



**Village of Mount Prospect  
Committee of the Whole  
"On the Road" Meeting Agenda  
Burning Bush Community Center**

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**June 9, 2026**

**1313 N. Burning Bush Lane**

**6:00 PM**

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**1. CALL TO ORDER**

**2. ROLL CALL**

**3. MAYOR'S REPORT**

3.1. Mayor's Comment

**4. CITIZENS TO BE HEARD**

4.1. Individuals wishing to address the Village Board in person regarding issues not on the agenda must register to participate in the Citizens to Be Heard process. You may sign in before the meeting in person or by emailing your intent to speak to [publiccomment@mountprospect.org](mailto:publiccomment@mountprospect.org) no later than 1:00 p.m. on the day of the meeting.

**5. DISCUSSION ITEMS**

5.1. Streetlight Program Update

5.2. Sidewalk Programs Update

5.3. Review and Discuss Next Steps for the MP2040 Comprehensive Plan.

**6. VILLAGE MANAGER'S REPORT**

6.1. As submitted

**7. ANY OTHER BUSINESS**

**8. ADJOURNMENT**



## Item Cover Page

<b>Subject</b>	<b>Streetlight Program Update</b>
Meeting	June 9, 2026 - "ON THE ROAD" MEETING OF THE MOUNT PROSPECT COMMITTEE OF THE WHOLE
Fiscal Impact	
Dollar Amount	
Budget Source	
Category	DISCUSSION ITEMS
Type	Presentation

### **Information**

This memorandum transmits a Streetlighting Program Update pursuant to the 2027-2031 Strategic Plan Policy Agenda.

There are 2,171 streetlights installed on public right-of-way in Mount Prospect. Of these, 1,228 are Village-owned streetlights and 943 are owned by Commonwealth Edison (ComEd). The Village-owned poles are generally spun aluminum or painted aluminum poles with light-emitting diode (LED) luminaires. ComEd lights are generally mounted on wood poles and also feature LED luminaires.

In addition, the Village owns 175 pedestrian lights. These lights provide pedestrian-level lighting for sidewalk spaces in the downtown business district. These poles are painted aluminum with a mixture of metal halide and LED luminaires. Staff is in the process of converting all the metal halide bulbs to LEDs.

The current streetlight replacement programs stem from the Corridor Lighting Program Evaluation report (2016) and the Residential Street Lighting Review report (2017). These documents, along with the overall street lighting capital improvements program, were discussed with the Village Board at a Committee of the Whole meeting on September 12, 2017. A written update was also provided to the Village Board in June 2023.

The Corridor Lighting Program Evaluation report describes the existing inventory of lights as well as proposed lighting improvements along major roads.

Generally, these corridors are multi-lane, high-volume roadways owned and maintained by other governmental bodies such as the Illinois Department of Transportation (Northwest Highway, Algonquin Road, Central Road, IL Route 83, etc.) and the Cook County Department of Transportation and Highways (Euclid Avenue, Camp McDonald Road, Busse Road, and Dempster Street).

Streetlight projects on corridor roadways are generally more expensive than on local roads

due to the engineering requirements of the owner agencies. For example, IDOT requires a photometric study which usually results in a lighting plan that requires more poles and higher output luminaires than would be acceptable on local roads.

Corridor streetlighting projects are prioritized based on a number of factors including traffic volume, sidewalk, and bike routes. Factors also include nearby destinations such as schools, parks, churches, shopping centers and restaurants. To view the priority matrix for corridor streetlight projects, please follow this link and select the corridor tab: [Corridor Streetlight Matrix](#).

You can also view the proposed corridor streetlighting projects on the attached Corridor Lighting Program Matrix maps.

Corridor lighting costs per mile vary greatly depending on corridor characteristics and how the project is set up (stand alone or incorporated in other projects, and who leads the project). Stand-alone lighting projects led by the Village are the most expensive. This makes estimates much more difficult. Here are currently estimated costs for in-design projects:

- Rand Road – Camp McDonald to Kensington – Village Led – lighting only— \$1,458,000 per mile
- Busse Road – Central to Golf – County Led – Part of major reconstruction — \$401,000 per mile
- Algonquin Road – Busse to IL 83 – Village Led – Part of pedestrian improvements — \$845,000 per mile.

When the Village completed major lighting projects in the early 2000s, the cost per mile was between \$500,000 and \$600,000. New IDOT requirements and the general cost of construction today have resulted in much higher prices.

The total cost to complete the remaining corridors identified in the Corridor Matrix is estimated at \$33,570,000 in 2026 dollars.

The Residential Street Lighting Review report presents a similar analysis of lighting needs on secondary arterials, collector streets, and local roads. It details existing streetlight inventories, examines applicable lighting standards, discusses design considerations, identifies costs, and explores various funding sources.

The Village Code stipulates that streetlights on Village-owned streets should be installed at intersections, curves, and at straight-away intervals not more than 300 feet.

In general, the Village's lighting plans feature 25' aluminum poles with LED luminaires. The LED luminaires are 2700 K color temperature and incorporate appropriate lumen (output), light distribution (mid-block or intersection), and shielding depending upon pole location. Attached is a specification sheet for the current luminaire.

The estimated construction cost for residential streetlights on local roads is \$550,000 per mile. The total cost to complete the remaining residential streets listed on the Residential Lighting Priority Matrix is estimated at \$10,566,000 in 2026 dollars.

The Residential Lighting Priority Matrix can be found at this link: [Residential Streetlighting Program Matrix](#) (select Residential tab) or by viewing the attached document. Please note

projects are prioritized using the same algorithm as corridor roadways (volume and the presence or absence of sidewalks, schools, multifamily housing, parks, churches, bike paths, and other pedestrian generators).

Also, please be aware that not all the residential streets are listed in the current Residential Lighting Priority Matrix. Rather, the streets currently listed in the matrix are limited to those designated as "collector" streets. Collector streets are local streets with moderate capacity designed to collect and convey traffic from lower volume local roads to arterial roadways.

## **Discussion**

## **Alternatives**

## **Staff Recommendation**

## **Attachments**

1. VOMP\_Residential\_Lighting\_Evaluation-2017-09-07
2. 06-20-2016 - VOMP Street Lighting Capital Program Corridor Lighting Evaluation
3. Corridor Lighting Program Matrix\_P1
4. Corridor Lighting Program Matrix\_P2
5. Corridor Lighting Program Matrix\_P3
6. Corridor Lighting Program Matrix\_P4
7. Residential Lighting Program Matrix\_P1
8. Residential Lighting Program Matrix\_P2
9. Residential Lighting Program Matrix\_P3
10. Residential Lighting Program Matrix\_P4
11. ComfortView-CV1-Specification-Sheet(e75a009b8a15aad6fb355cf2b5883272) (1)

# Village of Mount Prospect



## Residential Street Lighting Program Review

September 7, 2017

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## **Executive Summary**

### **Purpose**

In the summer and fall of 2016, the Village of Mount Prospect completed a Community Survey to gather feedback on Village programs and services. Most respondents indicated that an emphasis should be placed on residential street lighting. In fact, residential street lighting was deemed the highest priority for infrastructure upgrades requested. Ciorba Group has been retained to review the existing residential lighting system, identify potential improvements, provide cost estimates and comparisons, and outline a path to move forward with the enhancement of the Village's residential lighting system.

### **Methodology**

Existing Village GIS information was reviewed to evaluate the existing lighting equipment and determine the need for additional lighting. Other data was gathered through online sources such as Google Earth and the Illinois Department of Transportation (IDOT) website. Additional data was gathered from industry sources such as manufacturers and professional organizations.

### **Existing Resident Street Lighting**

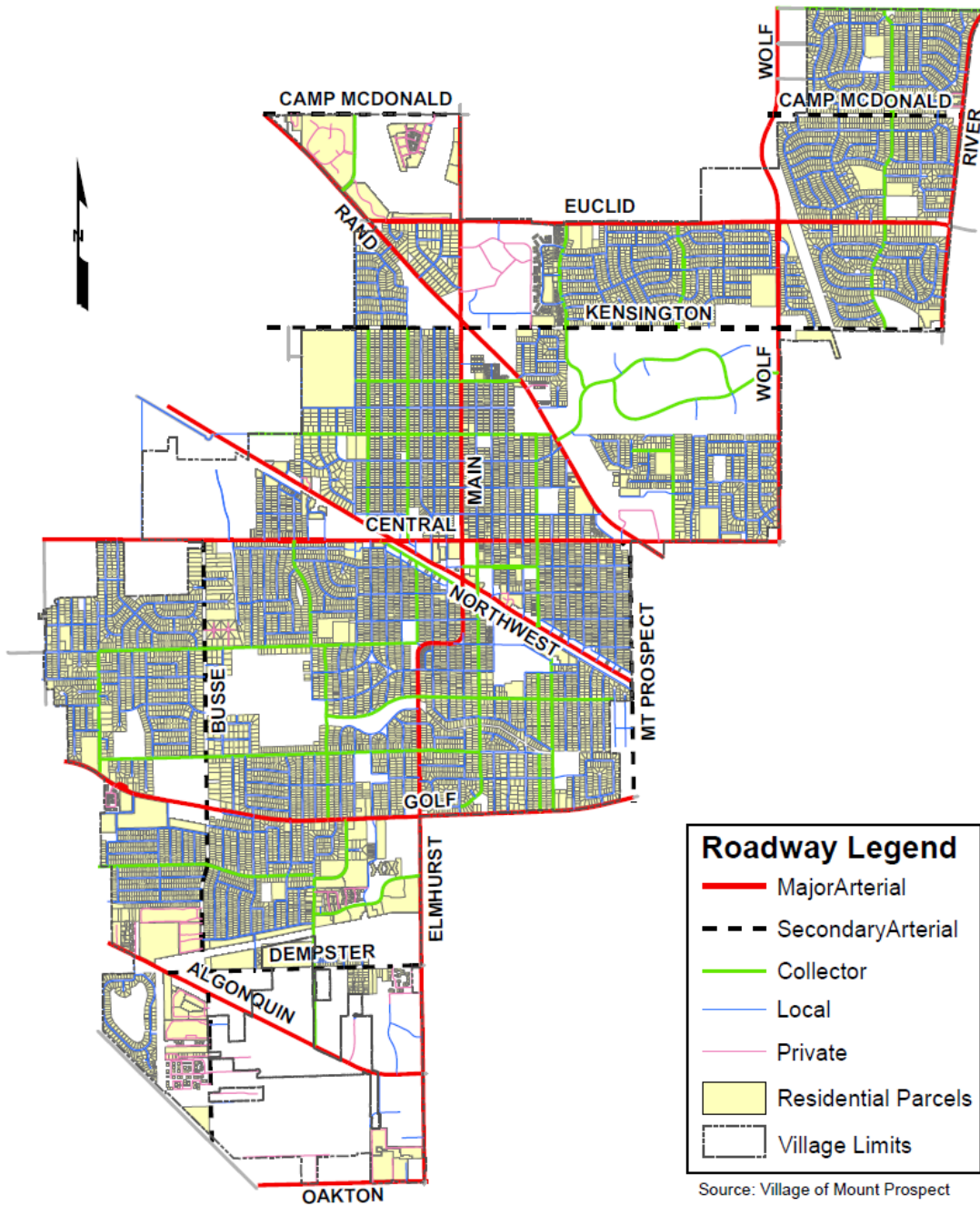
The Village's existing residential street lighting system is comprised of 388 Village-owned poles along with 719 ComEd-leased poles. Approximately 87% of the Village's 781 intersections within residential areas are illuminated. Approximately 16% of the Village's 1,144 residential blocks longer than 300' are illuminated. Both metrics should equal 100% to meet current code requirements.

### **Recommendations**

The following recommendations are offered for consideration:

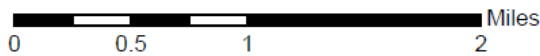
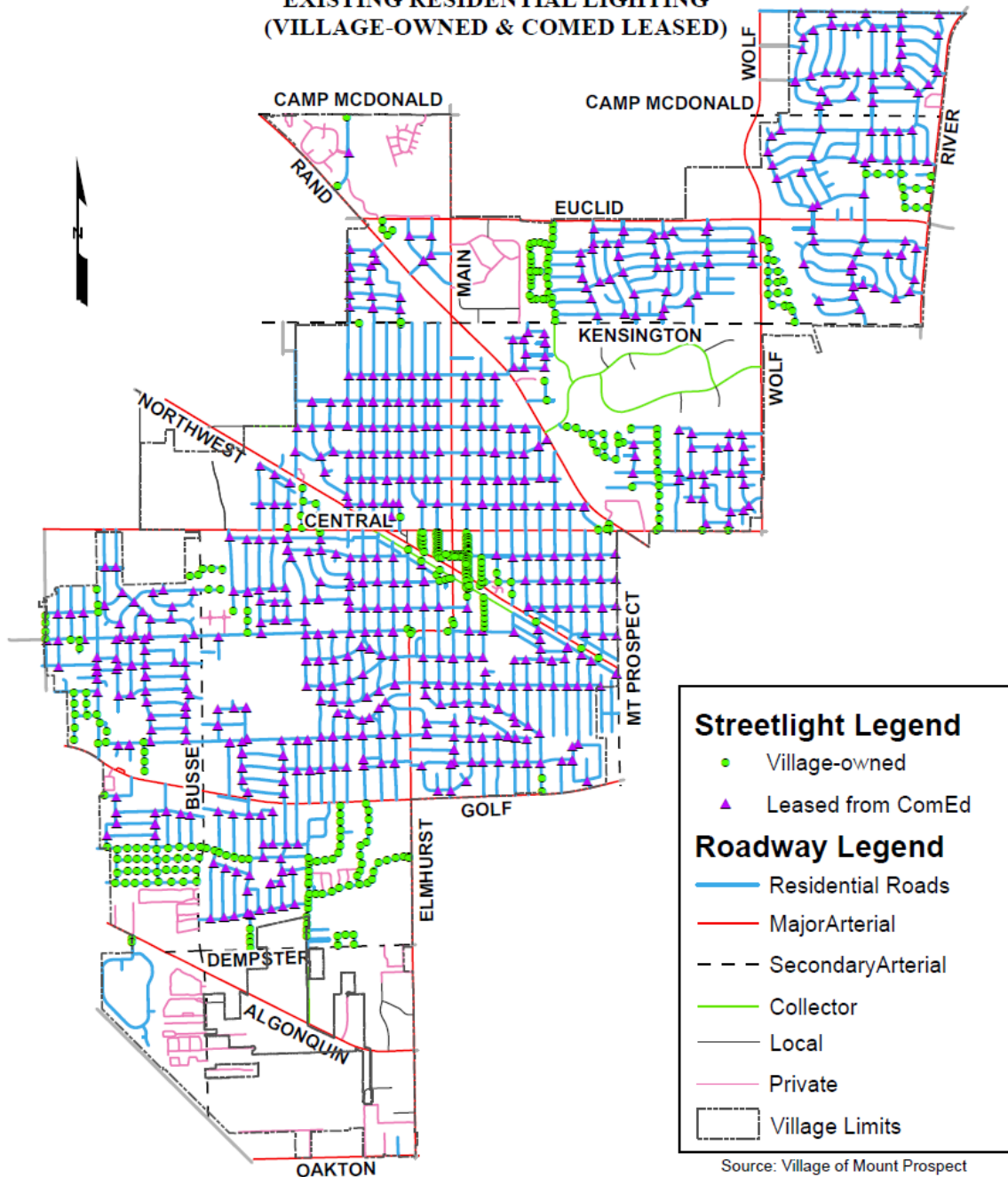
- Obtain public feedback
- Identify community goals
- Identify the extent of lighting desired
- Identify preferred equipment
- Develop a residential street lighting policy
- Amend Village lighting ordinance
- Implementation

VILLAGE OF MOUNT PROSPECT  
RESIDENTIAL STREET LIGHTING PROGRAM REVIEW



**VILLAGE OF MOUNT PROSPECT  
RESIDENTIAL STREET LIGHTING PROGRAM REVIEW**

**EXISTING RESIDENTIAL LIGHTING  
(VILLAGE-OWNED & COMED LEASED)**



## **Existing Residential Street Lighting Systems and Practice Summary**

The Village currently provides street lighting along 87% of intersections of local and collector roadways in residential areas. Mid-block lighting is provided for approximately 16% of blocks greater than 300', which is the recommended spacing for residential lighting required by the existing Village Code. The arterial corridors of Algonquin Road, Busse Road, Central Road, Dempster Street, Euclid Avenue, Golf Road, Elmhurst Road / Main Street, Northwest Highway and Rand Road were not included in this review as they were part of a previous study. Private roadways were not included because the street lighting systems along these roadways are not maintained by the Village.

### **GIS Data Review**

Review of the existing residential lighting within the Village consisted of evaluation of GIS data for the existing lighting equipment, inspection of aerial imagery from Google Earth, and conversations with Village staff. The Village provided GIS data in several files, including shapefiles containing roadways, centerlines, parcels, Village boundaries and streetlights. These files were analyzed to determine residential areas, local and collector roadways and the existing street lighting equipment in use in residential areas.

### **Current Residential Street Lighting Requirements**

Current street lighting installations are regulated by the Village of Mount Prospect Village Code, Chapter 16, Article VIII: *Street Lighting*. Street light installations shall meet these criteria:

- For Residential, Commercial and Industrial areas, street light poles are placed at intersections, the end of cul-de-sacs, on curves, and at spacings not to exceed 300 feet for midblock locations. The poles are generally centered two feet behind the back of curb, with mast arms perpendicular to the centerline, and at intersections, oriented at right angles to intersecting centerlines.
- For Arterials and Collector streets, street light poles are placed at intersections and midblock locations and must attain an average illuminance of 1.2 foot-candles, a max/min ratio of 6:1, and an average/minimum ratio of 3:1.
- Light poles must meet requirements including being able to withstand 80 mph winds and vibration and vibrations associated with that wind speed. For residential areas, the non-frangible based poles have a mounting height of 25 feet with 10-foot truss style mast arms. In commercial and business areas, the mounting height should be 30 feet
- All new luminaires should use a high-pressure sodium lamp, and should be either flat lens cobra head or decorative shoebox style luminaires with cutoff classifications.

### **Summary of Existing Installations**

Currently the Village has a mixture of Village-owned lighting equipment and equipment leased from ComEd. Overall, the Village owns and maintains 1,107 street lights in residential, arterial and other locations. 388 (35%) of these lights are located within residential areas that are not along arterial roadways. ComEd owns and maintains 800 street lights within the Village of Mount Prospect. 719 (90%) of these lights are located within residential areas not along arterial roadways. These locations are broken between intersection and mid-block lighting:

*Table 1: Village Owned Residential Street Lights*

Village Owned Residential Street Lights	388
Intersection Installations	88
Mid-Block Installations	300

*Table 2: ComEd Owned Residential Street Lights*

ComEd Owned Residential Street Lights	719
Intersection Installations	590
Mid-Block Installations	129

*Table 3: Residential Intersection Lighting*

Residential Intersections	781
Village Lighting	88
ComEd Lighting	590
Unlit	103

Table 4: Blocks > 300' in Length with Residential Intersection

Total Residential Blocks	1,144
Village Lighting	88
ComEd Lighting	94
Unlit	962

Table 5: Unlit Residential Locations

Unlit Residential Locations	787
Intersections	103
Mid-Block	684

**Current Residential Street Light Request Policy**

**Procedure**

If residents desire to have a street light installed, they must submit a request to the Village. The request is routed to the Public Works department. The requestor must obtain and provide approvals from the owners of each of the properties adjacent to the proposed pole location. Installation is then approved at the discretion of Public Works.

**Ranking**

There is currently no formal ranking procedure for residential street light requests.

**Budget**

Currently no capital funds are specifically dedicated for residential street light requests.

**Installation**

Once a residential street light request is approved, the installation is completed by Village staff, or by ComEd staff if the lighting equipment is to be leased from ComEd.

**Maintenance**

For street lighting equipment installed by the Village, installation, energy and maintenance costs are paid for by the Village. For equipment leased from ComEd, the Village pays ComEd to complete the initial installation. Energy costs and maintenance are included in monthly lease charges.

## **Existing Residential Lighting Equipment Summary**

### **Poles**

Roadway lighting within the Village is a mix of Village and ComEd owned equipment. Village equipment is typically aluminum mast arm style poles. ComEd equipment is typically mast arms mounted on wood poles. Some ComEd poles are aluminum mast arm style poles. Luminaire mounting height is generally either 20' or 25' above the pavement. Mast arms are typically 10' to 15' in length.



*ComEd owned street light located at the intersection of Elm Street with Isabella Street.*

*(25' mounting height with a 12' mast arm and cobra head luminaire))*



*ComEd owned street light at a mid-block location.*

*(25' mounting height with an 8' mast arm and cobra head luminaire)*



*Village owned street light at the intersection of Cardinal Lane and Eric Court.*

*(25' mounting height with a 10' mast arm and cobra head luminaire)*

## **Luminaire Properties**

### Style

Luminaires for Village and ComEd Equipment are generally cobra head style with either a flat or drop lens, as illustrated below.



*Drop Lens Luminaire*



*Flat Lens Luminaire*

## Technology

The Village has a variety of light sources (light color) and wattages (intensity) in use. LED is the latest technology. Other technologies are generally no longer used for new installations. Energy savings and reduced maintenance are the main driver towards LED technology.

Table 6: Village Owned Residential Luminaire Technology Summary

Luminaire Technology	Wattages Used	Quantity Installed
High Pressure Sodium (HPS)	50 to 400	229
Mercury Vapor (MV)	150 to 400	116
Light Emitting Diode (LED)	100 to 250 (equivalent)	18
Halogen (HAL)	50 & 250	13
Metal Halide (MH)	50& 250	17
Unknown	Unknown	4

## Distribution

Information received from the Village is insufficient to identify the photometric distribution of the installed luminaires. Luminaire used for continuous street lighting typically use Type II or Type III light distributions. These are industry standard light patterns that provide narrow to medium throw across the street and long throw up and down the street. For intersections, Type IV and Type V are used. These patterns, provide a square to circular area of light that better distribute light at wider locations such as intersections.

## **Typical Pole Layout and Locations**

For residential areas within the Village, a light pole is typically located at each intersection. Most of these poles have mast arms oriented 45 degrees from perpendicular to the roadway so that the luminaires are aimed toward the center of the intersection. Where they exist, mid-block poles are oriented perpendicular to the roadway.

Light poles may or may not be present along the blocks, but where they are, they are generally spaced in intervals of 300 feet or less. The poles are located approximately two feet behind the back of curb.

## **Billing Type**

The Village pays electrical charges to ComEd under two programs, Rate 23 and Rate 25.

### Rate 23

This rate is charged for equipment leased from ComEd. Charges include equipment rental, maintenance and electricity usage. Charges are based on the current rates in ComEd's Ratebook ([Link](#)). Charges are calculated by multiplying the number of units installed times the monthly rate. Typical charges for a roadway luminaire are \$13-17 per month per luminaire, inclusive of maintenance and energy charges.

### Rate 25

The Rate 25 program pertains to all lighting owned by a municipality. Electricity charges may be based on actual usage measured by a meter or flat rates established for various luminaires. Flat rates are based on the actual electricity usage of the luminaire multiplied by a theoretical number of hours in service per year, typically 12 hours per day. These charges apply regardless of lamp or system outages. ComEd has rates established for many common luminaires, however, it is possible to establish a Village-specific rate if required. A majority of the Village-owned residential street lighting luminaires are unmetered. With metered equipment, the Village only pays for the actual electricity used. Energy charges are assessed at the current rate filed with the Illinois Commerce Commission.

## **Control Type**

### Photocell

Luminaires that are directly connected to utility power and those using a simple disconnect switch/breaker are typically controlled by photocells. On most luminaires, the photocell is mounted on the top of each luminaire. At dusk, when a minimum ambient light level is reached, the photocell turns on the luminaire. In the morning, the luminaires turn off when light levels increase.

### Controller

Controller cabinets are generally used when multiple circuits will be controlled from a central point and are typically used on arterial streets. A connection to utility power is made to the controller, and the controller distributes it to the various circuits.

Controllers can be metered or unmetered, depending on the agreements with the power utility. Controllers offer the highest level of control over the power distributed to the lighting system.

## **Peer Practices Survey**

A survey containing questions about current residential street lighting policies, systems, and practices was developed and distributed municipalities with similar characteristics to

Mount Prospect within the greater Chicago region. The surveys were distributed to eight municipalities; Arlington Heights, Buffalo Grove, Des Plaines, Elk Grove Village, Morton Grove, Niles, Palatine, and Rolling Meadows.

### **Residential Lighting Survey Questions**

The residential street lighting survey focused on five main areas:

1. Current Residential Lighting Policy
2. Lighting Equipment
3. Equipment Operation
4. Electricity Charges
5. Maintenance

The full survey can be found in Appendix B.

### **Summary of Residential Lighting Survey Responses**

Survey responses can be found in Appendix C. Seven responses were received. The results are summarized below.

#### **Lighting Policies**

- Formal residential street lighting policy
  - No formal policy (3)
  - Incorporated in Municipal Code (2)
  - Formal policy (2)
- Included in budget
  - Maintenance only (4)
  - Expansion and maintenance (3)
- Lighting locations
  - Corners (6)
  - Cul-de-sacs (20)
  - Curves (3)
  - Fixed spacing (4)
  - Mid-block (3)
- Lighting required for new subdivisions
  - Yes (5)
  - No (1)
  - Not Sure (1)
- Equipment ownership
  - Combination of Municipal and ComEd owned (6)
  - ComEd owned (1)
- New residential street lighting approval process
  - Public Works/Engineering review (4)
  - Subdivision approval process (2)

- New installation performed by
  - Municipal staff (1)
  - Maintenance contractor (1)
  - ComEd (2)
  - Bid process (4)

### **Lighting Equipment**

- Style
  - Decorative and standard (4)
  - Standard only (3)
- Luminaire mounting height
  - Less than 20' (3)
  - 20' to 30' (7)
- Number of poles installed
  - Greater than 3000 (2)
  - 1000 to 3000 (1)
  - Less than 1000 (2)
  - No response (2)
- Percentage of residential areas covered
  - Greater than or equal to 90% (4)
  - 50 to 89% (1)
  - 11 to 49% (0)
  - Less than 10% (1)
  - No response (1)
- Light sources in use
  - High Pressure Sodium (7)
  - LED (6)
  - Metal Halide (3)
  - Mercury Vapor (3)
- Cabling
  - Underground for municipal-owned systems
  - Aerial for ComEd systems.
- Smart technology
  - In-Use (0)
  - Considering (3)

### **Operations**

- Control technology
  - Photocells (direct ComEd connection) (7)
  - Controller-mounted photocell (4)

## **Electricity Charges**

- Metered (6)
- Fixed rate (7)

## **Maintenance**

- Maintenance performed by
  - Village staff only (2)
  - Village Staff & Contractor (4)
  - Contractor (1)
- Preventative maintenance completed
  - Group relamping (3)
  - Photocell replacement (1)
  - Cleaning (3)
  - Inspections (3)
  - Painting (2)
  - Cable replacement (1)
- Outage identification
  - Police reporting (1)
  - Semi-annual inspection (1)
  - Resident notifications (4)
  - No official procedures (1)
- Defined response times
  - Yes (5)
  - No (2)

## **Industry Standards**

The Illuminating Engineering Society (IES) is the industry leader in developing recommended practices for lighting in the United States. The International Dark-Sky Association (IDA) is one of the more visible leaders in developing recommended lighting practices and education relating to reduction and elimination of light pollution. Each organization's recommendations for roadway lighting is detailed below.

### **IES Classification**

The IES has identified recommended lighting levels for various roadway types. The following classifications are defined in ANSI/IES RP-8-14, the current recommended practice for roadway lighting.

#### **Street Type**

##### **Major**

The part of the roadway system that serves as the principal network for through-traffic flow. The routes connect areas of principal traffic generation and important rural roadways entering and leaving the city. These routes are often known as "arterials,"

“thoroughfares,” or “preferentials.” They are sometimes subdivided into primary and secondary; however, such distinctions are not necessary in roadway lighting. These routes primarily serve through traffic and secondarily provide access to abutting property.

#### Collector

Roadways servicing traffic between major and local streets. These are streets used mainly for traffic movements within residential, commercial and industrial areas. They do not handle long, through trips. Collector streets may be used for truck or bus movements and give direct services to abutting properties.

#### Local

Local streets are used primarily for direct access to residential, commercial, industrial, or other abutting property. They make up a large percentage of the total street system, but carry a small proportion of vehicular traffic.

### **Pedestrian Conflict**

#### High

Areas with significant numbers of pedestrians expected to be on sidewalks or crossing the street during darkness. Examples are downtown retail areas, near theaters, concert halls, stadiums, and transit terminals.

#### Medium

Areas where lesser numbers of pedestrians utilize the streets at night. Typical are downtown office areas, blocks with libraries, apartments, neighborhood shopping, industrial, parks, and streets with transit lines.

#### Low

Areas with very low volumes of night pedestrian usage. They can occur in any of the cited roadway classifications but may be typified by suburban streets with single family dwellings, very low density residential developments, and rural or semi-rural areas.

### **Target Lighting Levels**

Target lighting levels are identified at 100 to 125% of the luminance values listed in Table 3 of the RP-8-14. Major Roadways have been removed from the table for clarity since the focus is on residential lighting.

Table 7: IES Target Lighting Levels

STREET CLASSIFICATION	PEDESTRIAN AREA CLASSIFICATION	AVG. LUMINANCE ( $L_{avg}$ (cd/m <sup>2</sup> ))	AVG. UNIFORMITY RATIO $L_{avg}/L_{min}$	MAX. UNIFORMITY RATIO $L_{max}/L_{min}$	MAX. VEILING LUMINANCE RATIO $L_{Vmax}/L_{avg}$
COLLECTOR	HIGH	0.8	3	5.0	0.4
	MEDIUM	0.6	3.5	6.0	0.4
	LOW	0.4	4.0	8.0	0.4
LOCAL	HIGH	0.6	6.0	10.0	0.4
	MEDIUM	0.5	6.0	10.0	0.4
	LOW	0.3	6.0	10.0	0.4

### **International Dark-Sky Association**

#### **Purpose**

The International Dark-Sky Association (IDA) is an organization that works to prevent and fight light pollution through education and advocacy.

#### **Website**

The IDA website ([www.darksky.org](http://www.darksky.org)) contains a lot of reference information regarding light pollution and how to reduce it. While much of the information is geared towards residential, architectural and commercial lighting, there is some information to be found regarding roadway lighting.

#### **Industry Acceptance**

While the cause is noble, support of the IDA among roadway lighting designers is lower than expected. Support is likely low because the many goals of the IDA are already incorporated into the requirements used to design roadway lighting systems, such as the IES RP-8. It is in the nature of an engineer to optimize their designs to provide the best quality design possible, including reducing light trespass, glare, excess illumination and excess energy usage. The tone of many articles posted on the IDA website also tend to support the organization's agenda, instead of an approach where the facts are laid out clearly and conclusions are built from these facts. To be clear, the information provided is not in error, it appears to be presented in a biased nature.

## **Model Lighting Ordinance**

In 2011, the IDA and IES published a joint Model Lighting Ordinance ([MLO](#)). This document presents a complete plan that can be adopted to govern the various types of outdoor lighting found throughout municipality, including residential and non-residential lighting. The MLO states that IES RP-8 shall generally be followed for roadway lighting. An Optional Streetlight Ordinance is included in the MLO to consider for adoption in the MLO. This optional ordinance builds upon RP-8 requirements to guide the designer towards limiting up-light, which is a major contributor to light pollution. This approach is similar to design requirements used for international street lighting. Further consideration of the MLO should be included in any revisions to Village code for street lighting.

### **Standard Practice**

While the IES provides recommended values for local streets, a majority of communities nationwide design to a lesser standard. While each community may have a unique reason for providing less than the IES recommended level of light, cost is the primary reason. Installation, maintenance and electricity charges add up quickly because local and collector routes are generally the predominant roadway type for municipalities in terms of mileage. To reduce costs, poles are typically located where there is a better return on investment in terms of safety, such as intersections, curves and other areas that experience higher than average accident rates.

## **Lighting System Design Considerations**

### **System Purpose**

#### **Improved Visibility and Illuminate Hazards**

The primary purpose of roadway lighting is to increase the visibility of the roadway so drivers can navigate safely along the road and identify potential conflicts and hazards in the vehicle's path with sufficient time to choose an appropriate action. Improved visibility can improve interactions between vehicles and bicycles and pedestrian.

#### **Increased Perceived Safety**

Roadway lighting can provide a sense of safety to drivers and pedestrians at night. Lighting allows the driver to detect potential conflicts sooner and make more confident driving decisions. Pedestrians benefit from increased visibility to drivers, especially at roadway crossings. Lighting also gives pedestrians the ability to detect faces and intent of other people in the vicinity, and reduces shadowing areas that can be perceived as dangerous.

#### **Provide Ambience**

The look and feel of a residential area can be impacted by the type and extent of lighting present. Areas with no lighting can appear uninviting, or even unsafe, whereas areas

with lighting can be inviting. Decorative light poles and luminaires can provide useful lighting as well as create a sense of place, an identity indicated by the type of lighting equipment used.

### **Pole Types**

There are many options available when selecting street lighting equipment. This section highlights some of the options available.

#### **Utility/Wood Pole Mounted**

This configuration utilizes utility pole or separate wood poles on which to mount the luminaire and mast arm. Power is generally provided by aerial cables, but can also be provide underground. This can be a low cost option to facilitate lighting systems, and is typical of systems provided by utility companies such as ComEd.



#### **Standard pole and Luminaire**

The term “standard pole and luminaire” refers generically to poles and luminaires that generally have simple designs. Straight or tapered poles without decoration or fluting, simple mast arm, such as davit or truss arms, and cobra head-style luminaires are typical of standard poles and luminaire assemblies. These are generally less expensive than more decorative pole assemblies.



### **Decorative Pole and Luminaire**

Decorative poles can help give a distinct look to an area, providing continuity and an identity to the streets or area. Many options are available. Some decorative poles evoke a certain time period, or a style associated with a particular place. These poles are often shorter pedestrian-scale poles, with mounting heights in the 14 to 20-foot range. Decorative bases, unique pole shapes, and more elaborate mast arms and configurations typify decorative poles.



### **ComEd Leased Equipment**

ComEd offers a program called the Fixture-included Delivery Class. In this program, a municipality can lease equipment from ComEd who furnishes, installs, owns, operates, and maintains the lighting facilities for a dusk to dawn lighting system. They have a line of standard cobra head style luminaires with brackets as well as a few decorative post top luminaires. Photocell control is provided with all leased ComEd equipment. Leased equipment is generally paid for by a fixed rate determined by the luminaire type and wattage.

### **Tree Conflicts**

The Village Forestry Department does not have any documented requirements for street lighting however, the following recommendations were provided.

- Directional boring is preferred to open trenching as it minimizes damage to tree roots.
- For new tree plantings, a minimum clearance of 10' is required, but more is preferred. Ideally, poles should not be located within the dripline of the tree at maturity.
- For new installation, underground conduit is preferred. Forestry typical plants large trees that will grow up into aerial cables. The Village does not current plant or trim to account for aerial cables.

Other notable items:

- Pruning will be performed during the normal tree maintenance cycle if the trees can handle it.
- As the trees age over the decades, they tend to get above the light poles, but obviously there is a lot of time there can be conflict.

- If trees are planted after the poles are in place, sometimes a tree species with smaller canopy will be selected if a future conflict is anticipated.

## **Luminaire Properties**

### **Mounting Height**

The height at which luminaires are mounted tends to vary by the roadway classification the size of the roadway, and the type of luminaire being used. With standard luminaires, Arterials may have mounting heights such as those, but generally have 30-40-foot mounting heights. Local and collector roads in residential areas will generally have shorter mounting heights in the 18 to 30-foot range, with residential tending toward the shorter end of the range.

The mounting height can have a significant impact on the photometric distribution of the luminaire. Lower mounting heights tend to produce a distribution close to the pole. As the height increases, the ability of the luminaire to project further down the road is increased. Shorter mounting heights also can produce areas of more intense light directly under the luminaire and light levels dropping off quickly further from the luminaire. This creates low uniformity levels, and is common with high intensity discharge lamps such as high-pressure sodium or metal halide lamps. LED luminaires are less prone to this since each luminaire in the LED packet can be aimed to create the distribution pattern desired. As the mounting height increases, the high intensity areas level out and the light levels become more uniform.

### **Light Source**

The choice of light source can impact the “look” of the lighting, but also the energy used in normal operations. Several characteristics help explain the operation of streetlighting light sources.

Color Rendering index (CRI) The CRI is a way to measure how well a light source reproduces colors of object as compared to a natural light source. The index ranges from 1 to 100, with 100 being closest to the ideal natural light source. As a rule of thumb, a CRI measured above 80 is considered good for most application, and greater than 90 is considered a high CRI light source.

Efficacy This is a measure of how much light (lumens) are produced related to the amount of electric power (watts) consumes to produce that light. This is measured in lumens per watt.

Restrike Time When power is interrupted to a high intensity discharge (HID) light source there is a delay during which the lamp must cool down before it will relight, or restrike. Restrike time can range from one to 15 minutes or more, depending on the HID light source.

Here is a description of typical light sources and the associated pros and cons:

### High Intensity Discharge Sources

This group of lamps produce light by use of an arc tub containing a variety of elements or mixtures of elements, which gasify and produce visible light when an electrical arc is created between the electrodes on either end of the tube. These lamps have a very high efficacy in lumens output per watt input. HID lights are susceptible to power interruptions, after which they have a restriking delay during which the lamp must cool sufficiently before the lamp will restart.

#### *Mercury Vapor (MV)*

One of the first HID lamp types produced, these lamps have a quartz arc tube and use argon gas as a starting gas, and use mercury vapor. They have an average life of 24,000 hours, and produce about 30 to 60 lumens per watt, depending on the lamp wattage. Restriking time times are about 5-6 minutes after power interruption.

#### *High Pressure Sodium (HPS).*

These lamps also have a long average life of more than 24,000 hours and an efficacy of between 80 and 140 lumens per watt. They utilize a ceramic arc tube and use xenon as the starting gas. HPS lamps are known for poor CRI and a unique yellowish color.

#### *Metal Halide (MH)*

Metal Halide lamps are similar to mercury vapor in that they use similar arc tubes and, mercury vapor, and argon gases, but MH lamps also have metallic salts that can cause the lamp to emit light at discrete wavelengths. This can result in lamps producing a much “whiter” light. Standard probe-start MH lamps have efficacies of 60 to 100 lumens per watt, and pulse-start MH lamps can reach 100 or more lumens per watt. A downside to MH lamps is their shorter average lifespan, which is generally 7,500 to 20,000 hours.

### Induction Light Source:

Induction light sources are fluorescent lamps except they do not have electrodes. Instead, they are driven by a high frequency current that induces the lamp to emit light. Since they don't have the physical electrodes that are often the failure point of standard fluorescent lamps, they have extremely long lives, lasting upwards of 100,000 hours. The CRI is usually very good, and efficacies are usually between 60 and 90 lumens per watt. Unfortunately, induction lamps are generally very large, and omnidirectional in light output, thus it can be difficult to control the light distribution.

### Light Emitting Diodes (LED):

LED light sources are a highly efficient light source with extremely long lives with manufacture claims of lifespans between 50,000 to 100,000 hours (about 22 years). The efficacy of LED ranges up to about 120 lumens per watt for streetlights, and the U.S Department of Energy projects LED efficacies to increase in the coming years. LED light sources tend to have good CRI. LED light sources for roadways generally contain a LED package of multiple LEDs with each specifically aimed to produce the desired light distribution. Unlike HID lamps, LEDs have an instantaneous restrike after a power interruption.

### **Light Distribution**

Light distribution is the illumination pattern on the roadway resulting from the light emitted by the luminaire. The pattern is created using lamp location and orientation, internal reflectors, external refracting lenses, or a combination of these. Luminaires with LED light sources often have lenses attached directly to the LED cell to direct the light. Different distribution patterns are used to efficiently illuminate the roadway. IES documentation in the RP-8-14 goes into more detail about these distribution classifications in Annex E – Classification of Luminaire Light Distribution, but a summary of the light distribution classifications is included here.

#### Type I:

These distributions have a short forward throw across the path or driveway, with a fairly wide distribution laterally. These work well for narrow paths and narrow single lane roads but the pole is generally located in the middle of the path.

#### Type II:

Type II distributions work well for wider paths and single lane or residential roads when located near the side of the road. The forward throw is larger than Type I distribution, and has similar lateral distribution.

#### Type III:

Type III distributions generally have more forward throw and wider lateral distribution than Type II distributions, and work well for most roadway uses.

#### Type IV:

Type IV distributions are useful lighting large areas, so are often used in parking lots and garages when lighting from the edge of the area. In some instances, they may be used for roadway intersections. The distribution is tending toward rectangular or shield shape, mostly forward from the light.

### Type V:

Type V distributions are generally symmetric, forming an either almost round or square coverage shape. These work well for illuminating parking lots and open areas

### **Color Temperature**

Color temperature describes the apparent warmth or coolness of a light source. It is based on the range of colors of a metal body (which for the tests a black body radiator is used) as it is heated and brought to higher temperatures, measured on the Kelvin scale. For reference, 0° Celsius equals 273° Kelvin. As the black body radiator is heated, it changes color from black, to reds, continuing through oranges and yellows, into whites, and then reaches blue colors. The color of a light source is described by its temperature in Kelvins (K). A typical incandescent light is in the 2300 to 2600 K range, which is a reddish yellow color, and a metal halide light source is about 5000 K, which is a white-blue color.

The choice of color temperature is important. With LED light sources, the color temperature can be selected generally from 2500 to 5500 K. The whiter light generally provides good color rendering, facial recognition, and a makes the driving task easier.

### **Power Sources**

#### **Direct Utility Connection**

Power can be connected directly to the utility power. There is no metering, fusing of the service, or disconnects associated with this connection. In these instances, the luminaire is usually controlled by a photocell, turning on the luminaire once a certain light level has been reached. This setup is usually seen when a municipality either provides its own power, or when it has entered into an agreement with the power utility company and a flat rate is applied to each type of luminaire attached to the utility company's power.

#### **Disconnect Box**

Disconnect boxes are used in scenarios similar to the Direct Utility Connection, only this installation has a disconnect box between the utility power and the luminaire. The disconnect may control a single luminaire or circuit with multiple street lights. Individual photocells are provided at each luminaire. This configuration allows maintenance staff the ability to easily de-energize the circuit for repairs or other maintenance activities.

#### **Controller**

Controller and the associated cabinets are generally used when multiple circuits will be controlled from a central point. A connection to utility power is made to the controller, and the controller distributes it to the various circuits. Controllers can be metered or unmetered, depending on the agreements with the power utility. Controllers offer the

highest level of control over the power distributed to the lighting system and are generally used on arterial roadways.

### **Smart Technology**

Advanced lighting system technologies are available that can increase an agency's ability to monitor the operations of the lighting systems and adjust or respond to system needs as they arise. The technology available permits detection of the status of streets lights individually and collectively, such as if a lamp is burned out and needs replacing, energy usage, and current power levels. Additionally, the systems can be used to develop different lighting levels to match the roadway use. For example, lights can be at full power from dusk to a defined time when road usage is low, such as 1 am, after which time, lighting levels can be reduced. Some systems also provide sensors to detect when users are on the roadway system and dynamically adjust light levels up ahead of the user and then return them to lowered levels after the vehicles pass.

### **Potential Benefits**

There many potential benefits derived from these systems.

- Potential for reduced annual energy costs for lighting.
- Reduced lighting levels and times of use may increase the life of the equipment
- Village staff time dedicated to outage reviews can be allocated to other tasks.
- Track equipment life and report upcoming replacements. This is especially useful with LED equipment as they continue to dim overtime and do not fail catastrophically.
- Automatic reporting of day-burning luminaires.

### **Comparison with Current Procedures**

The Village currently does not utilize smart technology for the residential street lighting system. Luminaires are generally controlled via photocells; therefore, each luminaire turns on and off individually. Dimming technology is currently not used within the Village. Day burning luminaires are reported as they are noticed.

Village staff currently must drive throughout the lighting system to locate lamp outages, or tripped lighting circuits, or they must rely on calls from residents to inform them of the outage. If the smart lighting systems are utilized, the outage would be evident at a central control area, and staff dispatched accordingly.

### **Potential Residential Lighting Installation Schemes**

Several potential residential lighting installation schemes were considered for the Village Residential Lighting program. The discussion, logic, and analysis is described for each installation scheme.

## Data Source

Each scheme was evaluated using GIS data provided the Village. While the provided data appears to be fairly accurate, incorrect coding of roadways or parcels with the GIS data may result in small changes to the quantities and estimates contained within this report.

## Assumptions

Several assumptions were made in order to provide the installation schemes.

### Roadway Geometric Design Information

Average roadway widths in residential areas were obtained by measuring aerial images within Google Earth's PC application. It was estimated that the average residential roadway width is 28 feet wide. It is understood that some roadways may differ in width from this average, but this value appears representative of most residential roadways in the Village. For intersection photometric calculations, each approaching roadway is assumed to have a 28-foot width, and the curve radius between approaches was assumed to be 15 feet.

