FLORIDA GIVES GREEN LIGHT TO ANIMAL ROAD SAFETY: NEW SMART TECHNOLOGIES AND CITIZEN SCIENTISTS HELP PREVENT ROADKILL STATEWIDE

(Tallahassee, FL - May 15, 2022) The Florida Fish and Wildlife Conservation Commission (FWC) has announced today that they will be launching a statewide solution called “RoadSAFE” (Roadkill Safety and Awareness for Everyone) to reduce roadkill incidents through an alliance between state authorities and citizens. RoadSAFE is a smart web-based platform to collect, analyze, and report a large amount of statewide roadkill data with a minimal work force. In the past, authorities were unable to collect sufficient data for a comprehensive understanding of road-associated animal behaviors, due to the limited resources of roadside sensors and wildlife specialists. The emerging smart technologies and citizen scientists provide the authorities efficiency and additional manpower to acquire necessary roadkill incidents data from the entire state of Florida.

Thousands of animals are struck and killed on Florida roadways each year. Roadkill is a significant threat to endangered species such as Florida Panthers. Approximately 22 Florida panthers have been annually killed by cars over the past 10 years, which is more than 90% of their known deaths, according to FWC. Roadkill is also a threat to motorists. Wildlife-vehicle collisions risk public safety, cause property damage, and produce traffic congestion, including the obvious hazards: injury and death to individual animals and threatened wildlife populations across the state.

Scientific understanding of animal behaviors associated with roads is crucial to develop effective solutions for reducing roadkill incidents, for the safety of both motorists and wildlife. Authorities need to be able to document accurate information on where and when roadkill incidents occur, and what animal species are involved with the incidents but shortage of manpower and lack of necessary collision data hinders these efforts. The FWC developed the RoadSAFE to overcome the limitations of traditional roadkill monitoring systems. It takes two new approaches: smart technologies and citizen science. Smart technology enables the automation of analyzing a large amount of roadkill data in terms of time, location and animal species. Thus authorities can save their limited amount of manpower and time.

Citizen Science is a new movement that utilizes a collective intelligence of non-professional citizens to explore various fields of science. “Although this movement has already been successfully used in many ecology projects, this project is unique in balancing between wildlife conservation and road safety using smart technologies,” Dr. Hae-Bum “Andrew” Yun, the lead investigator of this project and a professor from the University of Central Florida said.

Motorists are a vital group of citizen scientists, in this project, to collect roadkill incident data from the road network throughout Florida. The RoadSAFE mobile app will feature voice assistance to allow motorists to describe roadkill incidents, automatically tagged with geo-location and time information from the user’s smartphone. Recorded information is then uploaded to a database shared by the public, officials, and researchers. Local officials and other

drivers will be able to provide important information such as: time, location, species, size, etc. With the application/program and information provided, users and local officials will be able to set up specific reports, allowing for quick and efficient pickups.

“I can’t tell you the number of times I’ve seen vehicle accidents on my way to work. This application will help me feel safer as I commute,” said Jake Arnold, a Florida resident who has witnessed the challenges with roadkill encounters in Florida.

For more information and to access the state roadkill portal, please visit www.myfwc.com/roadkill. The Florida RoadKill app can be downloaded from the iphone and android stores.

FREQUENTLY ASKED QUESTIONS (FAQ)

1. What are we building and why?

A statewide solution called RoadSAFE to reduce roadkill incidents through an alliance between state authorities and citizens. RoadSAFEis a smart web-based platform to collect, analyze, and report a large amount of statewide roadkill data with a minimal work force. In the past, authorities were unable to collect sufficient data for a comprehensive understanding of road-associated animal behaviours, due to the limited resources of roadside sensors and wildlife specialists. The emerging smart technologies and citizen scientists provide the authorities efficiency and additional manpower to acquire necessary roadkill incidents data from the entire state of Florida.

