BROWARD MPO BICYCLE & PEDESTRIAN SAFETY ACTION PLAN

DEMONSTRATION SITE TECHNICAL MEMORANDUM

SEPTEMBER 2017

Broward MPO
Metropolitan Planning Organization
Bicycle & Pedestrian
SAFETY ACTION PLAN

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Metropolitan Planning Organization

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INTRODUCTION + BACKGROUND

Broward County consistently ranks as one of the most dangerous places to walk and bike in the country, with an average of 5-6 crashes involving walking or bicycling happening per day. Over 80 percent of those crashes result in someone being injured or killed.

The Broward Metropolitan Planning Organization's (MPO) Bicycle and Pedestrian Safety Action Plan (BPSAP) aims to create a safer walking and bicycling environment in Broward County by identifying strategic institutional changes and developing a strategy for how those changes can be accomplished.

In order to create the plan, a study team conducted an in depth analysis into the systemic walking and bicycling safety issues in the County, including consideration of crash statistics, land uses, demographics, existing walking and bicycling facilities, and other strategic issues. Utilizing this data, the team worked with a group of advocates for walking and bicycling safety to identify five demonstration sites that were chosen as representative examples of conditions in Broward County. Field reviews during the morning and evening were conducted to identify issues. Additionally, the study team worked with the advocates and other key stakeholders to identify underlying issues creating issues for walking and bicycling safety in the county.

To move the County forward, this Action Plan identifies key action items, partner organizations, and time frames to guide the work of the MPO and its partners in improving walking and bicycling safety in the County. The Action Plan serves as a foundation to improve safety for all roadway users in Broward County by shifting the transportation focus from moving cars to moving people utilizing four calls to action:

SET THE STAGE
Enact transportation and land use plans and policies to better support multimodal transportation.

CREATE SAFE STREETS
Implement complete streets projects and evaluation measures that go beyond a focus on vehicles and prioritize walking, bicycling, and riding transit.

PREVENT AGGRESSIVE BEHAVIOR
Enhance training of law enforcement officers and the public on pedestrian and bicycle issues, conduct targeted enforcement, and take legal action.

ALL HANDS ON DECK
Coordinate decision makers and find and support advocates to move forward an agreed upon vision for pedestrian and bicycle safety.

This document is a technical memorandum describing many of the tasks that went into the creation of the BPSAP. It provides the following information:

- Describes the methodology and background analysis that led to the final BPSAP
- Identifies and describes the demonstration sites
- Discusses the issues and opportunities uncovered at each site
- Develops projects that may be placed into the MPO's work program
- Identifies programmed projects where the recommendations from this study may be incorporated into and constructed through;
- Discusses prioritization criteria for those projects; and
- Discusses performance measures to analyze the effectiveness of those projects.

Methodology

The study team began the project by developing an understanding of the existing conditions affecting walking and bicycling safety in Broward County. The team utilized the following data:

Topic	Sources Used
Existing and Future Land Use	Broward County Comprehensive Plan and GIS, 2015
Number of Roadway Lanes	FDOT GIS, 2016
Posted Speed	FDOT GIS, 2016
Annual Average Daily Traffic	FDOT GIS, 2016
Transit Boardings + Alightings	Broward County Transit, 2015
Crash Data	FDOT CARS 2010-2014 Crash Data and Signal Four Analytics 2010-2015 Crash Data
Propensity for Walking and Bicycling	US Census Bureau 2010-2014 5-Year Estimates

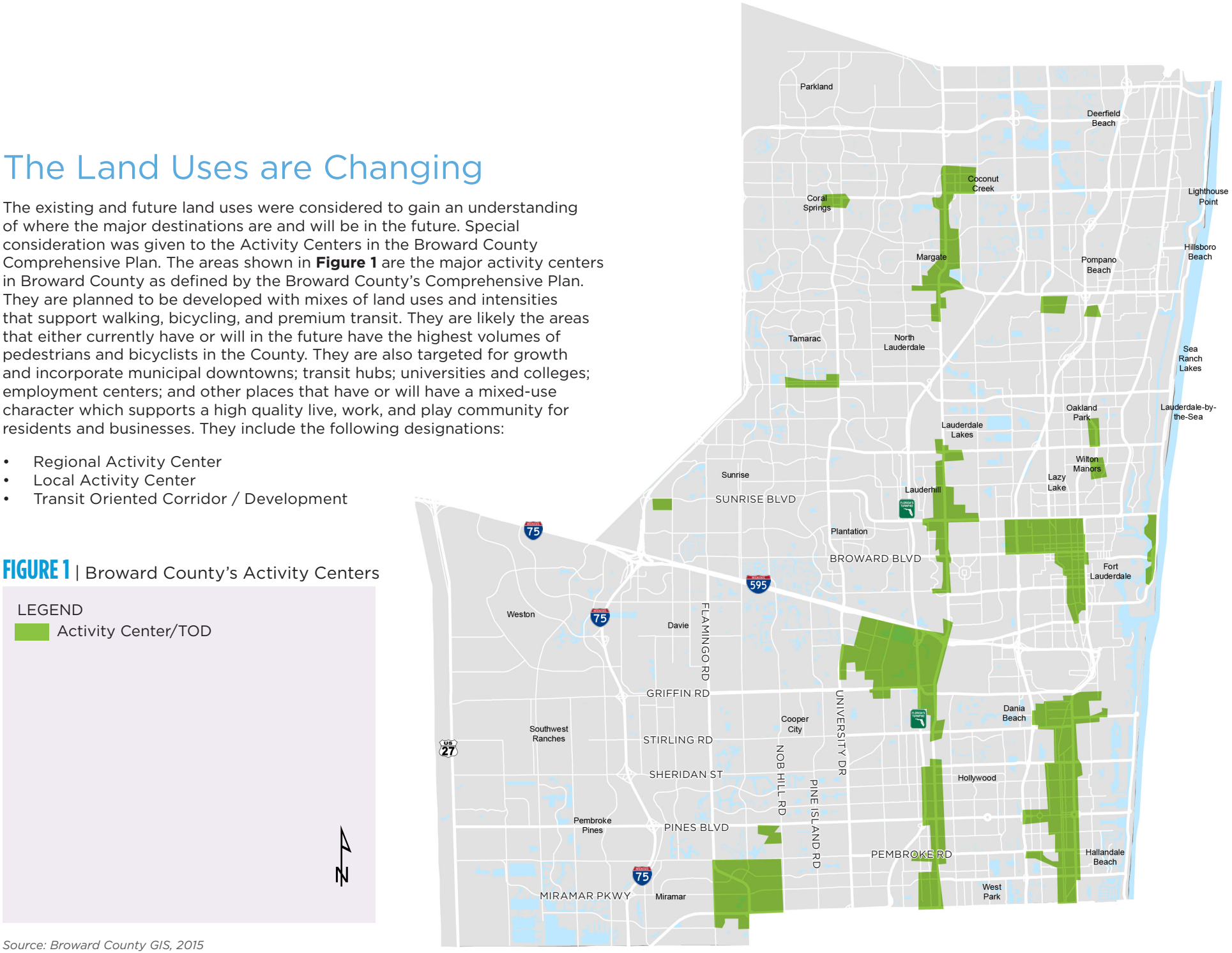
The results of this analysis are described on the following pages.

The Land Uses are Changing

The existing and future land uses were considered to gain an understanding of where the major destinations are and will be in the future. Special consideration was given to the Activity Centers in the Broward County Comprehensive Plan. The areas shown in **Figure 1** are the major activity centers in Broward County as defined by the Broward County's Comprehensive Plan. They are planned to be developed with mixes of land uses and intensities that support walking, bicycling, and premium transit. They are likely the areas that either currently have or will in the future have the highest volumes of pedestrians and bicyclists in the County. They are also targeted for growth and incorporate municipal downtowns; transit hubs; universities and colleges; employment centers; and other places that have or will have a mixed-use character which supports a high quality live, work, and play community for residents and businesses. They include the following designations:

- Regional Activity Center
- Local Activity Center
- Transit Oriented Corridor / Development

FIGURE 1 | Broward County's Activity Centers



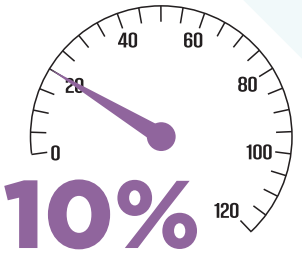
Source: Broward County GIS, 2015

The Roads are Wide & Don't Match the Land Use Context

In Broward County, the development pattern is generally made up of a roadway network that prioritizes major arterials with collector roads feeding them. In several instances, these roads make up a super grid with few connections between, as they are broken up by gated communities and closed-off streets. This causes challenges for walking and bicycling, as it creates long distances between destinations. This network design also creates an environment where the major roads have to be widened (and have been in the case of Broward County) over time in order to carry the amount of traffic needing to use them to get from point A to point B. Throughout the County, these roads typically carry high traffic volumes (58,400 vehicles a day for example)[1] and have higher posted speeds (40+ MPH), both of which can create an uncomfortable and unsafe space for those walking and bicycling. **Figure 2** shows the walking and bicycling crashes that have resulted in deaths as well as the 6-lane roads. It is clear that a majority of the fatal crashes have occurred on 6-lane roads.

Historically as roads have been widened throughout Broward County the design has focused on how to best move vehicles without significant consideration of the land use context. Many facilities in Broward County traverse several communities with different physical and built environments; however the roads typically have the same design and posted speeds regardless of those land use changes. This creates a scenario where drivers have the same driving behavior and expectations even though the built environment around them has changed. For example, the speed limit on Broward Boulevard in Fort Lauderdale changes from 40 MPH just west of I-95 to 35 MPH in the downtown area; however, the roadway design changes minimally. The safety concern is that drivers under this condition will naturally continue to drive at faster speeds and may not be expecting potentially conflict with those walking and bicycling. Ideally, once entering the downtown environment, the roadway design would change indicating to drivers that they are in an environment with high volumes of people walking and bicycling (whether along the street or at frequently-spaced crossings) naturally making them drive slower and more cautiously.

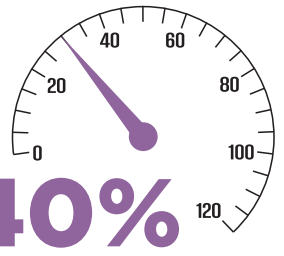
20MPH



10%

Likelihood of Fatality or Severe Injury

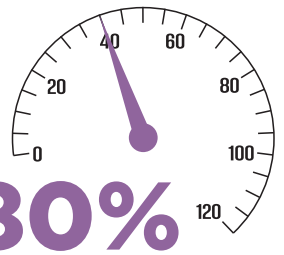
30MPH



40%

Likelihood of Fatality or Severe Injury

40MPH



80%

Likelihood of Fatality or Severe Injury

1 *Based on FDOT's 2013 Generalized Service Volume Tables for the Annual Average Daily Volumes for Florida Urbanized Areas for a 6-Lane Class 1 Divided State Signalized Arterial*

61%

of all deadly crashes occurred on roads with speeds 40+, *even though those roads only make up* 6% *of the network*

SPEED LIMIT 40

56%

of deadly crashes occurred on 4% of the network *(made up of 6-lane roads)*

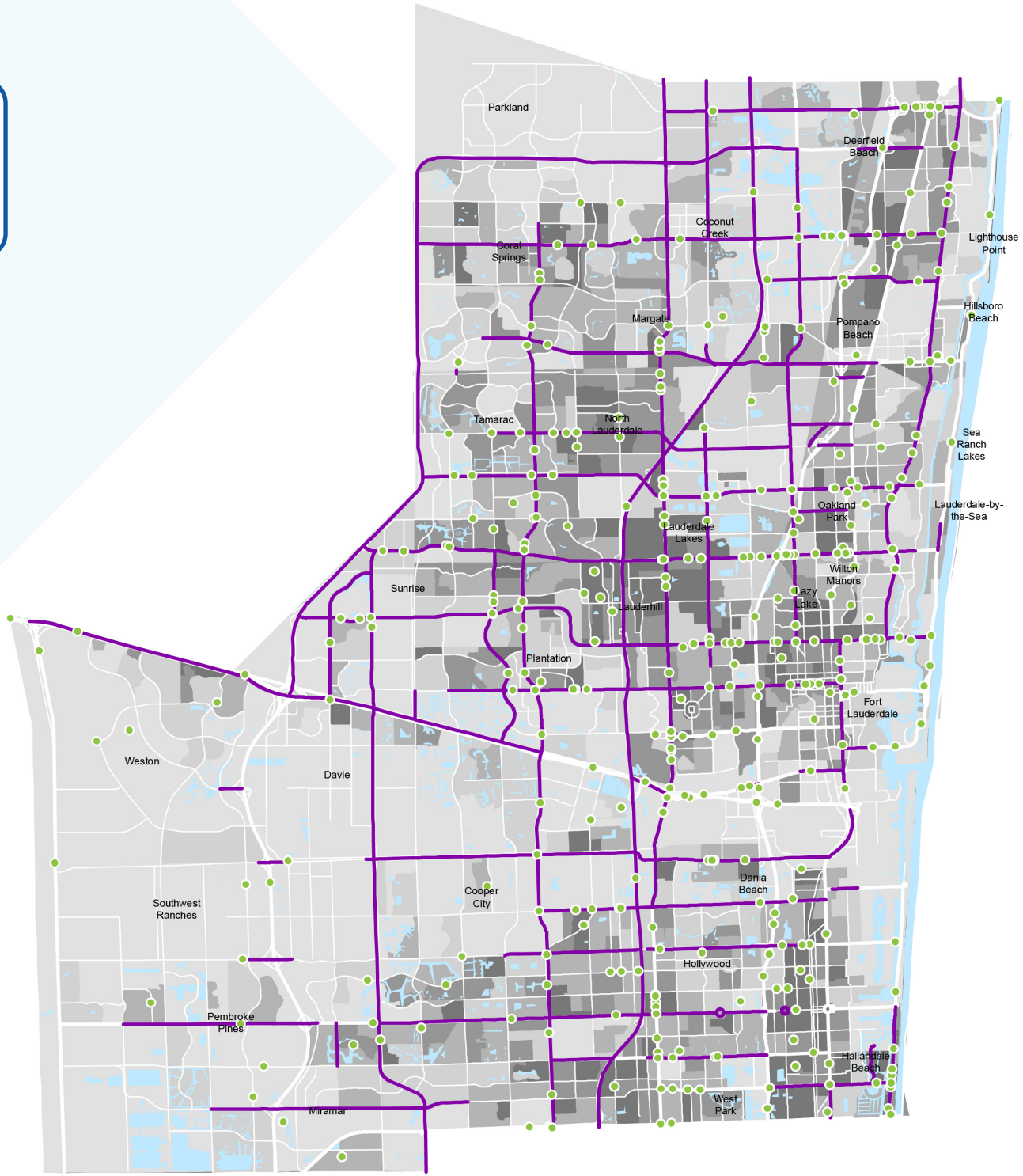


FIGURE 2 | Fatalities + 6-Lane Roads

LEGEND
- Pedestrian or Bicycle Fatality
- 6-Lane Road

Source: FDOT, 2017; CARS 2010-2014 Crash Data; Signal Four Analytics 2010-2015 Crash Data.

There is an Incomplete Network for Bicyclists & Existing Bicycling Facilities Aren't Comfortable for All Rider Types

The bicycling network is disconnected, as shown in **Figure 3**. Only three-percent of the roadway network currently has a bike lane or shared use path. In general, the three-percent is made up of shared use paths. Studies have shown that a completed network of comfortable facilities for all age levels will provide the best opportunities for increasing bicycle safety and ridership.[2] For example, a 2016 study considered 10 US cities that have worked to improve their bike networks over the last 15 years. The study found that all 10 cities saw increases in bicycling along with a decrease in crashes, fatalities, and severe injuries.[3] Another study for 74 US cities found that dense networks and direct connections were most likely to increase bicycle commuting.[4]

Throughout the County there are some areas with 5' wide bike lanes directly adjacent to traffic on 6-lane roads. Bicycling directly adjacent to high-speed traveling vehicles is commonly seen as uncomfortable for cyclists and creates potentially unsafe conditions, especially in the case where no buffer or physical barrier is in place.

National and international practices and standards are beginning to discuss speeds as well as traffic volumes should be considered when determining bicycling facilities. The most well known of these is The Netherlands' CROW Manual for Bicycle Traffic, however national guidance is reflecting this as well in places like Maryland, Oregon, and Pennsylvania. They suggest that on higher speed and volume roadways, bicycle facilities should be separated by a physical barrier to provide the most comfortable and safe riding experience.[5] This supported by research, such as a 2012 study that found that the odds of a crash occurring in protected bike lanes on roads without parked cars was 89 percent lower than on major streets with parked cars and no bike infrastructure.[6]

of network has a bike lane

of bike crashes are occurring in places with bike lanes or shared use paths

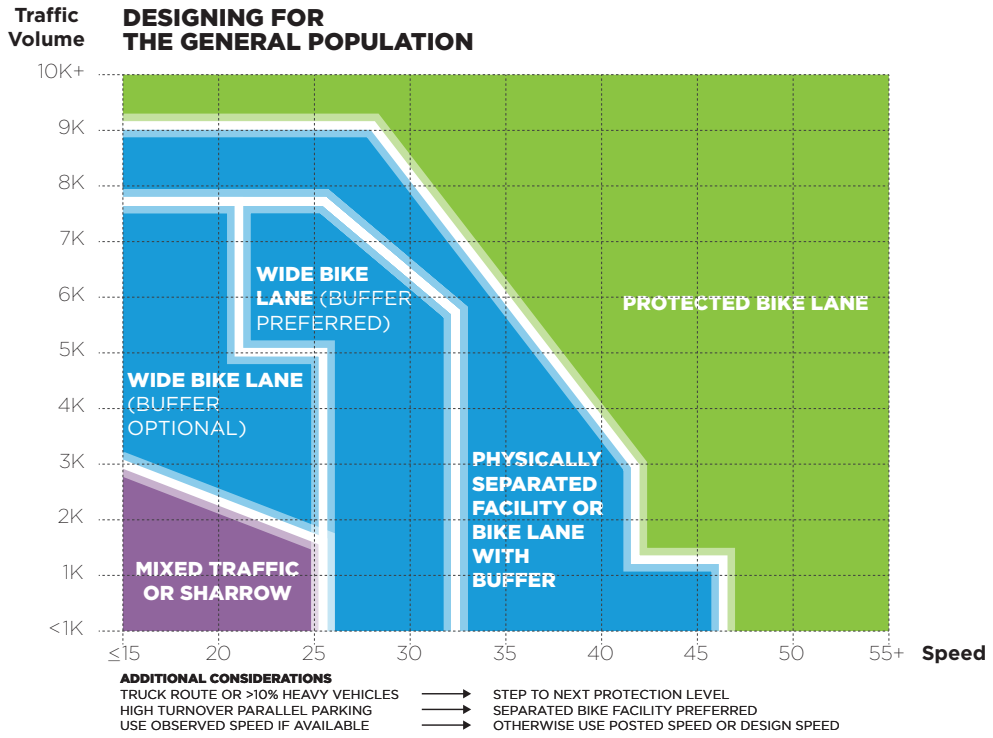
2 *Boldry, J., Anderson, M., and Roskowski, M. (May 2017). Defining Connected Bike Networks. Pedestrian and Bicycle Information Center. Chapel Hill, NC.*

3 *Pucher, R. & Buehler (2016). Safer Cycling Through Improved Infrastructure. American Journal of Public Health, 106(12), 2089-2091.*

4 *Schoner, J.E. & Levinson, D.M. (2014). The missing link: bicycle infrastructure networks and ridership in 74 US cities. Transportation, 41, 1187-1204.*

5 *The Metropolitan Washington Council of Governments & Montgomery County Planning Department. (July 2014). Montgomery County Bicycle Planning Guidance. Montgomery County, MD.*

6 *Teschke K., Harris M.A., Reynolds C.C., et al. (2012). Route infrastructure and the risk of injuries to bicyclists: a case-crossover study. American Journal of Public Health, 102 (12), 2336–2343*



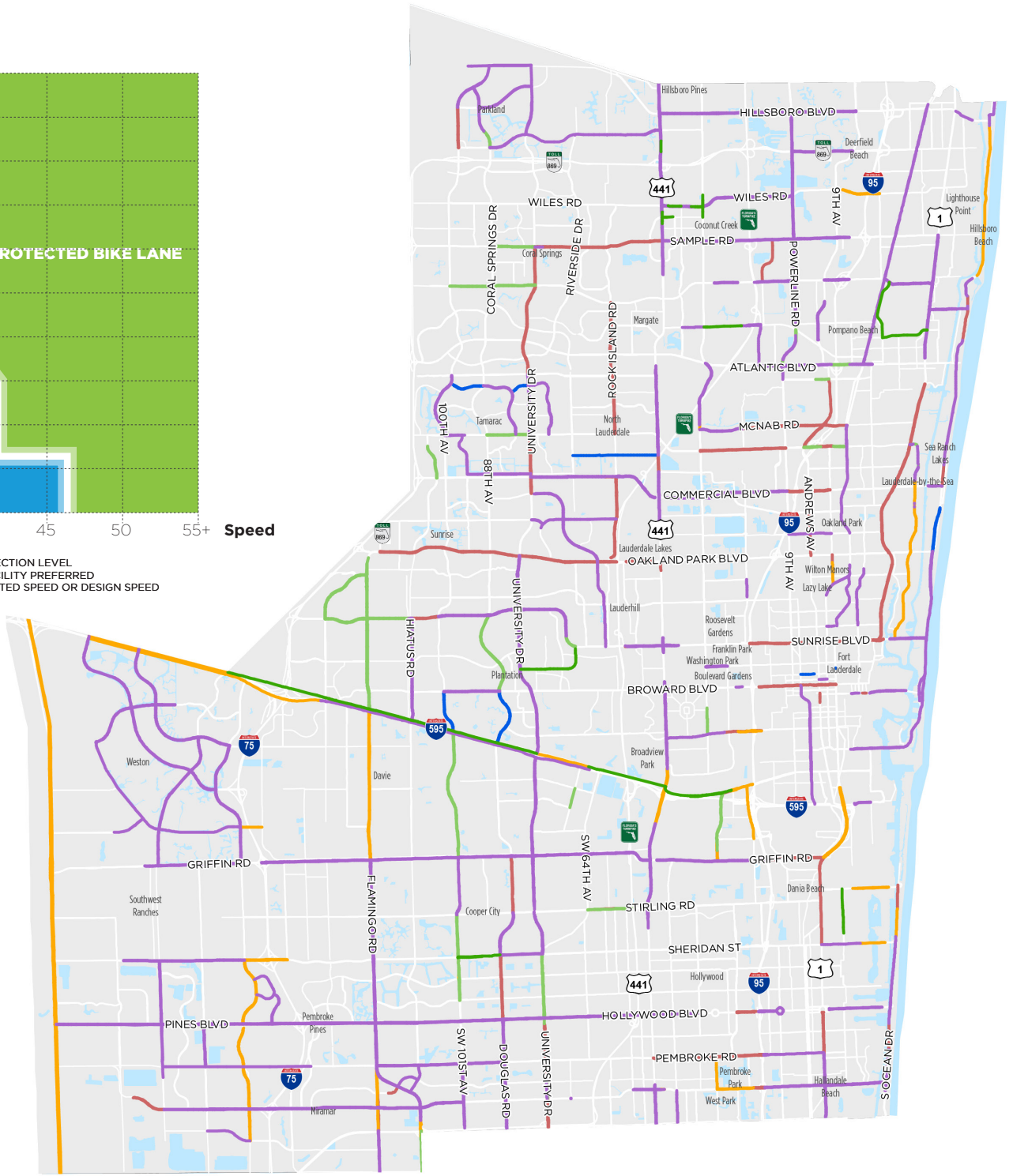


FIGURE 3 | Existing Bicycling Facilities

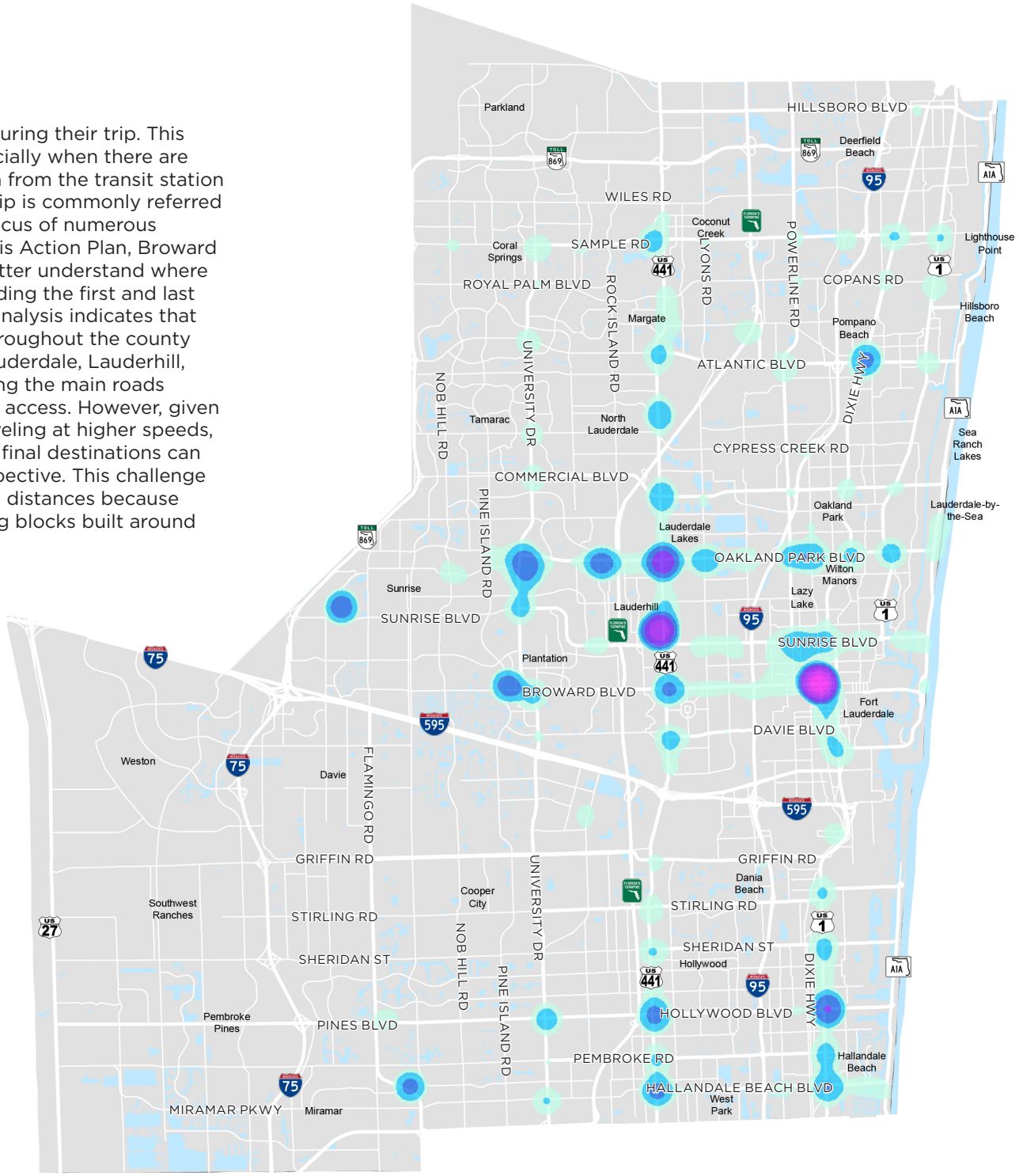
LEGEND
- No Identified Infrastructure
- Multipurpose Path
- Marked Bike Lane
- Wide Curb Lane
- Paved Shoulder
- Undesignated Lane
- Buffered Bike Lane

Source: FDOT, 2017; CARS 2010-2014 Crash Data; Signal Four Analytics 2010-2015 Crash Data.

Transit Ridership

Every transit rider walks and/or bikes at some point during their trip. This portion of the trip can, at times, be challenging, especially when there are missing walking or bicycling facilities on a rider's path from the transit station to or from their final destination. This stretch of the trip is commonly referred to as the "first mile" or "last mile" and has been the focus of numerous studies nationally, regionally, and locally. As part of this Action Plan, Broward County's transit ridership was analyzed in order to better understand where focal walking and biking activity was occurring (including the first and last mile activities). As can be seen in **Figure 4,** the data analysis indicates that transit ridership is concentrated along major roads throughout the county with the highest concentrations in downtown Fort Lauderdale, Lauderhill, and Lauderdale Lakes. Providing access to transit along the main roads within the network is a good first step for maximizing access. However, given these facilities are designed primarily for vehicles traveling at higher speeds, using them for walking or biking to transit stations or final destinations can be challenging from a comfort and convenience perspective. This challenge is typically a result from the need to walk or bike long distances because of a lack of frequent street crossing locations and long blocks built around suburban style development.

FIGURE 4 | Existing Transit Ridership



Source: Broward County Transit, 2015

Pedestrian/Bicycle Crash Hot Spots

To develop a general understanding of bicycle and pedestrian crashes within Broward County, the project team analyzed data from hundreds of crashes between the years 2010 and 2015, which were obtained from the Signal Four Analytics (https://s4.geoplan.ufl.edu/) and FDOT Crash Analysis Reporting System (CARS) databases. This data includes both Long Form and Short Form crash reports on all roadways in Broward County as well as reported incidents that occurred in private parking lots and along driveways. The crash data includes information such as location, severity of injury, time of day, road condition, and many other attributes that are key to identify the general trends and characteristics of bicycle and pedestrian crashes as well as conduct a crash hot spots analysis. A summary of the crash data can be found in Appendix 1.

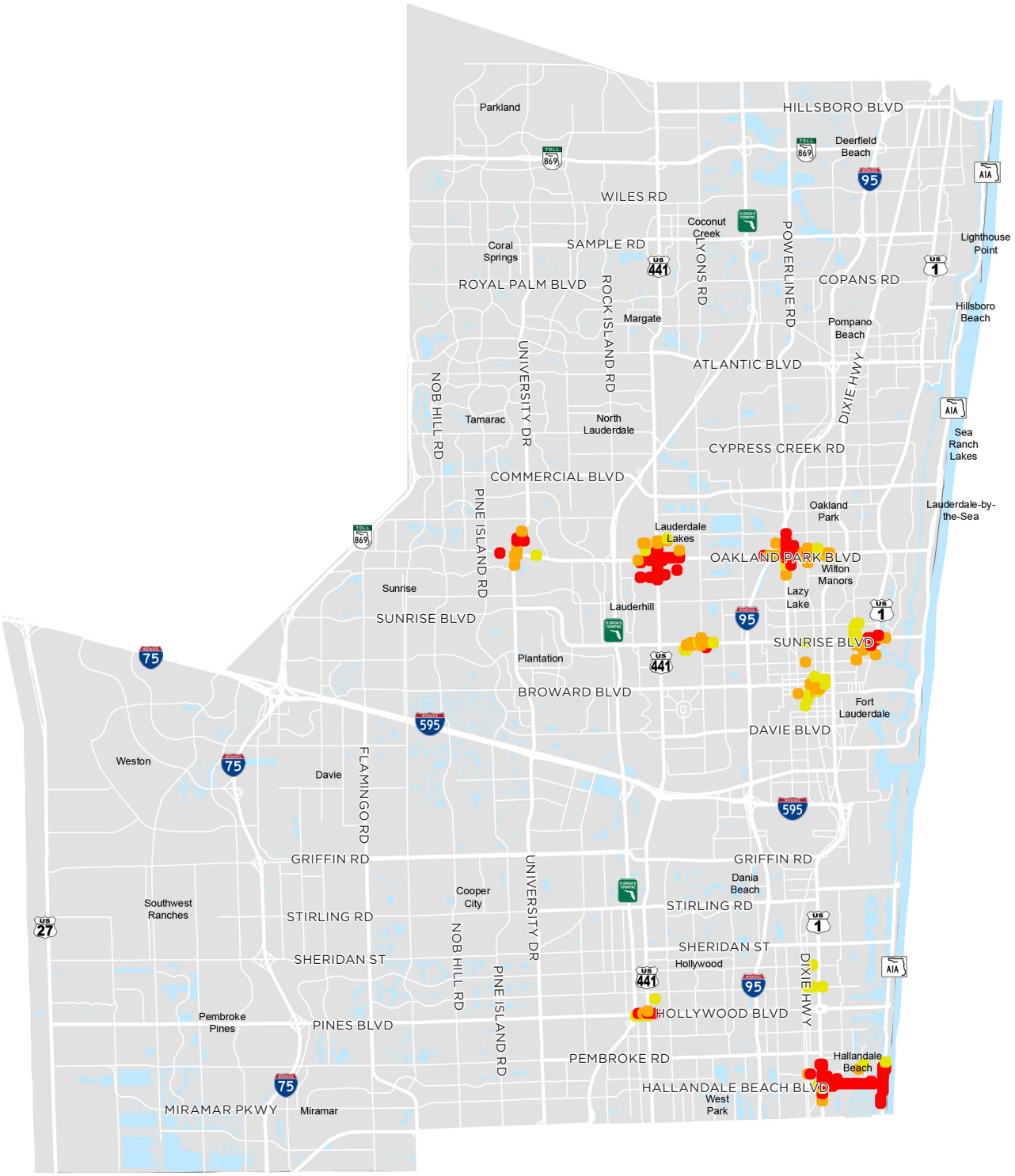
In preparation for the hot spot analysis, those crash records which were not properly geocoded were manually geocoded using crash report locational information. Approximately 1,942 records were unable to be geocoded due to lack of locational information; hence, these records were not included in the GIS hot spot analysis. The data was integrated to bring together data points within a short distance of each other (300 feet, to have a greater range of incident counts among records. Further, the crashes were numerically weighted by "crash severity." Crashes that resulted in "no injury/property damage only" were assigned a crash count of one; crashes that resulted in an "injury" were assigned a crash count of three; and crashes that resulted in a "fatality" were assigned a crash count of nine. For example, if there are three crash records within a 90,000 square foot area, and one of the crash records was a fatality (weight = nine) and the other two crashes records contained property damage only/no injury (weight = one), then the total crash count for this area would be three (9) plus (+) one (1) plus (+) one (1) equals (=) five (11) total crashes. After integrating crashes into a spatial grid, Optimize Hotspot Analysis tool in ArcGIS Spatial Analyst Extension was used to investigate whether any areas have a significantly high number of crashes.

The results show that bicycle and pedestrian crashes at certain intersections and corridors in Broward County were significant at the 99% confidence level, 95% confidence interval and 90% confidence interval. In other words, spatial clusters or patterns resulting from the crash hot spot analysis are not random occurrence but rather based on a high degree of confidence. Further, this analysis confirms general field observations related to bicyclist and pedestrian behavior as well as safety perceptions in these areas that has high bicycle and pedestrian activity. These concentrations, shown in **Figure 5** and **Figure 6,** generally occurred along major roads including Hallandale Beach Boulevard, Hollywood Boulevard, Broward Boulevard, Sunrise Boulevard, Oakland Park Boulevard, University Drive, State Road 7, and Federal Highway.

FIGURE 5 | Walking and Bicycling Crash Hot Spot Table

Street Name	From	To	# of Crashes	Segment Length (in miles)	Jurisdiction
E Hallandale Beach Boulevard	NE/SE 4th Avenue	NE/SE 26th Avenue	125	1.30	Hallandale Beach
US-1/S Federal Highway	SE 5th Street	NE 7th Street	51	1.00	Hallandale Beach
W Oakland Park Boulevard	NW 17th Terrace	N Andrews Avenue	84	1.00	Oakland Park
W Sunrise Boulevard	NW 34 Avenue	NW 28th Terrace	50	0.70	Lauderhill
E Sunrise Boulevard	NE 14th Avenue	US-1/N Federal Highway	57	0.75	Fort Lauderdale
W Oakland Park Boulevard	CSX/SFRC	N Andrews Avenue	76	1.00	Oakland Park
State Road 7	NW 26th Street	NW 37th Street	61	0.75	Oakland Park
W Oakland Park Boulevard	NW 46th Avenue	NW 35th Avenue	73	1.00	Oakland Park
Broward Boulevard	NW/SW 2nd Avenue	NE/SE 4th Avenue	37	0.40	Fort Lauderdale
Andrews Avenue	Broward Boulevard	NE 3rd Street	26	0.20	Fort Lauderdale
A1A/S Ocean Drive	Approximately 1/4 mile south of Hollywood Boulevard	Approximately 1/4 mile south of Magnolia Terrace	42	1.00	Hallandale Beach/ Hollywood

FIGURE 6 | Walking and Bicycling Crash Hot Spots, 2010-2014



Source: FDOT, 2017; CARS 2010-2014 Crash Data; Signal Four Analytics 2010-2015 Crash Data.

Walking and Bicycling Crashes that Resulted in an Injury or Fatality

Figure 7 shows the crashes involving pedestrians and bicyclists that were injured or killed. While there are concentrations of where these crashes occurred, it is a Countywide and systemic problem.

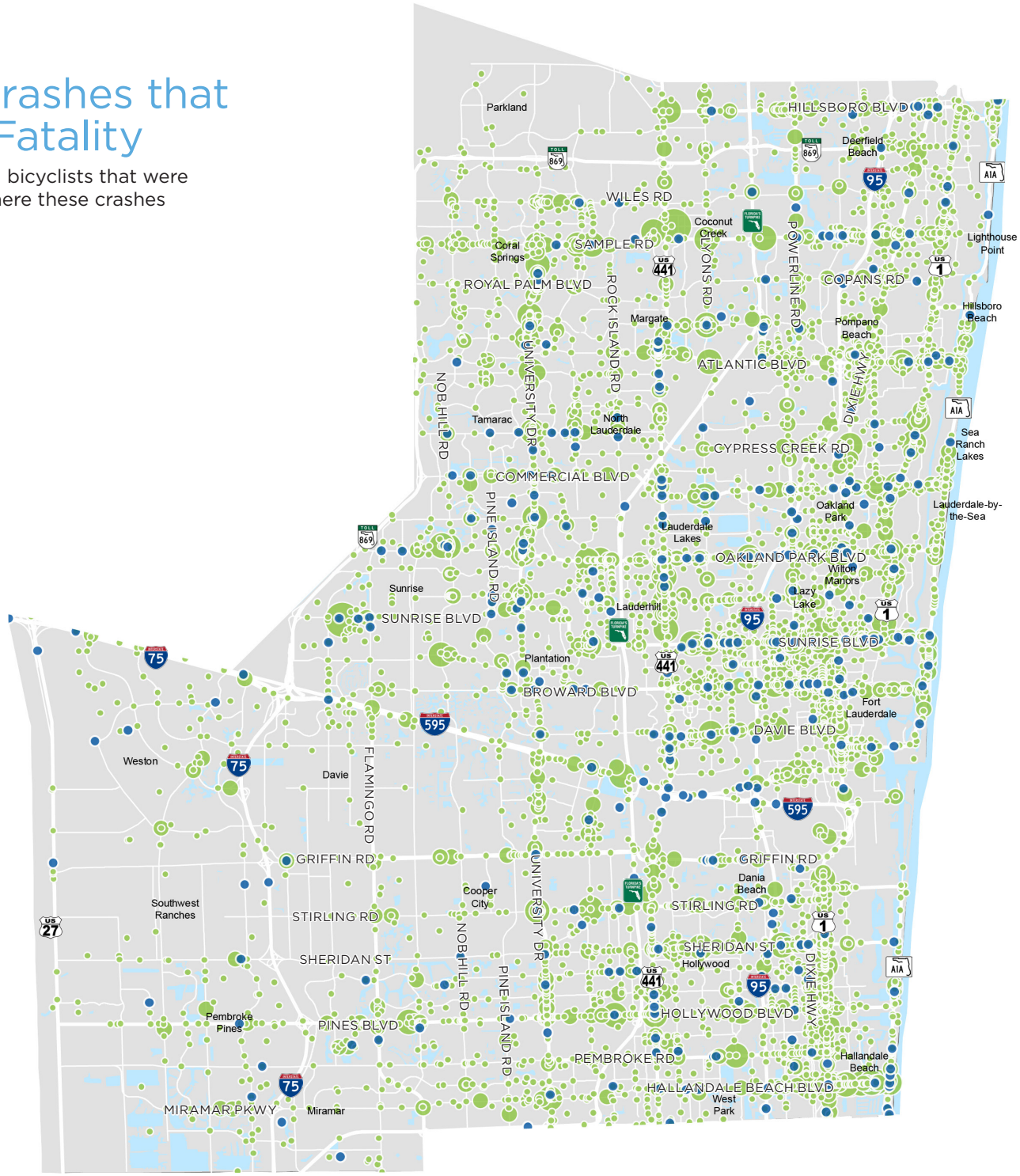


FIGURE 7 | Walking and Bicycling Crashes that Resulted in an Injury or Fatality, 2010-2014

LEGEND

- Pedestrian or Bicycle Fatality

Pedestrian or Bicycle Injury Crash

- Least
- Greatest

Source: FDOT, 2017; CARS 2010-2014 Crash Data; Signal Four Analytics 2010-2015 Crash Data.

Propensity for Walking and Bicycling

An analysis was conducted to identify areas where there is a propensity for walking and bicycling based on socioeconomic characteristics. This type of analysis is not based on where the highest concentrations of people are currently walking or bicycling, but does identify areas where the highest potential for walking and bicycling could occur if comfortable, connected, and convenient infrastructure was present. The analysis considers the following characteristics, obtained by census block group from the US Census Bureau 2010-2014 5-year estimates:

- Population density (persons per acre)
- Employment density (number of employees per acre)
- Children (persons under 18 per acre)
- Seniors (persons over 65 per acre)
- People of Color (people of color per acre)
- Poverty rate (persons with income below the federal poverty line per acre)
- Households without access to a car (households without access to a car per acre)
- Commute mode (people who walk, bike, or ride transit to work)

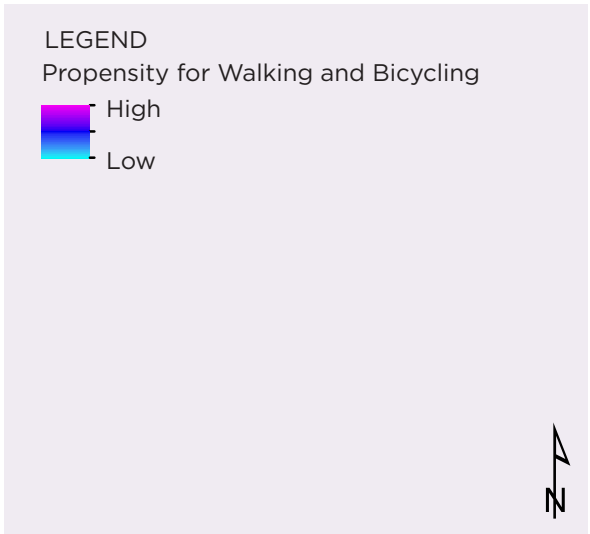
The methodology for this calculation reflects that used in the East Portland In Motion plan (2012). To calculate the score, each census block group in the County was assigned seven different sub-scores, ranging from 1 to 5, with 5 indicating a higher level of demand for active transportation. The sub-scores were assigned by dividing the range of possible scores into five classes based on quantiles, as shown in **Figure 8**. Then, the scores were summed to give a total score that had the potential to range from a low of 8 to a high of 39. No weighting was applied. The analysis is based on Broward County only, and therefore should not be compared to any other areas.

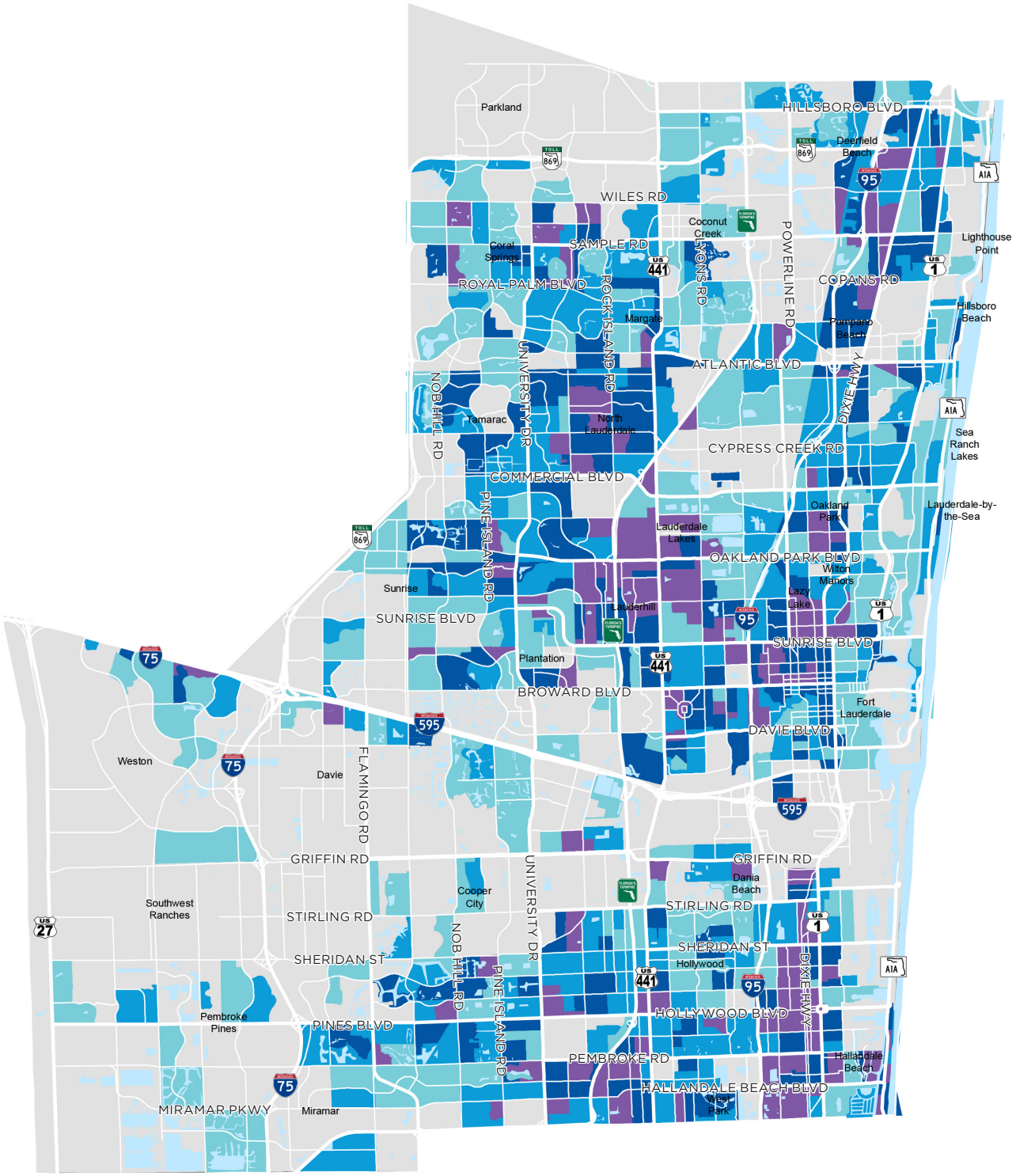
Figure 9 shows that the areas with the highest propensity for walking and bicycling, in many cases, match the areas with activity center designations. The current areas with the highest propensities can be found in Hallandale Beach, Hollywood, Fort Lauderdale, Lauderhill, Lauderdale Lakes, Oakland Park, and North Lauderdale.

FIGURE 8 | Data Inputs for Potential for Walking and Bicycling

Indicator	Score Value Basis				
	1	2	3	4	5
Population density	0-5.00	5.01-7.00	7.01-10.00	10.01-13.00	>13.00
Employment density	0-0.30	0.31-0.90	0.91-1.80	1.81-4.30	>4.30
Children	0-0.70	0.71-1.30	1.31-2.00	2.01-3.00	>3.00
Seniors	0-0.50	0.51-0.80	0.81-1.25	1.25-2.00	>2.00
People of color	0-1.50	1.51-3.50	3.51-6.00	6.01-9.40	>9.40
Poverty rate	0-0.30	0.31-0.75	0.75-1.50	1.51-2.50	>2.50
Households without access to a car	0	0.1	0.11-0.25	0.26-0.55	>0.55
Commute mode	0	0.1	0.11-0.25	0.26-0.50	>0.50

FIGURE 9 | Propensity for Walking and Bicycling





Source: US Census Bureau 2010-2014 5-year Estimates

County-Wide Data and Analysis Results

The results of the separate analyses were combined to determine final locations for demonstration sites. The results can be seen in **Figure 10.** The analysis revealed crash hot spots, which represent statistically significant (i.e. not random) geographic concentrations of crashes. As can be seen, the crash hot spots in the County correlate with the high transit ridership areas; the areas with the highest land use intensity and mix; and the highest propensities for walking, bicycling, and riding transit.

In the hot spot areas, a majority of the roadways are designed as large, high-speed facilities that prioritize the movement of vehicles. Wide roads such as this pose significant barriers to crossing for pedestrians and typically contain higher speeds and volumes that can pose a threat to bicyclists and pedestrians. In areas where there is high walking and bicycling activity or a desire for it, this roadway design approach is in conflict with the surrounding land use context.

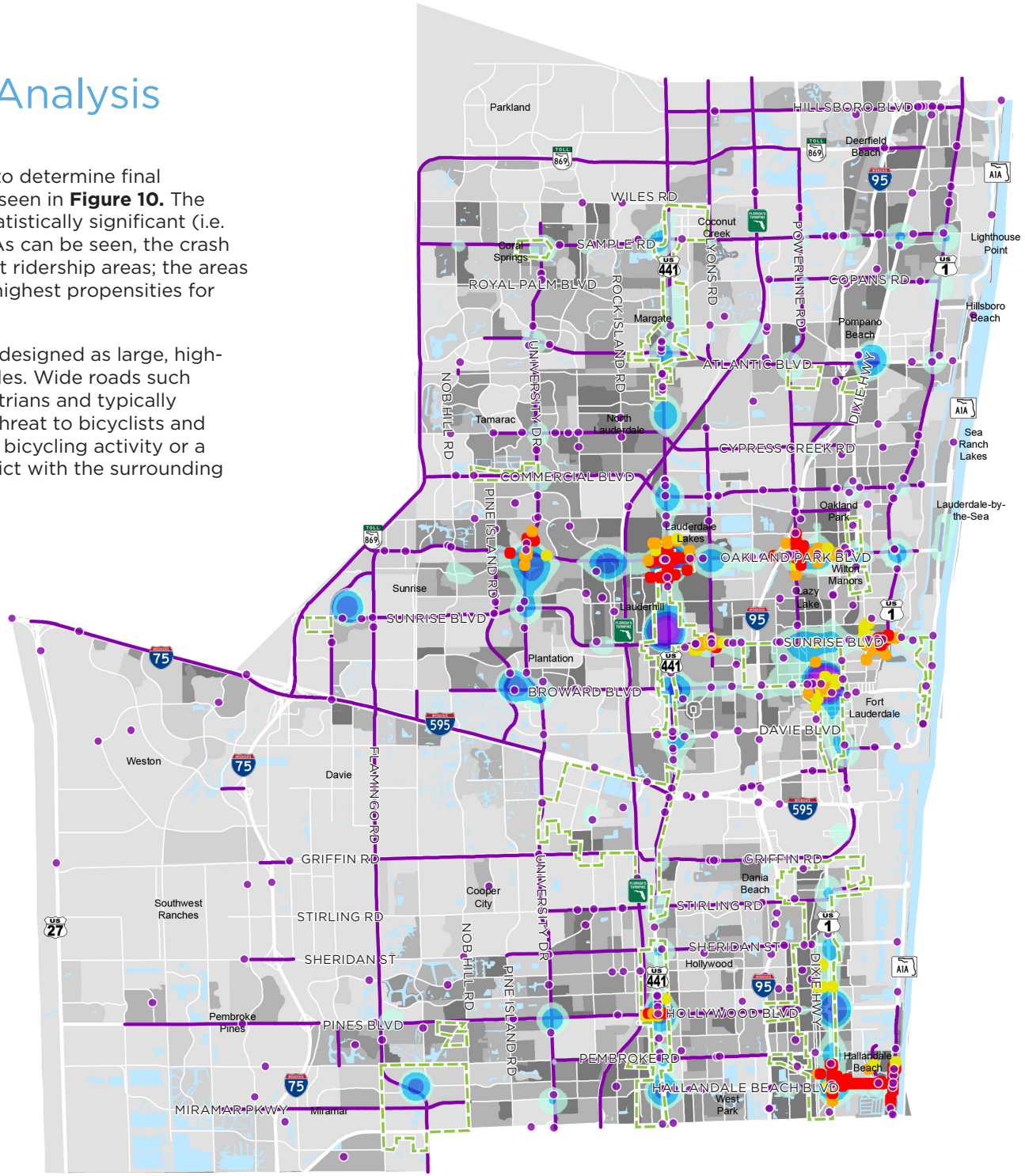


FIGURE 10 | Data Analysis Results

Source: Census 2010-2014 5-year Estimates; CARS 2010-2014 Crash Data; Signal Four Analytics 2010-2015 Crash Data; Broward County Transit, 2015; & Broward County GIS; 2015.

Demonstration Site Field Reviews

In order to gain a better understanding of the typical conditions for walking and bicycling in Broward County, five demonstration sites were selected. The demonstration sites were chosen as representative examples of conditions in Broward County for use in identifying systemic issues. The following criteria was applied when selecting the sites:

DIVERSITY IN ROADWAY CHARACTERISTICS: the type of road, the number of lanes, the posted speed limit, and the transit, pedestrian, and bicycling facilities of the demonstration site was considered.

DIVERSITY IN LOCATIONS: the location of the demonstration site within the County was considered.

DIVERSITY IN AREA TYPES: the land uses surrounding the demonstration site was considered.

DIVERSITY IN DEMOGRAPHICS: the social and economic characteristics surrounding the demonstration site was considered.

The five demonstration sites selected were:

SITE TYPE	SITE LOCATION
Beach Access Corridor (BAC)	Hallandale Beach Blvd. (NE 4th Ave. to NE 26th Ave.)
Urban Corridor (UC)	Sunrise Blvd. (NE 13th Ave. to Middle River)
Urban Intersection (UI)	Broward Blvd. at Andrews Ave.
Suburban Corridor (SC)	Oakland Park Blvd. (NW 84th Ave. to Atrium West)
Suburban Intersection (SI)	Oakland Park Blvd. at SR 7

Samplings intended to represent all municipalities wihtin the County

In order to prepare for the field reviews, detailed crash analyses were conducted for each study area site. This involved pulling all crash reports for each field review and creating crash diagrams. Additionally, other detailed crash data was pulled and summarized. The crash diagrams and data summaries can be found in Appendix 2-6.

The field reviews were completed for each location in July of 2016 during the daytime and nighttime hours. The following pages include summaries of each demonstration site field review.

BEACH ACCESS CORRIDOR DEMONSTRATION SITE

HALLANDALE BEACH BOULEVARD FROM NE 4TH AVENUE TO NE 26TH AVENUE

BAC

BEACH ACCESS CORRIDOR DEMONSTRATION SITE

Hallandale Beach Boulevard from NE 4th Avenue to NE 26th Avenue

Broward MPO
Metropolitan Planning Organization
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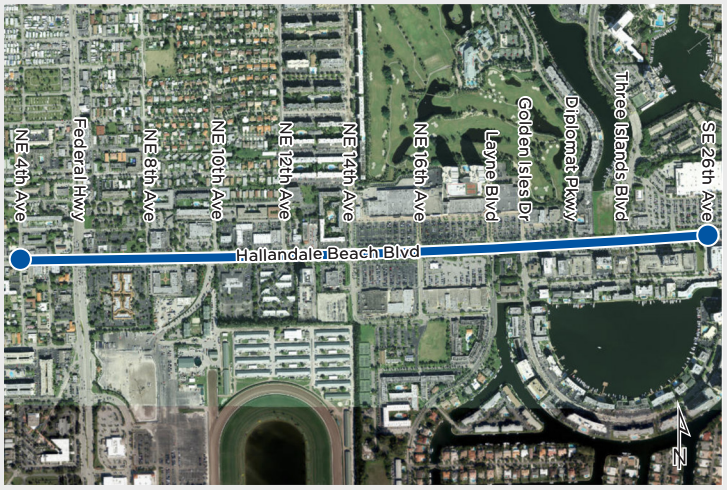
SAFETY ACTION PLAN

STUDY AREA | 1.30 Miles



CRASH DATA - 2010 TO 2015

26 Pedestrian

62 Bicycle

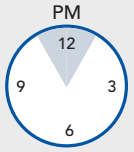
		Pedestrian	Bicycle
1	Fatal	0	1
81	Injury	25	56
6	Property Damage Only	1	5

16% Occurred in Non-Daylight Lighting Conditions

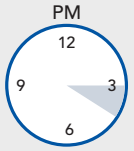
6% Involved Alcohol and/or Drugs

Peak Crash Time Periods

20%



10%



Peak Crash Months

35% Occurred in January, June, & August

Peak Crash Days of the Week

35% Occurred on Monday & Thursday

S	M	T	W	T	F	S

ROADWAY CHARACTERISTICS

Hallandale Beach Boulevard Looking West

The corridor has a three lanes in each direction. It has intermittent right- and left-turn lanes. It also has a heavily landscaped median and both pedestrian and vehicular lighting. The corridor has 5' - 7' sidewalks and 4' - 5' marked bike lanes. The posted speed is 35 MPH. The land uses mainly consist of new and/or well kept auto-oriented shopping centers set behind large surface parking lots.

FIELD REVIEW OBSERVATIONS

- Narrow Bike Lanes
- Bicyclists Riding on Sidewalks
- Objects Blocking Sidewalks
- Frequent Driveways
- Poorly Marked Driveway Crossings
- Faded Pavement Markings
- ADA Noncompliant Sidewalks and Ramps
- Missing Crosswalks
- Lack of Bicycle Markings at Conflict Areas
- Skewed Intersection Geometry
- Poor Drainage
- Out of Date Pedestrian Signal Signage
- Obstructed Views at Crosswalks
- Long Signal Times

Objects Blocking the Sidewalk

Narrow Bike Lanes & Faded Markings

Bicyclists in sidewalks and Poorly Marked Driveway Crossings

Missing Pedestrian Crosswalks

Poor Visibility Due to Vegetation

ADA Noncompliance

HALLANDALE BEACH BOULEVARD DEMONSTRATION CORRIDOR REVIEW

From NE 4th Avenue to NE 26th Avenue | Hallandale Beach

Hallandale Beach Blvd Looking West

Bike Lane and Sidewalk on Hallandale Beach Blvd

Overview

Hallandale Beach Boulevard from NE 4th Avenue to NE 26th Avenue was chosen as a demonstration study site for the Broward MPO Bicycle and Pedestrian Safety Action Plan (BPSAP) based on a review of its pedestrian and bicycle crash history; land uses; propensity for active transportation; transit activity; and the decisions of the BPSAP Advocacy Team. It is generally a six-lane divided arterial with intermittent right- and left-turn lanes. It also has a heavily landscaped median and both pedestrian and vehicular lighting throughout the corridor. It has 5' to 7' sidewalks and 3' to 4' marked bike lanes throughout the corridor. The posted speed in 35 miles per hour (MPH). The land uses mainly consist of new and/or well kept auto-oriented shopping centers set behind large surface parking lots.

The following review describes the results of the corridor safety review and general observations of the corridor. A field review was conducted on Wednesday, July 13th, 2016 from 9:00 AM to 12:00 PM and a night time field review was completed on Tuesday, July 12th, 2016 from 8:30 to 9:30 PM.

Crash Summary

Over the six-year period from 2010 through 2015, 88 pedestrian or bicyclist crashes occurred along the Hallandale Beach Boulevard study corridor. Seventy (70) percent of these crashes involved a bicyclist (62 crashes), and 30 percent involved a pedestrian (26 crashes). It has one of the highest concentrations of bicycle crashes in the county and has a higher percentage of bicycle crashes compared to pedestrian crashes than usually seen in similar corridors. One crash resulted in a fatality (1 percent) and 81 resulted in injury (92 percent). The majority of these crashes occurred during dry and daylight conditions (84 percent and 90 percent, respectively). Five of the crashes involved alcohol or drugs (6 percent).

Most of the crashes occurred at or near the crosswalks of the intersections (74 crashes, 84 percent). The greatest number of pedestrian crashes occurred at US 1 (5 crashes), NE 8th Avenue (4 crashes), and NE 10th Avenue (4 crashes). The greatest number of bicycle crashes occurred at US 1 and at NE 8th Avenue (9 crashes each). However, many bicycle crashes also occurred at driveways for bicyclists riding on the sidewalks (13 crashes, 15 percent). For detailed crash diagrams and statistics, please see Appendix 2.

FIGURE 11 | BAC Study Area Crashes

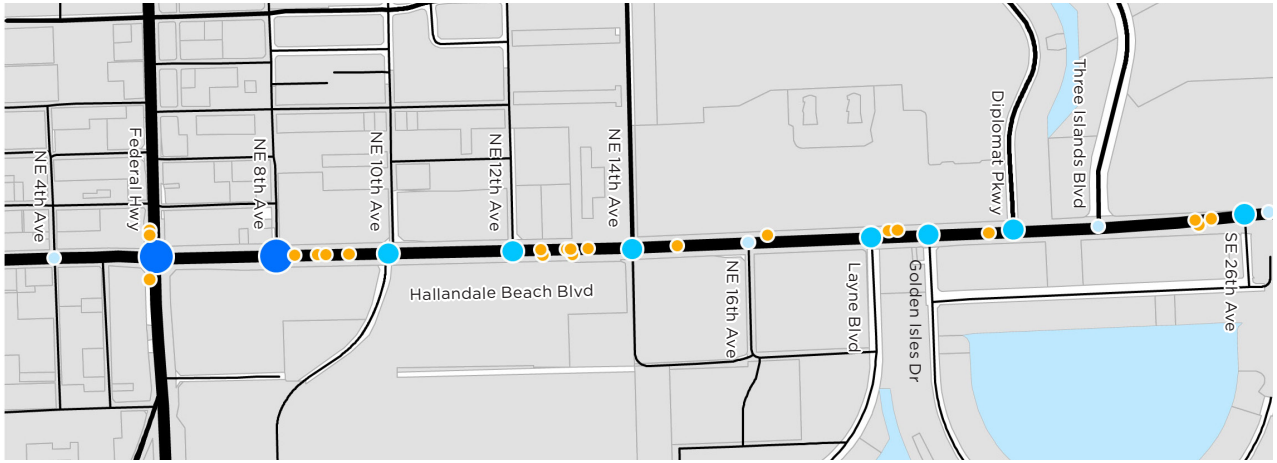
Legend

- 1 Segment Crash

Intersection Crash

- 1 - 5
- 6 - 10
- 11 - 15

Source: CARS 2010-2014 crash data; Signal Four Analytics 2010-2015 crash data



Transit Ridership & Land Use

Transit ridership is moderate in the Hallandale Beach Boulevard study area. The highest ridership is located at the intersection of Federal Highway and Hallandale Beach Boulevard, with transit stops that see over 250 boardings and alightings per day. However, ridership does not exceed 250 boardings and alightings per day anywhere else along the corridor, with the exception of the stop in front of the Walmart east of Three Islands Boulevard.

The land uses along the corridor, as noted previously, are generally auto oriented and provide large parking lots directly fronting the road. However, the portion of the corridor nearest Federal Highway is located in a Regional Activity Center, which is intended to have higher densities and transit supportive uses. These areas are intended to be the most walkable and bikeable in Broward County, and therefore deserve higher quality walking and bicycling infrastructure. According to demographic data, residents in the study area also have a high propensity for traveling on foot, by bike, or on transit in comparison to the rest of the county.

General Observations:

Based on the field review, several general issues were observed. Throughout the corridor, the inadequate bicycle infrastructure causes bicyclists to ride on the sidewalks instead of the road. Bicycle issues observed include: narrow bicycle lanes, lack of buffer between the bicycle lane and traffic, faded pavement markings, poorly marked driveways, and improper facility use (i.e., traveling against traffic and on sidewalks not intended for multi-use travel). In general, the pedestrian facilities do not comply with ADA requirements throughout the corridor. Pedestrian issues observed include: short signal crossing times, fixed objects mounted in sidewalks, missing or worn truncated domes at ramps, missing sidewalk connections, missing crosswalks, outdated signage at crosswalks, and drainage issues at ramps. The median vegetation generally prevents pedestrians from making mid-block crossings except at areas where there are breaks in vegetation. The vegetation on the along the sides of the street obstructs the sidewalks at some driveways and intersections. The following section describes the specific issues uncovered in the field review.

Typical Land Uses on Hallandale Beach Blvd

Sheltered Bus Stop on Hallandale Beach Blvd

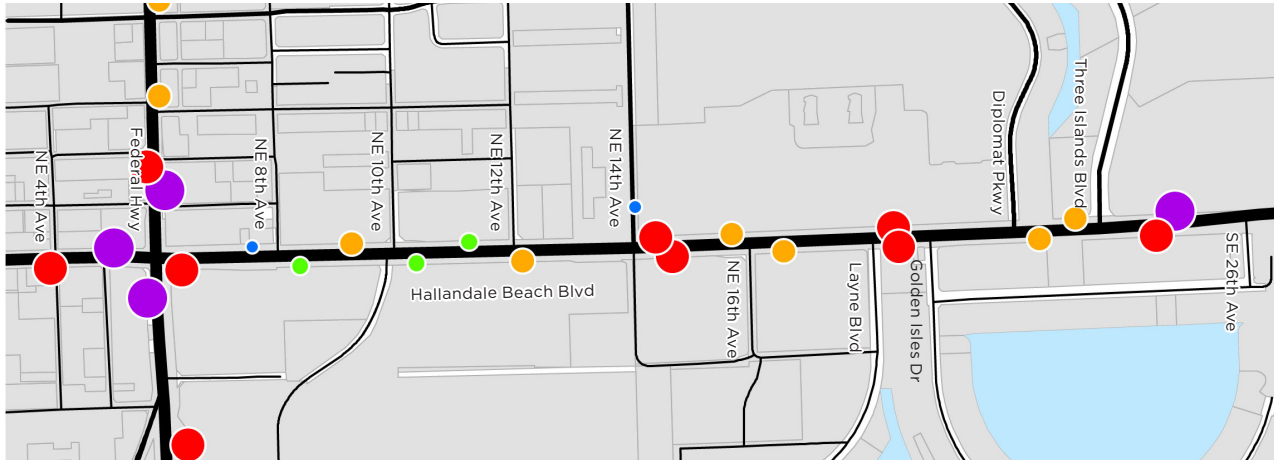


FIGURE 12 | BAC Study Area Transit Ridership

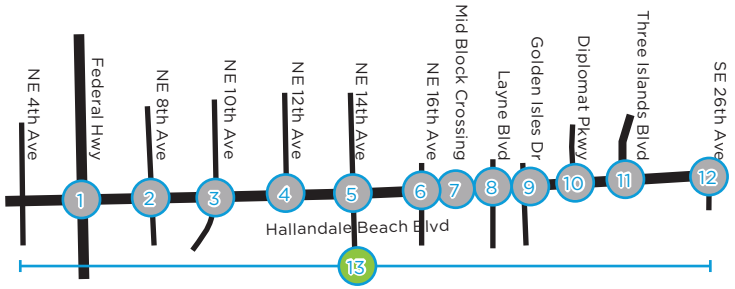
Legend

Daily Boardings + Alightings

- 1 - 25
- 26 - 50
- 51 - 100
- 101 - 250
- 250 +

Source: Broward County Transit, 2015

Issue: Bike Lane Deficiencies
Location: 13 (Corridor Wide)



General Observations:

- Bike lanes are approximately 3- to 4-feet wide throughout the corridor and provide no separation from vehicular traffic. This is not comfortable for most bicyclists.
- Bike lanes are worn throughout corridor.
- More bicyclists were observed riding on sidewalks than in bike lanes. The sidewalks are not wide enough to accommodate bicyclists and pedestrians at the same time, which causes potential for conflicts.
- Vehicles were observed driving in bike lanes.
- Many bicycle crashes occurred at intersections or driveways.