### Luminaires Used in Analysis

Four mast arm style LED luminaires manufactured by Leotek, were used in the analysis:

- GCM2, 30H, 3000K, Type 3 Medium distribution, 700 mA drive current (for mid-block locations)
- GCM2, 40H, 3000K, Type 3 Medium distribution, 950 mA drive current (for mid-block locations)
- GCM2, 30H, 3000K, Type 4 distribution, 700 mA drive current (for intersections)
- GCM2, 40H, 3000K, Type 4 distribution, 950 mA drive current (for intersections)

Decorative style luminaires manufactured by Sternberg were used in the analysis:

- "Oldtown" A850SRLED-3ARC45T3-MDL03, 3500K, Type 3 Medium distribution
- "Oldtown" A850SRLED-4ARC45T3-MDL03, 3500K, Type 3 Medium distribution
- "Euro" E450LED/FL/X/16L/45/T3/MDL(10 and 14)
- "Euro" E450LED/FL/X/21L/45/T3/MDL(10 and 14)

## Intersections Only

This scheme would place a street light only at intersections of residential roadways. Mid-block lighting would not be considered. Analysis was performed on the GIS data

provided by the Village and there are approximately 781 intersections within residential areas of the Village of Mount Prospect. The IES Recommended Practice RP-8-14 for Roadway Lighting details recommended lighting design criteria for intersections based on functional roadway classifications. Collector and Local roadway classifications are the two likely types to be located in residential areas. For this analysis, low pedestrian conflict classifications were selected. This classification has low pedestrian volumes at night, and typically has low density residential housing development and single-family dwellings. The recommended design criteria are shown in the Table 8 below.

Table 8: IES Recommended Intersection Illumination

Functional Classification	Pedestrian Area Classification	Average Maintained Illumination at Pavement in foot-candles (fc)	Average Uniformity Ratio $E_{avg}/E_{min}$
Collector/Collector	Low	1.2	4.0
Collector/Local	Low	1.0	4.0
Local/Local	Low	0.8	6.0

Adapted from IES RP-8-14, Table 8: Illumination for Intersections

The current practice for intersection lighting in the Village for a four-way intersection, as observed in Google Earth photography, is a single light pole, either stand-alone or on a utility pole, angled toward the center of the intersection. For analysis of four-legged intersections, the light pole layout consists of one pole with the mast arm oriented toward the center of the two streets. At “T” intersections, one pole will be placed in one of the quadrants adjacent to the terminating roadway, with mast arm oriented to the center of the intersection. Photometric analysis of this typical intersection using the Type IV light distribution luminaire on a 10’ mast arm confirms that the IES recommended illuminance levels can be obtained with one luminaire at the intersection. Photometric analysis also confirms that illuminance levels can also be attained with one decorative light pole and luminaire. Table 9 summarizes the estimated number of intersections with and without lighting.

Table 9: Summary of Residential Intersections

Residential Intersections	781
Intersections with Village Owned Lights	88
Intersections with ComEd Owned Lights	590
Unlit Intersections	103

**Intersections Plus Midblock where Block Length Greater than 300 Feet**

This scheme includes installation of lights at intersections plus one additional mid-block pole location for roadway segments greater than 300'. The total residential roadway sections were determined from the GIS roadway centerline data supplied by the Village. Based on the analysis, there are approximately 1,422 residential road segments, with 1,161 classified as local roadways and 261 classified as collector roadways. Of those, 1,144 are greater than 300' long. Table 10 illustrates the estimated number of poles.

Table 10: Estimated Number of Mid-Block Poles

Residential Blocks	1,422
Blocks < 300'	278
Blocks < 300' with Village owned lighting	15
Blocks < 300' with ComEd owned lighting	19
Blocks < 300' with no mid-block lighting	244
Blocks ≥ 300'	1,144
Blocks ≥ 300' with Village owned lighting	88
Blocks ≥ 300' with ComEd owned lighting	94
Blocks ≥ 300' with no mid-block lighting	962

**Pole Spacing to Meet IES Recommendations**

The IES Recommended Practice RP-8-14 for Roadway Lighting details recommended lighting design criteria for streets. For this analysis, low pedestrian conflict classifications were selected. This classification has low pedestrian volumes at night, and typically has low density residential housing developments and single-family dwellings. The recommended design criteria are shown in Table 11 below.

Table 11: IES Recommended Street Lighting Design Criteria

Street Classification	Pedestrian Area Classification	Average Luminance $L_{avg}$ (cd/m <sup>2</sup> )	Average Uniformity Ratio $L_{avg}/L_{min}$	Max Uniformity Ratio $L_{max}/L_{min}$	Max Veiling Luminance Ratio $LV_{max}/L_{avg}$
Collector	Low	0.4	4.0	8.0	0.4
Local	Low	0.3	6.0	10.0	0.4

Adapted from IES RP-8-14, Table 3: Lighting Design Criteria for Streets

Based on the recommended design criteria and the stated assumptions, a pole spacing analysis was performed. In Table 12, the approximate pole spacing and number of poles required to fill in between existing or proposed intersection lighting, roadway type and mounting height.

Table 12: Number of Poles Required to meet IES Design Recommendations – Standard Equipment

Roadway Classification	Mounting Height	Pole Spacing	Number of Poles Required
Collector	25'	185'	506
	30'	225'	373
Local	20'	160'	3,104
	25'	205'	2,221

Table 13: Number of Poles Required to meet IES Design Recommendations – Decorative Equipment

Roadway Classification	Mounting Height	Pole Spacing	Number of Poles Required
Collector	16'	125'	813
Local	16'	125'	4,047

### Intersections Plus Midblock Lighting, with a Not-to-Exceed Max Spacing

This scheme places a street light at each residential intersection plus mid-block streetlight installations. The mid-block lighting would consist of placing one or more light poles not to exceed a 300' spacing. Note that these are totals are the number of pole required to fill in between existing or proposed intersection lighting.

Table 14: Estimated Number of Mid-Block Poles for the Noted Spacing

Not to Exceed Spacing	Number of Poles
150'	3,788
200'	2,563
250'	2,019
300'	1,773

## **Estimates and Costs**

### **Unit Costs**

#### **New Pole Installations**

Estimated unit costs for new installations were determined by reviewing recent IDOT bid results for installations of standard equipment. Luminaire sales representatives were contacted to obtain current pricing for decorative equipment. The unit cost is estimated at \$8,000 per pole. This unit cost includes a cobra head style LED luminaire, standard mast arm style pole, cable, unit duct, controller, ComEd connection fees, restoration fees and all other expenses associated with installing a street lighting system through a bidding process. Unit prices are based on a small quantity (10) installed at a time. Larger installations will result in lower unit costs.

#### **Luminaire Replacements**

The estimated cost for the replacement of a standard cobrahead luminaire has been estimated at \$550 each. This estimate includes \$300 for the purchase of a luminaire and \$250 for labor, equipment and miscellaneous supplies for installation by Village staff. These values are based on past maintenance work orders provided by the Village. Additional savings will likely be realized if a significant number of luminaires can be replaced at the same time. Generally, installation by a contractor will result in reduced labor costs due to the competitive nature of the work and single focus on only replacements, in comparison with Village staff that will likely have other tasks to address. In addition, the Village can eliminate the labor cost from this unit price by making the assumption that Village labor is already included within the Village budget.

#### **ComEd Pole Removals**

Costs for removal of existing ComEd equipment are the responsibility of the Village. To arrange removal, the Village would need to contact ComEd New Business and submit a work order request. ComEd will then prepare an estimated cost for review and approval

by the Village. Because ComEd does not provide cost estimates for planning purposes, we have the cost for a crew of four to be \$7,200, which includes labor, materials and equipment. Estimated production is six removals per day, for a unit cost of \$1,200 per removal. This unit cost includes the removal of wood poles. Not all wood poles will be removed with the luminaires in cases where the poles are supporting other ComEd facilities or other utilities.

### **Replacement of ComEd Light Removals**

The costs of the removal of existing ComEd lights and replacement with Village-Owned lights is simply the sum of removal (\$1,200) and new installation (\$8,000), which is \$9,200.

### **Cost Factor**

A cost factor system has been developed to reduce the number of cost calculations included in this report. The cumulative cost factor can be multiplied times the \$8,000 per pole estimate or any of the estimates contained within this report. An example can be found below.

#### **Cost Factors**

##### Standard Lighting

Includes standard mast or davit arm pole and cobrahead luminaire and all other equipment required for a complete lighting system.

##### Decorative Lighting

Upgrade to basic decorative equipment, such as a fluted pole with decorative base, and post top luminaire.

##### Premium Decorative Equipment

Upgrade to a more detailed pole and luminaire.

##### Smart Controls

Include smart controls and infrastructure required to manage them.

##### Controller

Install full street lighting controller in lieu of direct utility connections.

##### Design Engineering

Estimated cost for a consultant to perform design engineering services. Note that work can be performed by Village staff, if resources allow.

## Construction Engineering

Estimated cost for a consultant to perform construction observation services. Note that work can be performed by Village staff, if resources allow.

Table 15: Cost Factors

Option	Cost Factor
Standard Lighting	1.00
Decorative Equipment	0.15
Premium Decorative Equipment	0.10
Smart Controls	0.02
Controller	0.30
Design Engineering	0.10
Construction Engineering	0.10

### **Examples of Cost Factor Application**

An estimated cost can be determined by using the following equation:

$$\text{Estimated Cost} = (\# \text{ of poles}) \times (\text{cost factor}) \times (\text{unit price}).$$

For an installation of 10 standard residential street lights, the estimated cost is \$80,000.

$$\text{Estimated Cost} = 10 \times 1.00 \times \$8,000 = \$80,000$$

For an installation of 10 premium decorative residential street lights, the estimated cost is \$100,000.

$$\text{Estimated Cost} = 10 \times (1.00+0.15+0.10) \times \$8,000 = \$100,000$$

For an installation of 10 residential street lights with all the options listed in Table 15, the estimated cost is \$141,600.

$$\text{Estimated Cost} = 10 \times (1.00+0.15+0.10+0.02+0.30+0.10+0.10) \times \$8,000 = \$141,600$$

### **Flat Rate vs. Metered Electrical Charges**

For a widely dispersed lighting system, as commonly found in residential areas, it is generally preferred to choose unmetered electrical billing. Meters are not required by ComEd for luminaire-only circuits; therefore, the cost of the meter pedestal can be saved. Savings are also realized by having to maintain the pedestals.

### **ComEd Monthly Lease Charges**

The monthly charges for ComEd leased street lighting equipment is specified in ComEd's *Schedule of Rates for Electric Service*. The rental rates for the ComEd lighting equipment currently in use by the Village is listed in the table below. The effective rate, also shown in the table, is the listed rate plus the prorated cost per month of all other charges and fees associated with leasing the lighting equipment, including electrical charges. The effective rate is calculated from current information valid through December 2017.

Table 16: ComEd Monthly Equipment Lease Charges

Equipment	Rate Book Cost/Mo.	Effective Cost/Mo.#
Light Emitting Diode (LED) Cobra Head – 40 to 60 Watts	\$2.67	\$4.15
Light Emitting Diode (LED) Cobra Head – 61 to 80 Watts*	\$3.28	\$5.10
Light Emitting Diode (LED) Cobra Head – 81 to 119 Watts*	\$3.63	\$5.64
Mercury Vapor (MV) Cobra Head – 100 Watts	\$4.18	\$6.50
MV Cobra Head – 175 Watts	\$4.21	\$6.55
MV Cobra Head – 250 Watts	\$4.39	\$6.83
MV Cobra Head – 400 Watts	\$4.95	\$7.70
High Pressure sodium (HPS) Cobra Head – 100 Watts	\$4.69	\$7.29
HPS Cobra Head – 150 Watts	\$4.54	\$7.06
HPS Cobra Head – 250 Watts	\$4.93	\$7.67
HPS Cobra Head – 400 Watts	\$5.38	\$8.37
Mounting Bracket – eight feet (8 ft.) or less in length	\$4.16	\$6.47
Mounting Bracket – over 8 ft. in length	\$5.58	\$8.68

\* Not currently in use by Village. Shown for comparative purposes.

# Includes electricity charges, maintenance and other fees.

### **Life Cycle Cost of Ownership**

Annual costs of ownership for Village owned and ComEd owned equipment have been calculated below. Installation costs were split over 50 years, the lifespan for light poles, as determined in the Village's Street Lighting Program Guidelines. Cost calculations are based on a 100-watt LED luminaire.

#### **Village-Owned Standard Pole**

*Table 17: Life Cycle Cost of Ownership – Village-Owned Standard Pole*

Expense	Cost
Installation (\$8,000/50 years)	\$160
Annual Maintenance	\$100*
Annual Electricity Charges (\$0.28/W)*	\$28
Total	\$288

\* = using rates calculated in the Village's Corridor Lighting Evaluation

#### **Village-Owned Decorative Pole**

*Table 18: Life Cycle Cost of Ownership – Village-Owned Decorative Pole*

Expense	Cost
Installation (\$9,200/50 years)	\$184
Annual Maintenance	\$100*
Annual Electricity Charges (\$0.28/W)*	\$28
Total	\$312

## ComEd (Leased) Wood Pole

Table 19: Life Cycle Cost of Ownership – ComEd (Leased) Wood Pole

Expense	Cost
Installation (\$3,600/50 years)	\$72
Lease Charges (\$14.32/month)#	\$172
Total	\$244

# = \$5.63/month for luminaire + \$8.68/month for mast arm. Includes electricity charges, maintenance and other fees.

Note that ComEd does not provide cost estimates without a work order, therefore, the installation costs above were estimated based on a crew of 4 completing two units per day.

## Replacement of Existing ComEd Pole with Village-Owned Standard Pole

Table 20: Life Cycle Cost of Ownership – Replacement of Existing ComEd-Owned pole with Village-Owned Standard Pole

Expense	Cost
Removal (\$1,200/50 years)	\$24
Installation (\$8,000/50 years)	\$160
Annual Maintenance	\$100*
Annual Electricity Charges (\$0.28/W)*	\$28
Total	\$312

\* = using rates calculated in the Village's Corridor Lighting Evaluation

## Payback of Replacing Existing ComEd Pole with Village-Owned Standard Pole

Based on the values in Table 20, replacement of an existing leased ComEd pole with a Village-owned LED pole costs \$9,200 (\$1,200 for removal, \$8,000 for installation of a new pole). Annual costs are reduced from \$244 (lease, maintenance and energy charges) for the ComEd pole to \$128 (maintenance and energy charges), a savings of \$134 per year. The payback for the replacement is calculated by dividing the replacement cost (\$9,200) by the annual savings (\$134) to determine the number years for payback. Payback is calculated at 69 years (\$9,200/\$134). Since this value significantly exceeds the expected service life of 50 years for the

poles, replacement of the existing leased ComEd poles with Village-owned equipment is not cost effective. However, there are other non-financial benefits associated with replacement that should be considered such as improved appearance, elimination of overhead cables and an appearance consistent with other installations throughout the Village.

### **Cost Summary & Comparison**

The table below summarizes the above information for easy comparison. Upfront costs are the initial cash outlay require to construct a new pole or replace an existing luminaire. Annual Maintenance and Annual Electricity Costs are based on Village historical data and projects for new LED equipment completed for the Corridor Lighting Study. Lease Costs are the charges for equipment leased from ComEd. These charges included maintenance and electricity charges. The Net Budget Impact is the net change (new costs minus existing costs) to the budget as a result of the listed improvement. Electricity and lease charges are inclusive of taxes and fees.

*Table 21: Cost Summary and Comparison – Standard Poles*

Improvement	Upfront Cost	Annual Maintenance Costs	Annual Electricity Costs	Lease Costs	Net Budget Impact
Existing HPS, MH, or MV Luminaire	-	\$100	\$42	-	\$142
Replace Existing Village-Owned Luminaire with LED Luminaire	\$550	\$82	\$28	-	(\$32)
Install New Village-Owned Pole with LED Luminaire	\$8,000	\$82	\$28	-	\$110
Replace Existing ComEd Pole with Village-Owned Pole and LED Luminaire	\$9,200	\$82	\$28	(\$244)	(\$134)
Existing ComEd-Owned Pole	-	-	-	\$244	-
Install New ComEd-Owned Pole	\$3,600	-	-	\$244	\$244

## **Implementation Cost Estimates**

Cost estimates have been prepared for several options to upgrade the Village's lighting system, ranging from filling in gaps in the existing system to complete replacement with a design that meets IES recommendations. All estimates are for standard equipment. The costs factors previously identified should be applied, if desired.

### **Fill-in Unlit Intersections**

Install lighting at the intersections that are currently unlit.

*Table 22: Estimate of Cost – Fill-in Unlit Intersections – Standard Poles*

Number of Poles	Unit Cost	Extended Cost
103	\$8,000	\$824,000

### **Upgrade Village-Owned Intersection Luminaires to LED**

*Table 23: Estimate of Cost – Upgrade Village Owned Intersection Luminaires to LED*

Number of Poles	Unit Cost	Extended Cost
88	\$550	\$48,400

### **Fill-in Unlit Mid-Block Locations, Single Pole**

Install a single mid-block pole for blocks with no current mid-block lighting.

*Table 24: Estimate of Cost – Fill-in Unlit Mid-Block Locations – Standard Poles*

Number of Poles	Unit Cost	Extended Cost
962	\$8,000	\$7,696,000

### **Fill-in Unlit Mid-Block Locations, 300' Minimum Spacings**

Install mid-block lighting for locations with no current mid-block lighting. Maximum spacing of 300' per current Village Code. Note that multiple poles may be required for blocks longer than 600'. Blocks with existing mid-block poles with spacings exceeding 300' are also included.

Table 25: Estimate of Cost – Fill-in Unlit Mid-Block Locations – Standard Poles

Number of Poles	Unit Cost	Extended Cost
1,868 (1,021 locations)	\$8,000	\$14,944,000

### Upgrade Village-Owned Mid-Block Luminaires to LED

Table 26: Estimate of Cost – Upgrade Village Owned Mid-Block Luminaires to LED

Number of Poles	Unit Cost	Extended Cost
300	\$550	\$165,000

### Illuminate to IES Recommended Levels

Costs include an all-new lighting system. Some poles and/or foundations may be reused; therefore, actual cost will likely be less. 2,594 standard poles are required to illuminate to IES recommended levels. If decorative poles are used, up to 4,860 poles may be required.

Table 27: Estimate of Cost – Illuminate to IES Recommended Levels

Number of Poles	Unit Cost	Extended Cost
2,594	\$8,000	\$20,752,000
to	to	to
4,860	\$9,200	\$44,712,000

### Illuminate with Fixed Spacing (150', 200' & 250')

Costs include an all-new lighting system. Some poles and/or foundations may be reused; therefore, actual cost will likely be less. A range of 2,019 to 3,788 poles are required depending on the selected fixed spacing and pole style.

Table 28: Estimate of Cost – Illuminate with Fixed Spacing (150', 200' & 250')

Number of Poles	Unit Cost	Extended Cost
2,019 to 3,788	\$8,000	\$16,152,000 to \$30,304,000

### **Potential Funding Sources**

#### **Grants**

The following sources offer grants that may be applied to the installation or retrofit of efficient lighting. With the current financial climate of the State of Illinois, many programs have been suspended or eliminated. The websites below should be checked on a regular basis for updated information.

#### **Public Sector Energy Efficiency Program by DCEO**

This program is no longer available as ComEd has taken over the Illinois Department of Commerce and Economic Opportunity's (DCEO) Energy Now program. See the ComEd's Energy Efficiency Program below.

#### **Illinois Clean Energy Community Foundation**

The Illinois Clean Energy Community Foundation does not currently offer any programs that apply to street lighting, but they have within the last 18 months. More information can be found at this [website](#).

#### **Database of State Incentives for Renewables & Efficiency (DSIRE)**

The DSIRE website (<http://www.dsireusa.org/>) is a searchable database of incentives and grants related to energy efficiency funded by the U.S. Department of Energy. The interface is very simple, allowing the ability to quickly search by zip code and topic.

#### **ComEd Energy Efficiency Program**

Beginning January 1, 2018, ComEd will begin administering their Energy Efficiency Program, which replaces the State of Illinois' DCEO program. This program is available to public entities and will include incentives for the replacement of older street lighting technologies with LED equipment. 2017 funding levels are \$1.47 per watt reduced, resulting in a savings between \$30 to \$175 per luminaire. 2018 funding levels have not been released at the time this document was prepared. The process for obtaining funding is complete an application with ComEd, obtain pre-approval, install the new equipment, and submit final paperwork. Further details can be found at ComEd's [website](#).

## **ComEd Smart Lighting Program**

ComEd is planning to upgrade the Village's leased HPS luminaires to LED in 2018 as part of their smart lighting program. While the existing luminaires will be replaced, ComEd's existing wood poles, mast arms and aerial cables will remain. The installation of LED luminaires will result in whiter light, which may appear to be brighter to the naked eye. This work will be completed at no charge to the Village, provided an updated lease agreement is adopted. ComEd has made initial contact with Village staff regarding these improvements.

## **Village Capital Improvement Plan**

The Village can consider adding the upgrade of the residential street lighting to the Village Capital Improvement Plan/budget and identify funding as necessary.

## **Private Financing**

Private financing is obtained from financial institutions, equipment manufacturers, contractors, and energy service companies. Private financing works similar to a car loan. Installment payments are created to finance a large purchase such as the installation of a street lighting system. Some financiers allow project costs such as design, installation, project management, energy charges and on-going maintenance to be included in the monthly payment, if desired. When retrofitting a large number of inefficient luminaires, it is common for the reduced monthly energy charges to offset the monthly payment for the luminaire upgrades.

Per discussion with two sources familiar with financing street lighting systems, the process of vetting this type of financing often takes up to one year. This is due to the cautious nature of the lender and the borrower. Actual time for processing the credit application is a few days to a couple of weeks. Our contacts also provided the following information:

### Term

Standard terms for roadway lighting installations range from 5 to 10 years. Terms of 5 to 6 years are preferred because they typically have better rates.

### Interest Rate

Current interest rates for roadway lighting installations range from 2 to 5 percent. Rates are influenced by credit rating, amount financed and tax-exempt status. Rates are generally fixed for the term.

### Payment

Payments typical range from \$10 to \$20 per month per thousand dollars financed. This number is highly dependent on the term of the financing. For example, \$1,000,000 financed over 5 years would result in a payment of approximately \$20,000 per month. Payments can be invoiced monthly, quarterly, semi-annual or annual.

## Fees

Fees may be incurred, depending on the provider. The maximum known fee reported was “a one-time Documentation Fee of 1%, not to exceed \$25,000”. This fee was billed with the first payment.

## **Implementation Recommendations**

The intent of this report is to provide the Village with the information necessary to make informed decisions regarding residential lighting policies and installations. Through review of this document and subsequent discussions, the Board can begin the process of exploring community goals and proposed improvements to be included in the Village of Mount Prospect Residential Lighting Policy. As preferences are identified, a more detailed analysis of a few options can be completed to refine scope and cost.

### **Obtain Public Feedback**

Through the 2016 Community Survey, residents indicated a desire for improved residential street lighting. The Village should consider opening a dialog with the community to better understand what improvements are important to Village residents. Involving the community in the decision process can be beneficial in many ways. It provides the Village an opportunity to disseminate information quickly and efficiently to the public. Inviting the public to have input can engender goodwill between the Village and residents. Public involvement allows for meaningful input from “end-users” of the system who may have specific concerns or suggestions not previously presented to the Village, and can be helpful when making key decisions later in the process. We recommend the Village use the public involvement process to help inform and guide their decision-making process.

### **Identify Community Goals**

As public feedback as received, potential goals for the lighting system can be identified. Opinions can be gathered and summarized to determine if too much or too little light is being provided, safety concerns or even maintenance issues. These goals may be associated with different types of neighborhoods such as residential or multi-family dwellings.

### **Determine Extent of Lighting Desired**

Evaluate potential lighting upgrades or new installations that are required to meet the identified community goals. Update budgetary estimates to provide an accurate cost for proposed improvements.

### **Identify Preferred Equipment**

Consider costs, performance and aesthetics to select a preferred style of equipment. Consider obtaining sample equipment, performing trial installations and site visits to evaluate options.

**Develop Residential Street Lighting Policy**

Develop a formal policy. Outline requirements, equipment and procedures required to complete the entire process. Prepare standardized details and specifications.

**Amend Village Lighting Ordinance**

Once a residential street lighting policy is developed, and preferred styles of lighting equipment have been selected, the Village may want to consider updating or amending the Street Lighting Ordinances, currently Chapter 16, Section 800, Article VIII Street Lighting. The current article 16.801: Street Lighting Improvements includes guidance for all roadway classifications and types of lighting.

## **Appendix A – Existing Village Code**

### **16.801: STREET LIGHTING IMPROVEMENTS:**

A. General: All development shall include the design and construction of street lighting facilities for the illumination of all roadways, public or private, which lie in or border the development. Street lighting to be accepted by the village shall be constructed within public right of way or in easements dedicated to the village. New developments proposed on a county or state roadway shall not be required to install streetlights at the time of development only if such installation is not permitted by the state of Illinois and/or Cook County and provided the owner signs a restrictive covenant guaranteeing their installation at a later time. Refer to section [15.202](#) of this code for a list of state and county roadways.

B. Specifications: Streetlights and appurtenances shall be designed and installed according to: the "American Standard Practice for Roadway Lighting", current edition, the national electrical code, current edition, as amended by the village electrical code; and this code.

C. Streetlight Locations:

1. Residential, Commercial and Industrial Districts: Poles shall be located at all intersections and spaced at a distance not exceeding three hundred feet (300') from one another for midblock locations. Poles shall also be located at the ends of cul-de-sacs and a curve in the roadway as required by the director of public works. Poles shall be set in the parkway two feet (2') from the back of curb. Where the distance between the sidewalk and the curb is such that this location is impractical or where the sidewalk is adjacent to the curb, the director of public works shall be consulted for an alternate location for the pole.

Unless otherwise directed by the director of public works, the direction of the support arm shall be at right angles to the intersection of the centerlines of the intersecting streets at a four (4) legged intersection. At "T" intersections, a pole shall be provided on the centerline extended of the terminating street at the top of the "T" with the support arm extending toward the center of the intersection. Between intersections, mast arms shall be orientated at a right angle to the centerline. In cul-de-sacs, lights shall be placed in the center median or if no center median is to be constructed, at the end of the cul-de-sac along the centerline extended.

2. Arterial and Collector Streets: Poles shall be located at intersections and spaced such that the illumination meets the following criteria:

a. Maintain 1.2 average foot-candles (after depreciation).

b. Maximum/minimum ratio of six to one (6.0: 1.0).

c. Average/minimum ratio of three to one (3.0: 1.0).

D. Light Pole Requirements:

1. Standard Light Poles:

- a. All poles shall be round tapered seamless poles fabricated from aluminum alloy 6063-T6. Poles shall be provided with bolt down anchor bases and handholes. Anchor bases and handhole frames shall be manufactured from aluminum alloy 356-T6.
- b. Bracket arms shall be truss tapered elliptical arms manufactured from aluminum alloy 6063-T6. Bracket arm shall taper to two and three-eighths inches (23/8") at luminaire end.
- c. Poles shall be designed and fabricated to withstand eighty (80) mph winds and associated wind gusts and vibrations. The light poles shall be able to support a luminaire panel up to one and seven-tenths (1.7) square feet. All poles shall be designed in conformance with AASHTO's "Standard Specifications for Structural Supports for Highway and Traffic Signals".

In residential areas, the lighting standards shall have bolt down bases and shall be constructed of spun aluminum with a twenty-five foot (25') mounting height and ten foot (10') truss arm with wraparound clamp in lieu of rivnuts. The lighting standards shall be Crouse-Hinds no. RTA8M25AAT10268 clamp design, Union Metal model 154-Y1 clamp design, or approved equal.

In commercial or business areas, the lighting standards shall have bolt down bases and shall be constructed of spun aluminum with a thirty foot (30') mounting height. The lighting standard shall be Crouse-Hinds no. RTA8M30AAT15268 clamp design, Union Metal model 154-Y11 clamp design, or approved equal. In cases where black finish is desired, the finish shall be anodized duranotic black finish on spun aluminum. Painted steel poles shall not be allowed. Alternate poles and mounting height shall be approved by the director of public works and director of community development.

2. Light Pole Designs: Light poles in village downtown business districts and their environs, and other areas designated by the director of public works shall be in keeping with the character of the area, and shall be specified by the director of public works.

#### E. Luminaries and Lamps:

1. Standard luminaries shall consist of a housing, reflector, reflector holder, lamp socket, slipfitter, three (3) terminal photoelectric cells and back light shield. The luminaries and lamps shall be high pressure sodium. Any mercury vapor lamps in existence on April 16, 1991, may continue in use.

All fixture components shall be designed to operate under all environmental conditions. All luminaries shall be designed and wired to operate on sixty (60) hertz alternating current with a multiple tap high power factor (95+%PF) regulator type ballast. All lenses shall be heat resistant borosilicate glass. All fixtures shall be designed to operate at minus twenty-degree Fahrenheit (-20°F) (28°C) minimum starting temperature.

- a. The mercury vapor luminaries existing as of April 16, 1991, shall have a die cast aluminum housing with a removable ballast assembly, acrylic or borosilicate glass refractor, photoelectrical cell receptacle and cell multitap reactor type ballast and universal slipfitter. Acceptable units include General Electric M-power/door, ITT horizontal luminaire or approved equal.
- b. The high-pressure sodium luminaire may be either the conventional horizontal flat lens cobra head type or the decorative shoebox type, either of which shall be the cutoff type fixture.

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c. The cobra head type shall have die cast aluminum housing, removable ballast assembly, a photoelectrical cell receptacle and cell, a multiple tap reactor type ballast and universal slipfitter receptacle. Acceptable units include:

(1) For Residential Areas:

(A) General Electric M-power/door M2AR155OH2GMS31.

(B) Crouse-Hinds OVS15SR22ET or approved equals.

(2) For Commercial Areas:

(A) General Electric M-power/door M4AC40SOA2GMC31.

(B) Crouse-Hinds OVM40SCW2EF quad tap or approved equals.

d. The high-pressure sodium decorative shoebox type fixture shall have a formed aluminum housing, removable ballast assembly, a photoelectrical cell receptacle and cell, and a multiple tap reactor type ballast. Acceptable units include:

(1) For Residential Areas:

(A) General Electric D25S15SOH2GMC3DBR.

(B) Quality Lighting 117-14G150WHPS quad tap.

(2) For Commercial Areas:

(A) General Electric D40S40SOH2GMC3DBR.

(B) Quality Lighting 117-14G-120HPS40OPCT.

2. Luminaries in village downtown business districts and their environs, and other areas designated by the director of public works shall be in keeping with the character of the area, and shall be specified by the director of public works.

#### F. Wire/Cable Requirements:

1. All wire and cable installed under this section from the power source to the lighting standards shall be contained in either unit duct manufactured from high density smooth wall polyethylene electrical plastic duct or heavy walled galvanized steel conduit. Direct burial of all wire and cable under this section is prohibited. All unit duct shall be installed in accordance with the "Standard Specifications for Road and Bridge Construction", Illinois department of transportation, latest edition.

All wire and cable installed under this section shall be heat and moisture resistant, type XHHW, and be suitable for use at seventy-five degrees centigrade (75°C) (167°F) and shall have insulation rated at 600V.

The bare ground wire shall be #8AWG stranded copper wire.

2. All wire will be subject to an insulation test to ground after installation. The minimum acceptable resistance to ground shall be 250,000 ohms. Any section of wiring failing to pass the minimum insulation test for any reason or showing an obvious short circuit shall be rejected. All wire, cable and unit duct to be furnished shall be buried not less than thirty inches (30") below finished grade.
3. All runs shall be continuous without splice in cable or unit duct from pole handhole to pole handhole or to control cabinet.

Cable slack shall be provided such that there is a minimum of two feet (2') of slack at the base of all light standards.

4. Adequate slack shall be provided such that the service connection can be made without splices other than at the power source. In the case of aerial service, rigid steel conduit for service pole riser including insulated bushing shall be provided for a service pole riser.
5. When passing under concrete or asphalt surfaces, rigid galvanized steel conduit not less than two inches (2") in diameter with bushings shall be used for raceways.
6. Disconnects shall be provided and installed at all points of connection to the Commonwealth Edison power source.
7. Fuse holders with fuses shall be installed in each conductor and located at the base of each pole so they are accessible through the handhole at the base of the pole. Fuse holders shall be Buss-Tron in-line waterproof fuse holder and breakaway receptacle #HEB-AW-RLC or approved equal. (Ord. 5253, 5-21-2002)

## **Appendix B – Survey Questions**

### **Policy:**

1. Does your municipality have a formal residential lighting policy?
2. Does your municipality include residential street lighting in the annual budget?
3. Where are residential light poles typically installed?
  - a. Corners
  - b. Mid-block
  - c. Fixed spacing
4. Is lighting required for new subdivisions or redevelopments?
5. Does your municipality own your residential lighting system or is it leased from other, such as ComEd?
6. What is the approval process for new residential lighting installations?
7. Who performs new lighting installations?
  - a. Village staff
  - b. On-call/maintenance contractor
  - c. Bid out

### **Equipment:**

1. What type of residential lighting equipment is installed within your municipality?
  - a. Aesthetics
    - i. Standard (mast or davit arm, cobrahead luminaire)
    - ii. Decorative/Architectural
  - b. Mounting height (estimate in feet)
  - c. Approximately how many are installed in your municipality?
  - d. Approximately what percentage of residential streets are illuminated?
  - e. What light sources are used?
    - i. HPS
    - ii. MV
    - iii. Induction
    - iv. LED
    - v. Other
  - f. Is aerial or underground cabling utilized?
  - g. Does the Village utilize smart lighting to identify outages, usage, etc.?
    - i. Currently using
    - ii. Considering using
    - iii. Not considering using

**Operations:**

1. How is your residential lighting controlled?
  - a. Controller or disconnect
  - b. Photocell (direct ComEd connection)
  - c. Timer
  - d. Other (please explain)

**Electricity Charges:**

1. How are electrical charges billed?
  - a. Fixed rate per pole/luminaire type
  - b. Metered (actual usage)

**Maintenance**

1. Who performs the maintenance of your residential lighting system?
  - a. Village staff
  - b. Contractor
2. Is preventative maintenance completed for the following?
  - a. Group relamping
  - b. Photocell replacement
  - c. Cleaning
  - d. Inspections
  - e. Painting
  - f. Other?
3. Has the Village defined a procedure for identifying outages and other issues with the lighting system? If yes, please explain.
4. Has the Village established recommended response times for responding to outages or maintenance requests?
  - a. If so, what are the response times for:
    - i. Light out
    - ii. Circuit/controller out
    - iii. Knockdown

## **Appendix C – Survey Results**

### **Arlington Heights**

#### **Policy:**

1. Does your municipality have a formal residential lighting policy? Yes
2. Does your municipality include residential street lighting in the annual budget? Yes
3. Where are residential light poles typically installed?
  - a. Corners
  - b. Mid-block
  - c. Fixed spacing xxx
4. Is lighting required for new subdivisions or redevelopments? Yes
5. Does your municipality own your residential lighting system or is it leased from other, such as ComEd? Combination, the majority is owned and maintained by the village
6. What is the approval process for new residential lighting installations? Handled by the Engineering Dept and Public Works
7. Who performs new lighting installations?
  - a. Village staff
  - b. On-call/maintenance contractor
  - c. Bid out xxx

#### **Equipment:**

1. What type of residential lighting equipment is installed within your municipality?
  - a. Aesthetics
    - i. Standard (mast or davit arm, cobrahead luminaire) xxx
    - ii. Decorative/Architectural xxx
  - b. Mounting height (estimate in feet) 14', 26', 30', 35, 47,
  - c. Approximately how many are installed in your municipality? Approx 3,900
  - d. Approximately what percentage of residential streets are illuminated? Approx. 75%
  - e. What light sources are used?
    - i. HPS xxx
    - ii. MV
    - iii. Induction
    - iv. LED xxx
    - v. Other
  - f. Is aerial or underground cabling utilized? underground
  - g. Does the Village utilize smart lighting to identify outages, usage, etc.?
    - i. Currently using

- ii. Considering using xxx
- iii. Not considering using

**Operations:**

1. How is your residential lighting controlled?
  - a. Controller or disconnect
  - b. Photocell (direct ComEd connection) xxx
  - c. Timer
  - d. Other (please explain) cabinet controlled by photo cell

**Electricity Charges:**

1. How are electrical charges billed?
  - a. Fixed rate per pole/luminaire type xxx
  - b. Metered (actual usage) xxx

**Maintenance**

1. Who performs the maintenance of your residential lighting system?
  - a. Village staff xxx
  - b. Contractor
2. Is preventative maintenance completed for the following?
  - a. Group relamping if a fair amount are out on a circuit, we will re-lamp all
  - b. Photocell replacement no, as needed
  - c. Cleaning yes when repairs are made
  - d. Inspections yes
  - e. Painting yes, downtown decorative
  - f. Other?
3. Has the Village defined a procedure for identifying outages and other issues with the lighting system? If yes, please explain. Currently repairs are made as reported, moving forward with the LED change out, smart lighting controls will be looked at
4. Has the Village established recommended response times for responding to outages or maintenance requests?
  - a. If so, what are the response times for:
    - i. Light out 3 days
    - ii. Circuit/controller out 1 day
    - iii. Knockdown 1 hour

**Buffalo Grove**

**Policy:**

1. Does your municipality have a formal residential lighting policy? **Only ordinance provisions and standard operating procedures for knock downs/maintenance**
2. Does your municipality include residential street lighting in the annual budget? **Only maintenance, recently adding some relamping to change to LED**

3. Where are residential light poles typically installed?
  - a. **Corners and Cul-de-sacs mostly**
  - b. Mid-block **All curves**
  - c. Fixed spacing **360' or as designed**
4. Is lighting required for new subdivisions or redevelopments? **Yes**
5. Does your municipality own your residential lighting system or is it leased from other, such as ComEd? **Both**
6. What is the approval process for new residential lighting installations? **Engineering review**
7. Who performs new lighting installations?
  - a. Village staff
  - b. **On-call/maintenance contractor**
  - c. Bid out

**Equipment:**

1. What type of residential lighting equipment is installed within your municipality?
  - a. Aesthetics
    - i. Standard (mast or davit arm, cobrahead luminaire) **Both**
    - ii. Decorative/Architectural **Both**
      1. **Ameron International, Centrecon Series Medium Embedded Octagonal Pole, twenty-three feet in height, catalog number MEO-7 (W/MO-AD-8ft. Davit Arm).**
      2. **Ameron International, Centrecon Series Medium Embedded Octagonal Pole, twenty-eight feet in height, catalog number MEO-8.5 (W/MO-AD-8ft. Davit Arm).**
      3. **Any poles also permitted for major streets as permitted by the Village Engineer.**
        - a. **Luminaries and lamps are to be matched to the proximal existing system to match Leotek Light-On group, ECobra-head, EC1-6-M-MV-NW-2-530-DB or any luminaires permitted for major streets as permitted by the Village Engineer.**
  - b. Mounting height (estimate in feet) **Varies**
  - c. Approximately how many are installed in your municipality? **3200**
  - d. Approximately what percentage of residential streets are illuminated? **90%**
  - e. What light sources are used?
    - i. **HPS**

- ii. MV
  - iii. Induction
  - iv. **LED – Will eventually only be LED, phasing out HPS**
  - v. Other
- f. Is aerial or underground cabling utilized? **Generally underground for lighting we own, aerial for ComEd rentals**
- g. Does the Village utilize smart lighting to identify outages, usage, etc.?
- i. Currently using
  - ii. **Considering using**
  - iii. Not considering using

**Operations:**

1. How is your residential lighting controlled?
  - a. **Controller or disconnect**
  - b. **Photocell (direct ComEd connection)**
  - c. Timer
  - d. Other (please explain)

**Electricity Charges:**

1. How are electrical charges billed?
  - a. **Fixed rate per pole/luminaire type - both**
  - b. **Metered (actual usage) - both**

**Maintenance**

1. Who performs the maintenance of your residential lighting system?
  - a. **Village staff – Initial response, assessment and ensure site is safe**
  - b. **Contractor – All other repairs**
2. Is preventative maintenance completed for the following?
  - a. **Group relamping**
  - b. Photocell replacement
  - c. **Cleaning**
  - d. **Inspections**
  - e. Painting
  - f. Other?
3. Has the Village defined a procedure for identifying outages and other issues with the lighting system? If yes, please explain. **Nothing more than visual identification or resident notification.**
4. Has the Village established recommended response times for responding to outages or maintenance requests?
  - a. If so, what are the response times for:
    - i. Light out – **24 hours**
    - ii. Circuit/controller out – **24 hours**

## Des Plaines

### Policy:

1. Does your municipality have a formal residential lighting policy?  
**No.**
2. Does your municipality include residential street lighting in the annual budget?  
**Apart from special, one-off projects, the only regular budgeting is for the maintenance and electricity costs for existing street lighting.**
3. Where are residential light poles typically installed?
  - a. Corners
  - b. Mid-block
  - c. Fixed spacing

**The general historic pattern throughout the City is that there is a single ComEd rental light at each intersection throughout the residential areas. There are some exceptions (historic reasons unknown). However, the current policy is generally that only the intersections are lit. When the City receives requests for new mid-block street lighting, residents are encouraged to install their own coach lights or security lighting on their property.**

4. Is lighting required for new subdivisions or redevelopments?  
**There is not a formal policy, but lighting is typically required.**
5. Does your municipality own your residential lighting system or is it leased from other, such as ComEd?  
**The vast majority of residential lighting is leased from ComEd. But there are some historical exceptions scattered throughout the City. And in new subdivisions, the lighting is typically constructed to be City-owned.**
6. What is the approval process for new residential lighting installations?  
**Request is generally routed through the Engineering Department. If it is an intersection that is missing a light, the request is generally approved. If it is not an intersection, the request is typically denied.**
7. Who performs new lighting installations?
  - a. Village staff
  - b. On-call/maintenance contractor
  - c. Bid out**ComEd. Or developer contractor if it is a new subdivision.**

### Equipment:

1. What type of residential lighting equipment is installed within your municipality?

- a. Aesthetics
  - i. Standard (mast or davit arm, cobrahead luminaire)
  - ii. Decorative/Architectural

**Non-ComEd lights were historically concrete post with aluminum mast arm and box luminaire. City is moving to aluminum post and mast arm, with LED cobra head.**

- b. Mounting height (estimate in feet) **~30'**
- c. Approximately how many are installed in your municipality?

**~1,300 ComEd, ~300 City-owned**

- d. Approximately what percentage of residential streets are illuminated?

**Intersections – guess would be 95%**

- e. What light sources are used?
  - i. HPS
  - ii. MV
  - iii. Induction
  - iv. LED
  - v. Other

**Whatever ComEd currently has installed. Mixture of legacy MV and HPS. And handful of new LED. The City used MV in its smaller number of City-owned residential lights. But that will likely transition to LED in the future.**

- f. Is aerial or underground cabling utilized? **ComEd – aerial. Historic City-owned concrete – generally underground. New subdivision – underground.**

- g. Does the Village utilize smart lighting to identify outages, usage, etc.?

- i. Currently using
- ii. Considering using
- iii. **Not considering using - It has come up with various vendors approaching the City. But not currently considering. Particularly since most of the lights are leased.**

### **Operations:**

- 1. How is your residential lighting controlled?
  - a. Controller or disconnect
  - b. Photocell (direct ComEd connection) – **Mostly photocell.**
  - c. Timer
  - d. Other (please explain)

### **Electricity Charges:**

- 1. How are electrical charges billed?
  - a. Fixed rate per pole/luminaire type – **Primarily fixed rate. Handful of metered locations.**
  - b. Metered (actual usage)

## **Maintenance**

1. Who performs the maintenance of your residential lighting system?
  - a. Village staff – **Most maintenance performed by City staff**
  - b. Contractor – **Some tasks such as painting and photocell replacement are occasionally performed by a contractor.**
  
2. Is preventative maintenance completed for the following?
  - a. Group relamping
  - b. Photocell replacement
  - c. Cleaning
  - d. Inspections
  - e. Painting
  - f. Other?

**Yes, for each of the above.**
  
3. Has the Village defined a procedure for identifying outages and other issues with the lighting system? If yes, please explain. – **Apart from preventative maintenance, based upon reports of outages or other issues.**
  
4. Has the Village established recommended response times for responding to outages or maintenance requests? - **Yes**
  - a. If so, what are the response times for:
    - i. Light out – **24-48 hours**
    - ii. Circuit/controller out – **24 hours**

Knockdown – **2-4 hours**

## **Elk Grove Village**

No response received.

## **Morton Grove**

### **Policy:**

1. Does your municipality have a formal residential lighting policy? Not really.
  
2. Does your municipality include residential street lighting in the annual budget? No.
  
3. Where are residential light poles typically installed? Wherever considered to be practical.
  - a. Corners
  - b. Mid-block
  - c. Fixed spacing

4. Is lighting required for new subdivisions or redevelopments? Not really. Regulation is limited to requirement that lighting installed must conform to Village standards.
5. Does your municipality own your residential lighting system or is it leased from other, such as ComEd? Both.
6. What is the approval process for new residential lighting installations? Subdivision approval process
7. Who performs new lighting installations? Bid out in 2007, the last time we had a Village program
  - a. Village staff
  - b. On-call/maintenance contractor
  - c. Bid out

**Equipment:**

1. What type of residential lighting equipment is installed within your municipality?
  - a. Aesthetics
    - i. Standard (mast or davit arm, cobrahead luminaire) mast arm, cobrahead and post-top
    - ii. Decorative/Architectural Mast arm and cobra head
  - b. Mounting height (estimate in feet) Residential is 15 feet. Roadway is 25 feet.
  - c. Approximately how many are installed in your municipality? Residential is 398. Roadway is 337.
  - d. Approximately what percentage of residential streets are illuminated? Small percentage. (<10%)
  - e. What light sources are used?
    - i. HPS - Yes
    - ii. MV – Not since February 2017
    - iii. Induction -No
    - iv. LED – Yes.
    - v. Other - MH
  - f. Is aerial or underground cabling utilized? UG
  - g. Does the Village utilize smart lighting to identify outages, usage, etc.?
    - i. Currently using – No.
    - ii. Considering using – No.
    - iii. Not considering using - Yes

**Operations:**

1. How is your residential lighting controlled?
  - a. Controller or disconnect - Yes
  - b. Photocell (direct ComEd connection) - Yes
  - c. Timer
  - d. Other (please explain)

### **Electricity Charges:**

1. How are electrical charges billed?
  - a. Fixed rate per pole/luminaire type - Yes
  - b. Metered (actual usage) – Yes.

