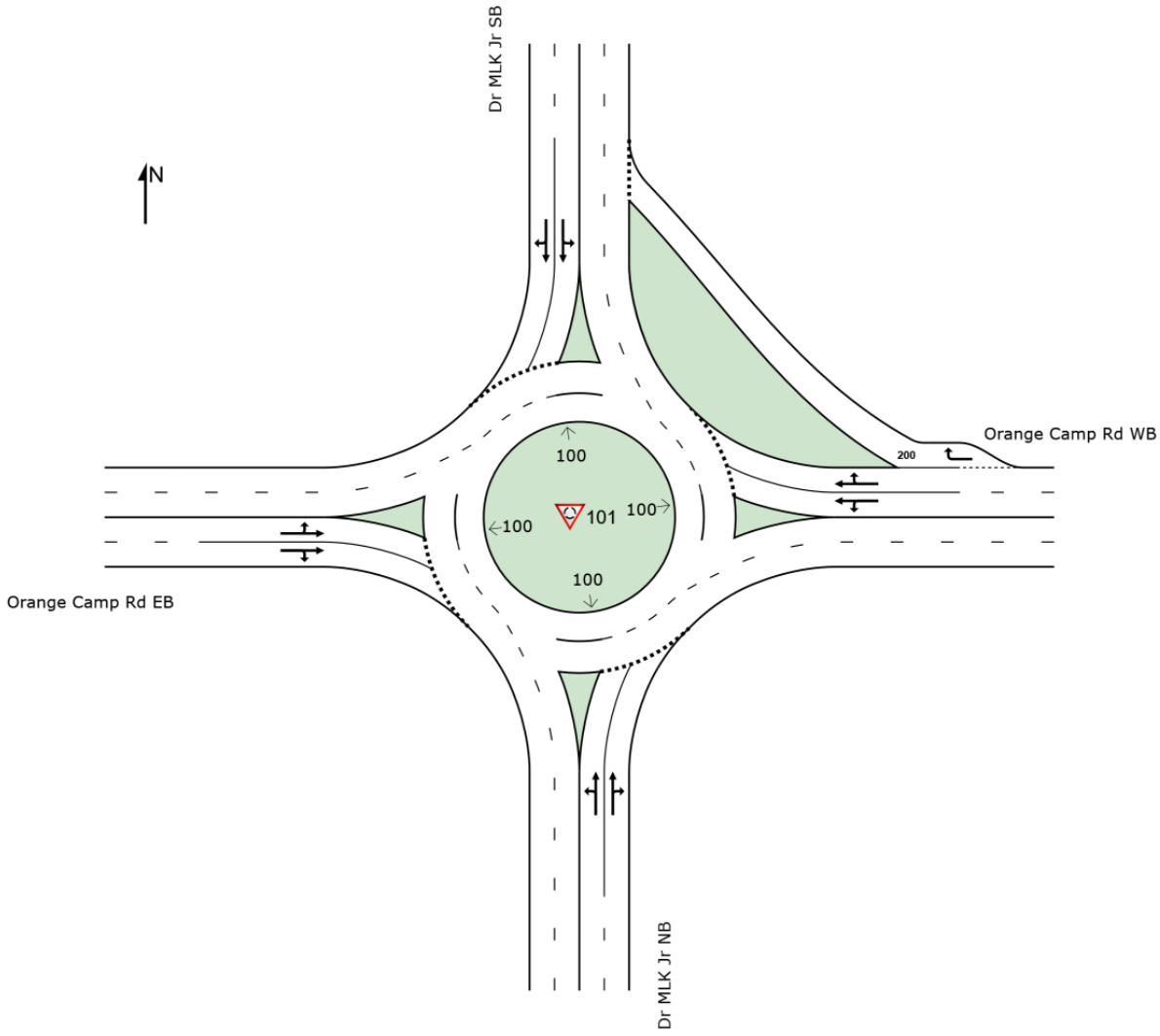
Intersection Summary

SITE LAYOUT

Site: 101 [2027 Future Buildout PM Peak Hour Conditions (Site Folder: General)]

Buildout Roundabout
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Project: H:\28\28629 - DeLand Tech Park TIA\sidra\Dr MLK Jr at Orange Camp Roundabout_KAI.sip9

MOVEMENT SUMMARY

Site: 101 [2027 Future Buildout PM Peak Hour Conditions (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Buildout Roundabout
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Dr MLK Jr NB															
3	L2	All MCs	223	1.0	223	1.0	0.965	59.0	LOS E	13.2	331.5	0.98	1.64	3.28	18.4
8	T1	All MCs	639	1.0	639	1.0	0.965	56.6	LOS E	14.2	356.9	0.98	1.66	3.33	19.1
18	R2	All MCs	172	0.0	172	0.0	0.965	54.5	LOS D	14.2	356.9	0.98	1.67	3.36	19.3
Approach			1034	0.8	1034	0.8	0.965	56.8	LOS E	14.2	356.9	0.98	1.66	3.32	18.9
East: Orange Camp Rd WB															
1	L2	All MCs	161	5.0	161	5.0	0.673	23.4	LOS C	4.3	109.0	0.82	0.99	1.42	25.8
6	T1	All MCs	618	1.0	618	1.0	0.673	20.6	LOS C	4.6	114.9	0.82	0.98	1.41	27.3
16	R2	All MCs	195	2.0	195	2.0	0.262	7.9	LOS A	1.0	25.1	0.60	0.53	0.60	32.2
Approach			974	1.9	974	1.9	0.673	18.5	LOS B	4.6	114.9	0.77	0.89	1.25	27.8
North: Dr MLK Jr SB															
7	L2	All MCs	217	3.0	217	3.0	0.989	66.0	LOS E	14.6	378.1	0.99	1.81	3.76	17.3
4	T1	All MCs	577	6.0	577	6.0	0.989	65.6	LOS E	15.2	395.2	1.00	1.84	3.83	17.8
14	R2	All MCs	187	4.0	187	4.0	0.989	63.2	LOS E	15.2	395.2	1.00	1.86	3.88	17.9
Approach			982	5.0	982	5.0	0.989	65.2	LOS E	15.2	395.2	1.00	1.83	3.82	17.7
West: Orange Camp Rd EB															
5	L2	All MCs	63	7.0	63	7.0	0.991	68.0	LOS E	14.4	375.9	0.99	1.80	3.71	17.3
2	T1	All MCs	722	5.0	722	5.0	0.991	65.4	LOS E	15.9	409.1	1.00	1.82	3.76	17.8
12	R2	All MCs	226	2.0	226	2.0	0.991	61.7	LOS E	15.9	409.1	1.00	1.84	3.83	18.1
Approach			1011	4.5	1011	4.5	0.991	64.7	LOS E	15.9	409.1	1.00	1.82	3.77	17.9
All Vehicles			4000	3.0	4000	3.0	0.991	51.5	LOS D	15.9	409.1	0.94	1.56	3.06	19.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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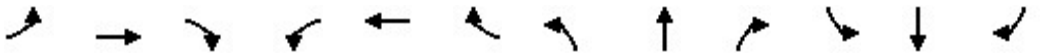
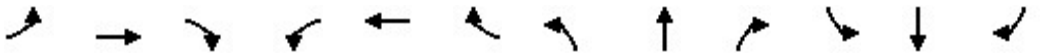


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	96	169	35	77	94	217	667	44	35	773	108
Future Volume (veh/h)	78	96	169	35	77	94	217	667	44	35	773	108
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1811	1811	1900	1900	1900	1856	1900	1752	1826	1856
Adj Flow Rate, veh/h	84	103	149	38	83	101	233	717	43	38	831	108
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	6	6	0	0	0	3	0	10	5	3
Cap, veh/h	98	120	180	50	109	137	261	980	851	289	867	746
Arrive On Green	0.12	0.12	0.12	0.08	0.08	0.08	0.10	0.53	0.53	0.04	0.47	0.47
Sat Flow, veh/h	835	1024	1535	587	1283	1610	1810	1856	1610	1668	1826	1572
Grp Volume(v), veh/h	187	0	149	121	0	101	233	717	43	38	831	108
Grp Sat Flow(s),veh/h/ln	1858	0	1535	1871	0	1610	1810	1856	1610	1668	1826	1572
Q Serve(g_s), s	11.1	0.0	10.7	7.1	0.0	6.9	8.9	33.5	1.5	1.3	49.4	4.4
Cycle Q Clear(g_c), s	11.1	0.0	10.7	7.1	0.0	6.9	8.9	33.5	1.5	1.3	49.4	4.4
Prop In Lane	0.45		1.00	0.31		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	218	0	180	159	0	137	261	980	851	289	867	746
V/C Ratio(X)	0.86	0.00	0.83	0.76	0.00	0.74	0.89	0.73	0.05	0.13	0.96	0.14
Avail Cap(c_a), veh/h	223	0	184	224	0	193	262	980	851	321	900	775
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.8	0.0	48.6	50.4	0.0	50.3	31.1	20.4	12.9	16.9	28.5	16.7
Incr Delay (d2), s/veh	27.0	0.0	26.0	10.6	0.0	10.2	29.4	2.8	0.0	0.2	20.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	10.8	0.0	9.0	6.9	0.0	5.5	9.4	19.3	0.9	0.8	31.9	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.8	0.0	74.6	61.0	0.0	60.5	60.5	23.2	12.9	17.1	48.8	16.8
LnGrp LOS	E	A	E	E	A	E	E	C	B	B	D	B
Approach Vol, veh/h		336			222			993			977	
Approach Delay, s/veh		75.3			60.8			31.5			44.1	
Approach LOS		E			E			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.9	67.0		16.1	15.9	61.0		19.7				
Change Period (Y+Rc), s	5.0	7.5		6.5	5.0	7.5		6.5				
Max Green Setting (Gmax), s	7.0	59.5		13.5	11.0	55.5		13.5				
Max Q Clear Time (g_c+I1), s	3.3	35.5		9.1	10.9	51.4		13.1				
Green Ext Time (p_c), s	0.0	4.5		0.4	0.0	2.0		0.1				

Intersection Summary			
HCM 6th Ctrl Delay		44.8	
HCM 6th LOS		D	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	390	617	40	25	645	381	28	7	26	449	18	491
Future Volume (veh/h)	390	617	40	25	645	381	28	7	26	449	18	491
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1870	1900	1900	1870	1885	1796	1900	1796	1885	1900	1856
Adj Flow Rate, veh/h	411	649	39	26	679	390	29	7	16	473	19	479
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	2	0	0	2	1	7	0	7	1	0	3
Cap, veh/h	435	2184	131	359	759	649	40	10	22	622	339	589
Arrive On Green	0.20	0.64	0.64	0.41	0.41	0.41	0.04	0.04	0.04	0.18	0.18	0.18
Sat Flow, veh/h	1795	3406	204	766	1870	1598	978	236	540	3483	1900	1572
Grp Volume(v), veh/h	411	338	350	26	679	390	52	0	0	473	19	479
Grp Sat Flow(s),veh/h/ln	1795	1777	1834	766	1870	1598	1754	0	0	1742	1900	1572
Q Serve(g_s), s	27.0	12.7	12.8	3.2	51.2	29.0	4.4	0.0	0.0	19.5	1.3	27.0
Cycle Q Clear(g_c), s	27.0	12.7	12.8	3.2	51.2	29.0	4.4	0.0	0.0	19.5	1.3	27.0
Prop In Lane	1.00		0.11	1.00		1.00	0.56		0.31	1.00		1.00
Lane Grp Cap(c), veh/h	435	1140	1176	359	759	649	72	0	0	622	339	589
V/C Ratio(X)	0.95	0.30	0.30	0.07	0.89	0.60	0.72	0.00	0.00	0.76	0.06	0.81
Avail Cap(c_a), veh/h	487	1316	1359	413	891	761	81	0	0	622	339	589
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.7	12.0	12.0	27.6	41.9	35.3	71.6	0.0	0.0	59.0	51.5	42.5
Incr Delay (d2), s/veh	26.1	0.2	0.2	0.1	10.9	1.4	23.7	0.0	0.0	5.5	0.1	8.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	25.2	8.5	8.7	1.1	33.3	16.8	4.5	0.0	0.0	13.8	1.1	23.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.9	12.2	12.2	27.7	52.8	36.6	95.3	0.0	0.0	64.5	51.6	51.1
LnGrp LOS	E	B	B	C	D	D	F	A	A	E	D	D
Approach Vol, veh/h		1099			1095			52			971	
Approach Delay, s/veh		34.1			46.5			95.3			57.6	
Approach LOS		C			D			F			E	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		104.0		13.2	35.6	68.4		34.0				
Change Period (Y+Rc), s		7.0		7.0	6.0	7.0		7.0				
Max Green Setting (Gmax), s		112.0		7.0	34.0	72.0		27.0				
Max Q Clear Time (g_c+I1), s		14.8		6.4	29.0	53.2		29.0				
Green Ext Time (p_c), s		6.7		0.0	0.6	8.2		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			46.4									
HCM 6th LOS			D									



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	381	419	547	436	151	626
Future Volume (veh/h)	381	419	547	436	151	626
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1885	1885	1885	1856	1870
Adj Flow Rate, veh/h	401	398	576	459	159	605
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	1	1	3	2
Cap, veh/h	550	470	601	867	682	612
Arrive On Green	0.29	0.29	0.09	0.46	0.39	0.39
Sat Flow, veh/h	1870	1598	3483	1885	1767	1585
Grp Volume(v), veh/h	401	398	576	459	159	605
Grp Sat Flow(s),veh/h/ln	1870	1598	1742	1885	1767	1585
Q Serve(g_s), s	17.5	21.2	8.0	15.8	5.5	34.4
Cycle Q Clear(g_c), s	17.5	21.2	8.0	15.8	5.5	34.4
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	550	470	601	867	682	612
V/C Ratio(X)	0.73	0.85	0.96	0.53	0.23	0.99
Avail Cap(c_a), veh/h	660	564	601	977	682	612
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.7	30.1	26.8	17.5	18.8	27.7
Incr Delay (d2), s/veh	3.9	10.8	26.5	0.7	0.2	33.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	12.4	13.8	8.1	10.4	3.7	23.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	32.6	40.9	53.3	18.2	19.0	61.2
LnGrp LOS	C	D	D	B	B	E
Approach Vol, veh/h	799			1035	764	
Approach Delay, s/veh	36.7			37.8	52.4	
Approach LOS	D			D	D	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	15.0	33.7				48.7	42.0
Change Period (Y+Rc), s	7.0	7.0				7.0	7.0
Max Green Setting (Gmax), s	8.0	32.0				47.0	35.0
Max Q Clear Time (g_c+I1), s	10.0	23.2				17.8	36.4
Green Ext Time (p_c), s	0.0	3.5				4.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	41.7
HCM 6th LOS	D

Notes

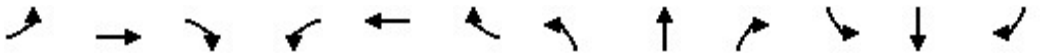
User approved pedestrian interval to be less than phase max green.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	236	297	330	527	779	163
Future Volume (veh/h)	236	297	330	527	779	163
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1856	1841	1856	1870
Adj Flow Rate, veh/h	271	341	379	606	895	187
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	3	4	3	2
Cap, veh/h	424	378	411	1109	968	202
Arrive On Green	0.24	0.24	0.18	0.60	0.33	0.33
Sat Flow, veh/h	1781	1585	1767	1841	2996	606
Grp Volume(v), veh/h	271	341	379	606	543	539
Grp Sat Flow(s),veh/h/ln	1781	1585	1767	1841	1763	1746
Q Serve(g_s), s	12.9	19.7	14.7	18.4	28.0	28.0
Cycle Q Clear(g_c), s	12.9	19.7	14.7	18.4	28.0	28.0
Prop In Lane	1.00	1.00	1.00			0.35
Lane Grp Cap(c), veh/h	424	378	411	1109	588	583
V/C Ratio(X)	0.64	0.90	0.92	0.55	0.92	0.92
Avail Cap(c_a), veh/h	475	422	431	1141	599	593
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.2	34.8	24.8	11.1	30.2	30.2
Incr Delay (d2), s/veh	2.4	20.9	24.7	0.7	20.3	20.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.5	14.4	12.9	10.3	20.2	20.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	34.6	55.7	49.5	11.8	50.6	50.8
LnGrp LOS	C	E	D	B	D	D
Approach Vol, veh/h	612			985	1082	
Approach Delay, s/veh	46.4			26.3	50.7	
Approach LOS	D			C	D	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	25.3	39.9		28.9		65.2
Change Period (Y+Rc), s	8.5	8.5		6.5		8.5
Max Green Setting (Gmax), s	17.9	32.0		25.1		58.4
Max Q Clear Time (g_c+I1), s	16.7	30.0		21.7		20.4
Green Ext Time (p_c), s	0.2	1.4		0.8		6.0

Intersection Summary	
HCM 6th Ctrl Delay	40.7
HCM 6th LOS	D



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1197	878	337	1503	0	0	0	0	531	0	469
Future Volume (veh/h)	0	1197	878	337	1503	0	0	0	0	531	0	469
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1900	1885	1870	1870	0				1885	0	1826
Adj Flow Rate, veh/h	0	1273	0	359	1599	0				565	0	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94				0.94	0.94	0.94
Percent Heavy Veh, %	0	0	1	2	2	0				1	0	5
Cap, veh/h	0	1363		526	2559	0				625	0	
Arrive On Green	0.00	0.38	0.00	0.30	0.72	0.00				0.18	0.00	0.00
Sat Flow, veh/h	0	3705	1598	1781	3647	0				3483	0	1547
Grp Volume(v), veh/h	0	1273	0	359	1599	0				565	0	0
Grp Sat Flow(s),veh/h/ln	0	1805	1598	1781	1777	0				1742	0	1547
Q Serve(g_s), s	0.0	50.9	0.0	26.7	34.4	0.0				23.8	0.0	0.0
Cycle Q Clear(g_c), s	0.0	50.9	0.0	26.7	34.4	0.0				23.8	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1363		526	2559	0				625	0	
V/C Ratio(X)	0.00	0.93		0.68	0.62	0.00				0.90	0.00	
Avail Cap(c_a), veh/h	0	1418		526	2559	0				720	0	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.63	0.63	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	44.9	0.0	46.7	10.7	0.0				60.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	13.0	0.0	2.3	0.7	0.0				13.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	32.3	0.0	16.3	16.2	0.0				17.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	57.9	0.0	49.0	11.4	0.0				74.0	0.0	0.0
LnGrp LOS	A	E		D	B	A				E	A	
Approach Vol, veh/h		1273			1958						565	
Approach Delay, s/veh		57.9			18.3						74.0	
Approach LOS		E			B						E	

Timer - Assigned Phs	2	5	6	8
Phs Duration (G+Y+Rc), s	115.1	51.4	63.7	34.9
Change Period (Y+Rc), s	7.1	7.1	7.1	8.0
Max Green Setting (Gmax), s	103.9	37.9	58.9	31.0
Max Q Clear Time (g_c+I1), s	36.4	28.7	52.9	25.8
Green Ext Time (p_c), s	17.7	0.7	3.8	1.1

Intersection Summary	
HCM 6th Ctrl Delay	39.9
HCM 6th LOS	D

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1601	217	0	1521	1044	966
Future Volume (veh/h)	1601	217	0	1521	1044	966
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1885	1841	0	1870	1870	1856
Adj Flow Rate, veh/h	1685	0	0	1601	1099	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	4	0	2	2	3
Cap, veh/h	2034		0	2899	1155	
Arrive On Green	1.00	0.00	0.00	0.57	0.33	0.00
Sat Flow, veh/h	3676	1560	0	5443	3456	1572
Grp Volume(v), veh/h	1685	0	0	1601	1099	0
Grp Sat Flow(s),veh/h/ln	1791	1560	0	1702	1728	1572
Q Serve(g_s), s	0.0	0.0	0.0	29.6	46.6	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	29.6	46.6	0.0
Prop In Lane		1.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2034		0	2899	1155	
V/C Ratio(X)	0.83		0.00	0.55	0.95	
Avail Cap(c_a), veh/h	2034		0	2899	1193	
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.43	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	20.4	48.8	0.0
Incr Delay (d2), s/veh	1.8	0.0	0.0	0.8	15.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.9	0.0	0.0	16.8	30.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	1.8	0.0	0.0	21.2	64.4	0.0
LnGrp LOS	A		A	C	E	
Approach Vol, veh/h	1685			1601	1099	
Approach Delay, s/veh	1.8			21.2	64.4	
Approach LOS	A			C	E	

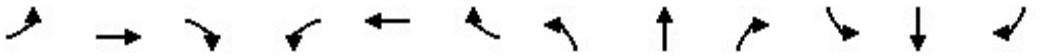
Timer - Assigned Phs	2	4	6
Phs Duration (G+Y+Rc), s	92.7	57.3	92.7
Change Period (Y+Rc), s	7.5	* 7.2	7.5
Max Green Setting (Gmax), s	83.5	* 52	83.5
Max Q Clear Time (g_c+I1), s	31.6	48.6	2.0
Green Ext Time (p_c), s	23.6	1.6	33.3

Intersection Summary	
HCM 6th Ctrl Delay	24.6
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	2085	222	488	1249	59	183	42	414	26	25	78
Future Volume (veh/h)	63	2085	222	488	1249	59	183	42	414	26	25	78
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1885	1826	1841	1870	1841	1811	1767	1885	1767	1900	1796
Adj Flow Rate, veh/h	66	2195	234	514	1315	62	224	0	0	27	26	82
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	1	5	4	2	4	6	9	1	9	0	7
Cap, veh/h	589	2540	764	544	3114	951	276	0		112	126	101
Arrive On Green	0.04	0.49	0.49	0.16	0.61	0.61	0.08	0.00	0.00	0.07	0.07	0.07
Sat Flow, veh/h	3319	5147	1547	3401	5106	1560	3450	0	1598	1682	1900	1522
Grp Volume(v), veh/h	66	2195	234	514	1315	62	224	0	0	27	26	82
Grp Sat Flow(s),veh/h/ln	1659	1716	1547	1700	1702	1560	1725	0	1598	1682	1900	1522
Q Serve(g_s), s	1.4	56.5	13.5	22.4	20.3	2.4	9.6	0.0	0.0	2.3	1.9	8.0
Cycle Q Clear(g_c), s	1.4	56.5	13.5	22.4	20.3	2.4	9.6	0.0	0.0	2.3	1.9	8.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	589	2540	764	544	3114	951	276	0		112	126	101
V/C Ratio(X)	0.11	0.86	0.31	0.94	0.42	0.07	0.81	0.00		0.24	0.21	0.81
Avail Cap(c_a), veh/h	599	2540	764	544	3114	951	437	0		123	139	112
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.4	33.6	22.7	62.3	15.4	11.9	67.9	0.0	0.0	66.4	66.3	69.1
Incr Delay (d2), s/veh	0.1	4.2	1.0	25.5	0.4	0.1	6.2	0.0	0.0	1.1	0.8	32.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.9	31.0	8.7	17.0	12.1	1.5	7.9	0.0	0.0	1.8	1.7	7.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.5	37.8	23.7	87.8	15.8	12.0	74.1	0.0	0.0	67.5	67.1	101.3
LnGrp LOS	B	D	C	F	B	B	E	A		E	E	F
Approach Vol, veh/h		2495			1891			224			135	
Approach Delay, s/veh		35.9			35.3			74.1			87.9	
Approach LOS		D			D			E			F	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.6	99.0		20.0	31.0	81.5		17.5				
Change Period (Y+Rc), s	7.0	7.5		8.0	7.0	7.5		7.5				
Max Green Setting (Gmax), s	7.0	83.0		19.0	24.0	66.0		11.0				
Max Q Clear Time (g_c+I1), s	3.4	22.3		11.6	24.4	58.5		10.0				
Green Ext Time (p_c), s	0.0	19.4		0.4	0.0	7.0		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		38.9
HCM 6th LOS		D

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	588	653	229	497	362	369
Future Volume (veh/h)	588	653	229	497	362	369
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1885	1885	1811	1870	1841	1796
Adj Flow Rate, veh/h	619	687	241	523	381	388
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	6	2	4	7
Cap, veh/h	1651	736	380	2232	417	637
Arrive On Green	0.46	0.46	0.09	0.63	0.24	0.24
Sat Flow, veh/h	3676	1598	1725	3647	1753	2679
Grp Volume(v), veh/h	619	687	241	523	381	388
Grp Sat Flow(s),veh/h/ln	1791	1598	1725	1777	1753	1340
Q Serve(g_s), s	10.9	39.4	6.7	6.2	20.5	12.5
Cycle Q Clear(g_c), s	10.9	39.4	6.7	6.2	20.5	12.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1651	736	380	2232	417	637
V/C Ratio(X)	0.37	0.93	0.63	0.23	0.91	0.61
Avail Cap(c_a), veh/h	1702	759	573	2680	435	664
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.0	24.7	12.2	7.9	35.9	32.9
Incr Delay (d2), s/veh	0.2	18.3	1.8	0.1	23.2	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.4	23.7	4.5	3.8	16.3	14.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	17.2	43.0	14.0	7.9	59.1	34.4
LnGrp LOS	B	D	B	A	E	C
Approach Vol, veh/h	1306			764	769	
Approach Delay, s/veh	30.8			9.8	46.6	
Approach LOS	C			A	D	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		67.8		29.0	16.2	51.6
Change Period (Y+Rc), s		7.0		6.0	7.0	7.0
Max Green Setting (Gmax), s		73.0		24.0	20.0	46.0
Max Q Clear Time (g_c+I1), s		8.2		22.5	8.7	41.4
Green Ext Time (p_c), s		5.7		0.5	0.5	3.3

