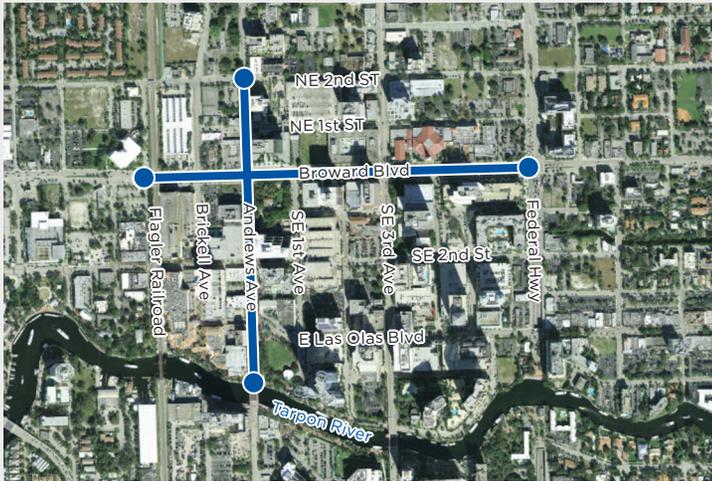


BROWARD BOULEVARD AND ANDREWS AVENUE SUMMARY

Fort Lauderdale, FL

Maintaining Agency: FDOT

BROWARD BOULEVARD AND ANDREWS AVENUE | Intersection Study



ROADWAY CHARACTERISTICS

Looking West



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.

CRASH DATA

33 Pedestrian

23 Bicycle

1 Fatal

46 Injury

9 Property Damage Only

48%
Occurred in Non-Daylight
Lighting Conditions

48% Occurred in February, March, or November

57% Occurred on Tuesday, Friday, or Saturday

CALENDAR						
S	M	T	W	T	F	S
		X			X	X
		X			X	X
		X			X	X
		X			X	X

Peak Crash Time Periods



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- Broken/Out of Date Pedestrian Signage and Signals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Out of Date Pedestrian Signage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, 56 pedestrian or bicyclist crashes occurred in the study area. Of those crashes, 59 percent (33) involved a pedestrian and 41 percent (23) involved a bicyclist. Most of the crashes occurred along Broward Boulevard, with a concentration at the study intersection.

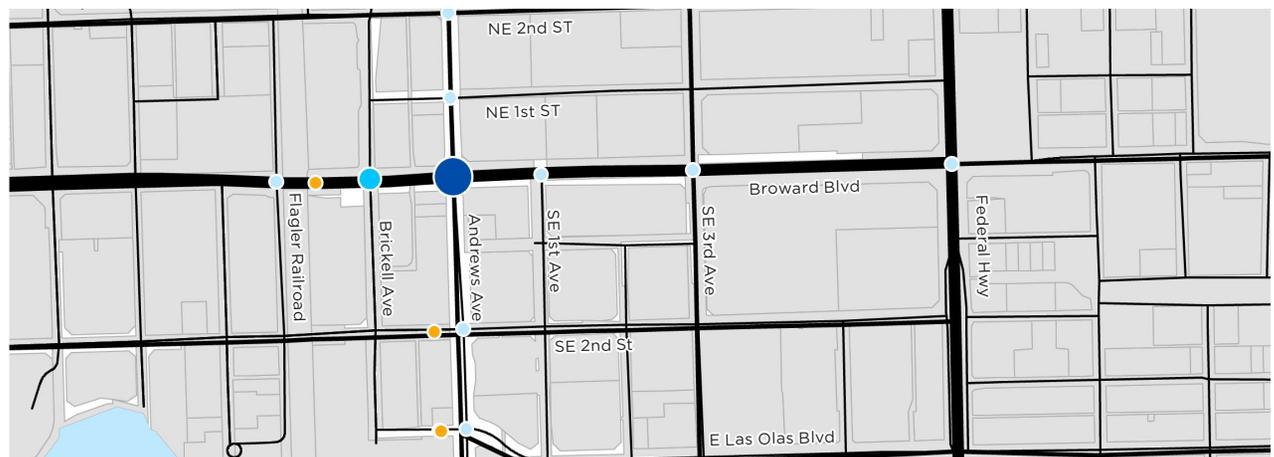
One of the crashes resulted in a fatality (2 percent) and 46 resulted in injury (82 percent). Most crashes occurred in dry conditions (49 crashes, 88 percent). However, almost half of the crashes (48 percent) occurred in non-daylight lighting conditions. One crash occurred in an area that was dark without street lighting, and that crash was the one fatality. Ten crashes (18 percent) involved alcohol or drugs, and the one fatality involved alcohol.