Recommendations:

- The relatively high number, percentage, and concentration of bicycle crashes in comparison to the rest of the county suggests that this corridor warrants protected or separated facilities to accommodate the needs of riders. A study should be completed that considers right-of-way, utilities, and other impacts so that these facilities can be constructed. This may require reconstruction.
- Repaint pavement markings.
- Provide additional visual separation of bike lanes through buffers.
- Use green paint at intersections, driveways, or other conflict points to highlight to drivers that bicyclists may be crossing.
- Create an outreach campaign to alert bicyclists of the dangers of riding on the sidewalks and to alert drivers of the need to look for bicyclists when turning in to and out of driveways.
- Create a progressive enforcement campaign where officers educate, warn, and finally ticket drivers who drive in bike lanes and bike riders who cross the street against the signal.

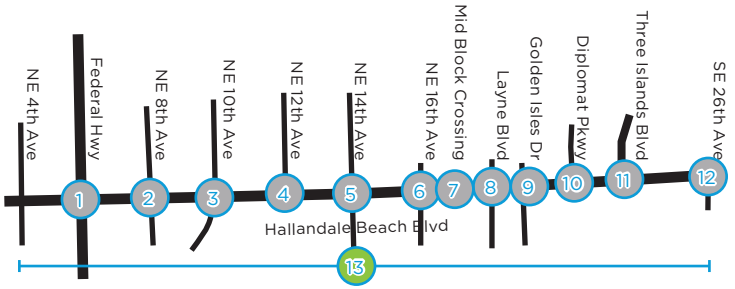
Faded bicycle lanes markings on Hallandale Beach Boulevard; issue persists throughout the corridor.

Bicyclist moves from bike lane to sidewalk after passing pedestrians.

Bicyclists riding on sidewalk as driver turns into driveway.

Bus rides next to bicycle on Hallandale Beach Blvd.

Issue: Fixed-Objects in Sidewalks
Location: 13 (Corridor Wide)

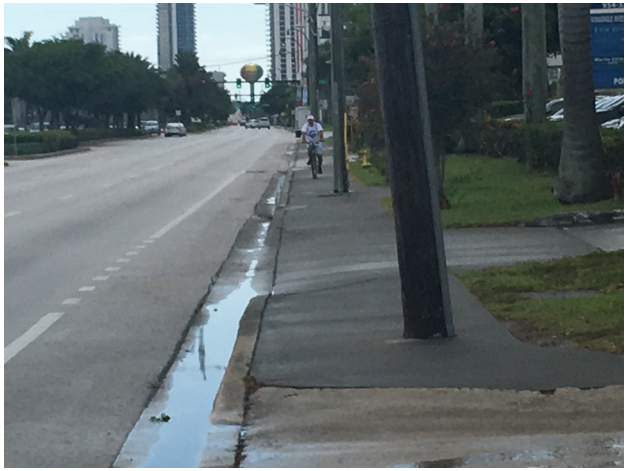


General Observations:

- Utility poles, sign poles, fire hydrants, and bus stop benches are mounted within the sidewalks or on approaches throughout the corridor.
- Metal support wires for utility poles create potential tripping hazards in several locations.

Recommendations:

- Relocate fixed objects off of sidewalks or provide additional sidewalk width to bypass. There should be a minimum of 4-feet clearance around fixed objects in accordance with forthcoming Public Right of Way Accessibility Guidelines.



Pole in the sidewalk that leaves little room for pedestrians and bicyclists.

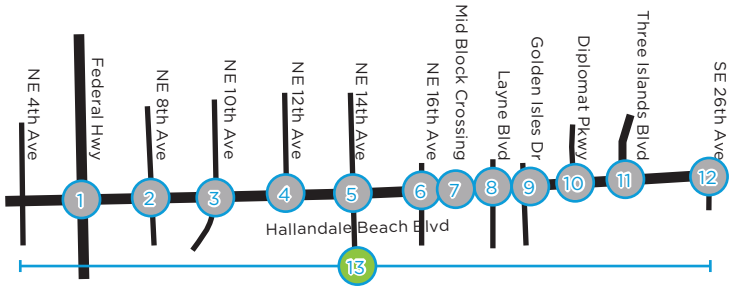
Sign in the sidewalk.

Bench and sign in sidewalk at bus stop; could be moved back on to slab behind the sign and bench.

Poles in the sidewalk on opposite sides; create the need to dodge poles for pedestrians.

Support wires cause a tripping hazard in the sidewalk.

Issue: Driveway Frequency & Design
Location: 13 (Corridor Wide)



General Observations:

- There are a number of driveways between intersections along the corridor. Many of these driveways are poorly marked from the bike lanes and sidewalks.
- In several locations, the sidewalks across the driveways are set back from the street and create potential safety issues.
- Driveways are oversized and encourage fast turning movements.

Recommendations:

- Refresh pavement markings to emphasize driveway locations.
- Use green paint at intersections, driveways, or other conflict points to highlight to drivers that bicyclists may be crossing.
- Upgrade sidewalks at driveways to meet ADA requirements.
- Create an outreach campaign to alert bicyclists of the dangers of riding on the sidewalks and to alert drivers of the need to look for bicyclists when turning in to and out of driveways.
- Encourage cross access agreements between developments to limit the number of driveways approved along the corridor.
- Consider narrowing driveways where possible and ensure that driveway width is considered in development review for new developments.

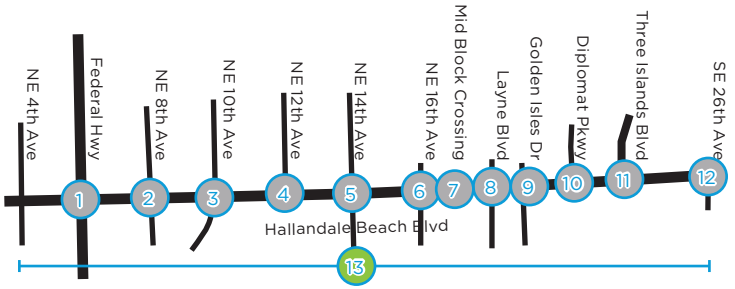
Oversized driveway.

Bicyclists riding through driveway that meets ADA requirements with no bicycle markings.

Driveway designed for high speed access.

Driveway that meets ADA requirements.

Issue: Noncompliant ADA Sidewalks and Ramps
Location: 13 (Corridor Wide)



General Observations:

- Fixed objects are mounted within the sidewalks,
- Sidewalk ramps do not comply with ADA requirements at every intersection along the corridor.
- In general, the truncated domes are missing, worn, or outdated.
- In several areas, accessible sidewalk connections are not present between the sidewalk and driveways or private parking lots.
- In several locations, the pedestrian signal push buttons are located far from the crosswalk ramps.

Recommendations:

- Update all ADA ramps along corridor to meet requirements.
- Relocate pedestrian signal push button near crosswalks.
- Expand sidewalk network to connect sidewalks with safe driveway crossings.

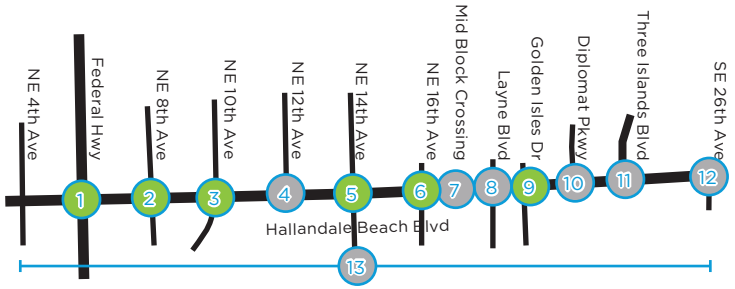
Ramp does not meet ADA requirements; detectable warning surfaces are cracked/inadequate,

Cracked sidewalk and missing detectable warning surfaces on ramp. Crosswalks do not line up properly.

Properly design connection between sidewalk and building.

No accessible sidewalk connection between sidewalk and parking lot.

Issue: Drainage / Flooding
Location: 1, 2, 3, 5, 6, 9



General Observations:

- Drainage is poor throughout the study area. Flooding was found at sidewalk ramps, in bike lanes, and otherwise throughout the corridor.

Recommendations:

- Update drainage system throughout corridor. Complete a study to determine specific locations where drainage issues are occurring. Consider options such as elevation modifications and improving draining through landscaping and other opportunities.


Flooding at mid-block crossing.

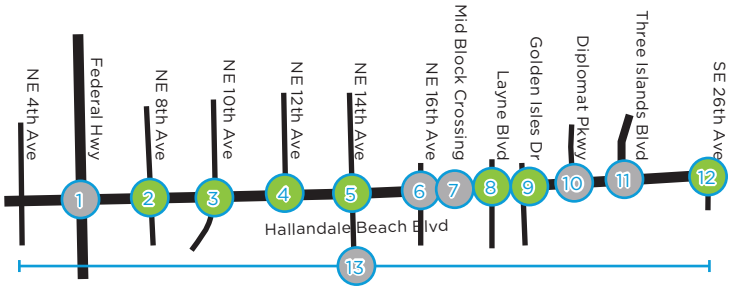
Flooding covering sidewalk ramp.


Flooding covering sidewalk ramp.


Flooding in crosswalk.


Flooding between bike lane and sidewalk.

Issue: Pedestrian Facility Deficiencies
Location: 2, 3, 4, 5, 8, 9, 12



General Observations:

- The pedestrian crossing signal timing is too short for slower pedestrians at several of the intersections along the corridor.
- Many of the crosswalks are faded, worn, or uneven.
- Most intersections do not have crosswalks across all four approaches. For example, no crosswalk is present near the eastbound bus stop that is located about one-half block east of Three Islands Boulevard, and there is a Walmart located directly north of the bus stop.
- The medians have some paved separations between landscaping, which allow pedestrians to cross through the median at mid-block locations.
- Sidewalks are directly adjacent to travel lanes without any separation from vehicles.

Recommendations:

- Review signal timing plans for corridor and extend pedestrian crossing times to meet minimum requirements.
- Add crosswalks to intersection legs where possible.
- Use lush landscaping to close off the medians to prevent pedestrians from making illegal mid-block crossings.
- Consider moving the eastbound bus stop that is located about one-half block east of Three Islands Boulevard closer to Three Islands Blvd to better facilitate access to Walmart.
- Consider adding a landscaped buffer between the sidewalk and the street.

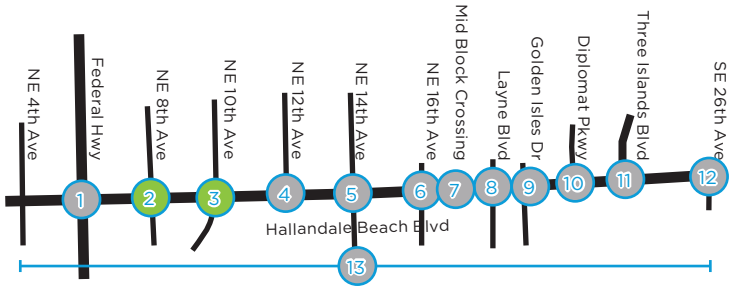
Pedestrian crossing mid-block at break in vegetation.

Pedestrian crossing mid-block at break in vegetation.

Pedestrian crossing at missing crosswalk.

Missing crosswalk.

Issue: Skewed Intersection Geometry
Location: 2, 3



General Observations:

- Off-set intersections create additional conflict points.
- Vehicles were observed driving turning onto the wrong lanes on the south leg of SE 8th Avenue.
- Wide turning radii allow for higher speed right turns across crosswalks.
- The off-set alignment of NE 10th Avenue/ Gulfstream requires a less effective signal timing plan than an aligned intersection.

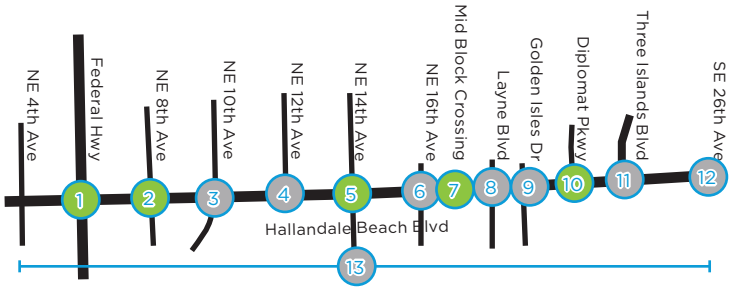
Recommendations:

- Reconstruct intersections to align north and south legs.

The geometry of the intersection at NE 8th Ave allows for high speed turns and is confusing for drivers.

Skewed intersection at NE 10th Ave.

Issue: Out-of-Date Pedestrian Signal Signage
Location: 1, 2, 5, 7, 10



General Observations:

- Many of the pedestrian signal push button signs do not provide the street names.
- At the legal mid-block crosswalk east of SE 16th Avenue, minimal warning signage is present.

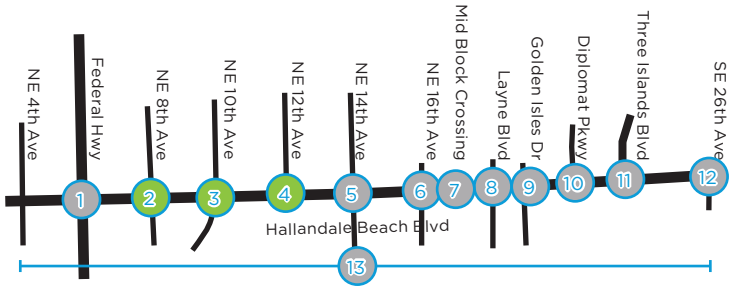
Recommendations:

- Update pedestrian signal push button signs as necessary to meet standards.
- Upgrade bike lane signage to alert drivers of the presence of bicyclists and to encourage the use of the bike lanes instead of the sidewalks.
- Upgrade pedestrian crossing signs and add Rectangular Rapid Flash Beacons (RRFBs) at the mid-block crosswalk east of SE 16th Avenue.

Signage does not indicate which street push button refers to.

Minimal warning signage at mid-block crosswalk.

Issue: Obstructed Views at Crosswalks
Location: 2, 3, 4



General Observations:

- Vegetation or other objects block view of pedestrians or bicyclists on sidewalk.

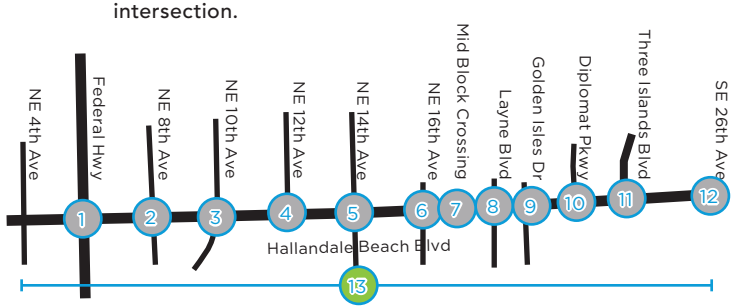
Recommendations:

- Cut back vegetation or move objects blocking views.

Object blocking view of pedestrians at SE corner of NE 8th Ave intersection.

Vegetation blocking view at NW corner of the NE 10th Ave intersection.

Issue: Signal Timing
Location: 13 (Corridor Wide)



General Observations:

- Signal times are long, which causes long wait times for pedestrians when crossing the street at intersections.
- It was observed that pedestrians cross the street against the signal even in crosswalks instead of waiting for the Walk signals.

Recommendations:

- Consider retiming signals with a focus on pedestrian and bicycle mobility.

Pedestrian crossing against the signal.

URBAN CORRIDOR DEMONSTRATION SITE

SUNRISE BOULEVARD FROM NE 13TH AVENUE TO MIDDLE RIVER

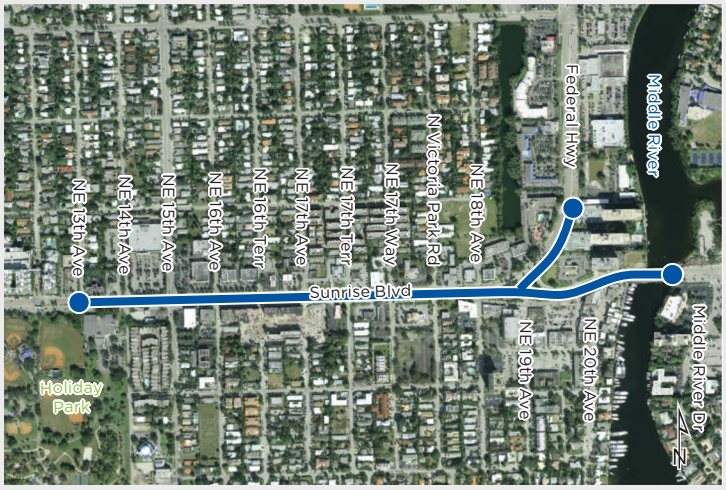
UC

URBAN CORRIDOR DEMONSTRATION SITE

Sunrise Boulevard from NE 13th Avenue to Middle River

Broward MPO Metropolitan Planning Organization
Bicycle & Pedestrian SAFETY ACTION PLAN

STUDY AREA | 1 Mile



CRASH DATA - 2010 TO 2015

26 Pedestrian

19 Bicycle

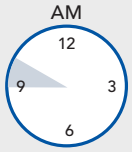
		Pedestrian	Bicycle
3	Fatal	3	0
41	Injury	22	19
1	Property Damage Only	1	0

47% Occurred in Non-Daylight Lighting Conditions

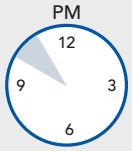
13% Involved Alcohol and/or Drugs

Peak Crash Time Periods

11%



16%



Peak Crash Months

44% Occurred in April, June, & October

Peak Crash Days of the Week

52% Occurred on Tuesday, Friday, and Saturday

ROADWAY CHARACTERISTICS


Sunrise Boulevard Looking West

The corridor has a three lanes in each direction. It has intermittent right- and left-turn lanes. It also has median with intermittent landscaping, cobra style vehicular lighting, and dynamic message signs. The corridor has 5' - 7' sidewalks and no marked bike lanes or paved shoulders. The posted speed is 35 MPH. The land uses are redeveloping; new buildings front the street while older buildings and shopping centers are set behind large surface parking lots.

FIELD REVIEW OBSERVATIONS

- No Bike Lanes
- Bicyclists Riding on Sidewalks
- Objects Blocking Sidewalks
- Narrow Sidewalks
- ADA Noncompliant Sidewalks and Ramps
- Missing Crosswalks
- Lack of Crossing Opportunities
- Illegal Mid-Block Crossings
- Frequent Driveways
- Poorly Marked Driveway Crossings
- Inattentive Drivers (Especially at Driveways and Intersections)
- Vehicles Blocking Crosswalks
- Lack of Shade/Shelter
- Lack of Bicycle Markings at Conflict Areas
- Poor Drainage
- Too Much/Poor Signage
- Long Signal Times


Objects Blocking the Sidewalk


Flooding Blocking Crossing


Bicyclists in sidewalks


Missing Pedestrian Crosswalks


Vehicle in Crosswalk


Pedestrians Crossing Outside of Crosswalk


Sunrise Blvd Looking West


New Wide, Shaded Sidewalks in Front of New Development

Overview

Sunrise Boulevard from NW 14th Avenue to Middle River was chosen as a demonstration study site for the Broward MPO Bicycle and Pedestrian Safety Action Plan (BPSAP) based on a review of its pedestrian and bicycle crash history; land uses; propensity for active transportation; transit activity; and the decisions of the BPSAP Advocacy Team. It is generally a six-lane divided arterial with intermittent right- and left-turn lanes. It has intermittent right- and left-turn lanes. It also has median with intermittent landscaping, cobra style vehicular lighting, and dynamic message signs. The corridor has 5' - 7' sidewalks and no marked bike lanes. The posted speed is 35 MPH. This corridor is in the process of being resurfaced and new pedestrian crossings are being painted. The land uses are redeveloping; new buildings front the street while older buildings and shopping centers are set behind large surface parking lots.

The following review describes the results of the corridor safety review and general observations of the corridor. A field review was conducted on Tuesday, July 12th, 2016 from 9:00 AM to 12:00 PM and a night time field review was completed on Tuesday, July 12th, 2016 from 8:30 to 9:30 PM.

Crash Summary

Over the six-year period from 2010 through 2015, 45 pedestrian or bicyclist crashes occurred along the Sunrise Boulevard study corridor. Of those crashes, 26 (58 percent) involved a pedestrian and 19 (42 percent) involved a bicyclist. The highest concentration of crashes occurred at NE 15th Avenue (14 Crashes).

Three of the crashes resulted in a fatality (7 percent) and 41 resulted in injury (91 percent). Only one crash did not result in an injury or fatality. Most crashes occurred in dry conditions (42 crashes, 93 percent). However, about half of the crashes (47 percent) occurred in non-daylight lighting conditions. One crash occurred in an area that was dark without street lighting. All three of the fatal crashes occurred in dark with street light conditions. Five crashes involved alcohol or drugs (11 percent).

Nearly one quarter of all pedestrians or cyclists involved in the crashes were 25-29 years old (11 crashes, 24 percent). Almost two thirds of the pedestrian crashes occurred during an illegal mid-block crossing (16 of 26 crashes, 62 percent). Two pedestrian crashes occurred at an intersection but on a side without a crosswalk. For detailed crash diagrams and statistics, please see Appendix 3.

FIGURE 13 | UC Study Area Crashes

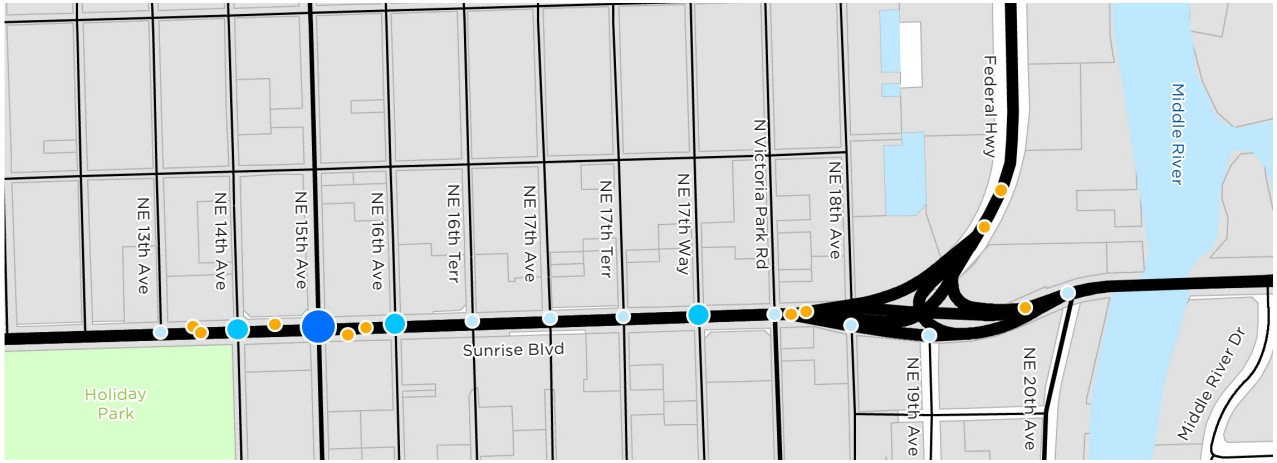
Legend

- 1 Segment Crash

Intersection Crash

- 1 - 5
- 6 - 10
- 11 - 15

Source: CARS 2010-2014 crash data; Signal Four Analytics 2010-2015 crash data



Transit Ridership & Land Use

Transit ridership is moderate in the Sunrise Boulevard study area. Ridership did not exceed 250 riders per day at any point along the study corridor, although it is relatively consistent throughout with between 101-250 daily riders at each stop. Transit facilities are generally missing bus shelters, although people were regularly observed waiting at the stops during the field review.

The land uses along the corridor, as noted previously, are transitioning. Traditional development follows an auto oriented pattern with separated land uses and buildings set back from the road behind parking lots. Redevelopment is occurring along the corridor with mixed used, mid-rise buildings that front the street and provide higher quality pedestrian amenities such as street trees and wide sidewalks. These developments include street level retail that can help to activate the street. The historic Gateway Theater is also located at the eastern end of the corridor. Along with the adjacent shopping destinations, the Gateway area attracts visitors from around Fort Lauderdale. According to demographic data, residents in the study area also have a high propensity for traveling on foot, by bike, or on transit in comparison to the rest of the county.

General Observations:

Throughout the corridor, pedestrians tend to cross outside of marked crossings. Many of the bus stops are not located near a convenient crosswalk to get to destinations on the opposite side of Sunrise Boulevard. The distance between signalized crossings is also long in some places, and the signals are long, causing long wait times for pedestrians when they do reach signals. There are destinations along both sides of the street that attract pedestrians. As a result, pedestrians cross mid-block throughout the corridor. Additionally, distracted pedestrians were observed crossing streets while looking at their phones rather than their surroundings. Drivers also tend to pull through crosswalks at red lights and stop signs without looking for pedestrians.

The sidewalks are also narrow in many places and do not offer any buffer between the sidewalk and the street. There is very little shade. Many of the facilities do not meet ADA requirements, and there are faded crosswalks. Because there are no bike lanes in the corridor, bicyclists ride on the narrow sidewalks and causes conflicts with pedestrians. Bicyclists were also observed riding on the sidewalk in the opposite direction of vehicles.

Typical Traditional Land Uses on Sunrise Boulevard

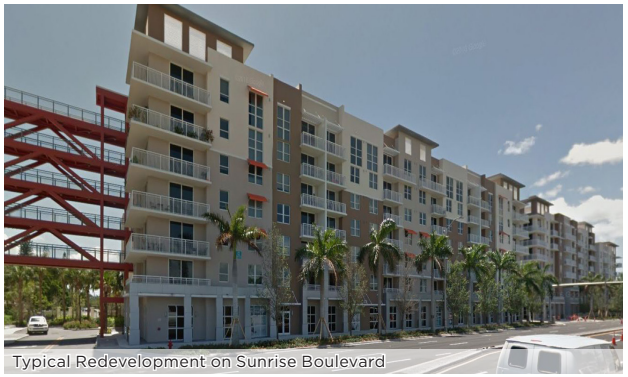

Typical Redevelopment on Sunrise Boulevard

FIGURE 14 | UC Study Area Transit Ridership

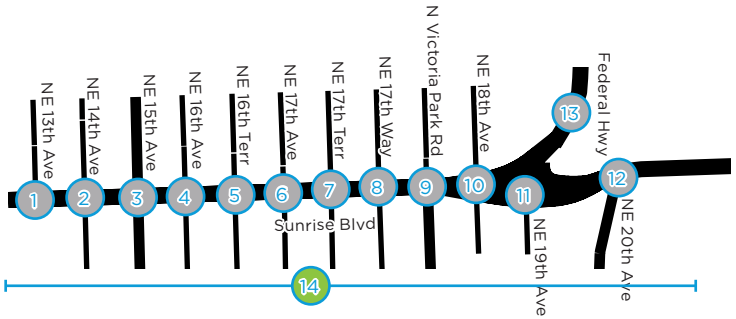
Legend

Daily Boardings + Alightings

- 1 - 25
- 26 - 50
- 51 - 100
- 101 - 250

Source: Broward County Transit, 2015

Issue: No Bike Lanes
Location: 14 (Corridor Wide)



General Observations:

- There are no bike lanes in the corridor.
- Bicyclists ride on the narrow sidewalks, creating conflicts between bicyclists and pedestrians.
- Bicyclists were also observed riding on the sidewalk in the opposite direction of vehicles.
- These conditions create safety issues for bicyclists, especially at intersection and driveway crossings.

Recommendations:

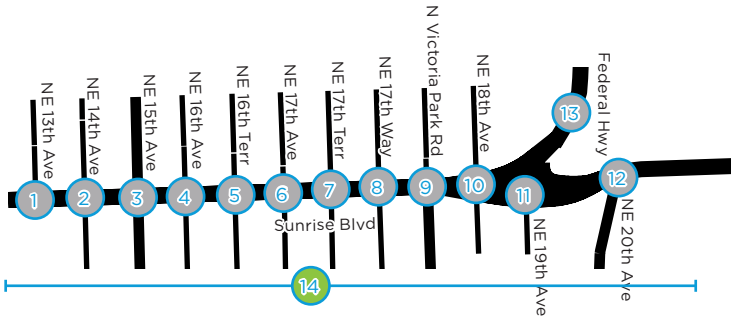
- Evaluate the addition of bike lanes throughout the corridor. Ensure that the bike lanes are designed to have sufficient width to safely separate bikes from the high-speed and high-volume vehicular traffic along Sunrise Boulevard, in order to promote use of the bike lanes rather than the sidewalks. The high volumes and speeds suggest the need for protected or separated bike lanes to accommodate the needs of riders.
- Provide additional visual separation of bike lanes through buffers.
- Use green paint at intersections, driveways, or other conflict points to highlight to drivers that bicyclists may be crossing.
- Create an outreach campaign to alert bicyclists of the dangers of riding on the sidewalks and to alert drivers of the need to look for bicyclists when turning in to and out of driveways.
- Create a progressive enforcement campaign where officers educate, warn, and finally ticket drivers who drive in bike lanes and bike riders who cross the street against the signal.

Bicyclists ride in the sidewalk, causing potential conflict between pedestrians and bicyclists.

Bicyclist riding in the sidewalk.

Bicyclist riding in the sidewalk.

Issue: Narrow Sidewalks and Obstructions
Location: 14 (Corridor Wide)



General Observations:

- Utility poles, signal poles, fire hydrants, and bus stop benches are mounted within the sidewalks throughout the corridor.
- Sidewalks are less than 6 feet.
- Sidewalks are directly adjacent to travel lanes without any separation from vehicles.
- Some adjacent sidewalks do not align with each other.

Recommendations:

- Widen sidewalks to meet or exceed ADA standard minimum width (6 feet if at back of curb) or add landscaped buffer between sidewalk and street.
- Relocate fixed objects off of sidewalks or provide additional sidewalk width to bypass. There should be a minimum of 4-feet clearance around fixed objects in accordance with forthcoming Public Right of Way Accessibility Guidelines.

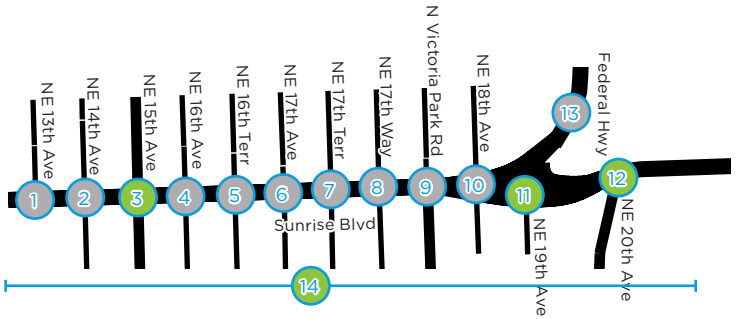
Poles are frequently placed in the sidewalk.

Objects in sidewalk on the SE corner of the NE 15th Avenue intersection.

Bench placed in the sidewalk; some sidewalks are wide but still do not offer separation from the street.

Some of the newer sidewalks are designed with buffers and shade trees.

Issue: Noncompliant ADA Sidewalks and Ramps
Location: 3, 14 (Corridor Wide)



General Observations:

- Fixed objects are mounted within the sidewalks,
- Sidewalk ramps do not comply with ADA requirements at every intersection along the corridor.
- In general, the truncated domes are missing, worn, or misaligned.
- In several areas, accessible sidewalk connections are not present between the sidewalk and driveways or private parking lots.
- The drainage inlet on the northwest corner of NE 15th Avenue blocks the ramp.

Recommendations:

- Update all ADA ramps along corridor to meet requirements.
- Expand sidewalk network to connect sidewalks with safe driveway crossings.
- Move the drainage inlet on the northwest corner of NE 15th Avenue away from ramp.

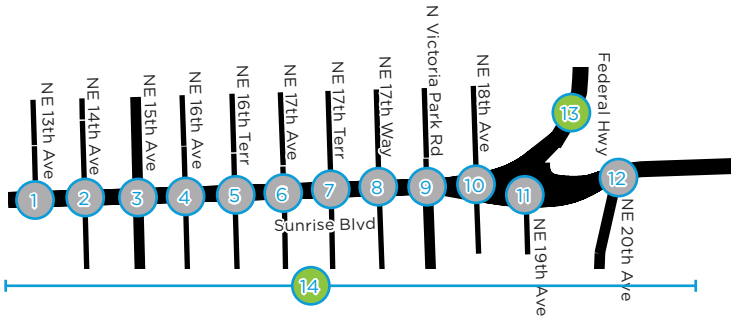
Lack of detectable warning surfaces and broken sidewalk.

Lack of detectable warning surfaces.

Lack of detectable warning surfaces.

The drainage inlet on the northwest corner of NE 15th Avenue blocks the ramp.

Issue: Driveway Frequency & Design
Location: 14 (Corridor Wide)



General Observations:

- There are a number of driveways between intersections along the corridor. Many of these driveways have poorly marked crosswalks.
- Many driveways along the corridor are very wide and allow drivers to turn in and out without slowing down.
- Many drivers were observed turning out of driveways without looking for or yielding to pedestrians.
- In section 13, almost every development has a right turn lane. These prevent new pedestrian crossings from being created and allow drivers to turn quickly in to driveways.

Recommendations:

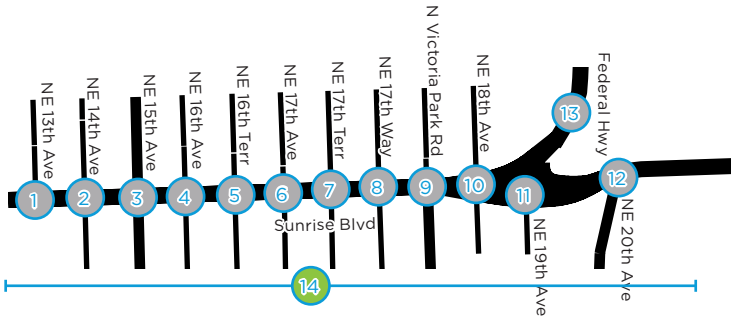
- Refresh pavement markings to emphasize crosswalks across driveways.
- Create an outreach campaign to alert bicyclists of the dangers of riding on the sidewalks and to alert drivers of the need to look for bicyclists when turning in to and out of driveways.
- Encourage cross access agreements between developments to limit the number of driveways approved along the corridor.
- Consider narrowing driveways where possible and ensure that driveway width is considered in development review for new developments.
- Consider whether right turn lanes are needed at every development. If not, consider where they might be able to be removed.

Wide driveways at a gas station on Sunrise Boulevard.

Frequent left and right turn lanes on Federal Highway.

Frequent driveways on Sunrise Boulevard.

Issue: Driver Behavior
Location: 14 (Corridor Wide)



General Observations:

- Drivers turning right on red do not always look for pedestrians in crosswalks before turning.
- During field observations, several drivers almost hit pedestrians or bicyclists in the crosswalks and at driveways.
- Drivers exiting driveways do not always yield or look for pedestrians or bicyclists.
- Drivers stop in the crosswalk and block access to the sidewalks. This is sometimes due vehicles pulling through the stop bars in order to see oncoming traffic because the stop bar is set back.

Recommendations:

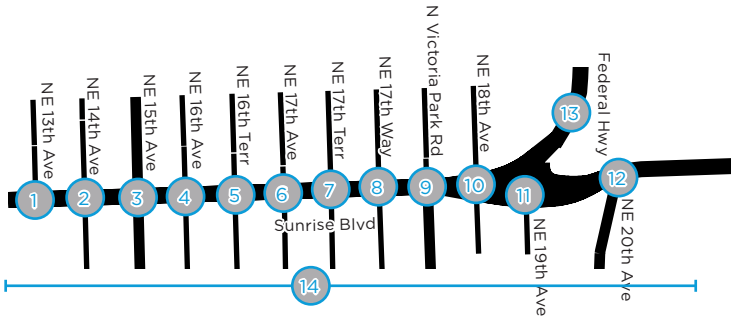
- Install warning signs at intersections and driveways, such as “Stop Here on Red”.
- Consider implementing “No Right Turn on Red.”
- Educate drivers on safe driving behavior through programs such as best foot forward, alert today, alive tomorrow and by working with Google and Waze.
- Create a progressive enforcement campaign where officers educate, warn, and finally ticket drivers who block crosswalks.
- Consider redesigning the location of the stop bar and crosswalk.


Vehicle waiting to turn left in the crosswalk.


Vehicle parked in the crosswalk.


Vehicle parked in the crosswalk.

Issue: Lack of Shade & Shelter
Location: 14 (Corridor Wide)



General Observations:

- Throughout the corridor, there is little shade for pedestrians.
- The bus stops lack shelter from the sun and rain. At NE 17th Way, the bus stop does not provide seating for waiting riders.
- At US 1 and other major intersections, no shade is available for pedestrians waiting for the long cycle lengths before safely crossing the road.

Recommendations:

- Upgrade bus stops to provide seating and shelter for users.
- Evaluate options to provide shade and shelter at intersections to encourage pedestrians to use crosswalks.

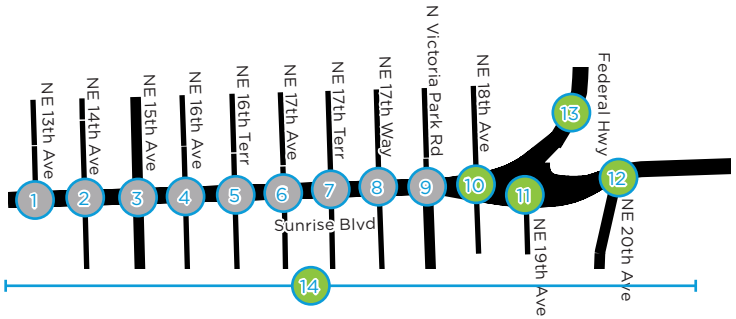
Bus stop without shelter on Sunrise Boulevard.


Much of the corridor does not have shade along the sidewalks.

Bus stop without shelter on Sunrise Boulevard.


Some of the newer sidewalks are designed with buffers and shade trees.

Issue: Limited Crossing Opportunities
Location: 10, 11, 12, 13, 14 (Corridor Wide)



General Observations:

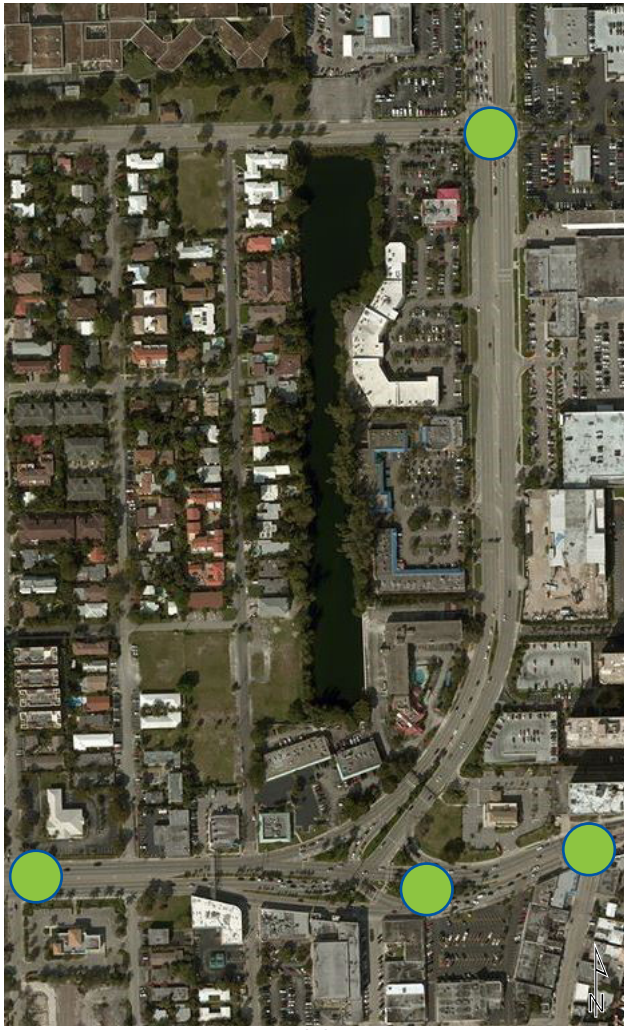
- The Gateway intersection offers limited crossing opportunities.
- There is no opportunity to cross from east to west on the north side of Sunrise Boulevard at Federal Highway.
- Corridor wide, frequent left and right turn lanes create limited opportunities for mid-block crossings.

Recommendations:

- Study realignment of the Gateway intersection to allow for an east/west crossing on the north leg.
- Explore locations for safe mid-block crossings and consider bi-directional median opening crosswalks and TWLTL median refuge islands such as on Federal Highway just north of Sunrise Boulevard.

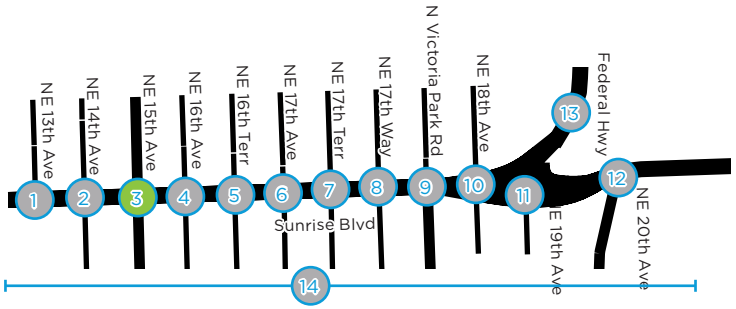
No east/west crossing for Federal Highway on the north leg of the Gateway intersection.

Frequent left and right turn lanes on Federal Highway.



Crossing opportunities around the Gateway intersection.

Issue: Drainage / Flooding
Location: 3



General Observations:

- Drainage is poor throughout the study area, but especially at the intersection of NE 15th Avenue. Flooding at this intersection blocks the sidewalk ramp.

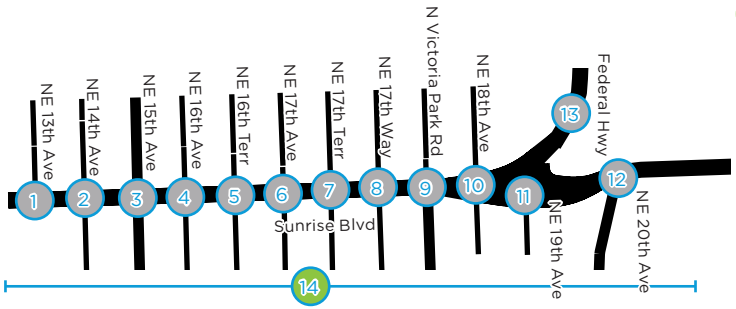
Recommendations:

- Update drainage system throughout corridor. Complete a study to determine specific locations where drainage issues are occurring. Consider options such as elevation modifications and improving draining through landscaping and other opportunities.

Flooding on the SE corner of the NE 15th Ave intersection.

Flooding on the SE corner of the NE 15th Ave intersection.

Issue: Poor Lighting
Location: 14 (Corridor Wide)



General Observations:

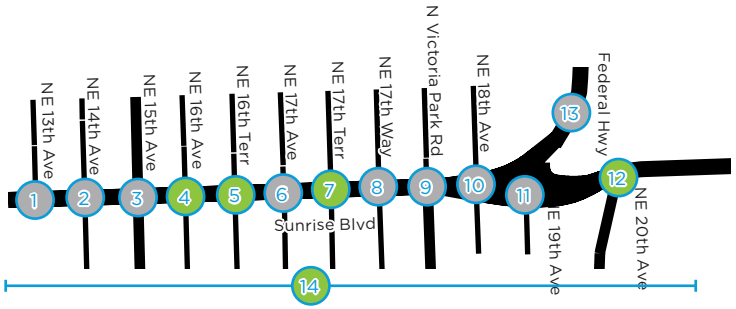
- Almost half of the crashes occurred at night.
- Lighting focuses on street and there is no pedestrian lighting.
- Lighting does not meet new illumination standards as noted in FDOT's Plans Preparation Manual.

Recommendations:

- Complete a lighting study with a focus on pedestrian lighting.
- Create an outreach campaign to alert pedestrians and bicyclists of the need to wear bright clothings at night and to use lighting.

Typical auto-oriented cobra head lighting on Sunrise Boulevard.

Issue: Crosswalk Deficiencies
Location: 14 (Corridor Wide)



General Observations:

- Many of the crosswalks are faded, worn, or uneven.
- Crosswalks are not present across the west leg the intersection at NE 20th Ave even though there is a bus stop on that leg.
- Crosswalks are not marked across the south leg of NE 16th Avenue, NE 16th Terrace, or NE 17th Avenue.

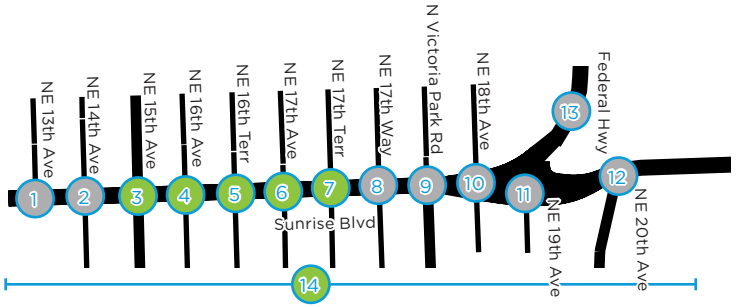
Recommendations:

- Due to the high pedestrian volumes along the corridor, add crosswalks across all intersection legs.

Missing crosswalk in driveway.

Missing crosswalk at NE 20th Ave.

Issue: Median Design
Location: 14 (Corridor Wide); NE 15th Ave to NW 17th Terr



General Observations:

- Most of the medians are concrete curbs, which do not discourage pedestrians from making mid-block crossings.

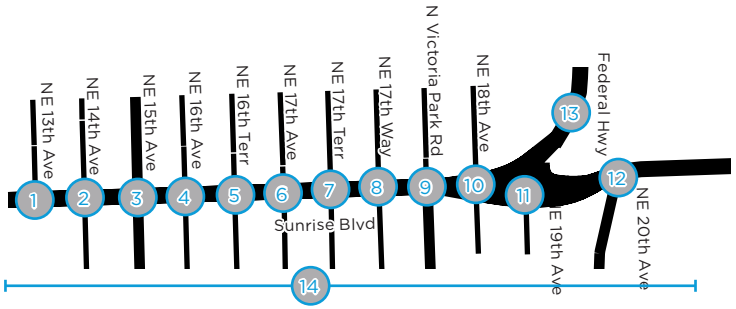
Recommendations:

- Use lush landscaping to close off the medians to prevent pedestrians from making illegal mid-block crossings.

Median with vegetation that allows pedestrians to pass through.

Frequent turn lanes limit space, allowing only for concrete curb medians.

Issue: Bus Stop Locations
Location: 14 (Corridor Wide)

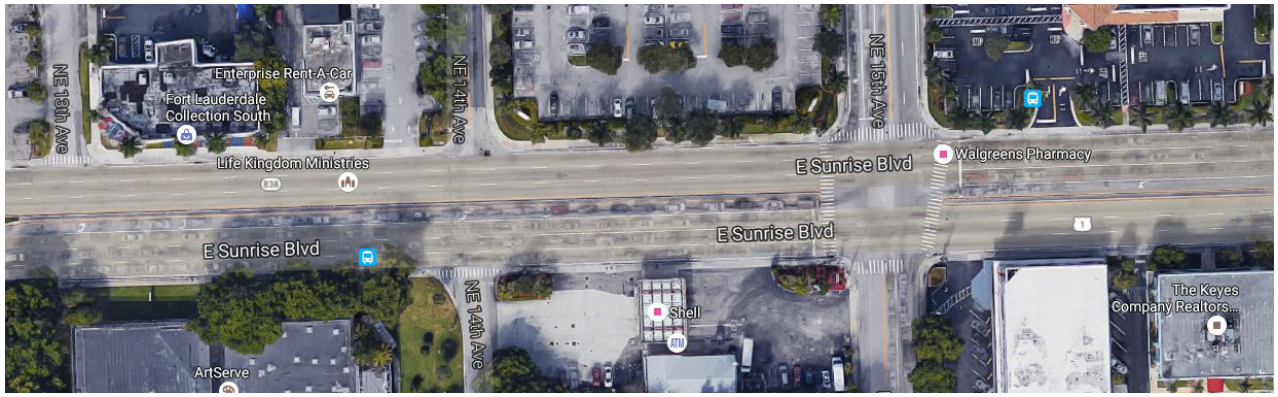


General Observations:

- Mid-block pedestrian crossing is a critical safety concern throughout the corridor. Many, but not all, of the observed illegal mid-block crossings result from bus stops that are not conveniently located near existing crosswalks. Alternatively, crosswalks are not conveniently located near the bus stops.

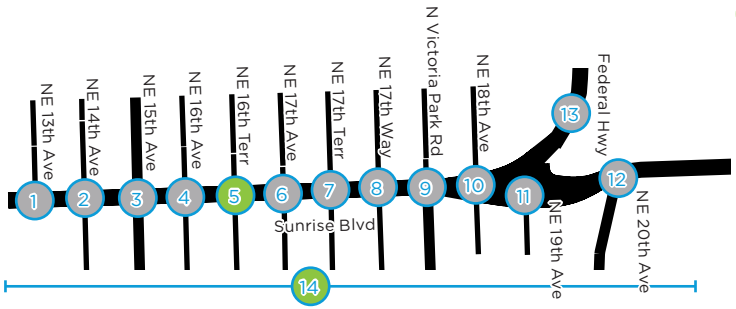
Recommendations:

- Evaluate the bus stop locations and potential mid-block crosswalk locations.
- Design mid-block crosswalks with enhanced visibility features, such as Rectangular Rapid Flash Beacons (RRFBs), to encourage use and to improve safety.



The bus stop located west of NE 14th Avenue is not close to a crossing of Sunrise Boulevard.

Issue: Signal Timing
Location: 13 (Corridor Wide)



General Observations:

- Signal times are long, which causes long wait times for pedestrians when crossing the street at intersections.
- It was observed that pedestrians cross the street against the signal even in crosswalks instead of waiting for the Walk signals.

Recommendations:

- Consider retiming signals with a focus on pedestrian and bicycle mobility.

The signal on the south leg of NE 16th Terrace rarely changes to allow pedestrians to cross.

Pedestrians crossing outside of the mid block crosswalk.

URBAN INTERSECTION DEMONSTRATION SITE

BROWARD BOULEVARD AT ANDREWS AVENUE

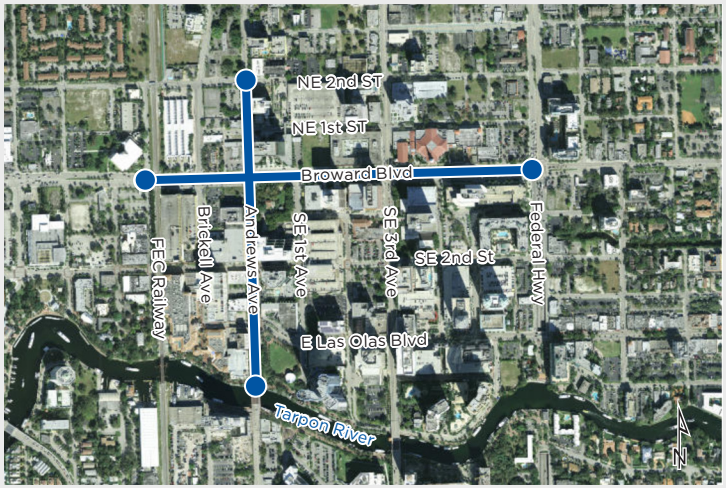
UI

URBAN INTERSECTION DEMONSTRATION SITE

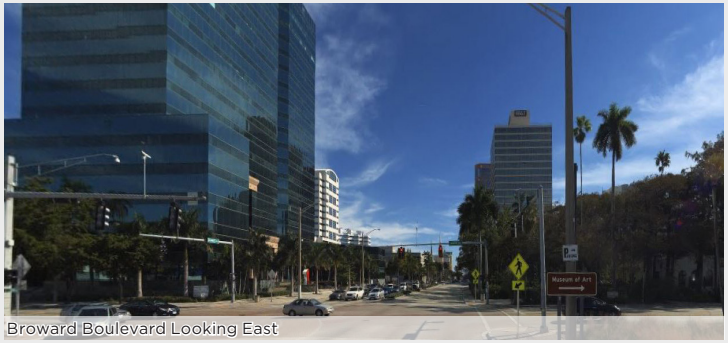
Broward Boulevard at Andrews Avenue

Broward MPO
Metropolitan Planning Organization
Bicycle & Pedestrian
SAFETY ACTION PLAN

STUDY AREA | Intersection Study



ROADWAY CHARACTERISTICS


Broward Boulevard Looking East

Broward Boulevard has three lanes in each direction and Andrews Avenue has two lanes in each direction. Both roads are divided with intermittent right- and left-turn lanes. At the intersection, each leg has left turn lanes. The roads have cement or lightly vegetated medians and cobra style vehicular lighting. The corridor has 6' or wider sidewalks and no marked bike lanes, although Broward Boulevard has paved shoulders that could potentially be widened and converted into bike lanes in the future. The intersection is located in the most urban part of Fort Lauderdale and is surrounded by high rise, mixed use buildings arranged in a generally walkable manner.

CRASH DATA - 2010 TO 2015

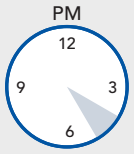
33 Pedestrian

22 Bicycle

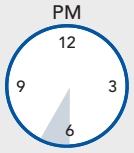
		Pedestrian	Bicycle
1	Fatal	1	0
45	Injury	26	19
9	Property Damage Only	6	3

Peak Crash Time Periods

11%



14%

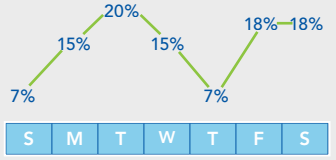


Peak Crash Months

35% Occurred in March & November

Peak Crash Days of the Week

56% Occurred on Tuesday, Friday, and Saturday



49% Occurred in Non-Daylight Lighting Conditions

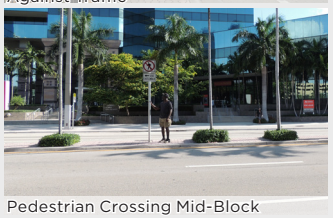
18% Involved Alcohol and/or Drugs

FIELD REVIEW OBSERVATIONS

- Illegal Mid-Block Crossings
- Inattentive Drivers (Especially at Driveways and Intersections)
- Vehicles Blocking Crosswalks
- Speeding/Aggressive Driving
- ADA Noncompliant Sidewalks and Ramps
- No Bike Lanes
- Missing/Faded Crosswalks
- Lack of Crossing Opportunities
- Objects Blocking Sidewalks
- Broken/Out of Date Pedestrian Signage and Signals
- Poor Pedestrian Access to Adjacent Development
- Wide Intersection/Excessive Pavement/Wide Turn Radius
- Lack of Bicycle Markings at Conflict Areas
- Long Signal Times
- Poor lighting


Bicyclists Riding in the Shoulder Against Traffic


Pedestrian Desire Line


Pedestrian Crossing Mid-Block

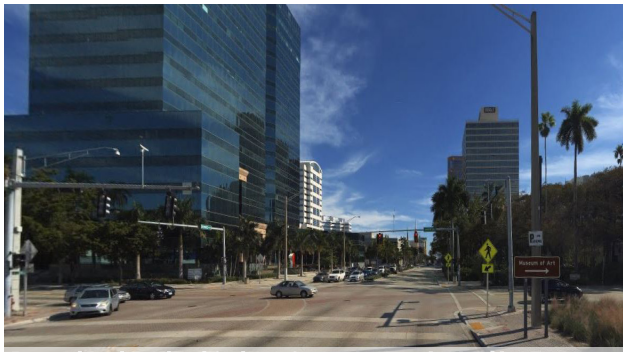

Vehicle Parked on Sidewalk


Out of Date Pedestrian Signage


Vehicle Blocking Crosswalk

BROWARD BOULEVARD AND ANDREWS AVENUE DEMONSTRATION INTERSECTION REVIEW

Broward Boulevard at Andrews Avenue | Fort Lauderdale



Broward Boulevard and Andrews Avenue Intersection Looking East

Aerial View of Broward Blvd Looking West

Overview

The intersection of Broward Boulevard and Andrews Avenue was chosen as a demonstration study site for the Broward MPO Bicycle and Pedestrian Safety Action Plan (BPSAP) based on a review of its pedestrian and bicycle crash history; land uses; propensity for active transportation; transit activity; and the decisions of the BPSAP Advocacy Team. Broward Boulevard has three lanes in each direction and Andrews Avenue has two lanes in each direction. Both roads are divided with intermittent right- and left-turn lanes. At the intersection, each leg has left turn lanes. The roads have cement or lightly vegetated medians and cobra style vehicular lighting. The corridor has 6' or wider sidewalks and no marked bike lanes. The intersection is located in the most urban part of Fort Lauderdale and is surrounded by high rise, mixed use buildings arranged in a generally walkable manner. However, some land uses are still auto-centric along Broward Boulevard.

The following review describes the results of the corridor safety review and general observations of the corridor. A field review was conducted on Tuesday, July 12th, 2016 from 8:00 AM to 12:00 PM and a night time field review was completed on Tuesday, July 12th, 2016 from 9:30 to 10:30 PM.

Crash Summary

Over the six-year period from 2010 through 2015, 55 pedestrian or bicyclist crashes occurred in the study area. Of those crashes, 60 percent (33) involved a pedestrian and 40 percent (22) involved a bicyclist. Most of the crashes occurred along Broward Boulevard, with a concentration at the study intersection.

Two percent (1) of the crashes resulted in a fatality and 82 percent (45) resulted in injury. Most crashes occurred in dry conditions (49 crashes, 89 percent). However, almost half of the crashes (47 percent) occurred in non-daylight lighting conditions. One crash occurred in an area that was dark without street lighting. 18 percent of the crashes (10) involved alcohol or drugs, and the one fatality involved alcohol.

One out of every three crashes involved a bicyclists or pedestrian under 30 years old, suggesting that targeted outreach to that age group could be helpful. Almost all of the crashes involved someone either crossing mid-block or in a crosswalk. For detailed crash diagrams and statistics, please see Appendix 4.

FIGURE 15 | UI Study Area Crashes

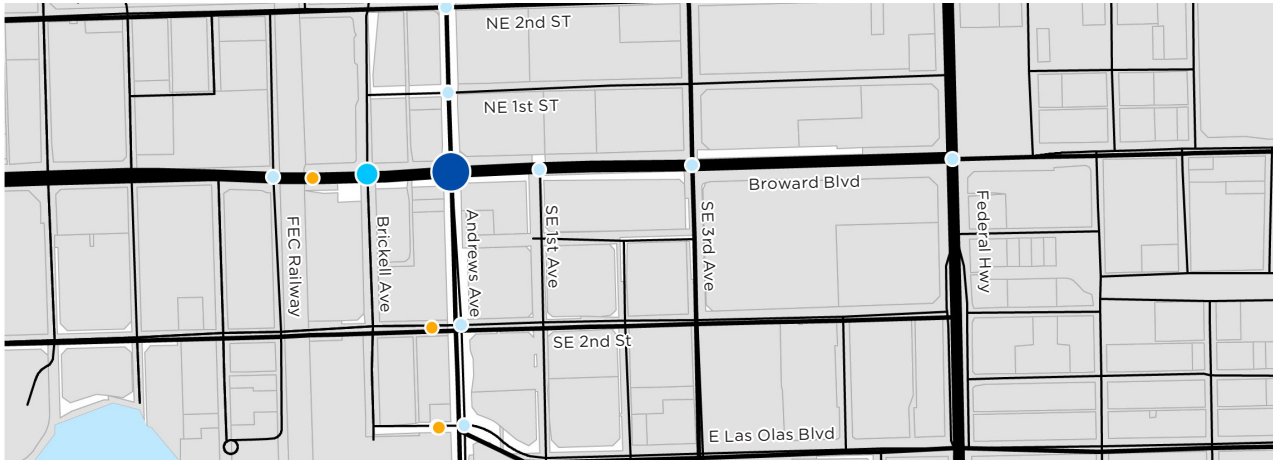
Legend

- 1 Segment Crash

Intersection Crash

- 1 - 5
- 6 - 10
- 18

Source: CARS 2010-2014 crash data; Signal Four Analytics 2010-2015 crash data



Transit Ridership & Land Use

Transit ridership is high in the study area, mainly due to the location of the central terminal for Broward County Transit on Broward Boulevard and Brickell Avenue. Ridership will likely continue to grow when the new Brightline rail station is built opposite to the central terminal. Ridership is also high at the Museum Plaza on Andrews Avenue south of NW 2nd Street. The other bus stops in the corridor see moderate ridership. People were regularly observed waiting at the stops during the field review. Many people were observed crossing illegally at the bus stops as opposed to utilizing the marked crossings or waiting for the walk signal.

The study area is located in the most urban part of Broward County, and the land uses generally include high rise office, civic, and residential buildings as well as parking structures and lots. The uses west of Andrews Avenue on Broward Boulevard are more auto oriented. The area is redeveloping, and the forthcoming Brightline and Wave Streetcar are expected to drive further dense, mixed-use development. According to demographic data, residents in the study area have a moderate propensity for traveling on foot, by bike, or on transit in comparison to the rest of the county. However, due to the urban nature of the area, many people walk and bike.

General Observations:

Throughout the study area, pedestrians tend to cross outside of marked crossings. There are long distances between signalized crossings and concrete medians are perceived as safe places to take refuge while crossing mid-block, even with signage discouraging their use. Long signal cycle lengths cause long wait times for pedestrians when they do reach signals. Although there are trees along the streets in the study area, many of them are not shade trees and therefore there is little shade for pedestrians. In general, the pedestrian facilities do not comply with ADA requirements throughout the corridor. Other pedestrian issues observed include: fixed objects mounted in sidewalks, missing or worn truncated domes at ramps, outdated signage at crosswalks, worn crosswalk striping, and pedestrian signals that do not function.

Because there are no bike lanes in the study area, bicyclists often ride on the sidewalk causing conflicts with pedestrian users and vehicles at driveways. Bicyclists were also observed in the corridor riding in shoulders against the direction of vehicular travel. Intersection corners with large radii encourage speeding and encourage drivers to block crosswalks at red lights. Lighting is poor throughout the corridor, except at intersections.

Typical Land Uses on Andrews Avenue

Typical Land Uses on Broward Boulevard

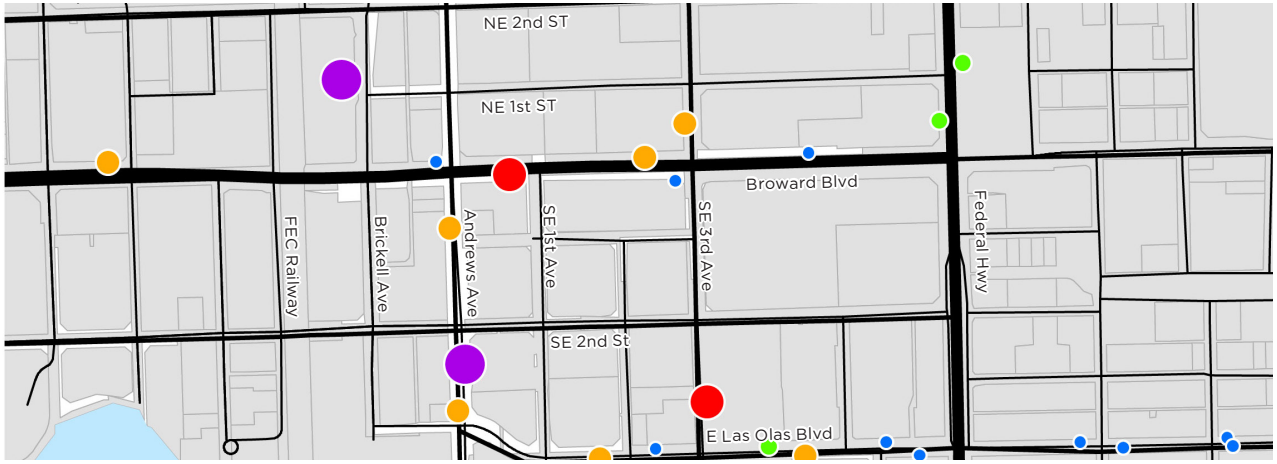


FIGURE 16 | UI Study Area Transit Ridership

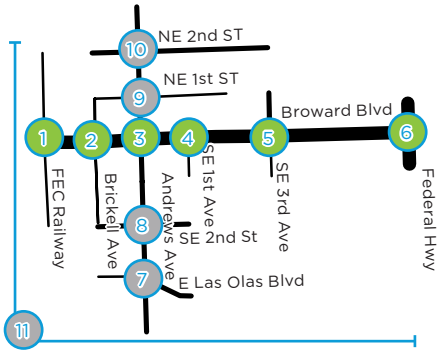
Legend

Daily Boardings + Alightings

- 1 - 25
- 26 - 50
- 51 - 100
- 101 - 250
- 250 +

Source: Broward County Transit, 2015

Issue: Roads Do Not Match the Context
Location: Broward Boulevard (1, 2, 3, 4, 5, 6)



General Observations:

- Downtown Fort Lauderdale is the urban core of Broward County, and as such has high volumes of pedestrians and bicyclists throughout the day. However, Broward Boulevard is a road built to suburban standards and has been widened to better allow vehicles to move faster in and out of downtown. Only minimal accommodations have been given to pedestrians and bicyclists. This creates an uncomfortable and unsafe experience for walking and bicycling and can discourage people from choosing to walk or bike.
- This design has resulted in wide intersections and therefore long crossing distances for pedestrians.
- There are long distances between signalized crossings for pedestrians, which can encourage mid-block crossing and does not promote the urban condition.

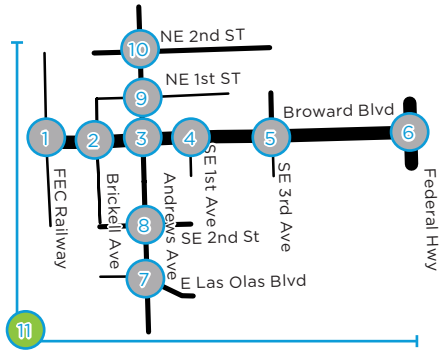
Recommendations:

- Begin a discussion on user priority. This discussion should take into account the context of an area in determining roadway design. A visioning effort could help to determine areas which are intended for pedestrian and bicycling priority. New standards should be applied to roads which are intended for greater pedestrian/bicycling focus. These standards should include performance measures based on elements beyond congestion that consider a broader definition of mobility, including those that evaluate the pedestrian and bicycle environment.

