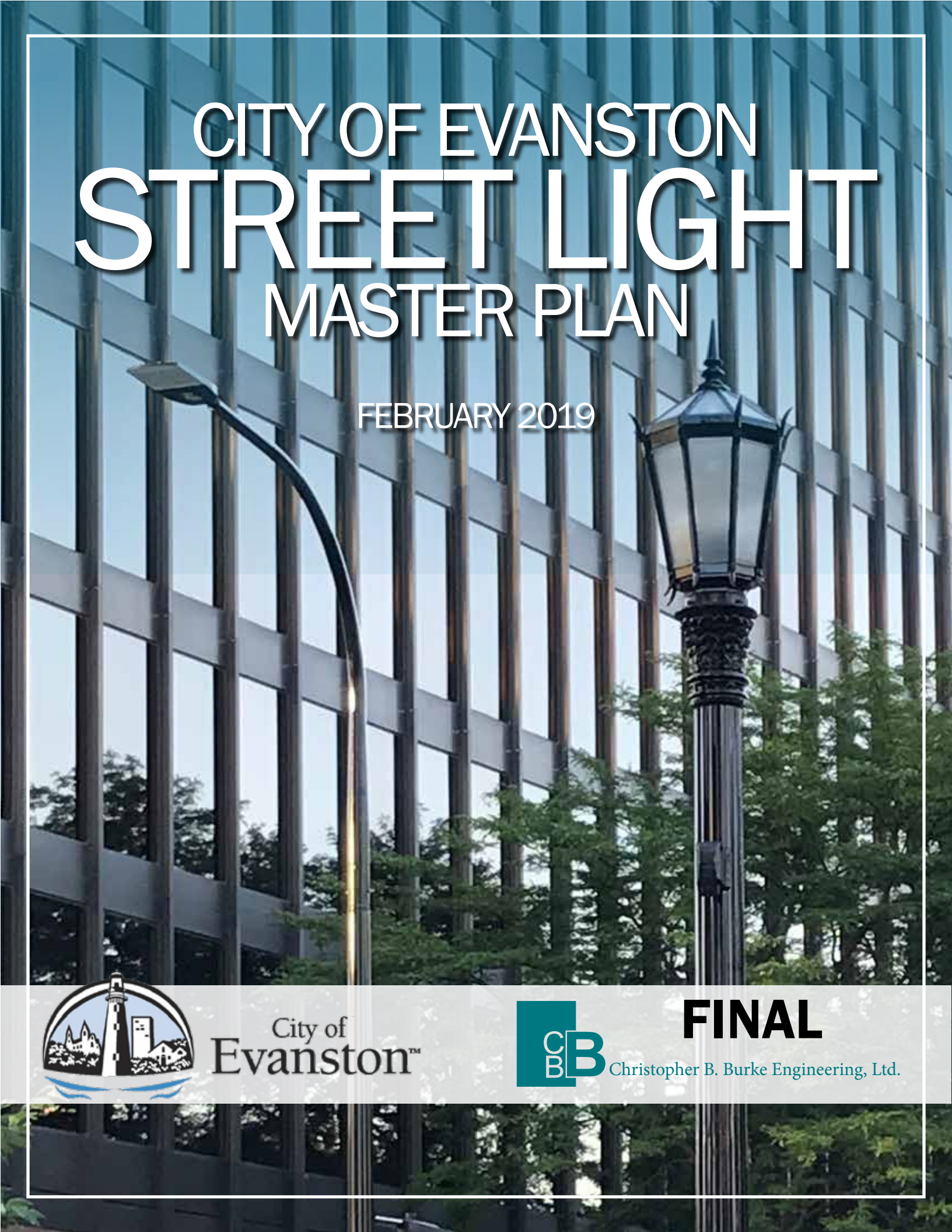


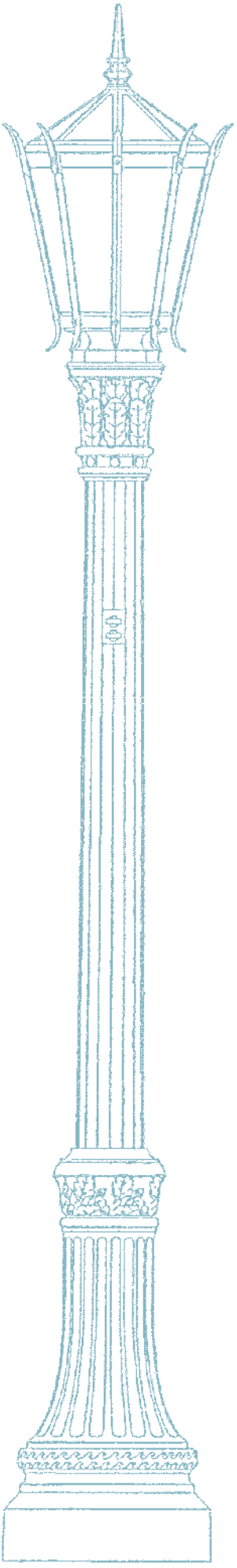
CITY OF EVANSTON
STREET LIGHT MASTER PLAN

FEBRUARY 2019

City of Evanston™

FINAL

Christopher B. Burke Engineering, Ltd.



CITY COUNCIL MEMBERS

Stephen H. Hagerty	Mayor
Judy Fiske	1st Ward
Peter Braithwaite	2nd Ward
Melissa A. Wynne	3rd Ward
Donald N. Wilson	4th Ward
Robin Rue Simmons	5th Ward
Thomas M. Suffredin	6th Ward
Eleanor Revelle	7th Ward
Ann Rainey	8th Ward
Cicely L. Fleming	9th Ward
Devon Reid	City Clerk
Wally Bobkiewicz	City Manager

STEERING COMMITTEE MEMBERS

Melissa A. Wynne	Alderman, 3rd Ward	Committee Chair
Robin Rue Simmons	Alderman, 5th Ward	Committee Co-Chair
Susan Cherco	Member	Age Friendly Task Force
Scott Osborne	Co-Chair	Environment Board
Andrew Pigozzi	Member	Plan Commission
Ken Itle	Vice-Chair	Preservation Commission
Elliott Dudnik	Member	Preservation Commission
Richard Lanyon	Chair	Utilities Commission
Richard Shure	Member	Utilities Commission
Johanna Leonard	Director	Community Development Department
Brian Henry	Commander	Police Department
David Stoneback	Director	Public Works Agency
Lara Biggs	Bureau Chief + City Engineer	Capital Planning + Engineering
Tom Twigg	Traffic Operations Supervisor	Street Lights
Rajeev Dahal	Senior Project Manager	Traffic + Transportation

CONSULTANT MEMBERS –
CHRISTOPHER B. BURKE ENGINEERING, LTD.

Mike Kerr	Project Manager	Executive Vice President
John Caruso	Project Engineer	Vice President + Engineer
Gerry Hennelly	Project Engineer	Senior Project Manager + Engineer
Doug Kerr	Project Engineer	Engineer
Delta Engineering	Lighting Design	Subconsultant

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1 BACKGROUND AND PROJECT SUMMARY

BACKGROUND AND PROJECT SUMMARY

In January of 2017, the City of Evanston sought proposals to complete a comprehensive Street Light Master Plan. The last time this type of study was undertaken by the City was in 1979. Since that time, lighting technologies have advanced rapidly. When the original 1979 study was completed, the majority of the City's existing lighting units were the historic Tallmadge type lighting units and davit arm units which were illuminated using mercury vapor-type lamps. Over the years, due to regulatory concerns and the high levels of mercury in the lamps and ballasts, these lamps were phased out and replaced by induction-type lamps which gave off the same "warm white" light source as the mercury vapor lamps.

The induction luminaires did not have the same life expectancy as the older mercury vapor, incandescent or high pressure sodium (HPS) luminaires, causing increased maintenance costs. Therefore, the City decided to investigate alternatives to the light sources currently installed throughout the City.

The current City street light system has 107 individual lighting systems that control approximately 6,000 lighting units. Those 6,000 lighting units consist of:

- 4,200 Tallmadge as manufactured by Union Metal which typically illuminate local and collector roadways
- 1,600 luminaires mounted on davit arm roadway poles which typically illuminate major roadways
- 200 other luminaires in various locations throughout the City

The purposes and goals of the Street Lighting Master Plan are as follows:

- ❑ Maintain the existing Tallmadge look wherever practical throughout the City.
- ❑ Establish uniform illumination standards for all new construction.
- ❑ Standardize light pole and luminaire types for all applications.
- ❑ Increase overall energy efficiency of the City's lighting systems and reduce related greenhouse gas emissions.
- ❑ Provide standards for lighting that are dark-sky compliant/friendly, including methods to minimize/eliminate glare nuisance and light spillage.
- ❑ Explore the latest lighting control technologies.
- ❑ Identify pilot areas in need of additional lighting levels for pedestrian safety.
- ❑ Establish ways to monitor existing lighting control centers by use of Smart Meter technology.
- ❑ Establish proposed lighting unit spacing requirements along residential streets for new roadway construction projects.
- ❑ Establish Light Pole offset distances from existing Tree canopies to provide maximum Illumination on roadways.

Prior to implementing new technologies, it was necessary to evaluate the existing lighting system. City staff, the Steering Committee (made up of several City elected officials and various Commission members), and Christopher B. Burke Engineering, Ltd. (CBBEL) chose several study areas to investigate what the lighting levels were throughout the City. These studies were performed to see which areas met current City of Evanston standards or the national standard for roadway lighting. The majority of the streets did not meet either standard.

Stakeholders and the public were engaged throughout the Master Planning process. CBBEL worked in conjunction with the City of Evanston to develop a community outreach strategy to engage the stakeholders and the public and provide opportunities to offer input throughout the process in developing the Street Light Master Plan.

The stakeholder and public engagement included the following meetings and surveys:

Project Kick Off Meeting
(Steering Committee Meeting #1) ..... July 18, 2017
Steering Committee Meeting #2 ..... November 7, 2017
Public Meeting #1 ..... November 28, 2017
Steering Committee Meeting #3 ..... January 23, 2018
Northwest Municipal Conference Survey ..... February 2018
Street Light Master Plan
Project Lighting Level Survey ..... April 2018
Steering Committee Meeting #4 ..... May 24, 2018
Steering Committee Meeting #5 ..... October 3, 2018
Public Meeting #2 ..... November 1, 2018
Utilities Commission ..... November 9, 2018
Preservation Commission ..... November 13, 2018
Transportation & Parking Committee ..... November 28, 2018

2

EXISTING CONDITIONS REVIEW & ANALYSIS

2.1: EXISTING STREET LIGHTING SYSTEM

The City street light system has 107 individual lighting systems (See Appendix A1) that control approximately 6,000 lighting units. Those 6,000 lighting units generally consist of:

- **4,200** Tallmadge lights as manufactured by Union Metal which typically illuminate local and collector roadways
- **1,600** luminaires mounted on davit arm roadway poles which typically illuminate major roadways
- **200** other luminaires in various locations throughout the City which includes park lights, parking lot lights and viaduct lights

INDUCTION TALLMADGE

SHOEBOX TYPE
METAL HALIDE (ROADWAY)

COBRA HEAD
METAL HALIDE (ROADWAY)

GLOBE TYPE
HIGH PRESSURE SODIUM (ROADWAY)

The City's existing Tallmadge light system was installed in the early 1980's. It consisted of a six-piece steel pole system with a mercury vapor lamp. In 2007, the City completed the replacement of mercury vapor lamps in the City's Tallmadge poles, replacing them with brighter, more efficient induction lamps that were designed as a custom retrofit inset into the existing Tallmadge fixture. The davit arm roadway poles, originally with mercury vapor luminaires, were installed in various commercial areas or arterial corridors. They have been upgraded to induction lamps as opportunities have arisen. However, recent infrastructure projects at Emerson/Ridge/Green Bay and Fountain Square included replacement of induction davit arm roadway poles with LED luminaires on davit arm roadway poles with pedestrian-scale LED lumianires to illuminate the sidewalk as shown below. Fountain Square included both the new davit arm lights and refurbished Tallmadge lights.

FOUNTAIN SQUARE
LED DAVIT ARM AND INDUCTION TALLMADGE

EMERSON/RIDGE/GREEN BAY
LED DAVIT ARM WITH PEDESTRIAN SCALE LED

EMERSON/RIDGE/GREEN BAY
LED DAVIT ARM

All street lighting is controlled via a photoelectric cell located at each of the 107 unmetered street light power centers as shown below. The City relies on Com Ed's system to estimate energy consumption. Most power centers throughout Evanston were replaced in 2010. They are either 100 amp or 150 amp capacity and are generally in very good condition.

TYPICAL CITY POWER CENTER

The City maintains lighting in City-owned parking lots. Parking lots typically have a variety of fixtures, including Tallmadge, davit arm or a combination of both. Most recently, as parking lots have been reconstructed, LED luminaires have been installed. The parking lot at the Lorraine H. Morton Civic Center was reconstructed in 2013 using Tallmadge fixtures and shoe box type luminaires with metal halide lamps. Parking lots at James Park were reconstructed in 2016 and 2017 using shoebox-type LED luminaires installed on a straight round aluminum pole as seen below. Additionally, ornamental type metal halides (Philips Lumec Domus) are installed throughout the City along bike/pedestrian pathways.

JAMES PARK PARKING LOT LED

TYPICAL PARK OR BIKE PATH ORNAMENTAL METAL HALIDE

2.2: EXISTING PLANS, POLICIES AND PROGRAMS

Previous Studies and Plans

A previous Street Light Master Plan was developed in 1979 with recommended lighting levels as shown in Table 2.1 (Appendix A2).

For the purposes of the 1979 Street Light Master Plan, roadways were classified as major, collector or local roadways with the definitions as follow:

- **MAJOR ROADWAY –** A roadway which serves as the principal thoroughfare that connects City boundaries and carries the majority of traffic throughout the City (such as Green Bay Road or Chicago Avenue).
- **COLLECTOR ROADWAY –** A roadway that typically services traffic between major roadways and local roadways, used mainly for traffic movements within residential, commercial and industrial areas (such as Central Park Avenue, Simpson Street or Foster Street).
- **LOCAL ROADWAY –** A roadway primarily used for direct access to residential, commercial and industrial areas. These are the majority of the City's roadway system and carry the smallest volume of traffic.

Table 2.1: Current City of Evanston Recommended Lighting Levels for Roadways

Street Category	Commercial and Institutional High Pedestrian Activity (fc)*	High Density Residential Medium Pedestrian Activity (fc)*	Low Density Residential Low Pedestrian Activity (fc)*
Major	1.0 – 4.0	0.4 – 0.6	0.2 – 0.4
Collector	0.4 – 1.0	0.2 – 0.4	0.2 – 0.4
Local	0.4 – 0.6	0.1 – 0.2	.05 – 0.1

** A footcandle (fc) is the unit of measurement used to calculate lighting level or lighting intensity and is defined as the illuminance on a one-square foot surface from a uniform source of light.*

For purposes of comparison, lighting standards for roadways and intersections as dictated by Illuminating Engineers Society of North American (IESNA) are provided below in Table 2.2 and Table 2.3 (National Standards generally consider intersections separately from roadways because the number of potential vehicle and pedestrian conflicts elevates safety and visibility concerns). City of Evanston recommend lighting levels are generally less than IESNA recommended lighting levels.

Table 2.2: Illuminating Engineers Society of North American (IESNA) Recommended Lighting Levels for Roadways

Road	Pedestrian Activity Area	Illumination (fc)	Uniformity Ratio E_{avg}/E_{min}**
Major	High	1.7	3.0
	Medium	1.3	3.0
	Low	0.9	3.0
Collector	High	1.2	4.0
	Medium	0.9	4.0
	Low	0.6	4.0
Local	High	0.9	6.0
	Medium	0.7	6.0
	Low	0.4	6.0

*** Uniformity Ratio = Average Illumination Level / Minimum Illumination Level*

Table 2.3: Illuminating Engineers Society of North America (IESNA) Recommended Lighting Levels for Intersections

Functional Classification	Average Maintained Illumination at Pavement by Pedestrian Area Activity Level (fc)			Uniformity Ratio E_{avg}/E_{min}
	Pedestrian			
	High	Medium	Low	
Major/Major	3.4	2.6	1.8	3.0
Major/Collector	2.9	2.2	1.5	3.0
Major/Local	2.6	2.0	1.3	3.0
Collector/Collector	2.4	1.8	1.2	4.0
Collector/Local	2.1	1.6	1.0	4.0
Local/Local	1.8	1.4	0.8	6.0

Lighting Policies for Development Projects

The existing City Ordinance's only requirement for outdoor lighting is that the lighting levels must be uniform.

These uniformity ratios are:

RESIDENTIAL DISTRICTS: 6:1 Average/Minimum Maintained Footcandles

ALL OTHER DISTRICTS: 3:1 Average/Minimum Maintained Footcandles

(The Ordinance also states that 0.0 footcandles (no Illumination) may exist at residential lot lines and lighting units must have horizontal sharp cut-off lenses.)

Lighting Upgrade Programs

The City currently upgrades street light infrastructure either as part of major street and parking lot reconstruction projects, spot location improvements, major planned unit private developments, or as part of Safer Neighborhood Area Project (SNAP). The function of SNAP is to improve street lighting in the Community Development Block Grant (CDBG) areas. The City believes that adequate lighting and illumination of neighborhoods throughout Evanston, especially pedestrian walkways, is critical to the safety of citizens in the Neighborhood Revitalization Strategy Areas (NRSA) and crime prevention through environmental design standards sets two distinct purposes for lighting; the first is that lighting is used for the illumination of human activity and secondly lighting is used for security.

An initial pilot program was introduced by Evanston Public Works Agency prior to development of this Street Light Master Plan in the area of Seward east of Dodge investigating options to replace the existing deteriorated aging Tallmadge fixtures with LED luminaires in lieu of induction bulbs with more affordable, durable, lightweight fiber glass poles that look similar to the Tallmadge.

Lighting Maintenance Operations

City traffic electricians presently perform routine maintenance, repairs and inspection to keep street lighting equipment in operation. The maintenance work includes: bulb replacement, tree trimming, repairs of light poles, power centers, cable and conduit, fixtures due to damages or aging and installation of darkening panels to prevent uplight. Lights in City parks and those luminaires mounted to City facilities are maintained by the Facilities Division.

Lighting Electricity Cost

Recently, The City has paid the following amounts for electrical energy charges to operate the 107 lighting systems:

FY 2016 = $152,832.00

FY 2017 = $140,630.00

Additionally, the City currently spends approximately **$140,000.00** annually to maintain the City's lighting systems.

Com Ed Policy for Lighting Alleys

Lighting in City alleys is provided by Com Ed as follows:

Residents complete a petition in support of the installation of the Com Ed supplied luminaire as seen in Appendix A3. Upon request, a petition is sent to the resident or applicant in support of the installation of the Com Ed supplied luminaire. The petition is circulated among residents living adjacent to the alley. The petition must be signed by at least 51% of the residents and/or be approved by the Ward Alderman. The resident or applicant in support of the installation of the Com Ed supplied luminaire is responsible for the electricity usage bill to be paid directly to Com Ed. If the location of installation is within the targeted CDBG program area, the City will reimburse, on a yearly basis, 50% of the electricity cost incurred by the applicant for the first five years after the installation date.

TYPICAL EXISTING ALLEY COM ED LUMINAIRE

Presently, Com Ed will furnish and install either a 100W or 250W high pressure sodium luminaire. Above is a typical existing alley ComEd luminaire.

2.3: LIGHTING LEVEL STUDY & ANALYSIS

Initial study and analyses were undertaken to determine the levels of existing lighting in different areas of the City. Means and methods of existing conditions lighting level study and analysis can be found in Appendix A4. Nineteen study areas were initially selected throughout the City's nine wards and included major roadways, collector roadways, local roadways, intersections and parks (bike/pedestrian pathways). An effort was made to select study areas near schools, parks and the other areas of interest. Due to concerns and questions from Public Meeting #1, additional areas were included in the lighting level study. Lastly, several pilot programs that were installed during the Master Plan process were included in the study. A listing of all 31 study areas is as follows:

Major Roadways

1. Green Bay Road (Simpson Street to Payne Street)
2. Main Street (Sherman Avenue to Hinman Avenue)
3. Chicago Avenue (Kedzie Avenue to South Boulevard)
4. Dodge Avenue (Washington Street to Seward Street)
5. Chicago Avenue (Church Street to Grove Street)
6. Ridge Avenue (Lake Street to Dempster Street)
7. Central Street (Walnut Avenue to Broadway Avenue)
8. Oakton Street (Florence Avenue to Asbury Street)
9. McCormick Boulevard (Golf Road to Green Bay Road)

Collector Roadways

10. Simpson Street (Dewey Avenue to Green Bay Road)
11. Foster Street (Maple Avenue to Sherman Avenue)

12. Central Park Avenue (Park Place to North End of Willard School)
13. Grant Street (Bennett Avenue to Pioneer Road)

Local Roadways

14. Seward Street Pilot Program (Dodge Avenue to Dewey Avenue)
    a. 55W 4000K Clear Lens LED City Tallmadge Replica
    b. 55W 3000K Clear Lens LED City Tallmadge Replica
15. Seward Street Pilot Program (Dewey Avenue to Florence Avenue)
    a. 55W 4000K Frosted Lens LED City Tallmadge Replica
    b. 55W 3000K Frosted Lens LED City Tallmadge Replica
16. Lyons Street (Dodge Avenue to Com Ed Substation)
17. Brummel Street (Custer Street to East Dead End)
18. Sheridan Square (West Sheridan Road to East Sheridan Road)
19. Hovland Court (Emerson Street to Church Street)
20. Barton Avenue (Hull Terrace to Harvard Terrace)
21. McDaniel Avenue (Crain Street to Greenleaf Street)
22. Ingleside Place (Orrington Avenue to Euclid Avenue)
23. Judson Avenue (Judson Avenue 1100 Block to Judson Avenue 1200 Block)
24. Seward Street Pilot Program (Florence Avenue to Wesley Avenue)
    a. 50W 3000K Acrylic Lens LED Sternberg Tallmadge Replica
    b. 50W 3000K Frosted Lens LED Sternberg Tallmadge Replica
25. Thayer Street Pilot Program (Central Park Avenue to Lawndale Avenue)
    a. 80W 4000K Original Lens LED Everlight Tallmadge Retrofit
26. Forest Avenue Pilot Program (Keeney Street to Kedzie Street)
    a. 40W 4000K Original Lens LED Elcast Tallmadge Retrofit
    b. 80W 4000K Original Lens LED Elcast Tallmadge Retrofit

Intersections

27. Chicago Avenue and Keeney Street
28. McCormick Boulevard and Bridge Street
29. Ridge Avenue and Foster Street
30. Sheridan Square and Keeney Street

Parks (Bike/Pedestrian Pathways)

31. Lakefront Bike Path (Greenwood Street to Northwestern University)

The lighting level study and analysis included a field survey determining the geometry of the roadway, bike path or intersection being studied; pole layout and spacing; geometry of parkways and sidewalks; location of trees for consideration of tree bloom; and adjacent business and porch ambient illumination that could effect the light studies.

LIGHTING STUDY LOCATIONS

MAJOR ROADWAYS

1. Green Bay Road (Simpson Street to Payne Street)
2. Main Street (Sherman Avenue to Hinman Avenue)
3. Chicago Avenue (Kedzie Avenue to South Boulevard)
4. Dodge Avenue (Washington Street to Seward Street)
5. Chicago Avenue (Church Street to Grove Street)
6. Ridge Avenue (Lake Street to Dempster Street)
7. Central Street (Walnut Avenue to Broadway Avenue)
8. Oakton Street (Florence Avenue to Asbury Street)
9. McCormick Boulevard (Golf Road to Green Bay Road)

COLLECTOR ROADWAYS

10. Simpson Street (Dewey Avenue to Green Bay Road)
11. Foster Street (Maple Avenue to Sherman Avenue)
12. Central Park Avenue (Park Place to North End of Willard School)
13. Grant Street (Bennett Avenue to Pioneer Road)

LOCAL ROADWAYS

14. Seward Street Pilot Program (Dodge Avenue to Dewey Avenue)
    a.55W 4000K Clear Lens LED City Tallmadge Replica
    b. 5W 3000K Clear Lens LED City Tallmadge Replica
15. Seward Street Pilot Program (Dewey Avenue to Florence Avenue)
    a.55W 4000K Frosted Lens LED City Tallmadge Replica
    b. 5W 3000K Frosted Lens LED City Tallmadge Replica
16. Lyons Street (Dodge Avenue to Com Ed Substation)
17. Brummel Street (Custer Street to East Dead End)
18. Sheridan Square (West Sheridan Road to East Sheridan Road)
19. Hovland Court (Emerson Street to Church Street)
20. Barton Avenue (Hull Terrace to Harvard Terrace)
21. McDaniel Avenue (Crain Street to Greenleaf Street)
22. Ingleside Place (Orrington Avenue to Euclid Avenue)
23. Judson Avenue (Judson Avenue 1100 Block to Judson Avenue 1200 Block)
24. Seward Street Pilot Program (Florence Avenue to Wesley Avenue)
    a.50W 3000K Acrylic Lens LED Sternberg Tallmadge Replica
    b.50W 3000K Frosted Lens LED Sternberg Tallmadge Replica
25. Thayer Street Pilot Program (Central Park Avenue to Lawndale Avenue)
    a.80W 4000K Original Lens LED Everlight Tallmadge Retrofit
26. Forest Avenue Pilot Program (Keeney Street to Kedzie Street)
    a.40W 4000K Original Lens LED Elcast Tallmadge Retrofit
    b.80W 4000K Original Lens LED Elcast Tallmadge Retrofit

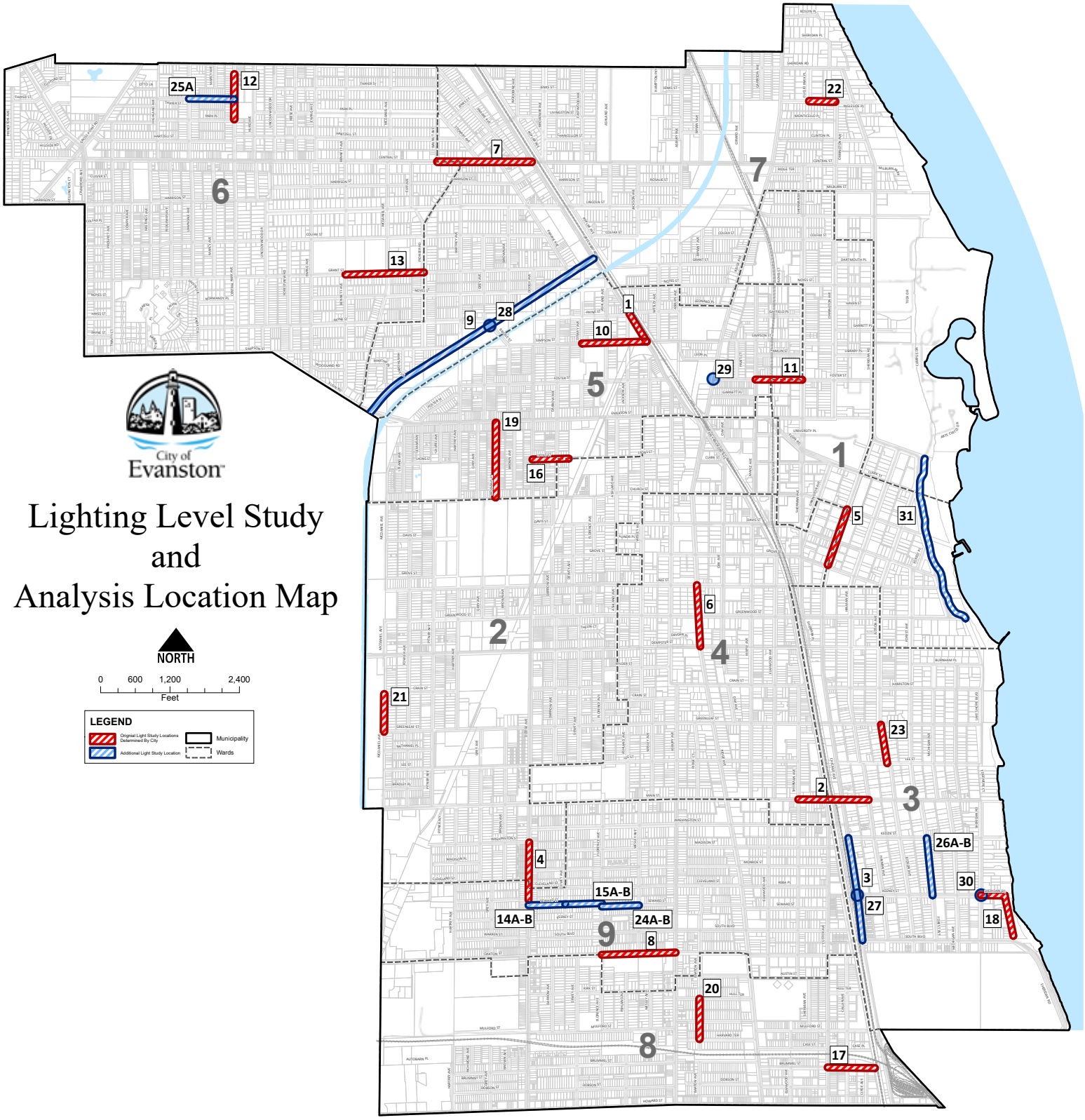
INTERSECTIONS

27. Chicago Avenue and Keeney Street
28. McCormick Boulevard and Bridge Street
29. Ridge Avenue and Foster Street
30. Sheridan Square and Keeney Street

PARKS (BIKE/PEDESTRIAN PATHWAYS)

31. Lakefront Bike Path (Greenwood Street to Northwestern University)

Following is a map displaying the original 19 study locations (red) determined by the City and the additional 12 study locations (blue) added after Public Meeting #1 and during pilot project development. The identifiers on the map correspond to the above listed study areas.



Below are findings determined by the existing conditions lighting level study and analysis at all 31 locations ranked in descending order of existing average illumination level classified by major, collector and local roadway or intersections and bike path. The criteria for meeting IESNA or COE standards as shown in the following tables only includes average illuminance, not uniformity ratio.

Major Roadway Lighting Level Study and Analysis

For major roadway lighting, the types of luminaires varied throughout the study areas. Of the nine locations studied, only one met both the IESNA and City of Evanston (COE) lighting level recommendations and an additional three met the less stringent City of Evanston lighting level recommendations.

Major Road Illumination Existing Conditions and Analysis							
Study Area	**Boundary**	**Luminaire Type**	**Wattage (W)**	**Average (fc)**	**Uniformity Ratio**	**Meets IESNA Standard**	**Meets COE Standard**
Green Bay Road	Simpson Street to Payne Street	LED Davit	140	2.28	5.7	●	●
Main Street	Sherman Avenue to Hinman Avenue	High Pressure Sodium Davit	250	1.47	14.7	●	●
Chicago Avenue	Kedzie Avenue to South Boulevard	Induction Tallmadge	165	0.81	8.1	●	●
Dodge Avenue	Washington Street to Seward Street	Induction Davit	200	0.66	66.1	●	●
Chicago Avenue	Church Street to Grove Street	Metal Halide Davit	400	0.51	50.6	●	●
Ridge Avenue	Lake Street to Dempster Street	Induction Tallmadge	85	0.27	26.7	●	●
Central Street	Walnut Avenue to Broadway Avenue	Induction Tallmadge	85	0.06	6.5	●	●
Oakton Street	Florence Avenue to Asbury Street	Induction Tallmadge	85	0.01	1.0	●	●
McCormick Boulevard	Golf Road to Green Bay Road	Induction Tallmadge	85	0.01	100.0	●	●

Collector Roadway Lighting Level Study and Analysis

For collector roadway lighting, the type of luminaire varied throughout the study areas. The type of poles also varied. Only one location met both IESNA and City of Evanston (COE) lighting level recommendations.

Collector Road Illumination Existing Conditions and Analysis							
Study Area	**Boundary**	**Luminaire Type**	**Wattage (W)**	**Average (fc)**	**Uniformity Ratio**	**Meets IESNA Standard**	**Meets COE Standard**
Simpson Street	Dewey Avenue to Green Bay Road	Induction Davit	200	1.1	10.7	●	●
Foster Street	Maple Avenue to Sherman Avenue	Induction Tallmadge	165	0.2	16.0	●	●
Central Park Avenue	Park Place to North End of Willard School	Induction Tallmadge	55	0.01	1.0	●	●
Grant Street	Bennett Avenue to Pioneer Road	Induction Tallmadge	85	0.01	1.0	●	●

Local Roadway Lighting Level Study and Analysis

The local roadway lighting mainly consisted of induction luminaires on Tallmadge poles. Of the ten locations studied, six met IESNA lighting level recommendations and five additional study areas met the less stringent City of Evanston (COE) lighting level recommendations. The roadways that did not meet any lighting level recommendations were generally the roadways illuminated by the existing induction Tallmadge.

Local Road Illumination Existing Conditions and Analysis

Study Area	Boundary	Luminaire Type	Wattage (W)	Average (fc)	Uniformity Ratio	Meets IESNA Standard	Meets COE Standard
Lyons Street	Dodge Avenue to ComEd Substation	Metal Halide Davit	400	1.22	122.3	●	●
Seward Street (Pilot Program)	Dewey Avenue to Florence Avenue	4000K Frosted Lens LED City Tallmadge Replica	55	1.05	–	●	●
Seward Street (Pilot Program)	Dodge Avenue to Dewey Avenue	4000K Clear Lens LED City Tallmadge Replica	55	0.97	–	●	●
Seward Street (Pilot Program)	Dodge Avenue to Dewey Avenue	3000K Clear Lens LED City Tallmadge Replica	55	0.91	–	●	●
Seward Street (Pilot Program)	Dewey Avenue to Florence Avenue	3000K Frosted Lens LED City Tallmadge Replica	55	0.70	–	●	●
Seward Street (Pilot Program)	Florence Avenue to Wesley Avenue	3000K Acrylic Lens LED Sternberg Tallmadge Replica	50	0.71	–	●	●
Seward Street (Pilot Program)	Florence Avenue to Wesley Avenue	3000K Frosted Lens LED Sternberg Tallmadge Replica	50	0.40	–	●	●
Thayer Street (Pilot Program)	Central Park Avenue to Lawndale Avenue	4000K Original Lens LED Everlight Tallmadge Retrofit	80	0.26	–	●	●
Brummel Street	Custer Street to East Dead End	Induction Tallmadge	165	0.15	15.0	●	●
Sheridan Square	Sheridan Road (West) to Sheridan Road (East)	Induction Tallmadge	165	0.11	11.0	●	●
Forest Avenue (Pilot Program)	Keeney Street to Kedzie Street	4000K Original Lens LED Elcast Tallmadge Retrofit	80	0.11	–	●	●
Forest Avenue (Pilot Program)	Keeney Street to Kedzie Street	4000K Original Lens LED Elcast Tallmadge Retrofit	40	0.05	–	●	●
Hovland Court	Emerson Street to Church Street	Induction Tallmadge	165	0.05	4.7	●	●
Barton Avenue	Hull Terrace to Harvard Terrace	Induction Tallmadge	165	0.04	4.5	●	●
McDaniel Avenue	Crain Street to Greenleaf Street	Induction Tallmadge	85	0.03	3.1	●	●
Ingleside Place	Orrington Avenue to Euclid Avenue	Induction Tallmadge	85	0.01	1.0	●	●
Judson Avenue	Judson Avenue 1100 Block to 1200 Block	Induction Tallmadge	85	0.01	1.0	●	●

Intersection Lighting Level Study and Analysis

From the intersection lighting, the luminaires varied as shown. None of the four locations studied met IESNA lighting level recommendations. There are currently no intersection-specific City of Evanston (COE) lighting level recommendations.

Intersection Illumination Existing Conditions and Analysis						
Intersection	**Luminaire Type**	**Wattage (W)**	**Average (fc)**	**Uniformity Ratio**	**Meets IESNA Standard**	**Meets COE Standard**
Chicago Avenue and Keeney Street	(2) Twin Head Induction Tallmadge	165	0.35	35.0	●	N/A
McCormick Boulevard and Bridge Street	(4) Induction Tallmadge (1) Induction Davit	85 400	0.33	33.0	●	N/A
Ridge Avenue and Foster Street	(3) Induction Tallmadge	165	0.20	20.0	●	N/A
Sheridan Square/Keeney	(2) Induction Tallmadge	165	0.08	8.0	●	N/A

Parks (Bike/Pedestrian Pathways) Lighting Level Study and Analysis

Per IESNA, the recommended maintained illuminance levels for pedestrian ways, average illuminance should be greater than 0.5 fc and uniformity ratios should not be greater than 10. The study area met IESNA lighting level recommendations.

Pathway Illumination Existing Conditions and Analysis				
Study Area	**Luminaire Type**	**Wattage (W)**	**Average (fc)**	**Uniformity Ratio**
Lakefront Bikeway (Greenwood Street to Northwestern University Campus)	Metal Halide	150	1.30	6.5

Parking Lots

Due to the wide variation in lighting levels and lack of consistency in existing design throughout City-owned parking lots, no studies were performed.

Uplight Measurements

Dark Sky Compliant is a designation given to outdoor lighting fixtures that meet the International Dark Sky Association's (IDA) requirements for reducing waste of ambient light. The inappropriate or excessive use of artificial light – known as light pollution – can have serious environmental consequences for humans, wildlife, and our climate (IDA – International Dark-Sky Association).

Light readings were taken from a City of Evanston utility truck atop the three existing Tallmadge induction luminaires at 55W, 85W and 165W to determine the amount of light illuminating above the luminaire and attributing to light pollution. Below is the measured illuminance five feet above the Tallmadge.

Central Park Avenue - Park Place to North End of Willard School

55 W Tallmadge Induction Luminaire
Illuminance = 5.8 fc, 5'-0" Above Fixture

Central Street – Walnut Street to Broadview Avenue

85 W Tallmadge Induction Luminaire
Illuminance = 6.2 fc, 5'-0" Above Fixture

Hovland Court - Emerson Street to Church Street

165 W Tallmadge Induction Luminaire
Illuminance = 19.7 fc, 5'-0" Above Fixture

These uplight measurements determined that the existing Tallmadge provides a significant amount of uplight light pollution, and are therefore, not dark sky compliant.

Existing Conditions Report

An Existing Conditions Report was prepared by CBBEL consisting of 206 pages summarizing the existing conditions lighting level study and analysis of the original 19 locations. This was issued to the City of Evanston on October 30, 2017. It was reviewed and accepted by City staff and Steering Committee.

2.4: CONCLUSIONS

- In comparison with IESNA lighting level recommendations, COE lighting level recommendations from the 1979 study are less stringent.
- Of the 31 locations studied throughout the City, lighting levels generally do not meet IESNA or COE recommended lighting levels.
- Tree canopies along local roadways are dense and impede lighting levels.
- Power centers are typically in good condition and a photoelectric cell at each power center is an adequate means for basic light controls.
- All power centers are unmetered and electrical usage bill is based on Com Ed's system to estimate energy consumption.
- A smart grid or smart lighting does not exist in COE.
- Existing lighting is a significant source of light pollution.

2.5: RECOMMENDATIONS

- The City of Evanston (COE) has too many types of poles and fixtures for davit arm roadway poles and should be standardized to a specific pole and luminaire that varies in height to meet new COE lighting level recommendations.
- LED luminaires should be the only lamp specified in future developments/construction.
- It is recommended for future construction and maintenance that a replica Tallmadge full cutoff LED luminaire that is dark sky friendly be installed on all Tallmadge poles.
- The City's alley light installation policies and procedures are well defined. The City is cognizant of citizen's requests for additional lighting. A petition process is taken into consideration as well as the concerns of the adjacent residents. Therefore, there is no need for policy or procedure changes at this time.
- With the existing built environment the City has created, a recommended spacing between trees and poles should be 25'±. This distance would be measured from the tree trunk to the centerline of light pole to allow for growth of tree canopy and root ball without diminishing light output.
- The 0.0 footcandle (fc) requirement at the lot line should not be changed and should remain per Ordinance.

3

STREET LIGHT INFRASTRUCTURE OPTIONS & RECOMMENDATIONS

3.1: STREET LIGHT STANDARDIZATION

The objective of this task is to provide equipment standards for various lighting applications. This section provides standard equipment for davit arm roadway lighting units, Tallmadge lighting units, park lighting units, shoe box lighting units and wall pack lighting units.

Davit Arm Roadway Lighting Unit

Presently, the City of Evanston has 1,600 davit arm roadway lighting units which include a variety of poles (typical davit arm and shepherd's hook) and luminaires (globe-type high pressure sodium, shoebox-type metal halide, cobra head-type metal halide, cobra head-type induction and cobra head-type LED). Below are recommended standards for replacement of existing davit arm roadway lighting units.

Pole

The City of Evanston davit arm roadway lighting unit pole should be a tapered aluminum davit arm pole with a 25 to 30-foot mounting height and an 8-foot arm fabricated from aluminum alloy seamless tube. The assembly pole and arm should be powder coated black. A previously specified pole meeting these requirements is the Hapco Model: SKKP091912A.

In areas where Tallmadge lighting units complement the lighting levels, the davit arm roadway lighting unit pole could have a decorative aluminum clamshell base cover to replicate the base of the Tallmadge lighting unit. A previously specified pole base meeting these requirements is the Stresscrete Model: KSB19.

