

INDOT 2017 Connected Vehicle Deployments on US 30 and US 31

John McGregor, INDOT

Howell Li, Purdue

June 15, 2017



Outline

- The AASHTO SPaT Challenge
- Purdue partnering with INDOT
- Denver/Econolite Partnerships
- Equipment Overview
- INDOT deployments statewide
- Q&A



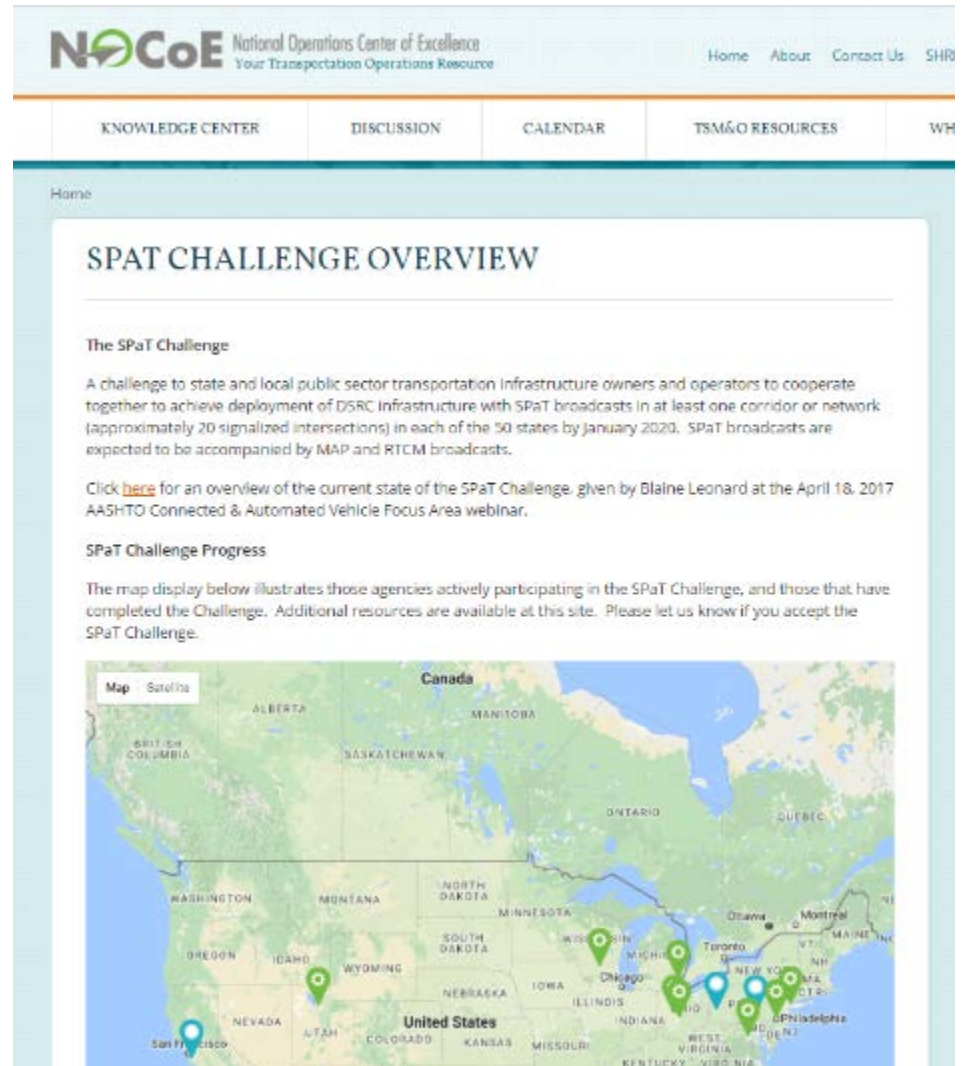
AASHTO SPaT Challenge

Challenge state and local public sector transportation Infrastructure Owners and Operators (IOOs) to deploy DSRC infrastructure with SPaT in all 50 states by January 2020

- At least one coordinated corridor
- 20 intersections

DSRC:
Dedicated Short Range Communication

SPaT:
Signal Phase and Timing



The screenshot shows the National Operations Center of Excellence (NCoE) website. The header includes the NCoE logo and navigation links: Home, About, Contact Us, and SHR. Below the header is a menu with links for KNOWLEDGE CENTER, DISCUSSION, CALENDAR, TSM&O RESOURCES, and WH. The main content area is titled "SPaT CHALLENGE OVERVIEW".

