



2014 **FLORIDA**
AUTOMATED VEHICLES
Creating the Framework for Implementation



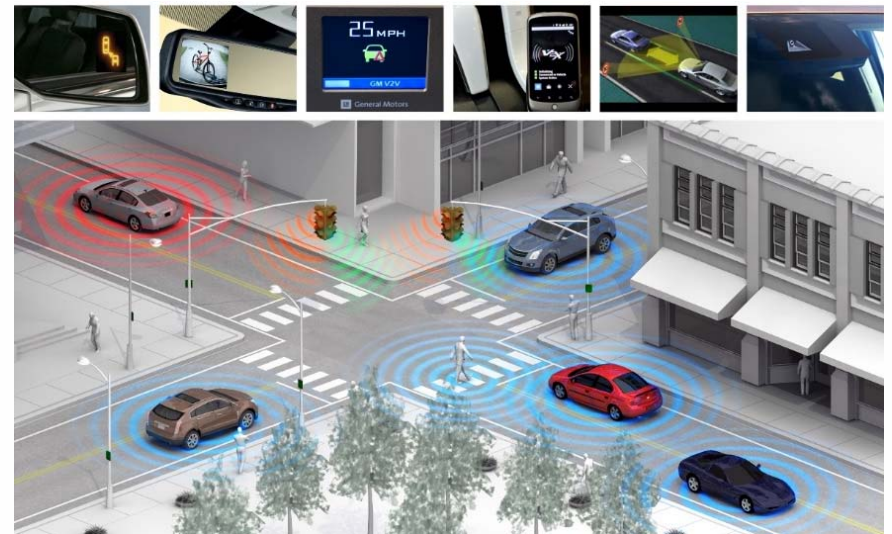
**Florida's Automated Vehicle
Initiative**



2014 **FLORIDA**
AUTOMATED VEHICLES
Creating the Framework for Implementation

Outline

- Overview of Autonomous Vehicles and Connected Vehicles
- Florida's Automated Vehicles Initiative Activities





Automated Vehicles

Connected Vehicles

Technology

- Direct Short Range Communications (DSRC) (5.9 Ghz)
- Cellular Phone Network

Data Gathering/Information Exchange

- Vehicle-to-Infrastructure (V2I)
- Vehicle-to-Vehicle (V2V)

Safety Critical Functions

(steering/throttle) **Not Affected**

Autonomous Vehicles

Technology

- Connected Vehicle technology not required
- Internal sensors, cameras, GPS, and advanced software utilized

Various Levels of Automation (defined by NHTSA)

Safety Critical Functions (steering/throttle)
Affected Without Direct Driver Input



2014 **FLORIDA**
AUTOMATED VEHICLES
Creating the Framework for Implementation

Connected Vehicles

Technology

- Direct Short Range Communications (DSRC) (5.9 Ghz)
- Cellular Phone Network

Data Gathering/Information Exchange

- Vehicle-to-Infrastructure (V2I)
- Vehicle-to-Vehicle (V2V)

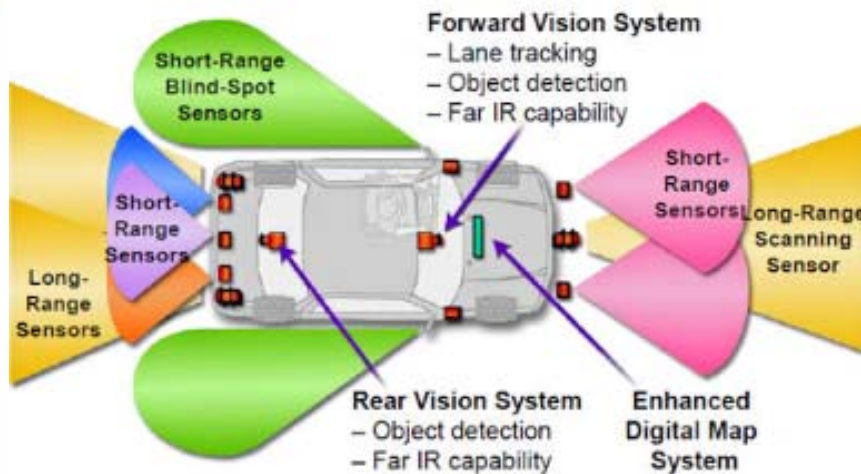
Safety Critical Functions Are Not Affected
(steering/throttle/brake)





2014 **FLORIDA**
AUTOMATED VEHICLES
Creating the Framework for Implementation

Autonomous Vehicles



Technology

- Connected Vehicle technology not required
- Internal sensors, cameras, GPS, and advanced software utilized

Various Levels of Automation (defined by NHTSA)

Safety Critical Functions (steering/throttle)
Affected Without Direct Driver Input



Levels of Automation

0 NO AUTOMATION

Forward collision warning, lane departure warning, blind spot monitoring



FUNCTION SPECIFIC AUTOMATION

Temporarily cede control of either forward (speed) or lateral (side-to-side) movements, but not at the same time.
Dynamic brake support, electronic stability control, adaptive cruise control

1

2 COMBINED FUNCTION AUTOMATION

At least two primary control functions designed to work in unison
Adaptive cruise control in combination with lane centering.



