Park Hills Street Lighting

Infrastructure Committee

Karl Oberjohn, Chair

December 10, 2018

Outline

- LED lighting technology
- Park Hills street light inventory
- Duke Energy LED street lighting proposals
- Next steps

LED lighting technology

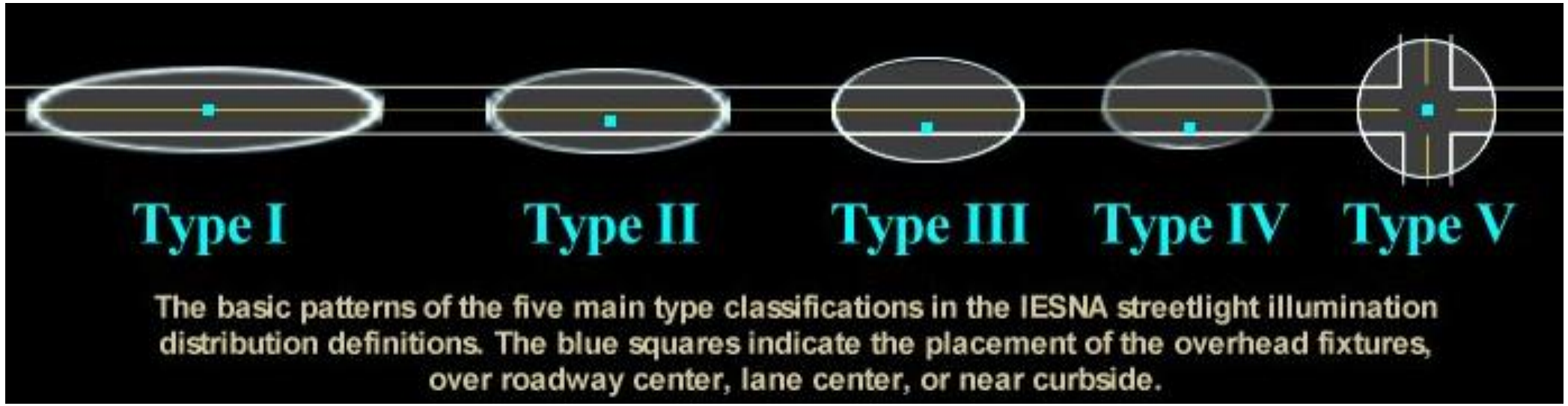
LED Street Lighting – Overview

- Current street lighting technology will be obsolete soon, to be replaced by LEDs (Light Emitting Diodes)
- Benefits of LEDs
  - Reduced energy usage (50% or greater energy savings)
  - Long life (up to 5X as long as older technology)
  - Monthly bills reduced by 1/3 to 1/2
- Concerns about LEDs
  - Poorly-designed lighting retrofits produce unintended consequences
    - Glare
    - Light pollution
  - Debate about “blue light” effect on circadian rhythms of humans and wildlife

Street Lighting Design Considerations

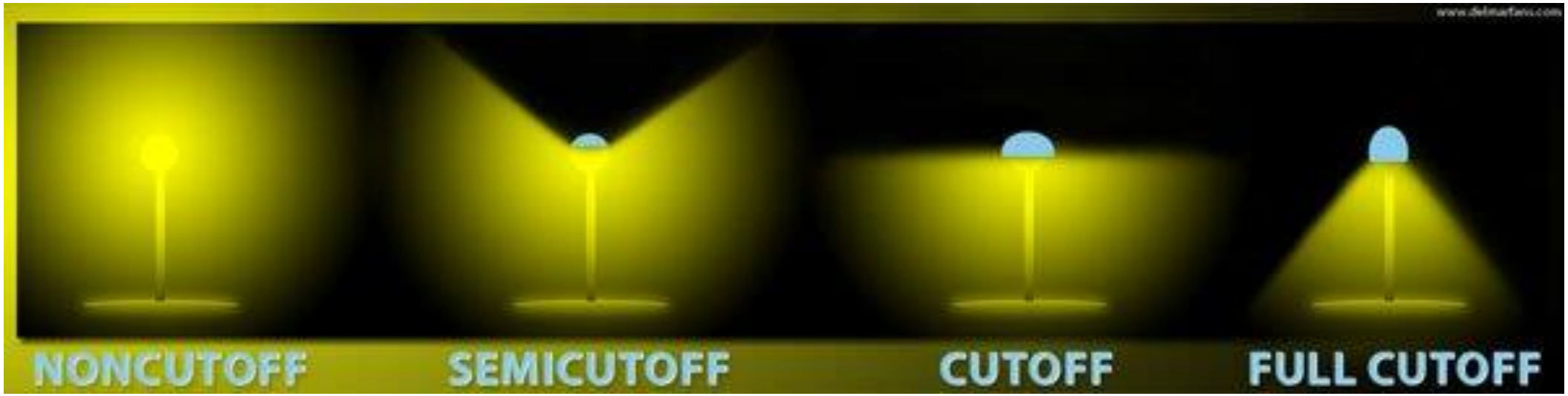
- Light distribution classification
  - Type I, II, III, IV, or V
- Light cutoff classification
  - Non-cutoff
  - Semi-cutoff
  - Cutoff
  - Full cutoff
- Correlated Color Temperature (CCT)
  - 2700/3000 K – Warm white
  - 4000 K – Neutral/cool white

IESNA Lighting Distribution Classifications



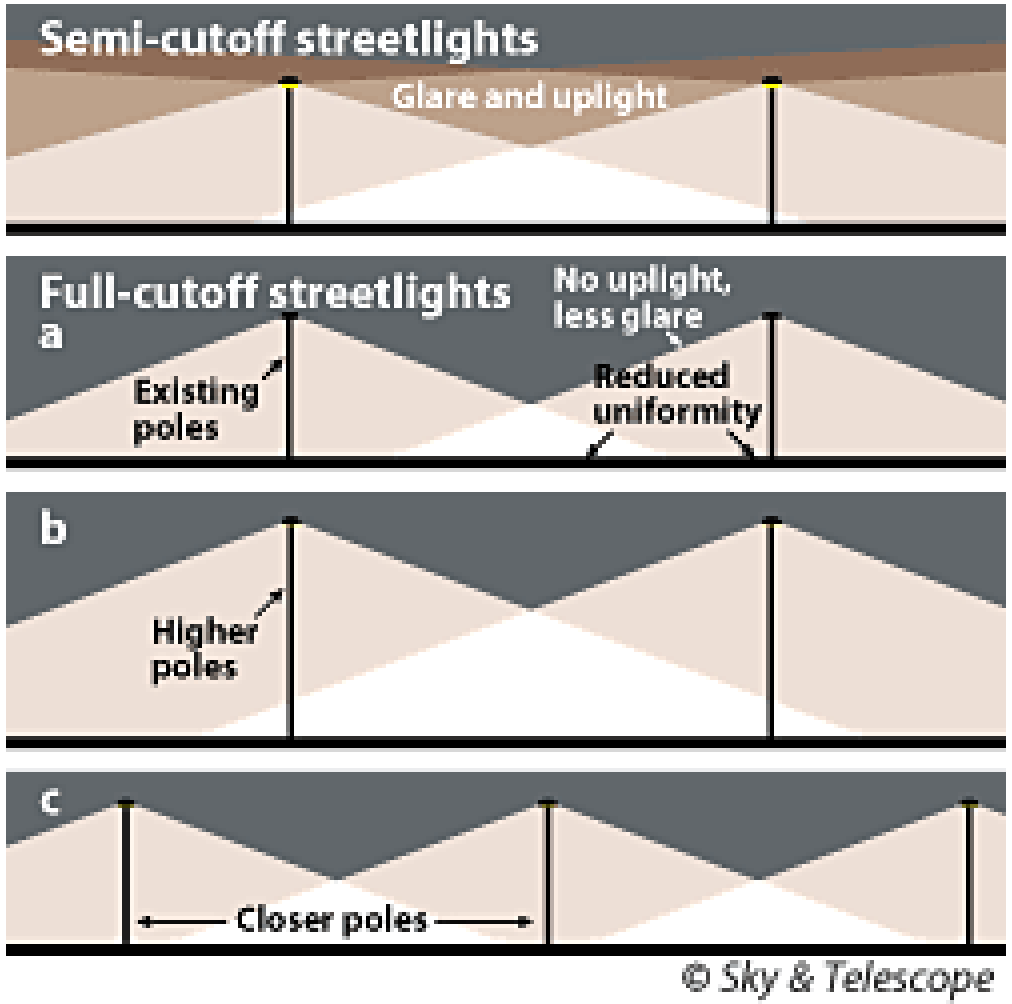
The basic patterns of the five main type classifications in the IESNA streetlight illumination distribution definitions. The blue squares indicate the placement of the overhead fixtures, over roadway center, lane center, or near curbside.