Broward Boulevard is a wide corridor that divides Downtown Fort Lauderdale and is difficult to cross for pedestrians.

Wide intersections create long crossing distances for pedestrians.

Issue: Mid-Block Crossings
Location: 11 (Whole Area)

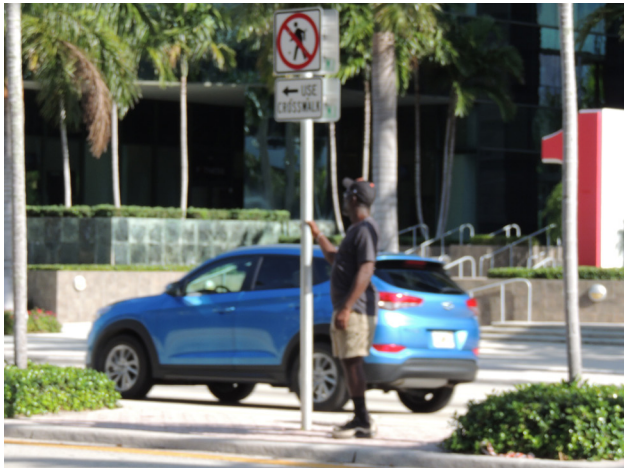


General Observations:

- Mid-block crossings observed at bus stops and where there are destinations on either side of the street.
- The distances between signalized crossings is very long in most locations.
- The signal times are long, which can discourage people from waiting for the signal to cross.
- In some locations, “Do Not Cross” signs have been installed, however they do not seem to have much of an impact based on field observations.
- Many pedestrians were observed crossing mid-block on Brickell Ave in front of the Broward Central Terminal.

Recommendations:

- Explore locations for safe mid-block crossings and consider bi-directional median opening crosswalks and TWLTL median refuge islands.
- Install thick shrubs in the median to physically prevent pedestrians to from crossing medians mid-block.
- Consider relocating bus stops closer to crossings to create incentive for crossing at signals.
- Create a progressive enforcement campaign where officers educate, warn, and finally ticket pedestrians who cross mid-block.



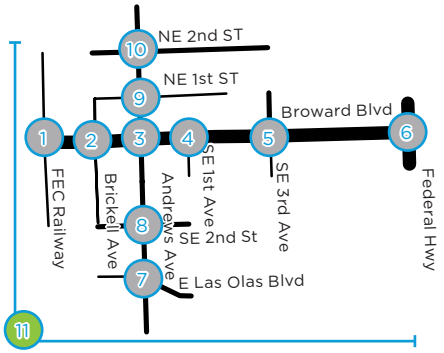
Pedestrians using the median as a refuge.

Pedestrian crossing mid-block.

Pedestrian crossing mid-block.

Pedestrians crossing against the signal.

Issue: No Bike Lanes
Location: 11 (Whole Area)



General Observations:

- There are no bike lanes in the study area.
- Bicyclists ride on the narrow sidewalks, creating conflicts between bicyclists and pedestrians.
- Bicyclists were also observed riding on the sidewalk in the opposite direction of vehicles.
- These conditions create safety issues for bicyclists, especially at intersection and driveway crossings.

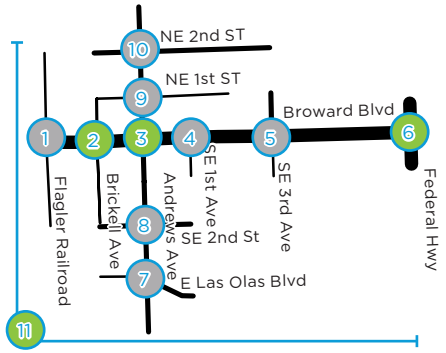
Recommendations:

- Evaluate the addition of bike lanes throughout the study area. Ensure that the bike lanes are designed to have sufficient width to safely separate bikes from the high-speed and high-volume vehicular traffic in the study area in order to promote use of the bike lanes rather than the sidewalks. The high volumes and speeds suggest the need for protected or separated bike lanes on Broward Boulevard to accommodate the needs of riders. This could potentially be done through restriping.
- Provide additional visual separation of bike lanes through buffers.
- Use green paint at intersections, driveways, or other conflict points to highlight to drivers that bicyclists may be crossing.
- Create an outreach campaign to alert bicyclists of the dangers of riding on the sidewalks and to alert drivers of the need to look for bicyclists when turning in to and out of driveways.
- Create a progressive enforcement campaign where officers educate, warn, and finally ticket drivers who drive in bike lanes and bike riders who cross the street against the signal.

Bicyclists riding on the sidewalk.


Bicyclist riding the wrong way in the shoulder on Broward Blvd.

Issue: Pedestrian Facility Deficiencies
Location: 2, 3, 6, 11 (Whole Area)



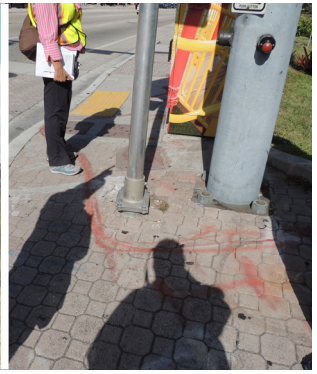
General Observations:

- Sidewalks are directly adjacent to travel lanes without any separation from vehicles.
- Sidewalks do not follow desire lines.
- Utility poles, sign poles, fire hydrants, and bus stop benches are mounted within the sidewalks or on approaches throughout the study area.

Recommendations:

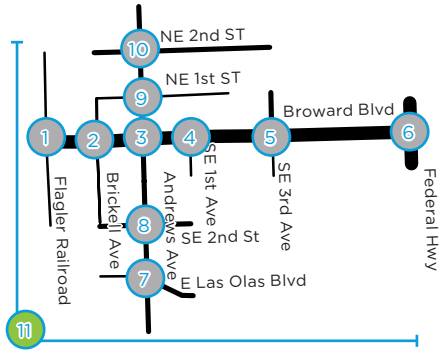
- Consider adding a landscaped buffer between the sidewalk and the street.
- Look at where pedestrians are crossing and create better connectivity to and between destinations.
- Relocate fixed objects off of sidewalks or provide additional sidewalk width to bypass. There should be a minimum of 4-feet clearance around fixed objects in accordance with forthcoming Public Right of Way Accessibility Guidelines.

Pedestrian desire line.



Objects in the sidewalk.

Issue: Noncompliant ADA Sidewalks and Ramps
Location: 11 (Whole Area)



General Observations:

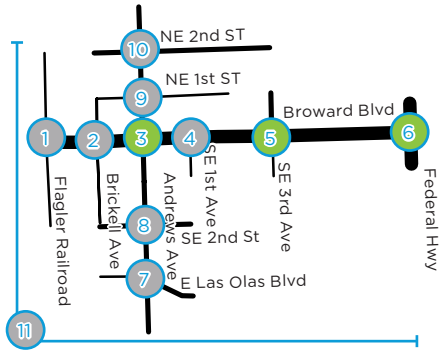
- Fixed objects are mounted within the sidewalks,
- Sidewalk ramps do not comply with ADA requirements at every intersection in the study area.
- In general, the truncated domes are missing, worn, or misaligned.
- In several areas, accessible sidewalk connections are not present between the sidewalk and driveways or private parking lots.
- In several locations, the pedestrian signal push buttons are located far from the crosswalk ramps or too close to each other.
- Some worn paths have been made where sidewalks do not exist.

Recommendations:

- Update all ADA ramps along corridor to meet requirements.
- Relocate pedestrian signal push buttons to achieve proper separation and proximity to crosswalks.
- Expand sidewalk network to connect sidewalks with safe driveway crossings.

The sidewalk does not provide a level surface behind the ramp as required by ADA.

Issue: Wide Intersections and Excessive Pavement
Location: 3, 5, 6



General Observations:

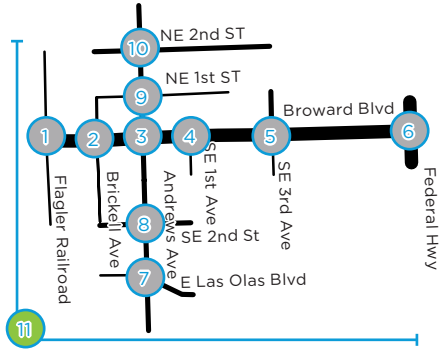
- Many intersections have excessive pavement widths. This is confusing to vehicles operating the intersection – especially with poorly maintained pavement markings – and yields long crossing distances for pedestrians.

Recommendations:

- Evaluate the need for separate turn lanes and consider road diets where possible.
- Utilize excess space to incorporate bump outs, bike lanes, and other improvements to the bicycle and pedestrian realm.

Wide intersection at Broward Blvd and NE 3rd Ave.

Issue: Driver Behavior
Location: 11 (Whole Area)



General Observations:

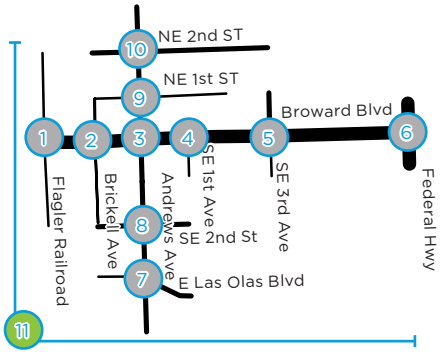
- Drivers turning right on red do not always look for pedestrians in crosswalks before turning.
- During field observations, several drivers almost hit pedestrians or bicyclists in the crosswalks and at driveways.
- Drivers exiting driveways do not always yield or look for pedestrians or bicyclists.
- Drivers stop in the crosswalk and block access to the sidewalks. This is sometimes due vehicles pulling through the stop bars in order to see oncoming traffic because the stop bar is set back.

Recommendations:

- Install warning signs at intersections and driveways, such as “Stop Here on Red”.
- Consider implementing “No Right Turn on Red.”
- Educate drivers on safe driving behavior through programs such as best foot forward, alert today, alive tomorrow and by working with Google and Waze.
- Create a progressive enforcement campaign where officers educate, warn, and finally ticket drivers who block crosswalks.
- Consider redesigning the location of the stop bar and crosswalk.

Vehicle waiting in crosswalk to turn right at a signal.

Issue: Pedestrian Signage Deficiencies
Location: 11 (Whole Area)



General Observations:

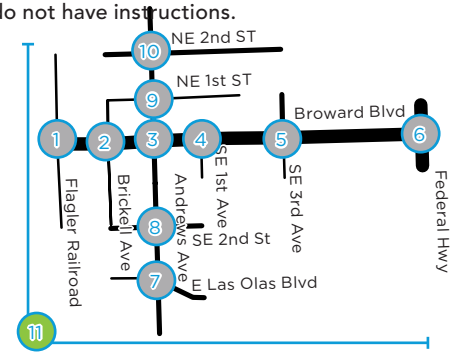
- Pedestrian signals are not functioning or the countdown signal is not working at multiple intersections.
- Many of the pedestrian signal push button signs do not provide the street names or signs with directions on how to properly use pedestrian signal heads.

Recommendations:

- Replace or fix pedestrian signals/controllers.
- Update pedestrian signal push button signs as necessary to meet standards.

Signs are out of date and either do not state which street they are referring to do not have instructions.

Issue: Signal Timing
Location: 11 (Whole Area)



General Observations:

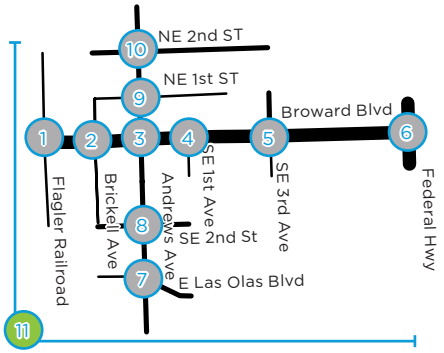
- Signal times are long, which causes long wait times for pedestrians when crossing the street at intersections.
- It was observed that pedestrians cross the street against the signal even in crosswalks instead of waiting for the Walk signals.

Recommendations:

- Consider retiming signals with a focus on pedestrian and bicycle mobility.

Pedestrian crossing against a signal.

Issue: Delivery Trucks
Location: 11 (Whole Area)



General Observations:

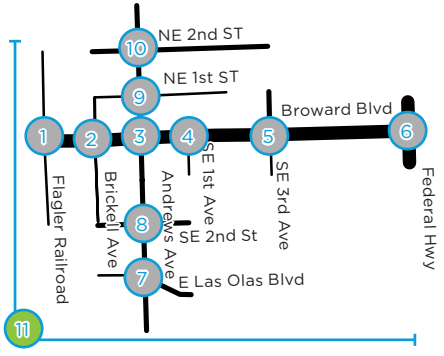
- Delivery trucks were observed parking on sidewalk or along the street.

Recommendations:

- Evaluate the locations of loading and loading areas.
- Enforce the use of loading and unloading areas.

Delivery truck parked in the sidewalk.

Issue: Lighting
Location: 11 (Whole Area)

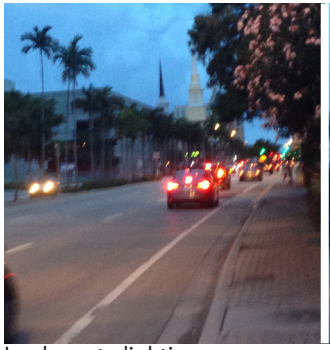


General Observations:

- Lighting is poor outside of the intersection of Broward Boulevard and Andrews Avenue.
- Some of the lamps were out at the intersection of Broward Boulevard and Andrews Avenue.

Recommendations:

- Implement the recommendations of FDOT's 2015 safety study. The study recommends installing six additional lights along Broward Boulevard.
- Complete a lighting study on Andrews Avenue with a focus on pedestrian lighting.
- Create an outreach campaign to alert pedestrians and bicyclists of the need to wear bright clothings at night and to use lighting.



Inadequate lighting on Broward Boulevard

Lamps out on Broward Boulevard at Andrews Avenue

SUBURBAN CORRIDOR DEMONSTRATION SITE

OAKLAND PARK BOULEVARD FROM NW 84TH AVENUE TO ATRIUM WEST

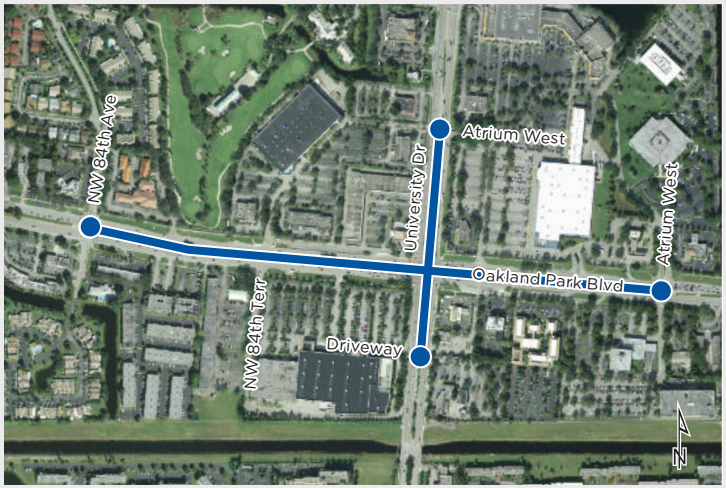
SC

SUBURBAN CORRIDOR DEMONSTRATION SITE

Oakland Park Boulevard from NW 84th Avenue to Atrium West

Broward MPO Metropolitan Planning Organization
Bicycle & Pedestrian SAFETY ACTION PLAN

STUDY AREA | 1 Mile



CRASH DATA - 2010 TO 2015

28 Pedestrian

9 Bicycle

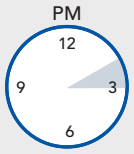
1	Fatal	0	1
34	Injury	26	8
2	Property Damage Only	2	0

51% Occurred in Non-Daylight Lighting Conditions

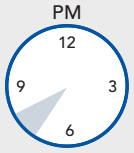
0% Involved Alcohol and/or Drugs

Peak Crash Time Periods

13%



18%

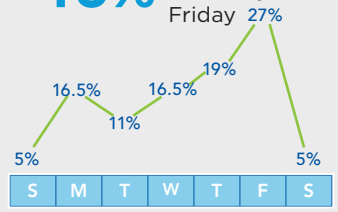


Peak Crash Months

30% Occurred in June & December

Peak Crash Days of the Week

46% Occurred on Thursday & Friday



ROADWAY CHARACTERISTICS


Oakland Park Boulevard Looking East

The corridor has a three lanes in each direction. It has intermittent right- and left-turn lanes. There are access roads in some areas as well. It also has median with intermittent landscaping. The corridor has 5' - 6' sidewalks separated from the roadway; and while there are no marked bike lanes, it does have paved shoulders that could potentially be widened and converted into bike lanes in the future. The posted speed is 45 MPH. The land uses generally consist of auto-oriented shopping centers and big box retail set behind large surface parking lots.

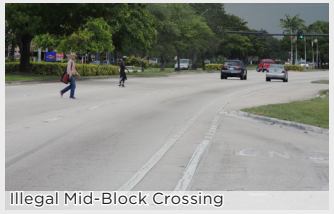
FIELD REVIEW OBSERVATIONS

- Illegal Mid-Block Crossings
- Inattentive Drivers (Especially at Driveways and Intersections)
- Vehicles Blocking Crosswalks
- Speeding/Aggressive Driving
- ADA Noncompliant Sidewalks and Ramps
- No Bike Lanes
- Missing/Faded Crosswalks
- Lack of Crossing Opportunities
- Objects Blocking Sidewalks
- Broken/Out of Date Pedestrian Signage and Signals
- Frequent Driveways
- Poorly Marked Driveway Crossings
- Wide Intersection/Excessive Pavement
- Lack of Bicycle Markings at Conflict Areas
- Long Signal Times
- Poor lighting

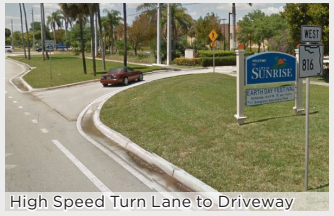

Excessive Pavement Width


Poor Lighting at Night


Faded Pavement Markings


Illegal Mid-Block Crossing

Out of Date Pedestrian Signage



High Speed Turn Lane to Driveway

OAKLAND PARK BOULEVARD DEMONSTRATION CORRIDOR REVIEW
From NW 84th Avenue to Atrium West | Sunrise


Oakland Park Blvd Looking East


Pedestrian Crossing Mid-Block on Oakland Park Blvd.

Overview

Oakland Park Boulevard from NW 84th Avenue to Atrium West was chosen as a demonstration study site for the Broward MPO Bicycle and Pedestrian Safety Action Plan (BPSAP) based on a review of its pedestrian and bicycle crash history; land uses; propensity for active transportation; transit activity; and the decisions of the BPSAP Advocacy Team. It is generally a six-lane divided arterial with intermittent right- and left-turn lanes. There are access roads in some areas as well. It also has median with intermittent landscaping. The corridor has 5' - 6' sidewalks separated from the roadway; and while there are no marked bike lanes, shoulders vary from 3' – 5'. The posted speed is 45 MPH. The land uses generally consist of auto-oriented shopping centers and big box retail set behind large surface parking lots.

The following review describes the results of the corridor safety review and general observations of the corridor. A field review was conducted on Tuesday, July 12th, 2016 from 2:00 PM to 6:00 PM and a night time field review was completed on Tuesday, July 12th, 2016 from 8:30 to 9:30 PM.

Crash Summary

Over the six-year period from 2010 through 2015, 39 pedestrian or bicyclist crashes occurred along the Oakland Park Boulevard study corridor. Of those crashes, 76 percent (28) involved a pedestrian and 24 percent (9) involved a bicyclist. Almost all of the crashes occurred around the intersection of Oakland Park Boulevard and University Drive.

Three percent (1) of the crashes resulted in a fatality and 92 percent (34) resulted in injury. Most crashes occurred in dry conditions (31 crashes, 84 percent). However, almost half of the crashes (49 percent) occurred in non-daylight lighting conditions. Three crashes occurred in an area that was dark without street lighting, and all three of those resulted in injuries. No crashes involved alcohol or drugs.

14 percent (5) of the crashes involved someone aged 20-24 and another 14 percent (5) of the crashes involved people aged 60-64. In total, 24 percent (9) of the crashes involved someone under the age of 30 and 27 percent (10) of the crashes involved someone over the age of 60. This suggests that special attention should be paid to these age group in planning and education efforts. For detailed crash diagrams and statistics, please see Appendix 5.

FIGURE 17 | SC Study Area Crashes

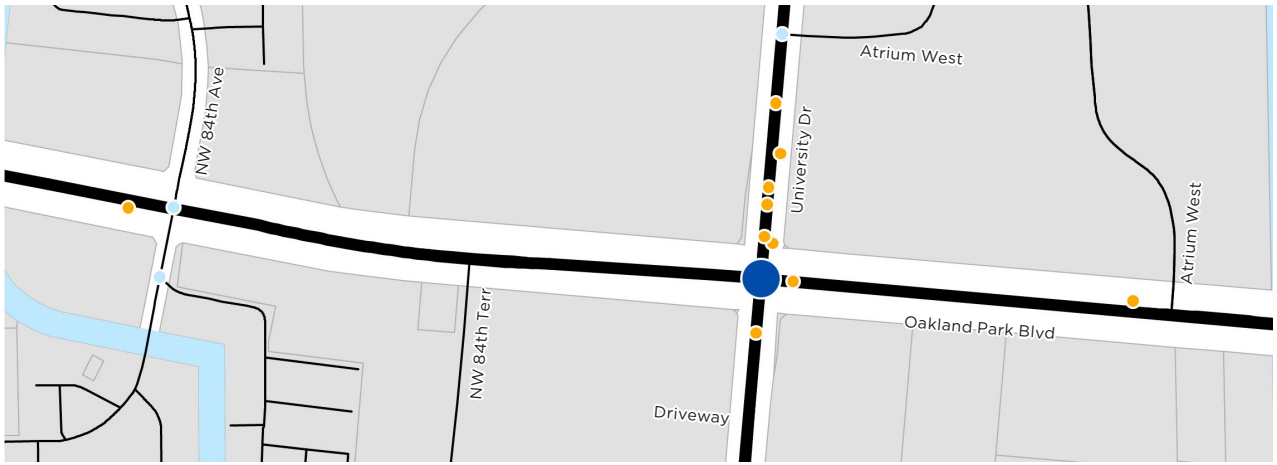
Legend

- 1 Segment Crash

Intersection Crash

- 1 - 5
- 6 - 6 - 10
- 11 - 15

Source: CARS 2010-2014 crash data; Signal Four Analytics 2010-2015 crash data



Transit Ridership & Land Use

Transit ridership is high in the corridor, especially around the intersection of Oakland Park Boulevard and University Drive. Ridership exceeds 250 riders per day at all of the bus stops around the intersection. Both Oakland Park Boulevard and University Drive are designated for premium transit service in the future, and the intersection is intended to become a transit hub. People were regularly observed waiting at the stops during the field review, and some of the bus stops include shelters to provide shade and comfortable waiting areas for riders. Some of the stops are located far from signalized crossings and many people were observed crossing illegally mid-block at those locations.

The land uses along the corridor are auto-oriented. Most of the development is in the form of big box stores set far back from the road behind parking lots. The land use pattern includes large superblocks with little internal roadway connectivity. The land uses are mostly commercial in nature. Conceptual plans suggest that the area is intended to eventually be developed in a high density and mixed use manner to support its designation as an Anchor Hub. According to demographic data, residents in the study area have a low propensity for traveling on foot, by bike, or on transit in comparison to the rest of the county.

General Observations:

Throughout the corridor, pedestrians tend to cross outside of marked crossings. Many bus stops and popular destinations are not located near crosswalks. There are long distances between signalized crossings and concrete medians are perceived as safe places to take refuge while crossing mid-block, even with signage discouraging their use. Long signal cycle lengths cause long wait times for pedestrians when they do reach signals. In general, the pedestrian facilities do not comply with ADA requirements throughout the corridor. Other pedestrian issues observed include: fixed objects mounted in sidewalks, missing or worn truncated domes at ramps, outdated signage at crosswalks, and pedestrian signals that do not function.

Because there are no bike lanes in the corridor, bicyclists often ride on the sidewalk causing conflicts with pedestrian users and vehicles at driveways. Bicyclists were also observed in the corridor riding in shoulders against the direction of vehicular travel. Intersection corners with large radii encourage speeding and encourage drivers to block crosswalks at red lights. Excessive, and in some cases inappropriate, signage leads to potential vehicular confusion. Lighting is poor throughout the corridor, except at intersections.

Typical Traditional Land Uses on Oakland Park Blvd.

Access Road and Land Uses Along Oakland Park Blvd.

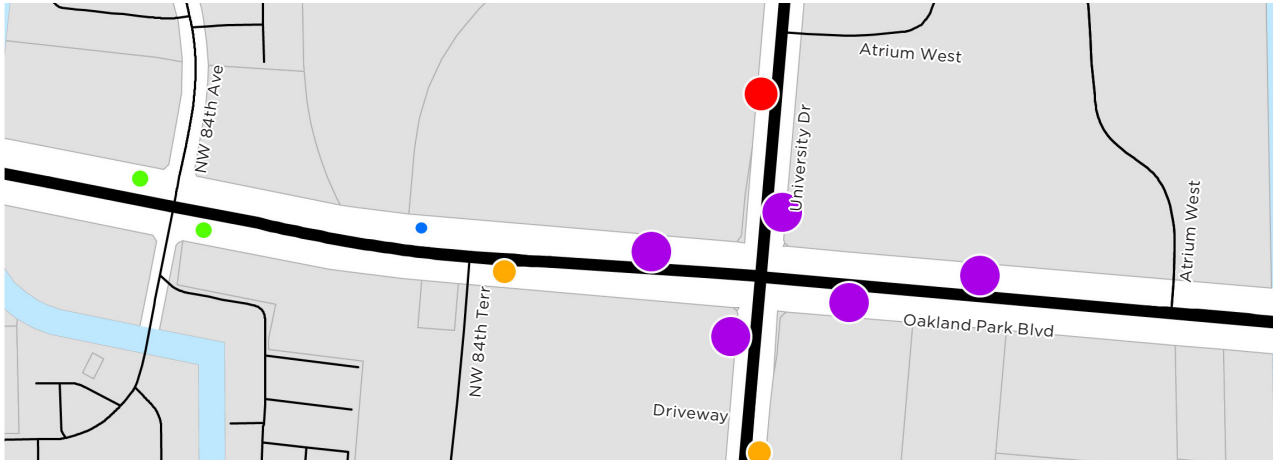


FIGURE 18 | SC Study Area Transit Ridership

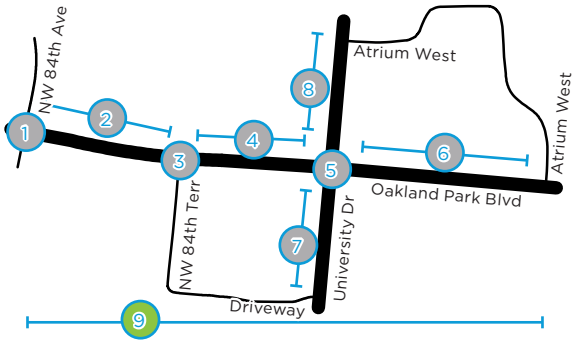
Legend

Daily Boardings + Alightings

- 1 - 25
- 26 - 50
- 51 - 100
- 101 - 250
- 250 +

Source: Broward County Transit, 2015

Issue: Mid-Block Crossings
Location: 9 (Whole Area)



General Observations:

- Mid-block crossings observed at bus stops and where there are destinations on either side of the street.
- The distances between signalized crossings is very long in most locations.
- The signal times are long, which can discourage people from waiting for the signal to cross.
- In some locations, “Do Not Cross” signs have been installed, however they do not seem to have much of an impact based on field observations.
- The City of Sunrise Police Department has been implementing a High Visibility Enforcement campaign focused on pedestrian and bicyclist issues over the past year. This strategy utilizes a progressive enforcement approach, where officers educate, warn, and finally ticket pedestrians, bicyclists, and drivers. The focus is heavy on pedestrian interaction, with police officers making contact with over 1,000 pedestrians, 50 motorists, and 27 bicyclists.

Recommendations:

- Explore locations for safe mid-block crossings and consider bi-directional median opening crosswalks and TWLTL median refuge islands.
- Install thick shrubs in the median to physically prevent pedestrians to from crossing medians mid-block.
- Consider relocating bus stops closer to crossings to create incentive for crossing at signals.
- Evaluate the effects of the High Visibility Enforcement campaign to determine if this kind of specialized focus worked in the study area. If so, continue the a progressive enforcement campaign where officers educate, warn, and finally ticket pedestrians who cross mid-block.

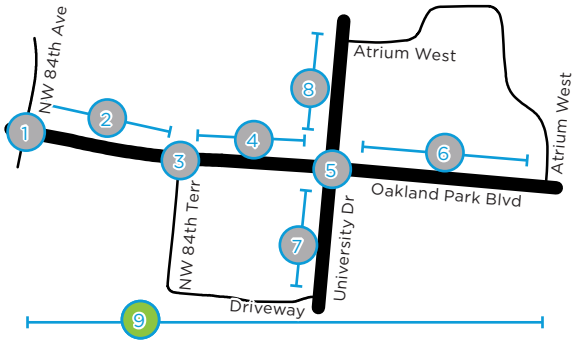

Pedestrian crossing against the signal.


Pedestrians crossing mid-block at a gap in the shrubs.


Pedestrian crossing mid-block.


Pedestrians using the median as a refuge.

Issue: Noncompliant ADA Sidewalks and Ramps
Location: 9 (Corridor Wide)



General Observations:

- Fixed objects are mounted within the sidewalks,
- Sidewalk ramps do not comply with ADA requirements at every intersection along the corridor.
- In general, the truncated domes are missing, worn, or misaligned.
- In several areas, accessible sidewalk connections are not present between the sidewalk and driveways or private parking lots.
- In several locations, the pedestrian signal push buttons are located far from the crosswalk ramps or too close to each other.
- Some worn paths have been made where sidewalks do not exist.

Recommendations:

- Update all ADA ramps along corridor to meet requirements.
- Relocate pedestrian signal push buttons to achieve proper separation and proximity to crosswalks.
- Expand sidewalk network to connect sidewalks with safe driveway crossings.

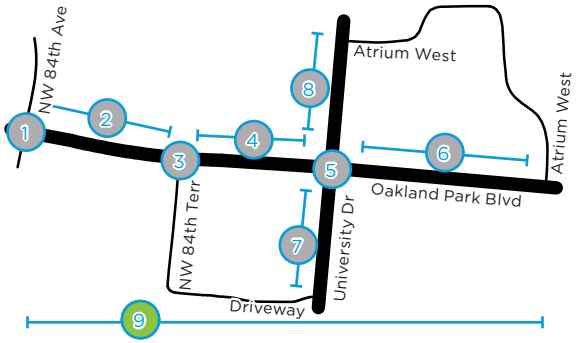
Improperly placed detectable warning surfaces and unnecessary ramp.

Improperly secured detectable warning surfaces.

Ramp to nowhere.

Cracked sidewalk.

Issue: Crosswalk Deficiencies
Location: 9 (Corridor Wide)



General Observations:

- Many of the crosswalks are faded, worn, uneven, or difficult to discern from other pavement markings.
- Crosswalks are not present for all legs of all intersections.
- The pedestrian crossing signal time is too short for slower pedestrians in some locations and crossing distances are long at some intersections.

Recommendations:

- Due to the high transit ridership along the corridor, add crosswalks across all intersection legs where possible.
- Review signal timing plans for corridor and extend pedestrian crossing times to meet minimum recommendations of 3.5 feet per second.
- Consider creating pedestrian bump outs and refuge islands to reduce pedestrian crossing distances.

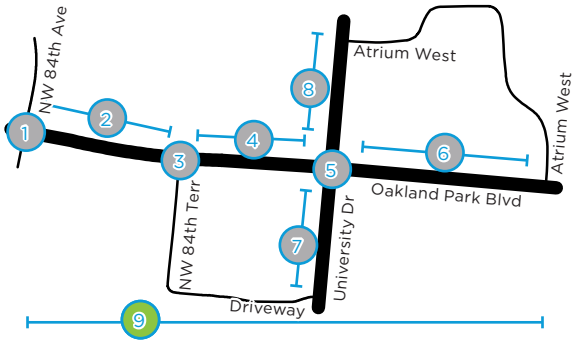

Faded crosswalk.


Missing crosswalk on west leg of NW 48th Terr.


Faded crosswalk.


Pedestrian crossing against the signal.

Issue: No Bike Lanes
Location: 9 (Corridor Wide)



General Observations:

- There are no bike lanes in the study area.
- Bicyclists ride on the narrow sidewalks, creating conflicts between bicyclists and pedestrians.
- Bicyclists were also observed riding on the sidewalk in the opposite direction of vehicles.
- These conditions create safety issues for bicyclists, especially at intersection and driveway crossings.
- The City of Sunrise Police Department has been implementing a High Visibility Enforcement campaign focused on pedestrian and bicyclist issues over the past year. This strategy utilizes a progressive enforcement approach, where officers educate, warn, and finally ticket pedestrians, bicyclists, and drivers. The focus is heavy on pedestrian interaction, with police officers making contact with over 1,000 pedestrians, 50 motorists, and 27 bicyclists.

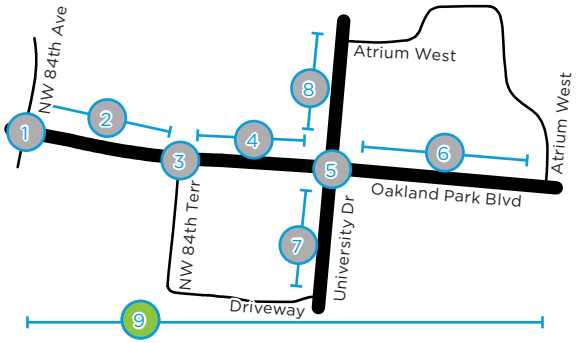
Recommendations:

- Evaluate the addition of bike lanes throughout the corridor. Ensure that the bike lanes are designed to have sufficient width to safely separate bikes from the high-speed and high-volume vehicular traffic in the study area in order to promote use of the bike lanes rather than the sidewalks. The high volumes and speeds suggest the need for protected or separated bike lanes to accommodate the needs of riders. This could potentially be done through restriping.
- Provide additional visual separation of bike lanes through buffers.
- Use green paint at intersections, driveways, or other conflict points to highlight to drivers that bicyclists may be crossing.
- Evaluate the effects of the High Visibility Enforcement campaign to determine if this kind of specialized focus worked in the study area. If so, continue to alert bicyclists of the dangers of riding on the sidewalks and to alert drivers of the need to look for bicyclists when turning in to and out of driveways. This progressive enforcement campaign where officers educate, warn, and finally ticket should extend to drivers who drive in bike lanes and bike riders who cross the street against the signal.

The lanes are wide enough in most places to fit buffered bike lanes with restriping.

There are no bike lanes, however there is a shoulder.

Issue: Driveway Frequency & Design
Location: 9 (Corridor Wide)



General Observations:

- There are a number of driveways between intersections in the study area. Many of these driveways have poorly marked crosswalks.
- Many driveways along the corridor are very wide and allow drivers to turn in and out without slowing down. Some also have right turn lanes that allow for this.
- Many drivers were observed turning out of driveways without looking for or yielding to pedestrians.
- The stop bar at some driveways is set back far from the street. Drivers pull pas the stop bar and in to the crosswalk for a better view of traffic, which causes conflicts with bicyclists and pedestrians.

Recommendations:

- Refresh pavement markings to emphasize crosswalks across driveways.
- Create an outreach campaign to alert bicyclists of the dangers of riding on the sidewalks and to alert drivers of the need to look for bicyclists when turning in to and out of driveways.
- Encourage cross access agreements between developments to limit the number of driveways approved along the corridor.
- Consider narrowing driveways where possible and ensure that driveway width is considered in development review for new developments.
- Consider whether right turn lanes are needed at every development. If not, consider where they might be able to be removed.
- Install warning signs at intersections and driveways, such as “Stop Here on Red”.
- Consider redesigning the location of the stop bar and crosswalk.

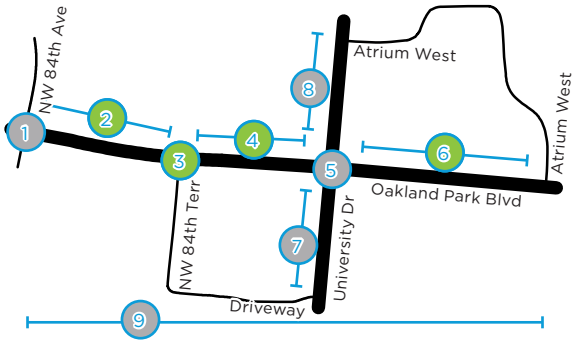
There are frequent driveways along the corridor.

High speed turn lanes into driveways are common.

Wide, channelized driveways allow cars to turn into parking lots without slowing down.

Stop bar is set far back from the road and cars pull through it for a better view of traffic.

Issue: Wide Intersections and Excessive Pavement
Location: 2, 3, 4, 6



General Observations:

- Many intersections have excessive pavement widths. This is confusing to vehicles operating the intersection – especially with poorly maintained pavement markings – and yields long crossing distances for pedestrians.

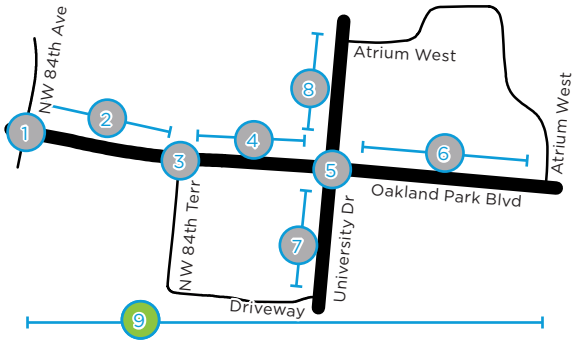
Recommendations:

- Evaluate the need for separate turn lanes and consider road diets where possible.
- Utilize excess space to incorporate bump outs, bike lanes, and other improvements to the bicycle and pedestrian realm.

Frontage road with markings that cause motorist confusion.

Excess pavement.

Issue: Driver Behavior
Location: 9 (Corridor Wide)



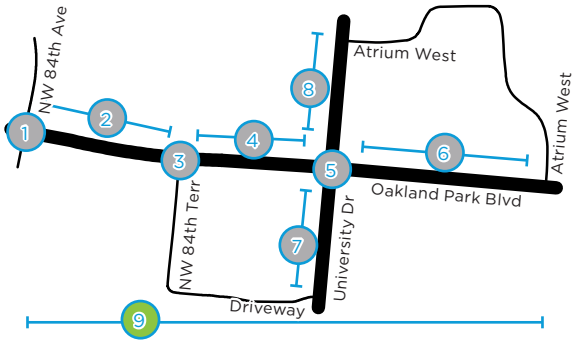
General Observations:

- Drivers turning right on red do not always look for pedestrians in crosswalks before turning.
- During field observations, several drivers almost hit pedestrians or bicyclists in the crosswalks and at driveways.
- Drivers exiting driveways do not always yield or look for pedestrians or bicyclists.
- Drivers stop in the crosswalk and block access to the sidewalks. This is sometimes due vehicles pulling through the stop bars in order to see oncoming traffic because the stop bar is set back.

Recommendations:

- Install warning signs at intersections and driveways, such as “Stop Here on Red”.
- Consider implementing “No Right Turn on Red.”
- Educate drivers on safe driving behavior through programs such as best foot forward, alert today, alive tomorrow and by working with Google and Waze.
- Create a progressive enforcement campaign where officers educate, warn, and finally ticket drivers who block crosswalks.
- Consider redesigning the location of the stop bar and crosswalk.

Issue: Pedestrian Signage Deficiencies
Location: 9 (Corridor Wide)



General Observations:

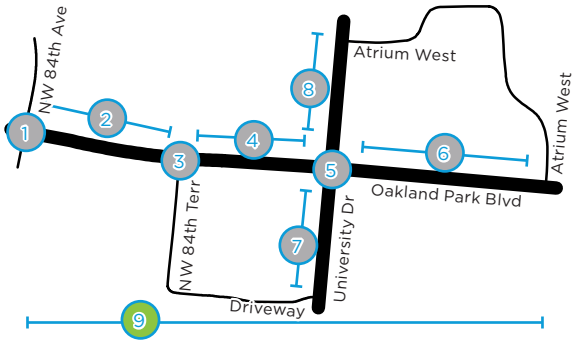
- Pedestrian signals are not functioning or the countdown signal is not working at multiple intersections.
- Many of the pedestrian signal push button signs do not provide the street names or signs with directions on how to properly use pedestrian signal heads.

Recommendations:

- Replace or fix pedestrian signals/controllers.
- Update pedestrian signal push button signs as necessary to meet standards.

Signs are out of date and either do not state which street they are referring to do not have instructions.

Issue: Signal Timing
Location: 9 (Corridor Wide)

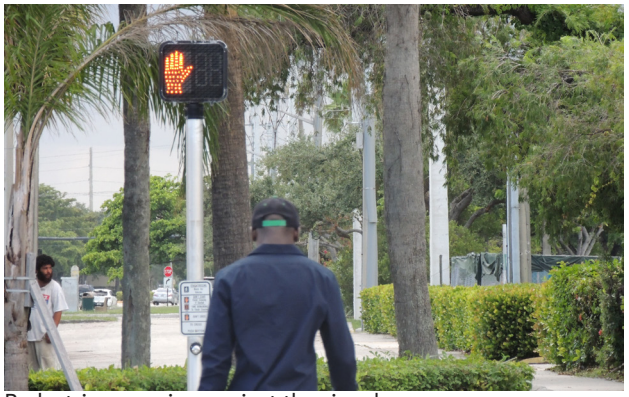


General Observations:

- Signal times are long, which causes long wait times for pedestrians when crossing the street at intersections.
- It was observed that pedestrians cross the street against the signal even in crosswalks instead of waiting for the Walk signals.

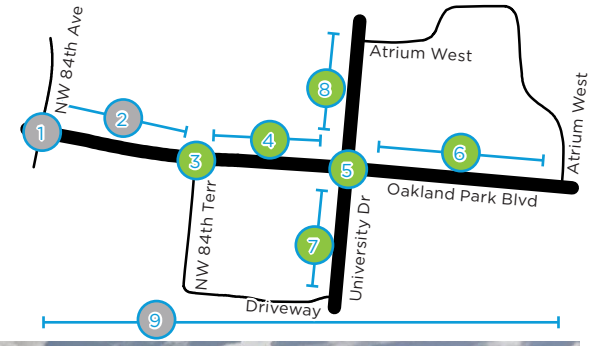
Recommendations:

- Consider retiming signals with a focus on pedestrian and bicycle mobility.



Pedestrian crossing against the signal.

Issue: Bus Stop Locations
Location: 3, 4, 5, 6, 7, 8



General Observations:

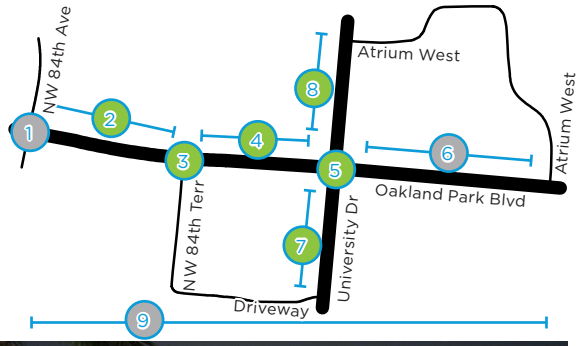
- Mid-block pedestrian crossing is a critical safety concern throughout the corridor. Many, but not all, of the observed illegal mid-block crossings result from bus stops that are not conveniently located near existing crosswalks. Alternatively, crosswalks are not conveniently located near the bus stops.

Recommendations:

- Evaluate the bus stop locations and potential mid-block crosswalk locations.
- Design mid-block crosswalks with enhanced visibility features, such as Rectangular Rapid Flash Beacons (RRFBs), to encourage use and to improve safety.

There is no crosswalk on the side of the intersection where the bus stop is located on the west leg of NW 48th Terr.

Issue: Lighting
Location: 2, 3, 4, 5, 7, 8



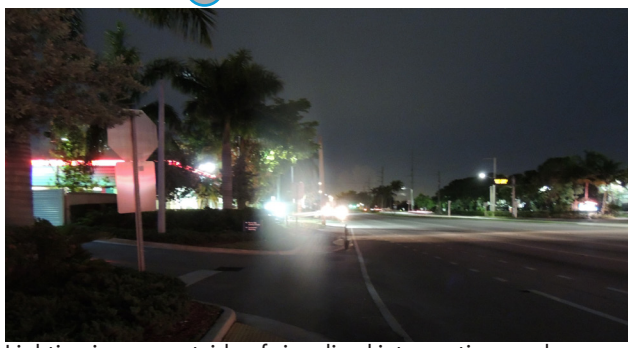
General Observations:

- Lighting is poor outside of the intersection of Oakland Park Boulevard and University Drive. That intersection was updated recently. The transition between lower and higher lighting levels is difficult at night.
- Lighting is present on only one side of the roadway between intersections.

Recommendations:

- Complete a lighting study with a focus on pedestrian lighting.
- Create an outreach campaign to alert pedestrians and bicyclists of the need to wear bright clothings at night and to use lighting.

Lighting is poor outside of signalized intersections and present only on one side of the street.



Lighting is poor outside of signalized intersections and present only on one side of the street.

SUBURBAN INTERSECTION DEMONSTRATION SITE

OAKLAND PARK BOULEVARD AT STATE ROAD 7

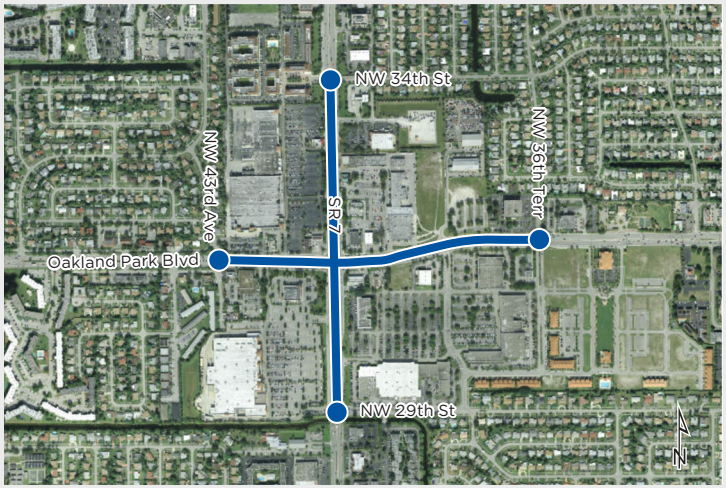
SI

SUBURBAN INTERSECTION DEMONSTRATION SITE

Oakland Park Boulevard at SR 7

Broward MPO Metropolitan Planning Organization
Bicycle & Pedestrian SAFETY ACTION PLAN

STUDY AREA | Intersection Study



CRASH DATA - 2010 TO 2015

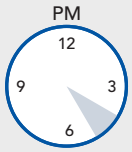
46 Pedestrian

17 Bicycle

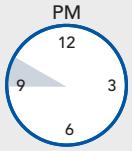
1	Fatal	1	0
49	Injury	37	12
13	Property Damage Only	8	5

Peak Crash Time Periods

13%



11%

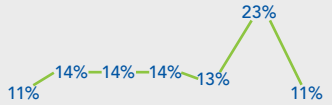


Peak Crash Months

35% Occurred in January, February, & August

Peak Crash Days of the Week

23% Occurred on Friday



S M T W T F S

32% Occurred in Non-Daylight Lighting Conditions

8% Involved Alcohol and/or Drugs

ROADWAY CHARACTERISTICS

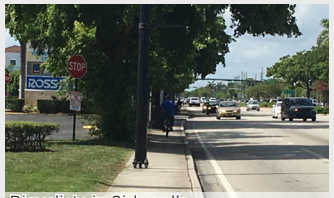
Oakland Park Boulevard Looking West

Oakland Park Boulevard and SR 7 are each 6 lane, divided roads with intermittent right- and left-turn lanes. At the intersection, each leg has dual left turn lanes and right turn lanes. The roads have cement or lightly vegetated medians and cobra style vehicular lighting. The corridor has 6' sidewalks and no marked bike lanes, although SR 7 has paved shoulders that could potentially be widened and converted into bike lanes in the future. The intersection is surrounded by large shopping centers with big box stores and out parcel development set behind expansive surface parking lots.

FIELD REVIEW OBSERVATIONS

- Illegal Mid-Block Crossings
- Inattentive Drivers (Especially at Driveways and Intersections)
- Vehicles Blocking Crosswalks
- ADA Noncompliant Sidewalks and Ramps
- No Bike Lanes
- Bicyclists Riding on Sidewalks
- Lack of Crossing Opportunities
- Objects Blocking Sidewalks
- Narrow Sidewalks
- Frequent Driveways
- Poorly Marked Driveway Crossings
- Poor Pedestrian Access to Adjacent Development
- Lack of Shade/Shelter
- Lack of Bicycle Markings at Conflict Areas
- Long Signal Times
- Buses Bunching and Stopped in Road
- Broken/Out of Date Pedestrian Signage and Signals

Pedestrians Crossing Mid-Block



Bicyclists in Sidewalk

Vehicle in Crosswalk

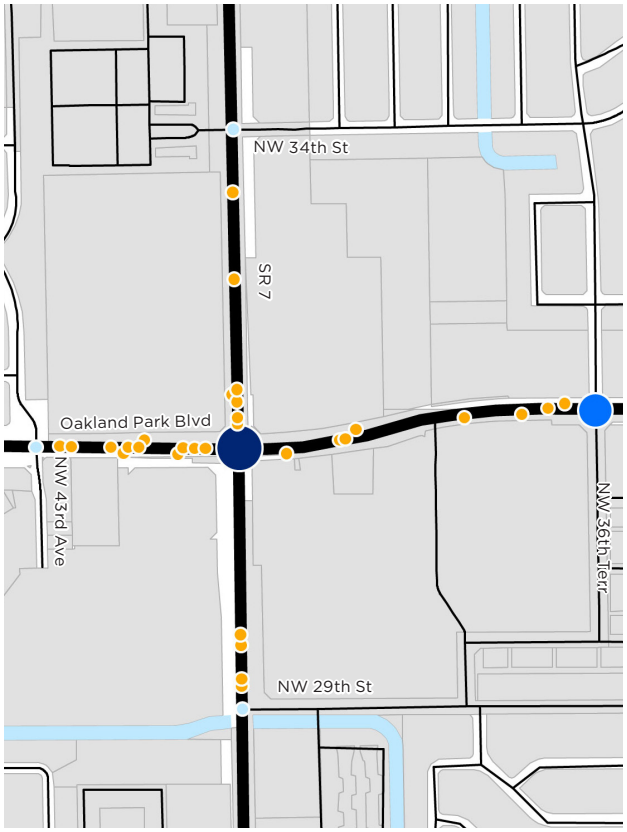
Wide Driveway

Poor Connectivity to Destinations

Poor ADA Compliance

Oakland Park Boulevard at SR 7 | Lauderdale Lakes


Oakland Park Blvd Looking West



Overview

The intersection of Oakland Park Boulevard and SR 7 was chosen as a demonstration study site for the Broward MPO Bicycle and Pedestrian Safety Action Plan (BPSAP) based on a review of its pedestrian and bicycle crash history; land uses; propensity for active transportation; transit activity; and the decisions of the BPSAP Advocacy Team. The two corridors are each 6 lane, divided roads with intermittent right- and left-turn lanes. At the intersection, each leg has dual left turn lanes and right turn lanes. The roads have cement or lightly vegetated medians and cobra style vehicular lighting. The corridor has 6' sidewalks and no marked bike lanes. The intersection is surrounded by auto-oriented shopping centers with big box stores and out parcel development set behind expansive surface parking lots. This intersection is designated as a Gateway Transit Hub by the Broward MPO, and existing plans suggest conceptual plans for redevelopment with high densities and mixed land uses.

The following review describes the results of the corridor safety review and general observations of the corridor. A field review was conducted on Monday, July 11th, 2016 from 2:00 PM to 5:00 PM and a night time field review was completed on Monday, July 11th, 2016 from 8:00 to 9:00 PM.

FIGURE 19 | SI Study Area Crashes

Legend

- 1 Segment Crash

Intersection Crash

- 1 - 5
- 11-15
- 28

Source: CARS 2010-2014 crash data; Signal Four Analytics 2010-2015 crash data

Crash Summary

Over the six-year period from 2010 through 2015, 63 pedestrian or bicyclist crashes occurred within the intersection study area. The intersection of Oakland Park Boulevard and SR 7 has one of the highest crash volumes in Broward County. 73 percent of the crashes involved a pedestrian (46 crashes), and 27 percent involved a bicyclist (17 crashes). One of these crashes resulted in a fatality (1 percent) and 19 resulted in injury (46 percent). The majority of these crashes occurred during dry and daylight conditions (89 percent and 68 percent, respectively). However, 27 percent (or 17) of the crashes occurred in dark conditions without a street light. Five of the crashes involved alcohol or drugs (8 percent). Nearly one third of all drivers involved in the crashes were 20-29 years old.

Most of the crashes occurred at or near the crosswalks of the intersections, with many of those crashes occurring just outside of crosswalks. The greatest number of crashes occurred at or near the intersection of Oakland Park Boulevard and SR 7 (23 pedestrian crashes and 7 bicycle crashes). However, it was also noted that many crashes also occurred near bus stops. For detailed crash diagrams and statistics, please see Appendix 6.


Pedestrian Crossing Illegally Mid Block at a Bus Stop

Transit Ridership & Land Use

Transit ridership is high study area. Ridership exceeds 250 riders per day at most of the bus stops around the intersection. Both Oakland Park Boulevard and SR 7 are designated for premium transit service in the future, and the intersection is intended to become a transit hub. People were regularly observed waiting at the stops during the field review, and some of the bus stops include shelters to provide shade and comfortable waiting areas for riders. Some of the stops are located far from signalized crossings and many people were observed crossing illegally mid-block at those locations.

The land uses around the intersection are auto-oriented. Big box stores, set far back from the road behind parking lots, surround the intersection. The land use pattern includes large superblocks with little internal roadway connectivity. The land uses are almost all commercial in nature, although Lauderdale Lakes is planning a mixed use town center on the south side of Oakland Park Boulevard east of NW 36th Terrace. Conceptual plans suggest that the whole area is intended to eventually be developed in a high density and mixed use manner. According to demographic data, residents in the study area also have a high propensity for traveling on foot, by bike, or on transit in comparison to the rest of the county.

Bus unloading on SR 7.

General Observations:

Throughout the study area, pedestrians tend to cross outside of marked crossings. This is especially true at or near bus stops when the bus stop is located across the street from a destination. Bicyclists also chose not to cross at intersections. However, there are long distances between signalized crossings and the signals are long, creating long wait times for pedestrians when they do reach signalized crossings. This may also lead to pedestrians crossing mid-block. In general, the pedestrian facilities do not comply with ADA requirements throughout the corridor. Other pedestrian and bicycling issues observed include: lack of any bicycle facilities, fixed objects mounted in sidewalks, missing or worn truncated domes at ramps, outdated signage at crosswalks, pedestrian signals that do not function, and vegetation obstructing the sidewalks. The median also does not prevent pedestrians from making mid-block crossings. However, drivers also tend to pull through crosswalks at red lights. There are high speed turn lanes into many businesses and few cues to cause the driver to slow down. Lighting is poor throughout the study area, except at the intersection of Oakland Park Boulevard and SR 7. There were also observed issues of buses stacking and buses parking in the street for several minutes.

FIGURE 20 | SI Study Area Transit Ridership

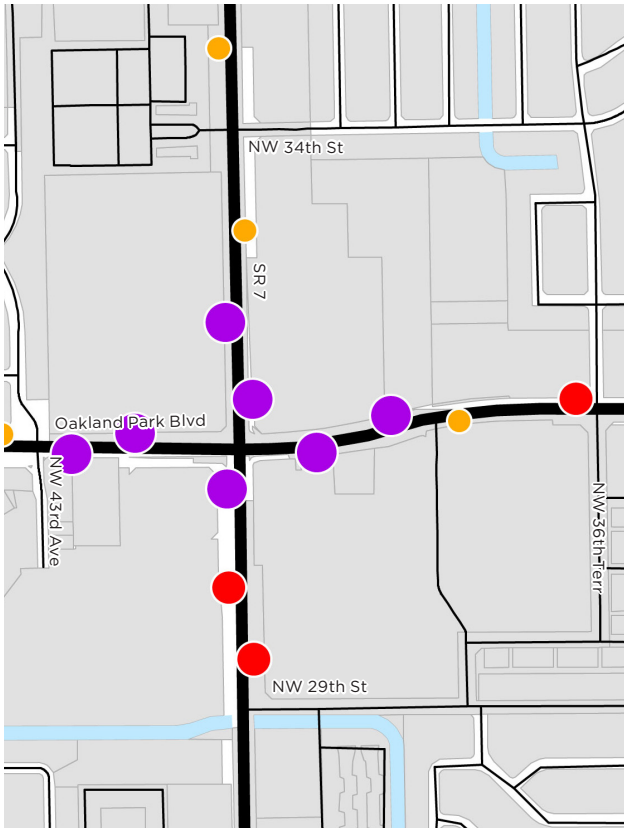
Legend

Daily Boardings + Alightings

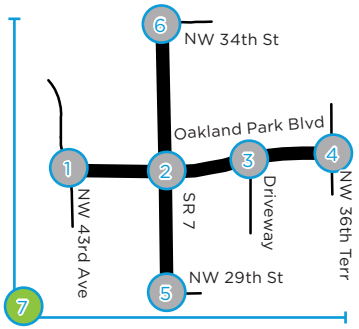
- 1 - 25
- 26 - 50
- 51 - 100
- 101 - 250
- 250 +

Source: Broward County Transit, 2015


Typical Land Uses Around the Intersection



Issue: Mid-Block Crossings
Location: 7 (Whole Area)



General Observations:

- Mid-block crossings observed at bus stops and where there are destinations on either side of the street.
- The distances between signalized crossings is very long in most locations.
- The signal times are long, which can discourage people from waiting for the signal to cross.
- In some locations, “Do Not Cross” signs have been installed, however they do not seem to have much of an impact based on field observations.

Recommendations:

- Explore locations for safe mid-block crossings and consider bi-directional median opening crosswalks and TWLTL median refuge islands.
- Install thick shrubs in the median to physically prevent pedestrians to from crossing medians mid-block.
- Consider relocating bus stops closer to crossings to create incentive for crossing at signals.
- Create a progressive enforcement campaign where officers educate, warn, and finally ticket pedestrians who cross mid-block.

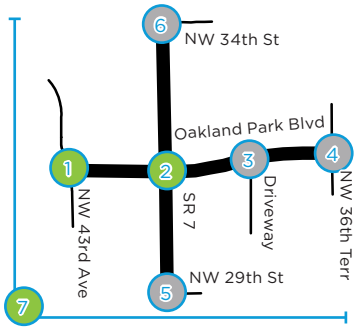
Pedestrian crossing mid-block.

Pedestrian crossing mid-block at a gap in the shrubs.

Pedestrian crossing mid-block as a vehicle approaches.

Pedestrians crossing near a crosswalk against the signal.

Issue: Pedestrian Facility Deficiencies
Location: 1, 2, 7 (Whole Area)



General Observations:

- Sidewalks are directly adjacent to travel lanes without any separation from vehicles.
- Sidewalk does not follow desire line from NW 43rd Avenue to the Walmart Driveway. There is a worn footpath between the Superstar K and Walmart.
- The sidewalk is broken in some locations, such as the NE corner of the intersection where a sandbag is placed to help fix the issue.
- Signal cabinets are located very close to the sidewalk. The cabinets can get very hot (up to 200* F) and can pose a danger to pedestrians.

Recommendations:

- Use lush landscaping to close off the medians to prevent pedestrians from making illegal mid-block crossings.
- Consider adding a landscaped buffer between the sidewalk and the street.
- Look at where pedestrians are crossing and create better connectivity to and between destinations.
- Consider wrapping signal cabinets or moving them away from pedestrians/sidewalks.

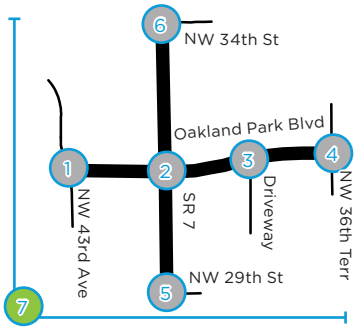
Pedestrian utilizing a worn path where a desire line exists between Superstar K and Walgreens/Walmart.

Worn path between showing a pedestrian desire line between the Superstar K and Walgreens/Walmart.

Lack of buffer between sidewalk and street and bench blocking portion of the sidewalk.

Broken sidewalk on the NE corner of the SR 7 intersection.

Issue: No Bike Lanes
Location: 7 (Whole Area)



General Observations:

- There are no bike lanes in the study area.
- Bicyclists ride on the narrow sidewalks, creating conflicts between bicyclists and pedestrians.
- Bicyclists were also observed riding on the sidewalk in the opposite direction of vehicles.
- These conditions create safety issues for bicyclists, especially at intersection and driveway crossings.
- Bicyclists cross mid block.

Recommendations:

- Evaluate the addition of bike lanes throughout the corridor. Ensure that the bike lanes are designed to have sufficient width to safely separate bikes from the high-speed and high-volume vehicular traffic in the study area in order to promote use of the bike lanes rather than the sidewalks. The high volumes and speeds suggest the need for protected or separated bike lanes to accommodate the needs of riders.
- Provide additional visual separation of bike lanes through buffers.
- Use green paint at intersections, driveways, or other conflict points to highlight to drivers that bicyclists may be crossing.
- Create an outreach campaign to alert bicyclists of the dangers of riding on the sidewalks and to alert drivers of the need to look for bicyclists when turning in to and out of driveways.
- Create a progressive enforcement campaign where officers educate, warn, and finally ticket drivers who drive in bike lanes and bike riders who cross the street against the signal.
- Install thick shrubs in the median to physically prevent bicyclists to from crossing medians mid-block.
- Create a progressive enforcement campaign where officers educate, warn, and finally ticket bicyclists who cross mid-block.

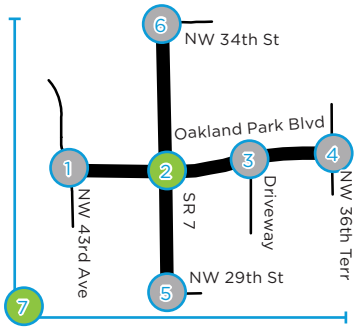
Bicyclist crossing in a crosswalk.

Bicyclist crossing in a crosswalk.

Bicyclist waiting at a signal to cross.

Bicyclists crossing mid block.

Issue: Transit Scheduling & Education, & Locations
Location: 2, 7 (Whole Area)



General Observations:

- The Lauderhill shuttle bus (operated by LSF Shuttle)'s driver was observed exiting the shuttle on the left side into the travel lane to help a wheelchair-bound passenger. Several vehicles had to stop for the bus.
- Three buses were observed to be bunched, blocking the travel lanes for the southbound through and westbound right-turn vehicles.
- One bus stopped in the travel lane for five minutes at the northwest corner of Oakland Park Boulevard at SR 7.
- Mid-block pedestrian crossing is a critical safety concern throughout the corridor. Many, but not all, of the observed illegal mid-block crossings result from bus stops that are not conveniently located near existing crosswalks. Alternatively, crosswalks are not conveniently located near the bus stops.

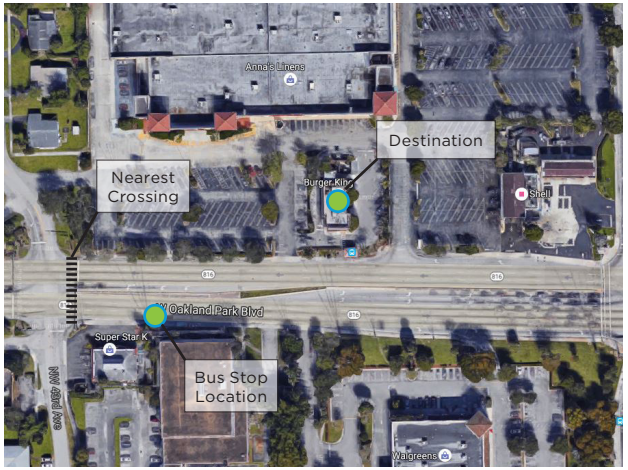
Recommendations:

- Bus driver education regarding how to safely assist passengers.
- Review bus schedules to reduce bus bunching.
- Evaluate the bus stop locations and potential mid-block crosswalk locations.
- Design mid-block crosswalks with enhanced visibility features, such as Rectangular Rapid Flash Beacons (RRFBs), to encourage use and to improve safety.

Driver helps wheelchair-bound passenger onto bus.

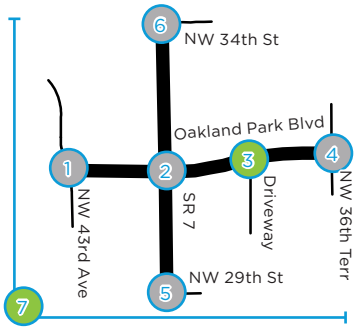
The bus stops are heavily utilized in the corridor.


Buses bunching south of Oakland Park Boulevard on SR 7.



This bus stop is located closer to the destination than the nearest crossing. Many pedestrians were observed crossing mid-block to access the Burger King. Relocating it to the other side of the crosswalk could help to encourage pedestrians to use the crosswalk.

Issue: Driveway Frequency & Design
Location: 3, 7 (Whole Area)



General Observations:

- There are a number of driveways between intersections in the study area. Many of these driveways have poorly marked crosswalks.
- Many driveways along the corridor are very wide and allow drivers to turn in and out without slowing down. Some also have right turn lanes that allow for this.
- Many drivers were observed turning out of driveways without looking for or yielding to pedestrians.
- The stop bar at some driveways is set back far from the street. Drivers pull pas the stop bar and in to the crosswalk for a better view of traffic, which causes conflicts with bicyclists and pedestrians.

Recommendations:

- Refresh pavement markings to emphasize crosswalks across driveways.
- Create an outreach campaign to alert bicyclists of the dangers of riding on the sidewalks and to alert drivers of the need to look for bicyclists when turning in to and out of driveways.
- Encourage cross access agreements between developments to limit the number of driveways approved along the corridor.
- Consider narrowing driveways where possible and ensure that driveway width is considered in development review for new developments.
- Consider whether right turn lanes are needed at every development. If not, consider where they might be able to be removed.
- Install warning signs at intersections and driveways, such as “Stop Here on Red”.
- Consider redesigning the location of the stop bar and crosswalk.