Intersection Summary		
HCM 6th Ctrl Delay		29.4
HCM 6th LOS		C

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	81	2060	1661	177	0	136
Future Vol, veh/h	81	2060	1661	177	0	136
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	250	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	7	1	0	0	0	0
Mvmt Flow	85	2168	1748	186	0	143

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1934	0	-	0	-	874
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.24	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.27	-	-	-	-	3.3
Pot Cap-1 Maneuver	281	-	-	-	0	297
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	281	-	-	-	-	297
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	27.9
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	281	-	-	-	297
HCM Lane V/C Ratio	0.303	-	-	-	0.482
HCM Control Delay (s)	23.3	-	-	-	27.9
HCM Lane LOS	C	-	-	-	D
HCM 95th %tile Q(veh)	1.2	-	-	-	2.5

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↱		↱
Traffic Vol, veh/h	0	2150	1718	76	0	42
Future Vol, veh/h	0	2150	1718	76	0	42
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	250	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	1	0	0	0	0
Mvmt Flow	0	2263	1808	80	0	44

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	904
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	-	0	284
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	284
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	20
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	284
HCM Lane V/C Ratio	-	-	-	0.156
HCM Control Delay (s)	-	-	-	20
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	0.5

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↱		↱
Traffic Vol, veh/h	0	2150	1683	76	0	41
Future Vol, veh/h	0	2150	1683	76	0	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	250	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	2263	1772	80	0	43

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	886
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	-	0	292
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	292
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	19.5
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	292
HCM Lane V/C Ratio	-	-	-	0.148
HCM Control Delay (s)	-	-	-	19.5
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	0.5

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	46	734	130	0	1307
Future Vol, veh/h	0	46	734	130	0	1307
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	150	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	3	3	0	0
Mvmt Flow	0	48	773	137	0	1376

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	773	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	402	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	402	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.2	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	402	-
HCM Lane V/C Ratio	-	-	0.12	-
HCM Control Delay (s)	-	-	15.2	-
HCM Lane LOS	-	-	C	-
HCM 95th %tile Q(veh)	-	-	0.4	-



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	410	45	730	50	88	897
Future Volume (veh/h)	410	45	730	50	88	897
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1856	1900	1900	1900
Adj Flow Rate, veh/h	432	47	768	53	93	944
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	3	0	0	0
Cap, veh/h	506	450	1088	944	307	1114
Arrive On Green	0.28	0.28	0.59	0.59	0.59	0.59
Sat Flow, veh/h	1810	1610	1856	1610	677	1900
Grp Volume(v), veh/h	432	47	768	53	93	944
Grp Sat Flow(s),veh/h/ln	1810	1610	1856	1610	677	1900
Q Serve(g_s), s	15.2	1.5	19.6	0.9	7.6	27.4
Cycle Q Clear(g_c), s	15.2	1.5	19.6	0.9	27.2	27.4
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	506	450	1088	944	307	1114
V/C Ratio(X)	0.85	0.10	0.71	0.06	0.30	0.85
Avail Cap(c_a), veh/h	1305	1162	2553	2215	841	2614
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.9	18.0	9.8	5.9	19.4	11.4
Incr Delay (d2), s/veh	4.2	0.1	0.9	0.0	0.6	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	11.0	1.0	9.6	0.4	1.9	13.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	27.1	18.1	10.7	6.0	19.9	13.3
LnGrp LOS	C	B	B	A	B	B
Approach Vol, veh/h	479		821			1037
Approach Delay, s/veh	26.2		10.4			13.9
Approach LOS	C		B			B

Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		43.9			43.9	23.3
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		92.5			92.5	48.5
Max Q Clear Time (g_c+I1), s		21.6			29.4	17.2
Green Ext Time (p_c), s		6.1			10.0	1.6

Intersection Summary	
HCM 6th Ctrl Delay	15.2
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	6.4

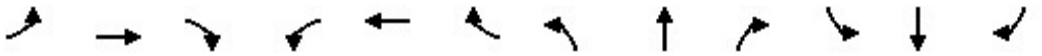
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	148	39	33	113	228	48
Future Vol, veh/h	148	39	33	113	228	48
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	200	200	-	150	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	156	41	35	119	240	51

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	197	0	345	156
Stage 1	-	-	-	-	156	-
Stage 2	-	-	-	-	189	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1388	-	656	895
Stage 1	-	-	-	-	877	-
Stage 2	-	-	-	-	848	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1388	-	640	895
Mov Cap-2 Maneuver	-	-	-	-	640	-
Stage 1	-	-	-	-	877	-
Stage 2	-	-	-	-	827	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	13.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	640	895	-	-	1388	-
HCM Lane V/C Ratio	0.375	0.056	-	-	0.025	-
HCM Control Delay (s)	14	9.3	-	-	7.7	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	1.7	0.2	-	-	0.1	-

Appendix O:
Buildout Improved Conditions Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	159	1456	317	228	1212	324	247	438	146	758	390	145
Future Volume (veh/h)	159	1456	317	228	1212	324	247	438	146	758	390	145
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1870	1885	1826	1870	1870	1841	1870	1870	1856	1870	1796
Adj Flow Rate, veh/h	167	1533	283	240	1276	308	260	461	0	798	411	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	5	2	1	5	2	2	4	2	2	3	2	7
Cap, veh/h	182	1590	760	265	1457	835	288	486		827	773	
Arrive On Green	0.10	0.31	0.31	0.03	0.09	0.09	0.16	0.14	0.00	0.24	0.22	0.00
Sat Flow, veh/h	1739	5106	1598	3374	5106	1585	1753	3554	1585	3428	3554	1522
Grp Volume(v), veh/h	167	1533	283	240	1276	308	260	461	0	798	411	0
Grp Sat Flow(s),veh/h/ln	1739	1702	1598	1687	1702	1585	1753	1777	1585	1714	1777	1522
Q Serve(g_s), s	14.3	44.3	16.9	10.6	37.0	18.7	21.8	19.3	0.0	34.5	15.3	0.0
Cycle Q Clear(g_c), s	14.3	44.3	16.9	10.6	37.0	18.7	21.8	19.3	0.0	34.5	15.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	182	1590	760	265	1457	835	288	486		827	773	
V/C Ratio(X)	0.92	0.96	0.37	0.90	0.88	0.37	0.90	0.95		0.96	0.53	
Avail Cap(c_a), veh/h	182	1590	760	265	1457	835	402	486		827	773	
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	66.5	50.8	25.0	72.5	65.3	26.9	61.5	64.2	0.0	56.3	51.9	0.0
Incr Delay (d2), s/veh	43.9	15.6	1.4	31.5	7.7	1.3	20.1	28.6	0.0	23.0	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	13.1	27.7	10.6	9.8	24.8	12.7	16.6	15.8	0.0	23.8	11.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	110.4	66.4	26.4	104.0	73.0	28.2	81.6	92.8	0.0	79.3	52.6	0.0
LnGrp LOS	F	E	C	F	E	C	F	F		E	D	
Approach Vol, veh/h		1983			1824			721			1209	
Approach Delay, s/veh		64.4			69.5			88.8			70.2	
Approach LOS		E			E			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	24.0	51.1	45.6	29.3	20.1	55.0	33.5	41.4
Change Period (Y+Rc), s	* 8.3	* 8.3	* 9.4	* 8.8	* 8.3	* 8.3	* 8.8	* 8.8
Max Green Setting (Gmax), s	* 16	* 43	* 36	* 21	* 12	* 47	* 34	* 27
Max Q Clear Time (g_c+I1), s	16.3	39.0	36.5	21.3	12.6	46.3	23.8	17.3
Green Ext Time (p_c), s	0.0	3.1	0.0	0.0	0.0	0.3	0.8	1.6

Intersection Summary	
HCM 6th Ctrl Delay	70.3
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	46	734	130	0	1307
Future Vol, veh/h	0	46	734	130	0	1307
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	250	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	3	3	0	0
Mvmt Flow	0	48	773	137	0	1376

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	387	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	617	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	617	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	617	-
HCM Lane V/C Ratio	-	-	0.078	-
HCM Control Delay (s)	-	-	11.3	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.3	-



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	410	45	730	50	88	897
Future Volume (veh/h)	410	45	730	50	88	897
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1856	1900	1900	1900
Adj Flow Rate, veh/h	432	47	768	53	93	944
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	3	0	0	0
Cap, veh/h	546	486	1734	792	402	1775
Arrive On Green	0.30	0.30	0.49	0.49	0.49	0.49
Sat Flow, veh/h	1810	1610	3618	1610	677	3705
Grp Volume(v), veh/h	432	47	768	53	93	944
Grp Sat Flow(s),veh/h/ln	1810	1610	1763	1610	677	1805
Q Serve(g_s), s	9.5	0.9	6.2	0.8	4.5	7.8
Cycle Q Clear(g_c), s	9.5	0.9	6.2	0.8	10.7	7.8
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	546	486	1734	792	402	1775
V/C Ratio(X)	0.79	0.10	0.44	0.07	0.23	0.53
Avail Cap(c_a), veh/h	2764	2460	6034	2756	1228	6178
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.9	10.9	7.2	5.8	10.7	7.6
Incr Delay (d2), s/veh	2.6	0.1	0.2	0.0	0.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	6.6	0.5	2.4	0.3	0.9	3.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	16.6	11.0	7.4	5.8	10.9	7.9
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	479		821			1037
Approach Delay, s/veh	16.0		7.3			8.1
Approach LOS	B		A			A

Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		25.9			25.9	17.6
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		74.5			74.5	66.5
Max Q Clear Time (g_c+I1), s		8.2			12.7	11.5
Green Ext Time (p_c), s		5.9			8.7	1.6

Intersection Summary	
HCM 6th Ctrl Delay	9.5
HCM 6th LOS	A



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	272	120	596	176	115	792
Future Volume (vph)	272	120	596	176	115	792
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8	7.5	7.5	7.5	7.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	1495	1845	1568	1770	1827
Flt Permitted	0.95	1.00	1.00	1.00	0.16	1.00
Satd. Flow (perm)	1805	1495	1845	1568	305	1827
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	296	130	648	191	125	861
RTOR Reduction (vph)	0	99	0	77	0	0
Lane Group Flow (vph)	296	31	648	114	125	861
Heavy Vehicles (%)	0%	8%	3%	3%	2%	4%
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	4		6		5	2
Permitted Phases		4		6	2	
Actuated Green, G (s)	23.6	23.6	44.2	44.2	62.3	62.3
Effective Green, g (s)	23.6	23.6	44.2	44.2	62.3	62.3
Actuated g/C Ratio	0.24	0.24	0.44	0.44	0.62	0.62
Clearance Time (s)	6.8	6.8	7.5	7.5	7.5	7.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	425	352	813	691	344	1135
v/s Ratio Prot	c0.16		0.35		0.04	c0.47
v/s Ratio Perm		0.02		0.07	0.19	
v/c Ratio	0.70	0.09	0.80	0.16	0.36	0.76
Uniform Delay, d1	35.0	29.9	24.1	16.9	13.6	13.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.9	0.1	5.5	0.1	0.7	3.0
Delay (s)	39.9	30.0	29.6	17.0	14.3	16.5
Level of Service	D	C	C	B	B	B
Approach Delay (s)	36.9		26.7			16.2
Approach LOS	D		C			B

Intersection Summary			
HCM 2000 Control Delay	24.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	100.2	Sum of lost time (s)	21.8
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

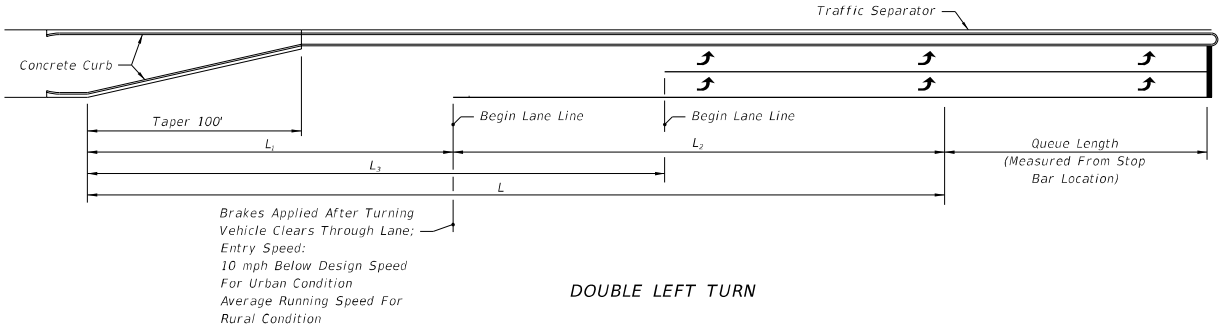


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	296	130	648	191	125	861
v/c Ratio	0.70	0.29	0.81	0.25	0.37	0.76
Control Delay	47.7	8.3	34.5	6.9	11.6	20.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.7	8.3	34.5	6.9	11.6	20.0
Queue Length 50th (ft)	170	0	341	19	29	352
Queue Length 95th (ft)	343	52	612	69	69	687
Internal Link Dist (ft)	1320		862			656
Turn Bay Length (ft)	180				125	
Base Capacity (vph)	837	763	1582	1364	472	1756
Starvation Cap Reductn	0	0	5	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.17	0.41	0.14	0.26	0.49

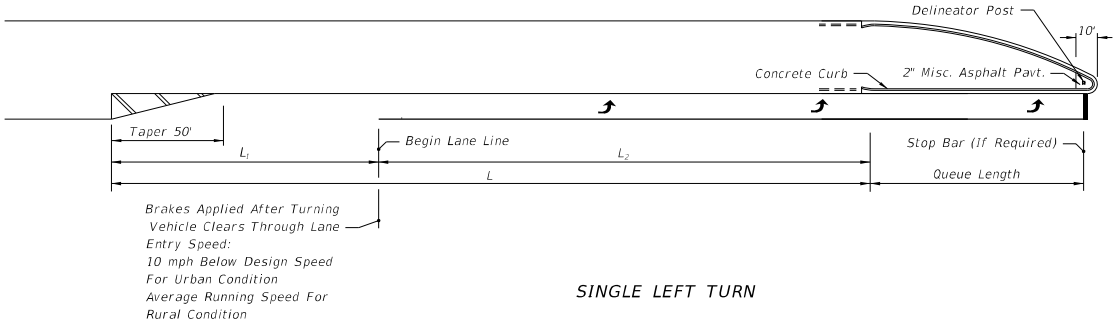
Intersection Summary

Appendix P:
Turn Lane Documentation

MEDIAN TURN LANES
MINIMUM DECELERATION LENGTHS



DOUBLE LEFT TURN



SINGLE LEFT TURN

MEDIAN TURN LANES								
			URBAN CONDITIONS			RURAL CONDITIONS		
Design Speed (mph)	Entry Speed (mph)	Clearance Distance L_1 (ft.)	Brake To Stop Distance L_2 (ft.)	Total Decel. Distance L (ft.)	Clearance Distance L_3 (ft.)	Brake To Stop Distance L_2 (ft.)	Total Decel. Distance L (ft.)	Clearance Distance L_3 (ft.)
35	25	70	75	145	110	——	——	——
40	30	80	75	155	120	——	——	——
45	35	85	100	185	135	——	——	——
50	40/44	105	135	240	160	185	290	160
55	48	125	——	——	——	225	350	195
60	52	145	——	——	——	260	405	230
65	55	170	——	——	——	290	460	270

NOT TO SCALE

EXHIBIT P-212-1
01/01/2018

Signalized, 4 lanes or more	370	380	385	1320*

DW = Driveway

Minor DW = Maximum ADT of 500 or a maximum peak hour volume of 50

Intermediate DW = Maximum ADT of 1,500 or maximum peak hour volume of 150

Major DW = Maximum ADT of 5,000 or maximum peak hour volume of 500

*Desirable spacing.

Driveway centerline spacing may be increased if the required turn lane storage or transition is increased by any governmental agency. Minimum driveway centerline spacing may be decreased if one-way driveways are utilized and accepted by the DRC.

(4) *Special driveway requirements.* In the case of a land use with special driveway needs, an applicant may submit a traffic engineering study requesting deviations from the requirements of this section. If deviations from driveway requirements are permitted, substitute requirements which deviate no more than necessary to serve the special land use needs may be applied to the development in order to minimize the impact on the adjacent street.

(5) *Turn lanes requirements.*

a. *Turn lane requirements immediately adjacent to the development.*

1. A left-turn lane of 12 feet in width, conforming to Table VI, shall be provided at each driveway when the average daily trip ends of the driveway is 1,000 vehicles or more and/or the average peak hour inbound left-turn volume is 25 vehicles or more. Increased queue lengths (waiting vehicle storage) may be required by the CTE to provide for additional storage, based upon a peak hour entering volume greater than 75 vehicles in the peak hour. No queue length is required if the peak hour entering volume is 75 vehicles in the peak hour or less.
2. A right-turn lane of 12 feet in width, conforming to Table VI shall be provided at each driveway when the speed limit equals or exceeds 35 miles per hour or if the development will generate 100 or more right-turn movements during the peak hour. Increased storage and transition queue lengths (waiting vehicle storage) may be

required by the CTE to provide for additional storage, based upon a peak hour entering volume greater than 150 vehicles in the peak hour. No queue length is required if the peak hour entering volume is 150 vehicles in the peak hour or less.

b. *Additional improvements immediately adjacent to the development.* At intersections, with a thoroughfare which abut the development, the following improvements shall be provided:

1. A right-turn lane of 12 feet in width, conforming to subsection (e)(5) and Table VI, shall be provided if the development will generate 100 or more right turns during the peak hour.
2. A left-turn lane of 12 feet in width conforming to subsection (e)(5) and Table VI, shall be provided if the street's speed limit is 35 miles per hour or greater and if the development will generate 25 or more left turns during the peak hour.

c. *Through lane pavement transition tapers.* A through lane pavement transition taper shall be provided on all streets and roadways where the through lane is offset to provide for right turn lanes, left turn lanes, lane width changes and an increase or reduction in the number of through lanes. The through lane pavement transition taper length shall be based upon FDOT Standard Index #526 and 17346, and calculated using the following formulas:

For design speeds less than or equal to 40 m.p.h. use:

$$L = \frac{WS^2}{60}$$

For design speeds greater than or equal to 45 m.p.h. use:

L	=	WS
L	=	the pavement transition taper length in feet.

W	=	the width of the through lane lateral transition in feet (offset).
S	=	the design speed (must be at least five m.p.h. greater than the posted speed limit.)

TABLE VI. TURN LANE DIMENSIONAL REQUIREMENTS

Speed Limit (mph)	Urban Section Deceleration Length (feet)*	Rural Section Deceleration Length (feet)*
30	145	145

35	155	155
40	185	185
45	240	320
50	N/A**	385
55	N/A**	455

* Includes minimum 50 feet bay taper in accordance with FDOT Standard Index #301 and 526.

** Curbing is not permitted for these speed limits, use rural section.

d. *Modifications.* Required storage and transition lengths may be modified where conditions warrant and such modifications are acceptable to the DRC.

(Ord. No. 96-32, §§ XXVIII, LXXX, 12-19-96; Ord. No. 2008-25, § III, 12-4-08; Ord. No. 2012-05, § VII, 4-19-12)

Appendix Q:
Proportionate Share Calculations

DeLand Tech Park - Proportionate Share Calculations

Roadways	Segment	Length	Improvement	Cost per Lane Mile	Additional Cost	Improvement Cost	Design + CEI (25%)	Total Improvement Cost	Existing Capacity	Improved Capacity	Capacity Increase	Project Trips	Project Percentage	Prop Share
Dr Martin Luther King Jr Beltway	SR 472 to Cassadaga Road	0.40	Widen 2 to 4 lanes, rural	$3,259,629		$1,303,852		$1,303,851.78	1,540	3,410	1,870	198	10.59%	$138,054.89
Kentucky Avenue	Graves Ave. to SR 472	0.79	Widen 2 to 4 lanes, rural	$3,259,629		$2,575,107		$2,575,107.27	1,540	3,410	1,870	111	5.94%	$152,853.96
Howland Boulevard	Wolf Pack Rn. to Catalina Blvd.	1.19	Widen 4 to 6 lanes, rural	$3,710,209		$4,415,149		$4,415,149.06	3,410	5,390	1,980	142	7.17%	$316,642.00
SR 472	Martin Luther King Jr Bltwy. to I-4	0.60	Widen 4 to 6 lanes, urban	$6,551,619		$3,930,971		$3,930,971.28	3,580	5,390	1,810	322	17.79%	$699,321.96
Segment Total								$12,225,079.38						**$1,306,872.82**

Intersections		Length (ft)	Improvement	Cost per 300 feet/Total Cost	Additional Cost	Improvement Cost	Design + CEI (25%)	Total Improvement Cost	Prop Share
SR 472	at Kentucky Avenue/Dr Martin Luther King Jr Beltway	1,005	Add second southbound left turn lane	$210,603		$705,520		$705,520.49	$705,520.49
		805	Add second westbound left turn lane	$210,603		$565,118		$565,118.40	$565,118.40
		275	Extend eastbound left turn lane	$210,603		$193,053		$193,052.87	$193,052.87
		295	Extend eastbound right turn lane	$205,980		$202,547		$202,547.08	$202,547.08
		275	Extend westbound left turn lane	$210,603		$193,053		$193,052.87	$193,052.87
		320	Extend westbound right turn lane	$205,980		$219,712		$219,712.09	$219,712.09
		-	Optimize signal timings	$4,000		$4,000		$4,000.00	$4,000.00
Dr Martin Luther King Jr Beltway	at Cassadaga Road	25	Extend northbound right turn lane	$205,980		$17,165		$17,165.01	$17,165.01
		25	Extend southbound left turn lane	$210,603		$17,550		$17,550.26	$17,550.26
Dr Martin Luther King Jr Beltway	at Taylor Road	25	Extend eastbound right turn lane	$205,980		$17,165		$17,165.01	$17,165.01
		50	Extend northbound left turn lane	$210,603		$35,101		$35,100.52	$35,100.52
Kentucky Avenue	at Graves Avenue	175	Extend westbound right turn lane	$205,980		$120,155		$120,155.05	$120,155.05
		475	Extend southbound right turn lane	$205,980		$326,135		$326,135.13	$326,135.13
Veteran's Memorial Parkway	at Graves Avenue	25	Extend westbound left turn lane	$210,603		$17,550		$17,550.26	$17,550.26
Veteran's Memorial Parkway	at Rhode Island Avenue	120	Extend eastbound left turn lane	$210,603		$84,241		$84,241.25	$84,241.25
Howland Boulevard	at Graves Avenue/Halifax Crossing Boulevard	50	Extend eastbound right turn lane	$205,980		$34,330		$34,330.01	$34,330.01
Normandy Boulevard	at Graves Avenue	50	Extend eastbound right turn lane	$205,980		$34,330		$34,330.01	$34,330.01
		50	Extend northbound left turn lane	$210,603		$35,101		$35,100.52	$35,100.52
		25	Extend northbound right turn lane	$205,980		$17,165		$17,165.01	$17,165.01
Intersection Total									**$2,838,991.82**
								Total	**$4,145,864.64**

PLANNING DIVISION STAFF REPORT
TO
THE CITY OF DELAND PLANNING BOARD

December 10, 2025

A. APPLICATION NO.: SMLU24-154 *(North Hill Villas Land Use)*
APPLICANT: Mr. Mark Watts, Cobb & Cole, P.A.
OWNER: Vidal Homes, LLC
STAFF PLANNER: Kendall Story, *Senior Planner*
REQUEST: To amend the land use designation from Low-Density Residential (LDR) to Medium-Density Residential (MDR)

B. SITE FACTORS:
PARCEL NUMBER: 701018000010; 701018000020; 701018000030
LOCATION: Northwest corner of N. Hill Ave. and E. Rich Ave.
SIZE OF PROPERTY: ±1.49 acres

C. LAND USE DESIGNATION & ZONING OF SUBJECT PROPERTY:
Future Land Use: Low Density Residential; Core Area Gateway/Downtown Support District
Existing Zoning: R-1B
Existing Use: Vacant, undeveloped

D. SURROUNDING LAND USE & ZONING:

	LAND USE	ZONING
North:	LDR (Low Density Residential)	R-1A (single-family residential)
South:	MDR (Medium Density Residential)	R-2 (two-family residential)
East:	HDR (High Density Residential)	R-16 (multi-family residential)
West:	LDR (Low Density Residential)	R-1A (single-family residential)

E. REQUESTED ACTION:

1. **REQUEST:** The applicant is requesting the future land use designation be amended for a ±1.49-acre parcel located on Hill Avenue from Low Density Residential (LDR) land use designation to the Medium-Density Residential (MDR) land use designation. The request for a small-scale future land use map amendment is accompanied by a request for rezoning (Z24-153).

