Fort Lauderdale

Street Lighting Master Plan

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Prepared By:

Kimley»Horn

Executive Summary

OVERVIEW

The Fort Lauderdale Street Lighting Master Plan establishes lighting level standards and guidelines for light assemblies (i.e. poles and fixtures). The Master Plan also establishes estimated costs to bring existing streetlights and corridors up to these new standards. As Fort Lauderdale implements these standards, guidelines, and cost estimates into regular maintenance and capital improvement projects, the City will be able to save money, reduce its energy consumption, apply consistent lighting conditions along streets, align lighting aesthetics with desired community character, and create safer streets.

In 2019, the City adopted the Design and Construction Manual to "provide a set of guidelines and principles for the development of a sustainable, resilient, and a cohesive public realm within the City of Fort Lauderdale." Recognizing that lighting is an important component of design within the City's public realm, this master plan details illumination and lighting fixture recommendations for public streets. The plan ultimately aligns street lighting policy with larger goals regarding sustainability and community design.

The City's streetlight network includes approximately 15,000 to 20,000 lights along 809 miles of streets. Most of these lights are owned by Florida Power and Light (FPL); the remaining lights are owned by the City, County, Florida Department of Transportation (FDOT), and private developers. Using the established streetlight standards, the City can guide maintenance and capital investments for the lighting infrastructure it owns as well as coordinate desired standards with partner owners, including FPL, Broward County, FDOT, and private landowners. The outcomes, over time, will be a consistent look, feel, and function of streetlights as well as safer streets that cost less to light and maintain.

GOALS

The goals outlined below were developed using community input and previously established goals for transportation and the sustainability of the City. They guide the recommendations for this plan.

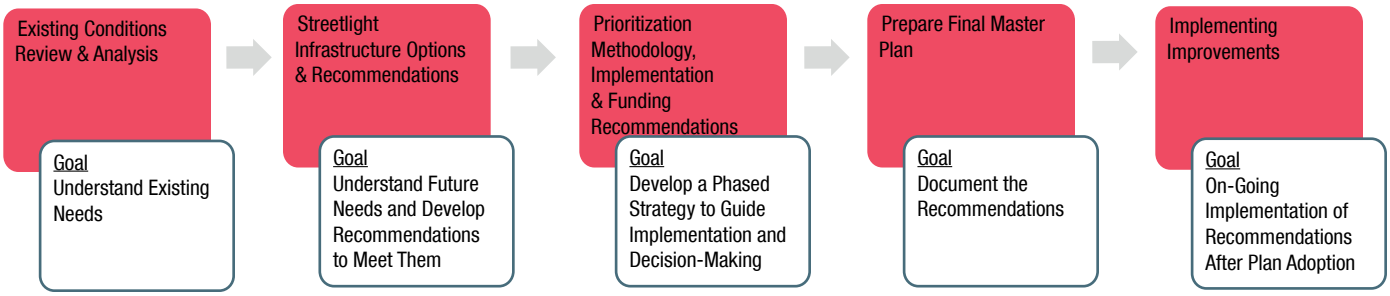
Fort Lauderdale Street Lighting Master Plan Goals

Goal	Need	Benefit
Establish Light Level Standards	Set standards for replacement of existing lights and installation of new lights	Provide uniform lighting levels based on street context
Standardize Light Assembly Styles	Select the right light for neighborhood character and street context	Provide a consistent look and feel throughout the City Reduce maintenance costs
Increase Energy Efficiency	Replace existing fixtures with energy efficient LED fixtures	Reduce energy costs, minimize glare Avoid light spillage on private property
Improve Safety for All Street Users	Improve light levels to reduce crashes	Safer low-light and nighttime conditions for people walking, biking, and driving along City streets

SUMMARY OF PROCESS

The lighting master plan followed a months-long process to analyze existing conditions, discuss needs with the public and stakeholders, and develop data-driven recommendations.

The chart below summarizes the process.



SUMMARY OF POLICY RECOMMENDATIONS

The key policy needs for the City are to establish light level standards, identify light assemblies, and develop guidelines to incorporate new technology into the streetlight system.

The key policy recommendations are:

» Establish standardized light levels based on street and land use context

» Establish light assembly standards based on street and land use context

» Establish guidelines to integrate “SMART” city technology into streetlight infrastructure

SUMMARY OF INVESTMENT RECOMMENDATIONS

The investment needed for the pilot locations evaluated for this project, as well as on-going cost savings related to energy use and physical infrastructure include:

» 20% energy cost savings with new light standards compared to existing conditions

» $9 million needed to bring the 13 pilot locations up to lighting standards established in this master plan

» 34% savings in annual capital costs by switching to LED light fixtures

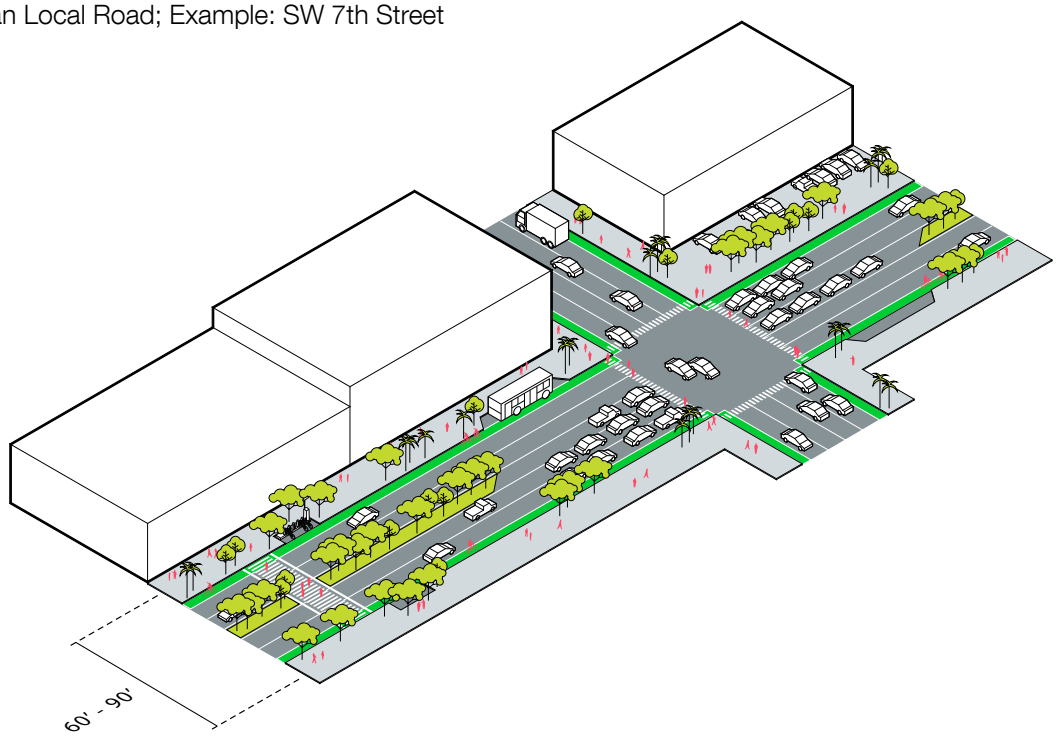
Citywide Streetlight Infrastructure Recommendations

One of the primary goals for this project is to standardize lighting levels for streetlights and the lighting assemblies. The sections in this chapter summarize the policy recommendations related to street lighting standards for the City of Fort Lauderdale.

The standards for lighting levels and streetlight assemblies are organized based on Complete Street typologies from the *Fast Forward Fort Lauderdale Design and Construction Manual.* The typologies are based on street-function and land-use context. By using the street typologies from the design and construction manual, lighting levels and assemblies can be applied to create desired community character and street functions. The street lighting standards can also be aligned with other public realm design considerations to create streets with the desired community character.

Occasionally, projects need to take motor/vehicle-traffic roadway classifications into consideration. To align the street typologies from the City's Design and Construction Manual with lighting criteria established for roadway functional classifications, the following conversion can be applied.

- Boulevard: Urban Principal Arterial; Example: Broward Boulevard
- Avenue: Urban Minor Arterial, Urban Major Collector, and Urban Minor Collector; Example: Las Olas Boulevard
- Street: Urban Local Road; Example: SW 7th Street



The Complete Street typologies, like the Commercial Boulevard example above, help align land use and transportation context.

STREET LIGHTING LEVEL RECOMMENDATIONS

The lighting level standards for this master plan should be used for maintenance projects of existing lights, capital projects that include a lighting element, and public street improvements that are done as part of private development projects. A lighting study should be conducted any time new assemblies are being installed. Lighting levels will be influenced by the mix of roadway and pedestrian assemblies.

The table below establishes the lighting-level criteria for streets in the City. Where there are ranges, the minimum amount of illumination to meet the criteria should be used. Any streets on the State Highway System (SHS) shall follow State standards and criteria. Additionally, FPL tariff light assemblies shall follow the lighting standards and criteria described in the matrix below.

Fort Lauderdale Lighting Matrix

Policy Connection	Land Use Context	Street Classification	Average Maintenance Illuminance Ratio	Maximum Illuminance Uniformity Ratio	Veiling Luminance Ratio
Fast Forward Fort Lauderdale Design and Construction Manual Street Typologies	City Center	Boulevards	1.6	3:1	0.3:1
		Avenues	1.1 - 1.4	4:1	0.3:1 - 0.4:1
		Streets	0.8	6:1	0.4:1
	Commercial	Boulevard	1.2	3:1	0.3:1
		Avenues	0.8 - 1.0	4:1	0.3:1 - 0.4:1
		Streets	0.7	6:1	0.4:1
	Residential	Boulevard	0.8	3:1	0.3:1
		Avenues	0.6 - 0.7	4:1	0.3:1 - 0.4:1
		Streets	0.4	6:1	0.4:1
	Special Designations	Beach Thoroughfares	0.8 - 1.0	4:1	0.3:1 - 0.4:1
		Industrial Thoroughfare	0.8 - 1.0	4:1	0.3:1 - 0.4:1
		Shared Street	0.8 - 1.0	4:1	0.3:1 - 0.4:1
		Green Alley	0.4	6:1	0.4:1

Lighting Standard Definitions

Land Use Context

Streets are the largest public space in the City. The development along a street has a significant influence on how a street functions. By identifying land use context, the multifaceted needs of the community can be aligned with the design and function of a street. The Land Use Context categories are based on the street typologies described in the *Fast Forward Fort Lauderdale Design and Construction Manual*.

Street Classification

Street are categorized to describe how the street and network needs to be treated to handle traffic for all modes. For the street classification, Streets have the lowest level of activity and movement of people. Boulevards have the highest level of activity and movement of people. The Street Classification categories are based on the street typologies described in the *Fast Forward Fort Lauderdale Design and Construction Manual*.

Illuminance

Illuminance is the density of incident light, expressed using footcandles (fc), on a surface. The recommendations for illumination maintenance and uniformity are based on standards from the current FDOT Greenbook and input from stakeholders during the development of this master plan.

Average Maintained Illuminance

The average measured value of illuminance for all photometric points in a roadway segment. The average maintained illuminance value for streets and highways should not be less than this minimum value.

Maximum Illuminance Uniformity Ratio

A ratio of the average illuminance to the minimum illuminance of all photometric points in a roadway segment. It is important to maintain illumination uniformity over the roadway to avoid vision problems due to varying illumination. The maximum uniformity ratio value should not be exceeded.

Veiling Luminance Ratio

The measure of disability glare based on the luminance method. The luminance method is dependent on pavement reflectivity and location of the driver. This criterion measures the glare of a fixed lighting system which the observer or driver experiences. The veiling luminance ratio value should not be exceeded.

STREETLIGHT ASSEMBLY STANDARDIZATION RECOMMENDATIONS

Two of the goals for this master plan are to reduce maintenance costs and create consistent street lighting aesthetics as part of street design. The Streetlight Assembly Matrix provides a summary of the different streetlight assemblies.

Streetlight assemblies are the combination of the pole and light fixture. In the table, there are two types of assemblies:

» **Roadway Assemblies:** Lighting that primarily illuminates the roadway portion of a street.

» **Pedestrian Assemblies:** Lighting that primarily illuminates the sidewalk and streetscape portion of a street.

The streetlight assemblies are organized based on the street typologies described in the *Fast Forward Fort Lauderdale Design and Construction Manual.* Assemblies should be selected using the Manual as well as the lighting criteria in this master plan. Assembly details are provided in *Appendix A: Streetlight Assemblies.* For projects that use the FPL LT-1 tarrif program, FPL light assemblies should be used.

Streetlight Assembly Matrix

Fast Forward Fort Lauderdale Design and Construction Manual Complete Street Typologies

Land Use Context	Street Typology	STREETLIGHT ASSEMBLIES										
		ROADWAY LIGHT ASSEMBLIES (R)					PEDESTRIAN LIGHT ASSEMBLIES (P)					
		R-1	R-2	R-3	R-4	R-5	P-1	P-2	P-3	P-4	P-5	P-6
Pole/Bracket		45' pole and 6' bracket	40' pole and 6' bracket	35' pole and 6' bracket	30' pole and 6' bracket	25' pole and 6' bracket	Washington by Ameron	Victorian VII by Ameron	Victorian I by Ameron (decorative concrete)	RSA with decorative base by ULS	1C1 Octagonal decorative concrete by Ameron	Decorative fluted fiberglass pole
Fixtures		ATB2 or ATBL by American Electric Lighting	ATB2 or ATBL by American Electric Lighting	ATB0 or ATBM by American Electric Lighting	ATB0 or ATBS by American Electric Lighting	ATB0 or ATBS by American Electric Lighting	Citta by Vertex Illuminations of America	Serenade S55 by Lumec or Key West by Spring City	Eclipse by Luminis	Urban VX600 by Hadco	Serenade S55 by Lumec or Key West by Spring City	Prismatic style acorn with decorative banding
City Center	Boulevards	✓	✓					✓	✓			
	Avenues		✓	✓				✓	✓			
	Streets				✓	✓		✓	✓			
Commercial	Boulevard	✓	✓					✓	✓			
	Avenues		✓	✓				✓	✓			
	Streets				✓	✓				✓	✓	✓
Residential	Boulevard	✓	✓					✓	✓			
	Avenues	✓	✓	✓						✓	✓	✓
	Streets				✓	✓				✓	✓	✓
Special Designations	Beach Thoroughfares			✓	✓	✓	✓					
	Industrial Thoroughfare			✓	✓	✓						
	Shared Street				✓	✓		✓	✓			
	Green Alley											

ELECTRICAL SYSTEM MANAGEMENT

In addition to the streetlights, the main components of the City's streetlight electrical system are:

- **Circuit Breakers:** Provide overcurrent protection for multiple circuits
- **Load Centers:** Provide power to multiple circuits and are metered by the utility company
- **Conduit:** The wiring system that distributes the electricity throughout the streetlight system.

Based on field observations for the evaluation areas for this master plan, close to 50% of the breakers and load centers had visible signs of corrosion. Additionally, many of the service points had visible clutter such as leaves and debris. While corrosion and debris are a common occurrence, delayed maintenance and excessive corrosion and debris buildup can lead to system malfunctions.

Regular inspection and maintenance should occur for the entire system. Developing an asset management system for the City's streetlights can help track inspections and schedule regular, preventative maintenance of the streetlight electrical system.

ENERGY SAVINGS

One city-wide recommendation is to continue converting all non-LED streetlights to low-wattage, LED equivalent fixtures. This strategy has an initial up-front cost, but long-term will save the City approximately 20% in energy and capital costs over a 10 year period.

These changes can be implemented over time as part of maintenance or capital projects. For lights and areas with FPL-owned streetlights, the City should negotiate the conversion to LED and have the cost included in the City's FPL streetlight tariff. With this approach, the capital cost for LED upgrades will be included in the ownership and maintenance tariff as part of the City's monthly FPL utility bill.

Comparison of Yellow-Colored High Pressure Sodium Lights vs. Whiter LED Lights

Changing the City's lights to LED will provide clearer lighting conditions and save energy. Source: Los Angeles Bureau of Street Lighting

STREET LIGHTING TECHNOLOGY

Streetlight technology should be used when it can accomplish one or more of the following goals:

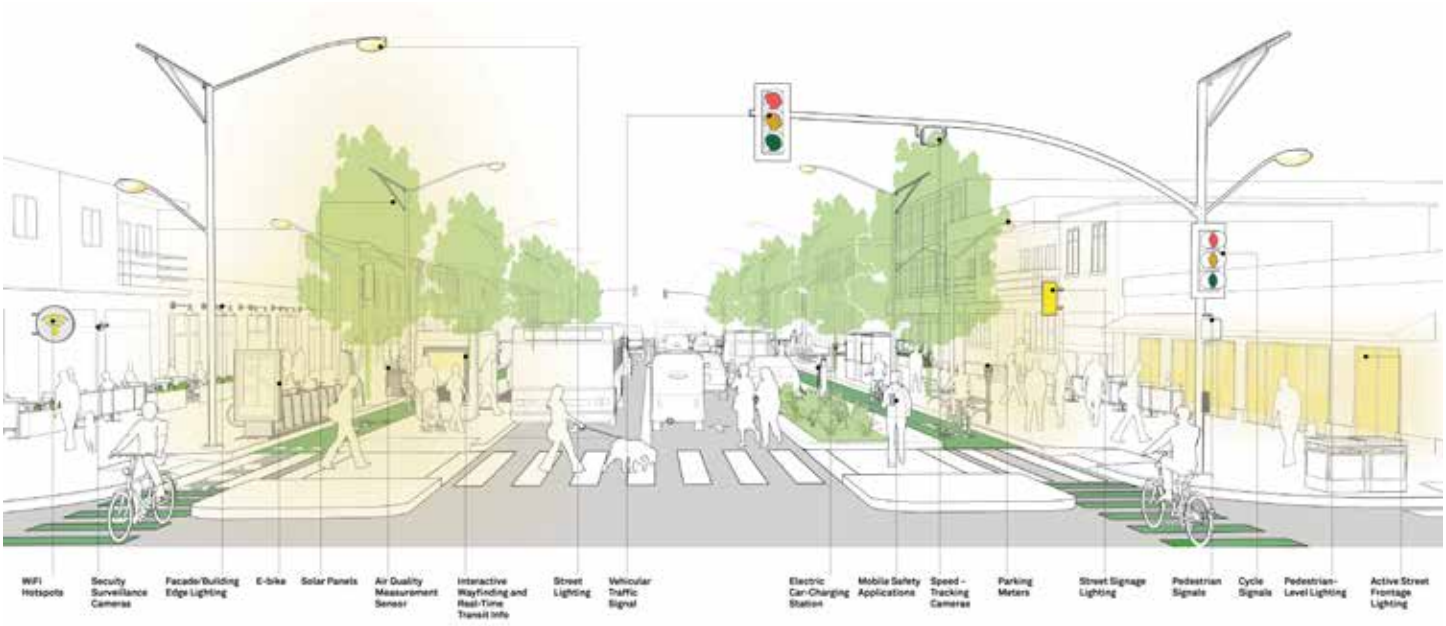
» **Create Safe Streets:** Lighting strategies can expand to better address the needs of all modes of travel.

» **Improve Streetlight Network Efficiency and Maintenance:** Sensors can be utilized to inform City staff in real time of necessary lighting repairs or replacements.

» **Support Other Community Transportation, Sustainability, and Public Life Goals:** Infrastructure can be created to provide digital services like WiFi.

Leveraging advances in technology can help the City build, maintain, and operate safe and accessible streets and public spaces. New technology should be tested before being deployed at a city-wide scale. Solar and battery operated light technology was evaluated as part of this master plan. Currently, it is not a mature enough technology to deploy in the City.

Street Lighting Technology Opportunities



Streetlights can provide the infrastructure needed to create safer streets and more useful streets for people walking, biking, taking transit, and driving. Source: NACTO Global Street Design Guide

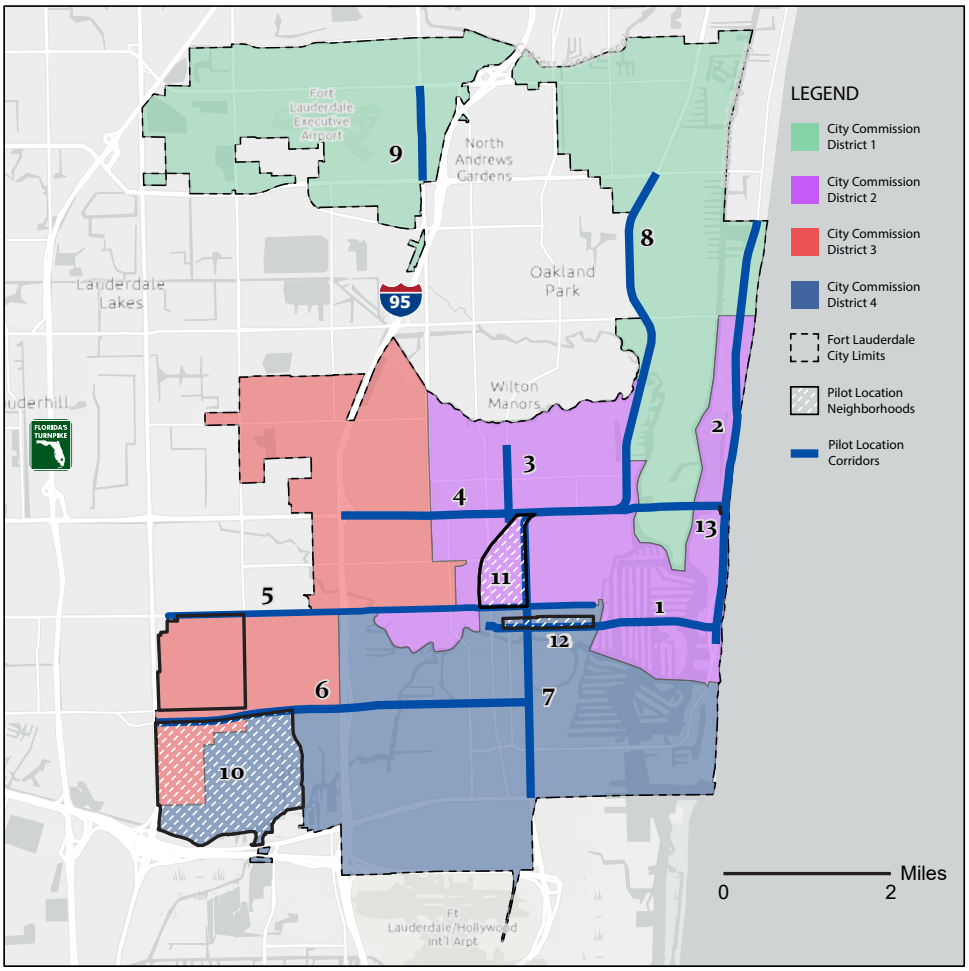
Pilot Location Recommendations

The street light master plan includes a more detailed analysis of lighting conditions within specific pilot locations. Thirteen pilot locations were selected, including nine street corridors and four neighborhood areas. The pilot locations were selected based on several criteria including traffic data, crash data, and development intensity. The street corridors are currently lit with a combination of FPL, FDOT, and City-owned streetlights. The four neighborhood areas have under-lighted areas.

In total, it will cost $9 million dollars to light and bring the 13 pilot locations up to the streetlight standards established in this master plan. Additionally, doing so will save the City $85,000 dollars per year in capital and energy costs. Over a ten year period, the City will save $850,000 by implementing the pilot projects.

This chapter provides a summary of the needs and recommendations to bring the pilot locations up to the streetlight criteria established in this master plan. Additionally, the pilot locations are prioritized. For more on the prioritization results, see the *Pilot Location Prioritization* chapter.

