ADA Self-Evaluations & Transition Plans

TECH TOOLS FOR ADA PROGRAM COMPLIANCE

Dean Perkins & Chris Talbot

SELF-EVALUATIONS

- **You must:**
  - Review Policies and Procedures, etc. for obstacles that limit access for persons with disabilities.
  - Revise policies and procedures as appropriate to remove discriminatory language, practices that may limit ability of persons with disabilities to participate in programs, services or activities.
- **You must also:**
  - Provide opportunity for interested persons and groups to participate in self-evaluation(s) leading to transition plan(s).
  - Make self-evaluations available for public inspection.

ADA TRANSITION PLANS

- **4 Steps:**
  - Identify physical obstacles that limit access of persons with disabilities to public programs, services, activities or facilities, etc.
  - Describe in detail methods to be used to correct deficiencies.
  - Specify schedule for improving facilities by prioritizing needs of persons with disabilities in existing facilities.
  - Indicate official responsible for implementation of plan.
- **Also:**
  - Include affected people in the process
  - Have available for public inspection

FDOT ADA PROGRAM PARTICIPANTS

- Central Office ADA Coordinators:
  - Title I: Trans. Support/Equal Opportunity Office
  - Titles II & III: Design/Production Support Office
  - Title IV: Information Technology/Communications
- District Office Coordinators:
  - 7 Districts and Florida Turnpike – 2 per district
- General:
  - Secretary, District Secretaries, Directors, etc.
- U.S. DOT, FHWA Florida Division

GOING FORWARD

The next few slides will describe some tools we are developing to help FDOT and local agencies demonstrate ADA Program compliance

- **SAPFIM**
- **VIDEO-LOG**

SAPFIM

- **S**afe and **A**ccessible **P**edestrian **F**acilities **I**nventory **M**odel
  - Tablet-based, GIS-driven program to survey and document pedestrian facilities along roadways
  - Intended to be provided to local agencies to develop/document their ADA transition plans
  - Coordinate/support other policies:
    - Complete Streets, Context-Sensitive Design, etc.

SAPFIM

- **S**afe and **A**ccessible **P**edestrian **F**acilities **I**nventory **M**odel
  - Tablet-based, GIS-driven program to survey and document pedestrian facilities along roadways
  - Intended to be provided to local agencies to develop/document their ADA transition plans
  - Coordinate/support other policies:
    - Complete Streets, Context-Sensitive Design, etc.

SAPFIM - OBJECTIVES

- The main objective of this scope of work is to develop the SAPFIM tool: a web-based software application that local agencies can use for the collection, storage, querying, and reporting of pedestrian facilities.
- It will include accessible and safety features associated with sidewalks, curb ramps and blended transitions, and street crossings.
- Data will be collected using field devices (i.e., tablets with GPS, camera, and wireless capability) which can be uploaded directly into the web server.

SAPFIM

- Using STIC Grant, Florida International University was contracted to coordinate with FDOT & FHWA to:
  - Develop the database
  - Develop the user interface
  - Develop training curriculum
  - Pilot-test the program & equipment
  - Develop marketing plan
    - In-state & national
  - FIU Investigators:
    - Dr. Fabian Cevallos, Principle Investigator
    - Thalia Pickering, Co-Principle Investigator

SIDEWALKS ACCESSIBLE FEATURES

Description	Measurement	Detail	Criteria (ADA/FDOT)
General Width	Feet		≥4' (ADA) ≥5' (FDOT)
Cross-Slope	Percentage		≤1:48, 2%
Vertical Change in Level (Joint or Crack)	Inches	Perpendicular or diagonal to path	≤1/4" Vertical ≤1/2" Sloped
Horizontal Opening (Joint or Grate)	Inches	Perpendicular to path	≤1/2" Opening
Protruding Object (Horizontal offset)	Inches	Sign Panel	≥27" ≤80" AFF • ≤12" on Post • ≤ 4" on Wall
	Inches	Landscape Material	
	Inches	Other	
Width Restriction (≤24")	Inches	Utility Pole	≥32" (ADA) ≥32" (UAM) ≥48" (FDOT)
	Inches	Signal Pole	
	Inches	Sign Post	
	Inches	Fire Hydrant	
	Inches	Bench	
	Inches	Other	
Physical Constraint	Inches	Building	≥36" (ADA) ≥48" (FDOT)
	Inches	Retaining Wall	
	Inches	Right-of-Way	
	Inches	Other	