In areas where holiday lighting will be displayed on the davit arm roadway lighting unit, banner arms and/or 20A 120V NEMA 5-20R duplex GFCI festoon receptacle recessed into the light pole with weatherproof cover rated for in-use and painted black may be specified.

Luminaire

A goal of this project was to standardize the replacement of the City's many existing luminaires. As such several alternatives were explored.

The current industry wide trend is the conversion of the current high intensity discharge (H.I.D.) lamps to the LED light source. The conversion to LED lighting will increase the City's energy efficiency, standardize the look of each light source, control glare and uplighting, add to the current life cycle of the light source and reduce greenhouse gas emissions.

Color temperature is a measure of spectral content of light from a source or how much yellow, red, green and blue exists at the source. A higher color temperature means greater blue content, and the whiter light appears as seen in Figure 3.1.

Based on the results of the community survey in Appendix A8.7 and current research, it is suggested that a temperature of 3000K or less be utilized in the City of Evanston. This recommendation will apply to all luminaires in the following discussion.

The City of Evanston davit arm roadway lighting unit luminaire should be:

- A black color
- Full cutoff with a wattage range of 140W - 200W cobra head-type LED luminaire
- 3000K or less color temperature
- Type III optics.

A previously specified luminaire meeting these requirements is the Autobahn Model: ATB2-60BLED85-MVOLT-R3-3K.

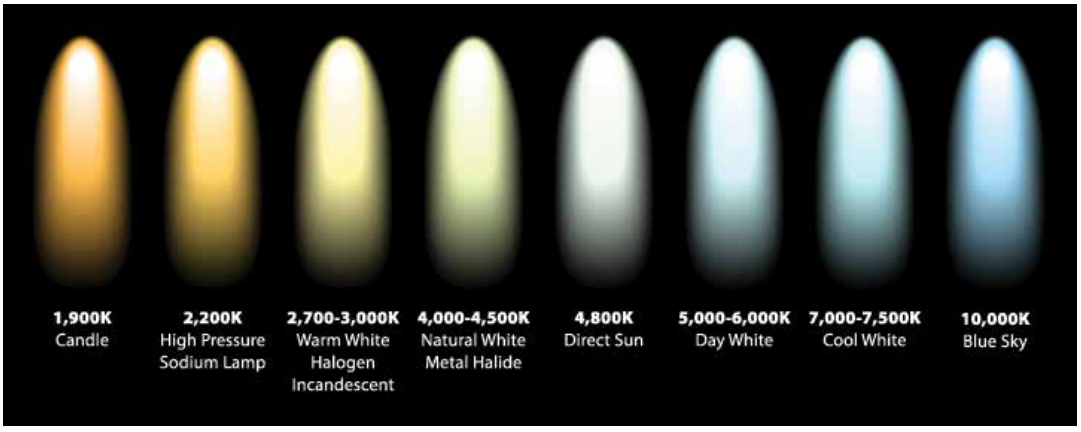


Figure 3.1: Color Temperature Chart

In areas where pedestrian traffic is high, a black full cutoff 20W - 40W cobra head-type LED pedestrian-scale luminaire with 3000K color temperature and type II optics could be installed on the opposite side of the roadway luminaire at a height of 14 feet to increase uniform lighting levels, increase efficiency, eliminate uplighting levels and reduce glare. A previously specified luminaire meeting these requirements is the Autobahn Model: ATB0-20BLED53-MVOLT-R2-3K.

Location

The davit arm roadway lighting unit should be installed along all major roadways, select collector roadways and critical intersections where pedestrian traffic and/or vehicular traffic is high.

Capital Cost

The cost to replace existing davit arm luminaires with new luminaires is estimated to be as follows:

Material	$1,500.00	(Luminaire)
Labor and Equipment	$200.00	
Total Cost	**$1,700.00**	

The cost to replace existing davit arm lighting units which includes a new pole and luminaire is estimated to be as follows:

Material	$1,500.00	(Luminaire)
	$8,300.00	(Pole)
Labor and Equipment	$1,000.00	
Total Cost	**$10,800.00**	

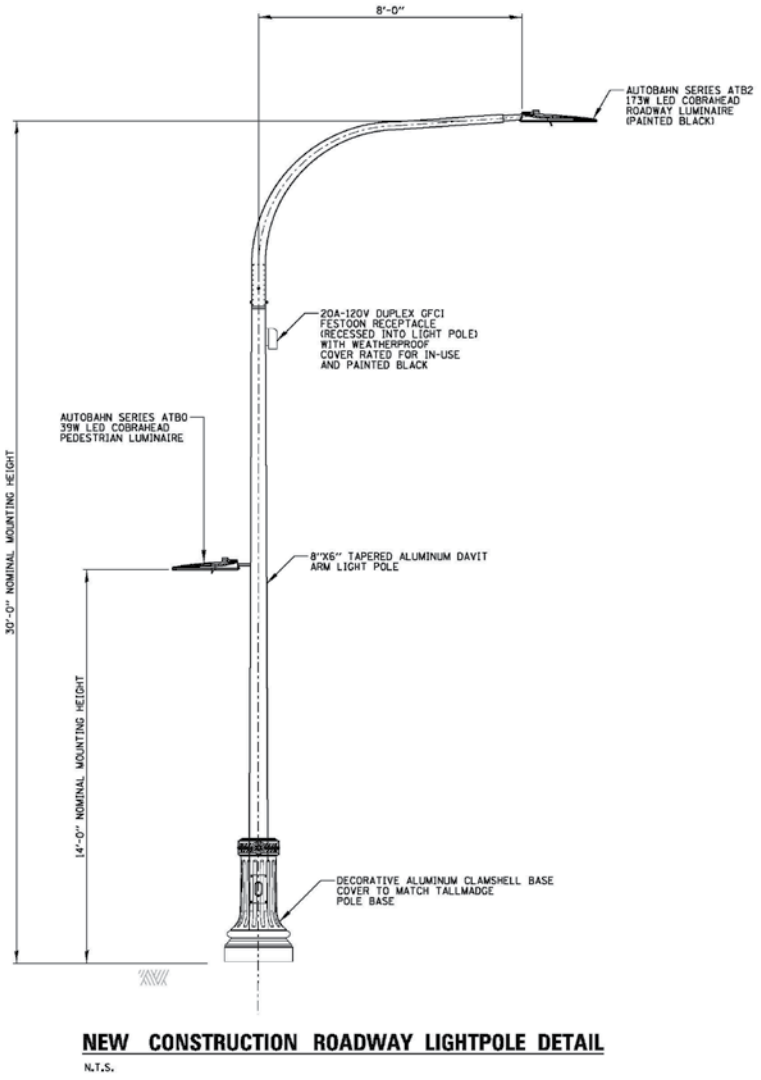


Figure 3.2: City of Evanston Davit Arm Roadway Lighting Unit

Tallmadge Lighting Unit

Presently, the City of Evanston has 4,200 Tallmadge lighting units manufactured by Union Metal Corporation. Union Metal Corporation has since gone out of business. The current Tallmadge lighting unit is an assembly of six separate parts making maintenance and inventory a constant hardship. Below are recommended standards for replacement of existing Tallmadge lighting units.

Pole

The City of Evanston Tallmadge lighting unit pole should be a flute tapered steel, cast iron, aluminum or fiberglass pole with a 14-foot mounting height complete with decorative luminaire fitter and decorative base to best replicate existing Tallmadge pole, powder coated black. A pole meeting these requirements can be furnished by a custom mold manufactured for the City of Evanston.

In areas where holiday lighting will be displayed on the Tallmadge lighting unit, a 20A 120V NEMA 5-20R duplex GFCI festoon receptacle recessed into the light pole with weatherproof cover rated for in-use (allowing the plug and cord to be completely enclosed with the cover closed when devices are plugged in) and painted black may be specified.

Luminaire

Due to inefficiencies with the existing Tallmadge luminaire, several options for replacement were evaluated. Two retrofits manufactured by Everlight and Elcast were tested to replicate the existing Tallmadge lighting unit luminaire. In both cases substantial amount of

up light and glare was observed. The pilot retrofits were inferior and would not be an adequate upgrade to the existing Tallmadge lighting unit luminaire. The LED luminaire will be fully shielded on the top and its lighting component will be installed in the top of the fixture and not be visible. This will allow for the luminaire to be dark sky friendly and allow the energy produced by the LED's to be directed downward. The Pilot Program explored several lens types including: clear, prismatic acrylic and frosted acrylic. Determined by public opinion, aesthetics, light level readings and the amount of glare, the luminaire lens panels will be a frosted acrylic lens.

Based on the public feedback and stakeholder involvement, a Sternberg luminaire or equal is recommended for future luminaire replacement. See Pilot Program Area Summary in Appendix A5 for additional detail.

The City of Evanston Tallmadge lighting unit luminaire should be:

- Powder coated with a black color
- Full cutoff with a wattage range of 50W to 100W for the light source
- 3000K or less color temperature
- Type III or Type V optics with frosted acrylic lens that best matches the existing Tallmadge luminaire

A previously specified luminaire meeting these requirements is the Sternberg Model: MS805ALED-4AIR30-T3-MDL03-SV1.

The Tallmadge lighting unit luminaire can be installed on a Tallmadge lighting unit pole.

Location

The Tallmadge lighting unit may be installed along select collector roadways, all local roadways and intersections where a collector and local roadway meet or where two local roadways meet. It may be necessary to supplement Tallmadge lighting with davit are roadway lights at high pedestrian or traffic areas and intersections. Existing Tallmadge lights will be maintained unless otherwise approved by the City Council.

Capital Cost

The cost to replace existing Tallmadge lighting unit luminaire with new replica Tallmadge lighting unit luminaire is estimated as follows:

Material	$2,800.00 (Luminaire)
Labor and Equipment	$200.00
Total Cost	**$3,000.00**

The cost to replace existing Tallmadge lighting unit with new replica Tallmadge lighting unit is estimated as follows:

Material	$2,800.00 (Luminaire)
	$2,560.00 (Pole)
Labor and Equipment	$400.00
Total Cost	**$5,760.00**

Figure 3.3: City of Evanston Tallmadge Lighting Unit

Figure 3.4: LED Tallmadge Lighting Unit

Park Lighting Units

Presently, the City of Evanston has various lighting units throughout the City; included in those lighting units are park lighting units. These units are generally used to provide security lighting in parks and along bike/pedestrian pathways. A metal halide luminaire is generally implemented within the lighting unit. To save money on energy and maintenance, installation of more-efficient longer-lasting LED lighting units matching the existing style is recommended. Below are recommended standards for park lighting units.

Pole

The pole should be a round aluminum pole complete with decorative base and decorative mast arm, powder coated black. A previously specified pole meeting these requirements is the Philips Lumec Domus.

A 20A 120V NEMA 5-20R duplex GFCI festoon receptacle recessed into the light pole with weatherproof cover rated for in-use and painted black may be specified for maintenance staff use.

Luminaire

The luminaire should be a black full cutoff decorative LED luminaire with 3000K or less color temperature and type III or type V optics. A previously specified luminaire meeting these requirements is the Philips Lumec Domus or equal.

Location

The lighting unit should be installed along bike/pedestrian pathways and in parks.

Athletic field lighting is not included in this study.

Figure 3.5: City of Evanston Bike/Pedestrian Pathway Lighting Unit

Shoe Box Lighting Unit

The shoebox lighting units are generally used in City owned and maintained parking lots. Below are recommended standards for shoe box lighting units.

Pole

The shoe box lighting unit pole should be a 16' – 30' round aluminum pole, powder coated black.

In parking lots where holiday lighting or advertisement will be displayed on the parking lot lighting unit, banner arms and/or 20A 120V NEMA 5-20R duplex GFCI festoon receptacle recessed into the light pole with weatherproof cover rated for in-use and painted black may be specified.

Luminaire

The shoe box lighting unit luminaire should be a black full cutoff shoe box-type LED luminaire with 3000K or less color temperature and type II, type III or type V optics.

Location

The shoe box lighting unit should be installed at City-owned parking lots.

Figure 3.6: Parking Lot Lighting Unit

Wall Pack Lighting Unit

The wall pack lighting units are generally used in viaducts, tunnels and underpasses. To save money on energy and maintenance, installation of more-efficient longer-lasting LED lighting units throughout the City is recommended. Below are recommended standards for wall pack lighting units.

Luminaire

The City of Evanston wall pack lighting unit luminaire should be:

- 29W to 79W LED luminaire with 3000K color temperature
- Type III optics constructed of die cast aluminum powder coated black

A previously specified luminaire meeting these requirements is the Lithonia Model: KAXW LED-P2-30K-R3-MVOLT.

Location

The wall pack lighting unit should be installed within viaducts throughout the City of Evanston.

Additional Street Light Infrastructure

Conduit

All underground cable shall be installed in conduit or unit duct. When a cable in conduit system is specified, the conduit shall be PVC unless noted otherwise.

- HDPE Unit Duct
  High-density polyethylene (HDPE) conduit, fittings, and accessories shall comply with ASTM standard D 1784, NEMA Publication No. TC2, and NEC Article 347.
- RGS
  Rigid steel conduit shall be galvanized and manufactured according to UL Standard 6 and shall meet Federal Specification WWC-581, ANSI Standard C 80.1, and the requirements of NEC Article 346-15. All couplings and fittings shall meet ANSI Standard C 80.1 and shall be hot-dip galvanized. Elbows and couplings shall conform to the specifications for conduit. All fittings and couplings for rigid conduit shall be of the threaded type.

All unit duct or conduit that passes under and within two feet of streets and driveways shall be encased in galvanized rigid steel conduit with a minimum size of 2” diameter.

Cable

- Conductors
  Conductors shall be coated or uncoated copper. Uncoated conductors shall be according to ASTM B3, ICEA S-95-658/NEMA WC70, and UL Standard 44. Coated conductors shall be according to ASTM B 33, ASTM B 8, ICEA S-95-658/NEMA WC70 and UL Standard 44. All conductors shall be stranded.

  All cable shall be rated 600V. The cable shall be rated 105°C dry and 90°C wet, suitable for installation in wet and dry locations, and resistant to oils and chemicals. Any cable for a service entrance shall have a Type USE-2 rating.

  All electric cables shall be color coded. Ground conductors shall be bare stranded copper installed within the duct. Neutral wires shall be color coded white. If additional conductors are required, the colors shall be in accordance with the NEC. The UL listing mark, cable voltage, insulation type and ratings, as well as the cable size shall all be clearly printed on the cable in a color contrasting with the insulation color.

- Insulation

  XLP Insulation: Insulation cable designated as XLP shall incorporate cross-linked polyethylene (XLP) insulation and shall meet or exceed the requirements of ICEA S-95-658, NEMA WC70, and U.L. Standard 44.

  Insulation thickness shall be according to Table 310-13 of the NEC. The cable shall be rated 600 volts and shall be UL Listed Type RHH/RHW-2/USE rated for underground service.

- Splices

  All underground cable shall be continuous. Necessary splices shall be made above ground or in handholes. Splices shall be made using 3M Scotch Cast Kits or approved equal.

Fuses

All luminaires and receptacles shall be protected with fuses at the base of the pole, accessible from the pole handhole. When more than one phase conductor is connected to a luminaire, two-pole fuseholders shall be used. All fuses shall be ten amperes with Bussmann in line, type HEB-AW or HEX-AW waterproof fuseholders or equivalent. Neutral conductors to luminaires and receptacles shall have an identical fuseholder to the phase conductors with a 'slug'.

Foundation

All concrete foundations shall be installed to a depth suitable for soil conditions. The top of the foundation shall be set 1" above finish grade with a ¾" chamfer. The foundations shall have a minimum of two raceways, 2 1/2" PVC long radius elbows for passing cables and duct into the light pole. Steel reinforcement and anchor rods shall be secured to prevent shifting during the placement of concrete. Forms shall remain in place for at least 24 hours after placement of concrete. Pole shall not be installed for a minimum of one week after the placement of concrete. All concrete foundations require a ground rod. Ground rod shall be connected to the light pole foundation reinforcing steel and anchor bolts with a #6 bare copper conductor. Concrete shall be class IDOT Class SI.

<u>Davit Type Light Pole Assemblies</u>

- When formed for light pole foundation shall be 20" diameter with a 4 bolt pattern.
- Anchor bolts shall be 1" diameter and have a 4'-0" minimum embedded depth and a 4" minimum galvanized threaded top.

<u>Tallmadge Light Pole Assemblies</u>

- When formed for the foundation assembly shall be 24" diameter with a 3 bolt or 4 bolt pattern dependent upon light pole base plate.
- Anchor bolts shall be 3/4" diameter and have 3'-0" minimum embedded depth and a 4" minimum galvanized threaded top.

3.2: CITY OF EVANSTON DESIGN AND LIGHTING LEVEL RECOMMENDATIONS

Figure 3.7 represents the recommended standards for lighting levels in the City of Evanston.

Illuminance

Illuminance is a calculation of the density of incident light on a surface expressed using footcandles (fc). The recommendations for illumination are a range of levels based on prior City of Evanston recommendations, current IESNA recommendations, and stakeholder and public input.

Uniformity

Both spacing and setback directly affect the uniformity. Uniform lighting allows us to perceive the environment continuously, a frequent change of contrasting high- and low-illuminated roadway segments cause visual impairment, leading to stress and tiredness jeopardizing road safety.

Uniformity is expressed as a ratio of average illuminance to minimum illuminance.

Lighting Level Recommendations for the City of Evanston for all new construction is as follows:

		FOR REFERENCE				PROPOSED CITY OF EVANSTON (COE) STANDARDS			
		IESNA STANDARDS		CURRENT CITY OF EVANSTON (COE) STANDARDS				PROPOSED POLE(S)	PROPOSED FIXTURE(S)
		AVERAGE ILLUMINANCE (FC)	UNIFORMITY RATIO	AVERAGE ILLUMINANCE (FC)		AVERAGE ILLUMINANCE (FC)	UNIFORMITY RATIO		
ROADWAYS	MAJOR	0.9-1.7	3.0	0.2-1.0		0.9-1.7	3.0	DAVIT	FULL CUTOFF COBRA HEAD LED
	COLLECTOR	0.6-1.2	4.0	0.2-1.0		0.6-0.9	4.0	DAVIT/TALLMADGE	FULL CUTOFF COBRA HEAD LED OR REPLICA TALLMADGE
	LOCAL	0.4-0.9	6.0	0.1-0.6		0.4-0.7	6.0	TALLMADGE	REPLICA TALLMADGE
	LOCAL - HIGH LEVEL	0.9	6.0	-		0.7-0.9	6.0	DAVIT/TALLMADGE	FULL CUTOFF COBRA HEAD LED OR REPLICA TALLMADGE
INTERSECTIONS	MAJOR/MAJOR	1.8-3.4	3.0	-		1.8-2.6	3.0	DAVIT	FULL CUTOFF COBRA HEAD LED
	MAJOR/COLLECTOR	1.5-2.9	3.0	-		1.5-2.2	3.0	DAVIT	FULL CUTOFF COBRA HEAD LED
	PEDESTRIAN DESIGNATED CROSSINGS	1.8-2.4	6.0	-		0.8-2.1	5.0	DAVIT/TALLMADGE	FULL CUTOFF COBRA HEAD LED OR REPLICA TALLMADGE
PARK	BIKE/PEDESTRIAN PATHWAY	0.5	-	-		0.3-0.5	-	ORNAMENTAL ALUMINUM POLE WITH MAST ARM	PHILIPS LUMEC DOMUS
OTHER	PARKING LOT	1.0	5.0	-		1.0	5.0	STRAIGHT ROUND ALUMINUM	SHOE BOX LED
	PARKING LOT - HIGH LEVEL	2.5	5.0	-		1.5-2.5	5.0	STRAIGHT ROUND ALUMINUM	SHOE BOX LED
	VIADUCTS	2.0	-	-		2.0	-	-	WALL PACK LED

Note: Existing Tallmadge light locations will be maintained unless otherwise approved by the City Council.

Spacing

Spacing is the distance between successive luminaires measured along the centerline of the street.

Three separate scenarios were modeled along a 30-foot cross-section of Seward Street (Dodge Avenue to Wesley Avenue) with the 92W LED replica Tallmadge luminaire mounted at 16 feet in different configurations to determine optimum spacing. The different configurations analyzed were single sided, opposite-sided, and staggered.

These three models were analyzed against IESNA recommended illuminance levels as seen in Figure 3.8 and existing conditions along Seward Street of 13 existing Tallmadge lighting units.

It was determined that along local roadways that staggered configuration is most efficient and provides the most economical means of meeting required lighting levels and uniformity. The typical spacing in a residential area (Tallmadge) using a staggered layout would be 75' to 100'. A typical spacing along a major roadway (Davit) would be 150' to 200'.

Setback

Setback is the lateral offset of the pole center from the face of the curb or edge of the traveled way. It is recommended where a sidewalk does not exist, or a parkway is present, that the proposed lighting unit be installed three feet from face of the curb to center of pole, unless utility conflicts dictate otherwise.

LOCAL ROADWAY (30' CROSS SECTION) PHOTOMETRIC SUMMARY TABLE	LUMINANCE(L) (CD/M^2) & ILLUMINANCE(E) (fc)					
	L(ave)	L(ave)/L(min)	L(max)/L(min)	LV(max)/L(ave)	SIDEWALK E(min)	SIDEWALK E(ave)/E(min)
IES RECOMMENDED*	>0.5	<6.0	<10.0	<0.4	>0.5	<4.0
EXISTING CONDITIONS (55W INDUCTION TALLMADGE)	0.05	N/A	N/A	3.33	0.05	N/A
95' SINGLE SIDED CONFIGURATION	0.55	2.62	7.19	1.11	0.12/0.58 (N/S)	1.20/1.45 (N/S)
175' OPPOSITE SIDED CONFIGURATION	0.67	3.39	8.22	0.93	0.40	4.00
210' STAGGERED CONFIGURATION	0.50	1.85	5.04	0.98	0.32	3.20

- RECOMMENDED VALUES PER IESNA ROADWAY LIGHTING RP-8-14, TABLE 3, "LIGHTING DESIGN CRITERIA FOR STREETS" AND TABLE 5, "RECOMMENDED VALUES FOR MEDIUM PEDESTRIAN CONFLICT AREAS"

Figure 3.8: Example Lighting Unit Spacing Results

Figure 3.9: Example Lighting Unit Spacing

4 LIGHTING CONTROL TECHNOLOGY

LIGHTING CONTROL TECHNOLOGY

A smart city is defined as “A City that utilizes operational information and communication technology to increase the quality of life of their inhabitants while providing sustainable development”.

A smart city is a municipality that uses information and communication technologies to increase operational efficiency, share information with the public and improve both the quality of government services and citizen welfare.

Energy conservation and efficiency are major focuses of smart cities. Using smart sensors, smart streetlights dim when there aren’t cars or pedestrians on the roadways. Smart grid technology can be used to improve operations, maintenance and planning, and to supply power on demand and monitor energy outages.

This type of system collects information about itself through sensors, communicating and analyzing that data to understand what’s happening now and in the future. Data collection may be obtained using either a wired or wireless network.

These technologies, when incorporated into the existing conditions of all existing City and ComEd owned lighting, will improve how each system operates.

Over the past several years there have been great advances in what capabilities can be provided by the latest control technologies in the lighting industry. Some of these new technologies are listed below and allow the City to pool more beneficial data that can be used to more efficiently operate their lighting systems and collect information. An introduction to these technologies is listed herein. These technologies have been broken out to show advances in utility based technologies provided by the City of Evanston’s utility, ComEd, for the Smart Grid and Smart Meter programs, the interactive lighting unit sensors and control monitoring systems.

Smart Grid

The smart grid is the evolution of our current electric grid, using new technology to optimize the conservation and delivery of power. The smart grid promises to increase the efficiency of today’s system. Saving operational costs and saving energy, a smart grid provides three key benefits.

1. Fewer and shorter outages.
2. Tools and services that can help save money.
3. A cleaner, greener planet by reducing electricity usage and greenhouse gas emissions through the use of LED lighting technology that utilizes lower wattage, more efficient lighting units, and through the use of system monitoring paired with dimmable technologies.

Smart Meter

Smart meters, a common form of smart technology, are digital meters that replace the old analog meters used in homes, buildings, schools etc. to record electrical usage. Digital meters can transmit energy consumption information back to the utility on a much more frequent schedule than analog meters, which requires a meter reader to transmit information. After a smart meter is installed, alerts and weekly usage reports can be made available to consumers, allowing them to manage usage more efficiently. Smart meters may also notify the utility of power outages or allow the utility to remotely switch electricity service on or off.

This application can also be used for street light systems. Once lighting controllers are retrofitted with smart meters, a City can enroll in an optional pricing program. This allows a City to take control of electric usage and save more in energy costs. This control means much more than turning on-off the street lights at dusk-sunrise, it means being able to program each fixture individually to brighten areas when needed and dim them when it is not. It also will help to detect and correct problems quickly to minimize down time. Additionally:

- There is no cost for the Smart Meter. ComEd supplies meters at NO charge.
- Estimated budgetary installation cost $550 per meter fitting upgrade on cabinet.
- For GE outdoor Wireless Control System, which includes 7 pin receptacle, and one modem for 500 fixtures, is approximately $500 for each fixture.

7 Pin Photocell Type Receptacles

The City of Evanston currently uses one individual photocell at each of the lighting controllers to automatically turn the street lights on and off. Within the last few years, more cities are using computer based access systems to monitor and control individual lighting controllers all the way down to individual lighting unit control, allowing for checking system operation (outages), circuit outages and allowing for dimming of the light source. The backbone of this technology is to install a 7-pin receptacle on each luminaire for individual control.

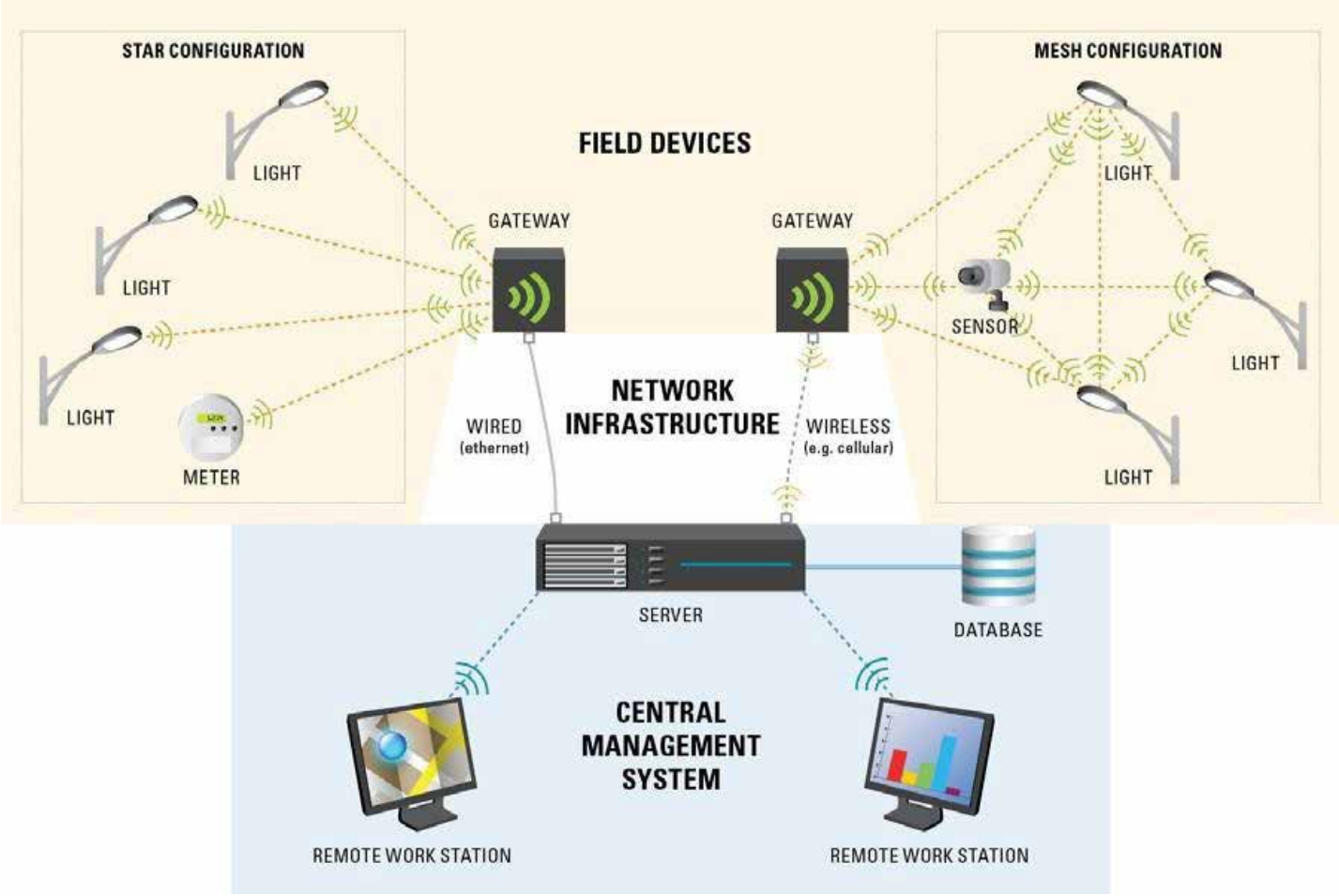
This type of control is run through a modem and an outdoor wireless control system for street and roadway lights. This technology is used for energy management and conservation. This system allows for remote operation and monitoring of all fixtures with the 7-pin receptacle installation through a web-enabled central management system. This system can be applicable for both street lights and area lights. ANSI C136.41 7-pin dimming receptacles can work with any lamp type or manufacturer with full support of all 7-pins on “plug and play” installation. Each 7-pin receptacle can be programmed to allow for:

- Integrated GPS in Each Node/Fixture for real time asset reporting
- DALI interface for Asset management and dimming
- Inrush current limiting circuit
- Utility grade measurement up to 0.5% accuracy
- Full autonomous photocell functionality
- Real time measurement and storage of Voltage, Current, Wattage, Power factor, and Hours of operation
- ON/OFF switching
- Analog and digital sensor inputs
- Constant status and health monitoring of your lighting fixture

Outdoor Lighting Control Systems

The 7-pin receptacle installed on each luminaire is managed by a wireless cellular signal or Wi-Fi compatible network. Each of the systems can be monitored by a desktop, laptop or smart phone device and are web-based sites. Outdoor control systems consist of three types of components: Field Devices/Controller, Gateway Cellular Modem Wi-Fi, or a Central Management System as follows:

- **Individual Nodes:** The system controller originates a command to execute a lighting change. The controller monitors and controls local luminaires to react and respond to logical and physical inputs from a program on user interface so that each command can make a control decision and communicate via network protocol.
- **Individual Gateways:** A device designed for interface between different protocols, such as DALI. Interface between the controller and a Central Management System.
- **Remote Server:** The Central Management System is a computer environment that functions as the core of the system by providing all shared system devices and consolidating and storing all system data.



Construction, Operation and Maintenance Costs

Three (3) individual controller centers were evaluated for use in exploring Smart Meters and Smart Grid technologies. The following controllers and readings taken are noted below. Refer to Appendix A1 for power center location maps.

Power Center 18N-05W
Total Wattage Consumed by Luminaires = 6230
Load Amps 23.15 @ 240 Volts
Operating Watts 5556

Power Center 26N-07W
Total Wattage Consumed by Luminaires = 7565
Load Amps 29 @ 240 Volts
Operating Watts 6960

Power Center 23N-08W
Total Wattage Consumed by Luminaires = 7395
Load Amps 27.25 @ 240 Volts
Operating Watts 6540

Connected load is the total load when all luminaires are functioning, and operating load is the load in its current operational condition (possible luminaire outages). The variance is due to nonfunctional luminaires during testing. By installing Smart Meters at each Power Center, the personnel monitoring the system can see an increase or decrease in how much power is being used.

Capital Costs:

The costs shown below are a scenario for upgrading the entire Tallmadge lighting system to LED and installing smart grid technology.

Description of Work	Material and Labor Costs X No. of Units	Total Cost
Replace Existing Tallmadge Induction Luminaire with LED	$1,860.00 x 4,200 Units	$7,812,000.00
Install Smart Grid Control System Hardware	$200.00 x 4,200 Units	$ 84,000.00
Install Modems or Wi-Fi Routers	$500.00 x 20 Units	$ 10,000.00
Software Start-Up and Computer Equipment	1 Unit	$ 15,000.00
Smart Meter Installation	$550.00 x 107 Controllers	$ 58,850.00
Total Cost of Upgrading Existing Tallmadge Luminaires and Smart Grid Technology		**$7,979,850.00**

Note: Cost does not include Tallmadge pole replacement or a new foundation.

Annual Operating Cost:

The City currently spends approximately $140,000 for the electricity to operate all of its street lights. Of that total, there are 4,200 Tallmadge lights.

If the City elects to move forward with the upgrading of the 4,200 existing Tallmadge lighting units to the recommended lower wattage LED Tallmadge luminaire, electric energy usage could be reduced.

Existing Tallmadge Lighting Energy Costs

Assuming street lights are on an average of 10 hours per day, energy cost 8 cents per KWH, Yearly Energy Cost = $0.08 x (102* Watts per Luminaire/1,000 kW) x 4,200 (lights) x 10 (hours per day) x 365 (days per year) = $125,093.00

* Based on an average of the combination of existing 55 watt, 85 watt and 165 watt Tallmadge lighting wattages.

Proposed Tallmadge Lighting Energy Costs

Assuming street lights are on an average of 10 hours per day, energy cost 8 cents per KWH, Yearly Energy Cost = $0.08 x (55 Watts per Luminaire/1,000 kW) x 4,200 (lights) x10 (hours per day) x 365 (days per year) = $67,452

This would realize as 53% cost reduction in the energy charges as paid to ComEd.

Recommendations:

The following topics were discussed throughout the course of the study and the recommendations are as follows:

- ComEd Smart Meter Technology is a major improvement the City can benefit from. This new metering technology will allow the City to access real time data on the actual kilowatts (power) being used for each lighting control system, knowledge of when the system is completely out or has reduced power usage, meaning possible lighting outages. This can be facilitated by smart phone or devices without sending labor forces out to patrol problems. Any time there is City infrastructure work or capital improvement projects, the project should include the installation of the Smart Meter at the nearest control center within the project area. The cost is very minimal at $550.00 per controller and ComEd provides the actual meter at no cost.
- Dimming of parking lot lighting using LED luminaires can be utilized after the parking lots are secured for the evening. The LED technology will allow the City to add dimming switches to the lighting control and reduce the electrical energy usage.

5 PRIORITIZATION AND METHODOLOGY, IMPLEMENTATION AND FUNDING RECOMMENDATIONS

PRIORITIZATION AND METHODOLOGY

The following upgrade costs have been developed to provide the City with a range of cost alternatives for general discussion. These scenarios can be considered on a case by case basis. The scenarios encompass utilizing general maintenance work swapouts as explained in scenario #1. In scenario #2 since a capital improvement plan is not in place solely based on roadway lighting, the City can elect to contract new lighting as part of a roadway reconstruction project. Scenario #3 allows the City to utilize the existing street lighting system in its current condition and replace existing luminaires with new LED luminaires, smart meter at the existing controller, smart controls (7-pin receptacle) and utilize the existing electrical wiring. Scenario #4 identifies the costs associated with taking one of the 107 individual lighting systems and regulated controls and completely removing and rebuilding it to meet recommended lighting levels. Lastly, scenario #5 identifies the costs of implementing a Capital Improvement Plan to replace the existing City-maintained lighting in their current locations with new LED and smart technologies. The second part of scenario #5 identifies the costs associated with completely removing and rebuilding all of the City-maintained lighting to meet the recommended lighting levels.

1. Maintenance and Light Pole Knockdown Case by Case Scenario

Under this scenario, if a mid-block Tallmadge type light pole is knocked down or failed and a new luminaire needs to be purchased and installed, the lighting units at nearest intersections should be replaced with newly purchased LED luminaires and the existing head from the intersection should be relocated to the mid-block location.

Materials Required	Material Costs
New Luminaire & Installation	$3,000.00
Relocate Existing Luminaire to Existing Pole	$ 200.00
Total	**$3,200.00/Occurrence**

2. Full System Replacement of Tallmadge Light

If a new roadway/capital improvement project is undertaken and existing lighting units are within the project limits, then the Tallmadge lighting units within those limits would be upgraded as part of the capital improvements. For demonstration purposes we will utilize Seward Street from Dodge to Wesley, since this area was part of the City's pilot program.

The approximate length of the project limit is 1,800 ft. and based on analysis 18 new Tallmadge light standards would be required and all existing Tallmadge light standards would be removed. The cost to install these new lights would be as follows:

Materials Required	Cost Per Unit	Total Unit Costs
New Light Standard & Luminaire	$5,760.00/Unit x 18	$103,680.00
New Foundations	$900.00/Foundation x 18	$ 16,200.00
New 1 ¼" HDPE Duct	$8.00/Ft x 3600 Ft	$ 28,800.00
New #8 XLP Cables	$1.35/Ft x 5 Cables x 4000 Ft	$ 27,000.00
New Controller & Service		$ 15,000.00
Total Cost of New System		**$190,680.00**

Total Cost per One (1) Complete Lighting Unit Installed = $190,680.00/18 Fixtures = $10,600.00/Light Standard

3. Upgrade One Entire Existing Lighting System Using Existing Spacing, Add New LED Luminaires, 7-Pin Receptacles and Add Smart Meter to Controller

For Options 3 and 4, we utilized Power Center 26N-07W located on Central between Sherman and Orrington which has 89 Tallmadge luminaires controlled by one power center.

Materials Required	Cost Per Unit	Total Unit Costs
New Luminaire & Installation	($3,000/location) x 89 Luminaires	$267,000.00
New 7-Pin Receptacles	$50.00 x 89 Luminaires	$ 4,450.00
New Smart Meter on Controller		$ 550.00
Total Existing Control System Upgrade		**$272,000.00**

4. Upgrade One Entire Existing System Using New Light Standards and Luminaires, New Wiring, New Foundations, New 7-Pin Receptacles and New Controller

For this scenario CBBEL used the same lighting system as described in scenario #3 above and took the 89 Tallmadge Light Standards and increased that number by approximately 30% to account for the additional poles required to meet proposed lighting levels required

Materials Required	Cost Per Unit	Total Unit Costs
New Light Standard & Luminaire	$5,760.00/Unit x 116	$ 668,160.00
New Foundations	$900.00/Foundation x 116	$ 104,400.00
New 1 ¼" HDPE Duct	$8.00/Ft x 13,020 Ft	$ 104,160.00
New #8 XLP Cables	$1.35/Ft x 5 Cables x 15,000 Ft	$ 101,250.00
New Controller and Smart Meter		$ 15,000.00
Total Entire Lighting System Upgrade		**$992,970.00**

5. Complete City Wide Capital Improvement Plan

Given the cost of $10,600.00 per lighting unit from the cost derived in scenario #2 above to replace individual lights within the City of Evanston, this cost can be utilized for a roadway light pole as well as the Tallmadge lighting unit since the component costs are similar.

Taking into consideration that some areas are larger and some are smaller, there are approximately 5,800 lighting units within the City powered by 107 control centers. There are on average approximately 54 lighting units on each system. For budgetary purposes it must be put into perspective the cost to replace all of the existing lighting units as is with adding the 30% additional lighting unit, which is based on the photometric studies and the pilot programs in order to meet proposed lighting levels on a 30-year cycle. Accordingly, the City would need to set aside approximately $2,050,000.00 per year for the next 30 years to complete the replacement of the lighting system as shown below.

Existing Infrastructure Replacement Costs	
($10,600.00/Lighting Unit) x (5,800 Lighting Units)	$61,480,000.00
($61,480,000.00 for all lights)/30-Year CIP	**$ 2,049,333.33/Year**

If the city pursues the alternative to add the 30% of additional lighting (5,800 existing lighting units versus 7,540 proposed lighting units) to meet proposed lighting levels then the costs would be increased as shown below:

Proposed Infrastructure Replacement Costs to Meet Proposed Lighting Levels	
($10,600.00/Lighting Unit) x (7,540 Lighting Units)	$79,924,000.00
Cost to Replace Lighting controllers(107x$15,000.00)	$ 1,605,000.00
($81,529,000.00 for all lights and controllers)/30-Year CIP	**$ 2,717,633.33/Year**

PILOT PROJECTS

Prioritization

Consideration of high accident locations, uncontrolled intersections near schools and parks, and in and around transit hubs should be considered first when implementing new stand alone pilot programs.

Other areas of concern would follow by need and public input. These places would include public gathering areas, houses of worship, libraries, senior centers and areas identified by COE Police Department.

Lastly, major roadways are illuminated by luminaires with greater mounting heights and wattage; producing more light than those luminaires in residential areas when maintained properly, thus those lighting systems should be prioritized last.

Currently, there is no City funding for the addition or replacement of existing luminaires. Luminaires and poles are replaced as needed due to knock downs, failures and other issues. If a pole is damaged or unrepairable, this location would necessitate a new light standard, complete with new luminaire and pole as shown above in Prioritization and Methodology Scenario No. 1. The new LED light standard, complete with new luminaire and pole would enhance the lighting levels at the intersection and the areas of pedestrian conflict.

