Pedestrian Safety at Signalized Intersections in Florida

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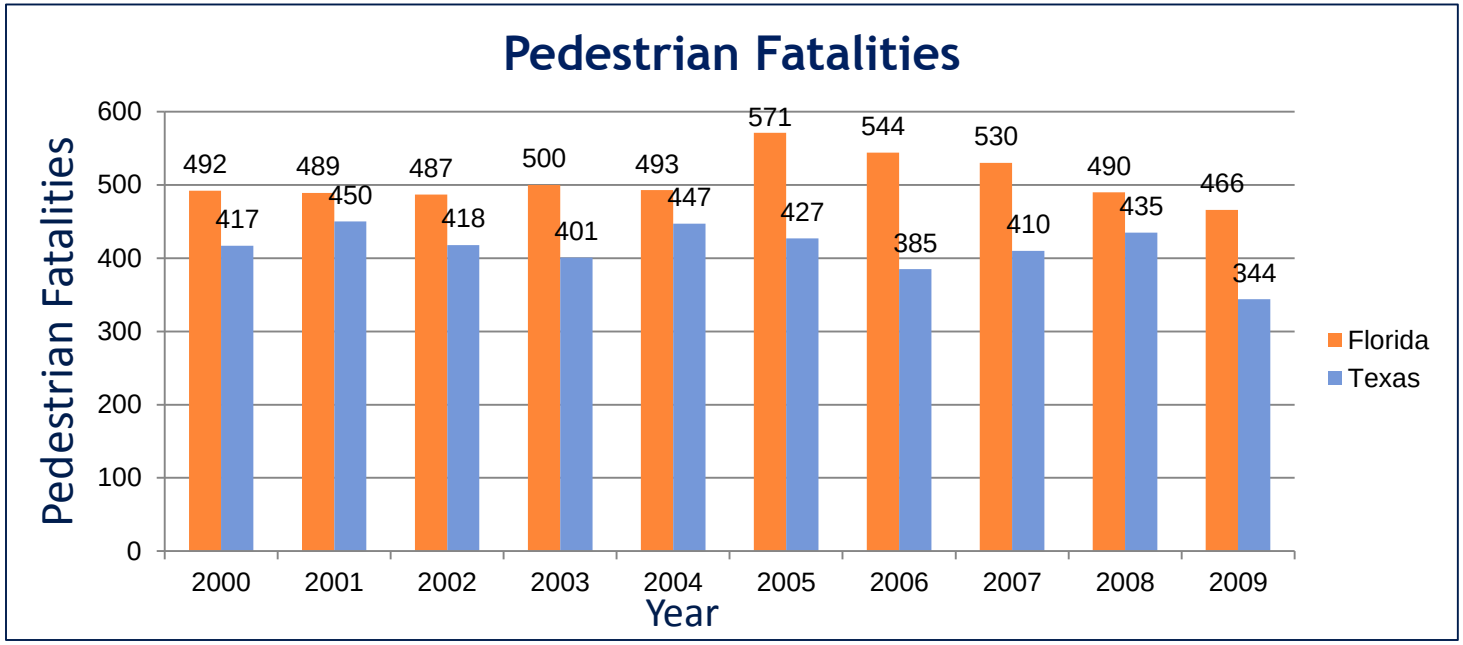
NATIONAL CENTER FOR TRANSPORTATION SYSTEMS PRODUCTIVITY AND MANAGEMENT

Project Motivation

- One in every five traffic-related fatalities in Florida is a pedestrian
- Florida has the highest pedestrian deaths per capita
- Florida is the most dangerous state in the country for pedestrians



Project Goal and Objectives

Project Goal:

To conduct a comprehensive study to improve pedestrian safety on state roads in Florida

Project Objectives:

- Review and summarize existing pedestrian safety studies
- Identify statewide pedestrian crash patterns and causes
- Identify factors contributing to pedestrian injury severity
- Identify and analyze pedestrian high crash locations for crash causes and potential countermeasures

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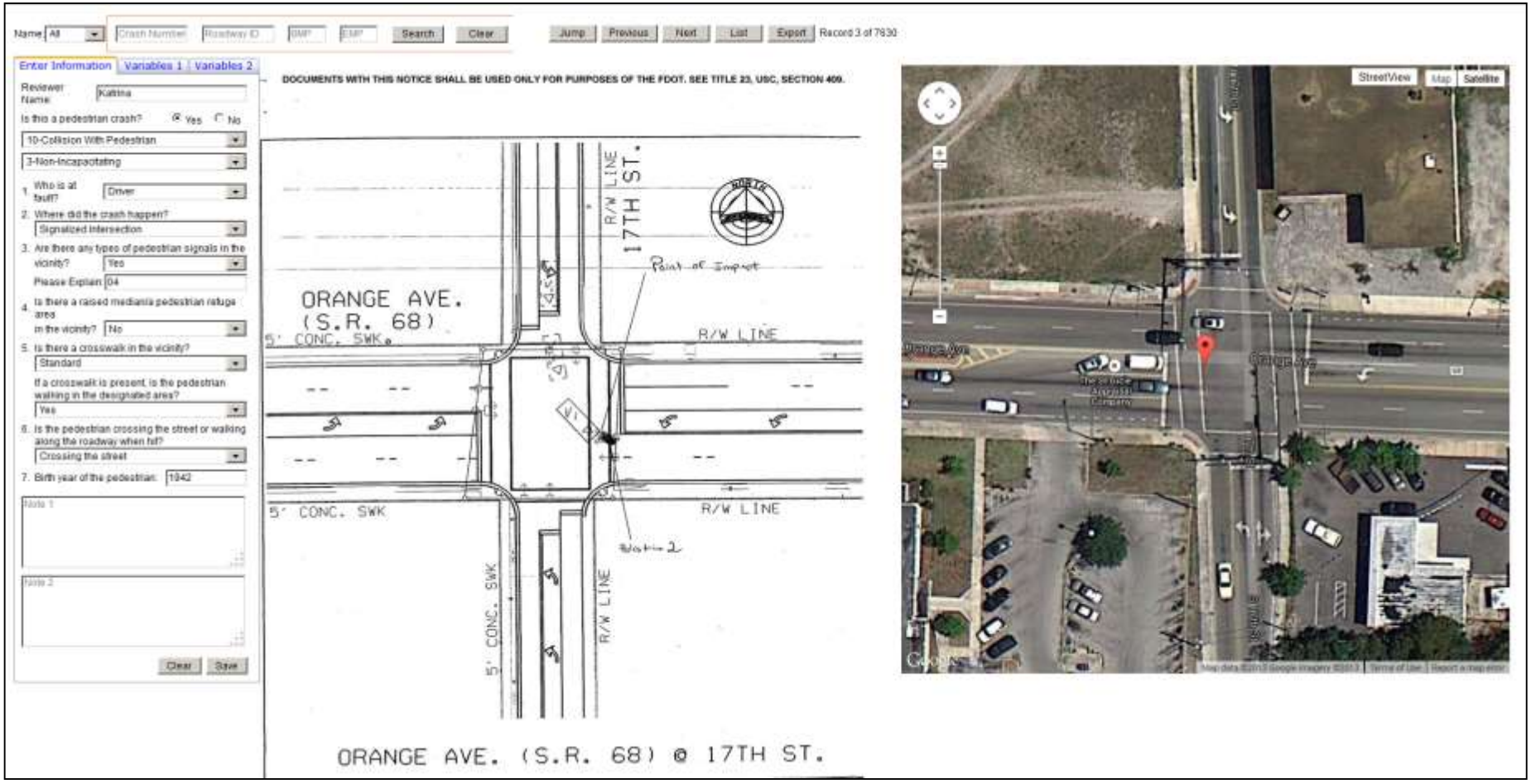
Data Collection