Pilot Location Map

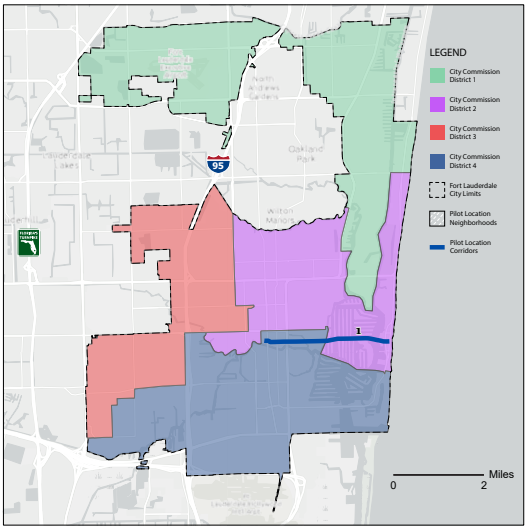


Pilot Locations

Pilot Locations #	Pilot Location Name	Extent	Cost to Bring Pilot Location up to Lighting Criteria
1	SR 842/Las Olas Boulevard	Brickell Avenue to SR A1A/N Ocean Boulevard	$260,000
2	SR A1A/N Ocean Boulevard	SE 5th Street to Flamingo Avenue	$89,000
3	SR 811/ NE 4th Ave (Dixie Highway)	FEC Train Tracks to NE 16th Street	$289,000
4	SR 838 / Sunrise Boulevard	I-95 to SR A1A	$328,000
5	SR 842 / Broward Boulevard	SW 38th Avenue to SE 17th Avenue	$131,000
6	SR 736 / Davie Boulevard	US-441 to US-1 Federal Highway	$87,000
7	US-1 Federal Highway	SR-84/Marina Boulevard to Sunrise Boulevard	$2,083,000
8	US-1 Federal Highway	Sunrise Boulevard to Commercial Boulevard	$1,397,000
9	SR 845 / Powerline Road	Commercial Boulevard to W Cypress Creek Road	$147,000
10	Riverland Road Neighborhood	N/A	$825,000
11	Flagler Village Area	N/A	$1,903,000
12	Himmarshee Area	N/A	$962,000
13	Sunrise Lane Area	N/A	$510,000
Total			$9,011,000

1. SR 842 LAS OLAS BOULEVARD FROM BRICKELL AVENUE TO SR A1A (N OCEAN BOULEVARD)

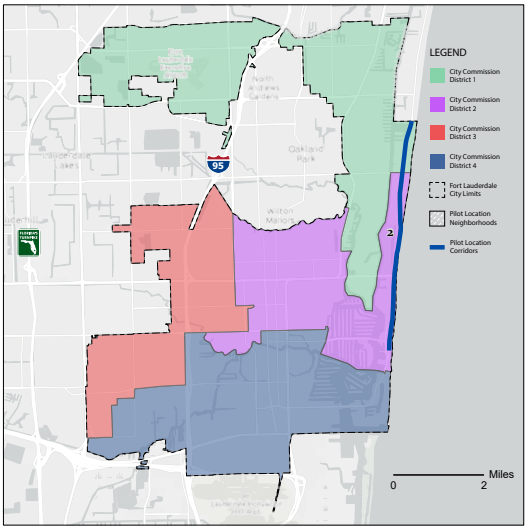
The Las Olas Boulevard evaluation area is from SR A1A/N Ocean Boulevard to Brickell Avenue/SW 1st Avenue. The evaluation area is 2.5 miles long. Vehicular AADT along the corridor ranges from 2,500 on the western end of corridor to 18,000 in the middle part of the corridor to 11,000 on the eastern end of the corridor. Land uses along the western half of the corridor is a Downtown mixed-use context with ground floor retail, restaurants, offices, and residential uses and along the eastern side of the corridor is medium to high density residential development.



Summary Topic	Notes
Lighting Ownership	» FDOT
Light Fixture Types	» Post top » Metal Halide » Double Post Top HPS » Decorative
Lighting Criteria Goals	» Street Typology: City Center Avenue » Average Maintenance Illuminance: 1.0 » Illuminance Uniformity Ratio: 4:1 » Veiling Luminance Ratio: 0.3:1 - 0.4:1
Does Area Meet Lighting Criteria Goals?	» The entire corridor does not meet lighting criteria.
Investment Needed to Achieve Lighting Criteria	» $260,000
Deficiency	» From Brickell Avenue to Birch Road does not meet lighting criteria. » 155 nighttime crashes over five-year period
Description of Improvements	» Retrofit the existing light poles with LED fixtures. » Coordinate improvement with FDOT.

2. SR A1A (N OCEAN BOULEVARD) FROM SE 5TH STREET TO FLAMINGO AVENUE

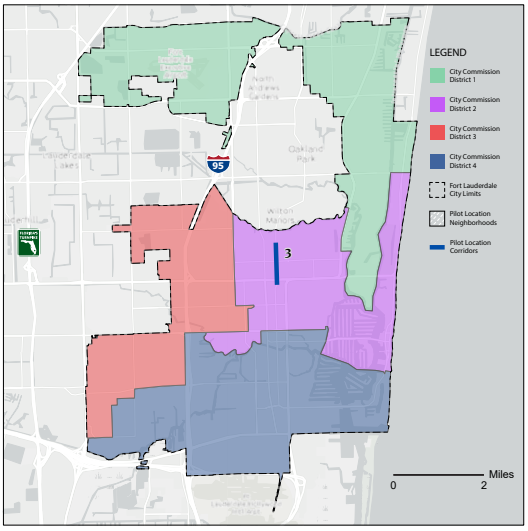
The A1A/N Ocean Boulevard evaluation area is from SE 5th Street to Flamingo Avenue. The evaluation area is 4.5 miles long. Vehicular AADT along the corridor ranges from 17,000 AADT to 26,000 AADT. Land uses are a mix of residential, retail, hotels, and other beach-oriented uses.



Summary Topic	Notes
Lighting Ownership	» FDOT
Light Fixture Types	» FPL Roadway HPS » Amber LED Pedestrian » Decorative Roadway » Decorative Pedestrian
Lighting Criteria Goals	» Street Typology: Beach Thoroughfare » Average Maintenance Illuminance: 1.0 » Illuminance Uniformity Ratio: 4:1 » Veiling Luminance Ratio: 0.3:1 - 0.4:1 » For additional standards related to lighting in wildlife-sensitive areas, see section *231.2.1 Environmental Lighting* of the *FDOT Design Manual*.
Does Area Meet Lighting Criteria Goals?	» The entire corridor does not meet lighting criteria.
Investment Needed to Achieve Lighting Criteria	» $89,000
Deficiency	» SR A1A from NE 18th Street to Oakland Park Blvd does not meet lighting criteria. » Consider lighting treatments that address turtle lighting needs. » 237 nighttime crashes over five-year period
Description of Improvements	» Retrofit the existing light poles with LED fixtures. » Coordinate improvement with FDOT. » Section from SE 5th Street to Sunrise Boulevard is in design phase and was not evaluated as part of this master plan. » Section from Sunrise Boulevard to NE 18th Street, section was recently designed with environmentally sensitive lighting as was not evaluated as part of this master plan.

3. SR 811 NE 4TH AVENUE (DIXIE HIGHWAY) FROM TRAIN TRACKS TO NE 16TH STREET

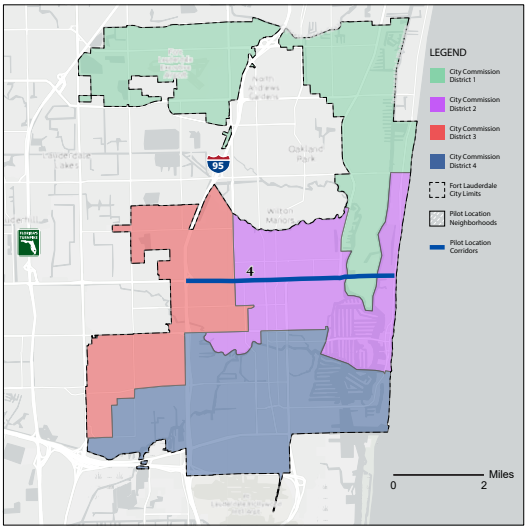
The SR 811/NE 4th Avenue (Dixie Highway) evaluation area is from FEC train tracks to NE 16th Street. The evaluation area is 1 mile long. Vehicular AADT along the corridor is 14,000 AADT. Land uses are primarily neighborhood commercial uses.



Summary Topic	Notes
Lighting Ownership	» FDOT
Light Fixture Types	» FPL HPS » FPL LED » Cooper Navion LED
Lighting Criteria Goals	» Street Typology: Commercial Avenue » Average Maintenance Illuminance: 1.0 » Illuminance Uniformity Ratio: 4:1 » Veiling Luminance Ratio: 0.3:1 - 0.4:1
Does Area Meet Lighting Criteria Goals?	» The entire corridor does not meet lighting criteria.
Investment Needed to Achieve Lighting Criteria	» $289,000
Deficiency	» Roadway from Train tracks to NE 16th Street does not meet lighting criteria. » 86 nighttime crashes over five-year period
Description of Improvements	» Retrofit the existing light poles with LED fixtures from train tracks to Sunrise. Add Pedestrian lights between roadway lights from Sunrise Blvd to 16th Street. » Coordinate improvement with FDOT.

4. SR 838 SUNRISE BOULEVARD FROM I-95 TO SR A1A

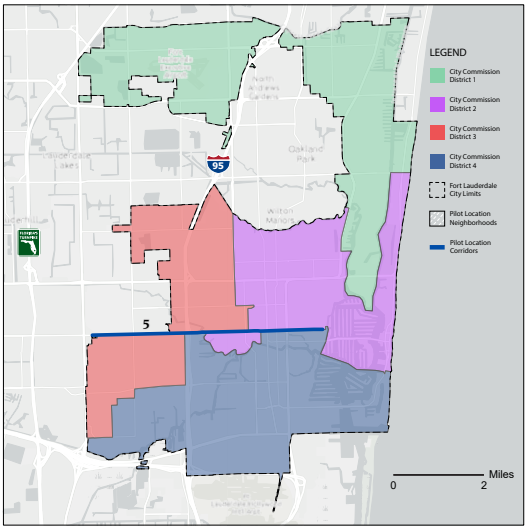
The SR 838/Sunrise Boulevard evaluation area is from I-95 to SR A1A. The evaluation area is 4 miles long. Vehicular AADT along the corridor ranges from 24,000 AADT to 70,000 AADT. Land uses are commercial with some small to medium-sized parks along the corridor.



Summary Topic	Notes
Lighting Ownership	» FDOT
Light Fixture Types	» GE HPS » HPS Mongoose » LUMEC HPS » LED » HPS
Lighting Criteria Goals	» Street Typology: Commercial Boulevard » Average Maintenance Illuminance: 1.2 » Illuminance Uniformity Ratio: 3:1 » Veiling Luminance Ratio: 0.3:1
Does Area Meet Lighting Criteria Goals?	» The entire corridor does not meet lighting criteria.
Investment Needed to Achieve Lighting Criteria	» $328,000
Deficiency	» Roadway from NE 7th Avenue to 17th Way does not meet lighting criteria. From NE 20th Avenue to SR A1A does not meet lighting criteria. » 762 nighttime crashes over five-year period
Description of Improvements	» Retrofit the existing light poles with LED fixtures and convert FP&L HPS to LED. Add FP&L lights and additional light poles. » Coordinate improvement with FDOT. FDOT scheduled FY2023 construction from Searstown to SE 10th Avenue. FDOT scheduled FY2024 construction from Middle River Bridge to Intracoastal Waterway. FDOT scheduled FY2025 construction from I-95 to US-1/ Gateway.

5. SR 842 BROWARD BOULEVARD FROM I-95 TO SE 15TH AVENUE

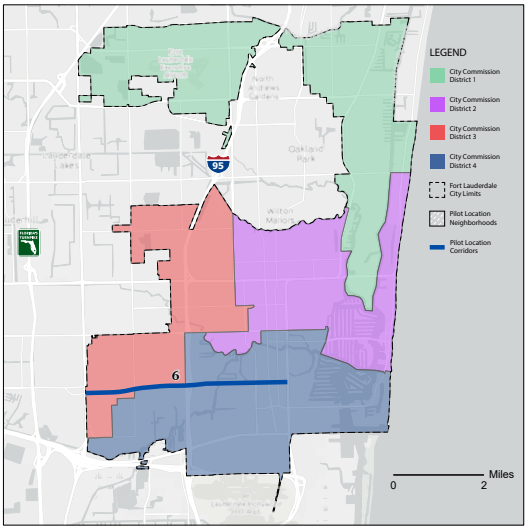
The SR 842/Broward Boulevard evaluation area is from SW 38th Avenue to SE 17th Avenue. The evaluation area is 2.5 miles long. Vehicular AADT along the corridor ranges from 25,000 AADT to 65,000 AADT. Land uses are medium to high density mixed use with some parks and a school along the corridor.



Summary Topic	Notes
Lighting Ownership	» FDOT
Light Fixture Types	» Smartlume Schreder LED » GE HPS
Lighting Criteria Goals	» Street Typology: City Center Boulevard » Average Maintenance Illuminance: 1.6 » Illuminance Uniformity Ratio: 3:1 » Veiling Luminance Ratio: 0.3:1
Does Area Meet Lighting Criteria Goals?	» The entire corridor does not meet lighting criteria.
Investment Needed to Achieve Lighting Criteria	» $131,000
Deficiency	» From SW 38th Avenue to I-95 does not meet lighting criteria. From US-1 to SE 17th Avenue does not meet lighting criteria. » 826 nighttime crashes over five-year period
Description of Improvements	» Retrofit the existing light poles with LED fixtures and convert FP&L HPS to LED. » Coordinate improvement with FDOT. FDOT scheduled FY2023 construction from SR7 to SW 22nd Avenue.

6. SR 736 DAVIE BOULEVARD FROM US-441 TO US-1 FEDERAL HIGHWAY

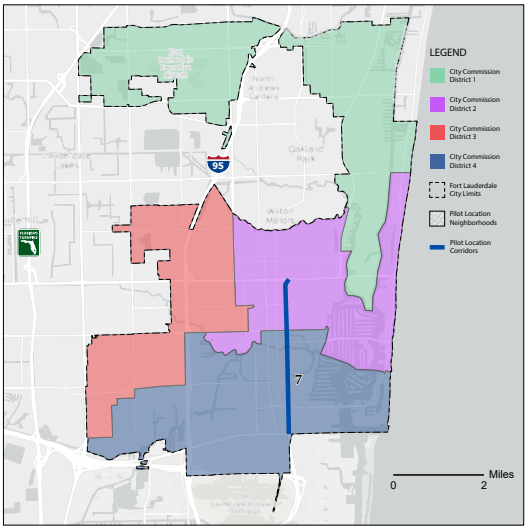
The SR 736/Davie Boulevard evaluation area is from US 441 to US-1 Federal Highway. The evaluation area is 4 miles long. Vehicular AADT along the corridor ranges from 15,000 AADT to 43,000 AADT. Land uses are predominantly low and medium density residential and commercial uses.



Summary Topic	Notes
Lighting Ownership	» FDOT
Light Fixture Types	» HPS » LED
Lighting Criteria Goals	» Street Typology: Commercial Avenue » Average Maintenance Illuminance: 0.8 - 1.0 » Illuminance Uniformity Ratio: 3:1 » Veiling Luminance Ratio: 0.3:1 - 0.4:1
Does Area Meet Lighting Criteria Goals?	» The entire corridor does not meet lighting criteria.
Investment Needed to Achieve Lighting Criteria	» $87,000
Deficiency	» The entire stretch of roadway does not uniformity lighting criteria. » 551 nighttime crashes over five-year period
Description of Improvements	» Retrofit the existing light poles with LED fixtures and convert the FP&L lights from HPS to LED. » Coordinate improvement with FDOT. FDOT scheduled FY2026 construction from SR7 to I-95.

7. US-1 FEDERAL HIGHWAY FROM SR 84 (MARINA BOULEVARD) TO SUNRISE BOULEVARD

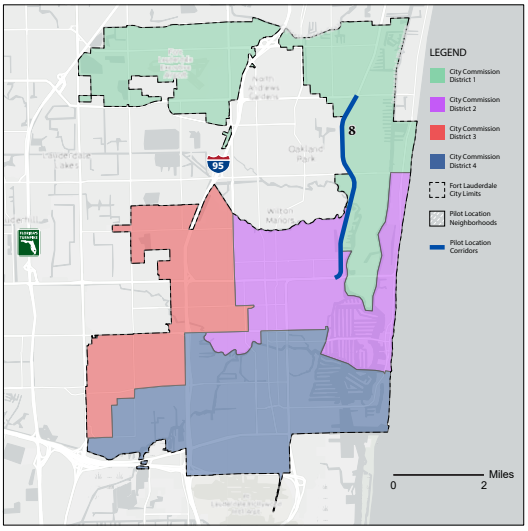
The US-1/Federal Highway evaluation area is from SR 84/Marina Boulevard to Sunrise Boulevard. The evaluation area is 3 miles long. Vehicular AADT along the corridor ranges from 38,000 AADT to 49,000 AADT. Land uses are predominantly low and medium density commercial uses.



Summary Topic	Notes
Lighting Ownership	» FDOT
Light Fixture Types	» HPS » LED » Post Top HPS Holophane Mongoose » ATBL-A/LED
Lighting Criteria Goals	» Street Typology: Commercial Boulevard » Average Maintenance Illuminance: 1.2 » Illuminance Uniformity Ratio: 3:1 » Veiling Luminance Ratio: 0.3:1
Does Area Meet Lighting Criteria Goals?	» The entire corridor does not meet lighting criteria.
Investment Needed to Achieve Lighting Criteria	» $2,083,000
Deficiency	» The lighting from SE 17th Street to Sunrise Blvd does not meet lighting criteria. » 416 nighttime crashes over five-year period
Description of Improvements	» Provide light poles spaced to meet criteria and update load centers. » Coordinate improvement with FDOT.

8. US-1 FEDERAL HIGHWAY FROM SUNRISE BOULEVARD TO COMMERCIAL BOULEVARD

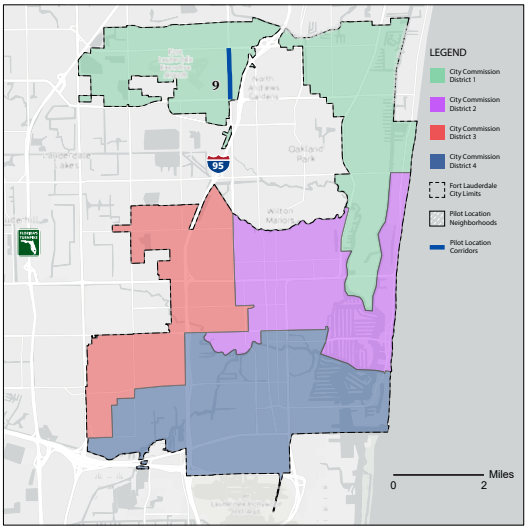
US-1/Federal Highway evaluation area is from Sunrise Boulevard to Commercial Boulevard. The evaluation area is 3.5 miles long. Vehicular AADT along the corridor ranges 38,000 to 51,000 AADT. The land uses along the corridor are predominantly low density commercial uses.



Summary Topic	Notes
Lighting Ownership	» FDOT
Light Fixture Types	» HPS » LED » Post Top HPS Holophane Mongoose
Lighting Criteria Goals	» Street Typology: Commercial Boulevard » Average Maintenance Illuminance: 1.2 » Illuminance Uniformity Ratio: 3:1 » Veiling Luminance Ratio: 0.3:1
Does Area Meet Lighting Criteria Goals?	» The entire corridor does not meet lighting criteria.
Investment Needed to Achieve Lighting Criteria	» $1,397,000
Deficiency	» The entire stretch of roadway does not meet lighting criteria. » 366 nighttime crashes over five-year period
Description of Improvements	» Add light poles and retrofit existing light poles. Convert HPS FP&L lights to LED. » Coordinate improvement with FDOT.

9. SR 845 (POWERLINE ROAD) FROM COMMERCIAL BOULEVARD TO W CYPRESS CREEK ROAD

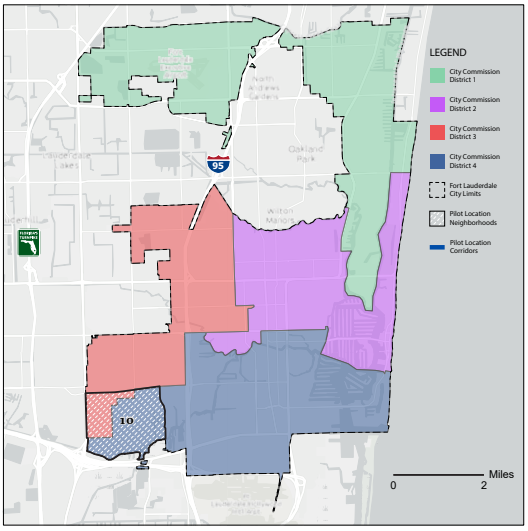
SR 845/Powerline Road evaluation area is from Commercial Boulevard to W Cypress Creek Road. The evaluation area is 1 mile long. Vehicular AADT is 35,000 AADT. The land uses are commercial and industrial uses.



Summary Topic	Notes
Lighting Ownership	» FDOT
Light Fixture Types	» HPS
Lighting Criteria Goals	» Street Typology: Industrial Thoroughfare » Average Maintenance Illuminance: 0.8 - 1.0 » Illuminance Uniformity Ratio: 4:1 » Veiling Luminance Ratio: 0.3:1 - 0.4:1
Does Area Meet Lighting Criteria Goals?	» The entire corridor does not meet lighting criteria.
Investment Needed to Achieve Lighting Criteria	» $147,000
Deficiency	» The entire stretch of roadway does not meet lighting criteria. » 154 nighttime crashes over five-year period
Description of Improvements	» Retrofit the existing light poles with LED fixtures. Add light poles. » Coordinate improvement with FDOT. FDOT scheduled FY2024 construction from Commercial Boulevard to McNab Road.

10. RIVERLAND ROAD NEIGHBORHOOD

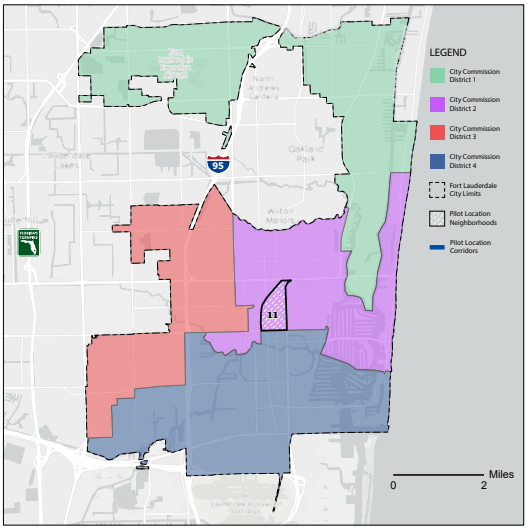
Riverland Road Neighborhood pilot location area is genererally bound by Davie Bouelvard, Riverland Road, South Fork New River, and US 441/SR-7. The pilot area is about 1.5 miles long east to west and about 1 mile long north to south. Vehicular AADT is 3,900 AADT or less on neighborhood. The land uses are residential.



Summary Topic	Notes
Lighting Ownership	» City of Fort Lauderdale » FPL
Light Fixture Types	» HPS
Lighting Criteria Goals	» Street Typology: Residential Street » Average Maintenance Illuminance: 0.4 » Illuminance Uniformity Ratio: 6:1 » Veiling Luminance Ratio: 0.4:1
Does Area Meet Lighting Criteria Goals?	» The entire area does not meet lighting criteria.
Investment Needed to Achieve Lighting Criteria	» $825,000
Deficiency	» Continuous lighting is not provided on neighborhood roadways. » 139 nighttime crashes over five-year period
Description of Improvements	» With FP&L's Tariff program, convert the existing 315 lights to LED fixtures, add approximately 539 light poles and run approximately 78,000 LF of direction bore for new lighting system.

11. FLAGLER VILLAGE AREA

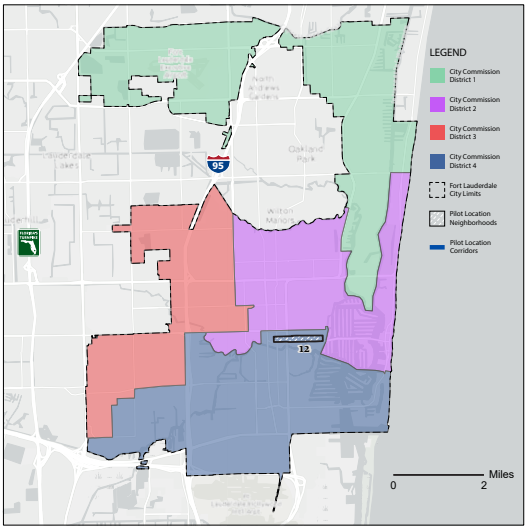
The Flagler Village Area pilot location area is generally bound by Sunrise Boulevard, US-1, Broward Boulevard and Florida East Coast Railway (FEC). The pilot area is about 0.5 miles long east to west and about 1 mile long north to south. Vehicular AADT ranges from 11,000 to 39,000 on north/south streets and 2,500 to 6,500 on east/west streets. The land uses are mix of residential, commercial, and civic uses. Sistrunk Boulevard and Broward Boulevard are excluded from this pilot location evaluation.