### **Maintenance**

1. Who performs the maintenance of your residential lighting system?
  - a. Village staff – Yes.
  - b. Contractor – Only for pole and fixture replacements
2. Is preventative maintenance completed for the following?
  - a. Group relamping – No.
  - b. Photocell replacement -No
  - c. Cleaning - No
  - d. Inspections - No
  - e. Painting - No
  - f. Other?
3. Has the Village defined a procedure for identifying outages and other issues with the lighting system? If yes, please explain. No.
4. Has the Village established recommended response times for responding to outages or maintenance requests? – No.
  - a. If so, what are the response times for:
    - i. Light out
    - ii. Circuit/controller out
    - iii. Knockdown

### **Niles**

#### **Policy:**

1. Does your municipality have a formal residential lighting policy? **YES**
2. Does your municipality include residential street lighting in the annual budget? **YES**
3. Where are residential light poles typically installed?
  - a. Corners **X**
  - b. Mid-block**X**
  - c. Fixed spacing
5. Is lighting required for new subdivisions or redevelopments? I AM NOT SURE. I HAVE NEVER HAD IT COME UP.
4. Does your municipality own your residential lighting system or is it leased from other, such as ComEd? **They are ComED**

5. What is the approval process for new residential lighting installations? **N/A That goes through Village Hall.**
6. Who performs new lighting installations?
  - a. Village staff
  - b. On-call/maintenance contractor
  - c. Bid out **X**

**Equipment:**

1. What type of residential lighting equipment is installed within your municipality?
  - a. Aesthetics
    - i. Standard (mast or davit arm, cobrahead luminaire) **x**
    - ii. Decorative/Architectural
  - b. Mounting height (estimate in feet) **AROUND 25 FT.**
  - c. Approximately how many are installed in your municipality?
  - d. Approximately what percentage of residential streets are illuminated? **ALL STREETS HAVE AT LEAST 1 STREET LIGHT**
  - e. What light sources are used?
    - i. HPS **X**
    - ii. MV
    - iii. Induction
    - iv. LED
    - v. Other
  - f. Is aerial or underground cabling utilized? **MOSTLY AERIAL**
  - g. Does the Village utilize smart lighting to identify outages, usage, etc.? **NO. WE ARE CURRENTLY WORKING ON ADDING THAT**
    - i. Currently using
    - ii. Considering using **X**
    - iii. Not considering using

**Operations:**

1. How is your residential lighting controlled?
  - a. Controller or disconnect
  - b. Photocell (direct ComEd connection) **X**
  - c. Timer
  - d. Other (please explain)

**Electricity Charges:**

1. How are electrical charges billed?
  - a. Fixed rate per pole/luminaire type **x**
  - b. Metered (actual usage)

**Maintenance**

1. Who performs the maintenance of your residential lighting system?
  - a. Village staff
  - b. Contractor **X**

2. Is preventative maintenance completed for the following? **None that I am aware of.**
  - a. Group relamping
  - b. Photocell replacement
  - c. Cleaning
  - d. Inspections
  - e. Painting
  - f. Other?
  
3. Has the Village defined a procedure for identifying outages and other issues with the lighting system? If yes, please explain. **Residents can call Public Services if they see an outage and Public Services contacts ComEd . Public Services staff members also will report an outage to ComEd**
  
4. Has the Village established recommended response times for responding to outages or maintenance requests?
  - a. If so, what are the response times for: **WE RESPOND AS SOON AS THE SERVICE REQUEST COMES IN BY CALLING THE RESIDENT BACK.**
    - i. Light out **USUALLY FIXED IN A COUPLE OF WEEKS.**
    - ii. Circuit/controller out **ASAP**
    - iii. Knockdown **ASAP**

**Palatine**

**Policy**

**Village of Palatine responses in red. An "X" indicates a yes or check mark**

1. Does your municipality have a formal residential lighting policy?
  - a. **All new subdivisions are required to install lighting. Per Appendix B of Village Code of ordinances (8.09. Street lighting.)**
  
2. Does your municipality include residential street lighting in the annual budget?
  - a. **We have a capital plan to install street lighting in areas not currently lit.**
  
3. Where are residential light poles typically installed?
  - a. Corners **X**
  - b. Mid-block **X**
  - c. Fixed spacing **X**
  
4. Is lighting required for new subdivisions or redevelopments?
  - a. **Yes, see #1**
  
5. Does your municipality own your residential lighting system or is it leased from other, such as ComEd?
  - a. **Most are owned by the village but there are several leased lights also**

6. What is the approval process for new residential lighting installations?

a. Needs to meet requirements in appendix b, See #1 above.

7. Who performs new lighting installations?

a. Village staff X-repairs/knockdowns only

b. On-call/maintenance contractor

c. Bid out X

#### **Equipment:**

1. What type of residential lighting equipment is installed within your municipality?

a. Aesthetics

i. Standard (mast or davit arm, cobrahead luminaire) X

ii. Decorative/Architectural X

b. Mounting height (estimate in feet) 14, see appendix b for height per street type

c. Approximately how many are installed in your municipality? N/A

d. Approximately what percentage of residential streets are illuminated? N/A

e. What light sources are used?

i. HPS X

ii. MV X

iii. Induction

iv. LED X – new standard residential street standard

v. Other X- metal-halide lamp

f. Is aerial or underground cabling utilized? UG, Most Com Ed rentals are OH

g. Does the Village utilize smart lighting to identify outages, usage, etc.?

i. Currently using

ii. Considering using

iii. Not considering using

iv. Unknown at this time

#### **Operations:**

1. How is your residential lighting controlled?

a. Controller or disconnect X

b. Photocell (direct ComEd connection) X

c. Timer

d. Other (please explain)

#### **Electricity Charges:**

1. How are electrical charges billed?

a. Fixed rate per pole/luminaire type X

b. Metered (actual usage) X

#### **Maintenance**

1. Who performs the maintenance of your residential lighting system?

a. Village staff X

b. Contractor

2. Is preventative maintenance completed for the following?
  - a. Group relamping
  - b. Photocell replacement
  - c. Cleaning
  - d. Inspections
  - e. Painting
  - f. Other? **X – capital plan for annual cable replacement in areas of direct burry cabling (Worst first)**
  
3. Has the Village defined a procedure for identifying outages and other issues with the lighting system? If yes, please explain.
  - a. **Police patrol reports outages as they see them, semiannually inspection is done by PW staff.**
  
4. Has the Village established recommended response times for responding to outages or maintenance requests? **N/A**
  - a. If so, what are the response times for:
    - i. Light out
    - ii. Circuit/controller out
    - iii. Knockdown

### **Rolling Meadows**

#### **Policy:**

1. Does your municipality have a formal residential lighting policy? Not yet adopted
2. Does your municipality include residential street lighting in the annual budget? Yes
3. Where are residential light poles typically installed? Corners, curves and cul-de-sacs
  - a. Corners
  - b. Mid-block
  - c. Fixed spacing
4. Is lighting required for new subdivisions or redevelopments? Yes
5. Does your municipality own your residential lighting system or is it leased from other, such as ComEd? We have both.
6. What is the approval process for new residential lighting installations? Request are taken into consideration and reviewed by staff. If they have merit, we will get quote from ComEd or City Engineer.
7. Who performs new lighting installations? ComEd or City Contractor
  - a. Village staff

- b. On-call/maintenance contractor
- c. Bid out

**Equipment:**

1. What type of residential lighting equipment is installed within your municipality?
  - a. Aesthetics
    - i. Standard (mast or davit arm, cobrahead luminaire) Yes
    - ii. Decorative/Architectural - No
  - b. Mounting height (estimate in feet) 30' and 50'
  - c. Approximately how many are installed in your municipality? 700
  - d. Approximately what percentage of residential streets are illuminated? 100%
  - e. What light sources are used? HPS / MV / MH / LED
    - i. HPS
    - ii. MV
    - iii. Induction
    - iv. LED
    - v. Other
  - f. Is aerial or underground cabling utilized? Both – all City owned are underground
  - g. Does the Village utilize smart lighting to identify outages, usage, etc.? Not at this time
    - i. Currently using
    - ii. Considering using
    - iii. Not considering using

**Operations:**

1. How is your residential lighting controlled? City owned are by controller and all ComEd are photocells.
  - a. Controller or disconnect
  - b. Photocell (direct ComEd connection)
  - c. Timer
  - d. Other (please explain)

**Electricity Charges:**

1. How are electrical charges billed? We have both due to installation of Holiday Decorations.
  - a. Fixed rate per pole/luminaire type
  - b. Metered (actual usage)

**Maintenance**

1. Who performs the maintenance of your residential lighting system? Both
  - a. Village staff
  - b. Contractor
2. Is preventative maintenance completed for the following? None
  - a. Group relamping
  - b. Photocell replacement
  - c. Cleaning

- d. Inspections
  - e. Painting
  - f. Other?
3. Has the Village defined a procedure for identifying outages and other issues with the lighting system? If yes, please explain. No
4. Has the Village established recommended response times for responding to outages or maintenance requests?
- a. If so, what are the response times for:
    - i. Light out – within 1 week
    - ii. Circuit/controller out – next business day
    - iii. Knockdown – within 1 hour

# Village of Mount Prospect



## Street Lighting Capital Program Corridor Lighting Evaluation

June 20, 2016

Prepared by:



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Village of Mount Prospect  
 Street Lighting Capital Program  
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**Executive Summary**

**Purpose**

In late 2015, the Village initiated a 2016-2021 strategic planning process. The Board of Trustees has expressed an interest to ‘brighten up’ Mount Prospect and become more sensitive to light pollution concerns. Ciorba Group has been retained to study these requests and provide recommendations to be considered for the strategic plan. This study includes the review of nine key ‘gateway’ corridors to evaluate the adequacy of the existing lighting and determine the cost and packaging for the installation of new roadway lighting for the unlit sections. Information regarding the Dark-Sky Association is also presented for consideration.

**Methodology**

Two field reviews were completed to evaluate the existing lighting and determine the need for additional lighting. Other data was gathered through online sources such as Google Earth, the Illinois Department of Transportation (IDOT) website and other websites. Additional data was gathered from industry sources such as manufacturers and professional organizations. This data was assembled into this document, which was reviewed by Village Public Works staff and revised as necessary.

**Existing Village Lighting**

The existing roadway lighting within the Village generally meets current recommended design standards. During the review, three locations were identified for further investigation, with one location requiring corrective action to bring it into compliance.

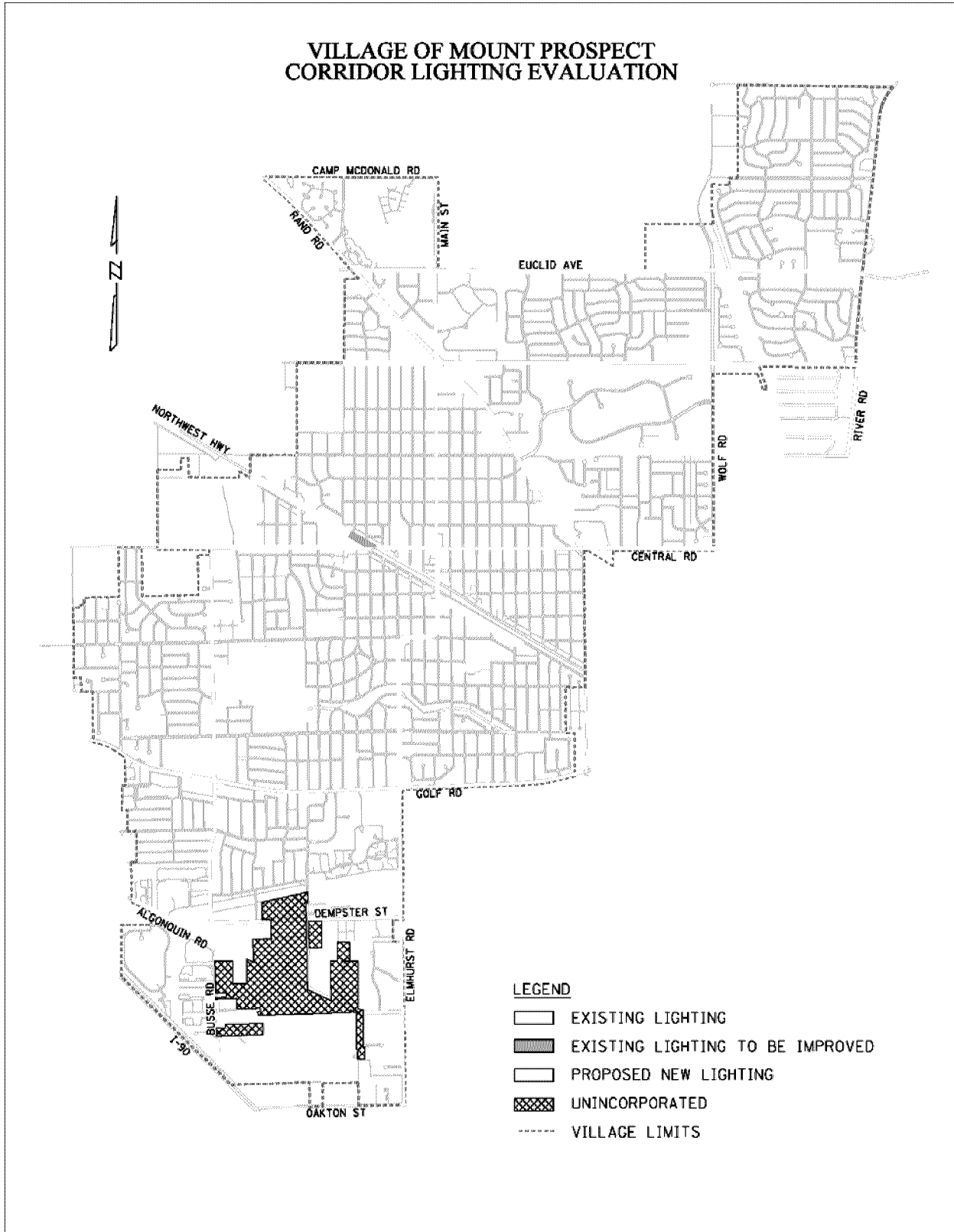
**Recommendations**

The following recommendations should be considered:

- Determine program scope.
- Determine program timeline.
- Obtain funding.
- Prepare pilot program/trial installation.
- Develop standard details and special provisions.
- Complete program.

Additional information regarding each of these recommendations can be found elsewhere in this document.

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**Existing Corridor Lighting Review**

The corridors included in this study were selected by the Village based on traffic volumes and/or the presence of commercial land use.

**Corridors**

The following corridors were identified for study:

- Algonquin Road (IL 62) – Cedar Glen Drive to Elmhurst Road
- Busse Road – I-90 to Central Road
- Central Road – Arthur Avenue to Wolf Road
- Dempster Street – Algonquin Road to Elmhurst Road
- Euclid Avenue (Cook Count A59) – Rand Road to River Road
- Golf Road (IL 58) – Goebbert Road to Mount Prospect Road
- Elmhurst Road / Main Street (IL 83) – Oakton Street to Camp McDonald Road
- Northwest Highway (US 14) – Waterman Street to Mount Prospect Road
- Rand Road – Albany Lane to Camp McDonald Road

**Field Reviews**

Two field reviews were completed to evaluate the existing lighting system and also identify the locations where new lighting is necessary to completely illuminate each corridor.

**Daytime Review**

The first review occurred during daytime hours. This purpose of this review was to identify locations without existing light poles. The entire length of each corridor was reviewed. Each corridor was broken down into segments of lit and unlit. The segments of each corridor without street lighting have been included in the *Existing Conditions Summary* table found at the end of this section.

**Nighttime Review**

A second review was completed for each segment of illuminated roadway during night hours while the luminaires were on. This review was focused on the quality of the lighting provided by the existing poles. Photometric analysis of the existing lighting would be very labor and cost prohibitive due to limited available information for the installed equipment. A much more cost-effective review was completed by having an experienced lighting designer drive each illuminated segment after dark. Locations that appeared to display inconsistent or low lighting levels were identified for further investigation by means of photometric analysis.

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Further Investigation

Three locations were identified for further investigation:

- Northwest Highway – Central Road to Fairview Avenue
- Northwest Highway – Evergreen Ave to Mount Prospect Road
- Rand Road – Elmhurst Road to Henry Street

These locations were analyzed using AGi32 lighting design software. Photometric curves for the existing luminaires were assumed by considering information from the Hansen database, Village equipment preferences and past experience.

Photometric analysis revealed that two of the three locations meet IES recommendations. Lighting levels for Northwest Highway between Central Road and Fairview Avenue are slightly out of the IES recommended ratios for a roadway of Collector Medium classification. This location can be brought into compliance by replacing the luminaires with those that have a better photometric distribution. Calculations were performed for a LED luminaire to confirm compliance with IES requirements. Photometric results for all three of these locations can be found in Appendix C.

**Data Collection**

Additional data was gathered for use in preparation of the recommended improvements. A brief description of the source of the data is included below. The collected data has been included in the *Existing Conditions Summary* table found at the end of this section.

**Roadway width**

Roadway widths were obtained by measuring aerial images within Google Earth’s PC application. Changes in roadway width generally have a big impact in the spacing of light poles and required photometric distribution, therefore, each corridor was broken down into multiple segments where the roadway width changed due the addition of lanes or changes to roadway cross-section. Isolated right turn lanes were not included in the roadway width measurements. Right turn lanes were included for segments with multiple consecutive turn lanes.

**Adjacent Land Use**

Field notes, Google Earth aerial, and Google Street View images we reviewed to determine an overall adjacent land use for each segment.

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**Length of Roadway to be Illuminated**

The limits of proposed lighting identified during the daytime field review were located using aerial images. The distance between these limits were measured using Google Earth.

**Average Annual Daily Traffic (AADT)**

Traffic volumes for each segment were identified using IDOT's [Traffic Count website](#). For segments that reported multiple AADT values, the higher value was used.

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**Existing Conditions Summary**

Corridor	Adjacent Land Use	Limits	Length (ft)	Width (ft)	AADT
Algonquin Road (IL 62)	Business/Light Industrial	1,150' E of Busse Rd to Elmhurst Rd	4,600	64	21,900
Busse Road	Residential/Business/Light Industrial	I-90 to Imperial Ct	3,200	64	22,700
	Residential	250' N of Dempster St to 800' S of Golf Rd	3,100	76	13,200
		800' S of Golf Rd to Lonnquist Blvd	1,250	52	10,950
Central Road	Residential	Lonnquist Blvd to 500' S of Central Rd	4,900	24	10,950
Dempster Street	Residential/Business	Emerson St to Edward St	2,600	44	12,600
Euclid Avenue (Cook County A59)	Residential	400' E of Redwood Dr to Elmhurst	3,750	64	12,300
		400' E of Rand Rd to Hemlock Ln	6,300	64	19,300
Golf Road (IL 58)	Residential/Commercial	Hemlock Ln to Des Plaines River Rd	7,800	52	18,100
		700' E of Goebbert Rd to 350' W of Mt. Prospect Rd	14,200	64	29,200

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Corridor	Adjacent Land Use	Limits	Length (ft)	Width (ft)	AADT
Main Street (IL 83)	Residential/Commercial	Oakton St to 300' S of Sunset Rd	10,200	64	27,300
		300' N of Central Rd to 600' S of Kensington Rd	4,400	42	15,800
		600' S of Kensington Rd to 600' N of Euclid Ave	3,850	64	17,300
		600' N of Euclid Ave to Camp McDonald Rd	2,000	52	22,100
Northwest Highway (US 14)	Residential/Commercial				
Rand Road (US 12)	Commercial/Residential	1300' S of Business Center Dr to 600' W of Main St	5,800	64	24,300
		600' W of Main St to 700' S of Euclid Ave	2,100	54	24,500
		700' N of Euclid Ave to Camp McDonald Rd	3,000	64	27,800

## **Recommended Improvements**

Recommended improvements were determined by photometric analysis. The following narrative documents the selections made to complete photometric calculations.

### **Photometric Analysis**

#### **IES Classification**

The following classifications are defined in ANSI/IES RP-8-14, the current recommended practice for roadway lighting. Each corridor was assigned to a classification based on the definitions listed below. Selections are included in the *Recommended Improvements Summary* table found at the end of this section.

#### **Street**

##### *Major*

The part of the roadway system that serves as the principal network for through-traffic flow. The routes connect areas of principal traffic generation and important rural roadways entering and leaving the city. These routes are often known as “arterials,” “thoroughfares,” or “preferentials.” They are sometimes subdivided into primary and secondary; however, such distinctions are not necessary in roadway lighting. These routes primarily serve through traffic and secondarily provide access to abutting property.

##### *Collector*

Roadways servicing traffic between major and local streets. These are streets used mainly for traffic movements within residential, commercial and industrial areas. They do not handle long, through trips. Collector streets may be used for truck or bus movements and give direct services to abutting properties.

##### *Local*

Local streets are used primarily for direct access to residential, commercial, industrial, or other abutting property. They make up a large percentage of the total street system, but carry a small proportion of vehicular traffic.

#### **Pedestrian Conflict**

##### *High*

Areas with significant numbers of pedestrians expected to be on sidewalks or crossing the street during darkness. Examples are downtown retail areas, near theaters, concert halls, stadiums, and transit terminals.

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*Medium*

Areas where lesser numbers of pedestrians utilize the streets at night. Typical are downtown office areas, blocks with libraries, apartments, neighborhood shopping, industrial, parks, and streets with transit lines.

*Low*

Areas with very low volumes of night pedestrian usage. The can occur in any of the cited roadway classifications but may be typified by suburban streets with single family dwellings, very low density residential developments, and rural or semi-rural areas.

**Target Lighting Levels**

Target lighting levels were identified at 100 to 125% of the luminance values listed in Table 3 of the RP-8-14:

STREET CLASSIFICATION	PEDESTRIAN AREA CLASSIFICATION	AVG. LUMINANCE ( $L_{avg}$ (cd/m <sup>2</sup> ))	AVG.UNIFORMITY RATIO $L_{avg}/L_{min}$	MAX. UNIFORMITY RATIO $L_{max}/L_{min}$	MAX. VEILING LUMINANCE RATIO $LV_{max}/L_{avg}$
MAJOR	HIGH	1.2	3.0	5.0	0.3
	MEDIUM	0.9	3.0	5.0	0.3
	LOW	0.6	3.5	6.0	0.3
COLLECTOR	HIGH	0.8	3	5.0	0.4
	MEDIUM	0.6	3.5	6.0	0.4
	LOW	0.4	4.0	8.0	0.4
LOCAL	HIGH	0.6	6.0	10.0	0.4
	MEDIUM	0.5	6.0	10.0	0.4
	LOW	0.3	6.0	10.0	0.4

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**Roadway Sections**

To reduce the number of calculations made, similar roadway widths were grouped together. Ten roadway sections were identified for analysis:

Section #	Roadway Width (ft)	Roadway Classification	Pedestrian Classification
1	24	Collector	Low
2	44	Collector	Low
3	44	Major	Low
4	54	Collector	Low
5	54	Major	Low
6	54	Major	Low
7	64	Collector	Medium
8	64	Major	Low
9	64	Major	Medium
10	76	Collector	Low

**Pole Mounting Height**

Pole mounting heights were chosen with two main criteria. The primary consideration was to matching the mounting height of other poles already installed in the Village. By sticking with a minimal number of pole sizes, maintenance inventory requirements are reduced. The second consideration was application of the golden ratio. This ratio is commonly used in architecture to approximate sizes of structures. This ratio (4:3 horizontal: vertical) provides a good starting point to find a pole mounting height that is aesthetically pleasing. Pole mounting height is included in the *Recommended Improvements Summary* table found at the end of this section.

**Pole Layout**

Pole layout was chosen based on the most economical configuration that meets RP-8-14 requirements. Generally, a one-sided pole layout is more cost effective than an

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opposite arrangement for narrow roadways. As roadway width increases, opposite arrangements become more cost effective. The preferred layout for each roadway section is included in the *Recommended Improvements Summary* table found at the end of this section.

**Luminaires**

Luminaires from American Electric and GE were used for this analysis based on the availability of photometric information. Two manufacturers were used for all calculations to confirm that more than one supplier can provide suitable luminaires. Catalog cuts for American Electric and GE have been included in Appendix A.

**Calculations**

Photometric calculations were prepared using the Roadway Optimizer design tool with AGI32 from Lighting Analysts. AGI32 is the format required by IDOT and is the standard for preparing photometric calculations within the State of Illinois. Calculations for each of the sections listed above have been included in Appendix B.

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**Recommended Improvements Summary**

Corridor	Limits	Section	Layout	Mounting Height	Mast Arm Length	Max. Spacing	90% Spacing
Algonquin Road (IL 62)	1,150' E of Busse Rd to Elmhurst Rd	8	Opposite	40	10	225	200
	I-90 to Imperial Ct	9	Opposite	40	10	225	200
Busse Road	250' N of Dempster St to 800' S of Golf Rd	10	Opposite	40	10	260	230
	800' S of Golf Rd to Lonnquist Blvd	4	One- Sided	40	12	250	225
	Lonnquist Blvd to 500' S of Central Rd	1	One- Sided	25	8	150	135
Central Road	Emerson St to Edward St	2	One- Sided	35	12	235	210
Dempster Street	400' E of Redwood Dr to Elmhurst	7	Opposite	40	10	290	260
Euclid Avenue (Cook County A59)	400' E of Rand Rd to Hemlock Ln	7	Opposite	40	10	290	260
	Hemlock Ln to Des Plaines River Rd	5	One- Sided	40	12	240	215
Golf Road (IL 58)	700' E of Goebbert Rd to 350' W of Mt. Prospect Rd	6	One- Sided	40	12	225	200

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Corridor	Limits	Section	Layout	Mounting Height	Mast Arm Length	Max. Spacing	90% Spacing
Main Street (IL 83)	Oakton St to 300' S of Sunset Rd	8	Opposite	40	10	225	200
	300' N of Central Rd to 600' S of Kensington Rd	3	One-Sided	35	12	195	175
	600' S of Kensington Rd to 600' N of Euclid Ave	9	Opposite	40	10	225	200
	600' N of Euclid Ave to Camp McDonald Rd	6	One-Sided	40	12	225	200
Northwest Highway (US 14)							
Rand Road (US 12)	1300' S of Business Center Dr to 600' W of Main St	9	Opposite	40	10	225	200
	600' W of Main St to 700' S of Euclid Ave	6	One-Sided	40	12	225	200
	700' N of Euclid Ave to Camp McDonald Rd	8	Opposite	40	10	225	200

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**Improvement Priority**

**Ratings Criteria**

The following criteria were used to prioritize the installation of street lights among the corridors:

**AADT**

AADT	Points
< 15,000	1
15,000 to 24,999	2
> 25,000	3

**Adjacent Land Use (ALU)**

Adjacent land use was assigned points based on the table below. When a corridor had more than one significant land use type, the average value of all land uses present was awarded.

Land Use	Points
Business	1
Commercial	2
Industrial	2
Residential	1

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**Roadway Geometry (RG)**

Roadways with complex roadway geometry were weighted heavier than roadways without. If the following feature existed within the unlit section of the roadway within a corridor, points were awarded.

Feature	Points
Curve	+1
> 2 lanes	+1
Complex intersections?	+1

**VOMP Police Department Input (PDI)**

The Village of Mount Prospect Police Department (PD) was invited to provide feedback on which corridors would benefit the most from the installation of street lighting. The PD recommended the installation of lighting for several locations. Points were assigned to each recommendation location,. See Appendix C for copies of this correspondence.

Impact	Points
Recommended	2

**Ratings**

An overall rating was determined by adding the points for each rating criteria. Corridors were ranked based on most total points. Ties were broken by using two criteria. Locations receiving a recommendation for lighting by the PD were ranked ahead of those without a recommendation. The second criteria was to compare AADT. The roadway with the highest AADT was given the higher priority.

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Priority	Corridor	AADT	ALU	RG	PDI	Total
5	Algonquin Road (IL 62)	2	1.5	2		5.5
4	Busse Road	2	1.5	2	2	7.5
8	Central Road	1	1	1		3
6	Dempster Street	1	1	1	2	5
7	Euclid Avenue (Cook County A59)	2	1	2		5
1	Golf Road (IL 58)	3	1.5	2	2	8.5
3	Main Street (IL 83)	3	1.5	2	2	8.5
2	Rand Road (US 12)	3	1.5	2	2	8.5

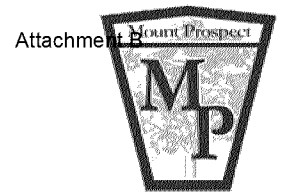
**Cost Estimate**

**Unit Cost**

The unit cost for a pole was reviewing recent IDOT bid results for similar installations. The unit cost is estimated at \$12,000 per pole. This unit cost includes a LED luminaire, pole, breakaway device, cable, controller, ComEd connection fees, restoration fees and all other expenses associated with installing a street lighting system through a bidding process.

**Number of Poles**

The number of poles required for each corridor was determined by dividing the length of roadway to be illuminated by the 90% Spacing for each section. Pole quantities were increased by five percent to account for conflicts with driveways, trees, utilities, etc. Eight additional poles were included for each signalized intersection to provide transition lighting on the cross street approaches as well as additional poles to meet the increased



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lighting levels required at intersections by RP-8. Note that these estimates are conservative. It is anticipated that slightly less poles will be required when a comprehensive design is completed.

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Corridor	Limits	Pole Layout	Length (ft)	90% Pole Spacing	# of Poles	5%	# of Inter.	# of Inter. Poles	Total # of Poles
Algonquin Road (IL 62)	1,150' E of Busse Rd to Elmhurst Rd	Opposite	4,600	200	46	3	2	16	65
	I-90 to Imperial Ct	Opposite	3,200	200	32	2	-	-	34
Busse Road	250' N of Dempster St to 800' S of Golf Rd	Opposite	3,100	230	28	2	1	8	38
	800' S of Golf Rd to Lonquist Blvd	One-Sided	1,250	225	6	-	1	8	14
	Lonnquist Blvd to 500' S of Central Rd	One-Sided	4,900	135	37	2	2	16	55
Central Road	Emerson St to Edward St	One-Sided	2,600	210	13	1	1	8	22
Dempster Street	400' E of Redwood Dr to Elmhurst	Opposite	3,750	260	30	2	2	16	48
Euclid Avenue (Cook County A59)	400' E of Rand Rd to Hemlock Ln	Opposite	6,300	260	50	3	3	24	77
	Hemlock Ln to Des Plaines River Rd	One-Sided	7,800	215	37	2	5	40	79
Golf Road (IL 58)	700' E of Goebbert Rd to 350' W of Mt. Prospect Rd	One-Sided	14,200	200	71	4	2	16	91

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Corridor	Limits	Layout	Length (ft)	90% Pole Spacing	# of Poles	5%	# of Inter.	# of Inter. Poles	Total # of Poles
Main Street (IL 83)	Oakton St to 300' S of Sunset Rd	Opposite	10,200	200	102	5	2	16	123
	300' N of Central Rd to 600' S of Kensington Rd	One-Sided	4,400	175	26	2	1	8	36
	600' S of Kensington Rd to 600' N of Euclid Ave	Opposite	3,850	200	40	2	3	24	66
	600' N of Euclid Ave to Camp McDonald Rd	One-Sided	2,000	200	10	1	1	8	19
Northwest Highway (US 14)									
Rand Road (US 12)	1300' S of Business Center Dr to 600' W of Main St	Opposite	5,800	200	58	3	2	16	77
	600' W of Main St to 700' S of Euclid Ave	One-Sided	2,100	200	11	1	-	-	12
	700' N of Euclid Ave to Camp McDonald Rd	Opposite	3,000	200	30	2	2	16	48

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**Estimate by Corridor – New Lighting**

Corridor Cost was obtained by multiplying the number of poles by the unit cost per pole (\$12,000).

Corridor	# of Poles	Corridor Cost
Algonquin Road (IL 62)	65	\$780,000
Busse Road	141	\$1,692,000
Central Road	22	\$264,000
Dempster Street	48	\$576,000
Euclid Avenue (Cook County A59)	156	\$1,872,000
Golf Road (IL 58)	91	\$1,092,000
Main Street (IL 83)	244	\$2,928,000
Rand Road (US 12)	137	\$1,644,000
<b>Total:</b>	<b>904</b>	<b>\$10,848,000</b>

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**Estimate by Area – LED Retrofit**

A cost to replace all the existing Village roadway luminaires with new LED luminaires has been included for reference. Should the Village adopt a color temperature that does not match the existing equipment, this budgetary amount will allow replacement, if desired. It is likely that some of the existing equipment will match the desired color temperature and will not need to be replaced; therefore, this amount is conservative.

Location	# of Luminaires	Cost
Algonquin/Busse/Dempster	80	\$46,000
Northwest Highway (US 14)	55	\$31,625
Downtown	265	\$152,375
Main Street (south of downtown)	75	\$43,125
Central Road (west of US 14)	90	\$51,750
Central & Rand	68	\$39,100
Everything else	457	\$262,775
<b>Totals</b>	<b>1,090</b>	<b>\$626,750</b>

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**Total Program Cost**

New Corridor Lighting	\$10,848,000
LED Retrofits	\$626,750
Sub-Total	\$11,474,750
Phase II Engineering (6%)	\$687,485
Phase III Engineering (10%)	\$1,147,475
<b>Total:</b>	<b>\$13,309,710</b>

**Energy Charges**

Calculations related to energy charges can be found in [Appendix E](#).

**Existing Charges**

The Village currently spends \$75,000 per year on electricity charges for roadway lighting. This does not include lighting in residential areas leased from ComEd.

**Proposed Charges**

Retrofit of the existing luminaires within the Village should result in a reduction of annual electricity charges to \$51,100. This is an annual savings of approximately \$24,000. This estimate is conservative, as many of the existing luminaires to be replaced have lower wattages than those used in the electricity charge calculation. Additional savings will be realized when lower wattage luminaires are installed.

Electricity charges for the new street lighting are estimated at \$45,600 per year. The net result of replacing all existing luminaires with LED and installing new lighting on all the corridors identified in this report will result in a net increase of \$21,700 (\$51,100 + \$45,600 - \$75,000) per year.

**Maintenance Expenses**

Calculations related to maintenance expenses can be found in [Appendix F](#).

**Existing Expenses**

Work orders from 2014 and 2015 were reviewed to determine recent expenses related to maintenance of the street lighting system. The Village currently spends approximately \$95,000 per year on materials, equipment and labor to maintain the existing street lighting system.

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**Proposed Expenses**

Failure Rates

Failure rates for other municipalities were identified for comparison with the Village’s rates. These failure rates can be found in the table below. The Village’s failure rate for 2013, 2014 & 2015 was identified to be 5.6% in the Street Lighting Program Guidelines. This is similar to the failure rates experienced by the other municipalities. To determine the reduced maintenance costs of LED lighting, a LED failure rate of 1% will be assumed. A lower LED failure rate will result in even more savings.

<b>Municipality</b>	<b>LED Failure Rate</b>	<b>HPS Failure Rate</b>
Kansas DOT	0.2%	10%
Portland, OR	0.5%	6%
Seattle, WA	1.0%	6%
Sunnyvale, CA	0.86%	8%

The number of failures for the retrofit of the existing street lighting system with LED luminaires is calculated to be 11 (1.0% x 1090) per year.

The number of failures for the combined retrofit of existing luminaires and installation of new corridor LED street lighting is calculated to be 20 (1.0% x 1994) per year.

LED Luminaire Replacements

LED luminaires generally do not fail completely at the end of their service life. LED luminaires slowly and continuously reduce their output over time. Because there is no obvious sign of when they reach the end of their useful life, these luminaires should be replaced at the end of their service life. This replacement should be included in the maintenance costs for the lighting system. A twelve year service life will be assumed for the purposed of comparing costs, therefore, 1/10 (10%) of the luminaires will be planed to be replaced.

The number of luminaire replacements required each year to maintain the Retrofit Only LED street lighting system is calculated to be 110 (10% x 1090) per year.

The number of luminaire replacements required each year to maintain the Retrofit and New Corridor LED street lighting system is calculated to be 200 (10% x 1994) per year.

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Expense Calculation

Maintenance expenses will be the sum of replacement of luminaire failures, planned luminaire replacements and other miscellaneous repairs such as knockdowns, blown fuses, photocell replacements, etc.

**Maintenance Expenses – Retrofit Only (Year 1)**

Luminaire Failures	11 ea. @ \$575/ea.	\$6,325
Misc. Repairs		\$20,000
	<b>Total (Year 1):</b>	<b>\$26,325</b>

**Maintenance Expenses – Retrofit Only (Year 10)**

Luminaire Failures	11 ea. @ \$575/ea.	\$6,325
Planned Luminaire Replacements	110 ea. @ \$575/ea	\$63,250
Misc. Repairs		\$20,000
	<b>Total (Year 1):</b>	<b>\$89,575</b>

Note that replacements will not be required for several years after initial installation of LED equipment, as it will have a full service life to expend prior to being replaced.

Also note that this estimate is conservative. As LED technology evolves, service life will increase and the percentage of luminaires to be replaced each year will decrease. The cost of luminaires will also continue to decline and the increased cost line item will reduce to zero.

**Maintenance Expenses – Retrofit and New Corridor Lighting (Year 1)**

Luminaire Failures	20 ea. @ \$575/ea.	\$11,500
Misc. Repairs		\$30,000
	<b>Total:</b>	<b>\$41,500</b>

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**Maintenance Expenses – Retrofit and New Corridor Lighting (Year 10)**

Luminaire Failures	20 ea. @ \$575/ea.	\$11,500
Planned Luminaire Replacements	200 ea. @ \$575/ea	\$115,000
Misc. Repairs		\$30,000
	<b>Total:</b>	<b>\$156,500</b>

**Comparison of Maintenance Expenses**

Expense	Current	Retrofit Only		Retrofit + New Corridor	
		Year 1	Year 10	Year 1	Year 10
Electricity	\$75,000	\$51,100	\$51,100	\$96,700	\$96,700
Maintenance	\$95,000	\$26,325	\$89,575	\$41,500	\$156,500
Total	\$170,000	\$77,425	\$140,675	\$138,200	\$253,200

**Potential Funding Sources**

**Village Capital Improvement Plan**

Consider adding a *Lighting Program* line item to the Village Capital Improvement Plan/budget and identify funding as necessary.

**Northwest Municipal Conference**

The Chicago Metropolitan Agency for Planning (CMAP), in association with the IDOT, administers federal money allocated to the local sub-region council, the Northwest Municipal Conference (NWMC). Mount Prospect is a member of NWMC. NWMC oversees many federal funding sources, such as the Surface Transportation Program (STP), Congestion Mitigation and Air Quality (CMAQ), Illinois Transportation Enhancement Program (ITEP), Illinois Safe Routes to School (SRTS), Highway Safety Improvement Program (HSIP), among others.

The following federal funding sources have been used to construct roadway lighting systems in the past:

**Highway Safety Improvement Program (HSIP)**

HSIP funds may be used to install lighting for locations where serious accidents or fatalities have occurred. Further information can be found on the IDOT website, [here](#).

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The maximum funding level possible is 90% of the cost of street lighting. Funding can be applied, to engineering, construction and construction engineering.

**Illinois Transportation Enhancement Program (ITEP)**

The ITEP program designates funds to be used for the enhancement roadway projects beyond the traditional accommodations for cars, trucks and transit. ITEP funds may be used to pay for 50-80% of the cost of street lighting. Funding can be applied to engineering, construction and construction engineering. The street lighting must be part of a larger project to qualify for funding. Further information can be found in the Illinois Transportation Enhancement Program 2016 Guidelines Manual, found [here](#).

**Surface Transportation Program (STP)**

Lighting projects can be constructed using STP funds; however, IDOT requires that ‘fully documented day/night accident warrants’ must be included in STP funding applications for lighting project. Further information can be found in the NWMC STP Guide, found [here](#). Funding may cover up to 80% of the cost of street lighting during the construction phase. Design and construction engineering are funded at 50%.

**Grants**

The following sources offer grants that may be applied to the installation or retrofit of efficient lighting. With the current financial climate of the State of Illinois, many programs have been suspended or eliminated. The websites below should be checked on a regular basis for updated information.

**Public Sector Energy Efficiency Program by DCEO**

This program provides grants to public sector entities for the installation of eligible energy efficiency measures such as lighting and HVAC. The incentives are available to units of local, state, and federal government, schools, community colleges and universities. More information can be found at the DCEO [website](#). The 2016 cycle has just ended. The 2017 cycle has not been announced yet.

**Illinois Clean Energy Community Foundation**

The Illinois Clean Energy Community Foundation does not currently offer any programs that apply to street lighting, but they have within the last 18 months. More information can be found at this [website](#).

**Database of State Incentives for Renewables & Efficiency (DSIRE)**

The DSIRE website (<http://www.dsireusa.org/>) is a searchable database of incentives and grants related to energy efficiency funded by the U.S. Department of Energy. The interface is very simple, allowing the ability to quickly search by zip code and topic.

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**Energy Service Company**

Energy Service Companies (ESCO) are organizations that specialize in energy efficiency upgrades as a turn-key solution. If desired, the ESCO can analyze the entire life-cycle of an existing system, provide design services, obtain project financing, monitoring, etc. A concern with the ESCO approach to roadway lighting is the ability for the ESCO to obtain IDOT or Cook County.

**Private Financing**

Private financing is obtained from financial institutions, equipment manufacturers and sometimes contractors. Private financing works similar to a car loan – installment payments are created to finance a large purchase such as the installation of a street lighting system. Some financiers allow project costs such as design, installation, project management, energy charges and on-going maintenance to be included in the monthly payment, if desired. When retrofitting a large number of inefficient luminaires, it is common for the reduced monthly energy charges to offset the monthly payment for the luminaire upgrades.

Per discussion with two sources familiar with financing street lighting systems, the process of vetting this type of financing often takes up to one year. This is due to the cautious nature of the lender and the borrower. Actual time for processing the credit application is a few days to a couple of weeks. Our contacts also provided the following information:

**Term**

Standard terms for roadway lighting installations range from 5 to 10 years. Terms of 5 to 6 years are preferred because they typically have better rates.

**Interest Rate**

Current interest rates for roadway lighting installations range from 2 to 5 percent. Rates are influenced by credit rating, amount financed and tax exempt status. Rates are generally fixed for the term.

**Payment**

Payments typical range from \$10 to \$20 per month per thousand dollars financed. This number is highly dependent on the term of the financing. For example, \$1,000,000 financed over 5 years would result in a payment of approximately \$20,000 per month. Payments can be invoiced monthly, quarterly, semi-annual or annual.

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**Fees**

Fees may be incurred, depending on the provider. The maximum known fee reported was “a one-time Documentation Fee of 1%, not to exceed \$25,000”. This fee was billed with the first payment.

**Recommendations**

Should the Village decide to move forward with expansion of the street lighting system, the following recommendations should be discussed before committing to a specific design or technology.

**Determine Program Scope**

The desired extent of corridor lighting desired shall be identified.

**Determine Program Timeline**

A program timeline should be established to complete the identified scope. This will likely be very closely related to project funding.

**Obtain Program Funding**

The Program Scope and Timeline will likely define the funding model for the program. If the scope and timeline of the program requires a significant amount of lighting to be installed in a short time, financing of the lighting installations should be considered. If a slow, methodical approach is preferred, funding the installations through the Village’s capital program should be considered.

**Project Packaging**

Larger projects generally offer a better economy of scale, therefore projects consisting of 50 poles or more are recommended. An annual program may be considered to increase contractor interest. The possibility of additional future work may encourage more aggressive bidding. For smaller budgets, a bi-annual program may be more cost effective than an annual program.

**Design Engineering**

Design engineering should be completed during the summer of the year prior to installation. This will allow ample time for utility coordination, permitting, bidding, contract award, catalog cut review and manufacturing so that construction can be completed as planned.

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**Construction Observation**

The Village should determine if construction observation will be completed in-house or with consultants. If a consultant is to be utilized, an agreement should be in place so that they can participate when required.

**Trial installation(s)**

A trial installation should be considered for testing potential equipment prior to making a Village-wide investment. Luminaire and controls manufacturers would be happy to provide samples for testing and comparison. Multiple options could be installed side by side for easy comparison.

The unlit section of Central Road is an ideal candidate for a trial installation. This section is fairly short, with only 22 poles required. The 22 poles would complete a gap between to illuminated sections of Central Road. The location is near downtown, within walking distance to several existing styles of equipment for comparison. A trial installation would also allow Village staff an opportunity to get first-hand experience with several different manufacturers before committing to anything long-term.

**Luminaire Preferences**

Sample luminaires can be obtained prior to installation so that a hands-on review can be made to observe build quality, installation procedures and adjustability. Recent LED designs can include an adjustable driver, allowing the adjustment of the light output of a luminaire with the twist of a switch. This feature would allow a single luminaire to be suitable for multiple installations, reducing required maintenance inventory.

**Light Color Temperature**

Multiple color temperatures can be installed side by side for comparison.

**Luminaire Manufacturers**

Preferred manufacturer(s) can be identified for future projects, if desired.

**Control Systems**

Controls can be ‘test driven’ to determine if the features available of interest. Current control systems can report outages, energy usage, and day-burning luminaires as well as monitor energy usage and report service life.

**Develop Standard Details and Specifications**

During a trial installation, Village standard details and specifications can be updated or created as necessary to ensure future projects are built to the Village’s requirements. Upon completion of the trial project, a review should be completed to identify required revisions or improvements.