The SPaT Challenge

A challenge to state and local public sector transportation infrastructure owners and operators 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. SPaT broadcasts are expected to be accompanied by MAP and RTCM broadcasts.

Click [here](#) for an overview of the current state of the SPaT Challenge, given by Blaine Leonard at the April 18, 2017 AASHTO Connected & Automated Vehicle Focus Area webinar.

SPaT Challenge Progress

The map display below illustrates those agencies actively participating in the SPaT Challenge, and those that have completed the Challenge. Additional resources are available at this site. Please let us know if you accept the SPaT Challenge.

The map shows the United States with various states labeled. Green pins indicate active participants, and blue pins indicate completed participants. Active participants are located in California, Oregon, Nevada, Utah, Colorado, Kansas, Missouri, Illinois, Indiana, Michigan, Ohio, Pennsylvania, and New York. Completed participants are located in Washington, Montana, Wyoming, Nebraska, Iowa, Wisconsin, Minnesota, North Dakota, South Dakota, and Texas.



May 4 workshop, Traffic Management Center, Indianapolis



 **ECONOLITE**
Solutions that Move the World®

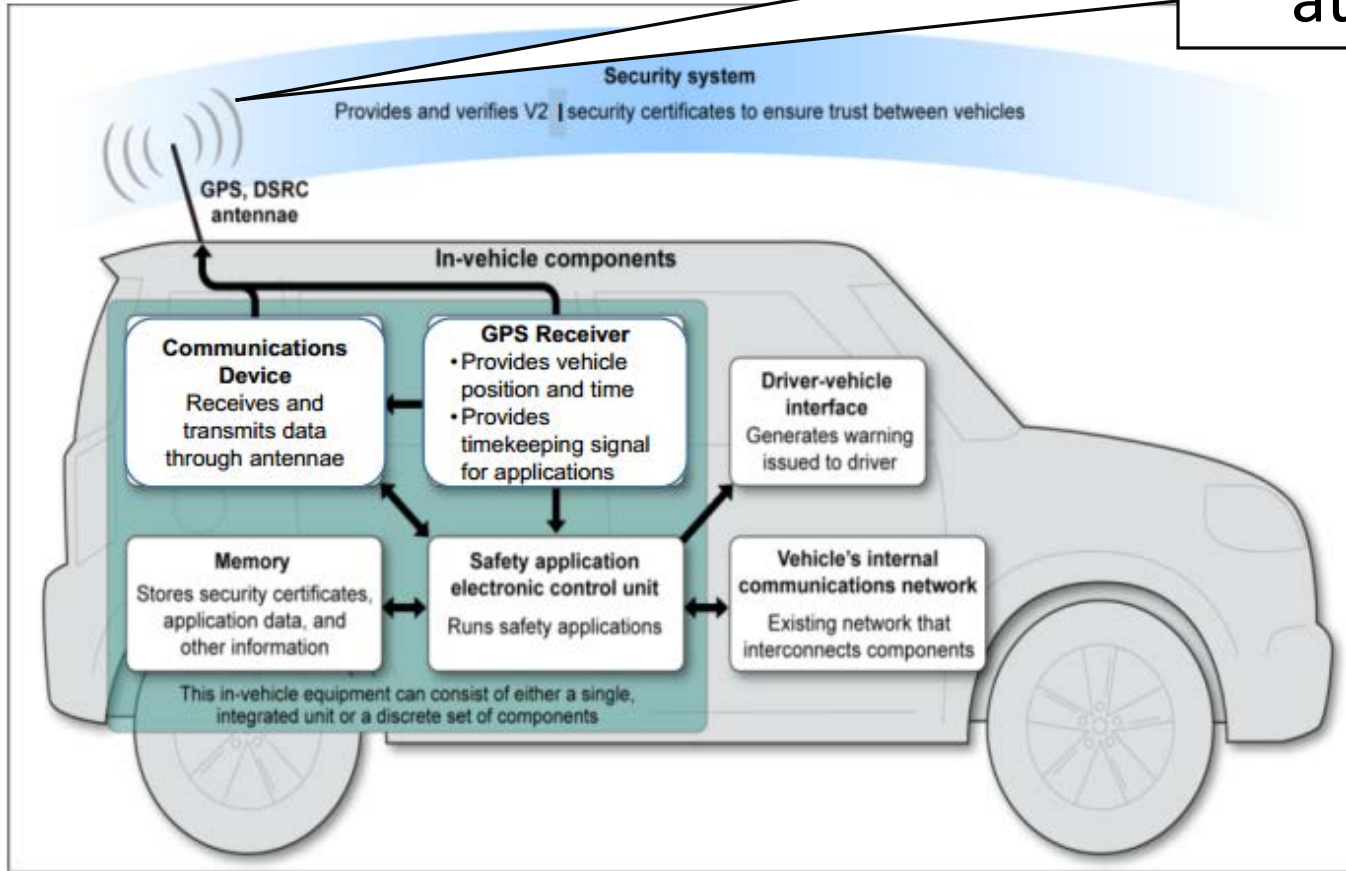
 **DENVER**
THE MILE HIGH CITY

PURDUE
UNIVERSITY



Onboard Equipment (OBE)