F. ANALYSIS:

The purpose of this section is to analyze the reasonableness of the applicant's request for an amendment of the land use designation for the subject property. This analysis will include a description of the current and future land uses of the site and the surrounding area, potential impacts on the transportation system, and any significant adverse environmental impacts. Florida Statute 163.3187 allows for a Future Land Use Map amendment for area of use under 50 acres, and are not an area of critical state concern.

1. **Availability of Public Facilities *(water, sewer, drainage, traffic, and schools if residential):***

   The City's Utilities Department determined that the site has water, sewer and reclaim available for extension as needed by the developer and that a Utility Service Agreement will be required.

   A Traffic Impact Statement letter dated July 8, 2024, states that the proposed development is projected to generate 95 average daily trips, of which 8 trips occur during the PM peak hour. Per the River to Sea Transportation Planning Organization (R2CTPO) traffic study guidelines, since the proposed development is not anticipated to generate more than 1,000 daily new trips, a TIA is not required.

   In a memo dated August 28, 2025, the Volusia County School Board issued a capacity determination letter which found that there is adequate capacity for the proposed project.

2. **Compatibility with Land Use and Other Elements:** The Future Land Use element requires that the subject property be consistent with surrounding development. The subject property is located within the City's Core Area Gateway/Downtown Support District, and the future land use is Low-Density Residential, which allows a maximum density of 5.8 dwelling units per acre. Per the 2050 Vision plan, the subject property is located within the Category 2, Urban Core. The Urban Core is described as the area where the majority of the new growth will take place. A greater focus is made on "missing middle" housing options such as duplexes, townhomes, small-sized apartment buildings and live-work units by allowing for infill and redevelopment to encourage increased density.

   The Comprehensive Plan describes the Medium-Density Residential land use designation as being typified by detached and attached moderate density housing types, serving as a transitional area between nonresidential or high-density residential and low-density residential land use with a maximum density of 12 dwelling units per acre. The development should provide recreation and open space through the clustering of dwelling units and shall include on-site amenities such as, but not limited to, recreational facilities, such as the provided tot lot, open space, and pedestrian walkways. The site is small in scale and considered an infill development. The applicant is meeting the intent of this section by providing additional TPA, sidewalks on both sides of the road and a tot lot.

   The proposed maximum density of the North Hill Villas townhome community proposes a density of 8.72 dwelling units per acre. This provides a transition from the

surrounding lower density single-family residential area, to the adjacent higher density residential units to the east (The Lofts of DeLand). Therefore, the request is compatible with the Comprehensive Plan and the 2050 Vision Plan.

3. **Future Land Use Map:** The proposed change in the land use designation to Medium-Density Residential (MDR) will be shown on the revised Future Land Use Map. There will be no change in the 2050 Vision Map, as the subject property is also within the Core Area Gateway/Downtown Support District.

4. **Location of Lakes, Floodplains, and Wetlands:** The property does not contain bodies of water, nor is it located within a floodplain.

5. **Analysis of Natural Resources:**
   - **a.** *Soil types:* Astatula, fine sand
   - **b.** *Presence of Endangered Species*: None known at this time.

6. **Existing and Future Impact upon Infrastructure Capacity:**
   - **a.** ***Water and Sewer:*** The City's Utility Department has indicated sufficient water supply is available for the proposed land use designation. The fully engineered plans and Utility Service Agreement will be reviewed at the time of preliminary plat.
   - **b.** ***Drainage:*** The city adheres to the County's standard to retain for the 100-year frequency, 24-hour storm event for landlocked basins. Stormwater capture for future development will be addressed on-site and will be further evaluated at the time of preliminary plat.
   - **c.** ***Solid Waste:*** Solid waste services are available for the property. The County has landfill capacity available to receive waste projected to be generated from the development. The Volusia County Waste Management Facility has capacity for the next twenty-seven (27) years.
   - **d.** ***Transportation*****:** In order to estimate traffic generation by development on the subject property, Staff must make projections for the most intense type of development allowed under the existing and proposed land use designations. Development under the most intensive of the uses allowed under the current land use designation of Volusia County Rural must be compared with the most intensive use proposed under the City's Medium-Density Residential (MDR) designation.

     The Low-Density Residential land use designation allows a maximum density of 5.8 dwelling units per acre; and with the most-intense allowable residential use, the property would currently be permitted to yield up to 8 units and would generate **75** trips per day according to the Institute of Transportation Engineers Trip Generation Manual (11th ed.).

     DeLand's Medium-Density Residential land use designation allows for a maximum residential density up to 12 dwelling units per acre. If the land use amendment is approved, the ± 1.49 acres of property could yield as many as 17 units and would generate **115** trips per day.

7. **Impact upon Recreation and Open Space:** The on-site amenities for the development includes a small park and open space. Therefore, the future land use amendment should not have an impact to the existing level of service.

8. **New Public Facilities Needed to Serve Land Use:** Per the feasibility analysis completed by staff, no need for new public facilities is anticipated.

9. **Impact Upon Existing Facilities:** Any future development on this site will be required to manage its own stormwater, based on retaining for the 100 year/24-hour storm event, and it will be further reviewed as part of the preliminary plat submittal.

10. **Impact upon Ability of the City to Fund Capital Improvements:** The development should not create an additional impact upon the City's ability to fund the projects listed in the adopted Five-Year Capital Improvement Program and will not require revision to the City's adopted Five-Year Capital Improvement Program.

11. **Compatibility with Existing Zoning Classification:** The proposed North Hill Villas PD would be compatible with the Medium-Density Residential land use designation.

12. **Will the proposed land use change impact schools?** The applicant has provided a current Finding of Adequate Capacity letter from the Volusia County School Board, determining that capacity is available for the proposed land use. At the time of the preliminary plat, the applicant will be required to reserve said capacity and submit an approval letter from the school board at that time.

13. **How does this proposal fit with the guidelines developed for DeLand 2050 Vision and the City's Strategic Plan?**
    a. **2050 Vision Plan:** The proposed development is located within Category 2, "Urban Core" which encourages higher density and infill housing to support the "missing middle".
    b. **DeLand Strategic Plan:** "To manage growth, the city will institute a number of smart growth principles" that provide "quality growth that preserves the character of the city." Smart growth includes development, redevelopment and infill development in areas of the city that already have access to city facilities. A key component of "Smart Growth" addresses housing for the "missing middle" that provides a variety of housing types that are smaller in scale, but higher in density. The subject property is 1.49 acres in size and has access to existing city facilities. Increasing the density of the site from Low Density Residential, to Medium Density Residential, will act as a transition between the lower density (single-family homes) and higher density (The Lofts of DeLand apartments.

G. CONCLUSION: The facility analysis presented in the above sections suggests the proposed land use should not cause any of the City's facilities to degrade below the adopted or current operational level of service (LOS). The proposed land use designation, Medium-

Density Residential, is consistent with the surrounding area, and is not expected to create any land use incompatibilities.

H. **NEXT STEPS:** The request for a small-scale future land use map amendment will go before the City Commission on January 21, 2026, for first reading, followed by Volusia Growth Management Commission Review (VGMC). After VGMC review, the request is anticipated to go before City Commission in February of 2026, for second reading.

I. **STAFF RECOMMENDATION:** Staff recommends that the Planning Board forward the request to the City Commission with a recommendation of approval of the proposed amendment of the subject property's future land use designation to the City's Medium-Density Residential.

J. **VGMC INFRASTRUCTURE IMPACT ASSESSMENT:**

In accordance with standard practice from the Florida Department of Economic Opportunity (DEO) and other review agencies, an impact comparison analysis of the proposed amendment has been completed based upon the theoretical maximum development potential under the currently adopted future land use designation versus the proposed designation.

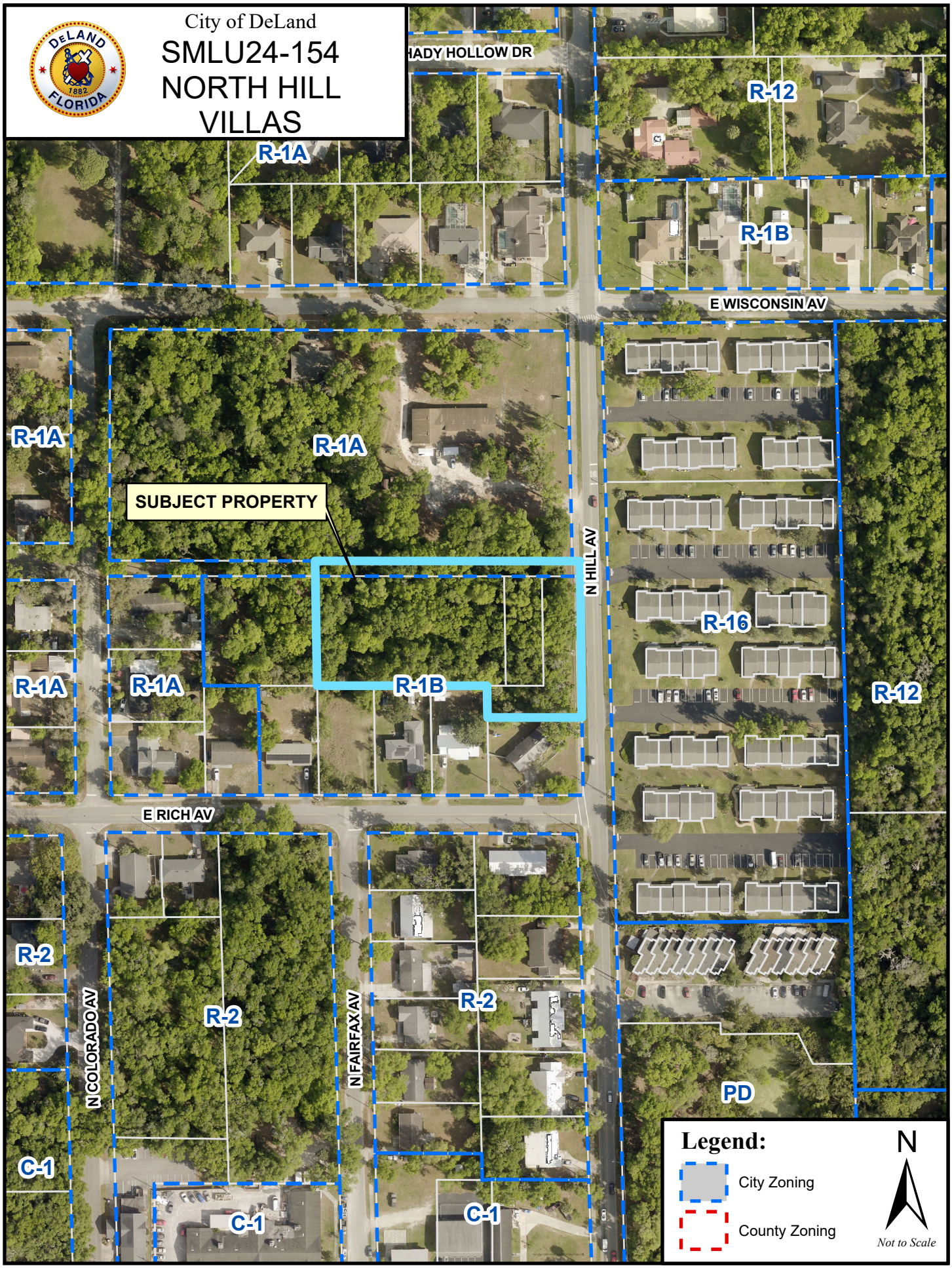
The following seven public facilities and services were examined (Table 4): Transportation, Stormwater Drainage, Sanitary Sewer, Recreation, Potable Water, Schools, and Solid Waste.

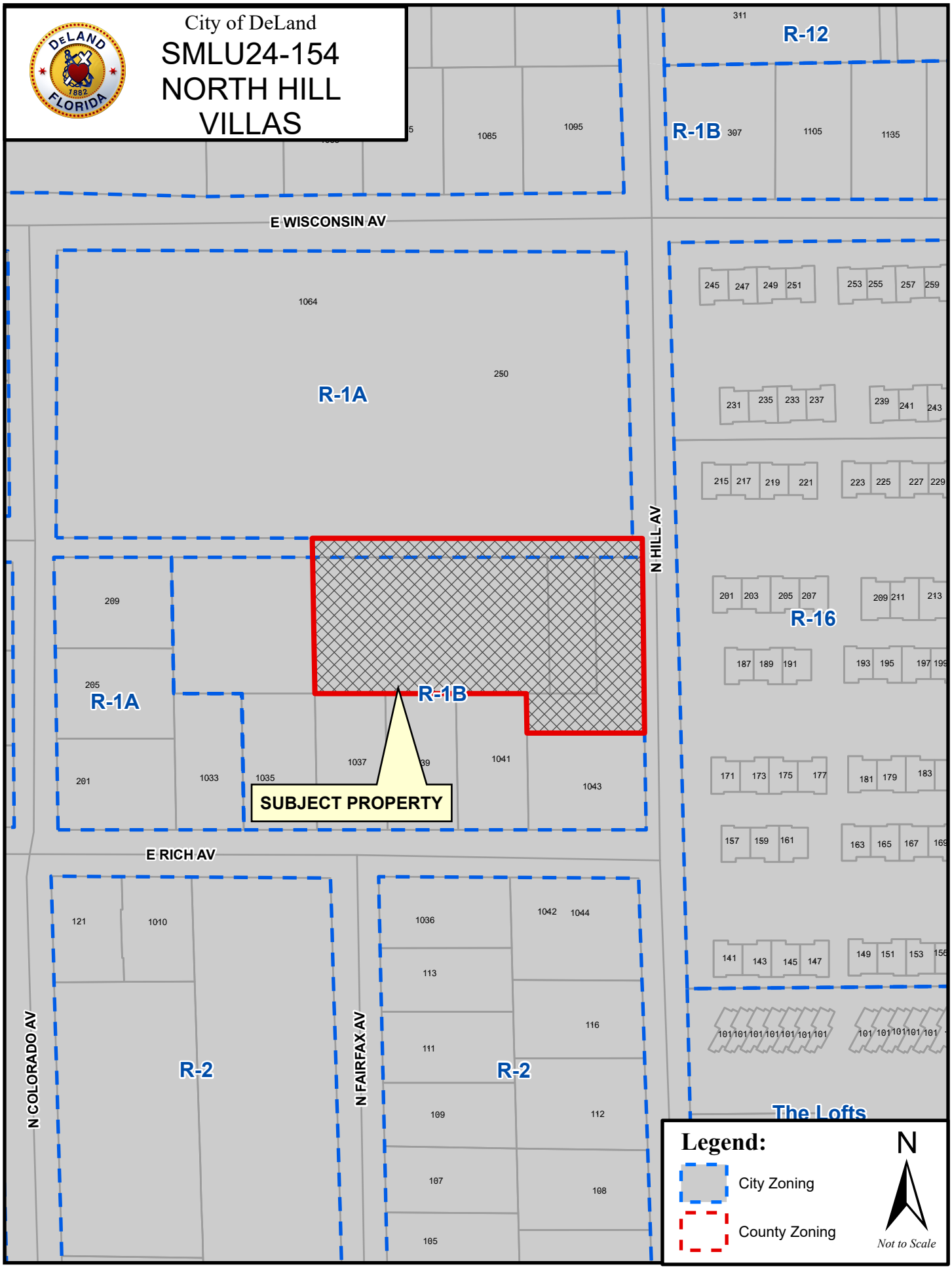
Table 4. Impact Analysis (Theoretical Maximums)

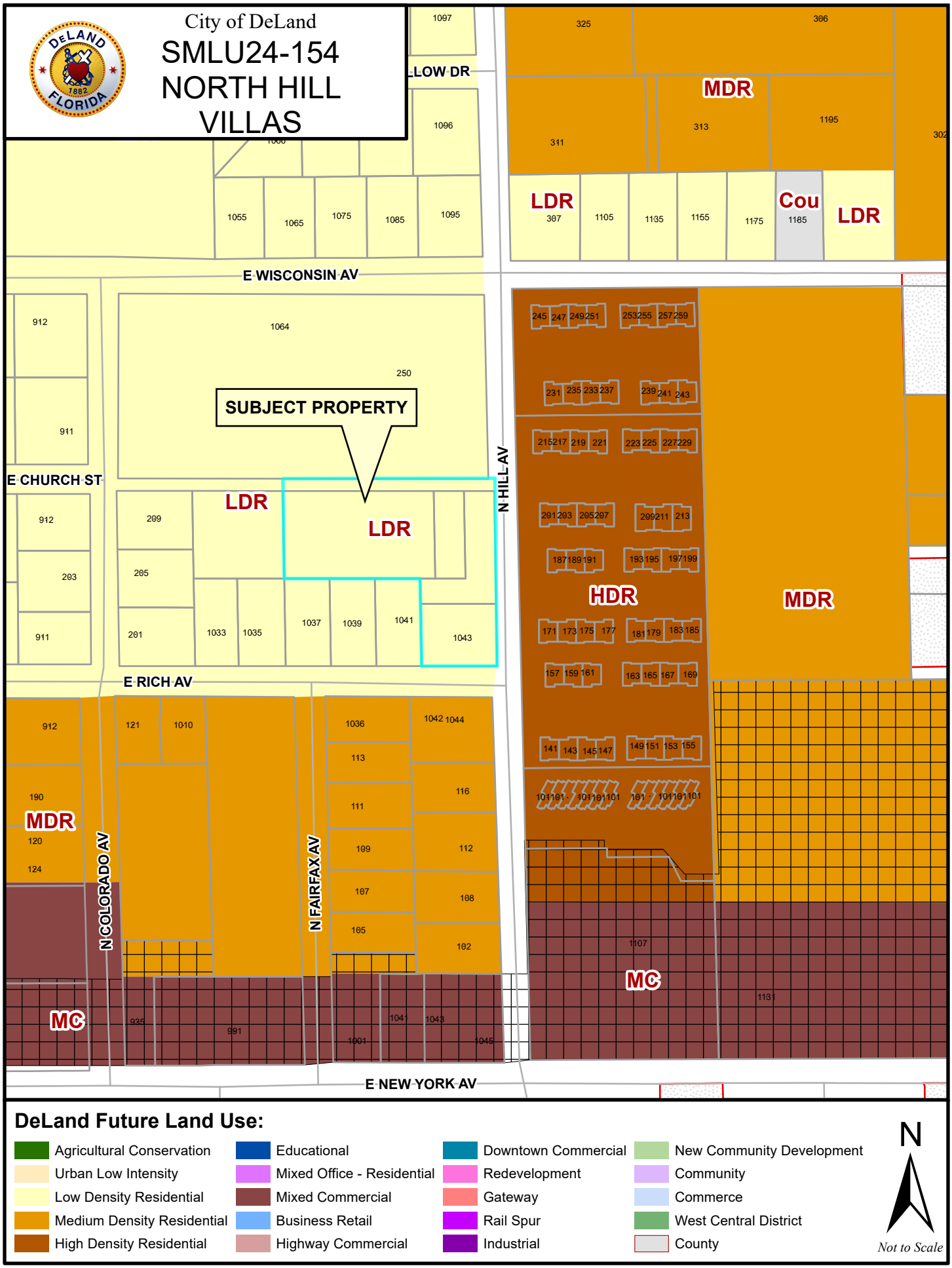
Development Variable	Theoretical Maximums		
	EXISTING ***LDR***	**PROPOSED** ***MDR***	**Net Change**
Permitted Density/Intensity	5.8 du/acre	12 du/acre	+6.2 du/acre
Dwelling Units	8	17	+9
Non-residential Sq. Ft.	N/A	N/A	N/A
Population *2.44 persons per household (per 2020 Census)*	19.52	41.48	+21.96
Transportation ***(PM Peak Hr. Trips/Daily Trips)*** *(ITE Trip Generation Manual, 11th Edition): PM PEAK HR rate (210): 0.94 trips per unit; ADT rate (220): 0.57 trips per day per unit*	8 peak/75 ADT	10 peak/115 ADT	+2 peak/+40 ADT
Sanitary Sewer ***(gallons/day)*** *225 GPD per Equivalent Residential Unit (ERU)*	1,800	3,825	+2,025
Potable Water ***(gallons/day)*** *255 GPD per Equivalent Residential Unit (ERU)*	2,040	4,335	+2,295
Solid Waste ***(pounds/day)*** *8.6 pounds per person per day*	68.8	146.2	+77.4

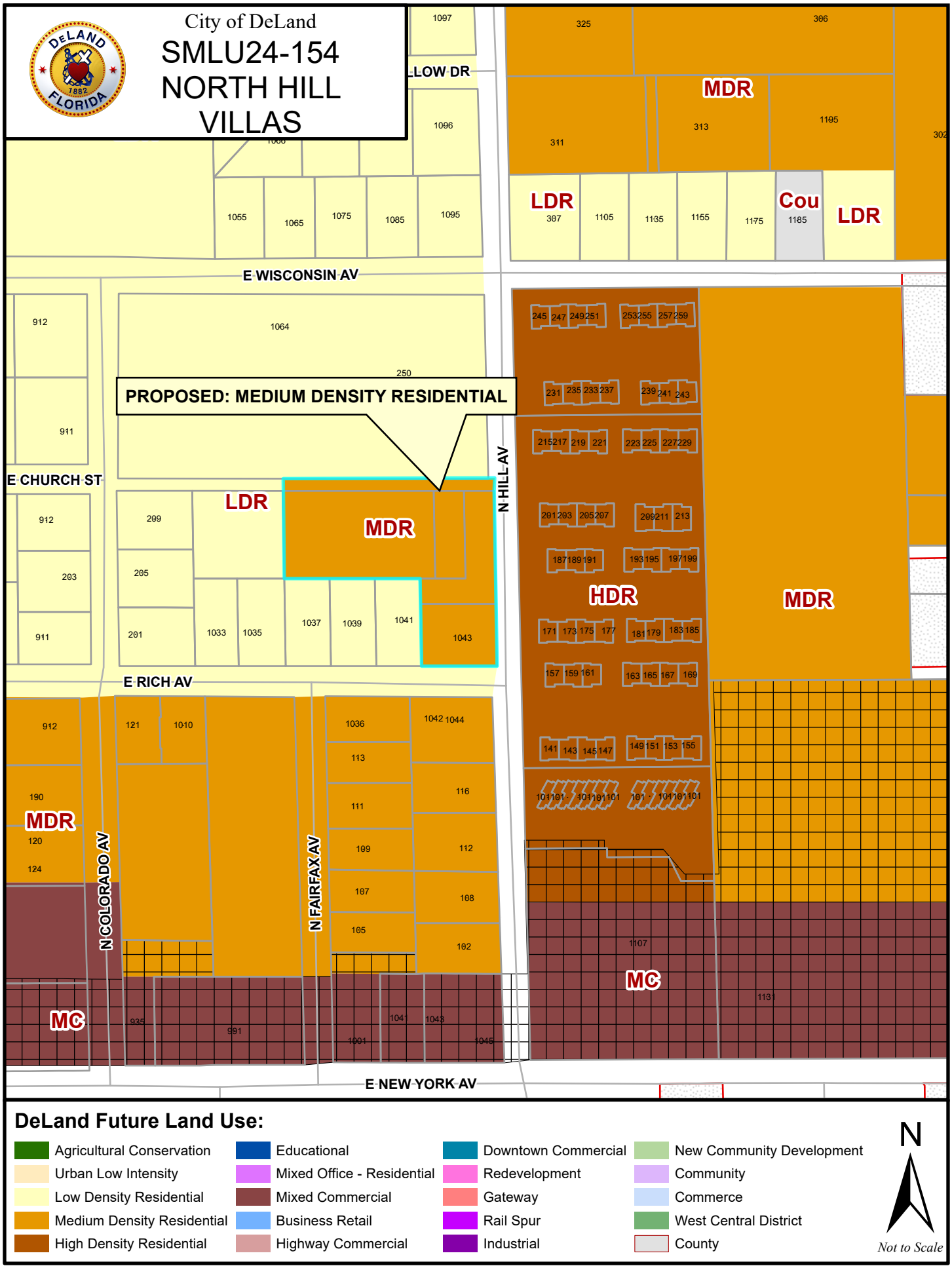
Stormwater Drainage *LOS Standard 100-yr/24-hr event. Drainage system to be designed to meet the req. of the LDR during subdivision or site plan review.*	N/A	N/A	N/A
Recreation/Open Space *4.6 parkland acres/1,000 persons (0.0046 acres/person)*	0.09	0.19	+0.10

The proposed amendment results in increased impacts to all public infrastructure and services based on the theoretical maximum impact analysis.