Crash Data Collection

- 7,630 pedestrian crashes occurred from 2008-2010
- Data were collected on:
  - Pedestrian age
  - Injury severity
  - At-fault road user
  - Crash location
  - Presence and type of crosswalk
  - Pedestrian walking pattern (i.e., crossing the street vs. walking along the roadway)

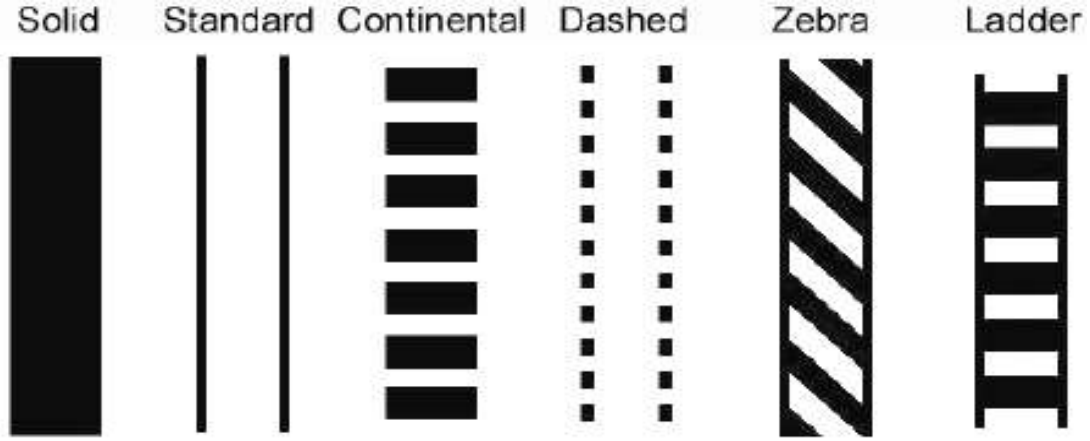
In-house Application to Collect Data



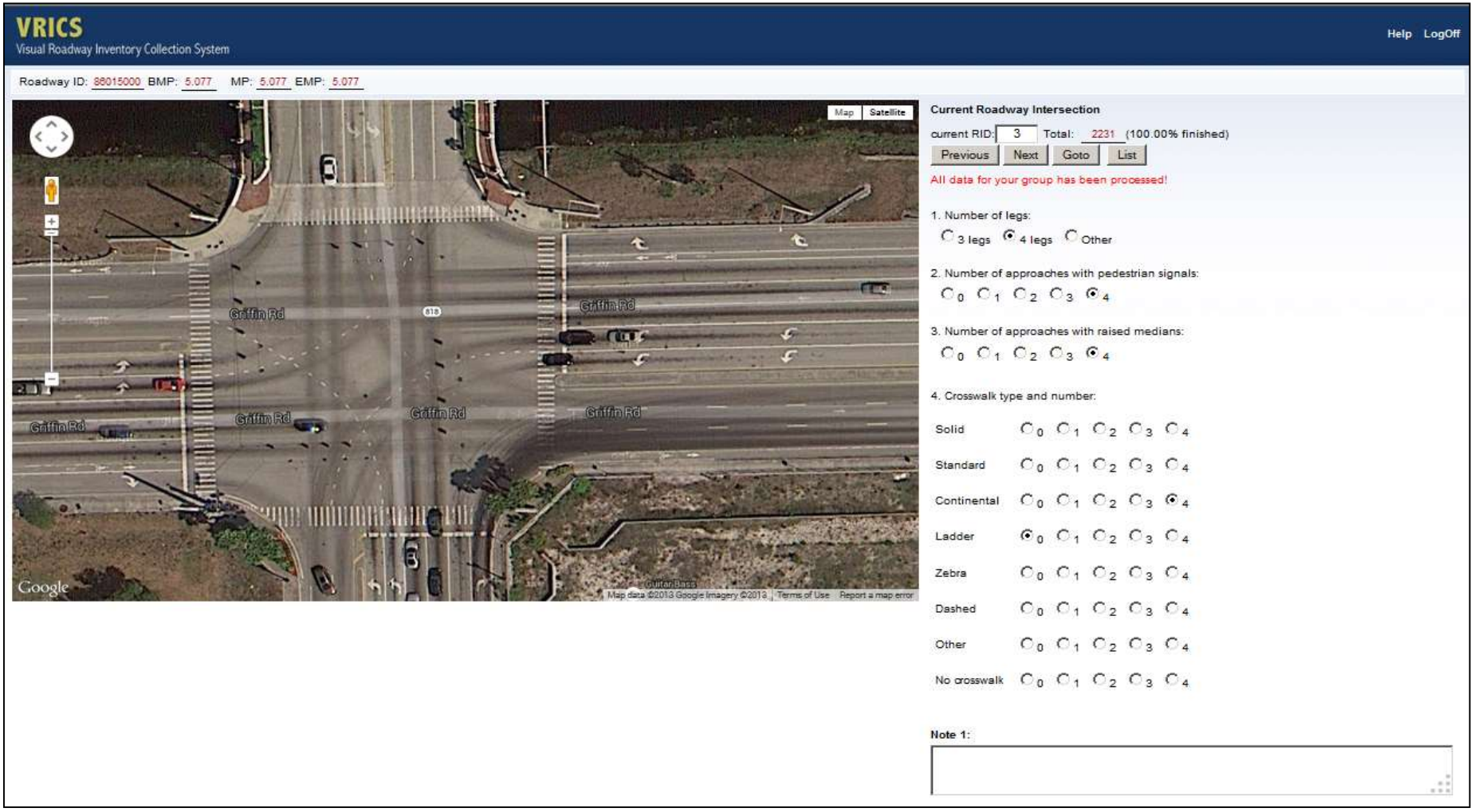
Signalized Intersection Data Collection

For 8,374 signalized intersections, data were collected on:

- Total number of legs
- Number of legs with pedestrian signals
- Number of legs with pedestrian refuge areas
- Number of legs with the following crosswalks:



VRICS: Application to Collect Intersection Data



Type of Crosswalk

Statistics by Crosswalk Type

Crosswalk Type	Fatal Crashes	Injury Crashes	Total Crashes	Total Number of Legs	Crashes per Year per 1,000 Legs	Fatal Crashes per Year per 1,000 Legs
Standard	75	1,004	1,185	11,270	35.05	2.22
Continental	60	616	728	6,211	39.07	3.22
Ladder	7	173	195	1,474	44.10	1.58
Solid with Special Surface	7	239	270	1,679	51.63	1.46
Solid with White Paint	1	10	13	148	--	--
Dashed	0	5	5	5	--	--
Zebra	0	2	2	2	--	--
None	16	140	170	6,293	9.00	0.85
Total	**168**	**2,208**	**2,591**	**27,082**	**31.89**	**2.07**

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Performance of Different Crosswalk Types

Comparison Between Crosswalk Types		% of Fatal Crashes That Occurred at Crosswalk Type A	% of Fatal Crashes That Occurred at Crosswalk Type B	Is Proportion of Fatal Crashes at Crosswalk Type A Significantly Different from those that Occurred at Crosswalk Type B?
Type A	Type B			
Standard	Continental	6.33%	8.24%	No
Standard	Ladder	6.33%	3.59%	No
Standard	Solid with Special Surface	6.33%	2.83%	No

Statistics by Crosswalk Type & Lighting Condition

Crosswalk Type	Lighting Condition						Percent of Nighttime Crashes
	Day	Dusk	Dawn	Night	Unk.	Total	
Standard	657	30	17	474	7	1,185	40.0%
Continental	391	15	9	307	6	728	42.2%
Ladder	112	5	2	75	1	195	38.5%
Solid with Special Surface	158	10	7	93	2	270	34.4%
No Crosswalk	69	4	0	97	0	170	57.1%
Total	**1,402**	**65**	**35**	**1,073**	**16**	**2,591**	**41.4%**

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At-fault Road User

Statistics by At-fault Road User

At-fault Road User	Fatal Crashes	Injury Crashes	Total Crashes
Driver	16 (2.2%)	643 (87.8%)	732 (100.0%)
Pedestrian	105 (7.6%)	1,182 (85.0%)	1,390 (100.0%)
Both Driver & Pedestrian	2 (8.0%)	20 (80.0%)	25 (100.0%)
Not Sure	45 (10.1%)	93 (20.9%)	444 (100.0%)
Total	168 (6.5%)	1,938 (74.8%)	2,591 (100.0%)

Contributing Causes

When the driver was at fault, the most frequent contributing causes were:

- careless driving
- failed to yield right-of-way
- disregarded traffic signal or other traffic control

When the pedestrian was at fault, the most frequent contributing causes were:

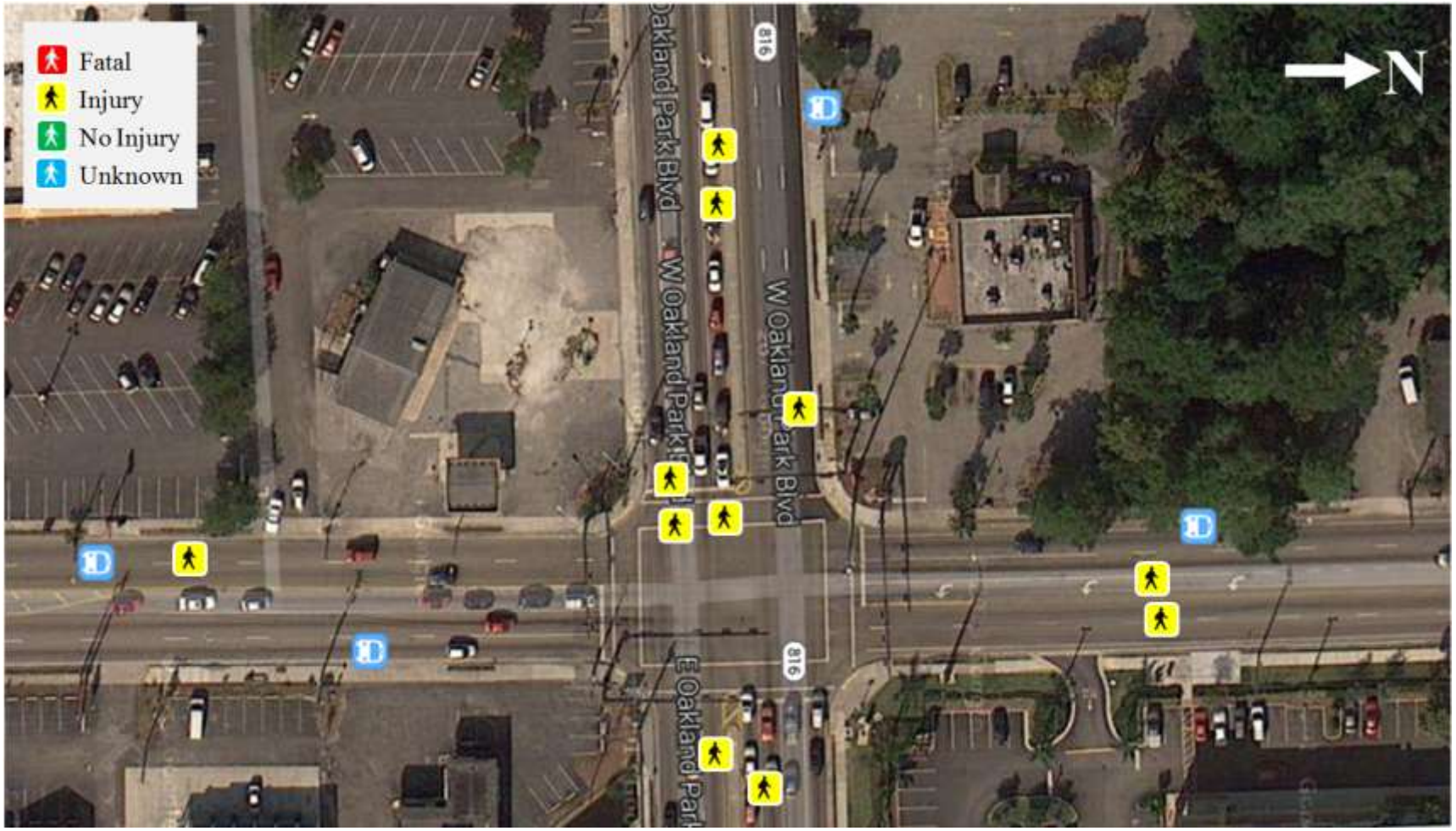
- failed to yield right-of-way
- under the influence of alcohol and/or drugs
- disregarded traffic signal or other traffic control