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**Dark-Sky**

**Purpose**

The International Dark-Sky Association (IDA) is an organization that works to prevent and fight light pollution through education and advocacy.

**Website**

The IDA website ([www.darksky.org](http://www.darksky.org)) contains a lot of reference information regarding light pollution and how to reduce it. While much of the information is geared towards residential, architectural and commercial lighting, there is some information to be found regarding roadway lighting.

**Industry Acceptance**

While the cause is noble, support of the IDA among roadway lighting designers is lower than expected. Support is likely low because the goals of IDA are usually already incorporated into the requirements used to design roadway lighting systems, such as the IES RP-8. It is in the nature of an engineer to optimize their design to provide the best quality design possible, including reducing light trespass, glare, excess illumination and excess energy usage. The tone of many articles posted on the IDA website also tend to support the organization’s agenda, instead of an approach where the facts are laid out clearly and conclusions are built from these facts. To be clear, the information provided is not in error, it appears to be presented in a biased nature.

**Model Lighting Ordinance**

In 2011, the IDA and IES published a joint Model Lighting Ordinance (MLO). This document presents a complete document that can be adopted to govern the outdoor lighting found within a municipality. However, the MLO states that IES RP-8 shall be followed for roadway lighting. A brief model street lighting ordinance is included in the MLO. The methodology within the IDA street lighting ordinance is similar to that used for international street lighting. This methodology is significantly different than the IES RP-8 method.

**Recommendations**

It is recommended to not consider adoption of the MLO street lighting ordinance because it does not align with current industry recommended practice, the RP-8. Choosing a different standard could open the Village to unwanted legal responsibility. In addition, the IDA ordinance could not be applied to all street lighting within the Village because IDOT routes would still need to be designed to RP-8 requirements.

Village of Mount Prospect  
 Street Lighting Capital Program  
 Corridor Lighting Evaluation

Adoption of the MLO for non-roadway outdoor lighting could be considered, but is beyond the scope of this report. Perhaps this topic would be best addressed by the building department, as it applies to their day-to-day activities.

**Dark-Sky Community Certification**

The IDA has developed a Dark Sky Places Program to recognize communities and other places that committed to protecting the night sky.

**Designation**

The Dark Sky Place designation is received by completing an application process. Further information can be found on [this](#) webpage.

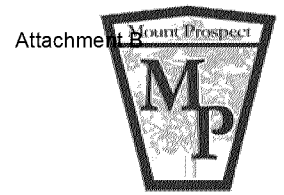
**Key Requirements**

Full requirements can be found [here](#).

- Adopt MLO or similar lighting ordinance
- Adopt a color temperature of 3000° Kelvin or less.
- Commit to bringing Village owned lighting into conformance with the adopted ordinance requirements.
- Require full-cutoff or shield for luminaires with an output over 1,500 lumens.
- Demonstrate community support for the Dark Skies movement.

**Recommendations**

Because roadway lighting is excluded from the MLO, the decision to pursue a Dark-Sky Places designation should not be considered within the context of the street lighting program.



Village of Mount Prospect  
Street Lighting Capital Program  
Corridor Lighting Evaluation

**Appendix A – Luminaire Catalog Cuts**

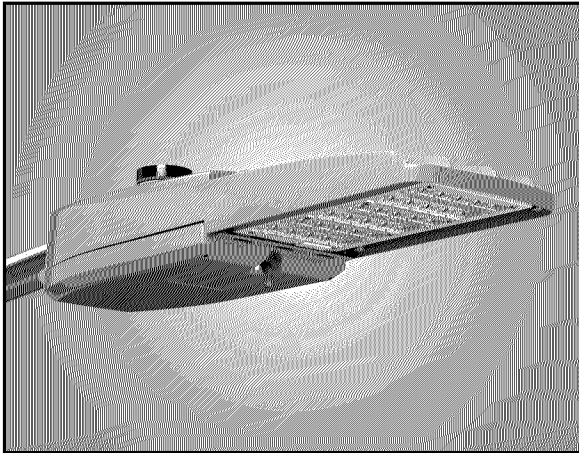


Consistent with LEED® goals & Green Globes™ criteria for light pollution reduction

# Autobahn Series ATB0

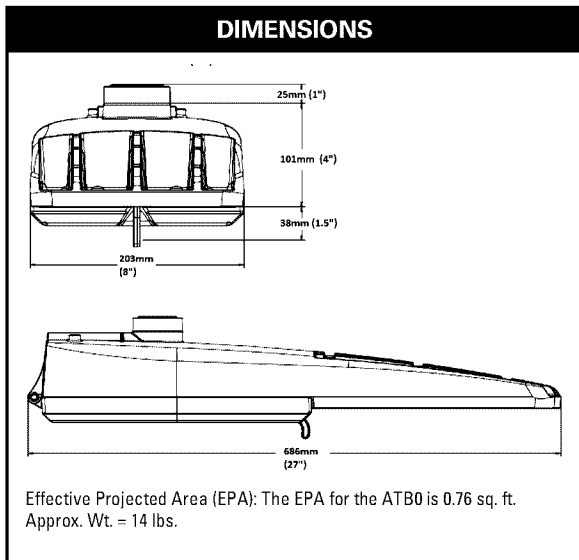
## Roadway Lighting

### PRODUCT OVERVIEW



### Applications:

- Roadways
- Off ramps
- Residential streets
- Parking lots



### Features:

#### OPTICAL

Same Light: Performance is comparable to 70-200W HPS roadway luminaires.

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

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

#### ELECTRICAL

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

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

Robust Surge Protection: Three different surge protection options provide a minimum of IEEE/ANSI C62.41 Category C (10kV/5kA) protection. 20kV/10kA protection is also available.

#### MECHANICAL

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

Rugged die-cast aluminum housing and door are polyester powder-coated for durability and corrosion resistance. Rigorous five-stage pre-treating and painting process yields a finish that achieves a scribe creepage rating of 8 (per ASTM D1654) after over 1000 hours exposure to salt fog chamber (operated per ASTM B117). Optional Enhanced Corrosion Resistant finish (CR) increases the salt spray exposure over 5000 hours.

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

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

#### CONTROLS

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

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

Multi-level dimming available to provide scheduled dimming as specified by the customer.

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

#### STANDARDS

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

Rated for -40°C to 40°C ambient

CSA Certified to U.S. and Canadian standards

Complies with ANSI: C136.2, C136.10, C136.14, C136.31, C136.15, C136.37

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

# Autobahn Series ATB0

## Roadway Lighting

### ORDERING INFORMATION

Example: ATB0 30LEDE10 MVOLT R2

Series	Performance Packages	Voltage	Optics
<b>ATB0</b> Autobahn LED Roadway	<b>20BLEDE53<sup>1</sup></b> 20B Chips, 525mA Driver <b>20BLEDE70</b> 20B Chips, 700mA Driver <b>20BLEDE10</b> 20B Chips, 1050mA Driver <b>20BLEDE13</b> 20B Chips, 1300mA Driver <b>30BLEDE70</b> 30B Chips, 700mA Driver <b>30BLEDE85</b> 30B Chips, 850mA Driver <b>30BLEDE10</b> 30B Chips, 1050mA Driver <b>30BLEDE13</b> 30B Chips, 1300mA Driver <b>30BLEDE15<sup>2</sup></b> 30B Chips, 1500mA Driver	<b>MVOLT</b> Multi-volt, 120-277V <b>347</b> 347V <b>480</b> 480V	<b>R2</b> Roadway Type II <b>R3</b> Roadway Type III <b>R4</b> Roadway Type IV <b>R5</b> Roadway Type V

### Options

#### Color Temperature (CCT)

- (Blank)** 4000K CCT, 70 CRI Min. (Standard)
- 5K** 5000K CCT, 70 CRI Min.

#### Paint

- (Blank)** Gray (Standard)
- BK** Black
- BZ** Bronze
- DDB** Dark Bronze
- GI** Graphite
- WH** White

#### Surge Protection

- Blank** Standard 10kV/5kA SPD
- 20** 20kV/10KA SPD
- MP<sup>2</sup>** MOV Pack
- IL<sup>2</sup>** SPD with Indicator Light

#### Terminal Block

- (Blank)** Terminal Block (Standard)
- T2** Wired to L1 & L2 Positions

#### Misc.

- BL** External Bubble Level
- CR** Enhanced Corrosion Resistant Finish
- HS** House-Side Shield
- NL** Nema Label
- XL** Not CSA Certified

#### Controls

- (Blank)** 3 Pin NEMA Photocontrol Receptacle (Standard)
- P5<sup>3</sup>** 5 Pin Photocontrol Receptacle (Dimmable Driver Included)
- P7<sup>3</sup>** 7 Pin Photocontrol Receptacle (Dimmable Driver Included)
- NR** No Photocontrol Receptacle
- AO<sup>4</sup>** Field Adjustable Output
- DM** 0V-10V Dimmable Driver (Controls by others)
- ML<sup>5,6</sup>** Multi-Level Dimming
- PCSS<sup>2</sup>** Solid State Lighting Photocontrol (120-277V)
- PCLL** Solid State Long Life Photocontrol
- SH** Shorting Cap

#### Packaging

- (Blank)** Single Unit (Standard)
- JP** Job Pack (42/Pallet)

#### Notes

- 1 20BLEDE53 not compatible with the following options: P5, P7, AO, DM, ML.
- 2 Not available in 347 or 480V.
- 3 Not available with DM, ML or NR.
- 4 Not available with DM or ML options.
- 5 Not available with AO, DM, P5 or P7 options.
- 6 Dimming Schedule and light level information required from the customer in order to configure product. Contact Infrastructure Technical Support to proceed.



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**Warranty** Five-year limited warranty. Complete warranty terms located at: [www.acuitybrands.com/CustomerResources/Terms\\_and\\_conditions.aspx](http://www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx)  
 Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.

*Please contact your sales representative for the latest product information.*

# Autobahn Series ATB0

## Roadway Lighting

### PERFORMANCE PACKAGE

Performance Package	Drive Current (mA)	Input Watts	Optic	4000K CCT		LLD @ 25°C	
				Delivered Lumens	Efficacy (LPW)	50k Hours	100k Hours
20B	525	39	R2	4623	119	0.98	0.96
	700	48		5571	116	0.98	0.96
	1000	72		7760	108	0.96	0.92
	1300	88		8990	102	0.95	0.89
	525	39	R3	4635	119	0.98	0.96
	700	48		5598	117	0.98	0.96
	1000	72		7829	109	0.96	0.92
	1300	88		9099	103	0.95	0.89
	525	39	R4	4542	116	0.98	0.96
	700	48		5487	114	0.98	0.96
	1000	72		7653	106	0.96	0.92
	1300	88		8870	101	0.95	0.89
	525	39	R5	4945	127	0.98	0.96
	700	48		5976	125	0.98	0.96
	1000	72		8391	117	0.96	0.92
	1300	88		9759	111	0.95	0.89
30B	700	70	R2	8536	122	0.98	0.96
	850	86		9891	115	0.96	0.92
	1000	104		11806	114	0.96	0.92
	1300	129		13754	107	0.95	0.89
	1500	150		15057	100	0.95	0.89
	700	70	R3	8413	120	0.98	0.96
	850	86		9774	114	0.96	0.92
	1000	104		11639	112	0.96	0.92
	1300	129		13502	105	0.95	0.89
	1500	150		15085	101	0.95	0.89
	700	70	R4	8209	117	0.98	0.96
	850	86		9635	112	0.96	0.92
	1000	104		11392	110	0.96	0.92
	1300	129		13215	102	0.95	0.89
	1500	150		14755	98	0.95	0.89
	700	70	R5	8576	123	0.98	0.96
	850	86		9968	116	0.96	0.92
	1000	104		11847	114	0.96	0.92
1300	129	13766		107	0.95	0.89	
1500	150	15172		101	0.95	0.89	

**Note:** Information shown above is based on nominal system data. Individual fixture performance may vary. Specifications subject to change without notice.

ATB0 LLD Multiplier	15°C	20°C	25°C	30°C	35°C	40°C
	1.02	1.01	1	0.98	0.97	0.95

To calculate the LLD for a temperature other than 25°C, multiply the LLD @ 25°C (shown in the performance package table) by the LLD multiplier for the selected temperature.



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[www.acuitybrands.com/CustomerResources/Terms\\_and\\_conditions.aspx](http://www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx)  
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 All values are design or typical values, measured under laboratory conditions at 25 °C.  
 Specifications subject to change without notice.

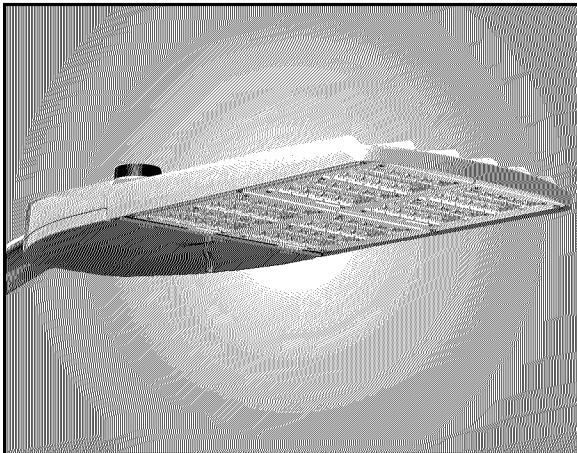
*Please contact your sales representative for the latest product information.*



Consistent with LEED® goals & Green Globes™ criteria for light pollution reduction

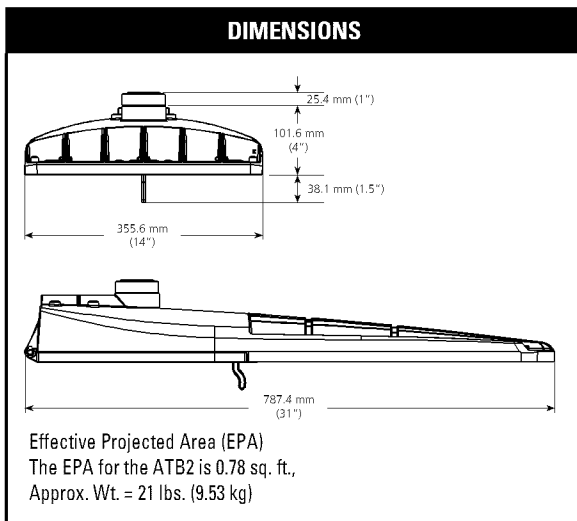
# Autobahn Series ATB2 Roadway Lighting

## PRODUCT OVERVIEW



### Applications:

- Roadways
- Off ramps
- Residential streets
- Parking lots



### Features:

#### OPTICAL

**Same Light:** Performance is comparable to 250-400W HPS roadway luminaires.

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

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

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

#### ELECTRICAL

**Expected Life:** LED light engines are rated >100,000 hours at 25°C, L70.

Electronic driver has an expected life of 100,000 hours at a 25°C ambient.

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

**Robust Surge Protection:** Three different surge protection options provide a minimum of IEEE/ANSI C62.41 Category C (10kV/5kA) protection. 20kV/10kA protection is also available.

#### MECHANICAL

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

Rugged die-cast aluminum housing is polyester powder-coated for durability and corrosion resistance. Rigorous five-stage pre-treating and painting process yields a finish that achieves a scribe creepage rating of 8 (per ASTM D1654) after over 1000 hours exposure to salt fog chamber (operated per ASTM B117) Optional Enhanced Corrosion Resistant finish (CR) increases the salt spray exposure to 5000 hours.

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

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

#### CONTROLS

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

Premium solid state locking sale photocontrol - PCSS (10 year rated life).

Extreme long life sold state locking style photocontrol - PCLL (20 year rated life).

Mult-level dimming available to provide scheduled dimming as specified by the customer.

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

#### STANDARDS

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

Rated for -40°C to 40°C ambient.

CSA Certified to U.S. and Canadian standards

Complies with ANSI: C136.2, C136.10, C136.14, C136.31, C136.15, C136.37

Note: Specifications subject to change without notice.

Autobahn Series – AEL\_0109\_ATB2

# Autobahn Series ATB2

## Roadway Lighting

Attachment 2

### ORDERING INFORMATION

Example: ATB2 40LEDE70 MVOLT R2

Series	Performance Packages	Voltage	Optics
<b>ATB2</b> Autobahn LED Roadway	<b>40BLEDE70</b> 40B Chips, 700mA Driver <b>40BLEDE10</b> 40B Chips, 1050mA Driver <b>40BLEDE13</b> 40B Chips, 1300mA Driver <b>40BLEDE15<sup>1</sup></b> 40B Chips, 1500mA Driver <b>60BLEDE70</b> 60B Chips, 700mA Driver <b>60BLEDE85</b> 60B Chips, 850mA Driver <b>60BLEDE10</b> 60B Chips, 1050mA Driver <b>60BLEDE13</b> 60B Chips, 1300mA Driver <b>80BLEDE70</b> 80B Chips, 700mA Driver <b>80BLEDE85</b> 80B Chips, 850mA Driver <b>80BLEDE10</b> 80B Chips, 1050mA Driver	<b>MVOLT</b> Multi-volt, 120-277V <b>347</b> 347V <b>480</b> 480V	<b>R2</b> Roadway Type II <b>R3</b> Roadway Type III <b>R4</b> Roadway Type IV <b>R5</b> Roadway Type V

#### Options

##### Color Temperature (CCT)

- (Blank)** 4000K CCT, 70 CRI Min. (Standard)
- 5K** 5000K CCT, 70 CRI Min.

##### Paint

- (Blank)** Gray (Standard)
- BK** Black
- BZ** Bronze
- DDB** Dark Bronze
- GI** Graphite
- WH** White

##### Surge Protection

- Blank** Standard 10kV/5kA SPD
- 20** 20kV/10KA SPD
- MP<sup>1</sup>** MOV Pack
- IL<sup>1</sup>** SPD with Indicator Light

##### Terminal Block

- (Blank)** Terminal Block (Standard)
- T2** Wired to L1 & L2 Positions

##### Misc.

- BL** External Bubble Level
- CR** Enhanced Corrosion Resistant Finish
- HS** House-Side Shield
- NL** Nema Label
- XL** Not CSA Certified
- HK** Hingekeepers

##### Controls

- (Blank)** 3 Pin NEMA Photocontrol Receptacle (Standard)
- P5<sup>2</sup>** 5 Pin Photocontrol Receptacle (Dimmable Driver Included)
- P7<sup>2</sup>** 7 Pin Photocontrol Receptacle (Dimmable Driver Included)
- NR** No Photocontrol Receptacle
- AO<sup>2</sup>** Field Adjustable Output
- DM** 0V-10V Dimmable Driver (Controls by others)
- ML<sup>3,4</sup>** Multi-Level Dimming
- PCSS<sup>1</sup>** Solid State Lighting Photocontrol (120-277V)
- PCLL** Solid State Long Life Photocontrol
- SH** Shorting Cap

##### Packaging

- (Blank)** Single Unit (Standard)
- JP** Job Pack (24/Pallet)

##### Notes

1. Not available in 347 or 480V.
2. Not available with DM or ML options.
3. Not available with AO, DM, P5 or P7 options.
4. Dimming schedule and light level information required from the customer in order to configure product. Contact Infrastructure Technical Support to proceed.



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**Warranty** Five-year limited warranty. Complete warranty terms located at: [www.acuitybrands.com/CustomResources/Terms\\_and\\_conditions.aspx](http://www.acuitybrands.com/CustomResources/Terms_and_conditions.aspx)  
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*Please contact your sales representative for the latest product information.*

# Autobahn Series ATB2

## Roadway Lighting

### PERFORMANCE PACKAGE

Performance Package	Drive Current (mA)	Input Watts	Optic	4000K CCT		LLD @ 25°C	
				Delivered Lumens	Efficacy (LPW)	50k Hours	100k Hours
40B	700	91	R2	11266	124	0.98	0.96
	1000	138		15685	114	0.95	0.90
	1300	177		18277	103	0.94	0.88
	1500	204		20590	101	0.91	0.85
	700	91	R3	11160	123	0.98	0.96
	1000	138		15520	112	0.95	0.90
	1300	177		18050	102	0.94	0.88
	1500	204		20036	98	0.91	0.85
	700	91	R4	10775	118	0.98	0.96
	1000	138		15015	109	0.95	0.90
	1300	177		17341	98	0.94	0.88
	1500	204		19458	95	0.91	0.85
	700	91	R5	12097	133	0.98	0.96
	1000	138		16729	121	0.95	0.90
	1300	177		19564	111	0.94	0.88
	1500	204		21678	106	0.91	0.85
60B	700	133	R2	16986	128	0.98	0.96
	850	173		19966	115	0.95	0.90
	1000	208		23710	114	0.95	0.90
	1300	260		27308	105	0.94	0.88
	700	133	R3	17128	129	0.98	0.96
	850	173		20105	116	0.95	0.90
	1000	208		23250	112	0.95	0.90
	1300	260		27477	106	0.94	0.88
	700	133	R4	16516	124	0.98	0.96
	850	173		19429	112	0.95	0.90
	1000	208		22718	109	0.95	0.90
	1300	260		26400	102	0.94	0.88
	700	133	R5	17882	134	0.98	0.96
	850	173		21000	121	0.95	0.90
	1000	208		24673	119	0.95	0.90
	1300	260		28838	111	0.94	0.88
80B	700	180	R2	22528	125	0.98	0.96
	850	224		26394	118	0.95	0.90
	1000	274		30998	113	0.95	0.90
	700	180	R3	22127	123	0.98	0.96
	850	224		25955	116	0.95	0.90
	1000	274		30491	111	0.95	0.90
	700	180	R4	21701	121	0.98	0.96
	850	224		25350	113	0.95	0.90
	1000	274		29567	108	0.95	0.90
	700	180	R5	23799	132	0.98	0.96
	850	224		27851	124	0.95	0.90
	1000	274		32391	118	0.95	0.90

Note: Information shown above is based on nominal system data. Individual fixture performance may vary. Specifications subject to change without notice.

ATB2 LLD Multiplier	15°C	20°C	25°C	30°C	35°C	40°C
	1.02	1.01	1	0.99	0.97	0.96

To calculate the LLD for a temperature other than 25°C, multiply the LLD @ 25°C (shown in the performance package table) by the LLD multiplier for the selected temperature.



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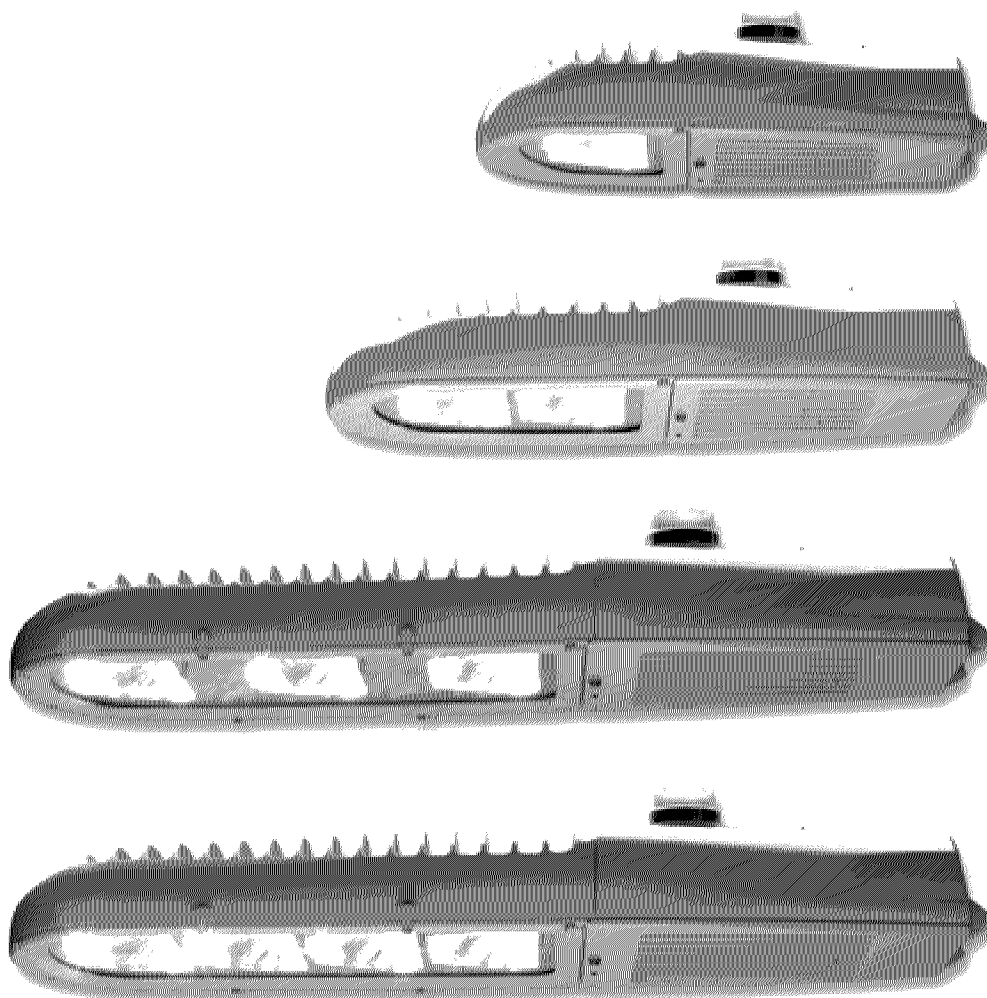
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Please contact your sales representative for the latest product information.

GE  
Lighting

# Evolve™ LED Roadway Lighting

Scalable Specification Grade Cobrahead (ERS1, ERS2, ERS3 & ERS4)



imagination at work

## Product Features

From local to major roadways, the GE Evolve™ LED Roadway Scalable Cobrahead fixtures are changing the way you light your lanes. Preserving the aesthetic look of traditional roadway Cobrahead fixtures, GE balances the technical needs of a sophisticated LED system with the functional demands of an outdoor fixture facing extreme weather hazards. GE's advanced LED optical design offers hundreds of photometric options to meet your precise lighting requirements, while delivering reduced glare and improved light control. The refined thermal management system incorporates a sleek and robust heat sink directly into the fixture to ensure maximum heat transfer and long LED life.

The GE Evolve LED Roadway Scalable Cobrahead offers more than 11 years of reliable service life to significantly reduce maintenance frequency and expense, based on a 50,000 hour life and 12 hours of operation per day.

### Applications

- Designed to meet recommended luminance and illuminance requirements for local to major roadway / street classifications.

### Housing

- Die cast aluminum housing.
- A modern design preserving the aesthetic look of traditional roadway Cobrahead fixtures incorporates the heat sink directly into the unit ensuring maximum heat transfer and long LED life.
- Meets 3G vibration per C136.31-2010
- Power door assembly with removable retention latch.



### LED & Optical Assembly

- Structured LED array for optimized roadway photometric distribution.
- Evolve light engine consisting of scalable reflective technology designed to optimize application efficiency and minimize glare.
- Reverse facing light engine options available.
- Utilizes high brightness LEDs, 70 CRI at 3000K, 4000K & 5000K typical.
- LM-79 tests and reports are performed in accordance with IESNA standards.

### Lumen Maintenance

- Lumen Maintenance and TM21 projections listed below each lumen data table

### Ratings

- /  listed, suitable for wet locations per UL 1598.
- IP66 rated optical enclosure per ANSI C136.25-2009.
- Temperature ratings:
  - 40°C to 50°C for 525mA and 700mA skus except for ERS4 @ 347-480V (-40°C to +45°C)
  - 40°C to +40°C for 1050mA skus
- Upward Light Output Ratio (ULOR) = 0.

### Mounting

- Slipfitter with +/- 5 degree of adjustment for leveling.
- Integral die cast mounting pipe stop feature.
- Wildlife intrusion protection at mounting pipe entry.
- Adjustable for 1.25 in. or 2 in. mounting pipe.

### Finish

- Corrosion resistant polyester powder painted, minimum 2.0 mil. thickness.
- Standard colors: Black and Gray.
- RAL & custom colors available.

### Electrical

- 120-277 volt and 347-480 volt available.
- System power factor is >90% and THD <20%.\*
- Class "A" audible sound rating.
- Surge Protection per ANSI C136.2-2014
  - Standard: 6kV/3kA "Basic" (w/extended C62.41.2 Combination Wave capacity of 120 events)
  - Optional: 10kV/5kA "Enhanced"
  - Optional: 6kV/3kA High Capacity (w/extended C62.41.2 Combination Wave capacity of 5000 events)
- EMI: Title 47 CFR Part 15 Class A.
- Photo electric sensors (PE) available for all voltages.

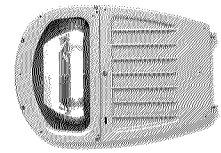
\* System power factor and THD is tested and specified at 120V input and maximum load conditions.

### Ambient Temperature Conversion Table

AMBIENT TEMPERATURE (°C)	INITIAL LUMENS FACTOR	INITIAL WATTS FACTOR
15	1.01	1.01
20	1.01	1.00
25	1.00	1.00
30	0.99	1.00
35	0.99	0.99

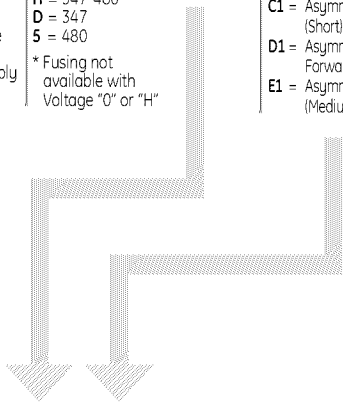
# Ordering Number Logic

## Scalable Specification Grade Cobrahead (ERS1)



### ERS1

PROD. ID	VOLTAGE	OPTICAL CODE	PHOTOMETRIC TYPE	DRIVE CURRENT	LED COLOR TEMP	PE FUNCTION	COLOR	OPTIONS
<b>E</b> = Evolve	<b>0</b> = 120-277*	Product Tier <b>*3</b> = Specification Grade  See Charts for all levels	<b>A1</b> = Extra Narrow Asymmetric	<b>5</b> = 525mA	<b>30</b> = 3000K	<b>1</b> = None	<b>BLCK</b> = Black <b>GRAY</b> = Gray	<b>D</b> = Wired Dimming <b>E</b> = External Bubble Level <b>F</b> = Fusing <b>G</b> = Internal Bubble Level <b>L</b> = Tool-Less Entry <b>R</b> = Additional Secondary Surge Protection Device <b>T</b> = GE Energy Extreme Surge Protection per IEEE/ANSI C62.41.2-2002. - Rating 1 - 10kV/5kA Location Category (120 events). - Rating 2 - 6kV/3kA Location Category C-Low (5000 events). <b>XXX</b> = Special Options
<b>R</b> = Roadway	<b>1</b> = 120		<b>B1</b> = Narrow Asymmetric (Medium)	<b>7</b> = 700mA	<b>40</b> = 4000K	<b>2</b> = PE Receptacle		
<b>S</b> = Scalable	<b>2</b> = 208		<b>C1</b> = Asymmetric (Short)	<b>1</b> = 1050mA	<b>50</b> = 5000K*	<b>4</b> = PE Receptacle & Shorting Cap		
<b>1</b> = Single Module Optical Assembly	<b>3</b> = 240		<b>D1</b> = Asymmetric Forward		<b>NOTE:</b> For 1050mA drive current, nominal color temperature (CCT) = 5300K	<b>5</b> = PE Receptacle & ANSI C136.1 PE Control		
	<b>4</b> = 277		<b>E1</b> = Asymmetric (Medium)			<b>A</b> = ANSI C136.41-7-pin Dimming Receptacle	<b>D</b> = ANSI C136.41-7-pin Dimming Receptacle with Shorting Cap	
	<b>H</b> = 347-480*							
	<b>D</b> = 347							
	<b>5</b> = 480							
	* Fusing not available with Voltage "0" or "H"							



525 mA															
PRODUCT ID	OPTICAL CODE	PHOTOMETRIC TYPE	DRIVE CURRENT	TYPICAL SYSTEM WATTAGE		TYPICAL INITIAL LUMENS		BUG RATING		IES FILE NUMBERS		IES FILE NUMBERS		IES FILE NUMBERS	
				120-277V	347-480V	3000K	4000K & 5000K	3000K	4000K & 5000K	120-277V	3000K	120-277V	4000K	120-277V	5000K
ERS1	23	A1	525mA	31	34	2300	2700	1-0-1	1-0-1	ERS1_23A1530	-120-277V.ies	ERS1_23A1540	-120-277V.ies	ERS1_23A1550	-120-277V.ies
ERS1	A3		525mA	45	50	3400	4000	1-0-1	1-0-1	ERS1_A3A1530	-120-277V.ies	ERS1_A3A1540	-120-277V.ies	ERS1_A3A1550	-120-277V.ies
ERS1	B3		525mA	60	66	4500	5400	2-0-1	2-0-1	ERS1_B3A1530	-120-277V.ies	ERS1_B3A1540	-120-277V.ies	ERS1_B3A1550	-120-277V.ies
ERS1	C3		525mA	73	80	5500	6600	2-0-1	2-0-2	ERS1_C3A1530	-120-277V.ies	ERS1_C3A1540	-120-277V.ies	ERS1_C3A1550	-120-277V.ies
ERS1	23	B1	525mA	31	34	2300	2800	1-0-1	1-0-1	ERS1_23B1530	-120-277V.ies	ERS1_23B1540	-120-277V.ies	ERS1_23B1550	-120-277V.ies
ERS1	A3		525mA	45	50	3500	4100	1-0-1	1-0-1	ERS1_A3B1530	-120-277V.ies	ERS1_A3B1540	-120-277V.ies	ERS1_A3B1550	-120-277V.ies
ERS1	B3		525mA	60	66	4600	5500	1-0-1	2-0-1	ERS1_B3B1530	-120-277V.ies	ERS1_B3B1540	-120-277V.ies	ERS1_B3B1550	-120-277V.ies
ERS1	C3		525mA	73	80	5600	6800	2-0-1	2-0-1	ERS1_C3B1530	-120-277V.ies	ERS1_C3B1540	-120-277V.ies	ERS1_C3B1550	-120-277V.ies
ERS1	23	C1	525mA	31	34	2300	2800	1-0-1	1-0-1	ERS1_23C1530	-120-277V.ies	ERS1_23C1540	-120-277V.ies	ERS1_23C1550	-120-277V.ies
ERS1	A3		525mA	45	50	3500	4100	1-0-1	1-0-1	ERS1_A3C1530	-120-277V.ies	ERS1_A3C1540	-120-277V.ies	ERS1_A3C1550	-120-277V.ies
ERS1	B3		525mA	60	66	4600	5500	1-0-1	2-0-1	ERS1_B3C1530	-120-277V.ies	ERS1_B3C1540	-120-277V.ies	ERS1_B3C1550	-120-277V.ies
ERS1	C3		525mA	73	80	5600	6800	2-0-1	2-0-1	ERS1_C3C1530	-120-277V.ies	ERS1_C3C1540	-120-277V.ies	ERS1_C3C1550	-120-277V.ies
ERS1	23	D1	525mA	31	34	2300	2700	1-0-1	1-0-1	ERS1_23D1530	-120-277V.ies	ERS1_23D1540	-120-277V.ies	ERS1_23D1550	-120-277V.ies
ERS1	A3		525mA	45	50	3400	4000	1-0-1	1-0-1	ERS1_A3D1530	-120-277V.ies	ERS1_A3D1540	-120-277V.ies	ERS1_A3D1550	-120-277V.ies
ERS1	B3		525mA	60	66	4500	5400	1-0-1	1-0-1	ERS1_B3D1530	-120-277V.ies	ERS1_B3D1540	-120-277V.ies	ERS1_B3D1550	-120-277V.ies
ERS1	C3		525mA	73	80	5500	6600	1-0-1	2-0-1	ERS1_C3D1530	-120-277V.ies	ERS1_C3D1540	-120-277V.ies	ERS1_C3D1550	-120-277V.ies
ERS1	23	E1	525mA	31	34	2300	2800	1-0-0	1-0-1	ERS1_23E1530	-120-277V.ies	ERS1_23E1540	-120-277V.ies	ERS1_23E1550	-120-277V.ies
ERS1	A3		525mA	45	50	3500	4100	1-0-1	1-0-1	ERS1_A3E1530	-120-277V.ies	ERS1_A3E1540	-120-277V.ies	ERS1_A3E1550	-120-277V.ies
ERS1	B3		525mA	60	66	4600	5500	1-0-1	2-0-1	ERS1_B3E1530	-120-277V.ies	ERS1_B3E1540	-120-277V.ies	ERS1_B3E1550	-120-277V.ies
ERS1	C3		525mA	73	80	5600	6800	2-0-1	2-0-1	ERS1_C3E1530	-120-277V.ies	ERS1_C3E1540	-120-277V.ies	ERS1_C3E1550	-120-277V.ies

**NOTES:**

- Max Operating Ambient 50° C
- Some 347-480 Not DLC Listed (Contact Manufacturer)

### Lumen Maintenance

- Projected L92 (10K) ≥ 50,000 at Ta 25C
  - Projected L70 (10K) > 100,000 at Ta 25C
- Based on 10,000h LM-80 data for Nichia 219B SQETMLH17005

Scalable Specification Grade Cobrahead (ERS1)

525 mA															
PRODUCT ID	OPTICAL CODE	PHOTOMETRIC TYPE	DRIVE CURRENT	TYPICAL SYSTEM WATTAGE		TYPICAL INITIAL LUMENS		BUG RATING		IES FILE NUMBERS		IES FILE NUMBERS		IES FILE NUMBERS	
				120-277V	347-480V	3000K	4000K & 5000K	3000K	4000K & 5000K	347-480V 3000K	347-480V 4000K	347-480V 5000K			
ERS1	23	A1	525mA	31	34	2300	2700	1-0-1	1-0-1	ERS1_23A1530	347-480V.ies	ERS1_23A1540	347-480V.ies	ERS1_23A1550	347-480V.ies
ERS1	A3		525mA	45	50	3400	4000	1-0-1	1-0-1	ERS1_A3A1530	347-480V.ies	ERS1_A3A1540	347-480V.ies	ERS1_A3A1550	347-480V.ies
ERS1	B3		525mA	60	66	4500	5400	2-0-1	2-0-1	ERS1_B3A1530	347-480V.ies	ERS1_B3A1540	347-480V.ies	ERS1_B3A1550	347-480V.ies
ERS1	C3		525mA	73	80	5500	6600	2-0-1	2-0-2	ERS1_C3A1530	347-480V.ies	ERS1_C3A1540	347-480V.ies	ERS1_C3A1550	347-480V.ies
ERS1	23	B1	525mA	31	34	2300	2800	1-0-1	1-0-1	ERS1_23B1530	347-480V.ies	ERS1_23B1540	347-480V.ies	ERS1_23B1550	347-480V.ies
ERS1	A3		525mA	45	50	3500	4100	1-0-1	1-0-1	ERS1_A3B1530	347-480V.ies	ERS1_A3B1540	347-480V.ies	ERS1_A3B1550	347-480V.ies
ERS1	B3		525mA	60	66	4600	5500	1-0-1	2-0-1	ERS1_B3B1530	347-480V.ies	ERS1_B3B1540	347-480V.ies	ERS1_B3B1550	347-480V.ies
ERS1	C3		525mA	73	80	5600	6800	2-0-1	2-0-1	ERS1_C3B1530	347-480V.ies	ERS1_C3B1540	347-480V.ies	ERS1_C3B1550	347-480V.ies
ERS1	23	C1	525mA	31	34	2300	2800	1-0-1	1-0-1	ERS1_23C1530	347-480V.ies	ERS1_23C1540	347-480V.ies	ERS1_23C1550	347-480V.ies
ERS1	A3		525mA	45	50	3500	4100	1-0-1	1-0-1	ERS1_A3C1530	347-480V.ies	ERS1_A3C1540	347-480V.ies	ERS1_A3C1550	347-480V.ies
ERS1	B3		525mA	60	66	4600	5500	1-0-1	2-0-1	ERS1_B3C1530	347-480V.ies	ERS1_B3C1540	347-480V.ies	ERS1_B3C1550	347-480V.ies
ERS1	C3		525mA	73	80	5600	6800	2-0-1	2-0-1	ERS1_C3C1530	347-480V.ies	ERS1_C3C1540	347-480V.ies	ERS1_C3C1550	347-480V.ies
ERS1	23	D1	525mA	31	34	2300	2700	1-0-1	1-0-1	ERS1_23D1530	347-480V.ies	ERS1_23D1540	347-480V.ies	ERS1_23D1550	347-480V.ies
ERS1	A3		525mA	45	50	3400	4000	1-0-1	1-0-1	ERS1_A3D1530	347-480V.ies	ERS1_A3D1540	347-480V.ies	ERS1_A3D1550	347-480V.ies
ERS1	B3		525mA	60	66	4500	5400	1-0-1	1-0-1	ERS1_B3D1530	347-480V.ies	ERS1_B3D1540	347-480V.ies	ERS1_B3D1550	347-480V.ies
ERS1	C3		525mA	73	80	5500	6600	1-0-1	2-0-1	ERS1_C3D1530	347-480V.ies	ERS1_C3D1540	347-480V.ies	ERS1_C3D1550	347-480V.ies
ERS1	23	E1	525mA	31	34	2300	2800	1-0-0	1-0-1	ERS1_23E1530	347-480V.ies	ERS1_23E1540	347-480V.ies	ERS1_23E1550	347-480V.ies
ERS1	A3		525mA	45	50	3500	4100	1-0-1	1-0-1	ERS1_A3E1530	347-480V.ies	ERS1_A3E1540	347-480V.ies	ERS1_A3E1550	347-480V.ies
ERS1	B3		525mA	60	66	4600	5500	1-0-1	2-0-1	ERS1_B3E1530	347-480V.ies	ERS1_B3E1540	347-480V.ies	ERS1_B3E1550	347-480V.ies
ERS1	C3		525mA	73	80	5600	6800	2-0-1	2-0-1	ERS1_C3E1530	347-480V.ies	ERS1_C3E1540	347-480V.ies	ERS1_C3E1550	347-480V.ies

700 mA															
PRODUCT ID	OPTICAL CODE	PHOTOMETRIC TYPE	DRIVE CURRENT	TYPICAL SYSTEM WATTAGE		TYPICAL INITIAL LUMENS		BUG RATING		IES FILE NUMBERS		IES FILE NUMBERS		IES FILE NUMBERS	
				120-277V	3000K	4000K & 5000K	3000K	4000K & 5000K	120-277V 3000K	120-277V 4000K	120-277V 5000K				
ERS1	23	A1	700mA	41	2860	3400	1-0-1	1-0-1	ERS1_23A1730	-120-277V.ies	ERS1_23A1740	-120-277V.ies	ERS1_23A1750	-120-277V.ies	
ERS1	A3		700mA	60	4200	5000	1-0-1	2-0-1	ERS1_A3A1730	-120-277V.ies	ERS1_A3A1740	-120-277V.ies	ERS1_A3A1750	-120-277V.ies	
ERS1	B3		700mA	78	5500	6600	2-0-1	2-0-2	ERS1_B3A1730	-120-277V.ies	ERS1_B3A1740	-120-277V.ies	ERS1_B3A1750	-120-277V.ies	
ERS1	C3		700mA	95	6700	8000	2-0-2	2-0-2	ERS1_C3A1730	-120-277V.ies	ERS1_C3A1740	-120-277V.ies	ERS1_C3A1750	-120-277V.ies	
ERS1	23	B1	700mA	41	2900	3500	1-0-1	1-0-1	ERS1_23B1730	-120-277V.ies	ERS1_23B1740	-120-277V.ies	ERS1_23B1750	-120-277V.ies	
ERS1	A3		700mA	60	4300	5100	1-0-1	2-0-1	ERS1_A3B1730	-120-277V.ies	ERS1_A3B1740	-120-277V.ies	ERS1_A3B1750	-120-277V.ies	
ERS1	B3		700mA	78	5600	6800	2-0-1	2-0-1	ERS1_B3B1730	-120-277V.ies	ERS1_B3B1740	-120-277V.ies	ERS1_B3B1750	-120-277V.ies	
ERS1	C3		700mA	95	6800	8200	2-0-1	2-0-1	ERS1_C3B1730	-120-277V.ies	ERS1_C3B1740	-120-277V.ies	ERS1_C3B1750	-120-277V.ies	
ERS1	23	C1	700mA	41	2900	3500	1-0-1	1-0-1	ERS1_23C1730	-120-277V.ies	ERS1_23C1740	-120-277V.ies	ERS1_23C1750	-120-277V.ies	
ERS1	A3		700mA	60	4300	5100	1-0-1	2-0-1	ERS1_A3C1730	-120-277V.ies	ERS1_A3C1740	-120-277V.ies	ERS1_A3C1750	-120-277V.ies	
ERS1	B3		700mA	78	5600	6800	2-0-1	2-0-1	ERS1_B3C1730	-120-277V.ies	ERS1_B3C1740	-120-277V.ies	ERS1_B3C1750	-120-277V.ies	
ERS1	C3		700mA	95	6800	8200	2-0-1	2-0-1	ERS1_C3C1730	-120-277V.ies	ERS1_C3C1740	-120-277V.ies	ERS1_C3C1750	-120-277V.ies	
ERS1	23	D1	700mA	41	2860	3400	1-0-1	1-0-1	ERS1_23D1730	-120-277V.ies	ERS1_23D1740	-120-277V.ies	ERS1_23D1750	-120-277V.ies	
ERS1	A3		700mA	60	4200	5000	1-0-1	1-0-1	ERS1_A3D1730	-120-277V.ies	ERS1_A3D1740	-120-277V.ies	ERS1_A3D1750	-120-277V.ies	
ERS1	B3		700mA	78	5500	6600	1-0-1	2-0-1	ERS1_B3D1730	-120-277V.ies	ERS1_B3D1740	-120-277V.ies	ERS1_B3D1750	-120-277V.ies	
ERS1	C3		700mA	95	6700	8000	2-0-1	2-0-1	ERS1_C3D1730	-120-277V.ies	ERS1_C3D1740	-120-277V.ies	ERS1_C3D1750	-120-277V.ies	
ERS1	23	E1	700mA	41	2900	3500	1-0-1	1-0-1	ERS1_23E1730	-120-277V.ies	ERS1_23E1740	-120-277V.ies	ERS1_23E1750	-120-277V.ies	
ERS1	A3		700mA	60	4300	5100	1-0-1	2-0-1	ERS1_A3E1730	-120-277V.ies	ERS1_A3E1740	-120-277V.ies	ERS1_A3E1750	-120-277V.ies	
ERS1	B3		700mA	78	5600	6800	2-0-1	2-0-1	ERS1_B3E1730	-120-277V.ies	ERS1_B3E1740	-120-277V.ies	ERS1_B3E1750	-120-277V.ies	
ERS1	C3		700mA	95	6800	8200	2-0-1	2-0-1	ERS1_C3E1730	-120-277V.ies	ERS1_C3E1740	-120-277V.ies	ERS1_C3E1750	-120-277V.ies	

