Central Florida CV Initiatives
Connected Vehicles Overview

CV Technologies

- Hardware
- Software
- Testing
CV Technologies (Hardware)

Roadside Units (RSU)
- Wireless communication between the roadway infrastructure and the vehicles that are equipped with OBUs
- Communicates on the 5.9 GHz DSRC band or 5G V2X (PC-5) to transmit and receive CV messages

On-board Units (OBU)
- Device installed on the motor vehicle to allow communication (transmitting/receiving) with other OBUs or RSUs having WAVE functionality

Integrated V2I Prototype (IVP) Hub / (Industrial Computer)
- A small form-factor computer
- Handles the processing of CV applications
- Allows the RSU to perform “radio” functions only
CV Technologies (Software)

IntelliConnect (Kyra Solutions)
- Platform for CV Central Mgmt
- Data Integration
- Device Management
- Dashboards & Maps
- Alerts and Notifications
CV Technologies (Software)

Kinetics (Cisco)

- Platform for CV Central Mgmt
- Data Integration
- Device Management
- Dashboards & Maps
- Alerts and Notifications
CV Testing

- Seminole County Lab
- Coordination with CV Vendors
- Interoperability Testing
- CV Application Testing
- Testing documents listed on:
  - www.cflsmartroads.com
  - Testing Matrix
  - Videos & Photographs
  - Lab Testing Documentation
Project Deployments

DB – DBB – Systems Manager
Project Deployment (Design-Build)

The purpose of the design-bid process is to reduce risks to the owner of the property by assigning all responsibilities to one single entity. It may also help meet shorter deadlines because you can overlap the design and construction process.

Pros

• A much quicker process that takes less time and tends to stay on budget better than design-bid-build projects.

• Reduced risk to the owner of the property because potential conflicts between the owner, architects and contractors are eliminated.

• The owner of the property is free from serious legal and managerial positions.

• Many of the costs and stresses associated with interior office build outs are taken on by the design-build team as opposed to the owner.

Cons

• There is no competitive bidding. If the project’s lead contractor has enough valuable contacts with vendors this might not be an issue.

• The design brief is subject to different interpretations, and therefore miscommunications can arise.
Project Deployment (Design-Bid Build)

Pros

• The in-house or consultant designer is your advocate and only has your interests at heart.

• The in-house or consultant assists or is in charge of preparing and assessing bid documents, which takes a lot of stress off of the client and helps make sure that all documents are complete and accurate.

• Utilizes competition in order to secure the best price for subcontractors.

Cons

• Competition can backfire and create a “cheaper is better” environment in which the cheapest suppliers and subcontractors are chosen to save money.

• An experienced design team might not be up to date on the latest costs, causing issues from the get-go with budgeting and finding an appropriate subcontractor for each job. This can end up costing you money and time if the original plans have to be redrawn up or rebid.

Reason Used

In-house designer or consultant working closely with the client to develop a set of plans to bid out to a contractor.
Project Deployment (Systems Manager)

Utilizes a Consultant as the Designer which works closely with the client to develop a set of plans for non-traditional projects to bid out to a contractor same as a DBB project.

Pros

• The Consultant designer is an advocate to the client.
• The Consultant assists or is in charge of preparing and assessing bid documents, which takes a lot of stress off of the client and helps make sure that all documents are complete and accurate.
• Utilizes competition in order to secure the best price for subcontractors.
• Allows the Consultant to integrate and provide oversight of the construction project.
• Consultant can work closer with the technical project elements and product vendors to test before implementation.
• Removes the risk off the Contractor for elements that are more technical in nature.