High Crash Locations

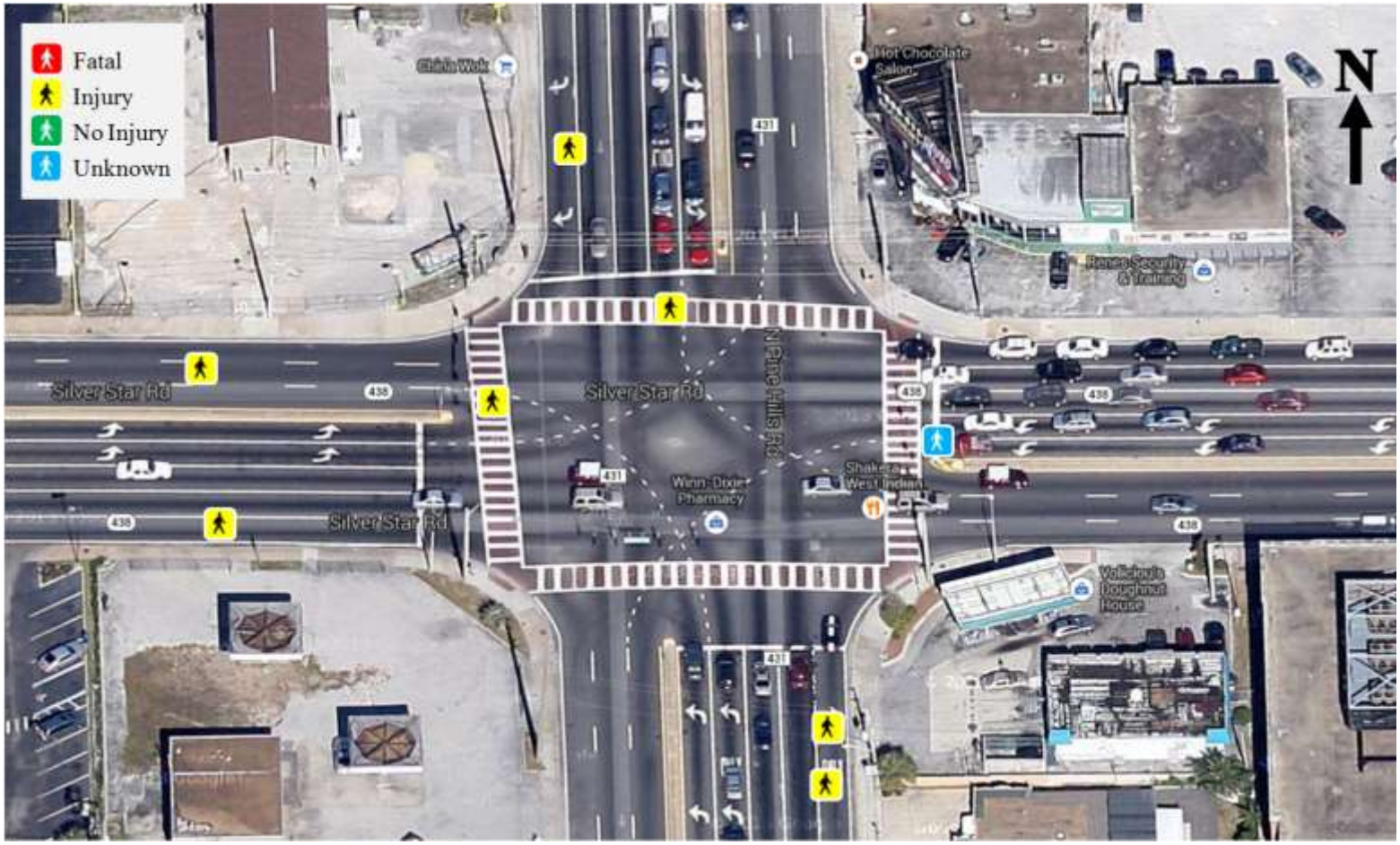
Signalized Pedestrian High Crash Locations

- Locations with crash frequency > (avg. freq. + 3× std. dev.) were identified and analyzed
- 622 urban signalized intersections that experienced ≥ 2 pedestrian crashes were analyzed
- 21 signalized intersections experienced ≥ 6 crashes

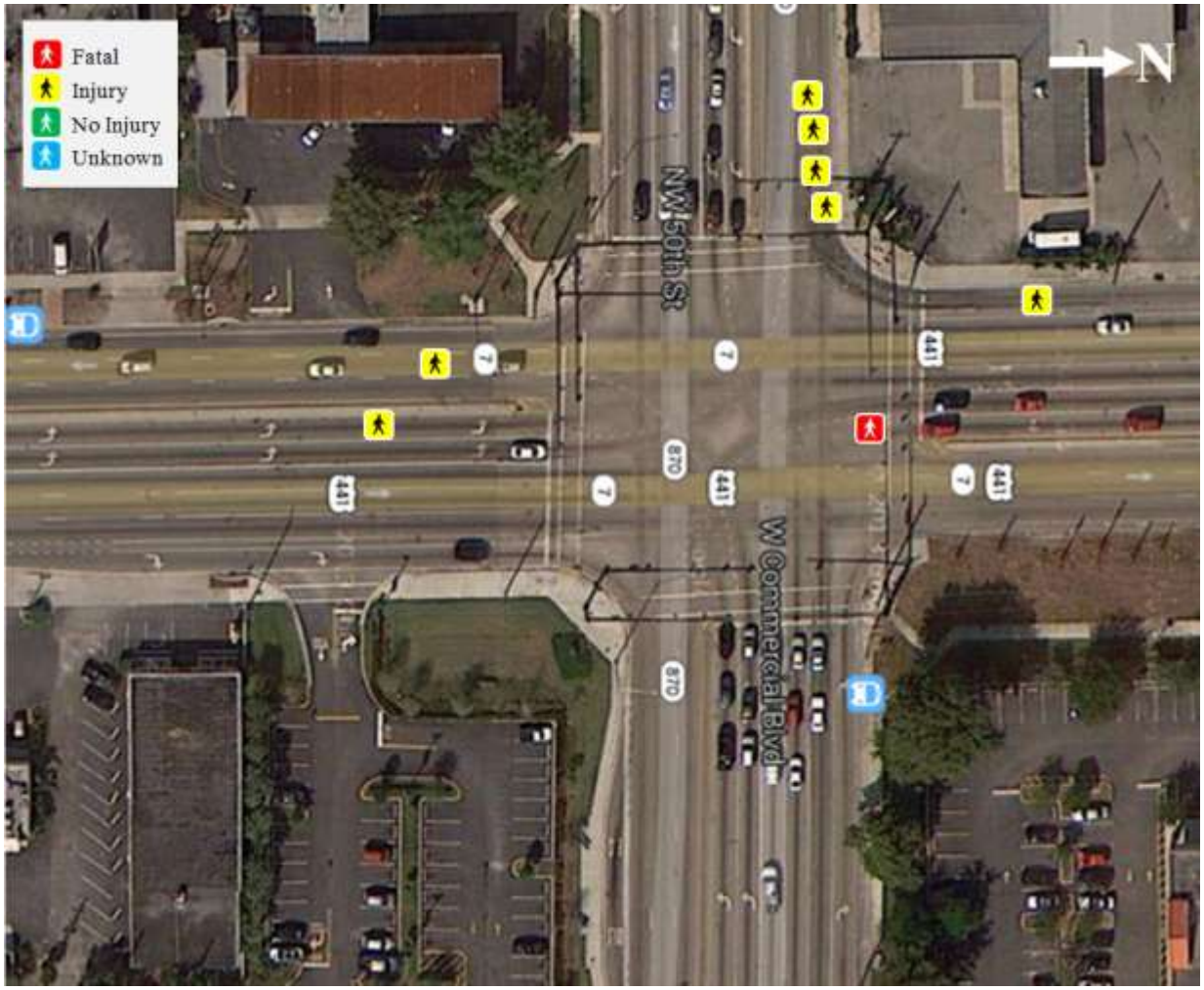
1. W Oakland Park Blvd and N Andrews Ave (Map)



