CENTRAL FLORIDA TSM&O CONSORTIUM MEETING SUMMARY

Meeting Date: June 1, 2023 (Thursday) **Time**: 10:00 AM – 12:00 PM

Subject: TSM&O Consortium Meeting

Meeting Location: Teleconference

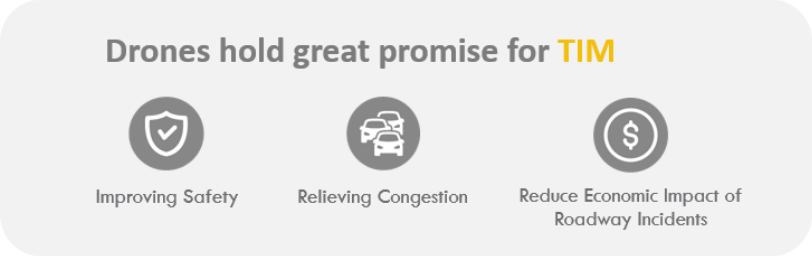
I. OVERVIEW

The purpose of this recurring meeting is to provide an opportunity for District Five FDOT staff and local/regional agency partners to collaborate on the state of the TSM&O Program and ongoing efforts in Central Florida. Jeremy Dilmore gave a short introduction and outlined the meeting agenda.

II. ICM OPERATIONS – DRONE SERVICE

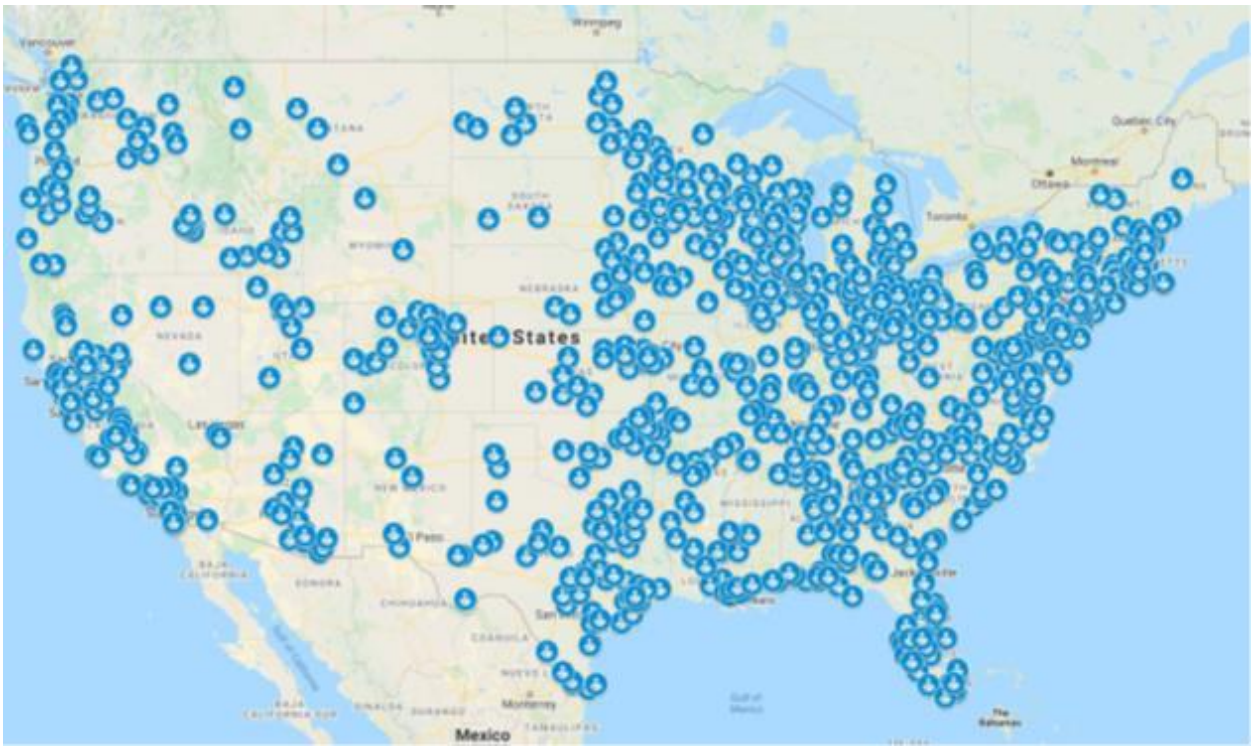
Mike Hudson, District Five's Traffic Incident Management Program Manager (Metric), gave a brief presentation on the drone services provided in the ICM Operations program.

- Unmanned Aerial Vehicle (UAV) or Unmman Aerial System (UAS) are typically battery-operated aircraft remotely controlled by a pilot to capture images using high-definition digital cameras
    - The cost to operate is a fraction of manned operations
- On average, there are nearly 327,000 intrusion attempts PER DAY from 62 different countries
- Software is available that enables the pilot to establish the perimeter of an aera the UAS will fly and the pattern it will use to carry out the flight



- The Federal Aviation Administration (FAA) regulates operation of UAS for recreational, commercial, and governmental uses
- UAS operators in public and private sectors must adhere to statutory and regulatory requirements
- 14 CFR Part 107 apply to most operations of UAS weighing less than 55lbs
- UAS operators must be aware of the requirements of the airspace in which they wish to fly
- UAS have proven effective in reducing the amount of time needed to document fatal crashes

- UAS are also effective in
    - Distaster response
    - Situational awareness
    - Diversion Route Monitoring
    - Incident verification
    - Queue detection and monitoring
    - Secondary crash detection
- Benefits of UAS for TIM
    - Saves Lives, Saves Time, Saves Money
- Law enforcement agencies across the country are using drones for TIM



Mike Hudson and Jovanny Varela provided a brief demonstration of the Skydio 2+ drone used in TIM operations at District Five. Jovanny conducted a brief flight outside while meeting participants watch the live video stream from the UAS.

- The Skydio 2+ has a max flight time of 27 minutes with a max flight speed of 36mph
    - It can withstand wind speeds up to 25mph

Following the demonstration, Mike Hudson showed drone footage from several field operations during traffic incident management. The footage obtained from the drone flight was superior to CCTVs with obstructed views of the incidents.

The drone footage also helped identify hurricane impacts to the shoreline in Flagler Beach.

- Drones have also been used during special events. An example is providing awareness of Orange County Convention Center parking.
- Drones can also be used to assist in connected vehicle communications such as intersection assist, emergency brake warning, and blind spot warning
- Discussion:
    - How do drones handle poor cell services?
        - The drones utilize Starlink when cell service is unavailable
    - Can you conduct nighttime flying?
        - Yes, we have to have special lights on the drone that are visible by aircraft
    - Anytime you're flying in controlled airspace, you have to tell FAA
    - The liability ultimately falls on UAS pilot

III. FLORIDA SENATE BILL 1068 – DRONE DELIVERY SERVICE

David Williams gave a brief presentation on the 2023 Florida Senate Bill 1068 relating to Drone Delivery Services.

- Signed into law in May 2023
- Defines *drone delivery service*
- Defines *drone port*
    - No more than 1,500 sqft or 36ft tall
    - Nonresidential area
    - Used by drone delivery service
    - Exempted from Florida Fire Prevention Code
- Jurisdictions can enforce minimum setback and landscaping regulations
- Jurisdictions cannot withhold business tax receipt, permit, or other use approval from vendor based on location of its drone port

IV. E-SCOOTER SAFETY: ISSUES AND SOLUTIONS (2022)

David Williams gave an overview of the *E-Scooter Safety: Issues and Solutions* Behavioral Traffic Safety Cooperative Research Program Research Results Digest (BTSCRP RRD) report sponsored by the Governors Highway Safety Association (GHSA) and the National Highway Traffic Safety Administration (NHTSA).

- Research conducted by University of North Carolina at Chapel Hill and University of Tennessee, Knoxville
- Report examines E-scooter context and safety issues, injuries, program safety management practices, and stakeholder practices, gaps and safety issues
- E-scooter benefits
    - Social, health, and environmental benefits
    - Enhanced multimodal connections
    - Positive economic benefits
- Real/perceived safety challenges
    - Improper e-scooter parking

  - E-scooter riders that are distracted, inexperienced, reckless, or impaired
  - Fear related to harassment and crime
- Prevailing research has focused on behaviors, usage, and data needs via short-term pilot projects
- Goals of the E-Scooter RRD report
  - Describe overall state of use or exposure; describe safety trends among users and markets
  - Characterize relationship between e-scooter crashes, injuries, and fatalities and contributing factors
  - Summarize how cities are working to support, manage, and regulate the use of e-scooters to prevent/mitigate injuries and provide series of case studies highlighting real-world practices
- RRD Methodology
  - Web-based survey from stakeholders
  - Literature review focusing exclusively on e-scooters
    - 349 studies/reports

- Users typically pay flat fee ($1) to unlock e-scooter, plus additional pay-per-minute charge ($0.15 to $0.39 per minute)
- Companies perform redistrubtion overnight based on usage trends
- Non-standard language led to unclear crash statistics prior to 2019
- Who rides e-scooters
  - Men more likely to ride, but there is conflicting data
  - Disproportionately white (typically)
  - 18-34 age group overrepresented
  - Middle-income users were overrepresented
    - Denver was exception;users were more likely to be on the extremes (low- or high-income)
- How often do people ride e-scooters?
  - From 2018 to 2019, e-scooter trips increased from 40M to 86M
  - Prior to COVID-19, there were 205 e-scooter programs; there were only 146 by August 2021
  - Weekdays – low morning ridership; peak from noon to afternoon commuter
  - Weekends – fairly consistent ridership from 11am to 6pm
- Trip replacement
  - E-scooter trips replace walking/biking to the same degree or greater degree as replacing auto trips
  - E-scooter has significantly impacted bikeshare usage
- Hesitant survey respondents indicated traffic safety concerns relating to hitting someone or being hit, unsteadiness and worries about falling, and lack of safe locations to ride
- Men prefer riding e-scooter in bike lanes over sidewalk, trail, or street
- Helmet use is uncommon (issues with advanced planning)
- Who is getting injured on e-scooters
  - Greater proportion of males received medical care
  - Average age of patient was in 30's

    - 53 e-scooter traffic fatalities reported globally from 2016-2021
        - Average age was 33
        - Nearly 90% of fatalities were male
    - Minimum age limits imposed by jurisdictions have limited enforcement
        - Study in California found 27 injured riders (11%) were 8-17 years old
        - 13% of e-scooter riders involved in a crash in Nashville were under 18
- Injury characteristics
    - Head and upper extremity injuries, especially fractures, were prevalent
    - Most injuries were deemed *Not Serious* on the Injury Severity Score system
    - Only 9.4% of e-scooter injuries resulted in hospital admissions in 2018
- Crashes most common in street and on sidewalk
- When e-scooter program is first introduced to a geographic area, crash rates will be relatively high but should decline over time
- Seasonality is also a key trend
- Safety Management Practices
    - Shared Use Mobility Center Mobility Learning Center https://learn.sharedusemobilitycenter.org/
- Rules, Restrictions and Other Regulations
    - Parking is a significant concern with dockless systems
        - However, only ~3% of e-scooters are parked improperly (most people use bike racks)
        - LA DOT created drop zones by using movable decals placed on sidewalk or pavement at popular dropoff points
    - Sidewalk riding is another concern
        - Sidewalk restrictions vary widely across the country
        - Sidewalk riding increases where bike lanes are absent
    - Helmet enforcement is untenable and can lead to equity issues
    - Nighttime riding restrictions vary widely
        - Consider restrictions due to higher proportion of severe injury and fatality
    - Speed governor requirements may vary, but are typically programmable
- Data gaps still exist; industry not yet mature enough for comprehensive trend data
- Discussion:
    - Did they speak about the effectiveness of these practices?
        - No, they just discussed how widespread various practices were, not their effectiveness.

- Most common safety management practices

TABLE 1 Ten Most-Reported E-Scooter Safety Management Practices in Survey

QUESTION GROUP	ITEM	PLANNED, OCCASIONAL, OR ESTABLISHED PRACTICES (*N*)	TOTAL NO.	TOTAL %
6: Programs and Policies	Utilizing geofencing in areas where e-scooter riding is not permitted	42	52	81
4: Rider Restrictions	Setting maximum speeds for e-scooter devices	39	57	68
4: Rider Restrictions	Establishing e-scooter parking requirements or rules	38	57	67
4: Rider Restrictions	Prohibiting e-scooter usage on sidewalks	38	57	67
6: Programs and Policies	Clarifying or unifying the legal status of micromobility devices in your state/region	35	53	66
5: Operator Restrictions	Establishing requirements for responding to user feedback/ community complaints	34	51	67
5: Operator Restrictions	Mandating that operators send in-app messages related to safety rules and regulations	33	51	65
5: Operator Restrictions	Mandating safety or accessibility features or equipment on e-scooters (e.g., seats, lights, reflectors)	32	51	63
6: Programs and Policies	Considering traffic safety concerns when defining e-scooter service areas	32	52	62
8: Communications and Messaging	Providing informational materials regarding e-scooter rules and regulations	32	43	74

- Least common safety management practices

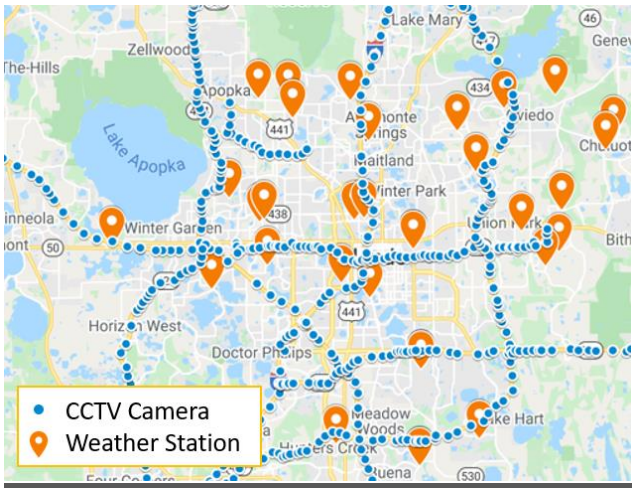
TABLE 2 Ten Least-Reported E-Scooter Safety Management Practices in Survey

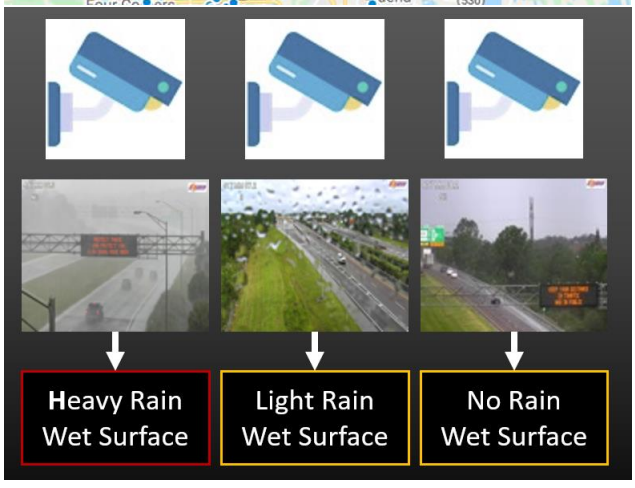
QUESTION GROUP	ITEM	NOT A CURRENT PRACTICE OR UNKNOWN/UNSURE/ NOT AVAILABLE (*N*)	TOTAL NO.	TOTAL %
4: Rider Restrictions	Limiting motor vehicle speed limits in e-scooter service areas	48	56	86
6: Programs and Policies	Providing incentives or bonuses to operators for safety performance	39	51	76
4: Rider Restrictions	Implementing time restrictions for e-scooter operations (e.g., nighttime curfews)	35	57	61
6: Programs and Policies	Funding one or more dedicated staff positions for safety program management and coordination	34	52	65
2: Infrastructure	Adjusting signal timing/operations to account for e-scooters	32	34	94
6: Programs and Policies	Funding helmet distribution efforts	31	52	60
4: Rider Restrictions	Mandating first-time e-scooter rider training	30	57	53
3: Markings and Maintenance	Identifying and addressing e-scooter roadside hazards such as grates, manhole covers, and stationary roadside objects	27	41	66
3: Markings and Maintenance	Modifying maintenance schedules to improve debris clearance	26	41	63
7: Engagement and Outreach	Including e-scooter safety education in driver training programs	25	40	63

V. NEXT GENERATION SAFETY AND MOBILITY: AI & COMPUTER VISION APPLICATIONS

Dr. Mohamed Abdel-Aty discussed the AI and Computer Vision development efforts conducted by the UCF Smart & Safe Transportation Lab (UCF SST).