Messages transmitted at 10Hz

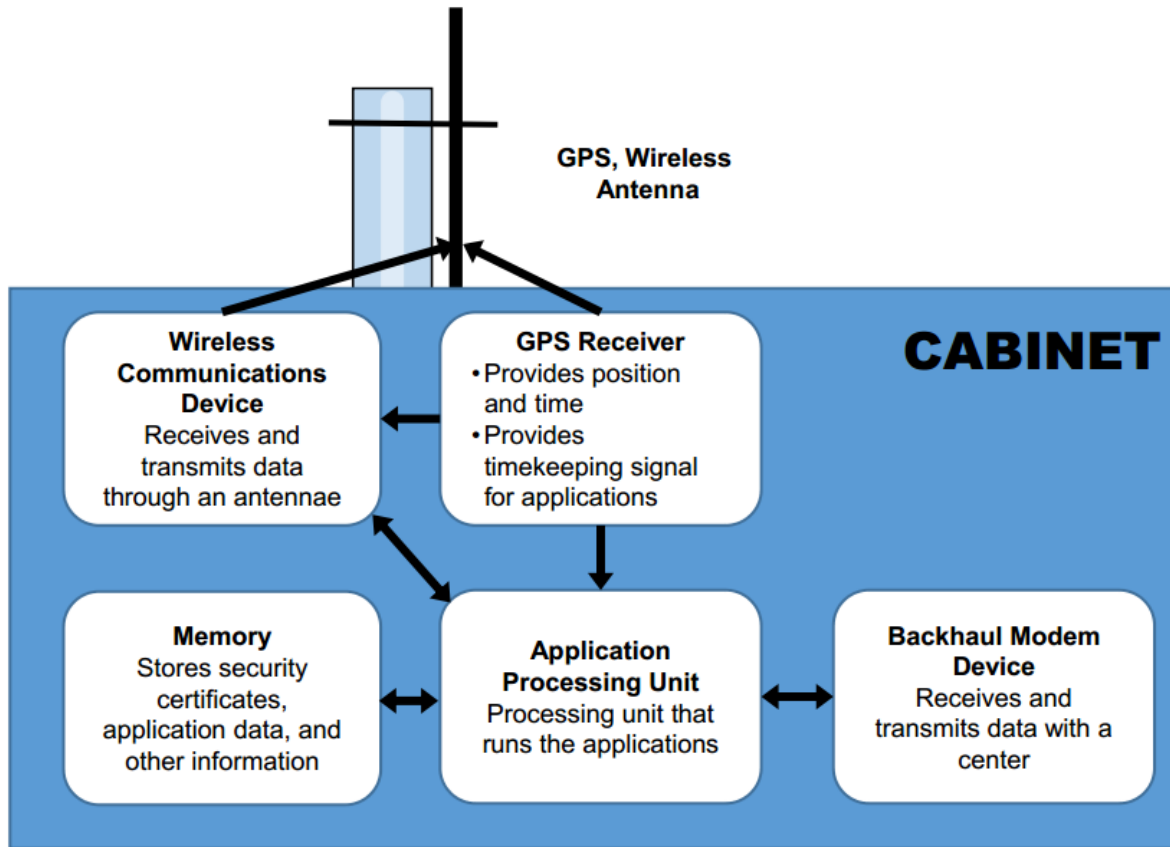


Retrofit device

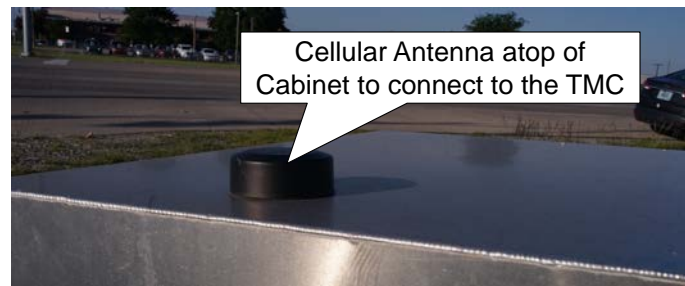
Source: Crash Avoidance Metrics Partnership and GAO



Roadside Equipment (RSE)