Funding Recommendations

The City of Evanston upgrades street light infrastructure as part of reconstruction projects, spot location improvements, major planned unit developments or as part of Safer Neighborhood Area Projects (SNAP). ComEd grant funding for LED lighting is currently available (See Appendix A6). ComEd facilitates rebates for replacing existing luminaires with reduced wattage LED luminaires. Currently the rebates offered by ComEd are $0.70 per watt. For example, if one of the current 400 watt high pressure sodium luminaires is replaced with a new LED equivalent luminaire of 180 watt, the wattage reduction would be 220 watts. (220 W × $0.70/W) = $154.00 rebate from ComEd.

Other Sources, when available, are grants from the Department of Commerce and Economic Opportunity (DCEO) (See Appendix A7). When available, improvements can be reimbursable up to 75% of the total cost for lighting improvements including carbon and materials.

6

LIVABILITY REVIEW – SUMMARY OF RECOMMENDATIONS

Livability Review - Summary of Recommendations

The City of Evanston's strategic vision is to "Create the Most Livable City". Evanston is using the STAR Community Rating System to define and measure community livability. Evanston was one of the first 20 communities to achieve STAR Certification, earning a 4-STAR rating. As part of this Street Light Master Plan, the STAR Community rating criteria relevant to street lighting were reviewed to determine recommended actions that the City can take to better align with the STAR community goals.

The detailed review is in Appendix A9. A summary of the recommendations is as follows.

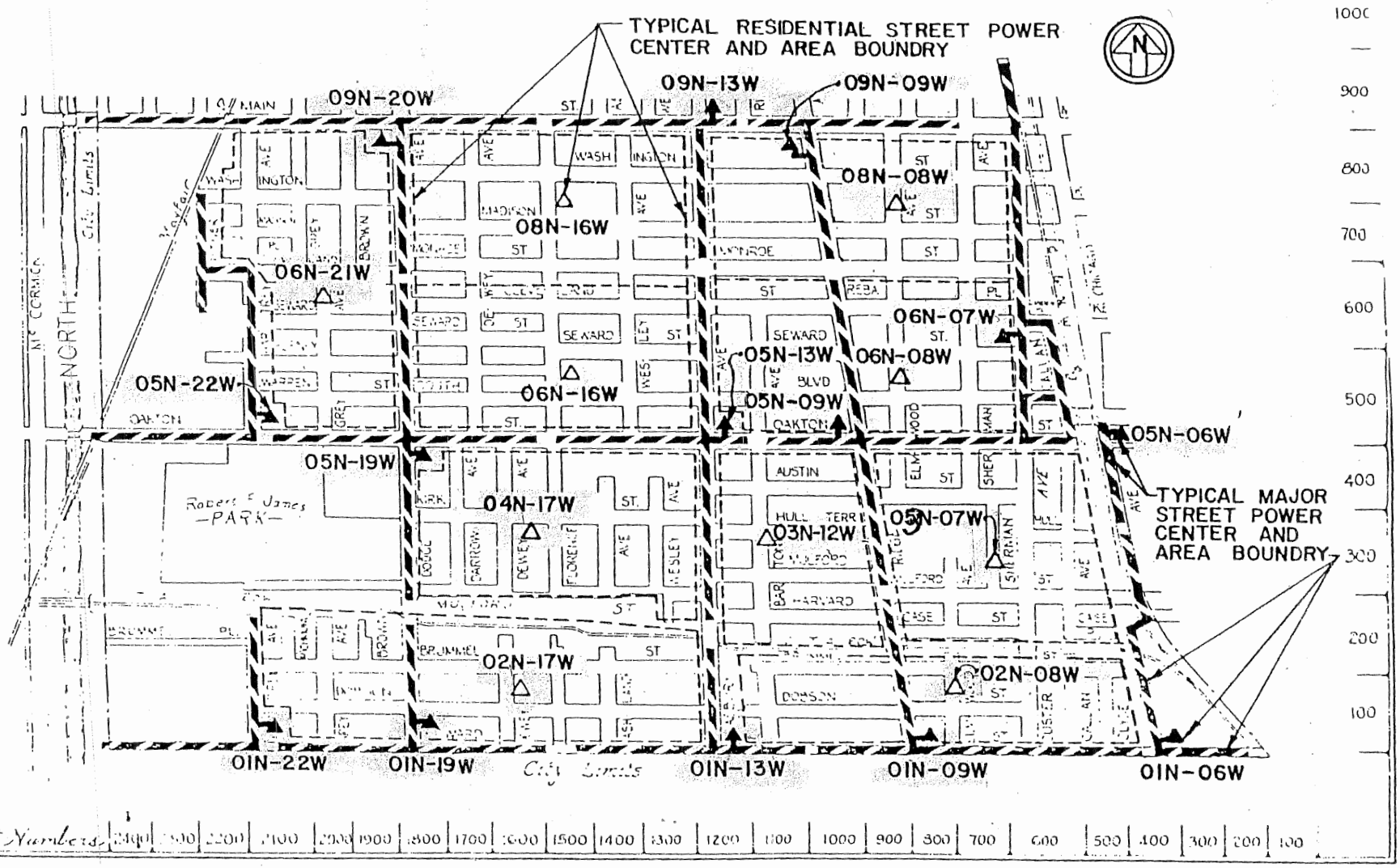
1. Develop a plan to measure ambient light levels throughout the City. This would allow Evanston to have baseline lighting data that could be used to quantitatively measure the effect of the various changes implemented because of this Street Light Master Plan.
2. Work with an existing board, commission or neighborhood group to determine a detailed plan to become dark-sky compliant/friendly. The dark-sky criteria are a third-party measurement system that objectively evaluates Evanston's sustainability related to night-time light pollution.
3. Work with other agencies (such as schools and hospitals) and neighboring communities to investigate mitigating area light pollution.
4. Set up a 311 request to get lighting complaint data that can be reviewed annually by issue and location.
5. Institute city code or policy requirements that private developments must utilize exterior LED lighting that is no more than 3000K in color temperature and dark-sky compliant/friendly.
6. All capital improvement projects involving exterior lighting and signage will be implemented in a way that minimizes or eliminates light pollution.

7 APPENDIX

STREET LIGHT POWER CENTERS

Locations	No. of
Area 1	24
Area 2	31 (2 overlap in 3, 1 in 4)
Area 3	16 (reduced by 2 from 2)
Area 4	14 (reduced by 1 from 1, And 1 from 2)

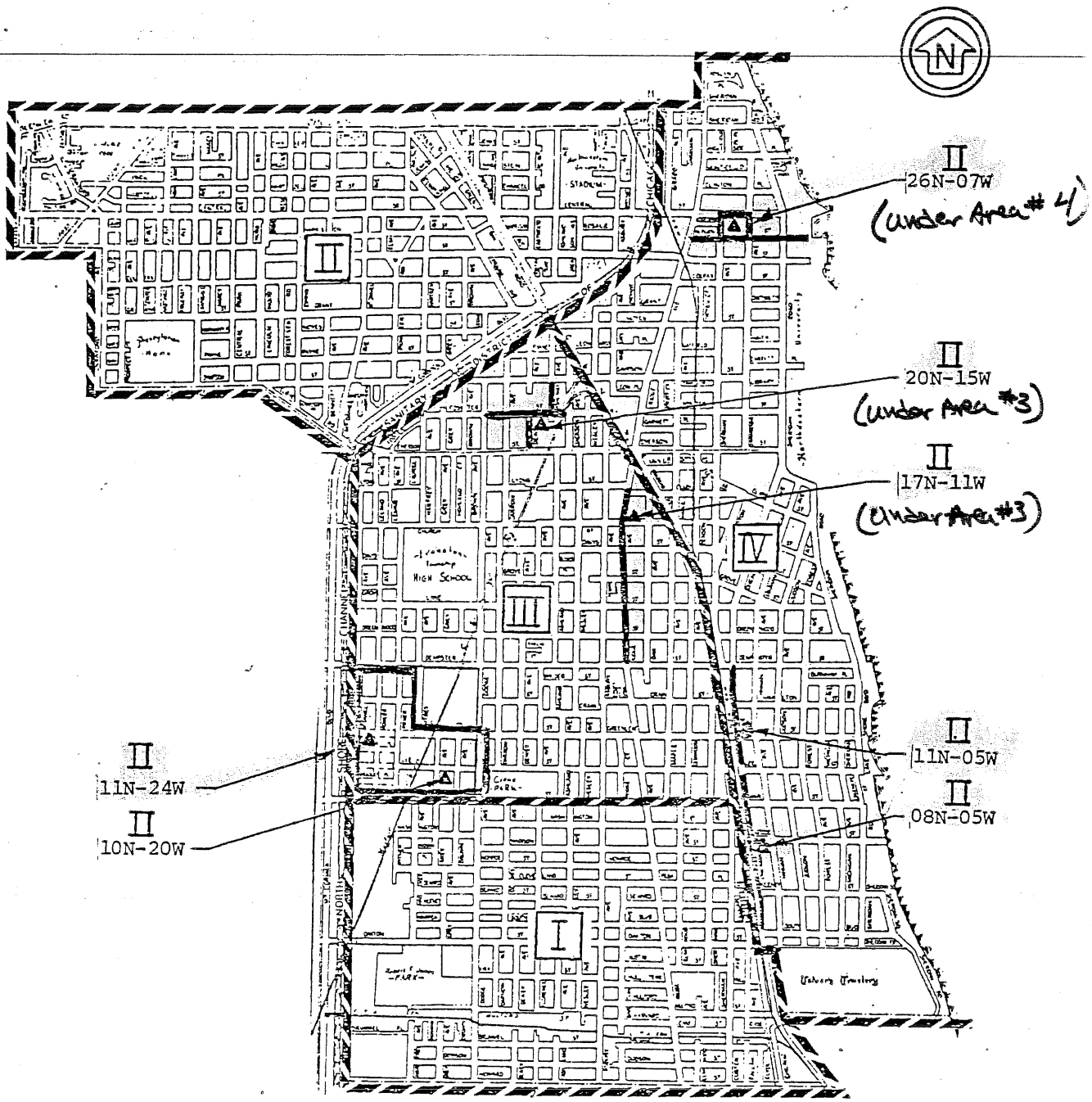
Emerson – Dodge to McCormick (Hartrey)	1
Emerson/Elgin – Oak to Orrington (Sherman)	1
Triangle (Ridge)	1
Research Park (Oak)	1
South Sheridan at Cemetery	1
Lake – Ashland to Dodge (Dewey)	1
Custer – Howard to Oakton (Mulford)	1
Dodge – Church to Dempster (Lake)	1
Emerson/Asbury – Asbury to Dodge (Wesley)	1
North Sheridan @ Campus (Garrett)	1
Green Bay – Isabella to Central (Livingston)	1
Green Bay – Central to Ashland (Lincoln)	1
Green Bay/Ashland – Ashland to Foster (Payne)	1
Simpson – Green Bay to McCormick (Dewey)	1
Noyes – Ridge to Sherman (Sherman)	1
Main – Sherman to Hinman (Hinman)	1
Hot Dog Island (Gross Point)	1
Downtown	3
Howard – Chicago to Ridge (Custer)	1
Dempster – Elmwood to alley E Chicago (Chicago)	1
Total	107



POWER CENTER LOCATION MAP

NOT TO SCALE

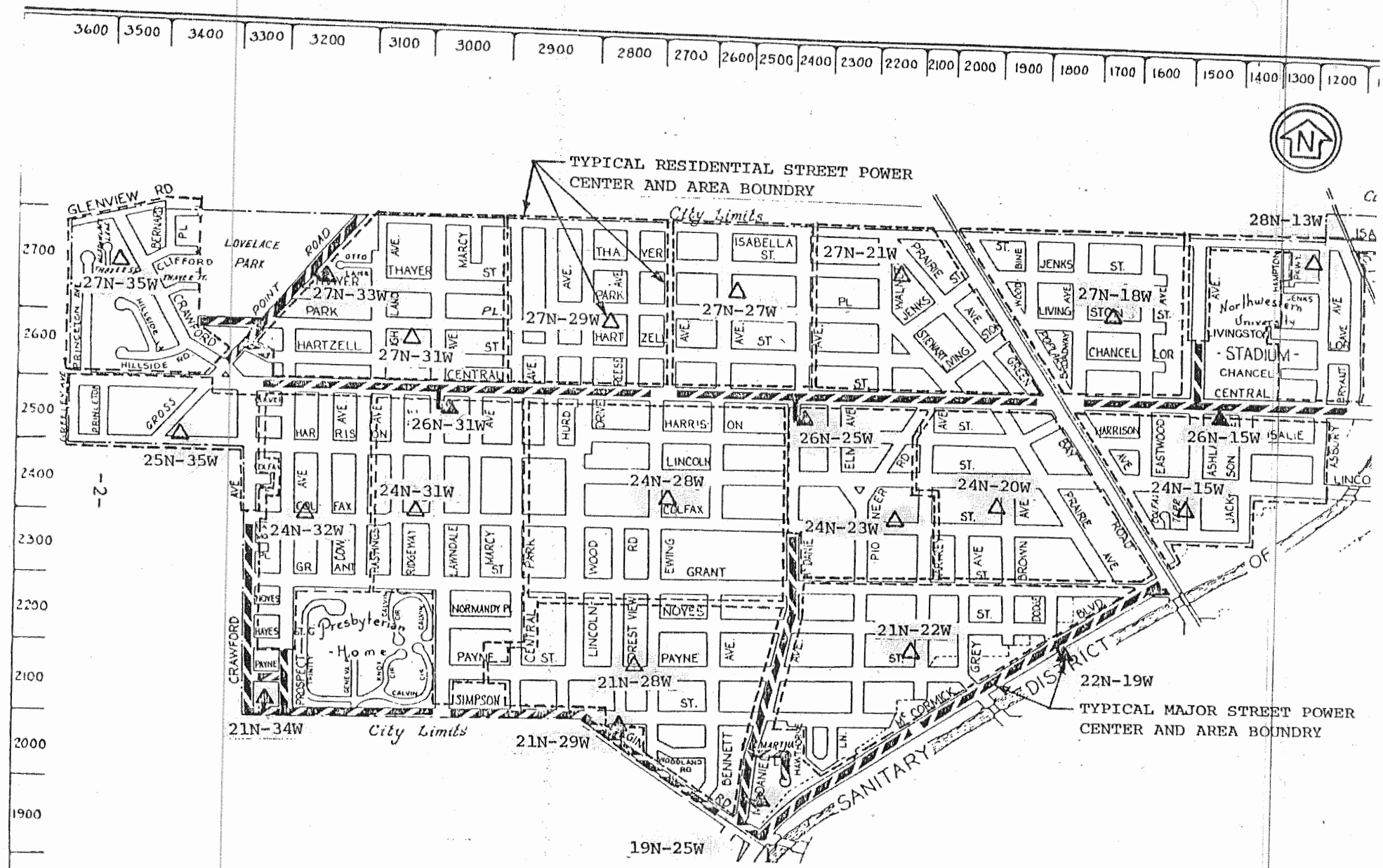
Area # 1



CONTRACT DESIGNATION MAP

NO SCALE

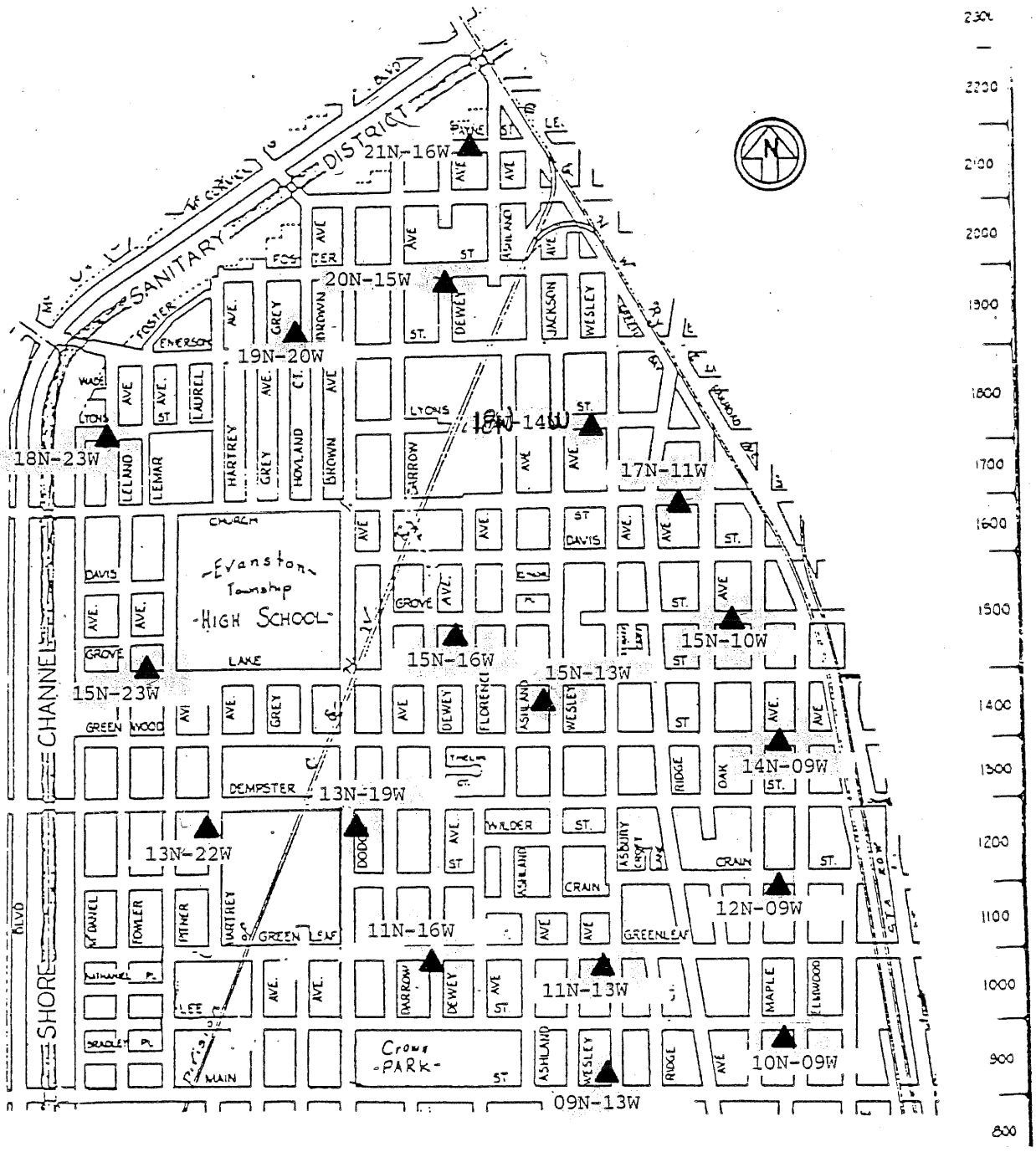
Area #2



POWER CENTER LOCATION MAP

NOT TO SCALE

Area #2

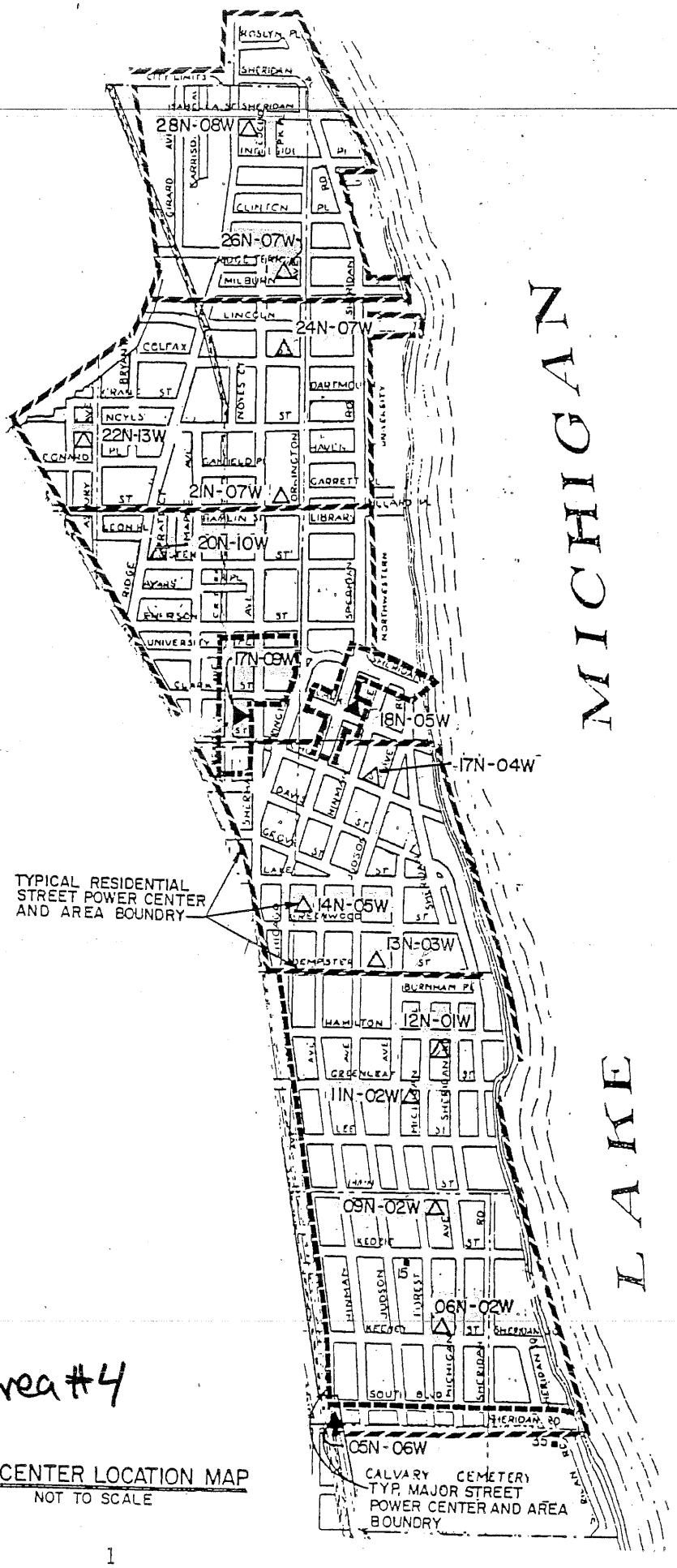


CONTRACT NO. 3

POWER CENTER LOCATION MAP

Not to Scale

Area #3



POWER CENTER LOCATION MAP

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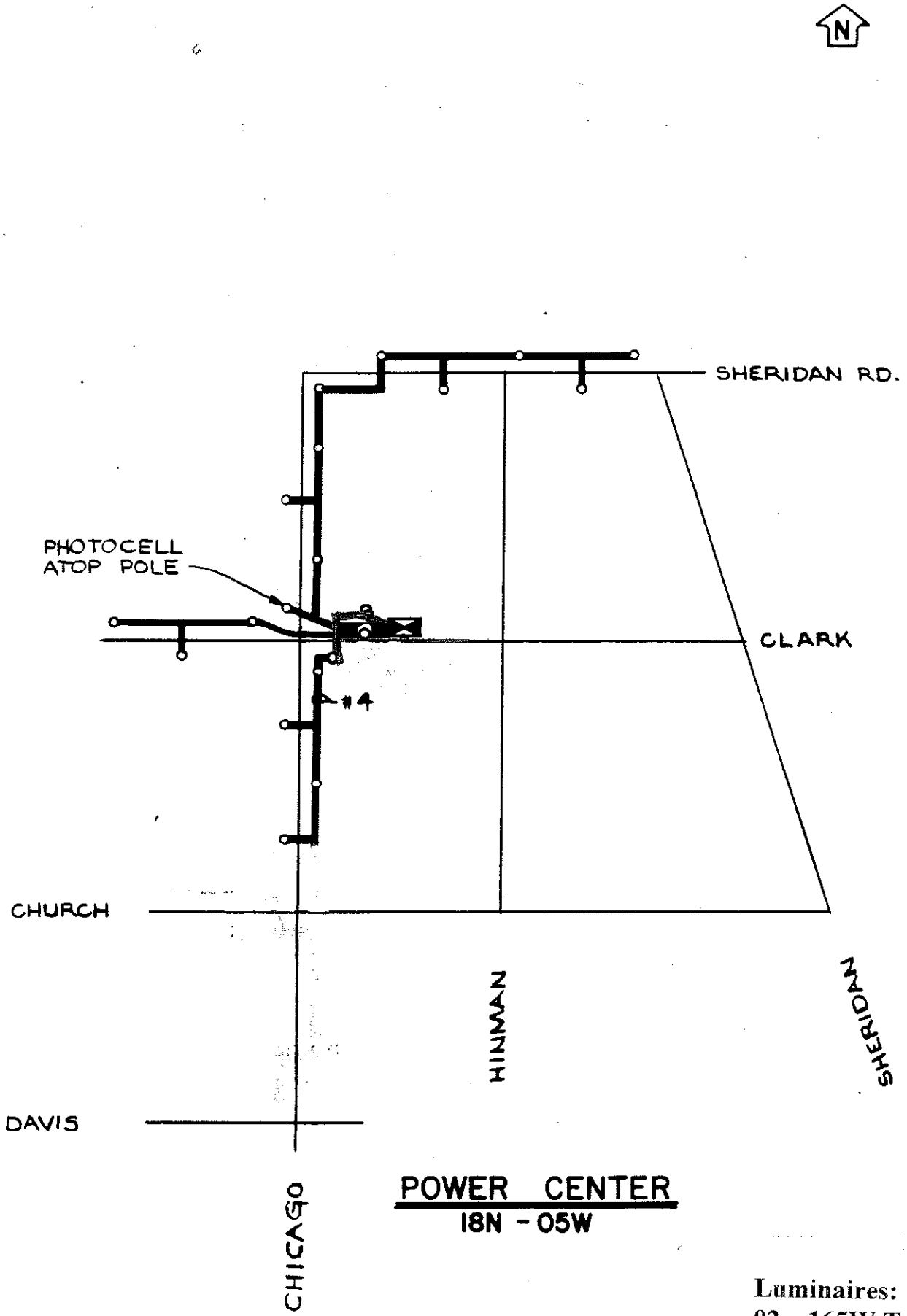
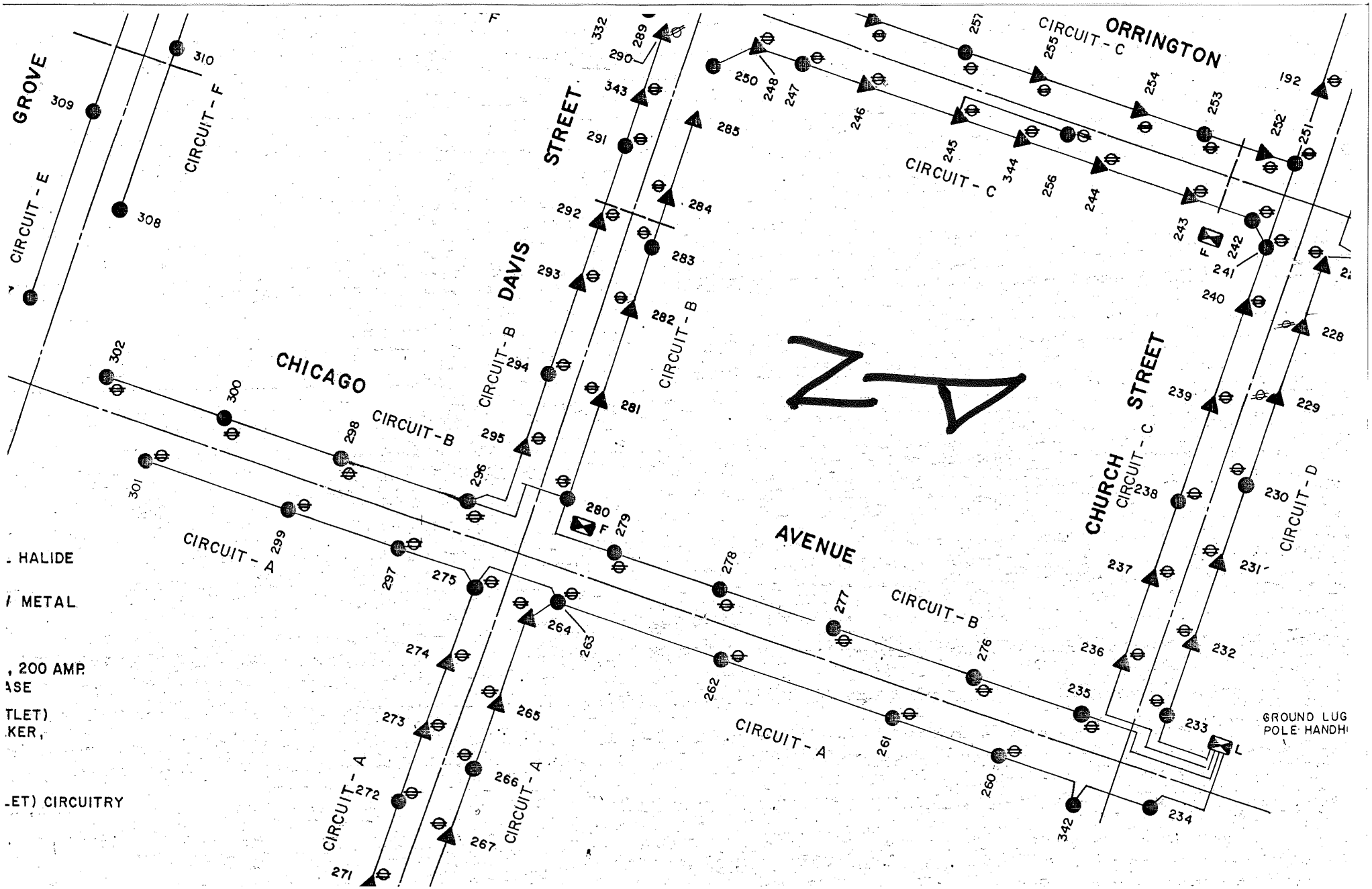
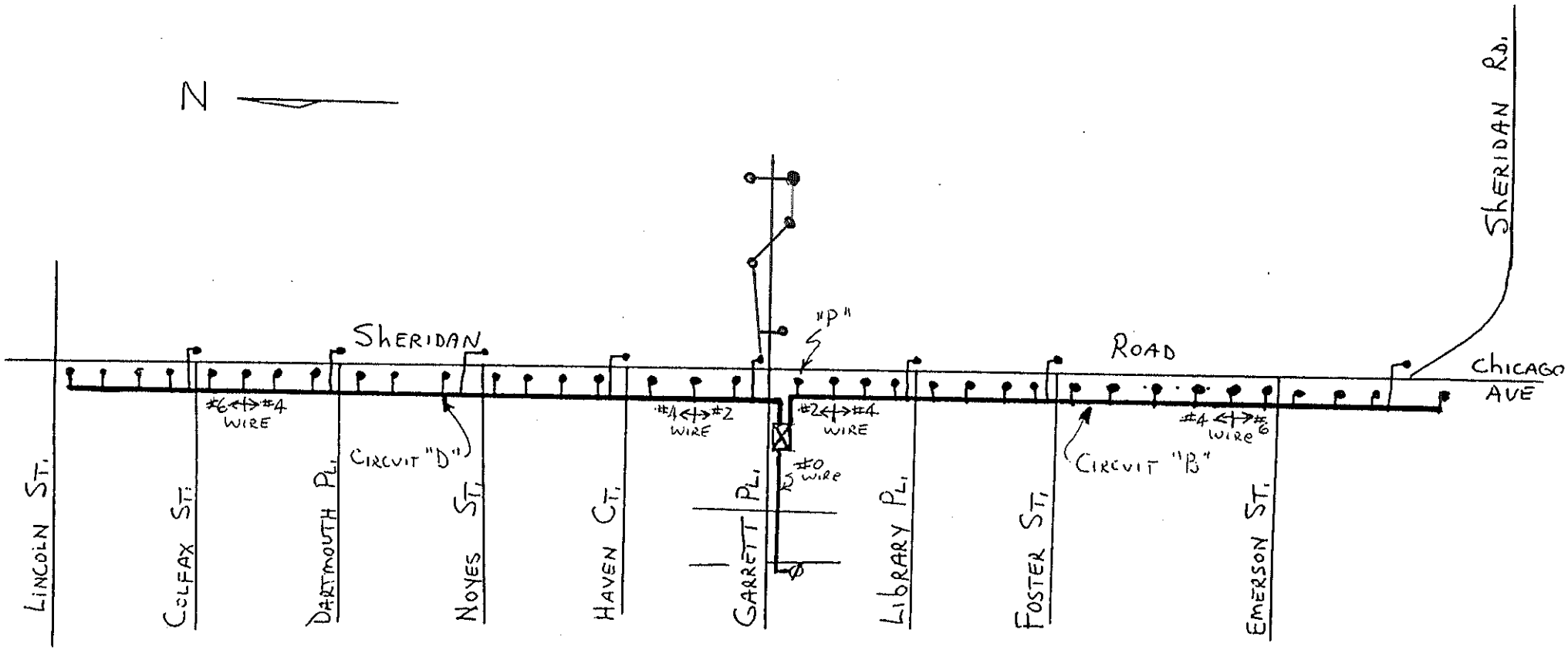


POWER CENTER
18N - 05W

Luminaires:
02 – 165W Tallm.
06 – 250W Davit
11 – 400W Davit


GROVE
CIRCUIT - E
CIRCUIT - F
DAVIS STREET
CHICAGO AVENUE
CHURCH STREET
ORRINGTON
CIRCUIT - A
CIRCUIT - B
CIRCUIT - C
CIRCUIT - D
. HALIDE
/ METAL
, 200 AMP.
ASE
TLET)
KER,
-ET) CIRCUITRY
GROUND LUG
POLE HANDH



"P" - Photocell

☒ - Power Center

ø - Power Pole

POWER CENTER 21N-05W

CIRCUIT A — 0

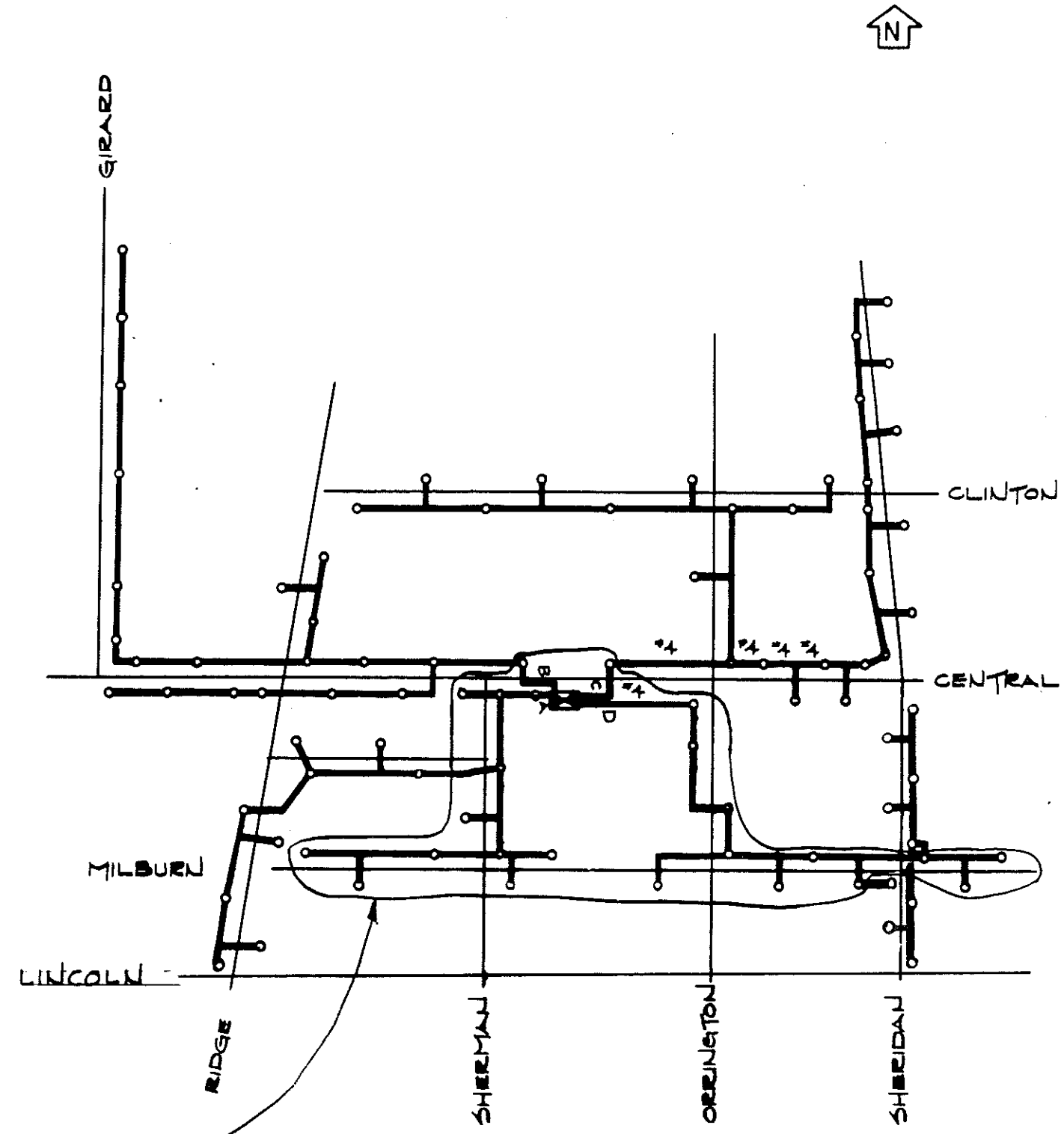
B — 21 @ 400 WATT

C — 0

D — 23 @ 400 WATT

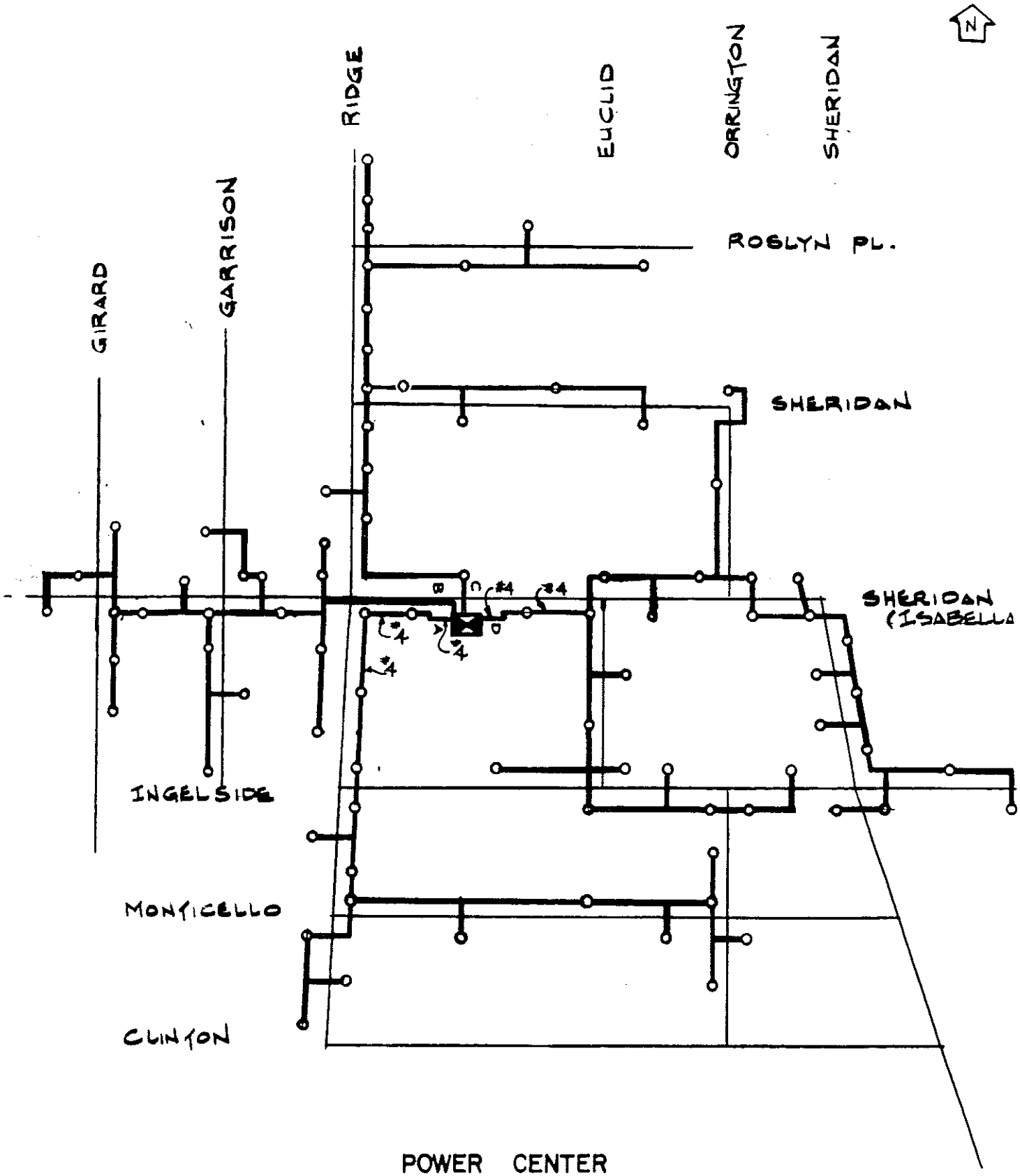
PUT IN by WOOD ELECTRIC

PW-SL-9113, 6/9-



POWER CENTER
26N-07W

Luminaires:
89 – 85W Tallm.



