Evaluation of Connected Vehicle Applications on Mahan Corridor – Phase I

collaborators

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presented to

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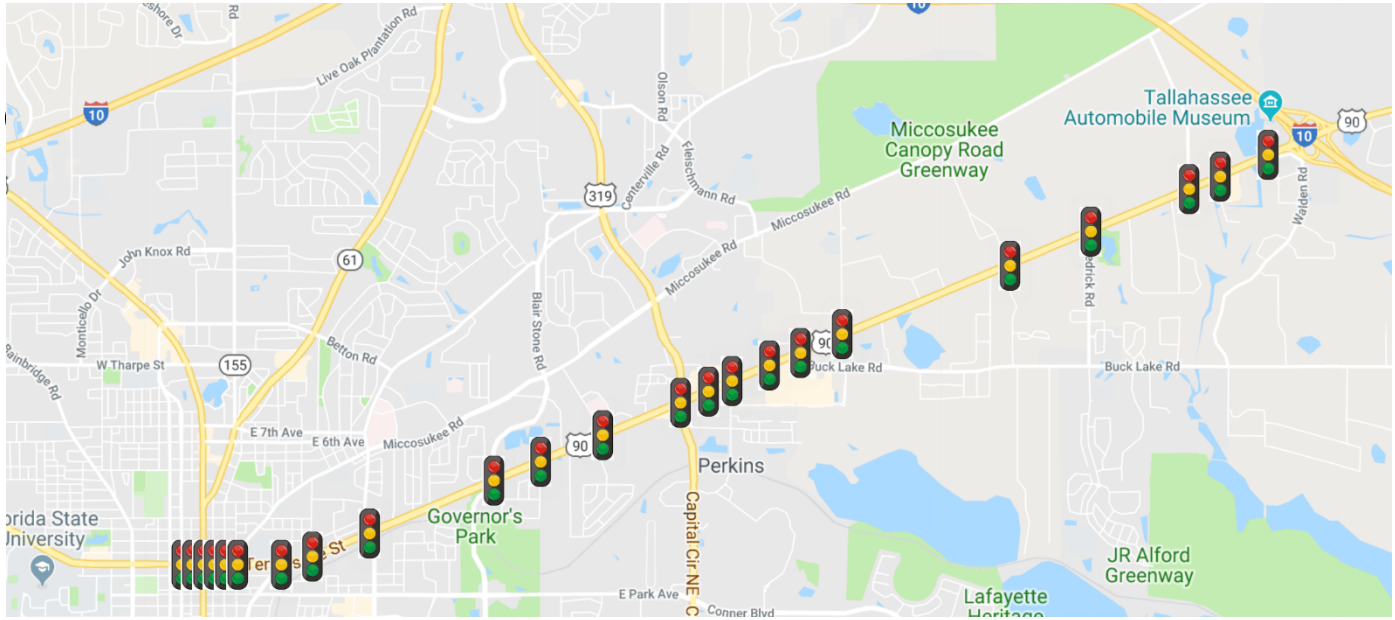
Presentation Outline

- Introduction
- Purpose & Scope
- Planning
- Procurement & Installation
- Testing
- Evaluation

Introduction

- The study corridor is located along Mahan Drive, US 90, Tallahasse
- The study corridor is approximately 7.7 miles with 21 signalized intersections



Purpose & Scope

- Test DSRC in communicating SPaT/ MAP to OBUs
- Evaluate SCMS
- Integrate pedestrian applications

Planning of the Project

- The project is FDOT response to SPaT Challenge issued by AASHTO, ITE, and ITS America (ITSA)[1]
- The challenge was "infrastructure owners and operators (IOO) to cooperate together to achieve deployment of DSRC infrastructure with SPaT broadcasts in at least one corridor or network (approximately 20 signalized intersections) in each of the 50 states by January 2020".

[1]Ref: https://transportationops.org/spat-challenge-infrastructure-system-model-concept-operations