IESNA Lighting Cutoff Classifications



Lighting Cutoff Tradeoffs

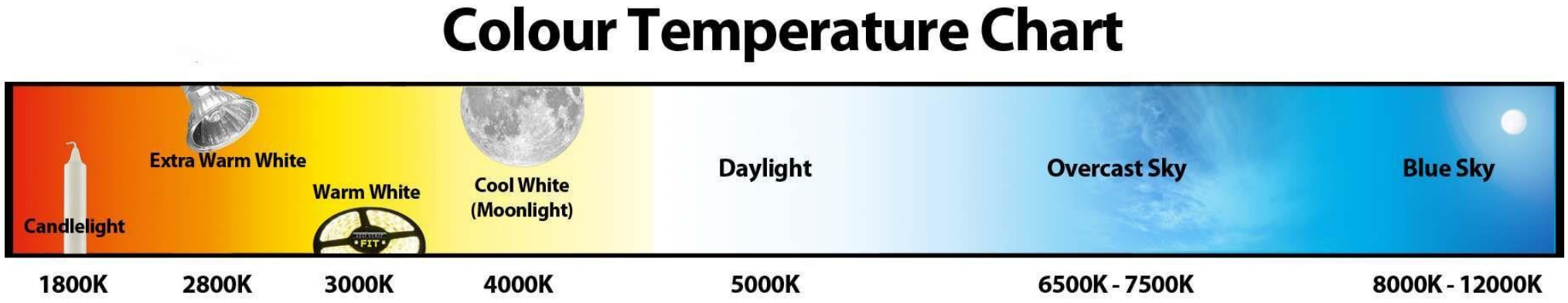
- Semi-cutoff streetlights
  - Pro: Greater light dispersion may offer better compatibility with existing poles
  - Con: Glare and uplight
- Full-cutoff streetlights
  - Pros: No uplight or unwanted spill light, less glare
  - Con: May require higher poles or more-closely spaced poles to achieve uniform lighting



LED lighting offers good cutoff capabilities

Dennis Griffin Stadium
Covington Catholic High School

Correlated Color Temperature (CCT)

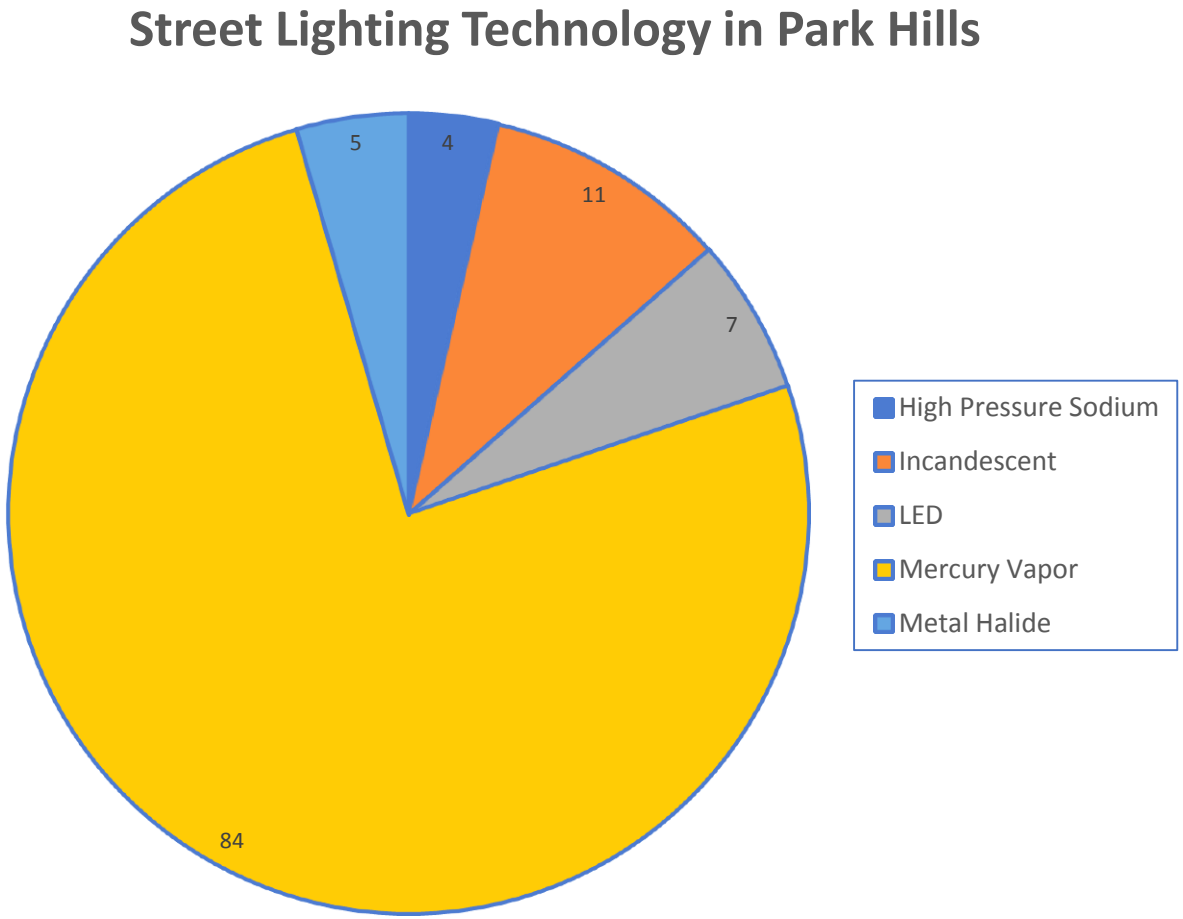


Warm White vs. Cool White

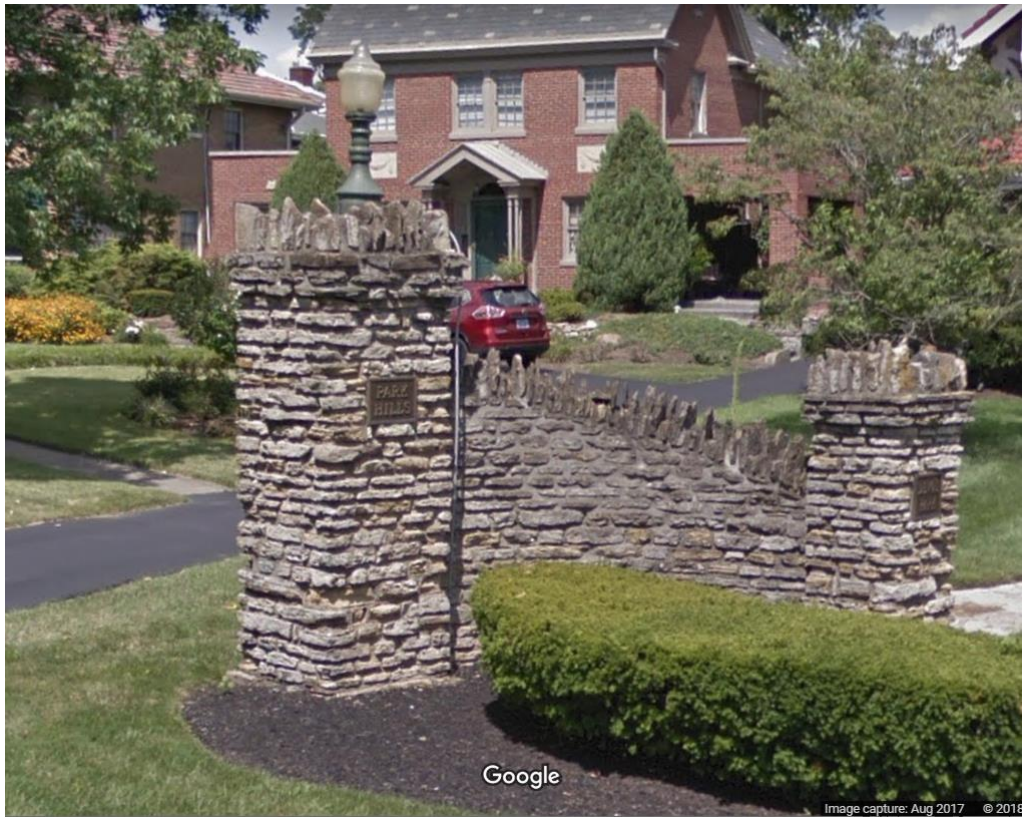
Park Hills street light inventory

Duke Energy Street Light Inventory for Park Hills

- 111 light fixtures in Park Hills
  - 91 street lights
  - 20 other uses
  - All owned and maintained by Duke Energy
- 90% use outdated technology
  - Mercury vapor
  - Incandescent
  - Metal halide
  - High-pressure sodium