POWER CENTER
28N-08W

Luminaires:
87 – 85W Tallm.

1979 Master Plan

Street lighting systems serving the following areas or streets shall be designed to satisfy the specific lighting level requirements set forth below:

	LOCATION	LIGHTING LEVEL (In Footcandles)
a.	RIDGE AVE. from Howard Street to Emerson Street Because of high levels of nighttime, vehicular traffic, mixed land uses including many institutions generating nighttime traffic, inadequate road and intersection geometry and a high incidence of traffic accidents, average maintained lighting levels should fall within the specified range.	0.6-1.0
b.	FOSTER STREET BUSINESS DISTRICT between Sherman and Maple	0.4-0.6
	CUSTER STREET BUSINESS DISTRICT between Cleveland and Main Streets To be consistent with Noyes Street and other small local business areas	0.4-0.6
c.	ELMWOOD from Main to Grove	0.2-0.4
	JUDSON from Kedzie to Lee	0.2-0.4
	HINMAN from Kedzie to Lee	0.2-0.4
	GREENLEAF from Ridge to Dodge	0.2-0.4
	DAVIS from Ridge to Ashland Local streets thru areas designated by Police Department for higher light levels to assist in crime prevention	0.2-0.4
d.	McCORMICK from Brown to Elgin Road for continuity with levels existing south of Elgin Road and to provide some nighttime lighting adjacent to Ladd Arboretum.	1.0-2.0

The recommended lighting level standards shown in Table 5 are to apply to all areas receiving new or rehabilitated street lighting under this plan except as noted below. Appropriate uniformity ratios and other technical requirements are to be established by detailed engineering studies as approved by the City Council.

RECOMMENDED LIGHTING LEVELS IN FOOTCANDLES

Adjacent Land Use:

Street Category	Industrial	Commercial & Institutional	High Density Residential	Low Density Residential	Notes
Major	0.4-1.0*	1.0-4.0*	0.4-0.6*	0.2-0.4	* special study required for each use. 4.0 footcandles to apply only to Central Business District. (CBD)
Collector	0.4-1.0	0.4-1.0	0.2-0.4	0.2-0.4	
Distributor	No such category	1.0-4.0 CBD only	0.2-0.6* East of Hinman & So. of Lake	0.2-0.4	* special study required for each street & block
Local	0.2-0.4	0.4-0.6	0.1-0.2	.05-0.1	

Alley Light Petition: AL # (Official Use Only)

CITY OF EVANSTON
PETITION FOR ALLEY LIGHTING

Date Submitted ___/____/___

I hereby petition the City of Evanston to authorize ComEd to install lighting in the alley behind the property at (ComEd utility pole location):

Address: _____ Ward: _____

I understand that ComEd offers only 100 watt or 250 watt High Pressure Sodium Luminaire/Lamps. ***(Note: this type of high pressure sodium lamp will emit orange glow and may shed light on to the adjacent properties)***. I request ComEd to install:

Check one: _____ 100 Watt Lamp _____ 250 Watt Lamp

I am aware that I am responsible for the electricity usage bill to be paid directly to ComEd.

Applicant:

Name:_____

Address:_____

Phone Number:_____Email:_____

***(Note: This petition must be signed by at least 51% of the residents living adjacent to this alley and/or approved by the Ward Alderman. For condominiums and rental properties, one letter of approval from the condominium association or management firm is sufficient*).**

I support the installation of an alley light at the address listed above located in my ward.

Signature: _____

Ward Alderman

Alley Light Petition: AL # (Official Use Only)

Name	Address	Phone

Submit your completed petition to:

Public Works Agency
Room 3700
2100 Ridge Avenue
Evanston, IL 60201

Alley Light Petition: AL # (Official Use Only)

CITY OF EVANSTON
PETITION FOR ALLEY LIGHTING
REIMBURSMENT & PAYMENT AGREEMENT

Date Submitted ___/____/___

I am aware that I am responsible for the electricity usage bill to be paid directly to ComEd.

(Note: If the location is within the targeted CDBG program area, the city will reimburse, on a yearly basis, 50% of the electricity cost incurred by the applicant for the first five (5) years after the installation date. The applicant must submit the utility bills to the Public Works Ageny with proof of payment on a yearly basis during the five (5) year period of City reimbursement, if applicable. The mailing address for submitting proof of payment is listed below.)

Applicant: (Person responsible for paying electricity charges)

Name:_____

Address: _____

Phone Number:_____Email:_____

Alternate Phone Number: _____

Send Proof of Payment to: City of Evanston
Public Works Agency
Room 3700
2100 Ridge Avenue
Evanston, IL 60201

Printed Name: _____

Signature: _____

Date: ___/____/___

Means and Methods of Existing Conditions Lighting Level Study and Analysis

The existing conditions were studied with an illumination light meter (Extech SDL400 as shown in Figure 1) collecting illumination readings in a grid format per IESNA Roadway Lighting ANSI/IES RP-8-14. Area and points for the grid are typical as shown in Figure 2, including two tranverse points per lane at each longitudinal point along one luminaire cycle. A luminaire cycle is defined as the distance between two luminaires having the same geometry, mounting height, overhang, tilt and orientation. In the event that the luminaire geometry is not uniform along the length of the roadway, the gridded portion should continue along the length of the roadway until it has reached the point where the luminaire geometry remains constant. Longitudinally, calculation points should be placed so there is atleast ten points along the roadway not more than five meters on center. In the event that the roadway varies in number of lanes, the grid should be based on the number of lanes for the majority of the length of the roadway. In the event that the roadway width and number of lanes change, then a revised grid should be used for the new width of the roadway.

Figure 1: *Illumination Light Meter (Extech SDL400)*

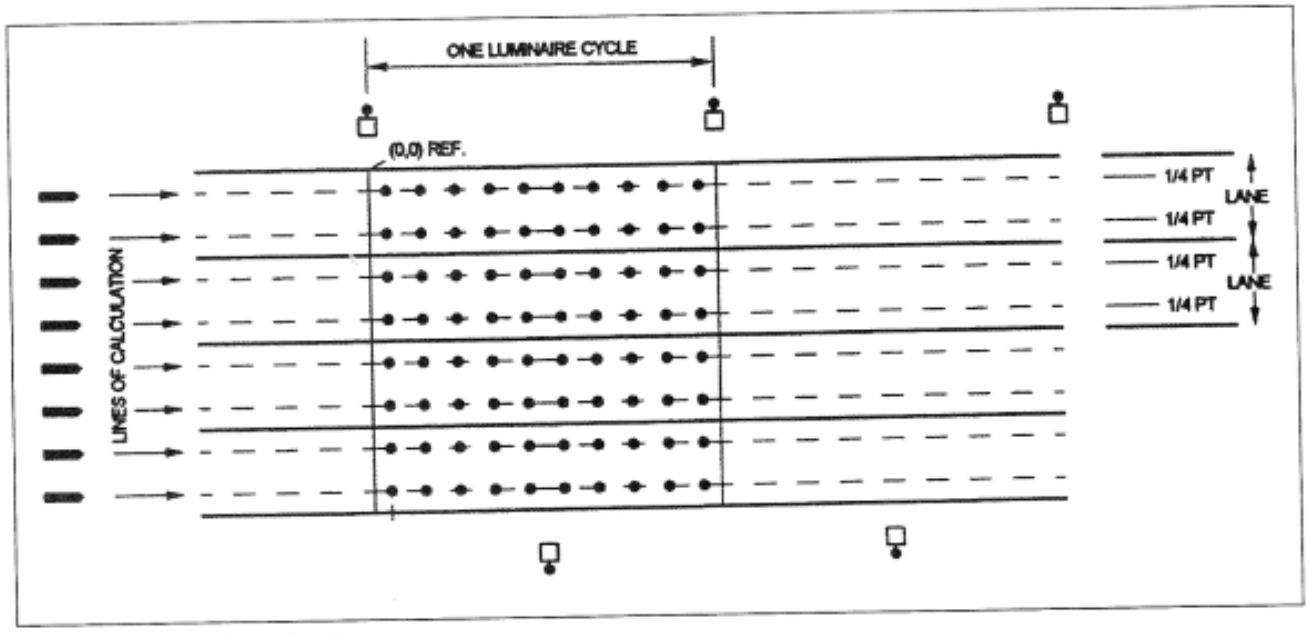


Figure 2: *Typical Roadway Grid Layout (Source: IESNA ANSI/IES RP-8-14)*

The calculation points for illuminance in the pedestrian area or sidewalk adjacent should match the roadway grid spacing, be positioned in the center and be calculated in assuming a meter aimed along the sidewalk in both walking directions.

Calculation points for intersections should extend from the stop bar at each street across the entire intersection. The grid spacing for the points should be at 2 meters throughout the calculation area as shown in Figure 3.

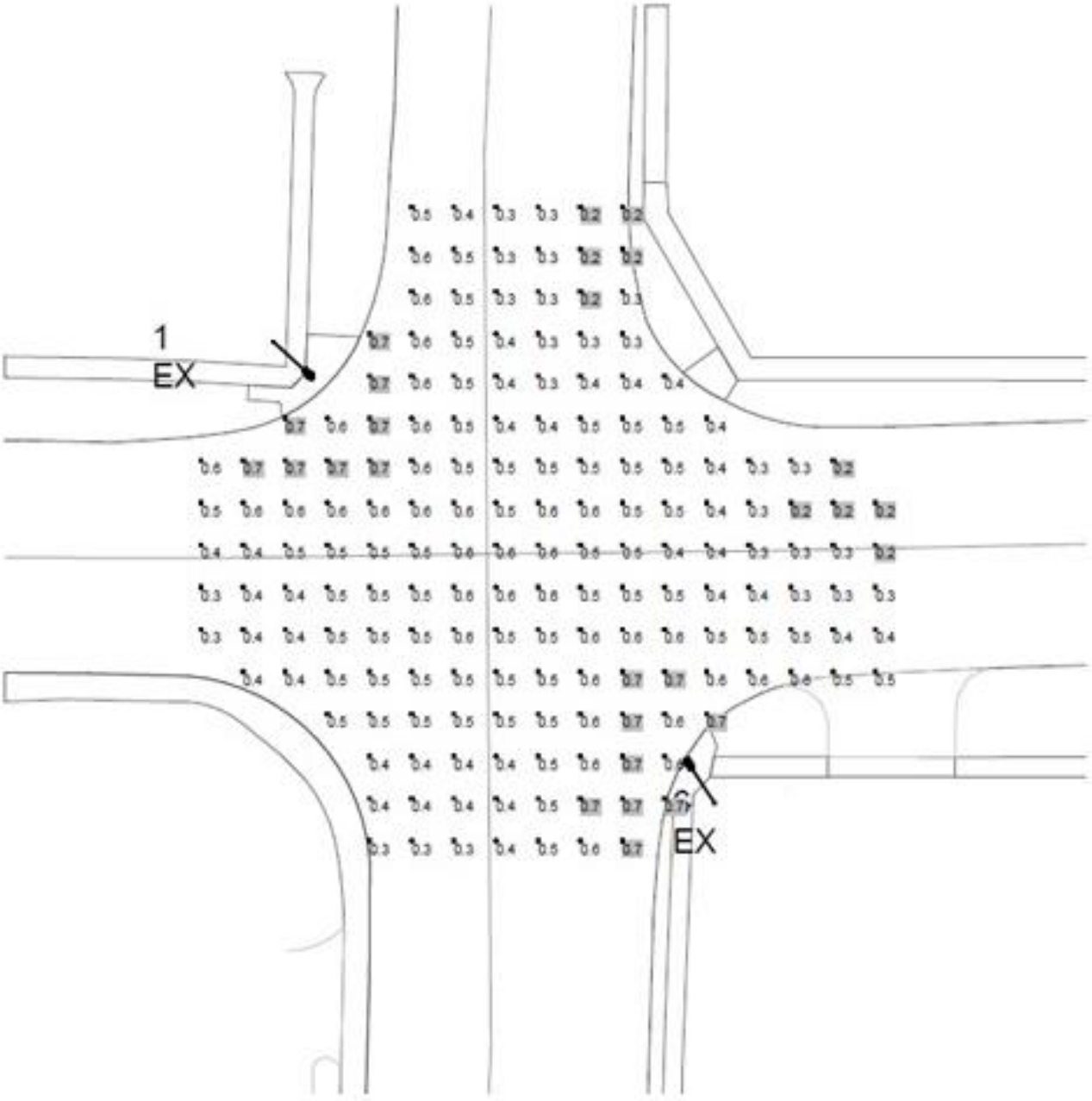


Figure 3: *Typical Intersection Grid Layout*

STREET LIGHTING MASTER PLAN

PILOT PROGRAM AREA SUMMARY

NOTE: *Due to the limited number of luminaires provide by each manufacturer and differentiating luminaires along the roadway a full pole cycle was unavailable for proper IES recommended testing. Each test was done taking measurements 20' in either direction of the stated pilot luminaire and pole in accordance with IES recommended testing.*

The following pages consist of a Pilot Program Area Summary followed by a narrative outlining observations and recommendations at each of the pilot program study areas.

City of Evanston

CHRISTOPHER B. BURKE ENGINEERING, LTD.

9575 W Higgins Road, Suite 600 Rosemont, Illinois 60018-4920
Telephone (847) 823-0500 Fax (847) 823-0520

PILOT PROGRAM AREA SUMMARY						
STUDY AREA	STUDY AREA LIMITS	MANUFACTURER	WATTAGE	COLOR TEMPERATURE	LENS TYPE	ROADWAY AVERAGE (FC)	AVERAGE AT ROW (FC)
1	SEWARD (DODGE-DEWEY)	FIXTURE PROVIDED BY CITY OF EVANSTON	55	4000 K	CLEAR	0.97	0.56
1	SEWARD (DODGE-DEWEY)	FIXTURE PROVIDED BY CITY OF EVANSTON	55	3000 K	CLEAR	0.91	0.39
2	SEWARD (DEWEY-FLORENCE)	FIXTURE PROVIDED BY CITY OF EVANSTON	55	4000 K	FROSTED	1.05	0.46
2	SEWARD (DEWEY-FLORENCE)	FIXTURE PROVIDED BY CITY OF EVANSTON	55	3000 K	FROSTED	0.70	0.21
3	SEWARD (FLORENCE-WESLEY)	STERNBERG	50	3000 K	ACRYLIC	0.71	0.22
3	SEWARD (FLORENCE-WESLEY)	STERNBERG	50	3000 K	FROSTED	0.39	0.43
4	THAYER (CENTRAL PARK-LAWNDALE)	EVERLIGHT	80	4000 K	ORIGINAL	0.26	0.17
5	FOREST (KEENEY-KEDZIE)	ELCAST LIGHTING	40	4000 K	ORIGINAL	0.05	0.10
5	FOREST (KEENEY-KEDZIE)	ELCAST LIGHTING	80	4000 K	ORIGINAL	0.11	0.21

City of Evanston

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Telephone (847) 823-0500 Fax (847) 823-0520

STUDY AREA 1 – SEWARD STREET (DODGE – DEWEY)

FIXTURE PROVIDED BY CITY OF EVANSTON

Two separate fixtures were tested along Seward Street (Dodge – Dewey) that classifies as a local street with medium pedestrian traffic. Illuminating Engineering Society (IES) recommends an average roadway illuminance of 0.7. Both fixtures exceeded the IES recommended illuminance, but provided an excessive amount of light into the neighboring property and R.O.W. It is unclear what optic was installed; with a proper optic, light trespassing into the neighboring property could be minimized. A substantial amount of up light and glare was observed. The pilot luminaire least replicates the existing Tallmadge physical appearance. The clear lens allows the reflector within the luminaire to be obvious and unappealing.

PILOT PROGRAM AREA SUMMARY (04/19/18)				
WATTAGE	COLOR TEMPERATURE	LENS TYPE	ROADWAY AVERAGE (FC)	AVERAGE AT ROW (FC)
55	4000 K	CLEAR	0.97	0.56
55	3000 K	CLEAR	0.91	0.39

PILOT PROGRAM AREA SUMMARY (01/23/18)				
WATTAGE	COLOR TEMPERATURE	LENS TYPE	ROADWAY AVERAGE (FC)	AVERAGE AT ROW (FC)
136	4000 K	CLEAR	1.94	1.58
136	3000 K	CLEAR	2.71	1.38

STUDY AREA 2 – SEWARD STREET (DEWEY – FLORENCE)

FIXTURE PROVIDED BY CITY OF EVANSTON

Two separate fixtures were tested along Seward Street (Dewey – Florence) that classifies as a local street with medium pedestrian traffic. Illuminating Engineering Society (IES) recommends an average roadway illuminance of 0.7. Both fixtures met or exceeded the IES recommended illuminance, but provided an excessive amount of light into the neighboring property and R.O.W. It is unclear what optic was installed; with a proper optic, light trespassing into the neighboring property could be minimized. A substantial amount of up light and glare was observed. The frosted acrylic lens was more effective in mitigating the amount of glare. The pilot luminaire least replicates the existing Tallmadge physical appearance. Of the four fixtures provided by City of Evanston measured and all factors taken into consideration the 55W 3000K pilot luminaire with a frosted acrylic lens performed the best.

PILOT PROGRAM AREA SUMMARY (04/19/18)				
WATTAGE	**COLOR TEMPERATURE**	**LENS TYPE**	**ROADWAY AVERAGE (FC)**	**AVERAGE AT ROW (FC)**
55	4000 K	FROSTED	1.05	0.46
55	3000 K	FROSTED	0.70	0.21

PILOT PROGRAM AREA SUMMARY (01/23/18)				
WATTAGE	**COLOR TEMPERATURE**	**LENS TYPE**	**ROADWAY AVERAGE (FC)**	**AVERAGE AT ROW (FC)**
136	4000 K	FROSTED	1.55	0.43
136	3000 K	FROSTED	2.64	0.85

STUDY AREA 3 – SEWARD STREET (FLORENCE – WESLEY)

STERNBERG

Two separate fixtures were tested along Seward Street (Florence – Wesley) that classifies as a local street with medium pedestrian traffic. Illuminating Engineering Society (IES) recommends an average roadway illuminance of 0.7. The 50W 3000K pilot luminaire with a prismatic acrylic lens exceeded the IES recommended illuminance and provided minimal amount of light into the neighboring property and R.O.W. It is unclear what optic was installed. The pilot luminaires are dark-sky compliant due to the elimination of the top lens and yielded a superior balance of lighting to the roadway while minimizing excess glare. The frosted acrylic lens was more effective in mitigating the amount of glare. The pilot luminaire mocks the existing Tallmadge physical appearance in all aspects except the elimination of the top lens. Of the two fixtures measured and all factors taken into consideration the 50W 3000K pilot luminaire with a prismatic acrylic lens performed the best.

PILOT PROGRAM AREA SUMMARY (04/19/18)				
WATTAGE	COLOR TEMPERATURE	LENS TYPE	ROADWAY AVERAGE (FC)	AVERAGE AT ROW (FC)
50	3000 K	ACRYLIC	0.71	0.22
50	3000 K	FROSTED	0.39	0.43

STUDY AREA 4 – THAYER STREET (CENTRAL PARK – LAWNDALE)

EVERLIGHT RETROFIT

A single retrofit was tested along Thayer Street (Central Park – Lawndale) that classifies as a local street with medium pedestrian traffic. Illuminating Engineering Society (IES) recommends an average roadway illuminance of 0.7. The pilot luminaire did not meet the IES recommended illuminance, but provided minimal amount of light into the neighboring property and R.O.W. It is unclear what optic was installed. A substantial amount of up light and glare was observed aided by using the existing Tallmadge prismatic acrylic lens.

PILOT PROGRAM AREA SUMMARY (04/19/18)				
WATTAGE	COLOR TEMPERATURE	LENS TYPE	ROADWAY AVERAGE (FC)	AVERAGE AT ROW (FC)
80	4000 K	ORIGINAL	0.26	0.17

STUDY AREA 5 – FOREST STREET (KEENEY – KEDZIE)

ELCAST LIGHTING RETROFIT

Two separate retrofits were tested along Forest Street (Keeney – Kedzie) that classifies as a local street with medium pedestrian traffic. Illuminating Engineering Society (IES) recommends an average roadway illuminance of 0.7. The pilot luminaires did not meet the IES recommended illuminance, but provided minimal amount of light into the neighboring property and R.O.W. It is unclear what optic was installed. A substantial amount of up light and glare was observed aided by using the existing Tallmadge prismatic acrylic lens. The pilot retrofit is inferior to all other pilot fixtures and retrofits tested and would not be an adequate upgrade to the existing Tallmadge luminaire.

PILOT PROGRAM AREA SUMMARY (04/19/18)				
WATTAGE	**COLOR TEMPERATURE**	**LENS TYPE**	**ROADWAY AVERAGE (FC)**	**AVERAGE AT ROW (FC)**
40	4000 K	ORIGINAL	0.05	0.10
80	4000 K	ORIGINAL	0.11	0.21

RETROFIT LUMINAIRE VERSUS LED TALLMADGE REPLICA LUMINAIRE

City of Evanston

CHRISTOPHER B. BURKE ENGINEERING, LTD.

9575 W Higgins Road, Suite 600 Rosemont, Illinois 60018-4920
Telephone (847) 823-0500 Fax (847) 823-0520

RETROFIT LUMINAIRE

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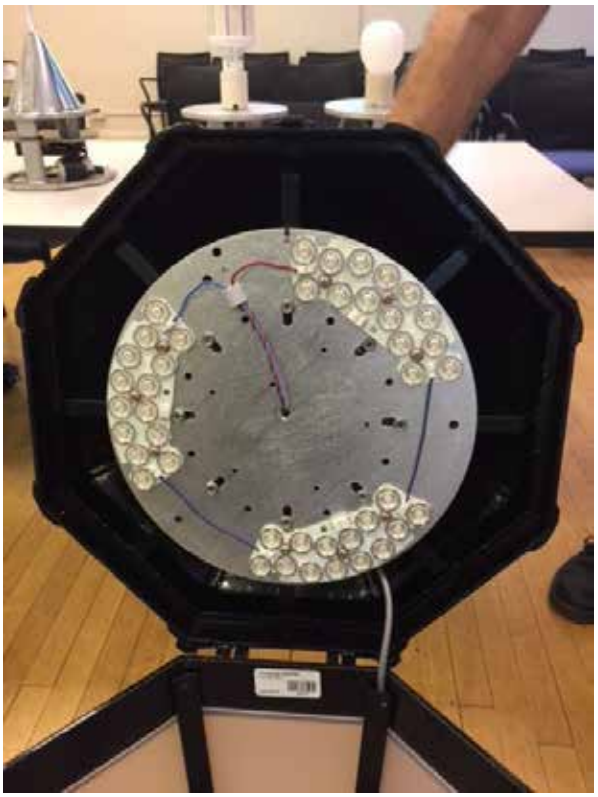
9575 W Higgins Road, Suite 600 Rosemont, Illinois 60018-4920
Telephone (847) 823-0500 Fax (847) 823-0520

LED TALLMADGE REPLICA LUMINAIRE



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ComEd Energy Efficiency Program

PUBLIC SECTOR

Municipal Street Lights
Light Your Way to Savings

Upgrading street lights to energy-efficient LED technology is a cost-effective option for municipalities to reduce energy and lighting maintenance costs. ComEd helps its municipal customers realize the cost savings, as well as other benefits, from upgrading to LED street lighting.

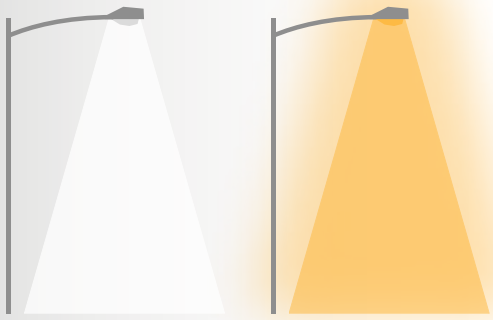
The ComEd Energy Efficiency Program provides an incentive of $0.70 per watt reduced, up to 75% of the total cost of the project for upgrading municipally owned street lights to LEDs.* The incentive is available for projects completed between January 1, 2018 and December 31, 2018.

To assist you in taking advantage of the municipal street lights incentive, the ComEd Energy Efficiency Program provides FREE technical and application processing assistance.

CONTACT US AND START SAVING NOW!

Learn more about the ComEd Energy Efficiency Program municipal street light incentive.

VISIT ComEd.com/PublicSectorEE
EMAIL PublicSectorEE@ComEd.com
CALL 773-328-7040



LED | High Intensity Discharge

BENEFITS OF LED STREET LIGHTS

- Decreased energy consumption and costs
- Reducedmaintenance costs due to longer product life
- Improved safety through enhanced visibility
- Decreased light trespass and pollution
- No warm-up period required, unlike legacy high-intensity discharge lamps
- No mercury, lead, or other known disposable hazards

MORE DETAILS ON BACK

*Incentive levels are subject to change at any time.

ComEd An Exelon Company | powering lives

FACT SHEET

ComEd
Energy Efficiency Program

TECHNICAL AND APPLICATION ASSISTANCE

ComEd offers the following free services:

- Help in identifying eligible street lighting projects
- Guidance in collecting and recording required application data
- Aid in street light location mapping
- Help with documenting project implementation and verifying that it meets program requirements
- Assistance in the preparation of pre-approval and final applications

Contact us to learn more or to be connected to a street lighting specialist.

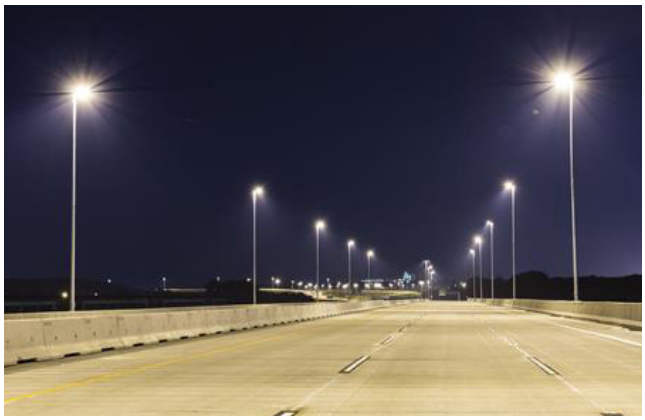
ELIGIBILITY REQUIREMENTS

Municipalities within the ComEd service territory (regardless of electricity supplier) are eligible for this incentive.

Projects must involve the replacement of municipally owned street lights with LED street lights.

Replacement street lights must be certified by the DesignLights Consortium. More information on qualified products can be found at www.designlights.org.

All municipal street light projects require pre-approval.



SAMPLE INCENTIVE

Old street light*	250W high pressure sodium (HPS)
LED street light	88W LED
Annual energy savings**	891 kWh per year
Incentive offered (at $0.70 per watt reduced)	$144.90

* Converts to 295 system watts per ComEd HID input wattage table.
** Assumes 4,303 operating hours per year.

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powering lives

Standard / Custom Incentives: January 1, 2018 - December 31, 2018

INDOOR AND OUTDOOR LIGHTING		
Fixtures	LED	$0.40 per watt reduced
	T8/T5 fluorescent	$0.30 per watt reduced
Retrofits	LED	$0.40 per watt reduced
	Fluorescent lighting	$0.20 per watt reduced
Sensors	Occupancy	$0.10 per watt reduced
	Vacancy (indoor only)	$0.10 per watt reduced
	Plug load occupancy	$10 per sensor
LED Signs	"Open" sign	$40 per sign
	Channel sign < 2 feet	$12 per letter
	Channel sign > 2 feet	$30 per letter
Daylighting controls (indoor only)		$0.12 per watt controlled
Occupancy sensor plus daylighting controls (indoor only)		$0.18 per watt controlled
Time clocks for lighting		$0.03 per watt controlled
Photocells (outdoor only)		$0.08 per watt controlled
Photocell plus time clock (outdoor only)		$0.09 per watt controlled
All other lighting (measure must meet simple payback requirements)		$0.05 per kWh saved

ADVANCED INDOOR AND OUTDOOR LIGHTING	
OPTION ONE	
New T8/T5 fluorescent fixture	$0.50 per watt reduced
New LED fixture	$0.50 per watt reduced
New lighting control system	$0.18 per watt controlled
Measurement & verification	$0.10 per kWh saved above target
Use NALCTP-certified contractor on installation team	$1,000
OPTION TWO	
Keep existing fixtures or install new or retrofitted fixtures that don't meet option one fixture specs but may be eligible for standard lighting incentives	$0.07 per kWh saved above baseline
New lighting control system	
Measurement & verification	
Use NALCTP-certified contractor on installation team	$1,000

ENERGY MANAGEMENT SYSTEM		
Installation of EMS on building with existing systems:	**TIER I** At least (3) control strategies implemented	**TIER 2** At least (6) control strategies implemented
Non-programmable pneumatic thermostats	$0.25 per sq. ft. of conditioned space	$0.35 per sq. ft. of conditioned space
Non-programmable electronic thermostats	$0.25 per sq. ft. of conditioned space	$0.35 per sq. ft. of conditioned space
Programmable thermostats	$0.15 per sq. ft. of conditioned space	$0.25 per sq. ft. of conditioned space
Existing digital EMS older than 15 years	$0.15 per sq. ft. of conditioned space	$0.25 per sq. ft. of conditioned space

HVAC		
Water cooled chiller	Centrifugal	$20 per ton plus $3.50 per ton efficiency bonus
	Scroll or helical-rotary (screw)	
	Reciprocating	
Air cooled chiller		$30 per ton plus $3.50 per ton efficiency bonus
Variable speed drive on HVAC chiller		$40 per HP
Chilled water reset controls		$5 per ton
SEHA tier 1 room air		$30 per ton
Package terminal AC/ package terminal heat pump		$30 per ton
Guest room energy management system	Electric heat/AC	$65 per guest room
	Non-electric heat/AC	$25 per guest room
Demand controlled ventilation	Conditioned space (interior)	$40 per 1,000 sq. ft.
	Parking garage (enclosed)	$300 per exhaust fan HP
	Commercial kitchen exhaust hoods	$400 per exhaust fan HP
Restroom exhaust fan occupancy sensor		$10 per fan
Wireless pneumatic thermostat		$100 per thermostat
Air-side economizer		$50 per ton
Electronically commutated motor on fan-powered box		$50 per motor
High efficiency pumps and pumping efficiency improvements (retrofits)		$15 per HP
Cogged V-belts for HVAC fans		$5 per nominal motor HP

VARIABLE SPEED DRIVES		
VSD	on HVAC chiller	$40 per HP
	on HVAC fan or pump ≤ 200 HP	$60 per HP
	on pool pump	$100 per HP
	on industrial process fan or pump ≤ 200 HP	$60 per HP
Air compressor with integrated VSD ≤ 150 HP		$75 per HP

COMPRESSED AIR		
High-efficiency air nozzles		$20 per nozzle
Low pressure drop filter		$3.5 per connected HP
No-loss condensate drains		$100 per drain
Refrigerated dryers	Thermal mass dryer	$1 per rated CFM
	Variable speed dryer	$3 per rated CFM
	Digital scroll dryer	$2 per rated CFM
Heat of compression desiccant compressed air dryer		$4 per CFM
Heated blower purge desiccant compressed air dryer		$4 per CFM
Variable displacement screw air compressor		$30 per HP
Compressed air pressure flow controller		$10 per HP
VSD on air compressor ≤ 150 HP		$60 per HP
Air compressor(s) with integrated VSD ≤ 150 HP		$75 per HP
Added compressor storage on load/no load systems		$1.50 per gallon

REFRIGERATION		
EC motor	for walk-in cooler or freezer	$60 per motor
	for reach-in refrigerated case	$30 per motor
	with evaporator fan controls for walk-in cooler or freezer	$90 per controlled motor
Anti-sweat heater controls for glass door cooler or freezer		$25 per linear ft.
Display cases with doors	on coolers	$180 per linear ft.
	on freezers	
Special door with low/ no-anti sweat heaters	on cooler display cases	$130 per door
	on freezer display cases	
Evaporator fan controls	on EC motor	$50 per controlled motor
	on shaded-pole motor	$25 per controlled motor
Demand defrost controls	on walk-in coolers	$20 per evaporator fan motor
	on walk-in freezers	
Efficient refrigeration condenser		$10 per ton
Floating head pressure controls	Condensing unit, medium temp.	$60 per compressor HP
	Condensing unit, low temp.	
	Remote condenser, medium temp.	
	Remote condenser, low temp.	
LED refrigerated display case lighting	for closed case	$40 per door
	for open case	$15 per linear ft. of case
Display case lighting controls	for closed case	$25 per door
	for open case	$8 per linear ft. of case
ENERGY STAR®	Solid door freezer	$100 per freezer
	Glass door freezer	$200 per freezer
	Solid door refrigerator	$45 per refrigerator
	Glass door refrigerator	$45 per refrigerator
	Refurbished vending machine	$50 per machine
Night covers		$10 per linear ft.
Strip curtains	Cooler / freezer door	$4 per sq. ft.
Automatic high speed doors	Freezer and cooler spaces	$50 per sq. ft.
	Freezer and dock spaces	
	Cooler and dock spaces	
Reach-in (novelty) cooler controls		$40 per cooler
Beverage machine controls		$100 per machine
Snack machine controls		$40 per machine
Insulation of bare refrigeration suction lines		$2 per linear ft.
ENERGY STAR efficient air-cooled ice makers	100-500 lbs/day	$100 per ice maker
	501-1500 lbs/day	$150 per ice maker
	> 1500 lbs/day	$200 per ice maker

CUSTOM (NON-LIGHTING)	
Project eligible for custom incentive	$0.07 per kWh saved

LED STREET LIGHTING	
Municipal owned streetlights	$0.70 per watt reduced

INDUSTRIAL SYSTEMS		
Barrel wraps for injection molders and extruders		$40 per sq. ft.
Insulated pellet dryer duct	Outer diameter 3 in. - 8 in.	$10 - 25 per foot
Conversion of DC drives in plastic extruders to AC drives		$40 per HP
Fiber laser cutting machines		$2,000 per output kW
All electric injection molding machine		$35 per rated ton
Hybrid injection molding machine		$30 per rated ton

LABORATORY	
High performance low flow fume hood	$400 per linear ft.
Variable air volume fume hood	$250 per linear ft.
Fume hood occupancy control	$100 per linear ft.
Automatic fume hood sash closer	$150 per linear ft.
Sash stops	$5 per linear ft.
Low pressure drop HEPA filters	$50 per 1,000 CFM
Low pressure drop high efficiency (non-HEPA) air filters	$15 per 1,000 CFM
Reduce/optimize air changes per hour (ACH) in laboratory space	$0.75 per CFM

AGRICULTURE		
Engine block timer		$20 per timer installed
Thermally insulated livestock waterer (electrically heated)		$110 per waterer installed
High-volume low-speed (HVLS) fans		$1,000 per fan installed
High-speed exhaust & ventilation fan	24-35 in. diameter	$25 per fan
	36-47 in. diameter	$50 per fan
	48-71 in. diameter	$100 per fan
High-speed circulation fan	24-35 in. diameter	$25 per fan
	36-47 in. diameter	$50 per fan
	48-71 in. diameter	$100 per fan

NETWORK DESKTOP POWER MANAGEMENT	
NDPM software	$15 per desktop computer

WASTE WATER TREATMENT PLANT	
Custom incentive for high efficiency blowers, aeration diffusers and controls	$0.21 per kWh saved

To view a complete list of incentives, please download current versions at ComEd.com/BusinessSavingsApplications. Specifications are available in the incentive worksheets.

The ComEd® Energy Efficiency Program offers incentives to help businesses and facilities reduce electricity use by improving the efficiency of their equipment. In order to be eligible for an incentive, all projects must be pre-approved. In order to qualify for 2018 incentives, all projects must be pre-approved and completed by December 31, 2018*.

ComEd Energy Efficiency Program incentive applications and worksheets can be found at **ComEd.com/BizIncentives**. For more information, email **BusinessEE@ComEd.com** or call 855-433-2700.

**To qualify for 2018 incentives, final applications must be submitted no later than 60 days from project completion, or February 28, 2019, whichever date comes first.*

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DCEO ILLINOIS ENERGY NOW

Public Sector Energy Efficiency Program

Illinois Energy Now (IEN) is a suite of energy efficiency programs administered by the State of Illinois. It provides millions of dollars in rebates to public agencies to make large scale equipment improvements to the electric and natural gas systems in their facilities. This funding supports several programs, including the Public Sector Energy Efficiency Program administered by the Metropolitan Mayors Caucus as part of DCEO's Energy Efficiency Aggregation Program. For more information about Illinois Energy Now programs, visit www.ilenergynow.org

Request for Proposals

Funding and technical assistance to improve energy efficiency in public buildings is available through a simple proposal process. Project Proposal Forms for the Public Sector Energy Efficiency Program are accepted on a rolling basis throughout the year, and multiple deadlines are offered to optimize rebates to public sector applicants.

- **September 30, 2014** --Early Bird Deadline for All Energy Efficiency Projects.
- **October 31, 2014** -- Completed Projects are eligible for a 10% bonus.
- **November 1, 2014 --** Standard Deadline for All Energy Efficiency Projects.
- **February 14, 2015 –** Completed projects are eligible for a 5% bonus.

Work for all projects must be completed by May 15, 2015.

Please note: Project planning can start anytime by submitting a Project Proposal Form. Funding for grant reimbursements is expected to be available as early as September 2014, pending approval from the Illinois Department of Commerce and Economic Opportunity.

WHO IS ELIGIBLE TO PARTICIPATE

All public sector entities in northeastern Illinois which receive service from Illinois investor-owned utilities (ComEd, Peoples Gas, North Shore Gas and Nicor Gas) are eligible to apply for this program, including municipalities, townships, counties, park districts, libraries, schools, community colleges, and more.

For public sector entities outside of northeastern Illinois, additional programs are available from other organizations throughout the state. Contact us for more information or for a referral. Public sector entities that receive service from municipal or cooperative utilities are not eligible to participate in this program.

PROGRAM PARTNERS – WHO'S WHO

The **Metropolitan Mayors Caucus (Caucus)** is a non-profit organization of mayors in the Northeastern Illinois region. It supports municipalities with programs and aligns resources to achieve common local and regional objectives. Through the Caucus Public Sector Energy Efficiency Program, it receives funding to support local energy efficiency projects in public sector buildings throughout the region projects as a partner to the Illinois Department of Commerce and Economic Opportunity.
http://www.mayorscaucus.org

360 Energy Group (360EG) is a full service energy efficiency consulting firm retained by the Caucus for its technical expertise and experience administering energy efficiency programs.
http://360eg.com

The **Illinois Department of Commerce and Economic Opportunity (DCEO)** is the source of funds for projects participating in the Caucus Public Sector Energy Efficiency Program. These funds are collected from all rate payers in Illinois investor-owned utilities as part of the Illinois Energy Now (IEN) Program.
http://www.ilenergynow.org

The **Illinois Clean Energy Community Foundation** is an independent foundation endowed by Commonwealth Edison that provides funding and support energy efficiency and environmental programs in Illinois.
http://www.illinoiscleanenergy.org/

Cook County Department of Environmental Control is collaborating to reach public agencies within Cook County to invite participation in the program (*NOTE*: Public agencies outside of Cook County are also eligible to participate in this program).
http://blog.cookcountyil.gov/sustainability/advisory-council-report/

The **Smart Energy Design Assistance Center (SEDAC)** is an applied research program at the University of Illinois at Urbana-Champaign that works in partnership with the DCEO to achieve energy efficiency savings by conducting energy assessments in buildings throughout the State of Illinois.
http://smartenergy.illinois.edu/

RESOURCES AVAILABLE

Technical Assistance to assess building energy use; design effective solutions; and draft specifications for work and materials that will save natural gas and electrical energy is available to public agencies. The types of assistance are:

- **Immediate project design assistance**
  360EG are experts in building energy efficiency and can assess public buildings for lighting, HVAC and other energy efficiency opportunities that are ready for immediate implementation.

- **Project management and grant program assistance**
  360EG has expert knowledge of resources to guide public agencies in applications, bidding and timely completion of work. Selected projects will also benefit from bid specifications, evaluation and project oversight, as needed. 360EG staff are knowledgeable about multiple funding sources and can assure all allowable resources are aligned for the most cost-effective projects possible. Once they are approved for assistance, 360EG will assist public agencies with managing deadlines, compliance and reporting.

- **Long-term energy efficiency design assistance**
  Public agencies wishing to comprehensively plan for long-term energy efficiency may also be eligible for a no-cost energy audit and design assistance through the Smart Energy Design Assistance Center (SEDAC).

Funding is available to pay for labor and materials to upgrade lighting, HVAC and other systems to save energy. There are three types of funding available:

- Grant Reimbursements
- Enhanced HVAC Tune-Ups
- Direct Installation of Efficiency Measures

Public agencies are encouraged to take advantage of as many components as are applicable to their energy efficiency needs. Multiple Program Components may be combined in one building, or across multiple buildings, for a public entity.

- **Grant Reimbursements**

  Grant reimbursements cover up to 75% of costs for lighting, HVAC and mechanical projects that save electricity or natural gas. 360EG will manage the technical and procedural aspects of this program component and the Caucus will administer the funds. The overhead administrative costs of the Caucus and 360EG are paid for directly by the DCEO, resulting in public entities receiving the greatest possible incentive amount.