Summary Topic	Notes
Lighting Ownership	» City of Fort Lauderdale » FPL
Light Fixture Types	» HPS » LED » Post Top
Lighting Criteria Goals	» Street Typology: City Center Street, Commercial Street, Residential Street » See Fort Lauderdale Lighting Matrix on page 4. Street typologies vary within this pilot location.
Does Area Meet Lighting Criteria Goals?	» Continuous lighting is not provided on roadways.
Investment Needed to Achieve Lighting Criteria	» $1,903,000
Deficiency	» The entire stretch of roadway does not meet lighting criteria. » 35 nighttime crashes over five-year period
Description of Improvements	» Add approximately 289 pedestrian light poles. Using FP&L Lighting Tariff: remove and replace roadway lighting on the following streets: NE 2nd Street, NE 1st Street, NW Flagler Avenue, N. Flagler Drive, NE 1st Avenue, NE 2nd Avenue » Convert the remaining HPS lights to LED, add approximately 180 light poles and run approximately 15,000 LF of direction bore for new lighting system.

12. HIMMARSHEE AREA

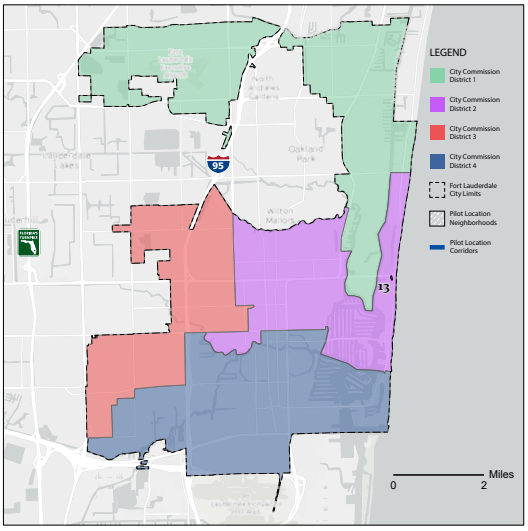
The Himmarshee Area pilot location area is generally bound by SE 2nd Street, US-1, Andrews Avenue, SE 2nd Court, and Himmarshee Canal. The pilot area is about 0.75 miles long east to west and about 0.1 miles long north to south. Vehicular AADT is 3,700 or less. The land uses are low density residential and retail as well as high density mixed uses. US-1 is excluded from this pilot location evaluation.



Summary Topic	Notes
Lighting Ownership	» City of Fort Lauderdale » FPL
Light Fixture Types	» HPS » Post Top
Lighting Criteria Goals	» Street Typology: City Center Street, Commercial Street, Residential Street » See Fort Lauderdale Lighting Matrix on page 4. Street typologies vary within this pilot location.
Does Area Meet Lighting Criteria Goals?	» The entire area does not meet lighting criteria.
Investment Needed to Achieve Lighting Criteria	» $962,000
Deficiency	» Continuous lighting is not provided on roadways. » 97 nighttime crashes over five-year period
Description of Improvements	» Add approximately 130 pedestrian light poles. Using FP&L Lighting Tariff: remove and replace roadway lighting on the following streets:SE 2nd Court, SE 2nd Avenue, SE 15th Avenue, SE 16th Avenue, SE 17th Avenue » Convert the remaining HPS lights to LED, add approximately 41 light poles and run approximately 9,800 LF of direction bore for new lighting system.

13. SUNRISE LANE AREA

The Sunrise Lane Area pilot location area is along Sunrise Lane from Sunrise Boulevard and NE 9th Street. The pilot area is 0.1 miles long. Vehicular AADT is less than 3,000. The land uses are a mix of hotel, restaurant, and retail uses.



Summary Topic	Notes
Lighting Ownership	» FPL
Light Fixture Types	» LED
Lighting Criteria Goals	» Street Typology: Commercial Street » Average Maintenance Illuminance: 0.7 » Illuminance Uniformity Ratio: 6:1 » Veiling Luminance Ratio: 0.4:1
Does Area Meet Lighting Criteria Goals?	» The entire corridor does meet lighting criteria, however pedestrian-scaled lighting was evaluated because of night-time pedestrian activity associated with restaurants and shops.
Investment Needed to Achieve Lighting Criteria	» $510,000
Deficiency	» The sidewalk does not meet lighting criteria. » 1 nighttime crash over five-year period
Description of Improvements	» Add 33 pedestrian lights.

Pilot Location Prioritization

For the Fort Lauderdale Master Plan, the pilot locations are prioritized. The prioritization is based on need and context. The results can be used to guide project selection for the capital improvements plan or secure other funding for implementation, such as working with FP&L to implement improvements.

Pilot locations are prioritized into three priority tiers:

- Tier 1: Highest Priority
- Tier 2: Medium Priority
- Tier 3: Lowest Priority

The table below summarizes the prioritization results.

Pilot Location Corridor Prioritization Summary

Priority Ranking #	Priority Ranking Score	Pilot Location #	Pilot Location Name	Cost to Bring Pilot Location Up to Lighting Criteria
Tier 1 Highest Priority				
1	18	4	SR 838 / Sunrise Blvd	$328,000
1	18	5	SR 842 / Broward Blvd	$131,000
2	15	6	SR 736 / Davie Blvd	$87,000
3	12	8	US-1 Federal Highway	$1,397,000
3	12	10	Riverland Road Neighborhood	$825,000
Tier 1 Total Cost				$2,768,000
Tier 2 Medium Priority				
4	9	7	US-1 Federal Highway	$2,083,000
4	9	2	SR A1A/N Ocean Boulevard	$89,000
5	6	1	SR 842/Las Olas Blvd	$260,000
5	6	9	SR 845 / Powerline Rd	$147,000
Tier 2 Total Cost				$2,579,000
Tier 3 Lowest Priority				
6	3	3	SR 811/ NE 4th Ave (Dixie Highway)	$289,000
6	3	11	Flagler Village Area	$1,903,000
6	3	12	Himmarshee Area	$962,000
7	0	13	Sunrise Lane Area	$510,000
Tier 3 Total Cost				$3,664,000
Total Corridor Pilot Location Costs				$9,011,000

PRIORITIZATION SCORING RESULTS

A composite score was developed for each pilot location. The composite score is created by adding the score for each criterion together for each pilot location. The sum of the score for each criterion is the total composite score. The higher the total composite score, the higher priority ranking.

Additionally, the scores are calculated separately for pilot corridors and pilot neighborhoods. The reason is because the land use and crash scores vary considerably because of the larger land area and number of miles of streets.

The table below summarizes the scoring for each criterion for each pilot project.

Pilot Location Prioritization Summary

Pilot Location #	AADT	AADT Score	Total Crashes (5 Year)	Crash Score	Land Use	Land Use Score	Total Priority Score
Pilot Location Corridor Scoring Results							
4	High	6	762	6	452	6	18
5	High	6	826	6	530	6	18
6	High	6	551	6	373	3	15
8	High	6	366	3	389	3	12
7	High	6	416	3	482	0	9
2	Medium	3	237	3	349	3	9
1	Medium	3	155	0	284	3	6
9	High	6	154	0	60	0	6
3	Medium	3	86	0	103	0	3
Pilot Location Neighborhood Scoring Results							
10	Low	0	139	6	3,719	6	12
11	Low	0	35	0	1,563	3	3
12	Low	0	97	3	401	0	3
13	Low	0	1	0	2	0	0

PRIORITIZATION CRITERIA AND METHODOLOGY

The prioritization for the master plan is based on criteria related to need. Specifically, the criteria are:

- Land Use Intensity
- Vehicular Traffic Volume
- Crashes that occur at night

The summaries that follow describe why the criterion was selected and how each one was used to calculate a prioritization score.

LAND USE INTENSITY

Land use intensity is used as a proxy for population and employment density. The higher the intensity of land use, the more people will be served by the pilot project. Additionally, land use intensity with a mix of residential and commercial uses is given a higher score.

Data for this calculation uses the City's zoning and future land use map. For pilot corridors, a 100' buffer was created around the centerline of the corridor. The land uses were clipped with this buffer and used to calculate the area associated with each land use category. For pilot neighborhoods, the neighborhood boundary was used to clip the future land use map and calculate the area associated with each land use category within the neighborhood.

After the area was calculated, the area for each land use (in acres) was multiplied by the score associated with each land use category. For example, if there were 10 acres of employment center, which has a score of 9, the employment center land use category would get a score of 90. This calculation is done for all of the land uses within each pilot location to create a land use category score. The scores were then given a priority score based on three different ranges of scoring. For example, a total land use score between 401 and 600 for a pilot corridor received a prioritization score of 6.

VEHICULAR TRAFFIC VOLUME

Streets with higher vehicular volumes typically have higher volumes of people using all modes. Vehicular volumes are used as a proxy to identify corridors that serve more people traveling on the City's streets.

The traffic volume scoring table is the same for pilot corridors and neighborhoods. For analysis, all of the pilot neighborhood streets where considered Low vehicular traffic volume streets and received a score of 0. The data used for this criterion is from FDOT.

CRASHES THAT OCCUR AT NIGHT

In urban areas like in Fort Lauderdale, low and no lighting during evening hours can contribute to crashes on city streets. This is particularly true for people walking and biking because it is often harder for people driving to see their surroundings when driving at night.

For the analysis, crashes that occurred during dark and lowlight conditions over the past five years within each pilot location were identified. Dark and lowlight conditions include dawn, dusk, and dark (lighted and not lighted) conditions. Because corridors are different in area than neighborhoods, one scoring table was developed for corridors and one was developed for neighborhoods. The crash data is from FDOT's Safety Office.

Vehicular Traffic Volume Criterion

AADT	Prioritization Score
Low (less than 10,000 AADT)	0
Medium (10,000 to 30,000 AADT)	3
High (Greater than 30,000 AADT)	6

Land Use Intensity Criterion

Land Use	Value
Regional Activity Center	9
Employment Center	9
Commercial	5
High Residential	5
Medium Residential	3
Medium-High Residential	3
Community Facilites	2
Low Residential	2
Low-Medium Residential	2
Industrial	1
Park and Open Space	1
Conservation	0
Commercial Recreation	1
Irrregular	2
Utilities	0

Land Use Score - Corridors

Land Use Score (Acres)	Prioritization Score
0 - 200	0
201 - 400	3
401 - 600	6

Land Use Score - Neighborhoods

Land Use Score (Acres)	Prioritization Score
0 - 1500	0
1501 - 3000	3
3001 - 4500	6

Crash Criterion - Corridors

Crashes at Night (5 Years)	Prioritization Score
Low <200	0
Med 200 - 399	3
High > 400	6

Crash Criterion - Neighborhoods

Crashes at Night (5 Years)	Prioritization Score
Low <50	0
Med 50-99	3
High > 100	6

Funding Recommendations

The funding recommendations for this master plan provide a summary of costs as well as two implementation scenarios. This information should be used as part of the annual budget process to program funding for system maintenance as well as program projects in the Capital Improvement Program. Additionally, the master plan should be used to apply for grant funding opportunities. Grant funds from Federal and state programs can help the City off-set the capital costs associated with the City's street light system.

The capital cost associated to implement the pilot locations is $9,011,000. If implemented over a ten-year period, about $900,000 needs to be budgeted annually.

Additionally, $250,000 is needed annually for maintenance costs (excluding costs for personnel) across the City maintained street light network. These capital and maintenance costs should be used to program projects in the City's CIP.

STATE ROAD PROJECTS

Along state roads, FDOT owns the streetlights and pays for the capital costs for the lights. The City of Fort Lauderdale pays for the upfront costs of electricity and maintenance, and FDOT reimburses the City for these costs. For pilot location projects or other projects with lighting elements along state roads, the City should work with FDOT and the Broward MPO to identify funding and coordinate lighting design.

FPL PROJECTS

FPL provides for many parts of the City, including many neighborhoods. FPL provides the streetlights, energy, and maintenance as part of an agreement between the City and FPL. Specifically, the FPL LT-1 Street Light Tarriff program is the City's preferred program to use with FPL.

The FPL-owned infrastructure is typically paid for by a tariff. The tariff is incorporated into the monthly utility bill for the City and is paid over a set time frame. The time frame is typically 10 to 15 years. The tariff pays for the capital costs of the lights, installation, and maintenance of the lights.

When working with FPL, the City should work with a lighting engineer and each neighborhood to develop a proposal to install new or change existing streetlights. For each FPL project, the following steps should be taken:

- **Coordinate with FPL to Host a Community Planning Process for Streetlights.** The process should identify neighborhood needs and also identify lighting that fits the desired neighborhood character. FPL maintains a menu of light assemblies. The City, FPL, and neighborhood residents should work together to select light assemblies for the neighborhood. If FPL light assemblies are used, they should be designed to meet the City's Street Lighting Level Recommendations.
- **Conduct Detailed Lighting Evaluation.** Based on community input, FPL and the City should use a lighting consultant to determine design and cost to light the streets in the neighborhood.
- **Negotiate a Tariff.** Once the first two steps are completed, the City should negotiate a tariff to fund the installation and maintenance of street lights.
- **Install Streetlights.** Once the lighting strategy is negotiated with FPL, construction should be scheduled. The City and FPL should provide regular updates before, during, and after construction.

Action Plan

This chapter outlines the implementation strategy for this plan. Achieving the goals for this plan will require policy changes, sustained programs to install and maintain street lighting, as well as projects to create desired street lighting conditions.

POLICY ACTIONS

Several policy steps are crucial to the success of street lighting improvements. These steps will legitimize the recommendations found in this Plan and support the creation of policies that are necessary to carry out those recommendations.

- **Adopt Lighting Criteria into the Land Development Code.** Currently, the City does not have adopted streetlight criteria. By adopting the lighting criteria in this master plan, the City will have a regulatory mechanism to require certain streetlight levels for new development and redevelopment projects.
- **Adopt Streetlight Assembly Standards into Land Development Code.** Currently, the City does not have their streetlight standards formally adopted. By adopting the standards, the City will have a technical basis for capital projects, maintenance projects, and streetlighting requirements for private development.

PROGRAM ACTIONS

While policies provide a legal basis for street lighting requirements, the program recommendations will guide day-to-day operations including maintenance and coordination and implementation of capital projects.

- **Maintain and Grow Streetlight Crew.** For many years, the City had only one light crew. This year, an additional light crew was approved. The City should invest in having a third light crew. As the City grows and maintenance demand increases, so too should the staff capacity to respond to outages and perform on-going maintenance of the City's streetlight system.
- **Invest in Public Outreach.** Investing in public outreach, particularly for capital projects, will keep residents informed about changes in their neighborhoods. Public outreach investments may include follow up communication about reported outages or reported streetlight needs. They can also be part of on-going capital improvements and work with FPL to light un-lit neighborhood areas.
- **Continue Light Outage Program.** Lights go out from time to time and the Lauderserv provides a means to report streetlights that are not working.
- **Coordinate with FPL.** FPL is responsible for a majority of the lights in the City. As a key streetlight provider, the City should continue to coordinate with FPL for maintenance as well as capital street light improvements.
- **Coordinate with FDOT.** FDOT works closely with the City to maintain the streetlights along state roads. The City should continue to coordinate with FDOT for capital projects and maintenance investments.
- **Create Streetlight Asset Management System.** To keep track of on-going maintenance work as well as be proactive with system maintenance, the City should create a streetlight asset management system. The system will help the City identify risks and infrastructure that may need maintenance before it is required, track maintenance work, and provide a comprehensive to analyze system performance.

PROJECT ACTIONS

While establishing the policies and programs, the City and its street lighting partners should move forward with the design and construction of priority projects. Funding levels should be evaluated annually to ensure project delivery is keeping pace with desired implementation schedule and that maintenance is keeping pace with needs.

- **Annually Program Evaluation Area Projects to the CIP.** Using this master plan as a guide, the City should program one or more capital lighting projects to be funded in the CIP.
- **Work with FPL to Light Neighborhoods.** Neighborhood lights in the City are typically built and maintained by FPL. These costs are covered with a utility tariff that the City pays for monthly as part of its utility bill. The City should coordinate with FPL to get this projects constructed.
- **Create a Dedicated Funding Source for Maintenance Projects.** Having dedicated funding for maintenance will make sure that the City can keep its streetlights operating and in good condition.

Appendix A: Streetlight Assemblies

R-1 ROADWAY LIGHT ASSEMBLY

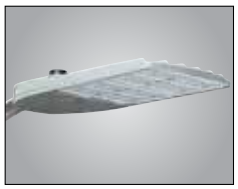
» Fixture: ATB2 or ATBL by American Electric Lighting

» Pole/Bracket: 45' pole and 6' bracket

ATB2

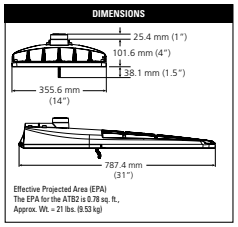
Autobahn Series ATB2
Roadway Lighting

PRODUCT OVERVIEW



Applications:
- Roadways
- Off ramps
- Residential streets
- Parking lots

DIMENSIONS



Effective Projected Area (EPA)
The EPA for the ATB2 is 0.78 sq. ft.,
Approx. Wt. = 21 lbs. (9.53 kg)

STANDARDS

DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

Color temperatures of ≤ 3000K must be specified for International Dark-Sky Association certification.

Rated for -40°C to 40°C ambient.
CSA Certified to U.S. and Canadian standards
Complies with ANSI: C136.2, C136.10, C136.14, C136.31, C136.15, C136.37

Note: Specifications subject to change without notice.
Autobahn Series – AEL_0109_ATB2

Features:

OPTICAL

The Autobahn's new molded silicone optics provide exceptional performance. Silicone optics are superior to other polymeric materials in the areas of; optical efficiency, thermal performance, and reduction in dirt accumulation, all of which can lead to long term lumen degradation and a shift in optical distribution. Also, because silicone allows for the molding of fine details as well as thick sections, it produces the most crisp, clean and well-defined lighting distributions available. Silicone optics paired with modern LED's allow the Autobahn to take full advantage of both technologies.

Same Light: Performance is comparable to 400-1000W HPS roadway luminaires.

White Light: Correlated color temperature - 4000K, or optional 2700K, 3000K or 5000K, all 70 CRI minimum.

Unique IP66 rated LED light engines provided 0% uplight and restrict backlight to within sidewalk depth, providing optimal application coverage and optimal pole spacing.

Available in Type II, III, IV, & V roadway distributions.

ELECTRICAL

Expected Life: LED light engines are rated >100,000 hours at 25°C, L70. Electronic driver has an expected life of 100,000 hours at a 25°C ambient.

Lower Energy: Saves an average of 40-60% over comparable HPS platforms.

Robust Surge Protection: Two different surge protection options provide a minimum of ANSI C136.2 10kV/5kA protection. 20kV/10kA protection is also available.

Luminaire ships with a 0-10v dimmable driver. Luminaire is continuous and step dimming capable via AO option or controls installed on P7 photocontrol receptacle option.

MECHANICAL

Easy to Maintain: Includes standard AEL lineman-friendly features such as tool-less entry, 3 station terminal block and quick disconnects. Bubble level located inside the electrical compartment for easy leveling at installation.

Rugged die-cast aluminum housing is polyester powder-coated for durability and corrosion resistance. Rigorous five-stage pre-treating and painting process yields a finish that achieves a scribe creepage rating of 7 (per ASTM D1654) after over 5000 hours exposure to salt fog chamber (operated per ASTM B117).

Four-bolt mast arm mount is adjustable for arms from 1-1/4" to 2" (1-5/8" to 2-3/8" O.D.) diameter and provides a 3G vibration rating per ANSI C136.31.

Wildlife shield is cast into the housing (not a separate piece).

CONTROLS

NEMA 3 Pin photocontrol receptacle is standard, with the Acuity designed ANSI 7 Pin receptacle optionally available.

Premium solid state locking sale photocontrol - PCSS (10 year rated life). Extreme long life sold state locking style photocontrol - PCLL (20 year rated life).

Optional onboard Adjustable Output module allows the light output and input wattage to be modified to meet site specific requirements, and can also allow a single fixture to be flexibly applied in many different applications.

Or

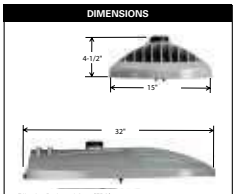
ATBL

Autobahn Series ATBL
Roadway

PRODUCT OVERVIEW

Applications:
- Residential streets
- Parking lots
- High speed roadways

DIMENSIONS



Effective Projected Area (EPA)
The EPA for the ATBL is 0.75 sq. ft.,
Approx. Wt. = 30 lbs. (13.6 kg)

STANDARDS

Color temperatures of ≤ 3000K must be specified for International Dark-Sky Association certification.

Rated for -40°C to 40°C ambient
CSA Certified to U.S. and Canadian standards
Complies with ANSI: C136.2, C136.10, C136.14, C136.31, C136.15, C136.37

Note: Specifications subject to change without notice. Actual performance may differ as a result of end-user environment and application.

 ATBL

Features:

OPTICAL

Same Light: Performance is comparable to 250W – 400W HPS.

White Light: Correlated color temperature - 4000K, 70 CRI minimum, 3000K, 70 CRI minimum or optional 5000K, 70 CRI minimum.

IP66 rated borosilicate glass optics ensure longevity and minimize dirt depreciation. Unique IP66 rated LED light engines provide 0% uplight and restrict backlight to within sidewalk depth, providing optimal application coverage and optimal pole spacing.

Available distributions are Type II, IIN, III, IV, V roadway distributions.

ELECTRICAL

Expected Life: LED light engines are rated >100,000 hours at 25°C, L70.
Electronic driver has an expected life of 100,000 hours at a 25°C ambient.

Lower Energy: Saves an expected 40-60% over comparable HID luminaires.

Robust Surge Protection: Three different surge protection options provide a minimum of ANSI C136.2 10kV/5kA protection. 20kV/10kA protection is also available.

MECHANICAL

Includes standard AEL lineman-friendly features such as tool-less entry, 3 station terminal block and quick disconnects. Bubble level located inside the electrical compartment for easy leveling at installation.

Rugged die-cast aluminum housing and door are polyester powder-coated for durability and corrosion resistance. Rigorous five-stage pre-treating and painting process yields a finish that achieves a scribe creepage rating of 8 (per ASTM D1654) after over 5000 hours exposure to salt fog chamber (operated per ASTM B117).

Mast arm mount is adjustable for arms from 1-1/4" to 2" (1-5/8" to 2-3/8" O.D.) diameter. The 2 – bolt and optional 4 bolt clamping mechanism provide 3G vibration rating per ANSI C136.31.

The Wildlife shield is cast into the housing (not a separate piece).

CONTROLS

NEMA 3 pin photocontrol receptacle is standard, with the Acuity designed ANSI standard 5 pin and 7 pin receptacles optionally available.

Premium solid state locking-style photocontrol – PCSS (10 year rated life) Extreme long life solid state locking-style photocontrol – PCLL (20 year rated life).

Extreme long life solid state locking-style photocontrol with on demand remote on/off control - PCCC (15 year rated life).

Optional onboard Adjustable Output module allows the light output and input wattage to be modified to meet site specific requirements, and also can allow a single fixture to be flexibly applied in many different applications.

R-2 ROADWAY LIGHT ASSEMBLY

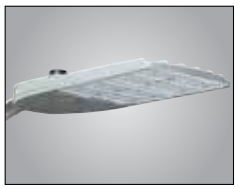
» Fixture: ATB2 or ATBL by American Electric Lighting

» Pole/Bracket: 40' pole and 6' bracket

ATB2

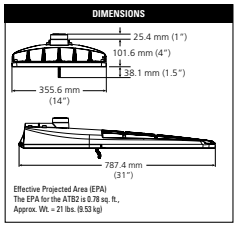
Autobahn Series ATB2
Roadway Lighting

PRODUCT OVERVIEW



Applications:
- Roadways
- Off ramps
- Residential streets
- Parking lots

DIMENSIONS



Effective Projected Area (EPA)
The EPA for the ATB2 is 0.78 sq. ft.,
Approx. Wt. = 21 lbs. (9.53 kg)

STANDARDS

DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

Color temperatures of ≤ 3000K must be specified for International Dark-Sky Association certification.