CURB RAMPS & BLENDED TRANSITIONS

Description	Measurement	Detail	Criteria (ADA/FDOT)
Slope	Percentage	Both sides of ramp	≤1:12, 8.3%
Cross-Slope	Percentage	Top and bottom	≤1:48, 2%
Width	Feet		≥36" (ADA) ≥48" (FDOT)
Top Landing	Inches		≥48"
Bottom Counter-slope	Percentage		≤13.3%
Detectable Warnings	Inches	Truncated Domes	Yes / No
	Percentage	Color contrast: Brick red, Yellow or Black	≥70% measured with light meter
	Feet	Size	24" x Full width
	Feet	Placement	Back of curb or ≤5' from Curb

STREET CROSSINGS

Description	Measurement	Detail	Criteria (ADA/FDOT)
Pavement Markings	Yes / No		Yes / No
Horizontal Opening (Joint or Grate)	Inches	Perpendicular to path	≤1/2"
Island/Median			Yes / No
	Feet	Pedestrian Refuge	48" deep x 60" wide
Pedestrian Signal			Yes / No
	Inches	Push-button	2" dia. raised
		Accessible Features	Audible/Tactile
	Inches	Height of Button	≤42" AFF
	Inches	Level Clear Space	≥30"x48"
	Seconds	Total Time	
	Number	Number of lanes	
	Walking speed?	Signal Timing	≤3.5 fps

SIDEWALKS SAFETY FEATURES

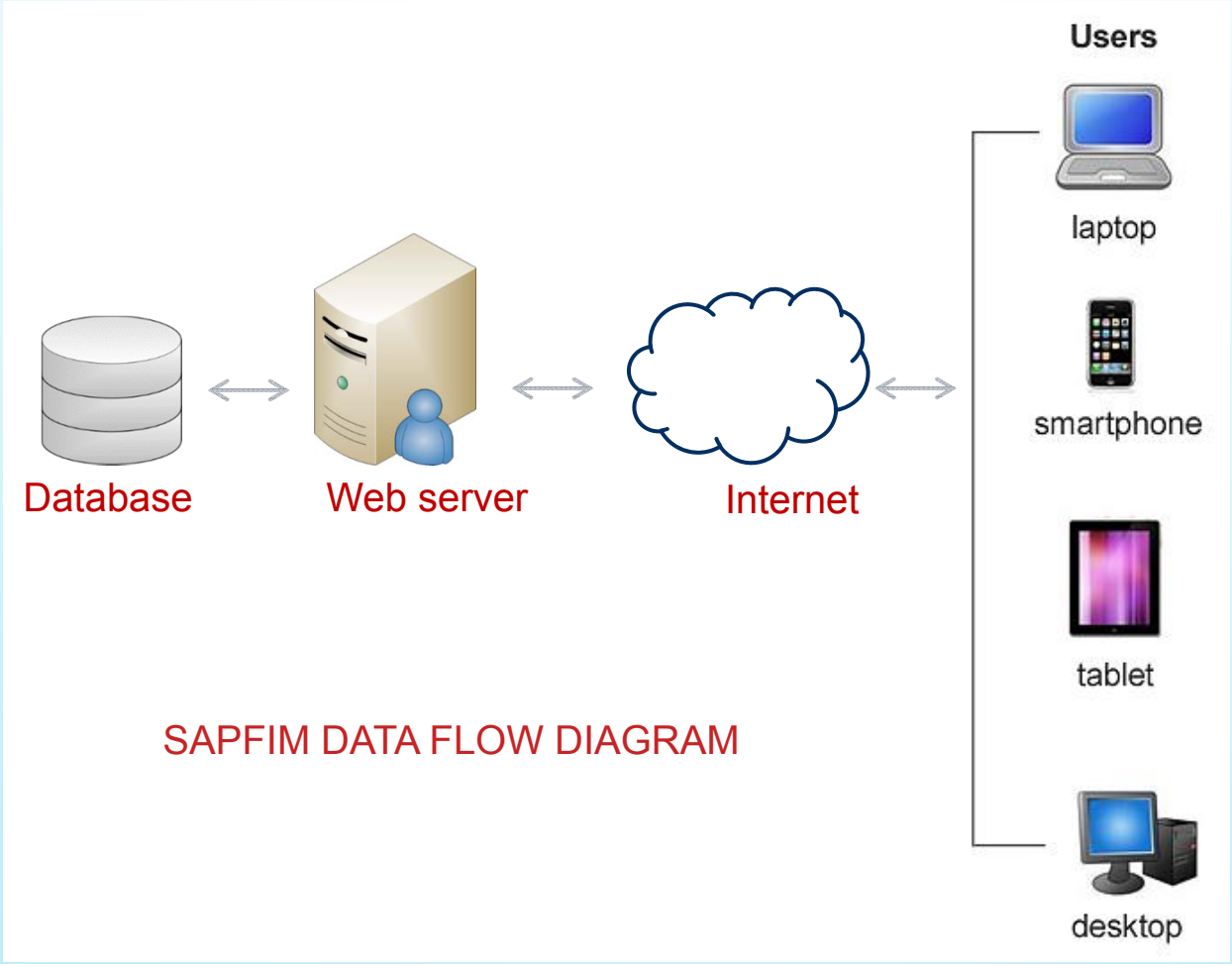
Description	Measurement	Detail	Criteria
Roadway cross-section	Yes / No	Curb and Gutter	
	Yes / No	Flush shoulder	
Sidewalk Separation from Roadway	Feet	Utility strip	≥2' if curb & gutter, or ≥5' if flush shoulder
Sidewalk Width	Feet	Separated from road: • Utility strip ≥2' if curb & gutter or • Utility strip ≥5' if flush shoulder	≥5' if separated
	Feet	Not separated: • Back of curb or • Utility strip <2' if curb & gutter or • Utility strip <5' if flush shoulder	≥6' if not separated