  Grant reimbursement amounts vary with the scope of the projects and are dependent upon the amount of energy saved, as detailed in the IL DCEO Technical Guidelines for the Illinois Energy Now Program. 360EG will calculate individual grant reimbursement amounts for each project based on energy savings, following DCEO standards. For some projects, prescriptive reimbursement rates will apply; others may be eligible for custom rates of $0.12 per kilowatt hour saved and/or $3.00 per therm saved.

  Early completion of projects is encouraged by the DCEO with additional 'Sweet Deal' Bonuses. As listed above, agencies are eligible to receive an additional 10% if work is completed by October 31, 2014 or 5% if completed by February 14, 2015. All projects must be completed by May 15, 2015 to qualify to receive any grant reimbursements.

  Some lighting projects may be eligible for additional supplementary funding through the Illinois Clean Energy Foundation. Combined with Caucus Public Sector Energy Efficiency grant reimbursements, these funds greatly reduce the cost to public agencies and can sometimes lead to 100% project reimbursement.

- **Enhanced HVAC Tune-Ups**

  This program provides enhanced maintenance services on qualifying packaged rooftop units and split systems in public sector buildings at no cost to participating public agencies. Unlike the reimbursement incentives, the Enhanced HVAC Tune-Up Program does not require public agencies to pay up-front for these services. The Tune-Ups are performed by one of our Qualified Service Providers who are contracted and paid directly through the Caucus Public Sector Energy Efficiency Program funding. These services result in an estimated heating savings of 6% and cooling savings of 12% per unit. Public agencies with buildings located in ComEd electric service territory and Nicor Gas natural gas service territory will be eligible to receive these enhanced HVAC Tune-Up services.

- **Direct Installation of Efficiency Measures**

  Some HVAC systems may be eligible for the Direct Installation of Energy Efficiency Measures Program Component that provides materials and labor at no cost to participating public agencies. Energy efficiency measures such as HVAC controllers are simple and inexpensive yet achieve measurable savings. The cost of purchase and labor are covered directly by the Caucus Public Sector Energy Efficiency Program.

PROGRAM PROCESS

Initial Process Steps for All Funding Types

1. **Identify public buildings needing energy efficiency improvements.** Eligible buildings include office, garage, water and waste water treatment plants, community centers, libraries, schools and more.

2. **Align potential projects with sustainability goals.** Progress towards energy conservation and greenhouse gas reduction goals can be documented for reporting.

3. **Complete a Project Proposal Form** and submit either a hard or electronic copy to the Caucus, along with a recent gas and electric bill for each building being considered for assistance. Public agencies may submit multiple buildings on one form. Project Proposal Form deadlines:

   July 30, 2014 – Deadline for Indoor and Outdoor Lighting Projects (to be eligible for supplemental ICECF foundation funding)*
   September 30, 2014 – Early Deadline for All Energy Efficiency Projects (all projects completed by October 31, 2014 are eligible for a 10% bonus)
   November 1, 2014 – Standard Deadline for All Energy Efficiency Projects (all projects completed by February 14, 2015 are eligible for a 5% bonus)

   * For eligible interior and exterior lighting projects for municipal buildings only, 360EG can help agencies apply for additional funds from ICECF. It is the public agency's responsibility to complete the ICECF application directly through their online process. Although 360EG can help with the application, the process and decision to award funds are wholly ICECF's. The deadline for this application is September 11, 2014. If approved, ICECF will reimburse applicants directly. Funds may also be available in 2015.

4. **Assess buildings and design projects.** 360EG reviews your proposal, arranges a site visit to asses existing conditions, and assists in the planning of the potential project(s). 360EG works with the public agency to analyze the selected project(s), demonstrate energy and monetary savings, and estimate costs and payback period.

Grant Reimbursements – Specific Program Process Steps

1. **Secure approval.** Each public agency secures approval of the project and informs the Caucus and 360EG that they want to proceed. The Caucus issues an Award Letter to the public agency, which includes Grant Terms, an Award Acceptance Form, and a preliminary Scope of Work, on which the budget is based. The Award Acceptance Form must be accepted and returned promptly.

2. **Perform Scope of Work.** The public agency completes the energy efficiency work described in the Scope of Work by performing the work in-house or awarding a contract and/or purchase order to their chosen supplier and contractor and paying them directly. The public agency issues contracts and/or purchase orders directly with their own vendors for the work to be performed.

3. **Complete all work by May 15, 2015.** Necessary changes in the Scope of Work are allowable with documentation and approval. 360EG and the Caucus are available to help agencies to assure successful project completion, as needed.

4. **Complete necessary paperwork.** Throughout the process, 360EG completes and submits any required paperwork to the DCEO, acting for the public agency and the Caucus, including calculating final energy savings and corresponding final grant/incentive amount. The public agency provides all necessary documents to close out the project including certification forms, copies of contractor invoices and any other documents required by DCEO.

5. **Request reimbursement.** The public agency receives a Final Scope of Work from the Caucus, along with reimbursement instructions. The public agency invoices the Caucus for the amount of the DCEO incentive listed in the Final Scope of Work. As this amount is based on actual energy savings from the project, it may be greater or less than estimated in the preliminary Award Letter.

6. **Receive project inspection.** 360EG inspects all approved projects before and after completion and verifies the final scope of work in cooperation with the public agency. The public agency may also receive an audit from a 3rd party verifier.

7. **Receive reimbursement from the Caucus.**

Enhanced HVAC Tune-Ups – Specific Program Process Steps

1. The Caucus and 360EG will provide public agencies with details about the Enhanced HVAC Tune-Up Program and help them to determine eligibility. Once eligibility is determined, 360EG will guide the public agency in selecting a Qualified Service Provider from our Pre-Approved Provider List.

2. The Qualified Service Provider assists the public agency to complete an Enhanced HVAC Tune-Up Application and Consent Agreement, and submit to 360EG along with a copy of the public agency's last month's electric and natural gas utility bills. Applications are accepted on a rolling basis throughout the program year, pending availability of funds.

3. Once a list of public agency HVAC units has been approved, they are contacted by the Qualified Service Provider to schedule work. HVAC units receive evaluation, service, and inspection from the Qualified Service Provider. **All work must be completed by May 15, 2015.** The Qualified Service Provider will assist the Public Agency to fill out and sign a Proof of Completion, which will then be submitted to 360EG.

4. The Qualified Service Provider is paid directly by the Caucus for work performed, making this a cost-free program for the public agency.

Direct Installation of Efficiency Measures – Specific Program Process Steps

1. If appropriate for public agency buildings, the Caucus and 360EG will provide public agencies with details about the Direct Installation of Efficiency Measures and help them to determine eligibility.

2. The Caucus issues a Direct Installation of Energy Efficient Measures Project Description, Scope of Work, Warranty Information, and Consent Agreement to the public agency. The Consent Agreement must be signed and returned promptly.

3. The public agency is contacted by 360EG or a qualified contractor to schedule work. HVAC units receive installation of equipment to optimize performance. **All work must be completed by May 15, 2015.**

4. 360EG completes and submits any required paperwork to the DCEO, acting for the public agency and the Caucus. 360EG inspects all approved projects before and after completion and verifies the final scope of work in cooperation with the public agency. All equipment and contractors are paid directly by the Caucus, making this a cost-free program for the public agency.

PROGRAM SUMMARY

Funding Types	Payment Process	How To Apply
Grant Reimbursements	Public agency pays up front for work performed, and receives a grant reimbursement from the Caucus and/or from ICECF	For all funding types, submit a Project Proposal Form to the Caucus. Project Proposal Forms are accepted on a rolling basis throughout the year, and multiple deadlines are offered to optimize rebates to public sector applicants: • **July 30, 2014** – Deadline for Indoor and Outdoor Lighting Projects (to be eligible for supplemental ICECF funding) • **September 30, 2014** – Early Deadline for All Energy Efficiency Projects (all projects completed by October 31, 2014 are eligible for a 10% bonus) • **November 1, 2014** – Standard Deadline for All Energy Efficiency Projects (all projects completed by February 14, 2015 are eligible for a 5% bonus)
Enhanced HVAC Tune-Ups	All materials and labor are paid directly by the Caucus	
Direct Installation of Efficiency Measures	All materials and labor are paid directly by the Caucus	

CONTACT INFORMATION

Submit Project Proposal Forms to:
Jeffrey Walter
Project Coordinator, Environmental Initiatives
Metropolitan Mayors Caucus
312-201-4508
jwalter@mayorscaucus.org

For Questions or Project Planning Assistance:
Mike Stanch
Energy Solutions Manager
360 Energy Group
312-264-8568
michael@360eg.com

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Steering Committee Meeting #1

The Project Kick Off Meeting or Steering Committee Meeting #1 set the scope of work, discussed existing lighting types and quantities, coordinated staff assignments, and set a schedule for the Street Light Master Plan.

The following major topics were discussed at the Project Kick Off Meeting and incorporated into the Street Light Master Plan:

- Consideration of streets with tree cover, tree bloom, and pole spacing when taking existing conditions light studies.
- Lighting unit for residential areas and local roadways should replicate the Tallmadge. The Historic Preservation Commision stated the Tallmadge are not considered historic but a replacement should be "sympathetic" to the existing Tallmadge.
- An initial pilot program was introduced by the City prior to development of Street Light Master Plan in the area of Seward and Dodge.
- Com Ed charges City of Evanston for electricity usage from existing non-metered 107 power centers.
- Determination of 19 individual study areas amongst the City's nine wards.
- Means and methods of existing conditions light studies.
- New luminaires should be dark sky compliant.
- Existing Tallmadge presents various ongoing maintenance issues due to multi-part composition.
- The last Street Light Master Plan was adopted by the City in 1979.

The Project Kick Off Meeting or Steering Committee Meeting #1 presentation can be found in Appendix A8.1.

Steering Committee Meeting #2

Steering Committee Meeting #2 was held on November 7, 2017. Means and methods of existing conditions light studies, existing conditions light study results, existing lighting systems and infrastructure, current City policies, and initial presentation to the public were discussed.

The following major topics were discussed at the Steering Committee Meeting #2 and incorporated into the Street Light Master Plan:

- Ambient lighting from adjacent house porches, store fronts, businesses and tree canopies were taken into consideration when taking existing conditions light studies.
- Pole spacing varies throughout the City.
- Lighting types include Tallmadge (55W, 85W, 165W induction) and davit arm roadway poles (250W and 400W high pressure sodium, 250W and 400W metal halide and 200W induction).
- From existing conditions light study it was determined local streets and major roadways typically did not meet recommended standards dictated by Illuminating Engineers Society of North America (IESNA). Collector roadways fall minimally short of meeting IESNA recommended standards. All roadway types typically did not meet City of Evanston standard from 1979 Street Light Master Plan.
- There is currently no Capital Improvement Plan exercised. The City of Evanston upgrades street light infrastructure as part of reconstruction projects, spot location improvements, major planned unit developments or as part of safer neighborhood area projects (SNAP).
- City of Evanston energy cost for electrical usage
    - FY 2016 = $152,830.00
    - FY 2017 = $140,630.00
- City of Evanston maintenance cost
    - FY 2017 = $140,000.00

The Steering Committee Meeting #2 presentation can be found in Appendix A8.2.

Public Meeting #1

A public meeting was held on November 28, 2017 where 40 people were in attendance. Findings of existing conditions analysis, existing infrastructure and aesthetics, future standardization, and cost effective, energy efficient alternatives were presented. 17 comments were received at the meeting and 90 comments were received online and addressed in developing the Street Light Master Plan.

The following is a summarization of comments received at the meeting and online that were discussed and taken into consideration when developing the Street Light Master Plan:

- 25 comments in favor of keeping the existing Tallmadge.
- Ten of the "keep Tallmadge" comments suggested upgrades to improve lighting levels, minimize light pollution and reduce maintenance costs.
- 21 comments requested higher lighting levels.
- 20 comments thought the pilot projects instilled in developing the Street Light Master Plan were too bright.
- Two comments questioned how to respond to online posts.
- Two comments stated that no study was necessary.
- Two comments questioned what other Villages or Citys were doing.
- Ten comments suggested that new luminaires shine down, smart lighting systems studied and change traffic laws.

The Public Meeting #1 presentation can be found in Appendix A8.3.

Steering Committee Meeting #3

Steering Committee Meeting #3, held on January 23, 2018, included a review of Public Meeting #1 and adressed concerns and questions to ensure the plan met community objectives, including the addition of nine (28 total) study areas, presentation of draft survey questions to be presented to Northwest Municipal Conference members to establish current street lighting practices and shifting focus of the Street Light Master Plan to explore options for modernizing the existing Tallmadge.

The Steering Committee Meeting #3 presentation can be found in Appendix A8.4.

Northwest Municipal Conference Survey

The Northwest Municipal Conference survey included elemental inquiries in regard to other municipalites street lighting ordinances, infrastructure, lighting levels, dark sky compliance, maintenance, Capital Improvement Plan and standard construction details (See Appendix A8.5). 12 of 45 communities responded including Arlington Heights, Buffalo Grove, Fox Lake, Grayslake, Libertyville, Lincolnshire, Morton Grove, Palatine, Park Ridge, Skokie, Streamwood and Wheeling. The results from this survey were addressed in developing the Street Light Master Plan.

The following is a summarization of Northwest Municipal Conference survey and taken into consideration when developing the Street Light Master Plan:

- Five of 12 municipalities have a lighting ordinance or standards.
- Lighting equipment differs immensely throughout different communities, but all communities are converting to LEDs.
- Four of 12 communities require dark sky compliance.
- Six of 12 communities contract out light maintenance and repair.
- Eight of 12 do not have a Capital Improvement Plan.
- Nine of 12 municipalities have standard construction details.
- None of the communities require pedways, bike paths or intersections to meet an illuminanation standard.

Street Light Master Plan Project Lighting Level Survey

In addition to The Northwest Municipal Conference Survey, a Street Light Master Plan Project Lighting Level Survey was conducted. The Street Light Master Plan Project Lighting Level Survey can be found in Appendix A8.6. This survey was administered to evaluate options for maintaining the City's existing street light system and to seek public input on future lighting levels desired for new development and major public works projects. The survey included lighting levels for major roadways, collector roadways, local roadways, Lakefront Path, intersections, and the resident's respective block. Included in the survey for local roads were pilot programs displaying lighting levels of replica Tallmadge luminaires for future new construction options and unrepairable maintenace of the existing Tallmadge.

Steering Committee Meeting #4

Steering Committee Meeting #4, held on May 24, 2018, included a compilation of results from The Northwest Municipal Conference Survey, Street Light Master Plan Project Lighting Level Survey and new construction options.

Following are the new construction options suggested:

- All new construction should meet IESNA recommended practice (collector roadways, major roadways, local roadways and intersections)
- Local Roadways should utilize the Sternberg Lighting replica Tallmadge (MS805 LED), or approved equal, mounted at 16' on a 24" concrete foundation.
- Collector and Major Roadways should be a 30' davit arm roadway pole with an LED type luminaire (Autobahn Series ATB2 or equal) on a 30" concrete to match those installed at Fountain Square.
    - A replica Tallmadge or a pedestrian-scale LED type luminaire (Autobahn Series ATB0 or equal) mounted at 14' to the 30' davit arm roadway pole may be used if necessary to enhance the illumination of the sidewalk if required for pedestrian traffic.
- It is recommended that new construction utilize a staggered configuration to conform with current City of Evanston typical layouts.
- Electrical infrastructure such as wiring, conduit and controls should be per National Electrical Code (NEC) compliance for outdoor lighting installations.

The Steering Committee Meeting #4 presentation can be found in Appendix A8.7.

Various meetings were held throughout the development of the Street Light Master Plan between CBBEL and City staff to discuss project progress and objectives.

Steering Committee Meeting #5

Steering Committee Meeting #5, held on October 3, 2018, included an overview of the final Street Light Master Plan that will be presented to the public and City Council for final acceptance and approval.

The following major topics were discussed at the Steering Committee Meeting #5 and incorporated into the Street Light Master Plan:

- Review of Community Survey
- Existing conditions conclusions and reccomendations
- Alternate technology exploration
- City of Evanston (COE) lighting level recommendations
- New construction standards throughout COE
    - Davit arm roadway lighting units
    - Tallmadge lighting units
    - Park and pathway lighting units
    - Parking lot lighting units
    - Wall pack lighting units
- Lighting control technology and recommendations
- Funding examples and prioritization
- Livability

The Steering Committee Meeting #5 presentation can be found in Appendix A8.8.

Public Meeting #2

Very similar to Steering Steering Committee Meeting #5, Public Meeting #2 was held on November 1, 2018, included a concise overview of the final Street Light Master Plan that will be presented to City Council for final acceptance and approval.

The following major topics were discussed at Public Meeting #2:

- Review of Community Survey
- Existing conditions conclusions and reccomendations
- Alternate technology exploration
- City of Evanston (COE) lighting level recommendations
- New construction standards throughout COE
    - Davit arm roadway lighting units
    - Tallmadge lighting units
    - Park and pathway lighting units
    - Parking lot lighting units
    - Wall pack lighting units
- Lighting control technology and recommendations
- Funding examples and prioritization
- Livability

The Public Meeting #2 presentation can be found in Appendix A8.9.

JULY 18, 2017

STREET LIGHT MASTER PLAN
PROJECT PLANNING SERVICES
PROJECT KICK OFF MEETING

INTRODUCTIONS: PROJECT TEAM

PROJECT MANAGEMENT STAFF	ROLE:
Dave Stoneback	Director
Lara Biggs	Bureau Chief of Capital Planning/City Engineer
Rajeev Dahal	Project Manager

CBBEL	ROLE:
Michael Kerr, PE	Project Management, Lighting
John Caruso, PE	Studies, Photometrics,
Anthony DeRicco, PE, LEED AP, LC	Inventory & Master Plan
Katrina Ballado, PE, LEED AP	Preparation, Stakeholder &
Gerald Hennelly	Public Engagement

ALTAMANU, INC.	ROLE:
Josephine Bellalta, ASLA, PLA	Fixture Selection & Urban
Phillip Hutchinson, ASLA, PLA, LEED	Planning, Stakeholder & Public Engagement

PROJECT BACKGROUND: EXISTING LIGHTING TYPES

Roadway Poles

Ornamental Tallmadge Poles

PROJECT BACKGROUND: EXISTING LIGHTING TYPES

Pedestrian Lighting




Viaduct Lighting



PROJECT BACKGROUND: EXISTING LIGHTING TYPES

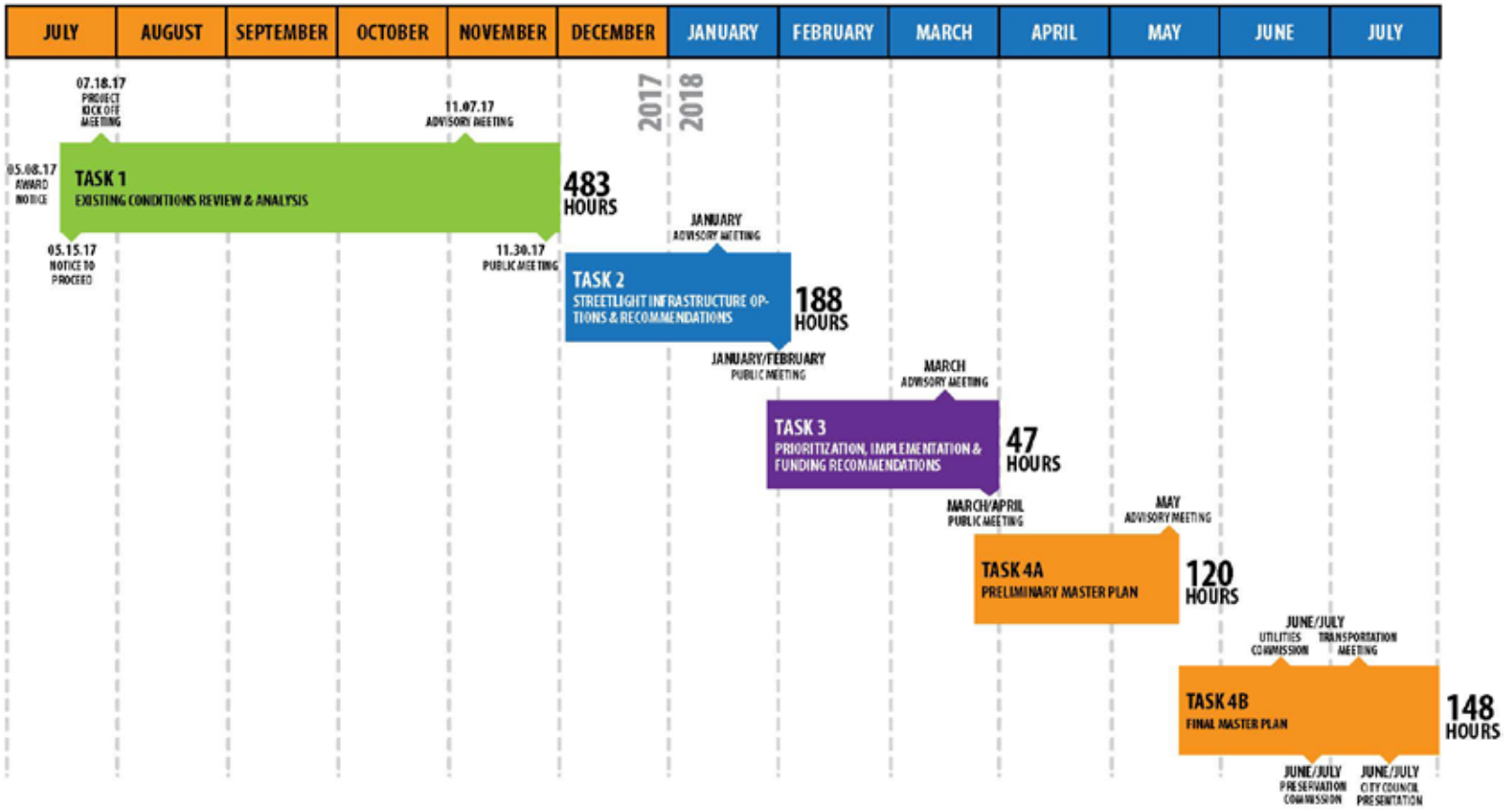
Parking Lot Lighting

Park Lighting

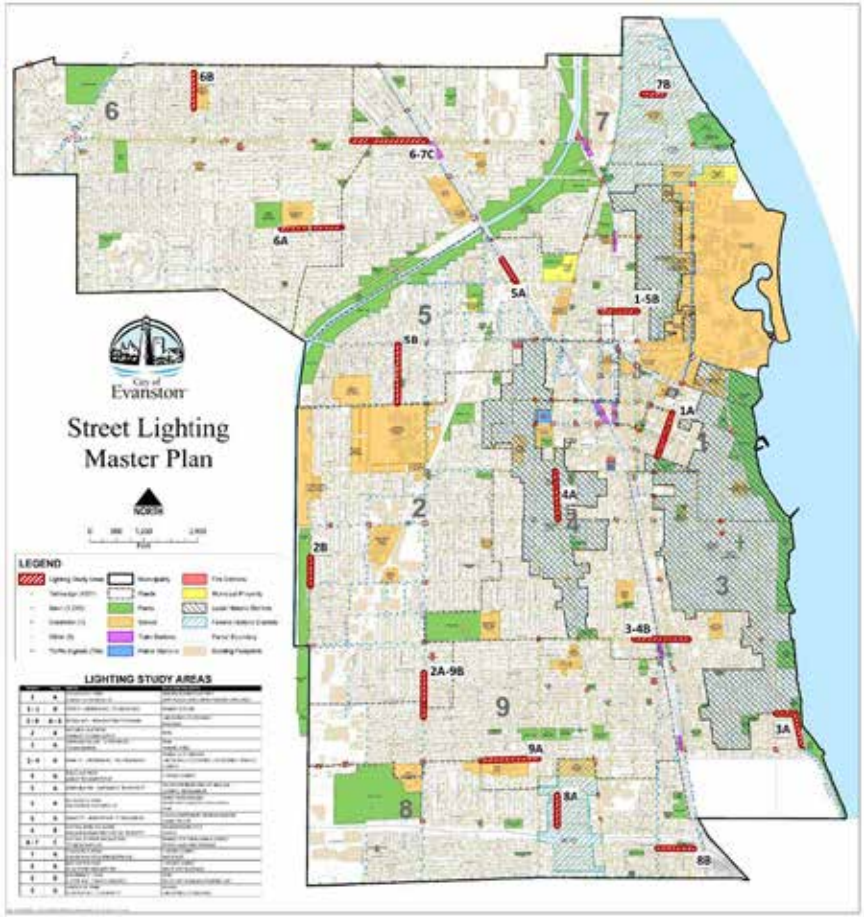
SCOPE OF WORK:

- TASK 1 – EXISTING CONDITIONS REVIEW AND ANALYSIS
  - Photometrics at ±15 Locations
- TASK 2 – STREET LIGHT INFRASTRUCTURE OPTIONS AND RECOMMENDATIONS
  - Design and Technology
  - Wiring
  - Circuitry
  - Controls
  - Policy and Program Review
- TASK 3 – PRIORITIZATION METHODOLOGY, IMPLEMENTATION AND FUNDING RECOMMENDATIONS
  - Fixture Selections
  - Grant Opportunities
- TASK 4 – FINAL STREET LIGHT MASTER PLAN
  - Final Fixture Selections
  - Illumination Standards
- TASK 5 – STAKEHOLDER AND PUBLIC ENGAGEMENT
  - Public Outreach

SCHEDULE:


JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
2017
2018
07.18.17
PROJECT KICK OFF MEETING
05.08.17
AWARD NOTICE
05.15.17
NOTICE TO PROCEED
TASK 1
EXISTING CONDITIONS REVIEW & ANALYSIS
483 HOURS
11.07.17
ADVISORY MEETING
11.30.17
PUBLIC MEETING
JANUARY
ADVISORY MEETING
TASK 2
STREETLIGHT INFRASTRUCTURE OPTIONS & RECOMMENDATIONS
188 HOURS
JANUARY/FEBRUARY
PUBLIC MEETING
MARCH
ADVISORY MEETING
TASK 3
PRIORITIZATION, IMPLEMENTATION & FUNDING RECOMMENDATIONS
47 HOURS
MARCH/APRIL
PUBLIC MEETING
MAY
ADVISORY MEETING
TASK 4A
PRELIMINARY MASTER PLAN
120 HOURS
JUNE/JULY
UTILITIES COMMISSION
JUNE/JULY
TRANSPORTATION MEETING
TASK 4B
FINAL MASTER PLAN
148 HOURS
JUNE/JULY
PRESERVATION COMMISSION
JUNE/JULY
CITY COUNCIL PRESENTATION

PHOTOMETRIC STUDY LOCATIONS:



EXISTING CONDITIONS STUDY AREAS:

WARD	AREA	LIMITS	AREA JUSTIFICATION *
1	A	CHICAGO AVE FROM CHURCH ST TO GROVE ST	CENTRAL BUSINESS DISTRICT *CONTROLLED PEDESTRIAN CROSSING BIKE LANES*
1 - 5	B	FOSTER - SHERMAN AVE. TO MAPLE AVE.	TRANSIT STATION
2-9	A-B	DODGE AVE. - WASHINGTON TO SEWARD	UNCONTROLLED CROSSING BIKE LANE
2	B	MCDANIEL AVE FROM CRAIN ST TO GREENLEAF ST	PARK
3	A	SHERIDAN SQUARE - SHERIDAN RD. TO SHERIDAN RD.	PARK PARKING AREA
3 - 4	B	MAIN ST. - SHERMAN AVE. TO HINMAN AVE.	TRANSIT STATION PARK UNCONTROLLED/CONTROLLED CROSSING BUSINESS DISTRICT
4	A	RIDGE AVE FROM LAKE ST TO DEMPSTER ST	HISTORIC DISTRICT
5	A	GREEN BAY RD. - SIMPSON ST. TO PAYNE ST.	MAJOR CORRIDOR AREA OF NEW LED LIGHTING INSTALLATION
5	B	HOVLAND CT FROM EMERSON ST TO CHURCH ST	PEDESTRIAN CROSSING *EVANSTON TOWNSHIP HIGH SCHOOL* *PARK*
6	A	GRANT ST. - BENNETT AVE. TO PIONEER RD.	SCHOOL RETIREMENT HOME & ASSISTED LIVING FACILITY
6	B	CENTRAL PARK AVE ALONG WILLARD ELEMENTARY SCHOOL PROPERTY	RESIDENTIAL DISTRICT *SCHOOL*
6-7	C	CENTRAL ST FROM WALNUT AVE TO BROADWAY AVE.	TRANSIT STATION BUSINESS DISTRICT *SCHOOL AND PARK CROSSING*
7	A	INGLESIDE PL FROM EUCLID PARK PL TO ORRINGTON AVE	HISTORIC DISTRICT *BIKE ROUTE*
8	A	BARTON AVE FROM HULL TER TO HARVARD TER	HISTORIC DISTRICT *MULTI UNIT BUILDINGS*
8	B	BRUMMEL ST. FROM CUSTER AVE. TO EAST DEAD END	PARK MULTI UNIT BUILDINGS/PARKING LOT
9	A	OAKTON ST. FROM FLORENCE AVE. TO ASBURY ST	SCHOOL UNCONTROLLED CROSSING

FUTURE MEETING SCHEDULE:

- QUESTIONS?

NOVEMBER 7, 2017

STREET LIGHT MASTER PLAN
EXISTING CONDITIONS REPORT

AGENDA

- EDUCATION & METHODOLOGY
- RESULTS
- POLICIES

WHAT WAS STUDIED?

- **LOCATIONS**

  18 study areas chosen by Committee and City staff

- **MEASUREMENTS**

  Were taken for the various study areas at varying cross-section widths for illumination levels

- **HOW IT WAS STUDIED**

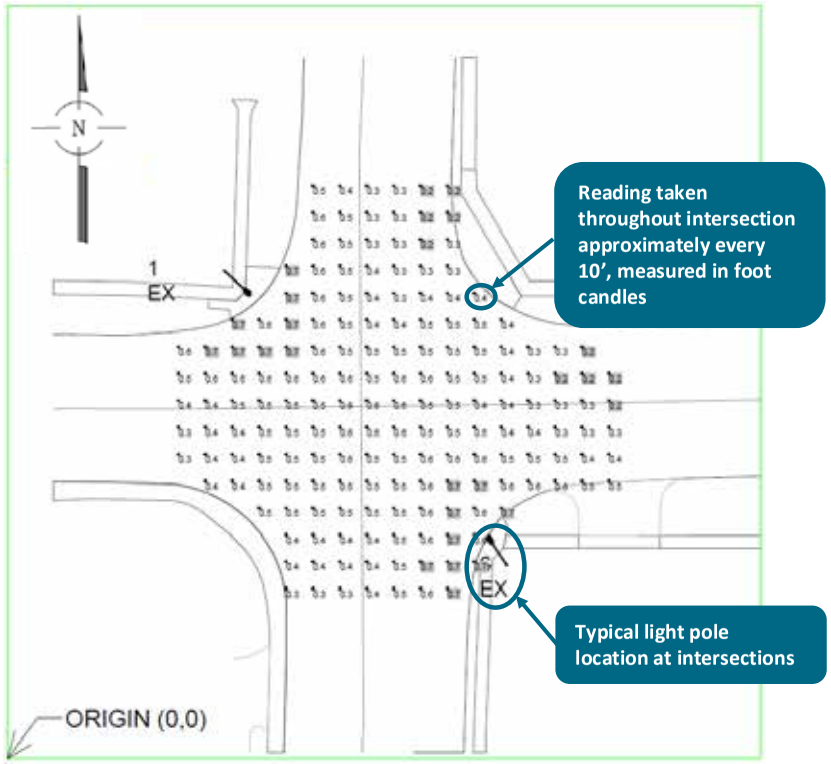
  With the light meter every 10’-0” at the pavement level

WHAT IS A FOOTCANDLE?

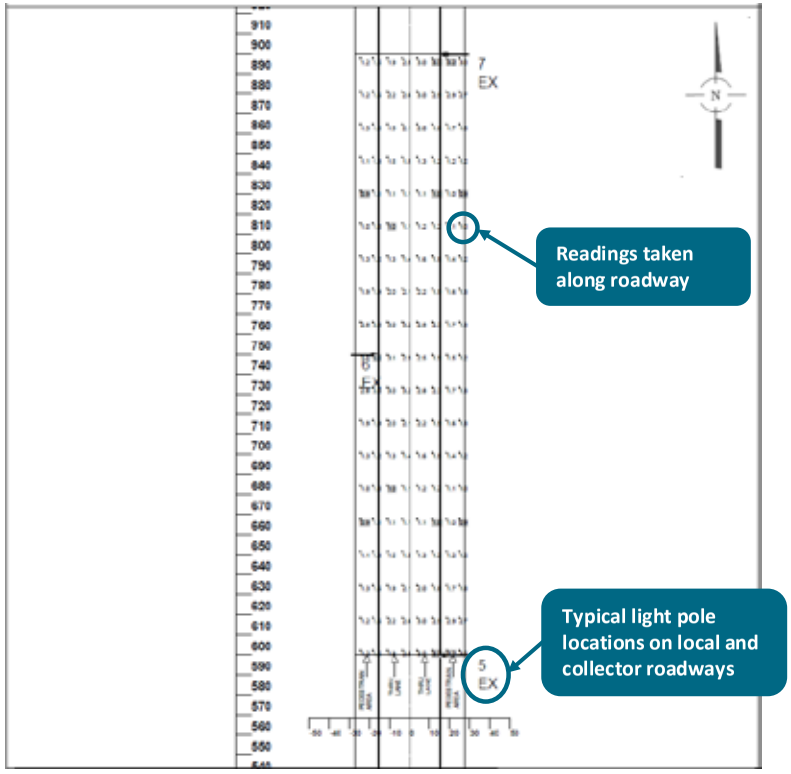
1 Footcandle (fc) = The measurement of light which equals the power of one candle one foot away (1 Lumen)

1 fc = 1 Lumen/Sq. Ft.

WHERE WERE THE LIGHTING LEVEL READINGS TAKEN?



Intersections



Roadways

WHAT DOES THE REPORT TELL YOU?

TABLE OF ILLUMINANCE MEASUREMENTS

(LOCATIONS PER ANSI/IESNA RP-8-14; VALUES IN FOOT-CANDLES AT GROUND LEVEL)

POINT	WEST SIDEWALK (12' SETBACK)	10' W.PARKING LANE		10' SB LANE		10' E.PARKING LANE		EAST SIDEWALK (12' SETBACK)
1	0.20	0.10	0.10	0.10	0.10	0.10	0.01	0.01
2	0.01	0.01	0.10	0.20	0.10	0.10	0.01	0.01
3	0.01	0.01	0.10	0.10	0.10	0.10	0.01	0.01
4	0.01	0.01	0.01	0.10	0.20	0.01	0.01	0.01
5	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
6	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
7	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
8	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
9	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
10	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
11	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
12	0.10	0.10	0.10	0.01	0.01	0.01	0.01	0.10
13	0.01	0.10	0.30	0.01	0.01	0.01	0.10	0.3*
14	0.01	0.01	0.10	0.30	0.01	0.20	0.30	0.4*
15	0.01	0.01	0.01	0.10	0.01	0.20	0.20	0.3*
16	0.01	0.01	0.01	0.10	0.01	0.20	0.20	0.3*
17	0.01	0.01	0.01	0.01	0.10	0.10	0.10	0.10
18	0.01	0.01	0.01	0.01	0.10	0.01	0.01	0.01
19	0.01	0.01	0.01	0.01	0.20	0.01	0.01	0.01
20	0.01	0.01	0.01	0.01	0.20	0.01	0.01	0.01
21	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
22	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
23	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
24	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
25	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
26	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
27	0.01	0.01	0.10	0.01	0.01	0.01	0.01	0.01
28	0.01	0.10	0.30	0.01	0.01	0.01	0.01	0.01
29	0.20	0.20	0.30	0.01	0.01	0.01	0.01	0.01
30	0.10	0.10	0.20	0.20	0.01	0.01	0.01	0.01
31	0.10	0.10	0.10	0.10	0.10	0.10	0.01	0.01

* HIGH VALUES RECORDED ON EAST SIDEWALK DUE TO HIGH AMBIENT LIGHTING FROM PARK

Where the measurements were taken

Light levels measured in footcandles

ILLUMINANCE MEASUREMENT SUMMARY (fc)		
	AVERAGE	AVE/MIN
ROADWAY	0.05	4.7
SOUTH SIDEWALK	0.03	3.1

Measurement Summary

VARIOUS SITE CONSIDERATIONS

- Ambient light from store fronts and businesses (glare)
- Front porch lighting
- Tree canopies

CURRENT CITY OF EVANSTON LIGHTING STANDARDS

Street Category	Commercial & Institutional (High Pedestrian Activity)	High Density Residential (Medium Pedestrian Activity)	Low Density Residential (Low Pedestrian Activity)
Major	1.0 – 4.0	0.4 – 0.6	0.2 – 0.4
Collector	0.4 – 1.0	0.2 – 0.4	0.2 – 0.4
Local	0.4 – 0.6	0.1 – 0.2	.05 – 0.1

ILLUMINATING ENGINEERS SOCIETY OF NORTH AMERICA (IESNA) RECOMMENDED LIGHTING LEVELS FOR ROADWAYS

Road and Pedestrian Activity Area		Pavement Classification (Minimum Maintained Average Values)		Uniformity Ratio E_{avg}/E_{min}
Road	**Pedestrian Activity Area**	**R3** fc	**COE Current Standards**	
Major	High	1.7	1.0 – 4.0	3.0
	Medium	1.3	0.4 – 0.6	3.0
	Low	0.9	0.2 – 0.4	3.0
Collector	High	1.2	0.4 – 1.0	4.0
	Medium	0.9	0.2 – 0.4	4.0
	Low	0.6	0.2 – 0.4	4.0
Local	High	0.9	0.4 – 0.6	6.0
	Medium	0.7	0.1 – 0.2	6.0
	Low	0.4	.05 – 0.1	6.0

ILLUMINATING ENGINEERS SOCIETY OF NORTH AMERICA (IESNA) RECOMMENDED LIGHTING LEVELS FOR INTERSECTIONS

Illuminance for Intersections					
Functional Classification	**Average Maintained Illumination at Pavement by Pedestrian Area Activity Level** fc			**City of Evanston Standard**	**E_{avg}/E_{min}****
	Pedestrian				
	High	Medium	Low		
Major/Major	3.4*	2.6	1.8	*	3.0
Major/Collector	2.9*	2.2	1.5	*	3.0
Major/Local	2.6*	2.0	1.3	*	3.0
Collector/Collector	2.4*	1.8	1.2	*	4.0
Collector/Local	2.1*	1.6	1.0	*	4.0
Local/Local	1.8*	1.4	0.8	*	6.0

* No Current City Standard

** Uniformity Ratio Average Illumination Level versus Minimum Illumination Level

EXISTING CONDITIONS LIGHTING STUDY SUMMARY

LOCATION	STREET	LIMITS	TYPE	PEDESTRIAN	RECOMMENDED LEVEL	ACTUAL LEVEL	COE LEVEL*	IESNA GRADE	COE GRADE
1A	Chicago Ave.	Church St. to Grove St.	Major	High	1.7 fc	0.51 fc	1.0 – 4.0		
1 – 5B	Foster St.	Maple Ave. to Sherman Ave.	Collector	Medium	0.9 fc	0.16 fc	0.2 – 0.4		
2A – 9B	Dodge Ave.	Washington St. to Seward St.	Major	Medium	1.3 fc	0.66 fc	0.4 – 0.6		
2B	McDaniel Ave.	Crain St. to Greenleaf St.	Collector	Medium	0.7 fc	0.03 fc	0.2 – 0.4		
3A	Sheridan Square	Sheridan Rd. (West) to Sheridan Rd. (East)	Local	Medium	0.7 fc	0.11 fc	0.1 – 0.2		
3 – 4B	Main St.	Sherman Ave. to Hinman Ave.	Major	High	1.7 fc	1.47 fc	1.0 – 4.0		
4A	Ridge Ave.	Lake St. to Dempster St.	Major	Medium	1.3 fc	0.27 fc	0.4 – 0.6		
5A	Green Bay Rd.	Simpson St. to Payne St.	Major	Medium	1.3 fc	2.28 fc	0.4 – 0.6		
5B	Hovland Ct.	Emerson St. to Church St.	Local	Medium	0.7 fc	0.05 fc	0.1 – 0.2		
6 – 7C	Central St.	Walnut Ave. to Broadway Ave.	Major	High	1.7 fc	0.06 fc	1.0 – 4.0		
6A	Grant St.	Bennett Ave. to Pioneer Rd.	Collector	Medium	0.9 fc	0.01 fc	0.2 – 0.4		
6B	Central Park Ave.	Park Place North to End of Willard Elementary School Property	Collector	Medium	0.9 fc	0.01 fc	0.2 – 0.4		
7B	Ingleside Place	Orrington Ave. to Euclid Ave.	Local	Medium	0.7 fc	0.01 fc	0.1 – 0.2		
8A	Barton Ave.	Hill Terrace to Harvard Terrace	Local	Medium	0.7 fc	0.04 fc	0.1 – 0.2		
8B	Brummel St.	Custer St. to East Dead End	Local	Medium	0.7 fc	0.15 fc	0.1 – 0.2		
9A	Oakton St.	Florence Ave. to Asbury St.	Major	High	1.7 fc	0.01 fc	1.0 – 4.0		
Judson Ave.	Judson Ave.	1100 Block to 1200 Block	Local	Medium	0.7 fc	0.01 fc	0.1 – 0.2		
Lyons St.	Dodge Ave.	To ComEd Substation	Local	Medium	0.7 fc	1.22 fc	0.1 – 0.2		
Simpson St.	Simpson St.	Dewey Ave. to Green Bay Rd.	Collector	Medium	0.9 fc	1.07 fc	0.2 – 0.4		

RED – Does not meet IESNA recommended standards or City of Evanston standards

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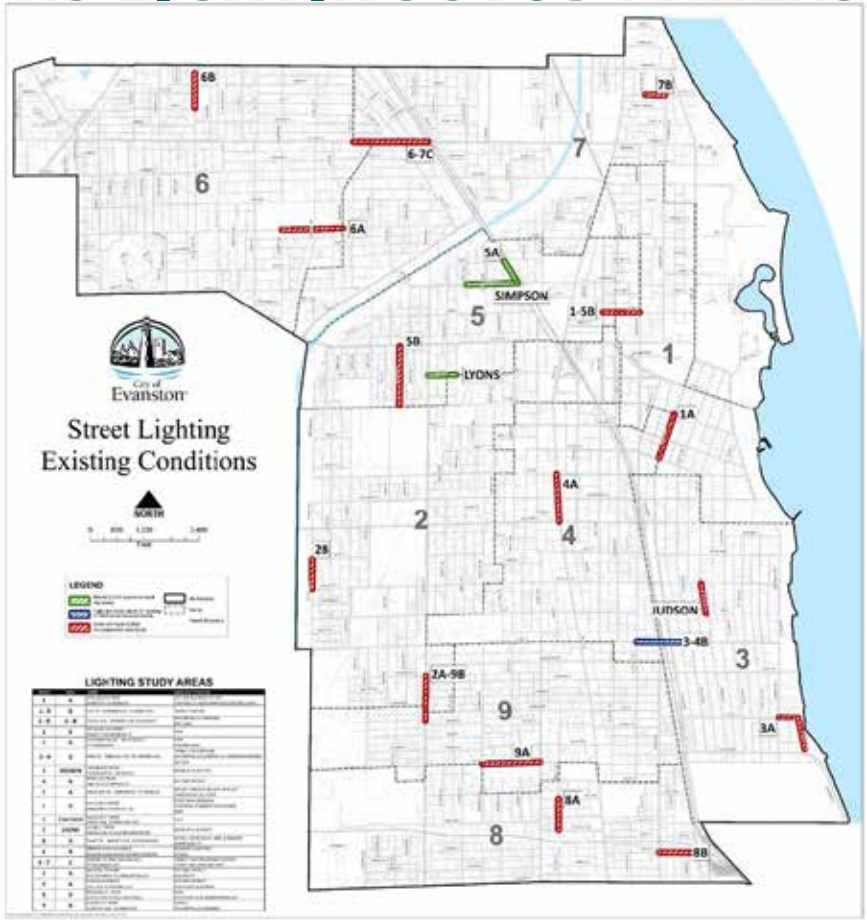

CONCLUSIONS

- Pole spacing varies throughout City
- Lighting types are: 55, 85, 165 and 200 Watt Induction, 250 and 400 Watt Metal Halide, 250 and 400 Watt High Pressure Sodium, 140 Watt LED
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POLICIES

CURRENT CITY OF EVANSTON POLICIES

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CITY PROGRAMS

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- Cost to Replace One (1) Complete Tallmadge Pole to Davit Arm Light Pole including Conduit and Wiring = $16,000

PUBLIC MEETING
NOVEMBER 28, 2017
7:00 P.M.