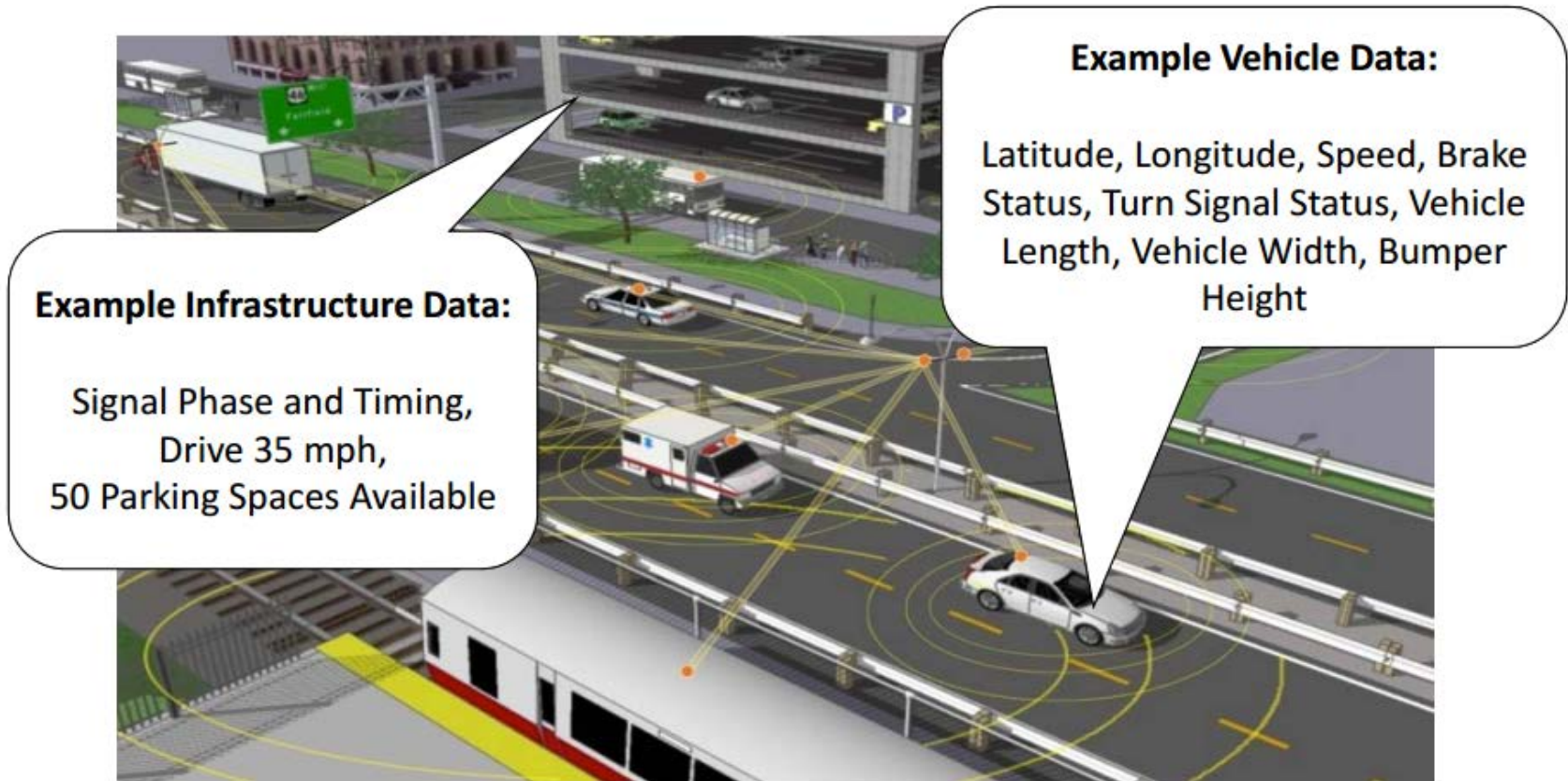
Wireless communication device



Backhaul modem



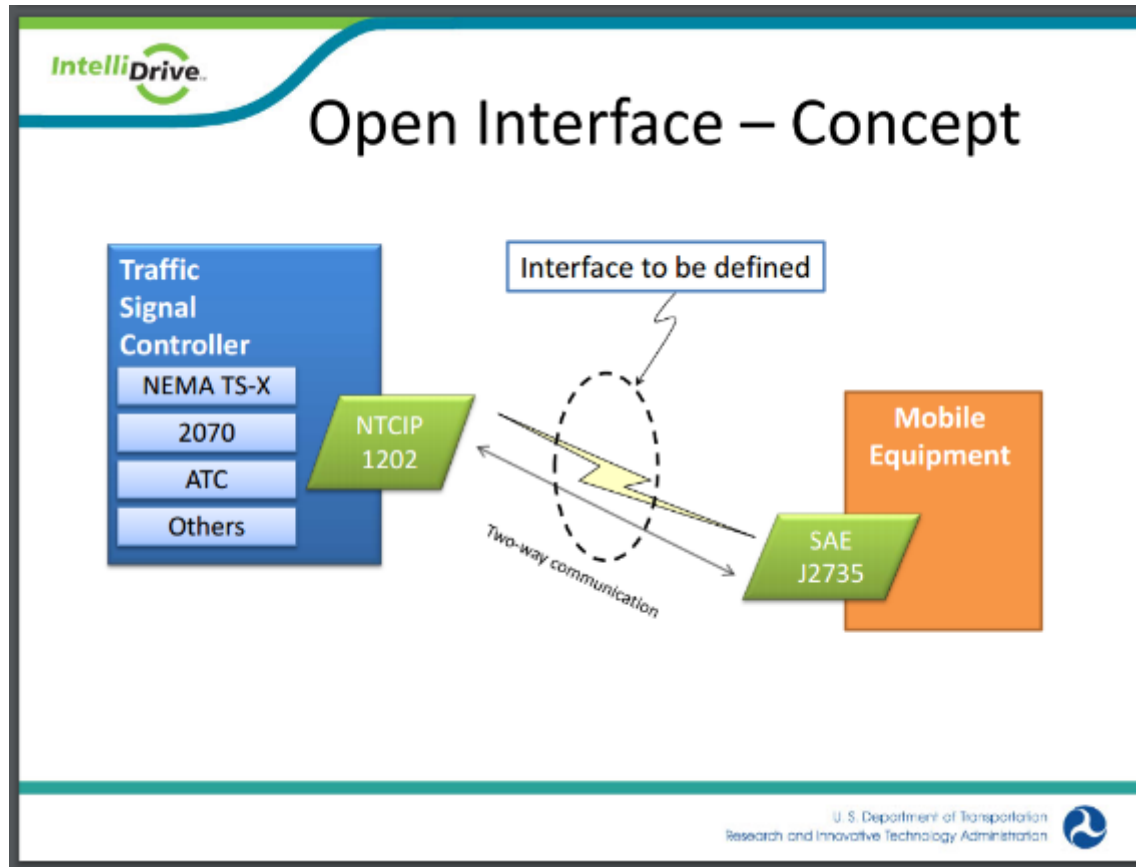
Deployed Infrastructure Vision



Source: US Department of Transportation



Standards



SAE J2735 Data Elements

- BasicSafetyMessage
- MapData
- SPaT
- CommonSafetyRequest
- EmergencyVehicleAlert
- IntersectionCollision
- NMEAcorrections
- ProbeDataManagement
- ProbeVehicleData
- RoadSideAlert
- RTCMcorrections
- SignalRequestMessage
- SignalStatusMessage
- TravelerInformation
- PersonalSafetyMessage