(Continued)

SIDEWALKS SAFETY FEATURES

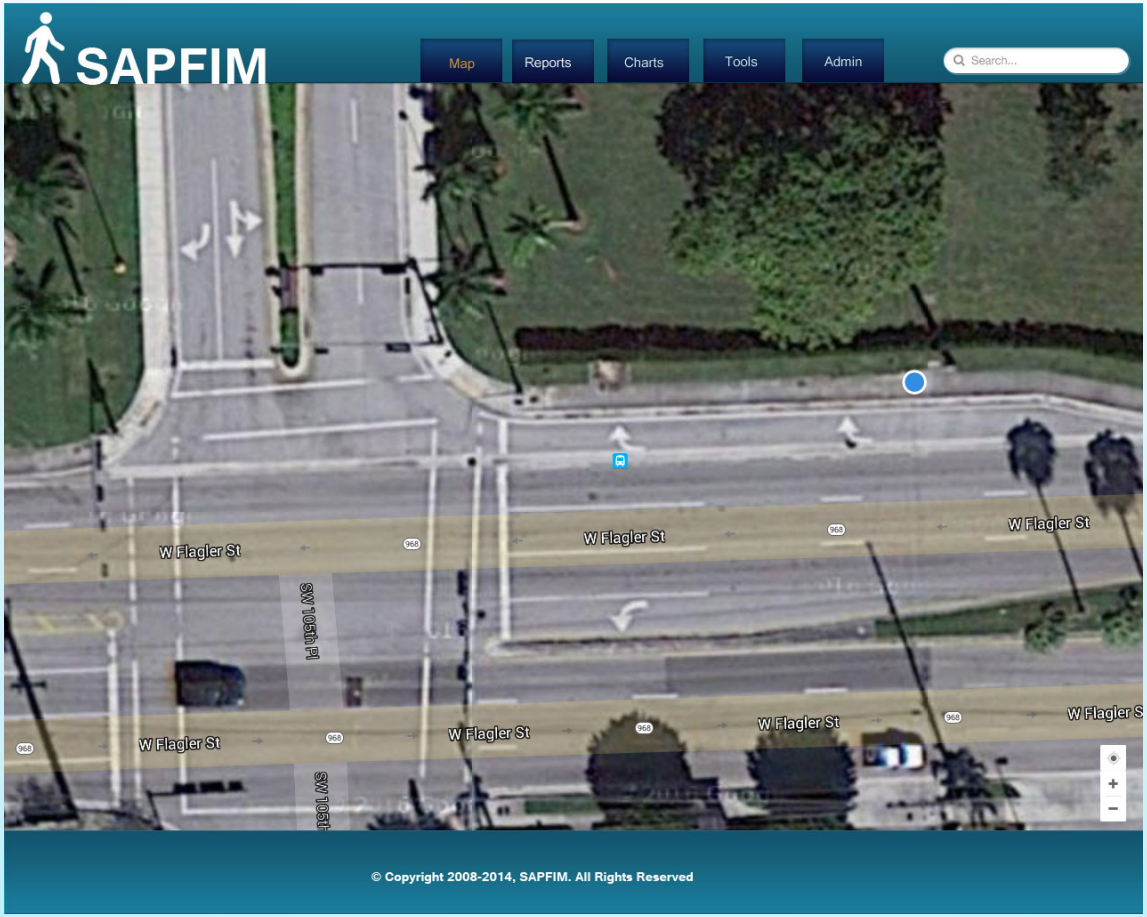
Description	Measurement	Detail	Criteria
Drop-off hazard	Feet	>10" w/in 24"	
	Yes / No	Protected by railing	
	Yes / No	Other protection	
Obstruction in Sidewalk	Yes / No	Utility Pole	≥32" (ADA) ≥32" (UAM) ≥48" (FDOT)
	Inches	Signal Pole	
	Inches	Sign Post	
	Inches	Fire Hydrant	
	Inches	Bench	
	Inches	Other	
Lighting		Roadway/high-level	Yes / No
		Pedestrian/low-level	Yes / No
Tripping Hazard/Change in Level	Inches	Perpendicular or diagonal to path	≤1/4" Vertical ≤1/2" Sloped