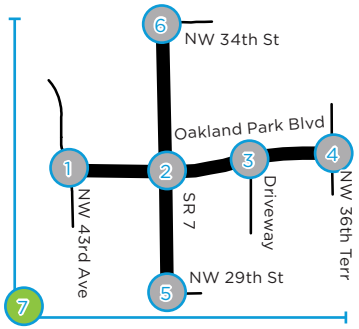
Wide driveway with a vehicle turning in front of crossing pedestrians. This vehicle did not slow down when turning.


Wide driveway.


Channelized, high speed driveway.

Vehicle pulling past stop bar because it is too far back.

Issue: Driver Behavior
Location: 7 (Whole Area)



General Observations:

- Drivers turning right on red do not always look for pedestrians in crosswalks before turning.
- During field observations, several drivers almost hit pedestrians or bicyclists in the crosswalks and at driveways.
- Drivers exiting driveways do not always yield or look for pedestrians or bicyclists.
- Drivers stop in the crosswalk and block access to the sidewalks. This is sometimes due vehicles pulling through the stop bars in order to see oncoming traffic because the stop bar is set back.

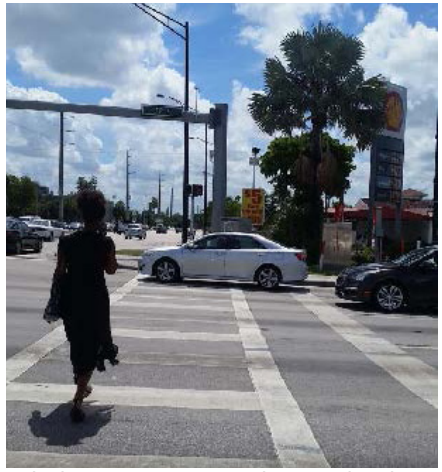
Recommendations:

- Install warning signs at intersections and driveways, such as “Stop Here on Red”.
- Consider implementing “No Right Turn on Red.”
- Educate drivers on safe driving behavior through programs such as best foot forward, alert today, alive tomorrow and by working with Google and Waze.
- Create a progressive enforcement campaign where officers educate, warn, and finally ticket drivers who block crosswalks.
- Consider redesigning the location of the stop bar and crosswalk.

Vehicle waiting to turn right on red in the crosswalk while pedestrians have a the walk signal.

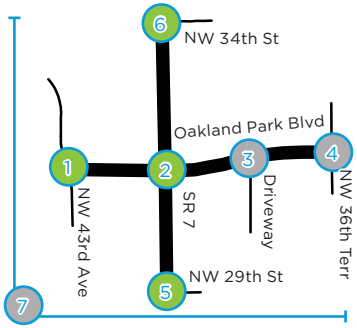
Vehicle pulling past stop bar because it is too far back.

Vehicle waiting to turn right on red in the crosswalk while pedestrians have a the walk signal.



Vehicle waiting to turn right on red in the crosswalk while pedestrian walks with the walk signal.

Issue: Pedestrian Signage Deficiencies
Location: 1, 2, 5, 6



General Observations:

- Pedestrian signals are not functioning or the countdown signal is not working at multiple intersections (1, 5, 6).
- Many of the pedestrian signal push button signs do not provide the street names.
- Many people do not know state road numbers if streets have other names, and some push buttons still refer to state road numbers.

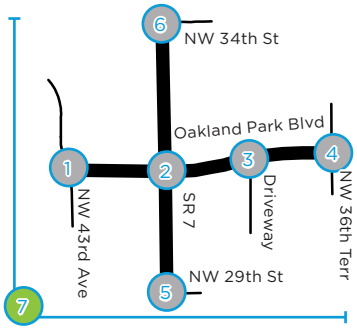
Recommendations:

- Replace or fix pedestrian signals/controllers.
- Update pedestrian signal push button signs as necessary to meet standards.

Signs are out of date and either do not state which street they are referring to or utilize state road number as opposed to common name.

Pedestrian signals are not working at NW 34th Street.

Issue: Signal Timing
Location: 7 (Whole Area)



General Observations:

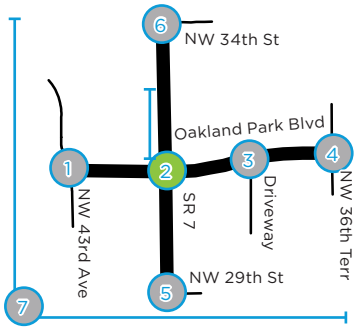
- Signal times are long, which causes long wait times for pedestrians when crossing the street at intersections.
- It was observed that pedestrians cross the street against the signal even in crosswalks instead of waiting for the Walk signals.

Recommendations:

- Consider retiming signals with a focus on pedestrian and bicycle mobility.

Pedestrians crossing against the signal.

Issue: Roadway Striping Utilization
Location: 2 (northeast segment)



General Observations:

- The southbound turn lane is striped out north of the intersection of Oakland Park and SR 7, however people drive through it.

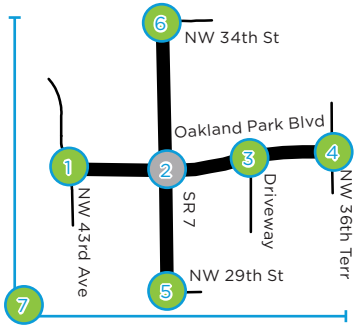
Recommendations:

- Consider creating a bulb out/transit stop so that transit can stop on the street for better loading and unloading at this high volume stop. This could be done permanently with curb or temporarily with plastic bollards.

Driver driving in striped out area.

Striped out area that could become a transit bulb out.

Issue: Lighting
Location: 1, 3, 4, 5, 6, 7 (Whole Area, Excluding 2)



General Observations:

- Lighting is poor outside of the intersection of Oakland Park Boulevard and SR 7. That intersection was updated recently. The transition between lower and higher lighting levels is difficult at night.
- Lighting is present on only one side of the roadway between intersections.

Recommendations:

- Complete a lighting study with a focus on pedestrian lighting.
- Create an outreach campaign to alert pedestrians and bicyclists of the need to wear bright clothings at night and to use lighting.

Lighting is poor outside of signalized intersections and present only on one side of the street.

Lighting is good within the intersection of Oakland Park Boulevard and SR 7.

RECOMMENDATIONS

Engineering Countermeasures

This section discusses a variety of bicycle and pedestrian countermeasures based on “5Es concept.” The systemic countermeasures can be implemented throughout Broward County to improve bicycle and pedestrian safety while the other strategies are generally site specific. **Figure 21** shows recommended engineering countermeasures for five “demonstration sites” identified through crash hot spot analysis that include different geographic areas, land uses and facility types available throughout Broward County. Some of the engineering solutions included in **Figure 21** to address bicycle and pedestrian safety require engineering studies and detailed analysis to evaluate their feasibility. Further, these engineering improvements can be implemented in other locations in the County with appropriate modifications.

FIGURE 21 | Recommended Engineering Countermeasures

Crash Hot Spot	Issue	Location(s)	Recommended Engineering Countermeasures
Hallandale Beach Boulevard (NE 4th Ave. to NE 26th Ave.)	Bike Lane Deficiencies	13 (Corridor Wide)	Conduct a feasibility study to accommodate buffered or protect bicycle lanes in this corridor.
			Repaint pavement markings.
			Provide additional visual separation of bike lanes through buffers.
			Use green paint at intersections, driveways, or other conflict points to highlight to drivers that bicyclists may be crossing.
	Fixed-Objects in Sidewalks	13 (Corridor Wide)	Relocate fixed objects of sidewalks or provide additional sidewalk width to bypass. There should be a minimum of 4-feet clearance around fixed objects in accordance with forthcoming Public Right of Way Accessibility Guidelines.
	Driveway Frequency and Design	13 (Corridor Wide)	Refresh pavement markings to emphasize driveway locations.
			Use green paint at intersections, driveways, or other conflict points to highlight to drivers that bicyclists may be crossing.
			Upgrade sidewalks at driveways to meet ADA requirements.
			Consider narrowing driveways where possible and ensure that driveway width is considered in development review for new developments.
	Noncompliant ADA Sidewalks and Ramps	13 (Corridor Wide)	Update all ADA ramps along corridor to meet requirements.
			Relocate pedestrian signal push button near crosswalks.
			Expand sidewalk network to connect sidewalks with safe driveway crossings.
	Drainage/Flooding	1, 2, 3, 5, 6, 9	Update drainage system throughout corridor.
	Pedestrian Facility Deficiencies	2, 3, 4, 5, 8, 9, 12	Review signal timing plans for corridor and extend pedestrian crossing times to meet minimum requirements.
			Add crosswalks to intersection legs where possible.
			Use landscaping to close of the medians to prevent pedestrians from making illegal mid-block crossings.
			Consider moving the eastbound bus stop that is located about one-half block east of Three Islands Boulevard closer to Three Islands Blvd to better facilitate access to Walmart.
			Consider adding a landscaped buffer between the sidewalk and the street.
	Skewed Intersection Geometry	2, 3	Reconstruct intersections to align north and south legs.
	Out-of-Date Pedestrian Signal Signage	1, 2, 5, 7, 10	Update pedestrian signal push button signs as necessary to meet standards.
			Upgrade bike lane signage to alert drivers of the presence of bicyclists and to encourage the use of the bike lanes instead of the sidewalks.
			Upgrade pedestrian crossing signs and add Rectangular Rapid Flash Beacons (RRFBs) at the mid-block crosswalk east of SE 16th Avenue.
	Obstructed Views at Crosswalks	2, 3, 4	Cut back vegetation or move objects blocking views.
	Signal Timing	13 (Corridor Wide)	Consider retiming signals with a focus on pedestrian and bicycle mobility.

Crash Hot Spot	Issue	Location(s)	Recommended Engineering Countermeasures
Sunrise Boulevard (NE 13th Ave. to Middle River)	No Bike Lanes	14 (Corridor Wide)	Evaluate the addition of buffered or protected bike lanes throughout the corridor.
			Provide additional visual separation of bike lanes through buffers.
			Use green paint at intersections, driveways, or other conflict points to highlight to drivers that bicyclists may be crossing.
	Narrow Sidewalks and Obstructions	14 (Corridor Wide)	Widen sidewalks to meet or exceed ADA standard minimum width (6 feet if at back of curb) or add landscaped buffer between sidewalk and street.
			Relocate fixed objects of sidewalks or provide additional sidewalk width to bypass. There should be a minimum of 4-feet clearance around fixed objects in accordance with forthcoming Public Right of Way Accessibility Guidelines.
	Noncompliant ADA Sidewalks and Ramps	3, 14 (Corridor Wide)	Update all ADA ramps along corridor to meet requirements.
			Expand sidewalk network to connect sidewalks with safe driveway crossings.
			Move the drainage inlet on the northwest corner of NE 15th Avenue away from ramp.
	Driveway Frequency and Design	14 (Corridor Wide)	Refresh pavement markings to emphasize crosswalks across driveways.
			Consider narrowing driveways where possible and ensure that driveway width is considered in development review for new developments.
			Consider whether right turn lanes are needed at every development. If not, consider where they might be able to be removed.
	Driver Behavior	14 (Corridor Wide)	Install warning signs at intersections and driveways, such as “Stop Here on Red”.
			Consider implementing “No Right Turn on Red.”
			Consider redesigning the location of the stop bar and crosswalk.
	Lack of Shade and Shelter	14 (Corridor Wide)	Upgrade bus stops to provide seating and shelter for users.
			Evaluate options to provide shade and shelter at intersections to encourage pedestrians to use crosswalks.
	Limited Crossing Opportunities	10, 11, 12, 13, 14 (Corridor Wide)	Study realignment of the Gateway intersection to allow for an east/west crossing on the north leg.
			Explore locations for safe mid-block crossings and consider bi-directional median opening crosswalks and TWLTL median refuge islands such as on Federal Highway just north of Sunrise Boulevard.
	Drainage/Flooding	3	Update drainage system throughout corridor.
	Poor Lighting	14 (Corridor Wide)	Complete a lighting study with a focus on pedestrian lighting.
	Crosswalk Deficiencies	14 (Corridor Wide)	Due to the high pedestrian volumes along the corridor, add crosswalks across all intersection legs.
	Median Design	14 (Corridor Wide); NE 15th Ave to NW 17th Terr	Use landscaping to close of the medians to prevent pedestrians from making illegal mid-block crossings.
	Bus Stop Locations	14 (Corridor Wide)	Evaluate the bus stop locations and potential mid-block crosswalk locations.
			Design mid-block crosswalks with enhanced visibility features, such as Rectangular Rapid Flash Beacons (RRFBs), to encourage use and to improve safety.
	Signal Timing	13 (Corridor Wide)	Consider retiming signals with a focus on pedestrian and bicycle mobility.

Crash Hot Spot	Issue	Location(s)	Recommended Engineering Countermeasures
Oakland Park Boulevard (NW 43rd Ave. to NW 36th Terr) and SR 7 (NW 29th St. to NW 34th St.)	Mid-Block Crossings	7 (Whole Area)	Explore locations for safe mid-block crossings and consider bi-directional median opening crosswalks and TWLTL median refuge islands.
			Install thick shrubs in the median to physically prevent pedestrians to from crossing medians mid-block.
			Consider relocating bus stops closer to crossings to create incentive for crossing at signals.
	Pedestrian Facility Deficiencies	1, 2, 7 (Whole Area)	Use lush landscaping to close of the medians to prevent pedestrians from making illegal mid-block crossings.
			Consider adding a landscaped buffer between the sidewalk and the street.
			Look at where pedestrians are crossing and create better connectivity to and between destinations.
			Consider wrapping signal cabinets or moving them away from pedestrians/sidewalks.
	No Bike Lanes	7 (Whole Area)	Evaluate the addition of buffered or protected bike lanes throughout the corridor.
			Provide additional visual separation of bike lanes through buffers.
			Use green paint at intersections, driveways, or other conflict points to highlight to drivers that bicyclists may be crossing.
			Install thick shrubs in the median to physically prevent bicyclists to from crossing medians mid-block.
	Bus Stop Locations	17 (Whole Area)	Evaluate the bus stop locations and potential mid-block crosswalk locations.
			Design mid-block crosswalks with enhanced visibility features, such as Rectangular Rapid Flash Beacons (RRFBs), to encourage use and to improve safety.
	Driveway Frequency and Design	3, 7 (Whole Area)	Refresh pavement markings to emphasize crosswalks across driveways.
			Consider narrowing driveways where possible and ensure that driveway width is considered in development review for new developments.
			Consider whether right turn lanes are needed at every development. If not, consider where they might be able to be removed.
			Consider redesigning the location of the stop bar and crosswalk.
			Install warning signs at intersections and driveways, such as “Stop Here on Red”.
	Driver Behavior	7 (Whole Area)	Install warning signs at intersections and driveways, such as “Stop Here on Red”.
			Consider implementing “No Right Turn on Red.”
			Consider redesigning the location of the stop bar and crosswalk.
	Pedestrian Signage Deficiencies	1, 2, 5, 6	Replace or fix pedestrian signals/controllers.
			Update pedestrian signal push button signs as necessary to meet standards.
	Signal Timing	7 (Whole Area)	Consider retiming signals with a focus on pedestrian and bicycle mobility.
	Roadway Striping Utilization	2 (northeast segment)	Consider creating a bulb out/transit stop so that transit can stop on the street for better loading and unloading at this high volume stop. This could be done permanently with curb or temporarily with plastic bollards.
	Lighting	1, 3, 4, 5, 6, 7 (Whole Area, excluding 2)	Complete a lighting study with a focus on pedestrian lighting.

Crash Hot Spot	Issue	Location(s)	Recommended Engineering Countermeasures
Oakland Park Boulevard (NW 84th Ave. to Atrium West) and University Drive	Mid-Block Crossings	9 (Whole Area)	Explore locations for safe mid-block crossings and consider bi-directional median opening crosswalks and TWLTL median refuge islands.
			Install thick shrubs in the median to physically prevent pedestrians to from crossing medians mid-block.
			Consider relocating bus stops closer to crossings to create incentive for crossing at signals.
	Noncompliant ADA Sidewalks and Ramps	9 (Whole Area)	Update all ADA ramps along corridor to meet requirements.
			Relocate pedestrian signal push buttons to achieve proper separation and proximity to crosswalks.
			Expand sidewalk network to connect sidewalks with safe driveway crossings.
	Crosswalk Deficiencies	9 (Whole Area)	Due to the high transit ridership along the corridor, add crosswalks across all intersection legs where possible.
			Review signal timing plans for corridor and extend pedestrian crossing times to meet minimum recommendations of 3.5 feet per second
			Consider creating pedestrian bump outs and refuge islands to reduce pedestrian crossing distances.
	No Bike Lanes	9 (Whole Area)	Evaluate the addition of buffered or protected bike lanes throughout the corridor.
			Provide additional visual separation of bike lanes through buffers.
			Use green paint at intersections, driveways, or other conflict points to highlight to drivers that bicyclists may be crossing.
	Driveway Frequency and Design	9 (Whole Area)	Refresh pavement markings to emphasize crosswalks across driveways.
			Consider narrowing driveways where possible and ensure that driveway width is considered in development review for new developments.
			Consider whether right turn lanes are needed at every development. If not, consider where they might be able to be removed.
			Install warning signs at intersections and driveways, such as “Stop Here on Red”.
			Consider redesigning the location of the stop bar and crosswalk.
	Wide Intersections and Excessive Pavement	2, 3, 4, 6	Evaluate the need for separate turn lanes and consider road diets where possible.
			Utilize excess space to incorporate bump outs, bike lanes, and other improvements to the bicycle and pedestrian realm.
	Driver Behavior	9 (Whole Area)	Install warning signs at intersections and driveways, such as “Stop Here on Red”.
			Consider implementing “No Right Turn on Red.”
			Consider redesigning the location of the stop bar and crosswalk.
	Pedestrian Signage Deficiencies	9 (Whole Area)	Replace or fix pedestrian signals/controllers.
			Update pedestrian signal push button signs as necessary to meet standards.
	Signal Timing	9 (Whole Area)	Consider retiming signals with a focus on pedestrian and bicycle mobility.
	Bus Stop Locations	3, 4, 5, 6, 7, 8	Evaluate the bus stop locations and potential mid-block crosswalk locations.
			Design mid-block crosswalks with enhanced visibility features, such as Rectangular Rapid Flash Beacons (RRFBs), to encourage use and to improve safety.
	Lighting	2, 3, 4, 5, 7, 8	Complete a lighting study with a focus on pedestrian lighting.

Crash Hot Spot	Issue	Location(s)	Recommended Engineering Countermeasures
Oakland Park Boulevard (NW 84th Ave. to Atrium West) and University Drive	Mid-Block Crossings	11 (Whole Area)	Identify opportunities for safe mid-block crossings; consider bi-directional median opening crosswalks and TWLTL median refuge islands.
			Install thick shrubs in the median to physically prevent pedestrians to from crossing medians mid-block.
			Consider relocating bus stops closer to crossings to create incentive for crossing at signals.
	No Bike Lanes	11 (Whole Area)	Evaluate the addition of bike lanes, preferably protected bike lanes or buffered bike lanes
			Use green paint at intersections, driveways, or other conflict points to highlight to drivers that bicyclists may be crossing
	Pedestrian Facility Deficiencies	2, 3, 6, 11 (Whole Area)	Consider adding a landscaped buffer between the sidewalk and the street
			Look at where pedestrians are crossing and create better connectivity to and between destinations
			Relocate fixed objects off of sidewalks or provide additional sidewalk width to provide at least 4-feet clearance
	Noncompliant ADA Sidewalks and Ramps	11 (Whole Area)	Update all ADA ramps along corridor to meet requirements
			Relocate pedestrian signal push buttons to achieve proper separation and proximity to crosswalks
			Expand sidewalk network to connect sidewalks with safe driveway crossings
	Wide Intersections and Excessive Pavement	3, 5, 6	Evaluate the need for separate turn lanes and consider road diets where possible
			Utilize excess space to incorporate bump outs, bike lanes, and other improvements to the bicycle and pedestrian realm
	Driver Behavior	11 (Whole Area)	Install warning signs at intersections and driveways, such as “Stop Here on Red”
			Consider implementing “No Right Turn on Red”
			Consider redesigning the location of the stop bar and crosswalk
	Pedestrian Signage Deficiencies	11 (Whole Area)	Replace or fix pedestrian signals/controllers
			Update pedestrian signal push button signs as necessary to meet standards
	Signal Timing	11 (Whole Area)	Consider retiming signals with a focus on pedestrian and bicycle mobility
	Delivery Trucks		Evaluate the locations of loading and unloading areas
			Enforce the use of loading and unloading areas
	Lighting	11 (Whole Area)	Implement the recommendations of FDOT’s 2015 safety study. The study recommends installing six additional lights along Broward Boulevard
			Complete a lighting study on Andrews Avenue with a focus on pedestrian lighting

Programmed Projects

A thorough review of the Broward MPO's Transportation Improvement Program (TIP) and of the Florida Department of Transportation (FDOT) Five-Year Work Program for Fiscal Years 2017/2018 – 2021/2022 was performed. The objective was to identify any phase of programmed projects, within that five-year time frame, for the roadway segments identified as crash hot spots in the Bike/Ped Safety Action Plan.

Figure 22 lists each project that could potentially be used to implement some of the recommendations listed under the engineering countermeasures. The process for implementation will involve the incorporation of bicycle- and pedestrian-friendly geometric design features into the scope of work of the identified projects to be designed and constructed by FDOT.

FIGURE 22 | Programmed Projects

Crash Hot Spot	Demonstration Site	Programmed Project	FM Number	Timeframe	Phase	Implementing Agency	Type of Work	Contact
Sunrise Boulevard from NW 13th Street to Middle River	Urban Corridor						FM # 428726-1 - 3R project in FY 2014/15 from Broward Boulevard to NE 17th Street, implemented sharrows on NE 11th Street parallel to Sunrise Boulevard; City of Fort Lauderdale is in the process of re-designing NE 15th Avenue cross-section to accommodate lane elimination and bike lanes	City of Fort Lauderdale's Lake Ridge Neighborhood Mobility Master Plan identifies several bicycle and pedestrian improvements in this corridor; FDOT is in the process of evaluating design concepts for US 1 at Gateway intersection
		SR-838/Sunrise Boulevard @ NW 16th Avenue	439159-1	FY 17/18, FY 18/19 & FY 19/20	ROW ($0.5M & $0.1M)/CST ($0.7M)	FDOT	Traffic signals	FDOT PM: Hughes
Oakland Park at SR 7	Suburban Intersection	SR-7/US-441, Transit Corridor, From Broward Miami Dade County Line to Sample Road	429576-1	FY 18/19	PE ($1.03M)	FDOT	Urban corridor improvements	FDOT PM: Lopes
		Lauderdale Lakes Mobility Improvements	435781-2	FY 18/19	CST ($2.8M)	FDOT	Intermodal hub capacity	FDOT PM: Dorvil

Crash Hot Spot	Demonstration Site	Programmed Project	FM Number	Timeframe	Phase	Implementing Agency	Type of Work	Contact
Oakland Park from NW 84th Avenue to Atrium West	Suburban Corridor	SR-816/Oakland Park Boulevard from Sawgrass Expressway to SR-A1A	429569-1	FY 17/18	PE ($0.04M)	FDOT	Urban corridor improvements	FDOT PM: Basnet
		SR-816/Oakland Park Boulevard from SR-817/ University Drive to SR-5/US-1	429569-4	FY 18/19	CST ($1.2M)	FDOT	Urban corridor improvements	FDOT PM: Basnet
		SR-817/University Drive from SR-816/Oakland Park Boulevard to SR-870/Commercial Boulevard	437731-1	FY 18/19	CST ($1.0M)	FDOT	Lighting improvements	FDOT PM: Hughes
		SR-817/University Drive from SR-858/ Hallandale Beach Boulevard to SR-834/Sample Road	432066-3	FY17/18	PE ($0.074M)	FDOT	Preliminary design	FDOT PM: Hughes
Broward Boulevard at Andrews Avenue	Urban Intersection	SR 842/Broward Boulevard from NW 15th Avenue to SR-5/US-1	428724-1	FY 17/18	CST ($0.07)	FDOT	Resurfacing	FDOT PM: Wallace
		Las Olas Boulevard from Andrews Avenue to NE 15th Street	431669-1	FY 17/18 & FY 19/20	PE ($0.80M)/ CST ($3.2M)	FDOT	Bike lane and sidewalk	FDOT PM: Jasmin

FIGURE 23 | FDOT Work Program "Boxed Items"

Programmed Project	FM Number	Timeframe	Phase	Implementing Agency	Type of Work	Contact
MEDIAN CROSSING DETERRENT/ PEDESTRIAN BARRIER	441450-1	FY17/18	PE ($0.05M)/ CST ($0.35M)	FDOT	Landscaping	FDOT PM: Hassett
BROWARD COUNTY RESERVE BOX FOR LOCAL INITIATIVES PROJECTS	435206-1	FY 21/22	CST ($6.8M)	FDOT	Miscellaneous	-
BROWARD RESERVE FOR FUTURE PROJECTS	440866-1	FY 18/19, FY 19/20 & FY 21/22	CST ($0.6M & $1.3M, $50.0M)	FDOT	-	FDOT PM: Adams

As shown in **Figure 23,** in addition to the specific projects identified in the crash hot spot locations, FDOT also programmed non-project specific "boxes" for the latter years of the work program. Projects related to the specific recommendations of the Broward MPO's Bicycle and Pedestrian Safety Action Plan (BPSAP) that cannot be incorporated into the scope of an existing specific roadway programmed project could then be prioritized to be eligible for some of the box funds. Further prioritization criteria could serve as the basis for programming those remedial improvements.

Project Prioritization Criteria

The following five evaluation criteria are recommended to prioritize bicycle and pedestrian safety projects for programming and implementation purposes:

- Number of bicycle/pedestrian crashes - The most significant factor in determining patterns and need for remedial action. Based on total number rather than rates given that the overall number of bikes and pedestrians at any given location is limited.
- Crash Modification Factor (CMF) or Crash Reduction Factor (CRF) – An indicator of the type of improvement that would be most suited for the type of crashes and the specific location.
- Benefit Cost Ratio – The most traditional prioritization criteria is a measure of the efficiency and suitability of the type of remedial action being proposed for any given location.
- Synergy with Adopted Plans – Projects that are more in line with Complete Streets-type plans for cities and neighborhoods, complement Broward MPO's Complete Streets Master Plan and adopted Long Range Transportation Plan (LRTP) would have preference and a higher priority for implementation.
- Community Support – To ensure that projects that favor pedestrians and bicyclists have the full support of the elected officials, residents and stakeholders in general. In some cases, these projects can only be implemented at the expense of higher speed automobile traffic, which can cause conflict.

Performance Measures Monitoring

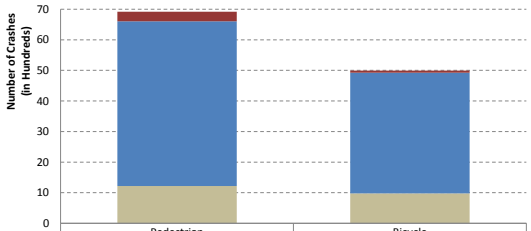
Safety is the determinant factor in evaluating the success of any Pedestrian/ Bicycle facility improvement program. The performance measures more readily suited to that evaluation are listed below:

- Crashes or Crash Rate - Actual number of bicycle and pedestrian crashes is a more appropriate and effective measure than Crash Rate given the relative low number of pedestrian and bicyclist using the facilities.
- Crash severity – Injury crashes and crashes involving fatalities, by their very nature, become the target of any performance evaluation program as they are the main type of crashes aimed to be addressed by the high Benefit/Cost projects selected to be implemented.
- Utilization: Number of bicyclist and pedestrians – The perception by the users that the facility is safer after the implementation of the specifically targeted project would be a good indicator of the appropriateness of the implemented project. A higher use of the facility by pedestrians and/or bicyclists would be a good indicator of success.

These performance measures are generally consistent with Broward MPO's Complete Streets Evaluation Toolkit.

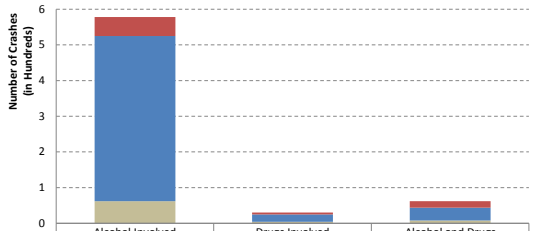
APPENDIX 1
DETAILED CRASH SUMMARIES

Crashes by Type and Severity



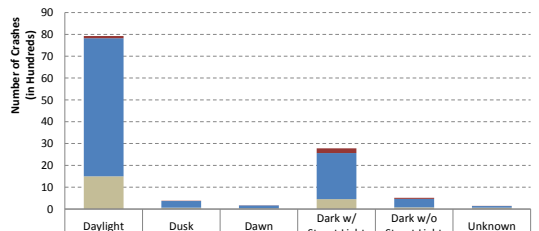
	Pedestrian	Bicycle
Fatal	312	69
Injury	5387	3944
PDO	1217	979

Alcohol and Drug Related Crashes



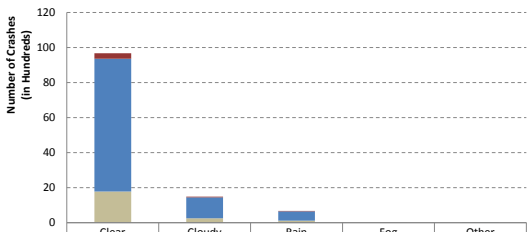
	Alcohol Involved	Drugs Involved	Alcohol and Drugs
Fatal	53	5	18
Injury	463	21	36
PDO	62	4	8

Crashes by Lighting Condition



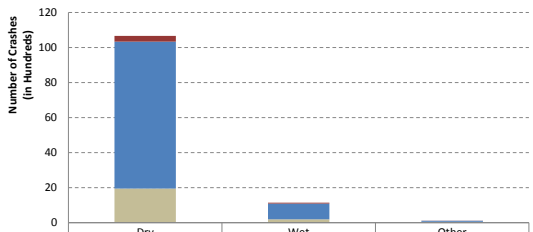
	Daylight	Dusk	Dawn	Dark w/ Street Light	Dark w/o Street Light	Unknown
Fatal	102	13	7	212	45	2
Injury	6323	299	134	2112	392	71
PDO	1502	67	30	455	76	66

Crashes by Weather Condition



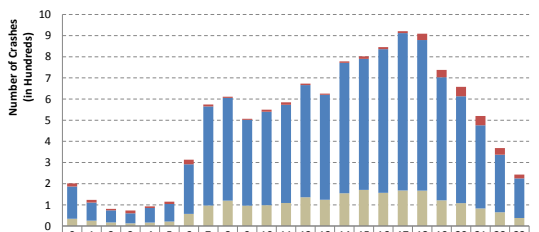
	Clear	Cloudy	Rain	Fog	Other
Fatal	308	48	25	0	0
Injury	7581	1187	531	6	19
PDO	1780	254	119	2	14

Crashes by Surface Condition



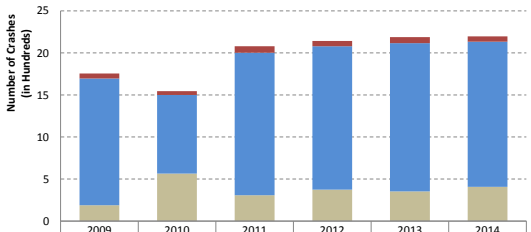
	Dry	Wet	Other
Fatal	328	51	2
Injury	8381	897	53
PDO	1953	191	52

Crashes by Time of Day



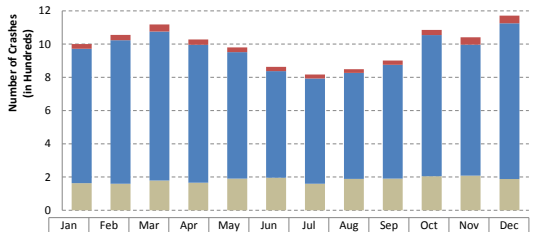
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Fatal	14	12	7	13	8	11	21	9	5	5	10	12	7	6	7	12	10	9	30	35	45	44	31	18
Injury	153	86	57	47	69	83	235	468	486	406	442	464	530	496	616	619	679	744	712	582	505	393	272	187
PDO	34	25	17	13	16	21	57	97	120	96	98	109	136	124	155	171	157	168	167	121	108	83	65	38

Crashes by Year



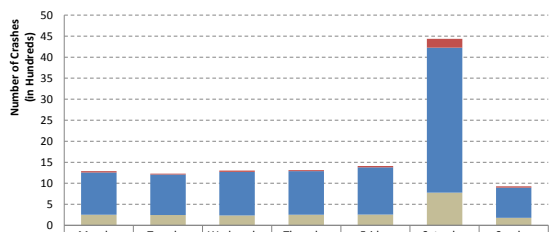
	2009	2010	2011	2012	2013	2014
Fatal	61	45	76	64	72	63
Injury	1506	935	1696	1705	1762	1727
PDO	189	565	307	374	354	407

Crashes by Month



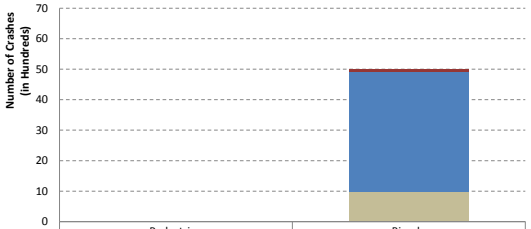
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Fatal	28	32	42	32	28	26	24	22	26	31	44	46
Injury	809	863	897	830	761	641	633	638	684	849	789	937
PDO	163	160	179	166	191	196	160	189	191	205	208	188

Crashes by Day of Week



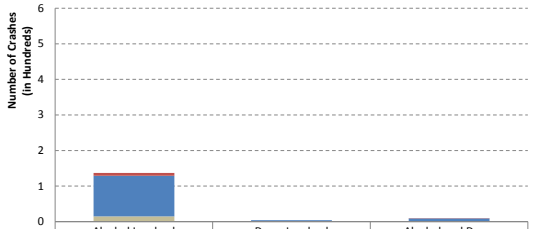
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Fatal	31	23	33	24	31	210	29
Injury	1005	962	1037	1036	1125	3447	719
PDO	253	245	233	253	255	778	179

Crashes by Type and Severity



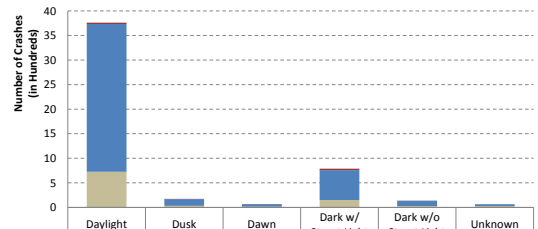
	Pedestrian	Bicycle
Fatal	0	69
Injury	0	3944
PDO	0	979

Alcohol and Drug Related Crashes



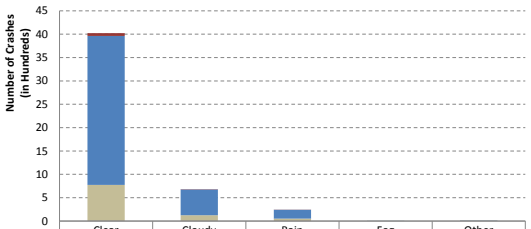
	Alcohol Involved	Drugs Involved	Alcohol and Drugs
Fatal	8	0	1
Injury	114	4	8
PDO	15	0	1

Crashes by Lighting Condition



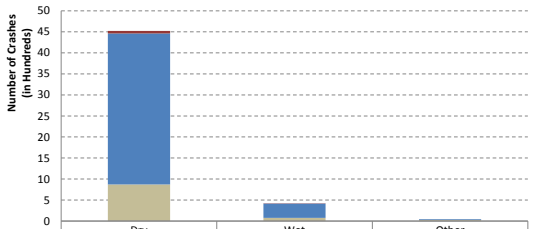
	Daylight	Dusk	Dawn	Dark w/ Street Light	Dark w/o Street Light	Unknown
Fatal	26	4	3	30	5	1
Injury	3010	135	51	607	107	34
PDO	725	34	15	150	27	28

Crashes by Weather Condition



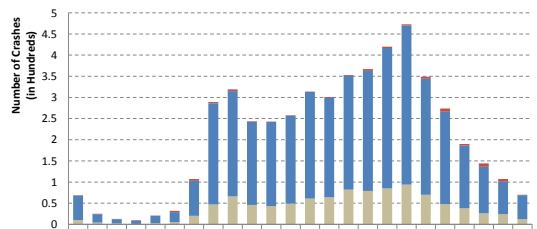
	Clear	Cloudy	Rain	Fog	Other
Fatal	58	9	2	0	0
Injury	3191	550	190	3	6
PDO	773	125	51	1	9

Crashes by Surface Condition



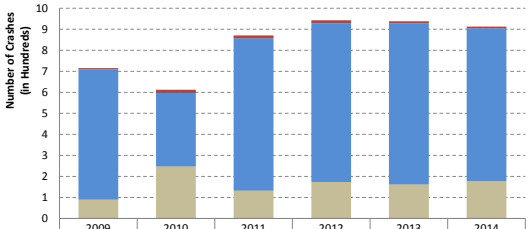
	Dry	Wet	Other
Fatal	62	7	0
Injury	3589	338	17
PDO	872	77	30

Crashes by Time of Day



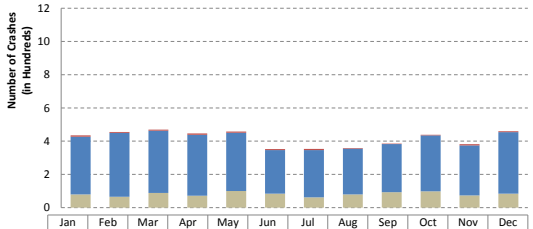
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Fatal	1	1	1	1	3	4	3	4	1	1	1	1	2	2	4	3	3	5	8	4	8	6	1	
Injury	58	20	10	8	17	24	83	239	249	197	199	208	252	235	269	284	332	376	274	218	148	110	77	57
PDO	10	4	2	1	3	5	20	47	66	46	43	49	61	64	82	79	85	94	70	48	38	26	24	12

Crashes by Year



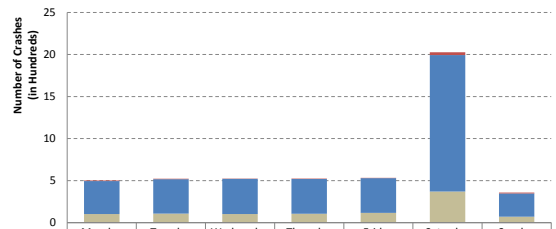
	2009	2010	2011	2012	2013	2014
Fatal	6	15	15	14	10	9
Injury	620	350	724	756	767	727
PDO	89	247	132	173	161	177

Crashes by Month



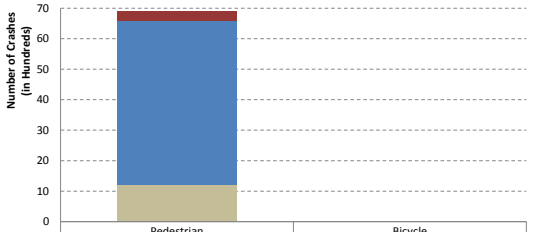
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Fatal	8	5	6	8	7	6	7	4	2	3	7	6
Injury	347	385	375	366	351	262	284	275	290	337	302	370
PDO	80	65	88	72	100	84	62	80	93	98	73	84

Crashes by Day of Week



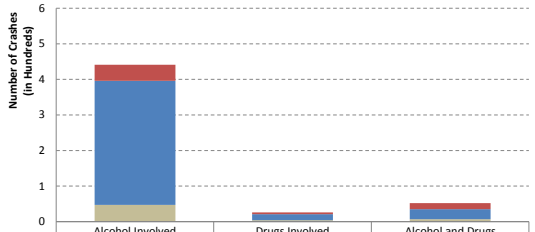
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Fatal	6	4	4	5	4	34	12
Injury	392	410	418	413	413	1622	276
PDO	103	108	103	107	116	371	71

Crashes by Type and Severity



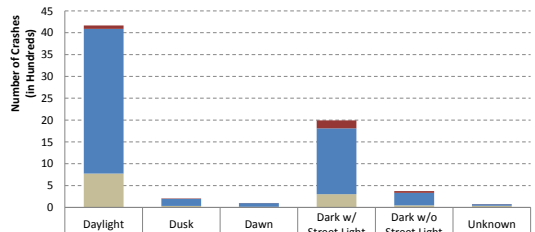
	Pedestrian	Bicycle
Fatal	312	0
Injury	5387	0
PDO	1217	0

Alcohol and Drug Related Crashes



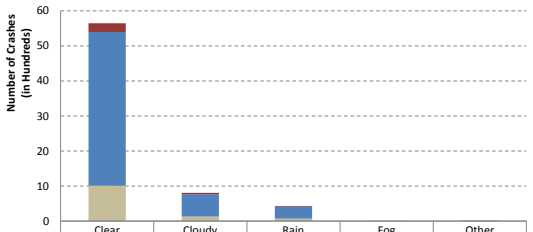
	Alcohol Involved	Drugs Involved	Alcohol and Drugs
Fatal	45	5	17
Injury	349	17	28
PDO	47	4	7

Crashes by Lighting Condition



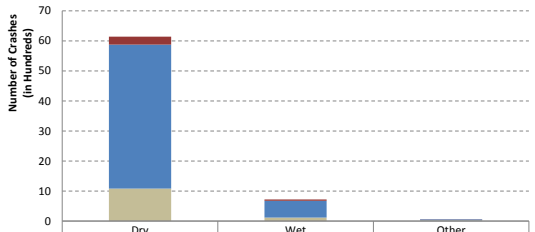
	Daylight	Dusk	Dawn	Dark w/ Street Light	Dark w/o Street Light	Unknown
Fatal	76	9	4	182	40	1
Injury	3313	164	83	1505	285	37
PDO	777	33	15	305	49	38

Crashes by Weather Condition



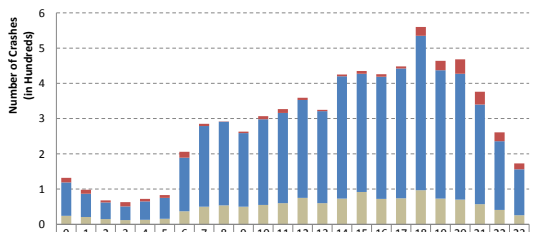
	Clear	Cloudy	Rain	Fog	Other
Fatal	250	39	23	0	0
Injury	4390	637	341	3	13
PDO	1007	129	68	1	5

Crashes by Surface Condition



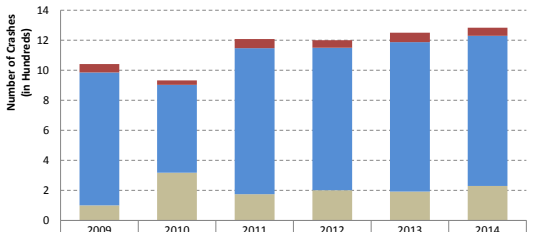
	Dry	Wet	Other
Fatal	266	44	2
Injury	4792	559	36
PDO	1081	114	22

Crashes by Time of Day



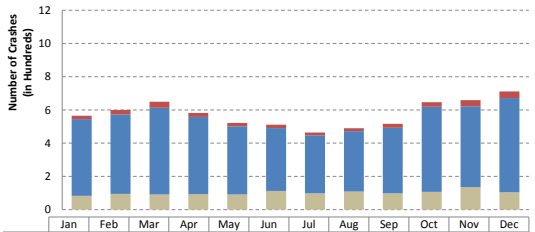
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Fatal	13	11	6	12	7	8	17	6	1	4	9	11	6	4	5	8	7	6	25	27	41	36	25	17
Injury	95	66	47	39	52	59	152	229	237	209	243	256	278	261	347	335	347	368	438	364	357	283	195	130
PDO	24	21	15	12	13	16	37	50	54	50	55	60	75	60	73	92	72	74	97	73	70	57	41	26

Crashes by Year



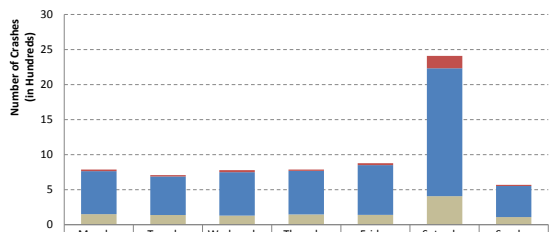
	2009	2010	2011	2012	2013	2014
Fatal	55	30	61	50	62	54
Injury	886	585	972	949	995	1000
PDO	100	318	175	201	193	230

Crashes by Month



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Fatal	20	27	36	24	21	20	17	18	24	28	37	40
Injury	462	478	522	464	410	379	349	363	394	512	487	567
PDO	83	95	91	94	91	112	98	109	98	107	135	104

Crashes by Day of Week



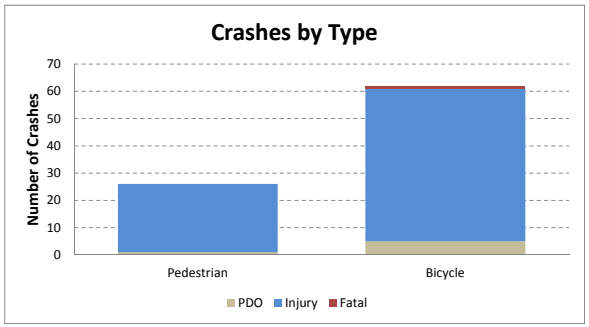
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Fatal	25	19	29	19	27	176	17
Injury	613	552	619	623	712	1825	443
PDO	150	137	130	146	139	407	108

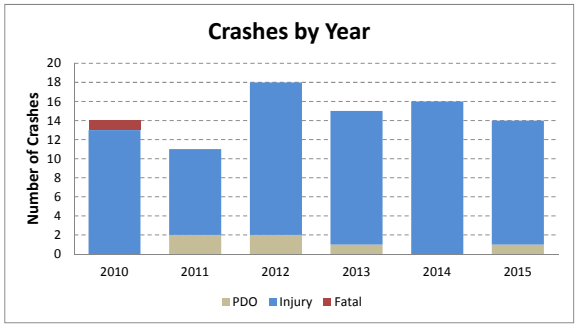
APPENDIX 2

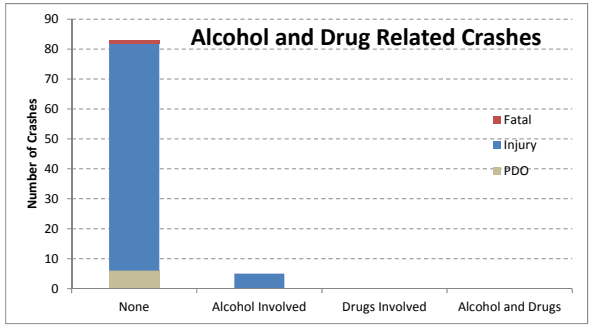
BEACH ACCESS CORRIDOR DEMONSTRATION SITE ANALYSIS

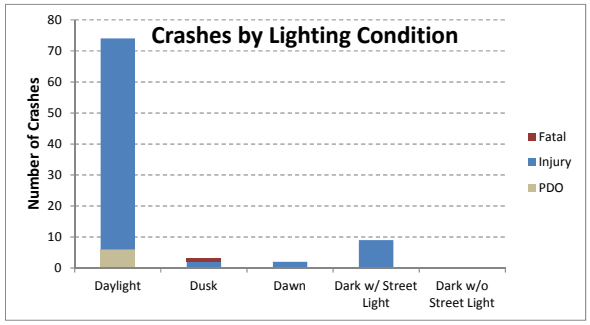
HALLANDALE BEACH BOULEVARD FROM NE 4TH AVENUE TO NE 26TH AVENUE

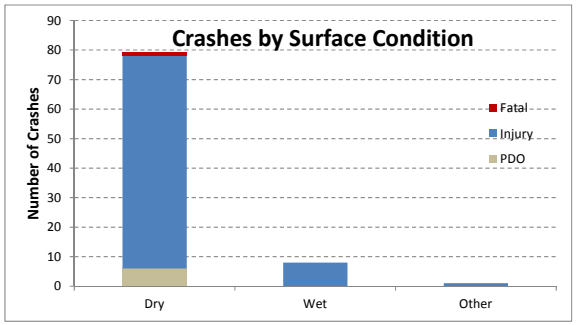
CRASH ANALYSIS - Hallandale Beach Blvd. from NE 4th Ave. to NE 26th Ave.

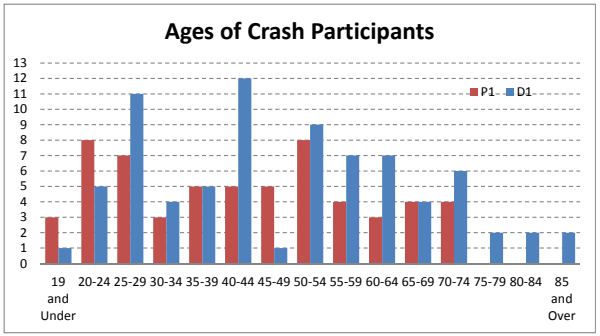


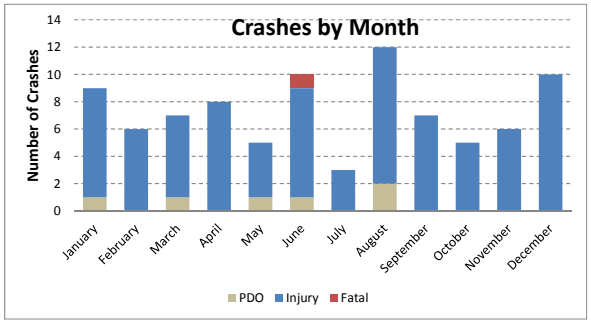


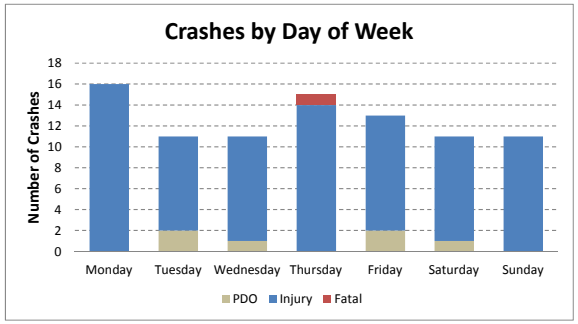


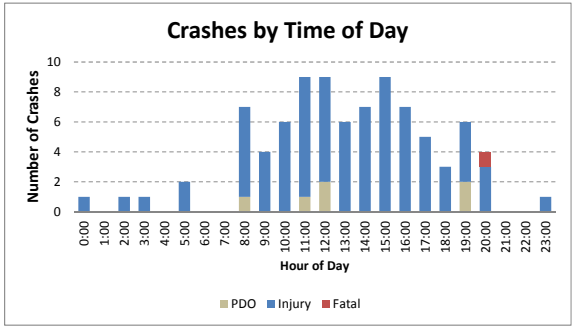








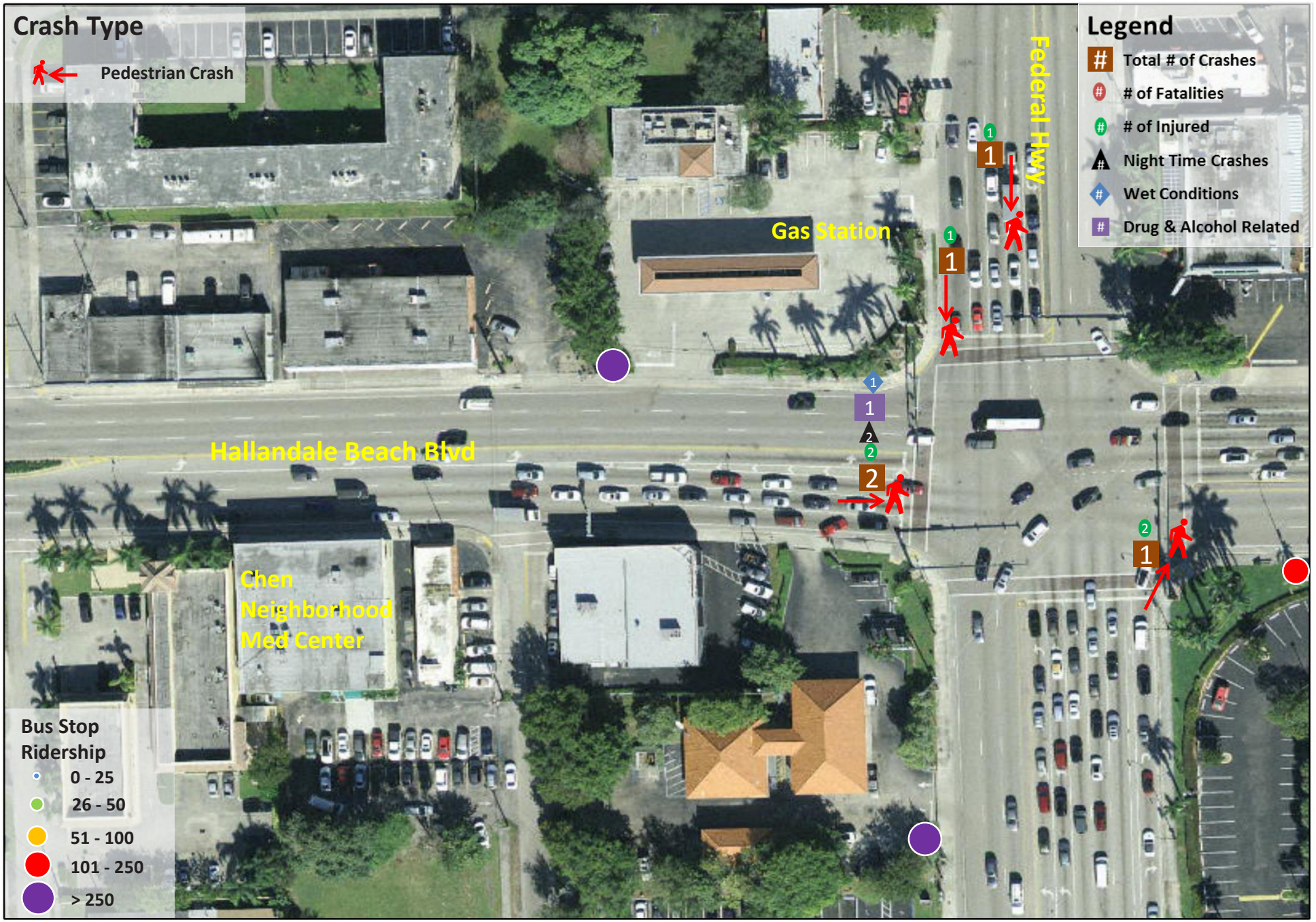




CRASH ANALYSIS - Hallandale Beach Blvd. from NE 4th Ave. to NE 26th Ave.

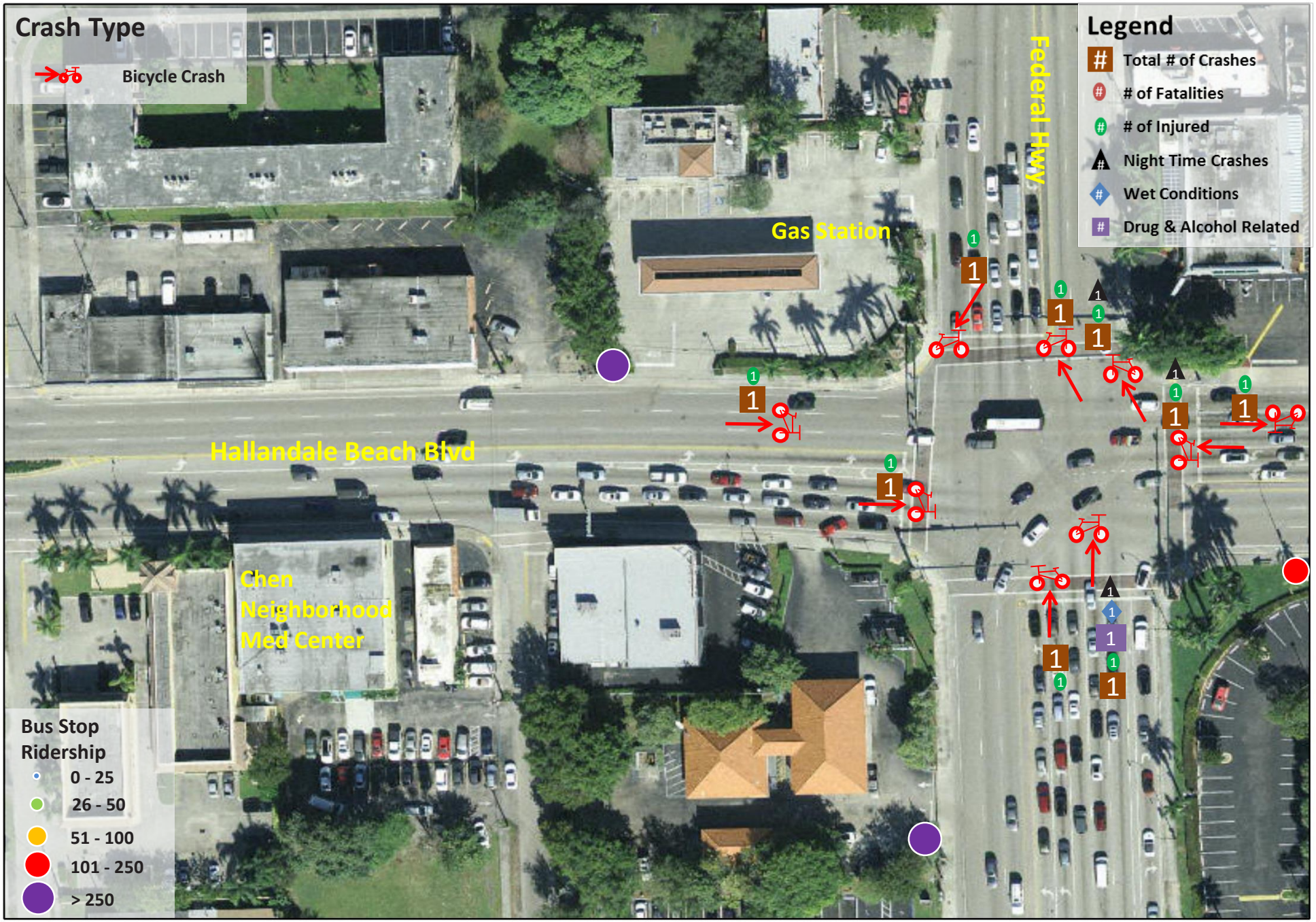
		Analysis Year						Severity			Total	Average	Percent
		2010	2011	2012	2013	2014	2015	PDO	Injury	Fatal			
Type of Crash	Pedestrian	2	5	4	5	7	3	1	25	0	26	4.33	29.5%
	Bicycle	12	6	14	10	9	11	5	56	1	62	10.33	70.5%
	Total Crashes	**14**	**11**	**18**	**15**	**16**	**14**	**6**	**81**	**1**	**88**	**14.67**	**100.0%**
Crash Severity	PDO	0	2	2	1	0	1				6	1.00	6.8%
	Injury	13	9	16	14	16	13				81	13.50	92.0%
	Fatal	1	0	0	0	0	0				1	0.17	1.1%
Light Conditions	Daylight	12	9	15	12	13	13	6	68	0	74	12.33	84.1%
	Dusk	1	0	0	0	2	0	0	2	1	3	0.50	3.4%
	Dawn	1	0	0	0	0	1	0	2	0	2	0.33	2.3%
	Dark w/ Street Light	0	2	3	3	1	0	0	9	0	9	1.50	10.2%
	Dark w/o Street Light	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	Unknown	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
Surface Condition	Dry	13	8	17	14	15	12	6	72	1	79	13.17	89.8%
	Wet	0	3	1	1	1	2	0	8	0	8	1.33	9.1%
	Other	1	0	0	0	0	0	0	1	0	1	0.17	1.1%
Month	January	0	2	2	4	0	1	1	8	0	9	1.50	10.2%
	February	0	0	1	1	0	4	0	6	0	6	1.00	6.8%
	March	2	1	1	0	3	0	1	6	0	7	1.17	8.0%
	April	0	2	2	0	3	1	0	8	0	8	1.33	9.1%
	May	1	0	0	2	0	2	1	4	0	5	0.83	5.7%
	June	4	1	1	3	1	0	1	8	1	10	1.67	11.4%
	July	1	0	2	0	0	0	0	3	0	3	0.50	3.4%
	August	1	1	4	2	4	0	2	10	0	12	2.00	13.6%
	September	3	0	2	0	1	1	0	7	0	7	1.17	8.0%
	October	0	0	0	2	2	1	0	5	0	5	0.83	5.7%
	November	0	3	1	0	0	2	0	6	0	6	1.00	6.8%
	December	2	1	2	1	2	2	0	10	0	10	1.67	11.4%
Day of Week	Monday	1	2	1	7	3	2	0	16	0	16	2.67	18.2%
	Tuesday	2	2	2	3	0	2	2	9	0	11	1.83	12.5%
	Wednesday	1	1	5	1	0	3	1	10	0	11	1.83	12.5%
	Thursday	4	0	3	2	3	3	0	14	1	15	2.50	17.0%
	Friday	1	1	3	0	6	2	2	11	0	13	2.17	14.8%
	Saturday	2	4	1	2	2	0	1	10	0	11	1.83	12.5%
	Sunday	3	1	3	0	2	2	0	11	0	11	1.83	12.5%
Hour of Day	0:00	0	0	0	1	0	0	0	1	0	1	0.17	1.1%
	1:00	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	2:00	0	1	0	0	0	0	0	1	0	1	0.17	1.1%
	3:00	0	1	0	0	0	0	0	1	0	1	0.17	1.1%
	4:00	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	5:00	1	0	0	0	0	1	0	2	0	2	0.33	2.3%
	6:00	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	7:00	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	8:00	0	2	2	0	2	1	1	6	0	7	1.17	8.0%
	9:00	0	0	1	2	0	1	0	4	0	4	0.67	4.5%
	10:00	2	1	0	0	2	1	0	6	0	6	1.00	6.8%
	11:00	1	0	2	3	3	0	1	8	0	9	1.50	10.2%
	12:00	1	0	3	0	2	3	2	7	0	9	1.50	10.2%
	13:00	1	1	0	2	0	2	0	6	0	6	1.00	6.8%
	14:00	2	2	0	1	1	1	0	7	0	7	1.17	8.0%
	15:00	2	1	2	1	2	1	0	9	0	9	1.50	10.2%
	16:00	0	0	3	2	0	2	0	7	0	7	1.17	8.0%
	17:00	2	0	1	0	1	1	0	5	0	5	0.83	5.7%
	18:00	0	0	2	0	1	0	0	3	0	3	0.50	3.4%
	19:00	1	1	1	1	2	0	2	4	0	6	1.00	6.8%
	20:00	1	1	1	1	0	0	0	3	1	4	0.67	4.5%

		Analysis Year						Severity			Total	Average	Percent
		2010	2011	2012	2013	2014	2015	PDO	Injury	Fatal			
	20:00	1	1	1	1	0	0	0	3	1	4	0.67	4.5%
	21:00	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	22:00	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	23:00	0	0	0	1	0	0	0	1	0	1	0.17	1.1%
Alcohol	None	12	9	18	15	16	13	6	76	1	83	13.83	94.3%
	Alcohol Involved	2	2	0	0	0	1	0	5	0	5	0.83	5.7%
	Drugs Involved	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	Alcohol and Drugs	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	Undetermined	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
Age of Ped/Bicyclist	19 and Under	0	1	1	1	0	0				3	0.50	3.4%
	20-24	3	1	3	1	0	0				8	1.33	9.1%
	25-29	1	4	0	2	0	0				7	1.17	8.0%
	30-34	1	1	0	1	0	0				3	0.50	3.4%
	35-39	1	0	1	3	0	0				5	0.83	5.7%
	40-44	3	0	1	0	0	1				5	0.83	5.7%
	45-49	1	2	1	1	0	0				5	0.83	5.7%
	50-54	3	1	3	0	1	0				8	1.33	9.1%
	55-59	0	0	3	1	0	0				4	0.67	4.5%
	60-64	0	1	1	1	0	0				3	0.50	3.4%
	65-69	1	0	2	1	0	0				4	0.67	4.5%
	70-74	0	0	2	2	0	0				4	0.67	4.5%
	75-79	0	0	0	0	0	0				0	0.00	0.0%
	80-84	0	0	0	0	0	0				0	0.00	0.0%
	85 and Over	0	0	0	0	0	0				0	0.00	0.0%
Age of Driver	19 and Under	0	0	0	1	0	0				1	0.17	1.1%
	20-24	1	2	1	0	1	0				5	0.83	5.7%
	25-29	0	3	1	2	1	4				11	1.83	12.5%
	30-34	1	0	2	0	1	0				4	0.67	4.5%
	35-39	0	1	1	1	1	1				5	0.83	5.7%
	40-44	2	1	4	2	3	0				12	2.00	13.6%
	45-49	0	0	0	0	0	1				1	0.17	1.1%
	50-54	1	1	2	1	3	1				9	1.50	10.2%
	55-59	1	1	1	1	3	0				7	1.17	8.0%
	60-64	1	1	0	1	2	2				7	1.17	8.0%
	65-69	0	0	0	2	1	1				4	0.67	4.5%
	70-74	1	0	3	2	0	0				6	1.00	6.8%
	75-79	1	0	1	0	0	0				2	0.33	2.3%
	80-84	0	0	2	0	0	0				2	0.33	2.3%
	85 and Over	1	0	0	0	0	1				2	0.33	2.3%



Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes – Hallandale Beach Boulevard from NE 4th Avenue to NE 26th Avenue