- Big data going into AI applications in traffic safety
  - Infrastructure data
  - Probe Vehicle Data
  - ITS data
  - New types of data sources
  - Signal timing
  - Weather
  - CAV

        - Image, video, smartphone, LiDAR, IoT
- AI applications in traffic safety
    - Prediction
        - Investigate nonlinear relationship between variables
        - Handle large data
        - Handle new data sources
    - Imbalance Data Issue
        - Generate artificial data
- AI-based Data Collection
    - Data sources – emerging sensors like camera, LIDAR, sonar, radar, UWB
    - Example – ground weather stations are very accurate but sparse in the region; using state-of-the-art computer vision algorithms, AI can detect weather conditions by using standard CCTV video feeds which are prevalent in any jurisdiction
        - 

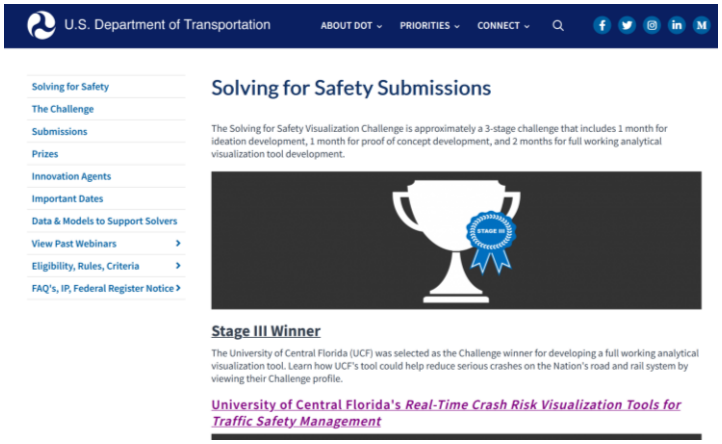
        - 

- Data Pipeline
    - Camera Calibration → Detection → Tracking → → → Traffic Data
- Automated Roadway Conflicts Identification System (ARCIS)
    - Uses UAV video and machine learning to generate

  - Trajectory data of road users including vehicles and VRUs
  - Road users' classification
  - Traffic statistics (volume, speed, etc.)
  - Safety indicators (PET, TTC, etc.)

- Near Miss Event Detection System (NMEDS)
  - 

  - 
- CitySim Open Dataset
  - Drone-based vehicle trajectory dataset for safety-oriented research and digital twins
  - More than 1,500 minutes of drone trajectory open data made available
    - OEMs and practitioners have been requesting access
  - Drones are better at capturing vehicles
    - CCTVs have a lot more in their view including occlusions
- Proactive Pedestrian Detection System
  - Machine learning system was able to detect pedestrians in zones of interest with a high accuracy
  - Driver and pedestrian can both receive alerts, potentially before they have visual confirmation of each other
- Crash Predictions for Expedited Detection (CPED)
  - Visualization platform intended to improve incident response and reduce secondary crash occurrence

        - Tells the operator which CCTV is appropriate to view and gives a direction
        - Allows for 3rd party data sharing
    - Safety Data Initiative (SDI) built in 2019; still live
        - 

    - CPED = upgrade to SDI
        - Added secondary crash prediction
        - Added CCTV verification
            - Notifies operators they need to check camera #4 now
        - Added API for third-party usage and report generation
        - John is in the process of implementing into D5 system
- For more information, visit http://ucfsst.com/
- Wejo just went out of business this week
- We have to use AI because of the large volume of data
- What kind of video quality do you need?
    - Using CCTVs is doable, but PTZ functionality is the problem
- ARCIS uses only drone videos, but other systems use road-level video
- Does ARCIS catch pedestrians?
    - The height makes it difficult but UCF is working on this
    - Typically use roadside cameras for pedestrians
- Surrogate safety measures (SSM) like Time-to-Collision (TTC) are a conflict or near-miss value/metric
- I2V can help AVs "see" pedestrians in blind spots
- Detection/Tracking output
    - Color of bounding box based on speed
- Post encroachment time (PET)
    - Able to do this for left-turn; very difficult to do this because the curve is an issue
- Proactive Pedestrian Detection
    - Application used to notify driver/pedestrian
        - Also used for queue warning, using nearby cameras
- Discussion:
    - How does the system function in weather and nighttime?
        - For real-time monitoring, yes this visibility issue could be a problem
            - Infrared is possible but expensive

- Weather algorithm?
  - Clear, light, heavy rain
  - Wet, not wet

VI. TSM&O UPDATES

Jeremy Dilmore briefly provided a brief update on changes to staff at District Five Traffic Operations.

- TSM&O Production Manager
  - Tushar has shifted to Construction
  - Position to be advertised shortly
- TSM&O Design Project Manager
  - Heidi Trivett is shifting to Maintenance
  - Position will be advertised shortly
- TSM&O Construction Project Manager
  - Daniel Simpson will be covering Heidi's projects in the interim
  - Swan Duncan and Jim Miller will be covering construction oversight in the interim
- TSM&O Operations
  - Ray Marlin has retired
  - John Lily is transitioning into this role
- TSM&O Engineer (Arterials) – Tricia Ballard
- TSM&O Maintenance and CEI – Lorena Cucek
- TSM&O RTMC Manager – Lauren Pearson
- TSM&O Pushbutton – Kevin Marquez
- TSM&O Retiming – Patrick White

VII. CURRENT INITIATIVES

Jeremy Dilmore briefly provided an update on the current work efforts throughout District Five.

- Central Office Priority Projects
  - Central Office requested a multiyear list of prioritized TSM&O projects
  - District 5 Traffic Ops Approach
    - Pulling together LOPP/PPL
    - Will meet with each MPO/TPO to discuss
    - Will establish a rubric/prioritization process
      - Borrowing from Eric Hill's CFMPOA Regional TSMO Project efforts
    - FDOT team will rank all assembled projects accordingly
    - Present to Consortium
- Executive Order 22-216
  - Strengthening Florida Cybersecurity Against Foreign Adversaries
  - Mandated for state agencies and strongly recommended for local agencies
  - EO 22-216 requires certain software be blocked from networks, computers, and mobile phones (via firewall)
    - QQ, TikTok, WeChot, Vkontakte, Kaspersky

- Flexible Delineators – FDOT has installed several delineators in the RTMC parking lot that can be bent or deformed but still return to their original shape when released
- ITS Architecture Change Request – New maintenance cycle; deadline for Change Request Forms is June 30th.
- Smart Signals
    - Internal guidance document created to train our signal staff on Smart Signal design
    - If locals are seeing gaps with their technicians being able to maintain the signals, they are asked to let District staff know
- Signal Design – D5 established new internal process for Signal Operating Plans
    - Seen a fair amount of issues with SOPs
    - After 60% plans, will hold internal meeting to review SOPs
        - Designers (FDOT or consultant staff)
        - Traffic Ops staff
        - Do locals want us to discuss anything else during these meetings?
- CV Update – Emergency Vehicle Preemption
    - Working on agreements with fire departments
- AV Shuttle – electrical charging upgrades amendment fully executed; working to finalize S&S plans
- Kiosks at UCF – Kiosks are deployed and functioning on UCF campus with multimodal trip generation software; wooden prototype developed
- Smart Work Zone – Advanced Smart Work Zone Information (AWZI) trailers; trailers will be deployed on the ongoing I-4 @ Sand Lake Rd interchange design-build project
- Event Management – verification cameras deployed at most locations in Daytona Beach area; fully brought into SunGuide; received WOWZA license to bring into Blank Out Sign software
- I-75 CCTV camera improvements – TPAS verification cameras for I-75 embedded DMS are in construction

VIII. NEXT MEETING

- September 14, 2022

IX. ATTACHMENTS

- A – Presentation Slides
- B – Meeting agenda

END OF SUMMARY

This summary was prepared by David Williams and is provided as a summary (not verbatim) for use by the Consortium Members. The comments do not reflect FDOT's concurrence. Please review and send comments via e-mail to dwilliams@vhb.com so the meeting summary can be finalized.

Welcome to the TSM&O Consortium Meeting

June 1, 2023

Transportation Systems Management & Operations

Meeting Agenda

1. Welcome
2. ICM Operations Drone Service
3. Florida Senate Bill 1068 – Drone Delivery Service
4. Micromobility Policies, Permits, and Practices (NCHRP)
5. UCF Research Efforts – Update
6. TSM&O Program Updates
7. Current Initiatives

Drone Use in Traffic Incident Management

Mike Hudson

FDOT District 5 TIM Program Manager

What are UAS?

UAS are typically battery-operated aircraft remotely controlled by a pilot to capture images using high-definition digital cameras. These aircraft are well-suited for many tasks, and the cost to operate is a fraction of manned air operations.

They encompass the hardware and software components required for the flight of an Unmanned Aerial Vehicle (UAV), commonly referred to as a "Drone."

Software is also available that enables the pilot to establish the perimeter of an area the UAS will fly and the pattern it will use.

Drones hold great promise for TIM

Improving Safety

Relieving Congestion

Reduce Economic Impact of Roadway Incidents

Regulations on Drone Use

The Federal Aviation Administration (FAA) regulates operation of UAS in the United States, including recreational, commercial, and governmental use:.

- UAS operators in both the public and private sectors must adhere to statutory and regulatory requirements.
- Public aircraft operations (including UAS operations) are governed under the statutory requirements for public aircraft established in 49 USC § 40102 and § 40125.

Regulations on Drone Use Continued

Both public and civil UAS operators may operate under the regulations promulgated by the FAA.

The provisions of 14 Code of Federal Regulations (CFR) part 107 apply to most operations of UAS weighing less than 55 pounds.

Operators of UAS weighing greater than 55 pounds may request exemptions to the airworthiness requirements of 14 CFR part 91 pursuant to 49 USC §44807.

UAS operators should also be aware of the requirements of the airspace in which they wish to fly.

Implementing UAS into Traffic Incident Management

UAS have proven effective in reducing the amount of time needed to document fatal crash scenes, and for other TIM related purposes.

Including, but not limited to:

Disaster Response

Situational Awareness

Diversion Route Monitoring

Incident Verification

Queue Detection & Monitoring

Secondary Crash Detection

Benefits of UAS for Traffic Incident Management

Saves Lives

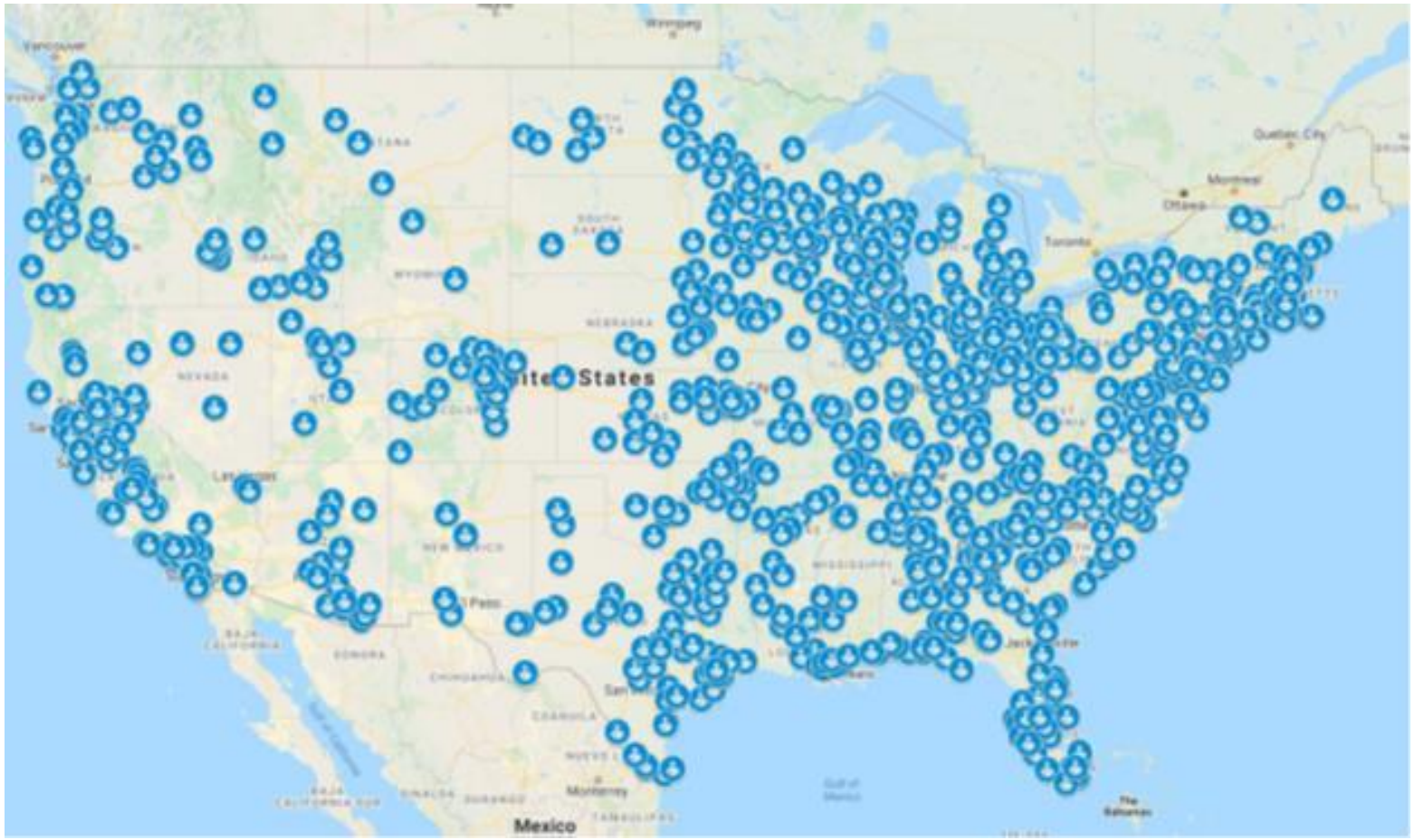
- Increased situational awareness
- Safety of incident responders & motorists
- Reduced likelihood of secondary crashes by providing real-time video streams to the RTMC

Saves Time

- Less time in the roadway by providing an aerial view of the scene to see tire marks, crash debris, etc.
- Reduced investigative man hours

Saves Money

- Lower cost compared to manned aircraft
- Reduced congestion and impact on climate change
- Cost-effective measuring and mapping



Law Enforcement Agencies Actively Using Drones

Source: Bard College Unmanned Aircraft Systems for Traffic Incident Management

Examples of TIM D5 Drone Implementation

Equipment used in D5

Skydio 2+

AIRCRAFT	
DIMENSIONS WITH BATTERY (ANTENNAS UP)	229 x 274 x 126 mm
WEIGHT (WITH BATTERY)	800 g
FLIGHT TIME	Up to 27 minutes
MAX FLIGHT SPEED (SEA LEVEL, NO WIND)	36 mph
MAX WIND SPEED RESISTANCE	25 mph
MAX SERVICE CEILING (ABOVE SEA LEVEL)	Up to 15,000 ft
OPERATIONAL TEMPERATURE RANGE	-5°C to 40°C
ADVANCED AI-PILOT ASSISTANCE	360 Superzoom, Close Proximity, Obstacle Avoidance, Point-of-Interest Orbit, Track-in-Place, Vertical View, Visual Return-to-Home

Equipment used in D5

Skydio 2+

Skydio Streaming

Real-time visibility from your browser or mobile device

- *Live Situational Awareness* shared with anyone in your organization
- *Multiple connectivity options* including Enterprise Controller, or mobile Enterprise