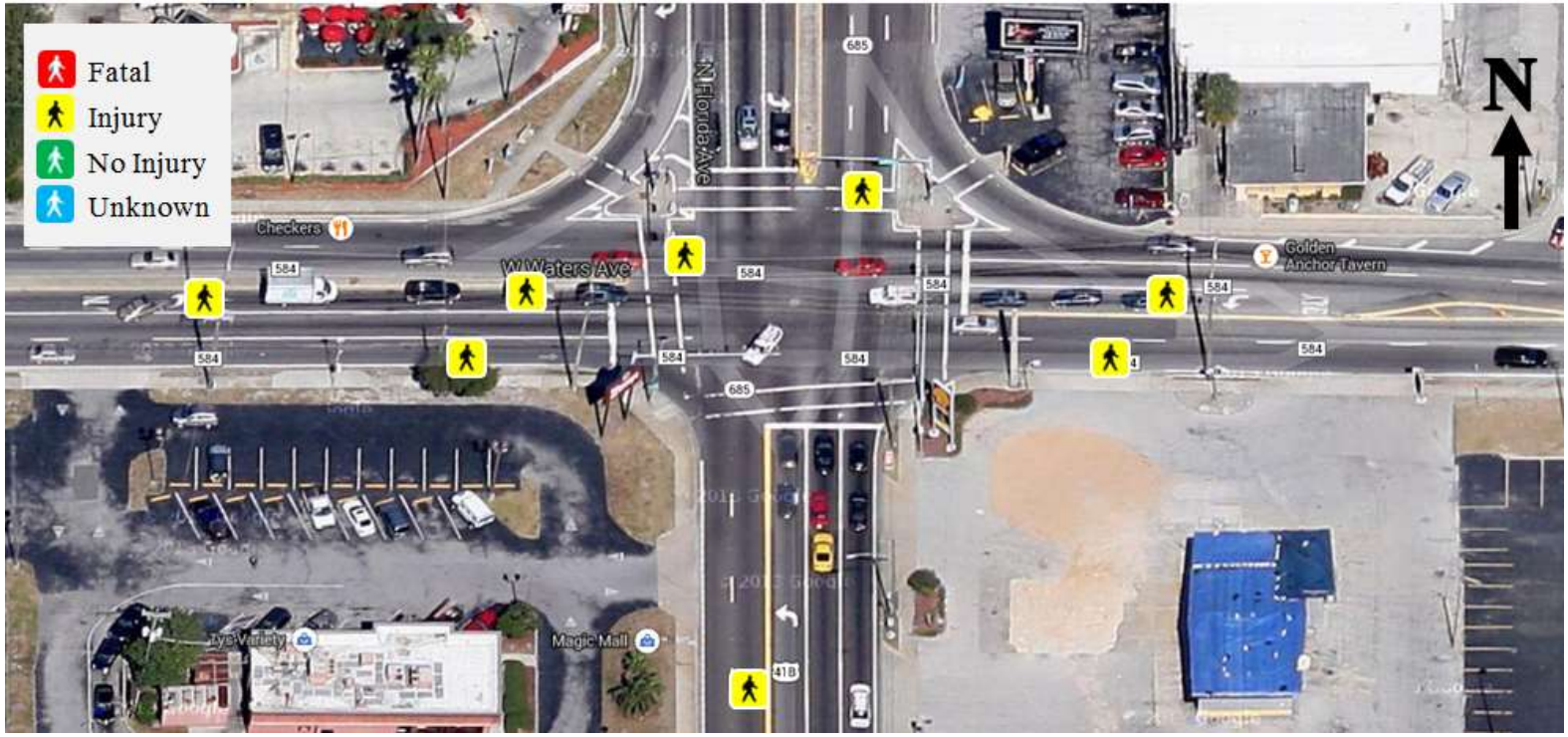
2. Silver Star Rd and N Pine Hills Rd (Map)



3. W Commercial Blvd and NW 50th St (Map)



4. W Waters Ave and N Florida Ave (Map)



5. Silver Star Rd and N Hiawassee Rd (Map)

Crash Contributing Factors

Prevalent Crash Types and Patterns:

1. Crashes that occurred in the vicinity of bus stops
2. Crashes that involved pedestrians who were not crossing at designated crossing locations
3. Crashes that involved pedestrians in a crosswalk and through traffic
4. Crashes that involved right-turning vehicles
5. Crashes that involved left-turning vehicles
6. Crashes that occurred in left-turning lanes and right-most lanes