One quarter of the crashes involved someone aged 20-29. Almost all of the crashes involved someone either crossing mid-block or in a crosswalk.

FIGURE 1 | Study Area Crashes

Legend

- 1 Segment Crash
- Intersection Crash
- 1 - 5
- 6 - 10
- 18



Source: CARS 2010-2014 crash data; Signal Four Analytics 2010-2016 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.

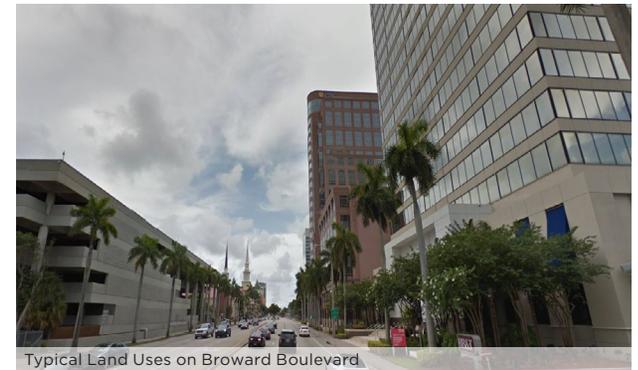


FIGURE 2 | Study Area Transit Ridership

Legend

Daily Boardings + Alightings

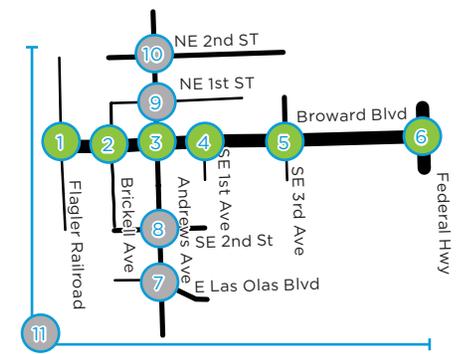
- 1 - 25
- 26 - 50
- 51 - 100
- 101 - 250
- 250 +

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.



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.

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.

Issue: Mid-Block Crossings

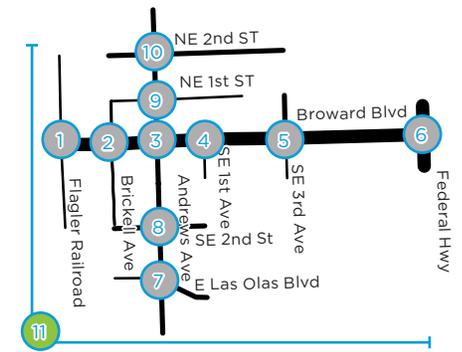
Location: 11 (Whole Area)

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 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:

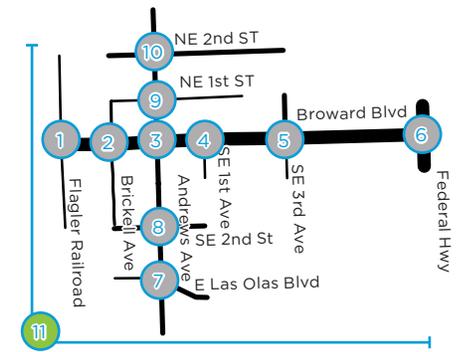
- Evaluate the addition of bike lanes throughout the study area. Ensure that the bike lanes are designed to have sufficient width to safely separate bikes from the high-speed and high-volume vehicular traffic in the study area in order to promote use of the bike lanes rather than the sidewalks. The high 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

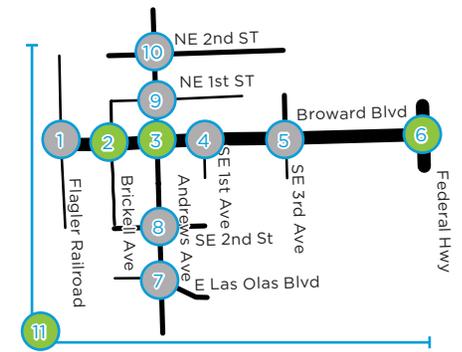
Location: 2, 3, 6, 11 (Whole Area)

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-foot 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

