

FINAL DRAFT

# Intelligent Transportation Systems Technical Memorandum

**State Road 414 Expressway Extension**  
**Project Development and Environment Study**  
From US 441 to SR 434  
Orange County and Seminole County, Florida

CFX Project Number: 414-227

**Prepared for:**

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EXPRESSWAY  
AUTHORITY



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**Acronyms and Abbreviations**

|         |   |
|---------|---|
| CAV     | connected and autonomous vehicles                         |
| CCTV    | closed-circuit television                                 |
| CFX     | Central Florida Expressway Authority                      |
| DCS     | data collection sensors                                   |
| DMS     | dynamic message sign                                      |
| EB      | eastbound   |
| FDOT    | Florida Department of Transportation                      |
| I-4     | Interstate 4  |
| ITS     | Intelligent Transportation Systems                        |
| mph     | mile(s) per hour  |
| MVDS    | microwave vehicle detection system                        |
| PD&E    | Project Development and Environment                       |
| ROW     | right-of-way  |
| RTMC    | Regional Transportation Management Centers                |
| SM      | single mode   |
| SR 414  | State Road 414  |
| SR 429  | State Road 429  |
| SR 434  | State Road 434  |
| STA     | Station   |
| TMS     | traffic monitoring station                                |
| US 441  | U.S. Highway 441  |
| VDS-AVI | vehicle detection system-automatic vehicle identification |
| WB      | westbound   |

# 1. Project Overview

## 1.1 Project Background and Description

The Central Florida Expressway Authority is conducting the State Road 414 Expressway Extension Project Development and Environment Study to evaluate alternatives for a proposed grade-separated expressway extension of the tolled SR 414 (John Land Apopka Expressway). The existing SR 414 Expressway provides regional connectivity from State Road 429 and U.S. Highway 441 in Apopka and extends south and east to SR 414 (Maitland Boulevard) just east of US 441. Figure 1-1 presents the Regional Location Map. The study limits extend along the existing SR 414 (Maitland Boulevard) corridor from US 441 (Orange Blossom Trail) to State Road 434 (Forest City Road). Figure 1-2 presents the Project Location Map. The approximate 2.3-mile-long study corridor generally runs along the boundary of Orange County and Seminole County and is located within the cities of Maitland (Orange County) and Altamonte Springs (Seminole County). Both CFX and the Florida Department of Transportation own portions of SR 414 within the project study limits. CFX owns and operates the SR 414 (John Land Apopka Expressway) from SR 429 to just east of US 441, and FDOT owns and operates SR 414 (Maitland Boulevard) from just east of US 441 to U.S. Highway 17/U.S. Highway 92. The existing SR 414 (Maitland Boulevard) is a four-lane divided urban principal arterial with three major signalized intersections at Bear Lake Road/Rose Avenue, Eden Park Road and Magnolia Homes Road, and an unsignalized intersection at Gateway Drive between the grade-separated intersections of SR 414/US 441 and SR 414/SR 434. A minor grade-separated overpass exists over the Little Wekiva Canal and an access road between the Lake Lotus Park and Ride lot and Lake Lotus Park.

The PD&E Study is evaluating alternatives for a proposed grade-separated SR 414 Expressway Extension to provide system linkage between the western terminus of the SR 414 (John Land Apopka Expressway) and Interstate 4. The SR 414 Expressway Extension includes alternatives for a facility with up to two lanes in each direction from US 441 to SR 434. Project alternatives involve various configurations of grade-separated express lanes on SR 414 (Maitland Boulevard) to provide needed capacity between US 441 and SR 434 while maintaining the existing local access lanes. Alternatives considered include reversible, bi-directional and convertible express lanes along the project corridor to avoid right-of-way acquisition needs.

Prior to the PD&E Study, CFX completed the SR 414 Reversible Express Lanes Schematic Report that included an assessment of tolled, directional express lanes within the median of SR 414 (CFX 2019). The Report recommended a two-lane, reversible, grade-separated viaduct in the median of SR 414. The Report also found that a single lane bi-directional express lane would require a 75 percent wider bridge and was not considered viable.

The proposed improvements also include reconfiguring the existing at-grade SR 414 (Maitland Boulevard) to accommodate the SR 414 toll facility while maintaining two SR 414 local access lanes in each direction. The study will involve analysis of intersection improvements, bridge modifications at Lake Bosse and Little Wekiva Canal, stormwater management facilities, pedestrian and bicycle needs and access management modifications. The No-Build Alternative is a viable option throughout the study.