Cons

The project is only as good as the Consultant that is performing as the Systems Manager.
### Summary

**Design-Bid-Build**
- We oversee the project delivery for design

**Design-Build**
- We work in conjunction with a Contract to design a constructible and biddable project
- Contractor installs infrastructure

**Systems Manager**
- We design it
- We help procure it for FDOT
  - Close collaboration with vendors and stakeholders
- FDOT furnishes it
- Contractor builds/installs most of it
- We integrate it into the system
Local CV Initiatives
Central Florida Projects
Current CV Initiatives in FL

Agencies & Projects Interviewed

- Interstate 75 Florida’s Regional Advanced Mobility Elements (FRAME) – FDOT D2, D5
- Tampa Hillsborough Expressway Authority (THEA) CV Pilot
- Colonial Parkway PD&E Study
- University of Florida I-Street Testbed

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Title: I-75 Florida’s Regional Advanced Mobility Elements (FRAME)

Location: Marion & Sumter County along I-75 & US 301/441 from TPK to D5 Boundary

Elements: Traffic Signals, 104 RSU’s

Goal: The purpose of this project is to implement CV technology and Signal Performance Metrics (SPM) in Sumter and Marion Counties to improve safety & mobility with the deployment of CV Technology

Project: System Manager Approach (Awarded to Metric Engineering)
- Includes CV technology along I-75, US441 & US 301
- Includes Signal Performance Measures
- CV Applications include:
  - Signal Phase & Timing (SPaT)
  - Map Data Message (MAP)
  - Traveler Information Message (TIM)
  - Transit Signal Priority (TSP)
  - Emergency Vehicle Preemption (EVP)

Status – In Construction
- Production data: Jan. 2, 2019
- Construction Awarded to In Line
- Implementation planned for late 2020
FDOT D1 – US 41 F.R.A.M.E.

• Title: US 41 Florida’s Regional Advanced Mobility Elements (FRAME)
• Location: 34 Miles in Lee County
• Elements: 71 Traffic Signals, RSU’s TBD
• Goal: Improve Safety & Mobility with the Deployment of CV Technology
• Project: System Manager Approach (Awarded to Metric Engineering)
  • Includes CV Pilot along US 98
  • CV @ 4 Intersections using Passive Pedestrian Detection
  • CV Applications include:
    • Signal Phase & Timing (SPaT)
    • Map Data Message (MAP)
    • Traveler Information Message (TIM)
    • Personal Safety Message (PSM)
• Status – Undergoing System Engineering Analysis
  • Design Planned for Feb 2020
  • Implementation planned for late 2022
• Title: I-4 Florida's Regional Advanced Mobility Elements (FRAME)
• Location: Along I-4 and Arterials in District 1, 5 and 7
• Elements: TBD Traffic Signals, RSU's, OBU
• Goal: Implement Connected Vehicle (CV) technology and Automated Traffic Signal Performance Metrics (ATSPM) for freeway management systems and arterial management systems in Hillsborough, Polk, Osceola, and Orange Counties
• Improve Safety & Mobility with the Deployment of CV Technology
• Project: System Manager Approach (Awarded to Metric Engineering)
  • Includes CV Pilot along I-4
  • Cellular Vehicle-to-Everything (C-V2X) and Dedicated Short Range Communication (DSRC)
  • Security Credential Management System (SCMS)
  • Automated Traffic Signal Performance Measures (ATSPM)
  • Software Development
  • CV Applications include:
    • Signal Phase & Timing (SPaT)
    • Map Data Message (MAP)
    • Traveler Information Message (TIM)
    • Personal Safety Message (PSM)
• Status –Awaiting Negotiations
  • Schedule not yet developed
• Title: FTE CV Pilot Project
• Location: 20 Miles in Orange County
• Elements: TBD RSU's, TBD OBU's via Fleet vehicles
• Goal: To test the effectiveness of deployed CV Technology
• Project: Continuing Services Consultant Contract (Metric Engineering)
  • Includes CV Pilot along SR 528 and SR 91
  • CV Applications include:
    • Signal Phase & Timing (SPaT)
    • Map Data Message (MAP)
    • Traveler Information Message (TIM)
    • Wrong Way Driving (WWD)
    • Curve Speed Warning (CSW)
• Status – In Staff hour Negotiations
  • Design planned to begin early March 2020
  • Construction TBD
Questions