HOW SAPFIM WORKS?

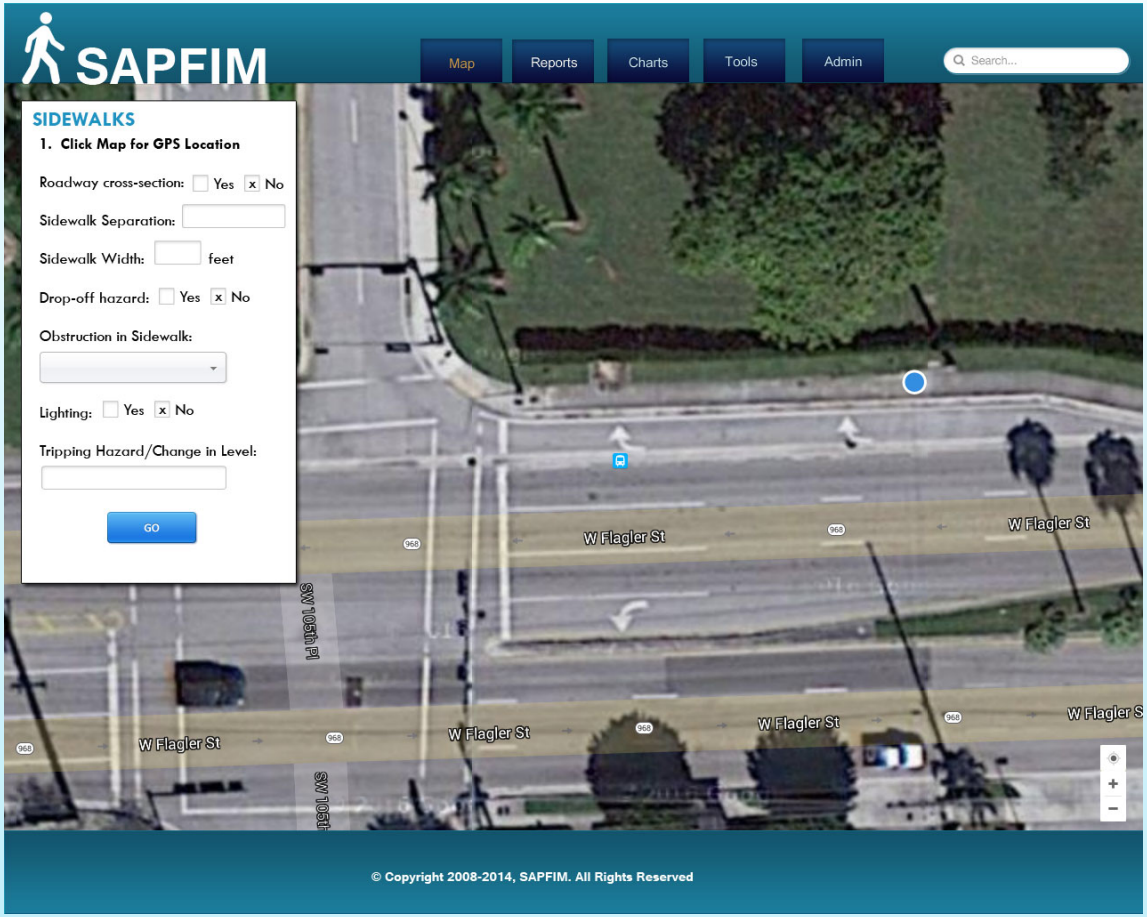


SAPFIM DATA FLOW DIAGRAM

WEB INTERFACE



WEB INTERFACE



VIDEO LOG DATA-MINING

IDENTIFYING ADA FEATURES THROUGH THE USE OF VIDEO LOG IMAGES

Chris Talbot, GISP
Quality Assurance Data Support/Video Log
FDOT – Office of Transportation Data & Analytics
(formerly Transportation Statistics)