January 9, 2023

RISC Event: Dump Truck Rollover

Traffic Incident Management

April 14th, 2023

Dump Truck Rollover ITS CCTV View

April 14th, 2023

Dump Truck Rollover Footage

Traffic Incident Management

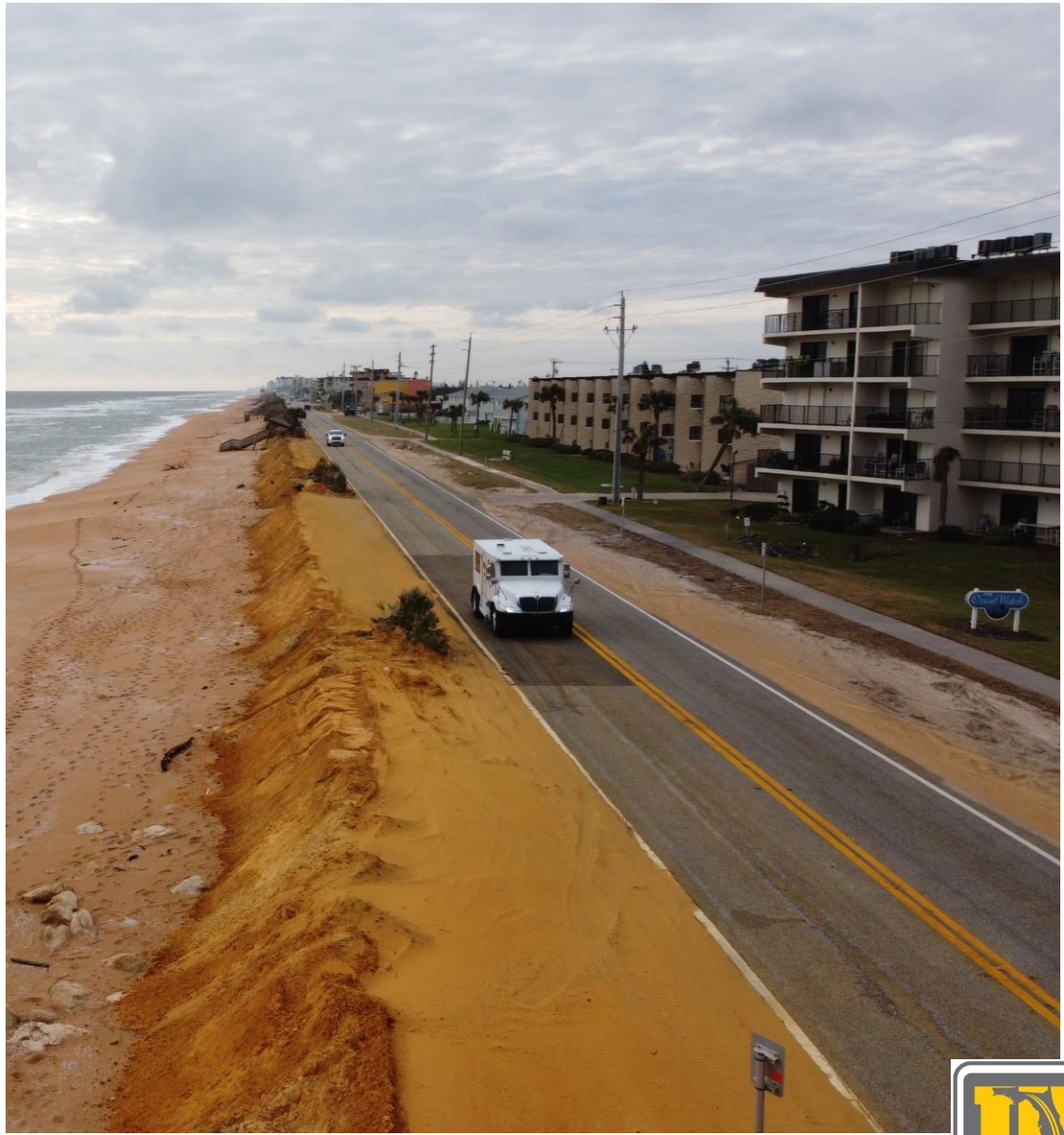
January 30th, 2023

Arterial Crash Involving A School Bus

Traffic Incident Management

November 2022

Hurricane Nicole



Traffic Incident Management

Special Events

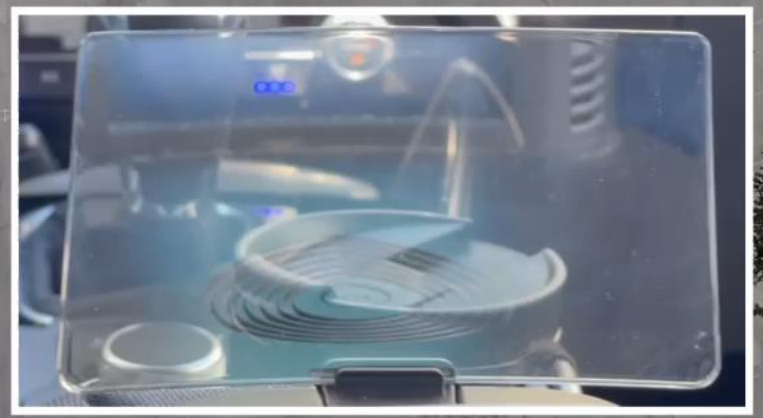
April 1st, 2023

Orange County Convention Center Parking

Move Over Slow Down Press Conference

Traffic Incident Management

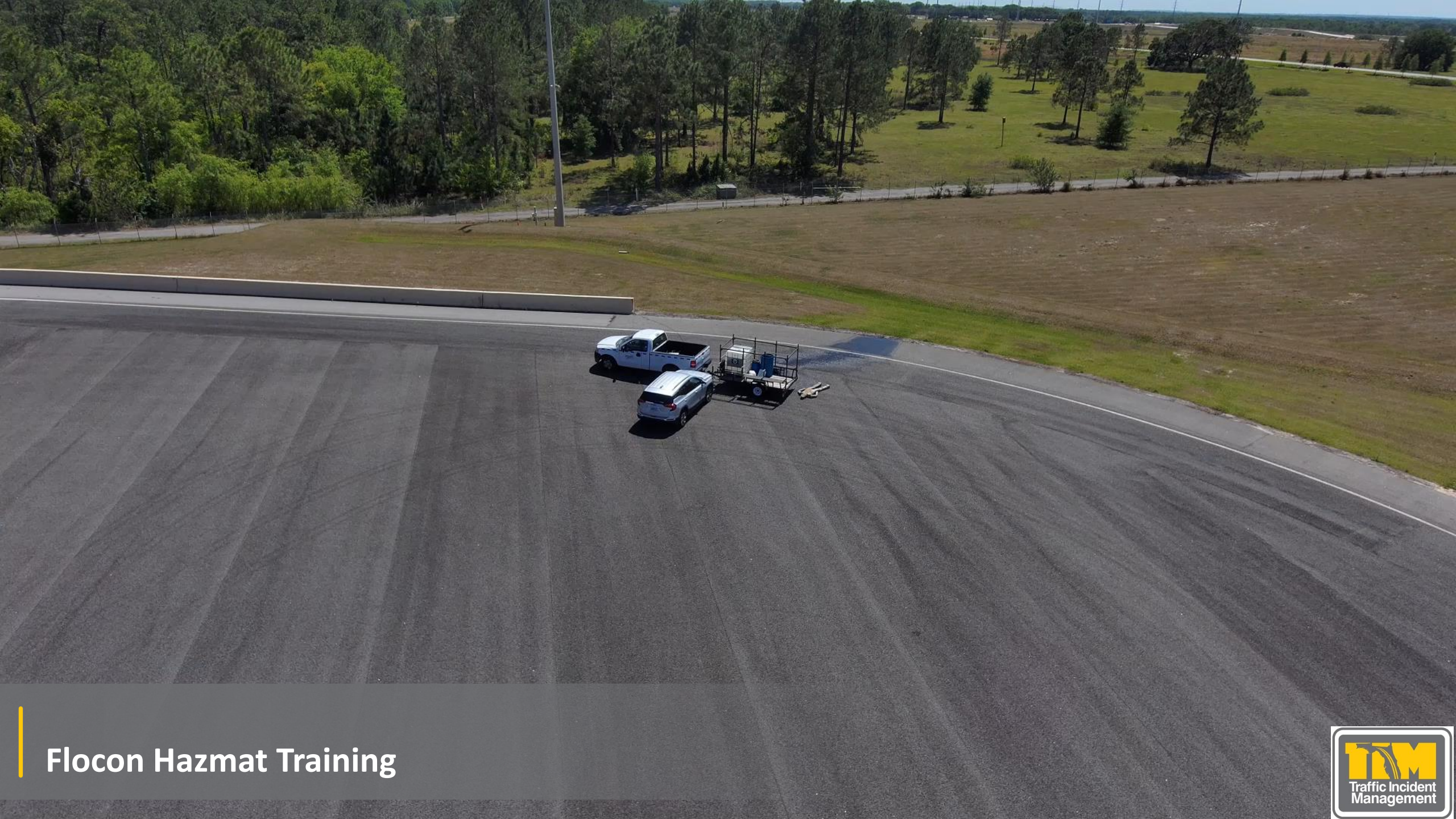
Testing:
Forward collision warning



Traffic Incident Management

FloCon 2023

Training Opportunities
Networking
Drone Vendors
New Technology/Test Flights



Flocon Hazmat Training

Traffic Incident Management

Mike Hudson

TIM Program Manager
Phone: 407-706-7334
Email: michael.hudson@dot.state.fl.us

FDOT TSM&O
Transportation Systems Management & Operations

Florida Senate Bill 1068
Drone Delivery Services

David Williams, VHB

Florida SB 1068 – Drone Delivery Services

- Signed into law in May 2023
- Defines “Drone Delivery Service”
- Defines “Drone Port”
  - No more than 1,500 sqft or 36ft tall
  - Nonresidential area
  - Used by drone delivery service
  - Exempted from Florida Fire Prevention Code
- Jurisdictions can enforce minimum setback and landscaping regulations
- Jurisdictions cannot withhold business tax receipt, permit, or other use approval from vendor based on location of its drone port

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E-Scooter Safety: Issues and Solutions

David Williams, VHB

E-Scooter Safety: Issues and Solutions

- Behavioral Traffic Safety Cooperative Research Program (BTSCRP)
  - *Research Results Digest*
    - Chapter 1: Introduction
    - Chapter 2: Study Methods and Data Sources
    - Chapter 3: E-Scooter Context and Safety Issues
    - Chapter 4: E-Scooter Injuries and Crash Context
    - Chapter 5: E-Scooter Program Safety Management Practices
    - Chapter 6: Stakeholder Practices, Gaps, and Safety Issues Identified
    - Chapter 7: Conclusion

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Transportation Systems Management & Operations

E-Scooter Safety: Issues and Solutions

Many communities with E-Scooter programs have observed:

- A variety of **benefits**
  - Social, health, and environmental benefits
  - Enhanced multimodal connections
  - Positive economic benefits (e.g., delivery/courier service using e-scooters)
- And some **real/perceived safety challenges**
  - Improper e-scooter parking
  - E-scooter riders that are distracted, inexperienced, reckless, or impaired
  - Fear related to harassment and crime

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E-Scooter Safety: Issues and Solutions

- Prevailing research has focused on travel behaviors, usage trends, and data needs via short-term pilot projects
- Knowledge gaps still exist
  - E-scooter users' perceptions of safety and injury risks
  - Incidence of injuries and risks relative to other travel modes
  - Differential treatment of racial minorities by law enforcement;
  - Current safety management practices, frequency of application, and measures of equity and general effectiveness

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E-Scooter Safety: Issues and Solutions

Goals of the RRD

1. Describe overall state of use or exposure and safety trends among e-scooter users and markets
2. Characterize relationship between e-scooter crashes, injuries, and fatalities and contributing factors
3. Summarize how cities are working to support, manage, and regulate the use of e-scooters to prevent/mitigate injuries and provide series of case studies highlighting real-world practices

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Methodology

- Web-based survey to collect data/insights from stakeholders
- Literature review, focusing exclusively on e-scooters
  - Studies, reports, etc.
  - Statistics and reports from academia, cities & counties (“gray literature”)
  - Team identified 349 studies/reports that met criteria

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Transportation Systems Management & Operations

E-Scooter Context and Safety Issues

- RRD research findings, based on surveys and e-scooter companies
  - What services, devices, and components are riders using?
    - Users typically pay flat fee ($1) to unlock e-scooter, plus additional pay-per-minute charge ($0.15 to $0.39 per minute)
  - Companies perform redistribution overnight based on usage trends
  - Non-standard language led to unclear crash statistics prior to 2019
  - Who rides e-scooters?
    - Men more likely to ride, but conflicting data
    - Disproportionately white (typically)
    - The 18-34 age group were overrepresented
    - Middle-income users were overrepresented

E-Scooter Context and Safety Issues

- How often and for what purposes do people ride e-scooters?
  - From 2018 to 2019, e-scooter trips increased from 40M to 86M
  - Prior to COVID-19, there were 205 e-scooter programs
  - Most people ride infrequently based on survey
    - Data from companies disagrees…. 41% of their users ride at least once per week; 42% of their users ride occasionally
  - Weekdays – Low morning ridership; peak from noon to afternoon commute
  - Weekends – fairly consistent ridership from 11am to 6pm

E-Scooter Context and Safety Issues

- How often and for what purposes do people ride e-scooters?
  - Trip Replacement

FIGURE 1 Percentage of e-scooter trips that replaced other travel modes in seven cities.

Source: Portland Bureau of Transportation and Alta Planning & Design 2020.

  - Proliferation of e-scooters has affected bikeshare usage

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E-Scooter Context and Safety Issues

- What Perceptions of safety and risk are associated with E-Scooters?
  - Hesitant respondents indicated traffic safety concerns relating to
    - Hitting someone or being hit
    - Unsteadiness and/or worries about falling or losing control
    - Lack of safe locations to ride
  - 92% of Oregon/Washington respondents cited danger from auto traffic as a common deterrent
  - Poor experiences riding an e-scooter lead to feeling uncomfortable around e-scooters while walking
  - Men prefer riding e-scooter in bike lanes over sidewalk, trail, or street
  - Helmet use is uncommon (issues with advanced planning)

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E-Scooter Injuries and Crashes

- Injury data relies on hospital and emergency department data
- Police-reported crashes fail to capture most e-scooter injuries
  - Collision with person or object other than motor vehicle
- Since most data available comes from hospitals, there may be a bias towards moderate/severe injuries

E-Scooter Injuries and Crashes

- Who is getting injured on e-scooters?
  - Greater proportion of males received medical care
  - Average age of patient was in the 30's
  - 53 e-scooter traffic fatalities reported globally from 2016-2021
    - Mean age was 33
    - Nearly 90% of fatalities were male
  - Minimum age limits imposed by jurisdictions have limited enforcement
    - A study in California found 27 injured riders (11%) were 8-17 years old
    - 13% of e-scooter riders involved in a crash in Nashville were under 18
  - 55% of patients were White, 11% Black

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E-Scooter Injuries and Crashes

- What characteristics are associated with e-scooter injuries?
  - Head and upper extremity injuries, especially fractures, were prevalent
    - Some studies found higher rates of abrasions and hematomas
  - 2013-2017 data showed the head was the most common injury (27%)
  - Most common fracture sites were the lower arm and wrist
  - Study in Austria found that these head injuries were typically severe
  - On the Injury Severity Score (ISS), most injuries were deemed *Not Serious*
  - In 2018, only 9.4% of e-scooter injuries resulted in hospital admission
  - Though typically minor, injuries are rising as e-scooter use rises

E-Scooter Injuries and Crashes

- What e-scooter characteristics, types, and scenarios are most common?
  - Location
    - In Austin, crashes most common in street (55%) and on sidewalk (33%)
    - In San Fran, crashes most common in street (83%) and sidewalk (10%)
    - In DC, sidewalks (58%), roads (23%), off-road (10%), and bike lane (8%)
    - Higher bicycle network analysis (BNA) score in area, safer for e-scooter use
    - When involving motor vehicle, 65% of e-scooter crashes occur at intersection, 17% at driveway/roadway junction
  - Roadway Conditions at crash site

E-Scooter Injuries and Crashes

- What e-scooter characteristics, types, and scenarios are most common?
  - Roadway Conditions at crash site
    - In Austin, 10% of incidents involved curbs, 7% involved stationary object
    - Roadway surface have been commonly attributed to crashes
      - E-scooters more susceptible to roadway irregularities than bikes
      - One study found over 50% of injured riders claimed an issue with road
      - DC study found 25% of e-scooter injuries caused by poor surface conditions (potholes, uneven surfaces)

E-Scooter Injuries and Crashes

- What e-scooter characteristics, types, and scenarios are most common?
  - Common crash scenarios
    - In DC, ~66% of incidents caused by roadway features, not collisions
    - In Portland, 83% of ER visits were attributed to falling (no collision)
    - In Austin study, injured riders attributed their crash to extremely high-speed riding (37%) and to vehicle issues (19%)
  - Inexperience is a key factor
  - Motor Vehicle Collisions
    - Small % of nonfatal e-scooter incidents involve MV
    - MVs are involved in +80% of e-scooter and bike fatalities
    - In a e-scooter company study, 10 fatalities occurred over 38M trips
      - 9 fatalities caused by MV

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E-Scooter Injuries and Crashes

- What e-scooter characteristics, types, and scenarios are most common?
  - Collisions with Pedestrians
    - Typically minor injuries
    - Tripping over parked e-scooter is common
  - Frequency and Severity by Time of Day and Day of Week
    - Typically occur during daylight
    - Minimal to no injuries occur during overnight hours
    - Fatalities occurred largely during evening or nighttime
  - Intoxication
    - In one study where 79% of patients tested, 48% were legally intoxicated
    - More data needed