11 Old (Incandescent) Acorn-style Post-top Fixtures along Park, Cleveland, and Audubon



7 New (LED) Acorn-style Post-Top Fixtures along Dixie Highway

About 91 Cobra-style Street Lights

Lights in Park Hills, KY

Legend

Mounting Support Type

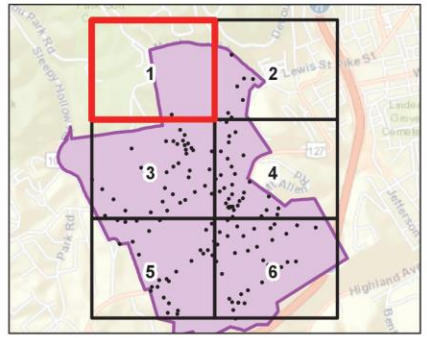
- Flood (0)
- Other/Not Listed/Unknown (0)
- Post Top (0)
- Street/Parking Lot (1)

Material By Pole Type

- Decorative Pole, Aluminum (0)
- Decorative Pole, Unknown (0)
- PAD, Fiberglass (0)
- Pole, Unknown (0)
- Pole, Wood (1)

Account Status

- Account Is Matched (1)
- No Matched Account (0)
- Not Company Owned (0)
- Map Grid
- City Extent



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DUKE ENERGY

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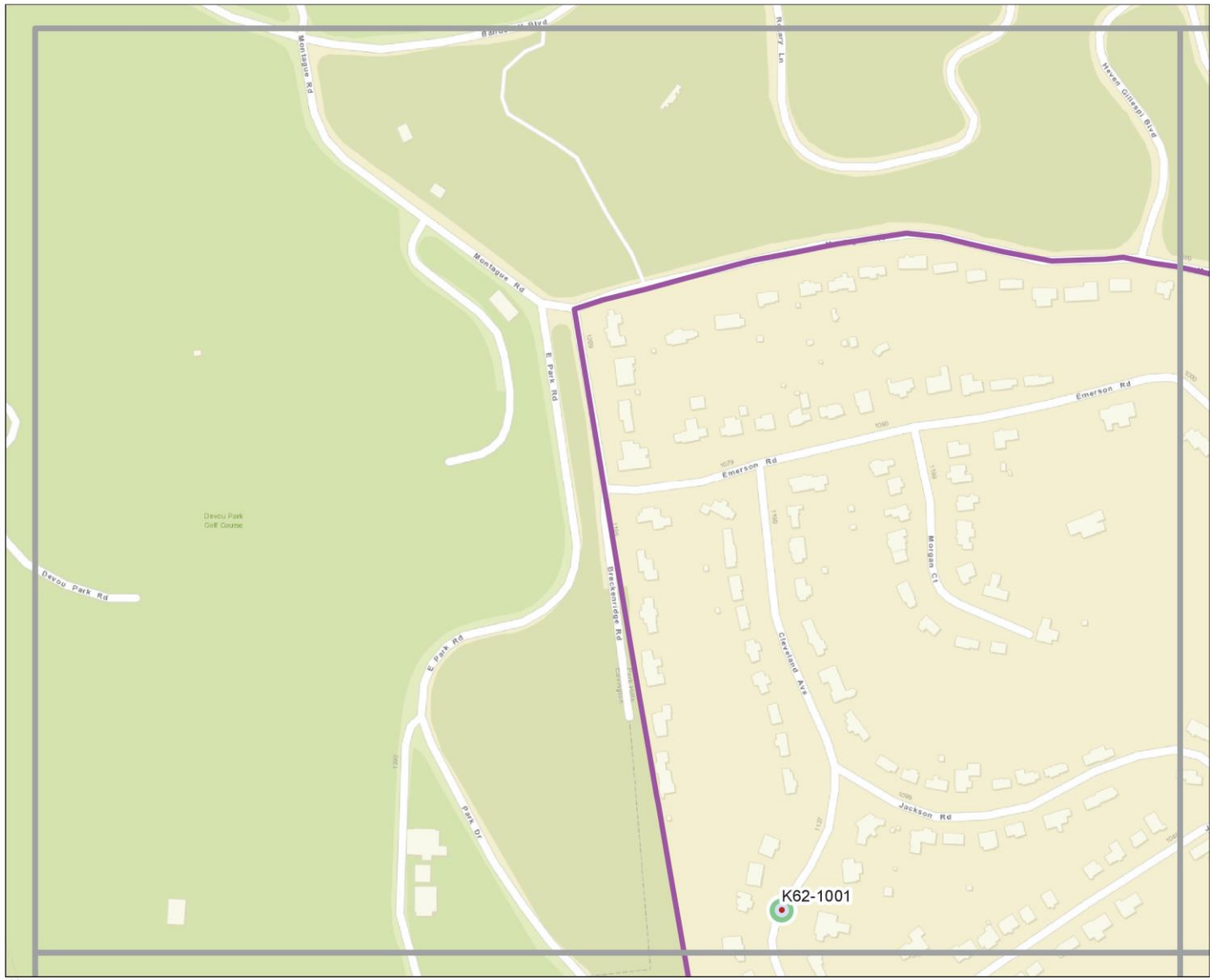


Lights in Park Hills, KY

Legend

Mounting Support Type

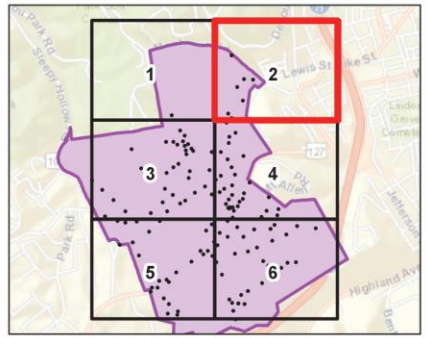
- Flood (1)
- Other/Not Listed/Unknown (7)
- Post Top (0)
- Street/Parking Lot (1)

Account Status

- Account Is Matched (9)
- No Matched Account (0)
- Not Company Owned (0)
- Map Grid
- City Extent

Material By Pole Type

- Decorative Pole, Aluminum (0)
- Decorative Pole, Unknown (0)
- PAD, Fiberglass (0)
- Pole, Unknown (0)
- Pole, Wood (9)