Figure **1**



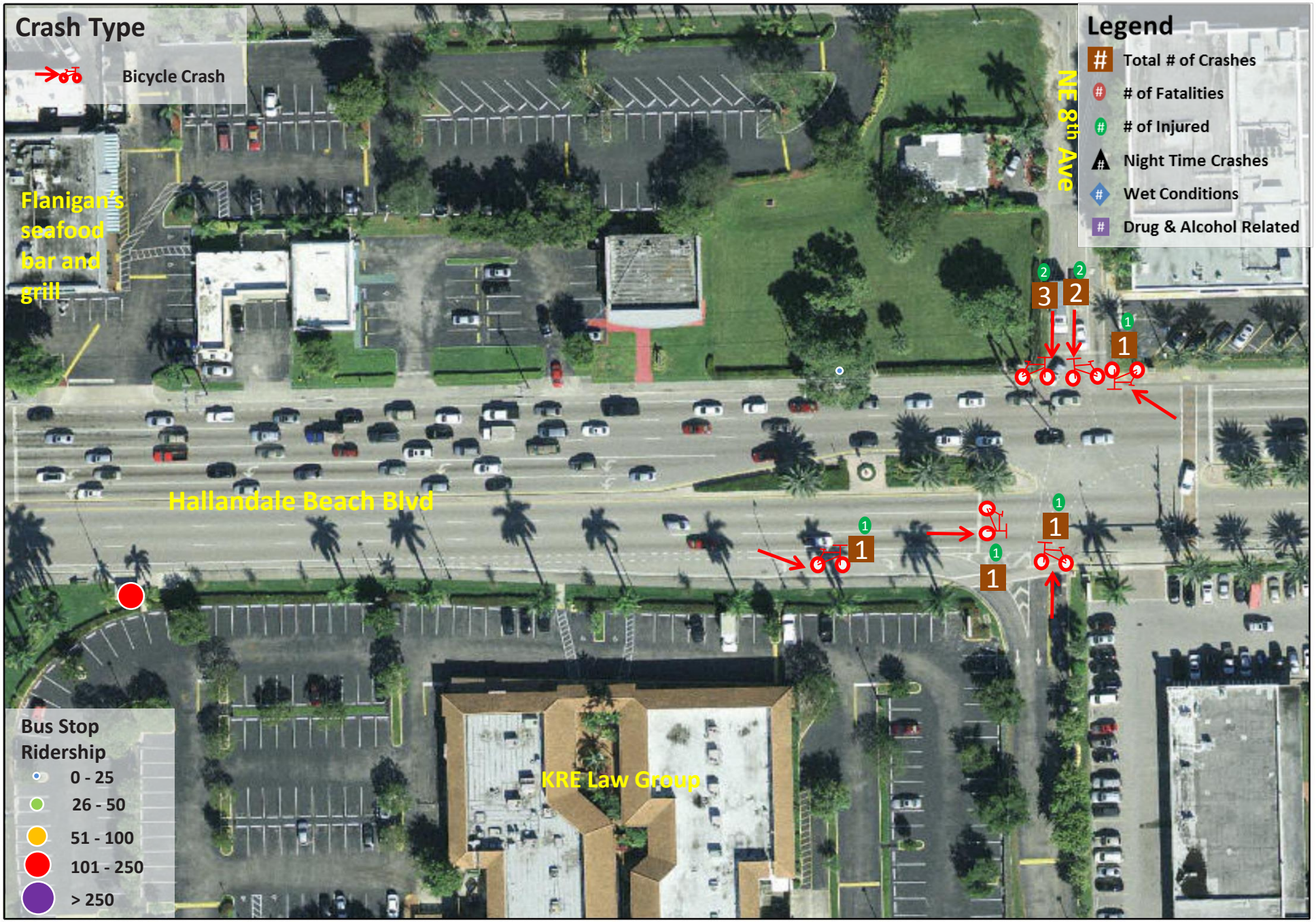
Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes – Hallandale Beach Boulevard from NE 4th Avenue to NE 26th Avenue

Figure **2**

100

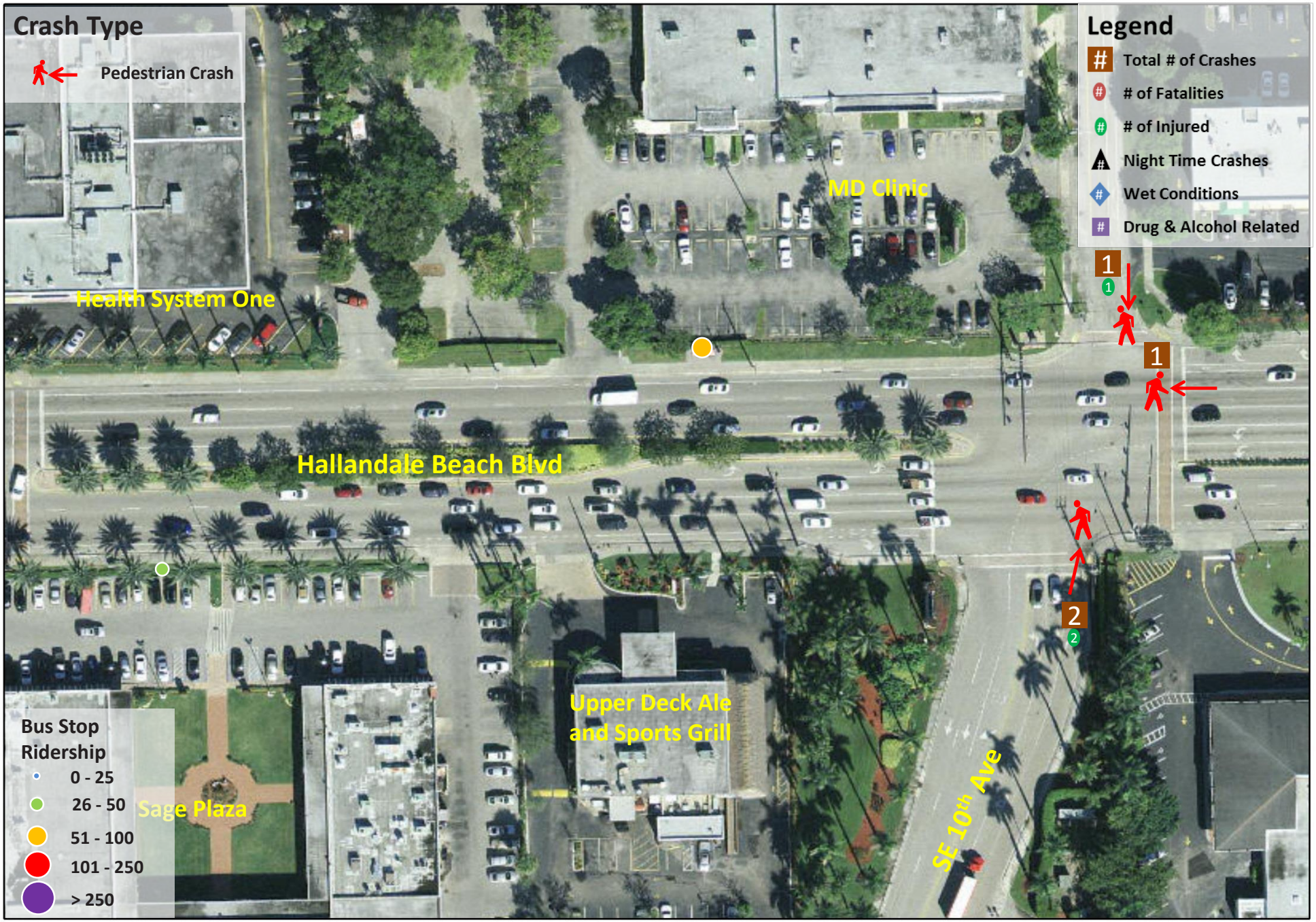
Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes – Hallandale Beach Boulevard from NE 4th Avenue to NE 26th Avenue

Figure **3**



Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes – Hallandale Beach Boulevard from NE 4th Avenue to NE 26th Avenue

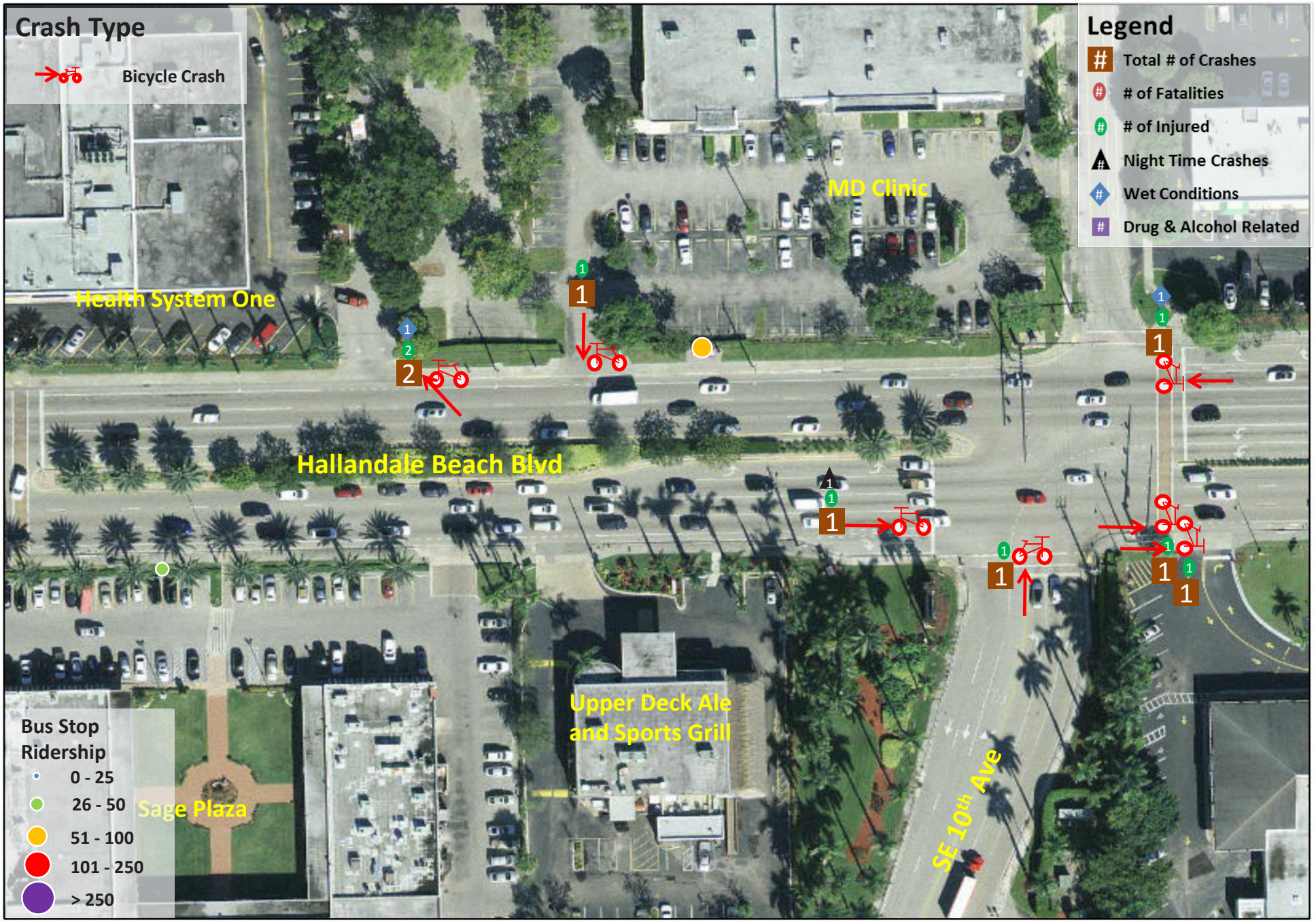
Figure **4**



Broward MPO Pedestrian and Bicycle Safety Action Plan

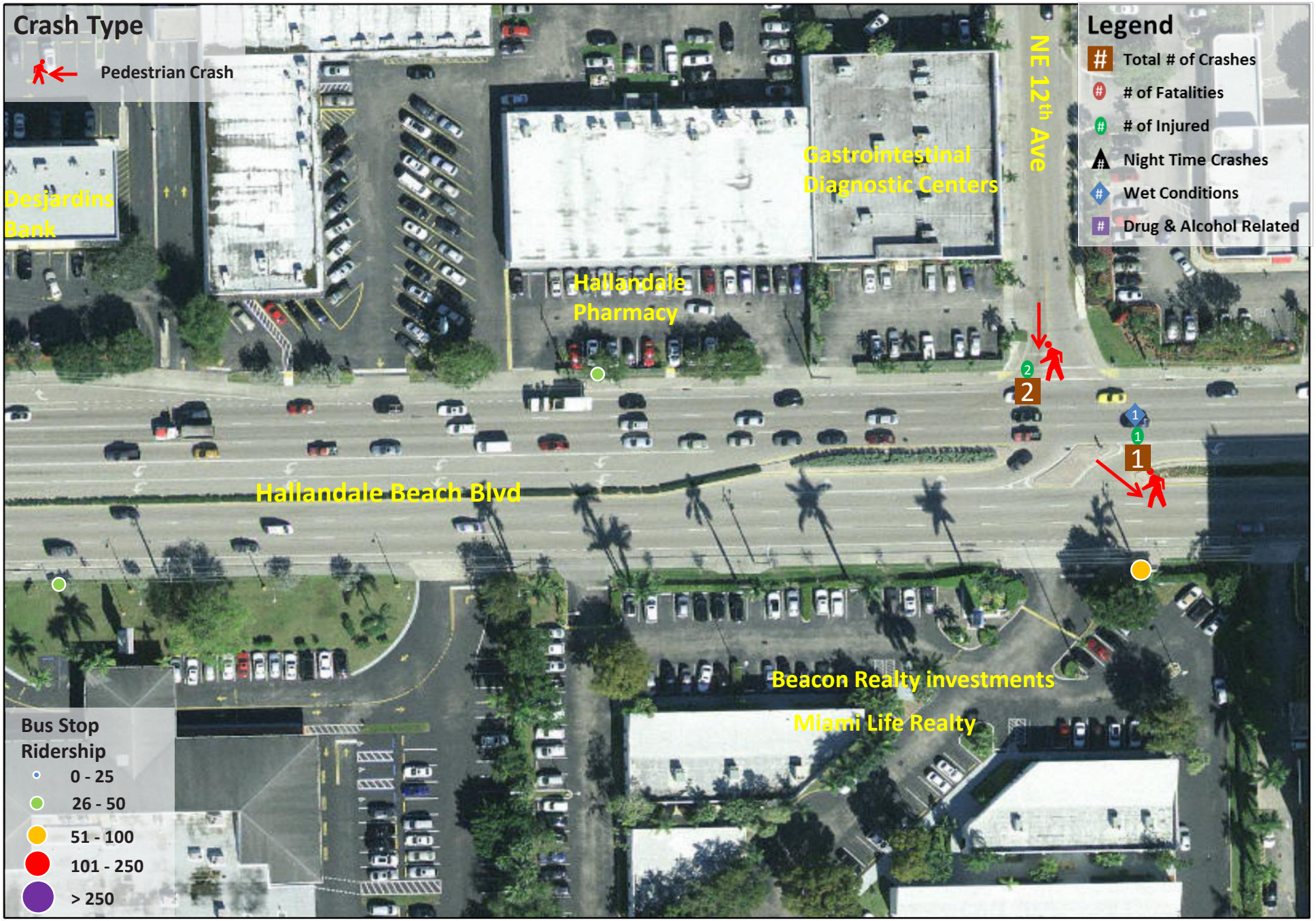
Pedestrian Crashes – Hallandale Beach Boulevard from NE 4th Avenue to NE 26th Avenue

Figure 5



Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes – Hallandale Beach Boulevard from NE 4th Avenue to NE 26th Avenue

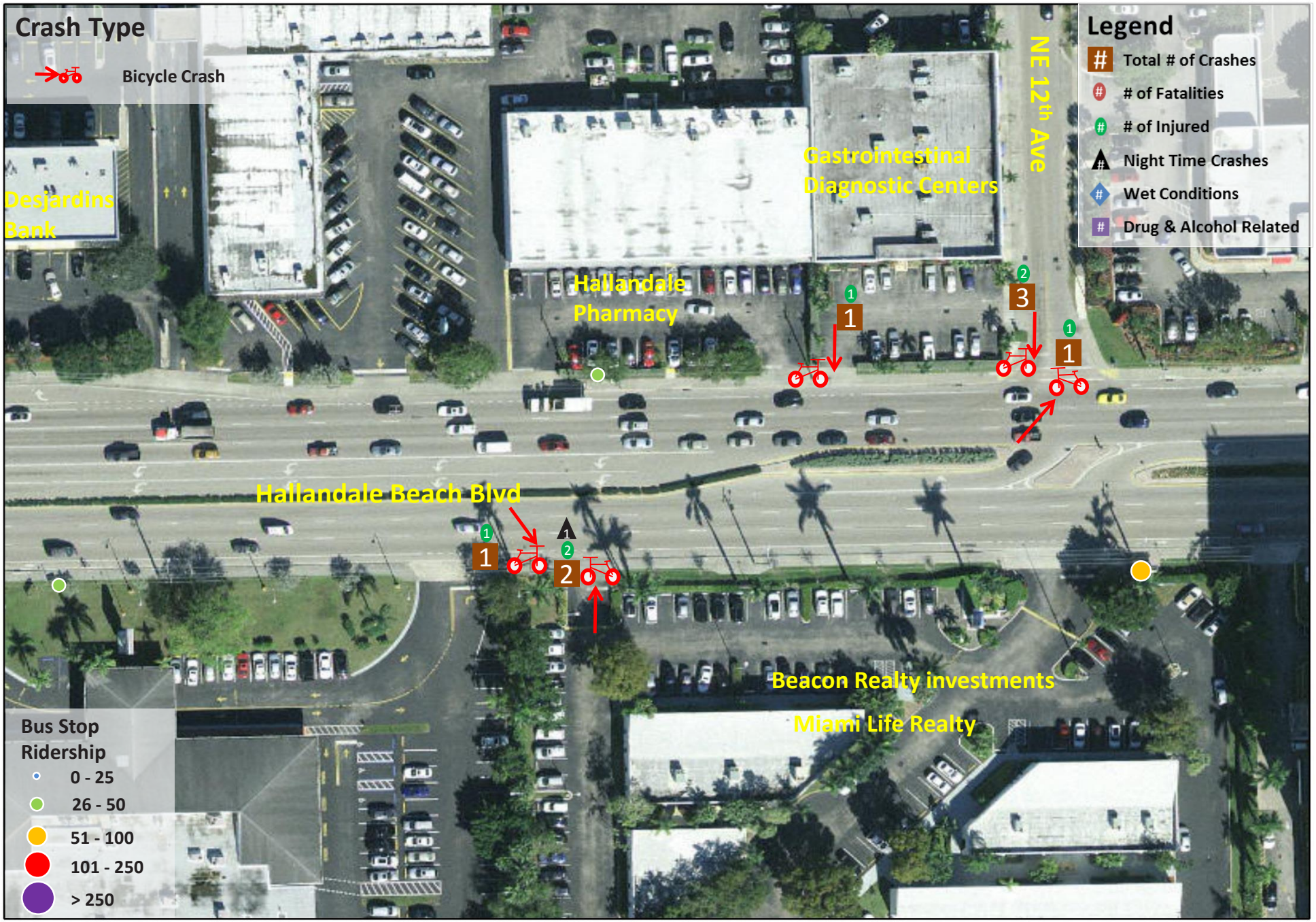
Figure **6**



104

Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes – Hallandale Beach Boulevard from NE 4th Avenue to NE 26th Avenue

Figure **7**



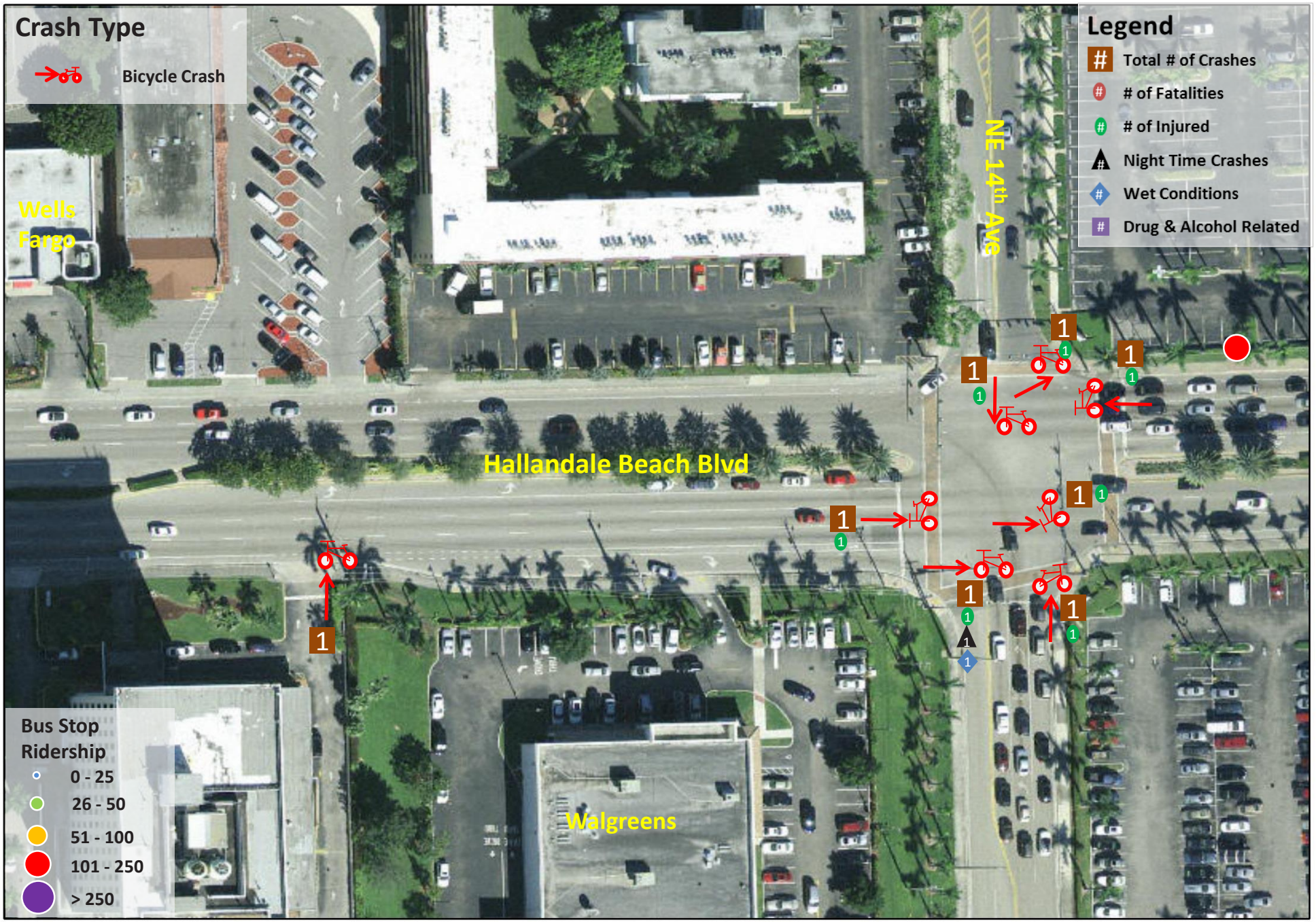
Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes – Hallandale Beach Boulevard from NE 4th Avenue to NE 26th Avenue

Figure **8**

106

Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes – Hallandale Beach Boulevard from NE 4th Avenue to NE 26th Avenue

Figure 9



Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes – Hallandale Beach Boulevard from NE 4th Avenue to NE 26th Avenue

Figure **10**

Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes – Hallandale Beach Boulevard from NE 4th Avenue to NE 26th Avenue

Figure 11

Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes – Hallandale Beach Boulevard from NE 4th Avenue to NE 26th Avenue

Figure **12**

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Broward MPD Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes – Hallandale Beach Boulevard from NE 4th Avenue to NE 26th Avenue

Figure **13**

Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes – Hallandale Beach Boulevard from NE 4th Avenue to NE 26th Avenue

Figure **14**

Broward MPO Pedestrian and Bicycle Safety Action Plan

Pedestrian Crashes – Hallandale Beach Boulevard from NE 4th Avenue to NE 26th Avenue

Figure 15

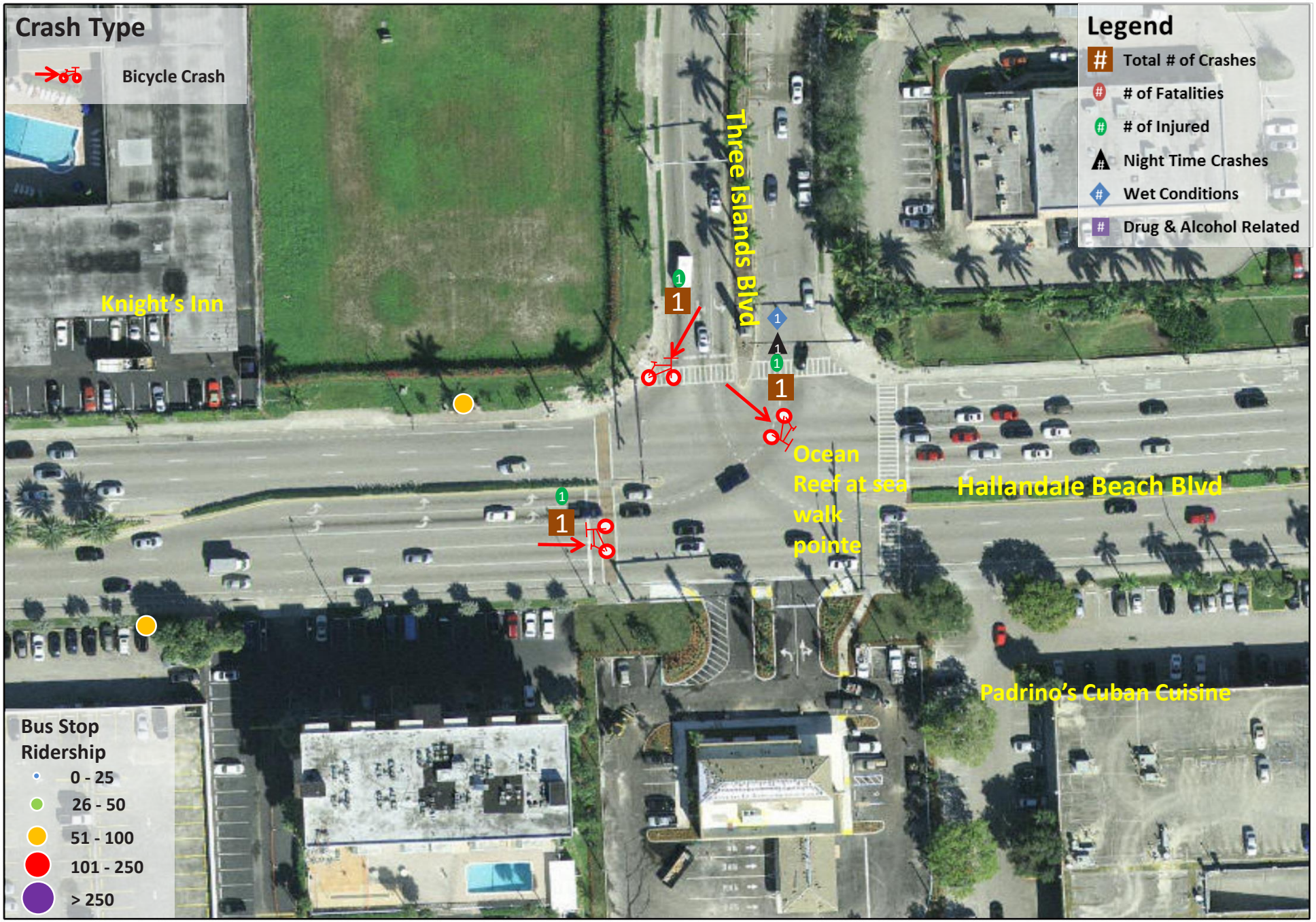
Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes – Hallandale Beach Boulevard from NE 4th Avenue to NE 26th Avenue

Figure **16**

Broward MPO Pedestrian and Bicycle Safety Action Plan

Pedestrian Crashes – Hallandale Beach Boulevard from NE 4th Avenue to NE 26th Avenue

Figure 17



Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes – Hallandale Beach Boulevard from NE 4th Avenue to NE 26th Avenue

Figure **18**

Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes – Hallandale Beach Boulevard from NE 4th Avenue to NE 26th Avenue

Figure 19

Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes – Hallandale Beach Boulevard from NE 4th Avenue to NE 26th Avenue

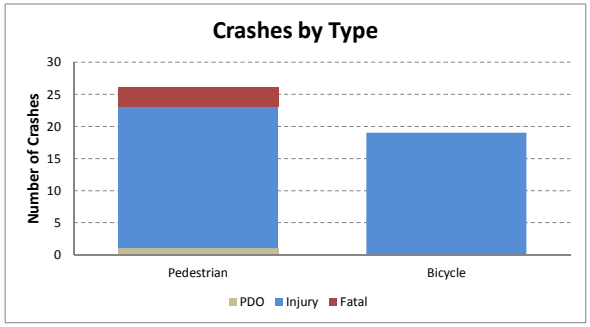
Figure **20**

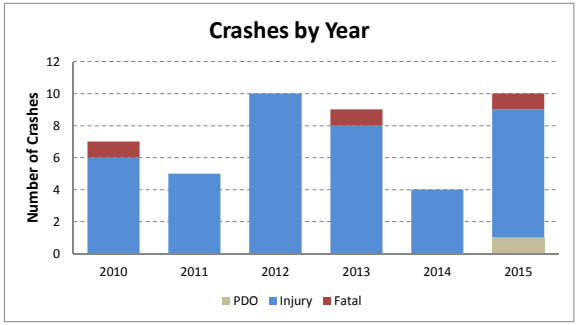
APPENDIX 3

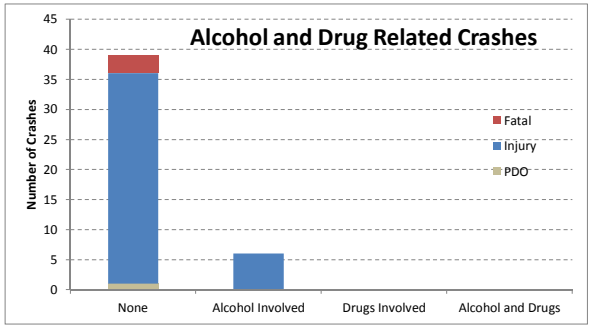
URBAN CORRIDOR DEMONSTRATION SITE

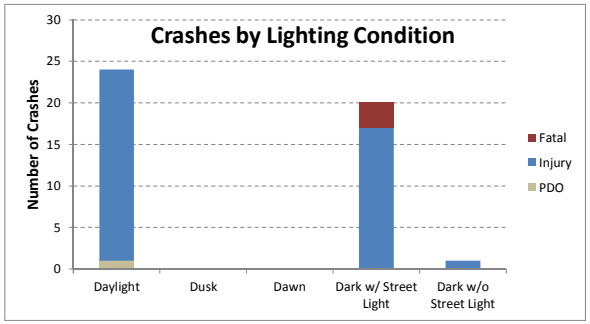
SUNRISE BOULEVARD FROM NE 13TH AVENUE TO MIDDLE RIVER

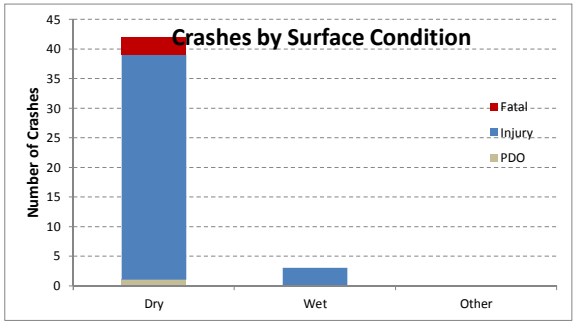
CRASH ANALYSIS - Sunrise Blvd.

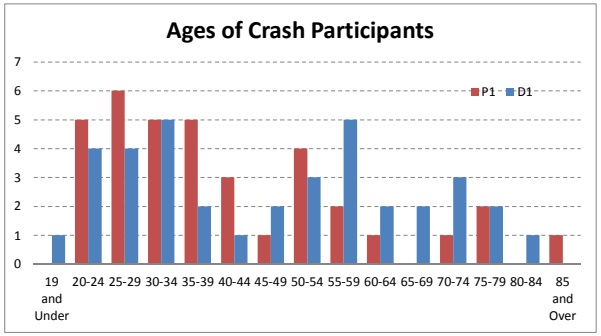


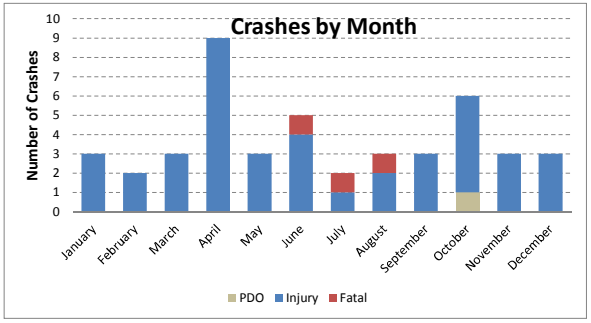


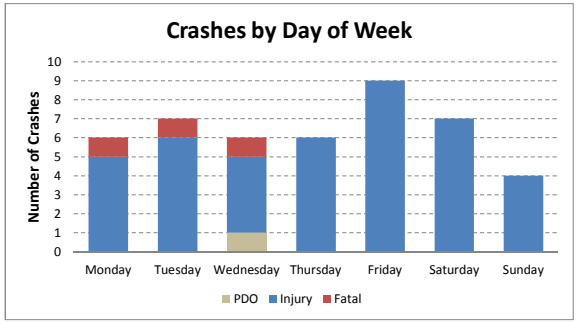


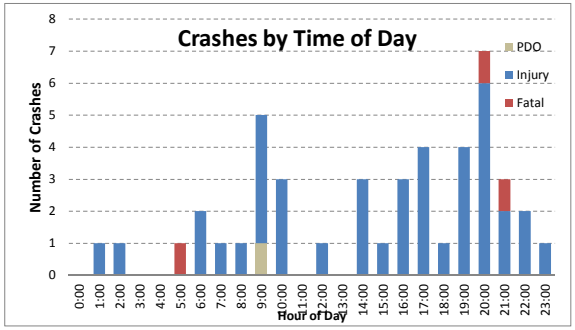












CRASH ANALYSIS - Sunrise Blvd.

		Analysis Year						Severity			Total	Average	Percent
		2010	2011	2012	2013	2014	2015	PDO	Injury	Fatal			
Type of Crash	Pedestrian	4	2	7	5	1	7	1	22	3	26	4.33	57.8%
	Bicycle	3	3	3	4	3	3	0	19	0	19	3.17	42.2%
	Total Crashes	**7**	**5**	**10**	**9**	**4**	**10**	**1**	**41**	**3**	**45**	**7.50**	**100.0%**
Crash Severity	PDO	0	0	0	0	0	1				1	0.17	2.2%
	Injury	6	5	10	8	4	8				41	6.83	91.1%
	Fatal	1	0	0	1	0	1				3	0.50	6.7%
Light Conditions	Daylight	2	2	8	4	2	6	1	23	0	24	4.00	53.3%
	Dusk	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	Dawn	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	Dark w/ Street Light	5	3	2	5	2	3	0	17	3	20	3.33	44.4%
	Dark w/o Street Light	0	0	0	0	0	1	0	1	0	1	0.17	2.2%
	Unknown	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
Surface Condition	Dry	6	4	10	9	4	9	1	38	3	42	7.00	93.3%
	Wet	1	1	0	0	0	1	0	3	0	3	0.50	6.7%
	Other	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
Month	January	0	0	2	0	0	1	0	3	0	3	0.50	6.7%
	February	0	0	0	2	0	0	0	2	0	2	0.33	4.4%
	March	0	0	2	1	0	0	0	3	0	3	0.50	6.7%
	April	1	2	1	2	1	2	0	9	0	9	1.50	20.0%
	May	0	1	1	0	0	1	0	3	0	3	0.50	6.7%
	June	0	1	0	1	2	1	0	4	1	5	0.83	11.1%
	July	1	0	1	0	0	0	0	1	1	2	0.33	4.4%
	August	0	0	0	1	0	2	0	2	1	3	0.50	6.7%
	September	0	1	0	1	0	1	0	3	0	3	0.50	6.7%
	October	3	0	0	0	1	2	1	5	0	6	1.00	13.3%
	November	2	0	1	0	0	0	0	3	0	3	0.50	6.7%
	December	0	0	2	1	0	0	0	3	0	3	0.50	6.7%
Day of Week	Monday	0	2	2	1	0	1	0	5	1	6	1.00	13.3%
	Tuesday	0	0	1	1	2	3	0	6	1	7	1.17	15.6%
	Wednesday	1	0	2	1	0	2	1	4	1	6	1.00	13.3%
	Thursday	2	0	1	2	0	1	0	6	0	6	1.00	13.3%
	Friday	2	1	1	3	0	2	0	9	0	9	1.50	20.0%
	Saturday	1	2	3	1	0	0	0	7	0	7	1.17	15.6%
	Sunday	1	0	0	0	2	1	0	4	0	4	0.67	8.9%
Hour of Day	0:00	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	1:00	1	0	0	0	0	0	0	1	0	1	0.17	2.2%
	2:00	0	1	0	0	0	0	0	1	0	1	0.17	2.2%
	3:00	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	4:00	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	5:00	0	0	0	1	0	0	0	0	1	1	0.17	2.2%
	6:00	0	0	0	0	1	1	0	2	0	2	0.33	4.4%
	7:00	0	0	1	0	0	0	0	1	0	1	0.17	2.2%
	8:00	0	0	0	0	0	1	0	1	0	1	0.17	2.2%
	9:00	0	1	2	1	0	1	1	4	0	5	0.83	11.1%
	10:00	0	0	3	0	0	0	0	3	0	3	0.50	6.7%
	11:00	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	12:00	0	0	0	0	0	1	0	1	0	1	0.17	2.2%
	13:00	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	14:00	0	0	1	1	1	0	0	3	0	3	0.50	6.7%
	15:00	1	0	0	0	0	0	0	1	0	1	0.17	2.2%
	16:00	0	1	0	1	1	0	0	3	0	3	0.50	6.7%
	17:00	1	0	1	1	0	1	0	4	0	4	0.67	8.9%
	18:00	0	0	0	1	0	0	0	1	0	1	0.17	2.2%
	19:00	2	0	0	1	0	1	0	4	0	4	0.67	8.9%
	20:00	0	2	2	0	1	2	0	6	1	7	1.17	15.6%
	21:00	1	0	0	0	0	2	0	2	1	3	0.50	6.7%

		Analysis Year						Severity			Total	Average	Percent
		2010	2011	2012	2013	2014	2015	PDO	Injury	Fatal			
	22:00	0	0	0	2	0	0	0	2	0	2	0.33	4.4%
	23:00	1	0	0	0	0	0	0	1	0	1	0.17	2.2%
Alcohol	None	5	4	10	9	3	8	1	35	3	39	6.50	86.7%
	Alcohol Involved	2	1	0	0	1	2	0	6	0	6	1.00	13.3%
	Drugs Involved	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	Alcohol and Drugs	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	Undetermined	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
Age of Ped/Bicyclist	19 and Under	0	0	0	0	0	0				0	0.00	0.0%
	20-24	0	2	1	2	0	0				5	0.83	11.1%
	25-29	2	0	1	1	2	0				6	1.00	13.3%
	30-34	1	1	1	1	1	0				5	0.83	11.1%
	35-39	1	0	2	1	1	0				5	0.83	11.1%
	40-44	1	1	0	1	0	0				3	0.50	6.7%
	45-49	0	1	0	0	0	0				1	0.17	2.2%
	50-54	2	0	1	1	0	0				4	0.67	8.9%
	55-59	0	0	2	0	0	0				2	0.33	4.4%
	60-64	0	0	0	0	0	1				1	0.17	2.2%
	65-69	0	0	0	0	0	0				0	0.00	0.0%
	70-74	0	0	0	1	0	0				1	0.17	2.2%
	75-79	0	0	1	1	0	0				2	0.33	4.4%
	80-84	0	0	0	0	0	0				0	0.00	0.0%
	85 and Over	0	0	1	0	0	0				1	0.17	2.2%
Age of Driver	19 and Under	0	1	0	0	0	0				1	0.17	2.2%
	20-24	1	1	1	1	0	0				4	0.67	8.9%
	25-29	1	0	2	1	0	0				4	0.67	8.9%
	30-34	2	0	0	1	0	2				5	0.83	11.1%
	35-39	0	0	0	1	0	1				2	0.33	4.4%
	40-44	1	0	0	0	0	0				1	0.17	2.2%
	45-49	0	0	0	1	0	1				2	0.33	4.4%
	50-54	0	0	1	0	1	1				3	0.50	6.7%
	55-59	1	1	2	1	0	0				5	0.83	11.1%
	60-64	0	0	1	0	1	0				2	0.33	4.4%
	65-69	0	1	0	1	0	0				2	0.33	4.4%
	70-74	1	0	0	1	0	1				3	0.50	6.7%
	75-79	0	1	0	0	1	0				2	0.33	4.4%
	80-84	0	0	1	0	0	0				1	0.17	2.2%
	85 and Over	0	0	0	0	0	0				0	0.00	0.0%

Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes – Sunrise Boulevard from NE 14th Avenue to US 1

Figure **1**

Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes – Sunrise Boulevard from NE 14th Avenue to US 1

Figure **2**

Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes – Sunrise Boulevard from NE 14th Avenue to US 1

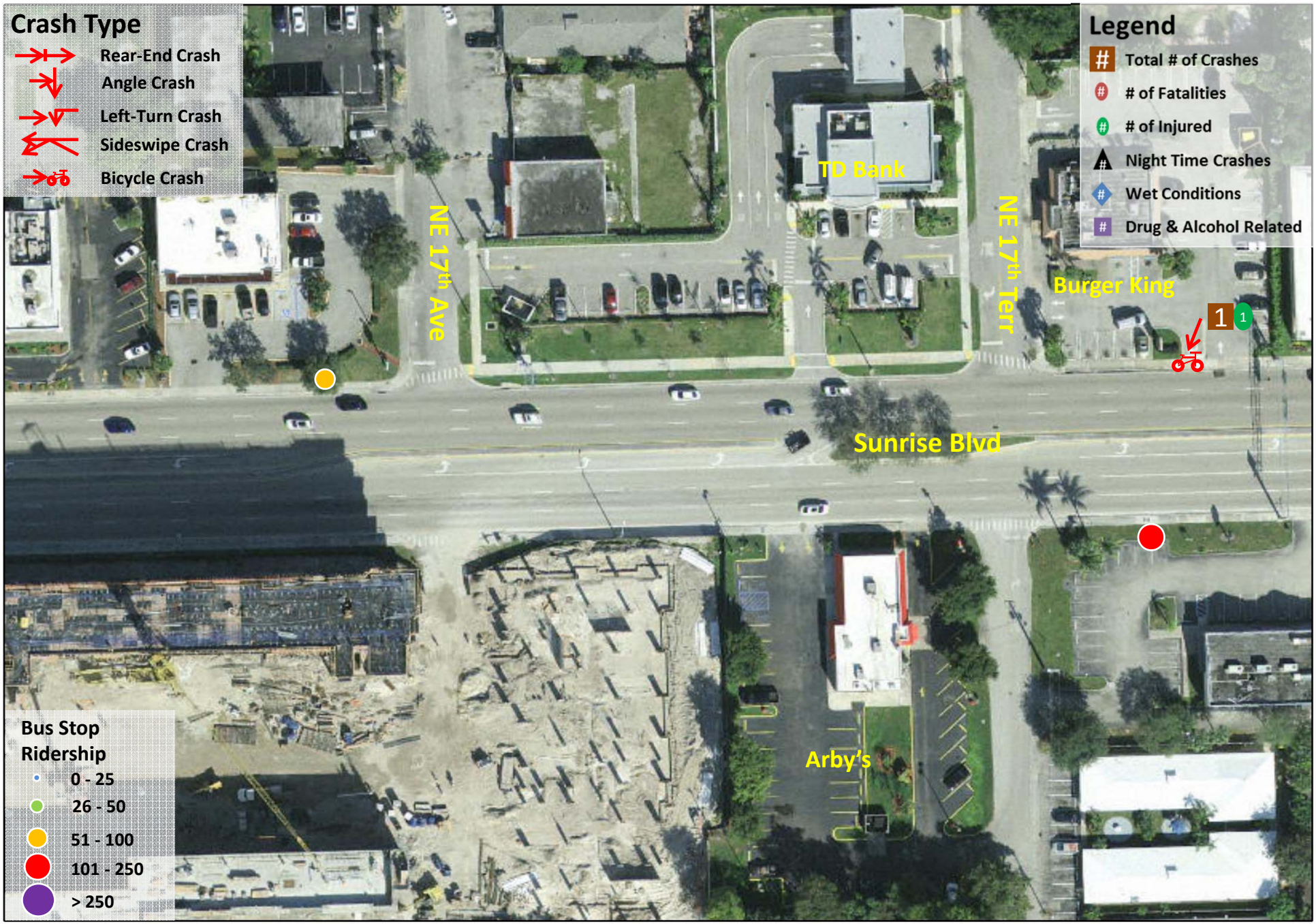
Figure **3**

Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes – Sunrise Boulevard from NE 14th Avenue to US 1

Figure **4**

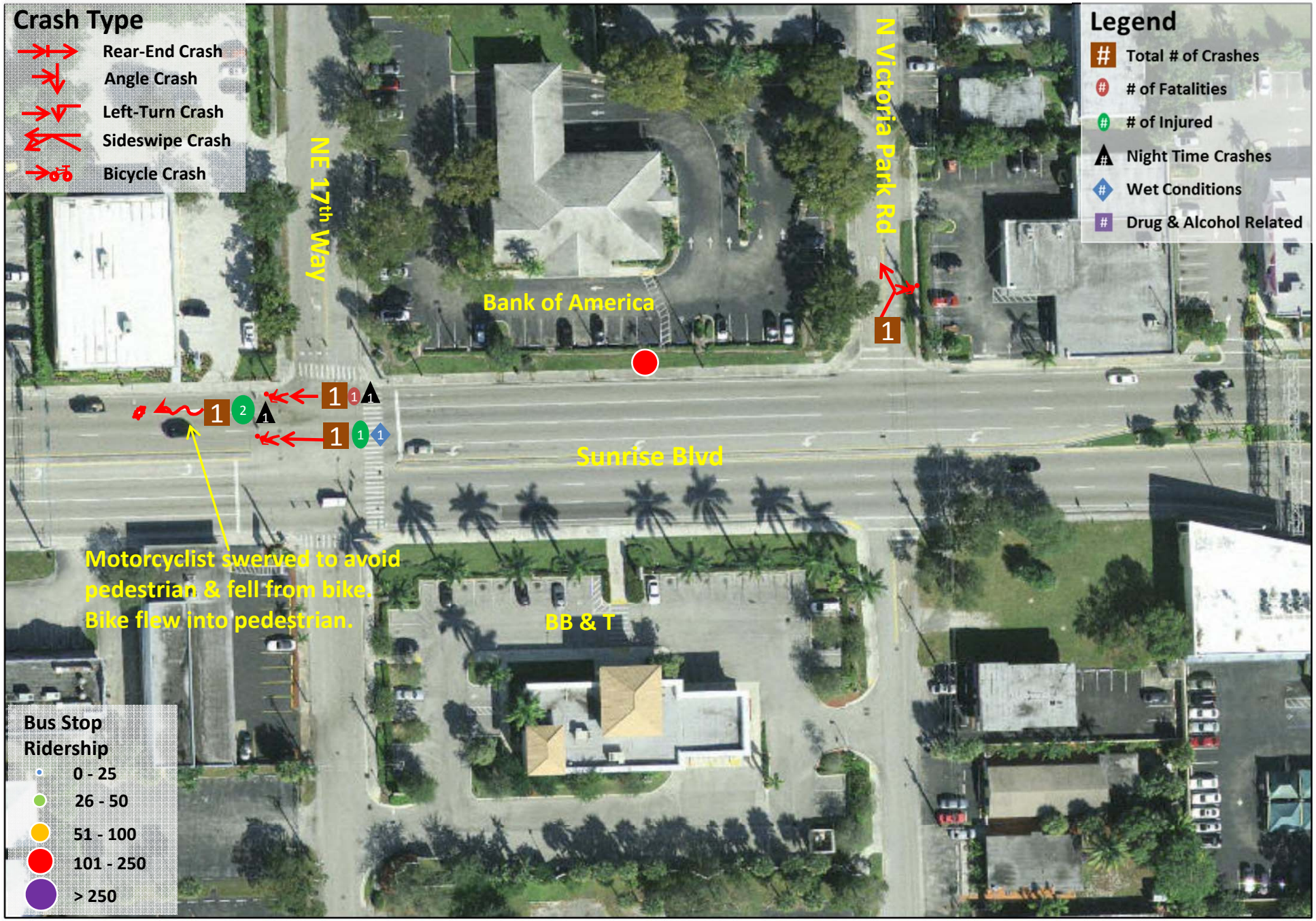
Broward MPD Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes – Sunrise Boulevard from NE 14th Avenue to US 1

Figure **5**



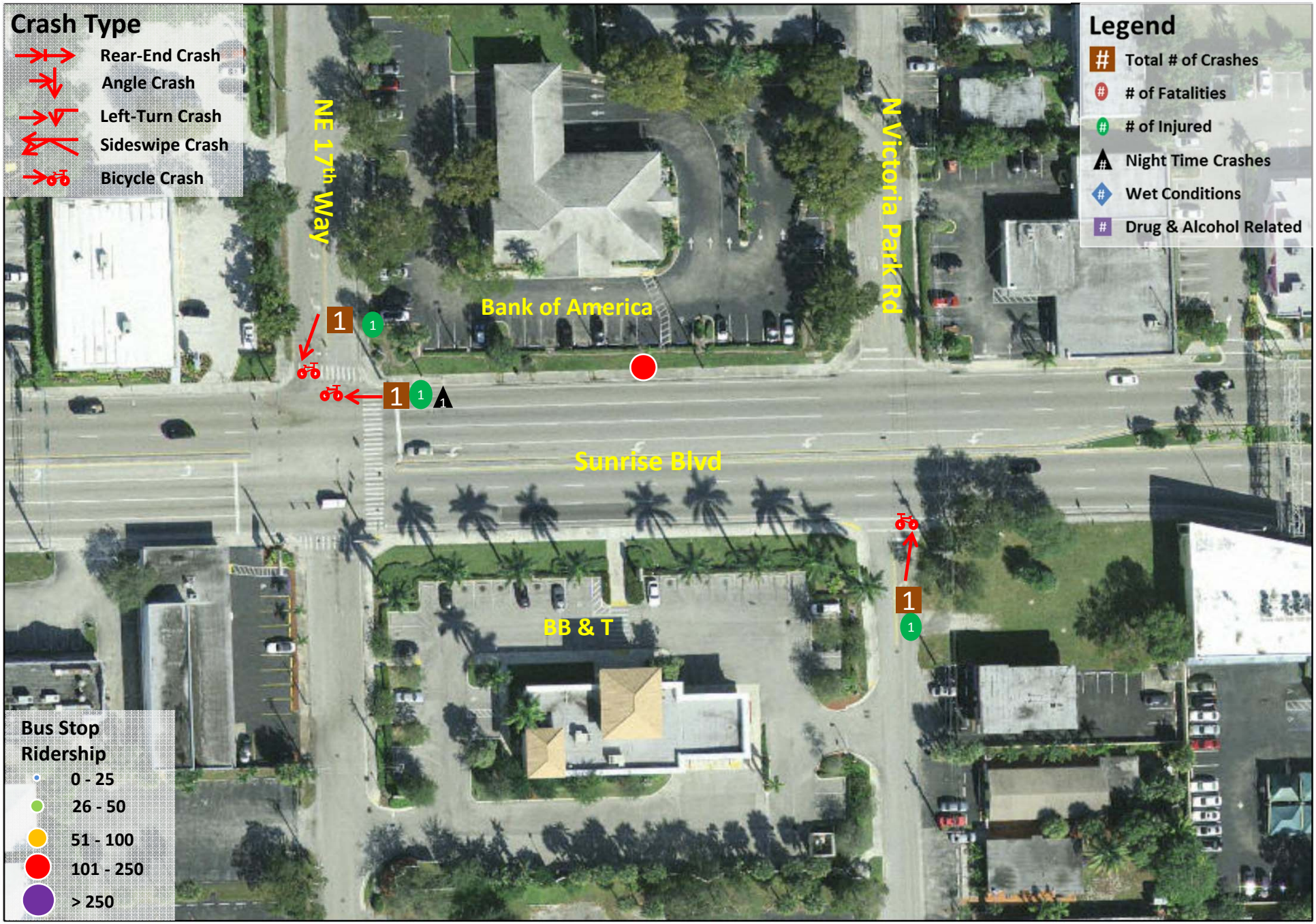
Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes – Sunrise Boulevard from NE 14th Avenue to US 1

Figure **6**



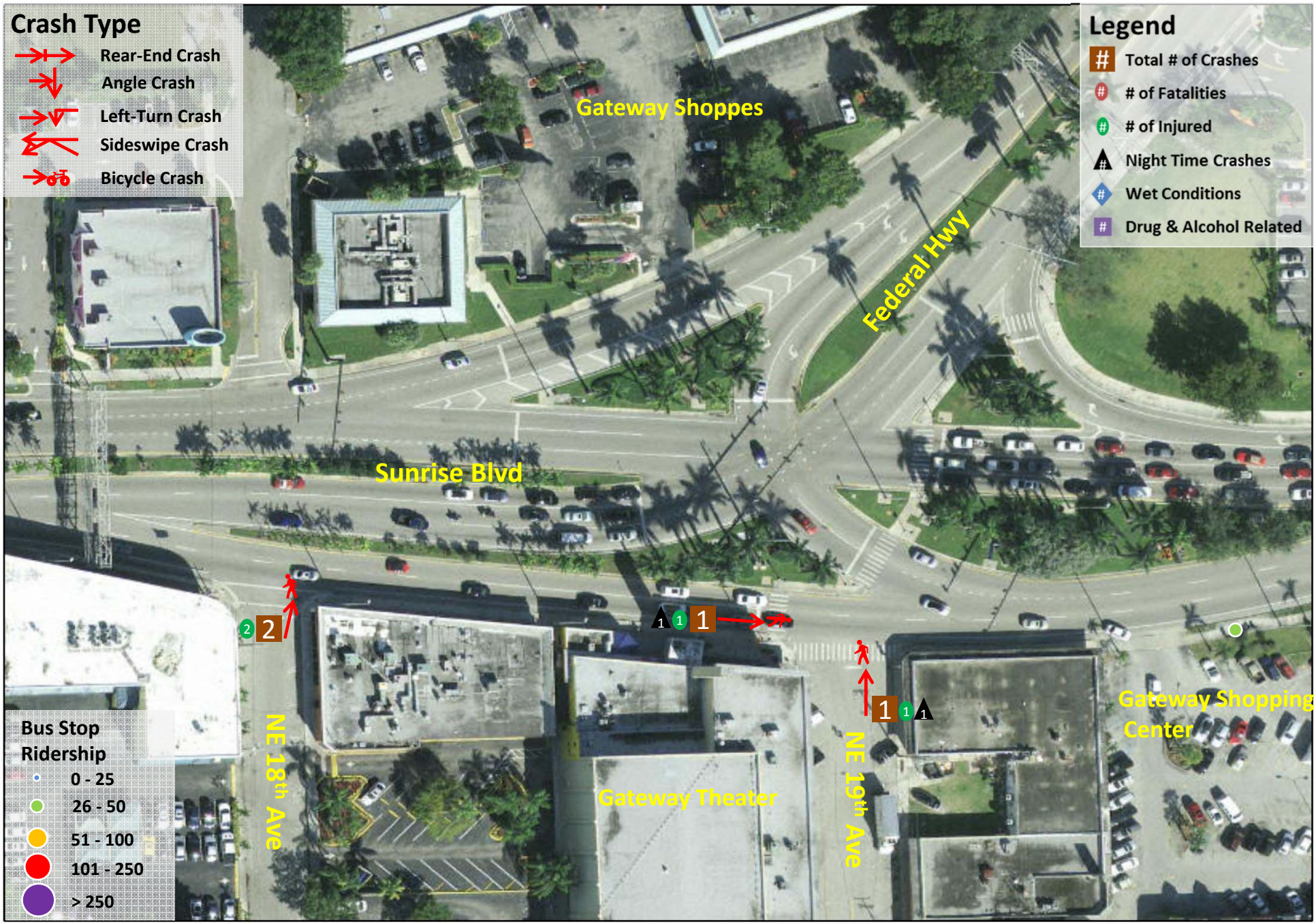
Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes – Sunrise Boulevard from NE 14th Avenue to US 1

Figure **7**



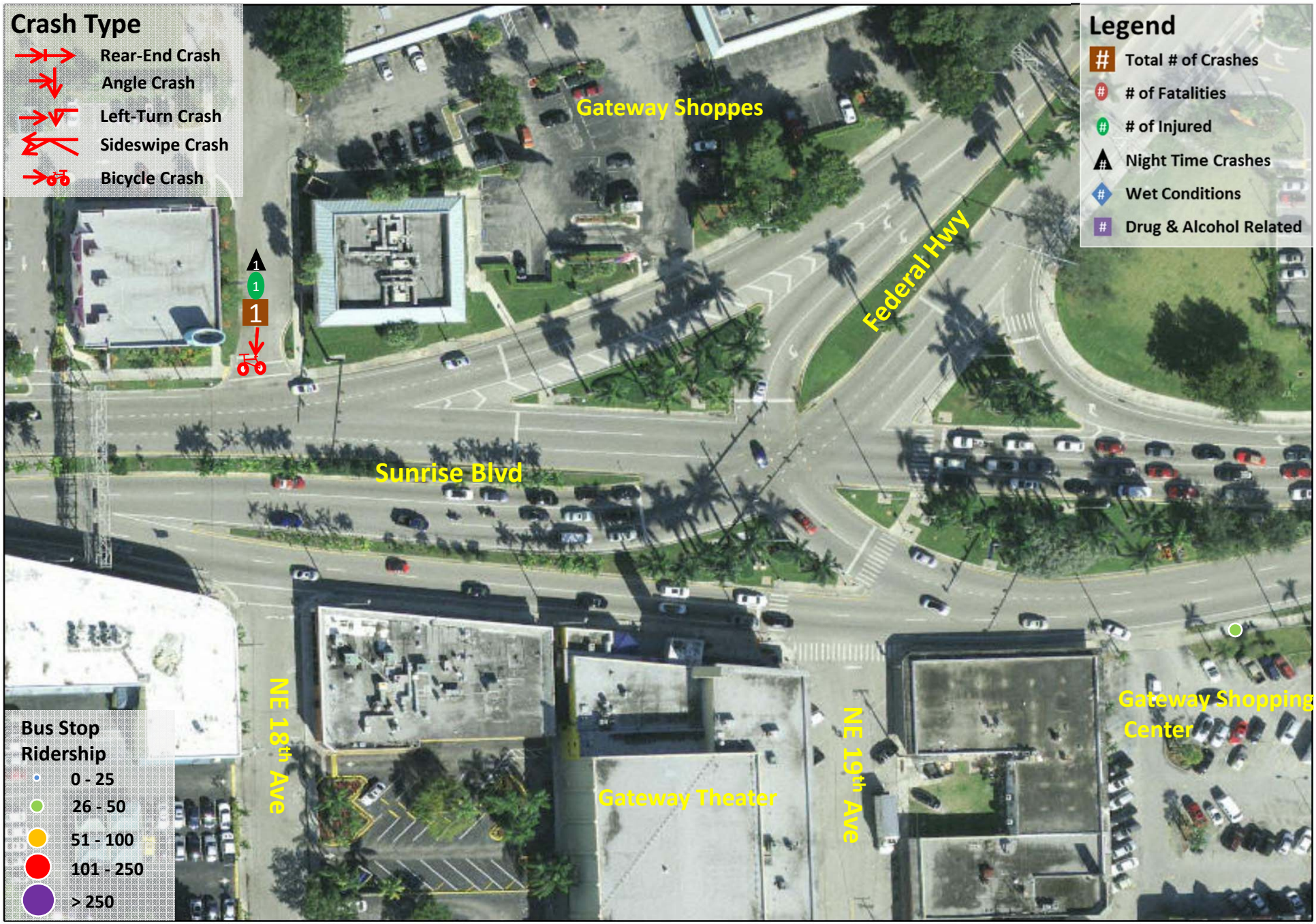
Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes – Sunrise Boulevard from NE 14th Avenue to US 1

Figure **8**



Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes – Sunrise Boulevard from NE 14th Avenue to US 1

Figure **9**

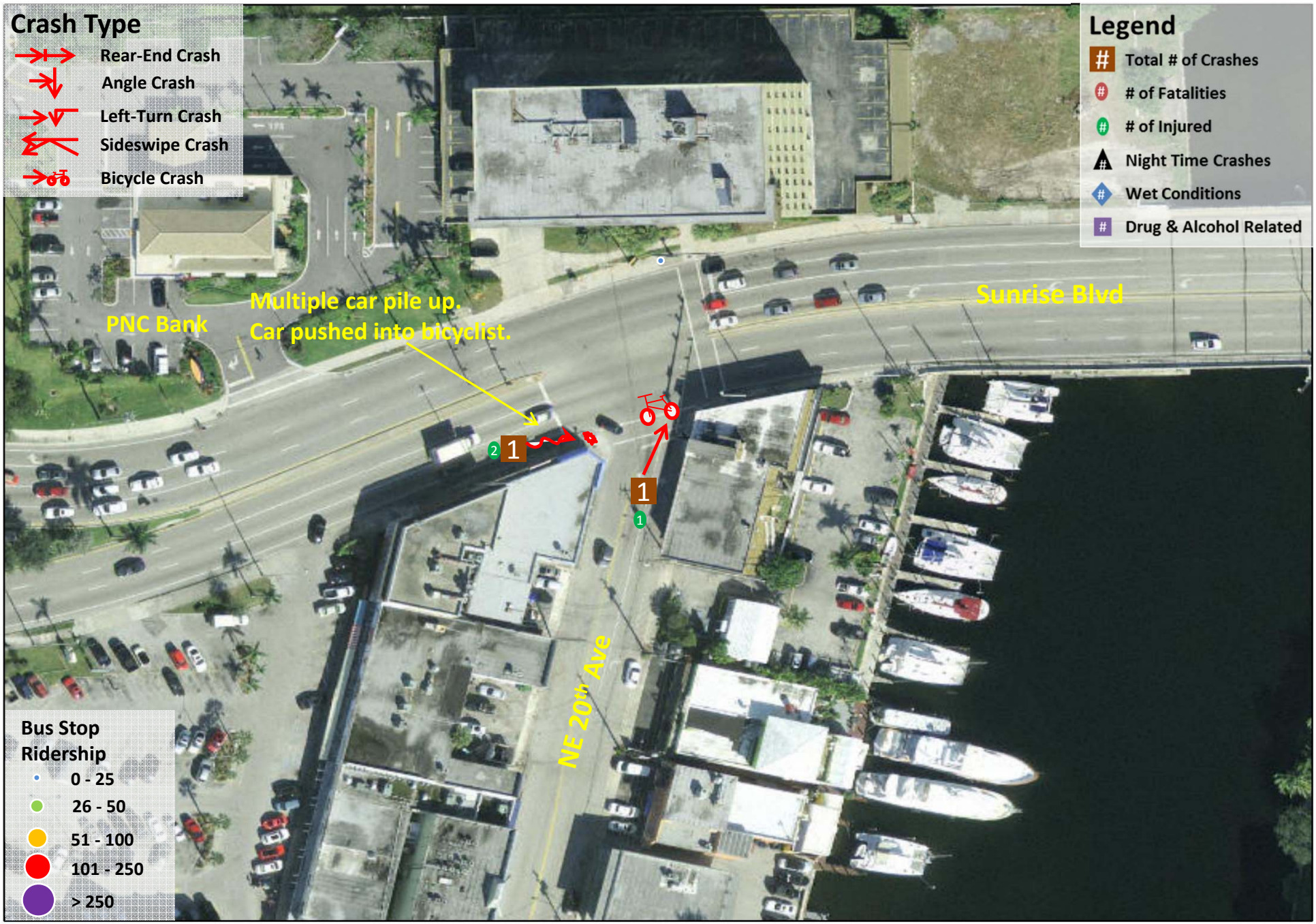


Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes – Sunrise Boulevard from NE 14th Avenue to US 1

Figure **10**

Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes – Sunrise Boulevard from NE 14th Avenue to US 1

Figure **11**



Broward MPD Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes – Sunrise Boulevard from NE 14th Avenue to US 1

Figure **12**

Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes – Sunrise Boulevard from NE 14th Avenue to US 1

Figure **13**

Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes – Sunrise Boulevard from NE 14th Avenue to US 1

Figure **14**

Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes – Sunrise Boulevard from NE 14th Avenue to US 1

Figure **15**

Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes – Sunrise Boulevard from NE 14th Avenue to US 1

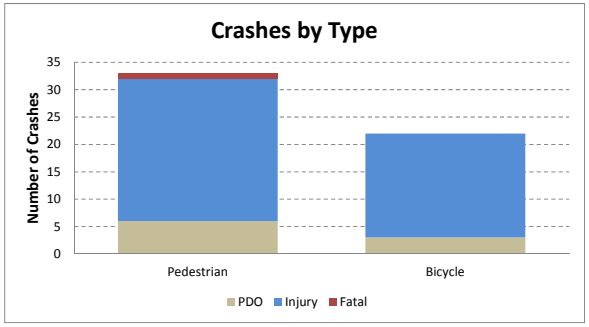
Figure **16**

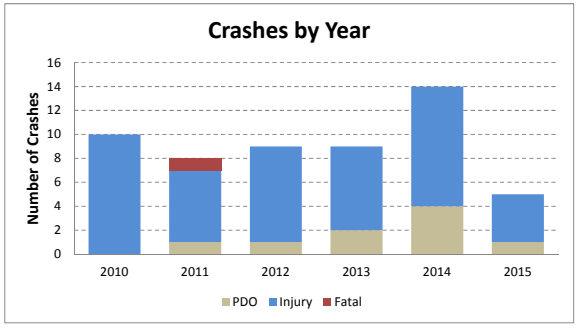
APPENDIX 4

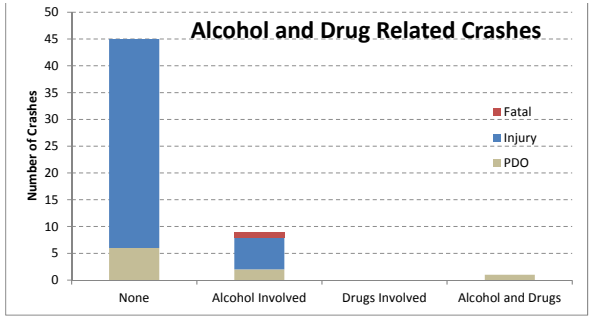
URBAN INTERSECTION DEMONSTRATION SITE

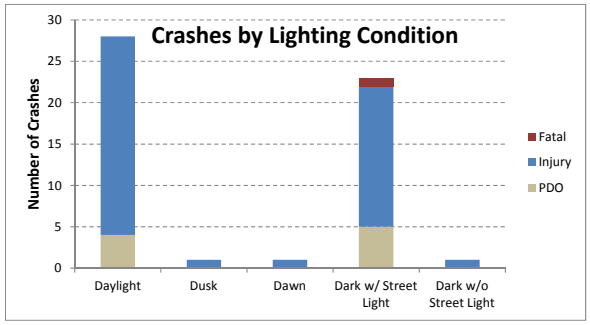
BROWARD BOULEVARD AT ANDREWS AVENUE

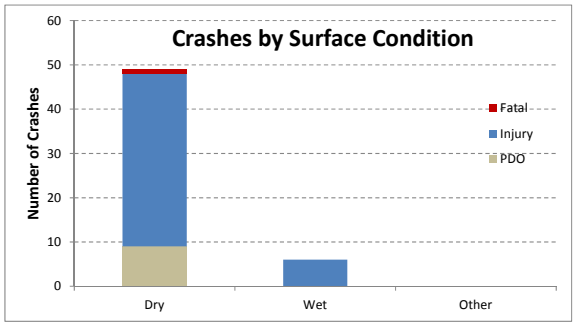
CRASH ANALYSIS - Broward Blvd. at Andrews Ave.