PARASOL ROOM

STREET LIGHT MASTER PLAN
EXISTING CONDITIONS REPORT
PUBLIC MEETING PRESENTATION

INTRODUCTIONS

STEERING COMMITTEE MEMBERS

Alderman, 3rd Ward	Committee Chair
Alderman, 5th Ward	Committee Co- Chair
Member	Age Friendly Task Force
Co-Chair	Environment Board
Member	Plan Commission
Vice-Chair	Preservation Commission
Member	Preservation Commission
Chair	Utilities Commission
Member	Utilities Commission
Director	Community Development Department
Commander	Police Department
Director	Public Works Agency
Bureau Chief/City Engineer	Capital Planning & Engineering
Traffic Operations Supervisor	Street Lights
Senior Project Manager	Traffic/Transportation

CONSULTANT TEAM – CHRISTOPHER B. BURKE ENGINEERING, LTD.

Mike Kerr	Project Manager	Executive Vice President
John Caruso	Project Engineer	Vice President/Electrical
Gerry Hennelly	Project Engineer	Senior Project Manager/Electrical
Altamanu, Inc.	Lighting Study/Lighting Design	Subconsultant
Delta Engineering	Lighting Design	Subconsultant

PROJECT GOALS

- DEVELOP A PLAN THAT IDENTIFIES FUTURE NEEDS OF THE COMMUNITY THAT CONSIDERS BUILT AND NATURAL ENVIRONMENTS
- ADDRESS SAFETY NEEDS
- MAINTAIN INFRASTRUCTURE AESTHETICS
- PROVIDE STANDARDIZATION
- COST EFFECTIVE, ENERGY EFFICIENT AND DARK SKY FRIENDLY ALTERNATIVES

AGENDA

- EXISTING LIGHTING INFRASTRUCTURE
- EDUCATION & METHODOLOGY
- RESULTS
- CURRENT NATIONAL LIGHTING STANDARDS AND CITY STANDARDS AND POLICIES

PROJECT TASKS

- **EXISTING CONDITIONS REVIEW AND ANALYSIS**
  - Completed
- **STAKEHOLDER AND PUBLIC ENGAGEMENT**
  - In Progress
- **STREET LIGHT INFRASTRUCTURE OPTIONS AND RECOMMENDATIONS**
  - In Progress, Awaiting Results from Public Engagement
- **PRIORITIZATION METHODOLOGY**
  - Awaiting Input from Stakeholders and Further Public Meetings
- **FINAL STREET LIGHT MASTER PLAN**
  - Project Completion Mid 2018

CITY OF EVANSTON EXISTING STREET LIGHTING INFRASTUCTURE

LIGHTING UNIT TYPES AND QUANTITIES

LIGHT POLE TYPES	QUANTITY
• TALLMADGE LIGHTING UNITS (POST TOP)	4,200
• DAVIT TYPE LIGHTING UNITS (ROADWAY) WITH COBRA HEAD AND GLOBE TYPE LIGHTING UNITS	1,600
• BOLLARD LIGHTING UNITS	(LIMITED)
• UNDERPASS TUNNEL (SPECIALTY) LIGHTING UNITS	(LIMITED)

LIGHTING SYSTEMS	
• CONTROLLERS/CONTROL CENTERS	107

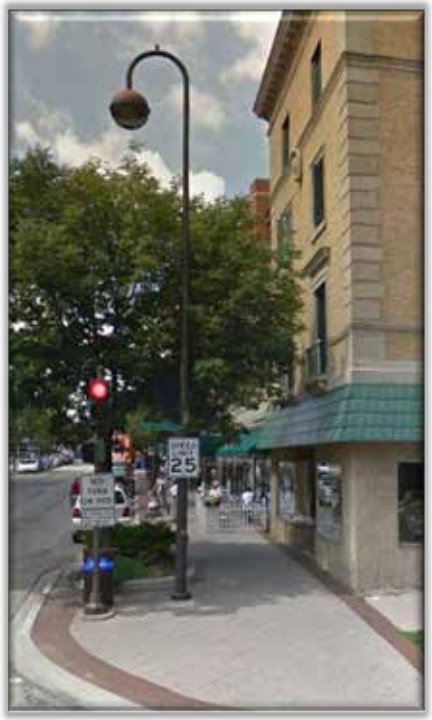
EXISTING CONDITIONS LIGHTING TYPES

INDUCTION TALLMADGE
(POST TOP)

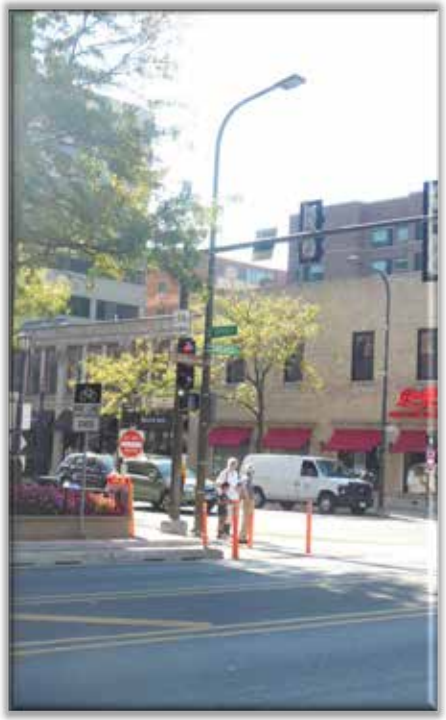
COBRA HEAD INDUCTION
(ROADWAY)

LED
(ROADWAY)

EXISTING CONDITIONS LIGHTING TYPES



GLOBE TYPE
METAL HALIDE
(ROADWAY)



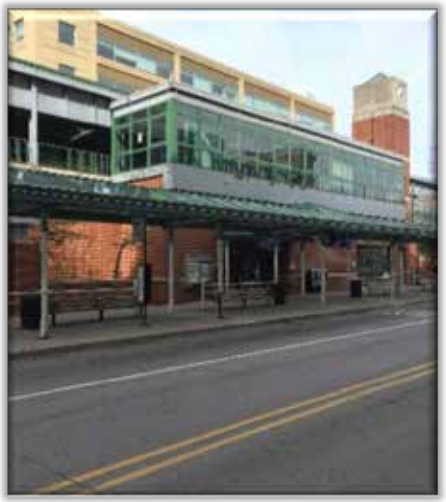
SHOEBOX TYPE
METAL HALIDE
(ROADWAY)

COBRA HEAD
METAL HALIDE
(ROADWAY)

EXISTING SPECIALTY AND AREA LIGHTING TYPES AND CONTROLLER

TUNNEL LIGHTING

UNDERPASS LIGHTING



SPECIALTY LIGHTING

LIGHTING CONTROLLER

WHAT WAS STUDIED?

- **LOCATIONS**

  18 study areas chosen by Committee and City staff

- **MEASUREMENTS**

  Were taken for the various study areas at varying cross-section widths for illumination levels

- **HOW IT WAS STUDIED**

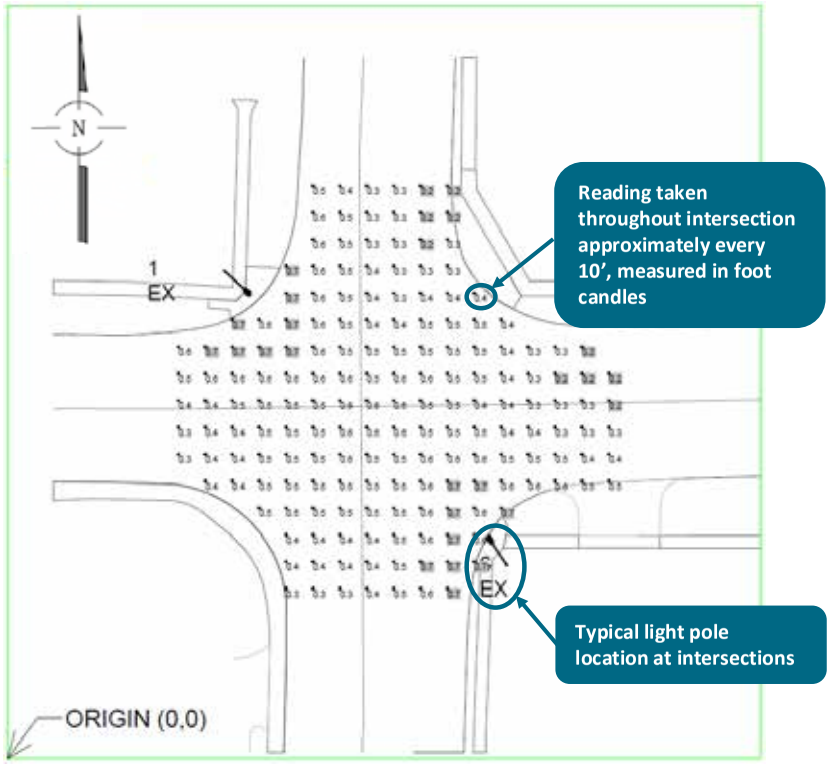
  With the light meter every 10’-0” at the pavement level

WHAT IS A FOOTCANDLE?

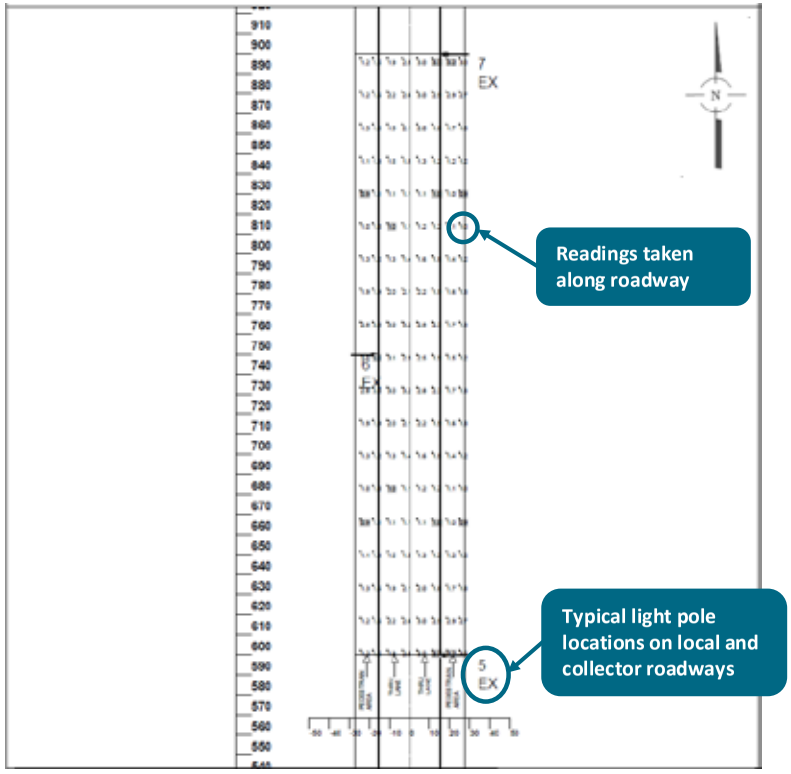
1 Footcandle (fc) = The measurement of light which equals the power of one candle one foot away (1 Lumen)

1 fc = 1 Lumen/Sq. Ft.

WHERE WERE THE LIGHTING LEVEL READINGS TAKEN?



Intersections



Roadways

WHAT DOES THE REPORT TELL YOU?

TABLE OF ILLUMINANCE MEASUREMENTS

(LOCATIONS PER ANSI/IESNA RP-8-14; VALUES IN FOOT-CANDLES AT GROUND LEVEL)

POINT	WEST SIDEWALK (12' SETBACK)	10' W.PARKING LANE		10' SB LANE		10' E.PARKING LANE		EAST SIDEWALK (12' SETBACK)
1	0.20	0.10	0.10	0.10	0.10	0.10	0.01	0.01
2	0.01	0.01	0.10	0.20	0.10	0.10	0.01	0.01
3	0.01	0.01	0.10	0.10	0.10	0.10	0.01	0.01
4	0.01	0.01	0.01	0.10	0.20	0.01	0.01	0.01
5	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
6	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
7	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
8	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
9	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
10	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
11	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
12	0.10	0.10	0.10	0.01	0.01	0.01	0.01	0.10
13	0.01	0.10	0.30	0.01	0.01	0.01	0.10	0.3*
14	0.01	0.01	0.10	0.30	0.01	0.20	0.30	0.4*
15	0.01	0.01	0.01	0.10	0.01	0.20	0.20	0.3*
16	0.01	0.01	0.01	0.10	0.01	0.20	0.20	0.3*
17	0.01	0.01	0.01	0.01	0.10	0.10	0.10	0.10
18	0.01	0.01	0.01	0.01	0.10	0.01	0.01	0.01
19	0.01	0.01	0.01	0.01	0.20	0.01	0.01	0.01
20	0.01	0.01	0.01	0.01	0.20	0.01	0.01	0.01
21	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
22	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
23	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
24	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
25	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
26	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
27	0.01	0.01	0.10	0.01	0.01	0.01	0.01	0.01
28	0.01	0.10	0.30	0.01	0.01	0.01	0.01	0.01
29	0.20	0.20	0.30	0.01	0.01	0.01	0.01	0.01
30	0.10	0.10	0.20	0.20	0.01	0.01	0.01	0.01
31	0.10	0.10	0.10	0.10	0.10	0.10	0.01	0.01

* HIGH VALUES RECORDED ON EAST SIDEWALK DUE TO HIGH AMBIENT LIGHTING FROM PARK

Where the measurements were taken

Light levels measured in footcandles

ILLUMINANCE MEASUREMENT SUMMARY (fc)		
	AVERAGE	AVE/MIN
ROADWAY	0.05	4.7
SOUTH SIDEWALK	0.03	3.1

Measurement Summary

VARIOUS SITE CONSIDERATIONS

- Ambient light from store fronts and businesses (glare)
- Front porch lighting
- Tree canopies
- Uplighting/Glare
  - Most Tallmadge light standards allow light to cast upward, creating glare and lost illumination capability. Glare and illumination readings were taken above the lights. The lost illumination levels for the uplight produced were as follows:

55 Watt Tallmadge	=	5.8 fc Above Fixture
85 Watt Tallmadge	=	6.2 fc Above Fixture
165 Watt Tallmadge	=	19.7 fc Above Fixture

CURRENT CITY OF EVANSTON LIGHTING STANDARDS

Street Category	Commercial & Institutional High Pedestrian Activity (Footcandles)	High Density Residential Medium Pedestrian Activity (Footcandles)	Low Density Residential Low Pedestrian Activity (Footcandles)
Major	1.0 – 4.0	0.4 – 0.6	0.2 – 0.4
Collector	0.4 – 1.0	0.2 – 0.4	0.2 – 0.4
Local	0.4 – 0.6	0.1 – 0.2	.05 – 0.1

ILLUMINATING ENGINEERS SOCIETY OF NORTH AMERICA (IESNA) RECOMMENDED LIGHTING LEVELS FOR ROADWAYS

Road and Pedestrian Activity Area		Pavement Classification (Minimum Maintained Average Values)		Uniformity Ratio E_{avg}/E_{min}
Road	**Pedestrian Activity Area**	**R3** (fc)	**COE Current Standards (fc)**	
Major	High	1.7	1.0 – 4.0	3.0
	Medium	1.3	0.4 – 0.6	3.0
	Low	0.9	0.2 – 0.4	3.0
Collector	High	1.2	0.4 – 1.0	4.0
	Medium	0.9	0.2 – 0.4	4.0
	Low	0.6	0.2 – 0.4	4.0
Local	High	0.9	0.4 – 0.6	6.0
	Medium	0.7	0.1 – 0.2	6.0
	Low	0.4	.05 – 0.1	6.0

ILLUMINATING ENGINEERS SOCIETY OF NORTH AMERICA (IESNA) RECOMMENDED LIGHTING LEVELS FOR INTERSECTIONS

Illuminance for Intersections					
Functional Classification	**Average Maintained Illumination at Pavement by Pedestrian Area Activity Level** (fc)			**City of Evanston Standard (fc)**	**E_{avg}/E_{min} ****
	Pedestrian				
	High	Medium	Low		
Major/Major	3.4*	2.6	1.8	*	3.0
Major/Collector	2.9*	2.2	1.5	*	3.0
Major/Local	2.6*	2.0	1.3	*	3.0
Collector/Collector	2.4*	1.8	1.2	*	4.0
Collector/Local	2.1*	1.6	1.0	*	4.0
Local/Local	1.8*	1.4	0.8	*	6.0

* No Current City Standard

** Uniformity Ratio Average Illumination Level versus Minimum Illumination Level

EXISTING CONDITIONS LIGHTING STUDY SUMMARY

LOCATION	STREET	LIMITS	TYPE	PEDESTRIAN	RECOMMENDED LEVEL	ACTUAL LEVEL	COE LEVEL*	IESNA GRADE	COE GRADE
1A	Chicago Ave.	Church St. to Grove St.	Major	High	1.7 fc	0.51 fc	1.0 – 4.0		
1 – 5B	Foster St.	Maple Ave. to Sherman Ave.	Collector	Medium	0.9 fc	0.16 fc	0.2 – 0.4		
2A – 9B	Dodge Ave.	Washington St. to Seward St.	Major	Medium	1.3 fc	0.66 fc	0.4 – 0.6		
2B	McDaniel Ave.	Crain St. to Greenleaf St.	Collector	Medium	0.7 fc	0.03 fc	0.2 – 0.4		
3A	Sheridan Square	Sheridan Rd. (West) to Sheridan Rd. (East)	Local	Medium	0.7 fc	0.11 fc	0.1 – 0.2		
3 – 4B	Main St.	Sherman Ave. to Hinman Ave.	Major	High	1.7 fc	1.47 fc	1.0 – 4.0		
4A	Ridge Ave.	Lake St. to Dempster St.	Major	Medium	1.3 fc	0.27 fc	0.4 – 0.6		
5A	Green Bay Rd.	Simpson St. to Payne St.	Major	Medium	1.3 fc	2.28 fc	0.4 – 0.6		
5B	Hovland Ct.	Emerson St. to Church St.	Local	Medium	0.7 fc	0.05 fc	0.1 – 0.2		
6 – 7C	Central St.	Walnut Ave. to Broadway Ave.	Major	High	1.7 fc	0.06 fc	1.0 – 4.0		
6A	Grant St.	Bennett Ave. to Pioneer Rd.	Collector	Medium	0.9 fc	0.01 fc	0.2 – 0.4		
6B	Central Park Ave.	Park Place North to End of Willard Elementary School Property	Collector	Medium	0.9 fc	0.01 fc	0.2 – 0.4		
7B	Ingleside Place	Orrington Ave. to Euclid Park Place	Local	Medium	0.7 fc	0.01 fc	0.1 – 0.2		
8A	Barton Ave.	Hull Terrace to Harvard Terrace	Local	Medium	0.7 fc	0.04 fc	0.1 – 0.2		
8B	Brummel St.	Custer Ave. to East Dead End	Local	Medium	0.7 fc	0.15 fc	0.1 – 0.2		
9A	Oakton St.	Florence Ave. to Asbury Ave.	Major	High	1.7 fc	0.01 fc	1.0 – 4.0		
Judson Ave.	Judson Ave.	1100 Block to 1200 Block	Local	Medium	0.7 fc	0.01 fc	0.1 – 0.2		
Lyons St.	Dodge Ave.	To ComEd Substation	Local	Medium	0.7 fc	1.22 fc	0.1 – 0.2		
Simpson St.	Simpson St.	Dewey Ave. to Green Bay Rd.	Collector	Medium	0.9 fc	1.07 fc	0.2 – 0.4		

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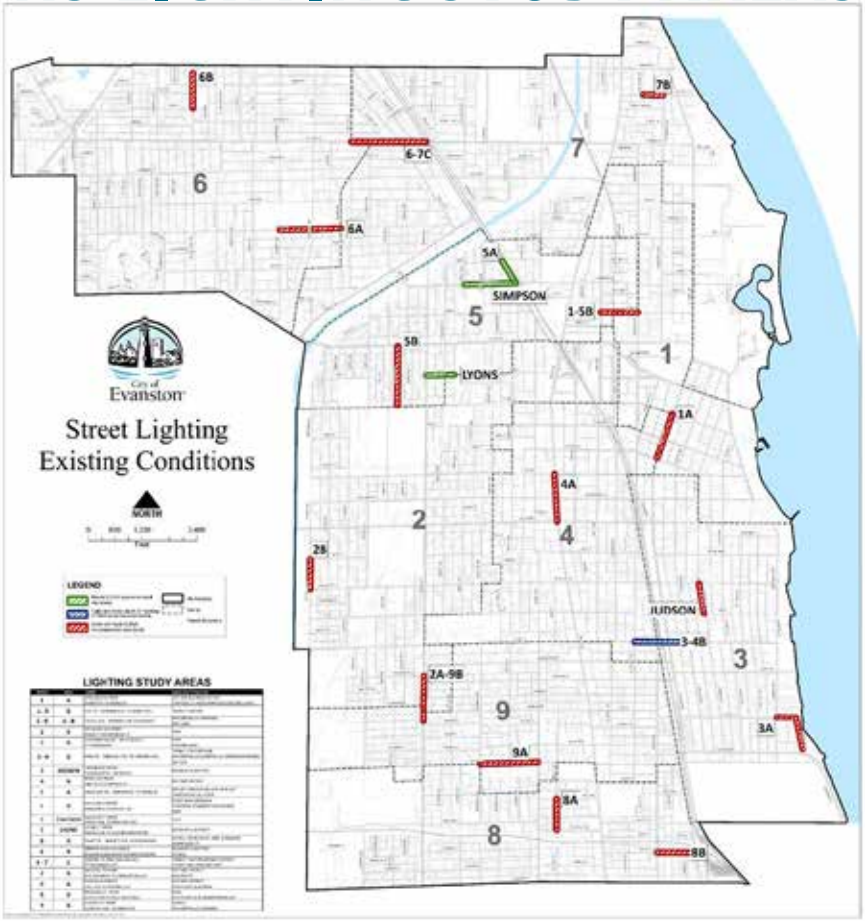

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WHAT'S NEXT:

- **PROJECT SCHEDULE**
  - Completion Mid 2018
- **NEXT TASK**
  - Review and Receive Public Input, Develop Options and Recommendations
- **NEXT PUBLIC MEETING**
  - Tentative Schedule February 2018
- **QUESTIONS?**

STREET LIGHT MASTER PLAN
STEERING COMMITTEE MEETING NO. 3

REVIEW OF INPUT RECEIVED AT AND AFTER PUBLIC MEETING

PUBLIC MEETING HELD NOVEMBER 28, 2017

- 40 people in attendance
- Received 17 comments at public meeting

ONLINE COMMENTS

- Received 34 comments online

REVIEW OF INPUT RECEIVED AT AND AFTER PUBLIC MEETING

RESULTS

- 24 comments in favor of keeping the existing Tallmadge lighting
- 7 of the “keep Tallmadge” comments suggested upgrades to improve lighting levels, minimize light pollution and reduce maintenance costs
- 5 comments requested higher lighting levels
- 4 comments thought the Seward pilot project was too bright
- 2 comments questioned how to respond to online posts
- 2 comments stated that no study was necessary
- 2 comments questioned what other Villages are doing

AS A RESULT OF PUBLIC MEETING #1

- Survey Northwest Municipal Conference for current street lighting practices.
- Analyze additional areas for lighting levels to be used in future community survey.
- Explore options for modernizing Tallmadge lights.

SURVEY OF NORTH SHORE MUNICIPAL CONFERENCE

Prepare list of lighting questions for fact finding in regard to what other municipalities are doing with regards to lighting

Topics for Survey:

- Ordinance/Policy/Guidelines
- Equipment Types
- Lighting Levels
- Dark Sky Compliance
- Technology/Light Sources
- Maintenance
- Capital Improvement Plans
- Standard Construction Details
- Consideration of LED Conversion Alternatives

ADDITIONAL LIGHTING STUDY AREAS

- McCormick Avenue – Golf Road to Green Bay Road
- McCormick Avenue at Bridge Street
- Chicago Avenue – Kedzie Avenue to South Boulevard
- Chicago Avenue at Keeney Street (Intersection)
- Sheridan Road at Keeney Street (Intersection)
- Ridge Avenue at Foster Street (Intersection)
- Pathways/Bikeways, Lake Front – Greenwood Street to NU Campus
- Seward Street – Dodge Avenue to Dewey Avenue
- Seward Street – Dewey Avenue to Florence Avenue

LIGHTING EQUIPMENT OPTIONS

- Retrofit existing Tallmadge luminaires with new LED light source, refractors and roof covers
- New Tallmadge LED luminaires engineered for appropriate optic with replica fitter and dark sky compliant
- New Tallmadge type poles with new LED luminaires
- New Tallmadge replica poles with new LED luminaires

FUTURE MEETING SCHEDULE

- Steering Committee Meeting
- Public Meeting

QUESTIONS TO BE SUBMITTED TO THE NORTHWEST MUNICIPAL CONFERENCE FOR INFORMATION ON LIGHTING ORDINANCES AND STANDARDS

As part of the City of Evanston's ongoing Street Lighting Master Plan Study, we are requesting information from members of the Conference in regards to your municipality's current standard practices for street lighting. The specific questions are below:

1. Does your municipality currently have a Village Code or Village Ordinance in regard to street lighting within public right of ways? If so, please provide a copy of this code or ordinance section.

2. What types street lighting equipment does your municipality currently maintain?

3. What lighting illumination levels does your municipality require?

4. Are the luminaires that your municipality allows or maintains Dark Sky Compliant?

5. What current lamp technology does your municipality allow for lamp types?

6. Does your municipality maintain your existing roadway lighting systems or is the maintenance of the street lighting contracted out?

7. Does your municipality currently have a Capital Improvement Plan (CIP) for the upgrading of lighting?

8. Does your municipality currently use standard roadway lighting construction details or standards?

9. Does your municipality currently consider the conversion of existing luminaires to LED by either retrofitting of light sources or full luminaire replacement?

GAH/pjb/mv
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Street Light Master Plan Project
Lighting Level Survey 2018

The City is evaluating options for maintaining its existing street light system and is seeking public input on future lighting levels desired for new development and major public works projects. The City is committed to keeping the existing Tallmadge Lighting System and has no plans to replace Tallmadge lights with standard roadway-type poles. Additional information regarding the project is available at the City's website: www.cityofevanston.org/streetlight.

Please provide your feedback on current lighting levels at the locations below. The City recommends taking some time to travel to the locations listed to evaluate current lighting, as some areas have been recently updated. If you are unfamiliar with the lighting at any of the locations, you should not provide a response for that location.

1. For the three major roads listed below, please provide your opinion on the current lighting levels.

	Too Dark	Too Bright	Just Right
Green Bay Rd from Simpson St to Payne St	☐	☐	☐
Main St from Sherman Ave to Hinman Ave	☐	☐	☐
Dodge Ave from Washington St to Seward St	☐	☐	☐

2. For the three collector roads listed below, please provide your opinion on the current lighting levels.

	Too Dark	Too Bright	Just Right
Simpson St from Dewey Ave to Green Bay Rd	☐	☐	☐
Foster St from Maple Ave to Sherman Ave	☐	☐	☐
Grant St from Bennett Ave to Pioneer Rd	☐	☐	☐

3. For the six local roads listed below, please provide your opinion on the current lighting levels.

	Too Dark	Too Bright	Just Right
Seward St from Dodge Ave to Dewey Ave	☐	☐	☐
Seward St from Dewey Ave to Florence Ave	☐	☐	☐
Seward St from Florence Ave to Wesley Ave	☐	☐	☐
Central Park from Park Place to Isabella St	☐	☐	☐
Thayer St from Central Park to Lawndale Ave	☐	☐	☐
Forest Ave from Keeney St to Kedzie St	☐	☐	☐

Street Light Master Plan Project
Lighting Level Survey 2018

4. Do you feel that the Lakefront Path between Greenwood Street and NU Campus is:

Too Dark	☐
Too Bright	☐
Just Right	☐

5. For the three intersections listed below, please provide your opinion on the current lighting levels.

	Too Dark	Too Bright	Just Right
Chicago Ave and Keeney St	☐	☐	☐
McCormick Boulevard and Bridge St	☐	☐	☐
Ridge Ave and Foster St	☐	☐	☐

6. How would you characterize the lighting levels on your block?

Too Dark	☐
Too Bright	☐
Just Right	☐

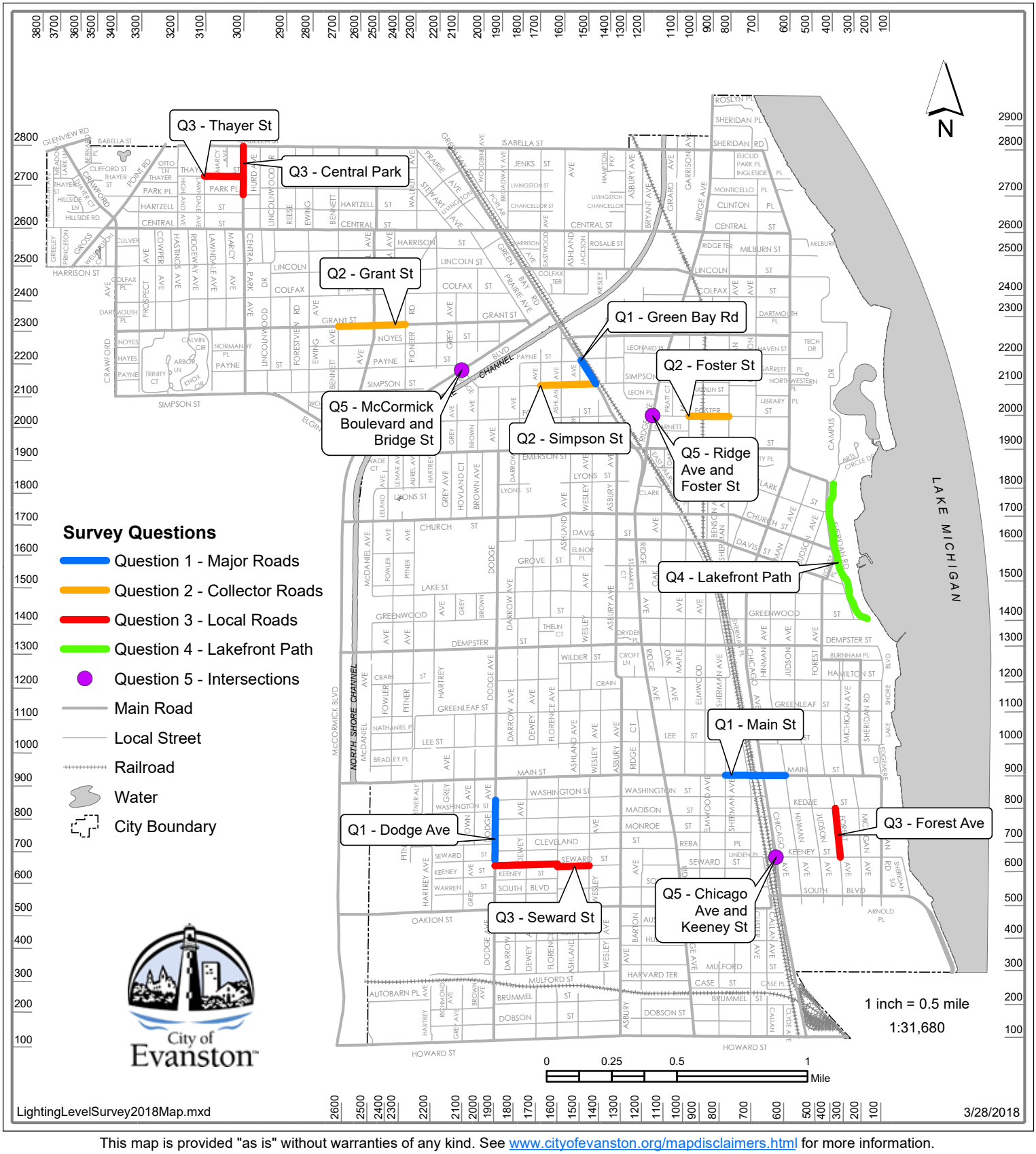
7. Please provide the address range for your block (e.g. 2100 block of Ridge Avenue).

_____

Please complete the survey by May 6, 2018 and return it to:

City of Evanston Public Works Agency
Lorraine H. Morton Civic Center, Room 3700
2100 Ridge Avenue

2018 Lighting Level Survey




MAY 24, 2018
City of
Evanston
EVANSTON
GET HEALTHY
MAPLE
STREET LIGHT MASTER PLAN
STEERING COMMITTEE MEETING NO. 4

UPDATE OF INPUT RECEIVED

ONLINE COMMENTS:

- Received 90 comments online

GENERAL RESULTS:

- 25 comments in favor of keeping the existing Tallmadge lighting
- 10 of the "keep Tallmadge" comments suggested upgrades to improve lighting levels, minimize light pollution and reduce maintenance costs
- 21 comments requested higher lighting levels
- 20 comments thought the pilot projects were too bright
- 2 comments questioned how to respond to online posts
- 2 comments stated that no study was necessary
- 2 comments questioned what other Villages are doing
- 10 comments suggested that lights shine down, smart lighting systems studied, and change traffic laws

REVIEW OF NORTHWEST MUNICIPAL CONFERENCE (NWMC) SURVEY

NWMC SURVEY SENT OUT FEBRUARY 2018

- **12** of 45 Communities Responded
- Respondents included Arlington Heights, Buffalo Grove, Fox Lake, Grayslake, Libertyville, Lincolnshire, Morton Grove, Palatine, Park Ridge, Skokie, Streamwood and Wheeling.