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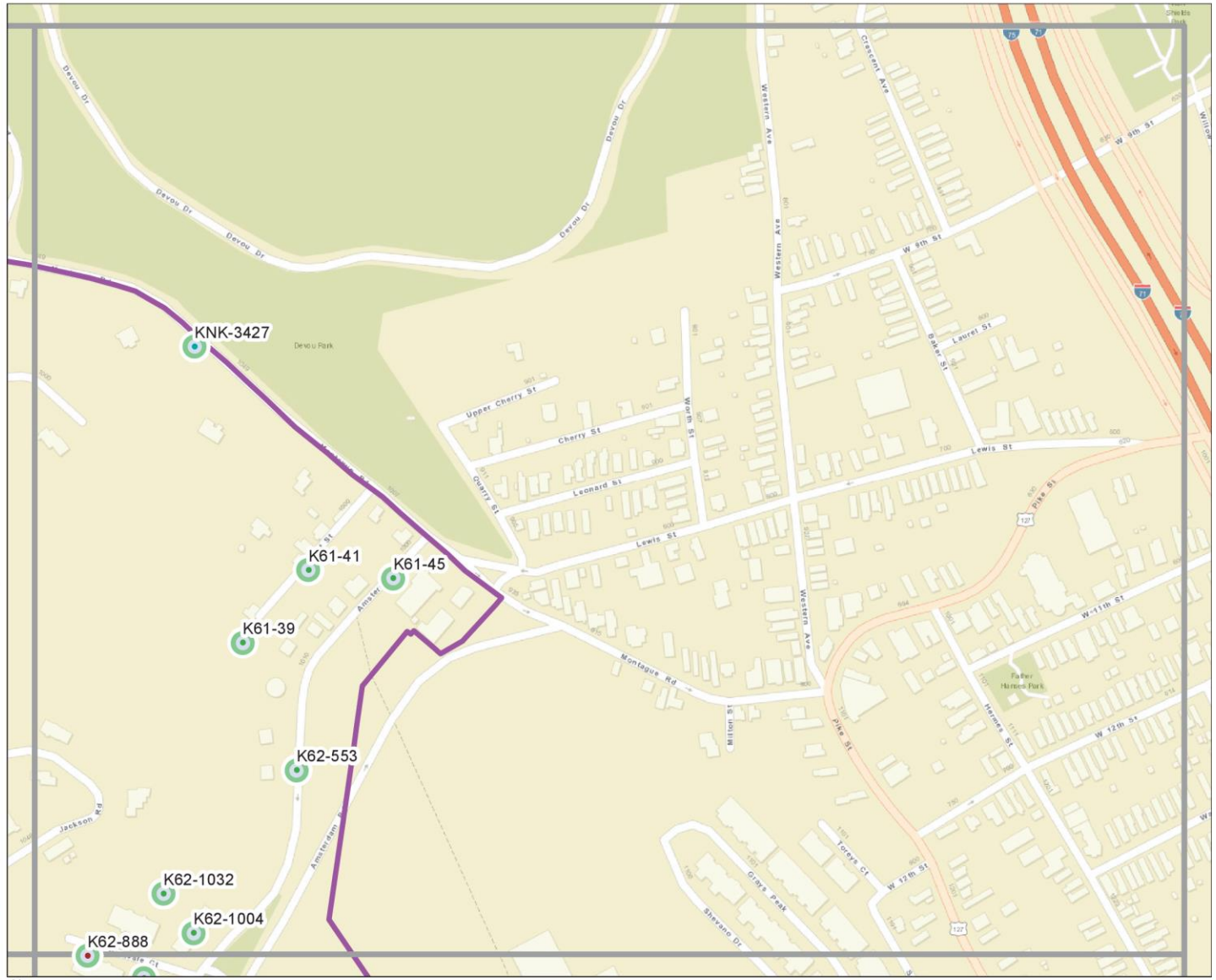


Lights in Park Hills, KY

Legend

Mounting Support Type

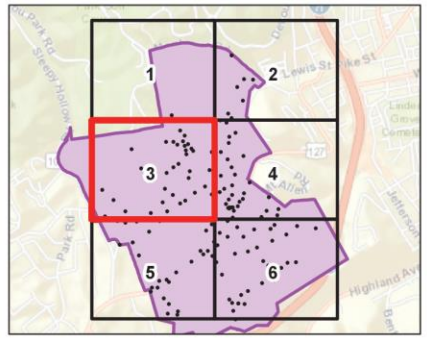
- Flood (0)
- Other/Not Listed/Unknown (38)
- Post Top (0)
- Street/Parking Lot (2)

Account Status

- Account Is Matched (30)
- No Matched Account (12)
- Not Company Owned (0)
- Map Grid
- City Extent

Material By Pole Type

- Decorative Pole, Aluminum (0)
- Decorative Pole, Unknown (12)
- PAD, Fiberglass (0)
- Pole, Unknown (4)
- Pole, Wood (25)



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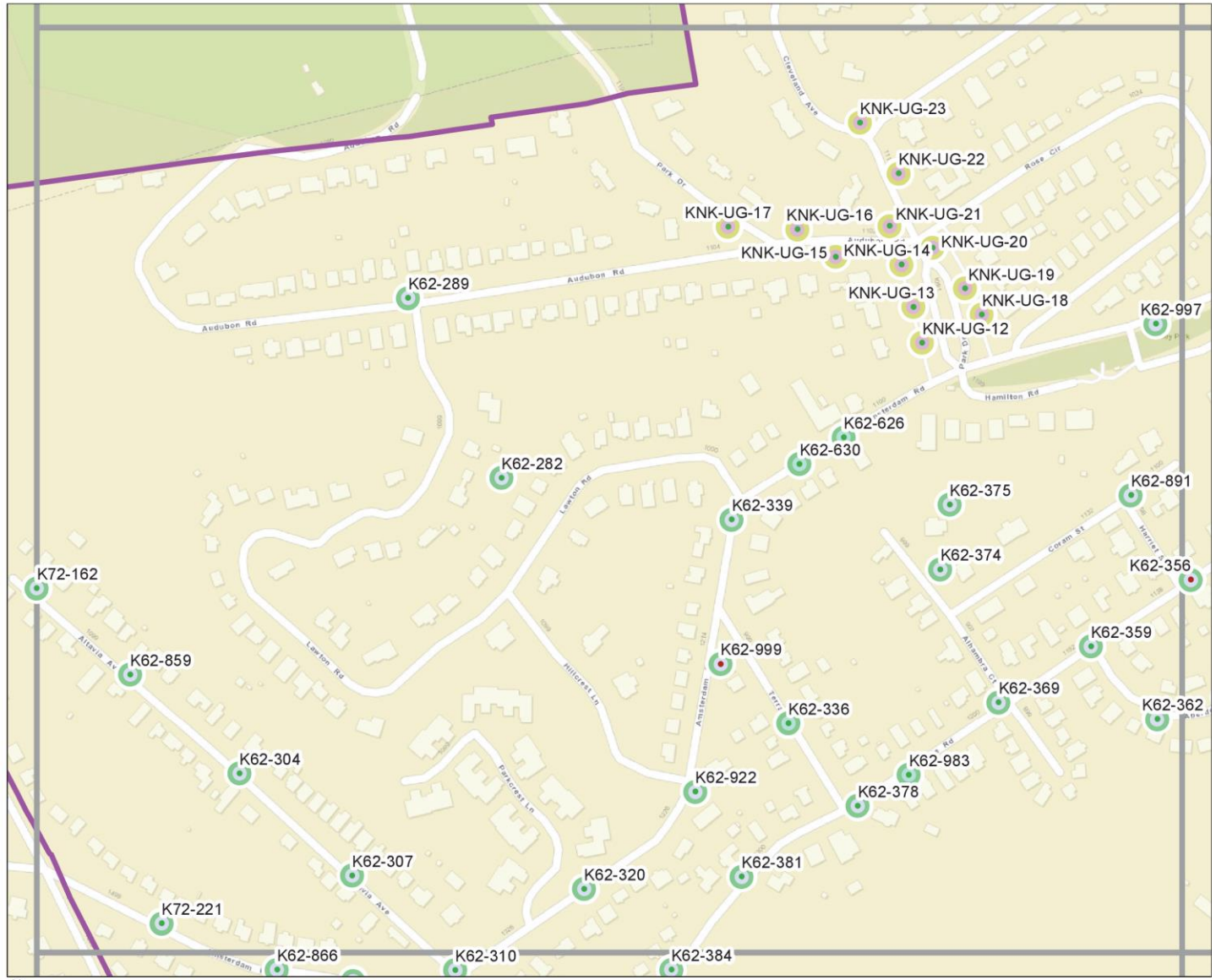


Lights in Park Hills, KY

Legend

Mounting Support Type

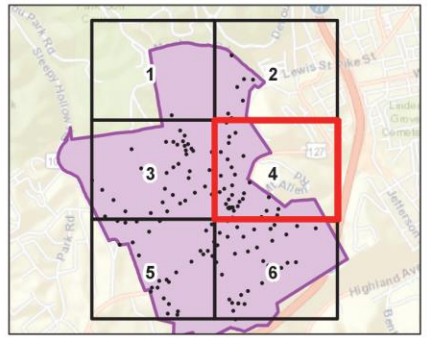
- Flood (1)
- Other/Not Listed/Unknown (32)
- Post Top (3)
- Street/Parking Lot (3)