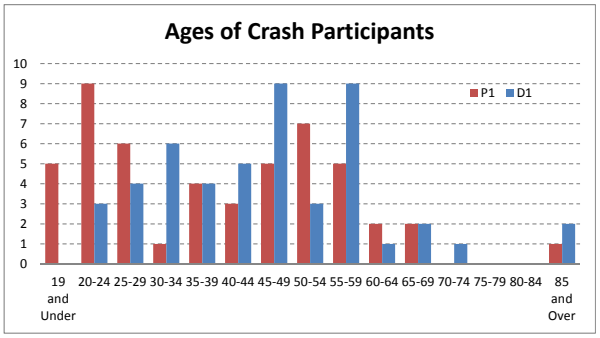


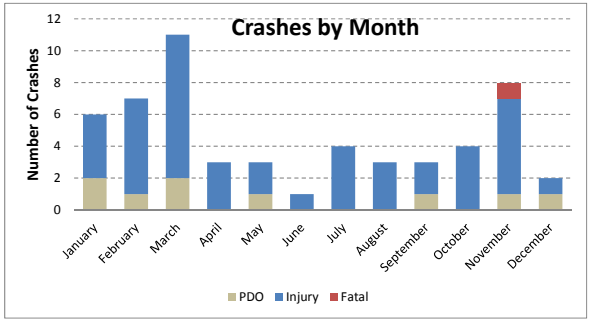


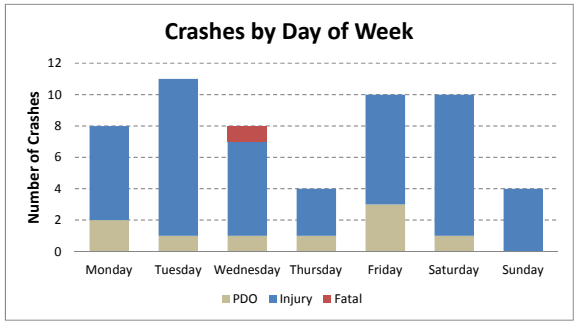


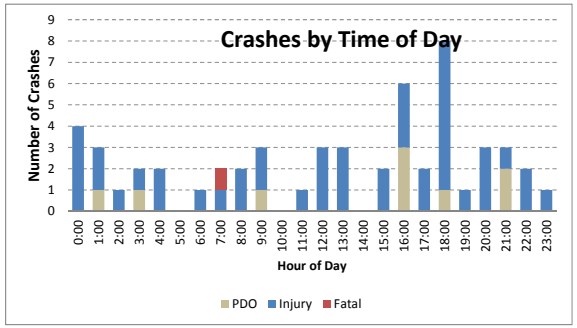








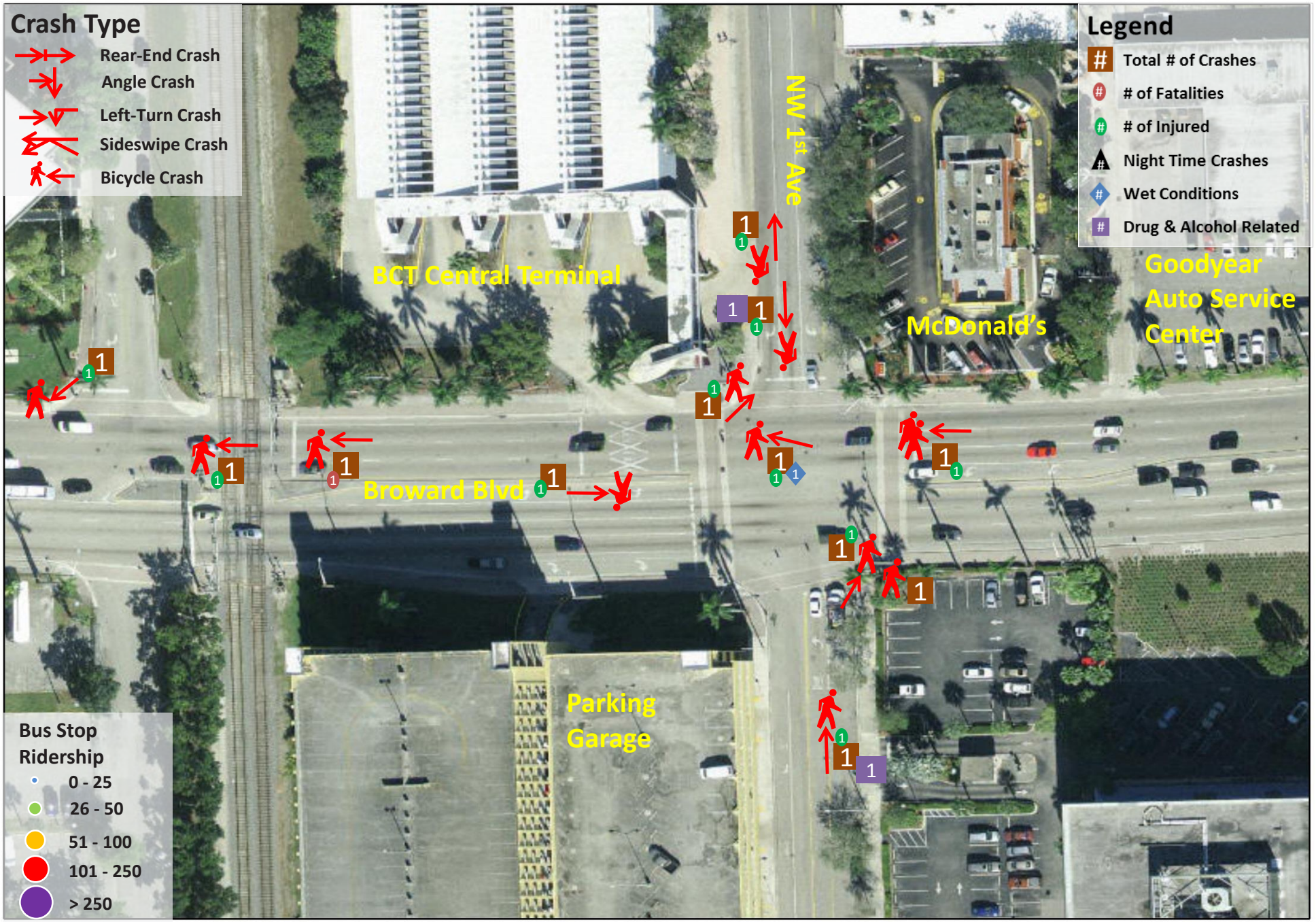




CRASH ANALYSIS - Broward Blvd. at Andrews Ave.

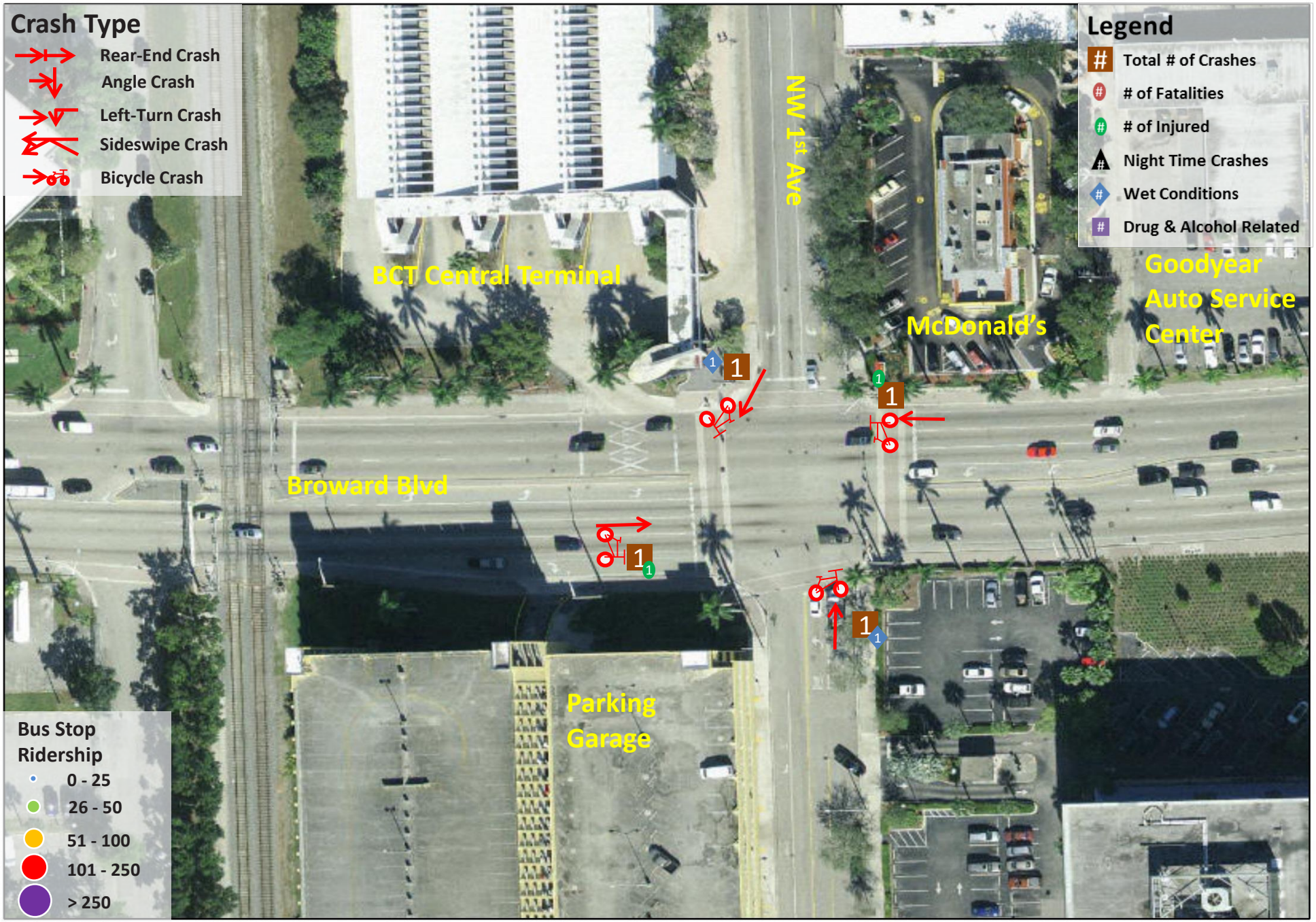
		Analysis Year						Severity			Total	Average	Percent
		2010	2011	2012	2013	2014	2015	PDO	Injury	Fatal			
Type of Crash	Pedestrian	6	4	5	4	10	4	6	26	1	33	5.50	60.0%
	Bicycle	4	4	4	5	4	1	3	19	0	22	3.67	40.0%
	Total Crashes	**10**	**8**	**9**	**9**	**14**	**5**	**9**	**45**	**1**	**55**	**9.17**	**100.0%**
Crash Severity	PDO	0	1	1	2	4	1				9	1.50	16.4%
	Injury	10	6	8	7	10	4				45	7.50	81.8%
	Fatal	0	1	0	0	0	0				1	0.17	1.8%
Light Conditions	Daylight	4	4	5	5	6	4	4	24	0	28	4.67	50.9%
	Dusk	0	0	1	0	0	0	0	1	0	1	0.17	1.8%
	Dawn	1	0	0	0	0	0	0	1	0	1	0.17	1.8%
	Dark w/ Street Light	4	4	3	3	8	1	5	17	1	23	3.83	41.8%
	Dark w/o Street Light	1	0	0	0	0	0	0	1	0	1	0.17	1.8%
	Unknown	0	0	0	1	0	0	0	1	0	1	0.17	1.8%
Surface Condition	Dry	9	6	9	7	13	5	9	39	1	49	8.17	89.1%
	Wet	1	2	0	2	1	0	0	6	0	6	1.00	10.9%
	Other	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
Month	January	1	0	0	3	1	1	2	4	0	6	1.00	10.9%
	February	0	1	1	2	1	2	1	6	0	7	1.17	12.7%
	March	4	2	0	2	3	0	2	9	0	11	1.83	20.0%
	April	1	0	0	0	1	1	0	3	0	3	0.50	5.5%
	May	0	0	2	0	1	0	1	2	0	3	0.50	5.5%
	June	0	0	0	0	1	0	0	1	0	1	0.17	1.8%
	July	1	2	0	0	0	1	0	4	0	4	0.67	7.3%
	August	0	0	1	0	2	0	0	3	0	3	0.50	5.5%
	September	1	0	2	0	0	0	1	2	0	3	0.50	5.5%
	October	1	1	0	2	0	0	0	4	0	4	0.67	7.3%
	November	1	2	3	0	2	0	1	6	1	8	1.33	14.5%
	December	0	0	0	0	2	0	1	1	0	2	0.33	3.6%
Day of Week	Monday	1	1	0	0	4	2	2	6	0	8	1.33	14.5%
	Tuesday	2	1	1	4	2	1	1	10	0	11	1.83	20.0%
	Wednesday	1	2	2	1	1	1	1	6	1	8	1.33	14.5%
	Thursday	1	1	0	2	0	0	1	3	0	4	0.67	7.3%
	Friday	2	1	3	0	4	0	3	7	0	10	1.67	18.2%
	Saturday	2	1	2	2	2	1	1	9	0	10	1.67	18.2%
	Sunday	1	1	1	0	1	0	0	4	0	4	0.67	7.3%
Hour of Day	0:00	1	1	1	0	0	1	0	4	0	4	0.67	7.3%
	1:00	1	0	1	1	0	0	1	2	0	3	0.50	5.5%
	2:00	0	0	0	0	1	0	0	1	0	1	0.17	1.8%
	3:00	0	1	0	0	1	0	1	1	0	2	0.33	3.6%
	4:00	0	0	0	0	2	0	0	2	0	2	0.33	3.6%
	5:00	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	6:00	1	0	0	0	0	0	0	1	0	1	0.17	1.8%
	7:00	0	1	0	0	1	0	0	1	1	2	0.33	3.6%
	8:00	0	0	0	2	0	0	0	2	0	2	0.33	3.6%
	9:00	0	0	2	0	1	0	1	2	0	3	0.50	5.5%
	10:00	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	11:00	0	0	0	0	1	0	0	1	0	1	0.17	1.8%
	12:00	1	0	0	1	0	1	0	3	0	3	0.50	5.5%
	13:00	0	0	0	1	2	0	0	3	0	3	0.50	5.5%
	14:00	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	15:00	1	0	1	0	0	0	0	2	0	2	0.33	3.6%
	16:00	1	1	1	0	1	2	3	3	0	6	1.00	10.9%
	17:00	0	1	0	1	0	0	0	2	0	2	0.33	3.6%
	18:00	1	2	2	1	2	0	1	7	0	8	1.33	14.5%
	19:00	0	0	0	0	1	0	0	1	0	1	0.17	1.8%

		Analysis Year						Severity			Total	Average	Percent
		2010	2011	2012	2013	2014	2015	PDO	Injury	Fatal			
	20:00	3	0	0	0	0	0	0	3	0	3	0.50	5.5%
	21:00	0	1	0	1	1	0	2	1	0	3	0.50	5.5%
	22:00	0	0	1	0	0	1	0	2	0	2	0.33	3.6%
	23:00	0	0	0	1	0	0	0	1	0	1	0.17	1.8%
Alcohol	None	9	6	5	7	13	5	6	39	0	45	7.50	81.8%
	Alcohol Involved	1	2	4	1	1	0	2	6	1	9	1.50	16.4%
	Drugs Involved	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	Alcohol and Drugs	0	0	0	1	0	0	1	0	0	1	0.17	1.8%
	Undetermined	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
Age of Ped/Bicyclist	19 and Under	0	1	1	1	2	0				5	0.83	9.1%
	20-24	2	0	0	1	4	2				9	1.50	16.4%
	25-29	1	1	0	2	2	0				6	1.00	10.9%
	30-34	0	0	0	0	1	0				1	0.17	1.8%
	35-39	1	0	1	1	1	0				4	0.67	7.3%
	40-44	1	0	0	1	1	0				3	0.50	5.5%
	45-49	0	3	1	1	0	0				5	0.83	9.1%
	50-54	2	1	2	1	1	0				7	1.17	12.7%
	55-59	1	1	1	1	1	0				5	0.83	9.1%
	60-64	0	1	1	0	0	0				2	0.33	3.6%
	65-69	2	0	0	0	0	0				2	0.33	3.6%
	70-74	0	0	0	0	0	0				0	0.00	0.0%
	75-79	0	0	0	0	0	0				0	0.00	0.0%
	80-84	0	0	0	0	0	0				0	0.00	0.0%
	85 and Over	0	0	1	0	0	0				1	0.17	1.8%
Age of Driver	19 and Under	0	0	0	0	0	0				0	0.00	0.0%
	20-24	1	0	0	1	1	0				3	0.50	5.5%
	25-29	1	1	0	1	1	0				4	0.67	7.3%
	30-34	2	1	0	1	0	2				6	1.00	10.9%
	35-39	0	1	2	0	1	0				4	0.67	7.3%
	40-44	1	1	1	1	1	0				5	0.83	9.1%
	45-49	2	1	1	1	3	1				9	1.50	16.4%
	50-54	0	0	0	0	3	0				3	0.50	5.5%
	55-59	1	2	2	1	2	1				9	1.50	16.4%
	60-64	0	0	1	0	0	0				1	0.17	1.8%
	65-69	1	0	0	1	0	0				2	0.33	3.6%
	70-74	1	0	0	0	0	0				1	0.17	1.8%
	75-79	0	0	0	0	0	0				0	0.00	0.0%
	80-84	0	0	0	0	0	0				0	0.00	0.0%
	85 and Over	0	0	1	1	0	0				2	0.33	3.6%



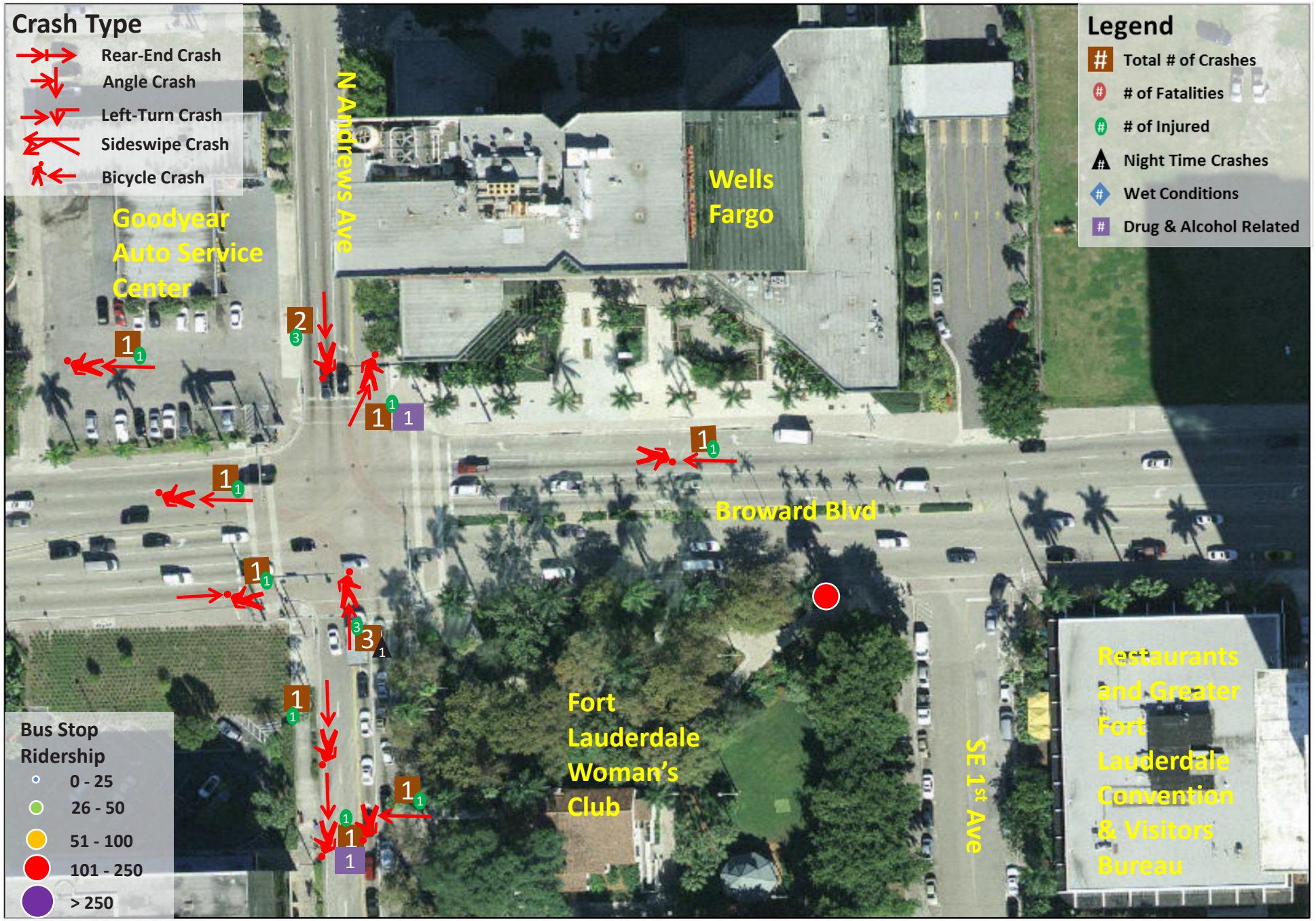
Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes - Andrews Avenue and Broward Boulevard

Figure 1



Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes - Andrews Avenue and Broward Boulevard

Figure **2**



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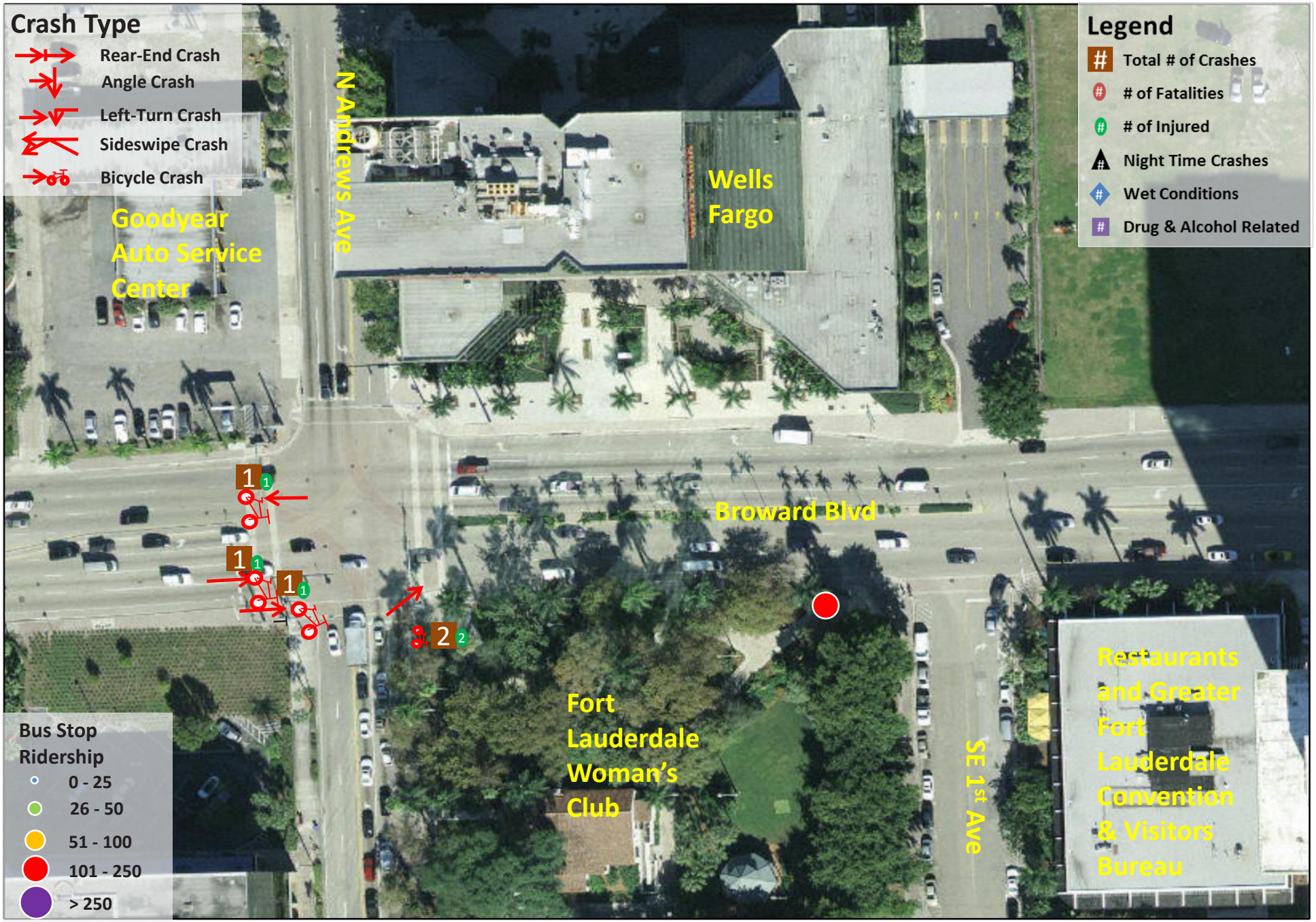
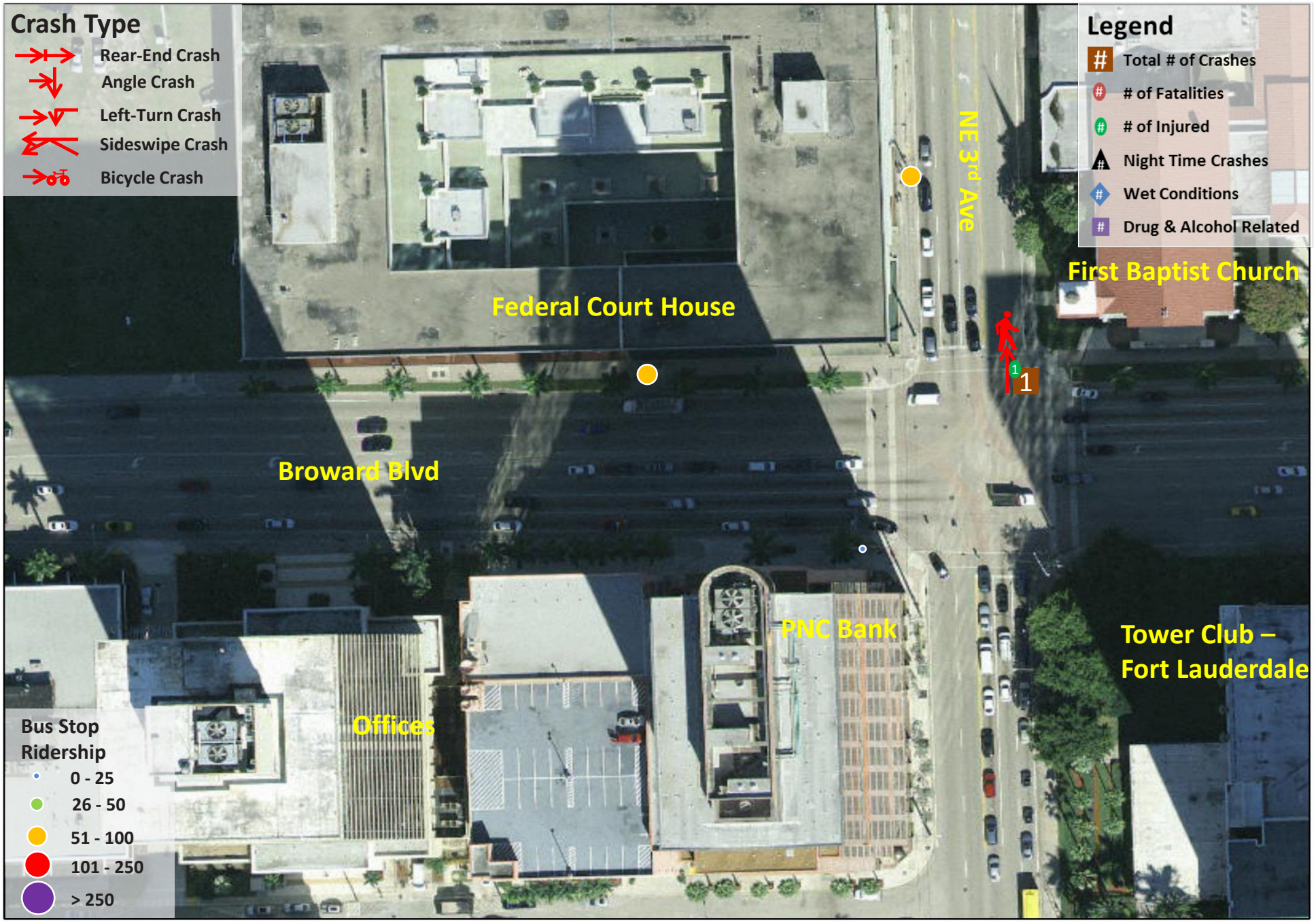
Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes - Andrews Avenue and Broward Boulevard

Figure **3**



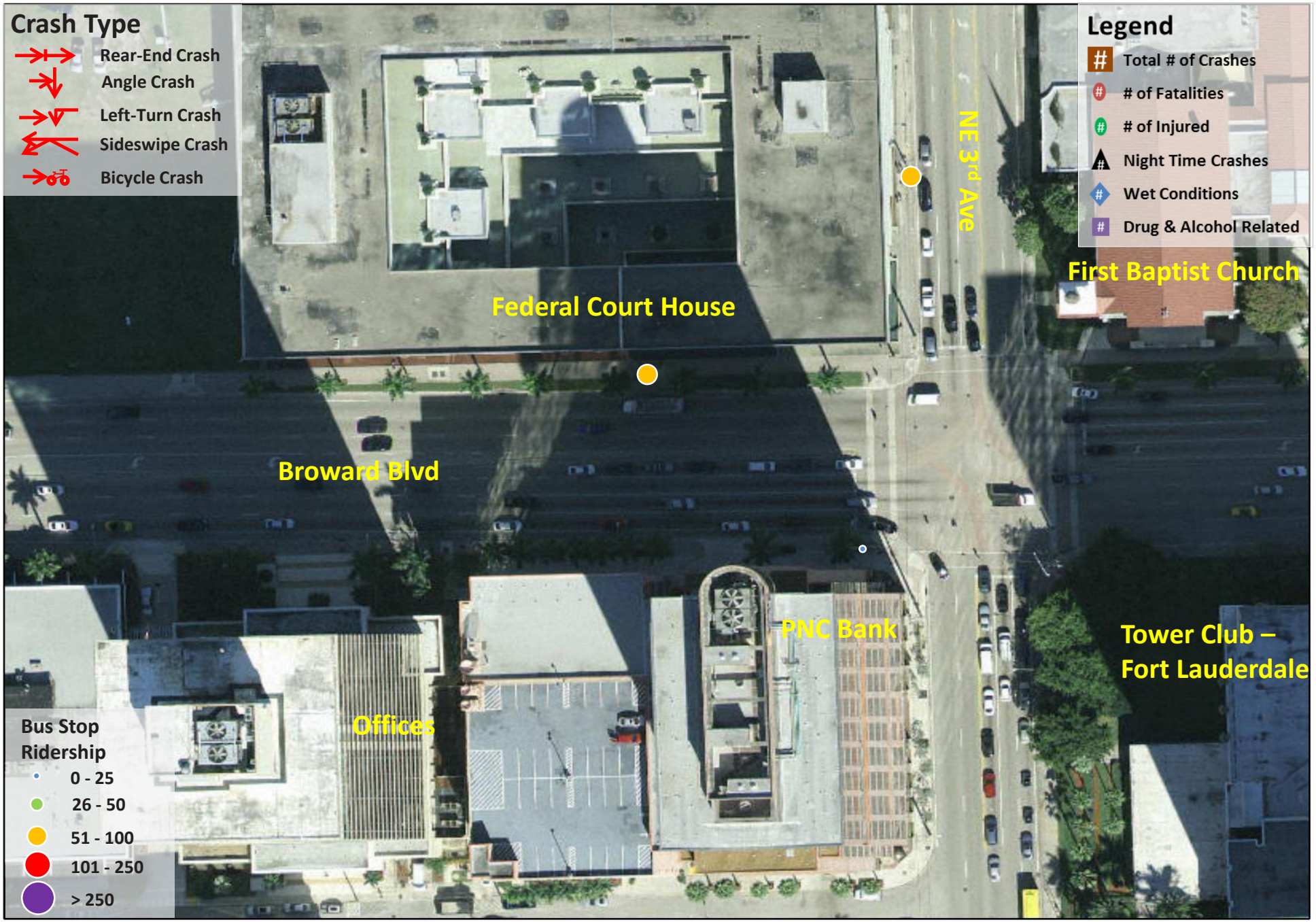
Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes - Andrews Avenue and Broward Boulevard

Figure **4**



Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes - Andrews Avenue and Broward Boulevard

Figure 5



Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes - Andrews Avenue and Broward Boulevard

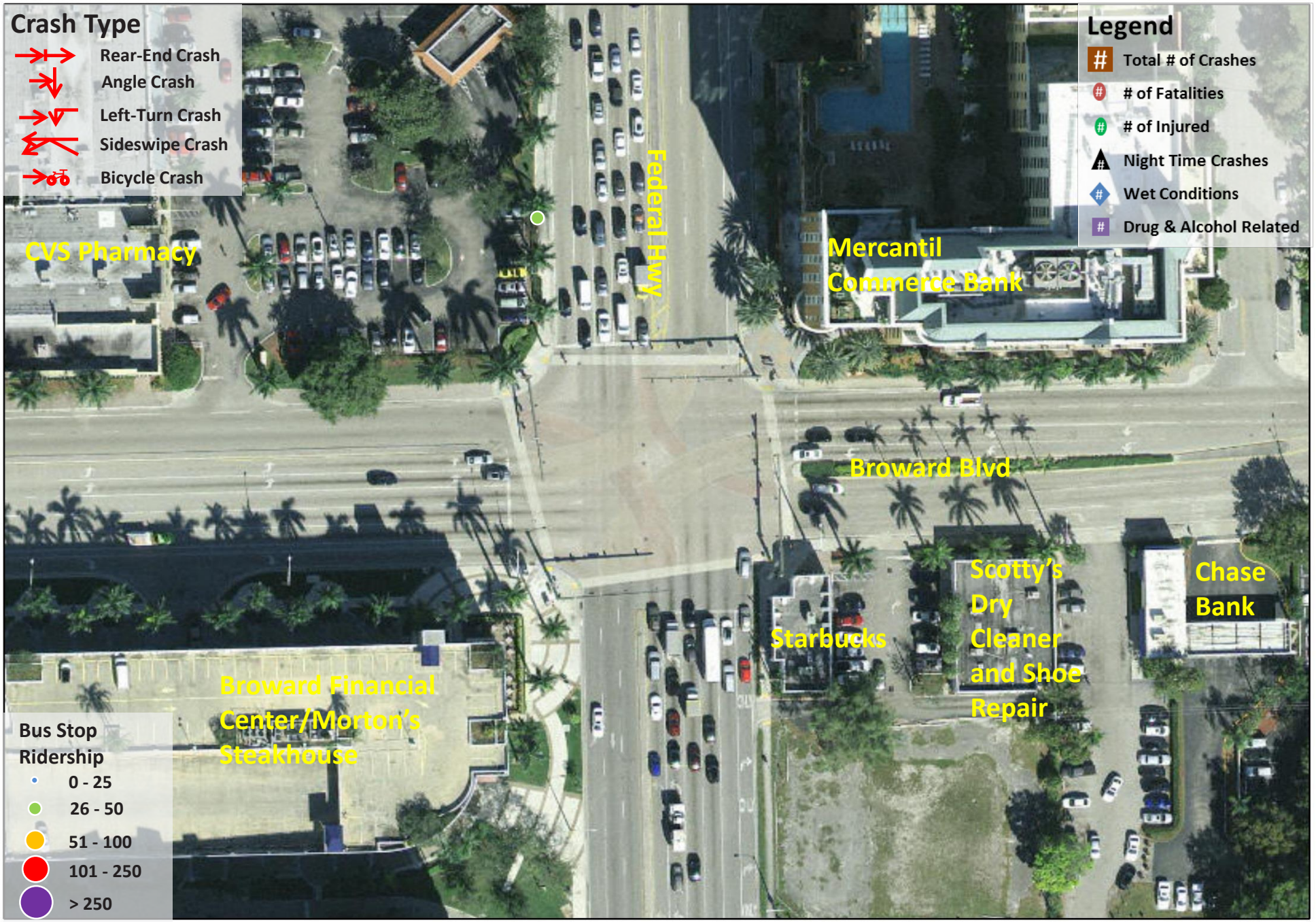
Figure 6

Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes - Andrews Avenue and Broward Boulevard

Figure 7

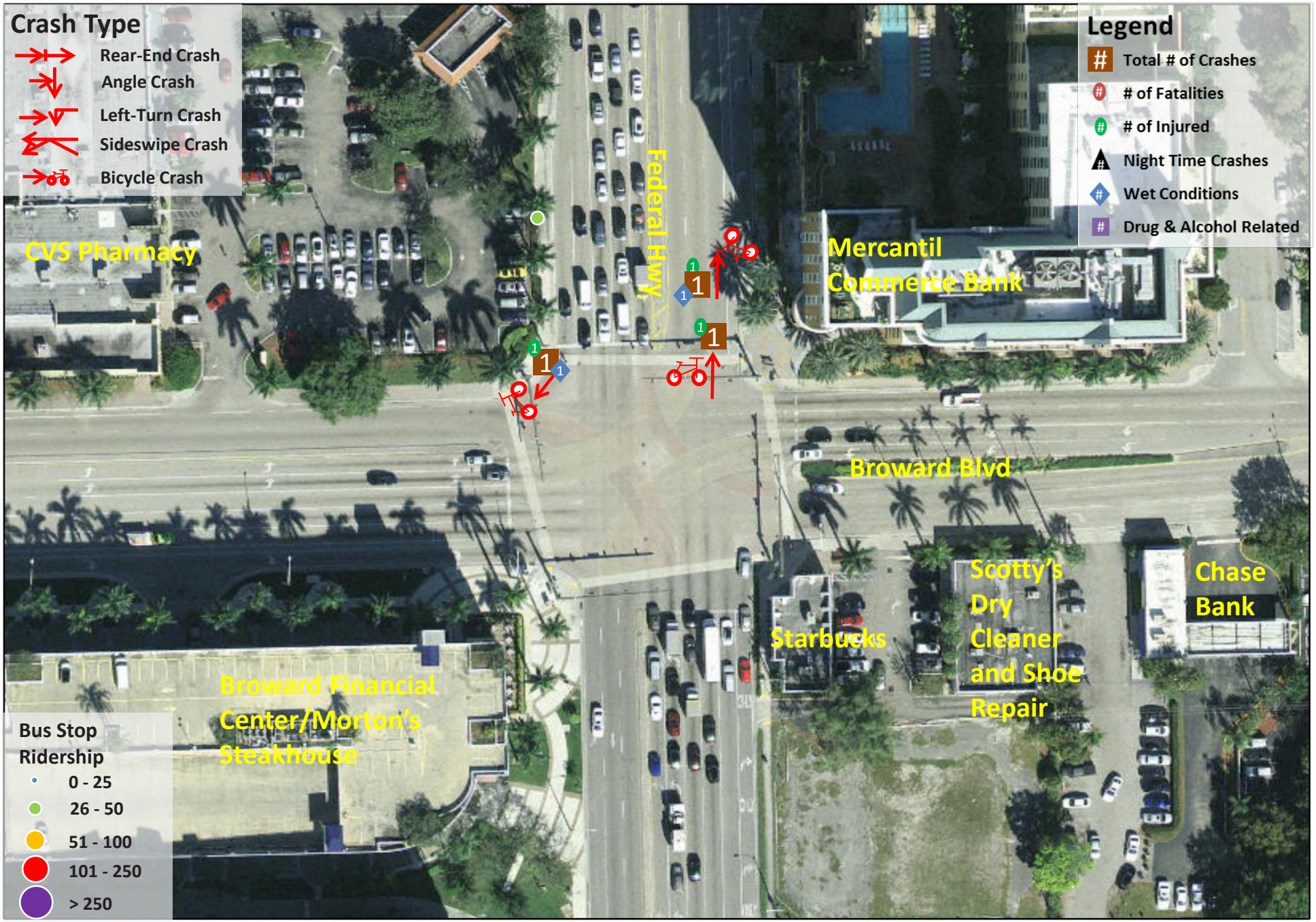
Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes - Andrews Avenue and Broward Boulevard

Figure 8



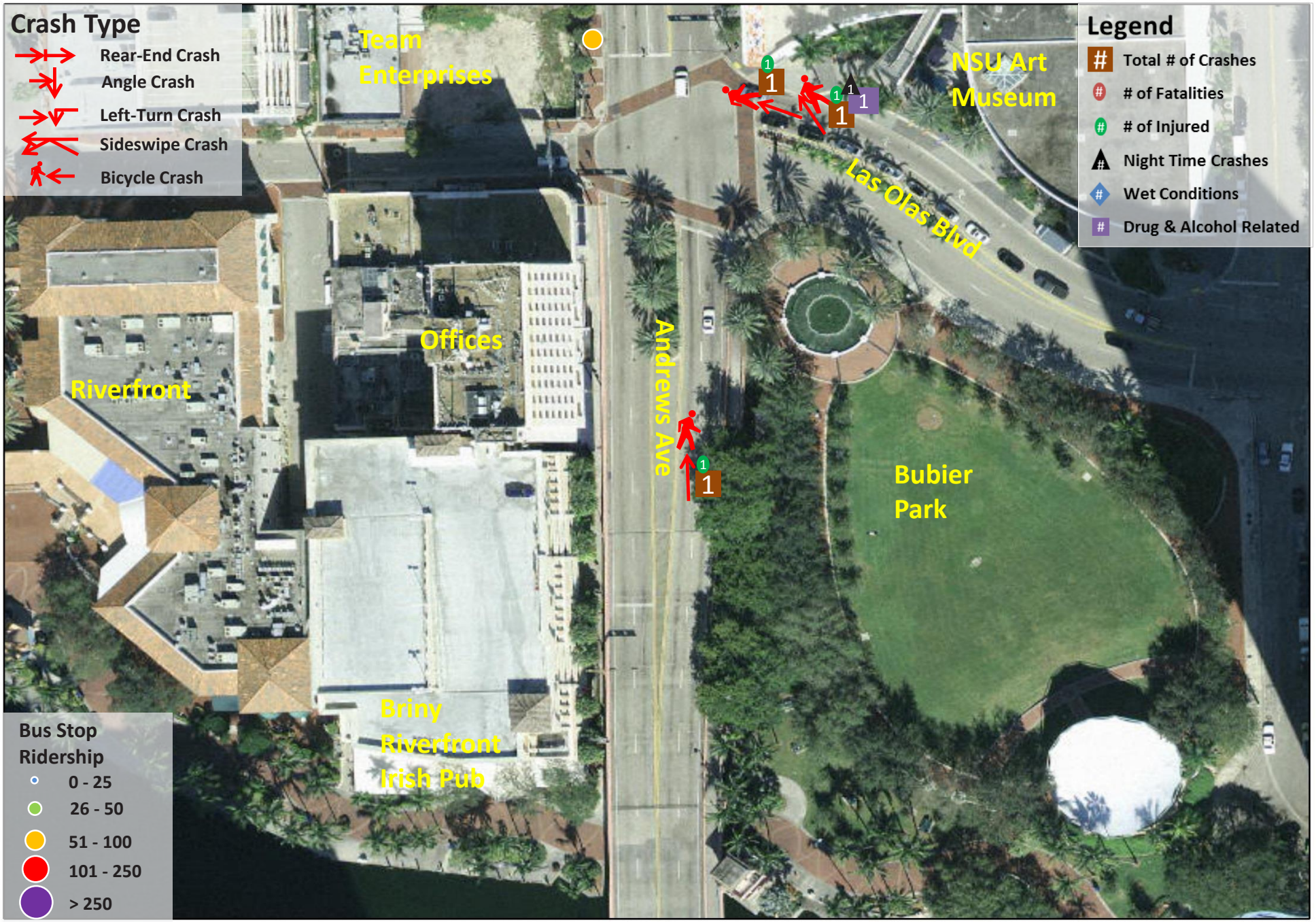
Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes - Andrews Avenue and Broward Boulevard

Figure 9



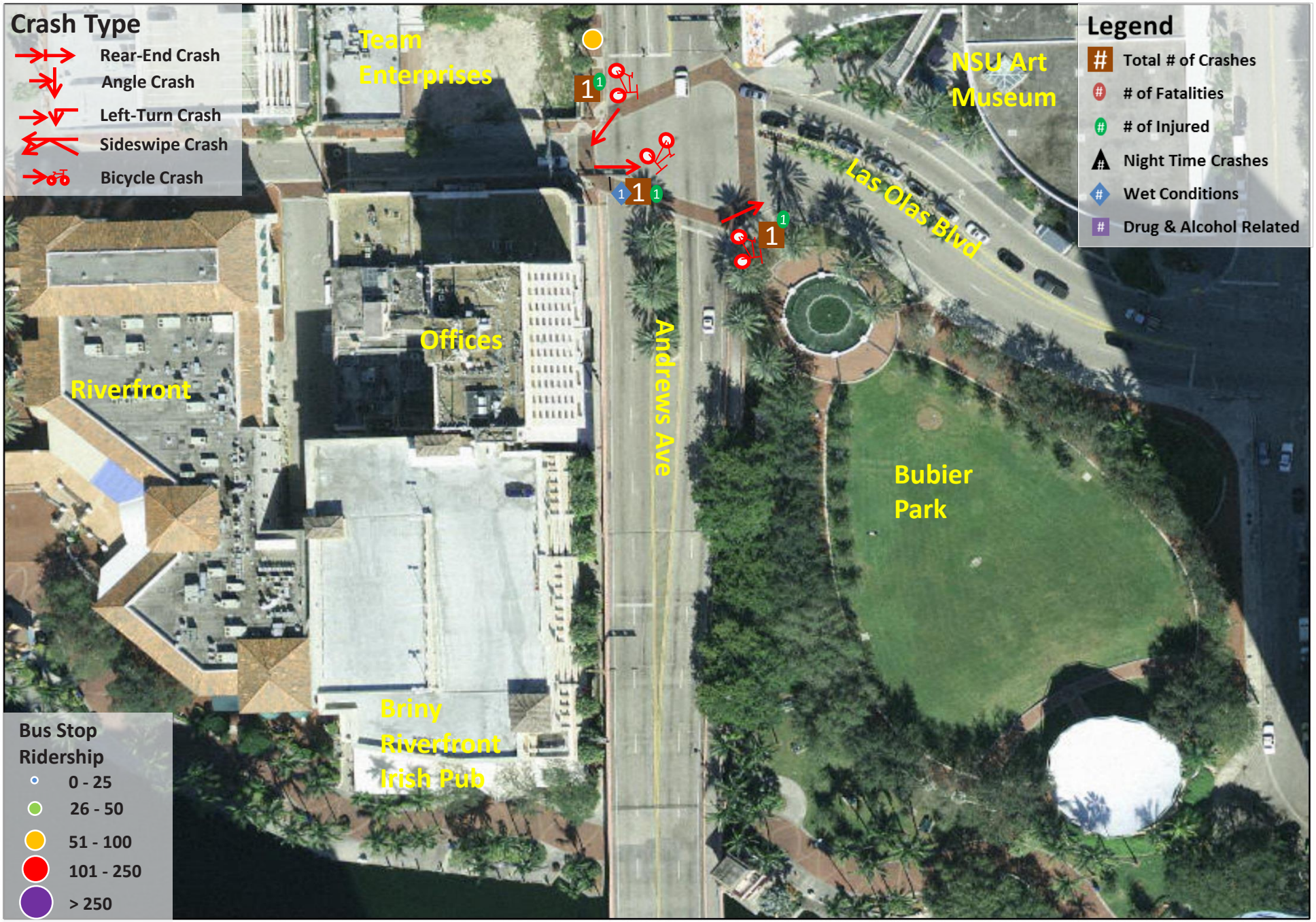
Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes - Andrews Avenue and Broward Boulevard

Figure **10**



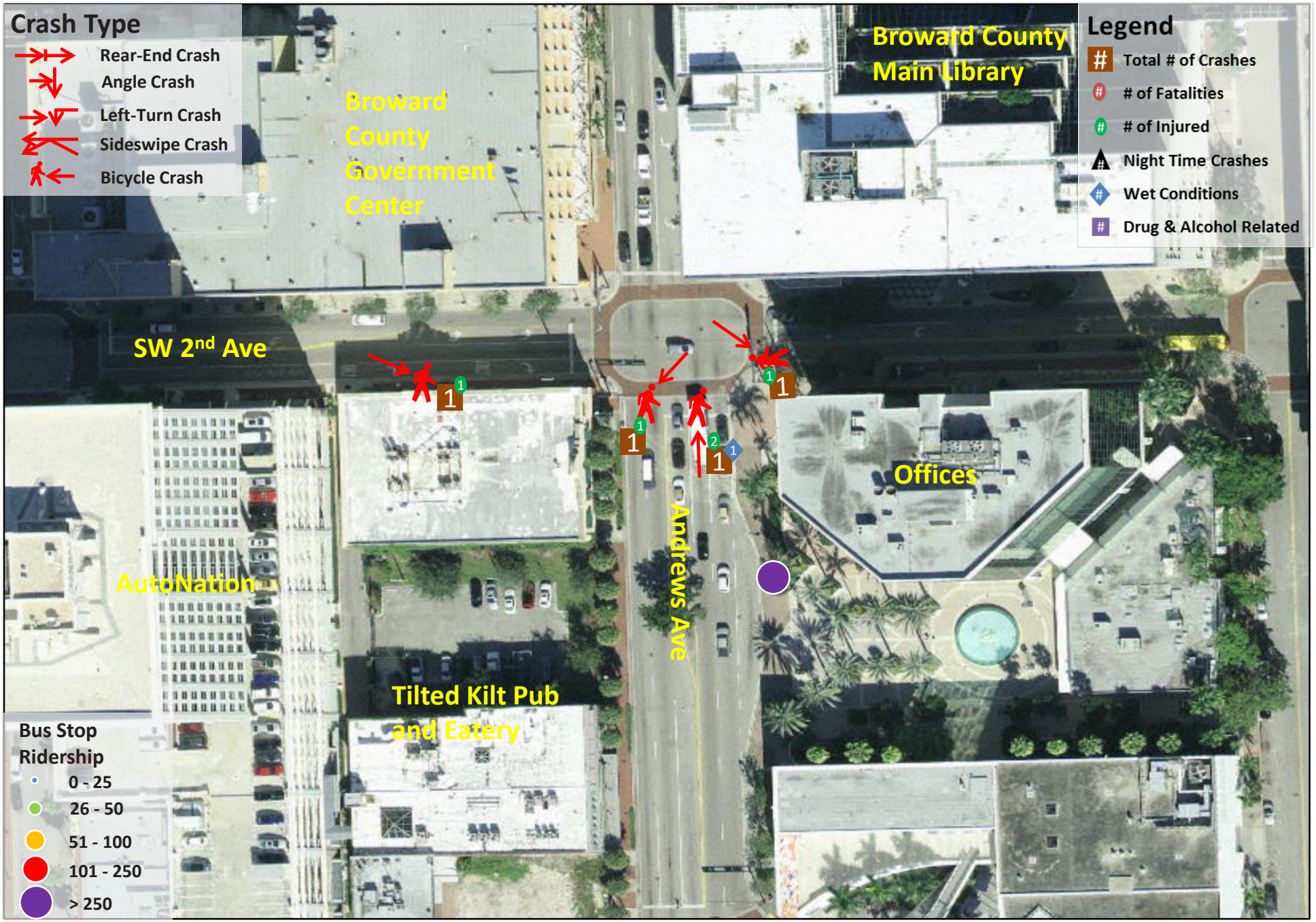
Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes - Andrews Avenue and Broward Boulevard

Figure **11**



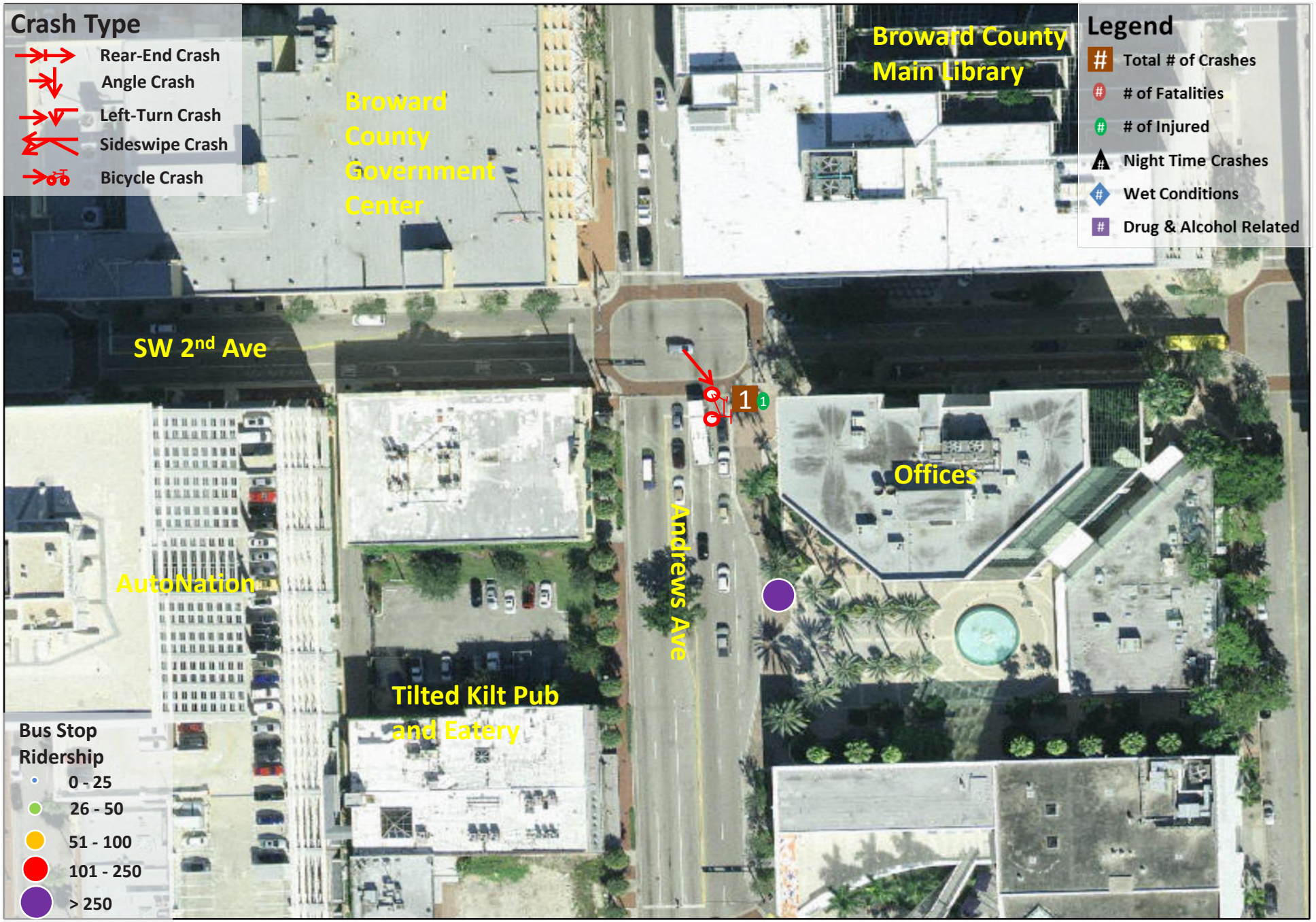
Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes - Andrews Avenue and Broward Boulevard

Figure **12**



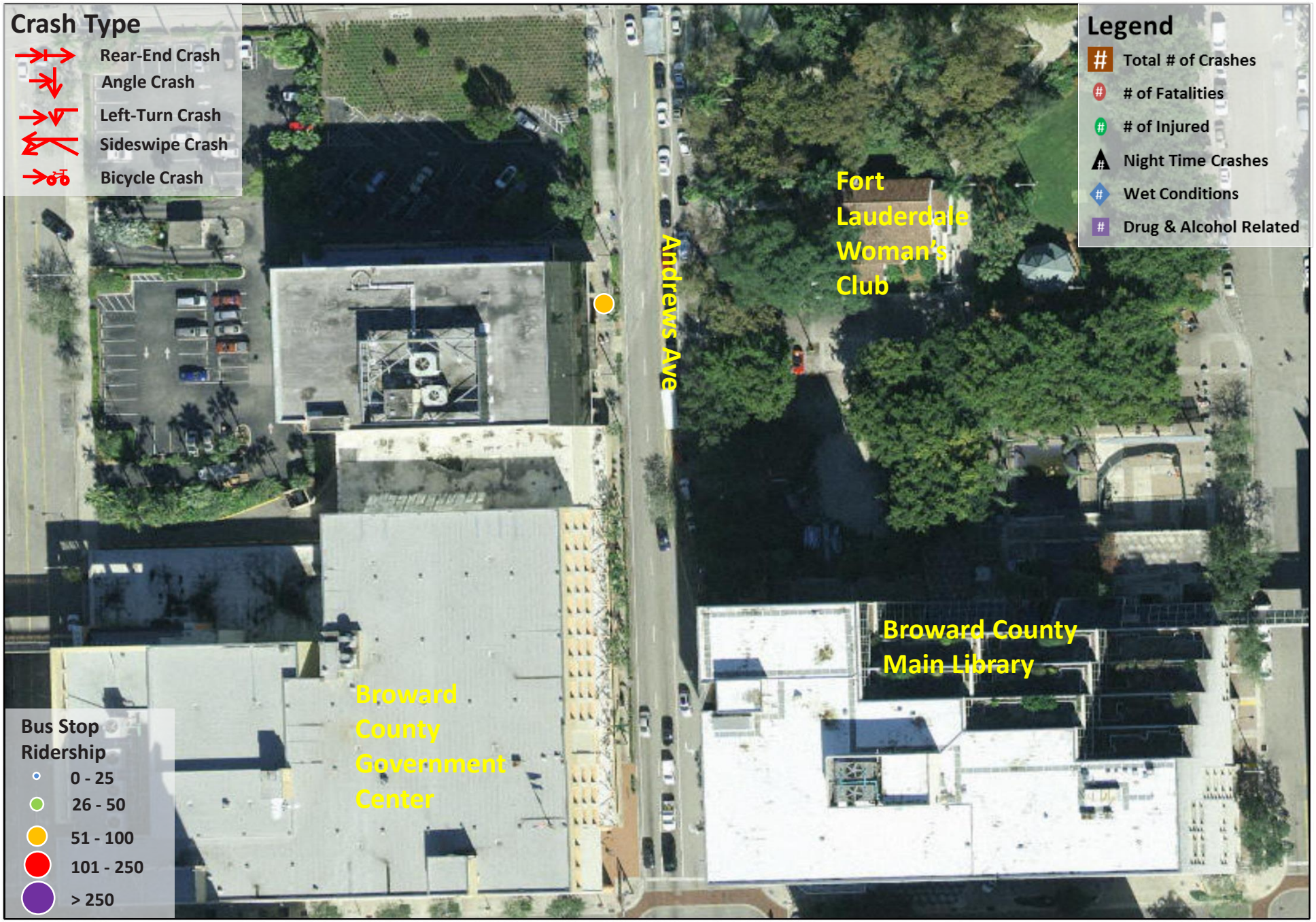
Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes - Andrews Avenue and Broward Boulevard

Figure 13



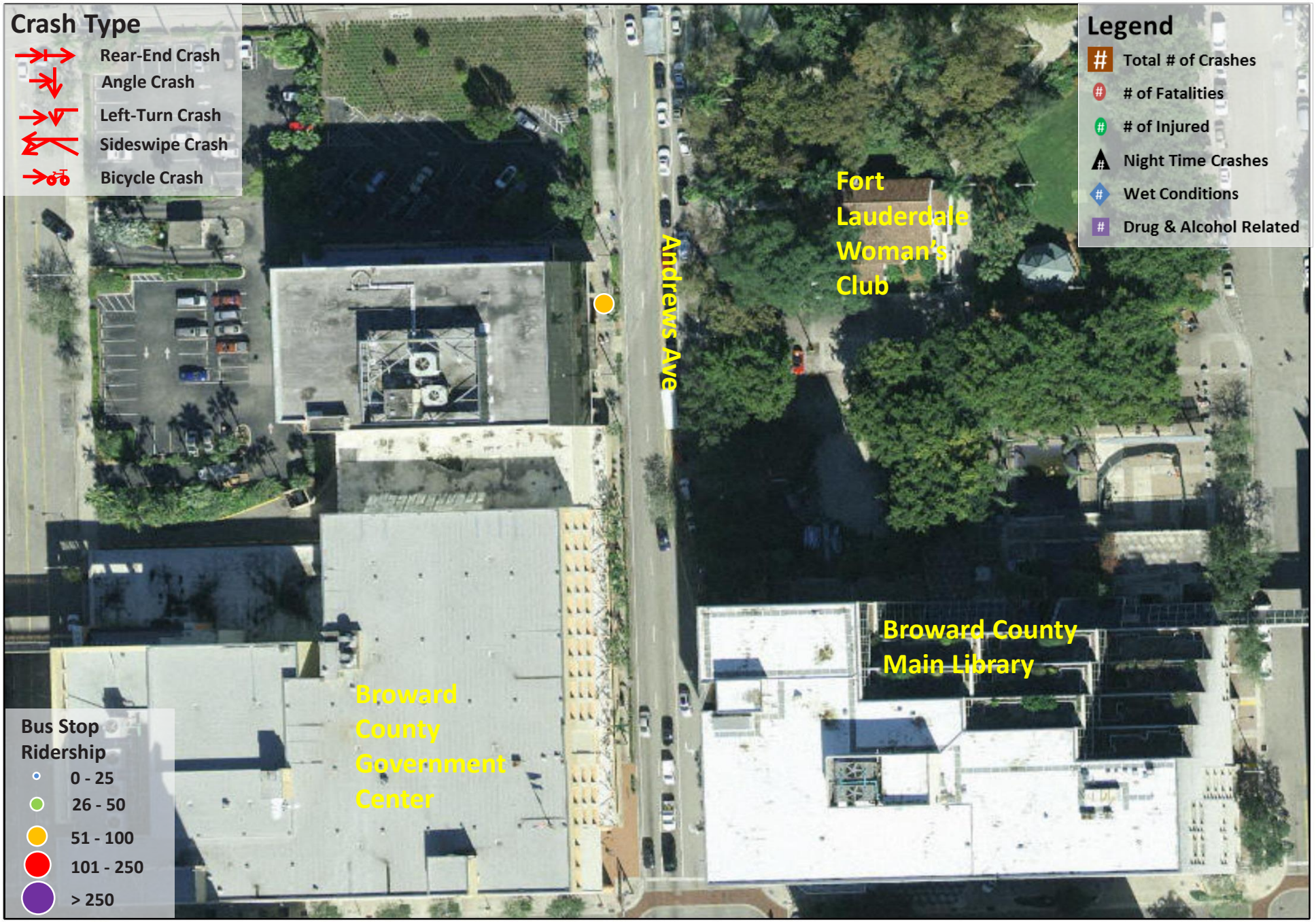
Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes - Andrews Avenue and Broward Boulevard

Figure **14**



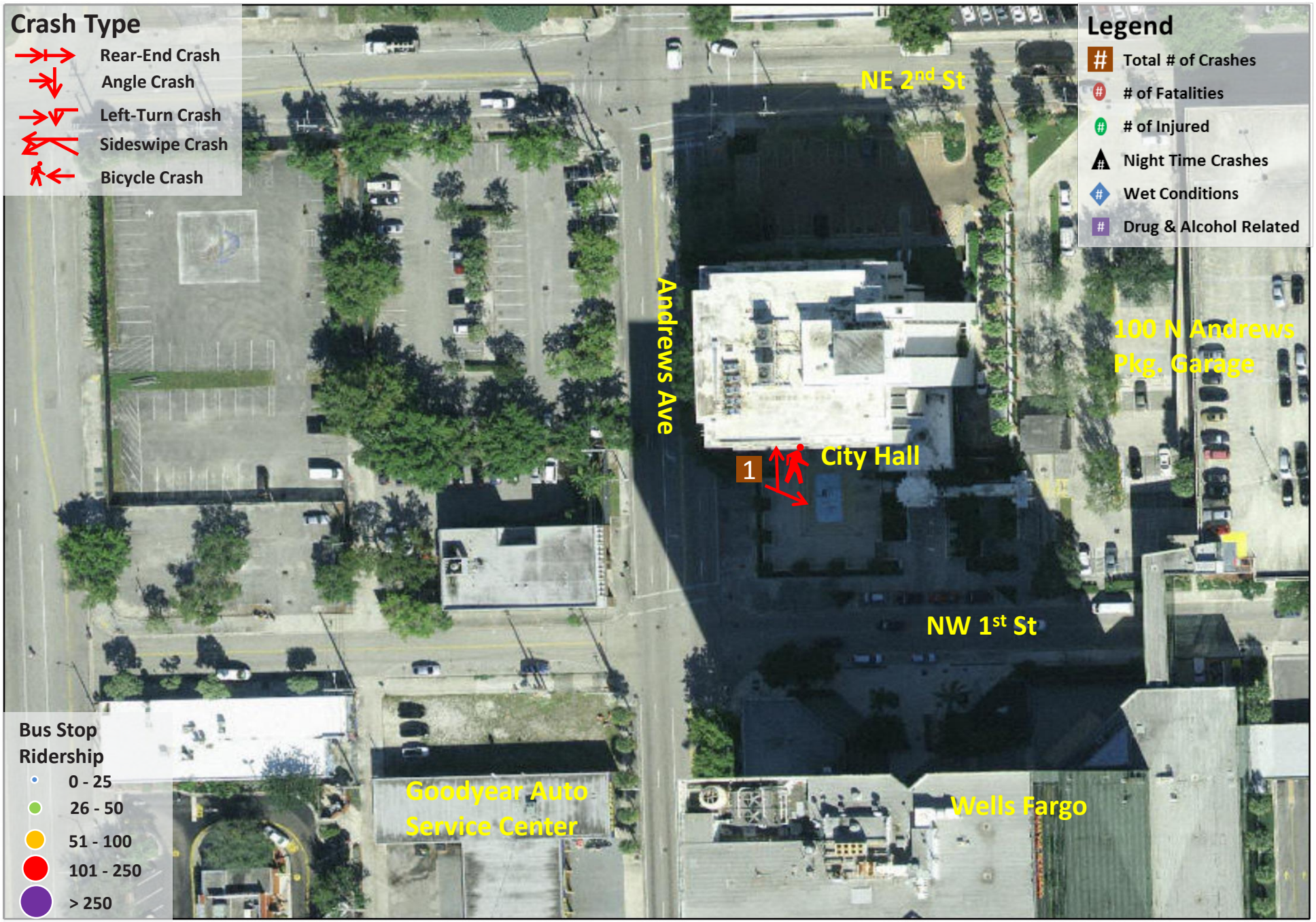
Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes - Andrews Avenue and Broward Boulevard

