Orange County Adaptive Signal System

Financial Project No. 434917-1

Systems Engineering Documentation

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Prepared By:
Orange County Traffic Engineering
4200 S John Young Pkwy
Orlando, FL 32839
(407) 836-7890

Background

Orange County's Adaptive Signal System is designed to enhance mobility on arterial roadways in the County by incorporating the latest technological advancements. Orange County currently operates a SCOOT adaptive signal system in two sub-systems. The first sub-system started deployment in 2000 near Orange County Convention Center at 47 intersections along the following corridors:

- International Dr.
- Universal Blvd.
- Sand Lake Rd.
- John Young Pkwy.
- Central Florida Blvd.

This sub-system is primarily serving the Convention Center, parking garages, hotels & Restaurants, and tourist attractions

The second sub-system started deployment in 2007 near the University of Central Florida at 32 intersections along the following corridors:

- University Blvd.
- Alafaya Trail
- Gemini Blvd.

This sub-system is primarily serving UCF Stadium, UCF Arena, parking garages, and variable class schedules.

The scope of the above deployments included:

- Provide central hardware and software (one system per sub-area)
- Replace some existing controllers
- Install fiber optic communication where needed
- Install system loop detectors
- Setup and validate the system
- Draft system maps and intersection graphics
- Provide training to County staff

Operational benefits achieved include:

- Convention Center traffic ingress & egress has been cleared efficiently
- Overall travel times and delays have been reduced
- Officer control of signals is no longer necessary
- Regular development and update of timing plans is not necessary
- Timing adjustment during long or short term lane closures is not necessary
- Real-time traffic data are monitored and archived

However, a before-and-after study concluded that average speed and travel time along John Young Pkwy became worse after the deployment of SCOOT. Therefore, SCOOT operation has been discontinued along that arterial.

Several difficulties have been faced with SCOOT, including:

- Hardware, communication, and detection failures
- Non-flexible phasing sequence
- Non-optimal signal progression
- No detectors on short links
- Long pedestrian phases
- Low volume traffic conditions
- System user non-friendliness
- Only remote technical support

Orange County realizes that ASCT has evolved and second generation systems are now available with advanced features that can address the difficulties faced in our previous deployments.

ASCT proposed for this project will be deployed at 38 intersections along US 441, SR 482, SR 535, and SR 536. Estimated project cost is $2.6 million in Federal funds. The project will be procured through a equipment purchase orders using existing state and county contracts. Installation will be performed using county funds.

SE documentation is therefore included herein for the ASCT components as follows:

- Adaptive traffic signal control – three (3) documents:
    - Concept of Operations Sample Statements document.
    - ASCT Verification Plan.
    - ASCT Validation Plan.
- Performance Measurement using Bluetooth Readers – three (3) documents:
    - Concept of Operations Sample Statements document.
    - ConOps Appendix 1 – High Level Requirements
    - Requirements Traceability Matrix.