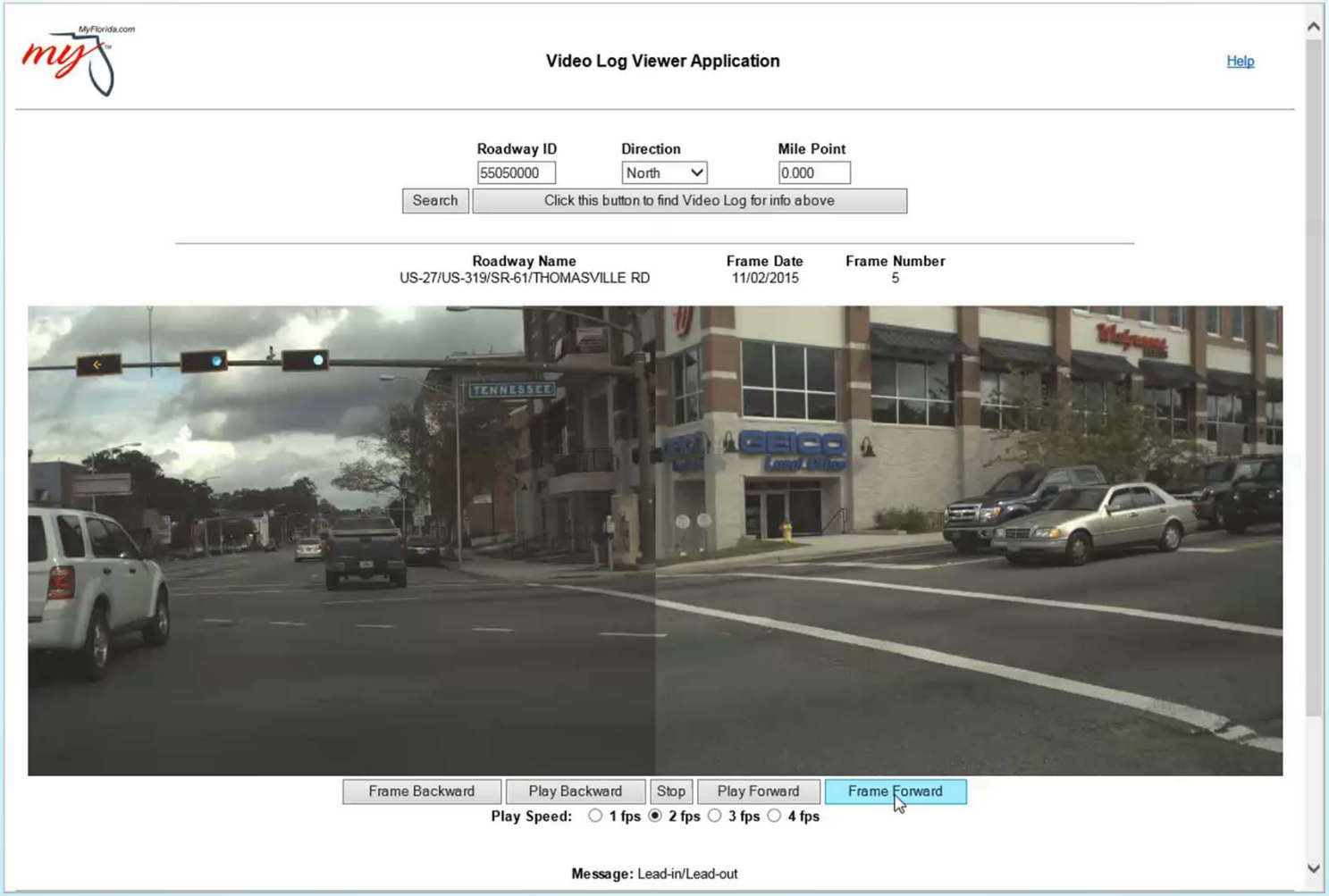
VIDEO LOG OVERVIEW

- What?!
- How this Project Came About
- Project Scope
- Who is Working on the Project
- How We're Working on the Project
- What We Hope to Achieve
- Future

WHAT?!?

- Video log – an FDOT application for viewing on-system roadways.
  - Search 'Florida video log' in Google

- An invaluable resource for safety and an untapped potential for classification, identification, and recognition of image features.



VIDEO LOG DEMONSTRATION

HOW THIS PROJECT CAME ABOUT

- I ran into Carey Shepherd at FDOT and said it would be cool to identify ADA features from video log images.
- Carey said yes. We can get funding to do a project.
- I received documents about how to apply and the project was born.
- We were awarded a T2 funded project with a $9,000 cap.

PROJECT SCOPE