Figure 15



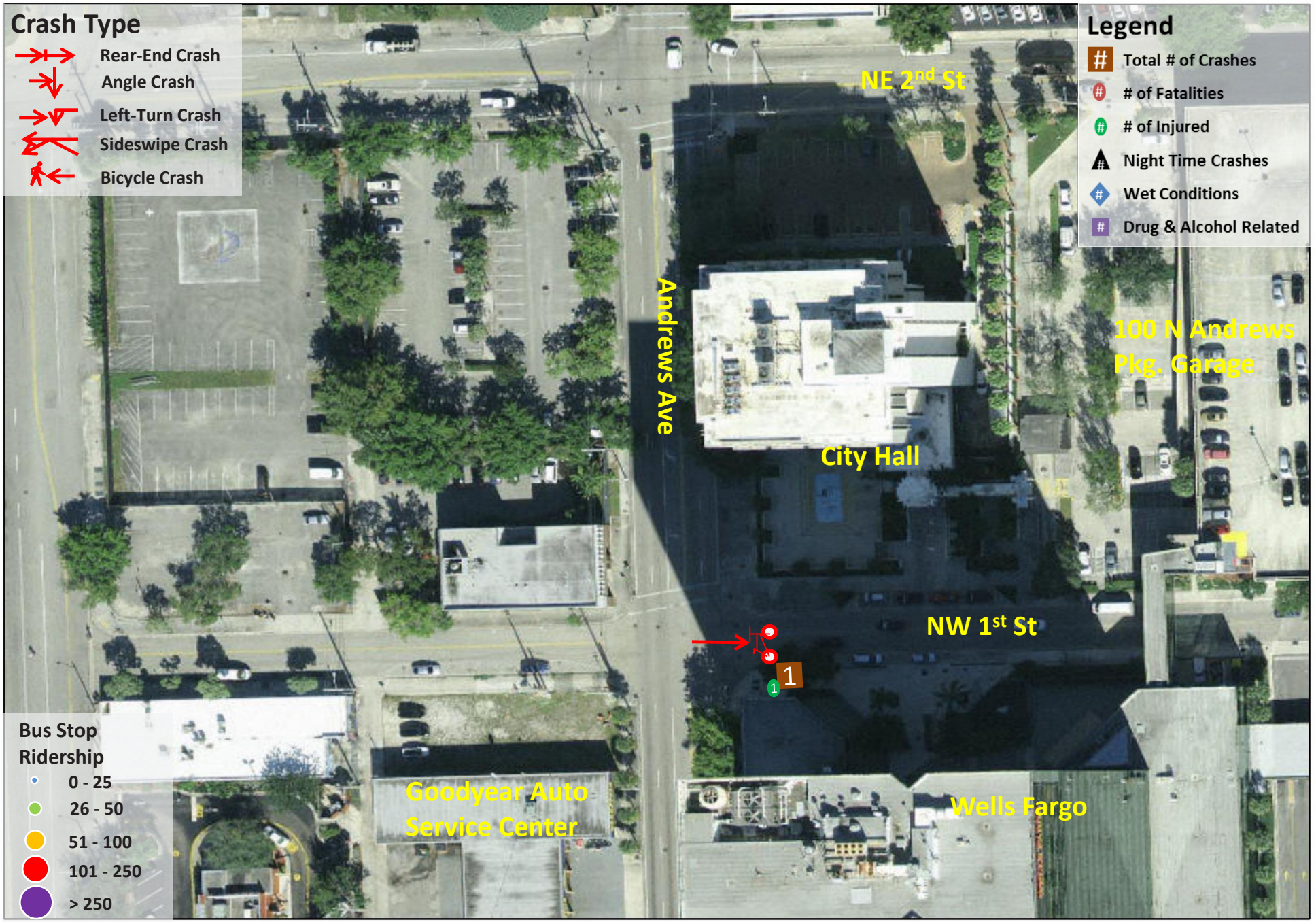
Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes - Andrews Avenue and Broward Boulevard

Figure **16**



Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes - Andrews Avenue and Broward Boulevard

Figure **17**



Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes - Andrews Avenue and Broward Boulevard

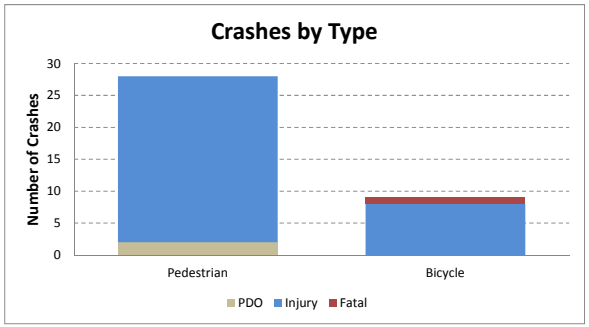
Figure **18**

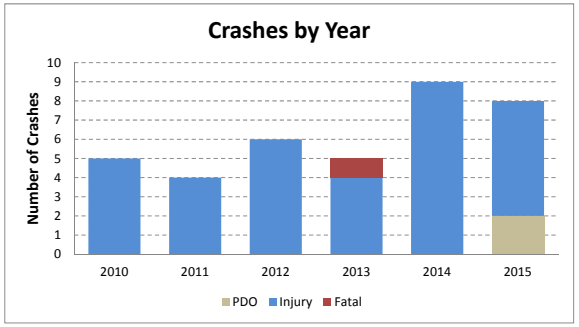
APPENDIX 5

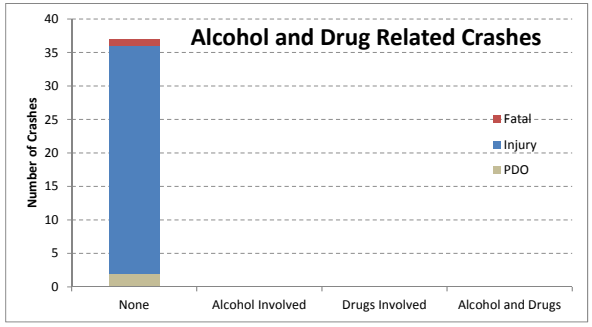
SUBURBAN CORRIDOR DEMONSTRATION SITE

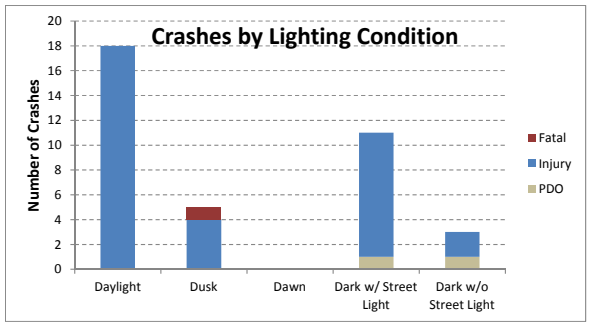
OAKLAND PARK BOULEVARD FROM NW 84TH AVENUE TO ATRIUM WEST

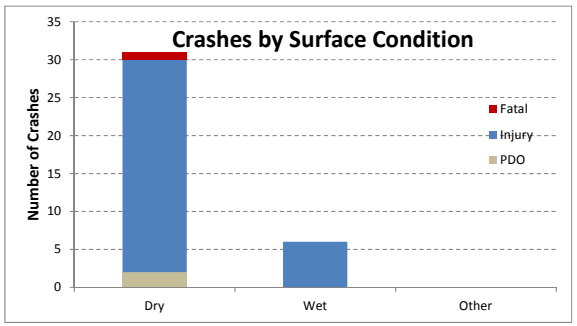
CRASH ANALYSIS - Oakland Park Blvd. from NW 84th Ave. to Atrium West

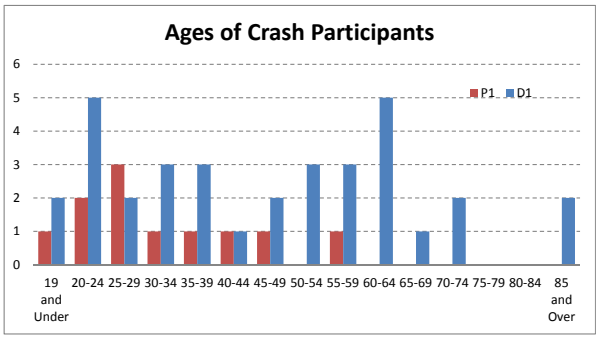


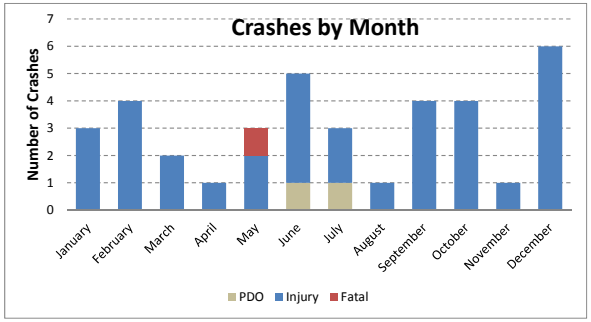


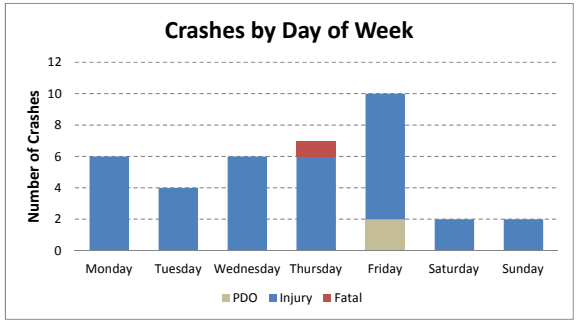


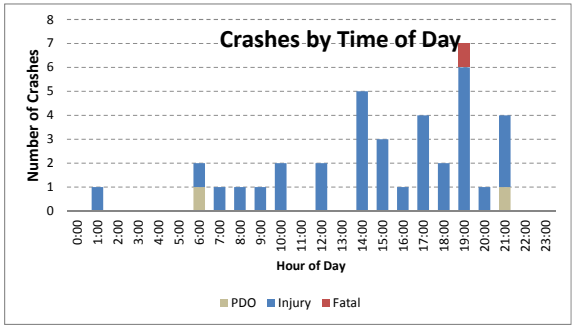








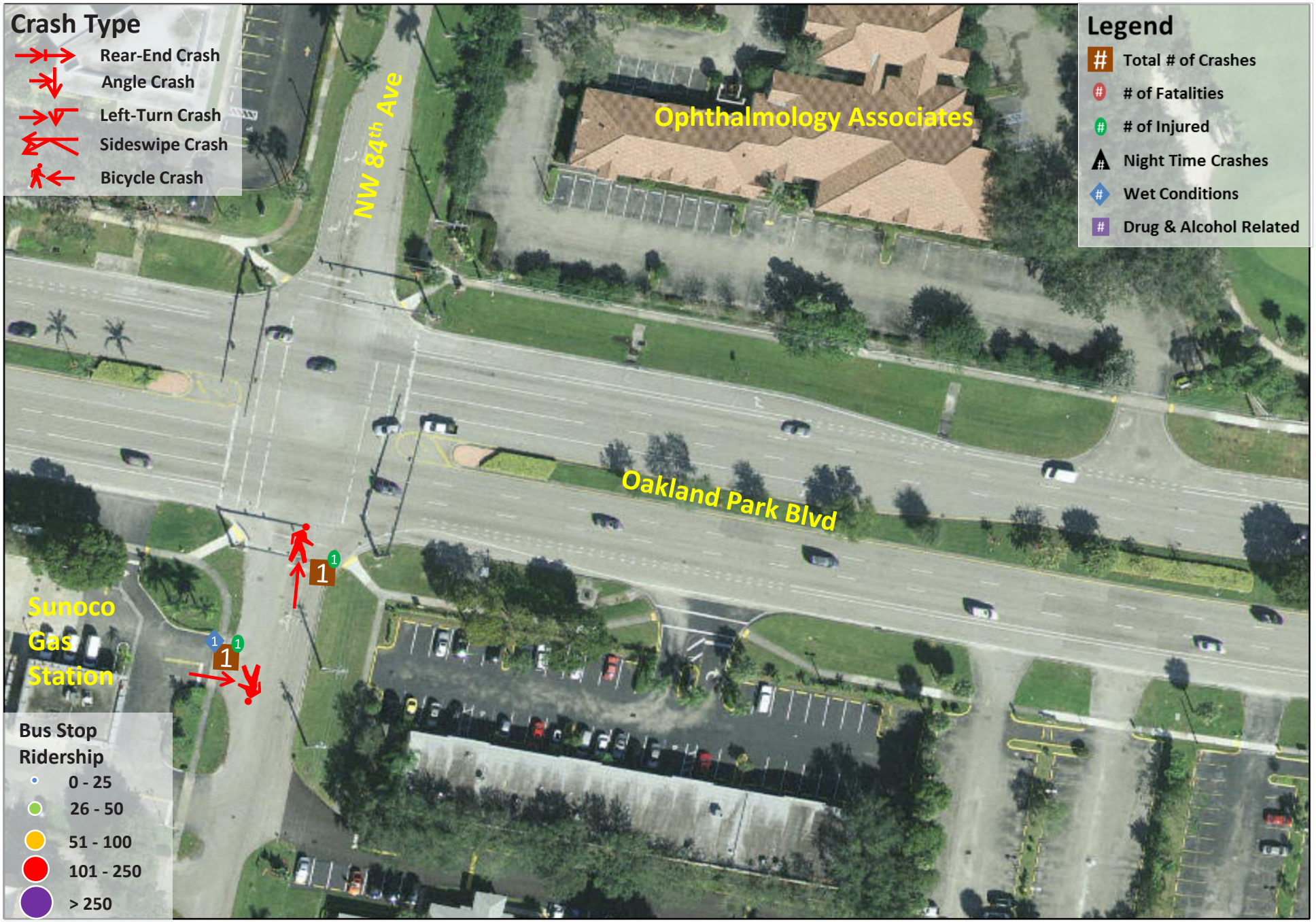




CRASH ANALYSIS - Oakland Park Blvd. from NW 84th Ave. to Atrium West

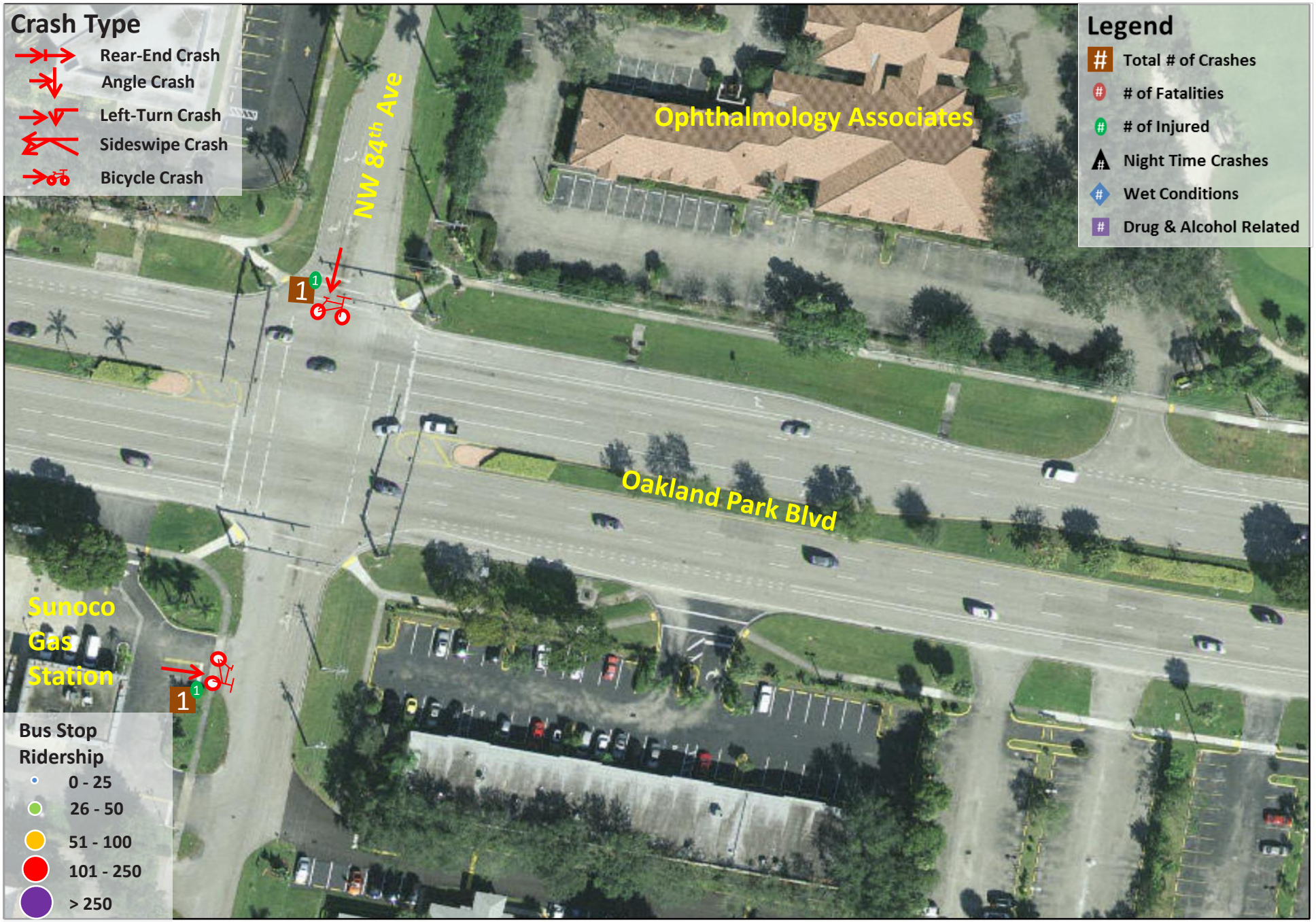
		Analysis Year						Severity			Total	Average	Percent
		2010	2011	2012	2013	2014	2015	PDO	Injury	Fatal			
Type of Crash	Pedestrian	3	3	6	2	7	7	2	26	0	28	4.67	75.7%
	Bicycle	2	1	0	3	2	1	0	8	1	9	1.50	24.3%
	Total Crashes	**5**	**4**	**6**	**5**	**9**	**8**	**2**	**34**	**1**	**37**	**6.17**	**100.0%**
Crash Severity	PDO	0	0	0	0	0	2				2	0.33	5.4%
	Injury	5	4	6	4	9	6				34	5.67	91.9%
	Fatal	0	0	0	1	0	0				1	0.17	2.7%
Light Conditions	Daylight	1	3	5	1	4	4	0	18	0	18	3.00	48.6%
	Dusk	1	0	0	2	2	0	0	4	1	5	0.83	13.5%
	Dawn	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	Dark w/ Street Light	3	1	1	1	2	3	1	10	0	11	1.83	29.7%
	Dark w/o Street Light	0	0	0	1	1	1	1	2	0	3	0.50	8.1%
	Unknown	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
Surface Condition	Dry	5	3	5	4	7	7	2	28	1	31	5.17	83.8%
	Wet	0	1	1	1	2	1	0	6	0	6	1.00	16.2%
	Other	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
Month	January	1	0	0	1	1	0	0	3	0	3	0.50	8.1%
	February	1	0	1	0	0	2	0	4	0	4	0.67	10.8%
	March	1	0	0	0	0	1	0	2	0	2	0.33	5.4%
	April	0	0	0	0	1	0	0	1	0	1	0.17	2.7%
	May	0	0	0	1	2	0	0	2	1	3	0.50	8.1%
	June	0	0	0	1	2	2	1	4	0	5	0.83	13.5%
	July	0	0	0	1	1	1	1	2	0	3	0.50	8.1%
	August	0	0	1	0	0	0	0	1	0	1	0.17	2.7%
	September	1	2	1	0	0	0	0	4	0	4	0.67	10.8%
	October	0	0	0	1	2	1	0	4	0	4	0.67	10.8%
	November	0	0	1	0	0	0	0	1	0	1	0.17	2.7%
	December	1	2	2	0	0	1	0	6	0	6	1.00	16.2%
Day of Week	Monday	1	1	4	0	0	0	0	6	0	6	1.00	16.2%
	Tuesday	1	0	1	0	1	1	0	4	0	4	0.67	10.8%
	Wednesday	0	2	0	2	0	2	0	6	0	6	1.00	16.2%
	Thursday	0	0	1	2	1	3	0	6	1	7	1.17	18.9%
	Friday	1	1	0	1	5	2	2	8	0	10	1.67	27.0%
	Saturday	1	0	0	0	1	0	0	2	0	2	0.33	5.4%
	Sunday	1	0	0	0	1	0	0	2	0	2	0.33	5.4%
Hour of Day	0:00	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	1:00	1	0	0	0	0	0	0	1	0	1	0.17	2.7%
	2:00	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	3:00	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	4:00	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	5:00	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	6:00	0	0	1	0	0	1	1	1	0	2	0.33	5.4%
	7:00	0	1	0	0	0	0	0	1	0	1	0.17	2.7%
	8:00	1	0	0	0	0	0	0	1	0	1	0.17	2.7%
	9:00	0	0	0	0	1	0	0	1	0	1	0.17	2.7%
	10:00	0	0	0	1	1	0	0	2	0	2	0.33	5.4%
	11:00	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	12:00	0	0	0	0	2	0	0	2	0	2	0.33	5.4%
	13:00	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	14:00	0	1	2	0	0	2	0	5	0	5	0.83	13.5%
	15:00	0	0	1	1	1	0	0	3	0	3	0.50	8.1%
	16:00	0	0	0	0	0	1	0	1	0	1	0.17	2.7%
	17:00	0	1	1	1	0	1	0	4	0	4	0.67	10.8%
	18:00	1	0	0	0	1	0	0	2	0	2	0.33	5.4%
	19:00	1	1	0	2	2	1	0	6	1	7	1.17	18.9%

		Analysis Year						Severity			Total	Average	Percent
		2010	2011	2012	2013	2014	2015	PDO	Injury	Fatal			
	20:00	0	0	1	0	0	0	0	1	0	1	0.17	2.7%
	21:00	1	0	0	0	1	2	1	3	0	4	0.67	10.8%
	22:00	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	23:00	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
Alcohol	None	5	4	6	5	9	8	2	34	1	37	6.17	100.0%
	Alcohol Involved	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	Drugs Involved	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	Alcohol and Drugs	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	Undetermined	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
Age of Ped/Bicyclist	19 and Under	0	1	0	0	0	0				1	0.17	2.7%
	20-24	2	0	0	0	0	0				2	0.33	5.4%
	25-29	0	2	1	0	0	0				3	0.50	8.1%
	30-34	0	0	1	0	0	0				1	0.17	2.7%
	35-39	0	0	1	0	0	0				1	0.17	2.7%
	40-44	1	0	0	0	0	0				1	0.17	2.7%
	45-49	1	0	0	0	0	0				1	0.17	2.7%
	50-54	0	0	0	0	0	0				0	0.00	0.0%
	55-59	1	0	0	0	0	0				1	0.17	2.7%
	60-64	0	0	0	0	0	0				0	0.00	0.0%
	65-69	0	0	0	0	0	0				0	0.00	0.0%
	70-74	0	0	0	0	0	0				0	0.00	0.0%
	75-79	0	0	0	0	0	0				0	0.00	0.0%
	80-84	0	0	0	0	0	0				0	0.00	0.0%
	85 and Over	0	0	0	0	0	0				0	0.00	0.0%
Age of Driver	19 and Under	0	0	2	0	0	0				2	0.33	5.4%
	20-24	1	3	0	1	0	0				5	0.83	13.5%
	25-29	1	0	0	0	1	0				2	0.33	5.4%
	30-34	0	0	0	0	2	1				3	0.50	8.1%
	35-39	0	0	0	0	2	1				3	0.50	8.1%
	40-44	0	0	0	1	0	0				1	0.17	2.7%
	45-49	0	0	0	0	1	1				2	0.33	5.4%
	50-54	0	0	1	1	1	0				3	0.50	8.1%
	55-59	0	1	0	1	0	1				3	0.50	8.1%
	60-64	1	0	1	1	0	2				5	0.83	13.5%
	65-69	1	0	0	0	0	0				1	0.17	2.7%
	70-74	0	0	1	0	1	0				2	0.33	5.4%
	75-79	0	0	0	0	0	0				0	0.00	0.0%
	80-84	0	0	0	0	0	0				0	0.00	0.0%
	85 and Over	0	0	0	0	0	2				2	0.33	5.4%



Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes - Oakland Park Boulevard from NW 84th Avenue to Atrium West

Figure **1**



Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes - Oakland Park Boulevard from NW 84th Avenue to Atrium West

Figure **2**

166

N

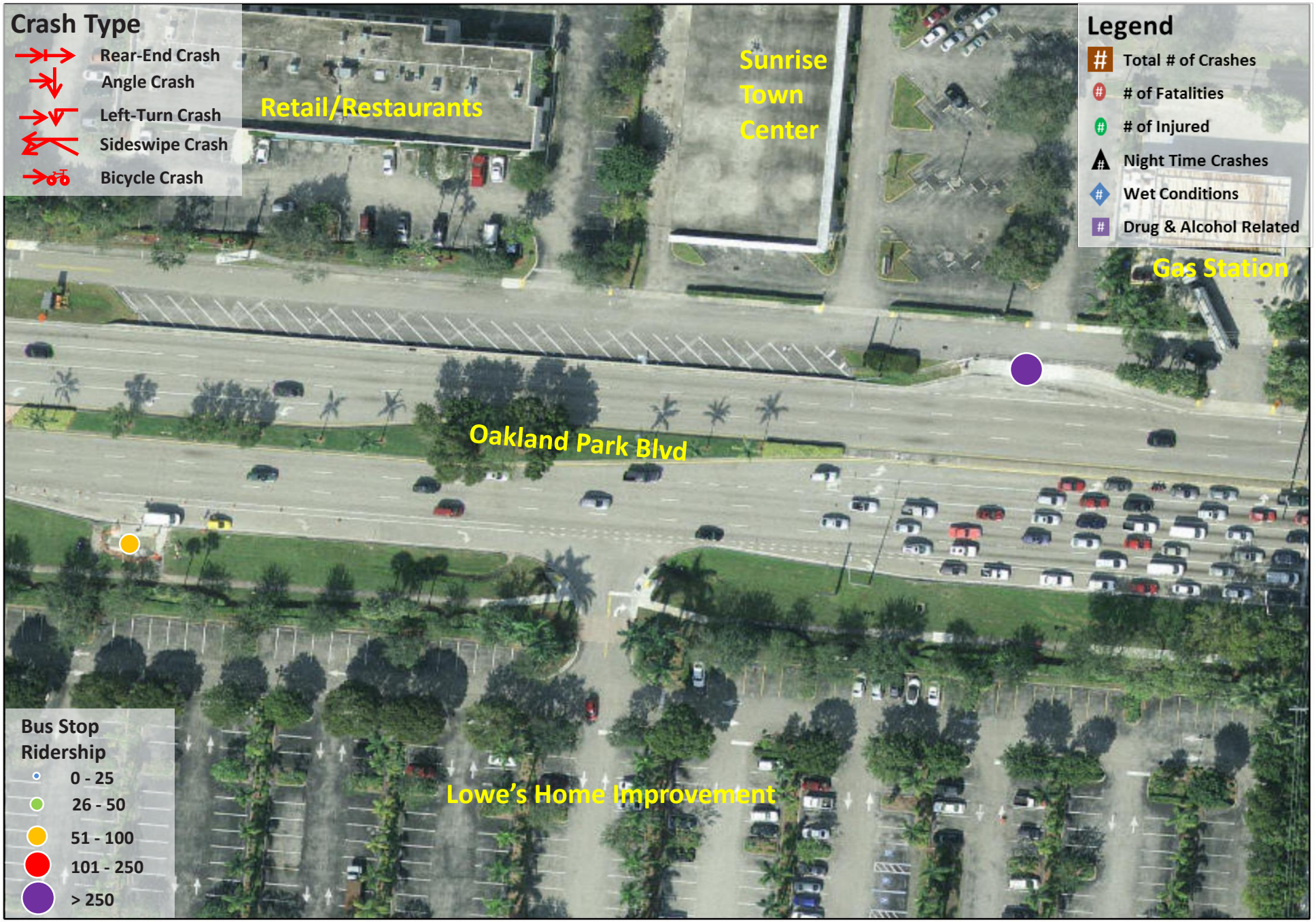
0 40 80 Feet

Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes - Oakland Park Boulevard from NW 84th Avenue to Atrium West

Figure 3

Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes - Oakland Park Boulevard from NW 84th Avenue to Atrium West

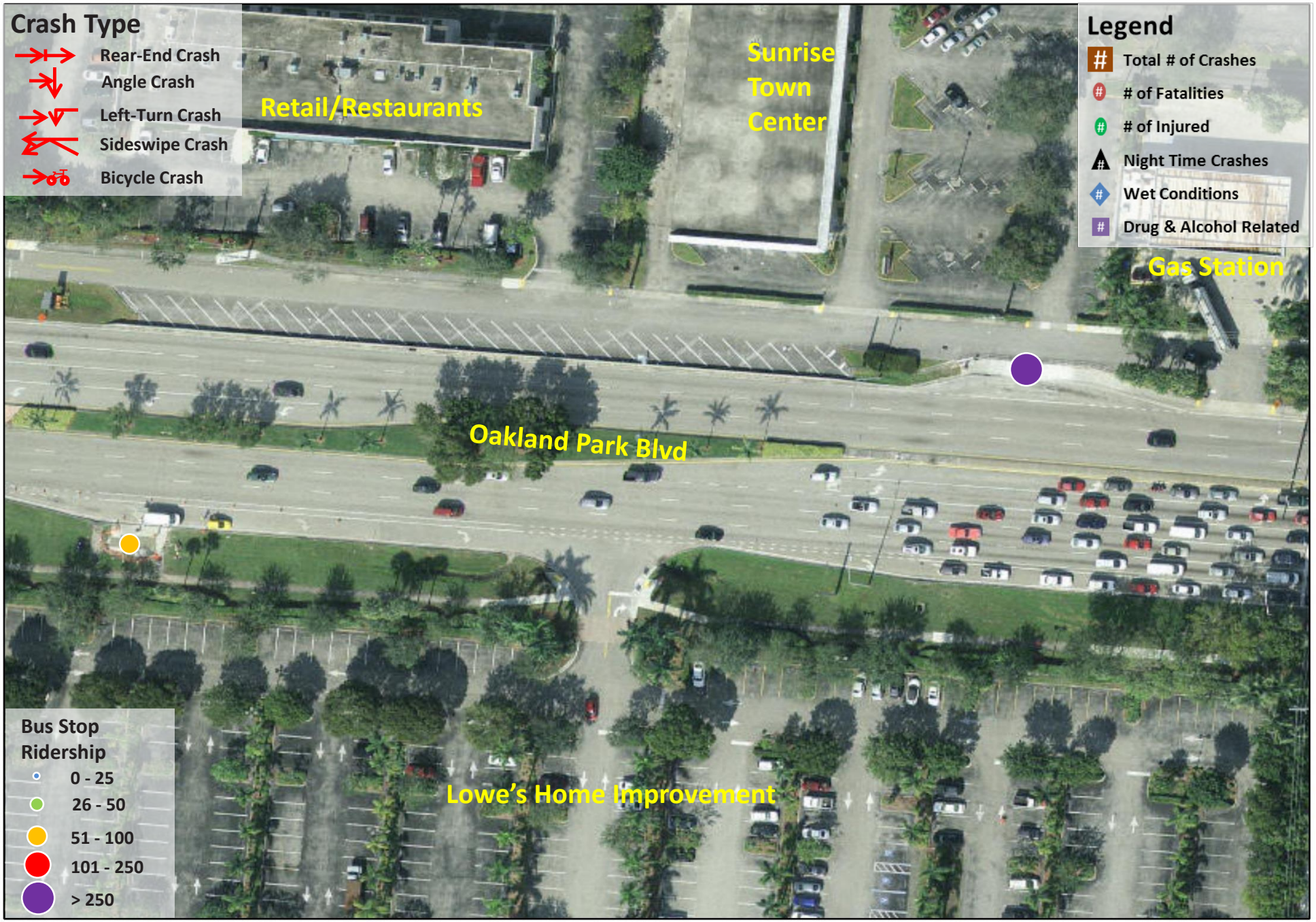
Figure 4



168

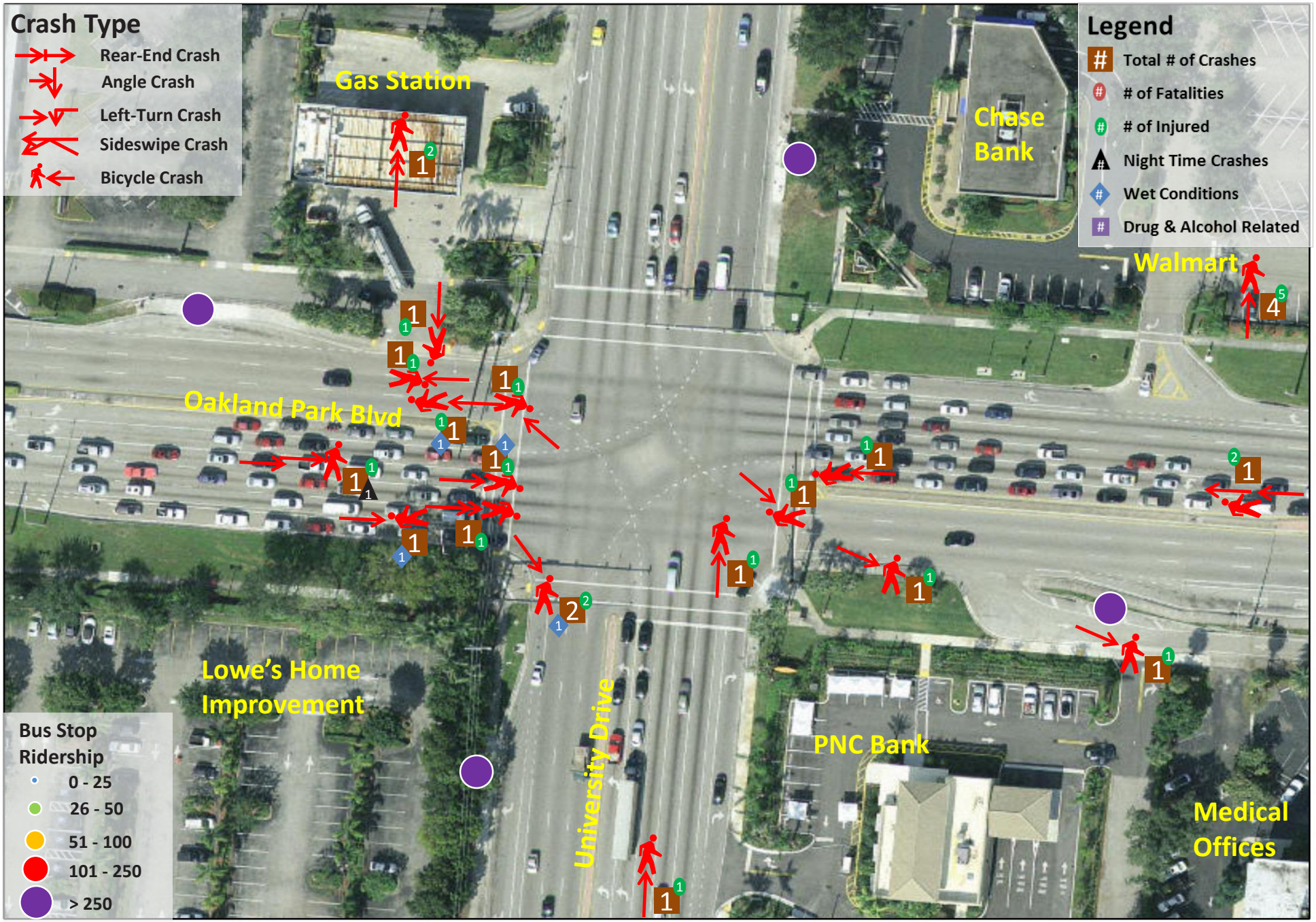
Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes - Oakland Park Boulevard from NW 84th Avenue to Atrium West

Figure **5**



Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes - Oakland Park Boulevard from NW 84th Avenue to Atrium West

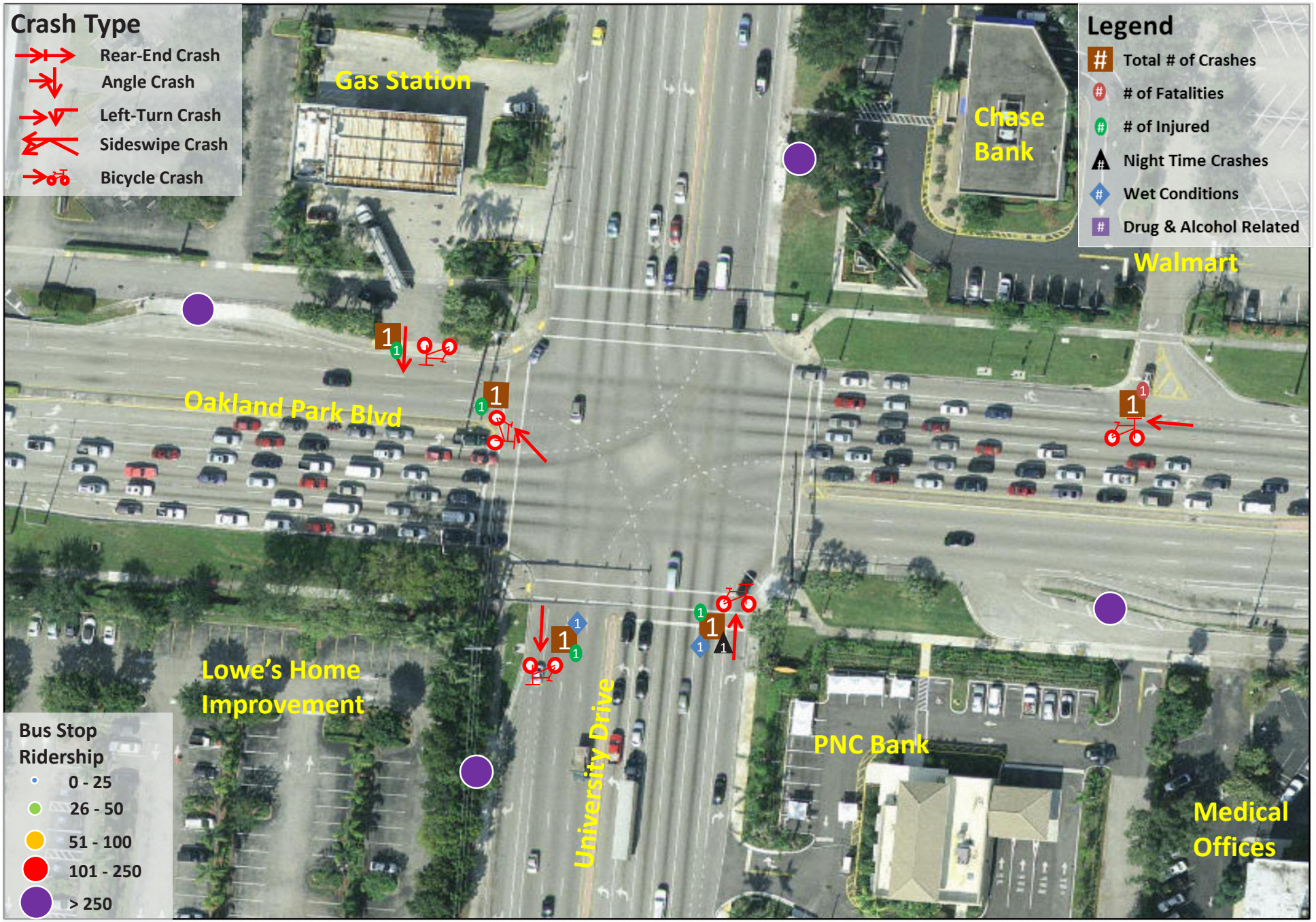
Figure **6**



Broward MPO Pedestrian and Bicycle Safety Action Plan

Pedestrian Crashes - Oakland Park Boulevard from NW 84th Avenue to Atrium West

Figure 7



Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes - Oakland Park Boulevard from NW 84th Avenue to Atrium West

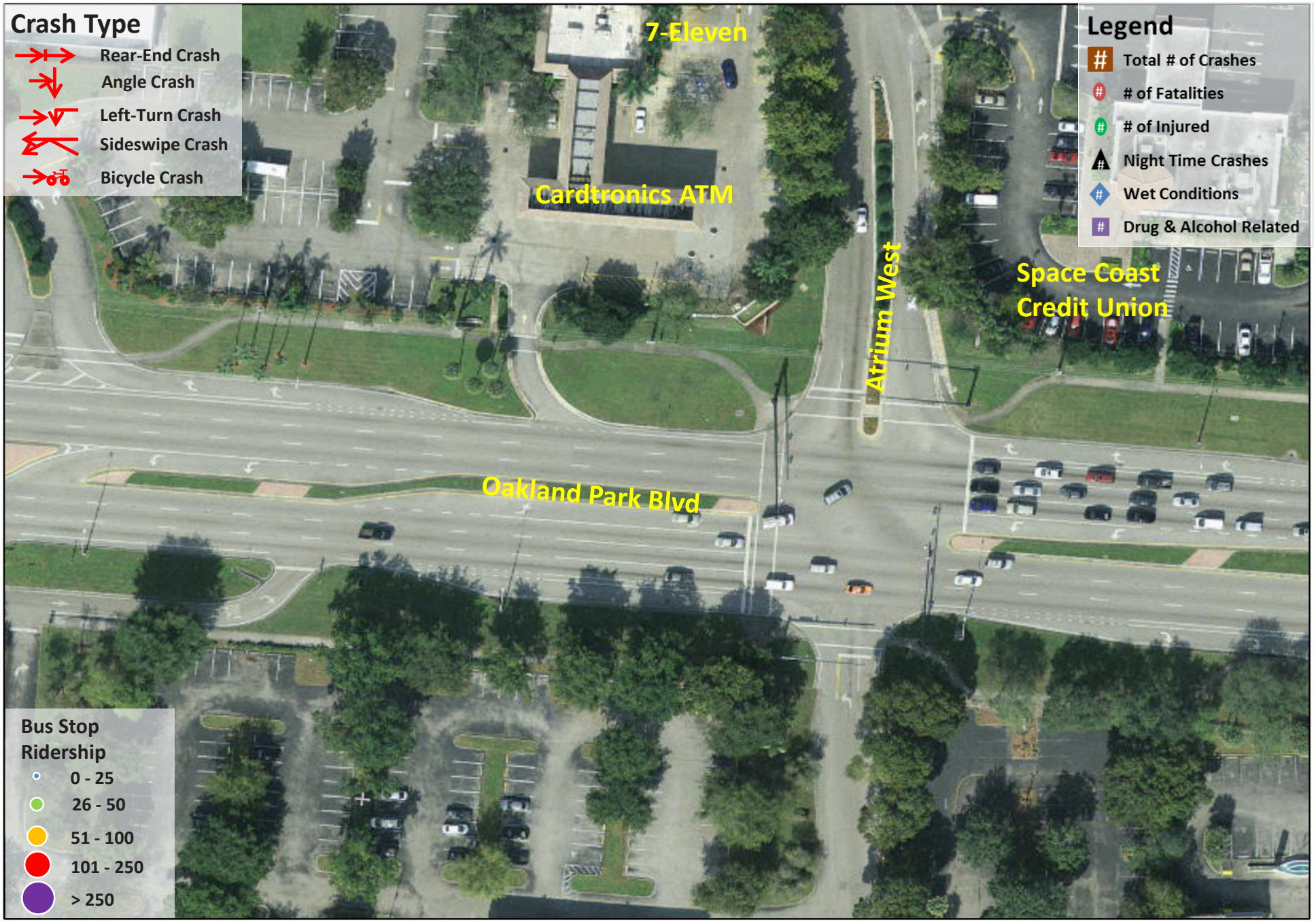
Figure 8

Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes - Oakland Park Boulevard from NW 84th Avenue to Atrium West

Figure 9

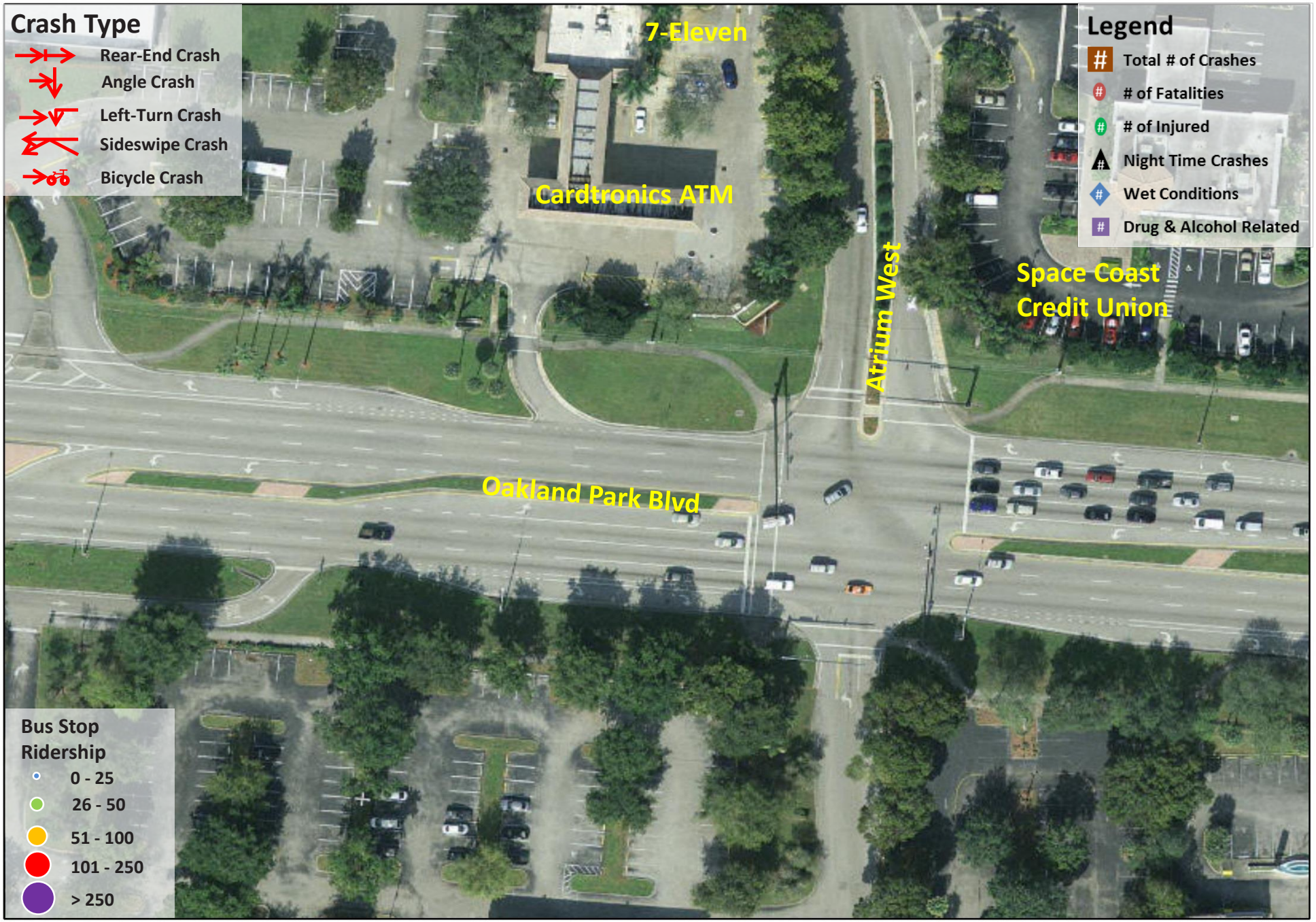
Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes - Oakland Park Boulevard from NW 84th Avenue to Atrium West

Figure 10



Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes - Oakland Park Boulevard from NW 84th Avenue to Atrium West

Figure **11**

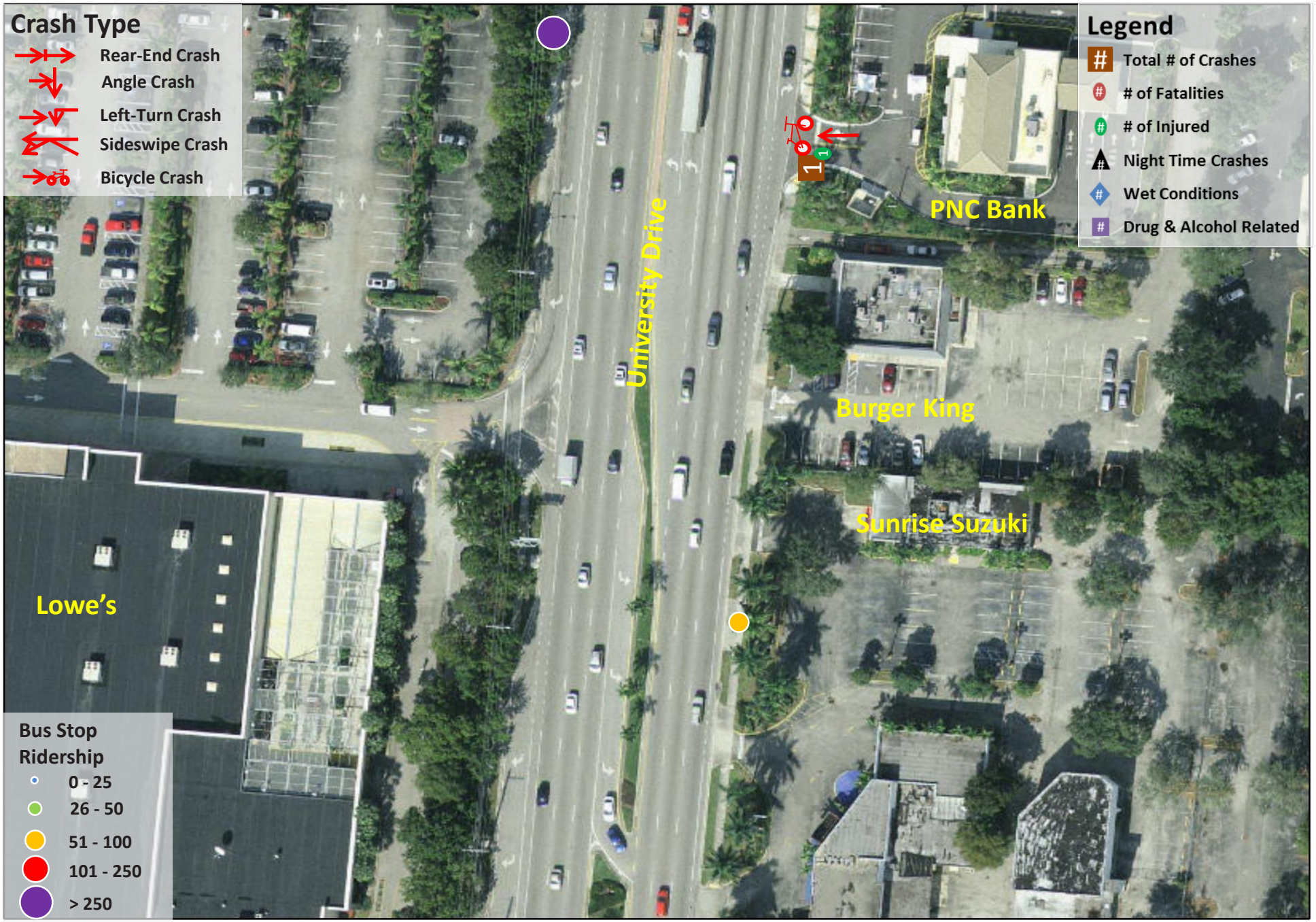


Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes - Oakland Park Boulevard from NW 84th Avenue to Atrium West

Figure **12**

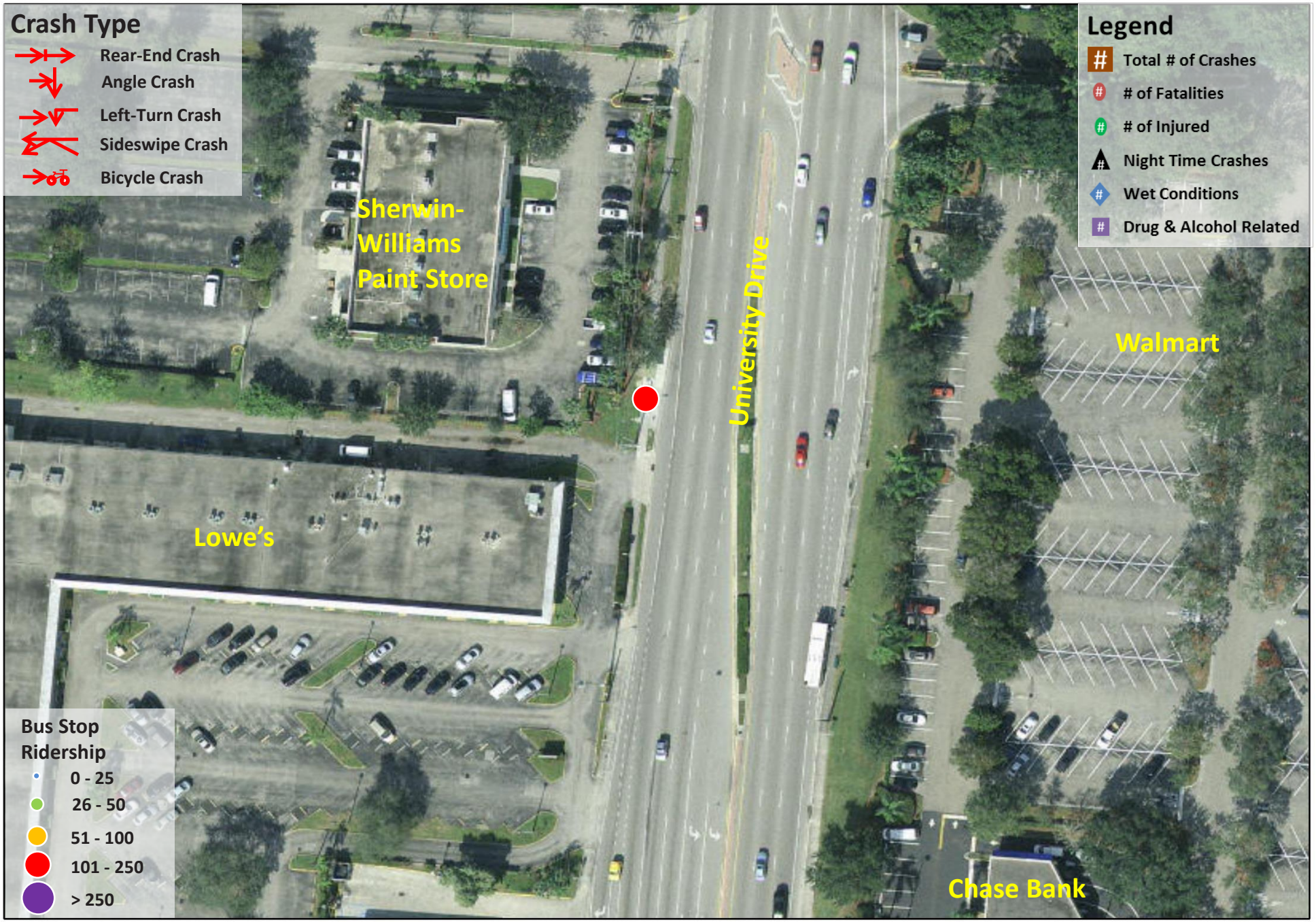
Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes - Oakland Park Boulevard from NW 84th Avenue to Atrium West

Figure **13**



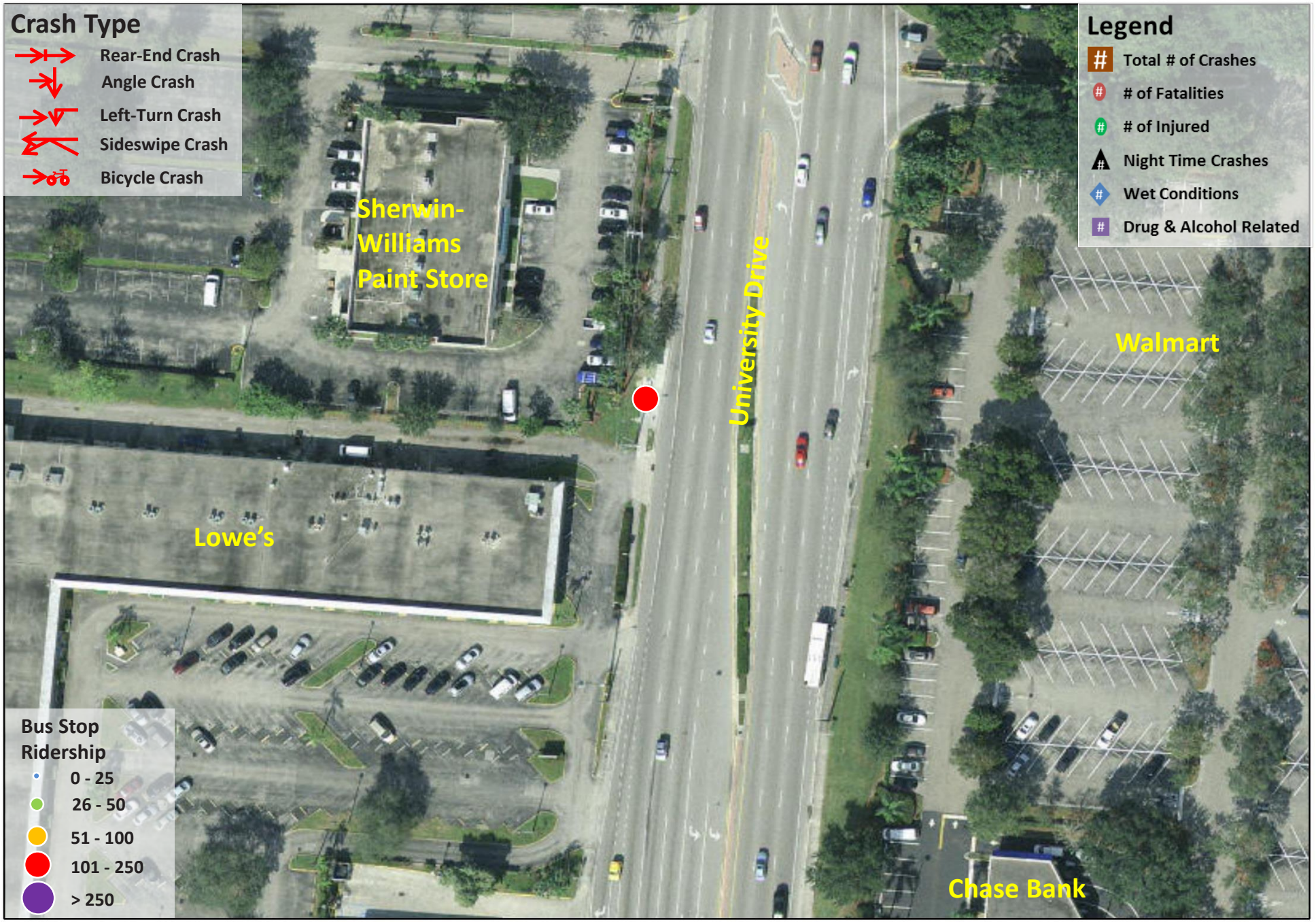
Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes - Oakland Park Boulevard from NW 84th Avenue to Atrium West

Figure **14**



Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes - Oakland Park Boulevard from NW 84th Avenue to Atrium West

Figure 15



Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes - Oakland Park Boulevard from NW 84th Avenue to Atrium West

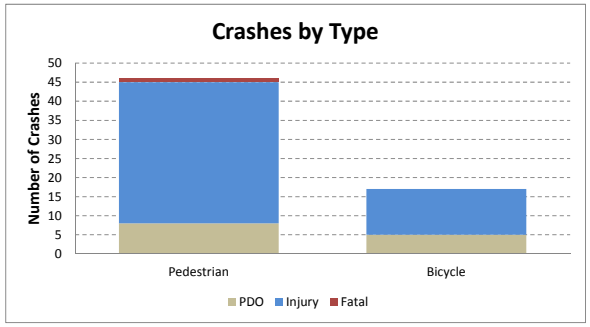
Figure **16**

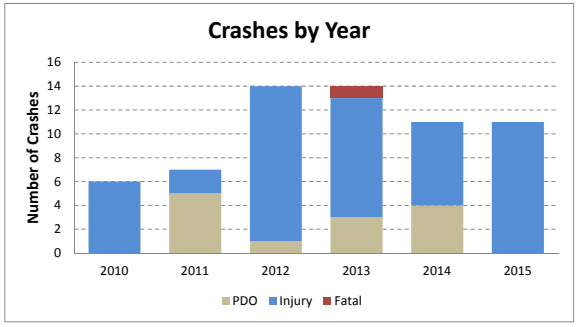
APPENDIX 5

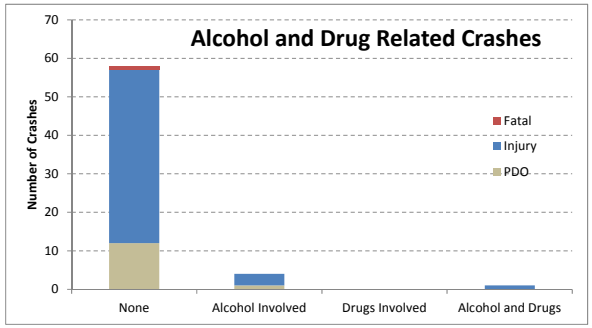
SUBURBAN INTERSECTION DEMONSTRATION SITE

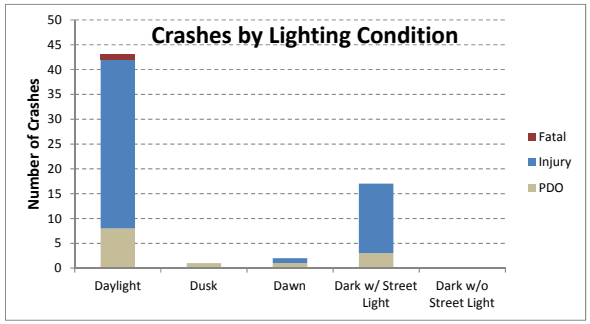
OAKLAND PARK BOULEVARD AT STATE ROAD 7

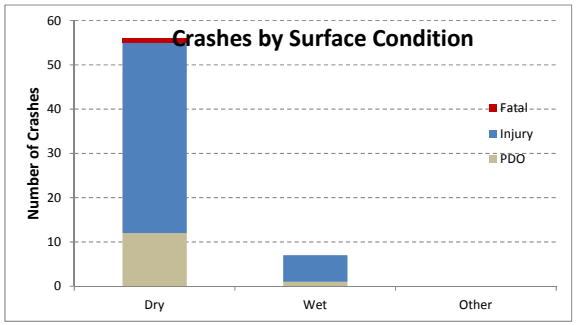
CRASH ANALYSIS - Oakland Park Blvd. at SR 7