Rated for -40°C to 40°C ambient.
CSA Certified to U.S. and Canadian standards
Complies with ANSI: C136.2, C136.10, C136.14, C136.31, C136.15, C136.37

Note: Specifications subject to change without notice.
Autobahn Series – AEL_0109_ATB2

Features:

OPTICAL

The Autobahn's new molded silicone optics provide exceptional performance. Silicone optics are superior to other polymeric materials in the areas of; optical efficiency, thermal performance, and reduction in dirt accumulation, all of which can lead to long term lumen degradation and a shift in optical distribution. Also, because silicone allows for the molding of fine details as well as thick sections, it produces the most crisp, clean and well-defined lighting distributions available. Silicone optics paired with modern LED's allow the Autobahn to take full advantage of both technologies.

Same Light: Performance is comparable to 400-1000W HPS roadway luminaires.

White Light: Correlated color temperature - 4000K, or optional 2700K, 3000K or 5000K, all 70 CRI minimum.

Unique IP66 rated LED light engines provided 0% uplight and restrict backlight to within sidewalk depth, providing optimal application coverage and optimal pole spacing.

Available in Type II, III, IV, & V roadway distributions.

ELECTRICAL

Expected Life: LED light engines are rated >100,000 hours at 25°C, L70. Electronic driver has an expected life of 100,000 hours at a 25°C ambient.

Lower Energy: Saves an average of 40-60% over comparable HPS platforms.

Robust Surge Protection: Two different surge protection options provide a minimum of ANSI C136.2 10kV/5kA protection. 20kV/10kA protection is also available.

Luminaire ships with a 0-10v dimmable driver. Luminaire is continuous and step dimming capable via AO option or controls installed on P7 photocontrol receptacle option.

MECHANICAL

Easy to Maintain: Includes standard AEL lineman-friendly features such as tool-less entry, 3 station terminal block and quick disconnects. Bubble level located inside the electrical compartment for easy leveling at installation.

Rugged die-cast aluminum housing is polyester powder-coated for durability and corrosion resistance. Rigorous five-stage pre-treating and painting process yields a finish that achieves a scribe creepage rating of 7 (per ASTM D1654) after over 5000 hours exposure to salt fog chamber (operated per ASTM B117).

Four-bolt mast arm mount is adjustable for arms from 1-1/4" to 2" (1-5/8" to 2-3/8" O.D.) diameter and provides a 3G vibration rating per ANSI C136.31.

Wildlife shield is cast into the housing (not a separate piece).

CONTROLS

NEMA 3 Pin photocontrol receptacle is standard, with the Acuity designed ANSI 7 Pin receptacle optionally available.

Premium solid state locking sale photocontrol - PCSS (10 year rated life). Extreme long life sold state locking style photocontrol - PCLL (20 year rated life).

Optional onboard Adjustable Output module allows the light output and input wattage to be modified to meet site specific requirements, and can also allow a single fixture to be flexibly applied in many different applications.

Or

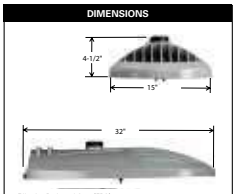
ATBL

Autobahn Series ATBL
Roadway

PRODUCT OVERVIEW

Applications:
- Residential streets
- Parking lots
- High speed roadways

DIMENSIONS



Effective Projected Area (EPA)
The EPA for the ATBL is 0.75 sq. ft.,
Approx. Wt. = 30 lbs. (13.6 kg)

STANDARDS

Color temperatures of ≤ 3000K must be specified for International Dark-Sky Association certification.

Rated for -40°C to 40°C ambient
CSA Certified to U.S. and Canadian standards
Complies with ANSI: C136.2, C136.10, C136.14, C136.31, C136.15, C136.37

Note: Specifications subject to change without notice. Actual performance may differ as a result of end-user environment and application.

 ATBL

Features:

OPTICAL

Same Light: Performance is comparable to 250W – 400W HPS.

White Light: Correlated color temperature - 4000K, 70 CRI minimum, 3000K, 70 CRI minimum or optional 5000K, 70 CRI minimum.

IP66 rated borosilicate glass optics ensure longevity and minimize dirt depreciation. Unique IP66 rated LED light engines provide 0% uplight and restrict backlight to within sidewalk depth, providing optimal application coverage and optimal pole spacing.

Available distributions are Type II, IIN, III, IV, V roadway distributions.

ELECTRICAL

Expected Life: LED light engines are rated >100,000 hours at 25°C, L70.
Electronic driver has an expected life of 100,000 hours at a 25°C ambient.

Lower Energy: Saves an expected 40-60% over comparable HID luminaires.

Robust Surge Protection: Three different surge protection options provide a minimum of ANSI C136.2 10kV/5kA protection. 20kV/10kA protection is also available.

MECHANICAL

Includes standard AEL lineman-friendly features such as tool-less entry, 3 station terminal block and quick disconnects. Bubble level located inside the electrical compartment for easy leveling at installation.

Rugged die-cast aluminum housing and door are polyester powder-coated for durability and corrosion resistance. Rigorous five-stage pre-treating and painting process yields a finish that achieves a scribe creepage rating of 8 (per ASTM D1654) after over 5000 hours exposure to salt fog chamber (operated per ASTM B117).

Mast arm mount is adjustable for arms from 1-1/4" to 2" (1-5/8" to 2-3/8" O.D.) diameter. The 2 – bolt and optional 4 bolt clamping mechanism provide 3G vibration rating per ANSI C136.31.

The Wildlife shield is cast into the housing (not a separate piece).

CONTROLS

NEMA 3 pin photocontrol receptacle is standard, with the Acuity designed ANSI standard 5 pin and 7 pin receptacles optionally available.

Premium solid state locking-style photocontrol – PCSS (10 year rated life) Extreme long life solid state locking-style photocontrol – PCLL (20 year rated life).

Extreme long life solid state locking-style photocontrol with on demand remote on/off control - PCCC (15 year rated life).

Optional onboard Adjustable Output module allows the light output and input wattage to be modified to meet site specific requirements, and also can allow a single fixture to be flexibly applied in many different applications.

R-3 ROADWAY LIGHT ASSEMBLY

» Fixture: ATB0 or ATBM by American Electric Lighting

» Pole/Bracket: 35' pole and 6' bracket

ATB0

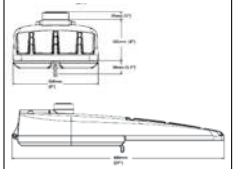
Autobahn Series ATB0
Roadway Lighting

PRODUCT OVERVIEW

Applications:

Roadways
Off ramps
Residential streets
Parking lots

DIMENSIONS



Effective Projected Area (EPA): The EPA for the ATB0 is 0.76 sq. ft.
Approx. Wt. = 14 lbs.

Features:

OPTICAL

The Autobahn's new molded silicone optics provide exceptional performance. Silicone optics are superior to other polymeric materials in the areas of; optical efficiency, thermal performance, and reduction in dirt accumulation, all of which can lead to long term lumen degradation and a shift in optical distribution. Also, because silicone allows for the molding of fine details as well as thick sections, it produces the most crisp, clean and well-defined lighting distributions available. Silicone optics paired with modern LEDs allow the Autobahn to take full advantage of both technologies.

Same Light: Performance is comparable to 100 - 400W HPS roadway luminaires.

White Light: Correlated color temperature - 4000K, or optional 2700K, 3000K or 5000K, all 70 CRI minimum.

Unique IP66 rated LED light engines provided 0% uplight and restrict backlight to within sidewalk depth, providing optimal application coverage and optimal pole spacing. Available in Type II, III, IV, and V roadway distributions.

ELECTRICAL

Expected Life: LED light engines are rated >100,000 hours at 25°C, L70. Electronic driver has an expected life of 100,000 hours at a 25°C ambient.

Lower Energy: Saves an expected of 40-60% over comparable HID luminaires.

Robust Surge Protection: Two different surge protection options provide a minimum of ANSI C136.2 10kV/5kA protection. 20kV/10kA protection is also available.

Luminaire ships with a 0-10v dimmable driver. Luminaire is continuous and step dimming capable via A0 option or controls installed on P7 photocontrol receptacle option.

MECHANICAL

Includes standard AEL lineman-friendly features such as tool-less entry, 3 station terminal block and quick disconnects. Bubble level located inside the electrical compartment for easily leveling at installation.

Rugged die-cast aluminum housing and door are polyester powder-coated for durability and corrosion resistance. Rigorous five-stage pre-treating and painting process yields a finish that achieves a scribe creepage rating of 7 (per ASTM D1654) after over 5000 hours exposure to salt fog chamber (operated per ASTM B117).

Mast arm mount is adjustable for arms from 1-1/4" to 2"(1-5/8" to 2-3/8" O.D.) diameter. Provides a 3G vibration rating per ANSI C136.31

Wildlife shield is cast into the housing (not a separate piece).

STANDARDS

DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

Color temperatures of ≤ 3000K must be specified for International Dark-Sky Association certification.

Rated for -40°C to 40°C ambient
CSA Certified to U.S. and Canadian standards
Complies with ANSI: C136.2, C136.10, C136.14, C136.31, C136.15, C136.37

CONTROLS

NEMA 3 pin photocontrol receptacle is standard, with the Acuity designed ANSI standard 7 pin receptacle optionally available.

Premium solid state locking style photocontrol - PCSS (10 year rated life) Extreme long life solid state locking style photocontrol - PCLL (20 year rated life).

Optional onboard Adjustable Output module allows the light output and input wattage to be modified to meet site specific requirements, and also can allow a single fixture to be flexibly applied in many different applications.

Note: Specifications subject to change without notice. Actual performance may differ as a result of end-user environment and application.

Or

ATBM

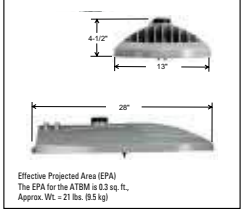
Autobahn Series ATBM
Roadway

PRODUCT OVERVIEW

Applications:

Residential streets
Parking lots
High speed roadways

DIMENSIONS



Effective Projected Area (EPA)
The EPA for the ATBM is 0.3 sq. ft.,
Approx. Wt. = 21 lbs. (9.5 kg)

Features:

OPTICAL

Same Light: Performance is comparable to 150W – 250W HPS

White Light: Correlated color temperature - 4000K, 70 CRI minimum, 3000K, 70 CRI minimum or optional 5000K, 70 CRI minimum.

IP66 rated borosilicate glass optics ensure longevity and minimize dirt depreciation. Unique IP66 rated LED light engines provide 0% uplight and restrict backlight to within sidewalk depth, providing optimal application coverage and optimal pole spacing.

Available distributions are Type II, III, IV, & V roadway distributions.

DualOptix™ visual comfort option is also available for all distributions.

ELECTRICAL

Expected Life: LED light engines are rated >100,000 hours at 25°C, L70.
Electronic driver has an expected life of 100,000 hours at a 25°C ambient.

Lower Energy: Saves an expected 40-60% over comparable HID luminaires.

Robust Surge Protection: Standard surge protection is 20kV/10kA "Extreme Level" per ANSI C136.2. An optional MOV pack provides 10kV/5kA "Enhanced Level.

MECHANICAL

Includes standard AEL lineman-friendly features such as tool-less entry, 3 station terminal block and quick disconnects. Bubble level located inside the electrical compartment for easy leveling at installation.

Rugged die-cast aluminum housing and door are polyester powder-coated for durability and corrosion resistance. Rigorous five-stage pre-treating and painting process yields a finish that achieves a scribe creepage rating of 8 (per ASTM D1654) after over 5000 hours exposure to salt fog chamber (operated per ASTM B117).

Mast arm mount is adjustable for arms from 1-1/4" to 2" (1-5/8" to 2-3/8" O.D.) diameter. The 2 – bolt and optional 4 bolt clamping mechanism provide 3G vibration rating per ANSI C136.31.

The Wildlife shield is cast into the housing (not a separate piece).

CONTROLS

NEMA 3 pin photocontrol receptacle is standard, with the Acuity designed ANSI standard 7 pin receptacle optionally available.

Premium solid state locking-style photocontrol – PCSS (10 year rated life) Extreme long life solid state locking-style photocontrol – PCL1 (20 year rated life).

Extreme long life solid state locking-style photocontrol with on demand remote on/off control - PCCC (15 year rated life).

Optional onboard Adjustable Output module allows the light output and input wattage to be modified to meet site specific requirements, and also can allow a single fixture to be flexibly applied in many different applications.

STANDARDS

Color temperatures of ≤ 3000K must be specified for International Dark-Sky Association certification.

Rated for -40°C to 40°C ambient
CSA Certified to U.S. and Canadian standards
Complies with ANSI: C136.2, C136.10, C136.14, C136.31, C136.15, C136.37

R-4 ROADWAY LIGHT ASSEMBLY

» Fixture: ATB0 or ATBS by American Electric Lighting

» Pole/Bracket: 30' pole and 6' bracket

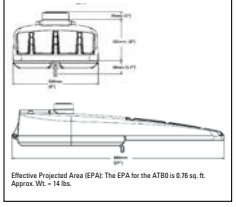
ATB0

Autobahn Series ATB0
Roadway Lighting

PRODUCT OVERVIEW

Applications:
Roadways
Off ramps
Residential streets
Parking lots

DIMENSIONS



Effective Projected Area (EPA): The EPA for the ATB0 is 0.76 sq. ft.
Approx. Wt. = 14 lbs.

Features:

OPTICAL

The Autobahn's new molded silicone optics provide exceptional performance. Silicone optics are superior to other polymeric materials in the areas of; optical efficiency, thermal performance, and reduction in dirt accumulation, all of which can lead to long term lumen degradation and a shift in optical distribution. Also, because silicone allows for the molding of fine details as well as thick sections, it produces the most crisp, clean and well-defined lighting distributions available. Silicone optics paired with modern LEDs allow the Autobahn to take full advantage of both technologies.

Same Light: Performance is comparable to 100 - 400W HPS roadway luminaires.

White Light: Correlated color temperature - 4000K, or optional 2700K, 3000K or 5000K, all 70 CRI minimum.

Unique IP66 rated LED light engines provided 0% uplight and restrict backlight to within sidewalk depth, providing optimal application coverage and optimal pole spacing. Available in Type II, III, IV, and V roadway distributions.

ELECTRICAL

Expected Life: LED light engines are rated >100,000 hours at 25°C, L70. Electronic driver has an expected life of 100,000 hours at a 25°C ambient.

Lower Energy: Saves an expected of 40-60% over comparable HID luminaires.

Robust Surge Protection: Two different surge protection options provide a minimum of ANSI C136.2 10kV/5kA protection. 20kV/10kA protection is also available.

Luminaire ships with a 0-10v dimmable driver. Luminaire is continuous and step dimming capable via A0 option or controls installed on P7 photocontrol receptacle option.

MECHANICAL

Includes standard AEL lineman-friendly features such as tool-less entry, 3 station terminal block and quick disconnects. Bubble level located inside the electrical compartment for easily leveling at installation.

Rugged die-cast aluminum housing and door are polyester powder-coated for durability and corrosion resistance. Rigorous five-stage pre-treating and painting process yields a finish that achieves a scribe creepage rating of 7 (per ASTM D1654) after over 5000 hours exposure to salt fog chamber (operated per ASTM B117).

Mast arm mount is adjustable for arms from 1-1/4" to 2"(1-5/8" to 2-3/8" O.D.) diameter. Provides a 3G vibration rating per ANSI C136.31

Wildlife shield is cast into the housing (not a separate piece).

STANDARDS

DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

Color temperatures of ≤ 3000K must be specified for International Dark-Sky Association certification.

Rated for -40°C to 40°C ambient
CSA Certified to U.S. and Canadian standards
Complies with ANSI: C136.2, C136.10, C136.14, C136.31, C136.15, C136.37

CONTROLS

NEMA 3 pin photocontrol receptacle is standard, with the Acuity designed ANSI standard 7 pin receptacle optionally available.

Premium solid state locking style photocontrol - PCSS (10 year rated life) Extreme long life solid state locking style photocontrol - PCLL (20 year rated life).

Optional onboard Adjustable Output module allows the light output and input wattage to be modified to meet site specific requirements, and also can allow a single fixture to be flexibly applied in many different applications.

Note: Specifications subject to change without notice. Actual performance may differ as a result of end-user environment and application.

Or

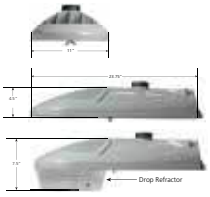
ATBS

Autobahn Series ATBS
Roadway & Security Lighting

PRODUCT OVERVIEW

Applications:
Residential streets
Parking lots
General security lighting

DIMENSIONS



Effective Projected Area (EPA) The EPA for the ATBS is 0.3 sq. ft.,
Approx. Wt. = 12 lbs. (5 kg)

Features:

OPTICAL

Same Light: Performance is comparable to 100W – 200W HPS and up to 175W Mercury Vapor roadway and security lighting luminaires.

White Light: Correlated color temperature - 4000K, 70 CRI minimum, 3000K, 70 CRI minimum or optional 5000K, 70 CRI minimum.

IP66 rated borosilicate glass optics ensure longevity and minimize dirt depreciation. Unique IP66 rated LED light engines provide 0% uplight and restrict backlight to within sidewalk depth, providing optimal application coverage and optimal pole spacing.

Available distributions are Type II, III, and V roadway distributions. When used with the optional acrylic refractor the unit provides approximately 10% uplight and increased vertical foot-candles

ELECTRICAL

Expected Life: LED light engines are rated >100,000 hours at 25°C, L70. Electronic driver has an expected life of 100,000 hours at a 25°C ambient.

Lower Energy: Saves an expected 40-60% over comparable HID luminaires.

Standard surge protection is 20kV/10kA "Extreme Level" per ANSI C136.2. An optional MOV pack provides 10kV/5kA "Enhanced Level".

MECHANICAL

Includes standard AEL lineman-friendly features such as tool-less entry, 3 station terminal block and quick disconnects. Bubble level located inside the electrical compartment for easy leveling at installation.

Rugged die-cast aluminum housing and door are polyester powder-coated for durability and corrosion resistance. Rigorous five-stage pre-treating and painting process yields a finish that achieves a scribe creepage rating of 8 (per ASTM D1654) after over 5000 hours exposure to salt fog chamber (operated per ASTM B117).

Mast arm mount is adjustable for arms from 1-1/4" to 2" (1-5/8" to 2-3/8" O.D.) diameter. The 2 – bolt clamping mechanism provides 3G vibration rating per ANSI C136.31.

The Wildlife shield is cast into the housing (not a separate piece).

CONTROLS

NEMA 3 pin photocontrol receptacle is standard, with the Acuity designed ANSI standard 7 pin receptacles optionally available.

Premium solid state locking-style photocontrol – PCSS (10 year rated life) Extreme long life solid state locking-style photocontrol – PCL1 (20 year rated life)

Optional onboard Adjustable Output module allows the light output and input wattage to be modified to meet site specific requirements, and also can allow a single fixture to be flexibly applied in many different applications.

STANDARDS

DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

Color temperatures of ≤ 3000K must be specified for International Dark-Sky Association certification.

Rated for -40°C to 40°C ambient
CSA Certified to U.S. and Canadian standards
Complies with ANSI: C136.2, C136.10, C136.14, C136.31, C136.15, C136.37

Note: Actual performance may differ as a result of end-user environment and application. Specifications subject to change without notice.

R-5 ROADWAY LIGHT ASSEMBLY

» Fixture: ATB0 or ATBS by American Electric Lighting

» Pole/Bracket: 25' pole and 6' bracket

ATB0

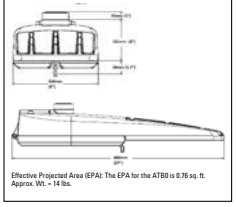
Autobahn Series ATB0
Roadway Lighting

PRODUCT OVERVIEW

Applications:

Roadways
Off ramps
Residential streets
Parking lots

DIMENSIONS



Effective Projected Area (EPA): The EPA for the ATB0 is 0.76 sq. ft.
Approx. Wt. = 14 lbs.

Features:

OPTICAL

The Autobahn's new molded silicone optics provide exceptional performance. Silicone optics are superior to other polymeric materials in the areas of; optical efficiency, thermal performance, and reduction in dirt accumulation, all of which can lead to long term lumen degradation and a shift in optical distribution. Also, because silicone allows for the molding of fine details as well as thick sections, it produces the most crisp, clean and well-defined lighting distributions available. Silicone optics paired with modern LEDs allow the Autobahn to take full advantage of both technologies.

Same Light: Performance is comparable to 100 - 400W HPS roadway luminaires.

White Light: Correlated color temperature - 4000K, or optional 2700K, 3000K or 5000K, all 70 CRI minimum.

Unique IP66 rated LED light engines provided 0% uplight and restrict backlight to within sidewalk depth, providing optimal application coverage and optimal pole spacing. Available in Type II, III, IV, and V roadway distributions.

ELECTRICAL

Expected Life: LED light engines are rated >100,000 hours at 25°C, L70. Electronic driver has an expected life of 100,000 hours at a 25°C ambient.

Lower Energy: Saves an expected of 40-60% over comparable HID luminaires.

Robust Surge Protection: Two different surge protection options provide a minimum of ANSI C136.2 10kV/5kA protection. 20kV/10kA protection is also available.

Luminaire ships with a 0-10v dimmable driver. Luminaire is continuous and step dimming capable via A0 option or controls installed on P7 photocontrol receptacle option.

MECHANICAL

Includes standard AEL lineman-friendly features such as tool-less entry, 3 station terminal block and quick disconnects. Bubble level located inside the electrical compartment for easily leveling at installation.

Rugged die-cast aluminum housing and door are polyester powder-coated for durability and corrosion resistance. Rigorous five-stage pre-treating and painting process yields a finish that achieves a scribe creepage rating of 7 (per ASTM D1654) after over 5000 hours exposure to salt fog chamber (operated per ASTM B117).

Mast arm mount is adjustable for arms from 1-1/4" to 2"(1-5/8" to 2-3/8" O.D.) diameter. Provides a 3G vibration rating per ANSI C136.31

Wildlife shield is cast into the housing (not a separate piece).

STANDARDS

DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

Color temperatures of ≤ 3000K must be specified for International Dark-Sky Association certification.

Rated for -40°C to 40°C ambient
CSA Certified to U.S. and Canadian standards
Complies with ANSI: C136.2, C136.10, C136.14, C136.31, C136.15, C136.37

CONTROLS

NEMA 3 pin photocontrol receptacle is standard, with the Acuity designed ANSI standard 7 pin receptacle optionally available.

Premium solid state locking style photocontrol - PCSS (10 year rated life) Extreme long life solid state locking style photocontrol - PCLL (20 year rated life).

Optional onboard Adjustable Output module allows the light output and input wattage to be modified to meet site specific requirements, and also can allow a single fixture to be flexibly applied in many different applications.

Note: Specifications subject to change without notice. Actual performance may differ as a result of end-user environment and application.

Or

ATBS

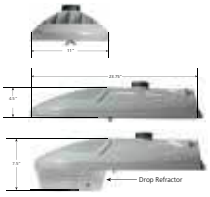
Autobahn Series ATBS
Roadway & Security Lighting

PRODUCT OVERVIEW

Applications:

Residential streets
Parking lots
General security lighting

DIMENSIONS



Effective Projected Area (EPA) The EPA for the ATBS is 0.3 sq. ft.,
Approx. Wt. = 12 lbs. (5 kg)

Features:

OPTICAL

Same Light: Performance is comparable to 100W – 200W HPS and up to 175W Mercury Vapor roadway and security lighting luminaires.

White Light: Correlated color temperature - 4000K, 70 CRI minimum, 3000K, 70 CRI minimum or optional 5000K, 70 CRI minimum.

IP66 rated borosilicate glass optics ensure longevity and minimize dirt depreciation. Unique IP66 rated LED light engines provide 0% uplight and restrict backlight to within sidewalk depth, providing optimal application coverage and optimal pole spacing.

Available distributions are Type II, III, and V roadway distributions. When used with the optional acrylic refractor the unit provides approximately 10% uplight and increased vertical foot-candles

ELECTRICAL

Expected Life: LED light engines are rated >100,000 hours at 25°C, L70. Electronic driver has an expected life of 100,000 hours at a 25°C ambient.

Lower Energy: Saves an expected 40-60% over comparable HID luminaires.

Standard surge protection is 20kV/10kA "Extreme Level" per ANSI C136.2. An optional MOV pack provides 10kV/5kA "Enhanced Level".