NOTES:

- Max Operating Ambient 50° C
- 347-480V Not Available in 700mA & 1050mA
- For T Option (Contact Manufacturer)

Lumen Maintenance

- Projected L91 (10K) ≥ 50,000 at Ta 25C
  - Projected L70 (10K) > 100,000 at Ta 25C
- Based on 10,000h LM-80 data for Nichia 219B SQETMLH17005

## Scalable Specification Grade Cobrahead (ERS1)

1050 mA															
PRODUCT ID	OPTICAL CODE	PHOTOMETRIC TYPE	DRIVE CURRENT	TYPICAL SYSTEM WATTAGE		TYPICAL INITIAL LUMENS		BUG RATING		IES FILE NUMBERS		IES FILE NUMBERS		IES FILE NUMBERS	
				120-277V	3000K	4000K & 5000K	3000K	4000K & 5000K	120-277V 3000K	120-277V 4000K	120-277V 5000K				
ERS1	23	A1	1050mA	64	3800	4600	1-01	2-0-1	ERS1_23A1130	-120-277V.ies	ERS1_23A1140	-120-277V.ies	ERS1_23A1150	-120-277V.ies	
ERS1	A3		1050mA	90	5500	6600	2-01	2-0-2	ERS1_A3A1130	-120-277V.ies	ERS1_A3A1140	-120-277V.ies	ERS1_A3A1150	-120-277V.ies	
ERS1	B3		1050mA	117	7200	8700	2-02	2-0-2	ERS1_B3A1130	-120-277V.ies	ERS1_B3A1140	-120-277V.ies	ERS1_B3A1150	-120-277V.ies	
ERS1	C3		1050mA	143	8900	10700	3-02	3-0-2	ERS1_C3A1130	-120-277V.ies	ERS1_C3A1140	-120-277V.ies	ERS1_C3A1150	-120-277V.ies	
ERS1	23	B1	1050mA	64	3900	4700	1-01	1-0-1	ERS1_23B1130	-120-277V.ies	ERS1_23B1140	-120-277V.ies	ERS1_23B1150	-120-277V.ies	
ERS1	A3		1050mA	90	5700	6800	2-01	2-0-1	ERS1_A3B1130	-120-277V.ies	ERS1_A3B1140	-120-277V.ies	ERS1_A3B1150	-120-277V.ies	
ERS1	B3		1050mA	117	7400	8900	2-01	2-0-1	ERS1_B3B1130	-120-277V.ies	ERS1_B3B1140	-120-277V.ies	ERS1_B3B1150	-120-277V.ies	
ERS1	C3		1050mA	143	9100	10900	2-0-1	3-0-2	ERS1_C3B1130	-120-277V.ies	ERS1_C3B1140	-120-277V.ies	ERS1_C3B1150	-120-277V.ies	
ERS1	23	C1	1050mA	64	3900	4700	1-0-1	1-0-1	ERS1_23C1130	-120-277V.ies	ERS1_23C1140	-120-277V.ies	ERS1_23C1150	-120-277V.ies	
ERS1	A3		1050mA	90	5700	6800	2-0-1	2-0-1	ERS1_A3C1130	-120-277V.ies	ERS1_A3C1140	-120-277V.ies	ERS1_A3C1150	-120-277V.ies	
ERS1	B3		1050mA	117	7400	8900	2-0-1	2-0-1	ERS1_B3C1130	-120-277V.ies	ERS1_B3C1140	-120-277V.ies	ERS1_B3C1150	-120-277V.ies	
ERS1	C3		1050mA	143	9100	10900	2-0-1	3-0-2	ERS1_C3C1130	-120-277V.ies	ERS1_C3C1140	-120-277V.ies	ERS1_C3C1150	-120-277V.ies	
ERS1	23	D1	1050mA	64	3800	4600	1-0-1	1-0-1	ERS1_23D1130	-120-277V.ies	ERS1_23D1140	-120-277V.ies	ERS1_23D1150	-120-277V.ies	
ERS1	A3		1050mA	90	5500	6600	1-0-1	2-0-1	ERS1_A3D1130	-120-277V.ies	ERS1_A3D1140	-120-277V.ies	ERS1_A3D1150	-120-277V.ies	
ERS1	B3		1050mA	117	7200	8700	2-0-1	2-0-2	ERS1_B3D1130	-120-277V.ies	ERS1_B3D1140	-120-277V.ies	ERS1_B3D1150	-120-277V.ies	
ERS1	C3		1050mA	143	8900	10700	2-0-2	2-0-2	ERS1_C3D1130	-120-277V.ies	ERS1_C3D1140	-120-277V.ies	ERS1_C3D1150	-120-277V.ies	
ERS1	23	E1	1050mA	64	3900	4700	1-0-1	1-0-1	ERS1_23E1130	-120-277V.ies	ERS1_23E1140	-120-277V.ies	ERS1_23E1150	-120-277V.ies	
ERS1	A3		1050mA	90	5700	6800	2-0-1	2-0-1	ERS1_A3E1130	-120-277V.ies	ERS1_A3E1140	-120-277V.ies	ERS1_A3E1150	-120-277V.ies	
ERS1	B3		1050mA	117	7400	8900	2-0-1	2-0-1	ERS1_B3E1130	-120-277V.ies	ERS1_B3E1140	-120-277V.ies	ERS1_B3E1150	-120-277V.ies	
ERS1	C3		1050mA	143	9100	10900	2-0-2	3-0-2	ERS1_C3E1130	-120-277V.ies	ERS1_C3E1140	-120-277V.ies	ERS1_C3E1150	-120-277V.ies	

## NOTES:

- Max Operating Ambient 40° C
- 347-480V Not Available in 700mA & 1050mA
- T Option Not Available
- For 1050mA Drive Current, Nominal Color Temperature (CCT) = 5300K

## Lumen Maintenance

- Projected L88 (10K) ≥ 50,000 at Ta 25C
  - Projected L70 (10K) > 100,000 at Ta 25C
- Based on 10,000h LM-80 data for Nichia 219B SQETMLH17005

# Photometrics

## Scalable Specification Grade Cobrahead (ERS1)

ISO Plot

Grid Distance in Units of Mounting Height at 30' Initial Footcandle Values at Grade

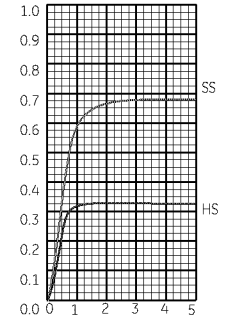
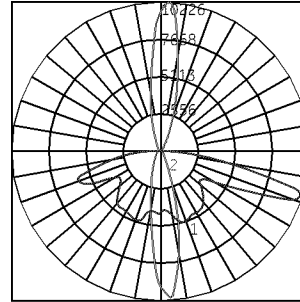
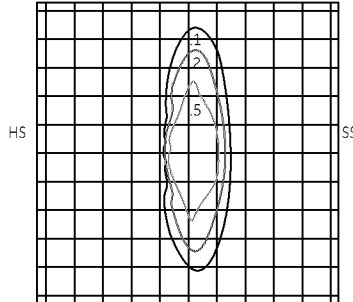
Polar Curve

Polar Trace Vertical and Horizontal Plane through Horizontal Angle of Maximum Candlepower

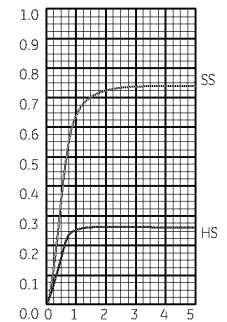
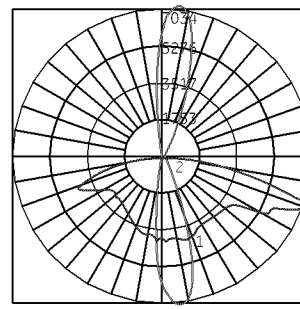
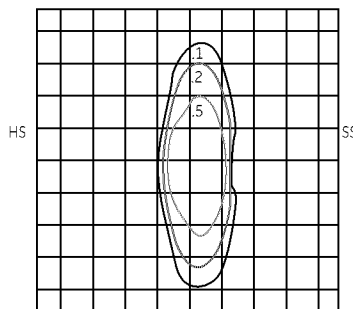
CU Graph

Coefficients of Utilization Street Width / Mounting Height

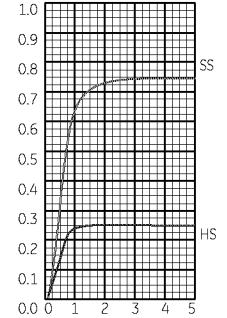
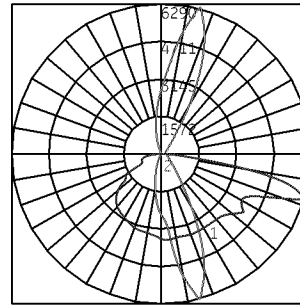
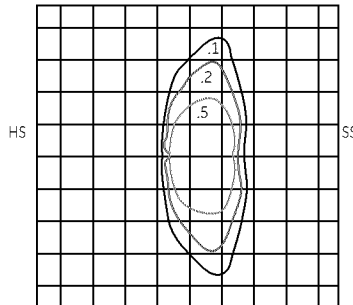
ERS1  
Extra Narrow Asymmetric  
(C3A1)  
10700 Lumens  
5000K  
ERS1\_C3A1150\_\_\_\_-120-277V.ies



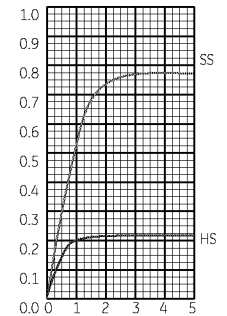
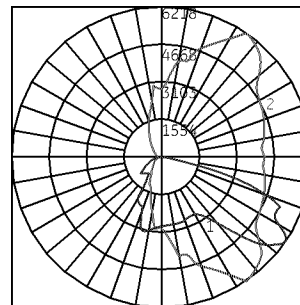
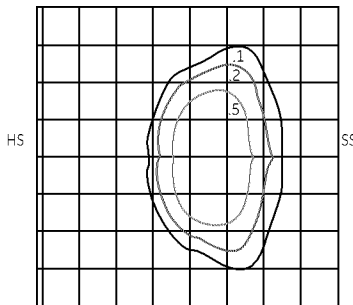
ERS1  
Narrow Asymmetric Medium  
(C3B1)  
10900 Lumens  
5000K  
ERS1\_C3B1150\_\_\_\_-120-277V.ies



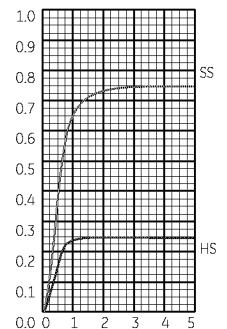
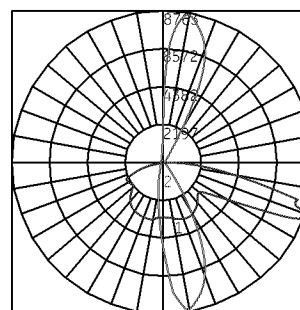
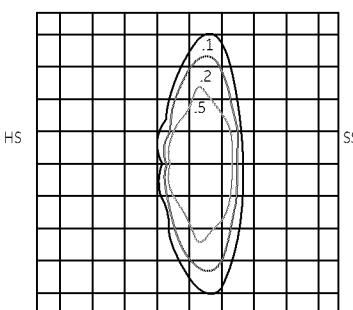
ERS1  
Asymmetric Short  
(C3C1)  
10900 Lumens  
5000K  
ERS1\_C3C1150\_\_\_\_-120-277V.ies



ERS1  
Asymmetric Forward  
(C3D1)  
10700 Lumens  
5000K  
ERS1\_C3D1150\_\_\_\_-120-277V.ies

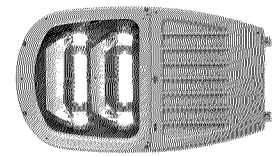


ERS1  
Asymmetric Medium  
(C3E1)  
10900 Lumens  
5000K  
ERS1\_C3E1150\_\_\_\_-120-277V.ies



# Ordering Number Logic

## Scalable Specification Grade Cobrahead (ERS2)



### ERS2

PROD. ID	VOLTAGE	OPTICAL CODE	PHOTOMETRIC TYPE	DRIVE CURRENT	LED COLOR TEMP	PE FUNCTION	COLOR	OPTIONS
<b>E</b> = Evolve	<b>0</b> = 120-277*	Product Tier <b>*3</b> = Specification Grade  See Charts for all levels	<b>A1</b> = Extra Narrow Asymmetric <b>B1</b> = Narrow Asymmetric (Medium) <b>C1</b> = Asymmetric (Short) <b>D1</b> = Asymmetric Forward <b>E1</b> = Asymmetric (Medium)	<b>5</b> = 525mA	<b>30</b> = 3000K <b>40</b> = 4000K <b>50</b> = 5000K*  <b>NOTE:</b> For 1050mA drive current, nominal color temperature (CCT) = 5300K	<b>1</b> = None <b>2</b> = PE Receptacle <b>4</b> = PE Receptacle & Shorting Cap <b>5</b> = PE Receptacle & ANSI C136.1 PE Control <b>A</b> = ANSI C136.41-7-pin Dimming Receptacle <b>D</b> = ANSI C136.41-7-pin Dimming Receptacle with Shorting Cap	<b>BLCK</b> = Black <b>GRAY</b> = Gray	<b>D</b> = Wired Dimming <b>E</b> = External Bubble Level <b>F</b> = Fusing <b>G</b> = Internal Bubble Level <b>L</b> = Tool-Less Entry <b>R</b> = Additional Secondary Surge Protection Device <b>T</b> = GE Energy Extreme Surge Protection per IEEE/ANSI C62.41.2-2002. - Rating 1 - 10kV/5kA Location Category (120 events). - Rating 2 - 6kV/3kA Location Category C-Low (5000 events). <b>XXX</b> = Special Options
<b>R</b> = Roadway	<b>1</b> = 120			<b>7</b> = 700mA				
<b>S</b> = Scalable	<b>2</b> = 208			<b>1</b> = 1050mA				
	<b>3</b> = 240							
	<b>4</b> = 277							
<b>2</b> = Double Module Optical Assembly	<b>H</b> = 347-480*							
	<b>D</b> = 347							
	<b>5</b> = 480							
	* Fusing not available with Voltage "0" or "H"							

525 mA		TYPICAL SYSTEM WATTAGE		TYPICAL INITIAL LUMENS		BUG RATING		IES FILE NUMBERS				
PRODUCT ID	OPTICAL CODE	PHOTOMETRIC TYPE	DRIVE CURRENT	120-277V	347-480V	3000K	4000K & 5000K	3000K	4000K & 5000K	120-277V 3000K	120-277V 4000K	120-277V 5000K
ERS2	D3	A1	525mA	88	97	6700	8000	2-0-2	2-0-2	ERS2_D3A1530_-120-277V.IES	ERS2_D3A1540_-120-277V.IES	ERS2_D3A1550_-120-277V.IES
ERS2	E3		525mA	99	109	7500	9100	2-0-2	3-0-2	ERS2_E3A1530_-120-277V.IES	ERS2_E3A1540_-120-277V.IES	ERS2_E3A1550_-120-277V.IES
ERS2	F3		525mA	112	123	8600	10300	2-0-2	3-0-2	ERS2_F3A1530_-120-277V.IES	ERS2_F3A1540_-120-277V.IES	ERS2_F3A1550_-120-277V.IES
ERS2	G3		525mA	125	138	9600	11500	3-0-2	3-0-2	ERS2_G3A1530_-120-277V.IES	ERS2_G3A1540_-120-277V.IES	ERS2_G3A1550_-120-277V.IES
ERS2	H3		525mA	138	152	10600	12700	3-0-2	3-0-3	ERS2_H3A1530_-120-277V.IES	ERS2_H3A1540_-120-277V.IES	ERS2_H3A1550_-120-277V.IES
ERS2	D3	B1	525mA	88	97	6900	8200	2-0-1	2-0-1	ERS2_D3B1530_-120-277V.IES	ERS2_D3B1540_-120-277V.IES	ERS2_D3B1550_-120-277V.IES
ERS2	E3		525mA	99	109	7700	9300	2-0-1	2-0-1	ERS2_E3B1530_-120-277V.IES	ERS2_E3B1540_-120-277V.IES	ERS2_E3B1550_-120-277V.IES
ERS2	E3		525mA	112	123	8800	10600	2-0-1	3-0-2	ERS2_F3B1530_-120-277V.IES	ERS2_F3B1540_-120-277V.IES	ERS2_F3B1550_-120-277V.IES
ERS2	G3		525mA	125	138	9800	11800	2-0-1	3-0-2	ERS2_G3B1530_-120-277V.IES	ERS2_G3B1540_-120-277V.IES	ERS2_G3B1550_-120-277V.IES
ERS2	H3		525mA	138	152	10800	13000	3-0-2	3-0-2	ERS2_H3B1530_-120-277V.IES	ERS2_H3B1540_-120-277V.IES	ERS2_H3B1550_-120-277V.IES
ERS2	D3	C1	525mA	88	97	6900	8200	2-0-1	2-0-1	ERS2_D3C1530_-120-277V.IES	ERS2_D3C1540_-120-277V.IES	ERS2_D3C1550_-120-277V.IES
ERS2	E3		525mA	99	109	7700	9300	2-0-1	2-0-1	ERS2_E3C1530_-120-277V.IES	ERS2_E3C1540_-120-277V.IES	ERS2_E3C1550_-120-277V.IES
ERS2	F3		525mA	112	123	8800	10600	2-0-1	3-0-1	ERS2_F3C1530_-120-277V.IES	ERS2_F3C1540_-120-277V.IES	ERS2_F3C1550_-120-277V.IES
ERS2	G3		525mA	125	138	9800	11800	2-0-1	3-0-2	ERS2_G3C1530_-120-277V.IES	ERS2_G3C1540_-120-277V.IES	ERS2_G3C1550_-120-277V.IES
ERS2	H3		525mA	138	152	10800	13000	3-0-2	3-0-2	ERS2_H3C1530_-120-277V.IES	ERS2_H3C1540_-120-277V.IES	ERS2_H3C1550_-120-277V.IES
ERS2	D3	D1	525mA	88	97	6700	8000	2-0-1	2-0-1	ERS2_D3D1530_-120-277V.IES	ERS2_D3D1540_-120-277V.IES	ERS2_D3D1550_-120-277V.IES
ERS2	E3		525mA	99	109	7500	9100	2-0-1	2-0-2	ERS2_E3D1530_-120-277V.IES	ERS2_E3D1540_-120-277V.IES	ERS2_E3D1550_-120-277V.IES
ERS2	F3		525mA	112	123	8600	10300	2-0-2	2-0-2	ERS2_F3D1530_-120-277V.IES	ERS2_F3D1540_-120-277V.IES	ERS2_F3D1550_-120-277V.IES
ERS2	G3		525mA	125	138	9600	11500	2-0-2	2-0-2	ERS2_G3D1530_-120-277V.IES	ERS2_G3D1540_-120-277V.IES	ERS2_G3D1550_-120-277V.IES
ERS2	H3		525mA	138	152	10600	12700	2-0-2	3-0-2	ERS2_H3D1530_-120-277V.IES	ERS2_H3D1540_-120-277V.IES	ERS2_H3D1550_-120-277V.IES
ERS2	D3	E1	525mA	88	97	6900	8200	2-0-1	2-0-1	ERS2_D3E1530_-120-277V.IES	ERS2_D3E1540_-120-277V.IES	ERS2_D3E1550_-120-277V.IES
ERS2	E3		525mA	99	109	7700	9300	2-0-1	2-0-2	ERS2_E3E1530_-120-277V.IES	ERS2_E3E1540_-120-277V.IES	ERS2_E3E1550_-120-277V.IES
ERS2	F3		525mA	112	123	8800	10600	2-0-1	3-0-2	ERS2_F3E1530_-120-277V.IES	ERS2_F3E1540_-120-277V.IES	ERS2_F3E1550_-120-277V.IES
ERS2	G3		525mA	125	138	9800	11800	2-0-2	3-0-2	ERS2_G3E1530_-120-277V.IES	ERS2_G3E1540_-120-277V.IES	ERS2_G3E1550_-120-277V.IES
ERS2	H3		525mA	138	152	10800	13000	3-0-2	3-0-2	ERS2_H3E1530_-120-277V.IES	ERS2_H3E1540_-120-277V.IES	ERS2_H3E1550_-120-277V.IES

**NOTES:**

- Max Operating Ambient 50° C
- Some 347-480V Not DLC Listed (Contact Manufacturer)
- For T Option Availability (Contact Manufacturer)

### Lumen Maintenance

- Projected L92 (10K) ≥ 50,000 at Ta 25C
  - Projected L70 (10K) > 100,000 at Ta 25C
- Based on 10,000h LM-80 data for Nichia 219B SQETMLH17005

Scalable Specification Grade Cobrahead (ERS2)

525 mA															
PRODUCT ID	OPTICAL CODE	PHOTOMETRIC TYPE	DRIVE CURRENT	TYPICAL SYSTEM WATTAGE		TYPICAL INITIAL LUMENS		BUG RATING		IES FILE NUMBERS		IES FILE NUMBERS			
				120-277V	347-480V	3000K	4000K & 5000K	3000K	4000K & 5000K	347-480V 3000K	347-480V 4000K	347-480V 5000K			
ERS2	D3	A1	525mA	88	97	6700	8000	2-0-2	2-0-2	ERS2_D3A1530	-347-480V/IES	ERS2_D3A1540	-347-480V/IES	ERS2_D3A1550	-347-480V/IES
ERS2	E3		525mA	99	109	7500	9100	2-0-2	3-0-2	ERS2_E3A1530	-347-480V/IES	ERS2_E3A1540	-347-480V/IES	ERS2_E3A1550	-347-480V/IES
ERS2	F3		525mA	112	123	8600	10300	2-0-2	3-0-2	ERS2_F3A1530	-347-480V/IES	ERS2_F3A1540	-347-480V/IES	ERS2_F3A1550	-347-480V/IES
ERS2	G3		525mA	125	138	9600	11500	3-0-2	3-0-2	ERS2_G3A1530	-347-480V/IES	ERS2_G3A1540	-347-480V/IES	ERS2_G3A1550	-347-480V/IES
ERS2	H3		525mA	138	152	10600	12700	3-0-2	3-0-3	ERS2_H3A1530	-347-480V/IES	ERS2_H3A1540	-347-480V/IES	ERS2_H3A1550	-347-480V/IES
ERS2	D3	B1	525mA	88	97	6900	8200	2-0-1	2-0-1	ERS2_D3B1530	-347-480V/IES	ERS2_D3B1540	-347-480V/IES	ERS2_D3B1550	-347-480V/IES
ERS2	E3		525mA	99	109	7700	9300	2-0-1	2-0-1	ERS2_E3B1530	-347-480V/IES	ERS2_E3B1540	-347-480V/IES	ERS2_E3B1550	-347-480V/IES
ERS2	F3		525mA	112	123	8800	10600	2-0-1	3-0-2	ERS2_F3B1530	-347-480V/IES	ERS2_F3B1540	-347-480V/IES	ERS2_F3B1550	-347-480V/IES
ERS2	G3		525mA	125	138	9800	11800	2-0-1	3-0-2	ERS2_G3B1530	-347-480V/IES	ERS2_G3B1540	-347-480V/IES	ERS2_G3B1550	-347-480V/IES
ERS2	H3		525mA	138	152	10800	13000	3-0-2	3-0-2	ERS2_H3B1530	-347-480V/IES	ERS2_H3B1540	-347-480V/IES	ERS2_H3B1550	-347-480V/IES
ERS2	D3	C1	525mA	88	97	6900	8200	2-0-1	2-0-1	ERS2_D3C1530	-347-480V/IES	ERS2_D3C1540	-347-480V/IES	ERS2_D3C1550	-347-480V/IES
ERS2	E3		525mA	99	109	7700	9300	2-0-1	2-0-1	ERS2_E3C1530	-347-480V/IES	ERS2_E3C1540	-347-480V/IES	ERS2_E3C1550	-347-480V/IES
ERS2	F3		525mA	112	123	8800	10600	2-0-1	3-0-1	ERS2_F3C1530	-347-480V/IES	ERS2_F3C1540	-347-480V/IES	ERS2_F3C1550	-347-480V/IES
ERS2	G3		525mA	125	138	9800	11800	2-0-1	3-0-2	ERS2_G3C1530	-347-480V/IES	ERS2_G3C1540	-347-480V/IES	ERS2_G3C1550	-347-480V/IES
ERS2	H3		525mA	138	152	10800	13000	3-0-2	3-0-2	ERS2_H3C1530	-347-480V/IES	ERS2_H3C1540	-347-480V/IES	ERS2_H3C1550	-347-480V/IES
ERS2	D3	D1	525mA	88	97	6700	8000	2-0-1	2-0-1	ERS2_D3D1530	-347-480V/IES	ERS2_D3D1540	-347-480V/IES	ERS2_D3D1550	-347-480V/IES
ERS2	E3		525mA	99	109	7500	9100	2-0-1	2-0-2	ERS2_E3D1530	-347-480V/IES	ERS2_E3D1540	-347-480V/IES	ERS2_E3D1550	-347-480V/IES
ERS2	F3		525mA	112	123	8600	10300	2-0-2	2-0-2	ERS2_F3D1530	-347-480V/IES	ERS2_F3D1540	-347-480V/IES	ERS2_F3D1550	-347-480V/IES
ERS2	G3		525mA	125	138	9600	11500	2-0-2	2-0-2	ERS2_G3D1530	-347-480V/IES	ERS2_G3D1540	-347-480V/IES	ERS2_G3D1550	-347-480V/IES
ERS2	H3		525mA	138	152	10600	12700	2-0-2	3-0-2	ERS2_H3D1530	-347-480V/IES	ERS2_H3D1540	-347-480V/IES	ERS2_H3D1550	-347-480V/IES
ERS2	D3	E1	525mA	88	97	6900	8200	2-0-1	2-0-1	ERS2_D3E1530	-120-277V/IES	ERS2_D3E1540	-120-277V/IES	ERS2_D3E1550	-120-277V/IES
ERS2	E3		525mA	99	109	7700	9300	2-0-1	2-0-2	ERS2_E3E1530	-347-480V/IES	ERS2_E3E1540	-347-480V/IES	ERS2_E3E1550	-347-480V/IES
ERS2	F3		525mA	112	123	8800	10600	2-0-1	3-0-2	ERS2_F3E1530	-347-480V/IES	ERS2_F3E1540	-347-480V/IES	ERS2_F3E1550	-347-480V/IES
ERS2	G3		525mA	125	138	9800	11800	2-0-2	3-0-2	ERS2_G3E1530	-347-480V/IES	ERS2_G3E1540	-347-480V/IES	ERS2_G3E1550	-347-480V/IES
ERS2	H3		525mA	138	152	10800	13000	3-0-2	3-0-2	ERS2_H3E1530	-347-480V/IES	ERS2_H3E1540	-347-480V/IES	ERS2_H3E1550	-347-480V/IES

700 mA														
PRODUCT ID	OPTICAL CODE	PHOTOMETRIC TYPE	DRIVE CURRENT	TYPICAL SYSTEM WATTAGE		TYPICAL INITIAL LUMENS		BUG RATING		IES FILE NUMBERS		IES FILE NUMBERS		
				120-277V	3000K	4000K & 5000K	3000K	4000K & 5000K	120-277V 3000K	120-277V 4000K	120-277V 5000K			
ERS2	D3	A1	700mA	113	8100	9700	2-0-2	3-0-2	ERS2_D3A1730	-120-277V/IES	ERS2_D3A1740	-120-277V/IES	ERS2_D3A1750	-120-277V/IES
ERS2	E3		700mA	130	9400	11300	3-0-2	3-0-2	ERS2_E3A1730	-120-277V/IES	ERS2_E3A1740	-120-277V/IES	ERS2_E3A1750	-120-277V/IES
ERS2	F3		700mA	148	10600	12800	3-0-2	3-0-3	ERS2_F3A1730	-120-277V/IES	ERS2_F3A1740	-120-277V/IES	ERS2_F3A1750	-120-277V/IES
ERS2	G3		700mA	172	12000	14200	3-0-2	3-0-3	ERS2_G3A1730	-120-277V/IES	ERS2_G3A1740	-120-277V/IES	ERS2_G3A1750	-120-277V/IES
ERS2	H3		700mA	189	13300	15700	3-0-3	3-0-3	ERS2_H3A1730	-120-277V/IES	ERS2_H3A1740	-120-277V/IES	ERS2_H3A1750	-120-277V/IES
ERS2	D3	B1	700mA	113	8300	10000	2-0-1	3-0-1	ERS2_D3B1730	-120-277V/IES	ERS2_D3B1740	-120-277V/IES	ERS2_D3B1750	-120-277V/IES
ERS2	E3		700mA	130	9600	11600	2-0-1	3-0-2	ERS2_E3B1730	-120-277V/IES	ERS2_E3B1740	-120-277V/IES	ERS2_E3B1750	-120-277V/IES
ERS2	F3		700mA	148	10900	13100	3-0-2	3-0-2	ERS2_F3B1730	-120-277V/IES	ERS2_F3B1740	-120-277V/IES	ERS2_F3B1750	-120-277V/IES
ERS2	G3		700mA	172	12100	14600	3-0-2	3-0-2	ERS2_G3B1730	-120-277V/IES	ERS2_G3B1740	-120-277V/IES	ERS2_G3B1750	-120-277V/IES
ERS2	H3		700mA	189	13400	16100	3-0-2	3-0-2	ERS2_H3B1730	-120-277V/IES	ERS2_H3B1740	-120-277V/IES	ERS2_H3B1750	-120-277V/IES
ERS2	D3	C1	700mA	113	8300	10000	2-0-1	3-0-1	ERS2_D3C1730	-120-277V/IES	ERS2_D3C1740	-120-277V/IES	ERS2_D3C1750	-120-277V/IES
ERS2	E3		700mA	130	9600	11600	2-0-1	3-0-2	ERS2_E3C1730	-120-277V/IES	ERS2_E3C1740	-120-277V/IES	ERS2_E3C1750	-120-277V/IES
ERS2	F3		700mA	148	10900	13100	3-0-2	3-0-2	ERS2_F3C1730	-120-277V/IES	ERS2_F3C1740	-120-277V/IES	ERS2_F3C1750	-120-277V/IES
ERS2	G3		700mA	172	12100	14600	3-0-2	3-0-2	ERS2_G3C1730	-120-277V/IES	ERS2_G3C1740	-120-277V/IES	ERS2_G3C1750	-120-277V/IES
ERS2	H3		700mA	189	13400	16100	3-0-2	3-0-2	ERS2_H3C1730	-120-277V/IES	ERS2_H3C1740	-120-277V/IES	ERS2_H3C1750	-120-277V/IES
ERS2	D3	D1	700mA	113	8100	9700	2-0-2	2-0-2	ERS2_D3D1730	-120-277V/IES	ERS2_D3D1740	-120-277V/IES	ERS2_D3D1750	-120-277V/IES
ERS2	E3		700mA	130	9400	11300	2-0-2	2-0-2	ERS2_E3D1730	-120-277V/IES	ERS2_E3D1740	-120-277V/IES	ERS2_E3D1750	-120-277V/IES
ERS2	F3		700mA	148	10600	12800	2-0-2	3-0-2	ERS2_F3D1730	-120-277V/IES	ERS2_F3D1740	-120-277V/IES	ERS2_F3D1750	-120-277V/IES
ERS2	G3		700mA	172	12000	14200	2-0-2	3-0-2	ERS2_G3D1730	-120-277V/IES	ERS2_G3D1740	-120-277V/IES	ERS2_G3D1750	-120-277V/IES
ERS2	H3		700mA	189	13300	15700	3-0-2	3-0-2	ERS2_H3D1730	-120-277V/IES	ERS2_H3D1740	-120-277V/IES	ERS2_H3D1750	-120-277V/IES
ERS2	D3	E1	700mA	113	8300	10000	2-0-1	2-0-2	ERS2_D3E1730	-120-277V/IES	ERS2_D3E1740	-120-277V/IES	ERS2_D3E1750	-120-277V/IES
ERS2	E3		700mA	130	9600	11600	2-0-2	3-0-2	ERS2_E3E1730	-120-277V/IES	ERS2_E3E1740	-120-277V/IES	ERS2_E3E1750	-120-277V/IES
ERS2	F3		700mA	148	10900	13100	3-0-2	3-0-2	ERS2_F3E1730	-120-277V/IES	ERS2_F3E1740	-120-277V/IES	ERS2_F3E1750	-120-277V/IES
ERS2	G3		700mA	172	12100	14600	3-0-2	3-0-2	ERS2_G3E1730	-120-277V/IES	ERS2_G3E1740	-120-277V/IES	ERS2_G3E1750	-120-277V/IES
ERS2	H3		700mA	189	13400	16100	3-0-2	3-0-2	ERS2_H3E1730	-120-277V/IES	ERS2_H3E1740	-120-277V/IES	ERS2_H3E1750	-120-277V/IES

NOTES:

- Max Operating Ambient 50° C
- 347-480V Not Available in 700mA & 1050mA
- For T Option, Contact Manufacturer

Lumen Maintenance

- Projected L91 (10K) ≥ 50,000 at Ta 25C
  - Projected L70 (10K) > 100,000 at Ta 25C
- Based on 10,000h LM-80 data for Nichia 219B SQETMLH17005

## Scalable Specification Grade Cobrahead (ERS2)

1050 mA														
PRODUCT ID	OPTICAL CODE	PHOTOMETRIC TYPE	DRIVE CURRENT	TYPICAL SYSTEM WATTAGE		TYPICAL INITIAL LUMENS		BUG RATING		IES FILE NUMBERS				
				120-277V	3000K	4000K & 5000K	3000K	4000K & 5000K	120-277V 3000K	120-277V 4000K	120-277V 5000K			
ERS2	D3	A1	1050mA	179	10900	13000	3-0-2	3-0-3	ERS2_D3A1130	-120-277V.IES	ERS2_D3A1140	-120-277V.IES	ERS2_D3A1150	-120-277V.IES
ERS2	E3		1050mA	204	12500	15000	3-0-3	3-0-3	ERS2_E3A1130	-120-277V.IES	ERS2_E3A1140	-120-277V.IES	ERS2_E3A1150	-120-277V.IES
ERS2	F3		1050mA	232	14100	16900	3-0-3	3-0-3	ERS2_F3A1130	-120-277V.IES	ERS2_F3A1140	-120-277V.IES	ERS2_F3A1150	-120-277V.IES
ERS2	G3		1050mA	257	15600	18800	3-0-3	3-0-3	ERS2_G3A1130	-120-277V.IES	ERS2_G3A1140	-120-277V.IES	ERS2_G3A1150	-120-277V.IES
ERS2	H3		1050mA	285	17100	20500	3-0-3	3-0-3	ERS2_H3A1130	-120-277V.IES	ERS2_H3A1140	-120-277V.IES	ERS2_H3A1150	-120-277V.IES
ERS2	D3	B1	1050mA	179	11100	13400	3-0-2	3-0-2	ERS2_D3B1130	-120-277V.IES	ERS2_D3B1140	-120-277V.IES	ERS2_D3B1150	-120-277V.IES
ERS2	E3		1050mA	204	12800	15400	3-0-2	3-0-2	ERS2_E3B1130	-120-277V.IES	ERS2_E3B1140	-120-277V.IES	ERS2_E3B1150	-120-277V.IES
ERS2	F3		1050mA	232	14500	17400	3-0-2	3-0-2	ERS2_F3B1130	-120-277V.IES	ERS2_F3B1140	-120-277V.IES	ERS2_F3B1150	-120-277V.IES
ERS2	G3		1050mA	257	16000	19200	3-0-2	3-0-2	ERS2_G3B1130	-120-277V.IES	ERS2_G3B1140	-120-277V.IES	ERS2_G3B1150	-120-277V.IES
ERS2	H3		1050mA	285	17500	21100	3-0-2	3-0-3	ERS2_H3B1130	-120-277V.IES	ERS2_H3B1140	-120-277V.IES	ERS2_H3B1150	-120-277V.IES
ERS2	D3	C1	1050mA	179	11100	13400	3-0-2	3-0-2	ERS2_D3C1130	-120-277V.IES	ERS2_D3C1140	-120-277V.IES	ERS2_D3C1150	-120-277V.IES
ERS2	E3		1050mA	204	12800	15400	3-0-2	3-0-2	ERS2_E3C1130	-120-277V.IES	ERS2_E3C1140	-120-277V.IES	ERS2_E3C1150	-120-277V.IES
ERS2	F3		1050mA	232	14500	17400	3-0-2	3-0-2	ERS2_F3C1130	-120-277V.IES	ERS2_F3C1140	-120-277V.IES	ERS2_F3C1150	-120-277V.IES
ERS2	G3		1050mA	257	16000	19200	3-0-2	3-0-2	ERS2_G3C1130	-120-277V.IES	ERS2_G3C1140	-120-277V.IES	ERS2_G3C1150	-120-277V.IES
ERS2	H3		1050mA	285	17500	21100	3-0-2	3-0-2	ERS2_H3C1130	-120-277V.IES	ERS2_H3C1140	-120-277V.IES	ERS2_H3C1150	-120-277V.IES
ERS2	D3	D1	1050mA	179	10900	13000	2-0-2	3-0-2	ERS2_D3D1130	-120-277V.IES	ERS2_D3D1140	-120-277V.IES	ERS2_D3D1150	-120-277V.IES
ERS2	E3		1050mA	204	12500	15000	3-0-2	3-0-2	ERS2_E3D1130	-120-277V.IES	ERS2_E3D1140	-120-277V.IES	ERS2_E3D1150	-120-277V.IES
ERS2	F3		1050mA	232	14100	16900	3-0-2	3-0-2	ERS2_F3D1130	-120-277V.IES	ERS2_F3D1140	-120-277V.IES	ERS2_F3D1150	-120-277V.IES
ERS2	G3		1050mA	257	15600	18800	3-0-2	3-0-2	ERS2_G3D1130	-120-277V.IES	ERS2_G3D1140	-120-277V.IES	ERS2_G3D1150	-120-277V.IES
ERS2	H3		1050mA	285	17100	20500	3-0-2	3-0-2	ERS2_H3D1130	-120-277V.IES	ERS2_H3D1140	-120-277V.IES	ERS2_H3D1150	-120-277V.IES
ERS2	D3	E1	1050mA	179	11100	13400	3-0-2	3-0-2	ERS2_D3E1130	-120-277V.IES	ERS2_D3E1140	-120-277V.IES	ERS2_D3E1150	-120-277V.IES
ERS2	E3		1050mA	204	12800	15400	3-0-2	3-0-2	ERS2_E3E1130	-120-277V.IES	ERS2_E3E1140	-120-277V.IES	ERS2_E3E1150	-120-277V.IES
ERS2	F3		1050mA	232	14500	17400	3-0-2	3-0-2	ERS2_F3E1130	-120-277V.IES	ERS2_F3E1140	-120-277V.IES	ERS2_F3E1150	-120-277V.IES
ERS2	G3		1050mA	257	16000	19200	3-0-2	3-0-2	ERS2_G3E1130	-120-277V.IES	ERS2_G3E1140	-120-277V.IES	ERS2_G3E1150	-120-277V.IES
ERS2	H3		1050mA	285	17500	21100	3-0-2	3-0-2	ERS2_H3E1130	-120-277V.IES	ERS2_H3E1140	-120-277V.IES	ERS2_H3E1150	-120-277V.IES

## NOTES:

- Max Operating Ambient 50° C
- 347-480V Not Available in 700mA & 1050mA
- T Option Not Available

## Lumen Maintenance

- Projected L91 (10K) ≥ 50,000 at Ta 25C
  - Projected L70 (10K) > 100,000 at Ta 25C
- Based on 10,000h LM-80 data for Nichia 219B SQETMLH17005

# Photometrics

## Scalable Specification Grade Cobrahead (ERS2)

ISO Plot

Grid Distance in Units of Mounting Height at 30' Initial Footcandle Values at Grade

Polar Curve

Polar Trace Vertical and Horizontal Plane through Horizontal Angle of Maximum Candlepower

CU Graph

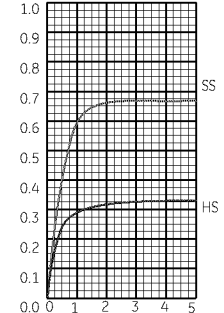
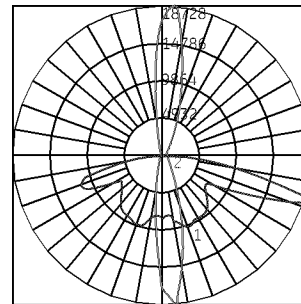
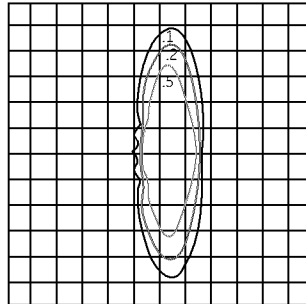
Coefficients of Utilization Street Width / Mounting Height

ERS2  
Extra Narrow Asymmetric  
(H3A1)

20500 Lumens  
5000K  
ERS2\_H3A1150\_\_\_\_-120-277V.IES

HS

SS

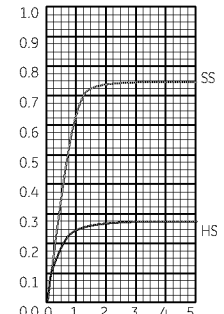
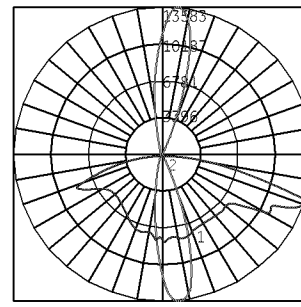
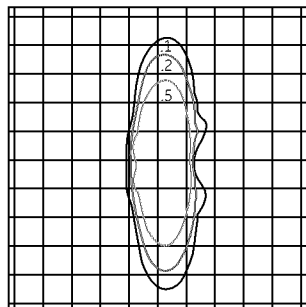


ERS2  
Narrow Asymmetric Medium  
(H3B1)

21100 Lumens  
5000K  
ERS2\_H3B1150\_\_\_\_-120-277V.IES

HS

SS

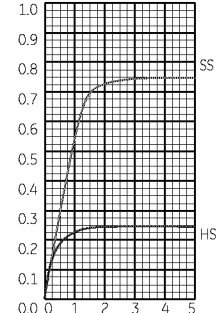
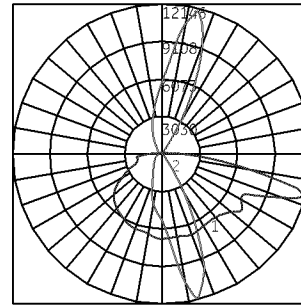
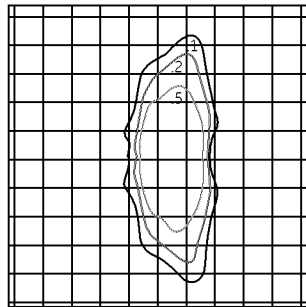


ERS2  
Asymmetric Short  
(H3C1)

21100 Lumens  
5000K  
ERS2\_H3C1150\_\_\_\_-120-277V.IES

HS

SS

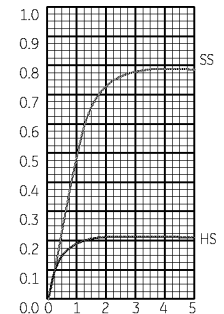
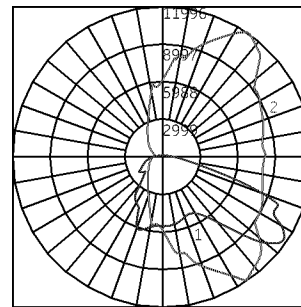
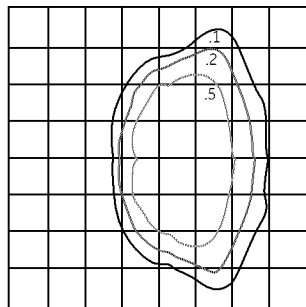


ERS2  
Asymmetric Forward  
(H3D1)

20500 Lumens  
5000K  
ERS2\_H3D1150\_\_\_\_-120-277V.IES

HS

SS

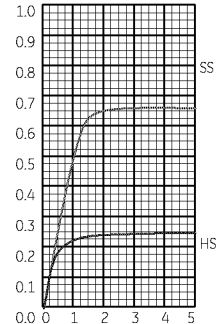
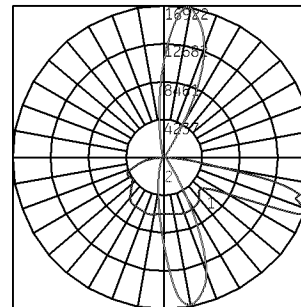
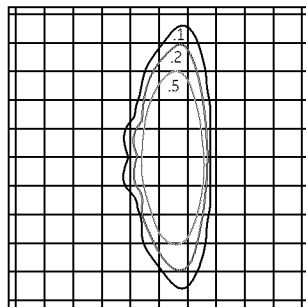