Procurement

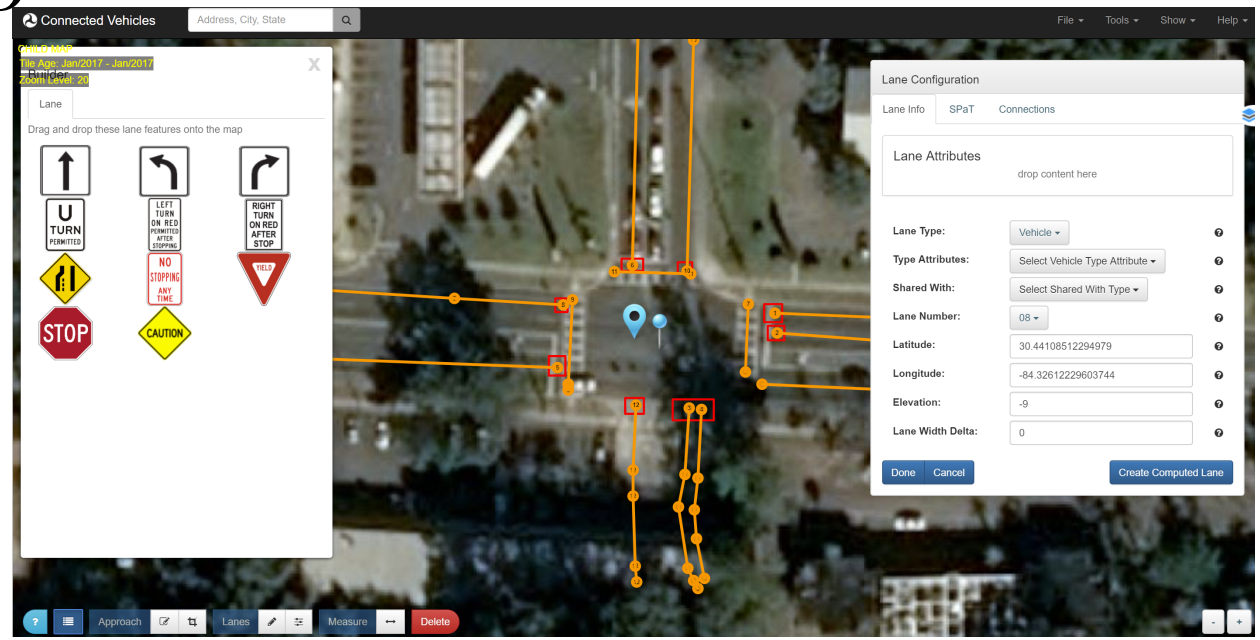
- FDOT managed vendor selection
- Technical proposal were reviewed and shortlisted
- Shortlisted vendors were invited for testing
- The bids were opened for vendor that successfully tested their equipment
- Final score were based on technical and financial score

Installation

- Install – FDOT and vendor
- Integrate – City, FDOT, vendor
- Testing – City, FDOT, vendor
- Training – Vendor
- Evaluation – FAMU-FSU College of Engineering

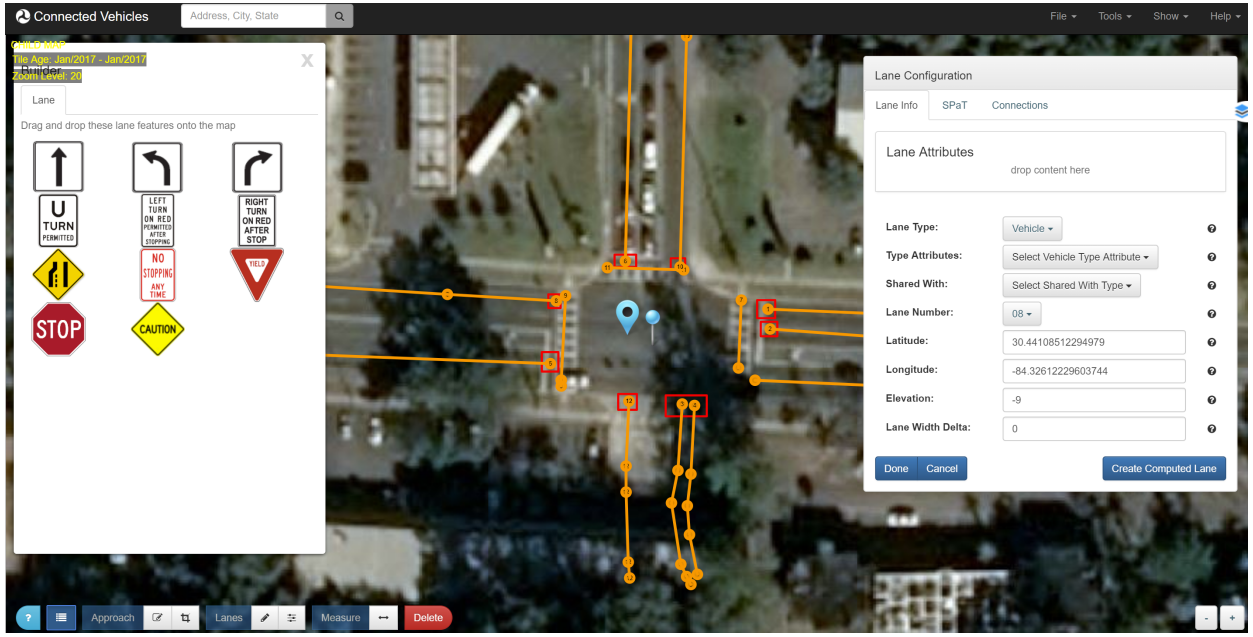
Installation - MAP Data

- FDOT hired a consultant to create the MAP data
- J2735 MAP Creator Tool is maintained by USDOT
- MAP data includes lanes, stop bars, signal group assignments, etc.