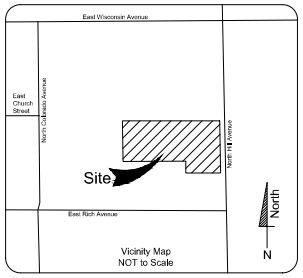

City of DeLand
SMLU24-154
NORTH HILL
VILLAS
HADY HOLLOW DR
R-12
R-1A
R-1B
E WISCONSIN AV
R-1A
R-1A
SUBJECT PROPERTY
N HILL AV
R-16
R-1A
R-1A
R-1B
R-12
E RICH AV
R-2
R-2
N COLORADO AV
N FAIRFAX AV
R-2
PD
C-1
C-1
C-1
Legend:
City Zoning
County Zoning
N
Not to Scale


City of DeLand
SMLU24-154
NORTH HILL VILLAS
E WISCONSIN AV
E RICH AV
N HILL AV
N COLORADO AV
N FAIRFAX AV
R-1A
R-1B
R-2
R-12
R-16
The Lofts
SUBJECT PROPERTY
Legend:
City Zoning
County Zoning
N
Not to Scale


City of DeLand
SMLU24-154
NORTH HILL VILLAS
SUBJECT PROPERTY
E WISCONSIN AV
E CHURCH ST
E RICH AV
E NEW YORK AV
N HILL AV
N COLORADO AV
N FAIRFAX AV
LDR
MDR
HDR
MC
Cou
DeLand Future Land Use:
Agricultural Conservation
Urban Low Intensity
Low Density Residential
Medium Density Residential
High Density Residential
Educational
Mixed Office - Residential
Mixed Commercial
Business Retail
Highway Commercial
Downtown Commercial
Redevelopment
Gateway
Rail Spur
Industrial
New Community Development
Community
Commerce
West Central District
County
N
Not to Scale


City of DeLand
SMLU24-154
NORTH HILL VILLAS
PROPOSED: MEDIUM DENSITY RESIDENTIAL
E WISCONSIN AV
E CHURCH ST
E RICH AV
E NEW YORK AV
N HILL AV
N COLORADO AV
N FAIRFAX AV
LDR
MDR
HDR
MC
Cou
DeLand Future Land Use:
Agricultural Conservation
Urban Low Intensity
Low Density Residential
Medium Density Residential
High Density Residential
Educational
Mixed Office - Residential
Mixed Commercial
Business Retail
Highway Commercial
Downtown Commercial
Redevelopment
Gateway
Rail Spur
Industrial
New Community Development
Community
Commerce
West Central District
County
N
Not to Scale

ALTA/NSPS Land Title Survey
Boundary Survey



Schedule B-II (Exceptions)

Issued by: Old Republic National Title Insurance Company
Your File No.: 154080V
Issuing Agent: Alonis Title Company (Oviedo)
Effective Date: October 14, 2024 @ 5:00 PM

1. Any defect, lien, encumbrance, adverse claim, or other matter that appears for the first time in the Public Records or is created, attaches, or is disclosed between the Commitment Date and the date on which all of the Schedule B, Part I-Requirements are met.
No Adverse Claims or Other Matters Observed at Time of Survey.
2. Facts which would be disclosed by an accurate and comprehensive survey of the premises herein described. *Visible Ground Encroachments Shown if Any.*
3. Rights or claims of parties in possession. *Not a Survey Matter.*
4. Construction, Mechanic's, Contractors' or Materialmen's lien claims, if any, where no notice thereof appears of record. *Not a Survey Matter.*
5. Easements or claims of easements not shown by the public records.
None Other than Those Provided to Surveyor at Time of Survey.
6. General or special taxes and assessments required to be paid in the year 2024 and subsequent years. *Not a Survey Matter.*
7. Restrictions, conditions, reservations, easements, dedications and other matters contained on the plat of Delmay Subdivision, as recorded in Map Book 8, Page 74, Public Records of Volusia County, Florida. *Nothing on Plat to Address.*
8. Easement to City of Deland contained in instrument recorded in O.R. Book 2706, Page 158, Public Records Volusia County, Florida. (Parcel 1 only)
Parcel Affected, Easements Shown Hereon.
9. Any lien provided by County Ordinance or by Ch. 159, F.S., in favor of any city, town, village or port authority, for unpaid service charges for services by any water systems, sewer systems or gas systems serving the land described herein; and any lien for waste fees in favor of any county or municipality. *Not a Survey Matter.*

-Benchmark Information-
NGS Datum Sheet
Designation: T 711
Point: DM3873
Elevation: 47.36'
(Elevations are based upon NAVD 88)

-Site Benchmark Information-
#1
Set ½" Iron & Cap "LB # 7623" In Ground.
Elevation: 81.55'
#2
Set ½ Iron & Cap "LB # 7623" In Ground.
Elevation: 80.74'

Legal Description (Per Deed):

PARCEL 1:
LOT 1, AND THE NORTH 42 FEET OF LOTS 23 AND 24, AND THE NORTH 42 FEET OF THE EAST 1/2 OF LOT 22, DELMAY SUBDIVISION, ACCORDING TO THE PLAT THEREOF AS RECORDED IN MAP BOOK 8, PAGE 74, PUBLIC RECORDS OF VOLUSIA COUNTY, FLORIDA.

PARCEL 2:
LOT 2, DELMAY SUBDIVISION, ACCORDING TO THE PLAT THEREOF AS RECORDED IN MAP BOOK 8, PAGE 74, PUBLIC RECORDS OF VOLUSIA COUNTY, FLORIDA.

PARCEL 3:
LOTS 3, 4, 5, 6 AND 7, DELMAY SUBDIVISION, ACCORDING TO THE PLAT THEREOF AS RECORDED IN MAP BOOK 8, PAGE 74, PUBLIC RECORDS OF VOLUSIA COUNTY, FLORIDA.

Legal Description (Per Surveyor):

LOTS 1 THROUGH 7, THE NORTH 42 FEET OF LOTS 23 THROUGH 24, THE NORTH 42 FEET OF THE EAST 1/2 OF LOT 22, AND THAT VACATED PORTION OF CHURCH STREET, AS RECORDED IN OFFICIAL RECORDS BOOK 8701, PAGE 2887, DELMAY SUBDIVISION, ACCORDING TO THE PLAT THEREOF AS RECORDED IN MAP BOOK 8, PAGE 74, OF THE PUBLIC RECORDS OF VOLUSIA COUNTY, FLORIDA BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHEAST CORNER OF LOT 24, DELMAY SUBDIVISION, ACCORDING TO THE PLAT THEREOF AS RECORDED IN MAP BOOK 8, PAGE 74, THENCE, ALONG THE EASTERLY LINE SAID LOT 24, NORTH 01°10'44" WEST, 103.00 FEET TO THE POINT OF BEGINNING;

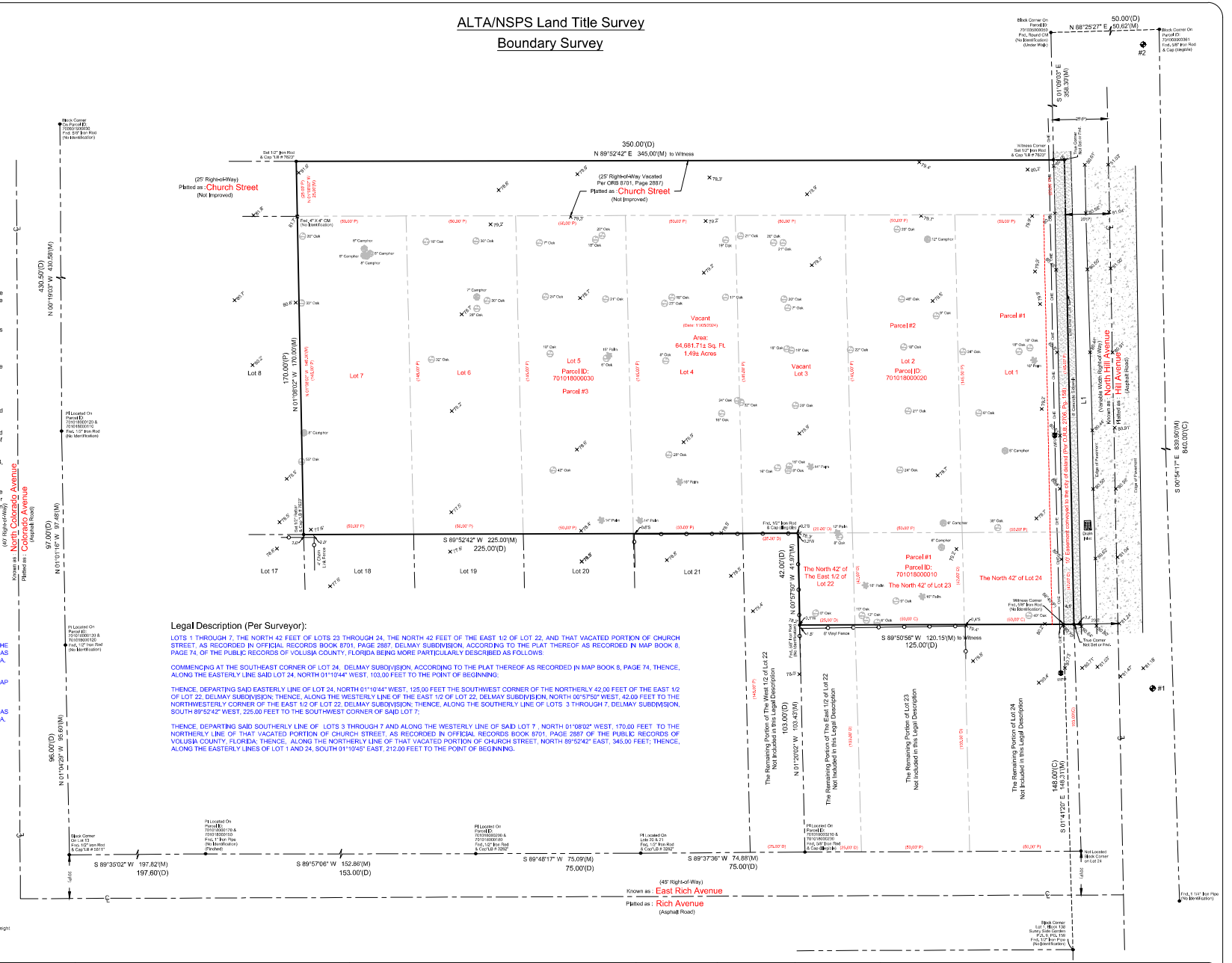
THENCE, DEPARTING SAID EASTERLY LINE OF LOT 24, NORTH 01°10'44" WEST, 125.00 FEET THE SOUTHWEST CORNER OF THE NORTHERLY 42.00 FEET OF THE EAST 1/2 OF LOT 22, DELMAY SUBDIVISION; THENCE, ALONG THE WESTERLY LINE OF THE EAST 1/2 OF LOT 22, DELMAY SUBDIVISION, NORTH 00°57'50" WEST, 42.00 FEET TO THE NORTHWESTERLY CORNER OF THE EAST 1/2 OF LOT 22, DELMAY SUBDIVISION; THENCE, ALONG THE SOUTHERLY LINE OF LOTS 3 THROUGH 7, DELMAY SUBDIVISION, SOUTH 89°52'42" WEST, 225.00 FEET TO THE SOUTHWEST CORNER OF SAID LOT 7;

THENCE, DEPARTING SAID SOUTHERLY LINE OF LOTS 3 THROUGH 7 AND ALONG THE WESTERLY LINE OF SAID LOT 7, NORTH 01°08'02" WEST, 170.00 FEET TO THE NORTHERLY LINE OF THAT VACATED PORTION OF CHURCH STREET, AS RECORDED IN OFFICIAL RECORDS BOOK 8701, PAGE 2887 OF THE PUBLIC RECORDS OF VOLUSIA COUNTY, FLORIDA; THENCE, ALONG THE NORTHERLY LINE OF THAT VACATED PORTION OF CHURCH STREET, NORTH 89°52'42" EAST, 345.00 FEET; THENCE, ALONG THE EASTERLY LINES OF LOT 1 AND 24, SOUTH 01°10'45" EAST, 212.00 FEET TO THE POINT OF BEGINNING.



L1
187.00'(D)
S 01°13'10" E 211.68'(M)
between Witnesses

Tree Note:
Palm - Denotes Tree Type
(18") - Diameter of Tree measured at Chest Height



There was NO Right of Way information provided to this Surveying Company at the time of the execution of this Boundary Survey. Therefore, this Survey is based upon field monumentation and occupation discovered on the date of 01-15-24, and delineated hereon the face of this Survey. Property Boundaries are subject to change, if or when, Right of Way information is discovered and determined to affect Subject Property. Said change is without hesitation, consultation or notification.

Flood Disclaimer:
BY PERFORMING A SEARCH WITH THE LOCAL GOVERNING MUNICIPALITY OR WWW.FEMA.GOV, THE PROPERTY APPEARS TO BE LOCATED IN ZONE X, THE PROPERTY WAS FOUND IN CITY OF DELAND, COMMUNITY NUMBER 120307, DATED 02-19-2014.

ALTA/NSPS CERTIFICATION

Certified to: VIDAL HOMES LLC; ALONIS TITLE COMPANY; OLD REPUBLIC NATIONAL TITLE INSURANCE COMPANY;

This is to certify that this map or plat and the survey on which it is based were made in accordance with the 2021 Minimum Standard Detail Requirements for ALTA/NSPS Land Title Surveys, jointly established and adopted by ALTA and NSPS, and includes items 1, 2, 3, 4, 6(a), 7(a), 7(b)(1), 8, 9, 11(b), 13, 16, and 18 of Table A thereof.

The Fieldwork was completed on 01/15/2024.

Date of Plat or Map: 11/05/2024.

I hereby Certify that this Boundary Survey of the above Described Property is True and Correct to the Best of my Knowledge and Belief as recently Surveyed under my Direction on the Date Shown. Based on Information furnished to Me as Noted and Conforms to the Standard of Practice for Land Surveying in the State of Florida in accordance with Chapter 5J-17.052 Florida Administrative Codes. Pursuant to Section 472.027 Florida Statutes.

Patrick K. Ireland, PSM 6637

Gross Land Area:	64,871.50 Square Feet or 1.49 Acres more or less
Setback Requirements:	Front: XX Side: XX Rear: XX
Zoning:	XXX
Square footage of Buildings:	0.00 Square Feet more or less
Parking Space Size:	(Standard) 00 Parking Stripes found at time of Survey (Handicap) 00 Parking Stripes found at time of Survey

In the process of conducting the fieldwork, no of earth moving work, building construction or building additions within recent months were observed.
In the process of conducting the fieldwork, no evidence of recent street or sidewalk construction or repairs were observed.
In the process of conducting the fieldwork, no evidence of site use as a solid waste dump, sump or sanitary landfill was observed.
In the process of conducting the fieldwork, no evidence of cemeteries and/or burial grounds were observed.
In the process of conducting the fieldwork, no evidence of any water features were observed.
In the process of conducting the fieldwork, no evidence of wetland delineation markers were observed.
Vehicular Access to Subject Property is provided by:
North Hill Avenue

Revisions
11/05/24 - TCK
11/14/24 - TCD
06/05/25 - AWW
06/27/25 - AWW

Field Date: 01/11/24 | Date Completed: 01/17/24
Drawn By: SD | File Number: IS-125850

-Legend-

C	- Calculated	PC	- Point of Curvature
CB	- Centerline	PG	- Page
CB	- Concrete Block	PI	- Point of Intersection
CM	- Concrete Monument	P.O.B.	- Point of Beginning
Conc.	- Concrete	P.O.C.	- Point on Line
D	- Description	PP	- Power Pole
D.E.	- Drainage Easement	P.R.M.	- Permanent Reference Monument
Esmt.	- Easement	PT	- Point of Tangency
F.E.M.A.	- Federal Emergency Management Agency	R	- Radius
F.F.E.	- Finished Floor Elevation	Rad.	- Radial
Fnd.	- Found	R&C	- Record & Calc
IP	- Iron Pipe	Rec.	- Recorded
L	- Length (Arc)	RSC	- Rooftop
M	- Measured	Set	- Set ½" Rebar & Cap "LB 7623"
N&D	- Nail & Disk	Tryp.	- Typical
N.R.	- Non-Radial	UE	- Utility Easement
O.R.B.	- Official Records Book	WM	- Water Meter
P	- Plat	Δ	- Delta (Central Angle)
P.B.	- Plat Book		- Chain Link Fence
	- Wood Fence		

-Notes-
>Survey is Based upon the Legal Description Supplied by Client.
>Subject to any Easements and/or Restrictions of Record.
>Bearings Shown hereon are based upon the Florida State Plane Coordinate System, East Zone, NAD 83.
>Building Ties are NOT to be used to reconstruct Property Lines.
>Fence Ownership is NOT determined.
>Roof Overhangs, Underground Utilities and/or Footers have NOT been located UNLESS otherwise noted.
>Septic Tanks and/or Drainfield locations are approximate and MUST be verified by appropriate Utility Location Companies.
>Use of This Survey for Purposes other than Intended, Without Written Verification, Will be at the User's Sole Risk and Without Liability to the Surveyor. Nothing Hereon shall be Construed to give ANY Rights or Benefits to Anyone Other than those Certified.
>If Flood Zone Determination Shown Hereon is Given as a Courtesy, and is Subject to Final Approval by F.E.M.A. This Determination may be affected by Flood Factors and/or other information NOT HERE known by NOR given to this Surveying Company at the time of this Endeavor. Ireland & Associates Surveying Inc. and the signing surveyor assume NO Liability for the Accuracy of this Determination.

Ireland & Associates Surveying, Inc.
800 Currency Circle Suite 1020
Lake Mary, Florida 32746
www.irelandsurveying.com
Office-407.678.3366
Fax-407.320.8165

Juan Manuel Vasquez

P.O. Box 560487, Orlando, FL 32856 * Ph: 407.219.8277 * Juan@vasquezcivil.com

July 8, 2024

City of Deland Engineering Department
1102 S Garfield Ave
Deland, Fl 32724

Reference Address	E Church St, Deland, Fl 32724
Owner	Vidal Homes Llc

Subject **Traffic Statement for 13 Apartment Units**

I, Juan Manuel Vasquez, licensed as Professional Engineer in the State of Florida, PE No. 95783 **hereby certify the traffic statement below** per the Trip Generation Manual, 11th Edition:

Traffic Statement:

THIS PROJECT WILL GENERATE APPROXIMATELY 8 PM PEAK HOUR TRIPS PER DAY (0.56 TRIPS PER UNIT) AND APPROXIMATELY 95.16 AVERAGE DAILY TRIPS PER DAY (7.32 TRIPS PER UNIT) BASED ON THE TRIP GENERATION MANUAL, 11TH. EDITION FOR LAND USE (220) MULTI–FAMILY HOUSING (LOW RISE).

In accordance with the current Trip Generation Manual, 11th Edition.

I certify that my statements herein are true and accurate to the best of my belief.

Sincerely,

Juan M Vasquez
Digitally signed by Juan M Vasquez
Date: 2024.07.08 10:47:49 -05'00'

Juan Manuel Vasquez
State of Florida Professional Engineer
PE No. 95783

School Board of Volusia County

Ms. Jamie M. Haynes, Chair
Mr. Ruben Colón, Vice Chair
Ms. Krista Goodrich
Mrs. Jessie Thompson
Ms. Donna Brosemer

Carmen J. Balgobin, Ed.D
Superintendent of Schools

School Adequate Capacity Determination
Finding of Adequate Capacity Letter

August 28, 2025

Mr. Mark A. Watts, Esq
Cobb Cole
231 N Woodland Blvd
DeLand, FL 32720

RE: North Hill Villas – City of DeLand
School Concurrency Case # 24-07-25-001-A

Mr. Watts:

The County Charter requires any Comprehensive Plan Amendment or Rezoning that allows increased residential density to be effective only when adequate public schools can be timely planned and constructed to serve the projected increase in student population. The district uses this requirement as the guiding principle behind the school adequate capacity review.

District staff have reviewed the school concurrency application for the proposed project known as North Hill Villas, associated with 1.49 +/- acres of property. The property is located at or near the intersection of E Rich Ave and N Hill Ave within DeLand city limits. Information provided in the application indicates the proposed project would provide thirteen (13) multi-family units.

The district uses a county wide Student Generation Rate (SGR) of (0.137) per multi-family dwelling unit to calculate projected students. By applying the SGR to the use types in Table 1 below, the project could generate two (2) full time students.

Table 1

UNIT TYPE	SGR	UNIT COUNT	STUDENTS GENERATED
Single Family Dwelling Unit	0.258	0	0
Multifamily Dwelling Unit	0.137	13	2
Manufactured Home Dwelling Unit	0.052	0	0
Total		**13**	**2**

When performing an adequate capacity review, district staff evaluates the effects of the proposed change compared to any remaining permanent capacity within the impacted schools, up to 100%, Table 2 (next page). The projected increase in student population may be over 100% if there are plans to serve increased student population in that planning area within the long-term planning horizon. A finding of adequate capacity may be issued in either case.

Table 2

Schools	SY 2024/25 Enrollment	% of Permanent Capacity	Plans for Capacity Increase Long-Term	Traditional K-12 students projected
Blue Lake Elementary	541	96%	No	1
DeLand Middle	1,067	99%	No	0
West CSA (DeLand High)	2,956	113%	No	1
Other				0

The student projections generated by this project **will** increase the existing percentage above 100% permanent capacity at the high school level. However, the concurrency service area (CSA) for DeLand High is over 100% but below 120% for level of service (LOS) standards. Based on this, the school district has no objections to the proposed development plan.

Minimum planning considerations should include pedestrian and vehicular access, safety, connectivity, and buffering. Additional considerations, particularly for gated and muti-family communities, include accessibility for school buses, by ensuring a turn radius of at least 60 feet at all entrances and exits, and the inclusion of dedicated pickup/drop off sites.

All future development orders, such as site plans and subdivisions, are subject to school concurrency review. School concurrency will be evaluated at the time when the impact of development is specifically quantified and known. Only funded school improvements and then current capacity will be considered at that time.

No student reservations have been made at this time.

Please note the School Board has the right to adjust the attendance boundaries to balance the student enrollment populations at these area schools. Consequently, students generated from this project may not attend the currently assigned schools.

Should you need additional information, please contact me at (386) 734-7190, ext. 50802.

Sincerely,

James F. Roberts
Specialist, Planning & GIS

CC: Carmen J. Balgobin, Ed.D, Superintendent of Schools
Ron Young, Director of Planning & Construction
Patricia S. Smith, AICP, Planning Coordinator
Kendall Story, CNU-A, Senior Planner, City of DeLand

FACILITIES SERVICES
3750 OLSON DRIVE ◆ DAYTONA BEACH, FL 32124
PHONE: (386) 947-8786 ◆ FAX (386) 506-5056

Finding of Adequate School Capacity

VOLUSIA COUNTY SCHOOL BOARD

Project Information	
Project Name	North Hill Villas
VCSB Project #	**24-07-25-001-A**
Jurisdiction Project #	
Parcel ID Numbers	7010-18-00-0010; 7010-18-00-0020 7010-18-00-0030
Project Location	E Rich Ave and N Hill Ave
Potential Residential Units	13 Multi-Family Units
Property Owner/Applicant	Mark A. Watts, Esq Cobb Cole

Notes: Additional review will be required at the time of subdivision/site plan submittal(s). No Student Reservations have been made.

Based upon the Findings of Fact, pursuant to School Board Policy 612 and Section 206 of the County Charter, the school district has determined at this time that school capacity is adequate to serve the proposed increase in residential density. This Finding shall constitute competent substantial evidence that adequate public school capacity is likely to be available at the time it is required to serve the planned new development.

Capacity is not being reserved with this Finding unless otherwise noted on this document. This Finding of Adequate School Capacity allows this subject project to continue through the Comprehensive Plan Amendment and/or rezoning process; however, it may be subject to additional school capacity review in the future.