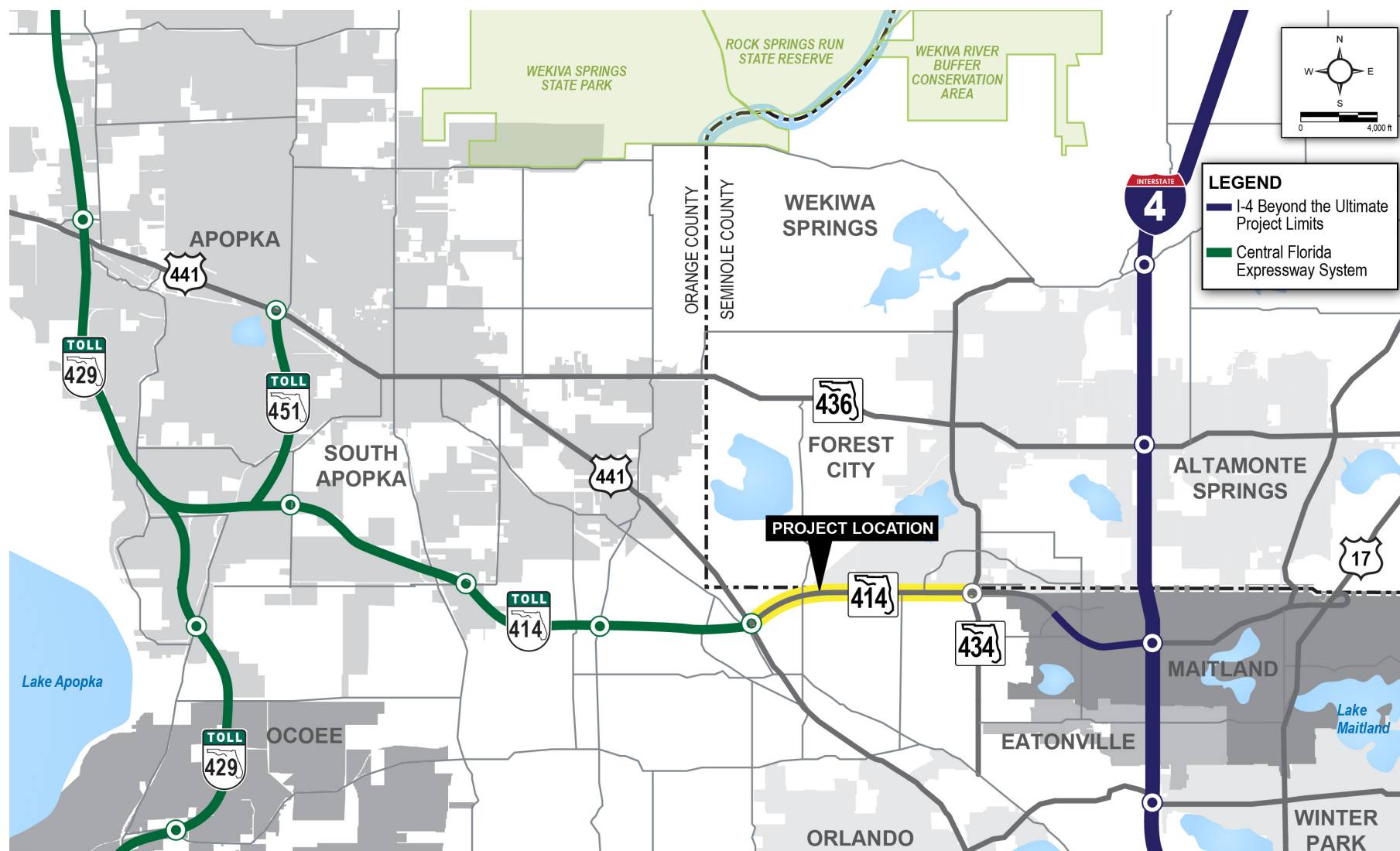


Figure 1-1. Regional Location Map

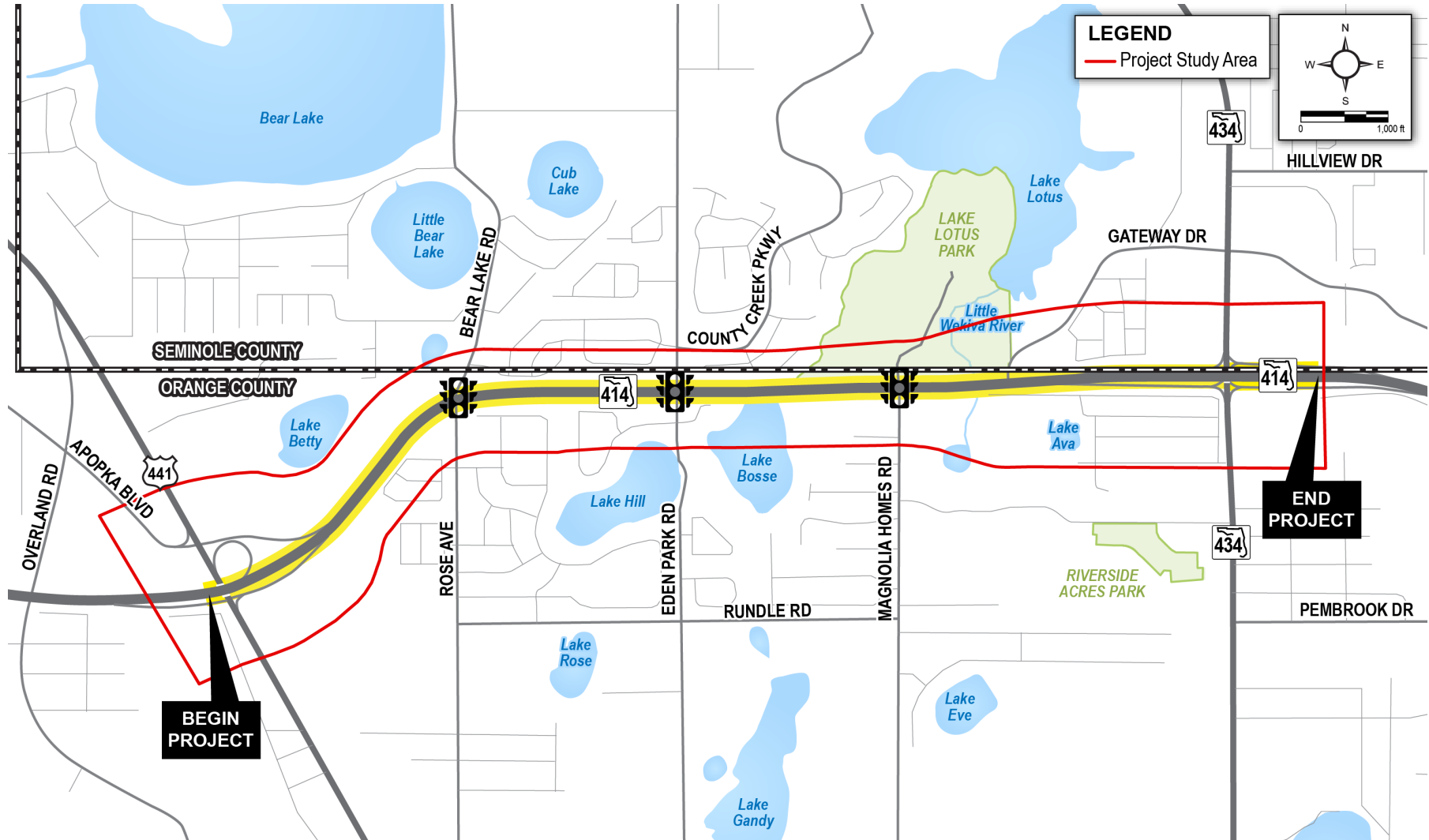


Figure 1-2. Project Location Map

## **1.2 Purpose and Need**

The purpose of the SR 414 Expressway Extension PD&E Study is to provide needed capacity on SR 414 and improve system connectivity between SR 429 and I-4 to meet future traffic needs. The 2.3-mile-long project corridor of SR 414 is an arterial connecting two limited-access facilities. The proposed project will complete the limited-access gap between US 441 and SR 434 and provide limited-access regional connectivity between SR 429 and I-4. The proposed grade-separated SR 414 Expressway Extension will separate the through traffic from the local traffic, allowing for greater mobility and reduced congestion for both facilities. The proposed improvements are to 1) accommodate anticipated transportation demand, 2) improve safety, 3) improve system connectivity/linkage and 4) support multimodal opportunities.

## **1.3 Report Purpose**

This Intelligent Transportation Systems Technical Memorandum for SR 414 Expressway Extension PD&E Study provides a brief overview of the project scope, methodology followed to conduct the study, evaluation of existing ITS condition along Maitland Boulevard (SR 414) corridor and development of proposed ITS concept plans for the Preferred Alternative along SR 414 Expressway Extension and at-grade Maitland Boulevard.

## **1.4 Alternatives Considered**

Alternatives were evaluated for environmental and operational constraints. An at-grade alternative within the median of SR 414 was eliminated because while it provided uninterrupted travel along SR 414, traffic from the local cross streets would not be able to cross Maitland Boulevard. Another alternative considered included an adjacent corridor to SR 414. However, because Maitland Boulevard is mostly developed, this alternative was not viable. Finally, an alternative that included individual overpasses at each of the existing intersections was also considered. However, because of the limited spacing between each intersection, this alternative was not feasible and was, therefore, eliminated.

Viable alternatives were developed and presented for public input at the Alternatives Public Workshop held on February 10, 2021. These viable alternatives included roadway concepts for the SR 414 Expressway Extension project, including the SR 414 toll lanes and the Maitland Boulevard local access lanes. The viable alternatives were updated after the Alternatives Public Meeting to reflect ongoing alternatives refinements that avoid and minimize environmental impacts.

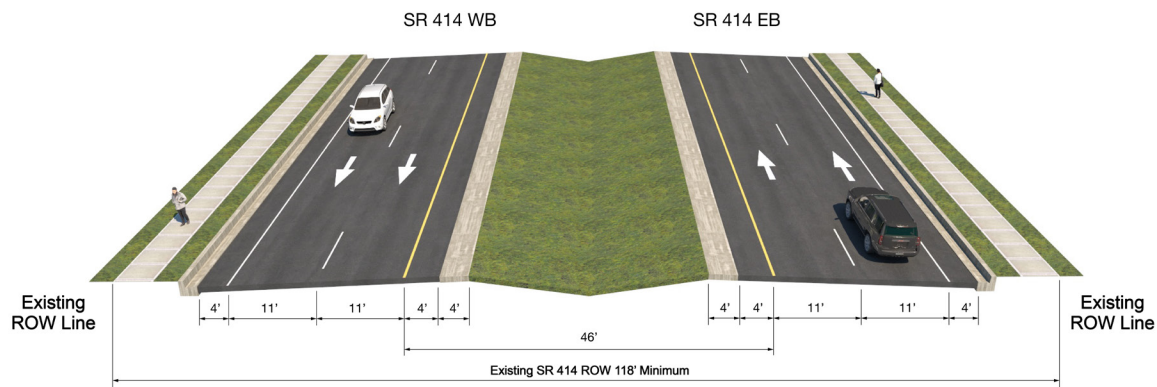
### **1.4.1 Preferred Alternative**

As a result of the alternatives analyses conducted for the project, a Preferred Alternative was identified for further analysis and public input. The Preferred Alternative involves an elevated SR 414 Expressway Extension toll facility to serve regional traffic and at-grade Maitland Boulevard local access lanes (non-tolled) from US 441 to SR 434. The proposed SR 414 Expressway Extension typical section for the Preferred Alternative includes the elevated SR 414 facility in the median, as four 12-foot-wide express lanes (two lanes per direction) separated by a median barrier wall. The Preferred Alternative also includes maintaining the existing Maitland Boulevard access lanes at-grade with two lanes per direction on either side and below the SR 414 Expressway Extension. The at-grade portion of the facility on Maitland Boulevard will maintain the existing pavement width (60 feet) but shifts and restripes the existing lanes to provide a 7-foot-wide buffered bike lane east of Bear Lake Road. Using these recommendations to minimize ROW and ongoing traffic analysis, the Preferred Alternative is further

evaluated as the study progresses. As part of the Preferred Alternative, operational improvements at intersections are anticipated to accommodate the elevated SR 414 Expressway Extension while maintaining local access at cross streets. In addition, impacts to environmental resources including social, cultural, natural and physical will be considered as the Preferred Alternative is further developed.