ERS2  
Extra Narrow Asymmetric  
(H3E1)

21100 Lumens  
5000K  
ERS2\_H3E1150\_\_\_\_-120-277V.IES

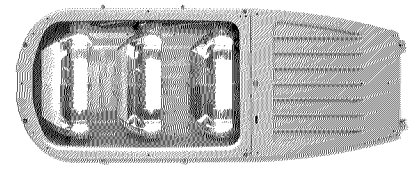
HS

SS



# Ordering Number Logic

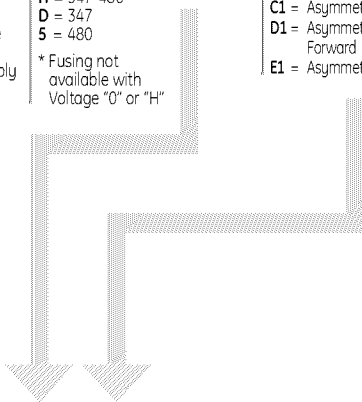
## Scalable Specification Grade Cobrahead (ERS3)



**ERS3**

**5**

PROD. ID	VOLTAGE	OPTICAL CODE	PHOTOMETRIC TYPE	DRIVE CURRENT	LED COLOR TEMP	PE FUNCTION	COLOR	OPTIONS
<b>E</b> = Evolve	<b>0</b> = 120-277* <b>1</b> = 120 <b>2</b> = 208 <b>3</b> = 240 <b>4</b> = 277 <b>H</b> = 347-480*	<b>Product Tier</b> <b>*3</b> = Specification Grade  See Charts for all levels	<b>A1</b> = Extra Narrow Asymmetric <b>B1</b> = Narrow Asymmetric (Medium) <b>C1</b> = Asymmetric (Short) <b>D1</b> = Asymmetric Forward <b>E1</b> = Asymmetric (Medium)	<b>5</b> = 525mA	<b>30</b> = 3000K <b>40</b> = 4000K <b>50</b> = 5000K	<b>1</b> = None <b>2</b> = PE Receptacle <b>4</b> = PE Receptacle & Shorting Cap <b>5</b> = PE Receptacle & ANSI C136.1 PE Control <b>A</b> = ANSI C136.41-7-pin Dimming Receptacle <b>D</b> = ANSI C136.41-7-pin Dimming Receptacle with Shorting Cap	<b>BLACK</b> = Black <b>GRAY</b> = Gray	<b>D</b> = Wired Dimming <b>E</b> = External Bubble Level <b>F</b> = Fusing <b>G</b> = Internal Bubble Level <b>L</b> = Tool-Less Entry <b>R</b> = Additional Secondary Surge Protection Device <b>T</b> = GE Energy Extreme Surge Protection per IEEE/ANSI C62.41.2-2002. - Rating 1 - 10kV/5kA Location Category (120 events). - Rating 2 - 6kV/3kA Location Category C-Low (5000 events). <b>XXX</b> = Special Options



525 mA		TYPICAL SYSTEM WATTAGE										TYPICAL INITIAL LUMENS			BUG RATING		IES FILE NUMBERS		
PRODUCT ID	OPTICAL CODE	PHOTOMETRIC TYPE	DRIVE CURRENT	120-277V	347-480V	3000K	4000K & 5000K	3000K	4000K & 5000K	120-277V/3000K	120-277V/4000K	120-277V/5000K	3000K	4000K & 5000K	120-277V/3000K	120-277V/4000K	120-277V/5000K		
ERS3	J3	A1	525mA	151	166	11700	14000	3-0-2	3-0-3	ERS3_J3A1530	ERS3_J3A1540	ERS3_J3A1550	11700	14000	ERS3_J3A1530	ERS3_J3A1540	ERS3_J3A1550		
ERS3	K3		525mA	170	187	12700	15300	3-0-3	3-0-3	ERS3_K3A1530	ERS3_K3A1540	ERS3_K3A1550	12700	15300	ERS3_K3A1530	ERS3_K3A1540	ERS3_K3A1550		
ERS3	L3		525mA	183	201	13700	16500	3-0-3	3-0-3	ERS3_L3A1530	ERS3_L3A1540	ERS3_L3A1550	13700	16500	ERS3_L3A1530	ERS3_L3A1540	ERS3_L3A1550		
ERS3	M3		525mA	196	216	14700	17700	3-0-3	3-0-3	ERS3_M3A1530	ERS3_M3A1540	ERS3_M3A1550	14700	17700	ERS3_M3A1530	ERS3_M3A1540	ERS3_M3A1550		
ERS3	N3		525mA	209	230	15700	18900	3-0-3	3-0-3	ERS3_N3A1530	ERS3_N3A1540	ERS3_N3A1550	15700	18900	ERS3_N3A1530	ERS3_N3A1540	ERS3_N3A1550		
ERS3	J3	B1	525mA	151	166	12000	14400	3-0-2	3-0-2	ERS3_J3B1530	ERS3_J3B1540	ERS3_J3B1550	12000	14400	ERS3_J3B1530	ERS3_J3B1540	ERS3_J3B1550		
ERS3	K3		525mA	170	187	13000	15600	3-0-2	3-0-2	ERS3_K3B1530	ERS3_K3B1540	ERS3_K3B1550	13000	15600	ERS3_K3B1530	ERS3_K3B1540	ERS3_K3B1550		
ERS3	L3		525mA	183	201	14000	16900	3-0-2	3-0-2	ERS3_L3B1530	ERS3_L3B1540	ERS3_L3B1550	14000	16900	ERS3_L3B1530	ERS3_L3B1540	ERS3_L3B1550		
ERS3	M3		525mA	196	216	15100	18100	3-0-2	3-0-2	ERS3_M3B1530	ERS3_M3B1540	ERS3_M3B1550	15100	18100	ERS3_M3B1530	ERS3_M3B1540	ERS3_M3B1550		
ERS3	N3		525mA	209	230	16100	19400	3-0-2	3-0-2	ERS3_N3B1530	ERS3_N3B1540	ERS3_N3B1550	16100	19400	ERS3_N3B1530	ERS3_N3B1540	ERS3_N3B1550		
ERS3	J3	C1	525mA	151	166	12000	14400	3-0-2	3-0-2	ERS3_J3C1530	ERS3_J3C1540	ERS3_J3C1550	12000	14400	ERS3_J3C1530	ERS3_J3C1540	ERS3_J3C1550		
ERS3	K3		525mA	170	187	13000	15600	3-0-2	3-0-2	ERS3_K3C1530	ERS3_K3C1540	ERS3_K3C1550	13000	15600	ERS3_K3C1530	ERS3_K3C1540	ERS3_K3C1550		
ERS3	L3		525mA	183	201	14000	16900	3-0-2	3-0-2	ERS3_L3C1530	ERS3_L3C1540	ERS3_L3C1550	14000	16900	ERS3_L3C1530	ERS3_L3C1540	ERS3_L3C1550		
ERS3	M3		525mA	196	216	15100	18100	3-0-2	3-0-2	ERS3_M3C1530	ERS3_M3C1540	ERS3_M3C1550	15100	18100	ERS3_M3C1530	ERS3_M3C1540	ERS3_M3C1550		
ERS3	N3		525mA	209	230	16100	19400	3-0-2	3-0-2	ERS3_N3C1530	ERS3_N3C1540	ERS3_N3C1550	16100	19400	ERS3_N3C1530	ERS3_N3C1540	ERS3_N3C1550		
ERS3	J3	D1	525mA	151	166	11700	14000	2-0-2	3-0-2	ERS3_J3D1530	ERS3_J3D1540	ERS3_J3D1550	11700	14000	ERS3_J3D1530	ERS3_J3D1540	ERS3_J3D1550		
ERS3	K3		525mA	170	187	12700	15300	3-0-2	3-0-2	ERS3_K3D1530	ERS3_K3D1540	ERS3_K3D1550	12700	15300	ERS3_K3D1530	ERS3_K3D1540	ERS3_K3D1550		
ERS3	L3		525mA	183	201	13700	16500	3-0-2	3-0-2	ERS3_L3D1530	ERS3_L3D1540	ERS3_L3D1550	13700	16500	ERS3_L3D1530	ERS3_L3D1540	ERS3_L3D1550		
ERS3	M3		525mA	196	216	14700	17700	3-0-2	3-0-2	ERS3_M3D1530	ERS3_M3D1540	ERS3_M3D1550	14700	17700	ERS3_M3D1530	ERS3_M3D1540	ERS3_M3D1550		
ERS3	N3		525mA	209	230	15700	18900	3-0-2	3-0-2	ERS3_N3D1530	ERS3_N3D1540	ERS3_N3D1550	15700	18900	ERS3_N3D1530	ERS3_N3D1540	ERS3_N3D1550		
ERS3	J3	E1	525mA	151	166	12000	14400	3-0-2	3-0-2	ERS3_J3E1530	ERS3_J3E1540	ERS3_J3E1550	12000	14400	ERS3_J3E1530	ERS3_J3E1540	ERS3_J3E1550		
ERS3	K3		525mA	170	187	13000	15600	3-0-2	3-0-2	ERS3_K3E1530	ERS3_K3E1540	ERS3_K3E1550	13000	15600	ERS3_K3E1530	ERS3_K3E1540	ERS3_K3E1550		
ERS3	L3		525mA	183	201	14000	16900	3-0-2	3-0-2	ERS3_L3E1530	ERS3_L3E1540	ERS3_L3E1550	14000	16900	ERS3_L3E1530	ERS3_L3E1540	ERS3_L3E1550		
ERS3	M3		525mA	196	216	15100	18100	3-0-2	3-0-2	ERS3_M3E1530	ERS3_M3E1540	ERS3_M3E1550	15100	18100	ERS3_M3E1530	ERS3_M3E1540	ERS3_M3E1550		
ERS3	N3		525mA	209	230	16100	19400	3-0-2	3-0-2	ERS3_N3E1530	ERS3_N3E1540	ERS3_N3E1550	16100	19400	ERS3_N3E1530	ERS3_N3E1540	ERS3_N3E1550		

**NOTES:**

- Max Operating Ambient 50° C
- Max Operating Ambient 45° C for 347-480V
- For T Option, Contact Manufacturer

**Lumen Maintenance**

- Projected L91 (10K) ≥ 50,000 at Ta 25C
  - Projected L70 (10K) > 100,000 at Ta 25C
- Based on 10,000h LM-80 data for Nichia 219B SQETMLH17005

Scalable Specification Grade Cobrahead (ERS3)

525 mA		PRODUCT ID	OPTICAL CODE	PHOTOMETRIC TYPE	DRIVE CURRENT	TYPICAL SYSTEM	TYPICAL SYSTEM	TYPICAL INITIAL	BUG RATING		IES FILE NUMBERS		IES FILE NUMBERS		IES FILE NUMBERS	
WATTAGE	WATTAGE					LUMENS	3000K	4000K & 5000K	3000K	4000K & 5000K	347-480V	3000K	347-480V	4000K	347-480V	5000K
ERS3	J3	A1	525mA	151	166	11700	14000	3-0-2	3-0-3	ERS3_J3A1530	347-480VIES	ERS3_J3A1540	347-480VIES	ERS3_J3A1550	347-480VIES	
ERS3	K3		525mA	170	187	12700	15300	3-0-3	3-0-3	ERS3_K3A1530	347-480VIES	ERS3_K3A1540	347-480VIES	ERS3_K3A1550	347-480VIES	
ERS3	L3		525mA	183	201	13700	16500	3-0-3	3-0-3	ERS3_L3A1530	347-480VIES	ERS3_L3A1540	347-480VIES	ERS3_L3A1550	347-480VIES	
ERS3	M3		525mA	196	216	14700	17700	3-0-3	3-0-3	ERS3_M3A1530	347-480VIES	ERS3_M3A1540	347-480VIES	ERS3_M3A1550	347-480VIES	
ERS3	N3		525mA	209	230	15700	18900	3-0-3	3-0-3	ERS3_N3A1530	347-480VIES	ERS3_N3A1540	347-480VIES	ERS3_N3A1550	347-480VIES	
ERS3	J3	B1	525mA	151	166	12000	14400	3-0-2	3-0-2	ERS3_J3B1530	347-480VIES	ERS3_J3B1540	347-480VIES	ERS3_J3B1550	347-480VIES	
ERS3	K3		525mA	170	187	13000	15600	3-0-2	3-0-2	ERS3_K3B1530	347-480VIES	ERS3_K3B1540	347-480VIES	ERS3_K3B1550	347-480VIES	
ERS3	L3		525mA	183	201	14000	16900	3-0-2	3-0-2	ERS3_L3B1530	347-480VIES	ERS3_L3B1540	347-480VIES	ERS3_L3B1550	347-480VIES	
ERS3	M3		525mA	196	216	15100	18100	3-0-2	3-0-2	ERS3_M3B1530	347-480VIES	ERS3_M3B1540	347-480VIES	ERS3_M3B1550	347-480VIES	
ERS3	N3		525mA	209	230	16100	19400	3-0-2	3-0-2	ERS3_N3B1530	347-480VIES	ERS3_N3B1540	347-480VIES	ERS3_N3B1550	347-480VIES	
ERS3	J3	C1	525mA	151	166	12000	14400	3-0-2	3-0-2	ERS3_J3C1530	347-480VIES	ERS3_J3C1540	347-480VIES	ERS3_J3C1550	347-480VIES	
ERS3	K3		525mA	170	187	13000	15600	3-0-2	3-0-2	ERS3_K3C1530	347-480VIES	ERS3_K3C1540	347-480VIES	ERS3_K3C1550	347-480VIES	
ERS3	L3		525mA	183	201	14000	16900	3-0-2	3-0-2	ERS3_L3C1530	347-480VIES	ERS3_L3C1540	347-480VIES	ERS3_L3C1550	347-480VIES	
ERS3	M3		525mA	196	216	15100	18100	3-0-2	3-0-2	ERS3_M3C1530	347-480VIES	ERS3_M3C1540	347-480VIES	ERS3_M3C1550	347-480VIES	
ERS3	N3		525mA	209	230	16100	19400	3-0-2	3-0-2	ERS3_N3C1530	347-480VIES	ERS3_N3C1540	347-480VIES	ERS3_N3C1550	347-480VIES	
ERS3	J3	D1	525mA	151	166	11700	14000	2-0-2	3-0-2	ERS3_J3D1530	347-480VIES	ERS3_J3D1540	347-480VIES	ERS3_J3D1550	347-480VIES	
ERS3	K3		525mA	170	187	12700	15300	3-0-2	3-0-2	ERS3_K3D1530	347-480VIES	ERS3_K3D1540	347-480VIES	ERS3_K3D1550	347-480VIES	
ERS3	L3		525mA	183	201	13700	16500	3-0-2	3-0-2	ERS3_L3D1530	347-480VIES	ERS3_L3D1540	347-480VIES	ERS3_L3D1550	347-480VIES	
ERS3	M3		525mA	196	216	14700	17700	3-0-2	3-0-2	ERS3_M3D1530	347-480VIES	ERS3_M3D1540	347-480VIES	ERS3_M3D1550	347-480VIES	
ERS3	N3		525mA	209	230	15700	18900	3-0-2	3-0-2	ERS3_N3D1530	347-480VIES	ERS3_N3D1540	347-480VIES	ERS3_N3D1550	347-480VIES	
ERS3	J3	E1	525mA	151	166	12000	14400	3-0-2	3-0-2	ERS3_J3E1530	347-480VIES	ERS3_J3E1540	347-480VIES	ERS3_J3E1550	347-480VIES	
ERS3	K3		525mA	170	187	13000	15600	3-0-2	3-0-2	ERS3_K3E1530	347-480VIES	ERS3_K3E1540	347-480VIES	ERS3_K3E1550	347-480VIES	
ERS3	L3		525mA	183	201	14000	16900	3-0-2	3-0-2	ERS3_L3E1530	347-480VIES	ERS3_L3E1540	347-480VIES	ERS3_L3E1550	347-480VIES	
ERS3	M3		525mA	196	216	15100	18100	3-0-2	3-0-2	ERS3_M3E1530	347-480VIES	ERS3_M3E1540	347-480VIES	ERS3_M3E1550	347-480VIES	
ERS3	N3		525mA	209	230	16100	19400	3-0-2	3-0-2	ERS3_N3E1530	347-480VIES	ERS3_N3E1540	347-480VIES	ERS3_N3E1550	347-480VIES	

NOTES:

- Max Operating Ambient 50° C
- Max Operating Ambient 45° C for 347-480V
- For T Option, Contact Manufacturer

Lumen Maintenance

- Projected L91 (10K) ≥ 50,000 at Ta 25C
- Projected L70 (10K) > 100,000 at Ta 25C

Based on 10,000h LM-80 data for Nichia 219B SQETMLH17005

# Photometrics

## Scalable Specification Grade Cobrahead (ERS3)

ISO Plot

Grid Distance in Units of Mounting Height at 30' Initial Footcandle Values at Grade

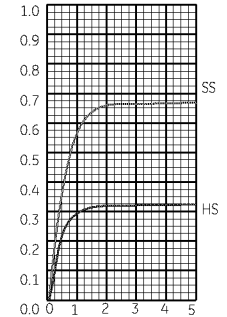
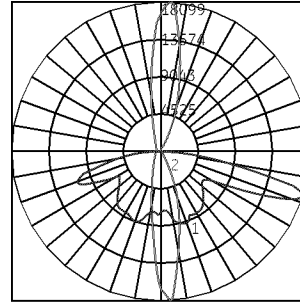
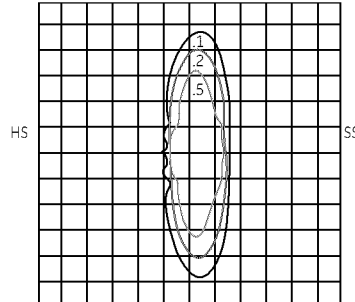
Polar Curve

Polar Trace Vertical and Horizontal Plane through Horizontal Angle of Maximum Candlepower

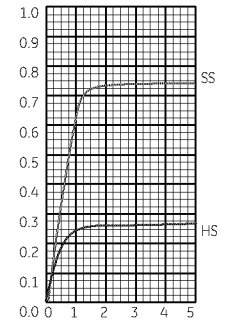
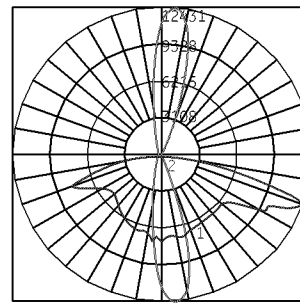
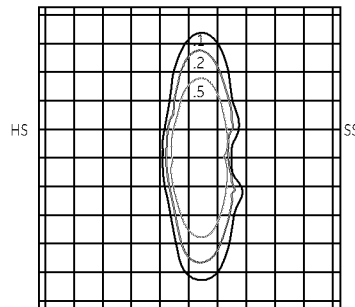
CU Graph

Coefficients of Utilization Street Width / Mounting Height

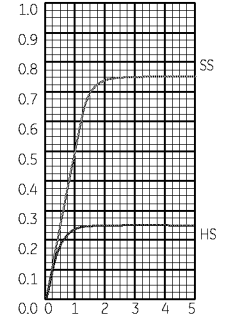
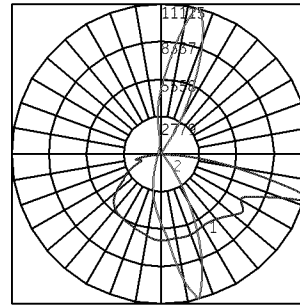
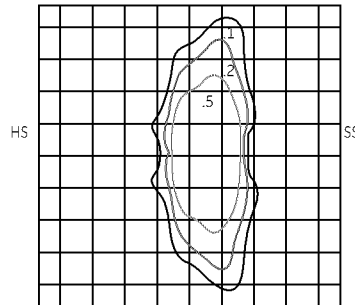
ERS3  
Extra Narrow Asymmetric  
(N3A1)  
18900 Lumens  
5000K  
ERS3\_N3A1550\_\_\_\_-120-277V.IES



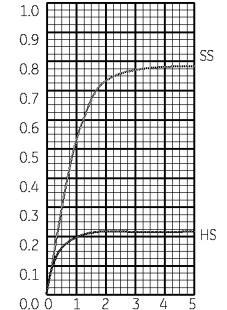
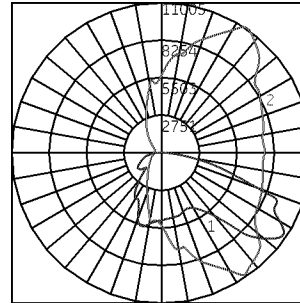
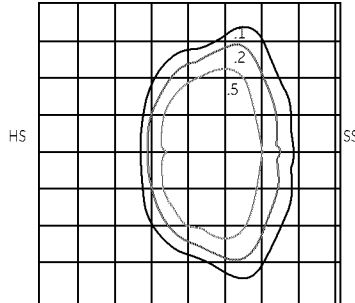
ERS3  
Narrow Asymmetric Medium  
(N3B1)  
19400 Lumens  
5000K  
ERS3\_N3B1550\_\_\_\_-120-277V.IES



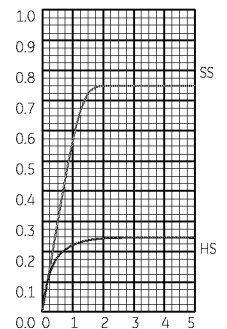
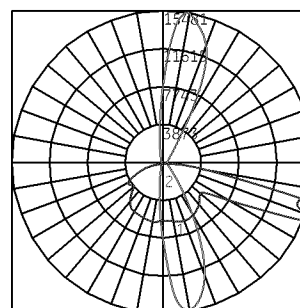
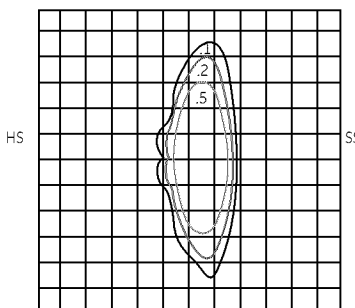
ERS3  
Asymmetric Short  
(N3C1)  
19400 Lumens  
5000K  
ERS3\_N3C1550\_\_\_\_-120-277V.IES



ERS3  
Asymmetric Forward  
(N3D1)  
18900 Lumens  
5000K  
ERS3\_N3D1550\_\_\_\_-120-277V.IES

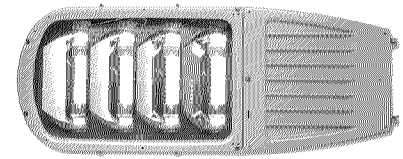


ERS3  
Asymmetric Medium  
(N3E1)  
19400 Lumens  
5000K  
ERS3\_N3E1550\_\_\_\_-120-277V.IES



# Ordering Number Logic

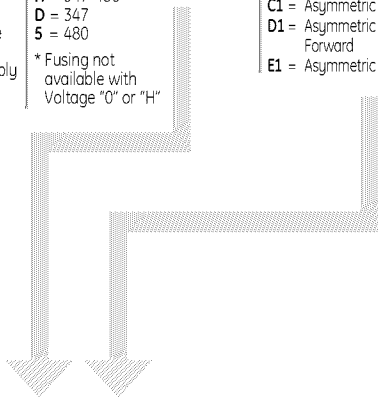
## Scalable Specification Grade Cobrahead (ERS4)



**ERS4**

**5**

PROD. ID	VOLTAGE	OPTICAL CODE	PHOTOMETRIC TYPE	DRIVE CURRENT	LED COLOR TEMP	PE FUNCTION	COLOR	OPTIONS
<b>E</b> = Evolve	<b>0</b> = 120-277*	<b>Product Tier</b> <b>*3</b> = Specification Grade  See Charts for all levels	<b>A1</b> = Extra Narrow Asymmetric	<b>5</b> = 525mA	<b>30</b> = 3000K <b>40</b> = 4000K <b>50</b> = 5000K	<b>1</b> = None	<b>BLCK</b> = Black <b>GRAY</b> = Gray	<b>D</b> = Wired Dimming
<b>R</b> = Roadway	<b>1</b> = 120		<b>B1</b> = Narrow Asymmetric (Medium)			<b>2</b> = PE Receptacle		<b>E</b> = External Bubble Level
<b>S</b> = Scalable	<b>2</b> = 208		<b>C1</b> = Asymmetric (Short)			<b>4</b> = PE Receptacle & Shorting Cap		<b>F</b> = Fusing
<b>4</b> = Quad Module Optical Assembly	<b>3</b> = 240		<b>D1</b> = Asymmetric Forward			<b>5</b> = PE Receptacle & ANSI C136.1 PE Control		<b>G</b> = Internal Bubble Level
	<b>4</b> = 277		<b>E1</b> = Asymmetric (Medium)			<b>A</b> = ANSI C136.41-7-pin Dimming Receptacle		<b>L</b> = Tool-Less Entry
	<b>H</b> = 347-480*				<b>D</b> = ANSI C136.41-7-pin Dimming Receptacle with Shorting Cap		<b>R</b> = Additional Secondary Surge Protection Device	
	<b>D</b> = 347						<b>T</b> = GE Energy Extreme Surge Protection per IEEE/ANSI C62.41.2-2002.	
	<b>5</b> = 480						- Rating 1 - 10kV/5kA Location Category (120 events).	
	* Fusing not available with Voltage "0" or "H"						- Rating 2 - 6kV/3kA Location Category C-Low (5000 events).	
							<b>XXX</b> = Special Options	



525 mA															
PRODUCT ID	OPTICAL CODE	PHOTOMETRIC TYPE	DRIVE CURRENT	TYPICAL SYSTEM WATTAGE		TYPICAL SYSTEM LUMENS		BUG RATING		IES FILE NUMBERS					
				120-277V	347-480V	3000K & 5000K	4000K	3000K	4000K & 5000K	120-277V 3000K	120-277V 4000K	120-277V 5000K			
ERS4	P3	A1	525mA	222	244	16700	20100	3-0-3	3-0-3	ERS4_P3A1530	-120-277V.IES	ERS4_P3A1540	-120-277V.IES	ERS4_P3A1550	-120-277V.IES
ERS4	Q3		525mA	234	257	17700	21300	3-0-3	3-0-3	ERS4_Q3A1530	-120-277V.IES	ERS4_Q3A1540	-120-277V.IES	ERS4_Q3A1550	-120-277V.IES
ERS4	R3		525mA	247	272	18700	22500	3-0-3	4-0-3	ERS4_R3A1530	-120-277V.IES	ERS4_R3A1540	-120-277V.IES	ERS4_R3A1550	-120-277V.IES
ERS4	S3		525mA	260	286	19700	23700	3-0-3	4-0-3	ERS4_S3A1530	-120-277V.IES	ERS4_S3A1540	-120-277V.IES	ERS4_S3A1550	-120-277V.IES
ERS4	T3		525mA	274	301	20700	24800	3-0-3	4-0-3	ERS4_T3A1530	-120-277V.IES	ERS4_T3A1540	-120-277V.IES	ERS4_T3A1550	-120-277V.IES
ERS4	P3	B1	525mA	222	244	17200	20600	3-0-2	3-0-2	ERS4_P3B1530	-120-277V.IES	ERS4_P3B1540	-120-277V.IES	ERS4_P3B1550	-120-277V.IES
ERS4	Q3		525mA	234	257	18200	21800	3-0-2	3-0-3	ERS4_Q3B1530	-120-277V.IES	ERS4_Q3B1540	-120-277V.IES	ERS4_Q3B1550	-120-277V.IES
ERS4	R3		525mA	247	272	19200	23000	3-0-2	3-0-3	ERS4_R3B1530	-120-277V.IES	ERS4_R3B1540	-120-277V.IES	ERS4_R3B1550	-120-277V.IES
ERS4	S3		525mA	260	286	20200	24300	3-0-2	3-0-3	ERS4_S3B1530	-120-277V.IES	ERS4_S3B1540	-120-277V.IES	ERS4_S3B1550	-120-277V.IES
ERS4	T3		525mA	274	301	21200	25400	3-0-3	4-0-3	ERS4_T3B1530	-120-277V.IES	ERS4_T3B1540	-120-277V.IES	ERS4_T3B1550	-120-277V.IES
ERS4	P3	C1	525mA	222	244	17200	20600	3-0-2	3-0-2	ERS4_P3C1530	-120-277V.IES	ERS4_P3C1540	-120-277V.IES	ERS4_P3C1550	-120-277V.IES
ERS4	Q3		525mA	234	257	18200	21800	3-0-2	3-0-2	ERS4_Q3C1530	-120-277V.IES	ERS4_Q3C1540	-120-277V.IES	ERS4_Q3C1550	-120-277V.IES
ERS4	R3		525mA	247	272	19200	23000	3-0-2	3-0-2	ERS4_R3C1530	-120-277V.IES	ERS4_R3C1540	-120-277V.IES	ERS4_R3C1550	-120-277V.IES
ERS4	S3		525mA	260	286	20200	24300	3-0-2	3-0-2	ERS4_S3C1530	-120-277V.IES	ERS4_S3C1540	-120-277V.IES	ERS4_S3C1550	-120-277V.IES
ERS4	T3		525mA	274	301	21200	25400	3-0-2	4-0-3	ERS4_T3C1530	-120-277V.IES	ERS4_T3C1540	-120-277V.IES	ERS4_T3C1550	-120-277V.IES
ERS4	P3	D1	525mA	222	244	16700	20100	3-0-2	3-0-2	ERS4_P3D1530	-120-277V.IES	ERS4_P3D1540	-120-277V.IES	ERS4_P3D1550	-120-277V.IES
ERS4	Q3		525mA	234	257	17700	21300	3-0-2	3-0-2	ERS4_Q3D1530	-120-277V.IES	ERS4_Q3D1540	-120-277V.IES	ERS4_Q3D1550	-120-277V.IES
ERS4	R3		525mA	247	272	18700	22500	3-0-2	3-0-3	ERS4_R3D1530	-120-277V.IES	ERS4_R3D1540	-120-277V.IES	ERS4_R3D1550	-120-277V.IES
ERS4	S3		525mA	260	286	19700	23700	3-0-2	3-0-3	ERS4_S3D1530	-120-277V.IES	ERS4_S3D1540	-120-277V.IES	ERS4_S3D1550	-120-277V.IES
ERS4	T3		525mA	274	301	20700	24800	3-0-2	3-0-3	ERS4_T3D1530	-120-277V.IES	ERS4_T3D1540	-120-277V.IES	ERS4_T3D1550	-120-277V.IES
ERS4	P3	E1	525mA	222	244	17200	20600	3-0-2	3-0-2	ERS4_P3E1530	-120-277V.IES	ERS4_P3E1540	-120-277V.IES	ERS4_P3E1550	-120-277V.IES
ERS4	Q3		525mA	234	257	18200	21800	3-0-2	3-0-2	ERS4_Q3E1530	-120-277V.IES	ERS4_Q3E1540	-120-277V.IES	ERS4_Q3E1550	-120-277V.IES
ERS4	R3		525mA	247	272	19200	23000	3-0-2	3-0-3	ERS4_R3E1530	-120-277V.IES	ERS4_R3E1540	-120-277V.IES	ERS4_R3E1550	-120-277V.IES
ERS4	S3		525mA	260	286	20200	24300	3-0-2	3-0-3	ERS4_S3E1530	-120-277V.IES	ERS4_S3E1540	-120-277V.IES	ERS4_S3E1550	-120-277V.IES
ERS4	T3		525mA	274	301	21200	25400	3-0-2	4-0-3	ERS4_T3E1530	-120-277V.IES	ERS4_T3E1540	-120-277V.IES	ERS4_T3E1550	-120-277V.IES

**NOTES:**

- Max Operating Ambient 50° C
- Max Operating Ambient 40° C for 347-480V
- For T Option, Contact Manufacturer

**Lumen Maintenance**

- Projected L91 (10K) ≥ 50,000 at Ta 25C
  - Projected L70 (10K) > 100,000 at Ta 25C
- Based on 10,000h LM-80 data for Nichia 219B SQETMLH17005

Scalable Specification Grade Cobrahead (ERS4)

525 mA															
PRODUCT ID	OPTICAL CODE	PHOTOMETRIC TYPE	DRIVE CURRENT	TYPICAL SYSTEM	TYPICAL SYSTEM	TYPICAL INITIAL		BUG RATING		IES FILE NUMBERS		IES FILE NUMBERS		IES FILE NUMBERS	
				WATTAGE 120-277V	WATTAGE 347-480V	LUMENS 3000K	LUMENS 4000K & 5000K	3000K	4000K & 5000K	347-480V 3000K	347-480V 4000K	347-480V 5000K			
ERS4	P3	A1	525mA	222	244	16700	20100	3-0-3	3-0-3	ERS4_P3A1530	-347-480V.IES	ERS4_P3A1540	-347-480V.IES	ERS4_P3A1550	-347-480V.IES
ERS4	Q3		525mA	234	257	17700	21300	3-0-3	3-0-3	ERS4_Q3A1530	-347-480V.IES	ERS4_Q3A1540	-347-480V.IES	ERS4_Q3A1550	-347-480V.IES
ERS4	R3		525mA	247	272	18700	22500	3-0-3	4-0-3	ERS4_R3A1530	-347-480V.IES	ERS4_R3A1540	-347-480V.IES	ERS4_R3A1550	-347-480V.IES
ERS4	S3		525mA	260	286	19700	23700	3-0-3	4-0-3	ERS4_S3A1530	-347-480V.IES	ERS4_S3A1540	-347-480V.IES	ERS4_S3A1550	-347-480V.IES
ERS4	T3		525mA	274	301	20700	24800	3-0-3	4-0-3	ERS4_T3A1530	-347-480V.IES	ERS4_T3A1540	-347-480V.IES	ERS4_T3A1550	-347-480V.IES
ERS4	P3	B1	525mA	222	244	17200	20600	3-0-2	3-0-2	ERS4_P3B1530	-347-480V.IES	ERS4_P3B1540	-347-480V.IES	ERS4_P3B1550	-347-480V.IES
ERS4	Q3		525mA	234	257	18200	21800	3-0-2	3-0-3	ERS4_Q3B1530	-347-480V.IES	ERS4_Q3B1540	-347-480V.IES	ERS4_Q3B1550	-347-480V.IES
ERS4	R3		525mA	247	272	19200	23000	3-0-2	3-0-3	ERS4_R3B1530	-347-480V.IES	ERS4_R3B1540	-347-480V.IES	ERS4_R3B1550	-347-480V.IES
ERS4	S3		525mA	260	286	20200	24300	3-0-2	3-0-3	ERS4_S3B1530	-347-480V.IES	ERS4_S3B1540	-347-480V.IES	ERS4_S3B1550	-347-480V.IES
ERS4	T3		525mA	274	301	21200	25400	3-0-3	4-0-3	ERS4_T3B1530	-347-480V.IES	ERS4_T3B1540	-347-480V.IES	ERS4_T3B1550	-347-480V.IES
ERS4	P3	C1	525mA	222	244	17200	20600	3-0-2	3-0-2	ERS4_P3C1530	-347-480V.IES	ERS4_P3C1540	-347-480V.IES	ERS4_P3C1550	-347-480V.IES
ERS4	Q3		525mA	234	257	18200	21800	3-0-2	3-0-2	ERS4_Q3C1530	-347-480V.IES	ERS4_Q3C1540	-347-480V.IES	ERS4_Q3C1550	-347-480V.IES
ERS4	R3		525mA	247	272	19200	23000	3-0-2	3-0-2	ERS4_R3C1530	-347-480V.IES	ERS4_R3C1540	-347-480V.IES	ERS4_R3C1550	-347-480V.IES
ERS4	S3		525mA	260	286	20200	24300	3-0-2	3-0-2	ERS4_S3C1530	-347-480V.IES	ERS4_S3C1540	-347-480V.IES	ERS4_S3C1550	-347-480V.IES
ERS4	T3		525mA	274	301	21200	25400	3-0-2	4-0-3	ERS4_T3C1530	-347-480V.IES	ERS4_T3C1540	-347-480V.IES	ERS4_T3C1550	-347-480V.IES
ERS4	P3	D1	525mA	222	244	16700	20100	3-0-2	3-0-2	ERS4_P3D1530	-347-480V.IES	ERS4_P3D1540	-347-480V.IES	ERS4_P3D1550	-347-480V.IES
ERS4	Q3		525mA	234	257	17700	21300	3-0-2	3-0-2	ERS4_Q3D1530	-347-480V.IES	ERS4_Q3D1540	-347-480V.IES	ERS4_Q3D1550	-347-480V.IES
ERS4	R3		525mA	247	272	18700	22500	3-0-2	3-0-3	ERS4_R3D1530	-347-480V.IES	ERS4_R3D1540	-347-480V.IES	ERS4_R3D1550	-347-480V.IES
ERS4	S3		525mA	260	286	19700	23700	3-0-2	3-0-3	ERS4_S3D1530	-347-480V.IES	ERS4_S3D1540	-347-480V.IES	ERS4_S3D1550	-347-480V.IES
ERS4	T3		525mA	274	301	20700	24800	3-0-2	3-0-3	ERS4_T3D1530	-347-480V.IES	ERS4_T3D1540	-347-480V.IES	ERS4_T3D1550	-347-480V.IES
ERS4	P3	E1	525mA	222	244	17200	20600	3-0-2	3-0-2	ERS4_P3E1530	-347-480V.IES	ERS4_P3E1540	-347-480V.IES	ERS4_P3E1550	-347-480V.IES
ERS4	Q3		525mA	234	257	18200	21800	3-0-2	3-0-2	ERS4_Q3E1530	-347-480V.IES	ERS4_Q3E1540	-347-480V.IES	ERS4_Q3E1550	-347-480V.IES
ERS4	R3		525mA	247	272	19200	23000	3-0-2	3-0-3	ERS4_R3E1530	-347-480V.IES	ERS4_R3E1540	-347-480V.IES	ERS4_R3E1550	-347-480V.IES
ERS4	S3		525mA	260	286	20200	24300	3-0-2	3-0-3	ERS4_S3E1530	-347-480V.IES	ERS4_S3E1540	-347-480V.IES	ERS4_S3E1550	-347-480V.IES
ERS4	T3		525mA	274	301	21200	25400	3-0-2	4-0-3	ERS4_T3E1530	-347-480V.IES	ERS4_T3E1540	-347-480V.IES	ERS4_T3E1550	-347-480V.IES

NOTES:

- Max Operating Ambient 50° C
- Max Operating Ambient 40° C for 347-480V
- For T Option, Contact Manufacturer

Lumen Maintenance

- Projected L91 (10K) ≥ 50,000 at Ta 25C
  - Projected L70 (10K) > 100,000 at Ta 25C
- Based on 10,000h LM-80 data for Nichia 219B SQETMLH17005

# Photometrics

## Scalable Specification Grade Cobrahead (ERS4)

ISO Plot

Grid Distance in Units of Mounting Height at 30' Initial Footcandle Values at Grade

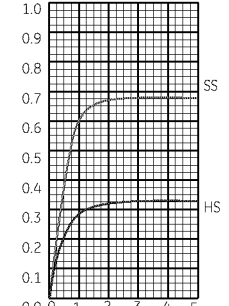
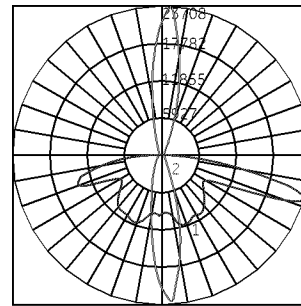
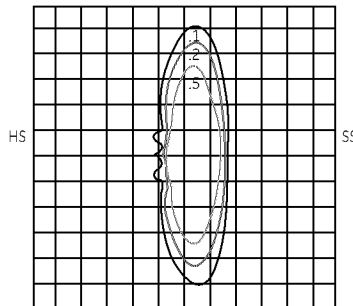
Polar Curve

Polar Trace Vertical and Horizontal Plane through Horizontal Angle of Maximum Candlepower

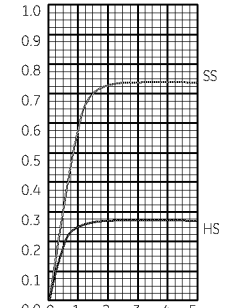
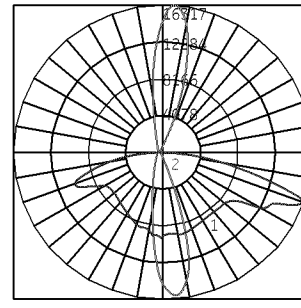
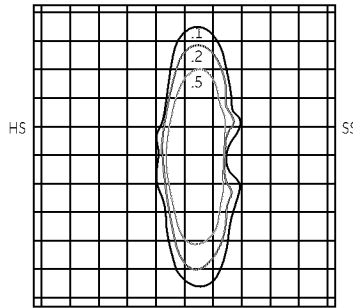
CU Graph

Coefficients of Utilization Street Width / Mounting Height

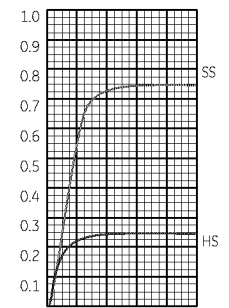
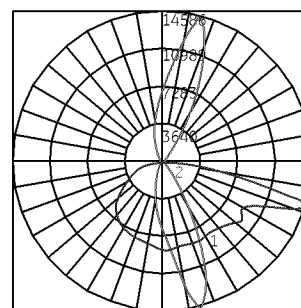
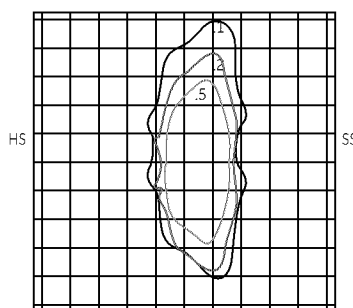
ERS4  
Extra Narrow Asymmetric  
(T3A1)  
24800 Lumens  
5000K  
ERS4\_T3A1550\_\_\_\_-120-277V.IES



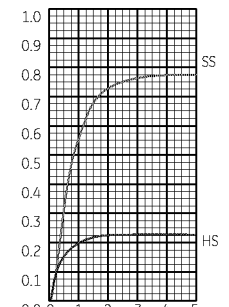
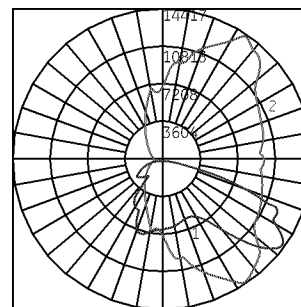
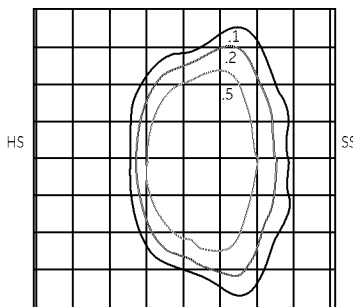
ERS4  
Narrow Asymmetric Medium  
(T3B1)  
25400 Lumens  
5000K  
ERS4\_T3B1550\_\_\_\_-120-277V.IES



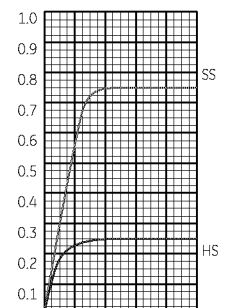
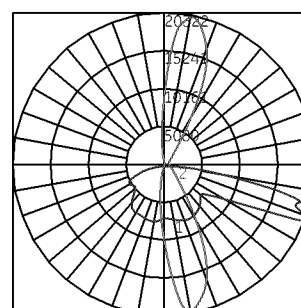
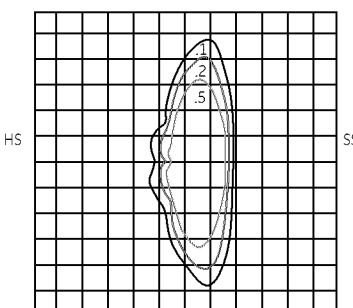
ERS4  
Asymmetric Short  
(T3C1)  
25400 Lumens  
5000K  
ERS4\_T3C1550\_\_\_\_-120-277V.IES



ERS4  
Asymmetric Forward  
(T3D1)  
24800 Lumens  
5000K  
ERS4\_T3D1550\_\_\_\_-120-277V.IES

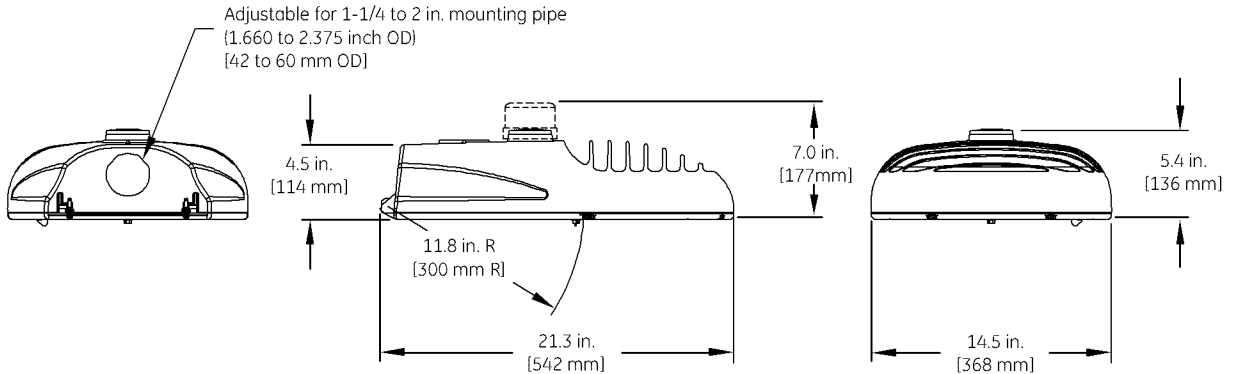
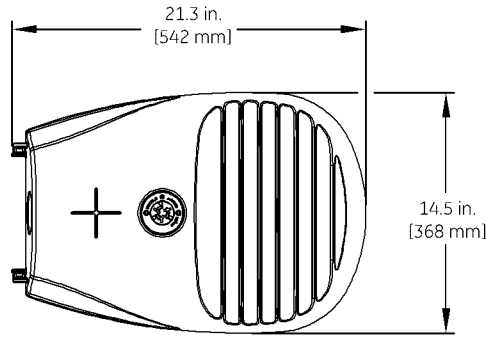