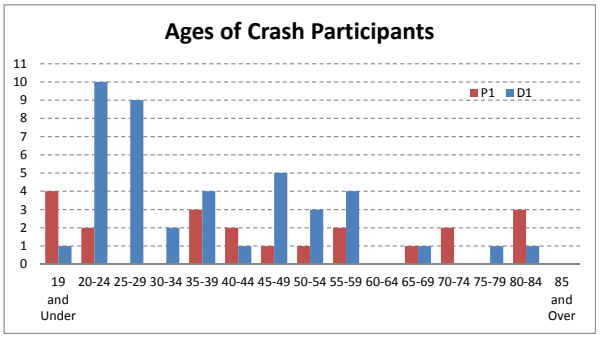


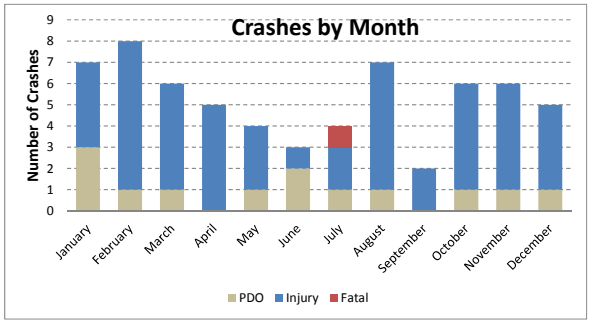


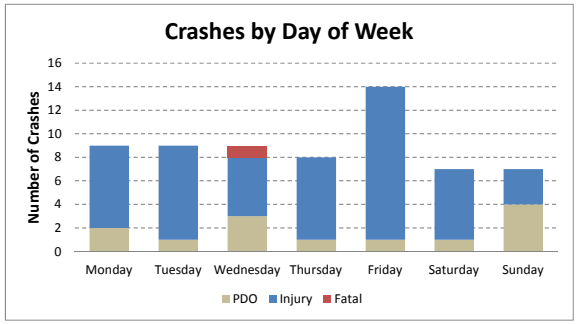


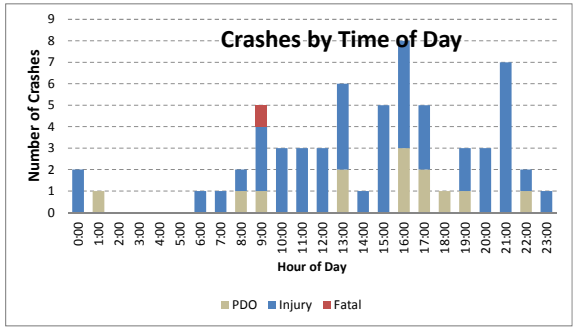








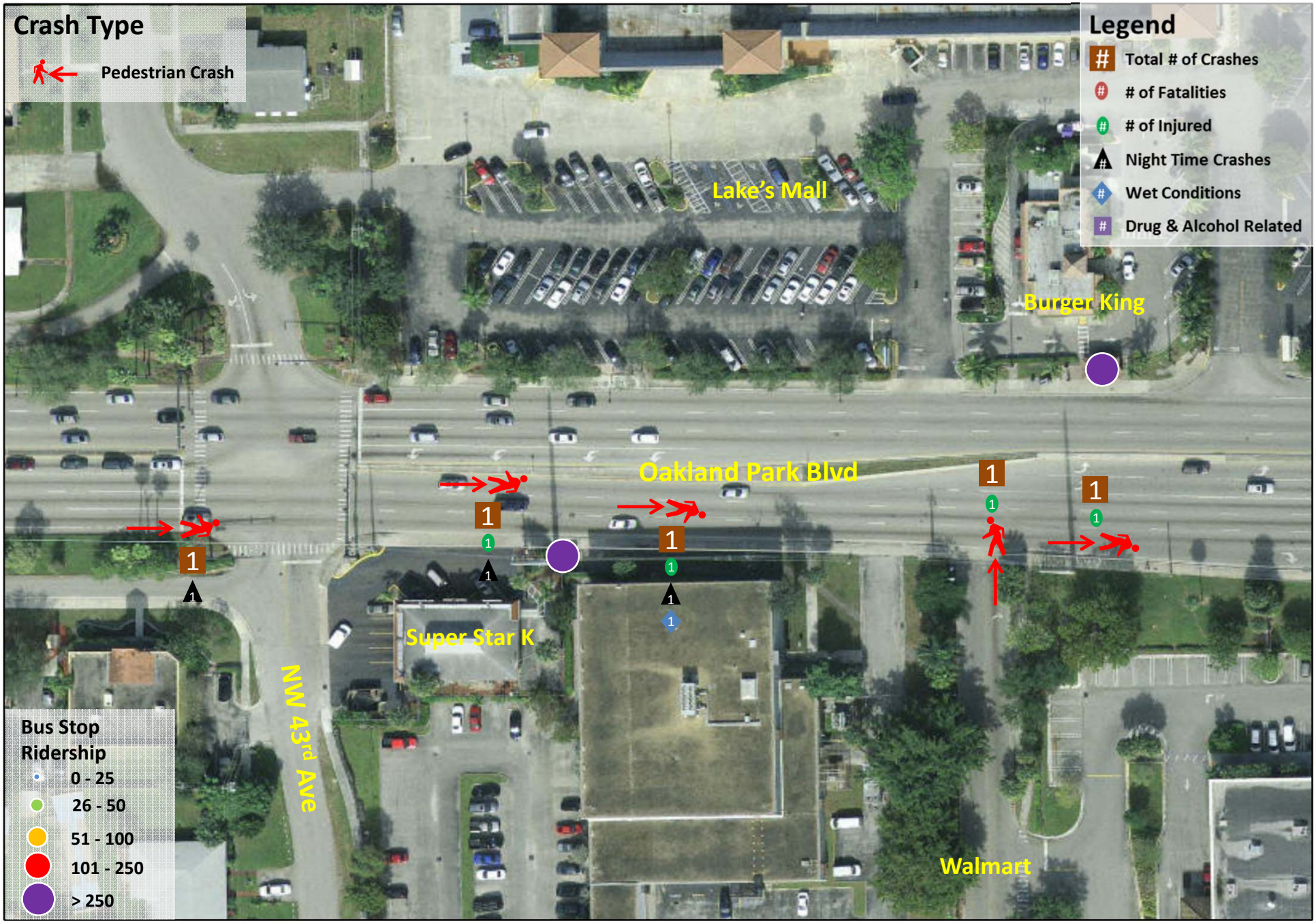




CRASH ANALYSIS - Oakland Park Blvd. at SR 7

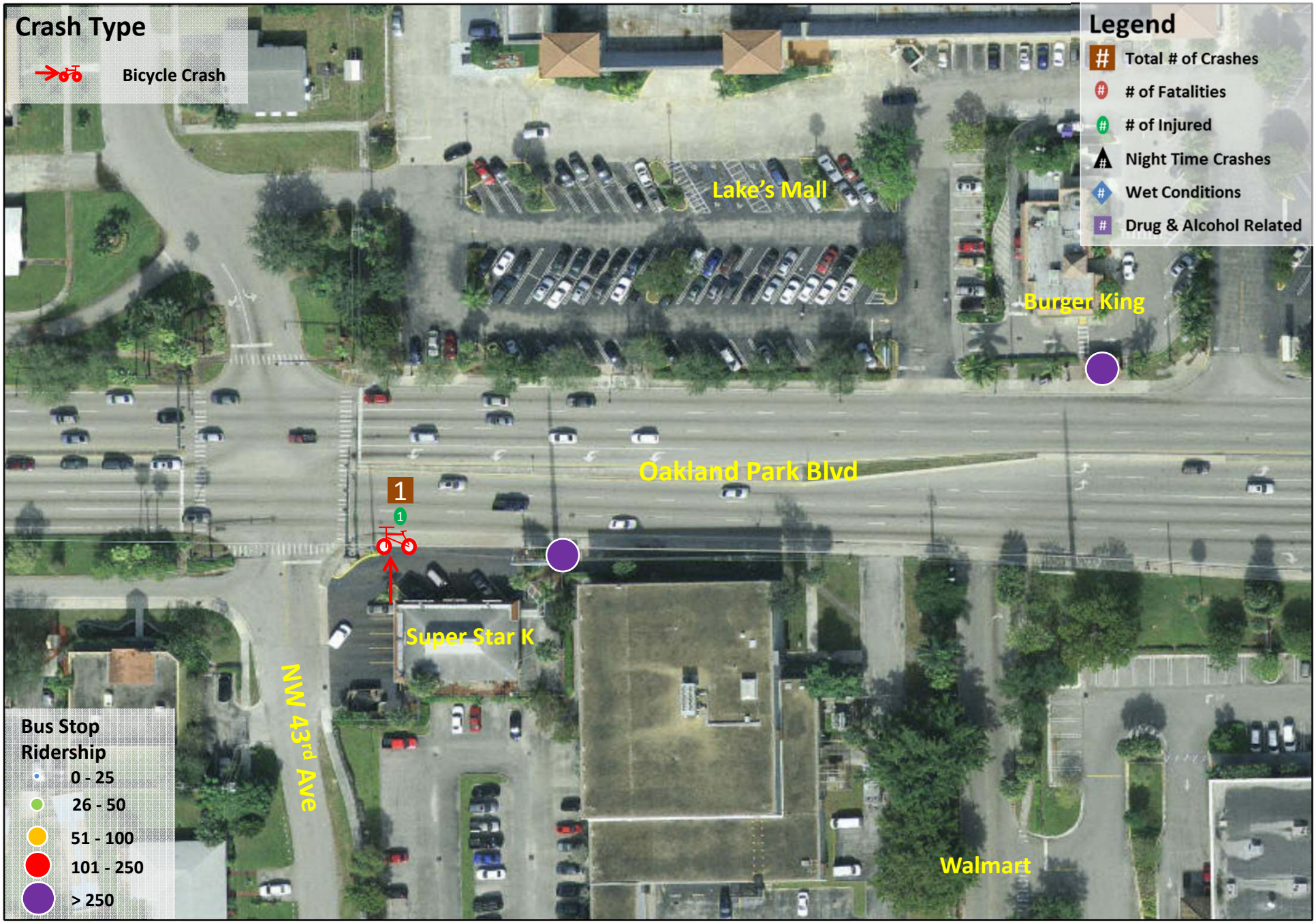
		Analysis Year						Severity			Total	Average	Percent
		2010	2011	2012	2013	2014	2015	PDO	Injury	Fatal			
Type of Crash	Pedestrian	6	7	11	8	5	9	8	37	1	46	7.67	73.0%
	Bicycle	0	0	3	6	6	2	5	12	0	17	2.83	27.0%
	Total Crashes	**6**	**7**	**14**	**14**	**11**	**11**	**13**	**49**	**1**	**63**	**10.50**	**100.0%**
Crash Severity	PDO	0	5	1	3	4	0				13	2.17	20.6%
	Injury	6	2	13	10	7	11				49	8.17	77.8%
	Fatal	0	0	0	1	0	0				1	0.17	1.6%
Light Conditions	Daylight	4	6	9	8	8	8	8	34	1	43	7.17	68.3%
	Dusk	0	0	0	1	0	0	1	0	0	1	0.17	1.6%
	Dawn	0	0	0	1	1	0	1	1	0	2	0.33	3.2%
	Dark w/ Street Light	2	1	5	4	2	3	3	14	0	17	2.83	27.0%
	Dark w/o Street Light	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	Unknown	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
Surface Condition	Dry	5	7	10	14	10	10	12	43	1	56	9.33	88.9%
	Wet	1	0	4	0	1	1	1	6	0	7	1.17	11.1%
	Other	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
Month	January	0	1	1	2	1	2	3	4	0	7	1.17	11.1%
	February	1	1	3	0	1	2	1	7	0	8	1.33	12.7%
	March	1	0	2	1	1	1	1	5	0	6	1.00	9.5%
	April	1	0	2	0	2	0	0	5	0	5	0.83	7.9%
	May	0	1	0	1	1	1	1	3	0	4	0.67	6.3%
	June	0	2	1	0	0	0	2	1	0	3	0.50	4.8%
	July	0	1	1	1	0	1	1	2	1	4	0.67	6.3%
	August	0	1	0	3	2	1	1	6	0	7	1.17	11.1%
	September	0	0	0	1	1	0	0	2	0	2	0.33	3.2%
	October	1	0	2	1	1	1	1	5	0	6	1.00	9.5%
	November	1	0	1	1	1	2	1	5	0	6	1.00	9.5%
	December	1	0	1	3	0	0	1	4	0	5	0.83	7.9%
Day of Week	Monday	2	2	0	3	1	1	2	7	0	9	1.50	14.3%
	Tuesday	0	2	2	2	2	1	1	8	0	9	1.50	14.3%
	Wednesday	0	1	3	1	2	2	3	5	1	9	1.50	14.3%
	Thursday	1	0	1	4	2	0	1	7	0	8	1.33	12.7%
	Friday	2	1	4	2	1	4	1	13	0	14	2.33	22.2%
	Saturday	1	0	2	0	2	2	1	6	0	7	1.17	11.1%
	Sunday	0	1	2	2	1	1	4	3	0	7	1.17	11.1%
Hour of Day	0:00	0	0	0	0	2	0	0	2	0	2	0.33	3.2%
	1:00	0	0	0	1	0	0	1	0	0	1	0.17	1.6%
	2:00	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	3:00	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	4:00	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	5:00	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	6:00	0	0	0	1	0	0	0	1	0	1	0.17	1.6%
	7:00	0	0	1	0	0	0	0	1	0	1	0.17	1.6%
	8:00	0	1	0	0	0	1	1	1	0	2	0.33	3.2%
	9:00	0	1	0	3	0	1	1	3	1	5	0.83	7.9%
	10:00	0	0	2	0	1	0	0	3	0	3	0.50	4.8%
	11:00	0	0	1	1	0	1	0	3	0	3	0.50	4.8%
	12:00	1	0	0	2	0	0	0	3	0	3	0.50	4.8%
	13:00	1	0	3	0	2	0	2	4	0	6	1.00	9.5%
	14:00	0	0	0	0	0	1	0	1	0	1	0.17	1.6%
	15:00	1	2	0	1	1	0	0	5	0	5	0.83	7.9%
	16:00	1	1	2	0	1	3	3	5	0	8	1.33	12.7%
	17:00	0	1	0	2	1	1	2	3	0	5	0.83	7.9%
	18:00	0	0	0	1	0	0	1	0	0	1	0.17	1.6%
	19:00	0	1	1	0	0	1	1	2	0	3	0.50	4.8%

		Analysis Year						Severity			Total	Average	Percent
		2010	2011	2012	2013	2014	2015	PDO	Injury	Fatal			
	20:00	0	0	3	0	0	0	0	3	0	3	0.50	4.8%
	21:00	1	0	1	2	1	2	0	7	0	7	1.17	11.1%
	22:00	1	0	0	0	1	0	1	1	0	2	0.33	3.2%
	23:00	0	0	0	0	1	0	0	1	0	1	0.17	1.6%
Alcohol	None	6	7	12	13	11	9	12	45	1	58	9.67	92.1%
	Alcohol Involved	0	0	1	1	0	2	1	3	0	4	0.67	6.3%
	Drugs Involved	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
	Alcohol and Drugs	0	0	1	0	0	0	0	1	0	1	0.17	1.6%
	Undetermined	0	0	0	0	0	0	0	0	0	0	0.00	0.0%
Age of Ped/Bicyclist	19 and Under	0	3	1	0	0	0				4	0.67	6.3%
	20-24	1	0	1	0	0	0				2	0.33	3.2%
	25-29	0	0	0	0	0	0				0	0.00	0.0%
	30-34	0	0	0	0	0	0				0	0.00	0.0%
	35-39	0	0	3	0	0	0				3	0.50	4.8%
	40-44	2	0	0	0	0	0				2	0.33	3.2%
	45-49	0	1	0	0	0	0				1	0.17	1.6%
	50-54	1	0	0	0	0	0				1	0.17	1.6%
	55-59	1	1	0	0	0	0				2	0.33	3.2%
	60-64	0	0	0	0	0	0				0	0.00	0.0%
	65-69	0	1	0	0	0	0				1	0.17	1.6%
	70-74	0	0	2	0	0	0				2	0.33	3.2%
	75-79	0	0	0	0	0	0				0	0.00	0.0%
	80-84	1	1	1	0	0	0				3	0.50	4.8%
	85 and Over	0	0	0	0	0	0				0	0.00	0.0%
Age of Driver	19 and Under	0	0	0	1	0	0				1	0.17	1.6%
	20-24	0	1	5	0	2	2				10	1.67	15.9%
	25-29	1	2	1	4	0	1				9	1.50	14.3%
	30-34	1	0	1	0	0	0				2	0.33	3.2%
	35-39	3	1	0	0	0	0				4	0.67	6.3%
	40-44	0	0	0	0	0	1				1	0.17	1.6%
	45-49	0	1	2	1	0	1				5	0.83	7.9%
	50-54	0	0	0	2	1	0				3	0.50	4.8%
	55-59	0	0	1	0	1	2				4	0.67	6.3%
	60-64	0	0	0	0	0	0				0	0.00	0.0%
	65-69	0	0	1	0	0	0				1	0.17	1.6%
	70-74	0	0	0	0	0	0				0	0.00	0.0%
	75-79	0	0	0	1	0	0				1	0.17	1.6%
	80-84	0	0	0	1	0	0				1	0.17	1.6%
	85 and Over	0	0	0	0	0	0				0	0.00	0.0%



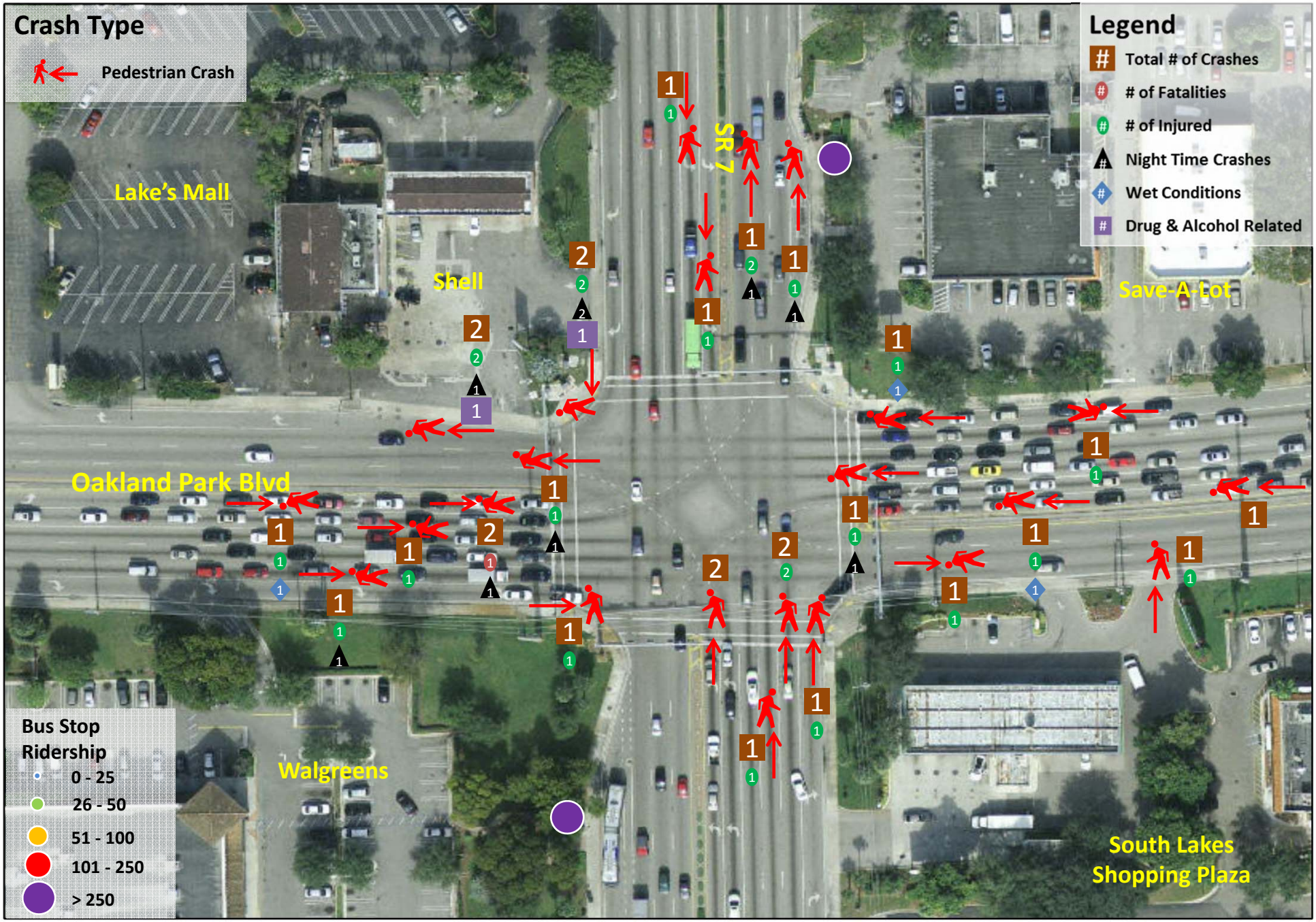
Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes - Oakland Park Boulevard and SR 7

Figure **1**



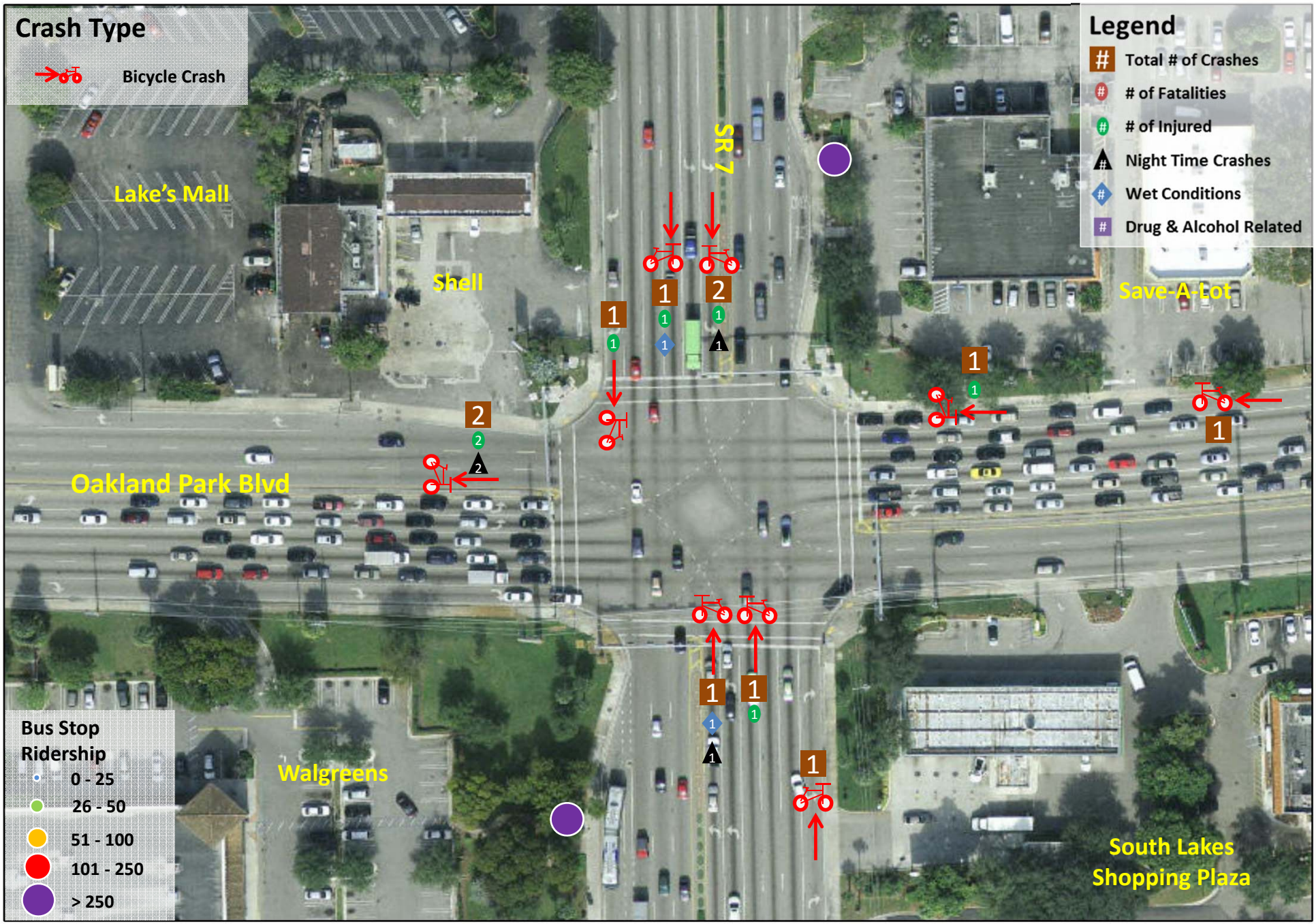
Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes - Oakland Park Boulevard and SR 7

Figure **2**



Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes - Oakland Park Boulevard and SR 7

Figure **3**



Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes - Oakland Park Boulevard and SR 7

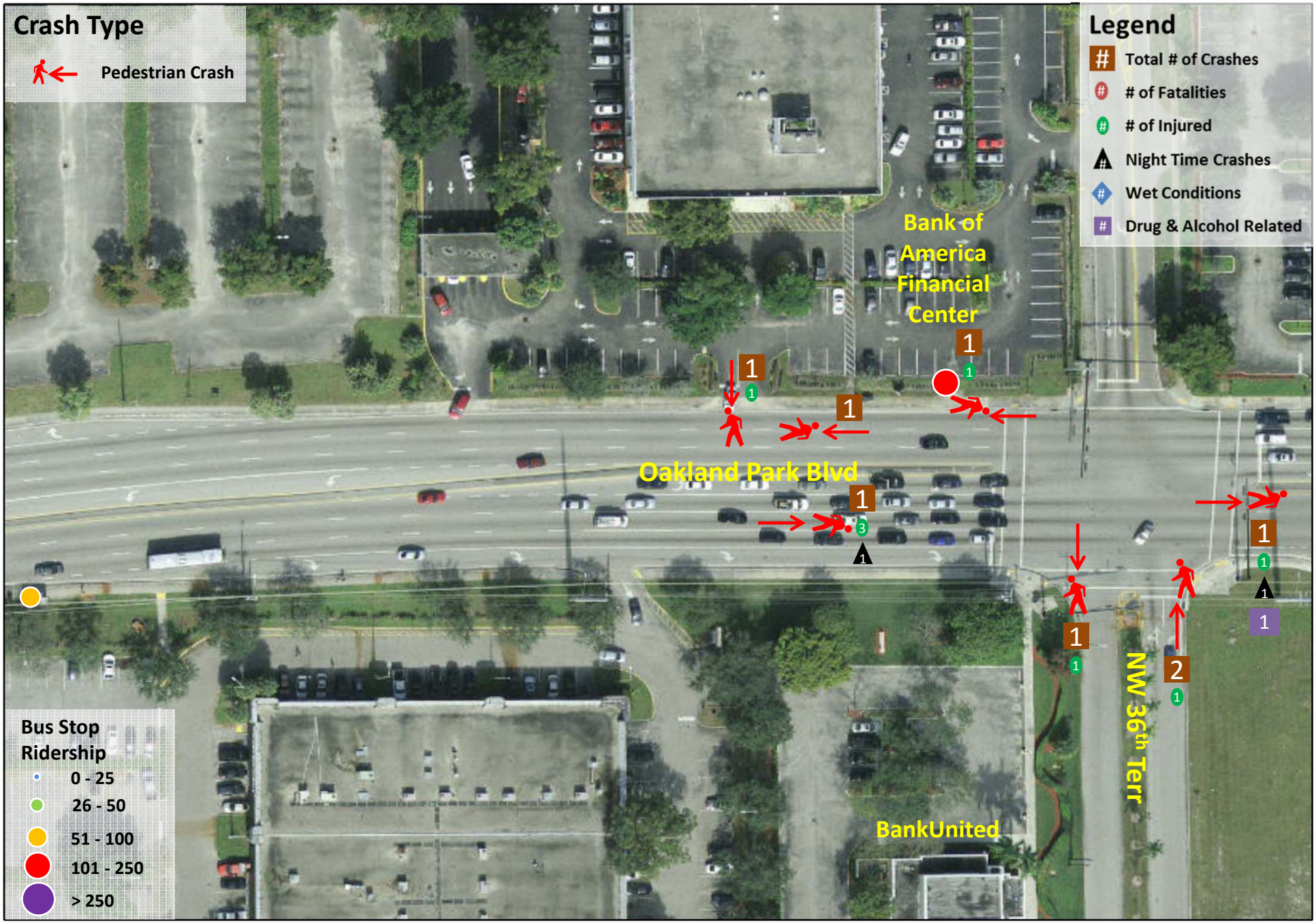
Figure **4**

Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes - Oakland Park Boulevard and SR 7

Figure **5**

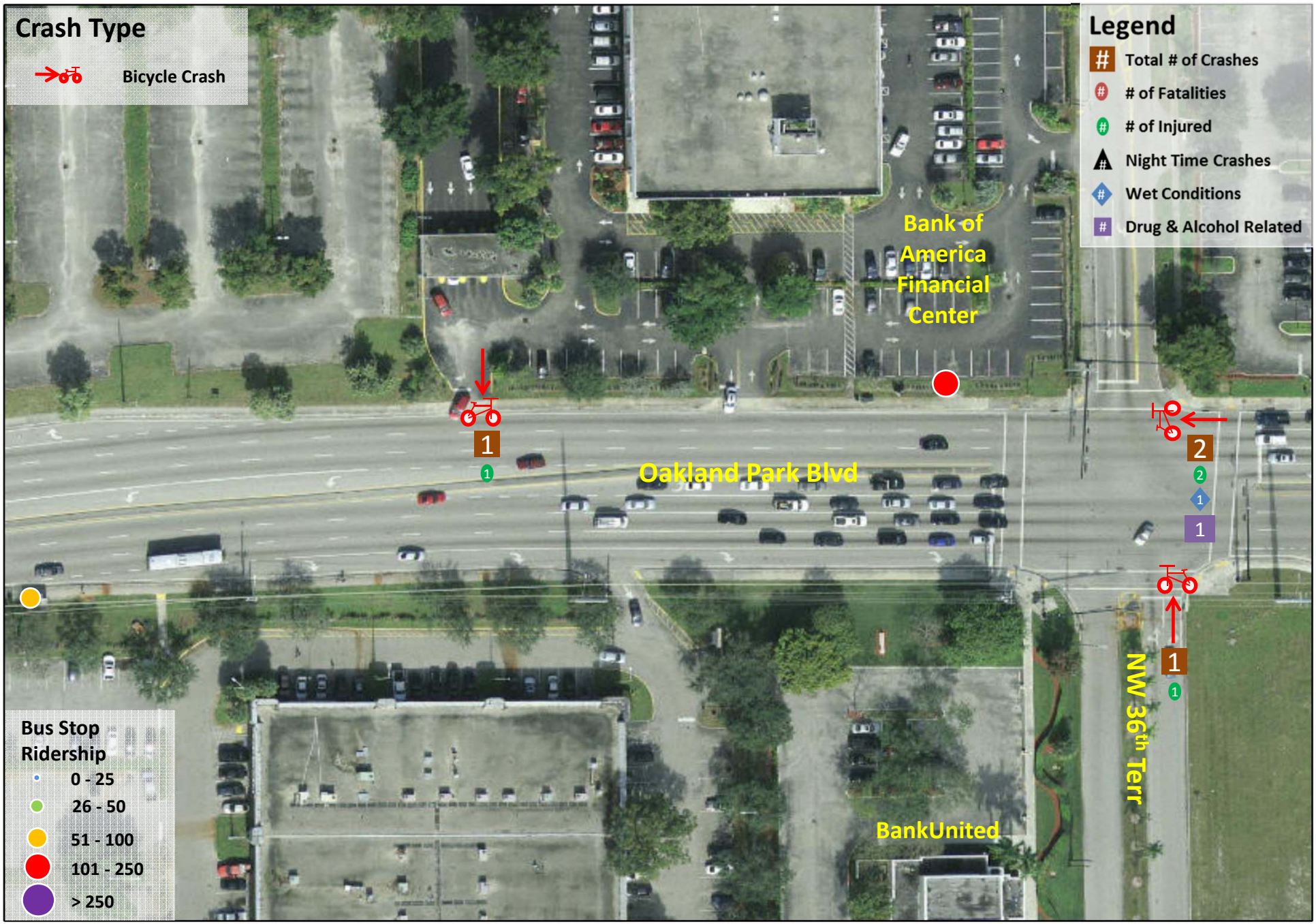
Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes - Oakland Park Boulevard and SR 7

Figure **6**



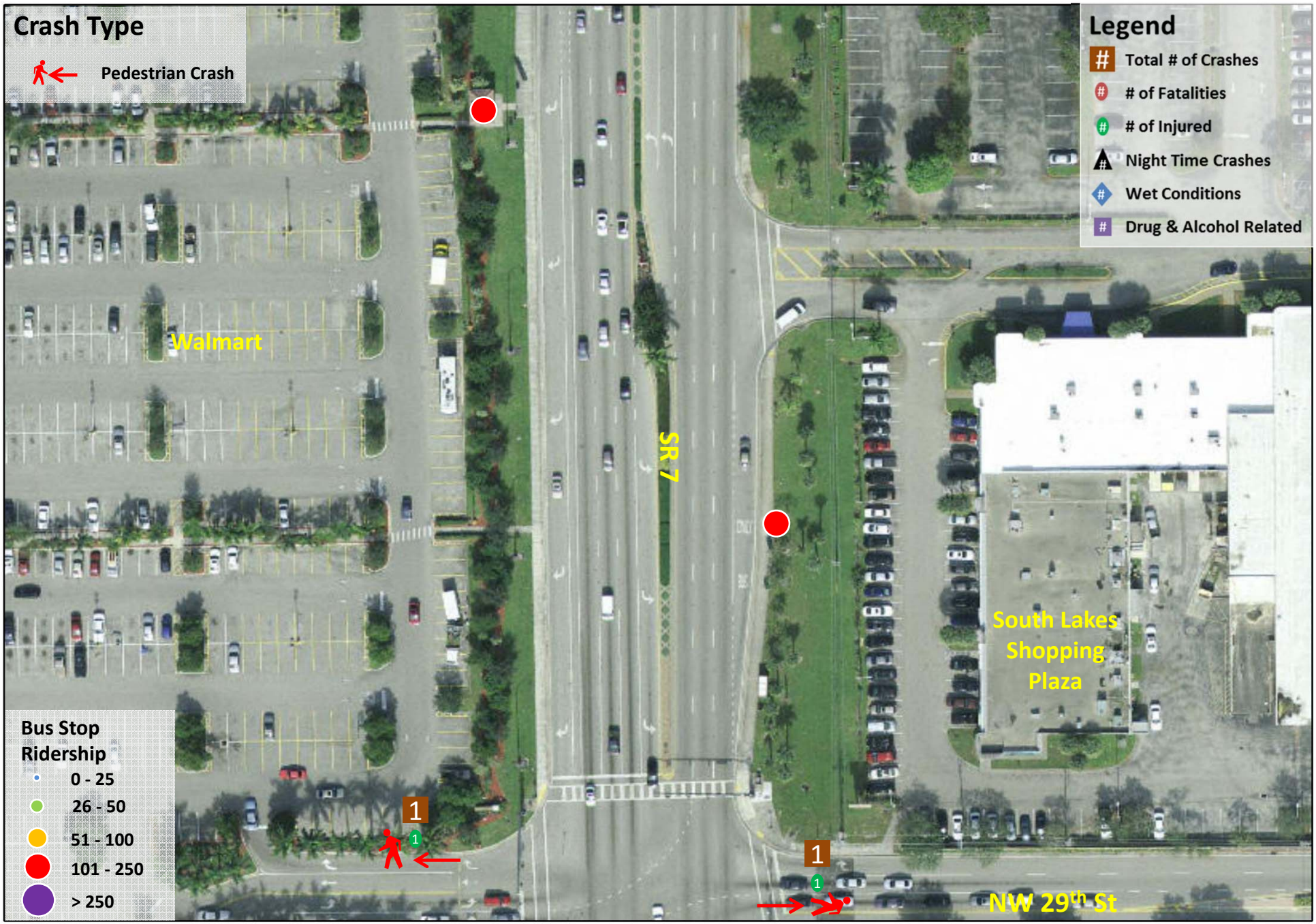
Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes - Oakland Park Boulevard and SR 7

Figure **7**



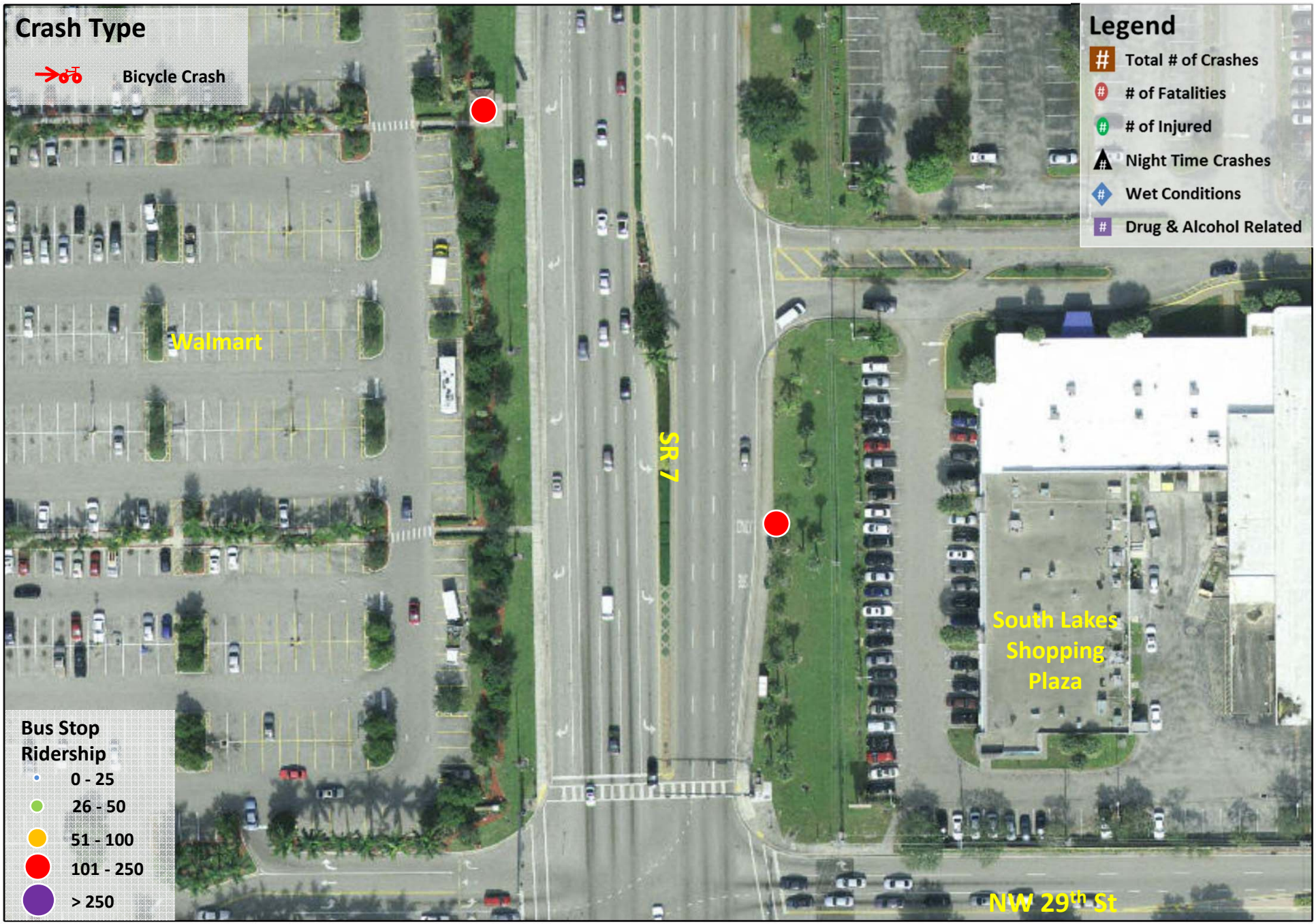
Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes - Oakland Park Boulevard and SR 7

Figure **8**



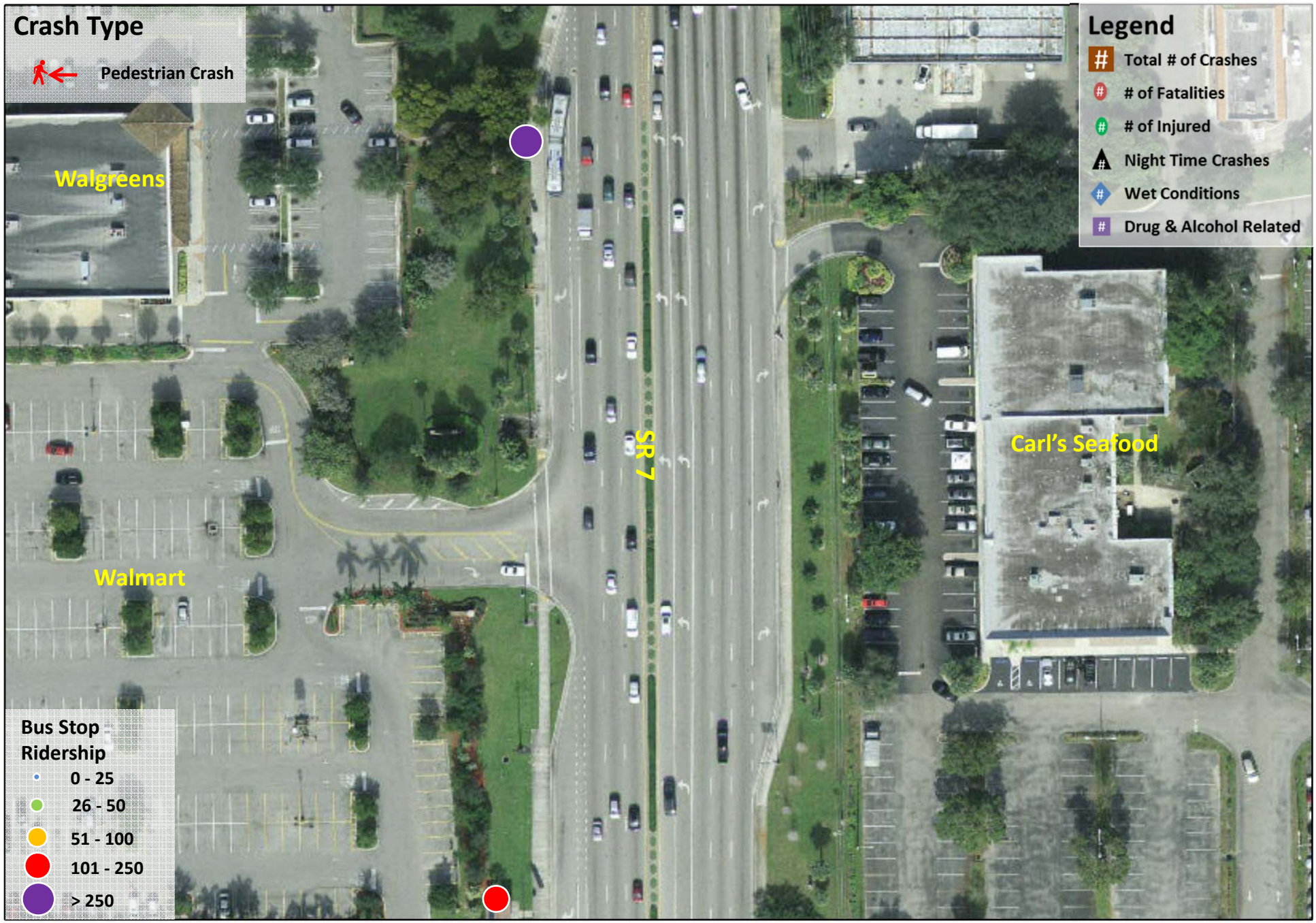
Broward MPD Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes - Oakland Park Boulevard and SR 7

Figure **9**



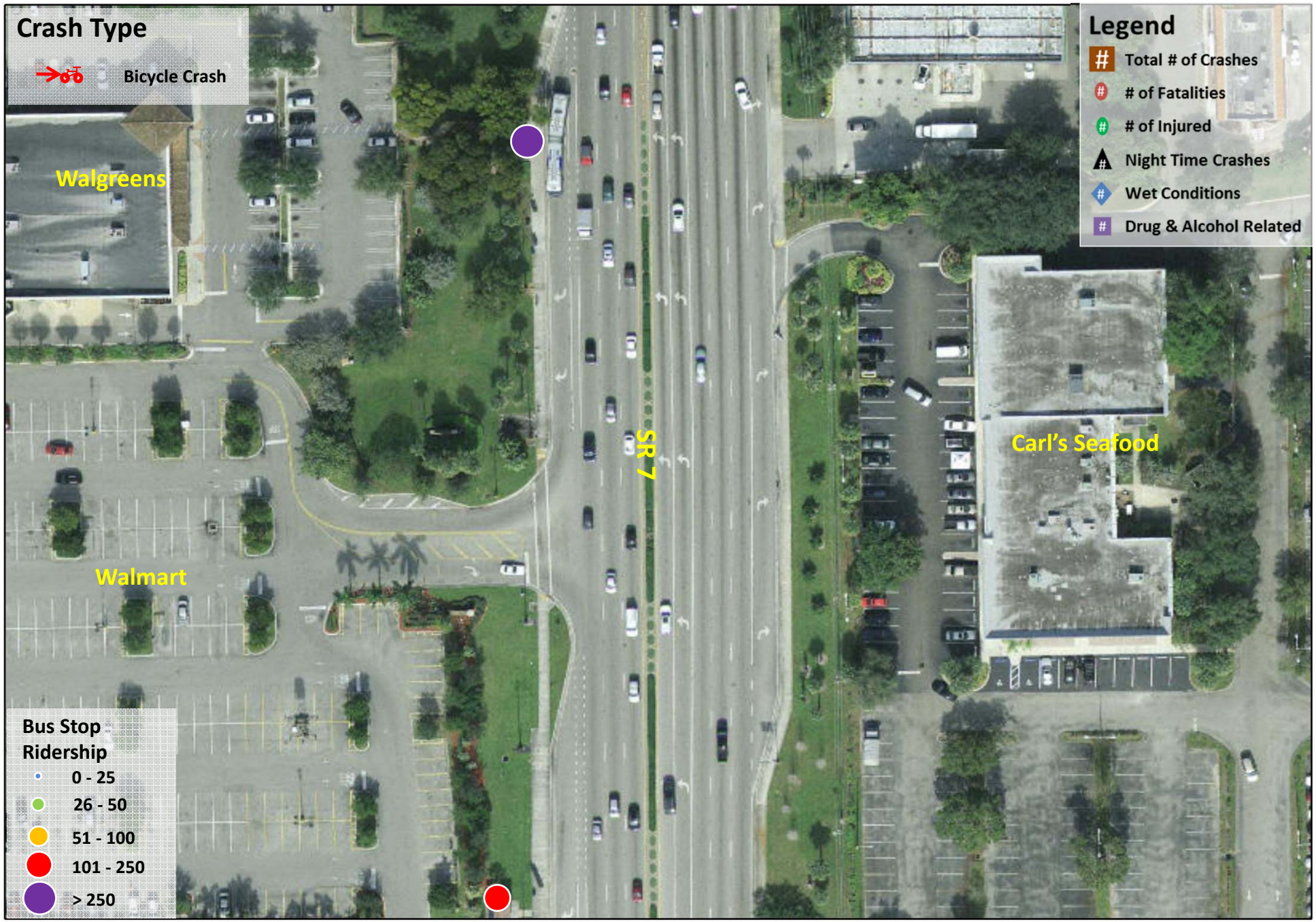
Broward MPD Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes - Oakland Park Boulevard and SR 7

Figure **10**



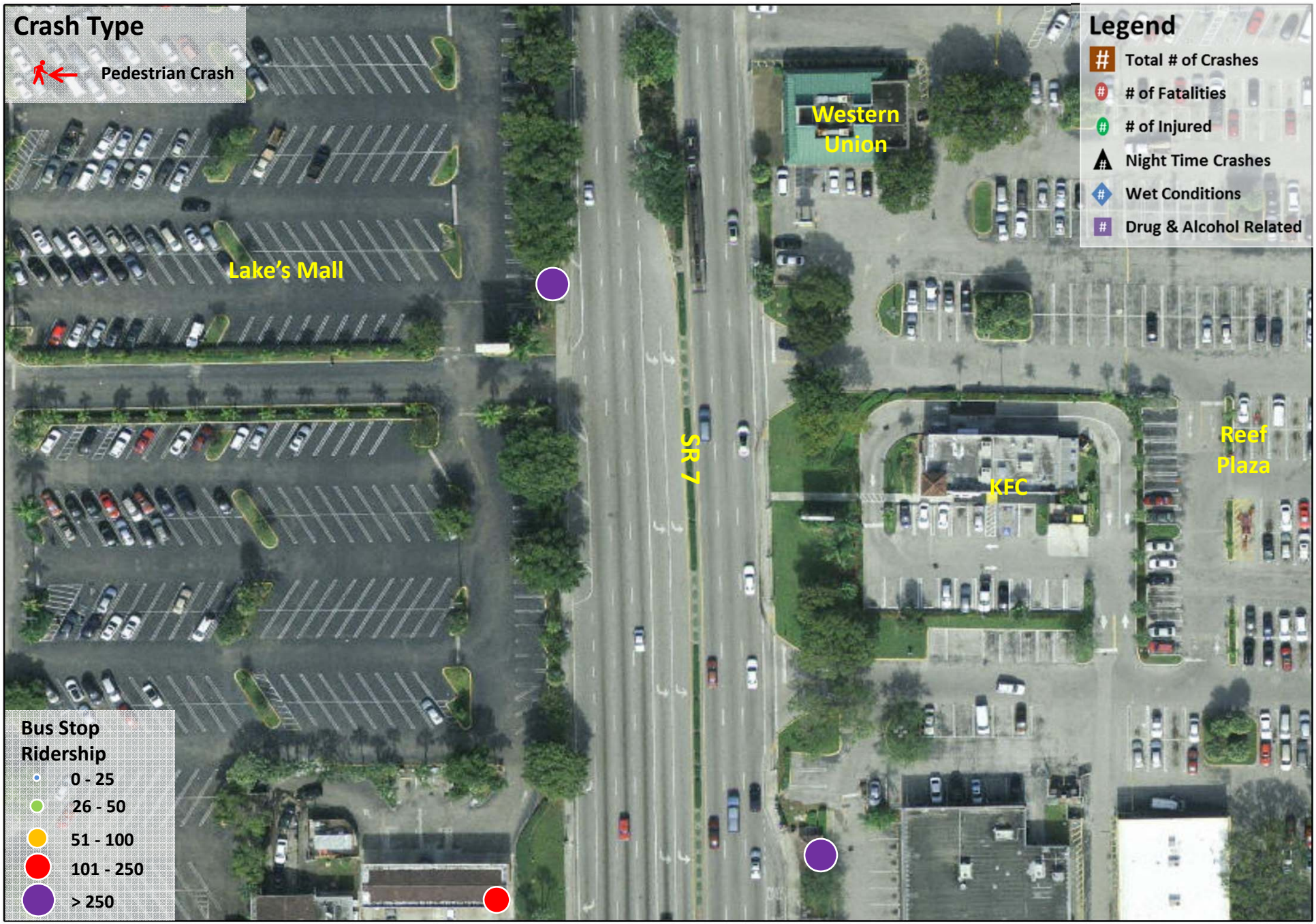
Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes - Oakland Park Boulevard and SR 7

Figure **11**



Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes - Oakland Park Boulevard and SR 7

Figure **12**



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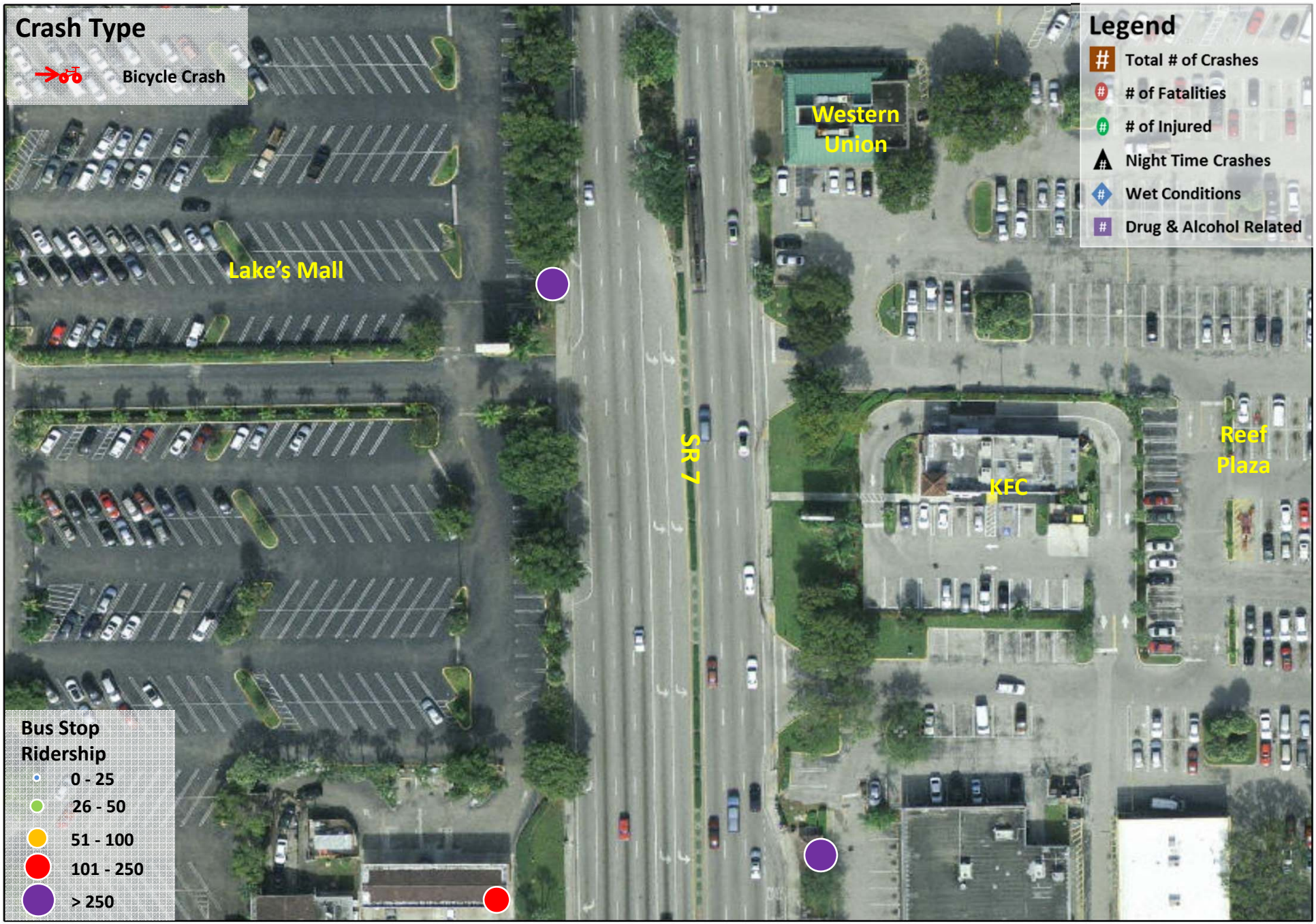
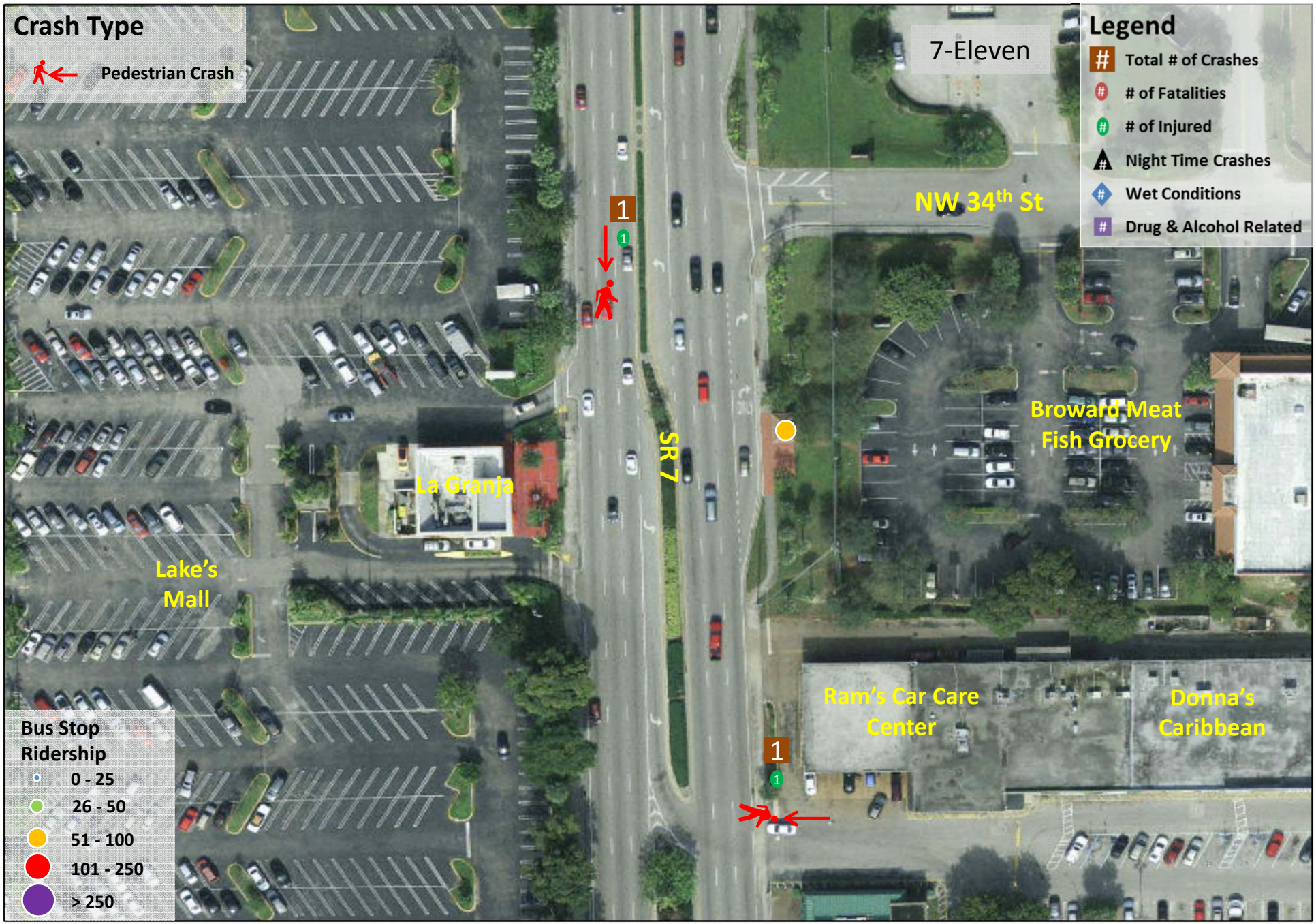
Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes - Oakland Park Boulevard and SR 7

Figure **13**



Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes - Oakland Park Boulevard and SR 7

Figure **14**



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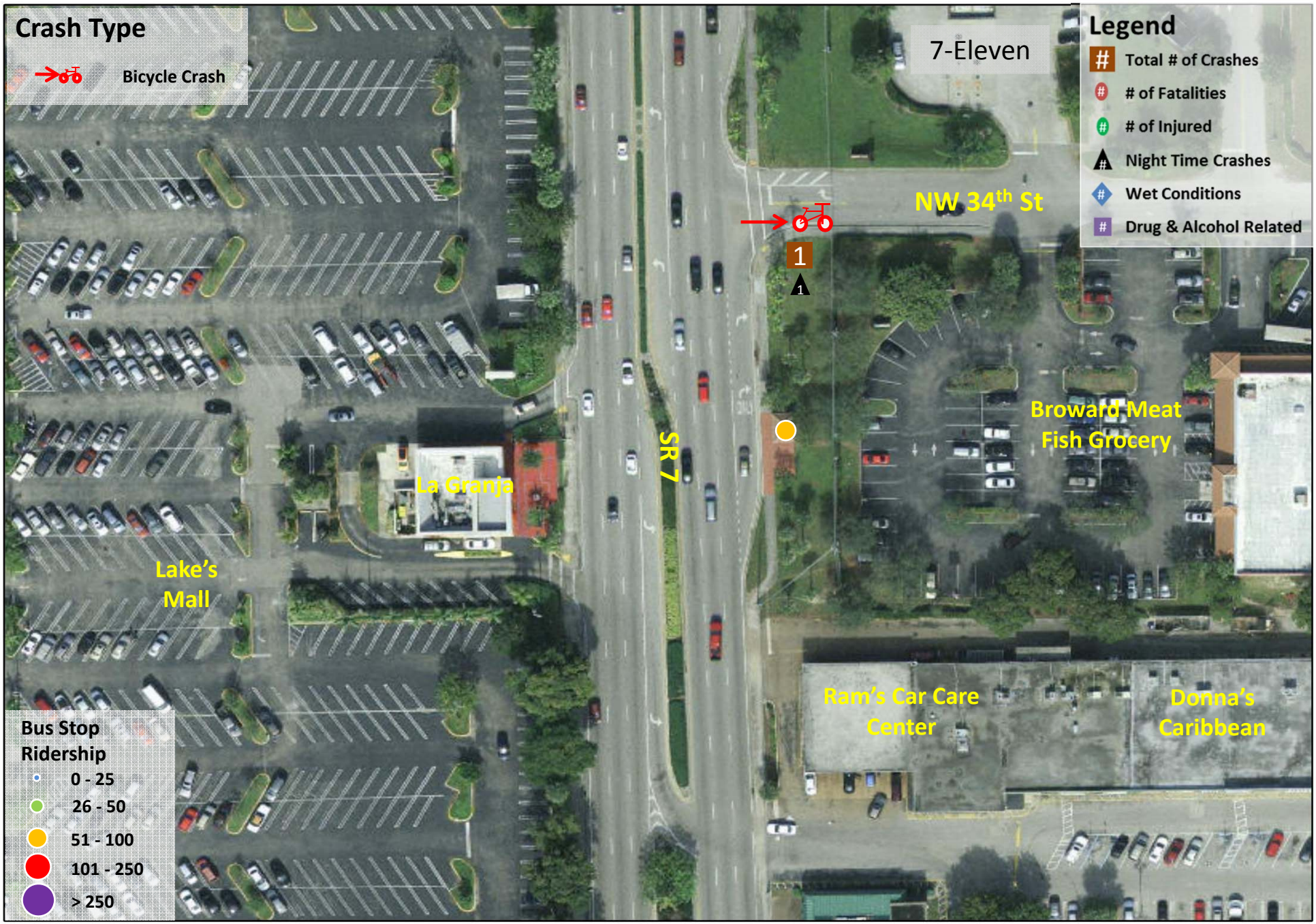
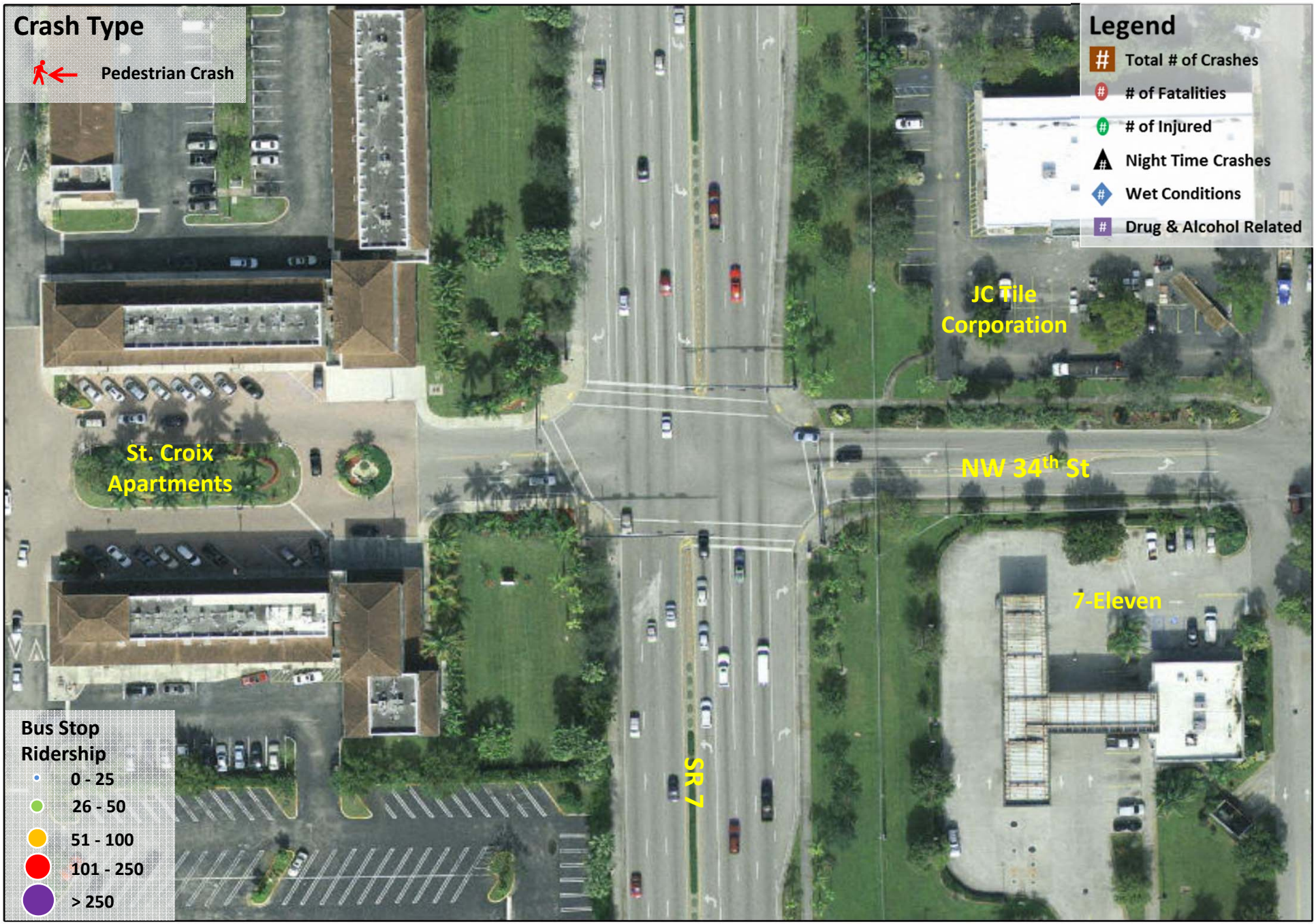
Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes - Oakland Park Boulevard and SR 7

Figure **15**



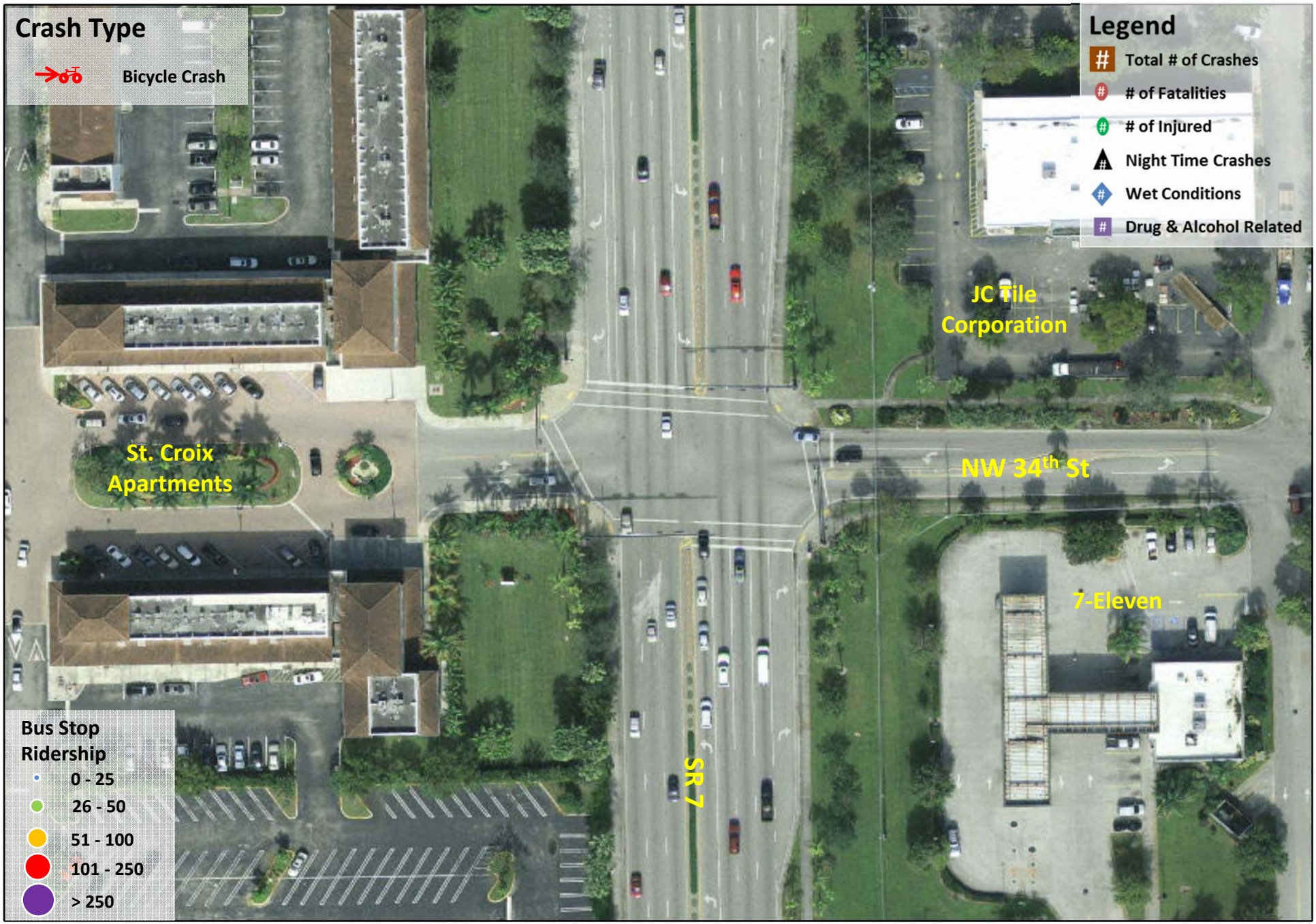
Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes - Oakland Park Boulevard and SR 7

Figure **16**



Broward MPO Pedestrian and Bicycle Safety Action Plan
Pedestrian Crashes - Oakland Park Boulevard and SR 7

Figure **17**



Broward MPO Pedestrian and Bicycle Safety Action Plan
Bicycle Crashes - Oakland Park Boulevard and SR 7

Figure **18**