MECHANICAL

Includes standard AEL lineman-friendly features such as tool-less entry, 3 station terminal block and quick disconnects. Bubble level located inside the electrical compartment for easy leveling at installation.

Rugged die-cast aluminum housing and door are polyester powder-coated for durability and corrosion resistance. Rigorous five-stage pre-treating and painting process yields a finish that achieves a scribe creepage rating of 8 (per ASTM D1654) after over 5000 hours exposure to salt fog chamber (operated per ASTM B117).

Mast arm mount is adjustable for arms from 1-1/4" to 2" (1-5/8" to 2-3/8" O.D.) diameter. The 2 – bolt clamping mechanism provides 3G vibration rating per ANSI C136.31.

The Wildlife shield is cast into the housing (not a separate piece).

CONTROLS

NEMA 3 pin photocontrol receptacle is standard, with the Acuity designed ANSI standard 7 pin receptacles optionally available.

Premium solid state locking-style photocontrol – PCSS (10 year rated life) Extreme long life solid state locking-style photocontrol – PCL1 (20 year rated life)

Optional onboard Adjustable Output module allows the light output and input wattage to be modified to meet site specific requirements, and also can allow a single fixture to be flexibly applied in many different applications.

STANDARDS

DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

Color temperatures of ≤ 3000K must be specified for International Dark-Sky Association certification.

Rated for -40°C to 40°C ambient
CSA Certified to U.S. and Canadian standards
Complies with ANSI: C136.2, C136.10, C136.14, C136.31, C136.15, C136.37

Note: Actual performance may differ as a result of end-user environment and application. Specifications subject to change without notice.

P-1 PEDESTRIAN LIGHT ASSEMBLY

» Fixture: Citta by Vertex Illuminations of America

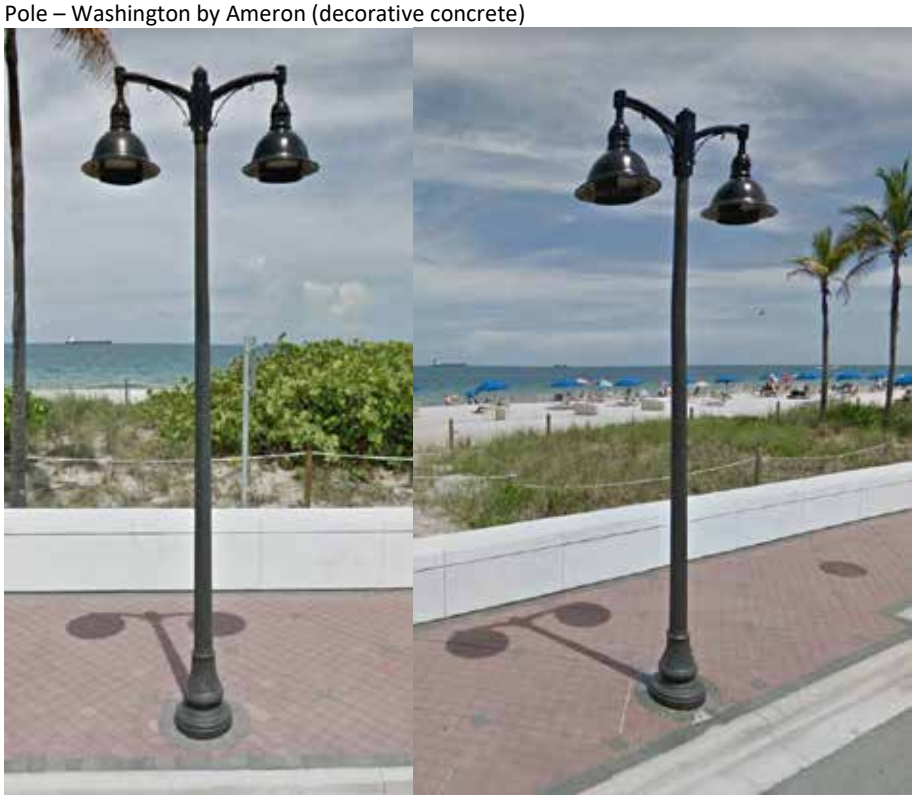
» Pole/Bracket: Washington by Ameron

SESCO lighting
LIGHTING FOR A GREENER TOMORROW®

City of Fort Lauderdale Lighting Material

A1A Decorative Assembly

Fixture – Citta by Vertex Illuminations of America
Pole – Washington by Ameron (decorative concrete)



SESCO Fort Lauderdale
737 Shotgun Road
Ft. Lauderdale, FL 33326
o: 954.474.9888 | f: 954.474.9773

P-2 PEDESTRIAN LIGHT ASSEMBLY

» Fixture: Serenade S55 by Lumec or Key West by Spring City

» Pole/Bracket: Victorian VII by Ameron (decorative concrete)

SESCO lighting
LIGHTING FOR A GREENER TOMORROW®

NE 13th Street

Fixture – Serenade S55 by Lumec or Key West by Spring City
Pole – Victorian VII by Ameron (decorative concrete)

SESCO Fort Lauderdale
737 Shotgun Road
Ft. Lauderdale, FL 33326
o: 954.474.9888 | f: 954.474.9773

P-3 PEDESTRIAN LIGHT ASSEMBLY

» Fixture: Eclipse by Luminis

» Pole/Bracket: Victorian VI by Ameron (decorative concrete)

SESCO lighting
LIGHTING FOR A GREENER TOMORROW®

Flagler Village

Fixture – Eclipse by Luminis
Pole – Victorian I by Ameron (decorative concrete)

SESCO Fort Lauderdale
737 Shotgun Road
Ft. Lauderdale, FL 33326
o: 954.474.9888 | f: 954.474.9773

P-4 PEDESTRIAN LIGHT ASSEMBLY

» Fixture: Urban VX600 by Hadco

» Pole/Bracket: RSA with decorative base by ULS

SESCO lighting
LIGHTING FOR A GREENER TOMORROW®

Hardy Park

Fixture – Urban VX600 by Hadco
Pole – RSA with decorative base by ULS

SESCO Fort Lauderdale
737 Shotgun Road
Ft. Lauderdale, FL 33326
o: 954.474.9888 | f: 954.474.9773

P-5 PEDESTRIAN LIGHT ASSEMBLY

» Fixture: Serenade S55 by Lumec or Key West by Spring City

» Pole/Bracket: 1C1 Octagonal decorative concrete by Ameron

SESCO lighting
LIGHTING FOR A GREENER TOMORROW®

Seabreeze Blvd

Fixture – Serenade S55 by Lumec or Key West by Spring City
Pole – 1C1 Octagonal decorative concrete by Ameron

SESCO Fort Lauderdale
737 Shotgun Road
Ft. Lauderdale, FL 33326
o: 954.474.9888 | f: 954.474.9773

P-6 PEDESTRIAN LIGHT ASSEMBLY

» Fixture: Prismatic style acorn with decorative banding

» Pole/Bracket: Decorative flutted fiberglass pole

SESCO lighting
LIGHTING FOR A GREENER TOMORROW®

Galt Ocean

Fixture – Prismatic style acorn with decorative banding
Pole – Decorative fluted fiberglass pole

Thank you for your consideration and continued use of our material. If I can be of any assistance, please do not hesitate to call me at 561-324-8866. Thank you!

Craig Grillo
Public Sector & Specifications

SESCO Fort Lauderdale
737 Shotgun Road
Ft. Lauderdale, FL 33326
o: 954.474.9888 | f: 954.474.9773

Appendix B: Pilot Locations Opinions of Probable Costs

OPINION OF PROBABLE COSTS SUMMARY

March 9, 2022

Kimley»Horn

OPINION OF PROBABLE PROJECT COSTS
Lighting

Areas	Area improvement costs	Type of work
1	$259,931.26	Retrofit lighting
2	$88,218.00	Retrofit lighting
3	$288,658.14	Additional lighting
4	$327,182.32	Additional lighting
5	$130,669.11	Retrofit lighting
6	$86,697.00	Retrofit lighting
7	$2,082,903.59	Additional lighting
8	$1,396,575.44	Additional lighting
9	$146,360.73	Additional lighting
10	$824,303.04	FPL Lighting
11	$1,902,297.60	FPL Lighting
12	$961,899.84	FPL Lighting
13	$509,640.51	no work required
Total	$9,005,336.58	

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PILOT LOCATION 1

Area 1 - Las Olas Blvd from Brickell Avenue to SR A1A

Retrofit the existing light poles with LED fixtures

January 25, 2022

Kimley»Horn

OPINION OF PROBABLE PROJECT COSTS
Lighting

ITEM NO.	ITEM	UNIT	PROJECT QUANTITY	UNIT COST	PROJECT COST
715-11-211	LUMINAIRE, F&I- REPLACE EXISTING LUMINAIRE ON EXISTING POLE/ARM, ROADWAY, COBRA HEAD	EA	25	$1,521.00	$38,025
715-11-213	LUMINAIRE, F&I- REPLACE EXISTING LUMINAIRE ON EXISTING POLE/ARM, ROADWAY, POLE TOP	EA	167	$1,328.78	$221,906
		Subtotal			$259,931
101-1	MOBILIZATION	LS	0%	-	$0
102-1	MAINTENANCE OF TRAFFIC	LS	0%	-	$0
		CONSTRUCTION COST			$259,931
	Preliminary Engineering (PE)	LS	0%	-	$0
	Construction Engineering and Inspection (CEI)	LS	0%	-	$0
		Subtotal			$259,931
	Contingency	LS	0%	-	$0.00
		TOTAL			**$259,931**

Note: From Brickell Avenue to Birch Road does not meet lighting criteria. Retrofit the existing light poles with LED fixtures.
Assumptions:

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PILOT LOCATION 2

Area 2 - SR A1A from SE 5th Street to Flamingo Avenue

Retrofit the existing light poles with LED fixtures, convert FP&L lights to LED.

January 25, 2022

Kimley»Horn

OPINION OF PROBABLE PROJECT COSTS
Lighting

ITEM NO.	ITEM	UNIT	PROJECT QUANTITY	UNIT COST	PROJECT COST
715-11-211	LUMINAIRE, F&I- REPLACE EXISTING LUMINAIRE ON EXISTING POLE/ARM, ROADWAY, COBRA HEAD	EA	58	$1,521.00	$88,218
LT-1 Tariff	FP&L LED Conversion of Street lights between Sunrise Blvd to N Atlantic Blvd	N/A	N/A	N/A	N/A
			Subtotal		$88,218
101-1	MOBILIZATION	LS	0%	-	$0
102-1	MAINTENANCE OF TRAFFIC	LS	0%	-	$0
			CONSTRUCTION COST		$88,218
	Preliminary Engineering (PE)	LS	0%	-	$0
	Construction Engineering and Inspection (CEI)	LS	0%	-	$0
			Subtotal		$88,218
	Contingency	LS	0%	-	$0.00
			TOTAL		**$88,218**

Note: Roadway from NE 18th Street to Oakland Park Blvd does not meet lighting criteria.
Proposed improvements: From NE 18th St to Oakland Park Blvd, retrofit the existing light poles with 58 LED fixtures to bring up to criteria.

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PILOT LOCATION 3

Area 3 - NE 4th Avenue from Train Tracks to NE 16th Street

Retrofit HPS lights to LED and add pedestrian lights in dark areas.

January 25, 2022

Kimley»Horn

OPINION OF PROBABLE PROJECT COSTS
Lighting

ITEM NO.	ITEM	UNIT	PROJECT QUANTITY	UNIT COST	PROJECT COST
630-2-12	CONDUIT, FURNISH & INSTALL, DIRECTIONAL BORE	LF	3,860	$21.76	$83,994
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	EA	10	$648.19	$6,204
715-1-13	LIGHTING CONDUCTORS, F&I, INSULATED, NO 4 TO NO 2	LF	12,116	$2.25	$27,261
715-11-211	LUMINAIRE, F&I- REPLACE EXISTING LUMINAIRE ON EXISTING POLE/ARM, ROADWAY, COBRA HEAD	EA	3	$1,521.00	$4,563
	Pedestrian Light poles	EA	10	$5,000	$47,857
			Subtotal		$169,879
101-1	MOBILIZATION	LS	8%	-	$13,590
102-1	MAINTENANCE OF TRAFFIC	LS	10%	-	$16,988
			CONSTRUCTION COST		$200,457
	Preliminary Engineering (PE)	LS	10%	-	$20,046
	Construction Engineering and Inspection (CEI)	LS	10%	-	$20,046
			Subtotal		$240,548
	Contingency	LS	20%	-	$48,109.69
			TOTAL		**$288,658**

Note: Train tracks to Sunrise Blvd will be retrofit
13th Street to 16th Street -Pedestrian lighting recommended to fill in dark areas.1 ped light every 210 ft between the roadway lights on West side
Pedestrian light - Eclipse by Luminis or Cooper mesa
There will be new pedestrian lights (Cooper Mesa) being installed from Sunrise to 13th Street

PILOT LOCATION 4

Area 4 - Sunrise Blvd from I-95 to SR A1A

Add lights on FP&L poles, retrofit existing poles and add some light poles.

January 25, 2022

Kimley»Horn

OPINION OF PROBABLE PROJECT COSTS
Lighting

21

ITEM NO.	ITEM	UNIT	PROJECT QUANTITY	UNIT COST	PROJECT COST
630-2-12	CONDUIT, FURNISH & INSTALL, DIRECTIONAL BORE	LF	1,050	$21.76	$22,848
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	EA	5	$648.19	$3,241
715-1-13	LIGHTING CONDUCTORS, F&I, INSULATED, NO 4 TO NO 2	LF	3,430	$2.25	$7,718
715-4-14	LIGHT POLE COMPLETE, FURNISH & INSTALL STANDARD POLE STANDARD FOUNDATION, 45' MOUNTING HEIGHT	EA	5	$5,957.87	$29,789
715-11-211	LUMINAIRE, F&I- REPLACE EXISTING LUMINAIRE ON EXISTING POLE/ARM, ROADWAY, COBRA HEAD	EA	53	$1,521.00	$80,613
715-11-211	LUMINAIRE, F&I- REPLACE EXISTING LUMINAIRE ON EXISTING POLE/ARM, ROADWAY, PENDANT/TEARDROP	EA	21	$2,302.00	$48,342
LT-1 Tariff	FP&L LED adding 11 Light poles and 10 lights on existing power poles	N/A	N/A	N/A	N/A
			Subtotal		$192,551
101-1	MOBILIZATION	LS	8%	-	$15,404
102-1	MAINTENANCE OF TRAFFIC	LS	10%	-	$19,255
			CONSTRUCTION COST		$227,210
	Preliminary Engineering (PE)	LS	10%	-	$22,721
	Construction Engineering and Inspection (CEI)	LS	10%	-	$22,721
			Subtotal		$272,652
	Contingency	LS	20%	-	$54,530.39
			TOTAL		**$327,182**

Note: Retrofit 34 fixtures from NE 7th Avenue to NE 17th Way. Retrofit 19 cobra heads and add some additional poles from Seminole to SR A1A. Add additional FP&L lighting as well. Retrofit 21 Pendant teardrop fixtures to LED from NE 20th Avenue to Seminole Drive.
Assumptions:

PILOT LOCATION 5

Area 5 - Broward Blvd fromSW 38th Avenue to SE 17th Avenue

Retrofit existing lights with LED fixtures and convert FP&L lights to LED

January 25, 2022

Kimley»Horn

OPINION OF PROBABLE PROJECT COSTS
Lighting

ITEM NO.	ITEM	UNIT	PROJECT QUANTITY	UNIT COST	PROJECT COST
715-11-211	LUMINAIRE, F&I- REPLACE EXISTING LUMINAIRE ON EXISTING POLE/ARM, ROADWAY, COBRA HEAD	EA	71	$1,521.00	$107,991
LT-1 Tariff	FP&L LED Conversion of 12 Street lights and adding light poles	N/A	N/A	N/A	N/A
		Subtotal			$107,991
101-1	MOBILIZATION	LS	0%	-	$0
102-1	MAINTENANCE OF TRAFFIC	LS	0%	-	$0
		CONSTRUCTION COST			$107,991
	Preliminary Engineering (PE)	LS	10%	-	$10,799
	Construction Engineering and Inspection (CEI)	LS	0%	-	$0
		Subtotal			$118,790
	Contingency	LS	10%	-	$11,879.01
		TOTAL			**$130,669**

Note: Replace 67 HPS lights from SW 38th Avenue to I-95 and 4 HPS Lights from US-1 to SE 17th Street. The rest of the roadway can be lighted by FP&L lights.
Assumptions:

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PILOT LOCATION 6

Area 6 - Davie Blvd from US441 to US-1 Federal Hwy

Retrofit existing lights with LED fixtures and convert FP&L lights to LED

January 25, 2022

Kimley»Horn

OPINION OF PROBABLE PROJECT COSTS
Lighting

ITEM NO.	ITEM	UNIT	PROJECT QUANTITY	UNIT COST	PROJECT COST
715-11-211	LUMINAIRE, F&I- REPLACE EXISTING LUMINAIRE ON EXISTING POLE/ARM, ROADWAY, COBRA HEAD	EA	57	$1,521.00	$86,697
LT-1 Tariff	FP&L LED Conversion of 40 Street lights	N/A	N/A	N/A	N/A
		Subtotal			$86,697
101-1	MOBILIZATION	LS	0%	-	$0
102-1	MAINTENANCE OF TRAFFIC	LS	0%	-	$0
		CONSTRUCTION COST			$86,697
	Preliminary Engineering (PE)	LS	0%	-	$0
	Construction Engineering and Inspection (CEI)	LS	0%	-	$0
		Subtotal			$86,697
	Contingency	LS	0%	-	$0.00
		TOTAL			**$86,697**

Note:
Assumptions:

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PILOT LOCATION 7

Area 7 - US1 Federal from Marina Mile Blvd to Sunrise Blvd

Add light poles and update the existing load centers.

January 25, 2022

Kimley»Horn

OPINION OF PROBABLE PROJECT COSTS
Lighting

ITEM NO.	ITEM	UNIT	PROJECT QUANTITY	UNIT COST	PROJECT COST
630-2-11	CONDUIT, FURNISH & INSTALL, OPEN TRENCH	LF	25,883	$13.79	$356,921
630-2-12	CONDUIT, FURNISH & INSTALL, DIRECTIONAL BORE	LF	681	$22.79	$15,523
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	EA	133	$724.00	$96,245
715-1-13	LIGHTING CONDUCTORS, F&I, INSULATED, NO 4 TO NO 2	LF	86,775	$1.78	$154,460
715-4-13	LIGHT POLE COMPLETE, FURNISH & INSTALL STANDARD POLE STANDARD FOUNDATION, 40' MOUNTING HEIGHT	EA	118	$3,893.00	$459,122
715 4 70	LIGHT POLE COMPLETE, REMOVE POLE AND FOUNDATION	EA	76	$545.10	$41,428
715 7 21	LOAD CENTER, REWORK, SECONDARY VOLTAGE	EA	5	$1,825.00	$9,125
715-500-1	POLE CABLE DISTRIBUTION SYSTEM, CONVENTIONAL	EA	118	$788.49	$92,991
		Subtotal			$1,225,814
101-1	MOBILIZATION	LS	8%	-	$98,065
102-1	MAINTENANCE OF TRAFFIC	LS	10%	-	$122,581
		CONSTRUCTION COST			$1,446,461
	Preliminary Engineering (PE)	LS	10%	-	$144,646
	Construction Engineering and Inspection (CEI)	LS	10%	-	$144,646
		Subtotal			$1,735,753
	Contingency	LS	20%	-	$347,150.60
		TOTAL			**$2,082,904**

Note: Weighted Unit Prices associated with the Current 12 Month Moving Averages for Area 12 were used when available.

PILOT LOCATION 8

Area 8 - US1 Federal from Sunrise to Commercial

Retrofit existing lighting and add light poles. Convert FP&L lights to LED.

January 25, 2022

Kimley»Horn

OPINION OF PROBABLE PROJECT COSTS
Lighting

ITEM NO.	ITEM	UNIT	PROJECT QUANTITY	UNIT COST	PROJECT COST
630-2-11	CONDUIT, FURNISH & INSTALL, OPEN TRENCH	LF	21,368	$13.79	$294,667
630-2-12	CONDUIT, FURNISH & INSTALL, DIRECTIONAL BORE	LF	562	$22.79	$12,815
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	EA	65	$724.00	$46,956
715-1-13	LIGHTING CONDUCTORS, F&I, INSULATED, NO 4 TO NO 2	LF	69,063	$1.78	$122,933
715-4-13	LIGHT POLE COMPLETE, FURNISH & INSTALL STANDARD POLE STANDARD FOUNDATION, 40' MOUNTING HEIGHT	EA	50	$3,893.00	$194,093
715 11	LUMINAIRE, F&I- REPLACE EXISTING LUMINAIRE ON EXISTING POLE/ARM, ROADWAY, POLE TOP	EA	85	$1,200.00	$102,000
715 7 21	LOAD CENTER, REWORK, SECONDARY VOLTAGE	EA	5	$1,825.00	$9,125
715-500-1	POLE CABLE DISTRIBUTION SYSTEM, CONVENTIONAL	EA	50	$788.49	$39,312
LT-1 Tariff	FP&L LED Conversion of 80 Street lights	N/A	N/A	N/A	N/A
			Subtotal		$821,902
101-1	MOBILIZATION	LS	8%	-	$65,752
102-1	MAINTENANCE OF TRAFFIC	LS	10%	-	$82,190
			CONSTRUCTION COST		$969,844
	Preliminary Engineering (PE)	LS	10%	-	$96,984
	Construction Engineering and Inspection (CEI)	LS	10%	-	$96,984
			Subtotal		$1,163,813
	Contingency	LS	20%	-	$232,762.57
			TOTAL		**$1,396,575**

Note: Weighted Unit Prices associated with the Current 12 Month Moving Averages for Area 12 were used when available.

PILOT LOCATION 9

Area 9 - Powerline road

Retrofit existing lighting relocate light poles and add 2 light poles

January 25, 2022

Kimley»Horn

OPINION OF PROBABLE PROJECT COSTS
Lighting

ITEM NO.	ITEM	UNIT	PROJECT QUANTITY	UNIT COST	PROJECT COST
715-4-60	LIGHT POLE COMPLETE, RELOCATE	EA	3	$3,483.00	$10,449
715-11-211	LUMINAIRE, F&I- REPLACE EXISTING LUMINAIRE ON EXISTING POLE/ARM, ROADWAY, COBRA HEAD	EA	47	$1,521.00	$71,487
715-65-366	LIGHT POLE COMPLETE, F&I, UTILITY CONFLICT POLE STANDARD FOUNDATION, 40' MOUNTING HEIGHT, 16' ARM LENGTH	EA	1	$8,875.00	$8,875
715-511-340	LIGHT POLE COMPLETE- SPECIAL DESIGN, F&I, SINGLE ARM SHOULDER MOUNT, CONCRETE, 40'	EA	1	$12,551.10	$12,551
			Subtotal		$103,362
101-1	MOBILIZATION	LS	8%	-	$8,269
102-1	MAINTENANCE OF TRAFFIC	LS	10%	-	$10,336
			CONSTRUCTION COST		$121,967
	Preliminary Engineering (PE)	LS	10%		$12,197
	Construction Engineering and Inspection (CEI)	LS	10%		$12,197
			Subtotal		$146,361
	Contingency	LS		-	$0.00
			TOTAL		**$146,361**

Note: Weighted Unit Prices associated with the Current 12 Month Moving Averages for Area 12 were used when available.
Scope Relocate 3 light poles, retrofit the existing light poles, 1 new concrete pole and 1 utility conflict pole.