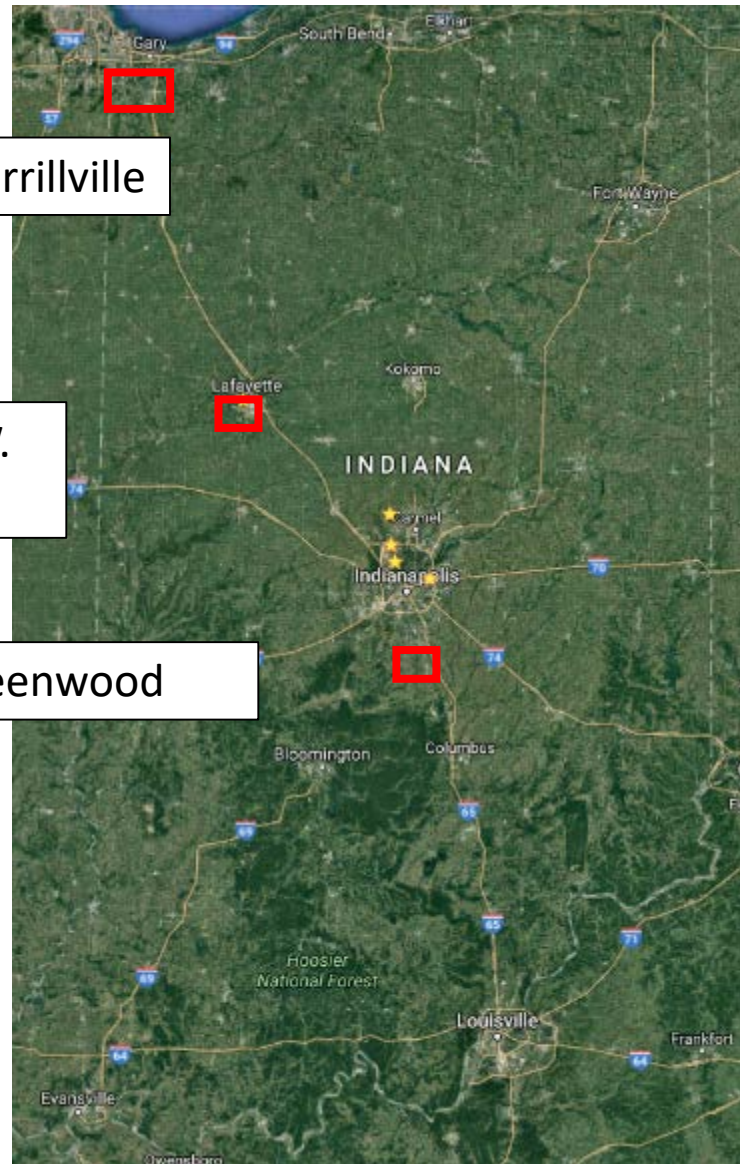


Deployment Locations

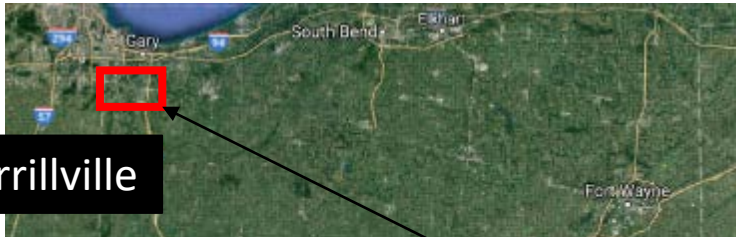
US-30 in Merrillville

US-231 in W.
Lafayette

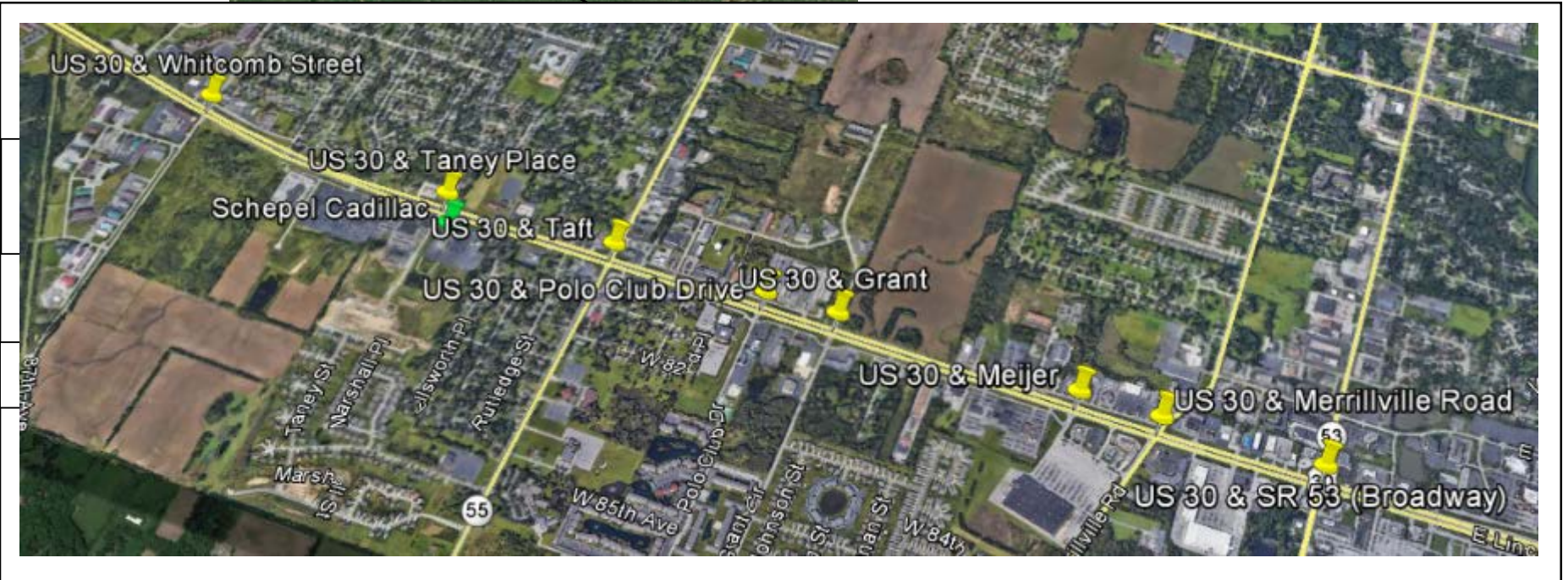
US-31 in Greenwood



Deployment Locations



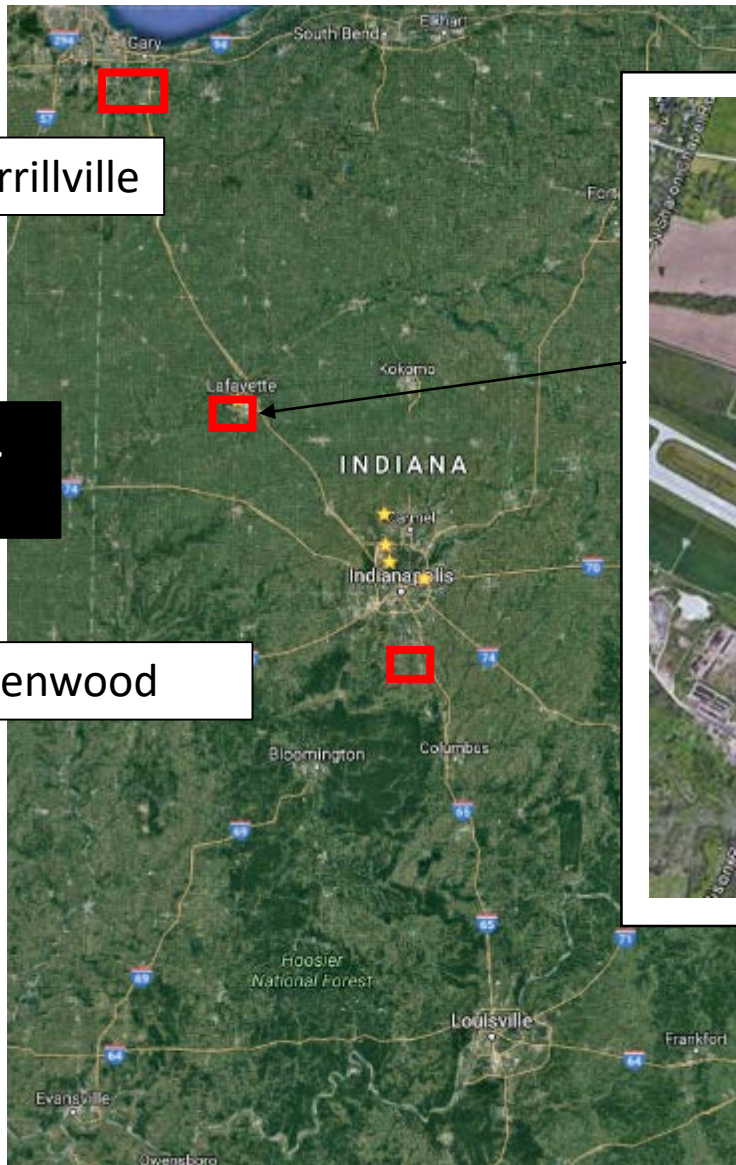
US-30 in Merrillville



8 intersections