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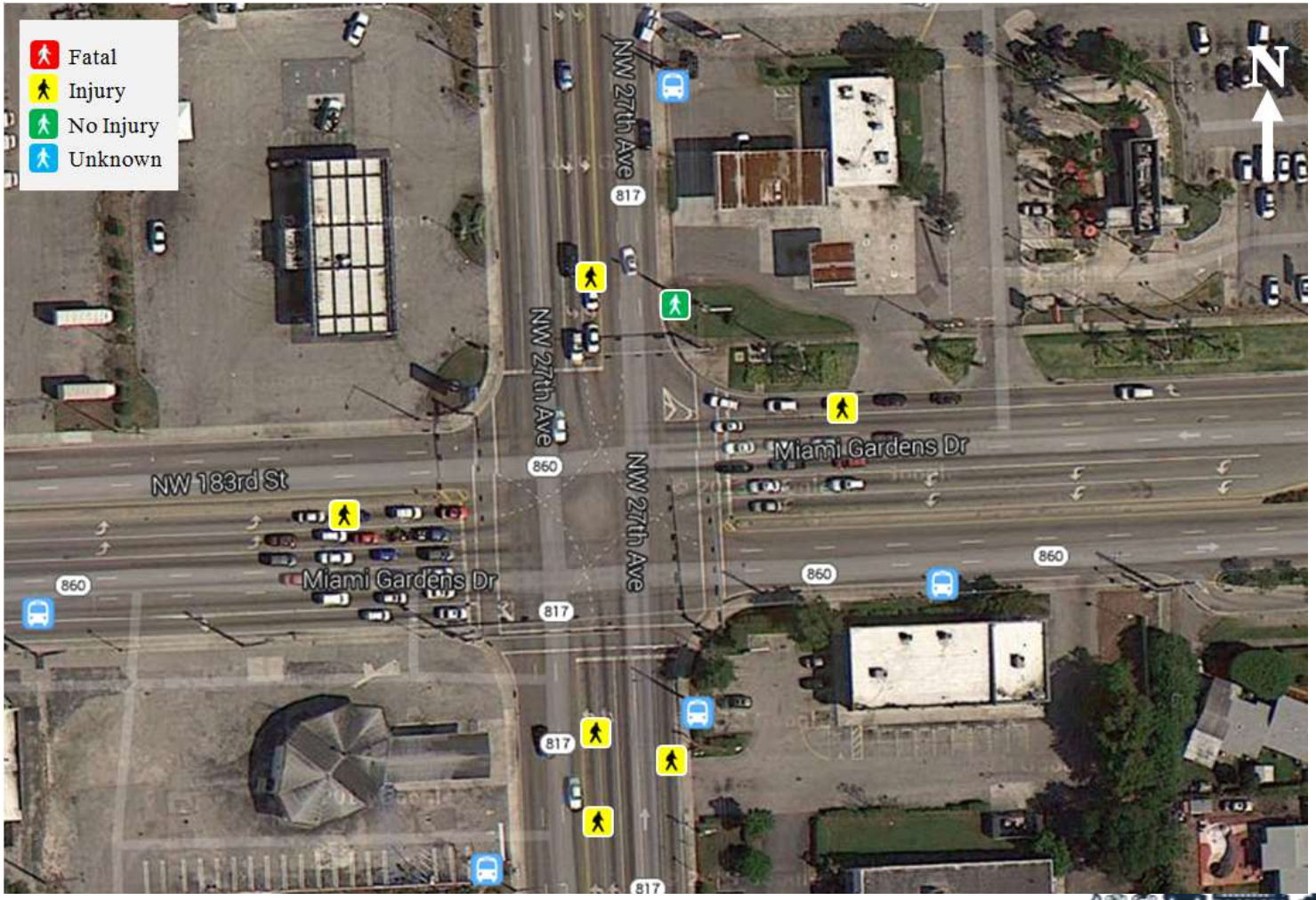
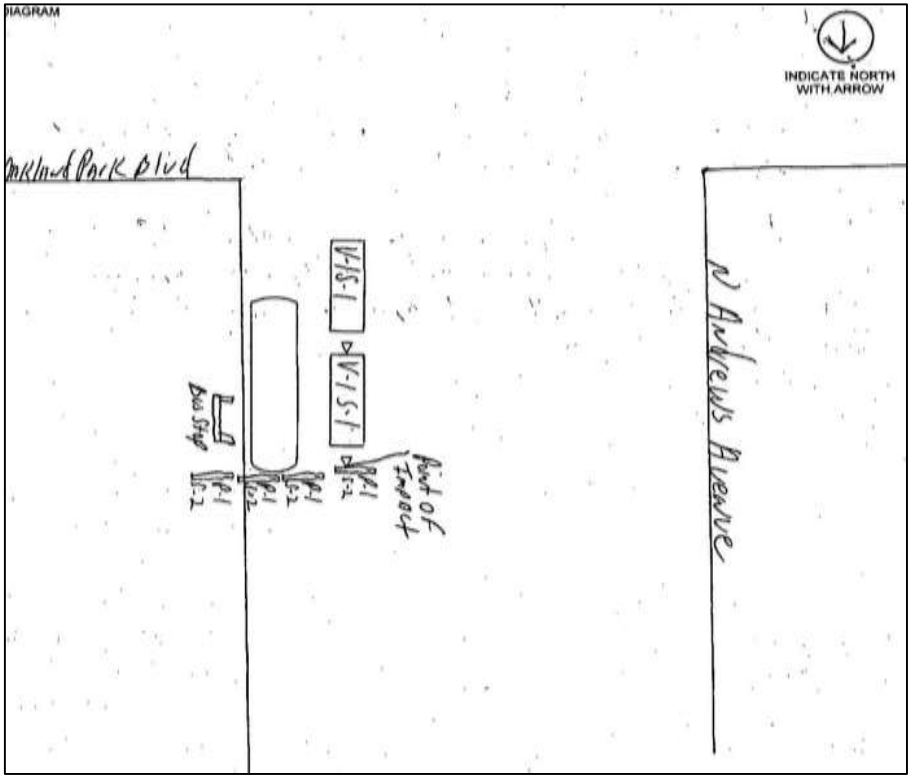
1. Crashes That Occurred in the Vicinity of Bus Stops



NW 27th St and NW 183rd St (Map)