PILOT LOCATION 10

Area 10 - Riverland Road Neighborhood

FP&L lighting retrofit and add lighting

January 25, 2022

Kimley»Horn

OPINION OF PROBABLE PROJECT COSTS
Lighting

ITEM NO.	ITEM	UNIT	PROJECT QUANTITY	UNIT COST	PROJECT COST
FP&L -DB	CONDUIT, FURNISH & INSTALL, DIRECTIONAL BORE	LF	78,059	$8.00	$624,472
LT-1 Tariff	FP&L Lighting design - retrofit 315 lights, add approximately 539 Light poles	N/A	N/A	N/A	N/A
			Subtotal		$624,472
101-1	MOBILIZATION	LS	0%	-	$0
102-1	MAINTENANCE OF TRAFFIC	LS	0%	-	$0
			CONSTRUCTION COST		$624,472
	Preliminary Engineering (PE)	LS	10%	-	$62,447
	Construction Engineering and Inspection (CEI)	LS	0%	-	$0
			Subtotal		$686,919
	Contingency	LS	20%	-	$137,383.84
			TOTAL		**$824,303**

Note: This estimate is based on recent FP&L projects. Photometric design is needed to provide a more accurate cost.
Majority Local Residential and matches GIS

PILOT LOCATION 11

Area 11 - Flagler Village

FP&L lighting - Convert HPS to LED and add lights in gaps

February 3, 2022

Kimley»Horn

OPINION OF PROBABLE PROJECT COSTS
Lighting

ITEM NO.	ITEM	UNIT	PROJECT QUANTITY	UNIT COST	PROJECT COST
FP&L -DB	CONDUIT, FURNISH & INSTALL, DIRECTIONAL BORE	LF	15,031	$8.00	$120,248
N/A	Pedestrian Light poles P-3	EA	289	$5,000	$1,445,000
LT-1 Tariff	FP&L Lighting design - convert approximately 160 HPS lights to LED and add light poles to fill in dark areas, replace lighting on 7 streets , approximately 90 poles	N/A	N/A	N/A	N/A
		Subtotal			$1,565,248
101-1	MOBILIZATION	LS	0%	-	$0
102-1	MAINTENANCE OF TRAFFIC	LS	0%	-	$0
		CONSTRUCTION COST			$1,565,248
	Preliminary Engineering (PE)	LS	10%	-	$20,000
	Construction Engineering and Inspection (CEI)	LS	0%	-	$0
		Subtotal			$1,585,248
	Contingency	LS	20%	-	$317,049.60
		TOTAL			**$1,902,298**

Note: Photometric design is needed to provide a more accurate cost. There is existing lighting throughout the City. Recommend retrofitting the existing lights with LED from FP&L.
Any additional poles shall be powered overhead.

PILOT LOCATION 12

Area 12 - Himarshee Area

FP&L Lighting - Add light poles and retrofit

February 3, 2022

Kimley»Horn

OPINION OF PROBABLE PROJECT COSTS
Lighting

ITEM NO.	ITEM	UNIT	PROJECT QUANTITY	UNIT COST	PROJECT COST
FP&L -DB	CONDUIT, FURNISH & INSTALL, DIRECTIONAL BORE	LF	9,839	$8.00	$78,712
N/A	Pedestrian Light poles P-3	EA	130	$5,000	$650,000
LT-1 Tariff	FP&L Lighting design retrofit lights to remain, remove light poles and add approximately 41 lights	N/A	N/A	N/A	N/A
		Subtotal			$728,712
101-1	MOBILIZATION	LS	0%	-	$0
102-1	MAINTENANCE OF TRAFFIC	LS	0%	-	$0
		CONSTRUCTION COST			$728,712
	Preliminary Engineering (PE)	LS	10%	-	$72,871
	Construction Engineering and Inspection (CEI)	LS	0%	-	$0
		Subtotal			$801,583
	Contingency	LS	20%	-	$160,316.64
		TOTAL			**$961,900**

Note: This estimate is based on recent FP&L projects. Photometric design is needed to provide a more accurate cost.
Majority Commercial and does not match GIS. A lot of pedestrian lighting.
Existing lighting is powered overhead. Maintain this for new light poles on the same stretch. Unless power is to be undergounded as well.

PILOT LOCATION 13

Area 13 - Sunrise Lane and NE 9th Street

No recommendations - Sunrise Lane meets criteria

February 3, 2022

Kimley»Horn

OPINION OF PROBABLE PROJECT COSTS
Lighting

ITEM NO.	ITEM	UNIT	PROJECT QUANTITY	UNIT COST	PROJECT COST
630-2-12	CONDUIT, FURNISH & INSTALL, DIRECTIONAL BORE	LF	1,590	$23.04	$36,634
715-1-12	LIGHTING CONDUCTORS, F&I, INSULATED, NO.8 - 6	LF	5,562	$2.84	$15,796
N/A	Pedestrian Light poles P-1	EA	33	$7,500.00	$247,500
		Subtotal			$299,930
101-1	MOBILIZATION	LS	8%	-	$23,994
102-1	MAINTENANCE OF TRAFFIC	LS	10%	-	$29,993
		CONSTRUCTION COST			$353,917
	Preliminary Engineering (PE)	LS	10%	-	$35,392
	Construction Engineering and Inspection (CEI)	LS	10%	-	$35,392
		Subtotal			$424,700
	Contingency	LS	20%	-	$84,940.09
		TOTAL			**$509,641**

Note: Criteria: 0.8 Avg, 6:1 uniformity, 0.4 veiling. Lighting meets criteria based on existing lighting
Add P-1 light poles to bring sidewalks up to criteria

Appendix C: Existing Conditions Report

Existing Conditions Report

Prepared by:
Kimley-Horn and Associates, Inc.
1920 Wekiva Way, Suite 200
West Palm Beach, Florida 33411

Table of Contents

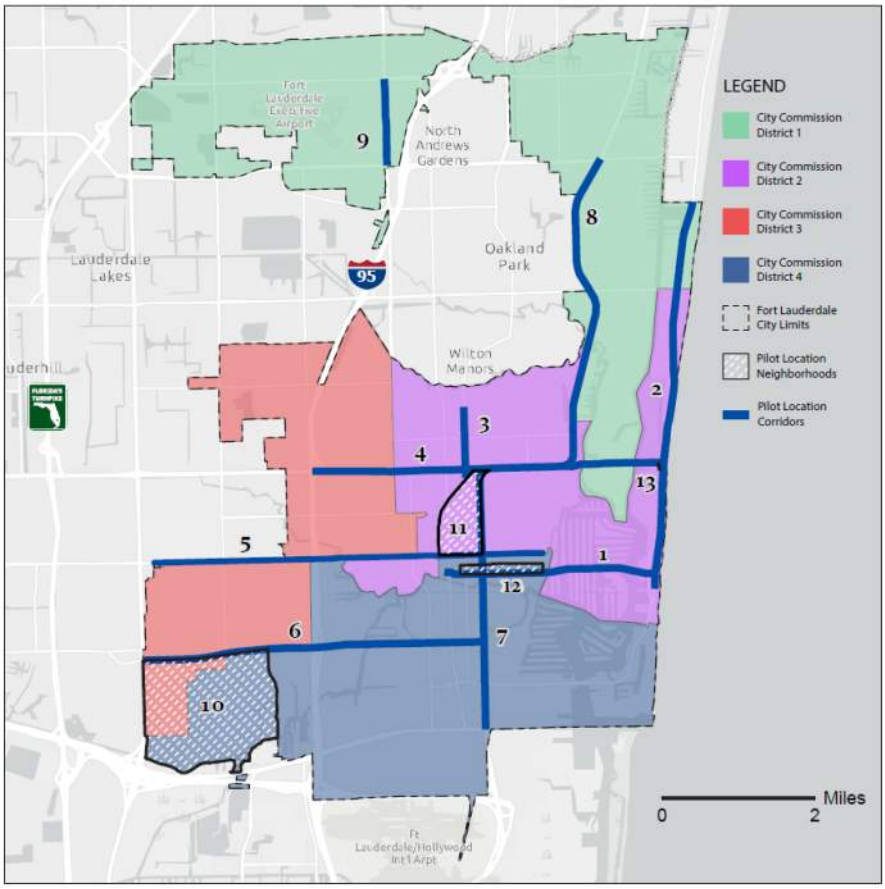
1.0 Introduction

The City of Fort Lauderdale, located on the southeastern coast of Florida, has 165,000 residents and welcomes hundreds of thousands of visitors every year. The City's streetlight network includes approximately 15,000 – 20,000 street and pedestrian lights and 809 miles of roadway. Most lights are owned by Florida Power and Light (FP&L), with the remaining lights owned by the City, County, Florida Department of Transportation (FDOT), and private developers. Adequacy of lighting throughout the City has been a major concern for the residents and visitors of Fort Lauderdale.

The City of Fort Lauderdale is seeking to address existing maintenance needs and has requested a Lighting Master Plan to address these needs. This master plan will provide guidance to future developments within the City and standardize details and specifications for lighting. The goal of the master plan is to achieve a uniform look and feel of roadway illumination for the various types of corridors throughout the City.

1.1 Existing Conditions

The City requested for the existing electrical and lighting systems to be reviewed in preliminary areas. The included map shows preliminary areas identified for review of electrical and lighting systems.



Lighting evaluation areas
1. SR 842 Las Olas Boulevard from Brickell Avenue to SR A1A (N Ocean Boulevard)
2. SR A1A (N. Ocean Boulevard) from SE 5th Street to Flamingo Avenue
3. SR 811 NE 4th Avenue (Dixie Highway) from train tracks to NE 16th Street
4. SR 838 Sunrise Boulevard from I-95 to SR A1A
5. SR 842 Broward Boulevard from SW 38th St to SE 17th Avenue
6. SR 736 Davie Boulevard from US-441 to US-1 Federal Highway
7. US-1 Federal Highway from SR 84 (Marina Boulevard) to Sunrise Boulevard
8. US-1 Federal Highway from Sunrise Boulevard to Commercial Boulevard
9. SR 845 (Powerline Road) from Commercial Boulevard to W. Cypress Creek Road
10. Riverland Road Neighborhood
11. Flagler Village Area
12. Himarshee Area
13. Sunrise Lane Area

2.0 Existing Lights

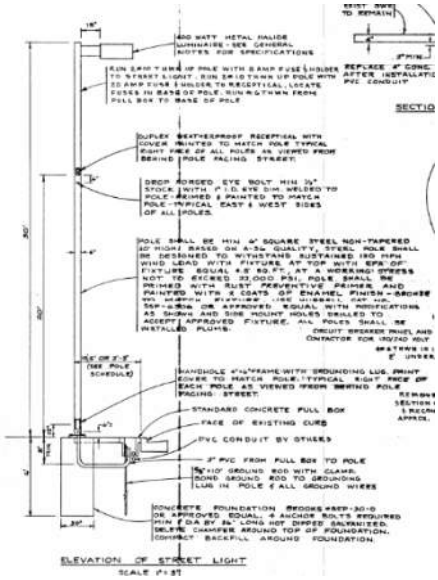
The project team performed a field review to document the types of existing lights used within the study area. The City uses a combination of Florida Power and Light (FPL) lights, FDOT-approved lights, and proprietary lights along their roadways. Kimley-Horn received 2006 GIS information from Troy & Banks Smart Solutions SM with locations and information about existing lights. The 2006 GIS shows FP&L owns and maintains 10,766 street lights and provides power to 4,033 City-owned streetlights.

2.1 Lights in evaluation areas

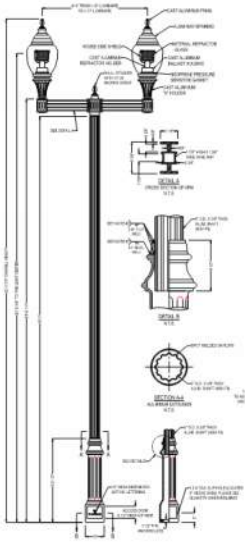
The light configurations were reviewed, in addition to pole types and fixture types. A summary of each evaluation area is provided below.

1. Las Olas Boulevard from Brickell Avenue to SR A1A is segmented into four lighting configurations:
   Segment 1 is from Brickell Avenue to SE 6th Avenue. There are two rows of light poles and a combination of concrete light poles and post top light poles. The concrete light poles are staggered with 200W HPS lights mounted at 30 feet. These are GE fixtures on 10-foot arms. The post top fixture is the same fixture and pole from Sistrunk Boulevard 1.

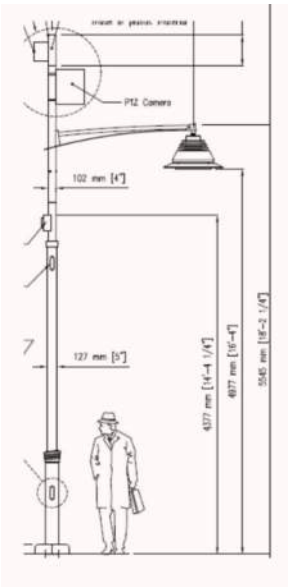
   Segment 2 is from SE 6th Avenue to SE 16th Avenue. There are two rows of staggered light poles. Both rows have a steel pole with an 18-inch arm. The fixture is a 400W Metal Halide mounted at 30 feet. According to record drawings, these poles were installed in 1982 and designed for 120 mph winds. The fixture manufacturer is EMCO. See the graphic below for more information.



Segment 3 is from SE 16th Avenue to South Birch Road. There are two rows of staggered light poles. The light poles are 18-foot double post top aluminum poles. The fixtures are 100W HPS lights from Spring City. They are mounted at 18 feet and equipped with house side shields. According to record drawings, the poles were installed in 1995 and designed for 110 mph winds. See the pole information below.

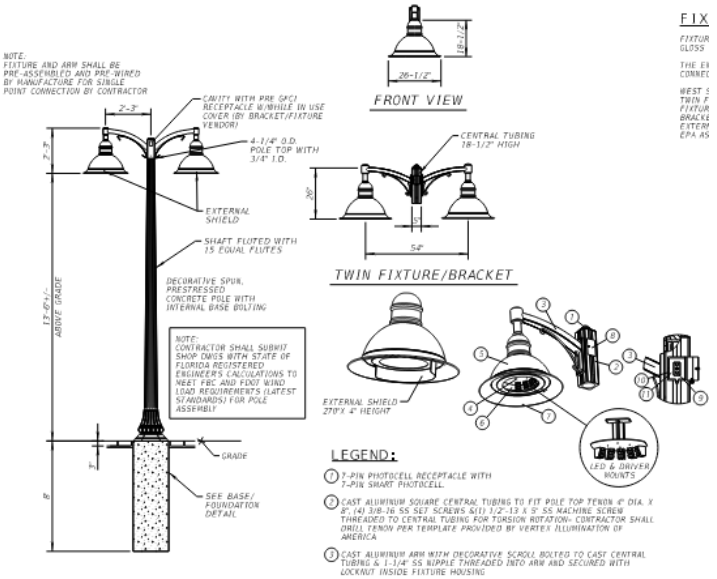


Segment 4 is from S. Birch Road to S. Fort Lauderdale Beach Boulevard. There are two rows of pedestrian light poles. The poles are 18-foot steel poles with a 4-foot bracket. The light provides a combination of amber and white light mounted at 16 feet. The light is a 61W LED from Neri. According to record plans, these light poles were designed in 2016. See the pole drawing below.



2. SR A1A from SE 5th street to Flamingo Avenue is segmented into four lighting configurations. Segment 1 is from SE 5th Street to Sunrise Boulevard and is currently under design with Kimley-Horn. This segment has been omitted from the study.

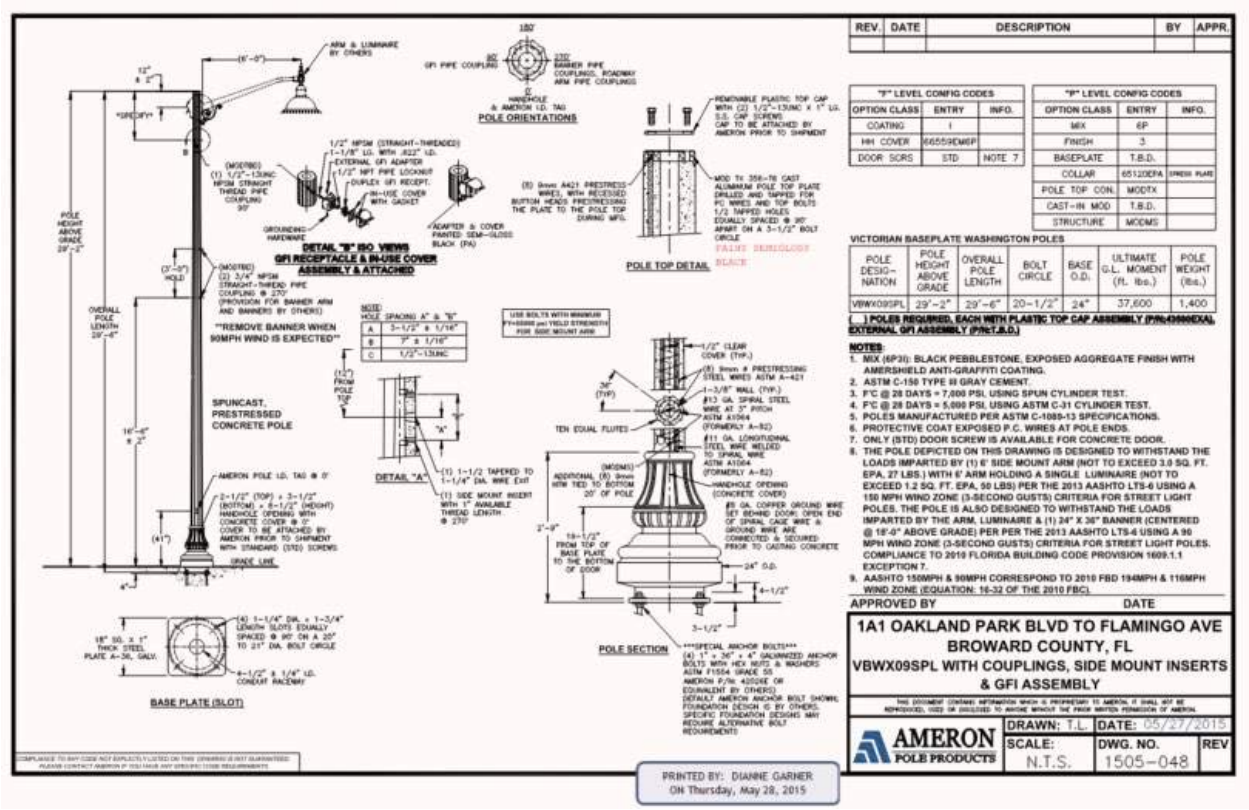
   Segment 2 is from Sunrise Boulevard to NE 18th Street. There are light poles on each side of the road opposite each other. The west side has concrete light poles. These light poles have shielded HPS and LED fixtures mounted at 30 feet with 10-foot arms. The HPS lights are 200W GE lights and the LED lights are American Electric Lighting ATB2 fixtures. Both roadsides have pedestrian light poles, installed in 2020. They have double 72W LED lights mounted at 13.5-feet. Due to the proximity of the beach, these LED fixtures are shielded amber lights. The manufacturer is Vertex Illuminations of America (VIA). See the graphic below for more information.

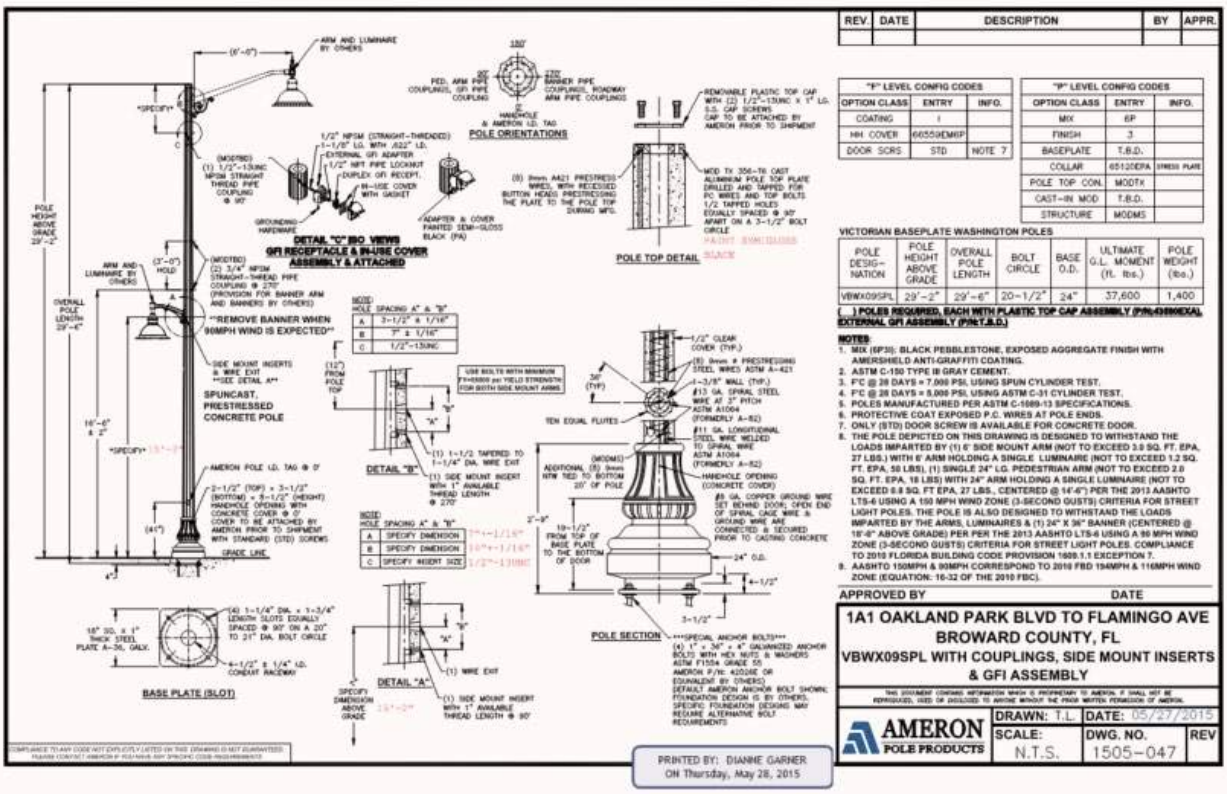


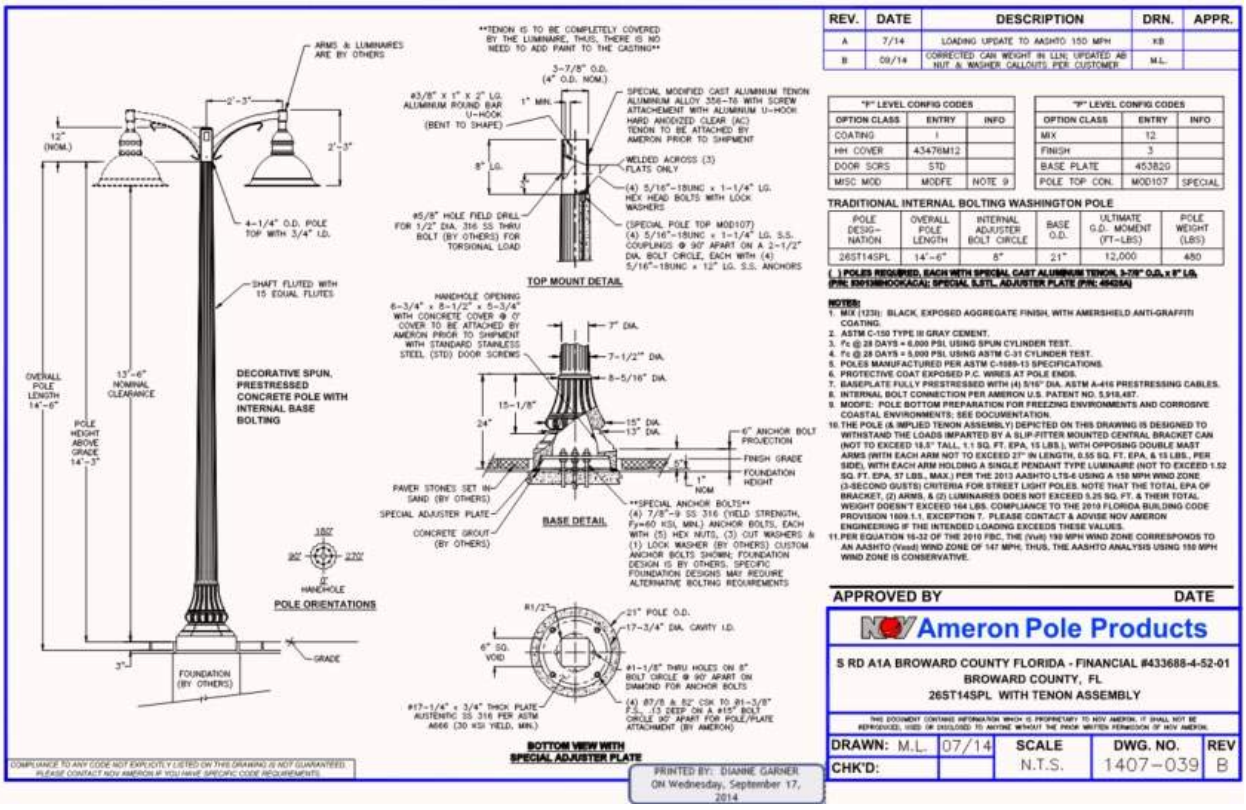
   Segment 3 is from NE 18th Street to Oakland Park Boulevard. There are two rows of staggered light poles. These are concrete poles with a 30-foot mounting height and 10-foot arm. The light

fixtures are HPS and LED. The LED fixtures are 200W GE lights and the LED lights are AEL ATB2 lights.