#### 1.4.2 No-Build Alternative

The No-Build Alternative for the study area assumes previously programmed improvements are built including widening SR 414 to six lanes (at-grade with no elevated expressway) from US 441 to SR 434 as noted in MetroPlan Orlando's 2045 Metropolitan Transportation Plan Cost Feasible Plan, Adopted December 9, 2020. The No-Build Alternative is not funded in the FDOT 5-Year Work Program, adopted July 2020 and is no longer programmed. Consistency with local transportation plans to update this change will be coordinated during the PD&E Study. The previously programmed improvements to SR 414 do not meet the future traffic needs through the year 2045 nor the purpose and need for the project to accommodate future transportation demand or improve system connectivity. An at-grade widening of SR 414 to six lanes would result in precluding a four-lane expressway within the median (two lanes per direction) or require substantial ROW impacts. Similarly, at-grade widening of SR 414 to six lanes and a two-lane expressway within the median (one lane per direction) would result in ROW impacts and impact the ability to maximize the use of the existing median to accommodate infrastructure (such as utilities and drainage needs). Therefore, the No-Build Alternative is not the Preferred Alternative. However, the No-Build Alternative shall remain under consideration throughout the PD&E Study for public input and to provide a comparison to the Preferred Alternative.



**Figure 1-3. SR 414 Existing Roadway**

## 2. Methodology

This section summarizes the data and methods used to analyze existing and future ITS associated with the project. The existing ITS infrastructure on SR 414 was identified using a combination of field reviews and as-built information provided by CFX and FDOT District 5.

The proposed ITS infrastructure will be designed based on the latest *CFX Design Guidelines* (CFX 2021a), *CFX ITS Design Standards* (CFX 2021b) and FDOT Standard Plans for Road Construction (FDOT 2021b).

The ITS equipment is not designed to be installed in the median, except in conjunction with barriers that are justified for other reasons, and all ITS equipment should be located outside the clear zone or as close as practical to the ROW line. In instances where there is a barrier that is justified for other reasons, ITS equipment may be located behind the barrier. Additionally, when ponds are present, the fiber optic cable should be placed in either front or back slopes.

All bridge attached conduit shall be bullet-resistant fiberglass and may require encasement for extra mechanical protection from potential damage.

All cabinet shells shall conform to National Electrical Manufacturers Association 3R standards. All ground-mounted cabinets shall be Model 334, and all Type 170 pole-mounted cabinets shall be Model 336S (Stretch), as defined in the FDOT Standard Specifications for Road and Bridge Construction (FDOT 2021c). All ITS cabinets and hubs shall be outfitted with Panduit brand cable management system. All cabinets shall be furnished with an uninterruptible power supply system, including a power transfer switch.

All closed-circuit television field assemblies shall be installed at the top of steel poles. A camera lowering system shall also be installed to permit maintenance without the need for a bucket truck.

Data collection sensors shall be installed on existing structures and/or in dynamic message sign enclosures. The DCS field equipment shall detect vehicles using Bluetooth/Wi-Fi readers and shall provide real-time vehicle information to CFX headquarters.

Traffic monitoring stations shall be capable of vehicle presence detection and traffic data collection. The TMS system shall be independent of and shall not interfere with the toll collection systems and/or the ITS device network operated by CFX or any other agency.

### 3. Existing Conditions

The existing ITS system backbone fiber optic cable is installed along eastbound and westbound of at-grade Maitland Blvd (SR 414) from west of Overland Road and continues east past US 441. The existing conduit system on SR 414 eastbound and westbound consists of eight 1-inch-diameter high-density polyethylene conduits. There is an existing CCTV camera and a walk-in DMS and associated equipment located on SR 414 westbound within the project limits east of US 441. There is existing FDOT and Seminole County fiber optic cable on the south side of SR 414 between Bear Lake Road and Magnolia Homes Road. This cable crosses over to the north side of SR 414 between Magnolia Homes Road and SR 434. The traffic signals in the project limits are maintained by Seminole County and there is an ongoing project to upgrade the traffic signal controllers to advanced traffic controller-type controllers. Table 3-1 lists the existing ITS equipment in the study area. Appendix A provides the locations of existing ITS devices.

**Table 3-1. Existing ITS Equipment**

| Equipment Type | Direction | Location                           | Structure Type      | Ownership                   |
|----------------|-----------|------------------------------------|---------------------|-----------------------------|
| CCTV           | WB        | Roadside, SR 414 at STA 412+65     | Pole                | CFX                         |
| 3-TMS          | WB        | Roadside, SR 414 at STA 416+80     | Pole                | CFX                         |
| DMS            | WB        | Roadside, SR 414 at STA 430+00     | Full Span           | CFX                         |
| CCTV           | WB        | Roadside, SR 414 at STA 434+30     | Pole                | CFX                         |
| CCTV           | WB        | Intersection (Bear Lake Road)      | Traffic Signal Pole | FDOT/Orange/Seminole County |
| 2-MVDS         | EB        | Intersection (Bear Lake Road)      | Traffic Signal Pole | FDOT/Orange/Seminole County |
| VDS-AVI        | EB        | Intersection (Bear Lake Road)      | Traffic Signal Pole | FDOT/Orange/Seminole County |
| MVDS           | WB        | Intersection (Eden Park Road)      | Traffic Signal Pole | FDOT/Seminole County        |
| MVDS           | EB        | Intersection (Eden Park Road)      | Traffic Signal Pole | FDOT/Seminole County        |
| CCTV           | EB        | Intersection (Eden Park Road)      | Traffic Signal Pole | FDOT/Seminole County        |
| MVDS           | WB        | Intersection (Magnolia Homes Road) | Traffic Signal Pole | FDOT/Seminole County        |
| MVDS           | WB        | Intersection (Magnolia Homes Road) | Traffic Signal Pole | FDOT/Seminole County        |
| MVDS           | EB        | Intersection (Magnolia Homes Road) | Traffic Signal Pole | FDOT/Seminole County        |
| CCTV & MVDS    | EB        | Intersection (Magnolia Homes Road) | Traffic Signal Pole | FDOT/Seminole County        |

Notes:

EB = eastbound

MVDS = microwave vehicle detection system

VDS-AVI = vehicle detection system-automatic vehicle identification

WB = westbound



All existing equipment located on traffic signal poles listed in Table 3-1 will be affected by the proposed project. The existing 3-TMS (CFX) at STA 416+80, CCTV (CFX) at STA 412+65 & CCTV (CFX) at STA 434+30 will be removed as they are expected to be impacted by the proposed project. The DMS (CFX) at STA 430+00 shall be relocated west to STA 410+30 (STA 1461+40 of proposed baseline).

## **4. Existing ITS System Replacement**

### **4.1 Fiber Optic Cable, Electric Cable, Splice Vaults, Pull Boxes, and Route Markers**

The existing fiber optic cable and electric power cable along the general lanes of SR 414 as well as the associated splice vaults, pull boxes, and fiber route markers will not be impacted and will remain. This could change depending on the actual construction conditions.

### **4.2 ITS Devices at Bear Lake Road Intersection**

The CCTV/2-MVDS/VDS-AVI at the Bear Lake Road intersection will be affected by the proposed roadway reconfiguration. The CCTV camera, 2-MVDS, VDS-AVI and associated infrastructure will be replaced along with new infrastructure as part of the intersection reconfiguration. This adjustment will include the replacement of associated communication and power infrastructure.

### **4.3 ITS Devices at Eden Park Road Intersection**

The CCTV/2-MVDS at the Eden Park Road intersection will be affected by the proposed roadway reconfiguration. The CCTV camera, 2-MVDS (at two corners) and associated infrastructure will be replaced along with new infrastructure as part of the intersection reconfiguration. This adjustment will include the replacement of associated communication and power infrastructure.

### **4.4 ITS Devices at Magnolia Homes Road Intersection**

The CCTV/4-MVDS at the Magnolia Homes Road intersection will be affected by the proposed roadway reconfiguration. The CCTV camera, 4-MVDS (at four corners) and associated infrastructure will be replaced along with new infrastructure as part of the intersection reconfiguration. This adjustment will include the replacement of associated communication and power infrastructure.

## **5. Proposed ITS System**

The proposed ITS will be used to monitor traffic and provide incident management and travel information to travelers within project corridor. The ITS consists of CCTV cameras, microwave vehicle detectors, dynamic message signs, automatic vehicle identification readers, traffic monitoring stations, data collection sensors and fiber optic cable for network communication. FDOT District 5 Regional Transportation Management Centers control, monitor, operate and manage traffic along regional interstates and major arterial roadways 24 hours a day, 7 days a week. The RTMC employs a dedicated staff trained to monitor and respond to the changing traffic conditions along SR 414 and the proposed SR 414 Expressway Extension. In addition, FDOT, CFX, Seminole County and Orange County will have to agree on a new or updated memorandum of understanding for the operation and maintenance of the proposed ITS infrastructure along SR 414 and the proposed SR 414 Expressway.