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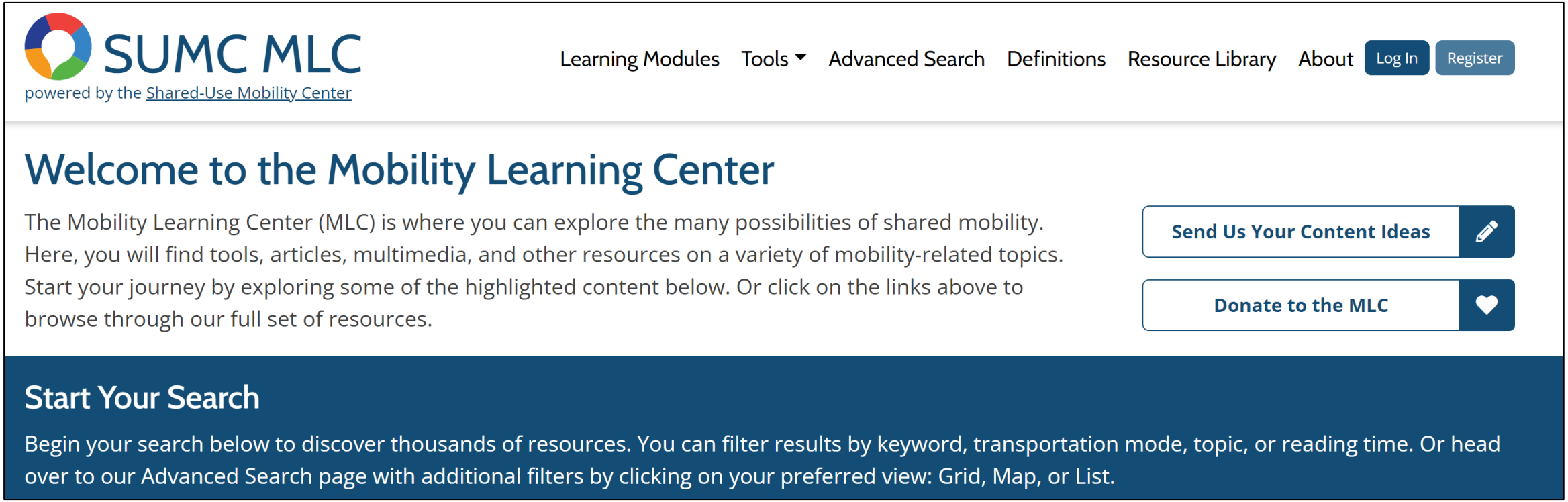
E-Scooter Injuries and Crashes

- How are injury trends changing over time?
  - Inexperience and novelty effect
    - When program is first introduced, crash rates will be relatively high but should decline over time
  - Seasonality is a key trend

E-Scooter Program Safety Management Practices

- Readers interested in a collection of micromobility policies can visit the *Shared Use Mobility Center* https://learn.sharedusemobilitycenter.org/



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E-Scooter Program Safety Management Practices

- Infrastructure Planning and Delivery
  - Cities have transitioned from pilots to a permanent micromobility permit program
- Roadway Design
  - E-scooters have similar operating speeds and characteristics to bicyclists
    - Similar infrastructure needs
  - Availability of bike lanes plays a key role in e-scooter riding preferences
- Rules, Restrictions, and Other Regulations
  - Parking is a significant concern with dockless systems
    - However, ~3% of e-scooters are parked improperly (most people use bike racks)
    - LA DOT created drop zones by using movable decals placed on sidewalk or pavement

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E-Scooter Program Safety Management Practices

- Rules, Restrictions, and Other Regulations
  - Sidewalk Riding has emerged as another concern
    - Sidewalk restrictions vary widely
    - Sidewalk riding increases where bike lanes are absent and at higher traffic speeds
    - Equity issues with bicycle infrastructure affect e-scooter usage as well
    - Companies are developing GPS technology to detect and alert riders that are illegally using sidewalks (where applicable)
      - Issues related to GPS accuracy and urban canyons
  - Helmet enforcement is untenable and can lead to equity issues

E-Scooter Program Safety Management Practices

- Operator Permitting and Regulation
  - Service area definitions and regulations (geofencing)
  - Speed governor requirements
    - Vehicle can't travel over a certain speed on even ground
    - Advanced programmability to reduce speeds further in certain geofenced areas
  - Nighttime riding restrictions vary widely; limited data
  - Riding restrictions during major events also vary
  - Speed restrictions
  - Fleet safety management
    - Cities require operators to have remote access to disable any malfunctioning units
  - Equity concerns
  - Accommodating Disabilities

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E-Scooter Practices, Gaps, and Safety Issues

TABLE 1 Ten Most-Reported E-Scooter Safety Management Practices in Survey

QUESTION GROUP	ITEM	PLANNED, OCCASIONAL, OR ESTABLISHED PRACTICES (*N*)	TOTAL NO.	TOTAL %
6: Programs and Policies	Utilizing geofencing in areas where e-scooter riding is not permitted	42	52	81
4: Rider Restrictions	Setting maximum speeds for e-scooter devices	39	57	68
4: Rider Restrictions	Establishing e-scooter parking requirements or rules	38	57	67
4: Rider Restrictions	Prohibiting e-scooter usage on sidewalks	38	57	67
6: Programs and Policies	Clarifying or unifying the legal status of micromobility devices in your state/region	35	53	66
5: Operator Restrictions	Establishing requirements for responding to user feedback/ community complaints	34	51	67
5: Operator Restrictions	Mandating that operators send in-app messages related to safety rules and regulations	33	51	65
5: Operator Restrictions	Mandating safety or accessibility features or equipment on e-scooters (e.g., seats, lights, reflectors)	32	51	63
6: Programs and Policies	Considering traffic safety concerns when defining e-scooter service areas	32	52	62
8: Communications and Messaging	Providing informational materials regarding e-scooter rules and regulations	32	43	74

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E-Scooter Practices, Gaps, and Safety Issues

TABLE 2 Ten Least-Reported E-Scooter Safety Management Practices in Survey

QUESTION GROUP	ITEM	NOT A CURRENT PRACTICE OR UNKNOWN/UNSURE/ NOT AVAILABLE (*N*)	TOTAL	
			NO.	%
4: Rider Restrictions	Limiting motor vehicle speed limits in e-scooter service areas	48	56	86
6: Programs and Policies	Providing incentives or bonuses to operators for safety performance	39	51	76
4: Rider Restrictions	Implementing time restrictions for e-scooter operations (e.g., nighttime curfews)	35	57	61
6: Programs and Policies	Funding one or more dedicated staff positions for safety program management and coordination	34	52	65
2: Infrastructure	Adjusting signal timing/operations to account for e-scooters	32	34	94
6: Programs and Policies	Funding helmet distribution efforts	31	52	60
4: Rider Restrictions	Mandating first-time e-scooter rider training	30	57	53
3: Markings and Maintenance	Identifying and addressing e-scooter roadside hazards such as grates, manhole covers, and stationary roadside objects	27	41	66
3: Markings and Maintenance	Modifying maintenance schedules to improve debris clearance	26	41	63
7: Engagement and Outreach	Including e-scooter safety education in driver training programs	25	40	63

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E-Scooter Practices, Gaps, and Safety Issues

TABLE 3 Ten Safety Management Practices Reported of Interest by Survey Respondents

QUESTION GROUP	ITEM	THERE IS INTEREST, BUT NOT A CURRENT PRACTICE (*N*)	TOTAL NO.	TOTAL %
6: Programs and Policies	Developing e-scooter safety performance measures and goals	16	53	30
1: Planning	Allocating funding for infrastructure or safety treatments for e-scooters	13	39	33
5: Operator Restrictions	Providing incentives/mandates to monitor and improve helmet use	13	51	25
6: Programs and Policies	Developing specific equity plans related to safety efforts	13	52	25
1: Planning	Incorporating micromobility issues into ADA accommodations and plans	12	39	31
7: Engagement and Outreach	Including e-scooter safety education in driver training programs	12	40	30
1: Planning	Developing e-scooter infrastructure safety plans	11	39	28
7: Engagement and Outreach	Providing resources to help riders determine safe routes to travel	11	40	28
6: Programs and Policies	Clarifying or unifying the legal status of micromobility devices in your state/region	10	53	19
9: Data and Injury Surveillance	Tracking e-scooter safety incidents using self-reported data on crashes or near-crash events	10	34	29

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E-Scooter Practices, Gaps, and Safety Issues

- Data gaps are still evident
  - Injury data
  - Injuries involving minors
  - Intoxication data
  - Industry not yet mature enough for comprehensive trend data
  - Data related to privately owned e-scooters
- Safety Messaging and Outreach needed
  - To public and to officials

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Next Generation Safety and Mobility: AI & Computer Vision Applications

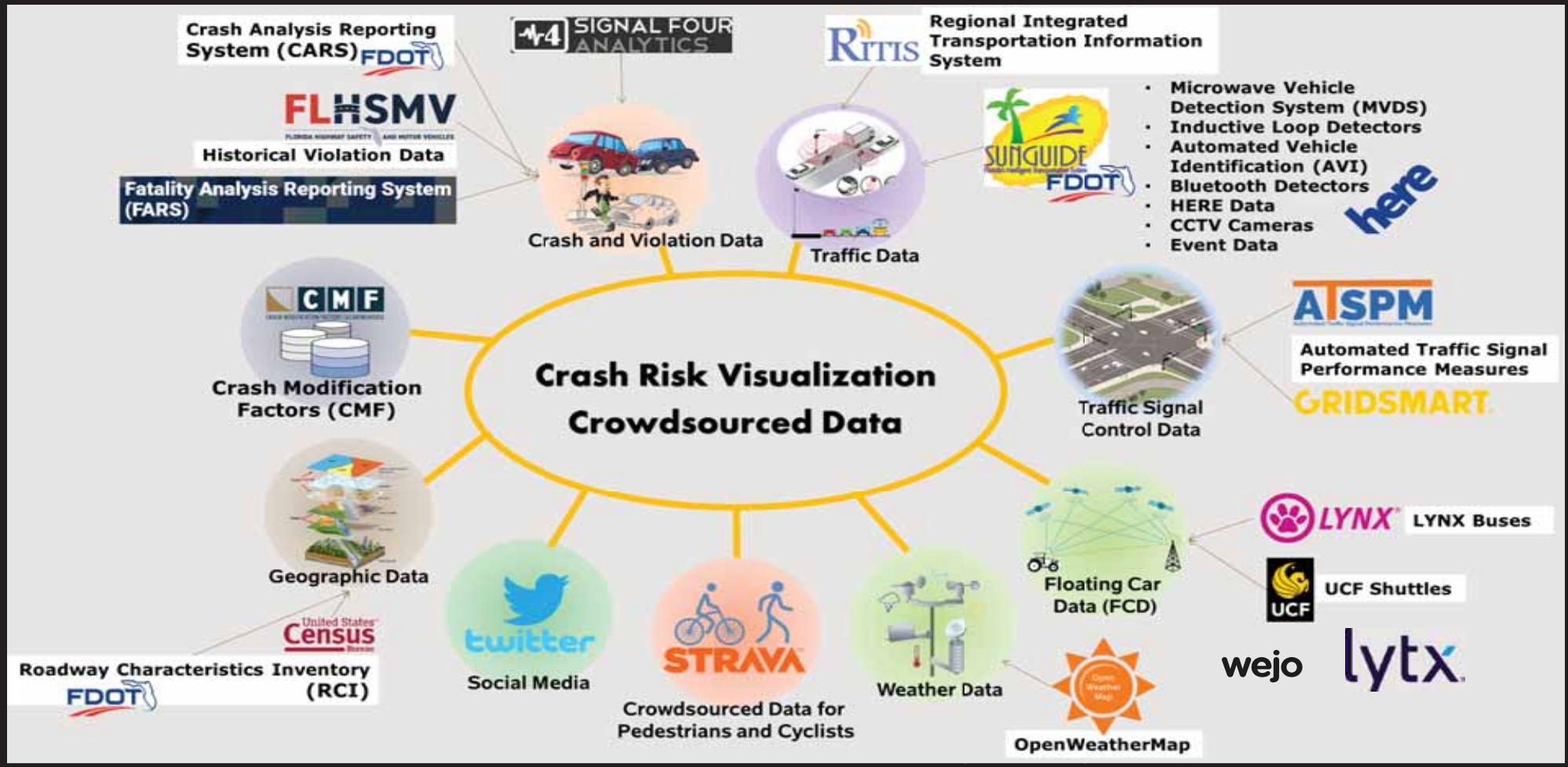
Mohamed Abdel-Aty

Trustee Chair, Pegasus Professor & Dept. Chair

UCF Smart & Safe Transportation Lab

Big Data

DATA-INFORMED



High-resolution Big data in real-time

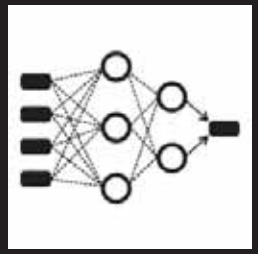
Infrastructure Data
Probe Vehicle Data
ITS Data
Signal Timing
Weather
CAV
Etc.

New Type of Data Sources

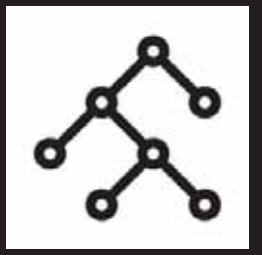
Image
Video
Smartphone
LiDAR
IoT
Etc.

AI applications in traffic safety

Prediction



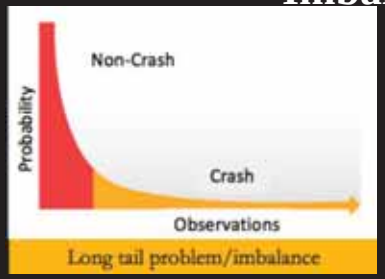
Neuron-based model
(e.g., CNN, LSTM)



Tree-based model
(e.g., XGBOOST)

- *Investigate nonlinear relationship between variables*
- *Handle large data*
- *Handle new data sources (high-dimension, time-series)*

Imbalance data issue



Generate Artificial Data

- Generative Adversarial Networks (GAN)
- Variational Autoencoder (VAE)

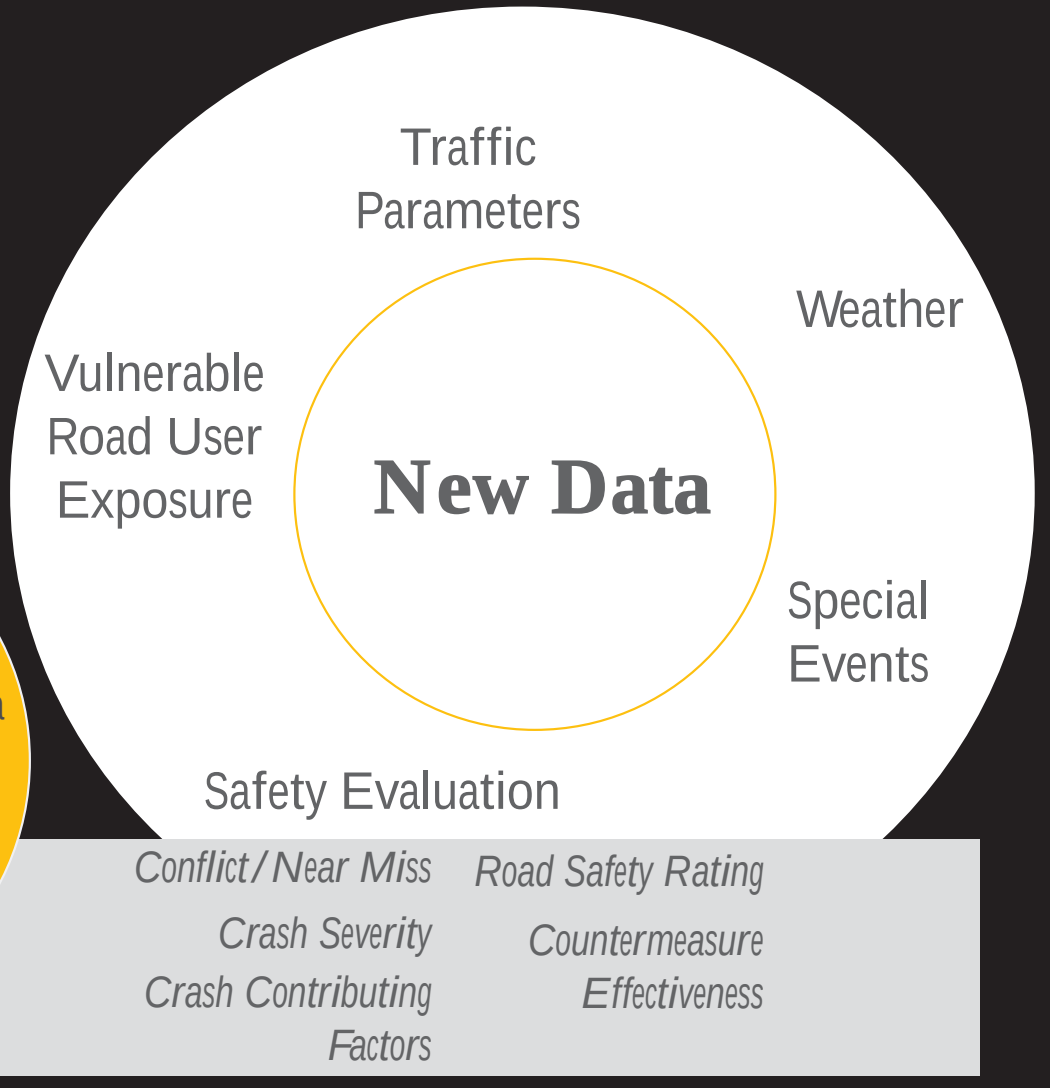
AI-based Data Collection

Data Sources

- **Emerging sensors**: Camera, LIDAR, Sonar, Radar, UWB;
- **National wide/worldwide data**: Telematics data, CCTVs, Google Street View, Satellite Images, Crash Report