- This is a feasibility and proof of concept study to use image processing techniques to automatically detect the following features from video log:
  - Sidewalks
  - Curb ramps
  - Detectible warnings
  - Pedestrian push-buttons

PROJECT SCOPE

- The project contains two tasks:
  - Task One – conduct research of image processing techniques that can be applied
  - Task Two – develop classification algorithms that provide information on which ADA features, if any, are likely in a given image

PROJECT SCOPE

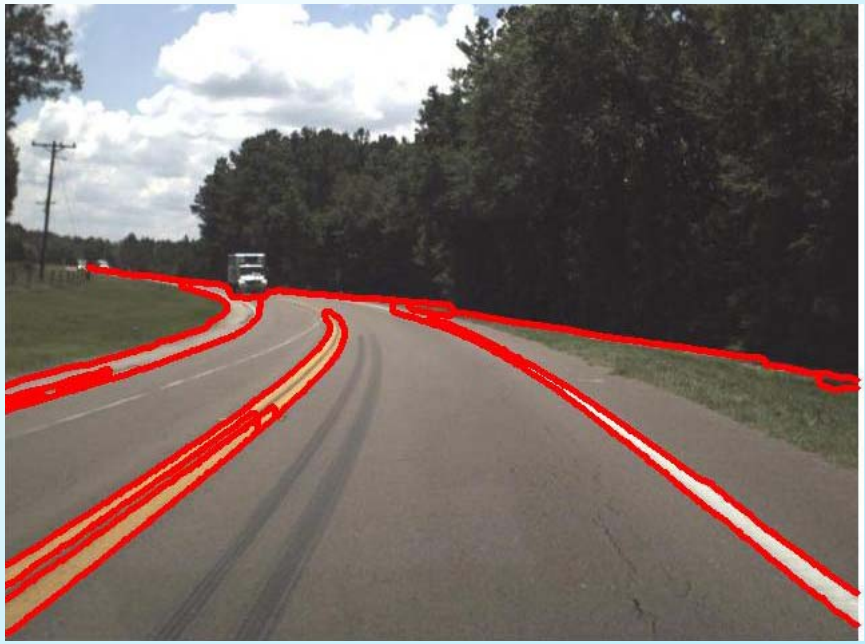
- We are working together to develop image processing techniques and algorithms to automatically identify which ADA features are contained in any given video log image.
- Though there are only 4 features to identify now, we hope to continue efforts in more research to expand the classification reach.