### **5.1 Fiber Communication**

The communication system for the SR 414 Expressway shall consist of backbone communication of 144 (2-72) single mode fiber optic cable on both sides of the road and distribution/lateral communication of 12 SM fiber optic cable. All field cabinets must be directly connected to the fiber optic network. Fiber optic cable lateral drops will be provided to all toll plazas on SR 414 Expressway. The ITS infrastructure will employ the fiber optic communication network in communicating with CFX Headquarters or Hiawassee Data Center via the mainline toll plazas on the project corridor. The proposed fiber communication infrastructure will follow CFX network standards and connect to CFX's network via existing fiber west of the project limits. The existing fiber optic cable communication along SR 414 will be used to connect proposed traffic signals and ITS infrastructure along SR 414.

### **5.2 CCTV Cameras**

CCTV spacing and line-of-sight distances shall be optimized to provide full video surveillance coverage without image degradation. The proposed high definition CCTV color cameras shall provide full (100 percent) overlapping video surveillance coverage of proposed SR 414 Expressway and SR 414. The CCTV cameras shall produce clear, detailed and usable video images of the areas, objects and other subjects visible from a roadside CCTV field site. In both color and monochrome modes, the video produced by the camera shall be true, accurate, distortion-free and free from transfer smear, over-saturation and any other image defect that negatively affects image quality under all lighting and weather conditions.

CCTV cameras will be used for incident management to monitor proposed SR 414 Expressway and SR 414. Appendix B shows proposed locations of CCTV cameras.

CCTV cameras installed on proposed SR 414 Expressway will be operated and maintained by CFX. CCTV cameras installed at intersections on SR 414 will be operated and maintained by FDOT/Orange County/Seminole County.

### **5.3 Dynamic Message Sign**

Travel advisory DMS is proposed for mainline proposed SR 414 Expressway and SR 414 and shall be installed before major exit points to provide traffic management information and travel time to

motorists. The DMS shall be a walk-in type, full matrix and full color. Traveler information DMS will be used for incident management and traveler information.

The DMS shall have a generator pad, transfer switch and auxiliary power connection installed. A leveled concrete pad shall be installed to support the DMS controller cabinet and portable generator.

Appendix B shows proposed locations of DMS.

#### **5.4 Microwave Vehicle Detection System/Traffic Monitoring Station**

Traffic monitoring stations are proposed at all ingress and egress points of the proposed SR 414 Expressway to provide vehicular traffic data consisting of volume, speed and occupancy between all interchanges and at all on- and off-ramps to general tolled lanes. The data shall be real time and provided for each lane. The TMS system shall be independent of and shall not interfere with the toll collection systems and/or the ITS device network operated by CFX or any other agency. Appendix B shows proposed locations of TMS.

MVDS shall be installed at all the signalized intersections along SR 414 and will be operated and maintained by FDOT/Orange County/Seminole County. Appendix B shows proposed locations of MVDS.

#### **5.5 Data Collection Sensor/Automatic Vehicle Identification**

DCS shall be installed on proposed structures and/or in DMS enclosures. The DCS field equipment shall detect vehicles using Bluetooth/Wi-Fi readers and shall provide real-time vehicle information to CFX headquarters. Appendix B shows proposed locations of DCS field equipment.

AVI shall be installed at Bear Lake Road signalized intersections along SR 414 and will be operated and maintained by FDOT/Orange County/Seminole County. Appendix B shows proposed locations of AVI.

#### **5.6 Connected Vehicle Technology**

Connected and autonomous vehicles implementation is rapidly approaching, and the proposed SR 414 Expressway and SR 414 ITS infrastructure should be planned to support any future CAV implementation.

Cellular Vehicle-to-Everything technology shall be designed and deployed to facilitate the implementation of CAV technology. Cellular Vehicle-to-Everything solutions include vehicle-to-vehicle, vehicle-to-infrastructure, vehicle-to-pedestrian and vehicle-to-cloud communication. The implemented technology shall be compatible with all existing CFX ITS infrastructure and shall ensure connectivity with future technology.

The CAV applications that can be used on the proposed SR 414 Expressway and SR 414 include but are not limited to electronic emergency break light, forward collision warning, blind spot warning and lane change warning, intersection movement assist, left-turn assist, curve speed warning and work zone warning.

#### **5.7 Operations and Maintenance**

CFX ITS infrastructure is proposed along proposed SR 414 Expressway and maintenance access will be required. The operational and maintenance responsibilities for the proposed ITS infrastructure will have

to be defined and documented in a memorandum of understanding between FDOT, CFX, Seminole County and Orange County. This memorandum of understanding can be new or an update of existing agreements and shall define limits of maintenance for each agency and jurisdiction, access to ROW for maintenance and operations and funding for any shared responsibilities.

## 6. References

Central Florida Expressway Authority (CFX). 2019. *Final Technical Memo SR 414 (Maitland Blvd.) Reversible Express Lanes Schematic*. Prepared by Dewberry. July.

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Florida Department of Transportation (FDOT). 2021c. *Standard Specifications for Road and Bridge Construction*. Accessed August 5, 2021. <https://www.fdot.gov/programmanagement/implemented/specbooks/default.shtm>



## Appendix A

### Existing ITS Devices Map





**LEGEND**

- EXISTING FDOT CLOSED-CIRCUIT TELEVISION (CCTV) CAMERA
- EXISTING MICROWAVE VEHICLE DETECTION SYSTEM (MVDS)
- EXISTING CFX CCTV WITH STEEL POLE & CABINET
- EXISTING CFX TRAFFIC MONITORING STATION (TMS)
- EXISTING AUTOMATIC VEHICLE IDENTIFICATION (AVI) SYSTEM
- EXISTING DYNAMIC MESSAGE SIGN (DMS)
- EXISTING CFX STEEL POLE
- EXISTING CONCRETE SIGNAL POLE
- EXISTING OVERHEAD SIGN STRUCTURE

PRELIMINARY - SUBJECT TO CHANGE

ENGINEER OF RECORD: ERNEST E. SACKKEY, P.E.  
P.E. LICENSE NO. 71730  
  
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|   |             |
|---|-------------|
| SR 414 MAITLAND BLVD.<br>EXPRESSWAY EXTENSION<br>US 441 TO SR 434 |             |
| ROAD NO.  | PROJECT NO. |
| SR 414  | 414-227     |



SR 414 EXISTING  
ITS DEVICES MAP (1)

|              |
|--------------|
| SHEET<br>NO. |
| 1            |





PRELIMINARY - SUBJECT TO CHANGE

ENGINEER OF RECORD: ERNEST E. SACKY, P.E.  
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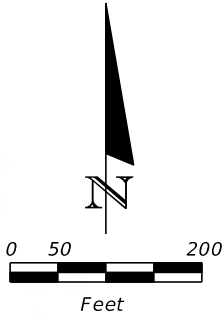
SR 414 EXISTING  
ITS DEVICES MAP (2)

SHEET  
NO.

2



MATCHLINE B



MATCHLINE C

**LEGEND**

- EXISTING FDOT CLOSED-CIRCUIT TELEVISION (CCTV) CAMERA
- EXISTING MICROWAVE VEHICLE DETECTION SYSTEM (MVDS)
- EXISTING CFX CCTV WITH STEEL POLE & CABINET
- EXISTING CFX TRAFFIC MONITORING STATION (TMS)
- EXISTING AUTOMATIC VEHICLE IDENTIFICATION (AVI) SYSTEM
- EXISTING DYNAMIC MESSAGE SIGN (DMS)
- EXISTING CFX STEEL POLE
- EXISTING CONCRETE SIGNAL POLE
- EXISTING OVERHEAD SIGN STRUCTURE

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SR 414 EXISTING  
ITS DEVICES MAP (3)

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NO.

3





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SR 414 EXISTING  
ITS DEVICES MAP (4)

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NO.