LIMITED SELF-DRIVING AUTOMATION

Enable the driver to cede full control of all safety-critical functions
Designed so that the driver is not expected to constantly monitor the roadway while driving.

3



4 FULL SELF-DRIVING AUTOMATION

Designed to perform all safety-critical driving functions and monitor roadway conditions for an entire trip.



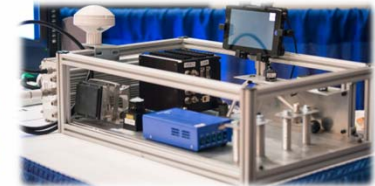
**Abridged from the National Highway Traffic Safety Administration*



2014 **FLORIDA**
AUTOMATED VEHICLES
Creating the Framework for Implementation

Active FDOT Initiatives

- **ITS Office Connected-Vehicle Test Bed**
25 Miles of roadway in Orlando, FL along portions of I-4, International Drive, and John Young Parkway
- **Florida Automated Vehicles Summits**
2013 - Tampa
2014 - Orlando
- **Stakeholder Working Groups**
- **Pilot Projects**
- **University Research Partnerships**
- **Public Outreach**

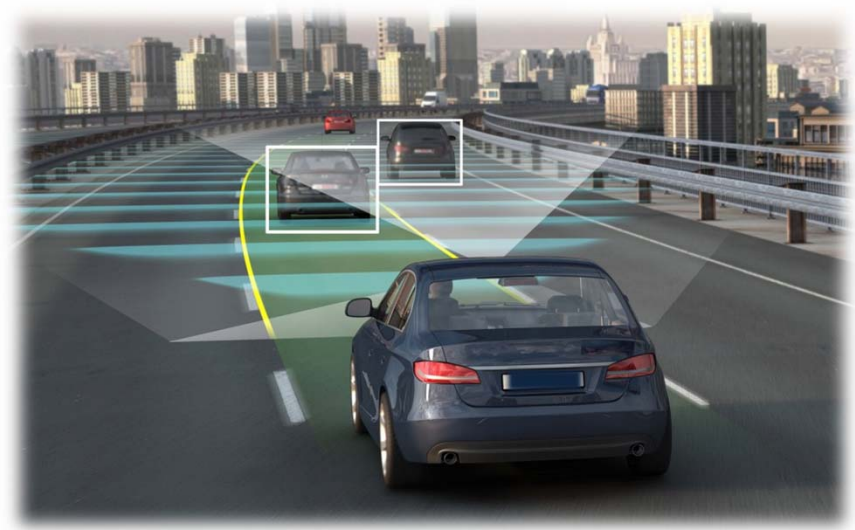




2014 **FLORIDA**
AUTOMATED VEHICLES
Creating the Framework for Implementation

Pilot Projects

- **Quantify Improvements**
 - Safety
 - Mobility
 - Efficiency
- **Performance Measures**
 - Before and after various levels of automation are implemented
- **Initial Test Beds**
 - Managed lanes (commuter)
 - Freight and transit (multi-modal)
 - Closed-course (Level 4 automation)





2014 **FLORIDA**
AUTOMATED VEHICLES
Creating the Framework for Implementation

Pilot Project Goals

- Leverage Existing Infrastructure to Maximize Benefits
- Develop Rich Dataset that Demonstrates Quantitative Safety and Efficiency Benefits



"If you can not measure it, you can not improve it." (Lord Kelvin)



2014 **FLORIDA**
AUTOMATED VEHICLES
Creating the Framework for Implementation

Miami-Dade Floral Freight Pilot Project

Preliminary Efforts

- Identify partners
- Identify repetitive routes
- Engage and collaborate with public/private stakeholders





2014 **FLORIDA**
AUTOMATED VEHICLES
Creating the Framework for Implementation

Miami-Dade Floral Freight Pilot Project

Three Cost-Effective Phases Over Multiple Years

- Measure
- Prioritize
- Automate





2014 **FLORIDA**
AUTOMATED VEHICLES
Creating the Framework for Implementation

FDOT District 7 Pilot Project - Advanced Safety Warnings

Participating Agencies

FDOT District 7

Hillsborough Area Regional Transit

Tampa Bay Area Regional Transit

Pinellas County Transit Agency

Pasco County Public Transportation

100 vehicles with GeoTab (telematics device)
Serves for comparison of study vehicles

50 with MobilEye (Advanced Driver Assistance)



Fleetistics
Measure. Lead. Succeed.