James F. Roberts
Specialist, Planning & GIS

August 28, 2025
Issue Date

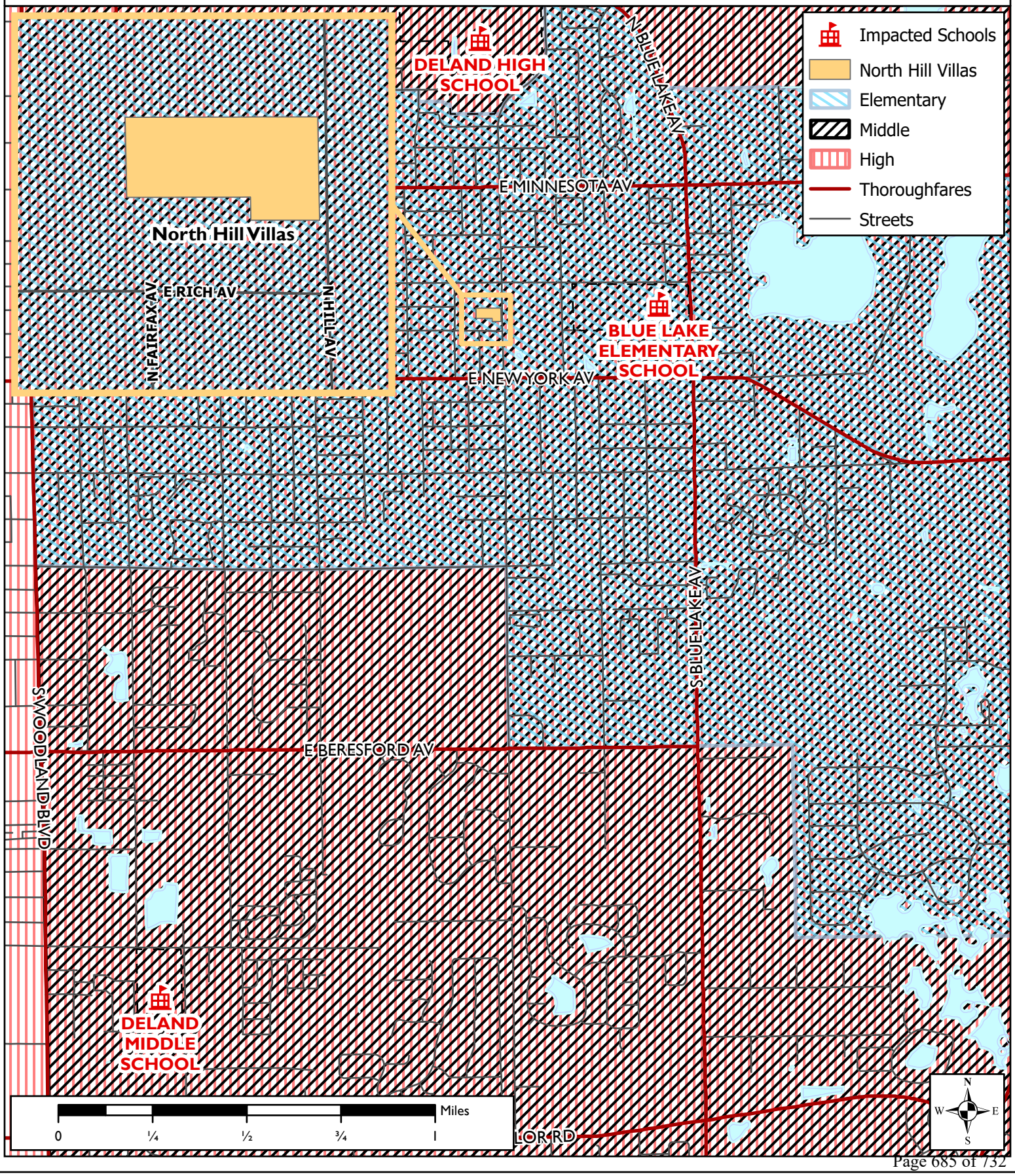
Created: 9/2007
Owner: Facilities Services

2007-073-VCS
Print Locally

VCSB Schools Impacted by Development

School Concurrency Review - North Hill Villas

VOLUSIA COUNTY SCHOOLS
PLANNING AND BUSINESS SERVICES
Created August 2025



PLANNING DIVISION STAFF REPORT
TO
THE CITY OF DELAND PLANNING BOARD

December 10, 2025

A. **APPLICATION NO.:** Z24-153 (North Hill Villas PD)
APPLICANT: Mr. Mark Watts, Cobb & Cole, P.A.
OWNER: Vidal Homes, LLC
STAFF PLANNER: Kendall Story, Senior Planner
REQUEST: Request for a rezone from R-1B (single-family residential) to North Hill Villas PD (Planned Development) for a 13-lot townhome community

B. **APPLICABLE REGULATIONS:**

Article IV **OVERLAY AND FLOATING ZONES**
Sec. 33-32 – Planned Development District.

Article XII **ADMINISTRATION AND ENFORCEMENT**
Sec. 33-135 – Procedure for text amendments & rezoning.

C. **SITE FACTORS:**

PARCEL NUMBER: 701018000010; 701018000020; 701018000030
LOCATION: Northwest corner of N. Hill Ave. and E. Rich Ave.
SIZE OF PROPERTY: ±1.49 acres

D. **LAND USE DESIGNATION & ZONING OF SUBJECT PROPERTY:**

Future Land Use: MDR (Medium Density Residential)
Existing Zoning: R-1B
Existing Use: Vacant/Undeveloped

E. **SURROUNDING LAND USE & ZONING:**

	LAND USE	ZONING
North:	LDR (Low Density Residential)	R-1A (single-family residential)
South:	MDR (Medium Density Residential)	R-2 (two-family residential)
East:	HDR (High Density Residential)	R-16 (multi-family residential)
West:	LDR (Low Density Residential)	R-1A (single-family residential)

F. **BACKGROUND:** The subject property is ± 1.49 acres, vacant, undeveloped and surrounded by single-family and multi-family residential properties. The current zoning is R-1B, single-family residential, which allows for single-family residential homes on a minimum of 7,500 SF lots. The applicant is requesting to rezone the property to the North Hill Villas PD, for 13 multi-family townhome units, each 2-stories high with a single-car garage and single-car driveway. The property will be accessed from N. Hill Ave., with a driveway designed for a firetruck to turn around.

G. ANALYSIS: The applicant is proposing to develop the site into a multi-family (townhomes) subdivision with 13 front-loaded lots, 7 visitor parking spaces and a tot lot that will be covered by a shade sail. The application for rezoning is accompanied by a request for a small-scale future land use map amendment (SMLU25-154).

Per Sec. 33-32 of the Land Development Regulations, in return for flexibility in site design and development, Planned Developments (PDs) are expected to include exceptional design that preserves critical environmental resources; provides above-average open space and recreational amenities, and incorporates creative design in the layout of buildings.

All development for the property shall rely upon the standards set forth below as identified on the Planned Development Plan. Where this document is silent, the R-12 zoning regulations shall apply.

Below is a table that compares the existing zoning district (R-1B) compared to the R-12 zoning district and the development standards outlined in the PD.

SITE DATA	R-1B (SINGLE-FAMILY)	R-12 (MULTI-FAMILY)	NORTH HILL VILLAS PD
Unit count (max)	8	17	13
Overall size	1.49 ACRES		
Density	5.81/ACRE	12/ACRE	8.72/ACRE
Maximum Height	35 ft.	65 ft.	35 ft.
Lot Width	75 ft.	60 ft.	22 ft.
Maximum impervious	45 %	N/A	60 % Overall, 80 % per lot
Minimum floor area	900 sq. ft.	900 sq. ft.	1,500 sq. ft.
Minimum lot area	7,500 sq. ft.		1,650 sq. ft.
Setbacks	Front: 30 ft. Rear: 25 ft. Side yard: 10 ft.	Front: 30 ft. Rear: N/A Side yard: N/A	Front: 20 ft. Rear: 10 ft. Side yard internal: 0 ft. Side yard end unit: 3 ft.
Eave Encroachment Over Driveway	24 in.	24 in.	48 in.

The concept plan shows approximately 18 % of the site being dedicated towards tree protection which shall include the required landscape buffers. As shown in the elevations, a variety of paint colors and façade finishes are used, with garage overhangs and small backyard private areas provided for each unit. Sidewalks are included along both sides of the roadway. The development shall include landscape designs such that plants will serve environmentally friendly functions including, but not limited to, cooling, privacy screening, shade, aesthetics and runoff pollution prevention. And unless stated otherwise in the PD, development shall comply with the city's Land Development Regulations as well as International Dark Sky standards, designed to reduce light pollution by restricting upward-directed light and avoiding glare.

As seen in the chart below, Type B buffers are proposed along the north, south, east, and west boundaries of the site. The applicant is requesting a deviation from the code requirement on the east boundary by providing a 10 ft. wide landscape buffer, in lieu of the required15 ft. buffer.

LANDSCAPE BUFFERS		
	REQUIRED	**PROVIDED**
NORTH	TYPE B, 15 ft.	TYPE B, 20 ft. *(with a 6-ft opaque fence)*
SOUTH	TYPE B, 15 ft.	TYPE B, 20 ft.
EAST	TYPE B, 15 ft.	TYPE B, 10 ft.
WEST	TYPE B, 15 ft.	TYPE B, 20 ft.

Parking shall comply with the city's Land Development Regulations, at a ratio of two (2) parking spaces per unit, and an additional 0.5 guest parking spaces per unit.

School Concurrency: A school concurrency letter dated August 28, 2025, was provided, stating that the district has no objections to the proposed development plan.

Traffic Analysis: A Traffic Impact Statement letter dated July 8, 2024, states that the proposed development is projected to generate 95 average daily trips, of which 8 trips occur during the PM peak hour. Per the River to Sea Transportation Planning Organization (R2CTPO) traffic study guidelines, since the proposed development is not anticipated to generate more than 1,000 daily new trips, a TIA is not required.

Stormwater: A stormwater retention pond is being provided along the west side of the site. Per the proposed PD Agreement, the stormwater system will be designed to meet all required governmental regulations, and that it shall be designed to accommodate a 100-year, 24-hour storm event which will be retained on site.

Section 33-135 of the Land Development Regulations provides the following criteria, which the City Commission shall utilize in reviewing any rezoning request:

1. **Is the proposed rezoning consistent with the Comprehensive Land Use Plan, the land use, zoning pattern and character of the surrounding area?**
   The proposed zoning classification of Planned Development (PD) is consistent with the Comprehensive Plan with a future land use designation of Medium Density Residential (MDR). The surrounding area is typified by single family residential homes and single-story multi-family apartments to the east. "Missing middle" housing options such as duplexes, townhomes, small-sized apartment buildings and live-work units allow for infill and redevelopment to encourage increased density.
2. **Will the proposed rezoning have an impact upon the environment or natural resources?**
   The subject property is currently undeveloped and heavily-wooded. Although trees will be removed during the future construction phase, the applicant is providing a greater Tree Protection Area (TPA) than required by code. Per the Land Development Regulations, the

developer is required to provide a minimum of 15% TPA. The PD is proposing a TPA of approximately 28% (18,290 SF).

3. **Will the proposed rezoning have an impact upon the economy of the affected area?**
   The subject property is currently vacant and undeveloped; therefore, the development should have a positive impact on the city and surrounding area, providing housing with small-scale development.

4. **Will the proposed rezoning have an impact upon governmental services?**
   Governmental services such as potable water, reclaimed water, sewer, code enforcement, police, and fire will be provided by the City. The TRC has indicated that there is adequate infrastructure and facilities to service the development, therefore there will be no impact to the level of governmental services. Additionally, a Utility Service Agreement (USA) will be required by the City's Utilities Department during the preliminary plat review.

5. **Are there changes in the circumstances or conditions affecting the area since the original assignment of zoning that will support the proposed zoning?**
   There have not been any significant changes in the area surrounding the subject property. The immediate area is typified by single-family homes and small-scale multi-family residences. The townhomes proposed are small-scale residences compatible with the existing single-family and multi-family homes in the area. The development is restricted to no more than 13 townhomes, with each no more than two-stories.

6. **Was there a mistake in the original classification?**
   There were no mistakes in the original classification.

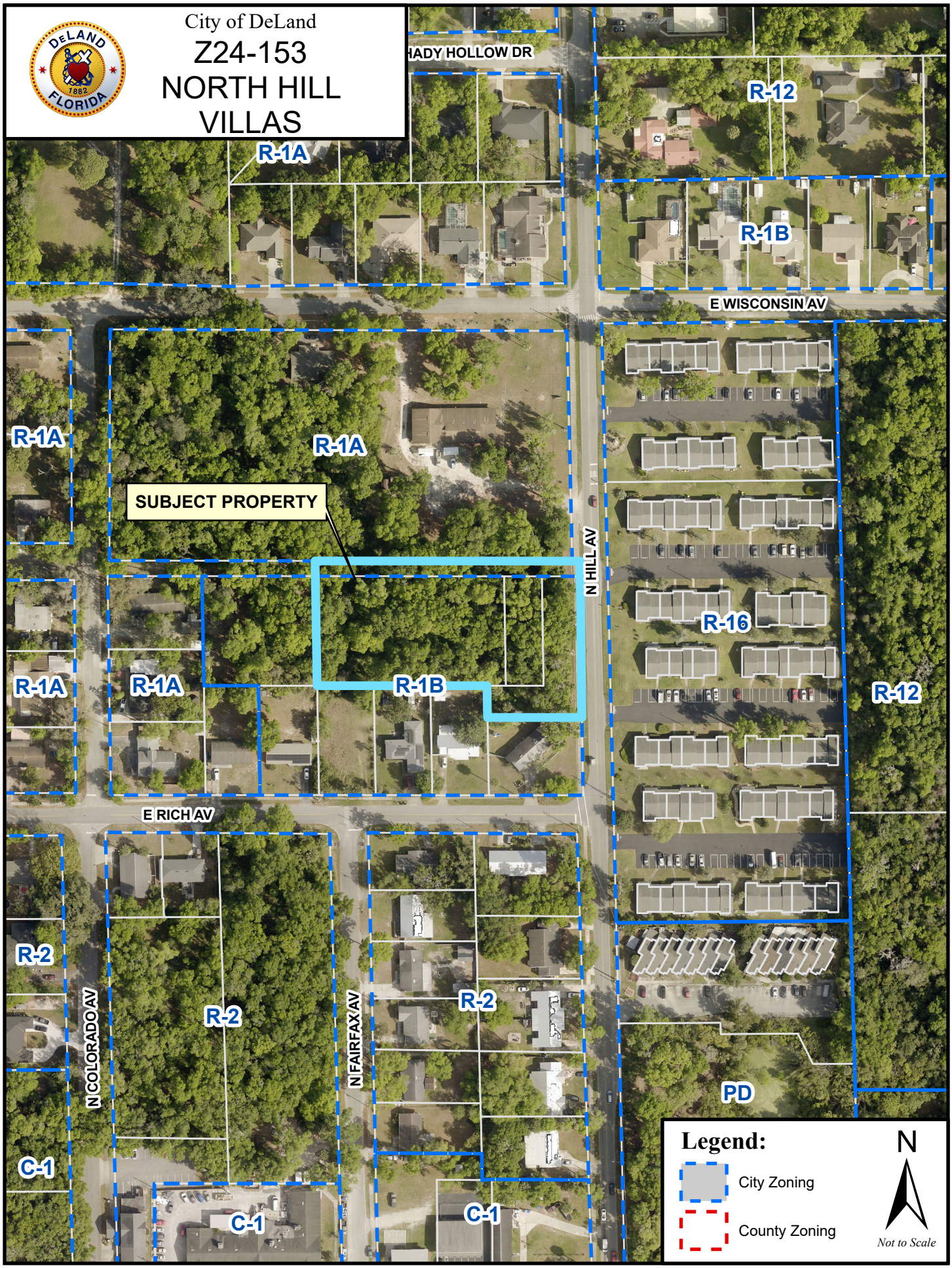
7. **Will the proposed rezoning have any effect upon the use or value of the affected area?**
   The proposed rezoning should have a positive impact upon the surrounding area, as the infusion of new homes should raise overall values and providing additional housing options.

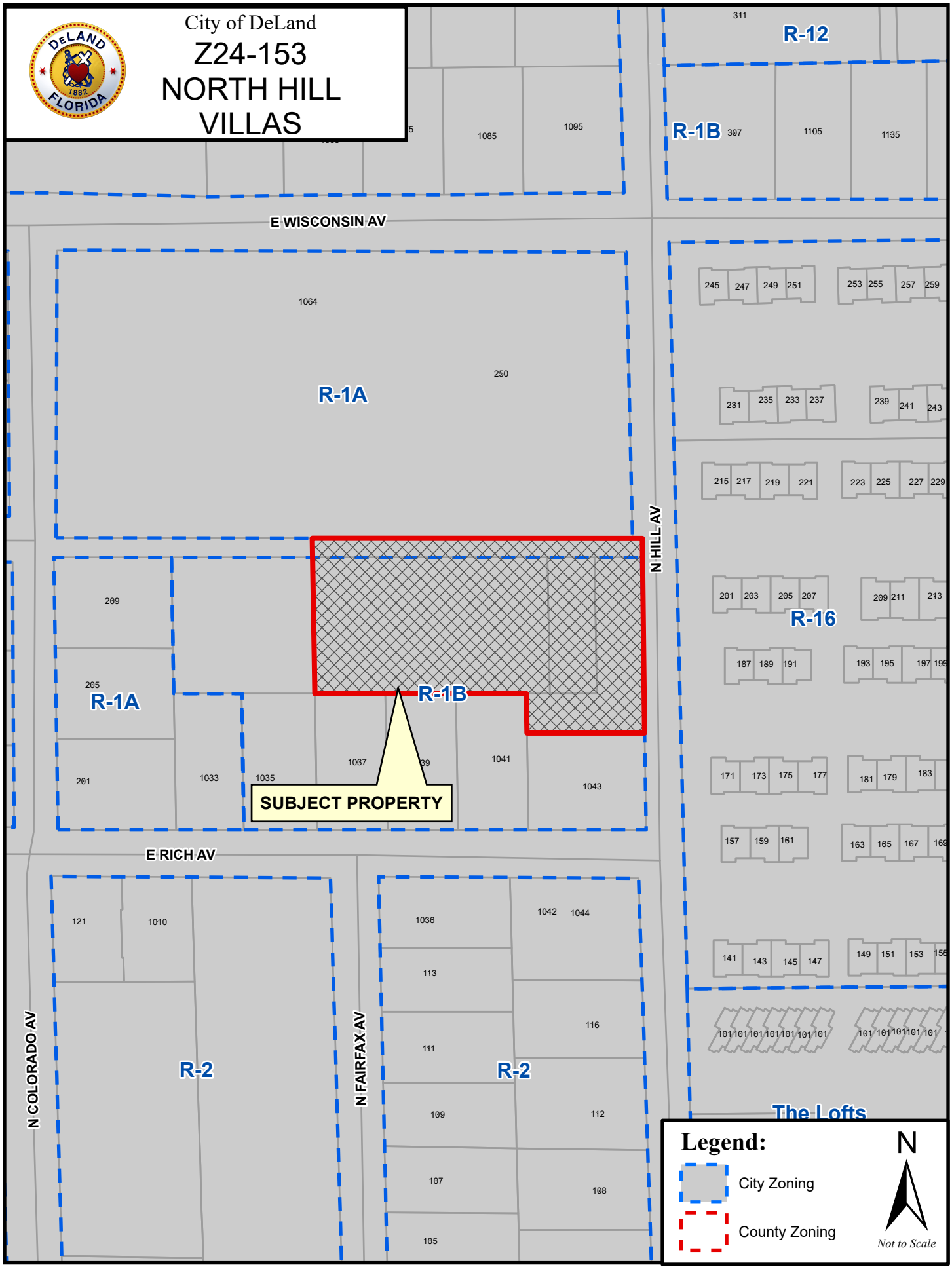
8. **Will the proposed rezoning have an impact upon public health, safety and welfare?**

   There is no indication at this time that the new proposal will create additional impacts upon public health, safety or welfare, as all provided public services have the capacity needed to accommodate the proposed development. The rezoning would be consistent and compatible with the uses of the surrounding area.

H. **NEXT STEPS:** The request for a rezoning will go before the City Commission on December 15, 2025, for first reading. The request for the land use amendment will be transmitted to Volusia Growth Management Commission (VGMC) for review. After VGMC review, the request is anticipated to go before City Commission for second reading in February of 2026.

I. **STAFF RECOMMENDATION**: Staff recommends that the Planning Board forward the application to the City Commission with a recommendation of approval for the request to rezone from R-1B (single-family residential) to North Hill Villas PD (Planned Development).


City of DeLand
Z24-153
NORTH HILL VILLAS
HADY HOLLOW DR
R-12
R-1A
R-1B
E WISCONSIN AV
R-1A
R-1A
SUBJECT PROPERTY
N HILL AV
R-16
R-1A
R-1A
R-1B
R-12
E RICH AV
R-2
R-2
N COLORADO AV
N FAIRFAX AV
R-2
PD
C-1
C-1
C-1
Legend:
City Zoning
County Zoning
N
Not to Scale

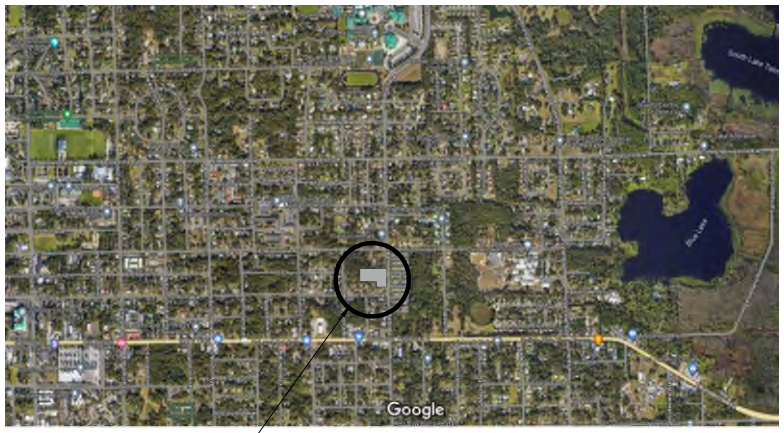

City of DeLand
Z24-153
NORTH HILL VILLAS
E WISCONSIN AV
E RICH AV
N HILL AV
N COLORADO AV
N FAIRFAX AV
R-1A
R-1B
R-2
R-12
R-16
The Lofts
SUBJECT PROPERTY
Legend:
City Zoning
County Zoning
N
Not to Scale

NORTH HILL VILLA -TOWNHOUSES APARMENT COMPLEX



3 3D View 9

SHEET LIST	
Sheet Number	Sheet Name
A-100	Cover Sheet
A-100.1	Site Plan
A-100.2	Overall Site Plan
A-100.3	Site Green Protected Area plan
A-100.5	Fire-Truck Maneuvers Simulation
A-250	3D Views
A-300	Architectural Elevations Type IA Unit Views
A-301	Architectural Elevations Type IIA Unit Views
A-303	Overall Architectural Elevations



1 LOCATION
1" = 1'-0"



2 SITE PLAN - Proposed
1" = 50'-0"

300 Broadway st, Methuen
978 | 902 - 1152

Project Description
Project Name: North Hill Villa
Address: North Hill Ave, Deland Fl
Client: Vidal Homes LLC.

Teams
Jose R Melo Assoc. AIA
Professional Designer

Sheet Name
Cover Sheet

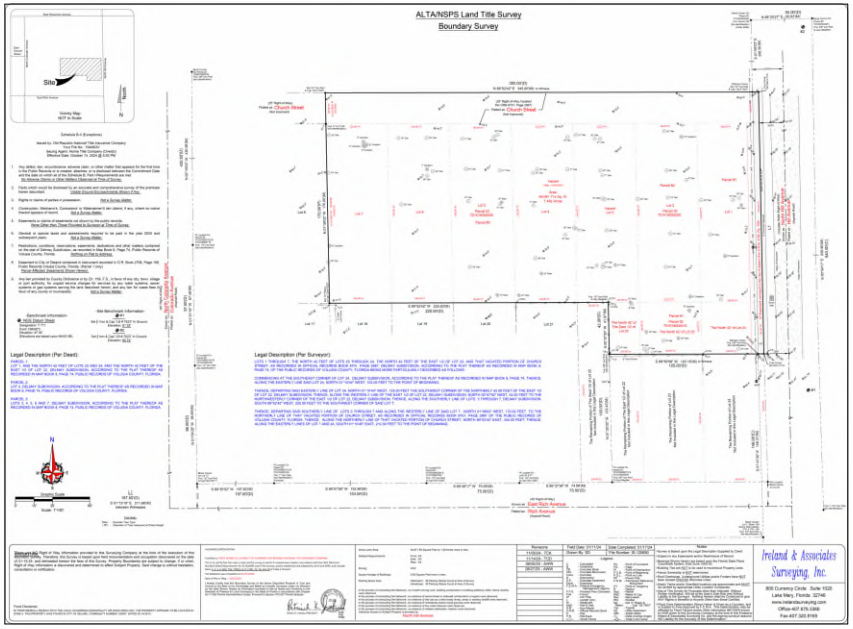
Revision Schedule

Revision #	Revision Description	Revision Date

General Notes
1- ALL DIMENSIONS AND CONDITIONS MUST BE CHECKED AND VERIFIED ON SITE BY THE CONTRACTOR AND SUB-CONTRACTORS, THE PROJECT MANAGER SHALL BE NOTIFIED IN WRITING OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH THE WORK.

Date: 11/20/2025
Scale: As indicated
Design by: JRM

A-100



1 **Site Plan**
1" = 80'-0"



2 **SITE PLAN - Proposed**
1" = 30'-0"

310 Broadway st. Methuen
978 | 902 - 1152
M DESIGN STUDIO

Project Description
Project Name: North Hill Villa
Address: North Hill Ave, Deland Fl
Client: Vidal Homes LLC.

Teams

Jose R Melo Assoc. AIA
Professional Designer

Sheet Name
Site Plan

Revision Schedule

Revision #	Revision Description	Revision Date

General Notes
1- ALL DIMENSIONS AND CONDITIONS MUST BE CHECKED AND VERIFIED ON SITE BY THE CONTRACTOR AND SUB-CONTRACTORS, THE PROJECT MANAGER SHALL BE NOTIFIED IN WRITING OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH THE WORK.