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414-227

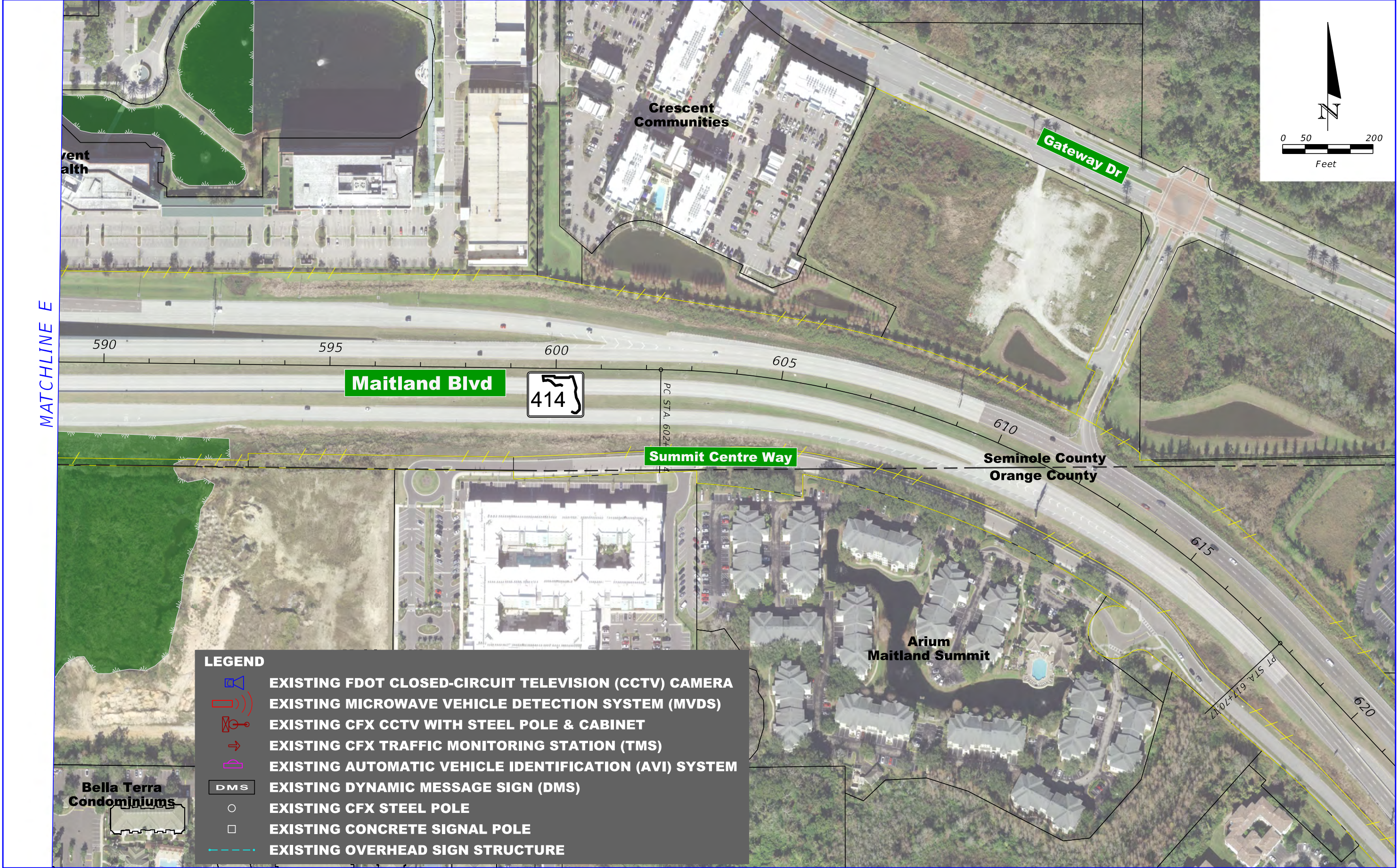
CENTRAL  
FLORIDA  
EXPRESSWAY  
AUTHORITY

SR 414 EXISTING  
ITS DEVICES MAP (5)

SHEET  
NO.

5





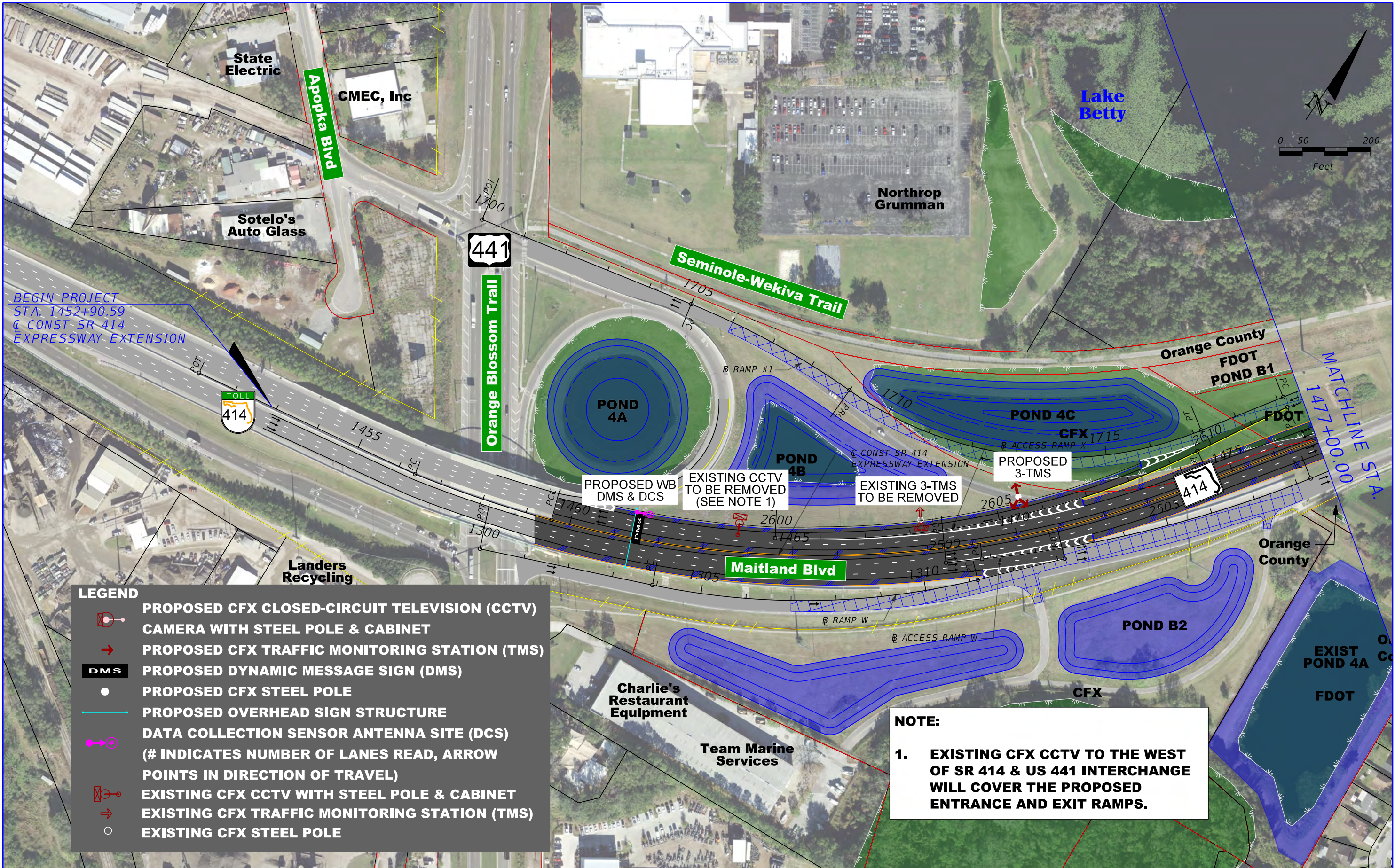
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| PRELIMINARY - SUBJECT TO CHANGE | ENGINEER OF RECORD: ERNEST E. SACKKEY, P.E.<br>P.E. LICENSE NO. 71730  |                        | SR 414 MAITLAND BLVD.<br>EXPRESSWAY EXTENSION<br>US 441 TO SR 434 | <div>CENTRAL<br/>FLORIDA<br/>EXPRESSWAY<br/>AUTHORITY</div> | SR 414 EXISTING<br>ITS DEVICES MAP (6) | SHEET<br>NO. |
|                                 | JACOBS ENGINEERING GROUP INC.<br>200 S. ORANGE AVENUE, STE 900<br>ORLANDO, FL 32801; PHONE (407) 903-5001<br>CERTIFICATE OF AUTHORIZATION No. 000072 |                        |   |   |  | 6            |
|                                 | ROAD NO.<br>SR 414   | PROJECT NO.<br>414-227 |   |   |  |              |