Account Status

- Account Is Matched (37)
- No Matched Account (0)
- Not Company Owned (2)
- Map Grid
- City Extent

Material By Pole Type

- Decorative Pole, Aluminum (3)
- Decorative Pole, Unknown (2)
- PAD, Fiberglass (0)
- Pole, Unknown (8)
- Pole, Wood (26)



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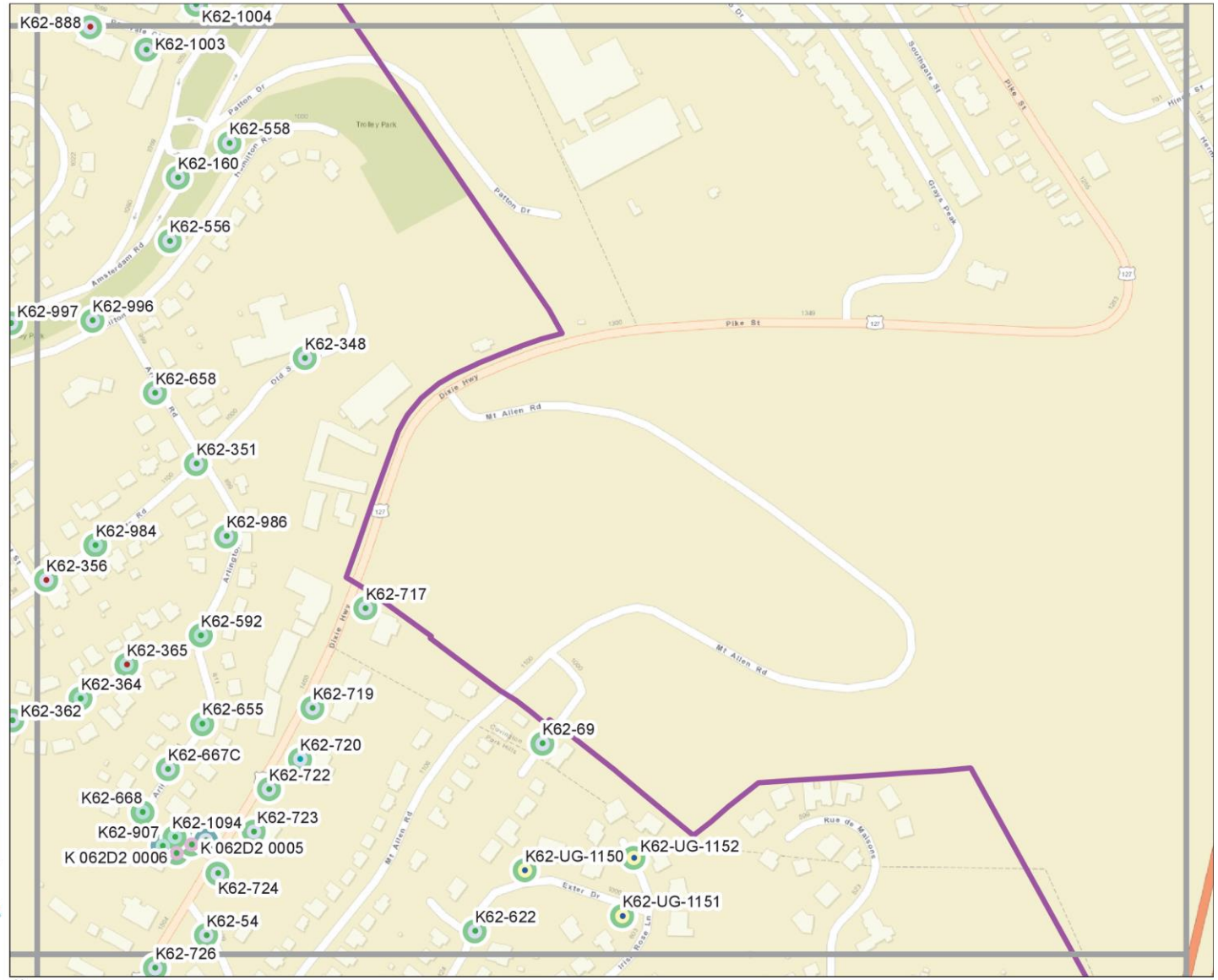


Lights in Park Hills, KY

Legend

Mounting Support Type

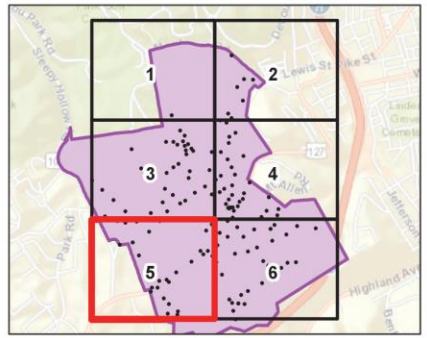
- Flood (3)
- Other/Not Listed/Unknown (22)
- Post Top (0)
- Street/Parking Lot (6)

Account Status

- Account Is Matched (31)
- No Matched Account (1)
- Not Company Owned (0)
- Map Grid
- City Extent

Material By Pole Type

- Decorative Pole, Aluminum (0)
- Decorative Pole, Unknown (0)
- PAD, Fiberglass (0)
- Pole, Unknown (0)
- Pole, Wood (32)



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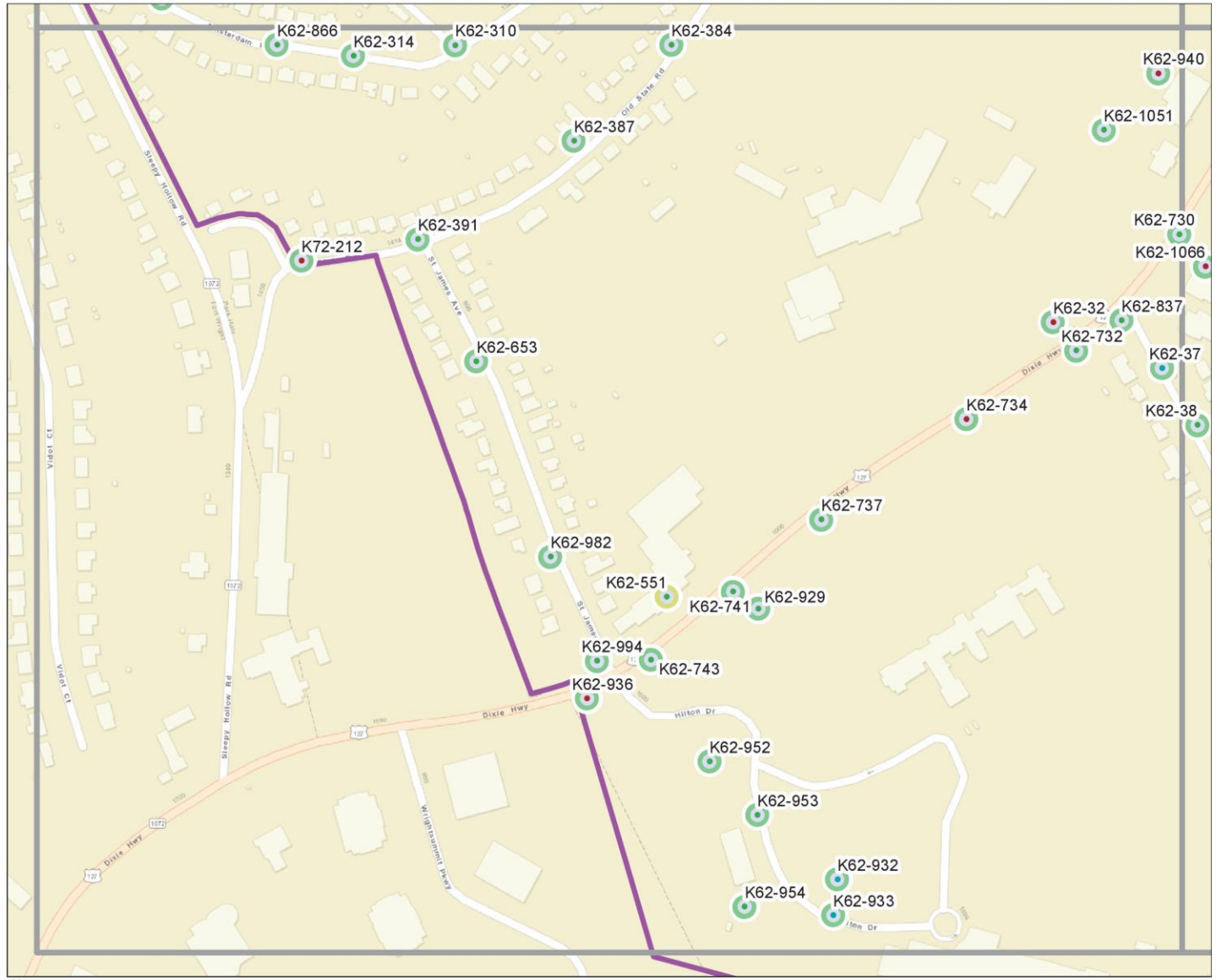