ERS4  
Asymmetric Medium  
(T3E1)  
25400 Lumens  
5000K  
ERS4\_T3E1550\_\_\_\_-120-277V.IES



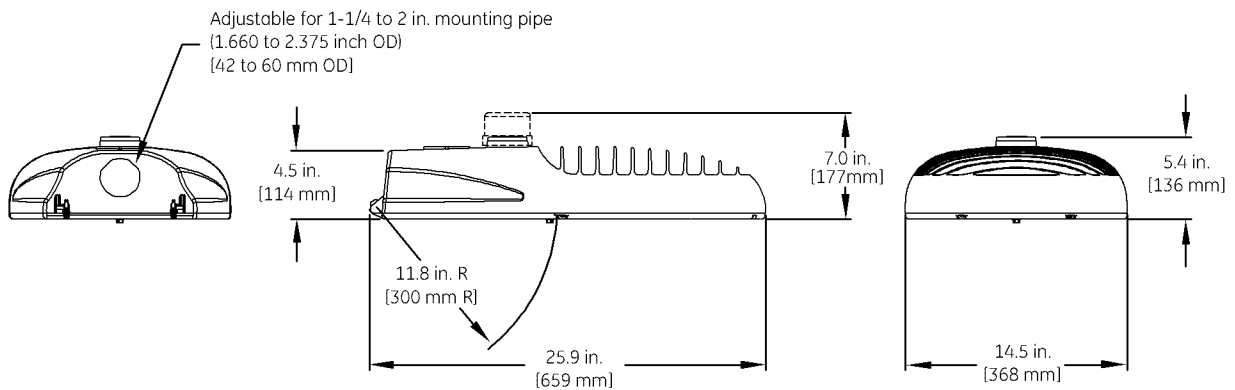
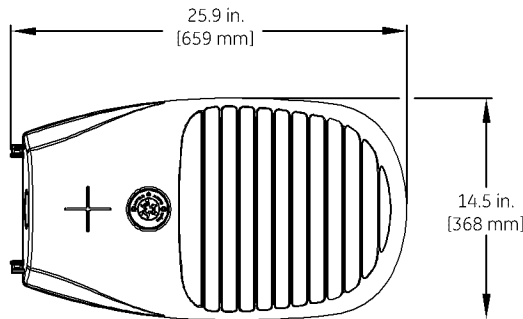
# Product Dimensions

## Evolve LED Scalable Specification Grade Cobrahead (ERS1)



<b>DATA</b>	<ul style="list-style-type: none"> <li>• Approximate Net Weight: 20 to 25 lbs. (9.07 to 11.34 kgs.) Contact manufacturer for specific configuration weight.</li> </ul>
	<ul style="list-style-type: none"> <li>• Effective Projected Area (EPA): 0.5 sq. ft. max (0.046 sq. m)</li> </ul>

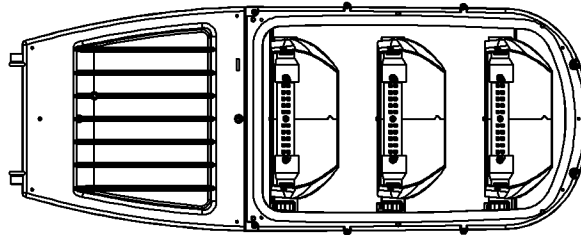
## Evolve LED Scalable Specification Grade Cobrahead (ERS2)



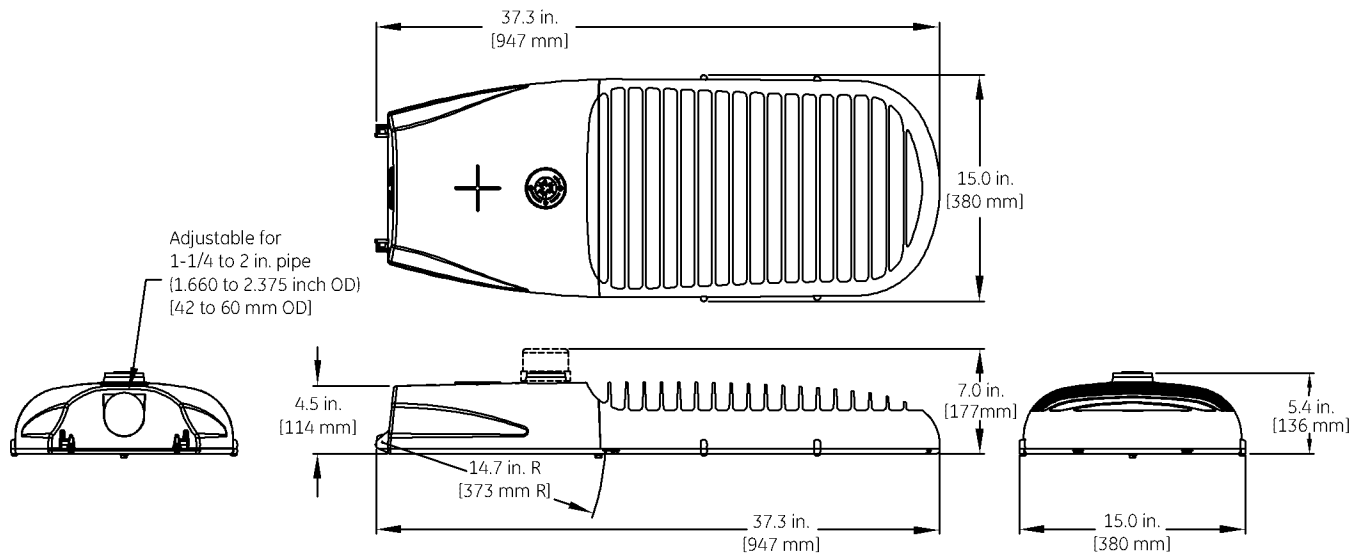
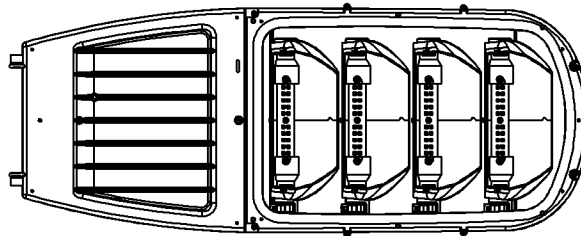
<b>DATA</b>	<ul style="list-style-type: none"> <li>• Approximate Net Weight: 25 to 29 lbs. (11.34 to 13.15 kgs.) Contact manufacturer for specific configuration weight.</li> </ul>
	<ul style="list-style-type: none"> <li>• Effective Projected Area (EPA): 0.7 sq. ft. max (0.065 sq. m)</li> </ul>

# Product Dimensions

Evolve LED Scalable Specification  
Grade Cobrahead (ERS3)



Evolve LED Scalable Specification  
Grade Cobrahead (ERS4)



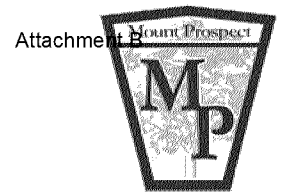
DATA	<ul style="list-style-type: none"> <li>• Approximate Net Weight: 40 to 46 lbs. (18.14 to 20.87 kgs.) Contact manufacturer for specific configuration weight.</li> </ul>
	<ul style="list-style-type: none"> <li>• Effective Projected Area (EPA): 1.0 sq. ft. max (0.093 sq. m)</li> </ul>



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OLP3067 (Rev 03/10/15)



Village of Mount Prospect  
Street Lighting Capital Program  
Corridor Lighting Evaluation

**Appendix B – Photometric Results**

Appendix B-1

6/20/2016

# LUMINAIRE PERFORMANCE SUMMARY

## 24' Section

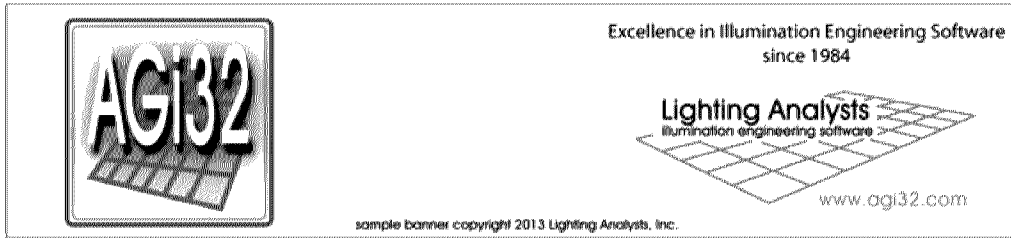
**Date:** 6/6/2016  
**Designer:** Joe Vondra  
**Project:** Village of Mount Prospect - Corridor Lighting Evaluation

IES Roadway Classification: Collector	Pedestrian Conflict Classification: Low	Luminance				Sidewalk Area Illuminance		
		L <sub>avg</sub>	L <sub>avg</sub> /L <sub>min</sub>	L <sub>max</sub> /L <sub>min</sub>	L <sub>v</sub> /L <sub>avg</sub>	E <sub>Havg</sub>	E <sub>Vmin</sub>	E <sub>avg</sub> /E <sub>min</sub>
<b>IES Recommended Levels</b>		0.4	4.0	8.0	0.4	0.4	0.1	4.0
<b>Manufacturer:</b> American Electric		0.54	2.45	5.41	0.37	0.35	0.20	1.75
<b>Curve #:</b> ATB0_20BLEDE70_XXXXX_R2		0.58	2.07	3.57	0.24	0.66	0.20	3.63
<b>Manufacturer:</b> GE Lighting								
<b>Curve #:</b> ers2_d3c1540-120-277v_tcm201								

Note: Sidewalk Area values out of spec will improve for 90% spacing. Final values should be calculated during design.

## DESIGN PARAMETERS

Combined LLF	0.7	Spacing	150'
Lamp lumens	5571/8200	Light Pole Set Back SB <sub>LP</sub>	6'
Roadway Width W <sub>R</sub>	24'	Mounting Height	25'
Number of Lanes	2	Mast Arm	8'
Lane Width W <sub>L</sub>	12'	Sidewalk Set Back SB <sub>SW</sub>	0'
Layout	Single Sided	Sidewalk Width W <sub>SW</sub>	12'



## Roadway Optimizer - Layout 1

### General:

American Electric ATB0 LED Luminaire

Roadway Standard: IES RP-8-14-IDOT (entire roadway)

R-Table: R3 (Slightly Specular), QO=0.07 Actual QO Value: 0.07

### Roadway Layout:

Layout Type: One Row, Near Side; 1RNS

Roadway Width: 24 ft

Lanes In Direction Of Travel: 1 In Opposite Direction: 1

Driver's Side Of Roadway: Right

### Luminaire Information:

#### ATB0 20BLEDE70 XXXXX R2

Description: ATB0 20BLEDE70 XXXXX R2

File Name: ATB0\_20BLEDE70\_XXXXX\_R2.ies

Lumens Per Lamp: N.A.

Number Of Lamps: 1

Total Lamp Lumens: N.A.

Luminaire Lumens: 5571

Luminaire Watts: 48

Efficiency (%): N.A.

Total Light Loss Factor: 0.700

Luminaire Arrangement: SINGLE

Arm Length: 8.392 ft

Offset: 0 ft

### Luminaire Location Summary:

Coordinates in ft

Spacing - Row 1: 135

<u>Label</u>	<u>X-Coord</u>	<u>Y-Coord</u>	<u>Z-Coord</u>	<u>Orient</u>	<u>Tilt</u>	<u>Spin</u>
ATB0_20BLEDE70_XXXX...	-405	-6	25	90	0	0
ATB0_20BLEDE70_XXXX...	-270	-6	25	90	0	0
ATB0_20BLEDE70_XXXX...	-135	-6	25	90	0	0
ATB0_20BLEDE70_XXXX...	0	-6	25	90	0	0
ATB0_20BLEDE70_XXXX...	135	-6	25	90	0	0
ATB0_20BLEDE70_XXXX...	270	-6	25	90	0	0
ATB0_20BLEDE70_XXXX...	405	-6	25	90	0	0

---

## Roadway Optimizer - Layout 1 - Cont.

---

**Luminaire Location Summary:**

Coordinates in ft

ATB0_20BLEDE70_XXXX...	540	-6	25	90	0	0
------------------------	-----	----	----	----	---	---

Total Number of locations: 8

## Roadway Optimizer - Layout 1

### RoadOpt\_2\_Luminance

-----	+0.37	+0.31	+0.32	+0.37	+0.39	+0.42	+0.40	+0.35	+0.32	+0.37	←
-----	+0.41	+0.41	+0.48	+0.55	+0.57	+0.62	+0.62	+0.55	+0.44	+0.40	
-----	+0.48	+0.55	+0.66	+0.78	+0.85	+0.93	+0.92	+0.81	+0.63	+0.48	→
-----	+0.55	+0.63	+0.76	+0.91	+1.01	+1.08	+1.08	+0.96	+0.80	+0.57	

### Luminance (Cd/SqM)

Average = 0.6

Maximum = 1.08

Minimum = 0.31

Avg/Min Ratio = 1.94

Max/Min Ratio = 3.48

Max/Avg Ratio = 1.8

---

## Roadway Optimizer - Layout 1

RoadOpt\_2\_Illum

---

	+0.90	+0.57	+0.42	+0.37	+0.34	+0.34	+0.37	+0.42	+0.57	+0.90
	+0.94	+0.67	+0.52	+0.42	+0.37	+0.37	+0.42	+0.52	+0.67	+0.94
→	+1.03	+0.81	+0.57	+0.41	+0.34	+0.34	+0.41	+0.57	+0.81	+1.03
	+1.21	+0.89	+0.53	+0.36	+0.28	+0.28	+0.36	+0.53	+0.89	+1.21

---

### Illuminance (Fc)

Average = 0.6

Maximum = 1.21

Minimum = 0.28

Avg/Min Ratio = 2.14

Max/Min Ratio = 4.32

Max/Avg Ratio = 2.02

---

## Roadway Optimizer - Layout 1

RoadOpt\_2\_Vis\_Level

-----	+0.97	+3.34	+3.58	+3.64	+3.18	+2.30	+1.18	+0.26	+ -0.58	+ -2.08
-----	+0.18	+2.70	+3.18	+2.70	+1.92	+1.22	+0.36	+ -0.73	+ -1.62	+ -2.82
-----	+ -0.69	+2.20	+2.05	+1.03	+0.16	+ -0.54	+ -1.14	+ -2.06	+ -2.87	+ -3.67
-----	+ -0.85	+2.01	+1.16	+ -0.16	+ -1.42	+ -2.19	+ -2.55	+ -3.16	+ -3.83	+ -4.31

### Visibility Level

STV = 1.75992

## Roadway Optimizer - Layout 1

### RoadOpt\_2\_Vis\_Level\_Bkgd\_Lum

-----		†0.37	†0.39	†0.42	†0.40	†0.36	†0.32	†0.36	†0.37	†0.31	†0.31
-----		†0.55	†0.58	†0.62	†0.62	†0.57	†0.45	†0.40	†0.41	†0.40	†0.46
-----	→	†0.77	†0.85	†0.92	†0.92	†0.84	†0.65	†0.50	†0.47	†0.54	†0.64
-----	→	†0.89	†1.00	†1.07	†1.09	†0.99	†0.82	†0.60	†0.55	†0.63	†0.73

### Background Luminance (Cd/SqM)

Average = 0.6

Maximum = 1.09

Minimum = 0.31

Avg/Min Ratio = 1.94

Max/Min Ratio = 3.52

Max/Avg Ratio = 1.82

## Roadway Optimizer - Layout 1

### RoadOpt\_2\_Vis\_Level\_Target\_Lum

-----	+0.50	+0.81	+0.90	+0.95	+0.87	+0.72	+0.56	+0.40	+0.26	+0.15
-----	+0.51	+0.94	+1.12	+1.11	+0.95	+0.77	+0.58	+0.39	+0.25	+0.14
-----	+0.54	+1.14	+1.24	+1.09	+0.88	+0.70	+0.54	+0.36	+0.22	+0.12
-----	+0.61	+1.25	+1.18	+0.97	+0.75	+0.57	+0.43	+0.29	+0.17	+0.09

### Target Luminance (Cd/SqM)

Average = 0.65

Maximum = 1.25

Minimum = 0.09

Avg/Min Ratio = 7.22

Max/Min Ratio = 13.89

Max/Avg Ratio = 1.92

---

## Roadway Optimizer - Layout 1

### RoadOpt\_2\_Veil\_Lum

-----	+0.04	+0.05	+0.08	+0.11	+0.12	+0.12	+0.10	+0.07	+0.05	+0.04	←
-----	+0.04	+0.06	+0.09	+0.14	+0.17	+0.17	+0.15	+0.11	+0.06	+0.04	
-----	+0.05	+0.06	+0.10	+0.16	+0.20	+0.20	+0.18	+0.14	+0.08	+0.05	→
-----	+0.04	+0.05	+0.08	+0.13	+0.17	+0.17	+0.16	+0.13	+0.09	+0.05	

### Veiling Luminance (Cd/SqM)

Average = 0.1

Maximum = 0.20

Minimum = 0.04

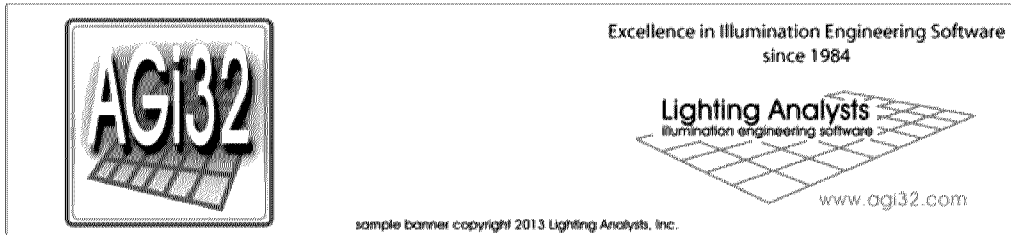
Avg/Min Ratio = 2.5

Max/Min Ratio = 5

Max/Avg Ratio = 2

MaxLv Ratio = 0.33

Threshold Increment (TI) = 19.56



## Roadway Optimizer - Layout 2

### General:

GE ERS2 LED Luminaire

Roadway Standard: IES RP-8-14-IDOT (entire roadway)

R-Table: R3 (Slightly Specular), QO=0.07 Actual QO Value: 0.07

### Roadway Layout:

Layout Type: One Row, Near Side; 1RNS

Roadway Width: 24 ft

Lanes In Direction Of Travel: 1 In Opposite Direction: 1

Driver's Side Of Roadway: Right

### Luminaire Information:

#### ers2 d3c1540-120-277v tcm201-

Description: ERS2\_D3C1540 -120-277V

File Name: ers2\_d3c1540-120-277v\_tcm201-95179.ies

Lumens Per Lamp: N.A.

Number Of Lamps: 1

Total Lamp Lumens: N.A.

Luminaire Lumens: 8200

Luminaire Watts: 88

Efficiency (%): N.A.

Total Light Loss Factor: 0.700

Luminaire Arrangement: SINGLE

Arm Length: 8.607 ft

Offset: 0 ft

### Luminaire Location Summary:

Coordinates in ft

Spacing - Row 1: 150

Label	X-Coord	Y-Coord	Z-Coord	Orient	Tilt	Spin
ers2_d3c1540-120-27...	-300	-6	25	90	0	0
ers2_d3c1540-120-27...	-150	-6	25	90	0	0
ers2_d3c1540-120-27...	0	-6	25	90	0	0
ers2_d3c1540-120-27...	150	-6	25	90	0	0
ers2_d3c1540-120-27...	300	-6	25	90	0	0
ers2_d3c1540-120-27...	450	-6	25	90	0	0

Total Number of locations: 6

---

## Roadway Optimizer - Layout 2

### RoadOpt\_2\_Luminance

-----	+0.71	+0.45	+0.31	+0.28	+0.34	+0.38	+0.41	+0.51	+0.63	+0.78	←
-----	+0.71	+0.41	+0.31	+0.31	+0.42	+0.50	+0.51	+0.66	+0.76	+0.83	
-----	+0.74	+0.41	+0.32	+0.34	+0.47	+0.65	+0.70	+0.88	+0.90	+0.92	→
-----	+0.72	+0.41	+0.31	+0.36	+0.53	+0.70	+0.80	+0.91	+1.00	+0.97	↑

### Luminance (Cd/SqM)

Average = 0.58

Maximum = 1.00

Minimum = 0.28

Avg/Min Ratio = 2.07

Max/Min Ratio = 3.57

Max/Avg Ratio = 1.72

---

## Roadway Optimizer - Layout 2

RoadOpt\_2\_Illum

---

	†2.18	†1.20	†0.57	†0.32	†0.27	†0.27	†0.32	†0.57	†1.20	†2.18
	†2.25	†1.17	†0.54	†0.28	†0.25	†0.25	†0.28	†0.54	†1.17	†2.25
→	†2.36	†1.14	†0.51	†0.24	†0.18	†0.18	†0.24	†0.51	†1.14	†2.36
	†2.34	†1.05	†0.42	†0.20	†0.14	†0.14	†0.20	†0.42	†1.05	†2.34

---

### Illuminance (Fc)

Average = 0.88

Maximum = 2.36

Minimum = 0.14

Avg/Min Ratio = 6.29

Max/Min Ratio = 16.86

Max/Avg Ratio = 2.68

---

## Roadway Optimizer - Layout 2

### RoadOpt\_2\_Vis\_Level

-----	+4.16	+10.37	+7.53	+4.46	+2.69	+0.54	+ -1.82	+ -3.59	+ -4.17	+ -4.50
-----	+4.32	+9.91	+6.47	+2.99	+1.56	+ -1.00	+ -2.99	+ -4.55	+ -4.64	+ -4.66
-----	+4.44	+9.35	+5.58	+1.45	+ -0.28	+ -2.94	+ -4.24	+ -5.36	+ -5.03	+ -4.86
-----	+4.40	+8.17	+3.73	+0.56	+ -1.71	+ -3.74	+ -4.77	+ -5.48	+ -5.28	+ -4.98

### Visibility Level

STV = 3.751027

## Roadway Optimizer - Layout 2

RoadOpt\_2\_Vis\_Level\_Bkgd\_Lum

-----	†0.28	†0.31	†0.37	†0.39	†0.44	†0.60	†0.72	†0.80	†0.54	†0.37
-----	†0.29	†0.37	†0.47	†0.51	†0.55	†0.73	†0.81	†0.87	†0.51	†0.35
-----	†0.31	†0.40	†0.55	†0.71	†0.77	†0.92	†0.95	†0.96	†0.52	†0.35
-----	†0.32	†0.45	†0.63	†0.77	†0.84	†1.01	†0.99	†0.93	†0.53	†0.34

### Background Luminance (Cd/SqM)

Average = 0.59

Maximum = 1.01

Minimum = 0.28

Avg/Min Ratio = 2.11

Max/Min Ratio = 3.61

Max/Avg Ratio = 1.71

## Roadway Optimizer - Layout 2

### RoadOpt\_2\_Vis\_Level\_Target\_Lum

-----	†1.17	†1.88	†1.43	†1.00	†0.82	†0.58	†0.34	†0.19	†0.09	†0.04	←
-----	†1.20	†1.84	†1.38	†0.90	†0.77	†0.48	†0.26	†0.12	†0.06	†0.03	
-----	→	†1.26	†1.79	†1.31	†0.78	†0.58	†0.34	†0.18	†0.08	†0.05	†0.03
-----	□	†1.24	†1.65	†1.07	†0.67	†0.45	†0.28	†0.14	†0.07	†0.04	†0.02

### Target Luminance (Cd/SqM)

Average = 0.67

Maximum = 1.88

Minimum = 0.02

Avg/Min Ratio = 33.5

Max/Min Ratio = 94

Max/Avg Ratio = 2.81

---

## Roadway Optimizer - Layout 2

### RoadOpt\_2\_Veil\_Lum

-----	†0.03	†0.05	†0.09	†0.12	†0.10	†0.08	†0.06	†0.03	†0.01	†0.02	←
-----	†0.03	†0.05	†0.08	†0.13	†0.14	†0.10	†0.09	†0.03	†0.01	†0.01	
-----	→	†0.02	†0.04	†0.06	†0.10	†0.13	†0.11	†0.09	†0.04	†0.01	†0.01
-----	†0.02	†0.03	†0.05	†0.08	†0.10	†0.09	†0.09	†0.04	†0.01	†0.01	↑

### Veiling Luminance (Cd/SqM)

Average = 0.06

Maximum = 0.14

Minimum = 0.01

Avg/Min Ratio = 6

Max/Min Ratio = 14

Max/Avg Ratio = 2.33

MaxLv Ratio = 0.24

Threshold Increment (TI) = 14.07

## Roadway Optimizer - Layout Comparison

	Layout 1	Layout 2
Description	American Electric ATB0 LED Luminaire	GE ERS2 LED Luminaire
Roadway Standard	IES RP-8-14-IDOT (entire roadway)	IES RP-8-14-IDOT (entire roadway)
R-Table	R3	R3
Actual Q0 Value	0.07	0.07
Layout Type	1RNS	1RNS
Road Width	24	24
Median Width	N.A.	N.A.
Number Lanes	1	1
Number Lanes Opposite	1	1
Drivers Side	Right	Right
Calc Area	Bottom	Bottom
Label - Row 1	ATB0_20BLEDE7 0_XXXXX_R2	ers2_d3c1540-1 20-277v_tcm201-
MH - Row 1	25	25
Setback - Row 1	6	6
+Orient - Row 1	0	0
Tilt - Row 1	0	0
Spin - Row 1	0	0
Spacing - Row 1	135	150
<b>1_Luminance (Cd/SqM)</b>		
Average	0.6	0.58
Maximum	1.08	1.00
Minimum	0.31	0.28
Avg/Min Ratio	1.94	2.07
Max/Min Ratio	3.48	3.57
Max/Avg Ratio	1.8	1.72
<b>1_Illum (Fc)</b>		
Average	0.6	0.88
Maximum	1.21	2.36
Minimum	0.28	0.14

---

**Roadway Optimizer - Layout Comparison - Cont.**

	<b>Layout 1</b>	<b>Layout 2</b>
Avg/Min Ratio	2.14	6.29
Max/Min Ratio	4.32	16.86
Max/Avg Ratio	2.02	2.68
<hr/>		
<b>1_Vis_Level</b>		
STV	1.76	3.75
<hr/>		
<b>1_Vis_Level_Bkgd_Lum (Cd/SqM)</b>		
Average	0.6	0.59
Maximum	1.09	1.01
Minimum	0.31	0.28
Avg/Min Ratio	1.94	2.11
Max/Min Ratio	3.52	3.61
Max/Avg Ratio	1.82	1.71
<hr/>		
<b>1_Vis_Level_Target_Lum (Cd/SqM)</b>		
Average	0.65	0.67
Maximum	1.25	1.88
Minimum	0.09	0.02
Avg/Min Ratio	7.22	33.50
Max/Min Ratio	13.89	94.00
Max/Avg Ratio	1.92	2.81
<hr/>		
<b>1_Veil_Lum (Cd/SqM)</b>		
Average	0.1	0.06
Maximum	0.20	0.14
Minimum	0.04	0.01
Avg/Min Ratio	2.50	6.00
Max/Min Ratio	5.00	14.00
Max/Avg Ratio	2	2.33
MaxLV Ratio	0.33	0.24
Threshold Incr. (TI)	19.56	14.07

# LUMINAIRE PERFORMANCE SUMMARY

## 44' Section

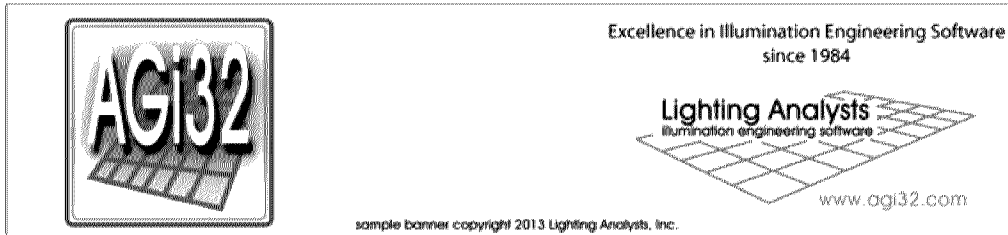
**Date:** 6/6/2016  
**Designer:** Joe Vondra  
**Project:** Village of Mount Prospect - Corridor Lighting Evaluation

IES Roadway Classification: Collector	Pedestrian Conflict Classification: Low	Luminance				Sidewalk Area Illuminance		
		L <sub>avg</sub>	L <sub>avg</sub> /L <sub>min</sub>	L <sub>max</sub> /L <sub>min</sub>	L <sub>v</sub> /L <sub>avg</sub>	E <sub>Havg</sub>	E <sub>Vmin</sub>	E <sub>avg</sub> /E <sub>min</sub>
<b>IES Recommended Levels</b>		0.4	4.0	8.0	0.4	0.4	0.1	4.0
<b>Manufacturer:</b> American Electric		0.42	3	7.71	0.36	0.41	0.10	4.1
<b>Curve #:</b> ATB2_40BLEDE10_XXXXX_R3		0.42	2.63	5.63	0.26	0.4	0.10	4.0
<b>Manufacturer:</b> GE Lighting								
<b>Curve #:</b> ers2_h3c1740-120-277v_tcm201								

Note: Sidewalk Area values out of spec will improve for 90% spacing. Final values should be calculated during design.

## DESIGN PARAMETERS

Combined LLF	0.7	Spacing	235'
Lamp lumens	15519/16100	Light Pole Set Back SB <sub>LP</sub>	6'
Roadway Width W <sub>R</sub>	44'	Mounting Height	35'
Number of Lanes	4	Mast Arm	12'
Lane Width W <sub>L</sub>	11'	Sidewalk Set Back SB <sub>SW</sub>	0'
Layout	Single Sided	Sidewalk Width W <sub>SW</sub>	12'



## Roadway Optimizer - Layout 1

### General:

American Electric ATB2 LED Luminaire

Roadway Standard: IES RP-8-14-IDOT (entire roadway)

R-Table: R3 (Slightly Specular), Q0=0.07 Actual Q0 Value: 0.07

### Roadway Layout:

Layout Type: One Row, Near Side; 1RNS

Roadway Width: 44 ft

Lanes In Direction Of Travel: 2 In Opposite Direction: 2

Driver's Side Of Roadway: Right

### Luminaire Information:

#### ATB2 40BLEDE10 XXXXX R3

Description: ATB2 40BLEDE10 XXXXX R3

File Name: ATB2\_40BLEDE10\_XXXXX\_R3.ies

Lumens Per Lamp: N.A.

Number Of Lamps: 1

Total Lamp Lumens: N.A.

Luminaire Lumens: 15519

Luminaire Watts: 138

Efficiency (%): N.A.

Total Light Loss Factor: 0.700

Luminaire Arrangement: SINGLE

Arm Length: 12.76175 ft

Offset: 0 ft

### Luminaire Location Summary:

Coordinates in ft

Spacing - Row 1: 235

<u>Label</u>	<u>X-Coord</u>	<u>Y-Coord</u>	<u>Z-Coord</u>	<u>Orient</u>	<u>Tilt</u>	<u>Spin</u>
ATB2_40BLEDE10_XXXX...	705	-6	35	90	0	0
ATB2_40BLEDE10_XXXX...	470	-6	35	90	0	0
ATB2_40BLEDE10_XXXX...	235	-6	35	90	0	0
ATB2_40BLEDE10_XXXX...	0	-6	35	90	0	0
ATB2_40BLEDE10_XXXX...	-235	-6	35	90	0	0
ATB2_40BLEDE10_XXXX...	-470	-6	35	90	0	0

Total Number of locations: 6

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Luminance

	0.29	0.30	0.27	0.21	0.18	0.15	0.14	0.14	0.18	0.23	0.31	0.36	0.37	0.37	0.36	0.30	
	0.39	0.35	0.29	0.23	0.19	0.15	0.15	0.16	0.21	0.28	0.35	0.41	0.44	0.44	0.44	0.41	
	0.44	0.37	0.29	0.24	0.19	0.16	0.16	0.19	0.27	0.35	0.44	0.48	0.54	0.53	0.50	0.47	
	0.44	0.37	0.30	0.25	0.20	0.17	0.18	0.24	0.36	0.46	0.57	0.63	0.68	0.64	0.58	0.50	
→	0.43	0.35	0.29	0.25	0.20	0.18	0.20	0.30	0.50	0.68	0.76	0.83	0.86	0.74	0.64	0.49	
	0.43	0.33	0.27	0.24	0.20	0.19	0.24	0.36	0.63	0.85	0.99	1.02	0.99	0.84	0.64	0.52	
→	0.41	0.30	0.24	0.23	0.19	0.19	0.25	0.39	0.70	0.93	1.05	1.08	1.01	0.82	0.60	0.52	
	0.36	0.27	0.22	0.20	0.17	0.17	0.20	0.30	0.52	0.73	0.86	0.90	0.86	0.71	0.53	0.44	

### Luminance (Cd/SqM)

Average = 0.42

Maximum = 1.08

Minimum = 0.14

Avg/Min Ratio = 3

Max/Min Ratio = 7.71

Max/Avg Ratio = 2.57

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Illum

	0.95	0.92	0.72	0.52	0.37	0.26	0.18	0.14	0.14	0.18	0.26	0.37	0.52	0.72	0.92	0.95	▶
	1.24	1.10	0.78	0.55	0.38	0.26	0.18	0.14	0.14	0.18	0.26	0.38	0.55	0.78	1.10	1.24	
	1.38	1.17	0.83	0.57	0.39	0.26	0.18	0.13	0.13	0.18	0.26	0.39	0.57	0.83	1.17	1.38	▶
▶	1.43	1.20	0.86	0.58	0.39	0.26	0.18	0.14	0.14	0.18	0.26	0.39	0.58	0.86	1.20	1.43	
	1.41	1.15	0.85	0.59	0.39	0.26	0.18	0.13	0.13	0.18	0.26	0.39	0.59	0.85	1.15	1.41	
▶	1.42	1.08	0.79	0.54	0.35	0.24	0.16	0.12	0.12	0.16	0.24	0.35	0.54	0.79	1.08	1.42	
▶	1.37	0.95	0.68	0.47	0.31	0.21	0.14	0.10	0.10	0.14	0.21	0.31	0.47	0.68	0.95	1.37	
	1.18	0.85	0.62	0.42	0.27	0.18	0.12	0.08	0.08	0.12	0.18	0.27	0.42	0.62	0.85	1.18	

### Illuminance (Fc)

Average = 0.57

Maximum = 1.43

Minimum = 0.08

Avg/Min Ratio = 7.13

Max/Min Ratio = 17.88

Max/Avg Ratio = 2.51

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Vis\_Level

	0.76	6.87	10.71	12.07	11.59	9.65	6.30	2.81	0.21	1.92	3.11	3.37	3.31	3.29	3.36	3.28
	1.05	7.93	11.51	12.62	11.54	9.11	5.71	2.31	0.32	2.43	3.47	3.70	3.75	3.72	3.72	3.59
	1.18	8.18	12.15	12.72	11.33	8.32	4.87	1.78	1.17	3.00	3.94	4.00	4.08	3.97	3.88	3.70
	1.26	8.31	12.41	12.54	10.55	7.25	3.98	0.99	2.12	3.72	4.46	4.53	4.40	4.15	4.00	3.71
→	1.23	8.07	12.20	12.17	9.86	5.90	2.67	0.01	3.17	4.69	5.07	5.00	4.73	4.28	4.05	3.64
	1.31	7.61	11.39	10.84	8.26	4.34	1.31	1.47	4.21	5.35	5.68	5.38	4.98	4.51	4.00	3.63
→	1.37	6.85	9.99	9.29	6.84	3.09	0.43	2.23	4.62	5.57	5.76	5.43	5.00	4.55	3.86	3.51
	1.21	6.49	9.50	8.95	6.79	3.31	0.64	2.04	4.15	5.08	5.34	5.06	4.70	4.27	3.71	3.40

## Visibility Level

STV = 4.215286

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Vis\_Level\_Bkgd\_Lum

	0.24	0.19	0.16	0.14	0.14	0.16	0.21	0.29	0.35	0.37	0.37	0.37	0.32	0.30	0.30	0.29
	0.25	0.20	0.16	0.15	0.15	0.19	0.24	0.33	0.40	0.43	0.44	0.44	0.43	0.41	0.37	0.31
	0.26	0.21	0.17	0.15	0.17	0.23	0.31	0.40	0.48	0.51	0.54	0.51	0.49	0.45	0.41	0.32
	0.26	0.21	0.18	0.17	0.21	0.30	0.40	0.52	0.62	0.66	0.65	0.62	0.53	0.45	0.41	0.32
	0.27	0.22	0.18	0.19	0.24	0.41	0.60	0.73	0.79	0.86	0.78	0.68	0.54	0.43	0.39	0.31
	0.25	0.21	0.19	0.21	0.29	0.52	0.76	0.95	1.02	1.02	0.91	0.71	0.55	0.45	0.37	0.29
	0.23	0.20	0.18	0.22	0.31	0.58	0.84	1.01	1.08	1.05	0.90	0.67	0.52	0.47	0.33	0.26
	0.21	0.18	0.16	0.19	0.24	0.43	0.65	0.82	0.89	0.88	0.79	0.59	0.46	0.40	0.30	0.23

### Background Luminance (Cd/SqM)

Average = 0.42

Maximum = 1.08

Minimum = 0.14

Avg/Min Ratio = 3

Max/Min Ratio = 7.71

Max/Avg Ratio = 2.57

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Vis\_Level\_Target\_Lum

	0.36	1.02	1.32	1.32	1.21	1.01	0.77	0.51	0.29	0.14	0.06	0.04	0.03	0.02	0.01	0.01
	0.46	1.22	1.43	1.41	1.24	1.01	0.76	0.51	0.28	0.14	0.05	0.03	0.02	0.02	0.01	0.01
	0.51	1.29	1.52	1.46	1.26	1.01	0.76	0.50	0.27	0.13	0.05	0.03	0.02	0.02	0.01	0.01
	0.53	1.32	1.58	1.49	1.27	1.02	0.77	0.52	0.26	0.12	0.05	0.03	0.02	0.02	0.01	0.01
→	0.52	1.27	1.56	1.50	1.27	1.01	0.78	0.51	0.25	0.11	0.05	0.03	0.02	0.02	0.01	0.01
	0.53	1.19	1.45	1.39	1.16	0.93	0.71	0.47	0.22	0.10	0.04	0.03	0.02	0.01	0.01	0.01
→	0.51	1.05	1.25	1.21	1.02	0.81	0.62	0.41	0.19	0.09	0.04	0.03	0.02	0.01	0.01	0.01
	0.44	0.93	1.13	1.08	0.90	0.71	0.52	0.32	0.15	0.08	0.04	0.03	0.02	0.01	0.01	0.01

### Target Luminance (Cd/SqM)

Average = 0.51

Maximum = 1.58

Minimum = 0.01

Avg/Min Ratio = 51

Max/Min Ratio = 158

Max/Avg Ratio = 3.1

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Veil\_Lum

	0.04	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.04	0.06	0.08	0.08	0.07	0.05
	0.04	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.04	0.06	0.09	0.09	0.08	0.07
	0.05	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.04	0.07	0.10	0.11	0.10	0.08
	0.06	0.03	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.05	0.08	0.12	0.13	0.11	0.09
	0.07	0.03	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.03	0.05	0.09	0.13	0.14	0.13	0.10
	0.07	0.03	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.03	0.05	0.10	0.14	0.15	0.13	0.11
	0.06	0.03	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.03	0.05	0.09	0.13	0.13	0.12	0.10
	0.05	0.03	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.03	0.04	0.07	0.10	0.11	0.10	0.08

### Veiling Luminance (Cd/SqM)

Average = 0.05

Maximum = 0.15

Minimum = 0.01

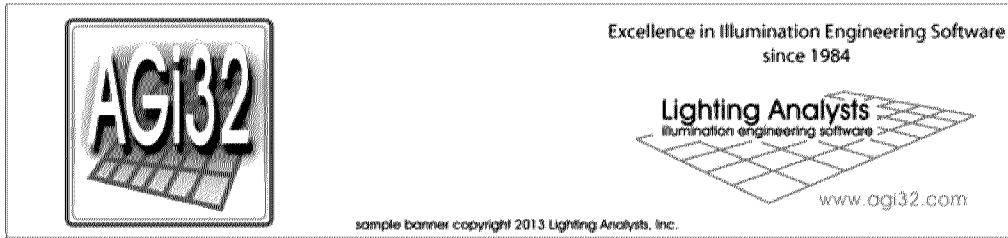
Avg/Min Ratio = 5

Max/Min Ratio = 15

Max/Avg Ratio = 3

MaxLv Ratio = 0.36

Threshold Increment (TI) = 19.52



## Roadway Optimizer - Layout 2

### General:

GE ERS2 LED Luminaire

Roadway Standard: IES RP-8-14-IDOT (entire roadway)

R-Table: R3 (Slightly Specular), QO=0.07 Actual QO Value: 0.07

### Roadway Layout:

Layout Type: One Row, Near Side; 1RNS

Roadway Width: 44 ft

Lanes In Direction Of Travel: 2 In Opposite Direction: 2

Driver's Side Of Roadway: Right

### Luminaire Information:

#### ers2\_g3c1740-120-277v\_tcm201-

Description: ERS2\_G3C1740 -120-277V

File Name: ers2\_g3c1740-120-277v\_tcm201-95332.ies

Lumens Per Lamp: N.A.

Number Of Lamps: 1

Total Lamp Lumens: N.A.

Luminaire Lumens: 14600

Luminaire Watts: 172

Efficiency (%): N.A.