## Appendix B

### ITS Concept Plan





**LEGEND**

- PROPOSED CFX CLOSED-CIRCUIT TELEVISION (CCTV) CAMERA WITH STEEL POLE & CABINET**
- PROPOSED CFX TRAFFIC MONITORING STATION (TMS)**
- PROPOSED DYNAMIC MESSAGE SIGN (DMS)**
- PROPOSED CFX STEEL POLE**
- PROPOSED OVERHEAD SIGN STRUCTURE**
- DATA COLLECTION SENSOR ANTENNA SITE (DCS) (# INDICATES NUMBER OF LANES READ, ARROW POINTS IN DIRECTION OF TRAVEL)**
- EXISTING CFX CCTV WITH STEEL POLE & CABINET**
- EXISTING CFX TRAFFIC MONITORING STATION (TMS)**
- EXISTING CFX STEEL POLE**

**NOTE:**

1. **EXISTING CFX CCTV TO THE WEST OF SR 414 & US 441 INTERCHANGE WILL COVER THE PROPOSED ENTRANCE AND EXIT RAMPS.**

PRELIMINARY - SUBJECT TO CHANGE

ENGINEER OF RECORD: ERNEST E. SACKKEY, P.E.  
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ORLANDO, FL 32801; PHONE (407) 903-5001  
CERTIFICATE OF AUTHORIZATION No. 000072

SR 414 MAITLAND BLVD.  
EXPRESSWAY EXTENSION  
US 441 TO SR 434

ROAD NO.  
SR 414

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EXPRESSWAY  
AUTHORITY**

ITS CONCEPT PLAN (1)

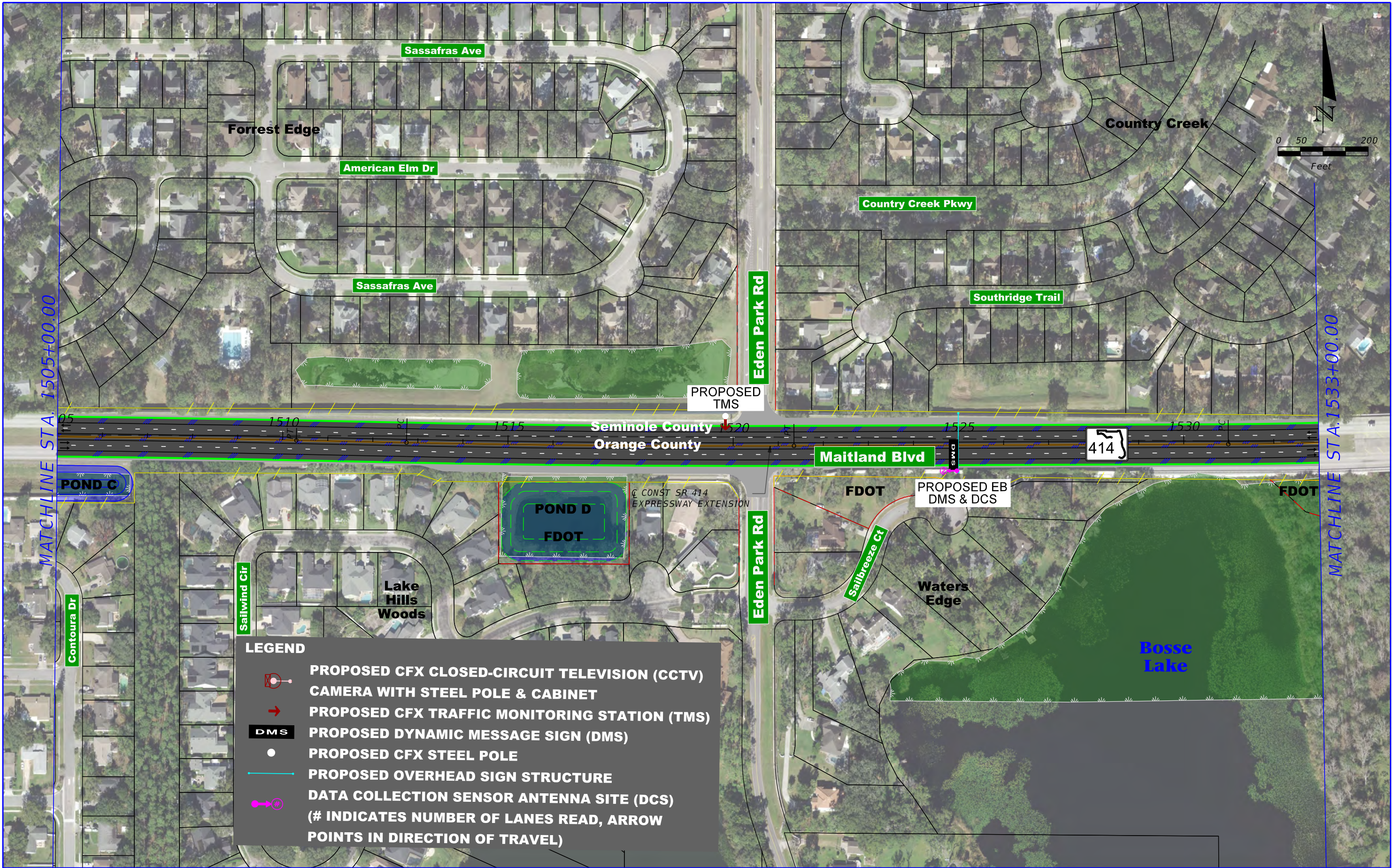
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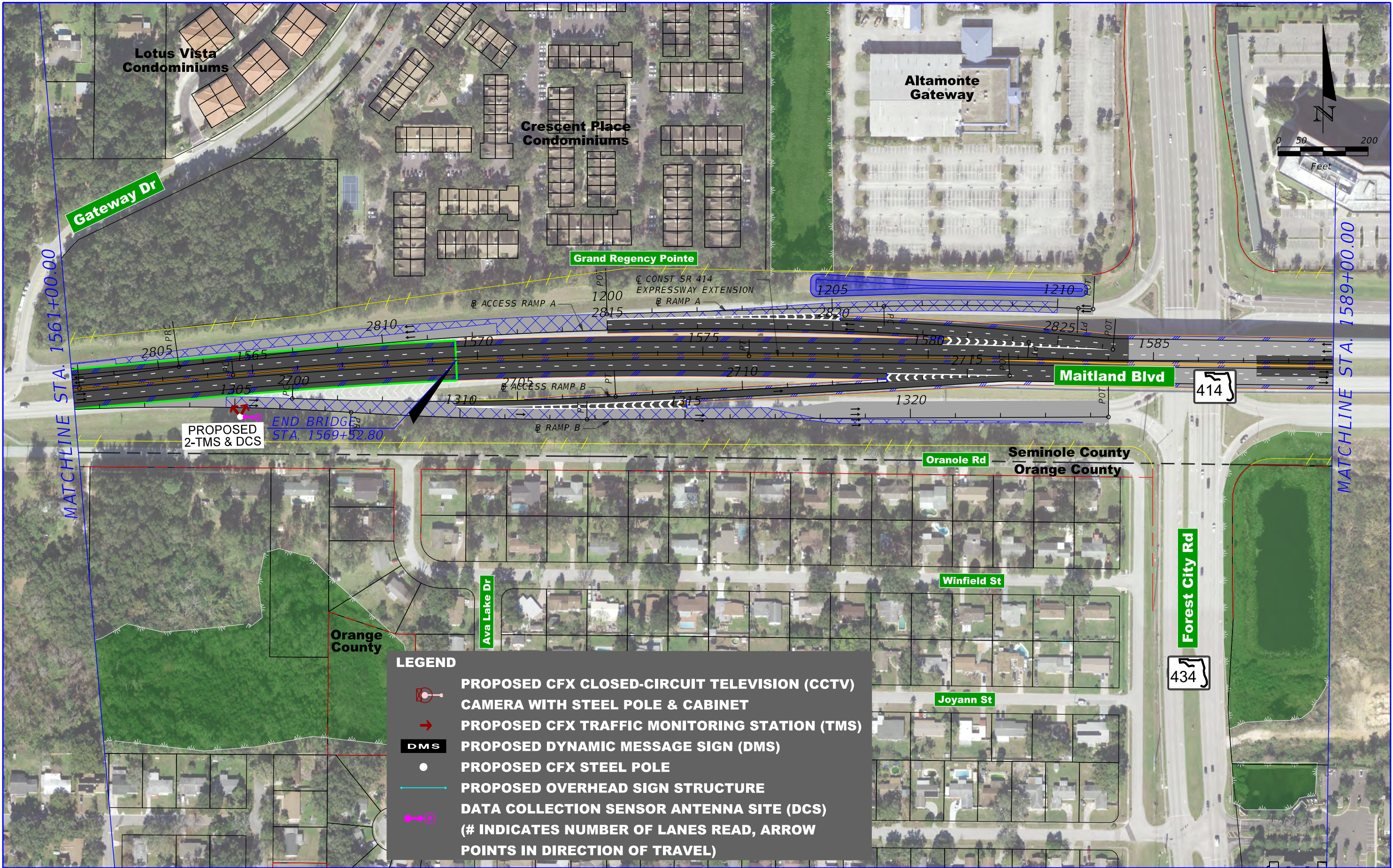