Segment 4 is from Oakland Park Boulevard to Flamingo Avenue. There are two rows of light poles. The light poles are a combination of decorative roadway and pedestrian poles. Pole 1 is a 29-foot concrete pole with a 6-foot arm. Pole 2 is a 29-foot concrete pole with a 6-foot arm and 2-foot arm mounted lower on the pole. Pole 3 is 14.5-foot concrete pole with double-mounted pedestrian fixtures. The roadway lights are 244W LED fixtures from Sternberg and the pedestrian lights are 96W LED fixtures from Sternberg. The light poles were designed for 150 mph wind speed and installed in 2015. See the drawings below for poles 1-3.




REV. | DATE | DESCRIPTION | BY | APPR.
"F" LEVEL CONFIG CODES
OPTION CLASS | ENTRY | INFO.
COATING | I
HH COVER | 66559EMIP
DOOR SCRS | STD | NOTE 7
"P" LEVEL CONFIG CODES
OPTION CLASS | ENTRY | INFO.
MIX | 6P
FINISH | 3
BASEPLATE | T.B.D.
COLLAR | 65120EPA | STRESS PLATE
POLE TOP CON. | MOD7X
CAST-IN MOD | T.B.D.
STRUCTURE | MOD#S
VICTORIAN BASEPLATE WASHINGTON POLES
POLE DESIG-NATION | POLE HEIGHT ABOVE GRADE | OVERALL POLE LENGTH | BOLT CIRCLE | BASE O.D. | ULTIMATE G.L. MOMENT (ft. lbs.) | POLE WEIGHT (lbs.)
VBWX09SPL | 29'-2" | 29'-6" | 20-1/2" | 24" | 37,600 | 1,400
( ) POLES REQUIRED, EACH WITH PLASTIC TOP CAP ASSEMBLY (P/N:43MMEXA), EXTERNAL GFI ASSEMBLY (P/N:T.B.D.)
NOTES:
1. MIX (6P3I): BLACK PEBBLESTONE, EXPOSED AGGREGATE FINISH WITH AMERSHIELD ANTI-GRAFFITI COATING.
2. ASTM C-150 TYPE III GRAY CEMENT.
3. f'C @ 28 DAYS = 7,000 PSI, USING SPUN CYLINDER TEST.
4. f'C @ 28 DAYS = 5,000 PSI, USING ASTM C-31 CYLINDER TEST.
5. POLES MANUFACTURED PER ASTM C-1089-13 SPECIFICATIONS.
6. PROTECTIVE COAT EXPOSED P.C. WIRES AT POLE ENDS.
7. ONLY (STD) DOOR SCREW IS AVAILABLE FOR CONCRETE DOOR.
8. THE POLE DEPICTED ON THIS DRAWING IS DESIGNED TO WITHSTAND THE LOADS IMPARTED BY (1) 6' SIDE MOUNT ARM (NOT TO EXCEED 3.0 SQ. FT. EPA, 27 LBS.) WITH 6' ARM HOLDING A SINGLE LUMINAIRE (NOT TO EXCEED 1.2 SQ. FT. EPA, 50 LBS), (1) SINGLE 24" LG. PEDESTRIAN ARM (NOT TO EXCEED 2.0 SQ. FT. EPA, 18 LBS) WITH 24" ARM HOLDING A SINGLE LUMINAIRE (NOT TO EXCEED 0.8 SQ. FT EPA, 27 LBS., CENTERED @ 14'-6") PER THE 2013 AASHTO LTS-6 USING A 150 MPH WIND ZONE (3-SECOND GUSTS) CRITERIA FOR STREET LIGHT POLES. THE POLE IS ALSO DESIGNED TO WITHSTAND THE LOADS IMPARTED BY THE ARMS, LUMINAIRES & (1) 24" X 36" BANNER (CENTERED @ 18'-6" ABOVE GRADE) PER PER THE 2013 AASHTO LTS-6 USING A 90 MPH WIND ZONE (3-SECOND GUSTS) CRITERIA FOR STREET LIGHT POLES. COMPLIANCE TO 2010 FLORIDA BUILDING CODE PROVISION 1609.1.1 EXCEPTION 7.
9. AASHTO 150MPH & 90MPH CORRESPOND TO 2010 FBD 194MPH & 116MPH WIND ZONE (EQUATION: 16-32 OF THE 2010 FBC).
APPROVED BY
DATE
1A1 OAKLAND PARK BLVD TO FLAMINGO AVE
BROWARD COUNTY, FL
VBWX09SPL WITH COUPLINGS, SIDE MOUNT INSERTS & GFI ASSEMBLY
AMERON POLE PRODUCTS
DRAWN: T.L.
DATE: 05/27/2015
SCALE: N.T.S.
DWG. NO. 1505-047
REV
PRINTED BY: DIANNE GARNER
ON Thursday, May 28, 2015


REV. | DATE | DESCRIPTION | DRN. | APPR.
A | 7/14 | LOADING UPDATE TO AASHTO 150 MPH | KB
B | 09/14 | CORRECTED CAN WEIGHT IN LLN; UPDATED AB NUT & WASHER CALLOUTS PER CUSTOMER | M.L.
"F" LEVEL CONFIG CODES
OPTION CLASS | ENTRY | INFO
COATING | I
HH COVER | 43476M12
DOOR SCRS | STD
MISC MOD | MODFE | NOTE 9
"P" LEVEL CONFIG CODES
OPTION CLASS | ENTRY | INFO
MIX | 12
FINISH | 3
BASE PLATE | 46382G
POLE TOP CON. | MOD107 | SPECIAL
TRADITIONAL INTERNAL BOLTING WASHINGTON POLE
POLE DESIG-NATION | OVERALL POLE LENGTH | INTERNAL ADJUSTER BOLT CIRCLE | BASE O.D. | ULTIMATE G.D. MOMENT (FT-LBS) | POLE WEIGHT (LBS)
26ST14SPL | 14'-6" | 8" | 21" | 12,000 | 450
( ) POLES REQUIRED, EACH WITH SPECIAL CAST ALUMINUM TENON, 3-7/8" O.D. x 8" LG. (P/N: 83613MHOOKACA); SPECIAL S.STL. ADJUSTER PLATE (P/N: 49428A)
NOTES:
1. MIX (12I3): BLACK, EXPOSED AGGREGATE FINISH, WITH AMERSHIELD ANTI-GRAFFITI COATING.
2. ASTM C-150 TYPE III GRAY CEMENT.
3. f'c @ 28 DAYS = 6,000 PSI, USING SPUN CYLINDER TEST.
4. f'c @ 28 DAYS = 5,000 PSI, USING ASTM C-31 CYLINDER TEST.
5. POLES MANUFACTURED PER ASTM C-1089-13 SPECIFICATIONS.
6. PROTECTIVE COAT EXPOSED P.C. WIRES AT POLE ENDS.
7. BASEPLATE FULLY PRESTRESSED WITH (4) 5/16" DIA. ASTM A-416 PRESTRESSING CABLES.
8. INTERNAL BOLT CONNECTION PER AMERON U.S. PATENT NO. 5,918,437.
9. MODFE: POLE BOTTOM PREPARATION FOR FREEZING ENVIRONMENTS AND CORROSIVE COASTAL ENVIRONMENTS. SEE DOCUMENTATION.
10. THE POLE (& IMPLIED TENON ASSEMBLY) DEPICTED ON THIS DRAWING IS DESIGNED TO WITHSTAND THE LOADS IMPARTED BY A SLIP-FITTER MOUNTED CENTRAL BRACKET CAN (NOT TO EXCEED 18.5" TALL, 1.1 SQ. FT. EPA, 15 LBS.), WITH OPPOSING DOUBLE MAST ARMS (WITH EACH ARM NOT TO EXCEED 27" IN LENGTH, 0.55 SQ. FT. EPA, & 15 LBS., PER SIDE), WITH EACH ARM HOLDING A SINGLE PENDANT TYPE LUMINAIRE (NOT TO EXCEED 1.52 SQ. FT. EPA, 57 LBS., MAX.) PER THE 2013 AASHTO LTS-6 USING A 150 MPH WIND ZONE (3-SECOND GUSTS) CRITERIA FOR STREET LIGHT POLES. NOTE THAT THE TOTAL EPA OF BRACKET, (2) ARMS, & (2) LUMINAIRES DOES NOT EXCEED 5.25 SQ. FT. & THEIR TOTAL WEIGHT DOESN'T EXCEED 164 LBS. COMPLIANCE TO THE 2010 FLORIDA BUILDING CODE PROVISION 1609.1.1, EXCEPTION 7. PLEASE CONTACT & ADVISE NOV AMERON ENGINEERING IF THE INTENDED LOADING EXCEEDS THESE VALUES.
11. PER EQUATION 16-32 OF THE 2010 FBC, THE (Vult) 150 MPH WIND ZONE CORRESPONDS TO AN AASHTO (Vasd) WIND ZONE OF 147 MPH; THUS, THE AASHTO ANALYSIS USING 150 MPH WIND ZONE IS CONSERVATIVE.
APPROVED BY
DATE
NOV Ameron Pole Products
S RD A1A BROWARD COUNTY FLORIDA - FINANCIAL #433688-4-52-01
BROWARD COUNTY, FL
26ST14SPL WITH TENON ASSEMBLY
DRAWN: M.L. 07/14
CHK'D:
SCALE N.T.S.
DWG. NO. 1407-039
REV B
PRINTED BY: DIANNE GARNER
ON Wednesday, September 17, 2014

3. SR 811 NE 4th Avenue from the train tracks to NE 16th Street is segmented into two light configurations:

   Segment 1 is from the train tracks to Sunrise Boulevard. There are two rows of staggered light poles. These are concrete poles with a mix of HPS and LED lights. The HPS lights are 200W GE fixtures mounted at approximately 30 feet and the LED lights are 270W ATB2 AEL fixtures mounted at approximately 30 feet. The fixtures are mounted with 6-foot arms.

   Segment 2 is from Sunrise Boulevard to NE 16th Street. There is one row of light poles. These are concrete poles with 12-foot brackets. The lights are 333W LED fixtures mounted at 40 feet with 12-foot arms. The manufacturer is Cooper Lighting; the model is Navion. These lights were installed in 2019.

Existing Dixie Highway Lights

4. SR 838 Sunrise Boulevard from Interstate 95 to SR A1A is segmented into four lighting configurations:

   Segment 1 is from I-95 to NE 17th Way. There are two rows of staggered light poles. The light poles are aluminum with 45-foot mounting heights and 15-foot arms. The lights are 400W HPS fixtures manufactured by GE. According to record drawings, these light poles were installed in 2002.

   Segment 2 is from NE 17th Way to NE 20th Avenue. There are lights on each side of the road opposite each other. The light poles are aluminum with a 50-foot mounting height and a post top bracket. The fixtures are 400W HPS fixtures tilted at 45 degrees. These are manufactured by Holophane and the model is Mongoose. According to record drawings, these light poles were installed in 2005 and designed for 110 mph wind speed.

   Segment 3 is from NE 20th Avenue to Seminole Drive. There are lights on each side of the road opposite each other. The fixtures are 400W HPS lights mounted at 45 feet on the decorative poles and mounted approximately 36 feet on the power poles. The north row has decorative concrete poles with 8-foot arms and the south row has decorative fixtures mounted on joint-use power poles. The light poles here are maintained by the City. The fixture manufacturer is Lumec and model is Renaissance.

Existing Sunrise Boulevard Lights

Segment 4 is from Seminole Drive to SR A1A. There is one row of light poles on the south roadside. The light poles are aluminum poles with 45-foot mounting height and 18-foot arms. The HPS fixtures are shielded 150W lights from GE. The LED fixtures are non-shielded lights from AEL. The model is ATB2.

5. SR 842 Broward Boulevard from SW 38th St to SE 17th Avenue is segmented into 3 lighting configurations.

   Segment 1 is from SW 38th St to I-95. There are one rows of light poles on the south side of the road. The light poles are aluminum with a 45’ mounting height and a 15’ arm. The light fixtures are 400W HPS.

   Segment 1 is from I-95 interchange to US-1 Federal Highway. There are two rows of staggered light poles. The light poles are aluminum with a 45-foot mounting height and a 15-foot arm. This LED fixture is the SmartLume model manufactured by Schreder. According to record drawings, these lights were installed in 2019 and all new poles were designed for 150 mph wind speed.

Existing Broward Boulevard US-1 fixture

Segment 2 is from US-1 Federal Highway to E. 15th Avenue. There is one row of lights mounted on joint-use poles. The fixture is a 250W HPS light manufactured by GE. The mounting height is approximately 28 feet with an 8-foot arm.

6. SR 736 Davie Boulevard from US-441 to US-1 Federal Highway is segmented into three lighting configurations:

   Segment 1 is from US-441 to I-95 interchange. There is one row of light poles on the north side of the road. The poles are concrete with 15-foot arms and HPS lights mounted at 40 feet. These fixtures are 150W and manufactured by GE.

   Segment 2 is from I-95 to SW 9th Avenue. There are two rows of light poles. One row has FP&L wood poles and the other row has joint-use power poles. The wood poles have 400W HPS fixtures mounted at 45 feet with 12-foot arms. The joint use poles have a 200W HPS light mounted at 30 feet with 6-foot arm. The HPS lights are manufactured by GE.

   Segment 3 is from SW 9th Avenue to US-1 Federal Highway. There are two rows of light poles. One row has decorative concrete poles and the other row has joint use power poles. The concrete poles have 400W HPS fixtures mounted at 45-foot with 12-foot arms. The joint-use poles have a 200W HPS light mounted at 30 feet with 6-foot arm. The HPS lights are manufactured by GE.

Existing Davie Boulevard Lights

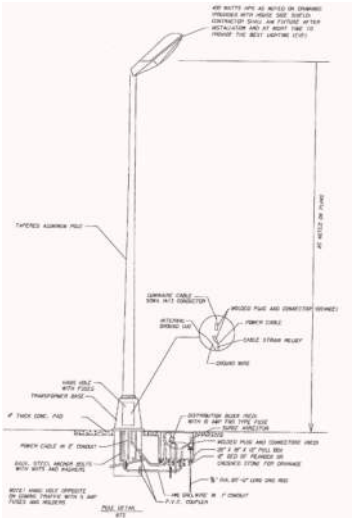
7. US-1 Federal Highway from SR 84 (Marina Mile Boulevard) to Sunrise Boulevard is segmented into two lighting configurations:

   Segment 1 is from SR 84 (Marina Mile Boulevard) to SE 17th Street. There are lights on each side of the road opposite each other. According to record drawings, these aluminum poles were installed in 2020 and designed for 160 mph wind speed. The fixtures are 170 W LED lights mounted on 8-foot brackets at 40 feet. The fixture is the ATBL model from AEL.

   Segment 2 is from SE 17th Street to Sunrise Boulevard. There is one row of light poles on the west side of the road. The light poles are concrete with 10-foot arms and fixtures mounted at 45 feet. The light fixtures are a mix of HPS and LED. The HPS fixtures are 400W HPS lights manufactured by GE. The LED lights are the ATB2 model from AEL.

8. US-1 Federal Highway from Sunrise Boulevard to Commercial Boulevard is segmented into three lighting configurations.

   Segment 1 is from Sunrise Boulevard to Oakland Park Boulevard. There is one row of light poles on the west side of the road. These light poles are aluminum with a post top mounting bracket. The light is 400W HPS mounted at 50 feet. The fixture is a Holophane Mongoose model. According to record plans, these light poles were installed in 2005 and designed for 110 mph wind speed. Information on the light feature is included below.



Segment 2 is from Oakland Park Boulevard to Floranada Road. There are light poles on each side of the road opposite each other. Both rows of are concrete light poles. These poles have 200W HPS lights mounted on 10-foot arms at 30 feet. The fixtures are manufactured by GE.

Segment 3 is from Floranada Road to Commercial Boulevard. There are light poles on each side of the road opposite each other. One row of light poles is aluminum and the other row is concrete. The lights on the aluminum poles are 400W HPS fixtures from GE. The lights on the concrete poles are 200W HPS fixtures from GE. The lights are mounted on 12-foot arms at 35 feet.

9. SR 845 Powerline Road from Commercial Boulevard to West Cypress Creek Road has one lighting configuration. The concrete light poles are on the west side of the road and have 400W HPS lights. The lights are mounted on 15-foot arms at 40 feet. These fixtures are manufactured by GE.

10. 11. Riverland Road Neighborhood is comprised of local residential streets. There are 67 streets with existing FP&L lighting. The existing lights are 70W and 100W HPS mounted at approximately 25 feet. The remaining 75 streets are unlit.

11. 12. Flagler Village is comprised of commercial and residential streets. There are 19 streets with existing lighting. Every street has HPS FP&L lights except NE 3rd Avenue and N. Andrews Avenue. These minor arterials have City- owned lights. In addition, some apartments built within 10 years in Flagler Village have incorporated the Luminis pedestrian lights on residential streets.

12. 13. The Himarshee area is comprised of commercial and residential streets. There are 20 streets with existing lighting. Every street has HPS FP&L lights except for SE 4th Avenue, SE 5th Avenue and SE 6th Avenue. Most of the fixtures are 70W HPS or 150W HPS lights mounted at approximately 25 feet. In addition, some apartments built within 10 years in Flagler Village have incorporated the Luminis pedestrian lights on residential streets.

13. 14. The Sunrise Lane Area is 2 roads: Sunrise Lane and NE 9th Street. These streets have existing LED lighting with and without shields.

2.2 Evaluation of existing lights

The review of existing lighting revealed some consistency with conventional roadway lights. Most roadways with conventional roadway lights are GE HPS lights or AEL LED lights. The outlier LED fixtures were both the Cooper Navion and Schreder SmartLume lights used at one location each. The pole types were consistently a concrete pole commonly used with FP&L services or an FDOT-standard aluminum pole. The decorative light poles and fixtures were different per roadway.

The roadways with HPS lights have LED lights sporadically placed. This results in conflicting color temperatures. HPS provides a color temperature of 3000K and LED provides a color temperature of 4000K. See the photo below for a visual difference of color temperature.

Comparison between HPS and LED lighting

The FDOT Standard Plans for FY 2021-22 provides a design wind speed of 160 mph for all new light poles on a state road in Broward County. Record plans for these roadways show that most of these lights were installed before 2020 with a wind speed less than 160 mph. US-1 from Sunrise boulevard to Oakland Park Boulevard has poles installed in 2005. Broward Boulevard segment 1 has new poles, which were installed in 2019 for 150 mph wind speed.

3.0 Existing Electrical Systems

3.1 Methodology

Kimley-Horn staff met with City Maintenance to evaluate existing load centers and service points in the lighting evaluation areas. Each electrical cabinet was reviewed for wear and tear, NEC requirements, and capacity to increase electrical load. The project team review 47 service locations with City maintenance staff to observe conditions and identify any needed repairs. Lighting limits were determined for each location.

3.2 NEC Requirements and Standard Practices

During the electrical component review, requirements from the 2017 National Electrical Code Handbook were considered. The following requirements apply to the reviewed areas:

1. The Florida Department of Transportation's standard minimum enclosure mounting height is 4 feet. We recommend mounting the enclosure at a height that is close to this standard. In locations where electrical equipment Is likely to be exposed to physical damage, enclosure or guards shall be so arranged and of such strength as to prevent such damage. (NEC 2017 Article 110.26(E)(2) & 110.27(B))
2. Working space for equipment operating at 1000V, nominal, or less (to ground) and likely to require examination, adjustment, servicing, or maintenance while energized shall comply with the dimensions set forth in section 110.26 .(NEC 2017 Table 110.26(A)(1))

Table 110.26(A)(1) Working Spaces

Nominal Voltage to Ground	Minimum Clear Distance		
	Condition 1	Condition 2	Condition 3
0–150	900 mm (3 ft)	900 mm (3 ft)	900 mm (3 ft)
151–600	900 mm (3 ft)	1.0 m (3 ft 6 in.)	1.2 m (4 ft)
601–1000	900 mm (3 ft)	1.2 m (4 ft)	1.5 m (5 ft)

Note: Where the conditions are as follows:

- Except as elsewhere required or permitted by this code, live parts of electrical operating equipment operating at 50 to 1000V nominal shall be guarded against accidental contact by approved enclosures or by any of the following means… partitions and space covers are required with panel assemblies. (NEC 2017 Article 110.27(A) & 230.62)

3. Means shall be provided to disconnect all conductors in a building or other structure from the service entrance conductors. (NEC 2017 230.70-230.76)
4. Review whether wires can handle the amp capacity. The standard wire sizes by breaker amp ratings are: #12 or higher for a 20-amp breaker. #10 for 30 amp. #6 for 50 amps. (NEC 2017 Table 310.15(B)(16))
5. An equipment grounding conductor shall be run with the supply conductors and be connected to the building or structure disconnecting means and to the grounding electrode. (NEC 2017 250.32(B))
6. Rusted condition - NEMA4x enclosures need to be used at the coastal area. More than 3 years duration. NEMA 3R enclosures are not adequate for coastal locations. Table 110.28 shall be used for selecting enclosures in specific locations. (NEC 2017 Table 110.28)

3.3 Common Electrical Components

The City has a variety of service points used for lighting. A total of 47 service points were reviewed. There are two types of service points commonly used in the City: a fusible disconnect switch and large load center. The small service point is used at 480-volt utility service connection where up to three circuits can be powered. These circuits power long segments of roadway lights and have capacity for three 60-amp circuits with a manual switch as well as a photocell. Many of these locations are not metered from the utility company. During the maintenance field review, 17 small service points were observed. Six of these service points showed signs of corrosion. The images below show a fusible

disconnect which acts as a switch for the system it is tied into. The image on the right is showing a disconnect which is acting as a main service disconnect, which means it is the switch that controls the main power for the load center it is attached to. These disconnects provide a wide range of overcurrent protection, as the fuses can be adjusted/sized to meet the necessary requirements.

The image below shows an electrical panel used to control multiple circuits. These panels provide the City with the ability to power many circuits from one enclosure. The capacity of these enclosures varies based on the frame and power supplied. The ampacity of the enclosed breakers can be chosen depending on the circuit requirements and is not fixed. This allows for many different types of load to be fed from a single panel. This type of enclosure is very common and is a staple in any electrical install.

The larger service points can be described as load centers. Load centers are typically 240/480 volts or 120/240 volt electrical panels with the capacity to power more than three circuits. Typical load centers have one or two spare circuits and a hand-off automatic selector switch. These panels can be used to power many lights and receptacles.

Load centers are commonly installed on state roads and are metered by the utility provider. During the maintenance field review, 30 load centers were observed. Out of the 30 load centers, 13 were showing signs of corrosion. See images below for examples of load centers housing a lighting controller in form of a contactor. These load centers come in different configurations and can be customized to meet the needs of the City.

3.4 Maintenance Concerns

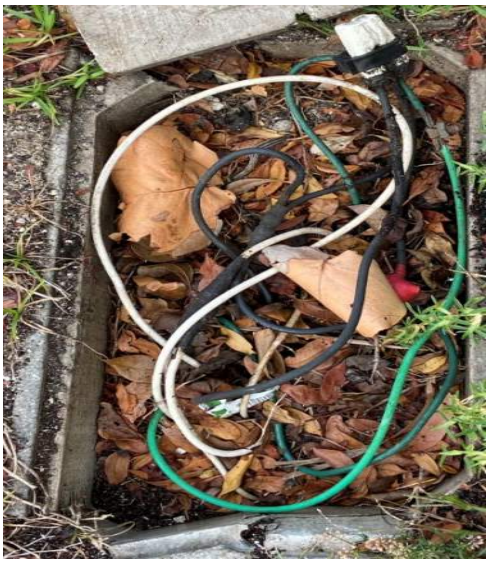
Close to half of the inspected load centers showed signs of corrosion in some form. Most of the signs were oxidization on the neutral and ground buses bars, rust/oxidization on the conduit connectors tying into the box, sections of rust around the panels, and signs of oxidization on the visible lugs inside the load center. These signs could lead to many issues; the oxidization on the lugs and buses could lead to a separation between the conductors and the metal buses/lugs. This separation could lead to arcing or shorting, which pose a larger threat than simple corrosion. This corrosion could also lead to the inability to work on or maintain the load centers, as the lugs and screws could become seized and no longer workable. The image below shows the rust on the enclosure and the visible oxidization on the grounding bushing in a load center that was inspected.

