U.S. Department of Transportation

FY23 SS4A Planning and Demonstration Grant
Lake~Sumter MPO Vision Zero Safety Action Plan

$689,992 awarded + UCF 20% local match

Team leads:
Dr. Natalia Barbour (PI) **UCF**
Prof. Mohamed Abdel-Aty (co-PI) **UCF**
Mr. Michael Woods, **Lake~Sumter MPO**

UCF team: Dr. Chenzhu Wang, Yuntong Zhou

SST team does research in the fields of transportation safety, mobility, travel behavior, as well as applies digital twinning to analyze different traffic scenarios. It has an expertise in computer vision and is home to advanced driving simulators. Although the lab was founded by Prof. Mohamed Abdel–Aty in 2018, the research and development work started more than 25 years ago. At any given moment, the lab hosts on average a team of about 25 researchers from different parts of the world and with various expertise.

- Data-Driven – Real-time safety analysis and big data analytics
- Digital Twinning and CitySim
- Big data and simulation
- Human factors and travel behavior

UCF-SST

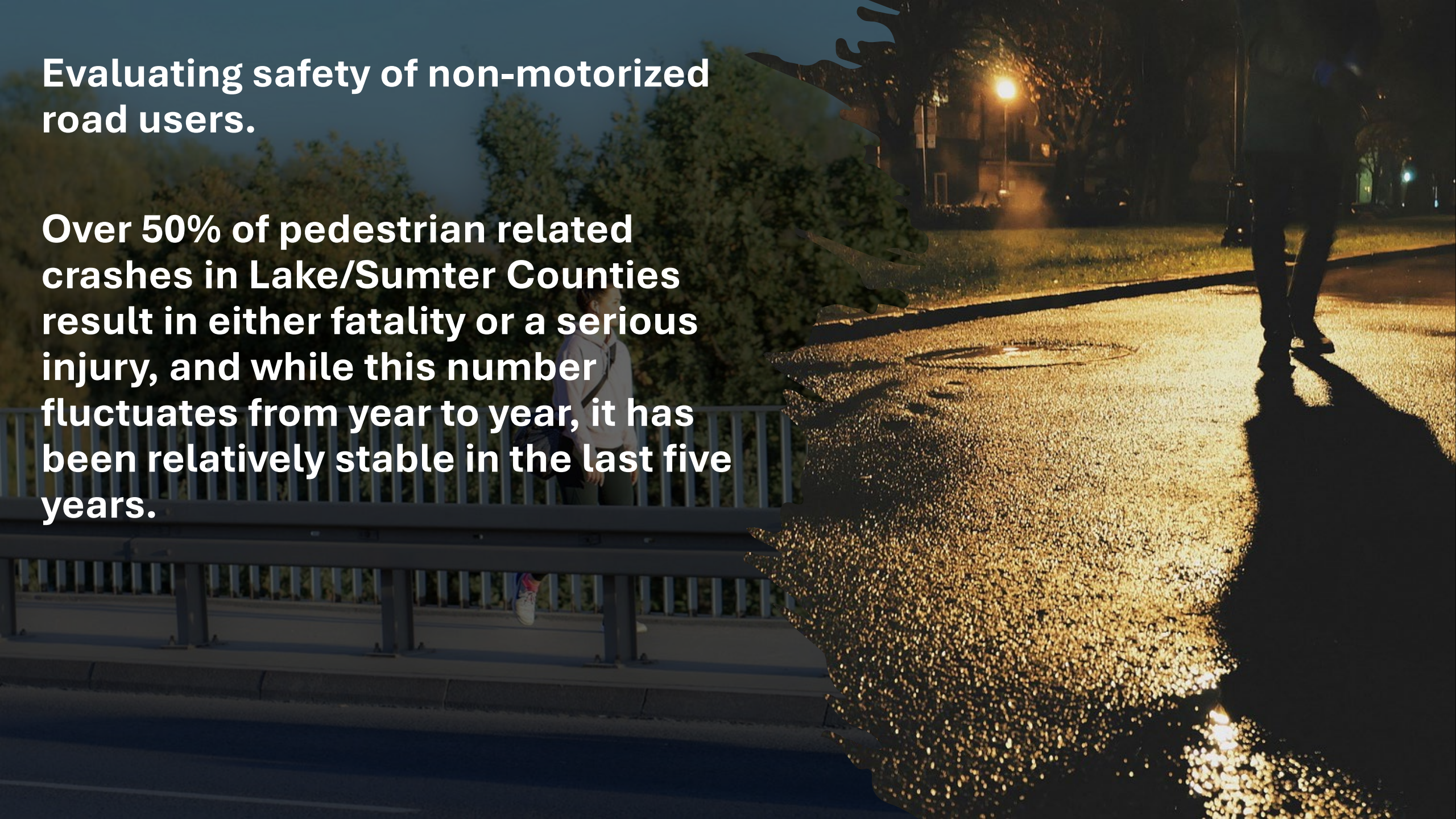
Smart & Safe Transportation Lab

VISION ZERO ACTION PLAN

Given the fact that 67% of all roads in Lake County and 82% of roads in Sumter County are classified as rural, rural town, or suburban residential by the FDOT road context classification (C2, C2T, C3R), the focus will primarily fall on:

1. Exploring crashes and their contributing factors on these roads followed by making region specific and targeted recommendations and drafting a Vision Zero Safety Plan.