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| PRELIMINARY - SUBJECT TO CHANGE | ENGINEER OF RECORD: ERNEST E. SACKEY, P.E.<br>P.E. LICENSE NO. 71730   |             | <div>SR 414 MAITLAND BLVD.<br/>EXPRESSWAY EXTENSION<br/>US 441 TO SR 434</div> <div>CENTRAL<br/>FLORIDA<br/>EXPRESSWAY<br/>AUTHORITY</div> | ITS CONCEPT PLAN (3) | SHEET<br>NO. |
|                                 | JACOBS ENGINEERING GROUP INC.<br>200 S. ORANGE AVENUE, STE 900<br>ORLANDO, FL 32801; PHONE (407) 903-5001<br>CERTIFICATE OF AUTHORIZATION No. 000072 |             |  |                      | 3            |
|                                 | ROAD NO.   | PROJECT NO. |  |                      |              |
|                                 | SR 414   | 414-227     |  |                      |              |









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CERTIFICATE OF AUTHORIZATION No. 000072

SR 414 MAITLAND BLVD.  
EXPRESSWAY EXTENSION  
US 441 TO SR 434

ROAD NO.  
SR 414

PROJECT NO.  
414-227

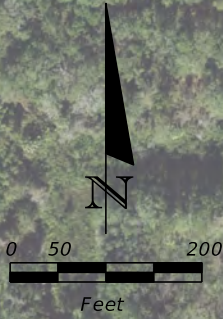
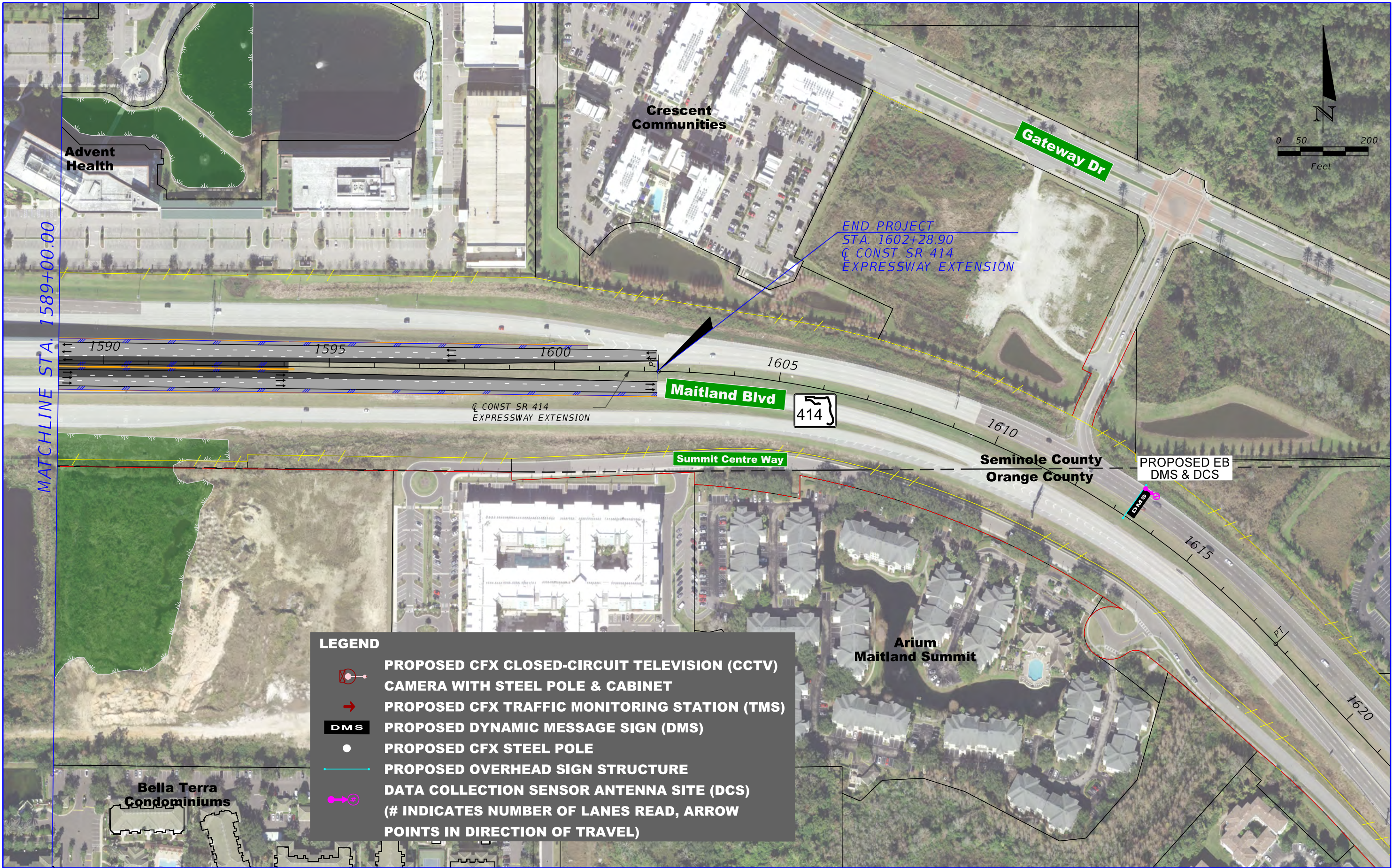
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FLORIDA  
EXPRESSWAY  
AUTHORITY**

ITS CONCEPT PLAN (5)

SHEET  
NO.

5





LEGEND

PROPOSED CFX CLOSED-CIRCUIT TELEVISION (CCTV)  
CAMERA WITH STEEL POLE & CABINET

PROPOSED CFX TRAFFIC MONITORING STATION (TMS)

PROPOSED DYNAMIC MESSAGE SIGN (DMS)

PROPOSED CFX STEEL POLE

PROPOSED OVERHEAD SIGN STRUCTURE

DATA COLLECTION SENSOR ANTENNA SITE (DCS)  
(# INDICATES NUMBER OF LANES READ, ARROW  
POINTS IN DIRECTION OF TRAVEL)









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US 441 TO SR 434

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SR 414

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EXPRESSWAY  
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ITS CONCEPT PLAN (8)

SHEET  
NO.

8





PRELIMINARY - SUBJECT TO CHANGE

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CERTIFICATE OF AUTHORIZATION No. 000072