Lights in Park Hills, KY

Legend

Mounting Support Type

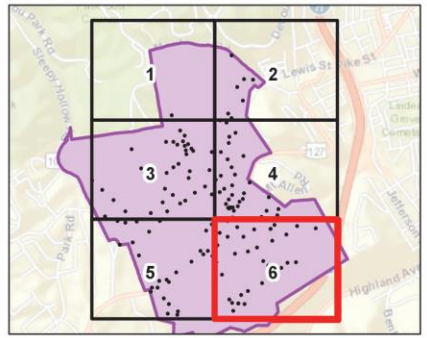
- Flood (1)
- Other/Not Listed/Unknown (32)
- Post Top (3)
- Street/Parking Lot (4)

Account Status

- Account Is Matched (39)
- No Matched Account (0)
- Not Company Owned (1)
- Map Grid
- City Extent

Material By Pole Type

- Decorative Pole, Aluminum (2)
- Decorative Pole, Unknown (0)
- PAD, Fiberglass (1)
- Pole, Unknown (11)
- Pole, Wood (26)



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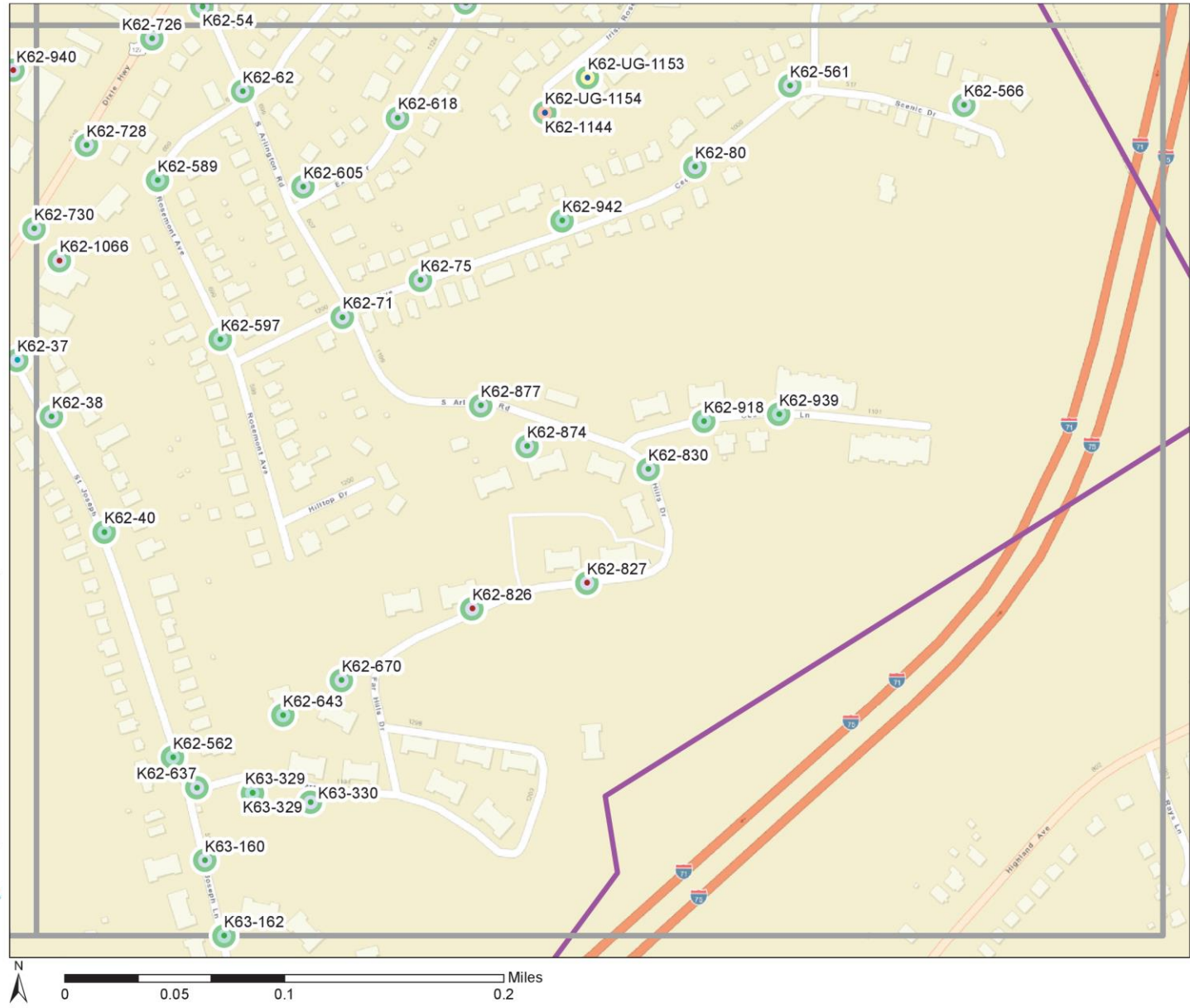
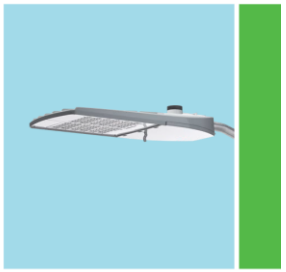


Duke Energy
LED street lighting proposals

Roadway LED

Outdoor Lighting

Roadway LED



Subject to variance from manufacturer. Contact us for region-specific details.

The Roadway LED is a green solution and great fit for streets, roads, long, narrow areas and parking lots. This energy-efficient luminaire delivers the light where it is needed while increasing visibility and reducing spill light to adjoining properties. Choose low to medium light output on wood or fiberglass poles (or mount on an existing pole). Available with one to four fixtures per pole, depending on the fixture/pole combination selected.

LED *(Light Emitting Diode)*	50 | 70 | 110 | 150 | 220 | 280 watts
Mounting heights	15', 20', 25', 30', 35'
Colors	Bronze Black Gray Green
Poles	Style A Wood
Applications	Neighborhoods Parks Streets Parking lots Businesses

For additional information, visit
duke-energy.com/OutdoorLighting
or call us toll free:
800.544.6900 (OH and KY)
800.521.2232 (IN)

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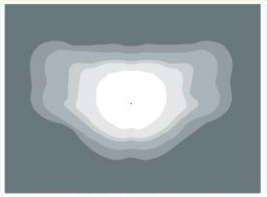
Outdoor Lighting

Roadway LED

Light source: LED *(white)*
Wattage: 50 | 70 | 110 | 150 | 220 | 280
Lumens: 4,500 | 6,500 | 9,500 | 12,500 | 18,500 | 24,000
Light pattern: IESNA Type III *(oval)*
IESNA cutoff classification: Full cutoff
Color temperature: 4,000K
Warm-up and restrike time: Instant on *(no warm-up or restrike time)*



light distribution pattern

Poles available:

Name	*Mounting height*	*Color*
Aluminum	15', 20', 25', 30', 35'	Bronze Black Gray Green
Wood	Various	Standard

Features	Benefits
Little to no upfront capital cost required	Frees up capital for other projects
Design services by lighting professionals included	Meets industry standards and lighting ordinances
Maintenance included	Eliminates high and unexpected repair bills
Electricity included	Less expensive than metered service
Warranty included	Worry-free
One low monthly cost on your electric bill	Convenience and savings for you
Turnkey operation	Provides hassle-free installation and service
Backed by over 125 years of experience	A name you can trust today … and tomorrow

Acorn LED

Outdoor Lighting

Acorn LED

Subject to variance from manufacturer. Contact us for region-specific details.