Date: 11/20/2025
Scale: As indicated
Design by: JRM

A-100.1

RESIDENTIAL AREA

a)	Minimum Lot Area of	1,452 sq/ft min. ,1.650 sq/ft max
b)	Minimum Lot Width of	22 ft.
c)	Minimum Lot Depth of	65 ft.
d)	Total Area (Acreage)	1.49 acres/64,904 SF
e)	Minimum Individual Unit Size of	1,500 sq. ft.
f)	Maximum Building Height of	35' ft.
g)	Maximum Unit Count Per Building:	5 units
h)	Minimum Setbacks:	
	a. Front yard:	20 ft.
	b. Rear yard:	10 ft.
	c. Side yard:	0 ft.
	d. Sideyard (end units)	3 ft
	e. Between buildings (side to side):	15 ft.
	f. Between buildings (front to front or rear to rear):	50 ft.
iii.	Eaves: "Into any required setback"	42"
i)	Maximum Impervious Surface Area:	60%
j)	Maximum Townhouse Unit Count:	13 unit

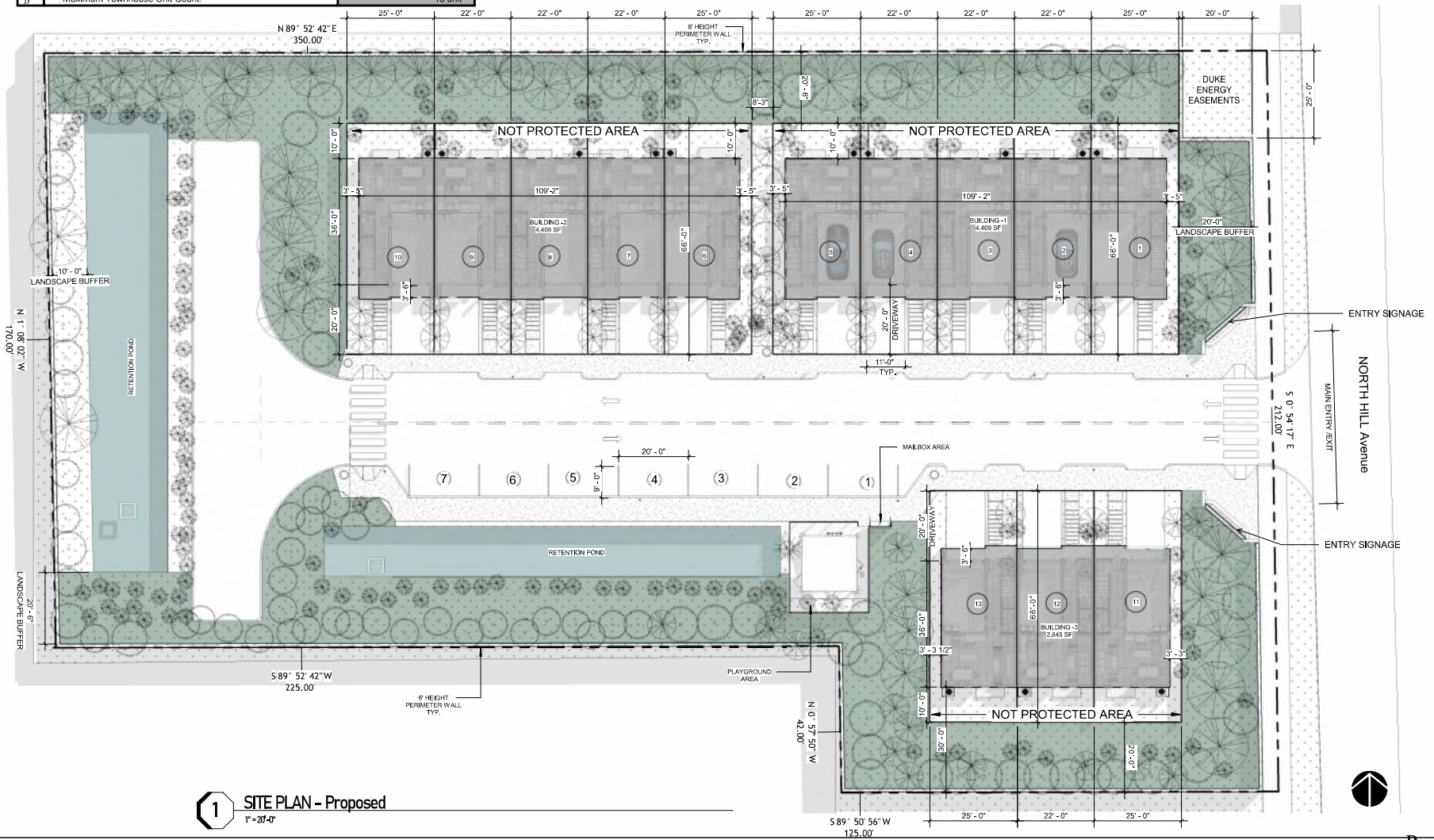
PROPOSE BUILDING (11,463 SF)

PROPOSED CONCRETE SIDEWALK (3,991 SF)

PROPOSED TREE PROTECTION AREA (TPA) (18,290 SF)

PROPOSED RETENTION PONDS

OPEN SPACES(NOT PROTECTED AREA)



1 SITE PLAN - Proposed

1" = 20'-0"

300 Broadway st, Methuen
978 | 902 - 1152

Project Description
Project Name: North Hill Villa
Address: North Hill Ave, Deland Fl
Client: Vidal Homes LLC.

Teams
Jose R Melo Assoc. AIA
Professional Designer

Sheet Name
Overall Site Plan

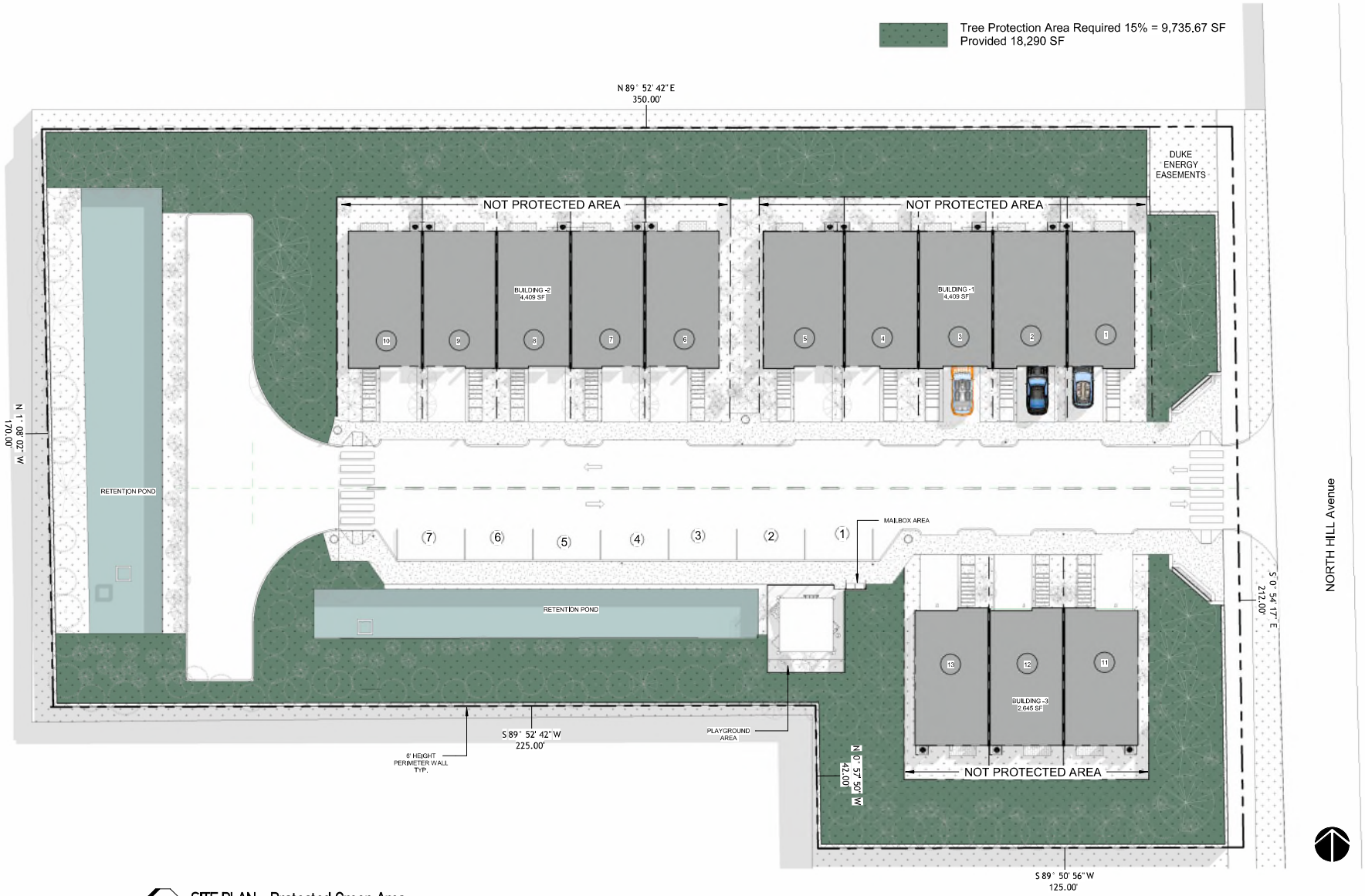
Revision Schedule

Revision #	Revision Description	Revision Date

General Notes
1- ALL DIMENSIONS AND CONDITIONS MUST BE CHECKED AND VERIFIED ON SITE BY THE CONTRACTOR AND SUB-CONTRACTORS, THE PROJECT MANAGER SHALL BE NOTIFIED IN WRITING OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH THE WORK.

Date: 11/20/2025
Scale: As indicated
Design by: JRM

A-100.2



1 SITE PLAN - Protected Green Area
1" = 20'-0"

300 Broadway st. Methuen
978 | 902 - 1152
M DESIGN STUDIO

Project Description
Project Name: North Hill Villa
Address: North Hill Ave, Deland Fl
Client: Vidal Homes LLC.

Teams

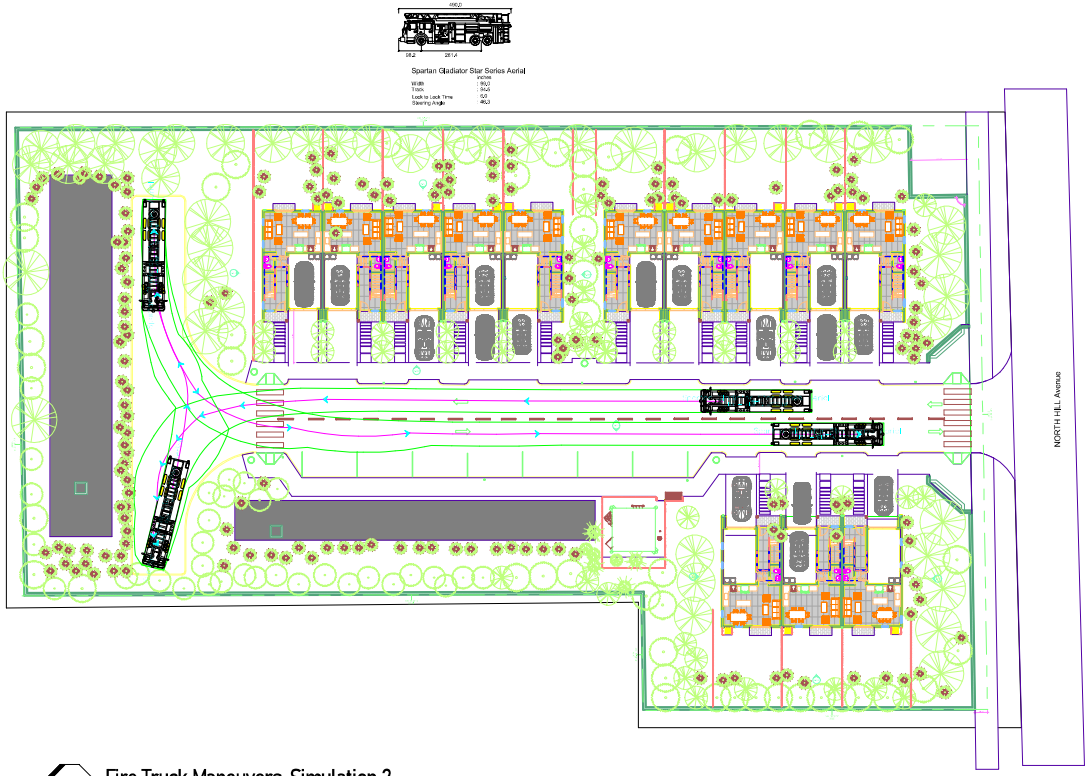
Sheet Name: Site Green Protected Area plan

Revision Schedule
Revision # | Revision Description | Revision Date

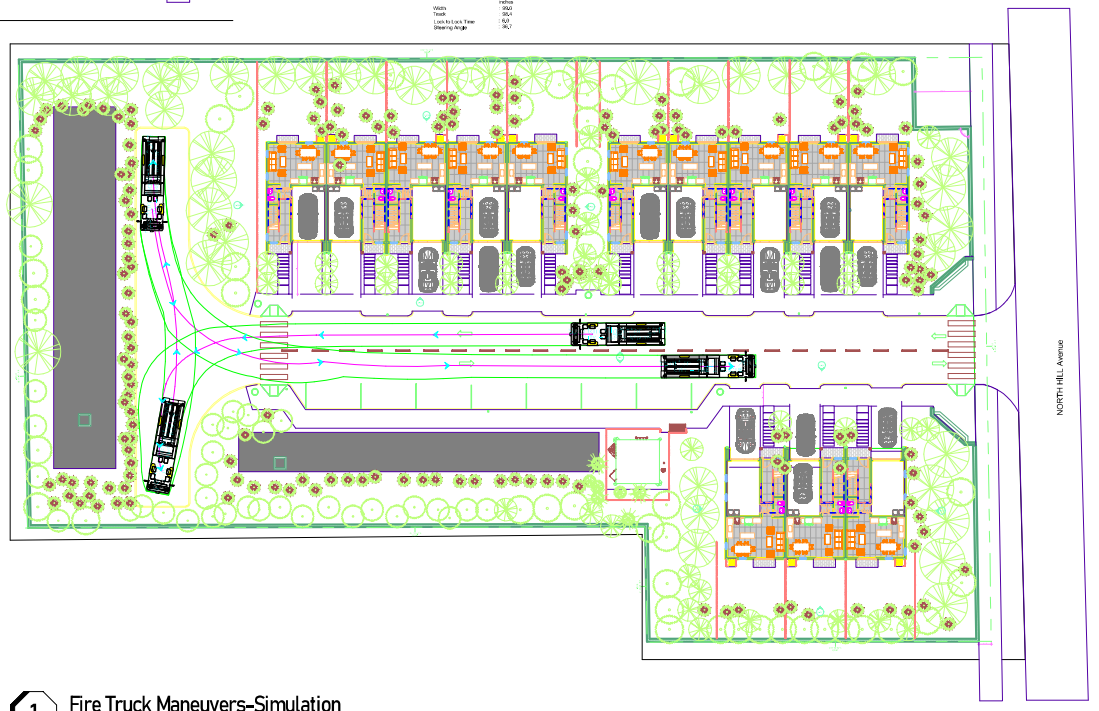
General Notes
1- ALL DIMENSIONS AND CONDITIONS MUST BE CHECKED AND VERIFIED ON SITE BY THE CONTRACTOR AND SUB-CONTRACTORS, THE PROJECT MANAGER SHALL BE NOTIFIED IN WRITING OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH THE WORK.

Date: 11/20/2025
Scale: 1" = 20'-0"
Design by: JRM

A-100.3



2 Fire Truck Maneuvers-Simulation 2
1/32" = 1'-0"



1 Fire Truck Maneuvers-Simulation
1/32" = 1'-0"

300 Broadway st, Methuen
978 | 902 - 1152

Project Description
Project Name: North Hill Villa
Address: North Hill Ave, Deland Fl
Client: Vidal Homes LLC.

Teams
Jose R Melo Assoc. AIA
Professional Designer

Sheet Name
Fire-Truck Maneuvers Simulation

Revision Schedule

Revision #	Revision Description	Revision Date

General Notes
1- ALL DIMENSIONS AND CONDITIONS MUST BE CHECKED AND VERIFIED ON SITE BY THE CONTRACTOR AND SUB-CONTRACTORS, THE PROJECT MANAGER SHALL BE NOTIFIED IN WRITING OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH THE WORK.

Date: 11/20/2025
Scale: 1/32" = 1'-0"
Design by: JRM

A-100.5



2 3D View 4



1 Site 3D Arial View



3 3D View 7

310 Broadway st. Methuen
978 | 902 - 1152

Project Description
Project Name: North Hill Villa
Address: North Hill Ave, Deland Fl
Client: Vidal Homes LLC.

Teams

Jose R Melo Assoc. AIA
Professional Designer

Sheet Name: 3D Views

Revision Schedule

Revision #	Revision Description	Revision Date

General Notes
1- ALL DIMENSIONS AND CONDITIONS MUST BE CHECKED AND VERIFIED ON SITE BY THE CONTRACTOR AND SUB-CONTRACTORS, THE PROJECT MANAGER SHALL BE NOTIFIED IN WRITING OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH THE WORK.

Date: 11/20/2025
Scale:
Design by: JRM

A-250



4 Left Elevation Type IA Units-Proposed
1/8" = 1'-0"



3 Rigth Elevation Type IA Units-Proposed
1/8" = 1'-0"



2 Rear Elevation Type IA Units-Proposed
1/8" = 1'-0"



1 Front Elevation Type IA Units-Proposed
1/8" = 1'-0"

310 Broadway st. Methuen
978 | 902 - 1152

Project Description
Project Name: North Hill Villa
Address: North Hill Ave, Deland Fl
Client: Vidal Homes LLC.

Teams

Sheet Name
Architectural Elevations
Type IA Unit Views

Revision Schedule

Revision #	Revision Description	Revision Date

General Notes
1- ALL DIMENSIONS AND CONDITIONS MUST BE CHECKED AND VERIFIED ON SITE BY THE CONTRACTOR AND SUB-CONTRACTORS, THE PROJECT MANAGER SHALL BE NOTIFIED IN WRITING OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH THE WORK.

Date: 11/20/2025
Scale: 1/8" = 1'-0"
Design by: JRM

A-300



4 Right Elevacion View
1/8" = 1'-0"



3 Left Elevacion View
1/8" = 1'-0"



2 Rear Elevation Type IIA Units
1/8" = 1'-0"



1 Enlarged Elevation Type IIA Units-Proposed
1/8" = 1'-0"

300 Broadway st. Methuen
978 | 902 - 1152

Project Description
Project Name: North Hill Villa
Address: North Hill Ave, Deland Fl
Client: Vidal Homes LLC.

Teams

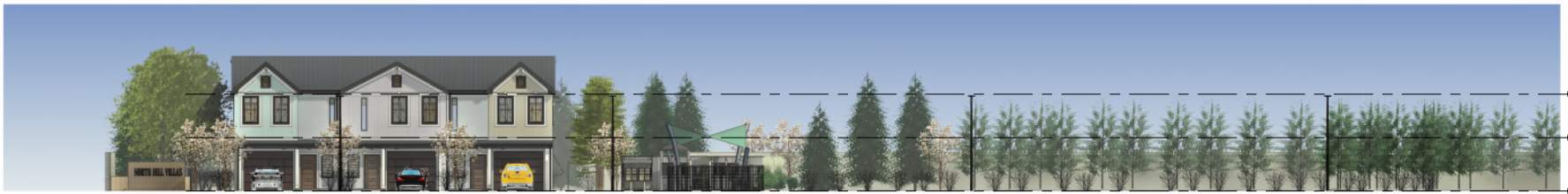
Sheet Name: Architectural Elevations Type IIA Unit Views

Revision Schedule
Revision # | Revision Description | Revision Date

General Notes
1- ALL DIMENSIONS AND CONDITIONS MUST BE CHECKED AND VERIFIED ON SITE BY THE CONTRACTOR AND SUB-CONTRACTORS, THE PROJECT MANAGER SHALL BE NOTIFIED IN WRITING OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH THE WORK.

Date: 11/20/2025
Scale: 1/8" = 1'-0"
Design by: JRM

A-301



2 Overall Elevation Type IIA Units -Proposal
1/16" = 1'-0"



1 Overall Elevation Type IA Units -Proposal
1/16" = 1'-0"

300 Broadway st. Methuen
978 | 902 - 1152

Project Description
Project Name: North Hill Villa
Address: North Hill Ave, Deland Fl
Client: Vidal Homes LLC.

Teams

Sheet Name: Overall Architectural Elevations

Revision Schedule

Revision #	Revision Description	Revision Date

General Notes
1- ALL DIMENSIONS AND CONDITIONS MUST BE CHECKED AND VERIFIED ON SITE BY THE CONTRACTOR AND SUB-CONTRACTORS, THE PROJECT MANAGER SHALL BE NOTIFIED IN WRITING OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH THE WORK.

Date: 11/20/2025
Scale: 1/16" = 1'-0"
Design by: JRM

A-303

PLANNED DEVELOPMENT AGREEMENT

IN THE CITY COMMISSION OF THE

CITY OF DELAND, FLORIDA

IN RE: Case # Z-24-153, Application of

VIDAL HOMES, LLC

ORDINANCE # 20____-_____

ORDER AND RESOLUTION

GRANTING A REQUEST FOR CHANGE OF ZONING FROM R-1B TO NORTH HILL VILLAS PD

The application of Vidal Homes, LLC, hereinafter, "Applicant", for rezoning was heard by and before the City Commission, DeLand Florida, on _____, Based upon the verified Application and other supporting documents, maps, charts, overlays, other evidence and instruments; the advice, report, and recommendations of the Community Development, and other Departments and agencies of DeLand, Florida; and the testimony adduced and evidence received at the Public Hearing on this Application by the Planning Board on _____, and otherwise being fully advised, the City Commission does hereby find and determine as follows:

GENERAL FINDINGS

A. That the application of Vidal Homes, LLC was duly and properly filed herein on July 15, 2024 as required by law.

B. That all fees and costs which are by law, regulation, or Ordinance required to be borne and paid by the applicant have been paid.

C. That the Applicant is the owner of a 1.49 +/- acre parcel of land which is the subject of this application and which land is situated in DeLand, Florida.

D. That the Applicant has complied with the Planned Development Plan provision as required by Land Development Regulations of the Code of Ordinances of the City of DeLand.

E. That the Applicant has complied with the "Due Public Notice" requirements of the City Commission, Land Development Regulations of the Code of Ordinances of the City of DeLand.

F. That the owner of the properties, Vidal Homes, LLC, agrees with the provisions of the Development Agreement adopted hereby.

FINDINGS REGARDING REZONING

A. That the applicant has applied for a change of zoning from the present zoning classification of the parcels described in Exhibit "A" (the "Property") from R-1B to NORTH HILL VILLAS PD (Planned Development).

B. That the said rezoning to a PD is consistent with both the City of DeLand Comprehensive Plan and the intent and purpose of the Land Development Regulations contained in Chapter 33 of the Code of Ordinances of the City of DeLand (the "LDR") and does promote the public health, safety, morals, general welfare and orderly growth of the area affected by the rezoning request.

NOW, THEREFORE, BE IT RESOLVED AND ORDERED BY THE CITY OF DELAND, FLORIDA, IN OPEN MEETING DULY ASSEMBLED IN THE CITY COMMISSION CHAMBERS, 120 SOUTH FLORIDA AVENUE, DELAND, FLORIDA, THIS _____ DAY OF _____, 2025, AS FOLLOWS:

A. That the Application of Vidal Homes, LLC, a Florida limited liability company, for the rezoning of the subject parcels is hereby granted.

B. That the zoning classification of the subject parcels described in Exhibit "A" attached hereto is hereby amended from R-1B to NORTH HILL VILLAS PD as described in Article VII of the LDR.

C. That the Official Zoning Map of the City of DeLand, is hereby amended to show the rezoning of said parcels to NORTH HILL VILLAS PD.

D. That the provisions of the “Development Agreement” as hereinafter set forth is consistent with the LDR and with respect to any conflict between the LDR and the Development Agreement, the provisions of the Development Agreement shall govern. The LDR shall govern with respect to any matter not covered by the Development Agreement. The City of DeLand will ensure overall compliance with the Development Agreement.

E. Unless otherwise provided for in the Development Agreement, the LDR shall apply to the Property in the same manner as the R-12 zoning classification.

F. Except as otherwise stated herein, nothing in the Development Agreement is intended to abridge the requirements of the LDR or any other City Ordinances.