2. How does it work?

The RoadSAFE is developed to overcome the limitations of traditional roadkill monitoring systems. It takes two new approaches: smart technologies and citizen science. Smart technology enables the automation of analyzing a large amount of roadkill data in terms of time, location and animal species. Thus authorities can save their limited amount of manpower and time.

Citizen Science is a new movement that utilizes a collective intelligence of non-professional citizens to explore various fields of science. “Although this movement has already been successfully used in many ecology projects, this project is unique in balancing between wildlife conservation and road safety using smart technologies,” Dr. Hae-Bum “Andrew” Yun, the lead investigator of this project and a professor from the University of Central Florida said. Motorists are a vital group of citizen scientists, in this project, to collect roadkill incident data from the road network throughout Florida. For the motorist’s minimal distraction, the RoadSAFE mobile app is featured with voice assistance to describe roadkill incidents, automatically tagged with geo-location and time information from the user’s smartphone. Citizen scientists can also contribute to validate AI-processed sensor data since no AI is perfect.

With the approval of motorists, the incident will be reported to responsible authorities of FWC, FDOT and municipal governments for timely and appropriate handling of incidents. Motorists' information is securely encrypted for their privacy and safety throughout the reporting process. To reduce authorities' workload, AI is also utilized to filter possible false reports and prioritize high-priority reports automatically.

3. Who will own and maintain the solution?

Potential owners of the solution would be

- Florida Fish and Wildlife Conservation Commission (FWC)
- Florida Department of Transportation (FDOT)
- Local governments (e.g., Orange County, City of Orlando)

Contractors would be hired to maintain the developed system.

4. How much will it cost to build, operate and maintain?

- Advanced roadside monitoring system
    - Roadside wildlife monitoring system
        - Objectives
            - A closed system for state officials
        - Customers
            - State biologists
            - Researchers/Park Staff
            - Conservation Planning
            - Department of Transportation (DOT) project planners
        - Hardware
            - Existing statewide sensing systems
            - New sensors
        - Software
            - Machine-learning (ML) software for automated animal recognition
- Mobile devices and apps
    - Data-collection app for motorists
        - Customers
            - Department of Transportation (DOT) road maintenance staffs
            - Collector/Pick-Up
            - Police
            - Motorists
        - Objectives
            - To report roadkill incident data by motorists
            - To deliver roadkill incident data to authorities and contractors
        - Hardware
            - Smart phones
            - Amazon Echo Auto
        - Software
            - AI voice assistant to minimize driving distraction
            - Data privacy
            - Automated filtering false reports with report reliability measures
            - Automated urgency prioritization with safety urgency measures
        - Data
            - Incident location, time and animal types
        - Marketing
            - Collaboration with wildlife conservation NGOs, citizen science communities, motorist communities, and legacy & social media for app marketing and users attraction
    - Data-collection app for field biologists and citizen scientists
        - Customers
            - Department of Transportation (DOT) project planners
            - State biologists

            - Citizen scientists
        - Objectives
        - Hardware
        - Software
        - To collect road-associated animal behaviors, like an electric field note
        - To upload field data to
        - Hardware
        - Data privacy using automated data anonymization techniques
    - Data-analysis app
- Data portal
    - A cloud platform that consists of CPU server(s), GPU server(s) for ML

5. **How are the sensors installed and maintained?**
    a. How are they powered?
    b. How do they transmit data?
    c. What is the useful life?
    d. Do you know when a sensor is/isn't working?

6. **Is the portal interoperable with the State of Florida GIS platform/SunStore?**

    DOT? Who grants access and interoperability, product management.

7. **Can I be a private/anonymous user?**
    To view data
    To submit data
    To create reporting/analytics

CUSTOMER FAQ

1. **Who can use it?**
    Our potential customers:
    - Wildlife Biologists/Managers
    - Researchers/Park Staff
    - Department of Transportation (DOT) Project Planners
    - Collector/Pick-Up
    - Police
    - Conservation Planning
    - Services Staff
    - Drivers