SR 414 MAITLAND BLVD.  
EXPRESSWAY EXTENSION  
US 441 TO SR 434

ROAD NO.  
SR 414

PROJECT NO.  
414-227

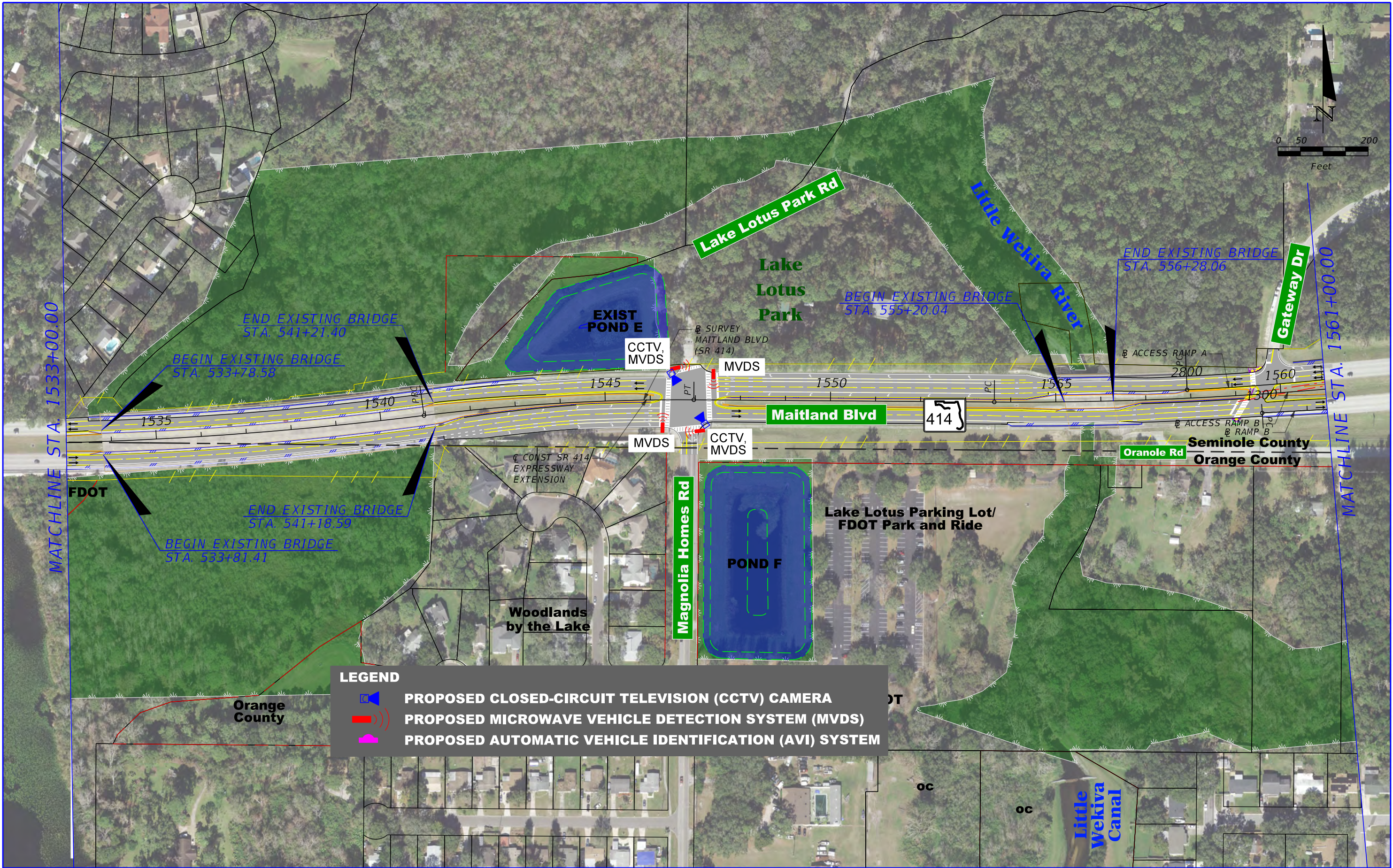
CENTRAL  
FLORIDA  
EXPRESSWAY  
AUTHORITY

ITS CONCEPT PLAN (9)

SHEET  
NO.

9





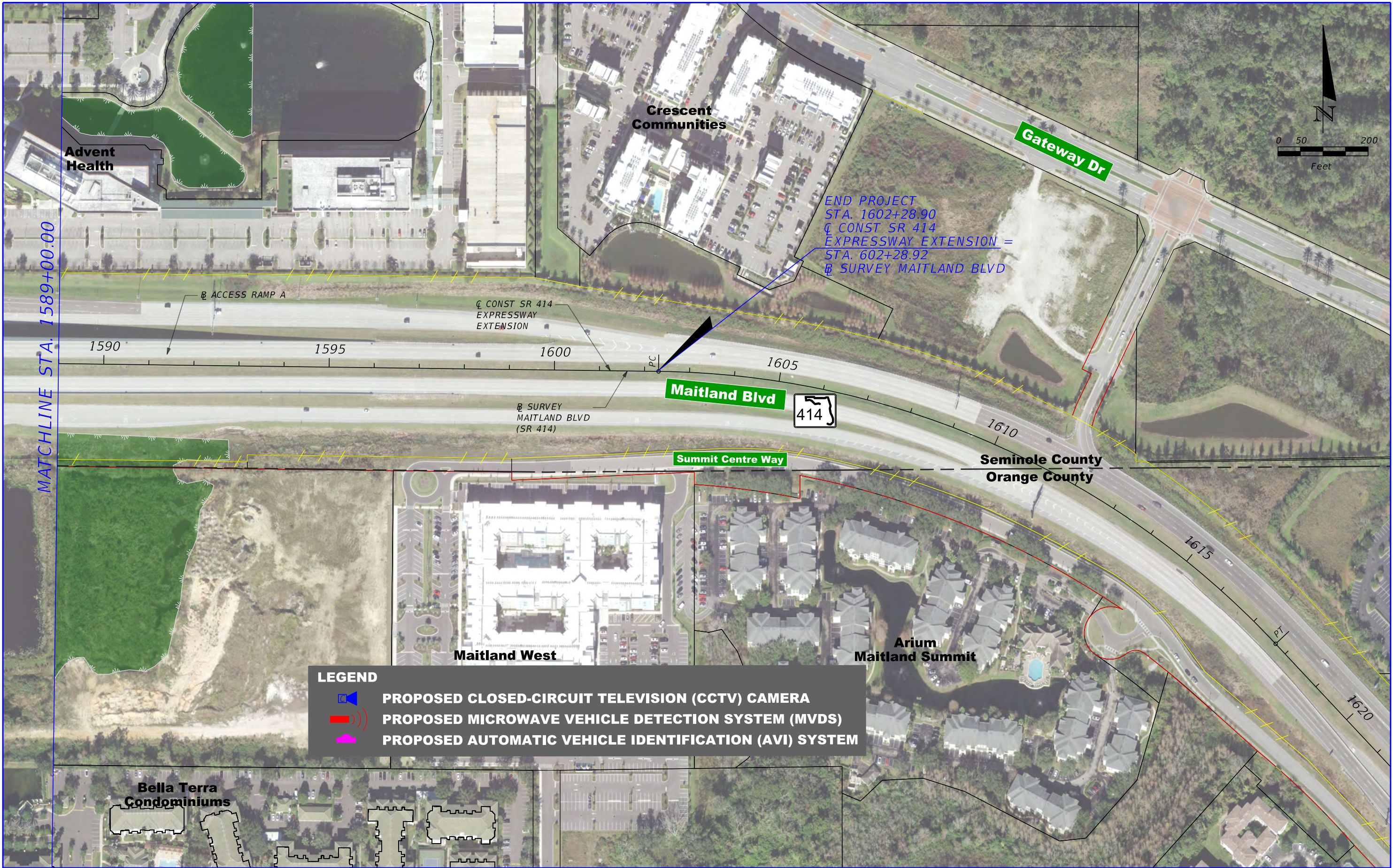
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| PRELIMINARY - SUBJECT TO CHANGE | ENGINEER OF RECORD: ERNEST E. SACKKEY, P.E.<br>P.E. LICENSE NO. 71730<br><br>JACOBS ENGINEERING GROUP INC.<br>200 S. ORANGE AVENUE, STE 900<br>ORLANDO, FL 32801; PHONE (407) 903-5001<br>CERTIFICATE OF AUTHORIZATION No. 000072 |  | SR 414 MAITLAND BLVD.<br>EXPRESSWAY EXTENSION<br>US 441 TO SR 434 | CENTRAL<br>FLORIDA<br>EXPRESSWAY<br>AUTHORITY | ITS CONCEPT PLAN (10) | SHEET<br>NO. |
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| PRELIMINARY - SUBJECT TO CHANGE | ENGINEER OF RECORD: ERNEST E. SACKKEY, P.E.<br>P.E. LICENSE NO. 71730  |                        | SR 414 MAITLAND BLVD.<br>EXPRESSWAY EXTENSION<br>US 441 TO SR 434 | <div>CENTRAL<br/>FLORIDA<br/>EXPRESSWAY<br/>AUTHORITY</div> | ITS CONCEPT PLAN (11) | SHEET<br>NO. |
|                                 | JACOBS ENGINEERING GROUP INC.<br>200 S. ORANGE AVENUE, STE 900<br>ORLANDO, FL 32801; PHONE (407) 903-5001<br>CERTIFICATE OF AUTHORIZATION No. 000072 |                        |   |   |                       | 11           |
|                                 | ROAD NO.<br>SR 414   | PROJECT NO.<br>414-227 |   |   |                       |              |





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| PRELIMINARY - SUBJECT TO CHANGE | ENGINEER OF RECORD: ERNEST E. SACKEY, P.E.<br>P.E. LICENSE NO. 71730   |                        | <div>SR 414 MAITLAND BLVD.<br/>EXPRESSWAY EXTENSION<br/>US 441 TO SR 434</div> <div>CENTRAL<br/>FLORIDA<br/>EXPRESSWAY<br/>AUTHORITY</div> | ITS CONCEPT PLAN (12) | SHEET<br>NO. |
|                                 | JACOBS ENGINEERING GROUP INC.<br>200 S. ORANGE AVENUE, STE 900<br>ORLANDO, FL 32801; PHONE (407) 903-5001<br>CERTIFICATE OF AUTHORIZATION No. 000072 |                        |  |                       | 12           |
|                                 | ROAD NO.<br>SR 414   | PROJECT NO.<br>414-227 |  |                       |              |