NORTHWEST MUNICIPAL CONFERENCE SURVEY

RESULTS:

- 5 of 12 Have Lighting Ordinance/Standards
- Lighting Equipment Varies Greatly
- 6 of 12 Do Not Require Specific Illumination Levels; Those That Do Vary From 0.2 fc to IES
- 4 of 12 Require Dark Sky Compliance
- **ALL COMMUNITIES ARE MOVING TO LED LAMPS**
- 6 of 12 Contract Out Street Light Maintenance
- 8 of 12 Do Not Have CIP for Lighting
- 9 of 12 have Standard Lighting Drawings/Details
- None of the Communities Have Required Illumination Levels for Pedways, Bikeways or Intersections

REVIEW OF COMMUNITY SURVEY

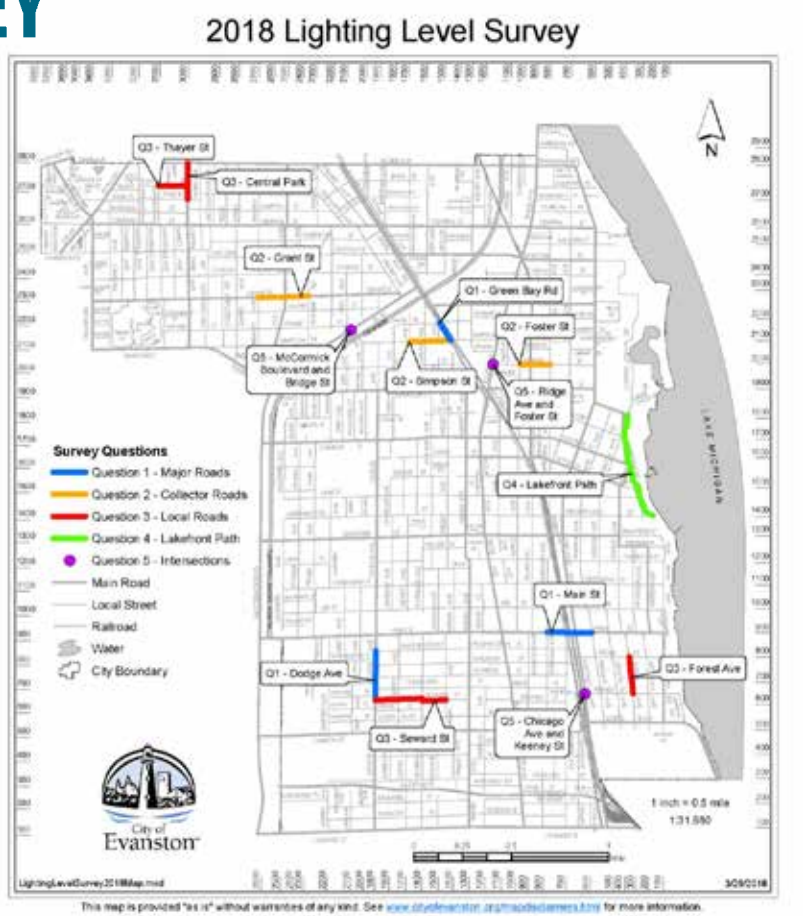
COMMUNITY STREET LIGHT SURVEY

SENT OUT APRIL 2018

- Over **700** Responded to the Survey

SURVEY INCLUDED LIGHTING LEVELS FOR:

- Major Streets
- Collector Roads
- Local Roads
- Lakefront Path
- Intersections
- "Your Block"

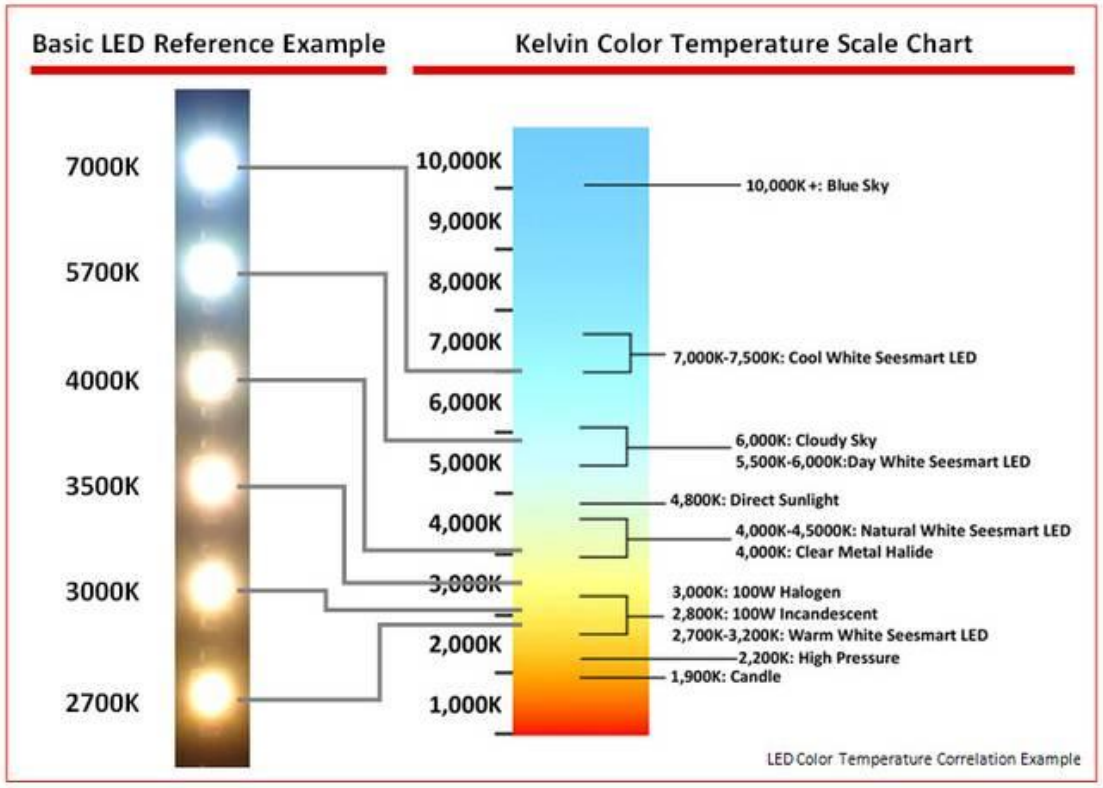


IES & COE RECOMMENDED LIGHTING LEVELS FOR ROADWAYS

Road and Pedestrian Activity Area		IES fc	COE fc	Uniformity Ratio E_{avg}/E_{min}
Road	**Pedestrian Activity Area**			
Major	High	1.7	1.0 – 4.0	3.0
	Medium	1.3	0.4 – 0.6	3.0
	Low	0.9	0.2 – 0.4	3.0
Collector	High	1.2	0.4 – 1.0	4.0
	Medium	0.9	0.2 – 0.4	4.0
	Low	0.6	0.2 – 0.4	4.0
Local	High	0.9	0.4 – 0.6	6.0
	Medium	0.7	0.1 – 0.2	6.0
	Low	0.4	.05 – 0.1	6.0

IES Intersection Lighting Levels fc	
Intersection Type	**Level**
Major-Major	3.4
Major-Collector	2.9
Major-Local	2.6
Collector-Collector	2.4
Collector-Local	2.1
Local-Local	1.9

LED COLOR TEMPERATURE SCALE



MAJOR STREETS

GREEN BAY ROAD

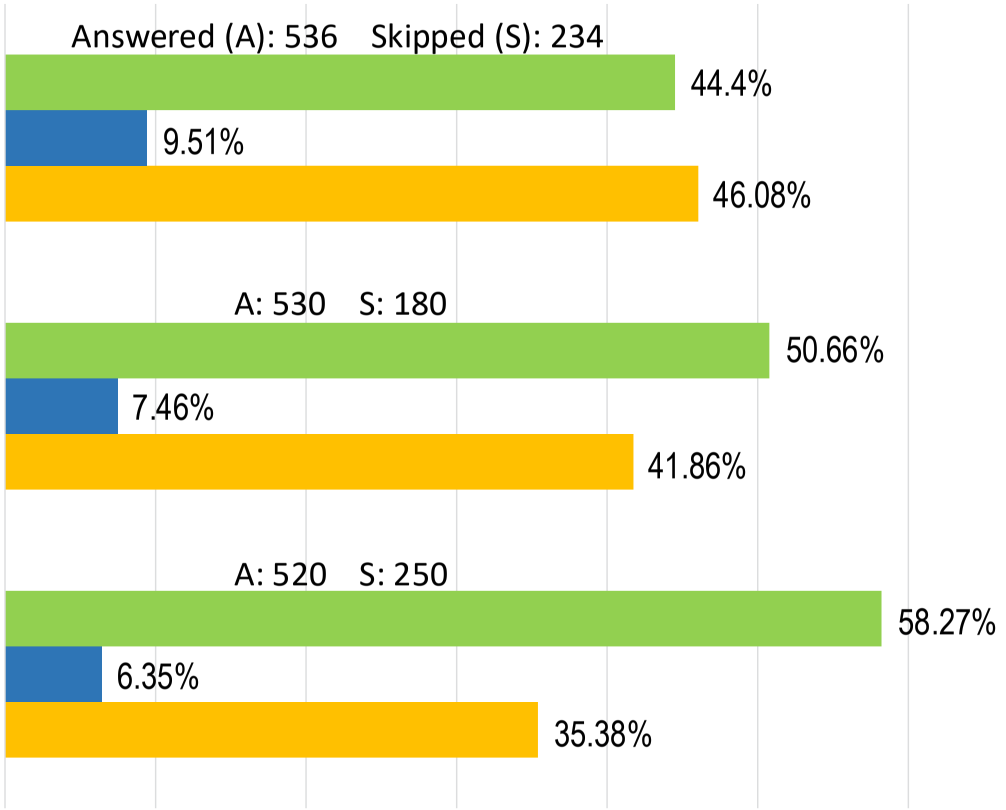
Davit, 140W, LED, 4000K
(Simpson St to Payne St)
2.28 fc

MAIN STREET

Davit, 250W, HPS
(Sherman Ave to Hinman Ave)
1.47 fc

DODGE AVENUE

Tallmadge, 85W, Induction
(Washington St to Seward St)
0.66 fc



	IES	COE
GREEN BAY ROAD	✓	✓
MAIN STREET	✓	✓
DODGE AVENUE		✓

✓ -- Meets Standards

COLLECTOR ROADS

SIMPSON STREET

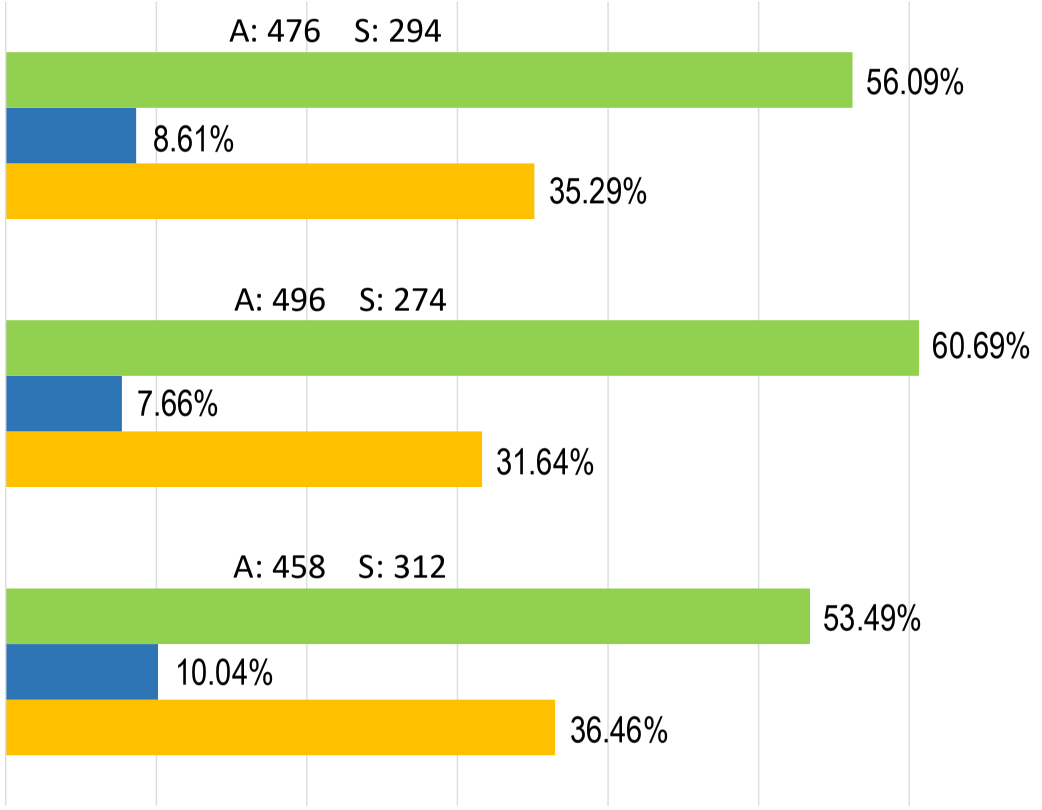
Davit, 200W, Induction
(Dewey Ave to Green Bay Rd)
1.07 fc

FOSTER STREET

Tallmadge, 165W, Induction
(Maple Ave to Sherman Ave)
0.16 fc

GRANT STREET

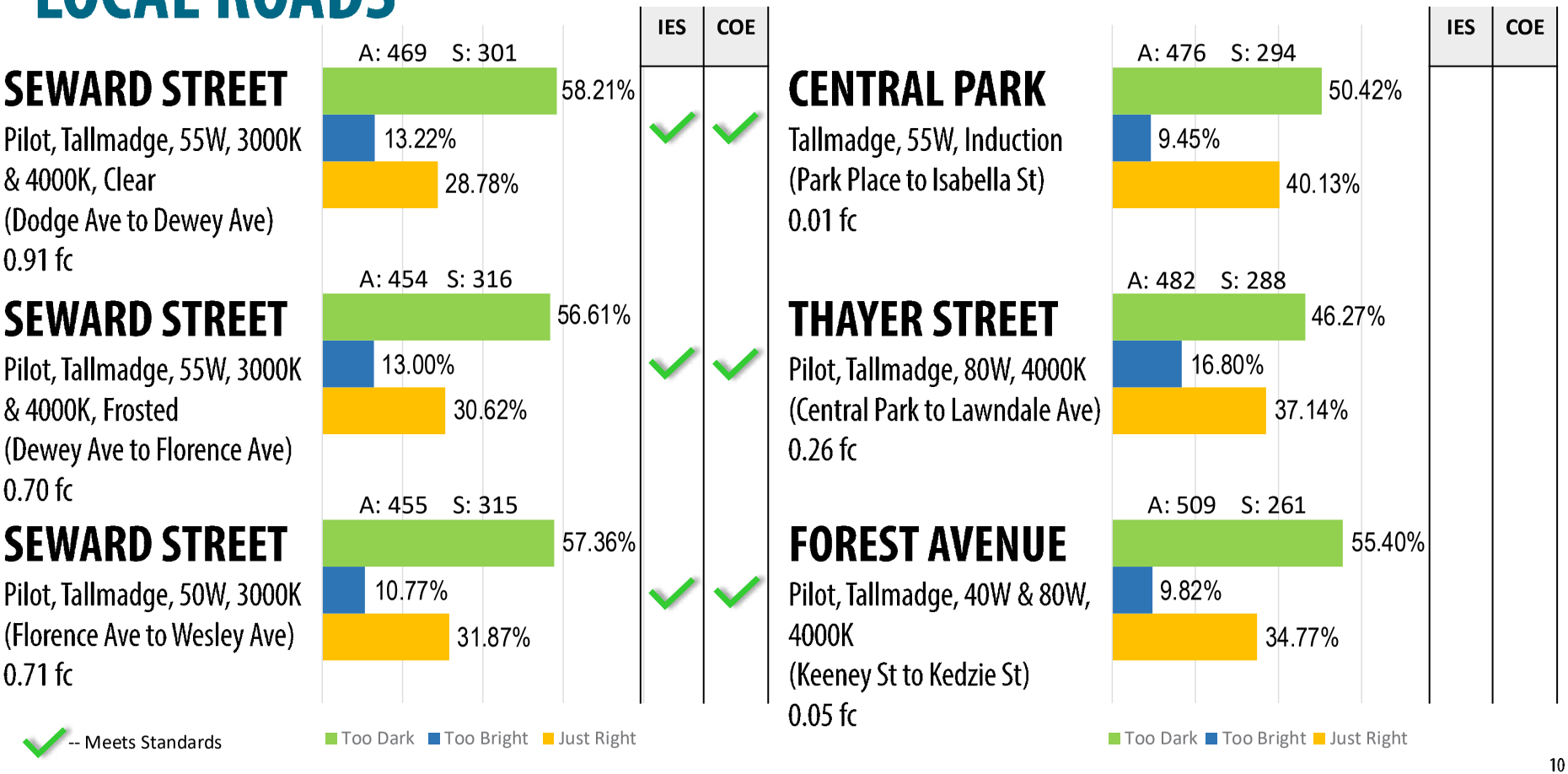
Tallmadge, 85W, Induction
(Bennett Ave to Pioneer Rd)
0.01 fc



IES	COE
✓	✓

✓ -- Meets Standards

LOCAL ROADS

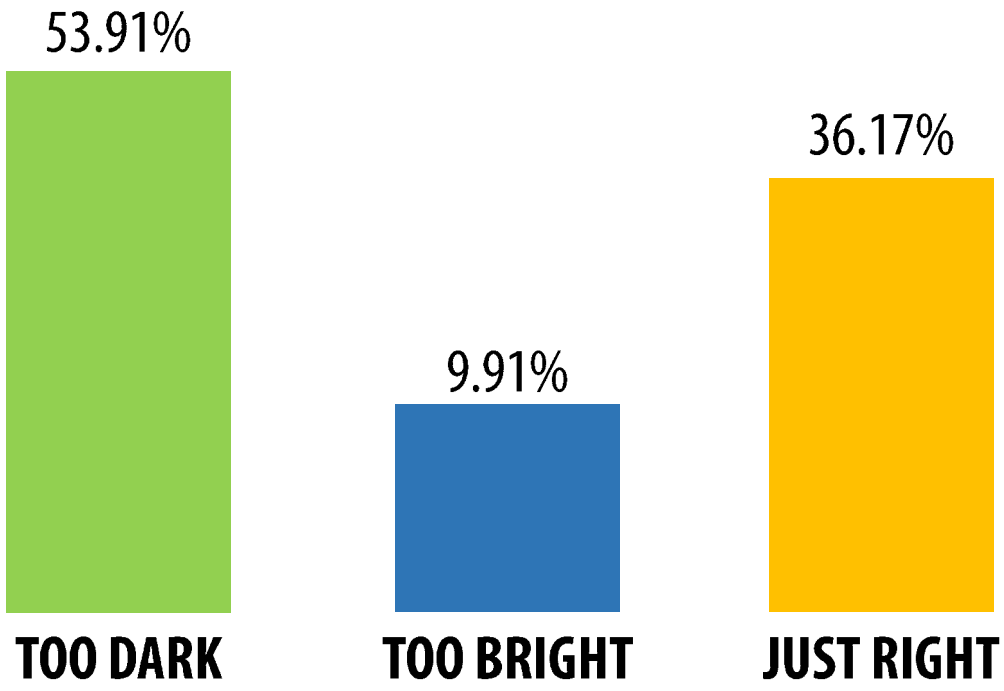

IES
COE
SEWARD STREET
Pilot, Tallmadge, 55W, 3000K & 4000K, Clear
(Dodge Ave to Dewey Ave)
0.91 fc
A: 469 S: 301
58.21%
13.22%
28.78%
SEWARD STREET
Pilot, Tallmadge, 55W, 3000K & 4000K, Frosted
(Dewey Ave to Florence Ave)
0.70 fc
A: 454 S: 316
56.61%
13.00%
30.62%
SEWARD STREET
Pilot, Tallmadge, 50W, 3000K
(Florence Ave to Wesley Ave)
0.71 fc
A: 455 S: 315
57.36%
10.77%
31.87%
-- Meets Standards
Too Dark
Too Bright
Just Right
IES
COE
CENTRAL PARK
Tallmadge, 55W, Induction
(Park Place to Isabella St)
0.01 fc
A: 476 S: 294
50.42%
9.45%
40.13%
THAYER STREET
Pilot, Tallmadge, 80W, 4000K
(Central Park to Lawndale Ave)
0.26 fc
A: 482 S: 288
46.27%
16.80%
37.14%
FOREST AVENUE
Pilot, Tallmadge, 40W & 80W, 4000K
(Keeney St to Kedzie St)
0.05 fc
A: 509 S: 261
55.40%
9.82%
34.77%
Too Dark
Too Bright
Just Right

LAKEFRONT PATH

Shepherds Hook, 150W, Metal Halide
(Between Greenwood Street and NU Campus)
1.30 fc

IES	COE
✓	✓

Answered (A): 575 Skipped (S): 195



✓ -- Meets Standards

INTERSECTIONS

CHICAGO AVENUE AT KEENEY STREET

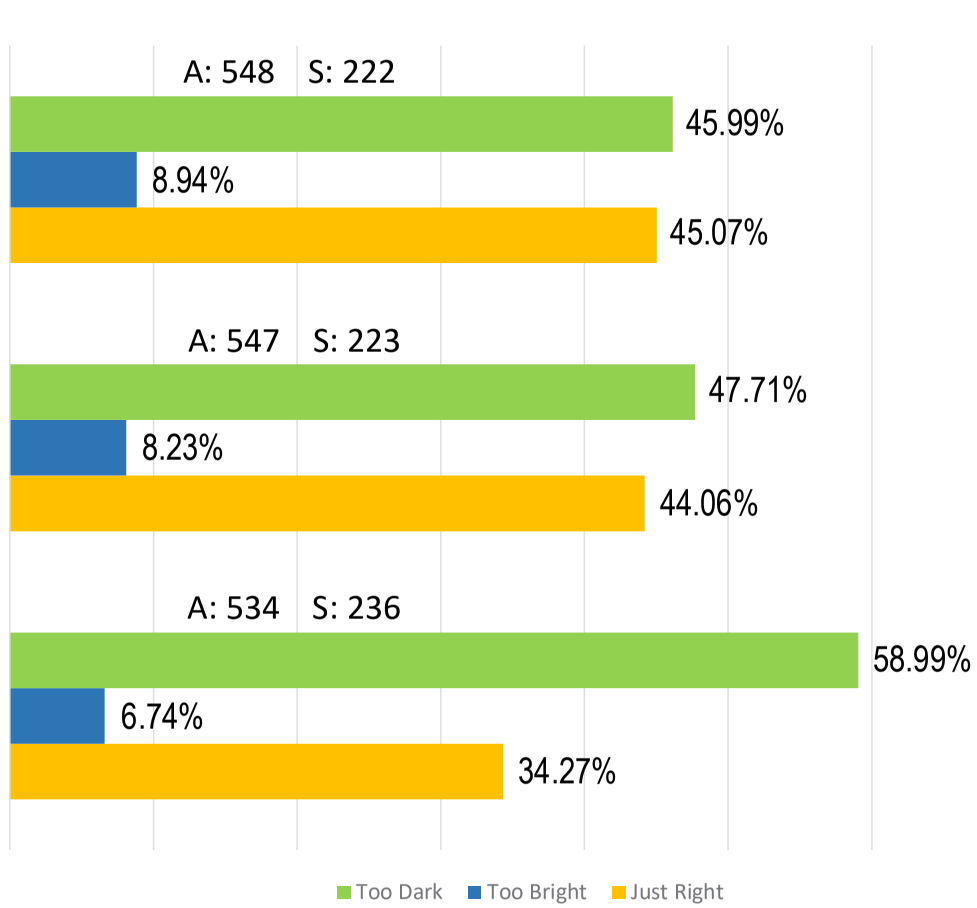
2 Twin Tallmadge, 165W, Induction
0.35 fc

McCORMICK BLVD AT BRIDGE STREET

4 Tallmadge, 165W, Induction
0.33 fc

RIDGE AVENUE AT FOSTER STREET

3 Tallmadge, 165W, Induction
0.20 fc

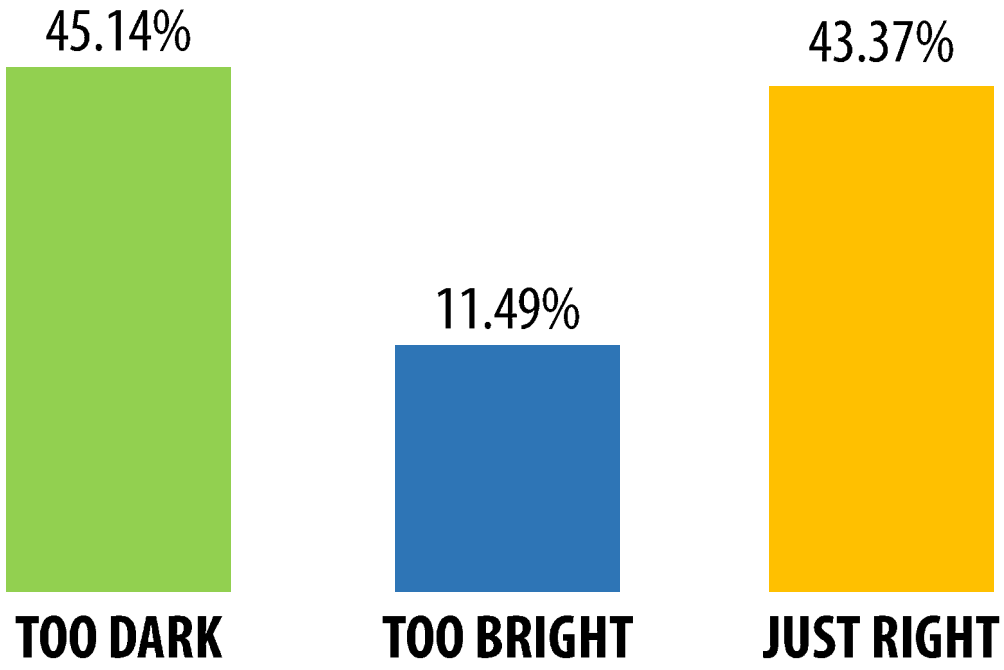


IES	COE

-- Meets Standards

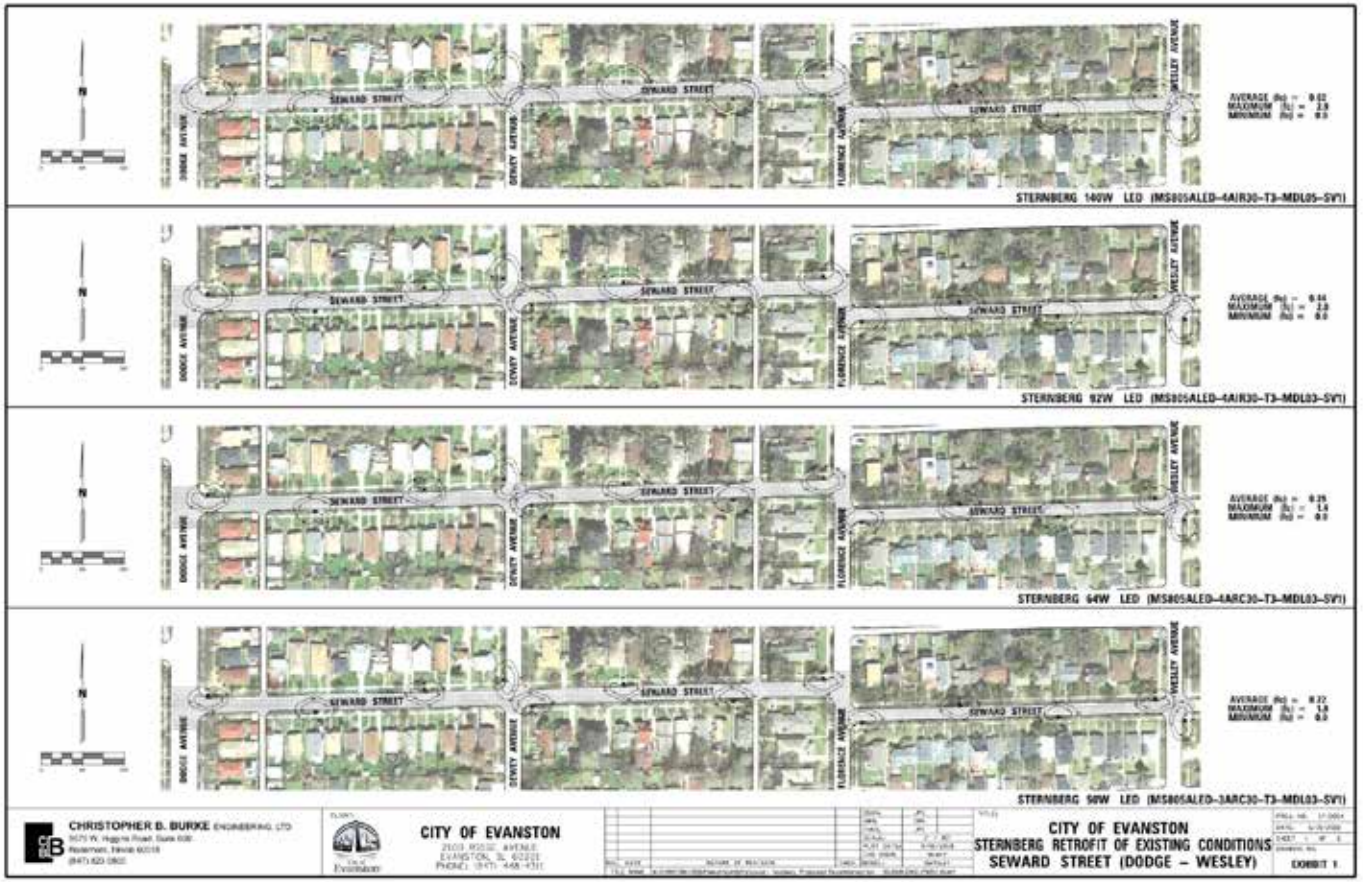
YOUR BLOCK

Answered (A): 731 Skipped (S): 39

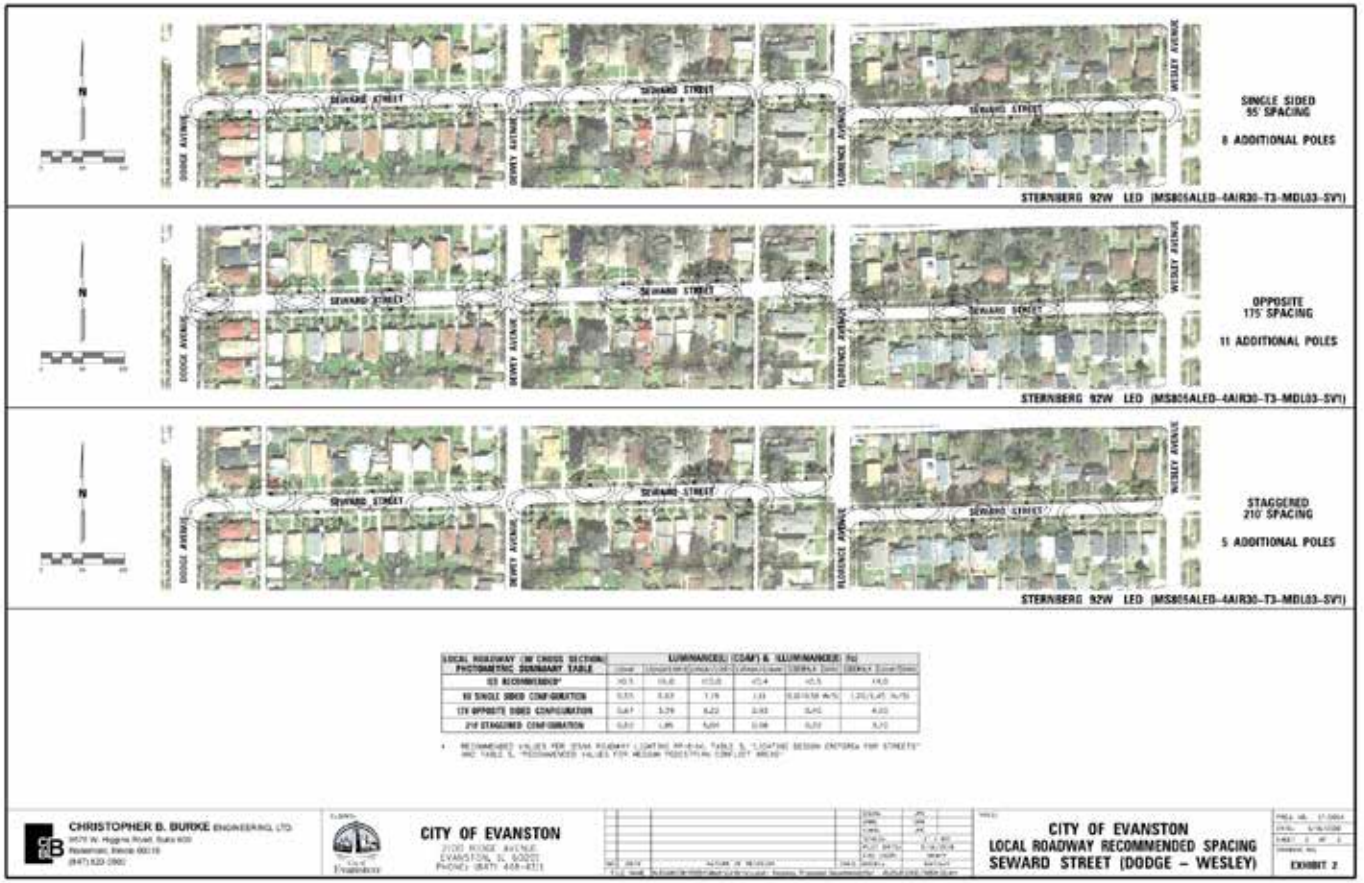


13

STERNBERG RETROFIT OF EXISTING CONDITIONS (EXAMPLE)



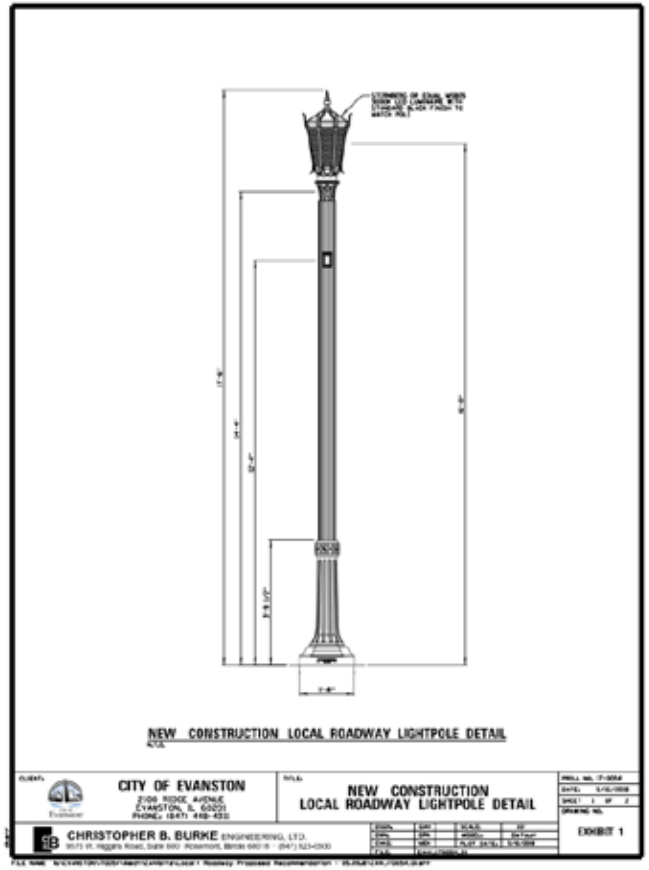
LOCAL ROADWAY OPTION (EXAMPLE)

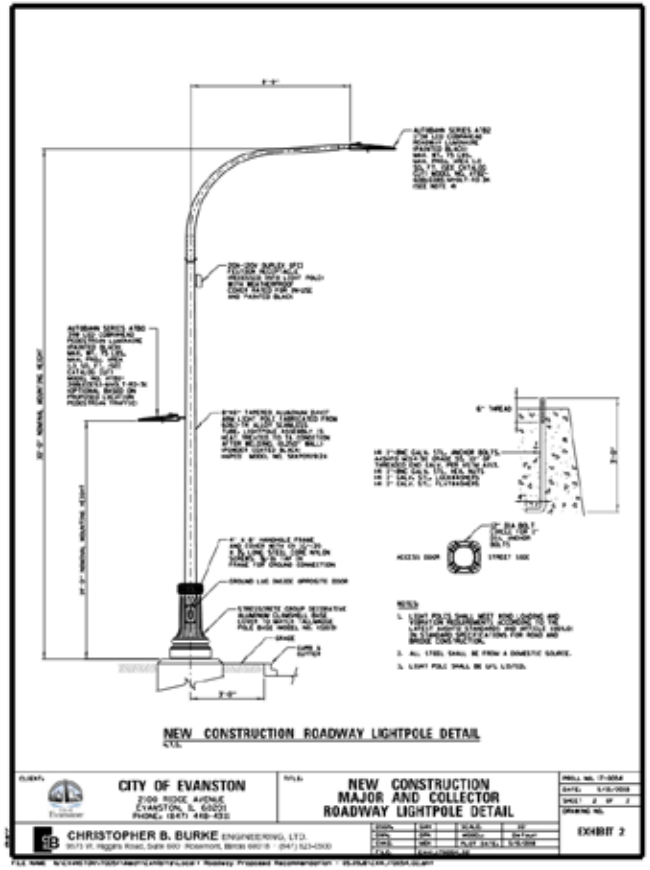


NEW CONSTRUCTION OPTIONS

- All new construction shall meet IESNA recommended practice (Collectors, Major Roadways, & Intersections)
- Local Roadways shall utilize the Sternberg Lighting replica Tallmadge luminaire (MS805LED), or approved equal, the luminaire shall be mounted at 16' concrete foundation or steel helix foundation with a round 24" top plate.
- Collector and Major Roadways shall be a 30'-0" Roadway Davit Arm pole with and LED type luminaire (Autobahn Series ATB2 or equal) on a concrete foundation or steel helix foundation with a round 30" top plate to match those recently installed in Fountain Square.
  - A replica Tallmadge luminaire or a pedestrian-scale LED type luminaire (Autobahn Series ATB0 or equal) mounted at 14' to the 30' roadway Davit Arm pole may be used if necessary to enhance the Roadway light standard when higher sidewalk illuminations if required for pedestrian traffic.
- It is recommended that new construction utilize a staggered configuration to conform with current City of Evanston typical layouts.
- Electrical Infrastructure such as Wiring, Conduit and Controls shall be per National Electrical Code (NEC) compliance for outdoor lighting installations.

NEW CONSTRUCTION OPTIONS (CONT'D)





FUTURE MEETING SCHEDULE

- **PUBLIC MEETING**

OCTOBER 3, 2018

STREET LIGHT MASTER PLAN
STEERING COMMITTEE MEETING NO. 5

REVIEW OF COMMUNITY SURVEY

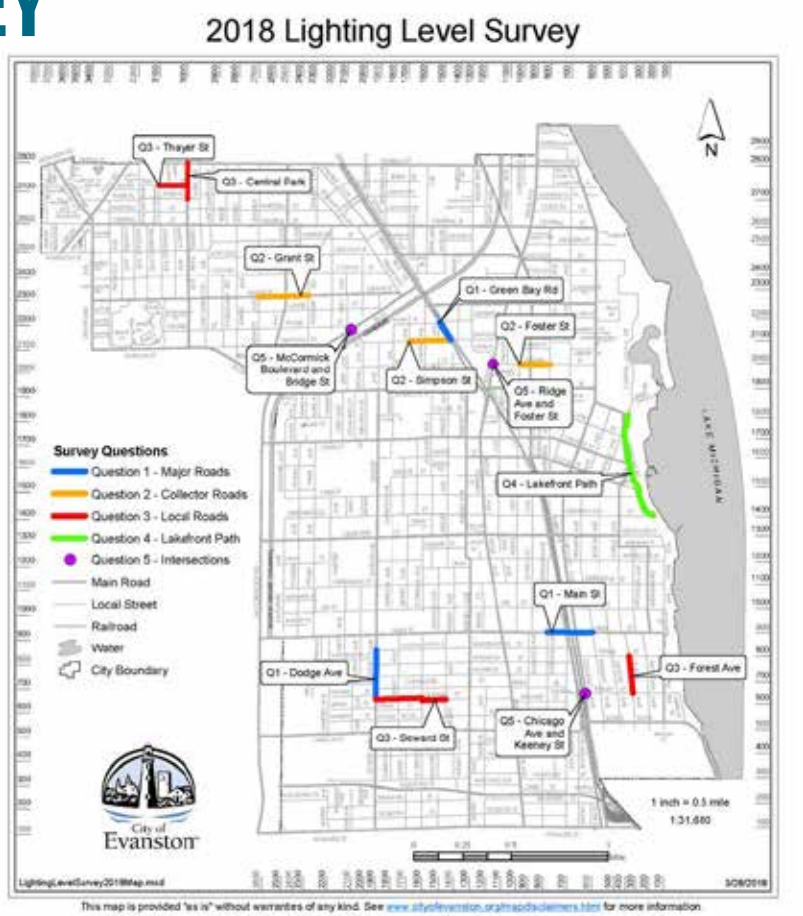
COMMUNITY STREET LIGHT SURVEY

SENT OUT APRIL 2018

- Over **700** Responded to the Survey

SURVEY INCLUDED LIGHTING LEVELS FOR:

- Major Streets
- Collector Roads
- Local Roads
- Lakefront Path
- Intersections
- "Your Block"



REVIEW OF COMMUNITY SURVEY

MAJOR STREETS

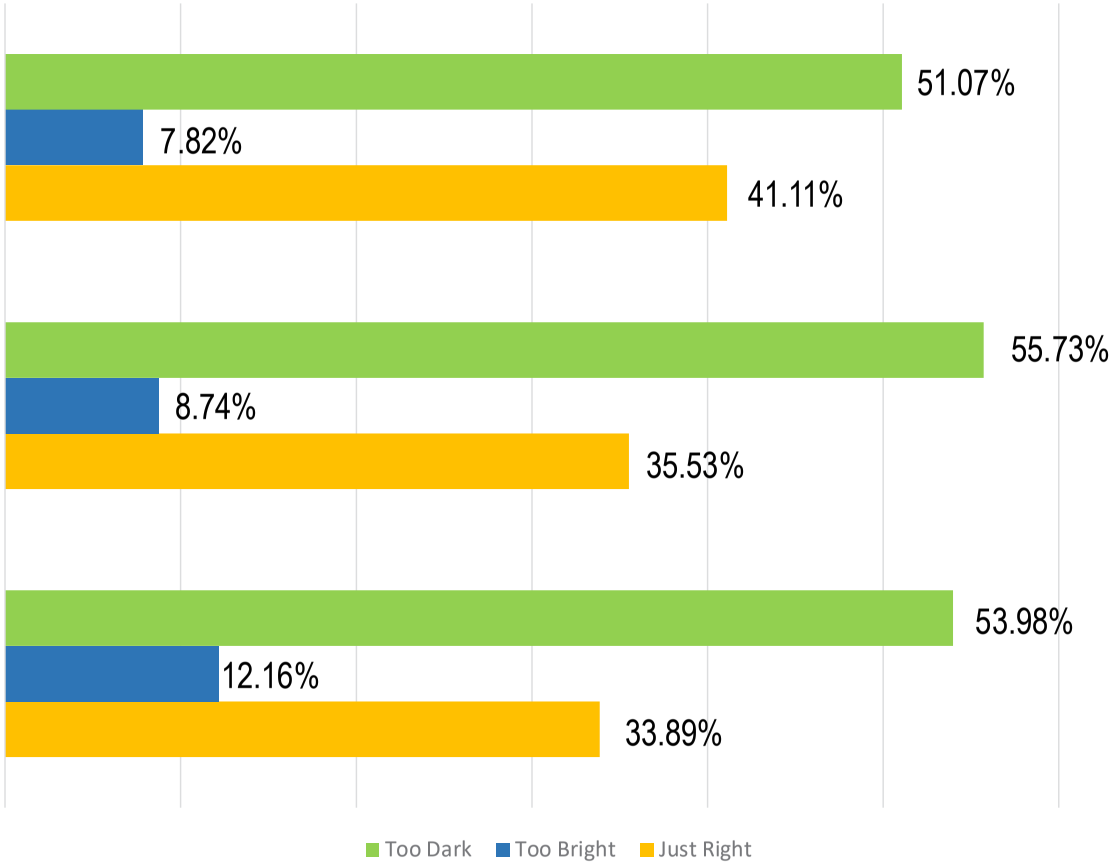
Too Dark – 51.07%
Too Bright – 7.82%
Just Right – 41.11%

COLLECTOR ROADS

Too Dark – 55.73%
Too Bright – 8.74%
Just Right – 35.53%

LOCAL ROADS

Too Dark – 53.98%
Too Bright – 12.16%
Just Right – 33.86%



REVIEW OF COMMUNITY SURVEY

LAKEFRONT PATH

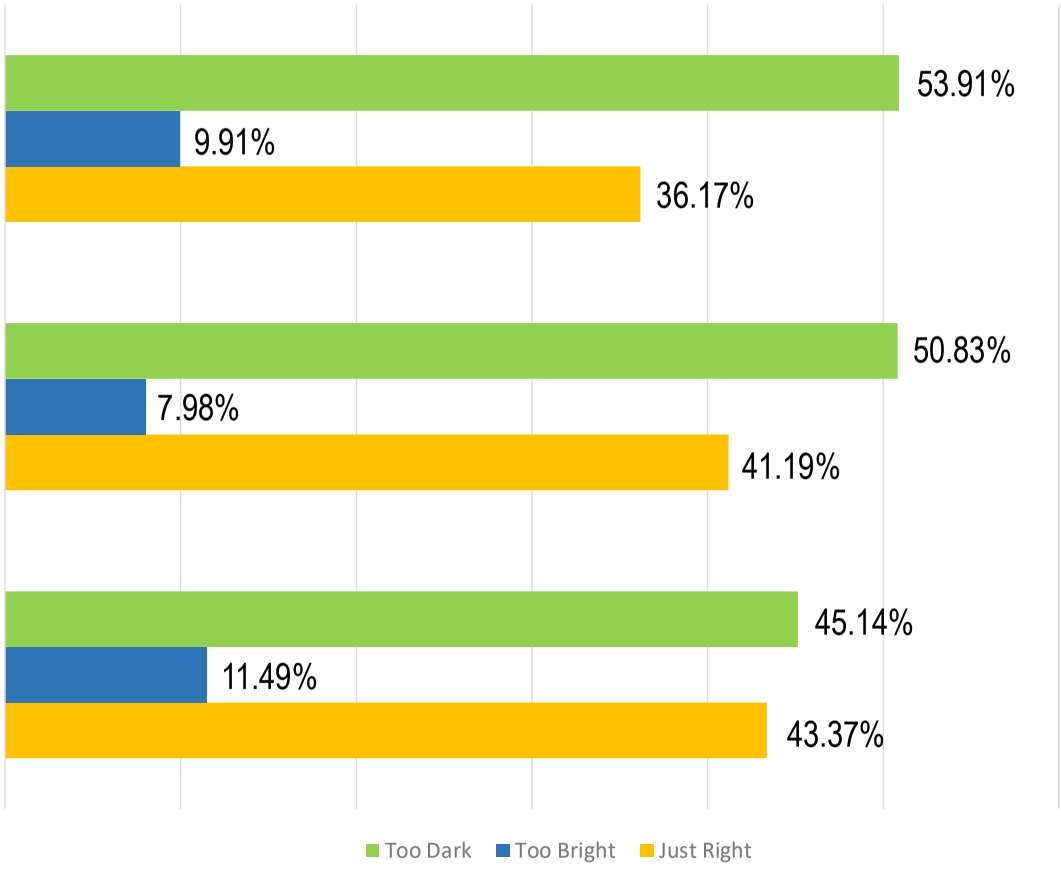
Too Dark – 53.91%
Too Bright – 9.91%
Just Right – 36.17%

INTERSECTIONS

Too Dark – 50.83%
Too Bright – 7.98%
Just Right – 41.19%

YOUR BLOCK

Too Dark – 45.14%
Too Bright – 11.49%
Just Right – 43.37%



EXISTING CONDITIONS CONCLUSIONS

- In comparison with IESNA lighting level recommendations, COE lighting level recommendations from the 1979 study are less stringent.
- Of the 31 locations studied throughout the City, lighting levels generally do not meet IESNA or COE recommended lighting levels.
- Tree canopies along local roadways are dense and impede lighting levels.
- Power centers are typically in good condition and the centrally located photoelectric cell at each power center is an adequate means for basic light controls.
- All power centers are unmetered and electrical usage bill is based on Com Ed's system to estimate energy consumption.
- A smart grid or smart lighting does not exist in COE.
- Existing lighting is a significant source of light pollution.