Deployment Locations



US-30 in Merrillville

US-231 in W. Lafayette

US-31 in Greenwood



2 intersections

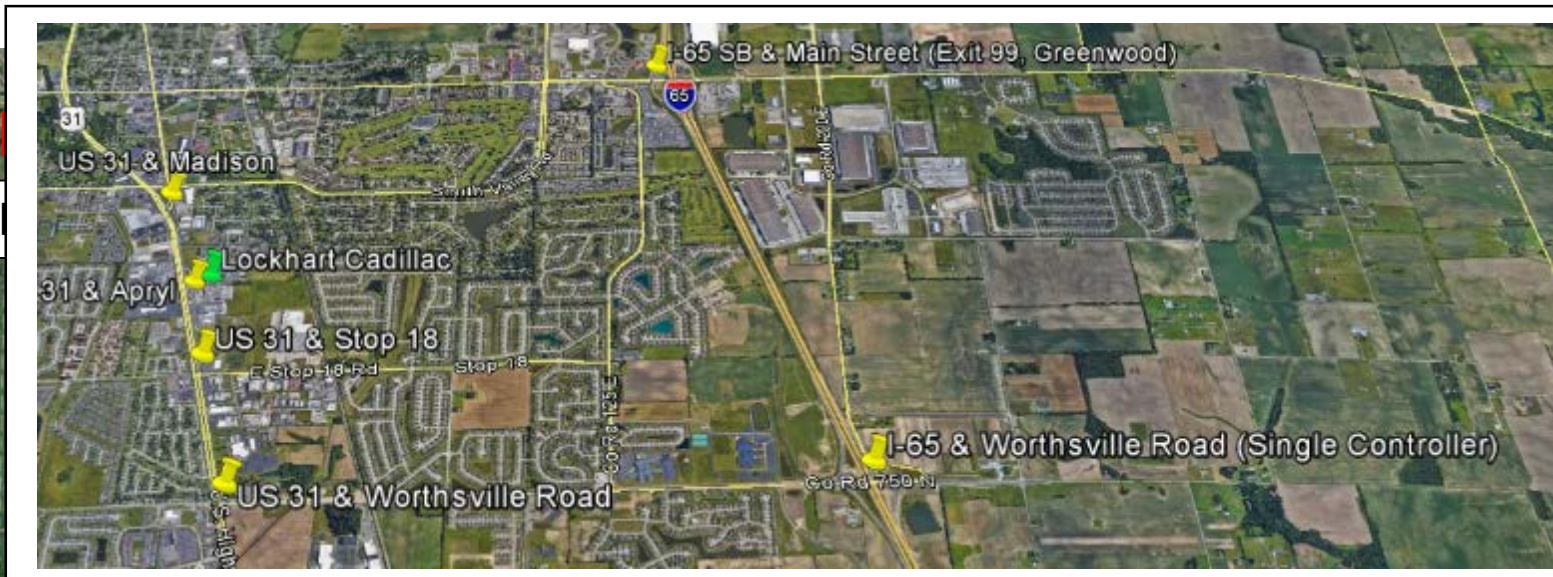


Deployment Locations

US-30 in Merrillville

US-231 in W. Lafayette

US-31 in Greenwood



6 intersections



Conclusions

- INDOT is rolling out RSEs at 3 strategic locations throughout the state to take on the SPaT challenge.
- Retrofitting OBE will allow INDOT and Purdue to generate data for testing and research.
- Deployments will leverage OEM connected vehicles around dealerships to get more probes.
- Emerging big data challenge/opportunity that is ripe for a few research papers.