Advantages

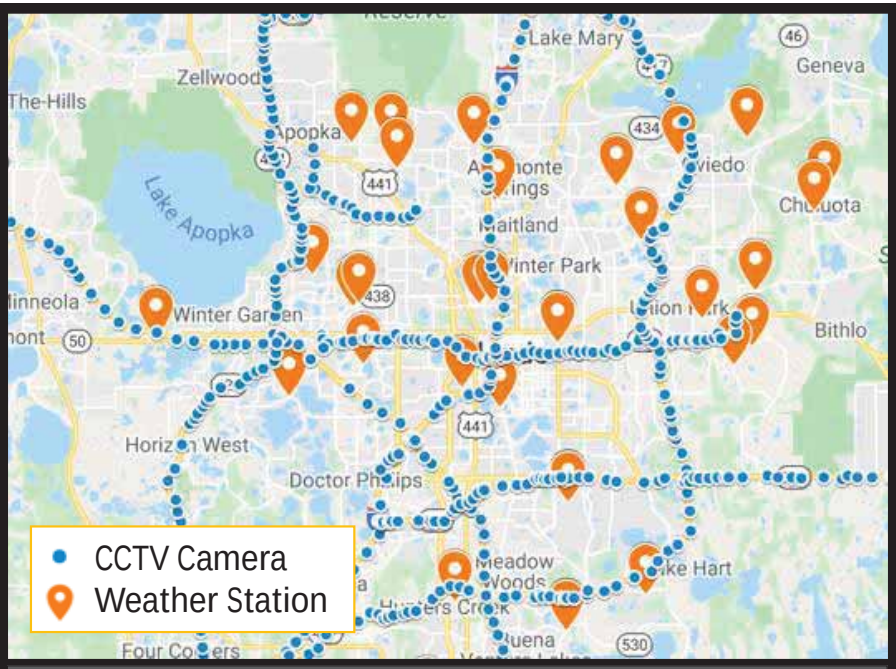
- Generate new type of data
- Reduce the cost/improve the efficiency for data collection
- Wide Coverage



AI-based Data Collection

Example: Camera-Based Rain and Road Condition Detection

- Ground weather stations provide accurate measurement of rain but are:
  - sparsely distributed in comparison to traffic cameras
  - not necessarily positioned near roads
  - cannot assess road condition
- CCTV cameras are spaced 0.5mi-1.0mi apart
- Using state-of-the-art computer vision algorithms to detect:
  - 3-level rain condition [heavy rain, light rain, no rain]
  - road surface condition [wet, dry]
- Obtaining real-time, high-frequency, granular observation of rain and road surface condition



Video Processing

Data Pipeline

Camera Calibration

Land-Mark

Input video

Optical flow

Detection

One stage

- YOLO
- SSD

Two stage

- MaskRCNN
- Fast-RCNN
- Faster-RCNN

3D pose detection

- openPose
- PIFPAF
- COCO-Pose

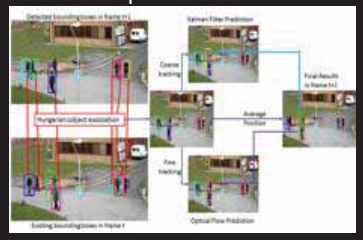
Tracking

Short term tracking(frame t+1)

- CSRT
- Center-Track

long term tracking(frame t+n)

- RE-ID
- Trajectory prediction



Traffic Data

- **Volume, Speed & Headway estimation, vehicle classification**
  - Real-time volume, speed estimation
  - Vehicle classification
  - Historical trajectories extraction
- **Vulnerable road user count & speed estimation**
  - Pedestrians & cyclists
  - Intersections
  - Arterials
- **Behavior & Human factors**
  - Crossing behavior
  - Turning behavior
  - Cyclist gesture
  - Age, Gender
  - Pedestrian step analysis
- **Conflict diagnostics based on conflicts of all road users including drivers, ped, cyclists**
- **Abnormal events identification and management**
- **Countermeasure effectiveness estimation/before-after anal**
- **Violation/Events identification (e.g. crash, queue)**
- ***Support first responders***

Automated Roadway Conflicts Identification System (A.R.C.I.S)

UCF SST computer vision platform

ARCIS

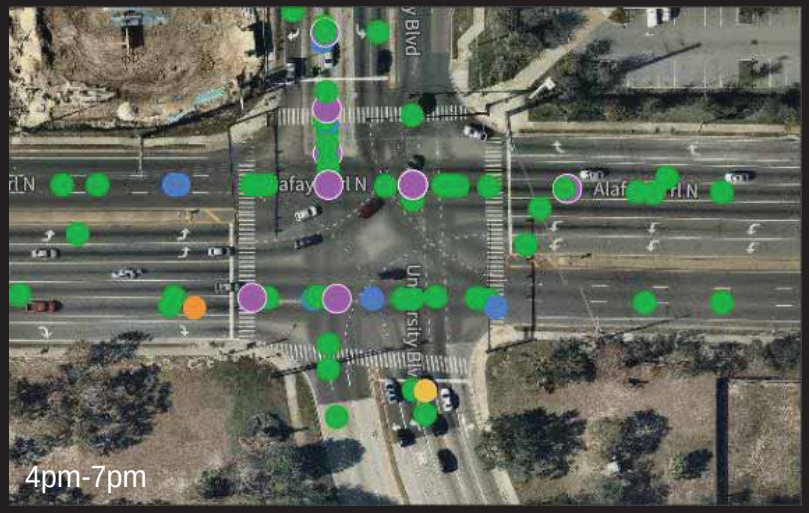
This system, applicable in particular to road traffic analysis, uses drone/Unmanned Aerial Vehicle (UAV) videos. The systems can generate the following types of outputs using drone/UAV video data:

- Trajectory data of road users including vehicles and vulnerable road users
- Road users' classification
- Traffic statistics (e.g., volume, speed)
- Safety indicators (e.g., Post-Encroachment Time (PET))
- Active Learning

- 1920 ×1080 resolution
- 30 FPS
- 120 feet
- 23 minutes

Vehicle Trajectory Output Example

University Blvd@ Alafaya Trail(28.59777019586448, -81.2077834245815)



A.R.C.I.S City-Sim Open Dataset

First and largest Digital Twin based drone trajectory open dataset for co-simulation

Signalized Intersection, FL

T-Signalized Intersection, FL

Tunnel entrance-Hongkong

Orlando-USA

UCF-USA

Weaving segment-China

DDI-Sarasota-USA

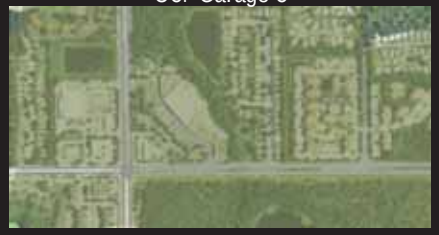
UCF-Orlando-USA

Non-Signalized intersection ,FL

Digital Twin Model

University @ Alafaya

UCF Garage C

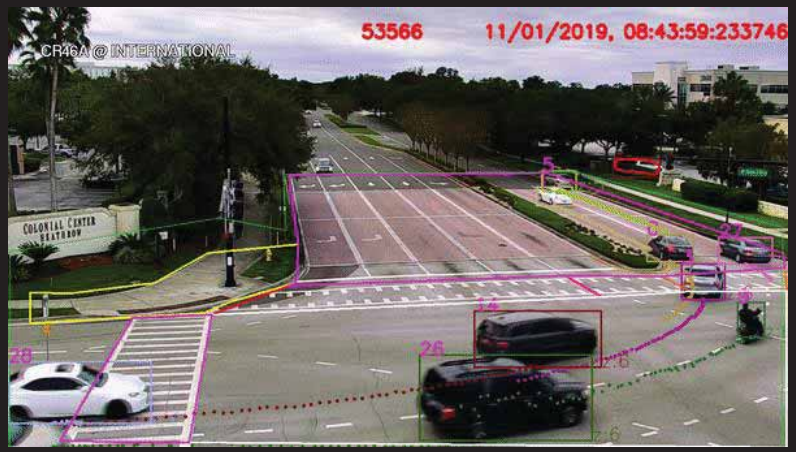


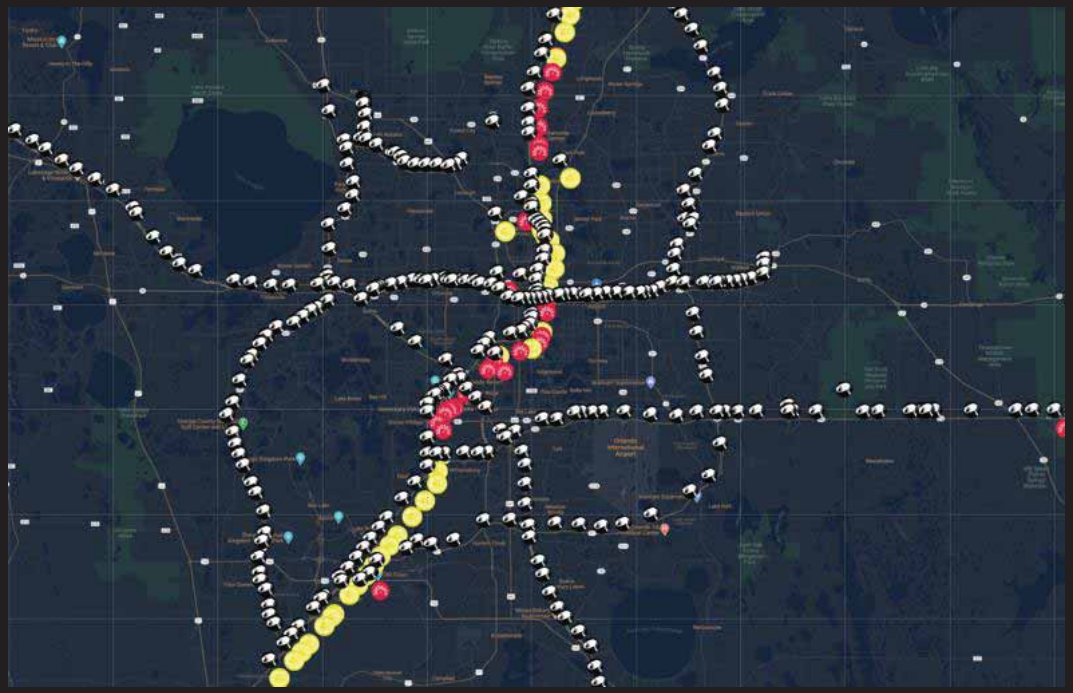
McCulloch

Near Miss Event Detection System (N.M.E.D.S)

UCF SST computer vision platform

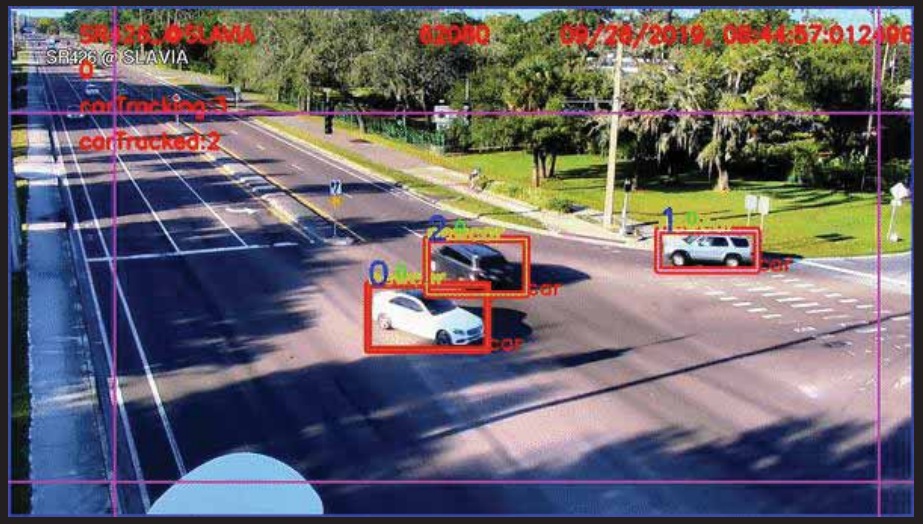
Near Miss Event Detection System (N.M.E.D.S)

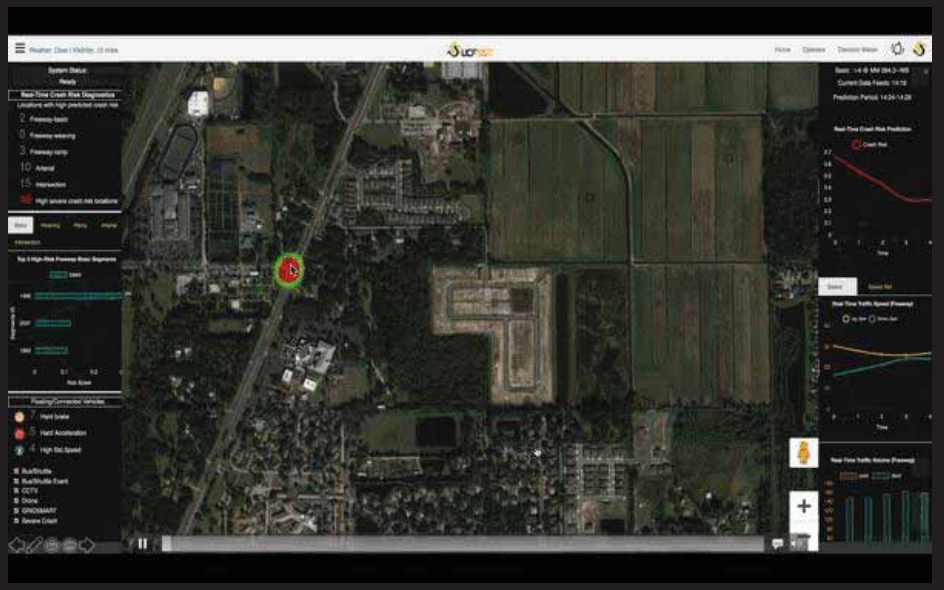




- Over 600 CCTV cameras

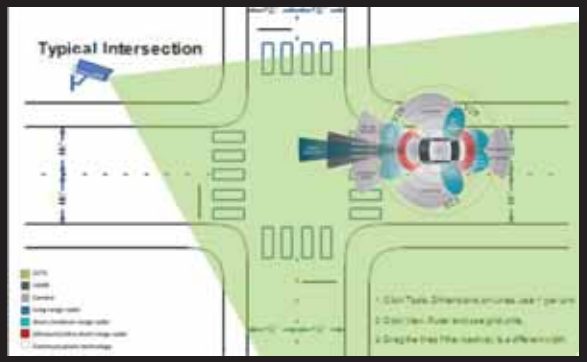
Near Miss Event Detection System (N.M.E.D.S)





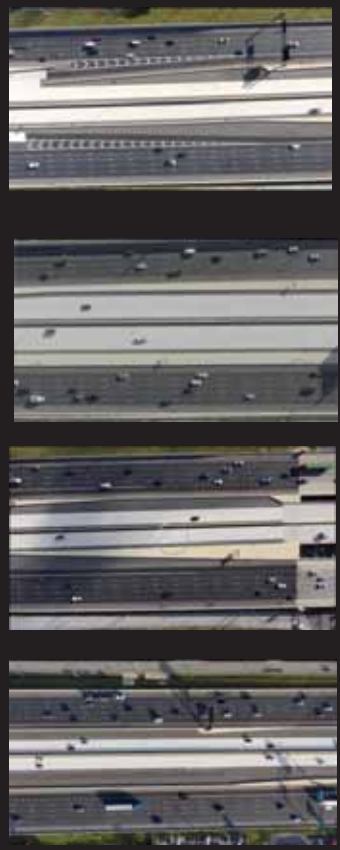
Near Miss Event Detection System (N.M.E.D.S)