WHO IS WORKING ON THE PROJECT

- UF Professors from UF Transportation Institute
  - Dr. Sanjay Ranka – principal investigator
  - Dr. Anand Rangarajan – co-principal investigator
  - Dr. Sivaramakrishnan (Siva) Srinivasan – co-principal investigator
- Immediate excitement when we started the project.
- Great enthusiasm and direction for accomplishing the tasks.

HOW WE'RE WORKING ON THE PROJECT

- Preliminary results using something called the Hough transform method



HOW WE'RE WORKING ON THE PROJECT

- Preliminary results using something called the Hough transform method

HOW WE'RE WORKING ON THE PROJECT

- Early results led to the need for building a classifier and more research.
- The next step was to use convolution neural networks (CNNs).
  - A CNN mimics the human brain. It actually sees an image as we do, where we can identify patterns, objects, colors, and different elements contained in the image, so can the CNN.
- However, our CNN first has to learn what to look for. It needs training images that have pre-identified ADA features.

HOW WE'RE WORKING ON THE PROJECT

Intent is to capture the existence of a pedestrian signal and the height from ground to the push-button.

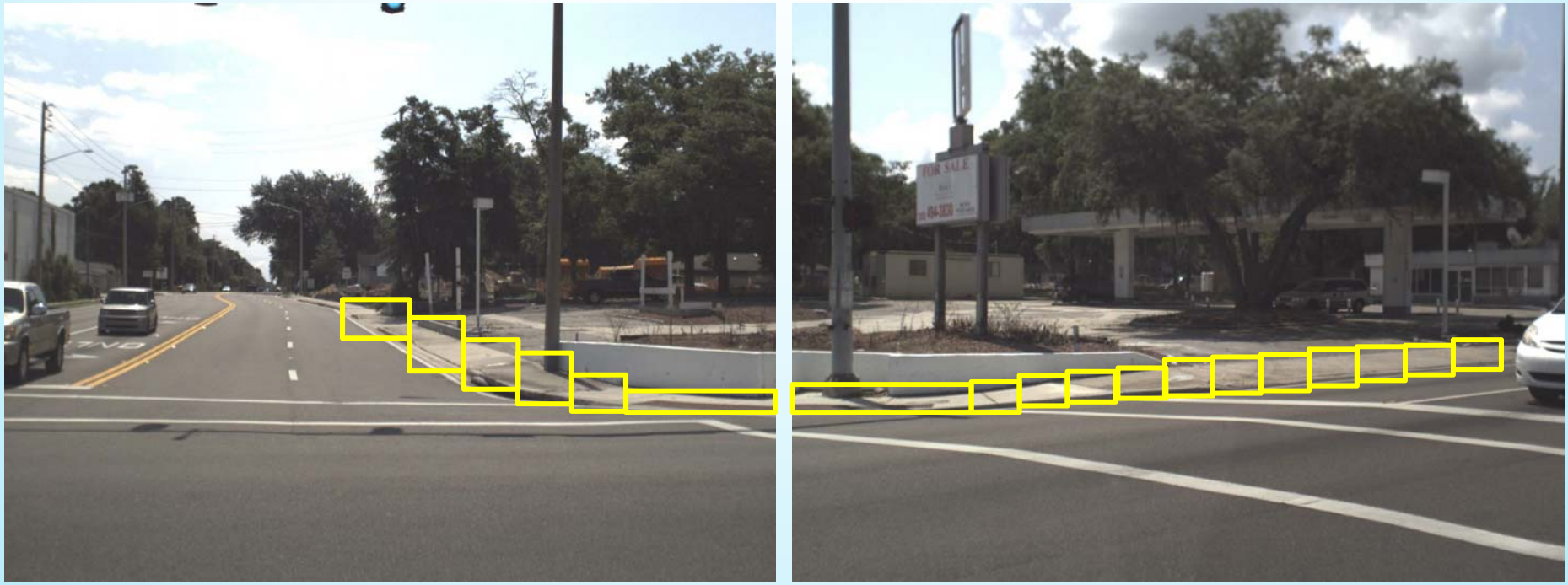
HOW WE'RE WORKING ON THE PROJECT

Intent is to capture the warning area.