1. Crashes That Occurred in the Vicinity of Bus Stops

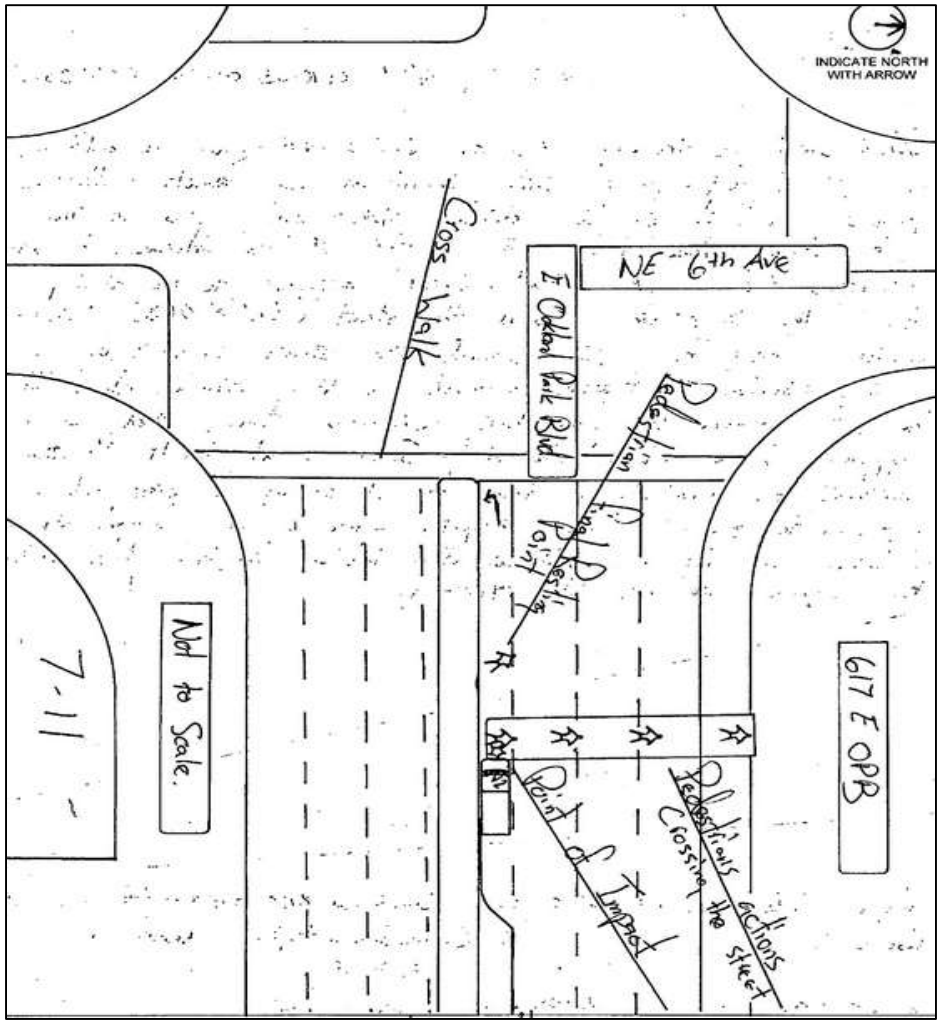


(Crash ID: 761813570)

1. Crashes That Occurred in the Vicinity of Bus Stops - Countermeasures

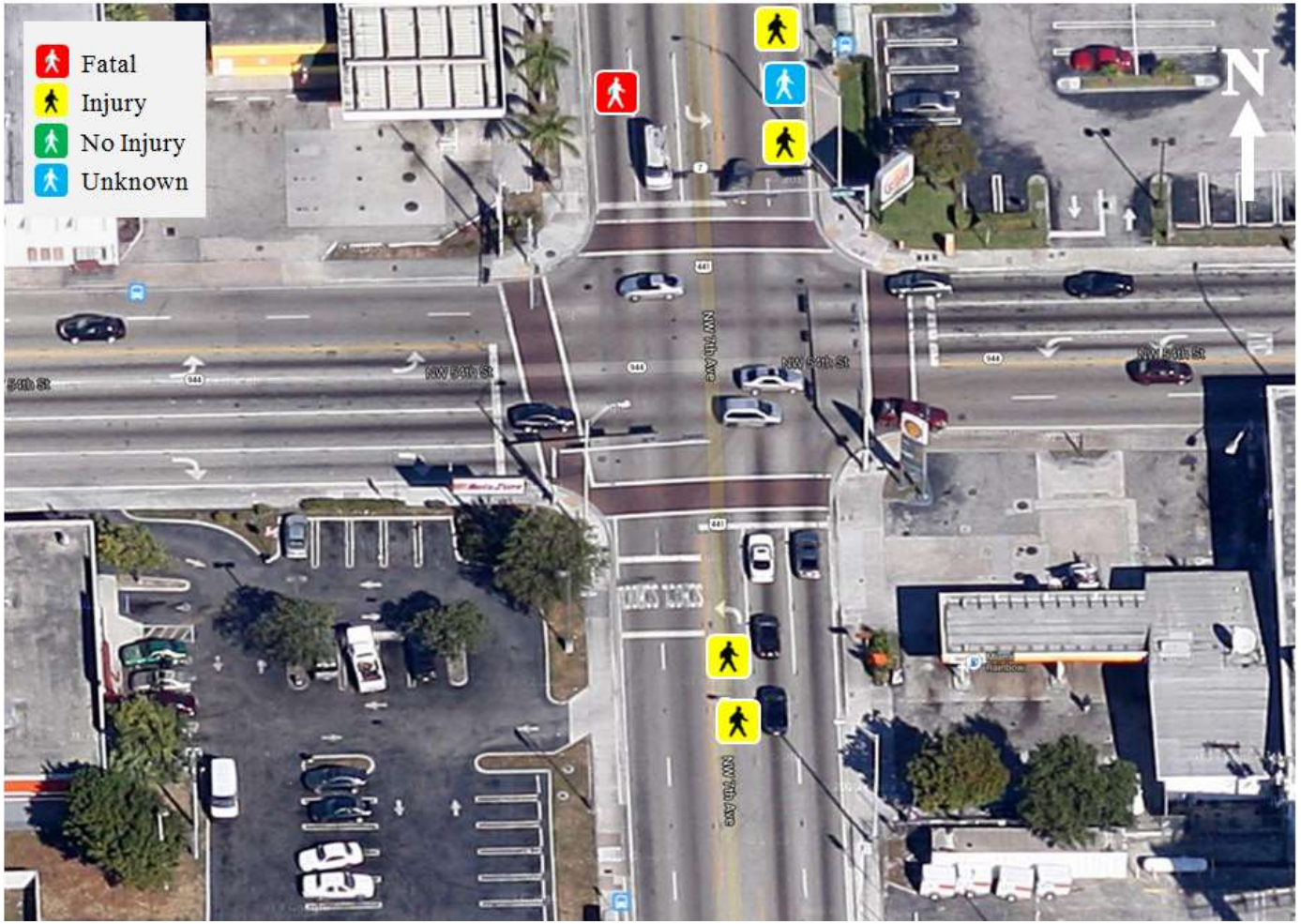
- Improve roadway lighting
- Provide curb extensions in the vicinity of bus stops
- If feasible, relocate near-side bus stops to the far-side of the intersection
- Add signs to warn drivers of increased pedestrian activity near bus stops