The Acorn LED is an energy-efficient luminaire, designed with the look of a traditional favorite. This green solution will complement any neighborhood or park with its classic, elegant design.

LED *(Light Emitting Diode)*	50 watts
Mounting height	12', 17' (Style B pole only)
Colors	Black Green
Poles	Style A, B, C, D, E, F
Applications	Neighborhoods Parks Streets Businesses

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Outdoor Lighting

Acorn LED

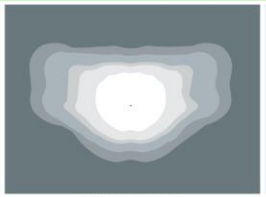
Light source: LED *(white)*
Wattage: 50
Lumens: 4,500

Light pattern: IESNA Type III *(oval)*

IESNA cutoff classification: Non-cutoff

Color temperature: 4,000K

Warm-up and restrike time: Instant on *(no warm-up or restrike time)*



light distribution pattern

Pole available:

Name	*Mounting height*	*Color*
Aluminum	12', 17' (Style B pole only)	Black Green

Features	Benefits
Little to no upfront capital cost	Frees up capital for other projects
Design services by lighting professionals included	Meets industry standards and lighting ordinances
Maintenance included	Eliminates high and unexpected repair bills
Electricity included	Less expensive than metered service
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Deluxe Acorn LED

Outdoor Lighting

Deluxe Acorn LED

Subject to variance from manufacturer. Contact us for region-specific details.

The Deluxe Acorn LED is a graceful Victorian-style fixture that enhances the character and prestige of streetscapes, greenways and pedestrian areas. This energy-efficient solution limits unwanted uplight and will complement any neighborhood or park with its classic, elegant design.

LED *(Light Emitting Diode)*	50 watts
Mounting height	12', 17' (Style B pole only)
Colors	Black Green
Poles	Style A, B, C, D, E, F
Applications	Neighborhoods Parks

For additional information, visit
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or call us toll free:
800.544.6900 (OH and KY)
800.521.2232 (IN)

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Outdoor Lighting

Deluxe Acorn LED

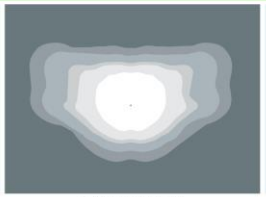
Light source: LED *(white)*
Wattage: 50
Lumens: 4,500

Light pattern: IESNA Type III *(oval)*

IESNA cutoff classification: Cutoff

Color temperature: 4,000K

Warm-up and restrike time: Instant on *(no warm-up or restrike time)*



light distribution pattern

Pole available:

Name	*Mounting height*	*Color*
Aluminum	12', 17' (Style B pole only)	Black Green

Features	Benefits
Little to no upfront capital cost required	Frees up capital for other projects
Design services by lighting professionals included	Meets industry standards and lighting ordinances
Maintenance included	Eliminates high and unexpected repair bills
Electricity included	Less expensive than metered service
Warranty included	Worry-free
One low monthly cost on your electric bill	Convenience and savings for you
Turnkey operation	Provides hassle-free installation and service
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Open Deluxe Acorn LED

Outdoor Lighting

Open Deluxe Acorn LED

Subject to variance from manufacturer. Contact us for region-specific details.

The Open Deluxe Acorn LED is a graceful Victorian-style fixture that enhances the character and prestige of streetscapes, greenways and pedestrian areas. This energy-efficient luminaire limits unwanted uplight and will complement any neighborhood or park with its classic, elegant design.

LED *(Light Emitting Diode)*	70 watts
Mounting height	12', 17' (Style B pole only)
Colors	Black Green
Poles	Style A, B, C, D, E, F
Applications	Neighborhoods Parks Shopping centers

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or call us toll free:
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800.521.2232 (IN)

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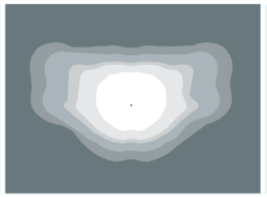
Outdoor Lighting

Open Deluxe Acorn LED

Light source: LED *(white)*
Wattage: 70
Lumens: 6,500
Light pattern: IESNA Type III *(oval)*
IESNA cutoff classification: Cutoff
Color temperature: 4,000K
Warm-up and restrike time: Instant on *(no warm-up or restrike time)*



light distribution pattern

Pole available:

Name	*Mounting height*	*Color*
Aluminum	12', 17' (Style B pole only)	Black Green

Features	Benefits
Little to no upfront capital cost required	Frees up capital for other projects
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Retrofit Cobra Head Fixtures to Roadway LED

Street	No. of Fixtures	Lump-Sum Equipment Cost	Monthly Maintenance + Energy Cost
Amsterdam	15	$ 6,345.53	$ 28.78
N. Arlington	6	$ 2,572.07	$ 11.68
Aberdeen	4	$ 1,714.72	$ 7.78
Altavia	4	$ 1,714.72	$ 7.78
St. James	4	$ 1,714.72	$ 7.78

SAFETYFirst
- PERSONAL ACCOUNTABILITY
- ACTIVE CARING
- HAZARD RECOGNITION

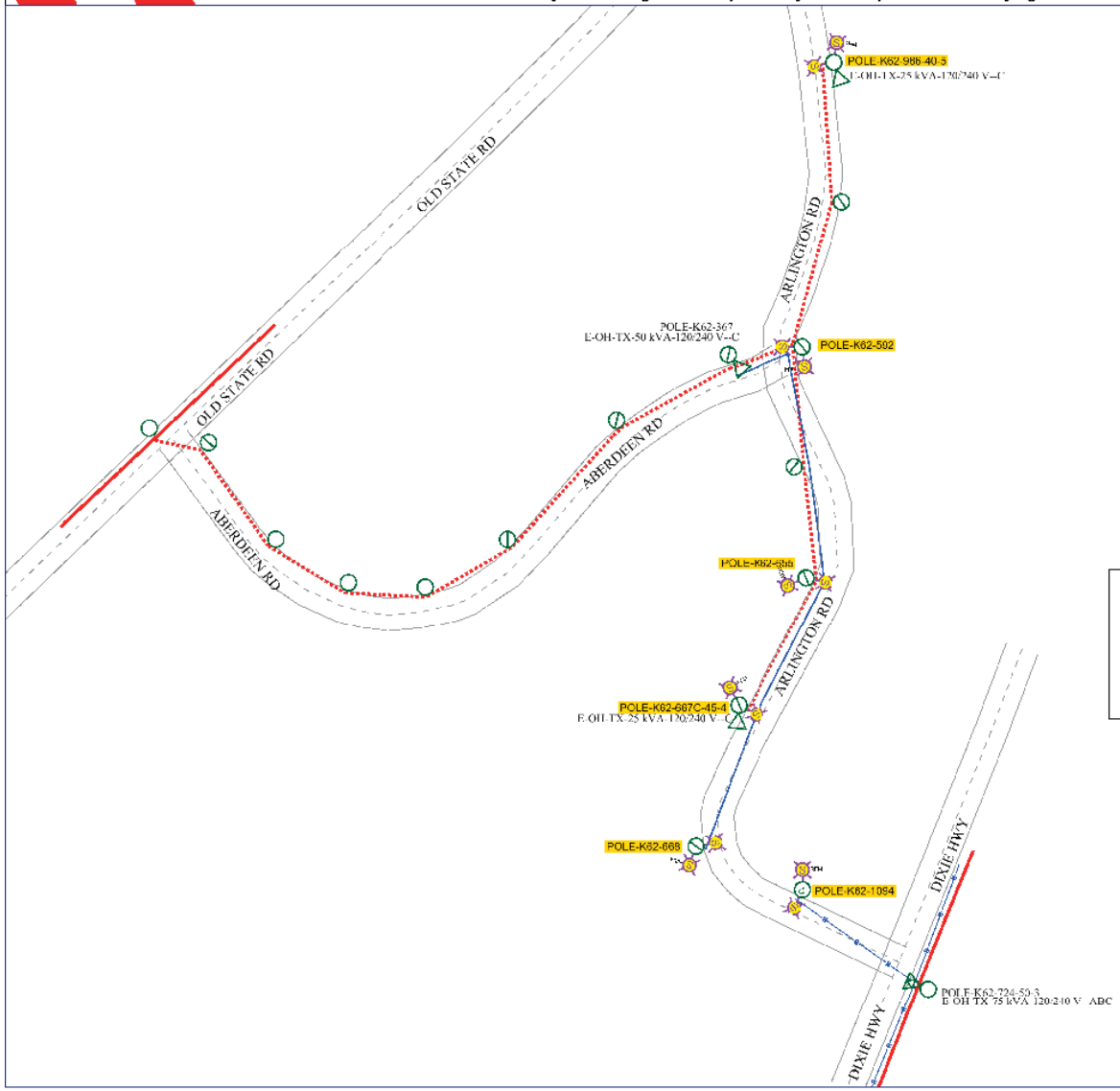
USP: FUSE ON POLE K62-359 AT INTERSECTION OF
USP: ABERDEEN AND OLDSTATE RD
USP: BREAKER AT SUBSTATION
USP:
USP:

Safety Reminders / Adverse Conditions

?: REMEMBER CESR
?:
?:
?:

Work Zone General Comments: Double click to e

REMEMBER: Work zone area conditions may have changed for this job! Everyone is responsible for verifying the above safety information is correct prior to any work being performed each day.