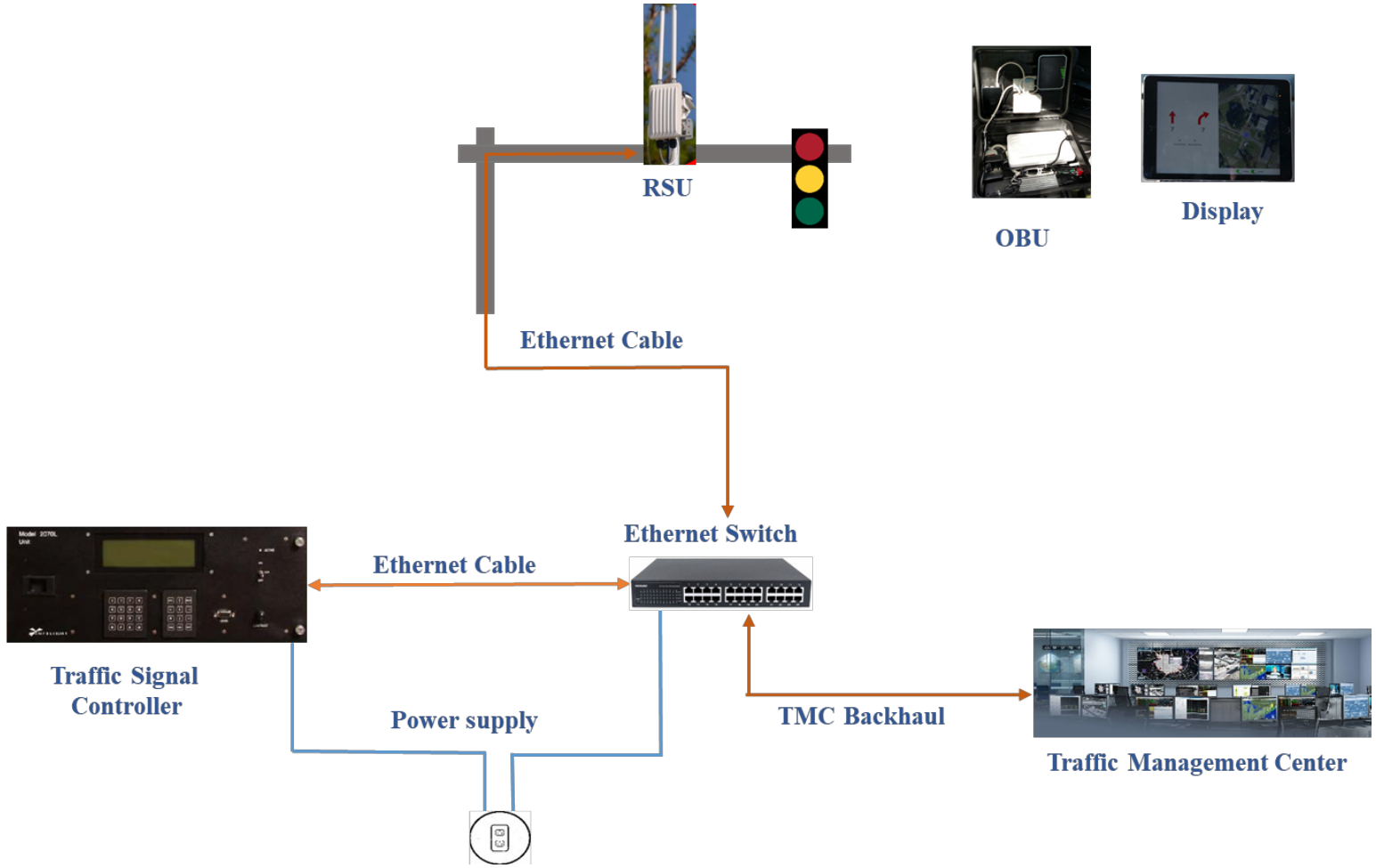


Installation - MAP Data

- MAP Creator Tool provided by the USDOT is easy to use/create MAP data
- There are challenges to make them work in the field
- Need to be properly coded