EXISTING CONDITIONS RECOMMENDATIONS

- The City of Evanston (COE) has too many types of poles and fixtures for davit arm roadway poles and should be standardized.
- LED luminaires should be the only lamp specified in future developments/construction.
- It is recommended for future construction and maintenance that a replica Tallmadge full cutoff LED luminaire that is dark sky compliant be installed on an existing Tallmadge pole.
- The City's alley light installation policies and procedures are well defined. A petition process is taken into consideration as well as the concerns of the adjacent residents. Therefore, there is no need for policy or procedure changes at this time.
- With the existing built environment the City has created, a recommended spacing between trees and poles should be 25'±.
- The 0.0 footcandle (fc) requirement at the lot line should not be changed and should remain per Ordinance.
- Smart metering should be explored by City of Evanston.

ALTERNATE TECHNOLOGY EXPLORATION

LUMINAIRES

- A variety of wattages were explored for both the Davit Arm Roadway Lighting Unit and Tallmadge Lighting Unit.
- Pilot projects included retrofits to the existing Tallmadge luminaire and an engineered LED luminaire manufactured by Sternberg or equal.
- Minimal glare and up light (Dark Sky Compliant)

COLOR TEMPERATURE

- 2,000K
- 3,000K
- 4,000K

OPTIC

- Type II
- Type III
- Type V

LENS TYPES

- Clear glass
- Frosted acrylic
- Prismatic acrylic

CITY OF EVANSTON LIGHTING LEVEL RECOMMENDATIONS

		FOR REFERENCE						
		IESNA STANDARDS		CURRENT CITY OF EVANSTON (COE) STANDARDS	PROPOSED CITY OF EVANSTON (COE) STANDARDS			
		AVERAGE ILLUMINANCE (FC)	UNIFORMITY RATIO	AVERAGE ILLUMINANCE (FC)	AVERAGE ILLUMINANCE (FC)	UNIFORMITY RATIO	PROPOSED POLE(S)	PROPOSED FIXTURE(S)
ROADWAYS	MAJOR	0.9-1.7	3.0	0.2-1.0	0.9-1.7	3.0	DAVIT	FULL CUTOFF COBRA HEAD LED
	COLLECTOR	0.6-1.2	4.0	0.2-1.0	0.6-0.9	4.0	DAVIT/TALLMADGE	FULL CUTOFF COBRA HEAD LED OR REPLICA TALLMADGE
	LOCAL	0.4-0.9	6.0	0.1-0.6	0.4-0.7	6.0	TALLMADGE	REPLICA TALLMADGE
	LOCAL - HIGH LEVEL	0.9	6.0	-	0.7-0.9	6.0	DAVIT/TALLMADGE	FULL CUTOFF COBRA HEAD LED OR REPLICA TALLMADGE
INTERSECTIONS	MAJOR/MAJOR	1.8-3.4	3.0	-	1.8-2.6	3.0	DAVIT	FULL CUTOFF COBRA HEAD LED
	MAJOR/COLLECTOR	1.5-2.9	3.0	-	1.5-2.2	3.0	DAVIT	FULL CUTOFF COBRA HEAD LED
	PEDESTRIAN DESIGNATED CROSSINGS	1.8-2.4	6.0	-	0.8-2.1	5.0	DAVIT/TALLMADGE	FULL CUTOFF COBRA HEAD LED OR REPLICA TALLMADGE
PARK	BIKE/PEDESTRIAN PATHWAY	0.5	-	-	0.3-0.5	-	ORNAMENTAL ALUMINUM POLE WITH MAST ARM	PHILIPS LUMEC DOMUS
OTHER	PARKING LOT	1.0	5.0	-	1.0	5.0	STRAIGHT ROUND ALUMINUM	SHOE BOX LED
	PARKING LOT - HIGH LEVEL	2.5	5.0	-	1.5-2.5	5.0	STRAIGHT ROUND ALUMINUM	SHOE BOX LED
	VIADUCTS	2.0	-	-	2.0	-	-	WALL PACK LED

Note: Existing Tallmadge light locations will be maintained unless otherwise approved by the City Council

CITY OF EVANSTON LIGHTING LEVEL RECOMMENDATIONS

		PROPOSED CITY OF EVANSTON (COE) STANDARDS	
		AVERAGE ILLUMINANCE (FC)	UNIFORMITY RATIO
ROADWAYS	MAJOR	0.9-1.7	3.0
	COLLECTOR	0.6-0.9	4.0
	LOCAL	0.4-0.7	6.0
	LOCAL - HIGH LEVEL	0.7-0.9	6.0
INTERSECTIONS	MAJOR/MAJOR	1.8-2.6	3.0
	MAJOR/COLLECTOR	1.5-2.2	3.0
	PEDESTRIAN DESIGNATED CROSSINGS	0.8-2.1	5.0
PARK	BIKE/PEDESTRIAN PATHWAY	0.3-0.5	-
OTHER	PARKING LOT	1.0	5.0
	PARKING LOT - HIGH LEVEL	1.5-2.5	5.0
	VIADUCTS	2.0	-

Note: Existing Tallmadge light locations will be maintained unless otherwise approved by the City Council

DAVIT ARM ROADWAY LIGHTING UNIT

POLE

- Tapered aluminum davit arm
- 25’ to 30’ mounting height
- 8’ arm
- Powder coated black
- In areas where the Tallmadge Lighting Units compliment the lighting levels, a decorative aluminum clamshell base cover may be installed to replicate the base of the Tallmadge Lighting Unit

LUMINAIRE

- Black color
- Type III optics
- ≤ 3,000K color temperature
- Full cutoff cobra head-type LED (140W-200W)

OPTIONS

- Banner arms
- GFCI festoon receptacle
- Black full cutoff cobra head-type pedestrian scale LED luminaire in high pedestrian traffic areas (20W-40W, type II optics, ≤ 3,000K color temperature)

LOCATION

- All major roadways, select collector roadways and critical intersections where pedestrian traffic and/or vehicle traffic is high

TALLMADGE LIGHTING UNIT

POLE

- Flute tapered steel, cast iron or aluminum
- 14’ mounting height
- Powder coated black
- Decorative luminaire fitter and base to best replicate existing Tallmadge Pole

LUMINAIRE

- Full cutoff LED (50W – 100W)
- Frosted acrylic lens
- Black color
- ≤ 3,000K color temperature
- Type III or type V optics
- Sternberg MS805 or Equal

OPTIONS

- GFCI festoon receptacle

LOCATION

- All local roadways, select collector roadways, intersections where a local and collector roadway meet or two local roadways meet
- At high pedestrian or traffic areas and intersections may be supplemented by Davit Arm Roadway Lighting Units

Note: Existing Tallmadge light locations will be maintained unless otherwise approved by the City Council

PARK PATHWAY LIGHTING UNIT

POLE

- Round aluminum
- Powder coated black
- Decorative base and arm

LUMINAIRE

- Black color
- ≤ 3,000K color temperature
- Type III or type V optics
- Full cutoff decorative LED (Philips Lumec Domus or equal)

OPTIONS

- GFCI festoon receptacle

LOCATION

- Bike/pedestrian pathways

SHOE BOX (PARKING LOT) LIGHTING UNIT

POLE

- Round aluminum
- Powder coated black
- 16’ to 30’ mounting height

LUMINAIRE

- Black color
- ≤ 3,000K color temperature
- Type II, type III or type V optics
- Full cutoff shoe box-type LED

OPTIONS

- GFCI festoon receptacle

LOCATION

- City-owned parking lots

WALL PACK LIGHTING UNIT

LUMINAIRE

- Wall pack LED (48W – 75W)
- ≤ 3,000K color temperature
- Type III optics
- Die cast aluminum powder coated black
- One-piece polycarbonate cover with optional vandal proof wire guard

LOCATION

- Viaducts

POWER CENTERS & LIGHTING CONTROL TECHNOLOGY

LIGHTING CONTROL TECHNOLOGY RECOMMENDATIONS

- Com Ed smart meter technology
  - Access to real time data on actual power being used for each lighting control system
  - Knowledge of power outages or reduce power usage
  - $550.00/power center
  - Facilitated by smart phone or devices without use of labor forces
- 7-pin photocell type receptacles or alternative technology

FUNDING EXAMPLES

- Single Tallmadge Lighting Unit LED Luminaire Replacement - $3,200.00

- Full System Replacement of Tallmadge Lighting Units
  (Seward Street, Dodge – Wesley, 18 Tallmadge Lighting Units) - $190,680.00
  - New foundations, new poles, new LED luminaires, cable, conduit, new controller and service

- Upgrade One Entire Lighting System (Power Center 26N-07W, 89 Tallmadge Lighting Units)-$272,000.00
  - Existing spacing, existing poles, new LED luminaires, 7-pin receptacles, smart meter on existing controller

- Upgrade One Entire Lighting System at Optimal Spacing (Power Center 26N-07W, 124 Tallmadge Lighting Units)-$1,046,250.00
  - New foundations, new poles, new LED luminaires, 7-pin receptacles, smart meter on new controller

- Complete City Wide Capital Improvement Plan
  - Existing Infrastructure Replacement Cost - $61,480,000.00
  - Proposed Infrastructure Cost to Meet Proposed Lighting Levels - $81,529,000.00

PRIORITIZATION

- Uncontrolled intersections near schools, where pedestrians cross major roadways should be considered first when implementing new stand alone pilot programs
- Consideration of schools, parks, public gathering areas, areas in and around transit hubs should be highly considered when implementing new stand alone pilot programs.
- Other areas of concern would follow by need and public input. These places would include high accident locations, houses of worship, libraries and senior centers.

LIVABILITY – "CREATE THE MOST LIVABLE CITY"

1. Develop a plan to measure ambient light levels throughout the City. This would allow Evanston to have baseline lighting data that could be used quantitatively measure the effect of the various changes implemented because of this Street Light Master Plan.

2. Work with an existing board, commission or neighborhood group to determine a detailed plan to become dark-sky compliant. The dark-sky criteria are a third-party measurement system that objectively evaluates Evanston's sustainability related to night-time light pollution.

3. Work with other agencies (such as schools and hospitals) and neighboring communities to investigate mitigating area light pollution.

4. Set up a 311 request to get lighting complaint data that can be reviewed annually by issue and location.

5. Institute city code or policy requirements that private developments must utilize exterior LED lighting that is no more than 3000K in color temperature and dark-sky compliant.

6. All capital improvement projects involving exterior lighting and signage will be implemented in a way that minimizes or eliminates light pollution.

FUTURE MEETING SCHEDULE

- PUBLIC MEETING
- PRESERVATION COMMISSION MEETING
- UTILITY COMMISSION MEETING
- TRANSPORTATION/PARKING COMMITTEE MEETING
- CITY COUNCIL MEETING

NOVEMBER 1, 2018

STREET LIGHT MASTER PLAN
PUBLIC MEETING NO. 2

STREET LIGHT MASTER PLAN TIMELINE

- Steering Committee Meetings (Five held between July 2017 and October 2018)
- Existing Conditions Light Level Readings – September 2017
- Existing Conditions Report – October 2017
- Public Meeting # 1 – November 2017
- Union Metal Goes Out of Business – December 2017
- Alternate Technology Exploration – January – March 2018
- Additional Existing Conditions Light Level Readings – January 2018
- Northwest Municipal Conference Survey – February 2018
- Community Lighting Level Survey – April 2018

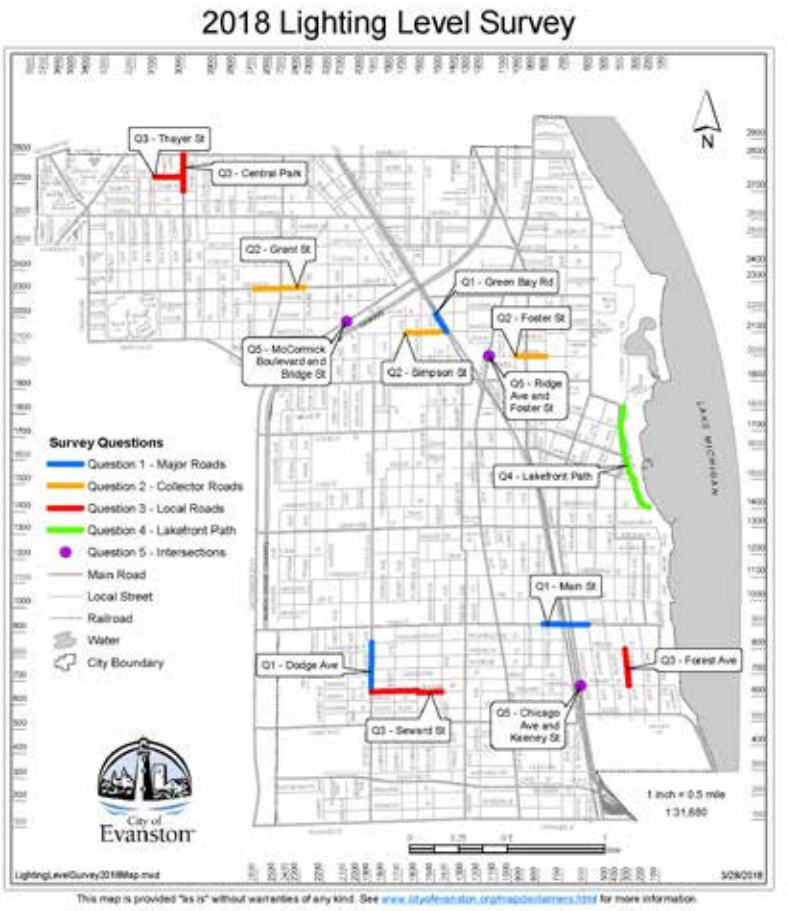
REVIEW OF COMMUNITY SURVEY

COMMUNITY STREET LIGHT SURVEY SENT OUT APRIL 2018

- Over **700** Responded to the Survey

SURVEY INCLUDED LIGHTING LEVELS FOR:

- Major Streets
- Collector Roads
- Local Roads
- Lakefront Path
- Intersections
- "Your Block"

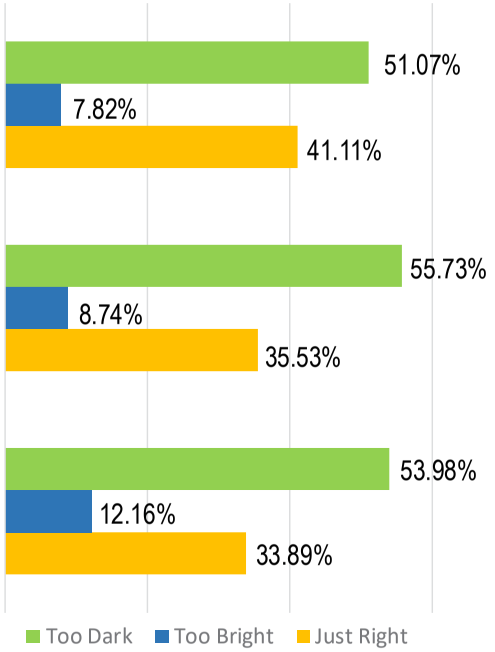


REVIEW OF COMMUNITY SURVEY

MAJOR STREETS
Too Dark – 51.07%
Too Bright – 7.82%
Just Right – 41.11%

COLLECTOR ROADS
Too Dark – 55.73%
Too Bright – 8.74%
Just Right – 35.53%

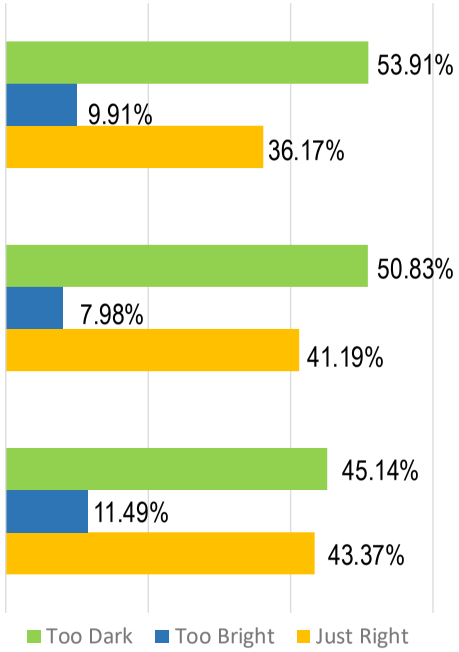
LOCAL ROADS
Too Dark – 53.98%
Too Bright – 12.16%
Just Right – 33.86%



LAKEFRONT PATH
Too Dark – 53.91%
Too Bright – 9.91%
Just Right – 36.17%

INTERSECTIONS
Too Dark – 50.83%
Too Bright – 7.98%
Just Right – 41.19%

YOUR BLOCK
Too Dark – 45.14%
Too Bright – 11.49%
Just Right – 43.37%



EXISTING CONDITIONS CONCLUSIONS

- COE lighting standards are less than IESNA lighting standards.
- Lighting levels generally do not meet IESNA or COE recommended lighting levels (18 of 31).
- Tree canopies impede lighting levels.
- Power centers are typically in good condition.
- Power centers are unmetered.
- Smart lighting does not exist in COE.
- Existing lighting is a significant source of light pollution.

EXISTING CONDITIONS RECOMMENDATIONS

- COE has too many types of lights and equipment should be standardized.
- LED luminaires should be used in future developments/construction.
- A replica Tallmadge full cutoff LED luminaire that is dark sky compliant should be used for future applications.
- The City's alley light installation policies and procedures are well defined and should remain.
- Recommended spacing between trees and poles should be 25'±.
- The 0.0 footcandle (fc) requirement at the lot line should remain.
- Smart metering should be explored by COE.

ALTERNATE TECHNOLOGY EXPLORATION

LUMINAIRES
- Wattages
- Retrofits to the existing Tallmadge luminaire and an engineered LED luminaire
- Dark Sky Compliance

COLOR TEMPERATURE
- 2,000K
- 3,000K
- 4,000K

OPTIC
- Type II
- Type III
- Type V

LENS TYPES
- Clear glass
- Frosted acrylic
- Prismatic acrylic

CITY OF EVANSTON LIGHTING LEVEL RECOMMENDATIONS

		FOR REFERENCE						
		IESNA STANDARDS		CURRENT CITY OF EVANSTON (COE) STANDARDS	PROPOSED CITY OF EVANSTON (COE) STANDARDS			
		AVERAGE ILLUMINANCE (FC)	UNIFORMITY RATIO	AVERAGE ILLUMINANCE (FC)	AVERAGE ILLUMINANCE (FC)	UNIFORMITY RATIO	PROPOSED POLE(S)	PROPOSED FIXTURE(S)
ROADWAYS	MAJOR	0.9-1.7	3.0	0.2-1.0	0.9-1.7	3.0	DAVIT	FULL CUTOFF COBRA HEAD LED
	COLLECTOR	0.6-1.2	4.0	0.2-1.0	0.6-0.9	4.0	DAVIT/TALLMADGE	FULL CUTOFF COBRA HEAD LED OR REPLICA TALLMADGE
	LOCAL	0.4-0.9	6.0	0.1-0.6	0.4-0.7	6.0	TALLMADGE	REPLICA TALLMADGE
	LOCAL - HIGH LEVEL	0.9	6.0	-	0.7-0.9	6.0	DAVIT/TALLMADGE	FULL CUTOFF COBRA HEAD LED OR REPLICA TALLMADGE
INTERSECTIONS	MAJOR/MAJOR	1.8-3.4	3.0	-	1.8-2.6	3.0	DAVIT	FULL CUTOFF COBRA HEAD LED
	MAJOR/COLLECTOR	1.5-2.9	3.0	-	1.5-2.2	3.0	DAVIT	FULL CUTOFF COBRA HEAD LED
	PEDESTRIAN DESIGNATED CROSSINGS	1.8-2.4	6.0	-	0.8-2.1	5.0	DAVIT/TALLMADGE	FULL CUTOFF COBRA HEAD LED OR REPLICA TALLMADGE
PARK	BIKE/PEDESTRIAN PATHWAY	0.5	-	-	0.3-0.5	-	ORNAMENTAL ALUMINUM POLE WITH MAST ARM	PHILIPS LUMEC DOMUS
OTHER	PARKING LOT	1.0	5.0	-	1.0	5.0	STRAIGHT ROUND ALUMINUM	SHOE BOX LED
	PARKING LOT - HIGH LEVEL	2.5	5.0	-	1.5-2.5	5.0	STRAIGHT ROUND ALUMINUM	SHOE BOX LED
	VIADUCTS	2.0	-	-	2.0	-	-	WALL PACK LED

Note: Existing Tallmadge light locations will be maintained unless otherwise approved by the City Council

CITY OF EVANSTON LIGHTING LEVEL RECOMMENDATIONS

		PROPOSED CITY OF EVANSTON (COE) STANDARDS	
		AVERAGE ILLUMINANCE (FC)	UNIFORMITY RATIO
ROADWAYS	MAJOR	0.9-1.7	3.0
	COLLECTOR	0.6-0.9	4.0
	LOCAL	0.4-0.7	6.0
	LOCAL - HIGH LEVEL	0.7-0.9	6.0
INTERSECTIONS	MAJOR/MAJOR	1.8-2.6	3.0
	MAJOR/COLLECTOR	1.5-2.2	3.0
	PEDESTRIAN DESIGNATED CROSSINGS	0.8-2.1	5.0
PARK	BIKE/PEDESTRIAN PATHWAY	0.3-0.5	-
OTHER	PARKING LOT	1.0	5.0
	PARKING LOT - HIGH LEVEL	1.5-2.5	5.0
	VIADUCTS	2.0	-

Note: Existing Tallmadge light locations will be maintained unless otherwise approved by the City Council

DAVIT ARM ROADWAY LIGHTING UNIT (1,600)

POLE

- Tapered aluminum davit arm
- 25’ to 30’ mounting height
- 8’ arm
- Powder coated black
- In areas where the Tallmadge Lighting Units compliment the lighting levels, a decorative aluminum clamshell base cover may be installed to replicate the base of the Tallmadge Lighting Unit

LUMINAIRE

- Black color
- Type III optics
- ≤ 3,000K color temperature
- Full cutoff cobra head-type LED (140W-200W)

OPTIONS

- Banner arms
- GFCI festoon receptacle
- Black full cutoff cobra head-type pedestrian scale LED luminaire in high pedestrian traffic areas (20W-40W, type II optics, ≤ 3,000K color temperature)

LOCATION

- All major roadways, select collector roadways and critical intersections where pedestrian traffic and/or vehicle traffic is high

TALLMADGE LIGHTING UNIT (4,200)

POLE

- Flute tapered steel, cast iron or aluminum
- 14' mounting height
- Powder coated black
- Decorative luminaire fitter and base to best replicate existing Tallmadge Pole

LUMINAIRE

- Full cutoff LED (50W – 100W)
- Frosted acrylic lens
- Black color
- ≤ 3,000K color temperature
- Type III or type V optics
- Sternberg MS805 or Equal

OPTIONS

- GFCI festoon receptacle

LOCATION

- All local roadways, select collector roadways, intersections where a local and collector roadway meet or two local roadways meet
- At high pedestrian or traffic areas and intersections may be supplemented by Davit Arm Roadway Lighting Units

Note: Existing Tallmadge light locations will be maintained unless otherwise approved by the City Council

PARK PATHWAY LIGHTING UNIT (200)

POLE
- Round aluminum
- Powder coated black
- Decorative base and arm

LUMINAIRE
- Black color
- ≤ 3,000K color temperature
- Type III or type V optics
- Full cutoff decorative LED (Philips Lumec Domus or equal)

OPTIONS
- GFCI festoon receptacle

LOCATION
- Bike/pedestrian pathways

SHOE BOX (PARKING LOT) LIGHTING UNIT

POLE

- Round aluminum
- Powder coated black
- 16’ to 30’ mounting height

LUMINAIRE

- Black color
- ≤ 3,000K color temperature
- Type II, type III or type V optics
- Full cutoff shoe box-type LED

OPTIONS

- GFCI festoon receptacle

LOCATION

- City-owned parking lots

WALL PACK LIGHTING UNIT

LUMINAIRE

- Wall pack LED (48W – 75W)
- ≤ 3,000K color temperature
- Type III optics
- Die cast aluminum powder coated black
- One-piece polycarbonate cover with optional vandal proof wire guard

LOCATION

- Viaducts

POWER CENTERS & LIGHTING CONTROL TECHNOLOGY

LIGHTING CONTROL TECHNOLOGY RECOMMENDATIONS

- Com Ed smart meter technology
  - Access to real time data on actual power being used for each lighting control system
  - Knowledge of power outages or reduce power usage
  - $550.00/power center
  - Facilitated by smart phone or devices without use of labor forces
- 7-pin photocell type receptacles or alternative technology

FUNDING EXAMPLES

- Single Tallmadge Lighting Unit LED Luminaire Replacement — $2,500 - $3,200
- Full Replacement of Power Center and Lighting System for Three Blocks (18 lights) — $200,000
- Upgrade One Entire Power Center and Lighting System (89 lights) — $300,000
- Full Replacement of Power Center and Lighting System (124 lights) — $1,000,000
- Upgrade Entire COE Power Centers and Lighting Systems — $60,000,000
- Full Replacement of COE Power Centers and Lighting Systems — $80,000,000

PRIORITIZATION

- High accident locations
- Uncontrolled crossings and sidewalks near schools
- Areas surrounding schools, parks, public gathering areas and transit hubs
- Areas identified by COE Police Department

LIVABILITY – "CREATE THE MOST LIVABLE CITY"

1. Develop a plan to measure ambient light levels.

2. Develop a plan to become dark sky compliant.

3. Work with other agencies and communities to reduce area light pollution.

4. Set up a 311 request to get lighting complaint data that can be reviewed annually by issue and location.

5. Institute city code or policy that requires 3000K, dark sky compliant luminaires.

FUTURE MEETING SCHEDULE

- PRESERVATION COMMISSION MEETING
- UTILITY COMMISSION MEETING
- TRANSPORTATION/PARKING COMMITTEE MEETING
- CITY COUNCIL MEETING

Livabilty Review (FOR INSERT INTO STREET LIGHT MASTER PLAN)

The City of Evanston's strategic vision is to "Create the Most Livable City". Evanston is using the STAR Community Rating System to define and measure community livability. Evanston was one of the first 20 communities to achieve STAR Certification, earning a 4-STAR rating. In 2018, Evanston became the first community to renew it's 4-STAR rating.

The City of Evanston is committed to promoting the highest quality of life for all residents by providing fiscally sound, responsive municipal services and delivering those services equitably, professionally, and with the highest degree of integrity. Since STAR Certification, the City is managing livability by aligning measurement systems and collaborating across departments and with community partners to achieve the livability vision.

In reviewing the Street Light Master Plan, the STAR criteria that is most applicable is classified under Built Environment: BE-1 Ambient Noise and Light. The STAR rating system evaluates municipalities on both "Outcomes" (objective measurements of success) and "Local Action" (plans for improvement). An analysis of the Street Light Master Plan in accordance with specific STAR criteria is shown below. For detailed information on the relevant STAR criteria, see Attachment 1.

Review of STAR Outcomes and Actions

Outcome 2: Light in the Community

> Show progress toward locally identified ambient light targets for light glare and/or light trespass [Partial credit available]

In order to achieve this goal, Evanston will need to set guidelines for light glare and/or light trespass. These target levels need to be specific to individual areas, such as setting different goals for commercial vs. residential areas. Target levels should be based on a justification, and should take into account locally-collected data, such as photometric studies. In order to achieve this outcome, Evanston will need to provide a description of local ambient light targets, light measurements, and a completed STAR-provided Excel spreadsheet demonstrating achievement.

Review of Outcome 2:

It is outside the scope of the Street Light Master Plan to directly achieve this outcome, as detailed photometric surveys for the purposes of measuring glare and light cutoffs were not included in the scope of work. In addition, it is also outside the scope of this study to replace existing light fixtures to meet the intended outcome.

However, criteria should be included in the plan to require future lighting installations to be compliant with the goal of eliminating night-time glare and light trespass by requiring shielded lights to be installed and to direct lighting to the appropriate areas. In addition, Evanston should consider conducting photometric studies to get additional baseline data for different areas of the city.

RECOMMENDATION: Develop a plan to measure ambient light levels.

Outcome 3: Light in the Night Sky

> Option A: Achieve a sky glow at or below 4 in the Bortle Dark-Sky Scale where the Milky Way is still visible in residential areas, or a Sky Quality Meter reading of 21.2 or greater [Partial credit available]
>
> --OR—
>
> Option B: Achieve certification as an International Dark Sky Community [Partial credit applies]

In order to achieve this outcome, Evanston would need to enact a substantial Dark Sky Implementation program. At a minimum, it would require:

a. Adoption of a comprehensive lighting code, including requirements that all lighting be fully shielded against contributing to light pollution and that all lighting have a maximum allowable color temperature of 3000 Kelvin.
b. A demonstrated community commitment to dark sky compliance by providing a fully-funded 5-year implementation plan to convert all municipally-owned lighting to conformance with the adopted lighting code describe above.
c. Demonstrated community-wide commitment to dark sky compliance, such as by holding at least two dark sky public events per year.
d. Measured success in light pollution control, such as through the completion of multiple capital projects to improve lighting compliance.
e. An ongoing annual sky brightness measurement program maintained by Evanston or a community organization.

Review of Outcome 3:

Parts of this can be accomplished as a direct outcome of the Street Light Master Plans, such as recommendations for the adoption of a comprehensive lighting code that is dark sky compliant. However, much of it is outside the scope of this study. Aside from developing and funding a capital improvement plan for lighting, it would be necessary for a community organization to partner with Evanston to champion many of the needed accomplishments listed above.

RECOMMENDATIONS: Work with existing board, commission or neighborhood group to determine a detailed plan to become dark-sky compliant.

Local Action 2: Policy and Code Adjustment

> Adopt a community light policy, ordinance, or regulations based upon a local assessment

Review of Local Action 2:

Recommendations for an Evanston light policy and/or ordinance will be developed as part of the Street Light Master Plan. Upon approval of these recommendations by the City Council, Evanston will be able to meet this goal.

RECOMMENDATION: Adopt code changes supporting master plan findings and dark sky compliance.

Local Action 3: Education and Outreach

> Educate the public about standards, effects of excessive exposure, and mitigation techniques for ambient noise or ambient light

In order to achieve this goal, Evanston will need to develop ongoing community involvement and educational events focused on reducing ambient noise and light pollution. Educational materials should encourage behavior change and explain the process for resolving noise and light complaints.

Review of Local Action 3:

This is outside the scope of the Street Light Master Plan. It may be necessary for a community partner or citizen task force to work with Evanston to develop educational material and host events.

RECOMMENDATION: Investigate partnering with outside group or working with an existing board or commission.

Local Action 4: Partnerships and Collaboration

> Create partnerships to address sources of noise and/or light pollution not subject to the local authority

Noise and light pollution may often be generated by industrial, commercial, or other sources (such as educational institutions) outside the direct control of the City of Evanston. Evanston should partner with these outside entities to mitigate pollution.

Review of Local Action 4:

This is outside the scope of the Street Light Master Plan. It may be necessary for a community partner or citizen task force to work with the outside entities to mitigate light pollution.

RECOMMENDATION: Work with other agencies (schools, hospitals) and neighboring communities to investigate mitigating area light pollution.

Local Action 6: Practice Improvements

> Develop a database of light issues and neighborhoods targeted for improvements

In order to achieve this goal, it is necessary to tracking complaints for the purpose of identifying and addressing target locations or neighborhoods with recurring light glare, trespass, or pollution issues. A 311 system or similar community hotline can receive credit as long as the information from these calls is being tracked in order to identify areas for improvement.

Review of Local Action 6:

Evanston should set up a specific category within the 311 system for tracking lighting complaints. This data should be then collected and analyzed for use in developing future policies and improvements.

RECOMMENDATION: Set up a 311 request to get data that can be reviewed annually by issue and location.

Local Action 9: Enforcement and Incentives

Enforce light standards during the permitting, design, and construction of new large-scale developments that can significantly increase ambient light levels.

In order to achieve, light standards should be enforced throughout the construction process, including permitting and post-construction. Permitting enforcement ensures light levels are designed to be within acceptable limits and post-construction enforcement verifies that the true level of lighting meets the standards.

Review of Local Action 9:

RECOMMENDATION: COE already has required lighting standards, and developers must document their intent to comply. However, private exterior lighting will be required to be 3000K and dark–sky compliant.

Local Action 10: Programs and Services

Establish programs that eliminate existing sources of light pollution coming from streetlights, parking facilities, and signage

For credit, Evanston must show how it is actively managing light pollution from publicly-owned facilities. Projects installed as demonstrations or more than 5 years ago without a broader, continuing effort will not qualify. Examples of programs that reduce this type of pollution include lighting systems that automatically dim after hours, the installation of light shielding to reduce light trespass, and the replacement of lights that poorly direct light with more directionally appropriate lighting systems.

Review of Local Action 10:

Evanston has been implementing lighting projects, and recent projects have generally complied with STAR goals. As lighting projects continue to be implemented, they will be evaluated for compliance. This compliance should be documented.

RECOMMENDATIONS: Ongoing CIP projects involving exterior lighting and signage will be implemented in compliance with these lighting standards to minimize or eliminate light pollution.

GOAL AREA: Built Environment

Achieve livability, choice, and access for all where people live, work, and play

Introduction

The 7 Objectives in the Built Environment Goal Area evaluate community development patterns, livability, and design characteristics, with emphasis on access and choice for all residents regardless of income. BE-3: Compact & Complete Communities promotes pedestrian-scaled, mixed-use development in high-density areas that support public transit. BE-4: Housing Affordability measures location efficiency through the combined costs of housing and transportation and encourages affordable housing in areas where transportation costs are already low due to public transit accessibility. BE-7: Transportation Choices provides the direct measure of transportation alternatives, affordability, safety, and Vehicle Miles Traveled.

The Built Environment Goal Area addresses other types of infrastructure, such as the provision of clean drinking water, wastewater, and stormwater in BE-2: Community Water Systems. BE-5: Infill & Redevelopment analyzes redevelopment and the condition of public infrastructure to encourage efficient use and reuse of land. BE-6: Public Parkland promotes accessibility to abundant, well-designed parks and greenways. Finally, BE-1: Ambient Noise & Light encourages reducing excessive noise and light trespass that adversely impact residents and local wildlife and protecting views of the night sky.

Objective Number	Objective Title and Purpose	Available Points
BE-1	**Ambient Noise & Light:** *Minimize and manage ambient noise and light levels to protect public health and the integrity of ecological systems*	**10**
BE-2	**Community Water Systems:** *Provide a clean and secure water supply for all local users through the management of potable water, wastewater, stormwater, and other piped infrastructure*	**15**
BE-3	**Compact & Complete Communities:** *Concentrate development in compact, human-scaled, walkable centers and neighborhoods that connect to public transit, offer diverse uses and services, and provide housing options for families of all income levels*	**20**
BE-4	**Housing Affordability:** *Construct, preserve, and maintain an adequate and diverse supply of location-efficient and affordable housing options for all residents*	**15**
BE-5	**Infill & Redevelopment:** *Focus growth and redevelopment in infill areas to reduce sprawl and ensure existing infrastructure that supports the community is in satisfactory working condition*	**10**
BE-6	**Public Parkland:** *Create a system of well-used and enjoyable public parkland that feature equitable, convenient access for residents throughout the community*	**15**
BE-7	**Transportation Choices:** *Promote diverse transportation modes, including walking, biking, and public transit, that are safe, low-cost, and reduce vehicle miles traveled*	**15**
	Total Points Available:	**100**

BE-1: Ambient Noise & Light

10 available points

PURPOSE

Minimize and manage ambient noise and light levels to protect public health and the integrity of ecological systems

EVALUATION MEASURES

Community Level Outcomes

100% of points available through Outcomes

Preliminary Step:

Part 1: Identify local ambient noise target areas based upon a local assessment
--AND--
Part 2: Identify local ambient light target areas based upon a local assessment

The Preliminary Step is required only if the community is applying for credit in the Community Level Outcomes. If the community is applying for credit through Local Actions only, the Preliminary Step need not be completed.

Outcome 1: Noise

3.4 Points

Part 1: Demonstrate that daytime ambient noise levels do not exceed 60 dBa in target residential areas
--AND--
Part 2: Show progress toward locally identified ambient noise targets in commercial and natural areas
[Partial credit available]

Outcome 2: Light in the Community

3.3 Points

Show progress toward locally identified ambient light targets for light glare and/or light trespass
[Partial credit available]

Outcome 3: Light in the Night Sky

3.3 Points

Option A: Achieve a sky glow at or below 4 in the Bortle Dark-Sky Scale where the Milky Way is still visible in residential areas, or a Sky Quality Meter reading of 21.2 or greater [Partial credit available]
--OR--
Option B: Achieve certification as an International Dark Sky Community [Partial credit applies]

Local Actions

70% of points available through Actions

Action 1:
Policy and Code Adjustment

Adopt a community noise policy, ordinance, or regulations based upon a local assessment

Action 2:
Policy and Code Adjustment

Adopt a community light policy, ordinance, or regulations based upon a local assessment

Action 3:
Education and Outreach

Educate the public about standards, effects of excessive exposure, and mitigation techniques for ambient noise or ambient light

Action 4:
Partnerships and Collaboration

Create partnerships to address sources of noise and/or light pollution not subject to the local authority

Action 5:
Practice Improvements

Develop a database of noise complaints and noise measurements (e.g. roads, industrial, outdoor music venues)

Action 6:
Practice Improvements

Develop a database of light issues and neighborhoods targeted for improvements

Action 7:
Enforcement and Incentives

Establish clear lines of authority for the enforcement of nuisance noise violations relative to different noise sources

Action 8:
Enforcement and Incentives

Enforce noise standards during the permitting, design, and construction of new large-scale developments that can significantly increase ambient noise levels

Action 9:
Enforcement and Incentives

Enforce light standards during the permitting, design, and construction of new large-scale developments that can significantly increase ambient light levels

Action 10:
Programs and Services

Establish programs that eliminate existing sources of light pollution coming from streetlights, parking facilities, and signage