Figure 1. FDOT Road context classification.



Evaluating safety of non-motorized road users.

Over 50% of pedestrian related crashes in Lake/Sumter Counties result in either fatality or a serious injury, and while this number fluctuates from year to year, it has been relatively stable in the last five years.

Proposed work:

Phase I: Data Collection for Network Screening

There are several data sources available to the team and they include crash data (S4A), real operating speeds HERE/INRIX/TomTom data, bicycle/pedestrian crashes, land use information, Google street view and population distribution (Census) that will be used to perform safety analysis.

- **Aim:** to identify hot spots within the rural and suburban roadway networks.

Phase II: Data Analysis

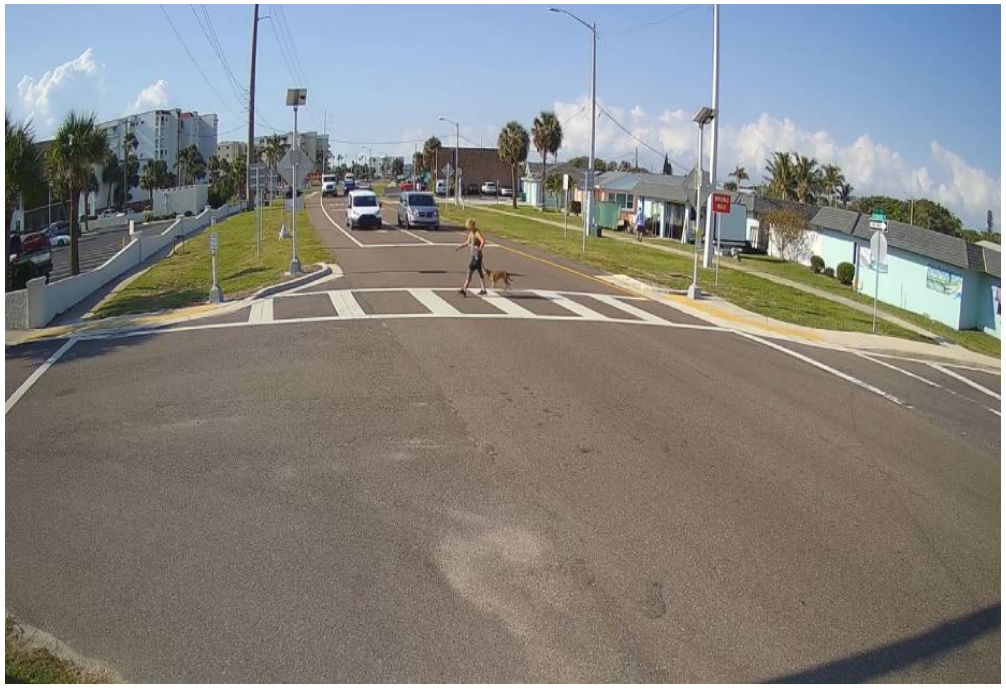
Aim:
(i) to identify the most common types of crashes on the rural and suburban roads,

(ii) to develop GIS heat maps of the past crash data that are cross-validated with the USDOT Equitable Transportation Community (ETC) Explorer to ensure emphasis on the underserved communities,

(iii) to analyze fatalities and serious injuries by mode and crash types (with focus on non-motorized road users).

Phase III: Possible Sensor Deployment

In cases when/if the microscopic data are not available, which would likely involve selected locations such as intersections, the team proposes to collect video trajectories by either using drone capabilities or roadside cameras. The trajectories of movements of different user groups, particularly in a multimodal context, will allow for a more in-depth analysis and more accurate data driven Vision Zero Safety Plan.



Phase IV: Comprehensive Action Plan and Deliverables

The proposed Vision Zero Safety Plan will include numerous data driven low-cost recommendations based on the analysis and the specific characteristics of the region.

Given the findings, the MPO team together with the UCF will work together on:

- **Developing goals and objectives and identification of the stakeholders (engineering departments, law enforcement, education, health partners, etc.)**
- **Defining performance measures for each objective**
- **Vision Zero Element for the 2050 Long Range Transportation Plan**
- **Vision Zero Element for the Transportation Improvement Program**
- **Vision Zero Element for the List of Priority Projects**