Installation



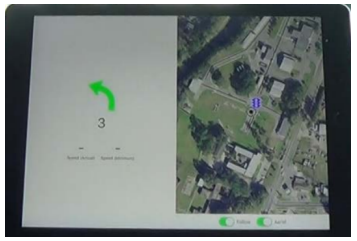
Typical architecture of the installed system

Installation

- 31 RSUs were installed
- Some intersections have two RSUs
- 4 OBUs have been acquired for the study

RSU

OBU



Displaying Unit

Testing & Deployment of the System

- DSRC Multi-Channel Test Tool (MCTT) was used to evaluate:
  - ❖ Interoperability
  - ❖ Amount of data sent by the RSUs
  - ❖ Verify transmitted digital data and protocol received from RSUs

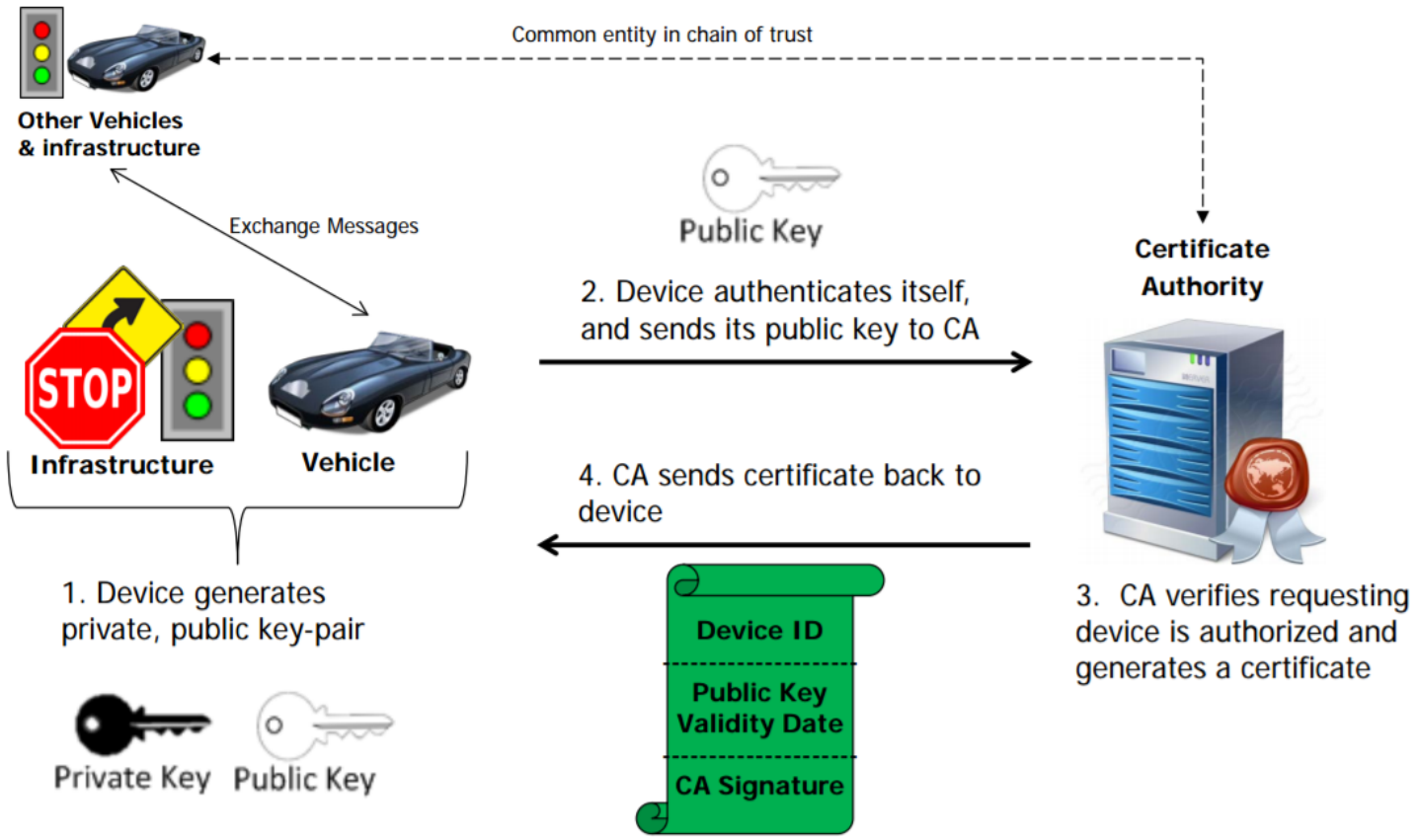
Operational Evaluation

The following are being evaluated:

- SPaT/MAP broadcasting
- Security Credentials Management System (SCMS)
- Integration of pedestrian applications
- Integration of CV data into ATSPM
- CV/ATSPM performance measures dashboard

Security Credentials Management System (SCMS)

- Issue certificates
- Authenticate messages
- Revoke and report misbehaving certificates



Source: USDOT

SCMS Procurement and Installation

- FSU advertised RFQ
- Four companies responded to the RFQ
- Two companies were selected in the project
- Implementation of the system is on progress

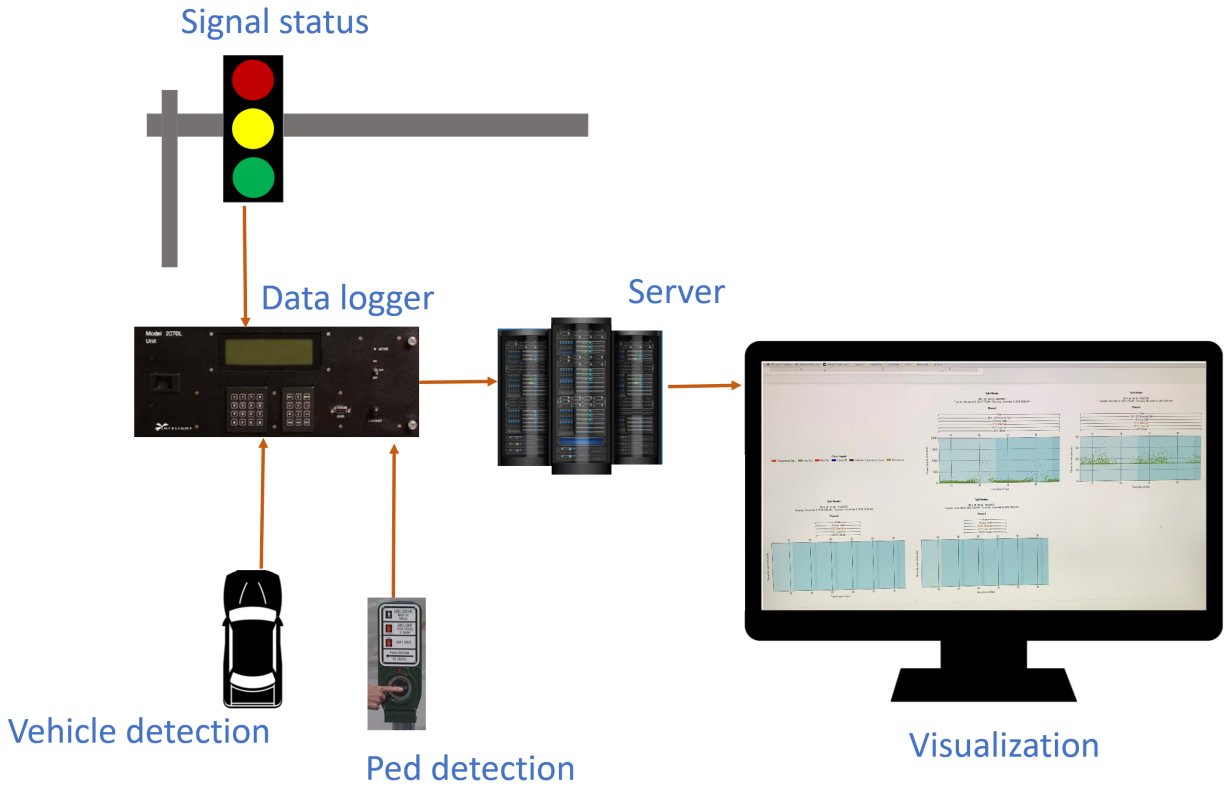
Integration of Pedestrians Applications

Pedestrians applications to facilitate:

- Pedestrian ⇔ vehicle communication
- Pedestrian ⇔ transit communication
- Pedestrian ⇔ traffic signal communication
- Pedestrian ⇔ freight communication

Integration of CV Data into ATSPM

- ATSPM uses high resolution data collected by the traffic signal controller to produce traffic performance measure charts
- Concept developed by Purdue Univ., FHWA, AASHTO, and software by Utah DOT



CV/ATSPM Performance Measures Dashboard