Another concern is the state of some of the conduits around the City. Most of the rigid metallic conduit used seem to have acquired a substantial amount of rust since installation. This poses a structural concern because, as seen in these photos, the conduit can rust to the point that it becomes brittle and breaks easily. In addition to the rust concern, the small service centers showed some severe structural issues and some had pipes fall out. It appears the knockout used to secure the pipe became so rusted it

gave way and the conduit was essentially held up by the conductor that was run inside. This could pose a serious issue if the conductor were cut or pulled out of the lug securing it inside the load center. See the images below for examples of these conduit issues.

There were a few panels that did not have blanks in the spot of spaces. These blanks act as covers for the busbar behind them and help prevent accidental contact to the bus. This is important because the main bus bar is energized if the main is engaged. It also appears that some of the panels were also lacking the “deadpan” or “deadfront” that covers the breakers and main bus bar. This cover is a necessity, as it prevents the exposure of the live copper and aids in preventing accidental contact with energized components. All panels need to have these two safety features for compliance with National Electric Codes. The image on the right is difficult to make out but shows there is no cover for the breakers or bus bar in the panel. If someone were access the panel, there would be nothing to prevent making contact with the energized copper bus. Refer to section 3.2(#3-5) for NEC implications.

A final concern to consider is the amount of clutter seen in the various inground junction boxes. The wiring connections are not clean and the boxes inspected had unnecessary trash and foreign objects. These boxes should ideally be kept clean and workable. One box we investigated was full of leaves, which poses a fire hazard. The images below show best and worst-case scenarios from the boxes inspected. The image on the left shows a trash-free box with wires that can be easily worked on. The image on the right shows a box that is full of leaves and debris, which pose an unnecessary risk that can be avoided if it is instead kept clean.



No breakers were observed to be tripped and there were no reports of breakers tripping during the inspections, however, all breakers have a shelf life. As mechanical devices, internal components can wear out over time. Breakers that have been in use for extended periods of time should be replaced as a preventative maintenance step.

4.0 Existing Light Level Review

4.1 Methodology

The City has chosen preliminary areas to review for lighting conditions. The following roadways have existing lighting systems and were reviewed against applicable lighting criteria.

Study Area	Boundary	Governing Criteria	Criteria		
			Criteria Value		
			Average (fc)	Uniformity Ratio	Veiling
Las Olas Blvd.	Brickell Ave. to SE 6th Ave.	Florida Greenbook	1.1	4:1 avg/min	0.4:1
	SE 6th Ave. to SE 16th Ave.	Florida Greenbook	1.1	4:1 avg/min	0.4:1
	SE 16th Ave. to S Birch Rd.	FDOT	1.0	4:1 avg/min 10:1 max/min	0.3:1

Study Area	Boundary	Governing Criteria	Criteria		
			Criteria Value		
			Average (fc)	Uniformity Ratio	Veiling
	S. Birch Rd. to S Fort Lauderdale Beach Blvd.	FDOT	1.0	4:1 avg/min 10:1 max/min	0.3:1
SR A1A/ N Ocean Blvd.	SE 5th St. to Sunrise Blvd.	*UNDER DESIGN, OMITTED FROM STUDY*			
	Sunrise Blvd. to NE 18th St.	FDOT	1.0	4:1 avg/min 10:1 max/min	0.3:1
	NE 18th St. to Oakland Park Blvd.	FDOT	1.0	4:1 avg/min 10:1 max/min	0.3:1
	Oakland Park Blvd. to Flamingo Ave.	FDOT	1.0	4:1 avg/min 10:1 max/min	0.3:1
SR 811/ NE 4th Ave./ Dixie Hwy.	Train tracks to Sunrise Blvd.	FDOT	1.0	4:1 avg/min 10:1 max/min	0.3:1
	Sunrise Blvd. to NE 16th St.	FDOT	1.0	4:1 avg/min 10:1 max/min	0.3:1
SR 838/ Sunrise Blvd.	Interstate 95 to NE 17th Way	FDOT	1.5	4:1 avg/min 10:1 max/min	0.3:1
	Ne 7TH AVE TO NE 17TH WAY	FDOT	1.5	4:1 avg/min 10:1 max/min	0.3:1
	NE 17th Way to NE 20th Ave.	FDOT	1.5	4:1 avg/min 10:1 max/min	0.3:1
	NE 20th Ave. to Seminole Dr.	FDOT	1.0	4:1 avg/min 10:1 max/min	0.3:1
	Seminole Dr. to SR A1A	FDOT	1.0	4:1 avg/min 10:1 max/min	0.3:1
SR 842/ Broward Blvd.	Interstate 95 to US-1/ Federal Hwy.	FDOT	1.5	4:1 avg/min 10:1 max/min	0.3:1
	US-1/ Federal Hwy. to E 15th Ave.	Florida Greenbook	0.8	4:1 avg/min	0.4:1
SR 736 Davie Blvd.	US-441 to Interstate 95	FDOT	1.0	4:1 avg/min 10:1 max/min	0.3:1

Study Area	Boundary	Governing Criteria	Criteria		
			Criteria Value		
			Average (fc)	Uniformity Ratio	Veiling
	Interstate 95 to SW 9th Ave.	FDOT	1.0	4:1 avg/min 10:1 max/min	0.3:1
	SW 9th Ave. to US-1/ Federal Hwy.	FDOT	1.0	4:1 avg/min 10:1 max/min	0.3:1
US-1/ Federal Hwy.	SR 84/ Marina Mile Blvd. to SE 17th St.	FDOT	1.5	4:1 avg/min 10:1 max/min	0.3:1
	SE 17th St. to Sunrise Blvd.	FDOT	1.5	4:1 avg/min 10:1 max/min	0.3:1
	Sunrise Blvd. to Oakland Park Blvd.	FDOT	1.5	4:1 avg/min 10:1 max/min	0.3:1
	Oakland Park Blvd. to Floranada Rd.	FDOT	1.5	4:1 avg/min 10:1 max/min	0.3:1
	Floranada Rd. to Commercial Blvd.	FDOT	1.5	4:1 avg/min 10:1 max/min	0.3:1
SR 845/ Powerline Rd.	Commercial Blvd. to W Cypress Creek Rd.	FDOT	1.5	4:1 avg/min 10:1 max/min	0.3:1

The applicable lighting criteria for state roads is provided by FDOT's Design Manual (FDM). The applicable lighting criteria for non-state roads is provided by the 2018 Manual of Uniform Minimum Standards for Design, Construction and Maintenance (Florida Greenbook).

The light levels review consists of a desktop review and field review. During the desktop review, a model was developed using known lighting conditions with as-built information and field review photos. Each state road was reviewed with the FDOT's Project Suite to gather lighting plans and shop drawings. This lighting information provides lighting parameters such as light fixtures, mounting heights, arm lengths, pole locations, etc.

4.2 Anticipated Results

Once as-builts were found for roadway lighting, a model was developed for a representative segment of the roadway. If as-builts were not found within the FDOT database, a model was developed with information from the City's maintenance office, field review information, and 2021 aerial photos. The model results were compared to the criteria. Each roadway segment which did not meet the lighting criteria has been identified as an area for lighting replacement. Each roadway segment which meets criteria is identified as needing further review.

4.3 Actual Results

A field review was completed to confirm the results of the desktop review. A total of six roadways were reviewed against the desktop review. The six roadways consist of the following conditions:

- Two roadways which meet lighting criteria and as-builts were used.
- Two roadways which meet lighting criteria and as-builts were not used.
- Two roadways which do not meet lighting criteria.

Anticipated lighting results were provided to the review team for the field review. The field review was conducted June 28, 2021, by a two-person team. The results had specific point locations to verify the photometrics. These points were located at the sidewalk adjacent to the road, behind light poles and between light poles. The photometric points were measured using a light meter (Dr. Meter Digital Lux Meter, model: LX1330B).

Dr. Meter Digital Lux Meter, model: LX1330B

4.4 Results Comparison

The actual results were compared with the anticipated results to determine the accuracy for the anticipated results.

It should be noted that model results of the existing conditions are a representation of newly installed fixtures. Actual results will vary from anticipated results due to several factors. The results have a light loss factor range of 0.9 to 1.0 because the time of fixture replacement is unknown. A fixture with a light loss factor of 1.0 is considered a new fixture providing 100% lumen output. A lower light loss factor may be appropriate for lights which have not been replaced in 7 years. Even with the appropriate light loss factor used, light levels may be different is one light is off and ready for replacement. In addition, the models omit tree cover. Tree cover can significantly diminish light levels if tree limbs are not groomed to allow light on the roadway.

The following is a summary of the field review.

1. Sunrise Boulevard from I-95 to NE 17th Way: This area meets criteria in AGI32 based on the as-built plans. The lights within the as-built plans were modeled at a 1.0 light loss factor (LLF). The model and actual results varied significantly. One out of the eight readings was consistent with the AGI32 existing lighting. Based on the actual light levels, this roadway does not meet criteria.

Figure 1 Photo of Sunrise Boulevard taken June 28, 2021.

2. US-1 Federal Highway from SR 84 to 17th Street: This area meets criteria in AGI32 based on the as-builts. The lights within the as-built plans were modeled at a 1.0 LLF. The anticipated results and actual results vary slightly because two streetlights were out. The actual results show the existing lighting meets criteria.

Figure 2 US-1 Federal Highway meets criteria, based on this photo taken July 22, 2021.

3. Davie Boulevard from I-95 to US-1 Federal Highway: This area meets criteria in AGI32 based on the desktop review of the lighting design. The lights were modeled at a 1.0 LLF. The anticipated results and actual results vary slightly, but the bright spots and dark spots were the same. The actual results show a much higher average foot candles (FC). The uniformity ratios do not meet FDOT criteria based on the actual results.

Figure 3 Davie Boulevard does not meet uniformity ratio criteria based on the review on July 22, 2021.

4. Sunrise Boulevard from NE 20th Avenue to Seminole Drive: This area meets criteria in AGI32 based on the desktop review of the lighting design. The lights were modeled at a 1.0 LLF. The anticipated results and actual results vary slightly but the bright spots and dark spots were the same. The actual results show a much higher maximum values and lower minimum values. The average FC meets criteria but uniformity ratios do not meet FDOT criteria based on the actual results.

Figure 4 Sunrise Boulevard decorative lighting as documented July 22, 2021.

5. NE 4th Avenue from Sunrise Boulevard to NE 16th Street: This area does not meet criteria in AGI32 based on the desktop review of the as-built plans. The lights were modeled at a 1.0 LLF. The anticipated results and actual results are consistent but overall lower foot-candles measurements were attained. The actual results show much lower values than were expected and confirms that the criteria are not met. The lower values bring the average below the required criteria and skew the uniformity of the lights due to the tree coverage.

Figure 5 As shown in this photo taken July 22, 2021, NE 4th Avenue does not meet criteria.

6. Las Olas Boulevard from SE 16th Avenue to S. Birch Road: This area does not meet criteria in AGI32 based on the desktop review of the as-built plans. The lights were modeled at a 1.0 LLF. The actual results have much lower foot-candles measurements than was expected and the criteria is not met. The lower values bring the average below the required criteria and skew the uniformity of the lights.

Figure 6 Las Olas Boulevard does not meet criteria, as shown in this photo taken July 22, 2021.

The following table provides the existing lighting level results for each evaluation area.

Existing Conditions and Analysis							
Study Area	**Boundary**	**Luminaire Type**	**Wattage (W)**	**Average (fc)**	**Uniformity Ratio (AVG/MIN, max/min)**	**Meets FDOT Standard ?**	**Meets FL Greenbook Standard?**
Las Olas Blvd.	Brickell Ave. to SE 6th Ave.	FP&L light poles, Post Top	150, 200	WB 1.03 EB 1.94	WB 5.15, 23.50 EB 4.83, 11.25	N/A	
	SE 6th Ave. to SE 16th Ave.	Metal Halide	400	WB 3.52 EB 3.52	WB 5.03, 10.57 EB 7.12, 15.60	N/A	
	SE 16th Ave. to S Birch Rd.	Double Post Top HPS	100	WB 0.51 EB 0.63	WB 51.00,107.00		N/A

Existing Conditions and Analysis							
Study Area	**Boundary**	**Luminaire Type**	**Wattage (W)**	**Average (fc)**	**Uniformity Ratio (AVG/MIN, max/min)**	**Meets FDOT Standard ?**	**Meets FL Greenbook Standard?**
					EB 2.33, 3.81		
	S. Birch Rd. to S Fort Lauderdale Beach Blvd.	Pedestrian	61	WB 1.85 EB 1.98	WB 2.83, 9.57 EB 2.64, 9.00		N/A
SR A1A/ N Ocean Blvd.	SE 5th St. to Sunrise Blvd.	*UNDER DESIGN, OMITTED FROM STUDY*					
	Sunrise Blvd. to NE 18th St.	*RECENT DESIGN FOR ENVIRONMENTALLY SENSITIVE LIGHTING, OMITTED FROM STUDY*					
	NE 18th St. to Oakland Park Blvd.	FP&L Roadway HPS	200	NB 1.5 SB 1.47	NB 7.50, 21.00 SB 7.35, 20.00		N/A
	Oakland Park Blvd. to Flamingo Ave.	Decorative Roadway, Pedestrian	244, 96	NB >1.50FC SB >1.50FC	NB <4.00 <10.00 SB <4.00 <10.00		N/A
SR 811/ NE 4th Ave./ Dixie Hwy.	Train tracks to Sunrise Blvd.	FP&L HPS and LED	HPS: 200 LED: 270	NB 1.76 SB 2.15	WB 4.40, 10.75 EB 10.75, 27.00		N/A
	Sunrise Blvd. to NE 16th St.	Cooper Navion LED Poles	333	NB 1.43 SB 0.73	WB 28.6, 28.8 EB 4.29, 7.12		N/A
SR 838/ Sunrise Blvd.	Interstate 95 to NE 7TH AVE	GE HPS Fixture	400	WB 1.76 EB 1.77	WB 3.54, 9.20 EB 3.54, 9.20		N/A
	Ne 7TH AVE TO NE 17TH WAY	GE HPS Fixture	400	WB 2.25 EB 2.07	WB 3.75, 7.50 EB 3.45, 7.50		N/A
	NE 17th Way to NE 20th Ave.	HPS Mongoose	400	WB 2.33 EB 2.15	WB 4.66, 9.00 EB 4.30, 9.20		N/A
	NE 20th Ave. to Seminole Dr.	LUMEC HPS	400	WB 1.5 EB 1.00	WB 6.76, 8.95 EB 2.05, 2.90		N/A
	Seminole Dr. to SR A1A	LED & HPS	150	WB 0.12 EB 0.41	WB N/A EB N/A		N/A

Existing Conditions and Analysis							
Study Area	Boundary	Luminaire Type	Wattage (W)	Average (fc)	Uniformity Ratio (AVG/MIN, max/min)	Meets FDOT Standard ?	Meets FL Greenbook Standard?
SR 842/ Broward Blvd.	SW 38th Street to I-95	GE HPS	400	EB – 1.02 WB-2.39	EB – 1.32, 1.81 WB-2.33, 3.88		N/A
	Interstate 95 to US-1/ Federal Hwy.	Smartlume Schreder LED	183	EB/WB 1.86	EB/WB - 3.10, 7.33		N/A
	US-1/ Federal Hwy. to SE 17th Ave.	GE HPS Fixture on Joint-Use Pole	250	WB 0.96 EB 2.34	WB 3.20, 15.00 EB 11.70, 48.50	N/A	
SR 736 Davie Blvd.	US-441 to Interstate 95	HPS/LED Fixtures on FP&L poles	400	WB 2.3 EB 1.3	WB 2.22, 4.17 EB 5.63, 14.00		N/A
	Interstate 95 to SW 9th Ave.	HPS Fixtures on Wood and Joint-Use FP&L Poles	200, 400	WB 3.0 EB 2.5	WB 2.85, 6.60 EB 8.93, 17.79		N/A
	SW 9th Ave. to US-1/ Federal Hwy.	HPS/LED Fixtures on Joint-Use & Decorative Concrete Poles	200, 400	WB 3.0 EB 2.5	WB 2.85, 6.60 EB 8.93, 17.79		N/A
US-1/ Federal Hwy.	SR 84/ Marina Mile Blvd. to SE 17th St.	ATBL-A/LED Fixtures	170	NB 2.09 SB 1.54	NB 2.32, 3.78 SB 3.08, 7.20		N/A
	SE 17th St. to Sunrise Blvd.	HPS/LED W Side Poles	HPS: 400	NB 0.72 SB 2.07	NB 3.60, 9.00 SB 6.90, 16.33		N/A
	Sunrise Blvd. to Oakland Park Blvd.	Post Top HPS Holophane Mongoose (High Tilt)	400	NB 1.11 SB 1.71	NB 3.70, 17.67 SB 2.14, 3.88		N/A
	Oakland Park Blvd. to Floranada Rd.	Roadway HPS	200	NB 0.8 SB 0.9	NB 4.00, 11.50 SB 3.03, 7.33		N/A
US-1/ Federal Hwy.	Floranada Rd. to Commercial Blvd.	Roadway HPS/LED	400, 200	NB 0.8 SB 0.9	NB 4.00, 11.50 SB 3.03, 7.33		N/A

Existing Conditions and Analysis							
Study Area	Boundary	Luminaire Type	Wattage (W)	Average (fc)	Uniformity Ratio (AVG/MIN, max/min)	Meets FDOT Standard ?	Meets FL Greenbook Standard?
SR 845/ Powerline Rd.	Commercial Blvd. to W Cypress Creek Rd.	Roadway HPS	400	NB 1.3 SB 3.5	NB 3.25, 8.50 SB 5.09, 11.14		N/A

Study Area	Luminaire Type	Wattage (W)	Meets FDOT Standard?	Meets FL Greenbook Standard?
Riverland Rd. Neighborhood	Roadway HPS	70 and 100	N/A	
Flagler Village Area	Roadway HPS and Post Top	70, 150, 200 and 110	N/A	
Himarshee Area	Roadway HPS and Post Top	70, 150, 200 and 110	N/A	
Sunrise Lane Area	Roadway LED	133	N/A	

5.0 City's Roadway Lighting Policy

5.1 Applicable Policies

The project team reviewed the City's current policies and standards from three locations:

1. City Engineering Standard Details
2. Code of Ordinances of the City of Fort Lauderdale
3. Unified Land Development Code (ULDR)

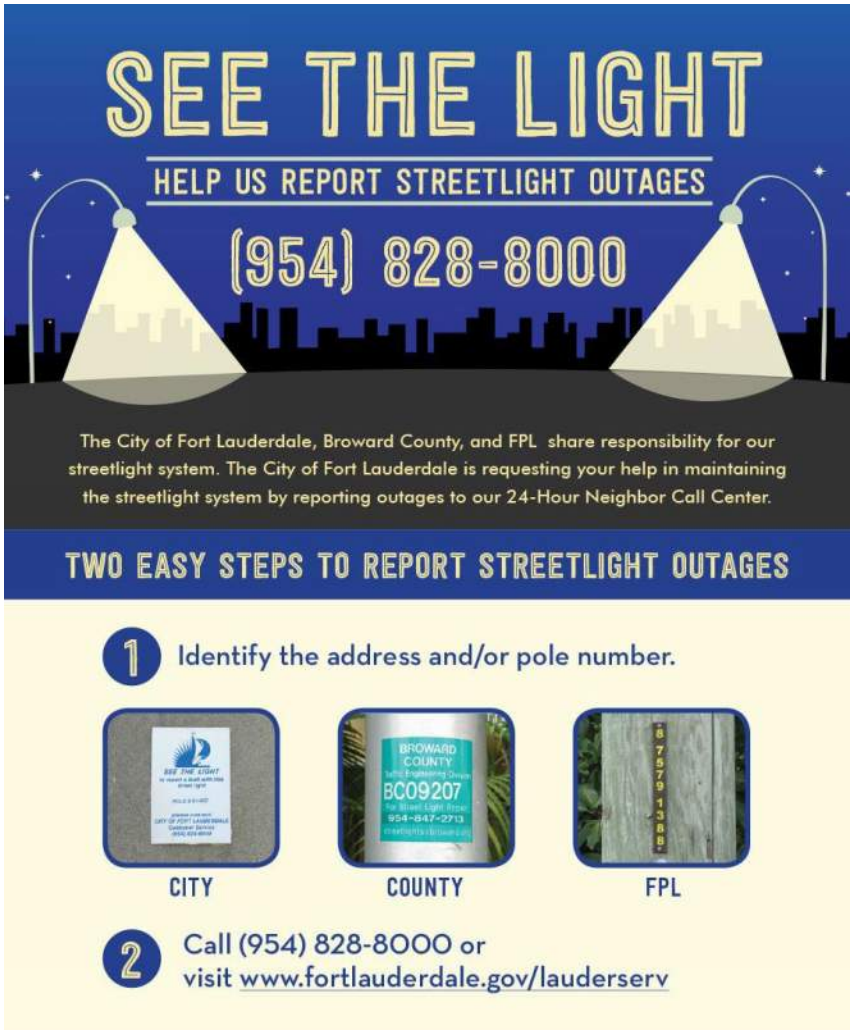
In the City's Code of Ordinances, there are two policies explaining lighting and electrical requirements. The *Code of Ordinance, Chapter 6, Article III. Division 2 – Beach Area Artificial Lighting Restrictions* explains the restrictions of placing lights near the coast for new and existing conditions. The *Code of Ordinance, Chapter 25, Article IV. Poles, Wires and Conduits* provides guidance for placing and removing poles and wires.

In the Unified Land Development Code, there are two sections which explain lighting policies. The *Unified Land Development Code, Article II, Section 47-14.30 – Minimum Design Standards* explains the lighting, light pole standards, and electrical wiring requirements for the General Aviation Districts. The

Unified Land Development Code, Article III, Section 47-20.14 – Lighting of Parking Facilities explains the requirements of lighting a parking lot or parking garage.

The City has an existing light outage program. The streetlight outage program allows anyone to report outages to the 24-hour neighbor call center. There are two steps to report an outage:

1. Identify the address and/or pole number.
2. Call (954) 828-8000 or request service online via https://www.fortlauderdale.gov/lauderserv.



5.2 Roadway Lighting

The City of Fort Lauderdale has no additional policies for roadway lighting. The FDOT provides the Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways, also known as the Florida Greenbook. This manual provides criteria for roadways off the state highway system. The Florida Greenbook recommends the illuminance method as the preferred method of measurement for roadway lighting. The veiling luminance ratio is a measurement of glare for roadway lighting. The illuminance and veiling luminance design values are summarized in Table 1. FL Greenbook Summarized Lighting Criteria, below.

Roadway and Walkway Classification	Off-Roadway Light Sources	Illuminance method		Veiling Luminance Ratio
	General Land Use	Average Maintained Illuminance (Horizontal) R3 pavement	Illuminance Uniformity Ratio	Lv(max)/Lavg(max)
		Foot-candles (min)	Avg/min (max)	
Principal Arterials	Commercial	1.6	3:1	0.3:1
	Intermediate	1.2	3:1	0.3:1
	Residential	0.8	3:1	0.3:1
Minor Arterials	Commercial	1.4	4:1	0.3:1
	Intermediate	1.0	4:1	0.3:1
	Residential	0.7	4:1	0.3:1
Collectors	Commercial	1.1	4:1	0.4:1
	Intermediate	0.8	4:1	0.4:1
	Residential	0.6	4:1	0.4:1
Local	Commercial	0.8	6:1	0.4:1
	Intermediate	0.7	6:1	0.4:1
	Residential	0.4	6:1	0.4:1
Pedestrian ways and bicycle ways	All	2.0	3:1	N/A

Table 1. FL Greenbook Summarized Lighting Criteria

6.0 Conclusion

- The review of existing conditions for the 15 evaluation areas showed that FP&L owns and maintains 10,766 streetlights and provides power to 4,033 City-owned streetlights.
- The streetlights in 14 of the evaluation areas are majority high pressure sodium roadway fixtures.
  14 out of 15 evaluation areas had existing lighting. The light level review showed that light levels do not meet FDOT or Florida Greenbook criteria for those 15 evaluation areas.