I2V

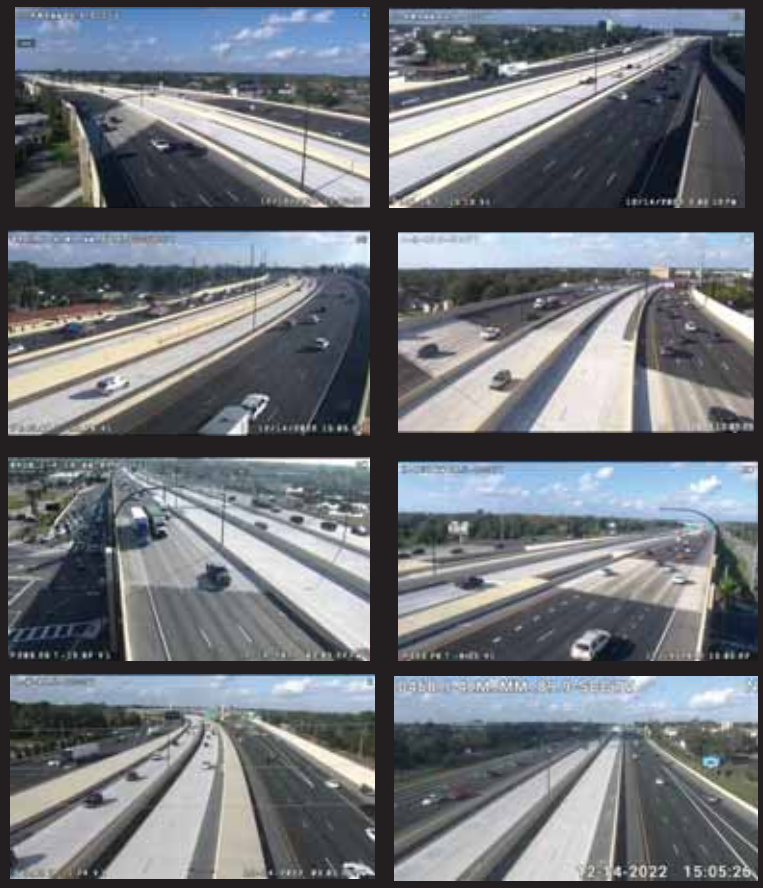


Benchmark -Data Collection

Drone
180 min



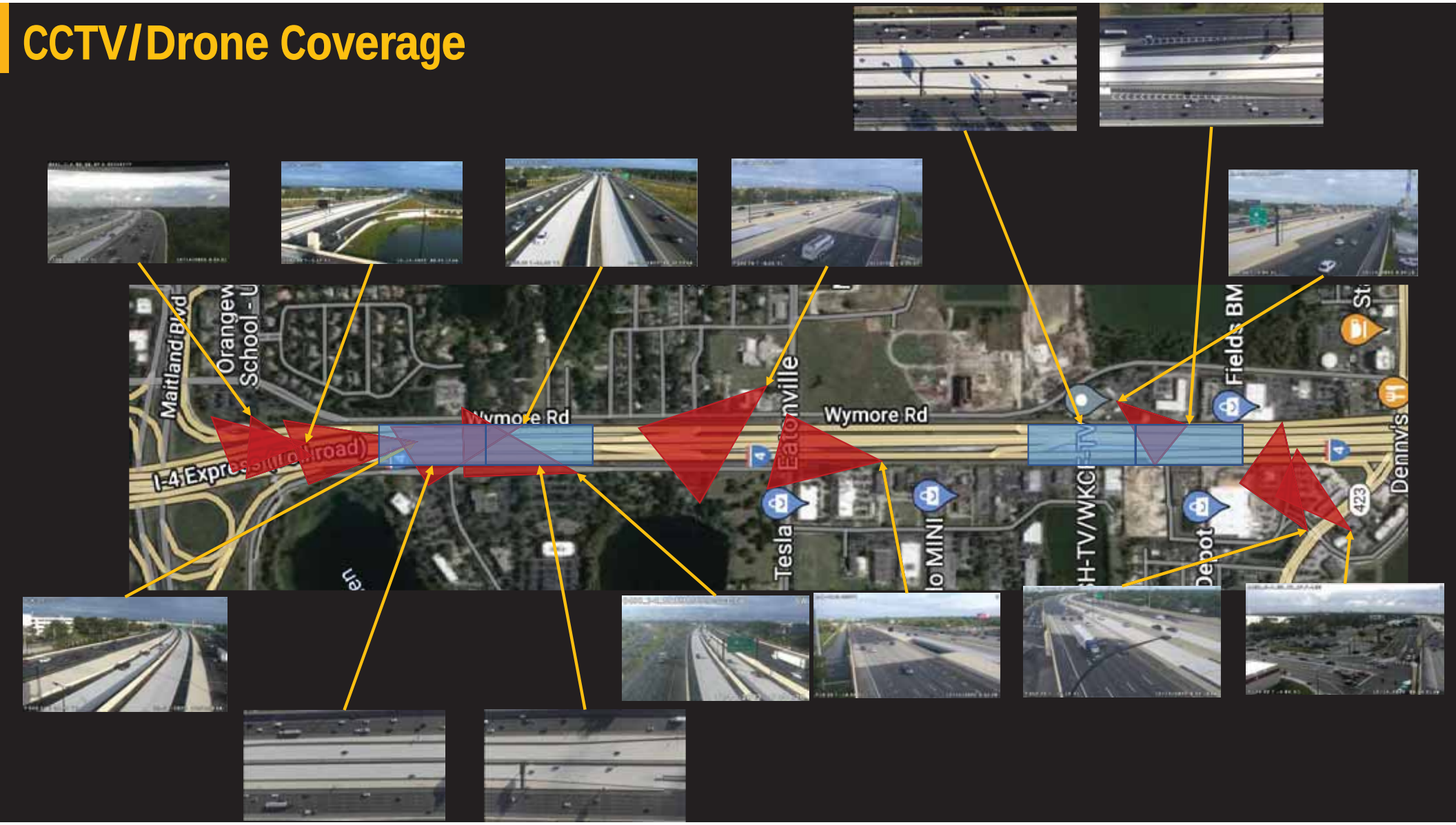
CCTV
360 min



Base Map

Carla Map

CCTV/Drone Coverage



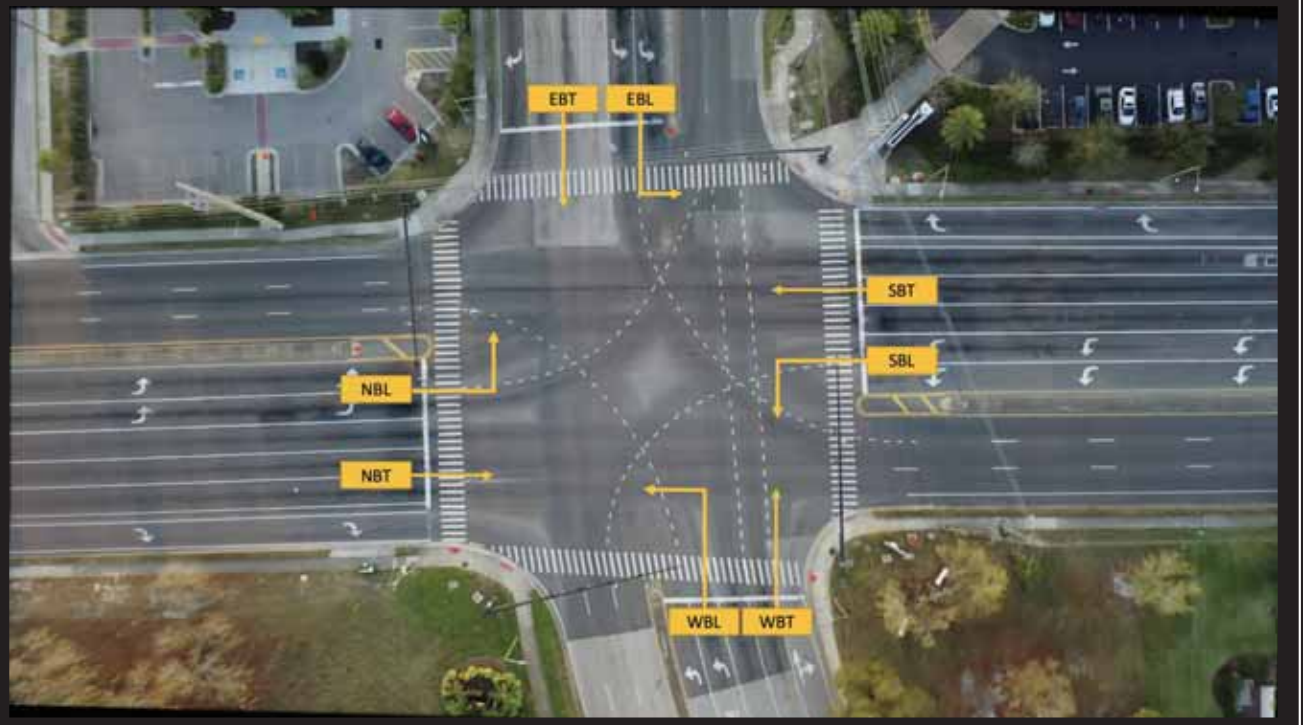
CitySim Open Dataset

Detection/ Tracking output

- Rotated Bounding Box 4 Point
- Car ID
- Heading (North is 0 degree)
- GPS (US Only)
- Coordinate System in feet
- Vehicles head and tail
- Vehicle Pixel course

Signal Timing Extraction

Signal Base Map



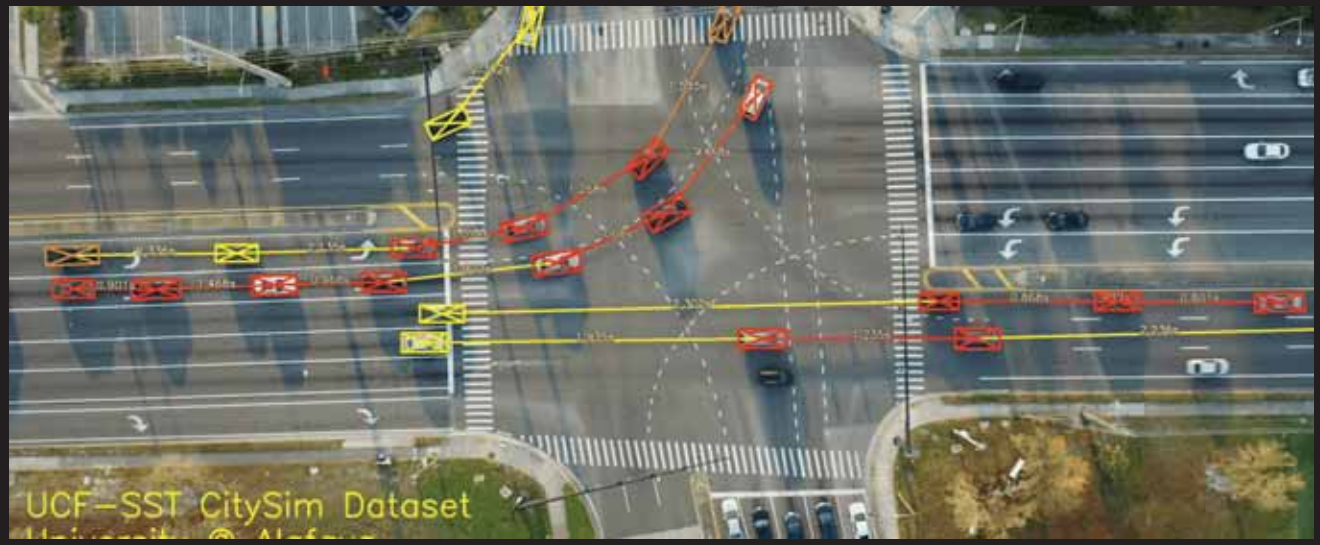
Signal Timing Output

Signal Timing Extraction Example

Surrogate Safety Measure (SSM)

post-encroachment time

PET<2.5s



Proactive Pedestrian Detection System

- The evaluation experiments were conducted at three different intersections
- Nearly 1,000 observations were collected for the evaluation
- The results suggested the proactive pedestrian detection system could detect pedestrians in zones of interest with a high accuracy
- The evaluation results also apply to other areas such as segments and other zones of intersections

Intersection Gemini Blvd & Orion Blvd

Intersection Gemini Blvd & Hydra Ln

Intersection Research Pkwy & Libra Drive

A framework of collision warning system

Detection result	Ground truth		Total
	Presence of pedestrians	No pedestrian	
Presence of pedestrians	388	11	399
No pedestrian	79	484	563
Total	467	495	962
Measurement	Sensitivity=388/467=0.831	Specificity=484/495=0.978	-
	Accuracy = (388+484)/ (388+11+79+484) = 0.906		

Prediction of Pedestrians' Red-Light Crossing Behavior Using Pose Estimation and Machine Learning

Experiment Results

- Four models were developed:
  - Support Vector Machine (SVM)
  - Random Forest (RF)
  - Gradient Boosting (GBM)
  - eXtreme Gradient Boosting (XGBT)
- RF model achieves the best performance with the AUC value as 0.870.
- The model can be further used in the I2V (infrastructure-to-vehicle) system to better warn drivers.

Modeling Results on the Test Dataset

Model (evaluation metrics)	SVM		RF		GBM		XGBT	
	Walking (red-light phases)	Average	**Walking (red-light phases)**	**Average**	Walking (red-light phases)	Average	Walking (red-light phases)	Average
Precision	0.677	0.709	**0.795**	**0.821**	0.806	0.800	0.707	0.754
Recall	0.488	0.651	**0.721**	**0.843**	0.674	0.808	0.674	0.782
F1-Score	0.568	0.675	**0.756**	**0.828**	0.734	0.798	0.690	0.765
Accuracy	0.840		**0.905**		0.886		0.867	
AUC	0.751		**0.870**		0.861		0.843	

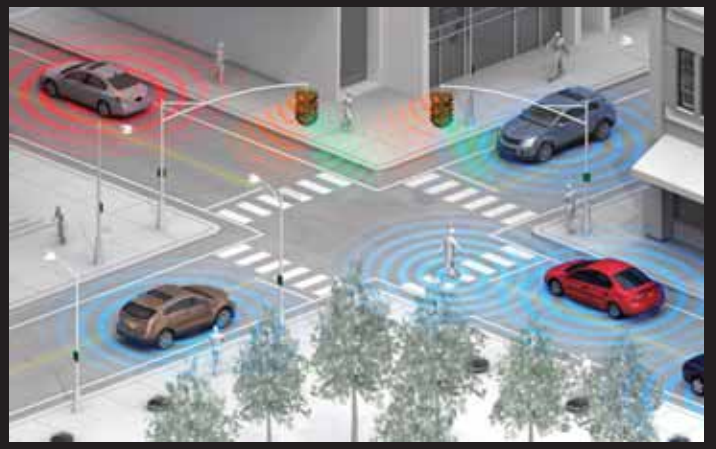


Illustration of warning messages about pedestrians' red-light crossing with the connected vehicle technology

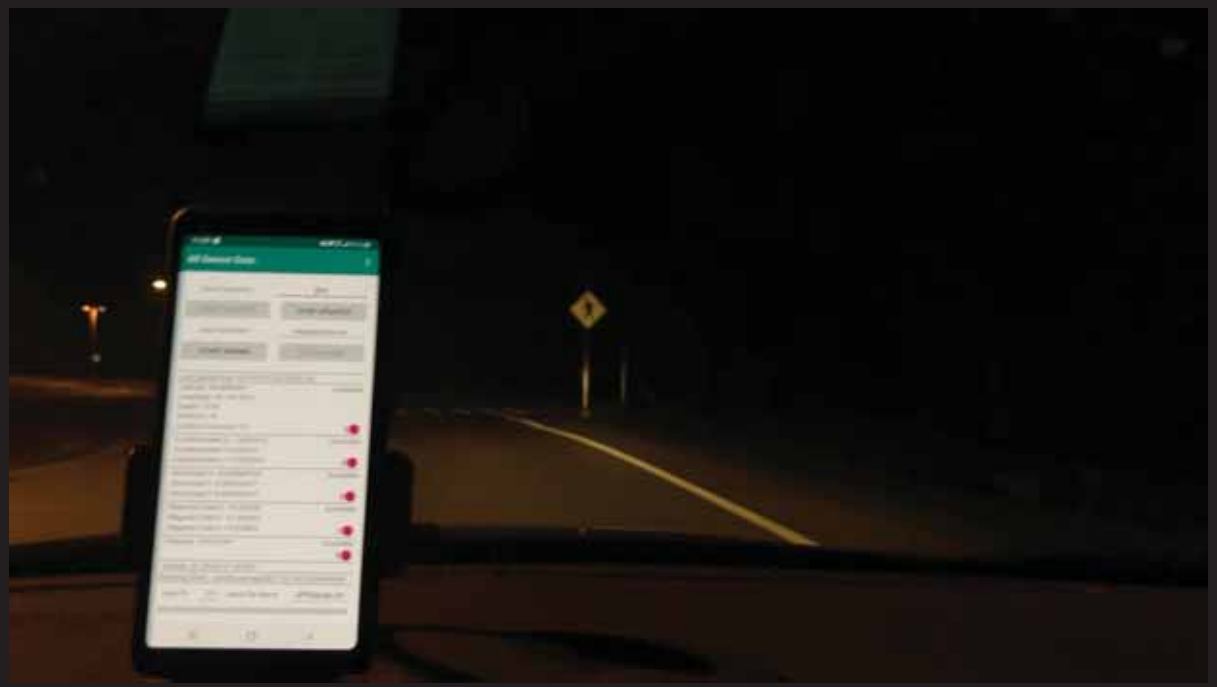
P2V warning – Pedestrians attempt to cross the road at segments