DEVELOPMENT AGREEMENT

The City of DeLand and the other parties executing this Development Agreement hereby enter into this Development Agreement which shall constitute a binding agreement, but is not a statutory development agreement as provided for in Sections 163.3220-163.3243, Florida Statutes, the Florida Local Government Development Agreement Act.

A. Development Concept. The properties shall be developed as NORTH HILL VILLAS PD, substantially in accordance with the Planned Development Plan. The Planned Development Plan shall govern the development of the Property and shall regulate the future land use of the Property.

B. Planned Development Plan. The Planned Development Plan shall consist of this Development Agreement and the Development Plan Map prepared by Jose R. Melo Assoc., and dated November 20, 2025. The Development Plan Map is hereby approved and incorporated in this Development Agreement by reference as Exhibit “B”. The Planned Development Plan shall be filed and retained for public inspection in the Planning Department, and it shall constitute a supplement to the Official Zoning Map of the City of DeLand.

C. Amendments. All amendments of the Planned Development Plan shall require the review and recommendation of the Planning Board and action by the City Commission in the same manner as a rezoning of the parcel. No administrative amendments may be authorized.

D. Subdivision Approval. After the Planned Development Plan is recorded, and prior to any construction, including clearing and fill, a preliminary plat of the area to be subdivided, whether one phase or multiple phases, shall be submitted for review and approval in the manner required by Article 13 of the LDR.

E. Unified Ownership. The Applicant or its successors shall maintain unified ownership of the Property until after the recordation of the Final Subdivision Plat in the public records of Volusia County.

F. Phase of Development. The project will be developed in one phase. No burning shall be permitted on site. No vertical construction or combustibles may be stored onsite until the utilities and roads have been inspected and approved by utilities/engineering and fire prevention.

G. Land Uses Within the PD. The development of the Property shall be consistent with the uses prescribed for each area within the proposed North Hill Villas PD. The location and size of said land use areas are shown on the Development Plan Map, attached hereto as Exhibit "B". The following land uses shall be allowed as permitted principal uses and structures along with their customary accessory uses and structures:

1. Permitted Uses:

Townhouses.

Community uses including but not limited to clubhouse, cabana, dog park, community garden, and bicycle facilities.

H. Development Standards. All development for the Property shall rely upon the standards set forth below.

1. Townhomes:

a) Minimum Lot Area: 1,452 sq. ft.

b) Minimum Lot Width: 22 feet

c) Minimum Lot Depth: 66 feet

d) Minimum Individual Unit Size: 1,500 sq. ft. living space

e) Maximum Building Height: 35 ft.

f) Maximum Building Length: 110 ft.

g) Maximum Unit Count Per Building: 5 units

h) Minimum Setbacks:

a. Front yard: 20 ft.

b. Rear yard: 10 ft.

c. Side yard:

Internal: 0 ft.

End Unit: 3 ft.

d. Between buildings (side to side): 15 ft.

e. Between buildings: 50 ft.

(front to front or rear to rear):

i) Perimeter Building Setback: 30 ft.

j) The eave or architectural roof overhangs on any principle structure may project up to 42" into any required front or rear setback.

k) Maximum Impervious Surface Area of Property: 80% per lot/60%

per PD area

l) Maximum Townhouse Unit Count: 13 units

m) All mechanical equipment will be screened from view from the front of each unit by planted vegetation or screening panels that do not exceed 4 feet in height.

n) All utility boxes will be painted to match the primary color of the adjacent buildings so long as allowed by the applicable utility provider.

o) Architectural elevation renderings will be consistent with Exhibit "C", subject to final approval during preliminary plat phase.

2. Accessory Structures. Unless otherwise stated herein, all accessory structures shall meet the development standards of Section 33-28 of the LDR.

3. Parking Standards. There will be two (2) parking spaces provided per unit. One (1) within the garage and one (1) within the driveway, which dimensions shall be a minimum of twenty (20) feet long by eleven (11) feet wide. An additional total of six (6) guest parking spaces, which shall be a minimum of twenty (20) feet long and nine (9) feet wide, plus one (1) handicap compliant space will be provided within the residential area. Enforcement of parking and maintenance of the access road(s) shall be the responsibility of a centrally managed maintenance association, homeowners' association or similar.

4. Buffer Standards. The following buffer requirements shall apply to the

Property:

Residential Area

a. A minimum of a 20 ft. buffer will run along the north side of the Property and will meet Buffer Standard “B” of Section 33-92.02(b)(2) of the LDR. The size and intensity of the north landscape buffer was coordinated with the church located north of the Property and, together with the construction of a 6 ft. screening wall or vinyl fence, was deemed to provide a sufficient visual buffer between the adjacent uses. The Applicant, its successors and assigns, hereby acknowledge that the church operates and maintains ongoing community outreach programs from its property, including the operation of a food pantry, and hereby expressly waives any claims of nuisance resulting from the church operations as long as they are otherwise in compliance with all applicable local ordinances and regulations.

b. A minimum of a 20 ft. buffer will run along the south side of the Property and will meet Buffer Standard “B” of Section 33-92.02(b)(2) of the LDR. The southern buffer will include as much existing vegetation as possible depending on the extent of site grading required to construct the stormwater management system.

c. The western side of the Property is providing an excess of 40 feet of total perimeter setback with an estimated 10 feet of landscape buffer. In addition, the primary stormwater pond serving the Property

is located adjacent to the western landscape buffer and will provide additional separation from adjacent single-family homes and single-family zoned property. Plantings will be included to meet Buffer Standard “B” of Section 33-92.02(b)(2) of the LDR.

d. A minimum of a 20 ft. buffer will run along the east side of the Property and will meet Buffer Standard “B” of Section 33-92.02(b)(2) of the City of DeLand Land Development Regulations.

e. A six (6’) foot wall or vinyl fence shall run along the north, south, east, and west Property lines, except in areas required for the primary driveway entrance or community identification signage.

5. Signage: Signage shall be provided per the Land Development Regulations. Monument signs identifying the development shall be placed at the primary driveway entrance along North Hill Avenue.

6. Tree Protection Area: 15% of the square footage of the total development shall be designated for the protection of trees and shall meet the requirement of the LDR. A 15 ft. tree protection area will be provided as part of the required landscape buffer on the north side of the Property. A 20 ft. tree protection area will be provided as part of the required landscape buffer on the east and south sides of the Property. A 10 ft. tree protection area will be provided on the western side of the property as part of the required landscape buffer. All required landscape buffers shown on the Planned Development Plan will count toward the required 15% tree protection area requirement regardless of minimum width or whether they include retained

or planted trees. The standard 20'-30' TPA standard is waived based on the infill nature of the proposed development.

7. Open Space. Open Space and/or Common Area shall meet the requirements of the Land Development Regulations.

8. Compliance. In the event that future development cannot comply with the standards set forth herein, then said entitlements shall be processed through an amendment to this Development Agreement.

I. Environmental Considerations. The development shall comply with the requirements for preservation of environmental resources as set forth in the Land Development Regulations Ordinance No. 2013-11, as amended. The development has been laid out in a manner to best accommodate the existing topography and drainage conditions identified on the property. However, the actual location and layout of the developed areas within the development shall be determined during subdivision and site plan review. In addition, all landscaping, including buffers, shall predominantly utilize Florida-Friendly Landscaping, as defined by the University of Florida/Institute of Food and Agricultural Sciences ("UF/IFAS") Center for Landscape Conservation and Ecology, native, or low-water plant material. The development shall include landscape designs such that plants will serve environmentally friendly functions including, but not limited to, cooling, privacy screening, shade, aesthetics, wildlife habitat and runoff pollution prevention, such as low impact development standards. All mulching will be conducted in accordance with the most current version of the Florida Green Industries Best Management Practices (BMPs) handbook guidelines. Mowing in common areas shall be

done in accordance with the most current version of the Florida Green Industries BMPs handbook and by certified landscaping contractors. Mowing adjacent to swales shall be performed such that no clippings are deposited into any swales or water bodies. All clippings that may have been deposited on impervious surfaces will be swept back into the vegetated area. All pesticide applications in common areas shall be done by a certified professional in accordance with the most current version of the Florida Green Industries BMPs handbook.

1. Dark Sky Standards: All lighting shall be downward and of the full cut-off shield variety in which the light source is recessed and shielded in a manner which prohibits upward light overspill into the night sky, except as otherwise permitted by the LDR. This type of lighting is specifically designed to reduce light pollution by restricting the amount of upward-directed light, avoiding glare, avoiding over-lighting, utilizing dimming and other appropriate lighting controls, and minimizing short-wavelength (bluish) light in the nighttime environment.

2. Street Trees: Street trees may be planted within the rights-of-way within the Property and said trees may be included in mitigation calculations; however, the Homeowners' Association shall be responsible for the maintenance of all trees planted in the public right-of-way, including the responsibility to repair any and all impacts upon the right-of-way infrastructure created by the presence of said trees, including any road or sidewalk facilities. Ornamental grasses shall be installed in lieu of street trees in landscaping areas located between the sidewalks and private

access roadway shown on the Planned Development Plan.

J. Sewage Disposal, Potable Water and Reclaimed Water. Provision for sewage disposal, potable and reclaimed water needs of the PD will be provided in accordance with the City of DeLand Comprehensive Plan, the LDR, and all other applicable regulations.

K. Solid Waste Collection. Solid waste bins will be provided for each unit and collected by the City. All solid waste bins will be stored in individual garages for each unit and only outside on designated collection days in accordance with City standards.

L. Stormwater Drainage. The stormwater retention system shall be designed to retain a 100-year, 24-hour storm event and to meet all other applicable governmental regulations. All stormwater systems on the Property shall be designed to accommodate existing onsite flows such that no adverse upstream or downstream flooding occurs due to the development of the property. All stormwater ponds shall utilize supplemental plantings. Wet detention ponds shall have littoral zone plantings, and dry retention ponds shall have supplemental plantings consisting of species native to Florida. The required property owner's association shall be responsible for the maintenance of Low Impact Design Elements and in no event shall they be the responsibility of the City of DeLand. Low Impact Development standards will be incorporated in the stormwater design to the greatest extent practicable.

M. Access and Transportation System Improvements. All access and transportation system improvements shall be provided in accordance with the LDR. The parcel shall be developed in substantial accordance with the following access and transportation system improvements:

1. Access. Access to the site will be from North Hill Avenue. The Planned Development Plan indicates the anticipated connection location; however, the final location may vary due to final engineering design and permitting considerations. The final location and design of the access driveway shall be approved by the City fire department to ensure adequate emergency access. The development shall meet height/weight/slope and turning radius for fire apparatus, as approved by the City fire department.

2. Waiver. The secondary access requirements under Land Development Regulations §33-90.05(g)(4) and §33-90.03(h)1.b. A turn-around for fire equipment is being provided in this project and is depicted on the Planned Development Plan. The turnaround may be designed and constructed in a similar manner as approved for the primary access driveway, but alternative, stabilized surfaces and designs may be approved by the fire department during subdivision or final site plan review.

3. Transportation System Improvements. Transportation system improvements will be provided as may be required by permitting agencies.

N. Internal Roadways. A primary access driveway will be developed as detailed on the Planned Development Plan. The access driveway will be privately owned

and maintained by the Homeowners Association.

O. Maintenance Association. The Applicant will establish a Homeowners Association ("HOA") to manage and maintain all common areas, including but not limited to the access driveway, stormwater management system, landscape buffers, tree protection areas, common area amenities and community signage. All subdivision improvements to be maintained by the HOA shall be identified during subdivision or final site plan review and dedicated to the HOA on the final plat and by separate instrument, as appropriate. Proof that the HOA and copies of all recorded agreements, covenants and restrictions relating to the HOA shall be subject to review and approval by the City during subdivision or final site plan review.

With respect to the enforcement of any HOA agreements, covenants, easements or restrictions entered into between the Applicant and the owners or occupiers of property within the North Hill Villas PD, the City of DeLand shall only enforce the provisions of the "Development Agreement" and City of DeLand Land Development Regulations Ordinance No. 2013-11, as amended, whichever is applicable, and not the private agreements entered into between the aforementioned parties.

P. Reverter Provision: The terms of this Development Agreement shall be vested upon issuance of a final development order for the first phase of the development, which shall occur within five (5) years from the effective date of this ordinance. If not vested, the City Commission may rezone the property as may be necessary or appropriate to protect adjoining properties or the public health, safety and welfare, unless

the City Commission, for good cause shown, shall extend the time period indicated in this paragraph.

Q. Binding Effect of Plans; Recording; and Effective Date. The Planned Development Plan, including any and all amendments shall bind and inure to the benefit of the Applicant and his successor in title or interest. The North Hill Villas PD zoning, provisions of the "Development Agreement," and all approved plans shall run with the land and shall be administered in a manner consistent with Article 12 of the LDR.

This Ordinance and all subsequent amendments shall be filed with the Clerk of the Court and recorded within forty-five (45) days following execution of the document by the City Commission, in the Official Records of Volusia County, Florida. One copy of the document, bearing the book and page number of the Official Record in which the document was recorded, shall be submitted to the Planning Department for placement in the public file. The date of recording of this document shall constitute the effective date of the North Hill Villas PD or its subsequent amendments. The applicant shall pay all filing costs for recording documents.

DONE and ORDERED by the City Commission, City of DeLand, Florida, this ____ day of _____, 20___.

ATTEST: City Commission of DeLand Florida

_____ _____

Michael P. Pleus
City Manager

Christopher M. Cloudman
Mayor

STATE OF FLORIDA
CITY OF DELAND

The foregoing instrument was acknowledged before me by means of ☐ physical presence or ☐ online notarization this ____ day of _____, 20___, by Michael P. Pleus and Christopher M. Cloudman, as City Manager and Mayor of the City of DeLand, respectively, on behalf of the City of DeLand, and who are personally known to me.

NOTARY PUBLIC, STATE OF FLORIDA
Type or Print Name:
_____
Commission No.:_____
My Commission Expires:_____

WITNESSES:

APPLICANT/OWNER:
VIDAL HOMES, LLC
a Florida limited liability company

_____

By:_____
Yohalmen Vidal, Manager

_____
Printed Name

_____

_____
Printed Name

STATE OF _____
COUNTY OF _____

The foregoing instrument was acknowledged before me by means of ☐ physical presence or ☐ online notarization this ____ day of _____, 20___, by _____ as Manager of VIDAL HOMES, LLC, who is personally known to me or who has produced _____ as identification.

NOTARY PUBLIC, STATE OF FLORIDA

Type or Print Name:

_____

Commission No.:_____

My Commission Expires:_____

EXHIBIT "A"
LEGAL DESCRIPTION

(PER DEED):

PARCEL 1:
LOT 1, AND THE NORTH 42 FEET OF LOTS 23 AND 24; AND THE NORTH 42 FEET OF THE EAST 1/2 OF LOT 22, DELMAY SUBDIVISION, ACCORDING TO THE PLAT THEREOF AS RECORDED IN MAP BOOK 8, PAGE 74, PUBLIC RECORDS OF VOLUSIA COUNTY, FLORIDA.

PARCEL 2:
LOT 2, DELMAY SUBDIVISION, ACCORDING TO THE PLAT THEREOF AS RECORDED IN MAP BOOK 8, PAGE 74, PUBLIC RECORDS OF VOLUSIA COUNTY, FLORIDA.

PARCEL 3:
LOTS 3, 4, 5, 6 AND 7, DELMAY SUBDIVISION, ACCORDING TO THE PLAT THEREOF AS RECORDED IN MAP BOOK 8, PAGE 74, PUBLIC RECORDS OF VOLUSIA COUNTY, FLORIDA.

(PER SURVEYOR):

LOTS 1 THROUGH 7, THE NORTH 42 FEET OF LOTS 23 THROUGH 24, THE NORTH 42 FEET OF THE EAST 1/2 OF LOT 22, AND THAT VACATED PORTION OF CHURCH STREET, AS RECORDED IN OFFICIAL RECORDS BOOK 8701, PAGE 2887, DELMAY SUBDIVISION, ACCORDING TO THE PLAT THEREOF AS RECORDED IN MAP BOOK 8, PAGE 74, OF THE PUBLIC RECORDS OF VOLUSIA COUNTY, FLORIDA BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHEAST CORNER OF LOT 24, DELMAY SUBDIVISION, ACCORDING TO THE PLAT THEREOF AS RECORDED IN MAP BOOK 8, PAGE 74, THENCE, ALONG THE EASTERLY LINE SAID LOT 24, NORTH 01°10'44" WEST, 103.00 FEET TO THE POINT OF BEGINNING; THENCE, DEPARTING SAID EASTERLY LINE OF LOT 24, NORTH 01°10'44" WEST, 125.00 FEET THE SOUTHWEST CORNER OF THE NORTHERLY 42.00 FEET OF THE EAST ½ OF LOT 22, DELMAY SUBDIVISION; THENCE, ALONG THE WESTERLY LINE OF THE EAST 1/2 OF LOT 22, DELMAY SUBDIVISION, NORTH 00°57'50" WEST, 42.00 FEET TO THE NORTHWESTERLY CORNER OF THE EAST 1/2 OF LOT 22, DELMAY SUBDIVISION; THENCE, ALONG THE SOUTHERLY LINE OF LOTS 3 THROUGH 7, DELMAY SUBDIVISION, SOUTH 89°52'42" WEST, 225.00 FEET TO THE SOUTHWEST CORNER OF SAID LOT 7; THENCE, DEPARTING SAID SOUTHERLY LINE OF LOTS 3 THROUGH 7 AND ALONG THE WESTERLY LINE OF SAID LOT 7 , NORTH 01°08'02" WEST,

170.00 FEET TO THE NORTHERLY LINE OF THAT VACATED PORTION OF CHURCH STREET, AS RECORDED IN OFFICIAL RECORDS BOOK 8701, PAGE 2887 OF THE PUBLIC RECORDS OF VOLUSIA COUNTY, FLORIDA; THENCE, ALONG THE NORTHERLY LINE OF THAT VACATED PORTION OF CHURCH STREET, NORTH 89°52'42" EAST, 345.00 FEET; THENCE, ALONG THE EASTERLY LINES OF LOT 1 AND 24, SOUTH 01°10'45" EAST, 212.00 FEET TO THE POINT OF BEGINNING.

CONTAINS 1.49 +/- ACRES, MORE OR LESS

EXHIBIT “B”
DEVELOPMENT PLAN MAP

RESIDENTIAL AREA

a)	Minimum Lot Area of	1,452 sq/ft min. ,1.650 sq/ft max
b)	Minimum Lot Width of	22 ft.
c)	Minimum Lot Depth of	65 ft.
d)	Total Area (Acreage)	1.49 acres/64,904 SF
e)	Minimum Individual Unit Size of	1,500 sq. ft.
f)	Maximum Building Height of	35' ft.
g)	Maximum Unit Count Per Building:	5 units
h)	Minimum Setbacks:	
	a. Front yard:	20 ft.
	b. Rear yard:	10 ft.
	c. Side yard:	0 ft.
	d. Sideyard (end units)	3 ft
	e. Between buildings (side to side):	15 ft.
	f. Between buildings (front to front or rear to rear):	50 ft.
iii.	Eaves: "Into any required setback"	42"
i)	Maximum Impervious Surface Area:	60%
j)	Maximum Townhouse Unit Count:	13 unit

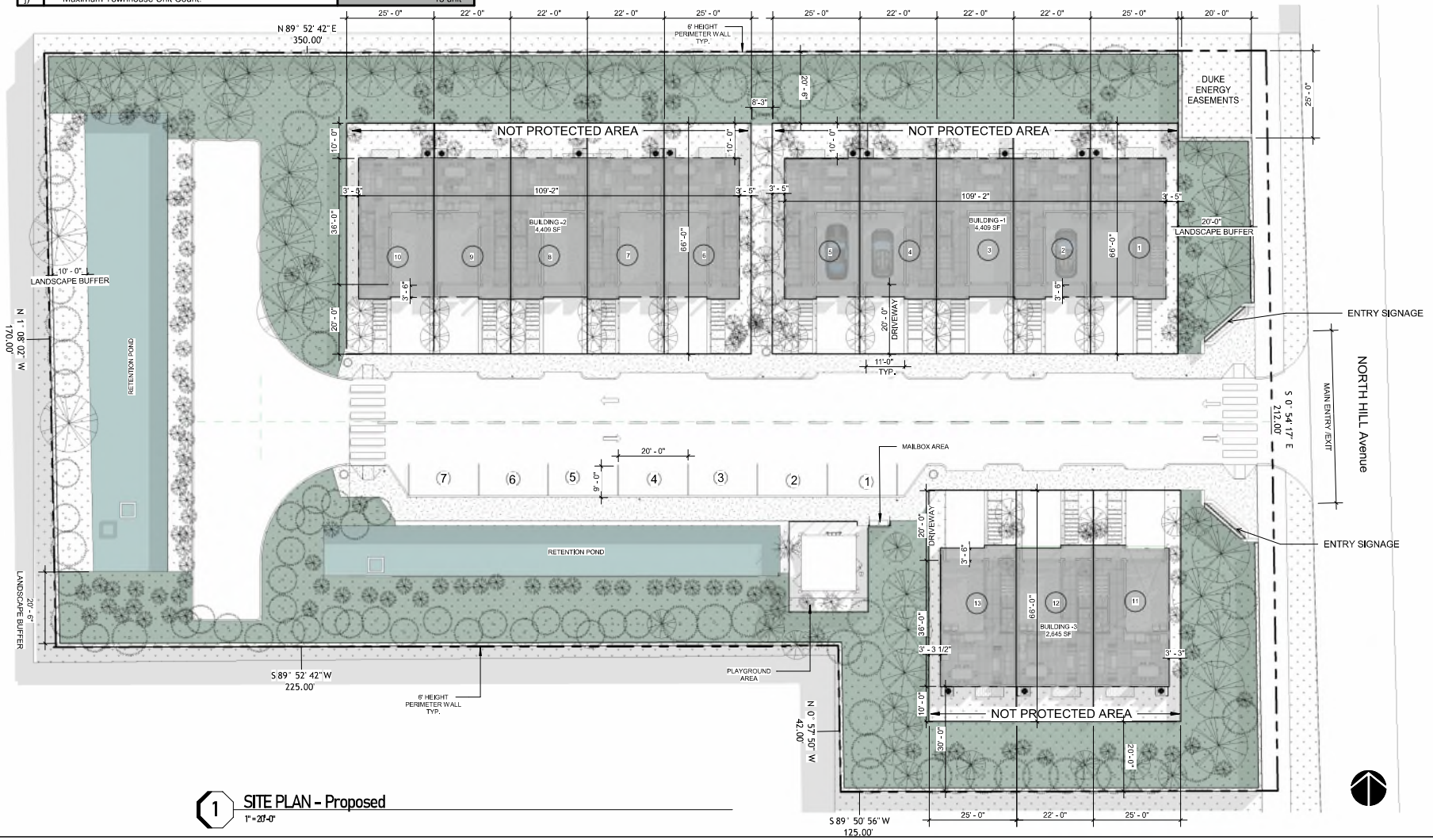
PROPOSE BUILDING (11,463 SF)

PROPOSED CONCRETE SIDEWALK (3,991 SF)

PROPOSED TREE PROTECTION AREA (TPA) (18,290 SF)

PROPOSED RETENTION PONDS

OPEN SPACES(NOT PROTECTED AREA)



1 SITE PLAN - Proposed
1" = 20'-0"

Project Description
Project Name: North Hill Villa
Address: North Hill Ave, Deland Fl
Client: Vidal Homes LLC.

Teams
Jose R Melo Assoc. AIA
Professional Designer

Sheet Name
Overall Site Plan

Revision Schedule
Revision # | Revision Description | Revision Date

General Notes
1- ALL DIMENSIONS AND CONDITIONS MUST BE CHECKED AND VERIFIED ON SITE BY THE CONTRACTOR AND SUB-CONTRACTORS, THE PROJECT MANAGER SHALL BE NOTIFIED IN WRITING OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH THE WORK.

Date: 11/20/2025
Scale: As indicated
Design by: JRM

A-100.2

303 Broadway st, Methuen
978 | 902 - 1152

EXHIBIT “C”
ARCHITECTURAL ELEVATIONS



4 Left Elevation Type IA Units-Proposed
1/8" = 1'-0"



3 Rigth Elevation Type IA Units-Proposed
1/8" = 1'-0"



2 Rear Elevation Type IA Units-Proposed
1/8" = 1'-0"



1 Front Elevation Type IA Units-Proposed
1/8" = 1'-0"

300 Broadway st, Methuen
978 | 902 . 1152

Project Description
Project Name: North Hill Villa
Address: North Hill Ave, Deland Fl
Client: Vidal Homes LLC.

Teams

Sheet Name
Architectural Elevations
Type IA Unit Views

Revision Schedule

Revision #	Revision Description	Revision Date

General Notes
1- ALL DIMENSIONS AND CONDITIONS MUST BE CHECKED AND VERIFIED ON SITE BY THE CONTRACTOR AND SUB-CONTRACTORS, THE PROJECT MANAGER SHALL BE NOTIFIED IN WRITING OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH THE WORK.