Source: iStock

U.S. Department of Transportation

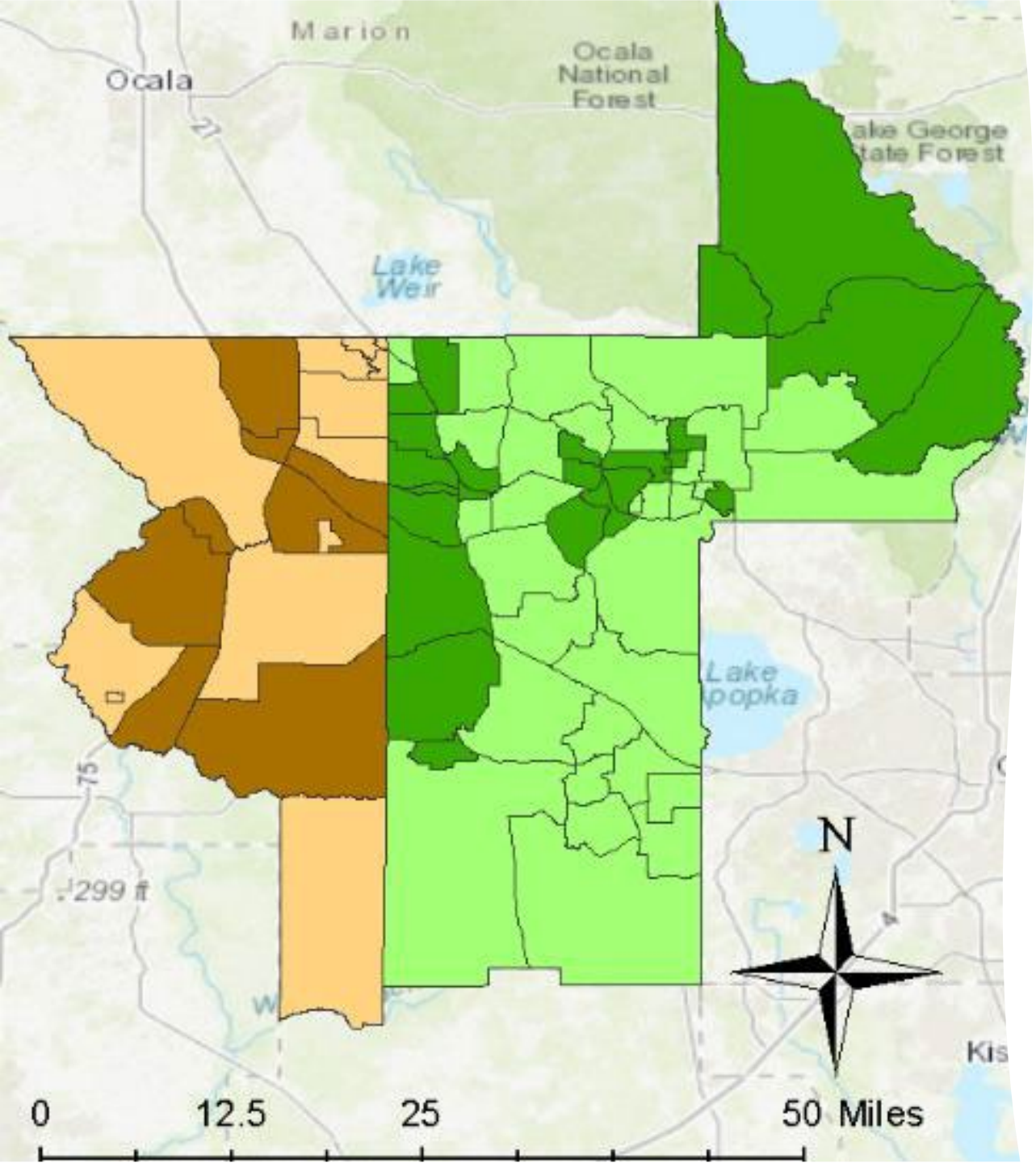
FY24 SS4A Planning and Demonstration Grant

Smart Infrastructure deployment and Advanced Analytics for Improving Mobility and Safety in Rural and Senior Communities

$1,605,503 awarded + UCF 20% local match

Team leads:
Dr. Naveen Eluru, UCF
FDOT D5 TSMO Office
Mr. Michael Woods, Lake~Sumter MPO

UCF team: Department of Civil, Environmental and Construction Engineering



SS4A Grant

Smart Infrastructure deployment and Advanced Analytics for Improving Mobility and Safety in Rural and Senior Communities

The study region for our demonstration project encompasses Lake and Sumter counties, home to predominantly rural communities with a high proportion of seniors (>65) and disadvantaged Census Tracts.

Specifically, more than 50% of Sumter County population and 26.7% of Lake County population are seniors (well above the percentage of seniors at the national level (17.7%)

• PROJECT TEAM:

• The proposal brings together different academic and public stakeholders including:

- University of Central Florida (Lead),
- Lake Sumter MPO
- Lake County
- Sumter County
- FDOT District 5 TSMO office

Technical Overview of Demonstration Project

- FDOT D5 TSMO Office is building a High-Definition Engineering Intersection Data platform via Integrative Modeling (HEIDI) in the Central Florida region.

- Building on this FDOT project, the current research effort will demonstrate the value of an augmented sensor-based framework to improve safety in the region. Using advanced radar and video-based sensing equipment on specific intersections, the research will identify mechanisms to improve safety for road users in the region.

- For the demonstration project, the research team will select 10 intersections to deploy sensing infrastructure.

This research augments existing FDOT D5 TSMO efforts by demonstrating the applicability of advanced sensing and analytics on improving safety in a unique study region – predominantly rural community with sizeable share of seniors and significant passenger and freight traffic.

If successful, this demonstration of safety improvements could contribute to the development and widespread adoption of sensing and inference architecture.