- A pedestrian attempted to cross the road at a segment
- During nighttime, it is difficult for drivers to observe the existence of pedestrians
- Smartphones could send the locations and statuses of the pedestrian and vehicle to the server
- The server determines whether a potential conflict could exist and send the warning to both the pedestrian and driver

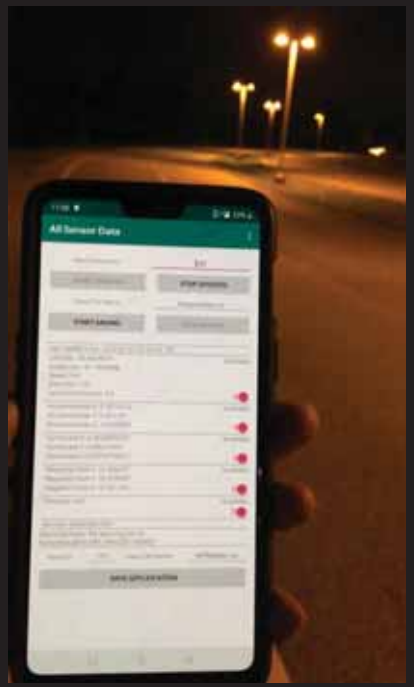
Scenario of the conflict between a jaywalking pedestrian and a vehicle

P2V warning – Pedestrians attempt to cross the road at segments (Jaywalking)

- The pedestrian and driver could receive the warning message at the same time
- The driver could receive the warning before he saw the pedestrian

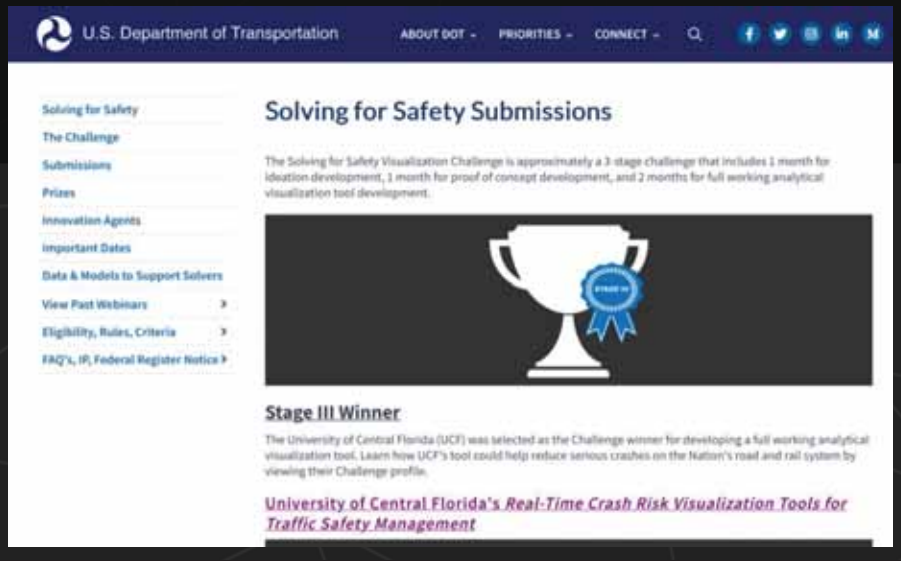


The driver's view



The pedestrian's view

Safety Data Initiative (SDI) tool



REAL-TIME

Operators

UCF-SST

Real-Time Crash Risk

Freeway Arterial

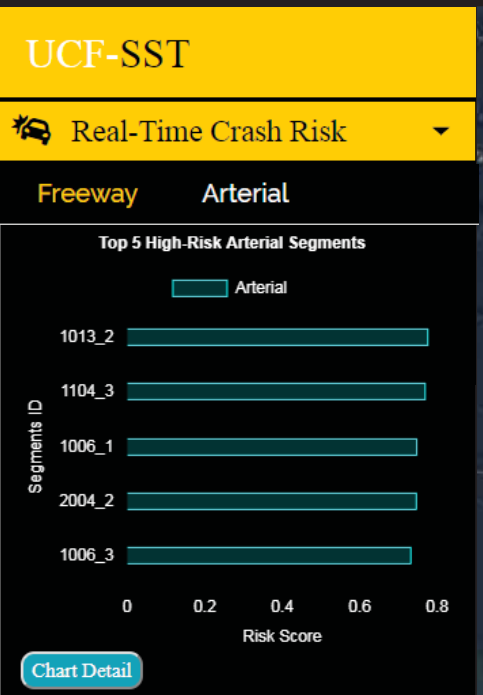
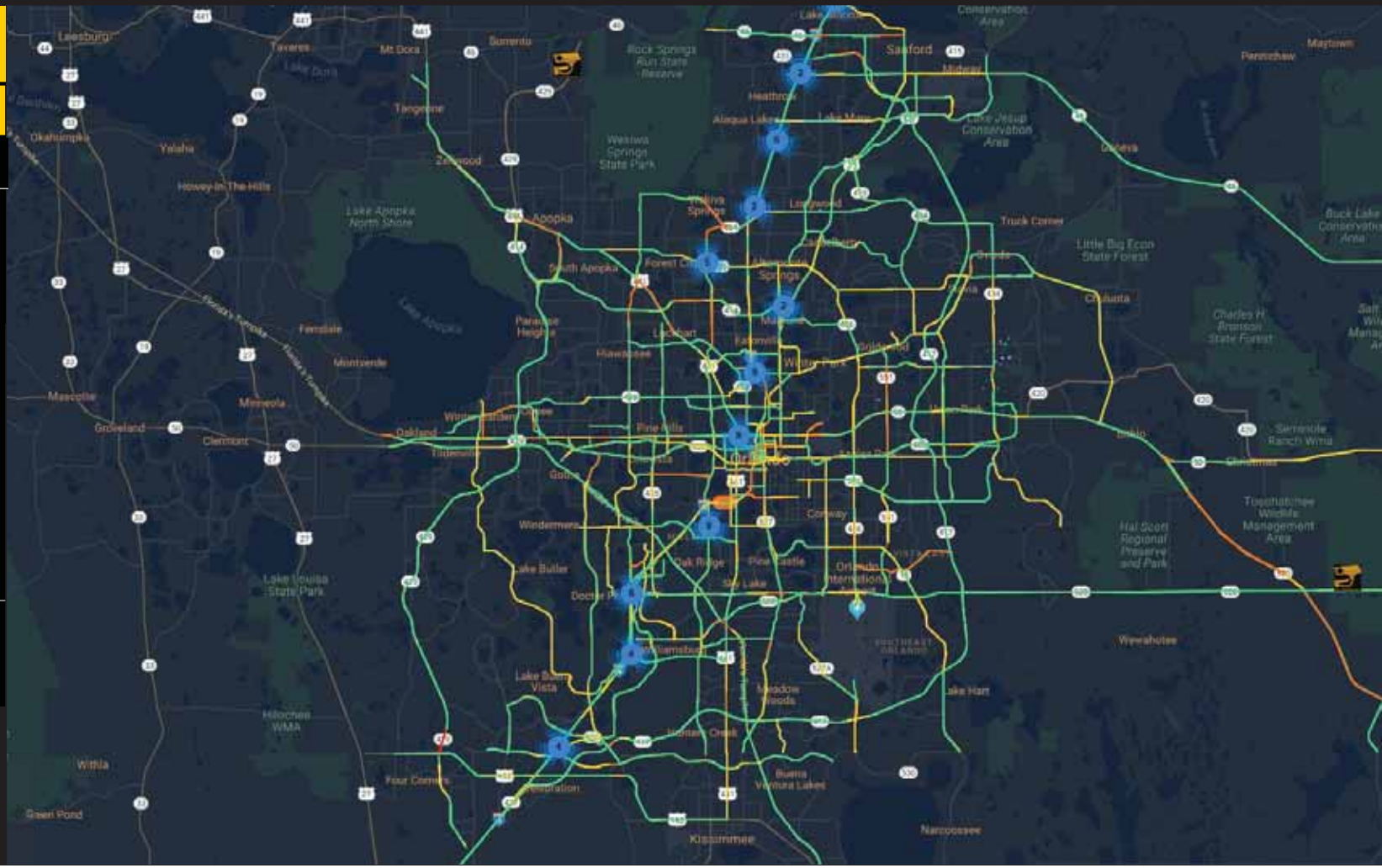


Chart Detail

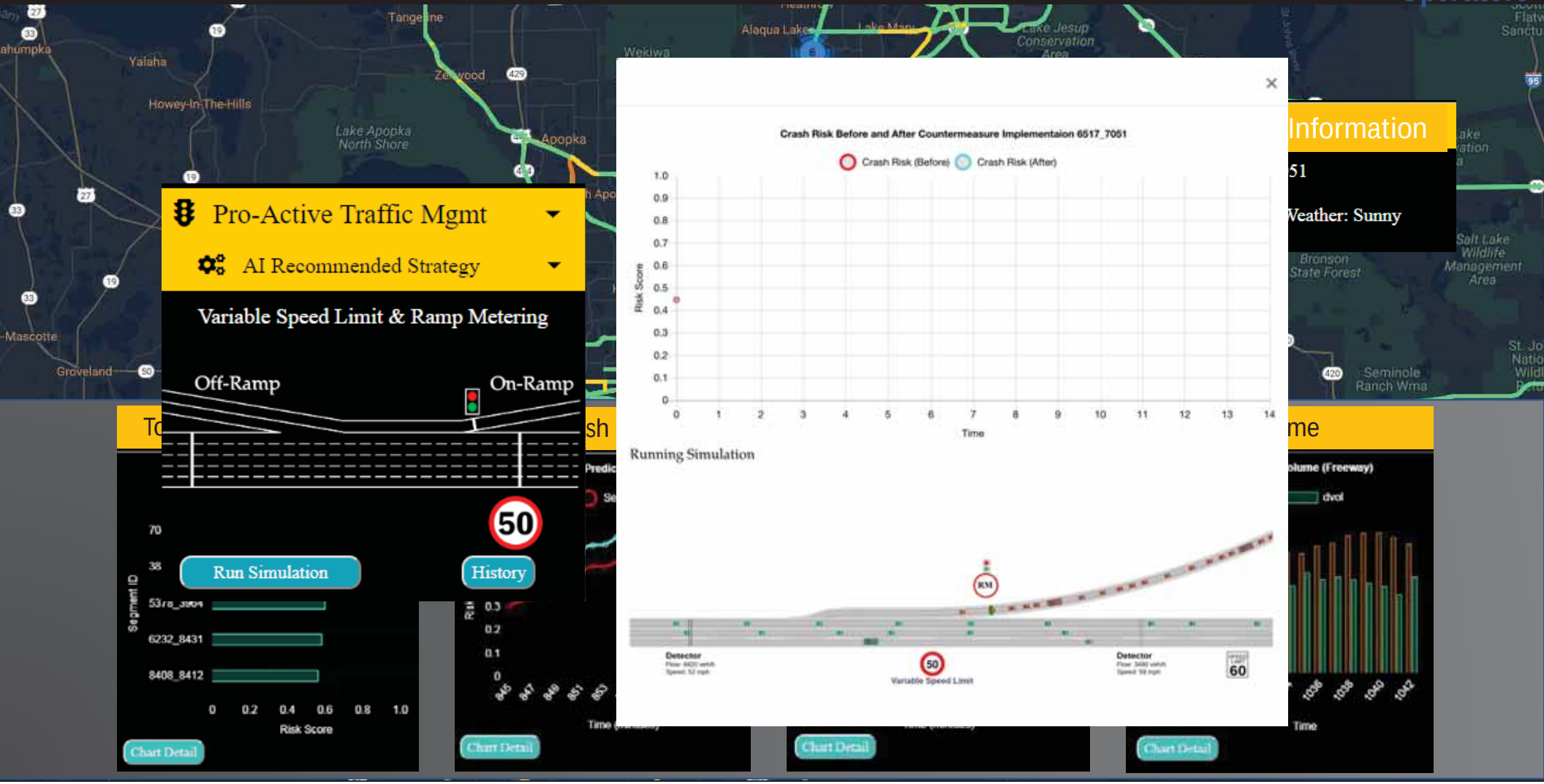
Real-Time Status

Pro-Active Traffic Mgmt



REAL-TIME

Operators



Crash Predictions for Expedited Detection (CPED)

MetroPlan Orlando

Florida Department of Transportation (FDOT)

University of Central Florida (UCF)

Overview

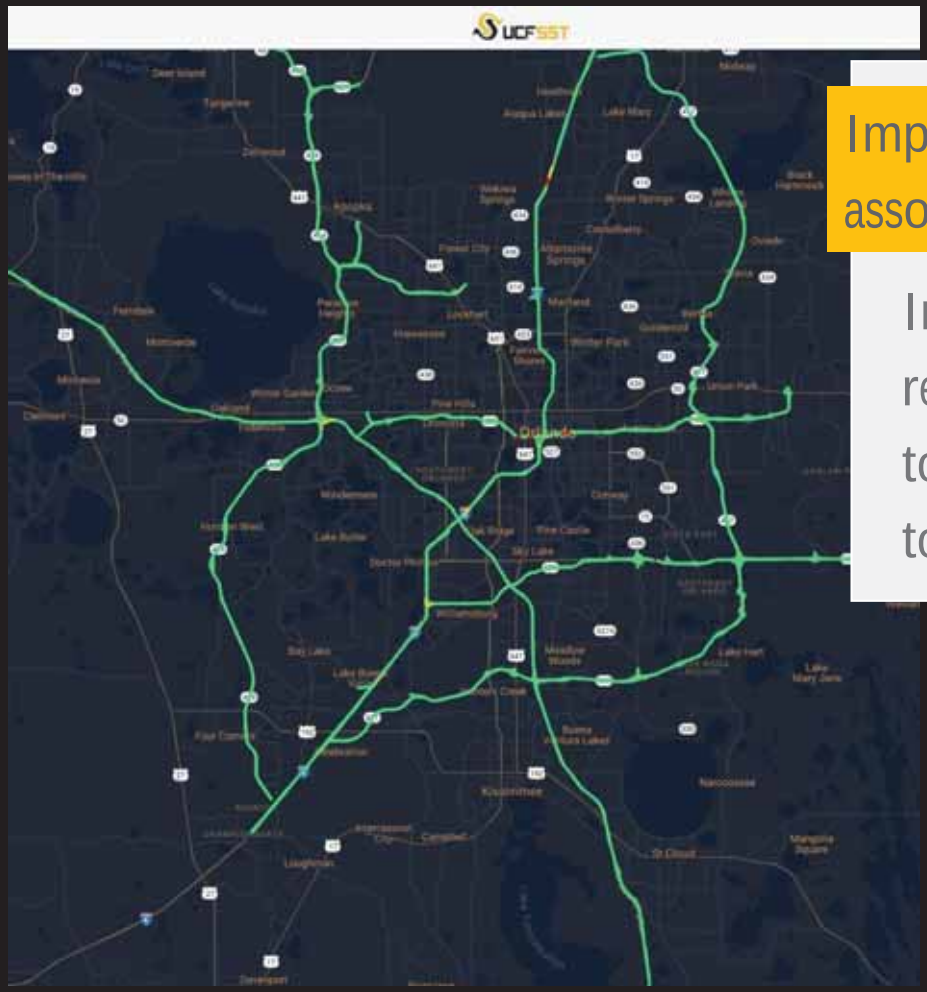
Secondary Crash Prediction

CCTV Verification

Third Party & Report Generation

Demo

Safety Benefits



Improve incident response and to reduce associated secondary crashes.

Increase road user and first-responder safety by reducing secondary crashes, to relieve congestion, to more effectively prepare for emergencies, and to stretch public resources further.

The CPED application will address a significant safety problem that is **widely shared among States and local governments**.