GEOTAB
management by measurement

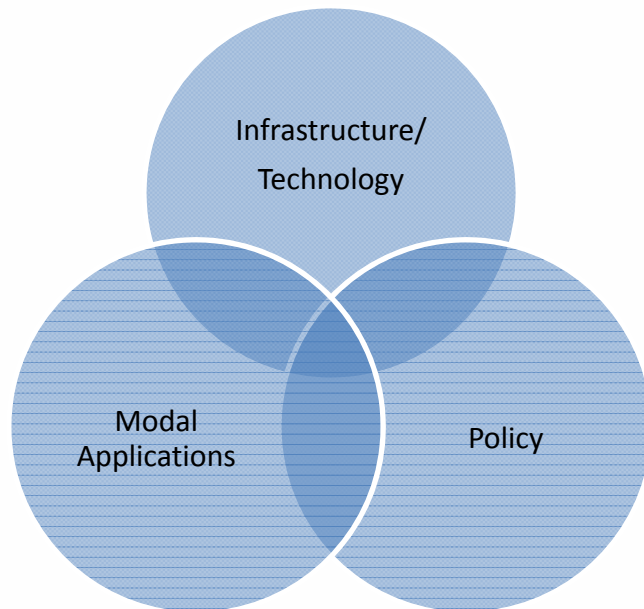
MOBILEYE

FDOT



2014 **FLORIDA**
AUTOMATED VEHICLES
Creating the Framework for Implementation

Stakeholder Working Groups



- Identify potential challenges and opportunities
- Recommend ways to leverage opportunities and mitigate challenges
- Provide recommendations to FDOT (and other state agencies as identified) regarding AV/CV technology in policies, standards, and infrastructure investments



2014 **FLORIDA**
AUTOMATED VEHICLES
Creating the Framework for Implementation

University Research Partnerships

Universities in Florida have been conducting research on AV/CV technology for >10 years.

Research Topics

- Autonomous technology (engineering)
- Effects of AV/CV technology on roadways (transportation modeling)
- Environmental impacts (sustainability)
- Policy implications (planning)
- Behavioral relationship between operator and vehicle (psychology)





2014 **FLORIDA**
AUTOMATED VEHICLES
Creating the Framework for Implementation

www.automatedFL.com

- **Resources**
 - News articles
 - Legislation
 - Blogs
 - Reports/presentations/videos
- **Events**
 - FDOT
 - National
- **Public Forum**

Public Involvement

The screenshot shows the homepage of the Florida Automated Vehicles website. At the top left is the logo with the text "Florida Automated Vehicles" and "Creating the Framework for Implementation". To the right is the "CONTACT FLORIDA DOT HOME" link and the "FDOT" logo. Below the header is a navigation menu with links for "HOME", "OVERVIEW", "EVENTS", "RESOURCES", and "FORUM". The main content area features a large image of a city at night. Below the image is a "WELCOME" section with the text: "This is the online home for the Florida Automated Vehicles program, led by the [FLORIDA DEPARTMENT OF TRANSPORTATION \(FDOT\)](#). This site will follow the". To the right of the image is a "Recent Articles" section with two entries: "Will The Google Car Force A Choice Between Lives And Jobs?" (dated 27 days ago) and "State Should Not Idle on Transportation Technology Planning" (dated 28 days ago).





2014 **FLORIDA**
AUTOMATED VEHICLES
Creating the Framework for Implementation

2nd Annual Florida Automated Vehicles Summit

December 15-16, 2014
Orlando – Walt Disney World

- **Day 1 – Coronado Springs**
Updates on progress since Summit in Tampa (2013)
Status of the Industry
- **Day 2 – WDW Speedway**
Demonstrations and Exhibit Hall





2014 **FLORIDA**
AUTOMATED VEHICLES
Creating the Framework for Implementation



Questions?

FDOT Systems Planning Office
oversees the automated vehicle
initiatives.

www.automatedFL.com

Email questions/comments to:
automatedFL@dot.state.fl.us