2. Crashes That Involved Pedestrians Who Were Not Crossing at Designated Crossing Locations



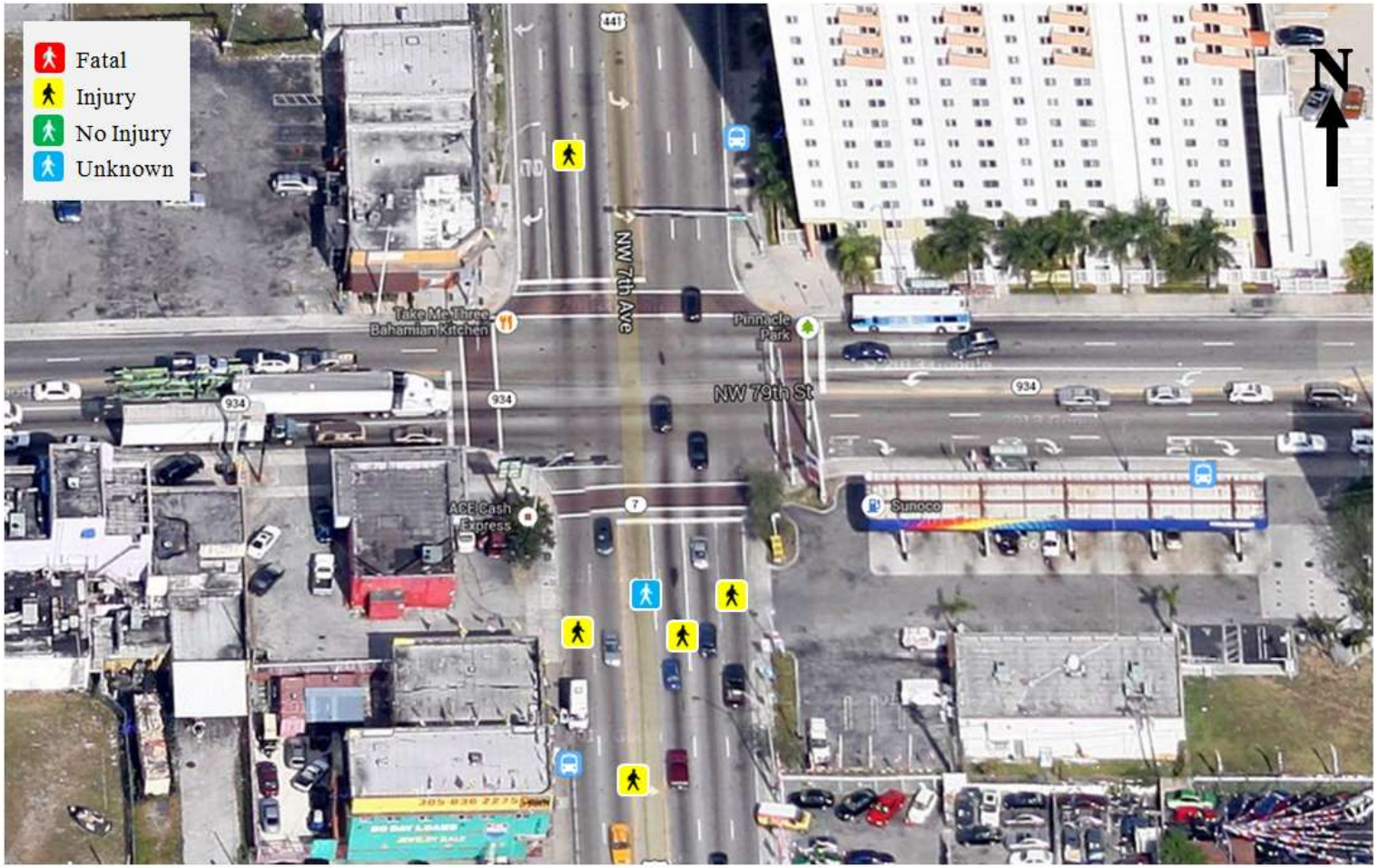
(Crash ID: 906723850)

2. Crashes That Involved Pedestrians Who Were Not Crossing at Designated Crossing Locations



NW 7th Ave and NW 54th St (Map)

2. Crashes That Involved Pedestrians Who Were Not Crossing at Designated Crossing Locations

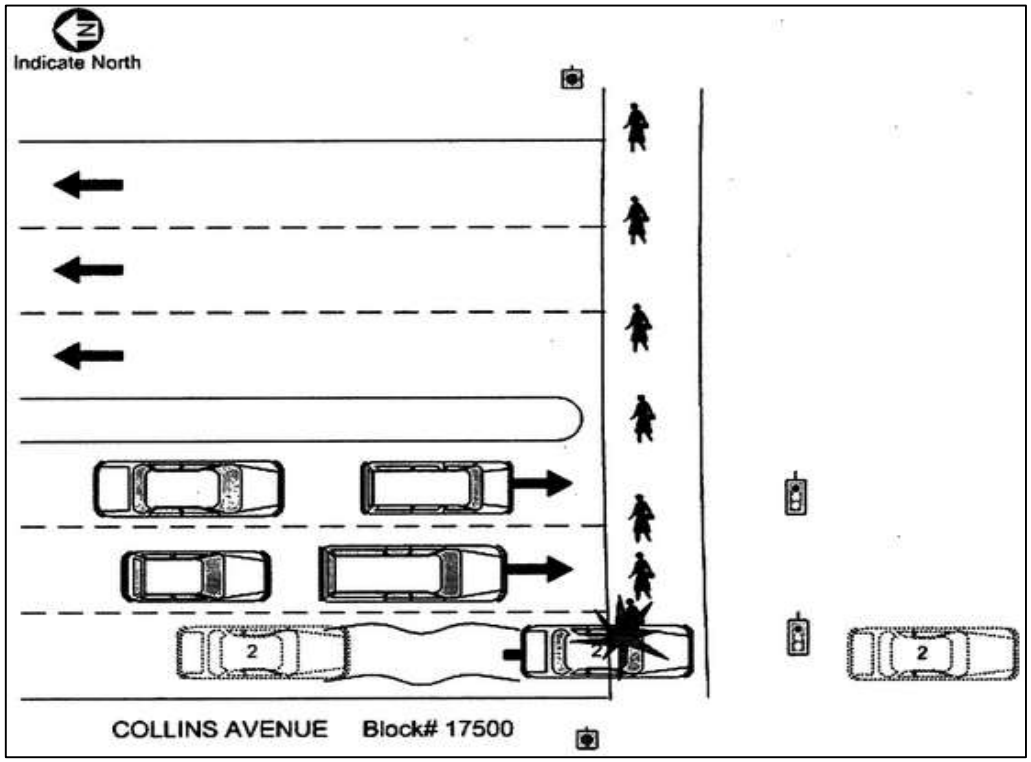


NW 79th St and NW 7th Ave (Map)

2. Crashes That Involved Pedestrians Who Were Not Crossing at Designated Crossing Locations - Countermeasures

- Extensive pedestrian education campaigns
- Stricter enforcement

3. Crashes That Involved Pedestrians in a Crosswalk and Through Traffic



(Crash ID: 801572120)

3. Crashes That Involved Pedestrians in a Crosswalk and Through Traffic - Countermeasures

- Extensive driver education campaigns that focus on driver compliance with pedestrian right-of-way laws
- Stricter enforcement

Thank you.

Questions?

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