New components

CPED Homepage

CCTV page

Report page

Third-party page

Traffic Operator

Traffic event visualization

Real-time **secondary crash** prediction

Real-time **CCTV verification**

- *Recommend nearby CCTV*
- *Recommend scanning direction*

Third party data sharing

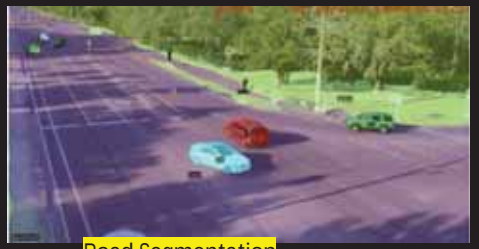
Decision Maker

Report generation

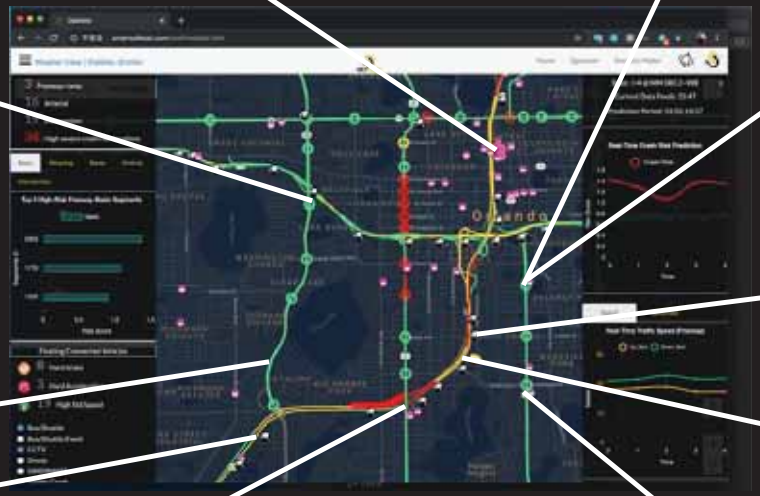
Our Research and Development Objective

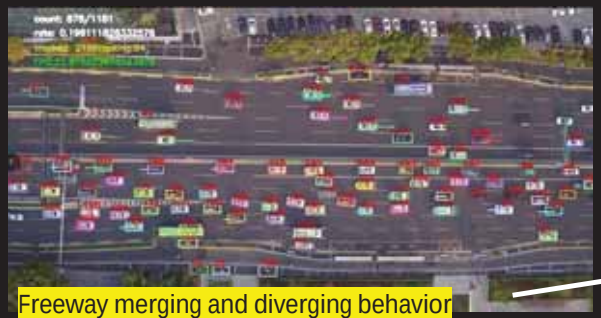

Intersection safety diagnostics

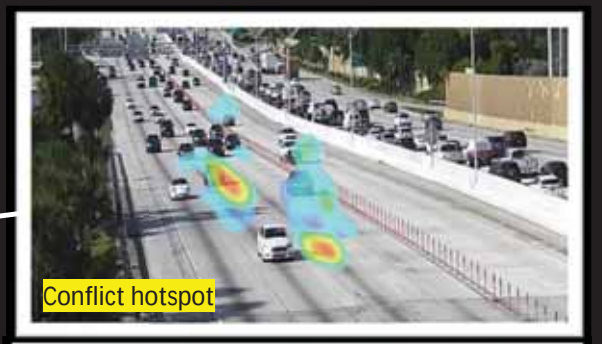

Volume Counter


Road Segmentation


Near miss event



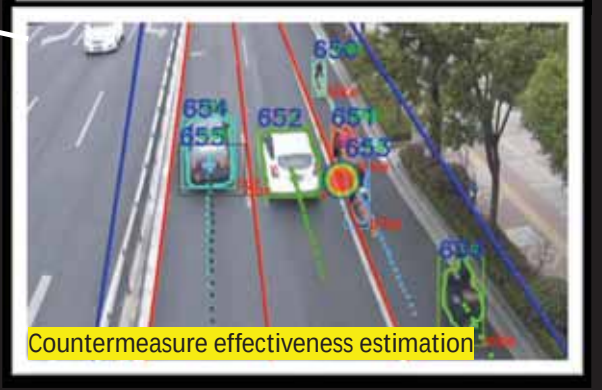

Freeway merging and diverging behavior


Conflict hotspot


Pedestrian behavior


Conflicts identification from 3d bounding box


Cyclist conflicts



Countermeasure effectiveness estimation

Vision for Intelligent Transportation

- **More Proactive (but data intensive) approaches / Real-Time**
- **Multi-driver-in-the-loop Co-simulation**
- **Ever richer information**
  - Smartphones, sensors, cameras, onboard vehicle hardware, provide continuous data
  - Traffic status, weather conditions in real-time
- **Better operation and safety**
  - Bottleneck detection in real-time
  - Crash risk evaluation and prediction in real-time
- **More accurate prediction**
  - Formation of congestion, queue length, congestion duration
  - Crash-prone conditions: unstable traffic flow, adverse weather
- **Timely communication**
  - Connected Vehicles
  - Media: smartphone, DMS, radio
  - Suggested countermeasures: trip planning, route choice, travel time calculation, VSL, speed advice, etc.

THANK YOU

Mohamed Abdel-Aty and UCF SST team

FDOT TSM&O
Transportation Systems Management & Operations

TSM&O Updates

Jeremy Dilmore, FDOT District Five

Traffic Operations Staff Updates

- TSM&O Production Manager
  - Tushar has shifted to Construction
  - Position will be advertised shortly
- TSM&O Design Project Manager
  - Heidi Trivett is shifting to Maintenance
  - Position will be advertised shortly
- TSM&O Construction Project Manager
  - Daniel Simpson will be covering Heidi's projects in the interim
  - Swan Duncan and Jim Miller are covering construction oversight in the interim

Updates to the Org Chart forthcoming

FDOT TSM&O
Transportation Systems Management & Operations

Traffic Operations Staff Updates

- TSM&O Operations
  - Ray Marlin has retired
  - John Lilly is transitioning into this role

Updates to the Org Chart forthcoming

- TSM&O Engineer (Arterials) – Tricia Ballard
- TSM&O Maintenance and CEI – Lorena Cucek
- TSM&O RTMC Manager – Lauren Pearson
- TSM&O Pushbutton – Kevin Marquez
- TSM&O Retiming – Patrick White

FDOT TSM&O
Transportation Systems Management & Operations

Central Office Priority Projects

- Central Office requested multiyear list of prioritized TSMO projects
- District 5 Traffic Ops Approach
  - Pulling together LOPP/PPL from each MPO/TPO
  - Will meet with each MPO/TPO to discuss
  - Will establish a rubric/prioritization process
    - Borrowing from Eric Hill's CFMPOA Regional TSMO Project efforts
  - FDOT team will rank all assembled projects accordingly
  - Present to Consortium (likely through email)
- Goal of making this the statewide approach

FDOT TSM&O
Transportation Systems Management & Operations

FDOT TSM&O

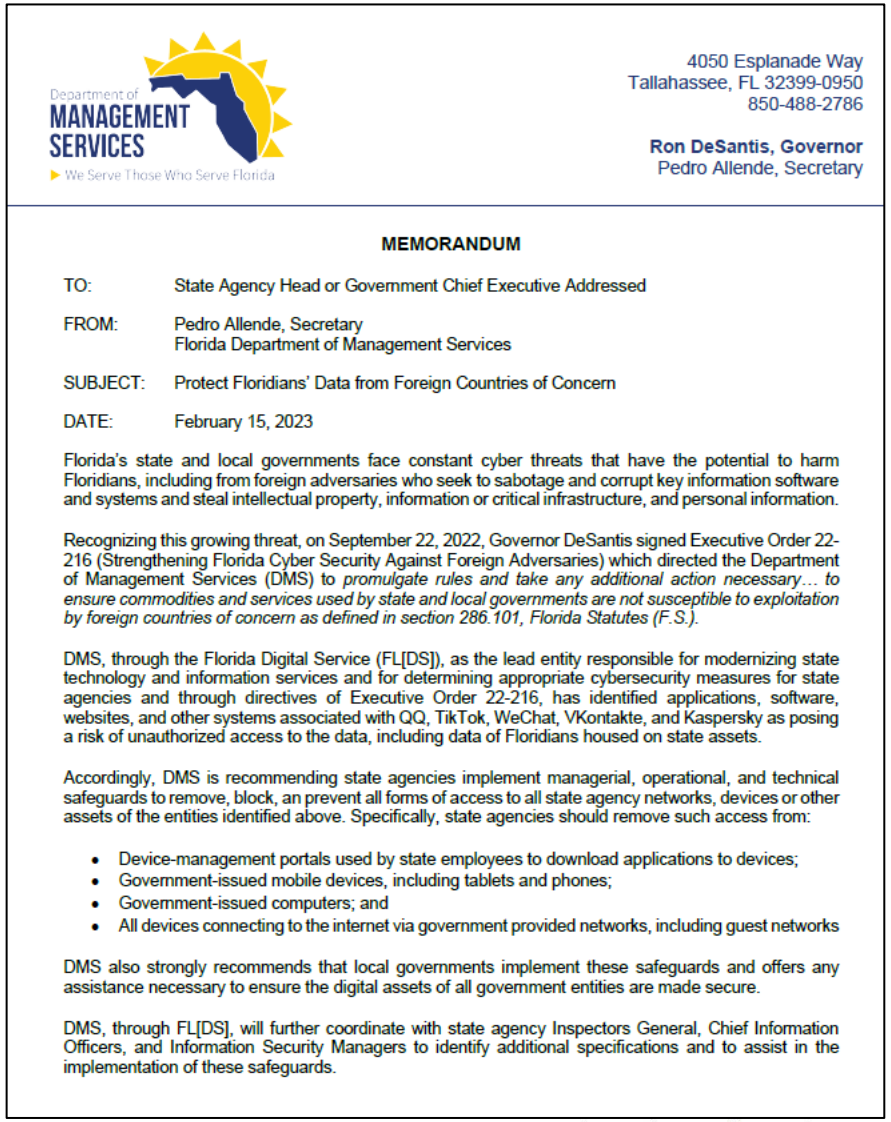
Transportation Systems Management & Operations

Executive Order 22-216

Jeremy Dilmore, FDOT District Five

Executive Order 22-216

- *Strengthening Florida Cybersecurity Against Foreign Adversaries*
  - Mandated for state agencies
  - Strongly recommneded for local agencies
- Block software from networks, computers, and mobile phones (via firewall)
  - QQ
  - TikTok
  - WeChat
  - Vkontakte
  - Kaspersky



Department of MANAGEMENT SERVICES
We Serve Those Who Serve Florida

4050 Esplanade Way
Tallahassee, FL 32399-0950
850-488-2786

Ron DeSantis, Governor
Pedro Allende, Secretary

MEMORANDUM

TO: State Agency Head or Government Chief Executive Addressed

FROM: Pedro Allende, Secretary
Florida Department of Management Services

SUBJECT: Protect Floridians' Data from Foreign Countries of Concern

DATE: February 15, 2023

Florida's state and local governments face constant cyber threats that have the potential to harm Floridians, including from foreign adversaries who seek to sabotage and corrupt key information software and systems and steal intellectual property, information or critical infrastructure, and personal information.

Recognizing this growing threat, on September 22, 2022, Governor DeSantis signed Executive Order 22-216 (Strengthening Florida Cyber Security Against Foreign Adversaries) which directed the Department of Management Services (DMS) to *promulgate rules and take any additional action necessary… to ensure commodities and services used by state and local governments are not susceptible to exploitation by foreign countries of concern as defined in section 286.101, Florida Statutes (F.S.).*

DMS, through the Florida Digital Service (FL[DS]), as the lead entity responsible for modernizing state technology and information services and for determining appropriate cybersecurity measures for state agencies and through directives of Executive Order 22-216, has identified applications, software, websites, and other systems associated with QQ, TikTok, WeChat, VKontakte, and Kaspersky as posing a risk of unauthorized access to the data, including data of Floridians housed on state assets.

Accordingly, DMS is recommending state agencies implement managerial, operational, and technical safeguards to remove, block, an prevent all forms of access to all state agency networks, devices or other assets of the entities identified above. Specifically, state agencies should remove such access from:

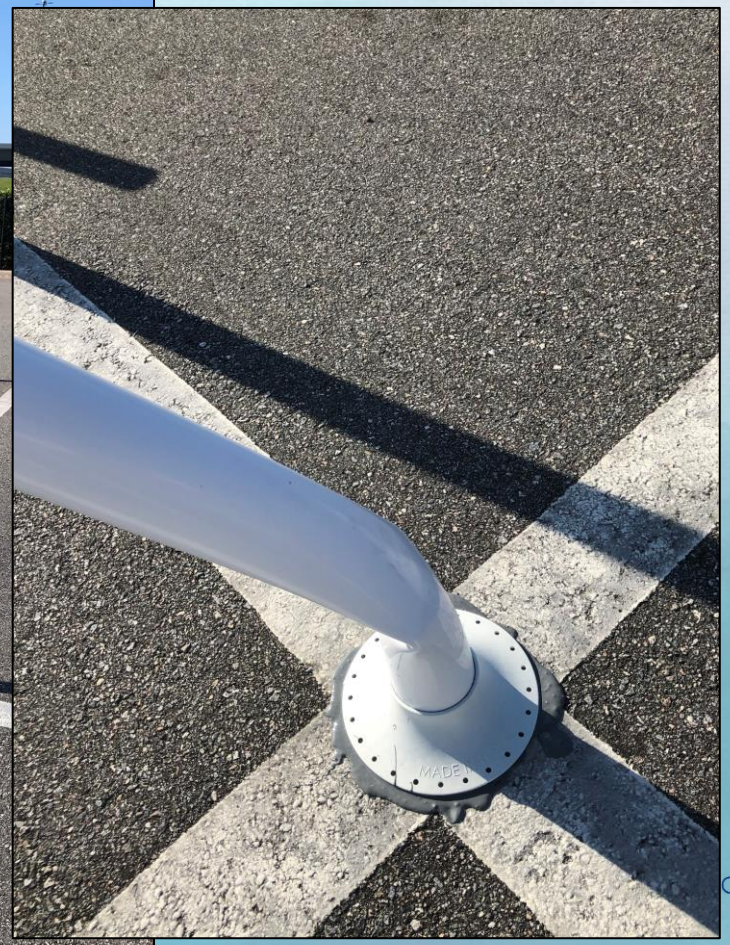
- Device-management portals used by state employees to download applications to devices;
- Government-issued mobile devices, including tablets and phones;
- Government-issued computers; and
- All devices connecting to the internet via government provided networks, including guest networks

DMS also strongly recommends that local governments implement these safeguards and offers any assistance necessary to ensure the digital assets of all government entities are made secure.

DMS, through FL[DS], will further coordinate with state agency Inspectors General, Chief Information Officers, and Information Security Managers to identify additional specifications and to assist in the implementation of these safeguards.

Current Initiatives

Current Initiatives



Transportation Systems Management & Operations

CENTRAL FLORIDA TSM&O CONSORTIUM

Current Initiatives

- ITS Architecture Change Request – New Maintenance Cycle
  - Deadline for Change Request Forms – June 30, 2023

Current Initiatives

- Smart Signals
  - Internal guidance document created to train our signal staff on Smart Signal design
  - Now available on CFLSmartRoads
  - If you are seeing gaps with your technicians being able to maintain the signals, please let us know

- Signal Design
  - D5 established new internal process for Signal Operating Plans

Current Initiatives

- CV Update – EVP
  - Working on agreements with fire departments
- OBU Testing

Current Initiatives

- I-75 CCTV Camera Improvements
  - TPAS verification cameras for I-75 embedded DMS are in construction
- PedSafe II
  - In development (in RTMC parking lot)

Current Initiatives

- AV Shuttle
  - Electrical charging upgrades amendment fully executed
  - Working to finalize S&S plans

- Kiosks at UCF
  - Wooden prototype developed

Current Initiatives

- Smart Work Zone
  - Purchased 5 Advanced Smart Work Zone Information (AWZI) trailers
  - Trailers will be deployed on the ongoing I-4 @ Sand Lake interchange DB project, beginning in May
  - Department is developing other applications and assemblies
- Event Management
  - Verification camera installations are in process

THANK YOU!

Next Consortium – September 14, 2023

TSM&O Consortium Meeting

MEETING AGENDA

Teleconference or
FDOT District 5 RTMC (4975 Wilson Rd, Sanford, FL 32771)

June 1, 2023
10:00 AM-12:00 PM

1) WELCOME

2) ICM OPERATIONS – DRONE SUPPORT

   - Mike Hudson, Metric Engineering

3) DRONE DELIVERY SERVICES – SENATE BILL 1068

   - David Williams, VHB

4) UCF RESEARCH EFFORTS – UPDATE

   - Dr. Mohamed Abdel-Aty, UCF Department of Civil, Environmental, and Construction Engineering

5) CURRENT INITIATIVES

   - Jeremy Dilmore, District Five TSM&O