N

FOR POLES HIGHLIGHTED:

HEAD CHANGEOUTS ONLY
- REMOVE:
-- 175 W-MV-COBRA HEAD
- INSTALL:
-- 50 W-LED-ROADWAY

Work Order Number	29954320
Customer/Contact	
Contact Phone	
Job Site Address	840 ARLINGTON RD
City	COVINGTON
County	KENTON
State, Zip	KY, 41011
Designer	Ethan Britton
Designer Phone	513-287-1429
Circuit ID	AUGUSTINE 46
Primary Voltage	12.47/7.2 KV
Permit Required	Yes __ No_X
Permit Type/No.	
Permit Type/No. 2	
Permit Type/No. 3	
Permit Type/No. 4	

DUKE ENERGY.

Sheet
Scale = 1"=100'

New Installation: Acorn LED Fixtures, Poles, and Conduit on Jackson Road

Street	No. of Fixtures	Lump-Sum Equipment Cost	Monthly Maintenance + Energy Cost
Jackson	7	$ 63,269.51	$ 55.30

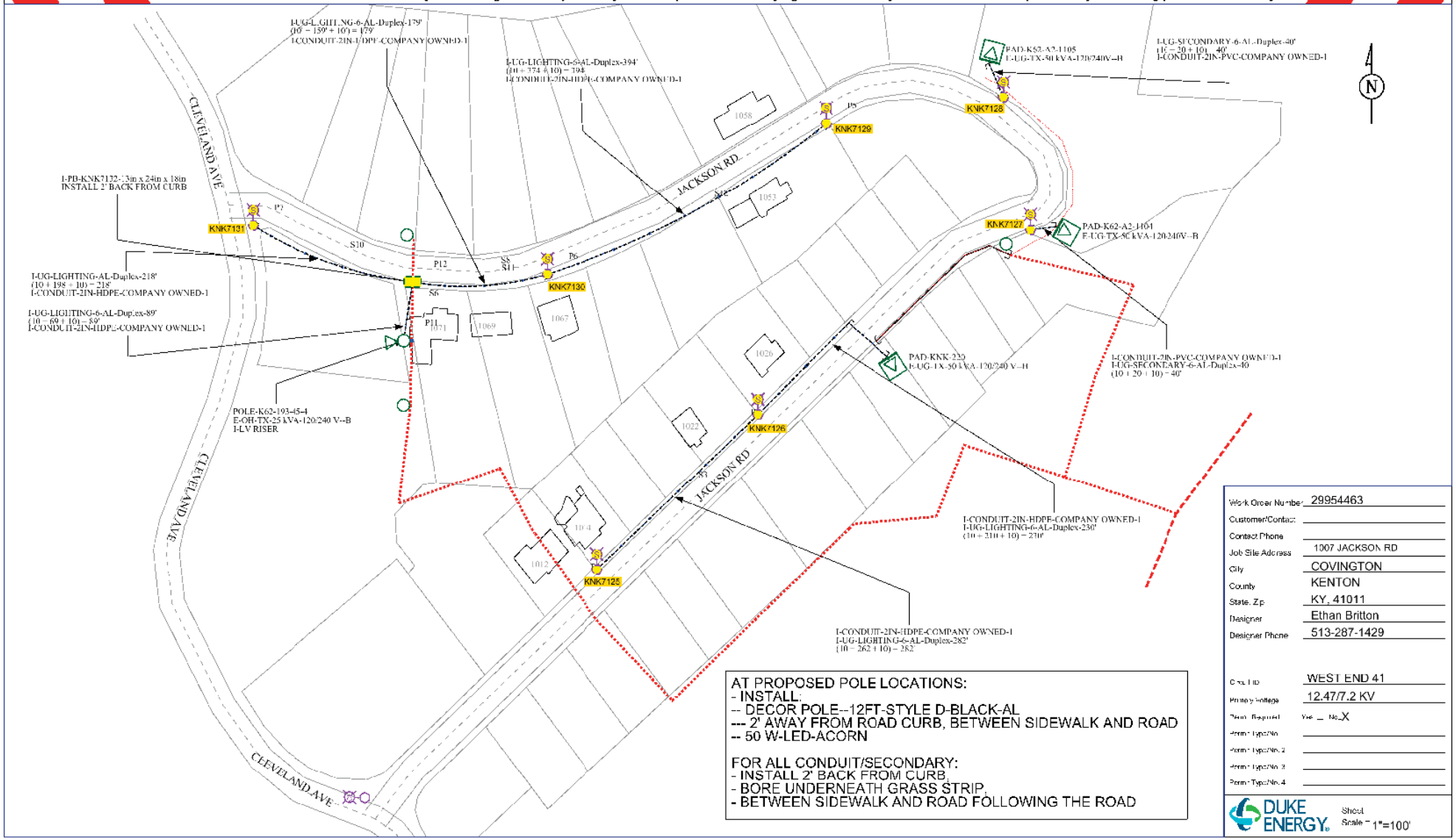
SAFETYFirst
- PERSONAL ACCOUNTABILITY
- ACTIVE CARING
- HAZARD RECOGNITION

USP: FUSE ON POLE K62-185 BEHIND 1013 JACKSON RD
USP: FUSE ON POLE K62-1106 BETWEEN 1045 AND 1047 JACKSON RD
USP:
USP:
USP:

Safety Reminders / Adverse Conditions
?: REMEMBER CESR
?:
?:
?:

Work Zone General Comments: Double click to e

REMEMBER: Work zone area conditions may have changed for this job! Everyone is responsible for verifying the above safety information is correct prior to any work being performed each day.



AT PROPOSED POLE LOCATIONS:
- INSTALL:
-- DECOR POLE--12FT-STYLE D-BLACK-AL
--- 2' AWAY FROM ROAD CURB, BETWEEN SIDEWALK AND ROAD
-- 50 W-LED-ACORN

FOR ALL CONDUIT/SECONDARY:
- INSTALL 2' BACK FROM CURB,
- BORE UNDERNEATH GRASS STRIP,
- BETWEEN SIDEWALK AND ROAD FOLLOWING THE ROAD

Work Order Number	29954463
Customer/Contact:	
Contact Phone	
Job Site Address	1007 JACKSON RD
City	COVINGTON
County	KENTON
State, Zip	KY, 41011
Designer	Ethan Britton
Designer Phone	513-287-1429
Circuit ID	WEST END 41
Primary Voltage	12.47/7.2 KV
Permit Required	Yes _ No_X
Permit Type/No.	
Permit Type/No. 2	
Permit Type/No. 3	
Permit Type/No. 4	

DUKE ENERGY.

Sheet
Scale = 1"=100'

Next steps

Next steps

- Current Council
  - Request extensions on Duke Energy proposals
  - Hand off inventory data and literature
- Incoming Council
  - Evaluate budget impact using current Duke Energy billing for comparison
  - Choose a street for a pilot study, or look at existing installations in other cities (Newport, Crescent Springs)
  - Install buried electrical conduit during lower Jackson street project to keep street lighting options open
  - Merge street light data with other infrastructure data (streets, sidewalks, signs, street trees)