HOW WE'RE WORKING ON THE PROJECT

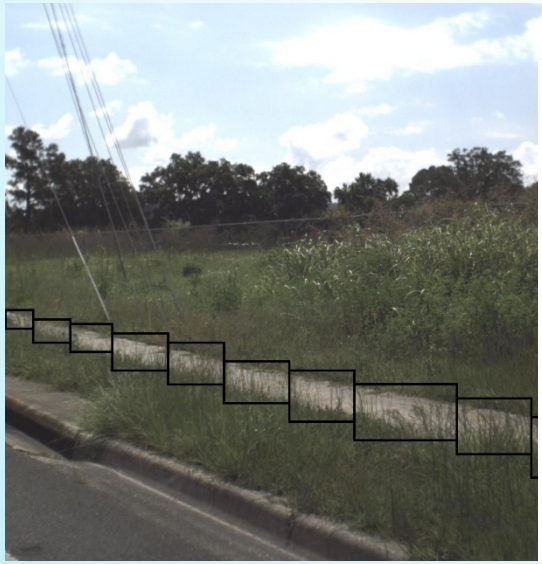
Intent is to capture the slope.

HOW WE'RE WORKING ON THE PROJECT



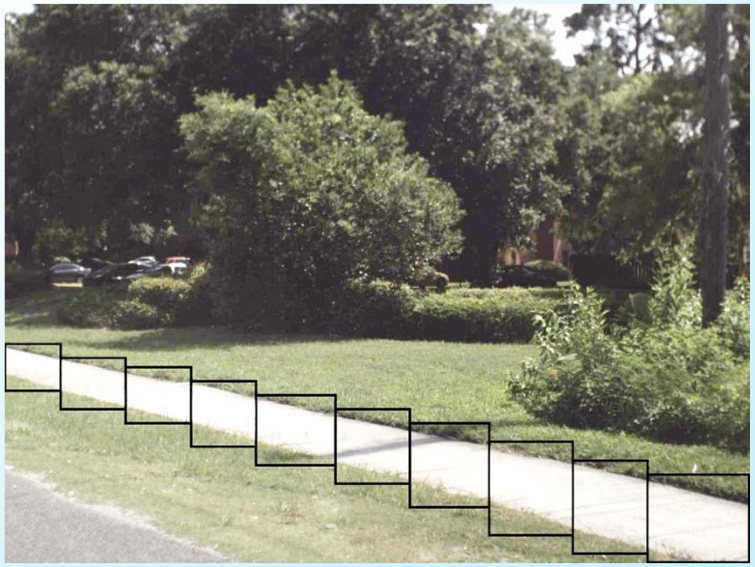
Intent is to capture the walkable area for pedestrians.

HOW WE'RE WORKING ON THE PROJECT



```
<roadway>B26010000N</roadway>
<layout>
      <image>I_02343</image>
      <part>
            <class>button</class>
            <bndbox>
                  <xmin>150</xmin>
                  <ymin>400</ymin>
                  <xmax>220</xmax>
                  <ymax>670</ymax>
            </bndbox>
      </part>
      <part>
            <class>warning</class>
            <bndbox>
                  <xmin>0</xmin>
                  <ymin>660</ymin>
                  <xmax>50</xmax>
                  <ymax>670</ymax>
            </bndbox>
      </part>
      <part>
            <class>sidewalk</class>
            <bndbox>
```

HOW WE'RE WORKING ON THE PROJECT



WHAT WE HOPE TO ACHIEVE

- Develop a CNN that successfully identifies ADA features.
- Eliminate manual feature extraction.
- Validate this project by proving its impact on future collection techniques.

FUTURE

- Obtain more funding to further the research.
- Identify more features:
  - Street signs
  - Traffic signals
  - Railroad crossings
  - Pavement markings
  - Median types

ADA & Transition Planning

QUESTIONS?

HOT ISSUES

- Elements, Features, Devices provided by others on the SHS
- Could these get FDOT in trouble?
  - Bus Stops
    - Shelters, Benches, etc.
  - Railroad Crossings
    - Sidewalk gaps, materials, flangeways, etc.
  - Utilities
    - Poles, hydrants, pull-boxes, etc.

Nice shelter – But, how do I get here?


Potentially unsafe for all peds,
especially those using mobility aids


"Hey… Let's cut up the sidewalk an put in a pole!"