Date: 11/20/2025
Scale: 1/8" = 1'-0"
Design by: JRM

A-300



4 Right Elevacion View
1/8" = 1'-0"



3 Left Elevacion View
1/8" = 1'-0"



2 Rear Elevation Type IIA Units
1/8" = 1'-0"



1 Enlarged Elevation Type IIA Units-Proposed
1/8" = 1'-0"

300 Broadway st. Methuen
978 | 902 - 1152

Project Description
Project Name: North Hill Villa
Address: North Hill Ave, Deland Fl
Client: Vidal Homes LLC.

Teams

Sheet Name: Architectural Elevations Type IIA Unit Views

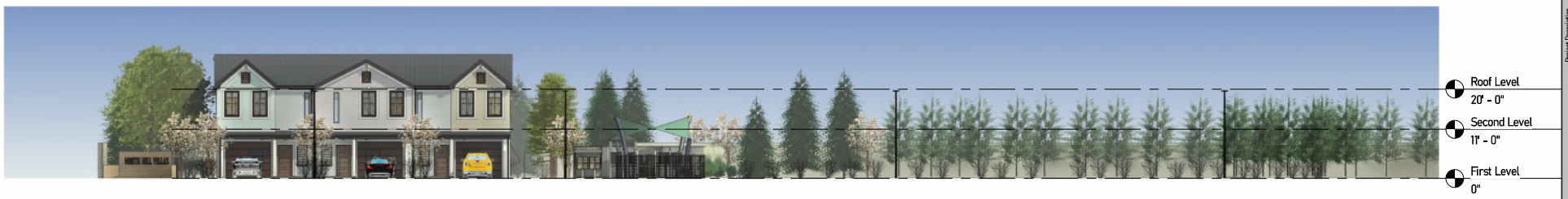
Revision Schedule

Revision #	Revision Description	Revision Date

General Notes
1- ALL DIMENSIONS AND CONDITIONS MUST BE CHECKED AND VERIFIED ON SITE BY THE CONTRACTOR AND SUB-CONTRACTORS, THE PROJECT MANAGER SHALL BE NOTIFIED IN WRITING OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH THE WORK.

Date: 11/20/2025
Scale: 1/8" = 1'-0"
Design by: JRM

A-301



2 Overall Elevation Type IIA Units -Proposal
1/16" = 1'-0"



1 Overall Elevation Type IA Units -Proposal
1/16" = 1'-0"

301 Broadway st, Methuen
978 | 902 . 1152

Project Description

Project Name: North Hill Villa

Address: North Hill Ave, Deland Fl

Client: Vidal Homes LLC.

Teams

Sheet Name: Overall Architectural Elevations

Revision Schedule

Revision #	Revision Description	Revision Date

General Notes

1- ALL DIMENSIONS AND CONDITIONS MUST BE CHECKED AND VERIFIED ON SITE BY THE CONTRACTOR AND SUB-CONTRACTORS, THE PROJECT MANAGER SHALL BE NOTIFIED IN WRITING OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH THE WORK.

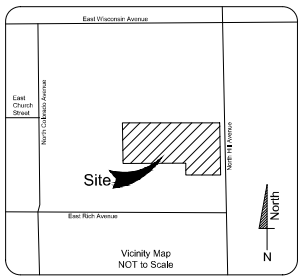
Date: 11/20/2025

Scale: 1/16" = 1'-0"

Design by: JRM

A-303

ALTA/NSPS Land Title Survey
Boundary Survey



Schedule B-II (Exceptions)

Issued by: Old Republic National Title Insurance Company
Your File No.: 15408OV
Issuing Agent: Alonso Title Company (Oviedo)
Effective Date: October 14, 2024 @ 5:00 PM

1. Any defect, lien, encumbrance, adverse claim, or other matter that appears for the first time in the Public Records or is created, attaches, or is disclosed between the Commitment Date and the date on which all of the Schedule B, Part I-Requirements are met.
No Adverse Claims or Other Matters Observed at Time of Survey.
2. Facts which would be disclosed by an accurate and comprehensive survey of the premises herein described. *Visible Ground Encroachments Shown if Any.*
3. Rights or claims of parties in possession. *Not a Survey Matter.*
4. Construction, Mechanic's, Contractors' or Materialsmen's lien claims, if any, where no notice thereof appears of record. *Not a Survey Matter.*
5. Easements or claims of easements not shown by the public records.
None Other than Those Provided to Surveyor at Time of Survey.
6. General or special taxes and assessments required to be paid in the year 2024 and subsequent years. *Not a Survey Matter.*
7. Restrictions, conditions, reservations, easements, dedications and other matters contained on the plat of Delmay Subdivision, as recorded in Map Book 8, Page 74, Public Records of Volusia County, Florida. *Nothing on Plat to Address.*
8. Easement to City of Deland contained in instrument recorded in O.R. Book 2706, Page 158, Public Records Volusia County, Florida. (Parcel 1 only)
Parcel Affected, Easements Shown Hereon.
9. Any lien provided by County Ordinance or by Ch. 159, F.S., in favor of any city, town, village or port authority, for unpaid service charges for services by any water systems, sewer systems or gas systems serving the land described herein; and any lien for waste fees in favor of any county or municipality. *Not a Survey Matter.*

-Benchmark Information-
NGS Datum Sheet
Designation: T 711
Point: DM3873
Elevation: 47.36'
(Elevations are based upon NAVD 88)

-Site Benchmark Information-
#1
Set ½" Iron & Cap "LB # 7623" In Ground.
Elevation: 81.55'
#2
Set ½ Iron & Cap "LB # 7623" In Ground.
Elevation: 80.74'

Legal Description (Per Deed):

PARCEL 1:
LOT 1, AND THE NORTH 42 FEET OF LOTS 23 AND 24, AND THE NORTH 42 FEET OF THE EAST 1/2 OF LOT 22, DELMAY SUBDIVISION, ACCORDING TO THE PLAT THEREOF AS RECORDED IN MAP BOOK 8, PAGE 74, PUBLIC RECORDS OF VOLUSIA COUNTY, FLORIDA.

PARCEL 2:
LOT 2, DELMAY SUBDIVISION, ACCORDING TO THE PLAT THEREOF AS RECORDED IN MAP BOOK 8, PAGE 74, PUBLIC RECORDS OF VOLUSIA COUNTY, FLORIDA.

PARCEL 3:
LOTS 3, 4, 5, 6 AND 7, DELMAY SUBDIVISION, ACCORDING TO THE PLAT THEREOF AS RECORDED IN MAP BOOK 8, PAGE 74, PUBLIC RECORDS OF VOLUSIA COUNTY, FLORIDA.

Legal Description (Per Surveyor):

LOTS 1 THROUGH 7, THE NORTH 42 FEET OF LOTS 23 THROUGH 24, THE NORTH 42 FEET OF THE EAST 1/2 OF LOT 22, AND THAT VACATED PORTION OF CHURCH STREET, AS RECORDED IN OFFICIAL RECORDS BOOK 8701, PAGE 2887, DELMAY SUBDIVISION, ACCORDING TO THE PLAT THEREOF AS RECORDED IN MAP BOOK 8, PAGE 74, OF THE PUBLIC RECORDS OF VOLUSIA COUNTY, FLORIDA BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHEAST CORNER OF LOT 24, DELMAY SUBDIVISION, ACCORDING TO THE PLAT THEREOF AS RECORDED IN MAP BOOK 8, PAGE 74, THENCE, ALONG THE EASTERLY LINE SAID LOT 24, NORTH 01°10'44" WEST, 103.00 FEET TO THE POINT OF BEGINNING;

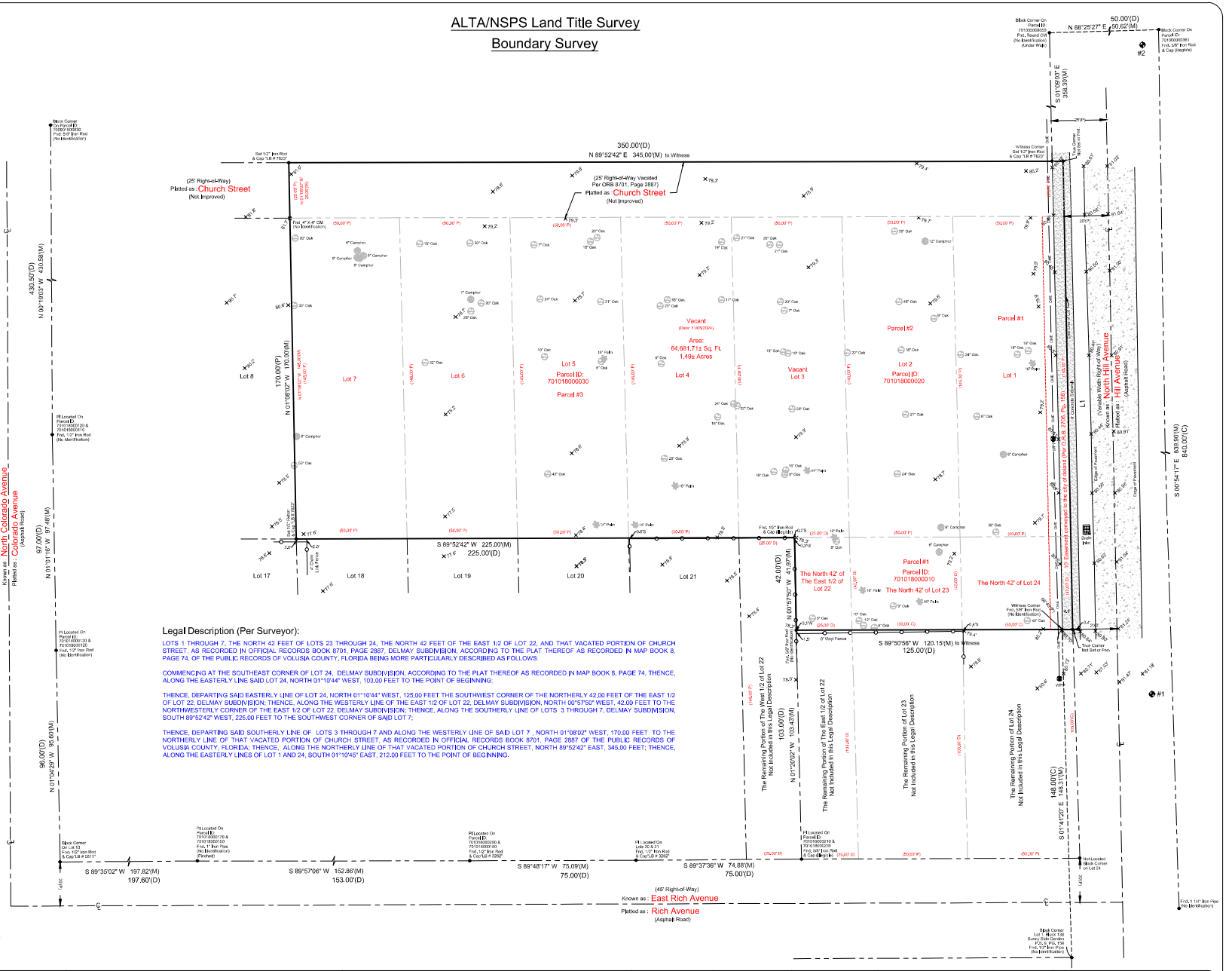
THENCE, DEPARTING SAID EASTERLY LINE OF LOT 24, NORTH 01°10'44" WEST, 125.00 FEET THE SOUTHWEST CORNER OF THE NORTHERLY 42.00 FEET OF THE EAST 1/2 OF LOT 22, DELMAY SUBDIVISION; THENCE, ALONG THE WESTERLY LINE OF THE EAST 1/2 OF LOT 22, DELMAY SUBDIVISION, NORTH 00°57'50" WEST, 42.00 FEET TO THE NORTHWESTERLY CORNER OF THE EAST 1/2 OF LOT 22, DELMAY SUBDIVISION; THENCE, ALONG THE SOUTHERLY LINE OF LOTS 3 THROUGH 7, DELMAY SUBDIVISION, SOUTH 89°52'42" WEST, 225.00 FEET TO THE SOUTHWEST CORNER OF SAID LOT 7;

THENCE, DEPARTING SAID SOUTHERLY LINE OF LOTS 3 THROUGH 7 AND ALONG THE WESTERLY LINE OF SAID LOT 7, NORTH 01°08'02" WEST, 170.00 FEET TO THE NORTHERLY LINE OF THAT VACATED PORTION OF CHURCH STREET, AS RECORDED IN OFFICIAL RECORDS BOOK 8701, PAGE 2887 OF THE PUBLIC RECORDS OF VOLUSIA COUNTY, FLORIDA; THENCE, ALONG THE NORTHERLY LINE OF THAT VACATED PORTION OF CHURCH STREET, NORTH 89°52'42" EAST, 345.00 FEET; THENCE, ALONG THE EASTERLY LINES OF LOT 1 AND 24, SOUTH 01°10'45" EAST, 212.00 FEET TO THE POINT OF BEGINNING.



L1
187.00'(D)
S 01°13'10" E 211.68'(M)
between Witnesses

Tree Note:
Palm - Denotes Tree Type
(18") - Diameter of Tree measured at Chest Height



There was NO Right of Way information provided to this Surveying Company at the time of the execution of this Boundary Survey. Therefore, this Survey is based upon field monumentation and occupation discovered on the date of 01-15-24, and delineated hereon the face of this Survey. Property Boundaries are subject to change, if or when, Right of Way information is discovered and determined to affect Subject Property. Said change is without hesitation, consultation or notification.

Flood Disclaimer:
BY PERFORMING A SEARCH WITH THE LOCAL GOVERNING MUNICIPALITY OR WWW.FEMA.GOV, THE PROPERTY APPEARS TO BE LOCATED IN ZONE X, THIS PROPERTY WAS FOUND IN CITY OF DELAND, COMMUNITY NUMBER 120037, DATED 02-19-2014.

ALTA/NSPS CERTIFICATION

Certified to: VIDAL HOMES LLC; ALOMA TITLE COMPANY; OLD REPUBLIC NATIONAL TITLE INSURANCE COMPANY;

This is to certify that this map or plat and the survey on which it is based were made in accordance with the 2021 Minimum Standard Detail Requirements for ALTA/NSPS Land Title Surveys, jointly established and adopted by ALTA and NSPS, and includes items 1, 2, 3, 4, 6(a), 7(a), 7(b)(1), 8, 9, 11(b), 13, 16, and 18 of Table A thereof.

The Fieldwork was completed on 01/15/2024.

Date of Plat or Map: 11/05/2024.

I hereby Certify that this Boundary Survey of the above Described Property is True and Correct to the Best of my Knowledge and Belief as recently Surveyed under my Direction on the Date Shown. Based on Information furnished to Me as Noted and Conforms to the Standard of Practice for Land Surveying in the State of Florida in accordance with Chapter 5J-17.052 Florida Administrative Codes. Pursuant to Section 472.027 Florida Statutes.

Patrick K. Ireland, PSM 6637

Gross Land Area: 64,871.50 Square Feet or 1.26 Acres more or less

Setback Requirements: Front: XX
Side: XX
Rear: XX

Zoning: XXX

Square footage of Buildings: 0.00 Square Feet more or less

Parking Space Size: (Standard) 00 Parking Stripes found at time of Survey
(Handicap) 00 Parking Stripes found at time of Survey

In the process of conducting the fieldwork, no of earth moving work, building construction or building additions within recent months were observed.
In the process of conducting the fieldwork, no evidence of recent street or sidewalk construction or repairs were observed.
In the process of conducting the fieldwork, no evidence of site use as a solid waste dump, sump or sanitary landfill was observed.
In the process of conducting the fieldwork, no evidence of cemeteries and/or burial grounds were observed.
In the process of conducting the fieldwork, no evidence of any water features were observed.
In the process of conducting the fieldwork, no evidence of wetland delineation markers were observed.
Vehicular Access to Subject Property is provided by:
North Hill Avenue

Revisions
11/05/24 - TCK
11/14/24 - TCD
06/05/25 - AWW
06/27/25 - AWW

Field Date: 01/11/24 | Date Completed: 01/17/24
Drawn By: SD | File Number: IS-125850

-Legend-

C	- Calculated	PC	- Point of Curvature
CB	- Centerline	PG	- Page
CB	- Concrete Block	PI	- Point of Intersection
CM	- Concrete Monument	P.O.B.	- Point of Beginning
Conc.	- Concrete	P.O.C.	- Point on Line
D	- Description	PP	- Power Pole
D.E.	- Drainage Easement	P.R.M.	- Permanent Reference Monument
Esmt.	- Easement		
F.E.M.A.	- Federal Emergency Management Agency	PT	- Point of Tangency
F.F.E.	- Finished Floor Elevation	R	- Radius
Fnd.	- Found	Rebar	- Reinforcing Steel
IP	- Iron Pipe	R&C	- Record & Calc
L	- Length (Arc)	Rec.	- Recorded
M	- Measured	Rstd.	- Rerated
N&D	- Nail & Disk	Set	- Set ½" Rebar & Cap "LB 7623"
N.R.	- Non-Radial	Typ.	- Typical
O.R.B.	- Official Records Book	UE	- Utility Easement
P	- Plat	WM	- Water Meter
P.B.	- Plat Book		- Delta (Central Angle)
	- Wood Fence		- Chain Link Fence

-Notes-
>Survey is Based upon the Legal Description Supplied by Client.
>Subject to any Easements and/or Restrictions of Record.
>Bearings Shown hereon are based upon the Florida State Plane Coordinate System, East Zone, NAD 83.
>Building Ties are NOT to be used to reconstruct Property Lines.
>Fence Ownership is NOT determined.
>Roof Overhangs, Underground Utilities and/or Footers have NOT been located UNLESS otherwise noted.
>Septic Tanks and/or Drainfield locations are approximate and MUST be verified by appropriate Utility Location Companies.
>Use of This Survey for Purposes other than Intended, Without Written Verification, Will be at the User's Sole Risk and Without Liability to the Surveyor. Nothing Hereon shall be Construed to give ANY Rights or Benefits to Anyone Other than those Certified.
>If Flood Zone Determination Shown Hereon is Given as a Courtesy, and is Subject to Final Approval by F.E.M.A. This Determination may be affected by Flood Factors and/or other information NOT HERE known by NOR given to this Surveying Company at the time of this Endeavor. Ireland & Associates Surveying Inc, and the signing surveyor assume NO Liability for the Accuracy of this Determination.

Ireland & Associates Surveying, Inc.
800 Currency Circle Suite 1020
Lake Mary, Florida 32746
www.irelandsurveying.com
Office-407.678.3366
Fax-407.320.8165

Juan Manuel Vasquez

P.O. Box 560487, Orlando, FL 32856 * Ph: 407.219.8277 * Juan@vasquezcivil.com

July 8, 2024

City of Deland Engineering Department
1102 S Garfield Ave
Deland, Fl 32724

Reference Address	E Church St, Deland, Fl 32724
Owner	Vidal Homes Llc

Subject **Traffic Statement for 13 Apartment Units**

I, Juan Manuel Vasquez, licensed as Professional Engineer in the State of Florida, PE No. 95783 **hereby certify the traffic statement below** per the Trip Generation Manual, 11th Edition:

Traffic Statement:

THIS PROJECT WILL GENERATE APPROXIMATELY 8 PM PEAK HOUR TRIPS PER DAY (0.56 TRIPS PER UNIT) AND APPROXIMATELY 95.16 AVERAGE DAILY TRIPS PER DAY (7.32 TRIPS PER UNIT) BASED ON THE TRIP GENERATION MANUAL, 11TH. EDITION FOR LAND USE (220) MULTI–FAMILY HOUSING (LOW RISE).

In accordance with the current Trip Generation Manual, 11th Edition.

I certify that my statements herein are true and accurate to the best of my belief.

Sincerely,

Juan M Vasquez

Digitally signed by Juan M Vasquez
Date: 2024.07.08 10:47:49 -05'00'

Juan Manuel Vasquez
State of Florida Professional Engineer
PE No. 95783

School Board of Volusia County

Ms. Jamie M. Haynes, Chair
Mr. Ruben Colón, Vice Chair
Ms. Krista Goodrich
Mrs. Jessie Thompson
Ms. Donna Brosemer

Carmen J. Balgobin, Ed.D
Superintendent of Schools

School Adequate Capacity Determination
Finding of Adequate Capacity Letter

August 28, 2025

Mr. Mark A. Watts, Esq
Cobb Cole
231 N Woodland Blvd
DeLand, FL 32720

RE: North Hill Villas – City of DeLand
School Concurrency Case # 24-07-25-001-A

Mr. Watts:

The County Charter requires any Comprehensive Plan Amendment or Rezoning that allows increased residential density to be effective only when adequate public schools can be timely planned and constructed to serve the projected increase in student population. The district uses this requirement as the guiding principle behind the school adequate capacity review.

District staff have reviewed the school concurrency application for the proposed project known as North Hill Villas, associated with 1.49 +/- acres of property. The property is located at or near the intersection of E Rich Ave and N Hill Ave within DeLand city limits. Information provided in the application indicates the proposed project would provide thirteen (13) multi-family units.

The district uses a county wide Student Generation Rate (SGR) of (0.137) per multi-family dwelling unit to calculate projected students. By applying the SGR to the use types in Table 1 below, the project could generate two (2) full time students.

Table 1

UNIT TYPE	SGR	UNIT COUNT	STUDENTS GENERATED
Single Family Dwelling Unit	0.258	0	0
Multifamily Dwelling Unit	0.137	13	2
Manufactured Home Dwelling Unit	0.052	0	0
Total		**13**	**2**

When performing an adequate capacity review, district staff evaluates the effects of the proposed change compared to any remaining permanent capacity within the impacted schools, up to 100%, Table 2 (next page). The projected increase in student population may be over 100% if there are plans to serve increased student population in that planning area within the long-term planning horizon. A finding of adequate capacity may be issued in either case.

Table 2

Schools	SY 2024/25 Enrollment	% of Permanent Capacity	Plans for Capacity Increase Long-Term	Traditional K-12 students projected
Blue Lake Elementary	541	96%	No	1
DeLand Middle	1,067	99%	No	0
West CSA (DeLand High)	2,956	113%	No	1
Other				0

The student projections generated by this project **will** increase the existing percentage above 100% permanent capacity at the high school level. However, the concurrency service area (CSA) for DeLand High is over 100% but below 120% for level of service (LOS) standards. Based on this, the school district has no objections to the proposed development plan.

Minimum planning considerations should include pedestrian and vehicular access, safety, connectivity, and buffering. Additional considerations, particularly for gated and muti-family communities, include accessibility for school buses, by ensuring a turn radius of at least 60 feet at all entrances and exits, and the inclusion of dedicated pickup/drop off sites.

All future development orders, such as site plans and subdivisions, are subject to school concurrency review. School concurrency will be evaluated at the time when the impact of development is specifically quantified and known. Only funded school improvements and then current capacity will be considered at that time.

No student reservations have been made at this time.

Please note the School Board has the right to adjust the attendance boundaries to balance the student enrollment populations at these area schools. Consequently, students generated from this project may not attend the currently assigned schools.

Should you need additional information, please contact me at (386) 734-7190, ext. 50802.

Sincerely,

James F. Roberts
Specialist, Planning & GIS

CC: Carmen J. Balgobin, Ed.D, Superintendent of Schools
Ron Young, Director of Planning & Construction
Patricia S. Smith, AICP, Planning Coordinator
Kendall Story, CNU-A, Senior Planner, City of DeLand

FACILITIES SERVICES
3750 OLSON DRIVE ◆ DAYTONA BEACH, FL 32124
PHONE: (386) 947-8786 ◆ FAX (386) 506-5056

Finding of Adequate School Capacity

VOLUSIA COUNTY SCHOOL BOARD

Project Information	
Project Name	North Hill Villas
VCSB Project #	**24-07-25-001-A**
Jurisdiction Project #	
Parcel ID Numbers	7010-18-00-0010; 7010-18-00-0020 7010-18-00-0030
Project Location	E Rich Ave and N Hill Ave
Potential Residential Units	13 Multi-Family Units
Property Owner/Applicant	Mark A. Watts, Esq Cobb Cole

Notes: Additional review will be required at the time of subdivision/site plan submittal(s). No Student Reservations have been made.

Based upon the Findings of Fact, pursuant to School Board Policy 612 and Section 206 of the County Charter, the school district has determined at this time that school capacity is adequate to serve the proposed increase in residential density. This Finding shall constitute competent substantial evidence that adequate public school capacity is likely to be available at the time it is required to serve the planned new development.

Capacity is not being reserved with this Finding unless otherwise noted on this document. This Finding of Adequate School Capacity allows this subject project to continue through the Comprehensive Plan Amendment and/or rezoning process; however, it may be subject to additional school capacity review in the future.

James F. Roberts
Specialist, Planning & GIS

August 28, 2025
Issue Date

Created: 9/2007
Owner: Facilities Services

2007-073-VCS
Print Locally

VCSB Schools Impacted by Development

School Concurrency Review - North Hill Villas

VOLUSIA COUNTY SCHOOLS
PLANNING AND BUSINESS SERVICES
Created August 2025