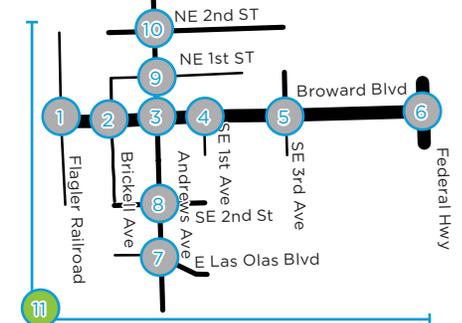
Location: 11 (Whole Area)

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

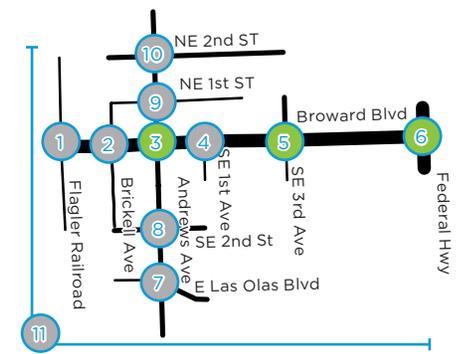
Location: 3, 5, 6

General Observations:

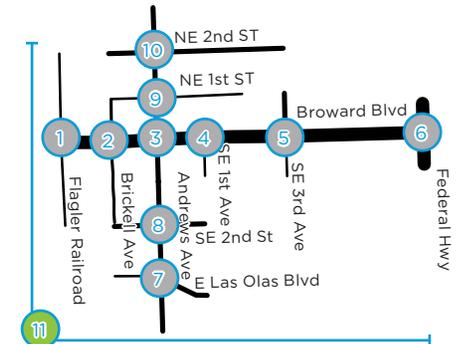
- Many intersections have excessive pavement widths. This is confusing to vehicles operating the intersection - especially with poorly maintained pavement markings - and yields long crossing distances for pedestrians.

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

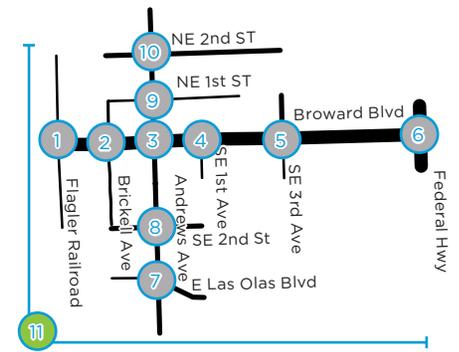
Location: 11 (Whole Area)

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

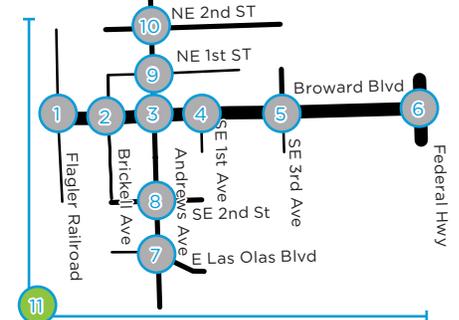
Location: 11 (Whole Area)

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.

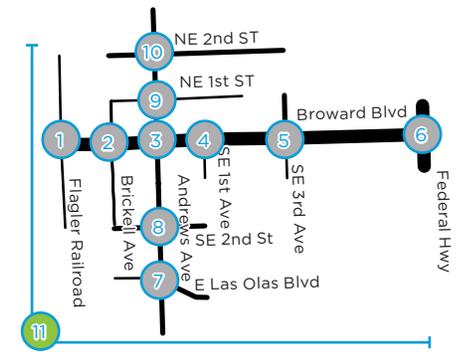
Issue: Delivery Trucks Location: 11 (Whole Area)

General Observations:

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

Recommendations:

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



Delivery truck parked in the sidewalk.

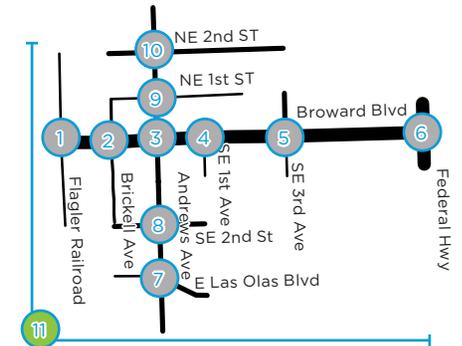
Issue: Lighting Location: 11 (Whole Area)

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 clothing at night and to use lighting.



Inadequate lighting on Broward Boulevard

Lamps out on Broward Boulevard at Andrews Avenue