Total Light Loss Factor: 0.700

Luminaire Arrangement: SINGLE

Arm Length: 8.607 ft

Offset: 0 ft

### Luminaire Location Summary:

Coordinates in ft

Spacing - Row 1: 235

Label	X-Coord	Y-Coord	Z-Coord	Orient	Tilt	Spin
ers2_g3c1740-120-27...	705	-6	35	90	0	0
ers2_g3c1740-120-27...	470	-6	35	90	0	0
ers2_g3c1740-120-27...	235	-6	35	90	0	0
ers2_g3c1740-120-27...	0	-6	35	90	0	0
ers2_g3c1740-120-27...	-235	-6	35	90	0	0
ers2_g3c1740-120-27...	-470	-6	35	90	0	0

Total Number of locations: 6

# Roadway Optimizer - Layout 2

## RoadOpt\_1\_Luminance

	0.33	0.30	0.25	0.18	0.16	0.16	0.16	0.18	0.18	0.18	0.21	0.22	0.25	0.30	0.33	0.33
	0.47	0.39	0.29	0.20	0.18	0.18	0.19	0.21	0.23	0.24	0.26	0.28	0.32	0.38	0.45	0.49
	0.62	0.45	0.33	0.24	0.19	0.19	0.21	0.25	0.28	0.30	0.32	0.35	0.42	0.51	0.57	0.65
→	0.65	0.46	0.33	0.25	0.20	0.20	0.23	0.26	0.33	0.37	0.37	0.41	0.52	0.59	0.63	0.70
→	0.71	0.45	0.31	0.24	0.19	0.20	0.23	0.30	0.42	0.54	0.58	0.61	0.75	0.76	0.82	0.82
→	0.72	0.47	0.30	0.23	0.19	0.22	0.28	0.37	0.50	0.61	0.68	0.70	0.84	0.90	0.90	0.87
→	0.67	0.45	0.29	0.22	0.19	0.21	0.28	0.37	0.51	0.61	0.69	0.73	0.82	0.90	0.89	0.85

### Luminance (Cd/SqM)

Average = 0.42  
 Maximum = 0.90  
 Minimum = 0.16  
 Avg/Min Ratio = 2.63  
 Max/Min Ratio = 5.63  
 Max/Avg Ratio = 2.14

# Roadway Optimizer - Layout 2

RoadOpt\_1\_Illum

	1.02	0.88	0.60	0.37	0.24	0.19	0.17	0.17	0.17	0.17	0.19	0.24	0.37	0.60	0.88	1.02	↔
	1.51	1.17	0.74	0.44	0.28	0.22	0.19	0.18	0.18	0.19	0.22	0.28	0.44	0.74	1.17	1.51	
	1.96	1.43	0.87	0.50	0.31	0.23	0.19	0.18	0.18	0.19	0.23	0.31	0.50	0.87	1.43	1.96	↔
→	2.06	1.44	0.90	0.53	0.31	0.22	0.19	0.17	0.17	0.19	0.22	0.31	0.53	0.90	1.44	2.06	
	2.14	1.45	0.89	0.50	0.28	0.20	0.17	0.14	0.14	0.17	0.20	0.28	0.50	0.89	1.45	2.14	
→	2.35	1.47	0.86	0.49	0.27	0.18	0.14	0.11	0.11	0.14	0.18	0.27	0.49	0.86	1.47	2.35	
→	2.40	1.51	0.82	0.44	0.23	0.16	0.12	0.10	0.10	0.12	0.16	0.23	0.44	0.82	1.51	2.40	
	2.27	1.42	0.76	0.39	0.21	0.14	0.10	0.08	0.08	0.10	0.14	0.21	0.39	0.76	1.42	2.27	

**Illuminance (Fc)**

Average = 0.67  
 Maximum = 2.40  
 Minimum = 0.08  
 Avg/Min Ratio = 8.38  
 Max/Min Ratio = 30  
 Max/Avg Ratio = 3.58

# Roadway Optimizer - Layout 2

## RoadOpt\_1\_Vis\_Level

	1.03	6.82	9.00	8.02	6.16	5.04	4.19	3.17	2.29	1.17	0.04	1.33	2.19	2.79	3.27	3.37
	1.53	8.34	10.58	9.20	7.01	5.55	4.47	3.04	1.91	0.41	-0.91	2.16	3.05	3.59	3.89	3.90
	1.76	9.57	11.90	10.25	7.48	5.59	4.24	2.72	0.96	-0.47	-1.87	2.85	3.75	4.25	4.32	4.31
	1.83	9.43	12.23	10.34	7.26	4.76	3.51	2.02	0.19	-1.48	-2.72	3.39	4.17	4.60	4.46	4.34
→	2.04	9.82	12.39	9.96	6.16	4.16	2.71	0.93	-1.04	-2.57	-3.56	4.02	4.60	4.88	4.69	4.38
→	2.26	9.86	12.02	9.58	5.93	3.49	1.49	-0.42	-2.28	-3.69	-4.35	4.66	5.02	5.20	4.86	4.53
→	2.38	9.97	11.33	8.13	4.20	2.10	0.31	-1.68	-3.07	-4.22	-4.88	5.07	5.36	5.41	5.08	4.64
→	2.35	9.46	10.57	7.00	3.70	1.47	-0.31	-2.04	-3.50	-4.38	-5.01	5.18	5.35	5.44	5.02	4.62

## Visibility Level

STV = 3.787158

## Roadway Optimizer - Layout 2

### RoadOpt\_1\_Vis\_Level\_Bkgd\_Lum

-----		0.20	0.16	0.16	0.16	0.17	0.17	0.18	0.20	0.22	0.23	0.28	0.33	0.34	0.31	0.31	0.28
-----		0.23	0.18	0.17	0.19	0.21	0.22	0.23	0.26	0.27	0.30	0.36	0.43	0.48	0.46	0.42	0.33
-----		0.27	0.21	0.19	0.20	0.23	0.26	0.28	0.31	0.34	0.38	0.48	0.53	0.64	0.65	0.52	0.37
-----		0.28	0.21	0.20	0.22	0.25	0.30	0.35	0.36	0.39	0.45	0.58	0.60	0.69	0.73	0.55	0.36
-----	→	0.27	0.19	0.19	0.22	0.28	0.35	0.42	0.45	0.47	0.55	0.66	0.71	0.77	0.78	0.55	0.35
-----	→	0.27	0.20	0.19	0.22	0.27	0.37	0.49	0.58	0.59	0.69	0.77	0.82	0.83	0.87	0.55	0.35
-----	→	0.26	0.20	0.20	0.25	0.34	0.45	0.56	0.67	0.68	0.79	0.89	0.90	0.90	0.84	0.58	0.35
-----	→	0.24	0.20	0.20	0.25	0.33	0.46	0.57	0.66	0.72	0.79	0.90	0.90	0.87	0.81	0.53	0.33

### Background Luminance (Cd/SqM)

Average = 0.42

Maximum = 0.90

Minimum = 0.16

Avg/Min Ratio = 2.63

Max/Min Ratio = 5.63

Max/Avg Ratio = 2.14

# Roadway Optimizer - Layout 2

## RoadOpt\_1\_Vis\_Level\_Target\_Lum

	0.38	0.96	1.09	0.91	0.73	0.63	0.57	0.52	0.44	0.34	0.24	0.17	0.11	0.06	0.04	0.02
	0.56	1.28	1.35	1.09	0.87	0.75	0.68	0.58	0.47	0.32	0.23	0.15	0.09	0.05	0.03	0.02
	0.72	1.57	1.59	1.27	0.98	0.82	0.72	0.61	0.43	0.29	0.21	0.12	0.07	0.04	0.03	0.02
	0.76	1.58	1.63	1.33	0.99	0.78	0.71	0.57	0.39	0.25	0.16	0.10	0.06	0.04	0.02	0.01
→	0.79	1.59	1.61	1.27	0.89	0.76	0.68	0.50	0.32	0.20	0.12	0.07	0.04	0.03	0.02	0.01
	0.87	1.61	1.56	1.23	0.87	0.70	0.56	0.40	0.25	0.15	0.09	0.06	0.04	0.03	0.02	0.01
→	0.88	1.65	1.49	1.12	0.74	0.60	0.47	0.33	0.22	0.13	0.08	0.05	0.03	0.02	0.02	0.01
→	0.84	1.56	1.39	0.98	0.68	0.53	0.39	0.29	0.18	0.11	0.07	0.04	0.03	0.02	0.01	0.01

### Target Luminance (Cd/SqM)

Average = 0.52

Maximum = 1.65

Minimum = 0.01

Avg/Min Ratio = 52

Max/Min Ratio = 165

Max/Avg Ratio = 3.17

## Roadway Optimizer - Layout 2

### RoadOpt\_1\_Veil\_Lum

	0.02	0.01	0.00	0.00	0.01	0.02	0.02	0.03	0.04	0.05	0.05	0.05	0.04	0.04	0.03	0.03
	0.03	0.02	0.00	0.00	0.01	0.01	0.02	0.03	0.05	0.06	0.07	0.07	0.06	0.05	0.04	0.04
	0.04	0.02	0.00	0.00	0.01	0.01	0.02	0.03	0.05	0.06	0.08	0.09	0.09	0.08	0.06	0.05
	0.05	0.03	0.00	0.00	0.01	0.01	0.02	0.03	0.04	0.06	0.08	0.10	0.11	0.09	0.08	0.07
	0.06	0.03	0.00	0.00	0.01	0.01	0.02	0.03	0.04	0.06	0.08	0.10	0.11	0.10	0.08	0.08
	0.06	0.03	0.00	0.00	0.01	0.01	0.02	0.02	0.03	0.04	0.06	0.09	0.11	0.10	0.09	0.08
	0.06	0.03	0.00	0.00	0.01	0.01	0.02	0.02	0.03	0.04	0.06	0.08	0.09	0.09	0.08	0.08
	0.06	0.03	0.00	0.00	0.01	0.01	0.02	0.02	0.03	0.04	0.05	0.07	0.08	0.08	0.07	0.07

### Veiling Luminance (Cd/SqM)

Average = 0.04

Maximum = 0.11

Minimum = 0.00

Avg/Min Ratio = N.A.

Max/Min Ratio = N.A.

Max/Avg Ratio = 2.75

MaxLv Ratio = 0.26

Threshold Increment (TI) = 14.31

## Roadway Optimizer - Layout Comparison

	Layout 1	Layout 2
Description	American Electric ATB2 LED Luminaire	GE ERS2 LED Luminaire
Roadway Standard	IES RP-8-14-IDOT (entire roadway)	IES RP-8-14-IDOT (entire roadway)
R-Table	R3	R3
Actual Q0 Value	0.07	0.07
Layout Type	1RNS	1RNS
Road Width	44	44
Median Width	N.A.	N.A.
Number Lanes	2	2
Number Lanes Opposite	2	2
Drivers Side	Right	Right
Calc Area	Bottom	Bottom
Label - Row 1	ATB2_40BLEDE1 0_XXXXX_R3	ers2_g3c1740-1 20-277v_tcm201-
MH - Row 1	35	35
Setback - Row 1	6	6
+Orient - Row 1	0	0
Tilt - Row 1	0	0
Spin - Row 1	0	0
Spacing - Row 1	235	235
<b>1_Luminance (Cd/SqM)</b>		
Average	0.42	0.42
Maximum	1.08	0.90
Minimum	0.14	0.16
Avg/Min Ratio	3.00	2.63
Max/Min Ratio	7.71	5.63
Max/Avg Ratio	2.57	2.14
<b>1_Illum (Fc)</b>		
Average	0.57	0.67
Maximum	1.43	2.40
Minimum	0.08	0.08

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**Roadway Optimizer - Layout Comparison - Cont.**

	<b>Layout 1</b>	<b>Layout 2</b>
Avg/Min Ratio	7.13	8.38
Max/Min Ratio	17.88	30.00
Max/Avg Ratio	2.51	3.58
<hr/>		
<b>1_Vis_Level</b>		
STV	4.22	3.79
<hr/>		
<b>1_Vis_Level_Bkgd_Lum (Cd/SqM)</b>		
Average	0.42	0.42
Maximum	1.08	0.90
Minimum	0.14	0.16
Avg/Min Ratio	3.00	2.63
Max/Min Ratio	7.71	5.63
Max/Avg Ratio	2.57	2.14
<hr/>		
<b>1_Vis_Level_Target_Lum (Cd/SqM)</b>		
Average	0.51	0.52
Maximum	1.58	1.65
Minimum	0.01	0.01
Avg/Min Ratio	51.00	52.00
Max/Min Ratio	158	165
Max/Avg Ratio	3.1	3.17
<hr/>		
<b>1_Veil_Lum (Cd/SqM)</b>		
Average	0.05	0.04
Maximum	0.15	0.11
Minimum	0.01	0.00
Avg/Min Ratio	5.00	N.A.
Max/Min Ratio	15.00	N.A.
Max/Avg Ratio	3	2.75
MaxLV Ratio	0.36	0.26
Threshold Incr. (TI)	19.52	14.31

## LUMINAIRE PERFORMANCE SUMMARY

### 44' Section

**Date:** 6/6/2016

**Designer:** Joe Vondra

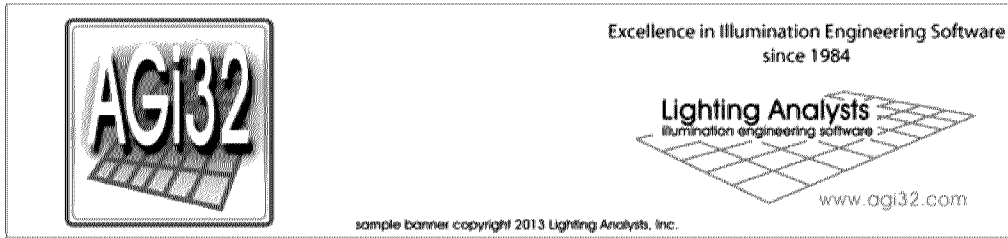
**Project:** Village of Mount Prospect - Corridor Lighting Evaluation

IES Roadway Classification:	Major	Luminance				Sidewalk Area		
						Illuminance		
Pedestrian Conflict Classification:	Low	$L_{avg}$	$L_{avg}/L_{min}$	$L_{max}/L_{min}$	$L_v/L_{avg}$	$E_{Havg}$	$E_{Vmin}$	$E_{avg}/E_{min}$
<b>IES Recommended Levels</b>		0.6	3.6=5	6.0	0.3	0.4	0.1	4.0
<b>Manufacturer:</b>	American Electric	0.72	2.12	4.62	0.29	0.69	0.40	1.73
<b>Curve #:</b>	ATB2_80BLEDE70_XXXXX_R3							
<b>Manufacturer:</b>	GE Lighting	0.75	2.14	3.83	0.21	0.61	0.30	2.03
<b>Curve #:</b>	ers4_p3c1540-120-277v_tcm201							

Note: Sidewalk Area values out of spec will improve for 90% spacing. Final values should be calculated during design.

## DESIGN PARAMETERS

Combined LLF	<u>0.7</u>	Spacing	<u>195'</u>
Lamp lumens	<u>22126/21800</u>	Light Pole Set Back $SB_{LP}$	<u>6'</u>
Roadway Width $W_R$	<u>44'</u>	Mounting Height	<u>35'</u>
Number of Lanes	<u>4</u>	Mast Arm	<u>12'</u>
Lane Width $W_L$	<u>11'</u>	Sidewalk Set Back $SB_{SW}$	<u>0'</u>
Layout	<u>Single Sided</u>	Sidewalk Width $W_{SW}$	<u>12'</u>



## Roadway Optimizer - Layout 1

### General:

American Electric ATB2 LED Luminaire

Roadway Standard: IES RP-8-14-IDOT (entire roadway)

R-Table: R3 (Slightly Specular), QO=0.07 Actual QO Value: 0.07

### Roadway Layout:

Layout Type: One Row, Near Side; 1RNS

Roadway Width: 44 ft

Lanes In Direction Of Travel: 2 In Opposite Direction: 2

Driver's Side Of Roadway: Right

### Luminaire Information:

#### ATB2 80BLEDE70 XXXXX R3

Description: ATB2 80BLEDE70 XXXXX R3

File Name: ATB2\_80BLEDE70\_XXXXX\_R3.ies

Lumens Per Lamp: N.A.

Number Of Lamps: 1

Total Lamp Lumens: N.A.

Luminaire Lumens: 22126

Luminaire Watts: 180

Efficiency (%): N.A.

Total Light Loss Factor: 0.700

Luminaire Arrangement: SINGLE

Arm Length: 12.76175 ft

Offset: 0 ft

### Luminaire Location Summary:

Coordinates in ft

Spacing - Row 1: 195

<u>Label</u>	<u>X-Coord</u>	<u>Y-Coord</u>	<u>Z-Coord</u>	<u>Orient</u>	<u>Tilt</u>	<u>Spin</u>
ATB2_80BLEDE70_XXXX...	780	-6	35	90	0	0
ATB2_80BLEDE70_XXXX...	585	-6	35	90	0	0
ATB2_80BLEDE70_XXXX...	390	-6	35	90	0	0
ATB2_80BLEDE70_XXXX...	195	-6	35	90	0	0
ATB2_80BLEDE70_XXXX...	0	-6	35	90	0	0
ATB2_80BLEDE70_XXXX...	-195	-6	35	90	0	0
ATB2_80BLEDE70_XXXX...	-390	-6	35	90	0	0

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## Roadway Optimizer - Layout 1 - Cont.

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### Luminaire Location Summary:

Coordinates in ft

Total Number of locations: 7

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Luminance

-----	+	0.42	+	0.44	+	0.39	+	0.34	+	0.35	+	0.41	+	0.48	+	0.53	+	0.55	+	0.53	+	0.53	+	0.44		
-----	+	0.57	+	0.50	+	0.41	+	0.37	+	0.38	+	0.44	+	0.54	+	0.60	+	0.64	+	0.64	+	0.64	+	0.64	+	0.60
-----	+	0.63	+	0.52	+	0.43	+	0.38	+	0.42	+	0.53	+	0.63	+	0.72	+	0.74	+	0.78	+	0.78	+	0.72	+	0.69
-----	+	0.64	+	0.53	+	0.44	+	0.43	+	0.51	+	0.64	+	0.80	+	0.92	+	0.96	+	0.93	+	0.93	+	0.87	+	0.72
-----	+	0.63	+	0.50	+	0.44	+	0.46	+	0.61	+	0.89	+	1.10	+	1.17	+	1.25	+	1.10	+	1.10	+	0.96	+	0.73
-----	+	0.64	+	0.49	+	0.45	+	0.50	+	0.71	+	1.09	+	1.38	+	1.49	+	1.47	+	1.29	+	1.29	+	0.98	+	0.77
-----	+	0.60	+	0.46	+	0.42	+	0.51	+	0.75	+	1.19	+	1.47	+	1.57	+	1.51	+	1.26	+	1.26	+	0.92	+	0.76
-----	+	0.53	+	0.40	+	0.38	+	0.42	+	0.59	+	0.91	+	1.20	+	1.29	+	1.27	+	1.11	+	1.11	+	0.80	+	0.65

### Luminance (Cd/SqM)

Average = 0.72

Maximum = 1.57

Minimum = 0.34

Avg/Min Ratio = 2.12

Max/Min Ratio = 4.62

Max/Avg Ratio = 2.18

# Roadway Optimizer - Layout 1

RoadOpt\_1\_Illum

	1.35	1.30	0.95	0.68	0.51	0.44	0.44	0.51	0.68	0.95	1.30	1.35
	1.76	1.51	1.02	0.72	0.52	0.44	0.44	0.52	0.72	1.02	1.51	1.76
	1.96	1.60	1.08	0.73	0.52	0.43	0.43	0.52	0.73	1.08	1.60	1.96
	2.03	1.64	1.11	0.74	0.52	0.43	0.43	0.52	0.74	1.11	1.64	2.03
→	2.01	1.58	1.11	0.74	0.51	0.43	0.43	0.51	0.74	1.11	1.58	2.01
	2.02	1.47	1.04	0.68	0.47	0.40	0.40	0.47	0.68	1.04	1.47	2.02
→	1.91	1.28	0.89	0.60	0.41	0.35	0.35	0.41	0.60	0.89	1.28	1.91
	1.66	1.14	0.81	0.53	0.36	0.29	0.29	0.36	0.53	0.81	1.14	1.66

## Illuminance (Fc)

Average = 0.97

Maximum = 2.03

Minimum = 0.29

Avg/Min Ratio = 3.34

Max/Min Ratio = 7

Max/Avg Ratio = 2.09

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Vis\_Level

-----	+1.09	+7.66	+10.51	+10.32	+7.94	+5.00	+2.15	+0.60	+2.66	+3.55	+3.70	+3.53
-----	+1.44	+8.48	+10.73	+10.15	+7.37	+4.29	+1.41	+1.36	+3.35	+4.22	+4.24	+3.94
-----	+1.55	+8.62	+10.59	+9.33	+6.44	+3.37	+0.62	+2.25	+3.94	+4.65	+4.50	+4.12
-----	+1.56	+8.27	+9.81	+8.22	+5.06	+2.24	+0.44	+3.15	+4.56	+4.94	+4.75	+4.14
-----	+1.47	+7.66	+8.61	+6.39	+3.41	+0.80	+1.92	+4.00	+5.23	+5.22	+4.84	+4.09
-----	+1.43	+6.75	+7.05	+4.53	+1.65	+0.80	+3.26	+4.98	+5.69	+5.60	+4.86	+4.10
-----	+1.37	+5.70	+5.52	+3.15	+0.66	+1.97	+3.93	+5.28	+5.76	+5.64	+4.70	+4.09
-----	+1.26	+5.74	+5.94	+3.57	+1.01	+1.44	+3.76	+5.00	+5.41	+5.27	+4.47	+3.87

## Visibility Level

STV = 3.849866

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Vis\_Level\_Bkgd\_Lum

	0.37	0.34	0.36	0.41	0.50	0.55	0.55	0.54	0.50	0.43	0.43	0.43
	0.39	0.37	0.40	0.47	0.56	0.62	0.65	0.63	0.63	0.59	0.55	0.46
	0.41	0.39	0.46	0.56	0.66	0.72	0.79	0.77	0.74	0.66	0.61	0.48
	0.43	0.45	0.57	0.69	0.85	0.92	0.99	0.92	0.80	0.67	0.62	0.48
→	0.45	0.49	0.72	0.99	1.15	1.20	1.24	1.04	0.86	0.66	0.60	0.48
	0.46	0.54	0.87	1.22	1.45	1.49	1.43	1.16	0.87	0.69	0.58	0.46
→	0.45	0.55	0.93	1.32	1.53	1.57	1.45	1.13	0.82	0.72	0.53	0.43
	0.39	0.44	0.72	1.03	1.25	1.30	1.24	0.98	0.74	0.61	0.48	0.39

### Background Luminance (Cd/SqM)

Average = 0.72

Maximum = 1.57

Minimum = 0.34

Avg/Min Ratio = 2.12

Max/Min Ratio = 4.62

Max/Avg Ratio = 2.18

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Vis\_Level\_Target\_Lum

-----	+0.57	+1.58	+1.91	+1.84	+1.59	+1.25	+0.86	+0.47	+0.22	+0.09	+0.05	+0.04	←
-----	+0.73	+1.84	+2.06	+1.95	+1.62	+1.24	+0.84	+0.45	+0.21	+0.08	+0.05	+0.03	
-----	+0.81	+1.95	+2.19	+2.00	+1.63	+1.24	+0.83	+0.44	+0.20	+0.07	+0.04	+0.03	←
-----	+0.84	+1.99	+2.25	+2.03	+1.65	+1.24	+0.83	+0.43	+0.19	+0.07	+0.04	+0.03	
-----	+0.83	+1.92	+2.24	+2.03	+1.63	+1.24	+0.83	+0.41	+0.17	+0.07	+0.04	+0.03	
-----	+0.84	+1.79	+2.09	+1.87	+1.49	+1.14	+0.76	+0.37	+0.15	+0.06	+0.04	+0.03	
-----	+0.79	+1.56	+1.80	+1.64	+1.31	+0.99	+0.66	+0.32	+0.14	+0.06	+0.04	+0.03	
-----	+0.69	+1.39	+1.63	+1.45	+1.15	+0.86	+0.53	+0.26	+0.12	+0.06	+0.04	+0.03	

### Target Luminance (Cd/SqM)

Average = 0.88

Maximum = 2.25

Minimum = 0.03

Avg/Min Ratio = 29.33

Max/Min Ratio = 75

Max/Avg Ratio = 2.56

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Veil\_Lum

-----	0.11	0.09	0.07	0.04	0.02	0.02	0.02	0.02	0.03	0.05	0.09	0.12
-----	0.14	0.11	0.08	0.05	0.02	0.02	0.02	0.02	0.03	0.06	0.10	0.13
-----	0.16	0.14	0.10	0.06	0.02	0.02	0.02	0.03	0.03	0.07	0.11	0.15
-----	0.18	0.16	0.11	0.06	0.03	0.02	0.03	0.03	0.04	0.07	0.13	0.18
-----	0.21	0.18	0.13	0.07	0.03	0.03	0.03	0.03	0.04	0.08	0.15	0.20
-----	0.21	0.18	0.13	0.07	0.03	0.03	0.03	0.03	0.04	0.08	0.15	0.21
-----	0.19	0.16	0.12	0.06	0.03	0.03	0.03	0.03	0.04	0.07	0.14	0.19
-----	0.16	0.14	0.10	0.06	0.03	0.03	0.03	0.03	0.04	0.06	0.11	0.15

### Veiling Luminance (Cd/SqM)

Average = 0.08

Maximum = 0.21

Minimum = 0.02

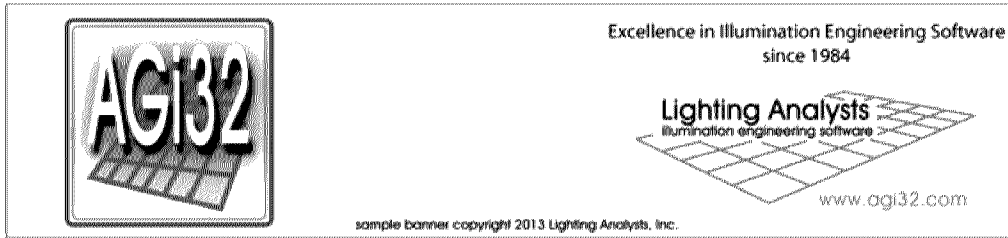
Avg/Min Ratio = 4

Max/Min Ratio = 10.5

Max/Avg Ratio = 2.63

MaxLv Ratio = 0.29

Threshold Increment (TI) = 17.75



## Roadway Optimizer - Layout 2

### General:

GE ERS4 LED Luminaire

Roadway Standard: IES RP-8-14-IDOT (entire roadway)

R-Table: R3 (Slightly Specular), QO=0.07 Actual QO Value: 0.07

### Roadway Layout:

Layout Type: One Row, Near Side; 1RNS

Roadway Width: 44 ft

Lanes In Direction Of Travel: 2 In Opposite Direction: 2

Driver's Side Of Roadway: Right

### Luminaire Information:

#### ers4 p3c1540-120-277v tcm201-

Description: ERS4\_P3C1540 -120-277V

File Name: ers4\_p3c1540-120-277v\_tcm201-95629.ies

Lumens Per Lamp: N.A.

Number Of Lamps: 1

Total Lamp Lumens: N.A.

Luminaire Lumens: 20600

Luminaire Watts: 222

Efficiency (%): N.A.

Total Light Loss Factor: 0.700

Luminaire Arrangement: SINGLE

Arm Length: 12.98225 ft

Offset: 0 ft

### Luminaire Location Summary:

Coordinates in ft

Spacing - Row 1: 195

Label	X-Coord	Y-Coord	Z-Coord	Orient	Tilt	Spin
ers4_p3c1540-120-27...	780	-6	35	90	0	0
ers4_p3c1540-120-27...	585	-6	35	90	0	0
ers4_p3c1540-120-27...	390	-6	35	90	0	0
ers4_p3c1540-120-27...	195	-6	35	90	0	0
ers4_p3c1540-120-27...	0	-6	35	90	0	0
ers4_p3c1540-120-27...	-195	-6	35	90	0	0
ers4_p3c1540-120-27...	-390	-6	35	90	0	0

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## Roadway Optimizer - Layout 2 - Cont.

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### Luminaire Location Summary:

Coordinates in ft

Total Number of locations: 7

## Roadway Optimizer - Layout 2

### RoadOpt\_1\_Luminance

-----	+0.66	+0.57	+0.44	+0.36	+0.35	+0.37	+0.40	+0.41	+0.45	+0.52	+0.65	+0.67
-----	+0.86	+0.65	+0.50	+0.41	+0.42	+0.45	+0.49	+0.50	+0.55	+0.69	+0.79	+0.89
-----	+0.96	+0.69	+0.55	+0.44	+0.46	+0.54	+0.56	+0.58	+0.65	+0.84	+0.90	+1.03
-----	+0.95	+0.66	+0.52	+0.46	+0.51	+0.62	+0.67	+0.66	+0.77	+0.93	+1.01	+1.06
-----	+1.02	+0.65	+0.50	+0.45	+0.54	+0.70	+0.82	+0.82	+0.96	+1.08	+1.18	+1.17
-----	+1.04	+0.68	+0.52	+0.52	+0.61	+0.78	+0.94	+0.95	+1.12	+1.26	+1.29	+1.23
-----	+1.01	+0.69	+0.52	+0.52	+0.64	+0.83	+0.97	+1.04	+1.16	+1.33	+1.34	+1.27
-----	+0.95	+0.61	+0.45	+0.44	+0.54	+0.69	+0.80	+0.89	+0.99	+1.15	+1.20	+1.17

### Luminance (Cd/SqM)

Average = 0.75

Maximum = 1.34

Minimum = 0.35

Avg/Min Ratio = 2.14

Max/Min Ratio = 3.83

Max/Avg Ratio = 1.79

## Roadway Optimizer - Layout 2

RoadOpt\_1\_Illum

	2.04	1.54	0.91	0.56	0.41	0.38	0.38	0.41	0.56	0.91	1.54	2.04
	2.59	1.83	1.07	0.63	0.45	0.42	0.42	0.45	0.63	1.07	1.83	2.59
	2.93	1.96	1.16	0.64	0.44	0.41	0.41	0.44	0.64	1.16	1.96	2.93
	2.97	1.89	1.11	0.60	0.40	0.38	0.38	0.40	0.60	1.11	1.89	2.97
→	3.23	1.92	1.08	0.57	0.37	0.33	0.33	0.37	0.57	1.08	1.92	3.23
	3.28	1.93	1.01	0.52	0.31	0.27	0.27	0.31	0.52	1.01	1.93	3.28
→	3.25	1.90	0.94	0.46	0.29	0.23	0.23	0.29	0.46	0.94	1.90	3.25
	3.05	1.73	0.85	0.42	0.26	0.21	0.21	0.26	0.42	0.85	1.73	3.05

### Illuminance (Fc)

Average = 1.17

Maximum = 3.28

Minimum = 0.21

Avg/Min Ratio = 5.57

Max/Min Ratio = 15.62

Max/Avg Ratio = 2.8

## Roadway Optimizer - Layout 2

### RoadOpt\_1\_Vis\_Level

-----	+2.00	+8.78	+9.33	+7.41	+5.20	+4.27	+2.64	+1.26	+0.58	+2.01	+3.25	+3.77
-----	+2.17	+9.61	+10.01	+7.60	+5.16	+3.71	+2.25	+0.32	+1.77	+3.29	+4.07	+4.41
-----	+2.30	+9.81	+10.15	+7.01	+4.52	+2.88	+1.19	+0.95	+2.83	+4.34	+4.61	+4.76
-----	+2.36	+9.30	+9.26	+5.80	+3.15	+2.07	+0.17	+2.02	+3.75	+4.93	+5.02	+4.82
-----	+2.67	+9.50	+8.78	+4.94	+2.19	+0.67	+1.80	+3.40	+4.84	+5.71	+5.46	+5.06
-----	+2.61	+8.98	+7.40	+3.66	+0.66	+0.78	+3.17	+4.41	+5.45	+6.01	+5.77	+5.29
-----	+2.66	+8.66	+6.61	+2.72	+0.18	+1.86	+3.69	+4.95	+5.70	+6.24	+5.85	+5.42
-----	+2.76	+8.62	+6.67	+3.02	+0.53	+1.63	+3.19	+4.67	+5.44	+5.85	+5.65	+5.22

### Visibility Level

STV = 3.775401

## Roadway Optimizer - Layout 2

### RoadOpt\_1\_Vis\_Level\_Bkgd\_Lum

		0.40	0.35	0.35	0.36	0.40	0.42	0.47	0.56	0.66	0.64	0.62	0.52
		0.47	0.41	0.43	0.46	0.49	0.51	0.60	0.72	0.82	0.89	0.78	0.58
		0.51	0.44	0.48	0.56	0.55	0.60	0.76	0.89	0.99	1.10	0.88	0.61
		0.51	0.47	0.56	0.64	0.67	0.66	0.88	0.96	1.04	1.14	0.89	0.58
	→	0.48	0.47	0.60	0.77	0.83	0.85	1.05	1.08	1.17	1.29	0.90	0.58
		0.52	0.54	0.68	0.84	0.98	0.99	1.20	1.26	1.28	1.27	0.94	0.60
	→	0.51	0.55	0.72	0.88	1.01	1.06	1.22	1.32	1.29	1.29	0.88	0.59
		0.43	0.47	0.60	0.73	0.85	0.93	1.01	1.18	1.18	1.10	0.83	0.53

### Background Luminance (Cd/SqM)

Average = 0.76

Maximum = 1.32

Minimum = 0.35

Avg/Min Ratio = 2.17

Max/Min Ratio = 3.77

Max/Avg Ratio = 1.74

## Roadway Optimizer - Layout 2

### RoadOpt\_1\_Vis\_Level\_Target\_Lum

	0.88	1.87	1.77	1.39	1.09	1.00	0.84	0.69	0.48	0.32	0.20	0.11
	1.09	2.22	2.10	1.60	1.24	1.07	0.93	0.67	0.44	0.30	0.17	0.09
	1.22	2.38	2.29	1.67	1.24	1.07	0.89	0.60	0.39	0.24	0.14	0.08
	1.23	2.30	2.21	1.57	1.15	1.02	0.81	0.52	0.31	0.18	0.10	0.06
→	1.33	2.34	2.17	1.53	1.10	0.91	0.66	0.41	0.23	0.13	0.08	0.05
	1.35	2.35	2.02	1.40	0.93	0.77	0.54	0.34	0.20	0.11	0.07	0.05
→	1.34	2.30	1.89	1.25	0.86	0.65	0.46	0.29	0.17	0.10	0.06	0.04
	1.26	2.10	1.71	1.14	0.79	0.58	0.42	0.26	0.15	0.09	0.06	0.04

### Target Luminance (Cd/SqM)

Average = 0.89

Maximum = 2.38

Minimum = 0.04

Avg/Min Ratio = 22.25

Max/Min Ratio = 59.5

Max/Avg Ratio = 2.67

## Roadway Optimizer - Layout 2

### RoadOpt\_1\_Veil\_Lum

-----	+0.07	+0.06	+0.05	+0.03	+0.02	+0.02	+0.04	+0.06	+0.08	+0.09	+0.09	+0.08	---
-----	+0.09	+0.08	+0.06	+0.05	+0.02	+0.02	+0.04	+0.06	+0.09	+0.11	+0.12	+0.11	---
-----	+0.12	+0.10	+0.09	+0.06	+0.02	+0.02	+0.04	+0.06	+0.09	+0.11	+0.14	+0.14	---
-----	+0.13	+0.11	+0.10	+0.06	+0.02	+0.02	+0.03	+0.05	+0.08	+0.11	+0.15	+0.16	---
-----	+0.14	+0.12	+0.10	+0.06	+0.02	+0.02	+0.03	+0.04	+0.06	+0.10	+0.13	+0.16	---
-----	+0.13	+0.12	+0.10	+0.07	+0.02	+0.02	+0.03	+0.04	+0.06	+0.09	+0.12	+0.14	---
-----	+0.12	+0.11	+0.10	+0.07	+0.02	+0.02	+0.03	+0.04	+0.05	+0.07	+0.10	+0.12	---
-----	+0.10	+0.10	+0.09	+0.06	+0.02	+0.02	+0.03	+0.03	+0.04	+0.06	+0.09	+0.10	---

### Veiling Luminance (Cd/SqM)

Average = 0.07

Maximum = 0.16

Minimum = 0.02

Avg/Min Ratio = 3.5

Max/Min Ratio = 8

Max/Avg Ratio = 2.29

MaxLv Ratio = 0.21

Threshold Increment (TI) = 13.09

## Roadway Optimizer - Layout Comparison

	Layout 1	Layout 2
Description	American Electric ATB2 LED Luminaire	GE ERS4 LED Luminaire
Roadway Standard	IES RP-8-14-IDOT (entire roadway)	IES RP-8-14-IDOT (entire roadway)
R-Table	R3	R3
Actual Q0 Value	0.07	0.07
Layout Type	1RNS	1RNS
Road Width	44	44
Median Width	N.A.	N.A.
Number Lanes	2	2
Number Lanes Opposite	2	2
Drivers Side	Right	Right
Calc Area	Bottom	Bottom
Label - Row 1	ATB2_80BLEDE7 0_XXXXX_R3	ers4_p3c1540-1 20-277v_tcm201-
MH - Row 1	35	35
Setback - Row 1	6	6
+Orient - Row 1	0	0
Tilt - Row 1	0	0
Spin - Row 1	0	0
Spacing - Row 1	195	195
<b>1_Luminance (Cd/SqM)</b>		
Average	0.72	0.75
Maximum	1.57	1.34
Minimum	0.34	0.35
Avg/Min Ratio	2.12	2.14
Max/Min Ratio	4.62	3.83
Max/Avg Ratio	2.18	1.79
<b>1_Illum (Fc)</b>		
Average	0.97	1.17
Maximum	2.03	3.28
Minimum	0.29	0.21

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## Roadway Optimizer - Layout Comparison - Cont.

	Layout 1	Layout 2
Avg/Min Ratio	3.34	5.57
Max/Min Ratio	7.00	15.62
Max/Avg Ratio	2.09	2.8
<hr/>		
<b>1_Vis_Level</b>		
STV	3.85	3.78
<hr/>		
<b>1_Vis_Level_Bkgd_Lum (Cd/SqM)</b>		
Average	0.72	0.76
Maximum	1.57	1.32
Minimum	0.34	0.35
Avg/Min Ratio	2.12	2.17
Max/Min Ratio	4.62	3.77
Max/Avg Ratio	2.18	1.74
<hr/>		
<b>1_Vis_Level_Target_Lum (Cd/SqM)</b>		
Average	0.88	0.89
Maximum	2.25	2.38
Minimum	0.03	0.04
Avg/Min Ratio	29.33	22.25
Max/Min Ratio	75.00	59.50
Max/Avg Ratio	2.56	2.67
<hr/>		
<b>1_Veil_Lum (Cd/SqM)</b>		
Average	0.08	0.07
Maximum	0.21	0.16
Minimum	0.02	0.02
Avg/Min Ratio	4.00	3.50
Max/Min Ratio	10.50	8.00
Max/Avg Ratio	2.63	2.29
MaxLV Ratio	0.29	0.21
Threshold Incr. (TI)	17.75	13.09

## LUMINAIRE PERFORMANCE SUMMARY

### 54' Section

**Date:** 6/6/2016

**Designer:** Joe Vondra

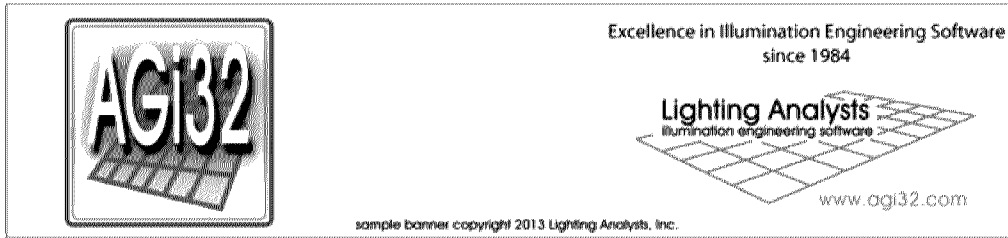
**Project:** Village of Mount Prospect - Corridor Lighting Evaluation

IES Roadway Classification:	Collector	Luminance				Sidewalk Area		
						Illuminance		
Pedestrian Conflict Classification:	Low	$L_{avg}$	$L_{avg}/L_{min}$	$L_{max}/L_{min}$	$L_v/L_{avg}$	$E_{Havg}$	$E_{Vmin}$	$E_{avg}/E_{min}$
<b>IES Recommended Levels</b>		0.4	4.0	8.0	0.4	0.4	0.1	4.0
<b>Manufacturer:</b>	American Electric	0.47	2.47	6.16	0.34	0.44	0.20	2.2
<b>Curve #:</b>	ATB2_80BLEDE70_XXXXX_R3							
<b>Manufacturer:</b>	GE Lighting	0.49	2.58	5.21	0.24	0.33	0.10	3.3
<b>Curve #:</b>	ers4_p3c1540-120-277v_tcm201							

Note: Sidewalk Area values out of spec will improve for 90% spacing. Final values should be calculated during design.

## DESIGN PARAMETERS

Combined LLF	<u>0.7</u>	Spacing	<u>250'</u>
Lamp lumens	<u>22126/20600</u>	Light Pole Set Back $SB_{LP}$	<u>6'</u>
Roadway Width $W_R$	<u>54'</u>	Mounting Height	<u>40'</u>
Number of Lanes	<u>5</u>	Mast Arm	<u>12'</u>
Lane Width $W_L$	<u>10.8'</u>	Sidewalk Set Back $SB_{SW}$	<u>0'</u>
Layout	<u>Single Sided</u>	Sidewalk Width $W_{SW}$	<u>12'</u>



## Roadway Optimizer - Layout 1

### General:

American Electric ATB2 LED Luminaire

Roadway Standard: IES RP-8-14-IDOT (entire roadway)

R-Table: R3 (Slightly Specular), QO=0.07 Actual QO Value: 0.07

### Roadway Layout:

Layout Type: One Row, Near Side; 1RNS

Roadway Width: 54 ft

Lanes In Direction Of Travel: 3 In Opposite Direction: 2

Driver's Side Of Roadway: Right

### Luminaire Information:

#### ATB2 80BLEDE70 XXXXX R3

Description: ATB2 80BLEDE70 XXXXX R3

File Name: ATB2\_80BLEDE70\_XXXXX\_R3.ies

Lumens Per Lamp: N.A.

Number Of Lamps: 1

Total Lamp Lumens: N.A.

Luminaire Lumens: 22126

Luminaire Watts: 180

Efficiency (%): N.A.

Total Light Loss Factor: 0.700

Luminaire Arrangement: SINGLE

Arm Length: 12.76175 ft

Offset: 0 ft

### Luminaire Location Summary:

Coordinates in ft

Spacing - Row 1: 250

<u>Label</u>	<u>X-Coord</u>	<u>Y-Coord</u>	<u>Z-Coord</u>	<u>Orient</u>	<u>Tilt</u>	<u>Spin</u>
ATB2_80BLEDE70_XXXX...	-500	-6	40	90	0	0
ATB2_80BLEDE70_XXXX...	-250	-6	40	90	0	0
ATB2_80BLEDE70_XXXX...	0	-6	40	90	0	0
ATB2_80BLEDE70_XXXX...	250	-6	40	90	0	0
ATB2_80BLEDE70_XXXX...	500	-6	40	90	0	0
ATB2_80BLEDE70_XXXX...	750	-6	40	90	0	0

Total Number of locations: 6

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Luminance

-----	0.26	0.28	0.29	0.24	0.21	0.19	0.19	0.20	0.23	0.29	0.34	0.36	0.36	0.36	0.31	0.22	▶
-----	0.33	0.34	0.31	0.26	0.22	0.20	0.20	0.21	0.25	0.32	0.38	0.40	0.42	0.41	0.39	0.33	
-----	0.42	0.39	0.33	0.27	0.22	0.21	0.21	0.23	0.28	0.36	0.42	0.45	0.48	0.47	0.47	0.44	▶
-----	0.48	0.42	0.34	0.28	0.23	0.21	0.22	0.27	0.33	0.41	0.49	0.52	0.58	0.56	0.54	0.50	
-----	0.48	0.42	0.34	0.29	0.23	0.23	0.26	0.32	0.41	0.52	0.59	0.64	0.70	0.66	0.59	0.53	
-----	0.48	0.41	0.34	0.29	0.24	0.25	0.29	0.42	0.55	0.64	0.75	0.81	0.83	0.74	0.66	0.54	
-----	0.47	0.40	0.33	0.30	0.25	0.27	0.32	0.51	0.72	0.88	0.97	1.01	0.98	0.81	0.69	0.54	
-----	0.48	0.37	0.31	0.28	0.24	0.29	0.37	0.61	0.85	1.04	1.13	1.14	1.06	0.88	0.67	0.57	
-----	0.45	0.35	0.29	0.27	0.24	0.29	0.38	0.64	0.91	1.09	1.17	1.17	1.06	0.85	0.64	0.53	
-----	0.41	0.32	0.27	0.25	0.22	0.25	0.31	0.51	0.73	0.92	1.02	1.02	0.95	0.77	0.58	0.49	

### Luminance (Cd/SqM)

Average = 0.47

Maximum = 1.17

Minimum = 0.19

Avg/Min Ratio = 2.47

Max/Min Ratio = 6.16

Max/Avg Ratio = 2.49

# Roadway Optimizer - Layout 1

RoadOpt\_1\_Illum

	0.83	0.84	0.75	0.57	0.43	0.33	0.26	0.22	0.22	0.26	0.33	0.43	0.57	0.75	0.84	0.83
	1.05	1.03	0.84	0.62	0.45	0.33	0.26	0.21	0.21	0.26	0.33	0.45	0.62	0.84	1.03	1.05
	1.33	1.22	0.91	0.65	0.47	0.34	0.25	0.21	0.21	0.25	0.34	0.47	0.65	0.91	1.22	1.33
→	1.49	1.30	0.96	0.68	0.48	0.34	0.25	0.21	0.21	0.25	0.34	0.48	0.68	0.96	1.30	1.49
→	1.54	1.33	1.00	0.70	0.48	0.34	0.25	0.21	0.21	0.25	0.34	0.48	0.70	1.00	1.33	1.54
→	1.56	1.33	1.00	0.71	0.49	0.34	0.25	0.21	0.21	0.25	0.34	0.49	0.71	1.00	1.33	1.56
→	1.54	1.28	0.98	0.70	0.48	0.33	0.24	0.20	0.20	0.24	0.33	0.48	0.70	0.98	1.28	1.54
→	1.57	1.17	0.88	0.63	0.43	0.30	0.22	0.18	0.18	0.22	0.30	0.43	0.63	0.88	1.17	1.57
→	1.49	1.06	0.79	0.57	0.39	0.27	0.19	0.16	0.16	0.19	0.27	0.39	0.57	0.79	1.06	1.49
	1.33	0.98	0.73	0.52	0.35	0.25	0.17	0.14	0.14	0.17	0.25	0.36	0.52	0.73	0.98	1.33

**Illuminance (Fc)**

Average = 0.65  
 Maximum = 1.57  
 Minimum = 0.14  
 Avg/Min Ratio = 4.64  
 Max/Min Ratio = 11.21  
 Max/Avg Ratio = 2.42

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Vis\_Level

-----	0.24	5.48	9.38	11.04	10.86	9.49	7.04	4.11	1.31	-0.76	-2.26	-2.97	-3.01	-3.16	-3.15	-3.27
-----	0.51	6.53	10.31	11.68	11.41	9.29	6.69	3.59	0.90	-1.19	-2.57	-3.26	-3.38	-3.47	-3.56	-3.54
-----	0.74	7.57	11.03	12.12	11.46	8.97	6.00	3.10	0.52	-1.67	-2.94	-3.58	-3.78	-3.85	-3.94	-3.88
-----	0.88	7.79	11.54	12.39	11.15	8.19	5.34	2.40	0.08	-2.19	-3.38	-3.88	-4.13	-4.11	-4.16	-4.02
-----	0.95	7.83	11.80	12.12	10.62	7.39	4.37	1.66	-0.78	-2.85	-3.85	-4.33	-4.42	-4.29	-4.23	-4.07
-----	1.00	7.83	11.78	11.84	9.72	6.06	3.31	0.77	-1.79	-3.68	-4.42	-4.80	-4.68	-4.43	-4.34	-4.07
-----	0.96	7.47	11.31	11.27	8.78	4.82	2.11	-0.35	-2.88	-4.64	-5.03	-5.16	-4.99	-4.54	-4.36	-4.02
-----	1.08	6.96	10.18	9.77	7.04	3.33	0.96	-1.64	-3.85	-5.21	-5.48	-5.40	-5.12	-4.74	-4.27	-4.05
-----	1.07	6.37	9.07	8.59	5.99	2.48	0.30	-2.27	-4.24	-5.41	-5.58	-5.43	-5.10	-4.74	-4.15	-4.00
-----	0.96	6.16	8.86	8.57	6.22	2.96	0.55	-2.08	-3.99	-5.13	-5.37	-5.16	-4.88	-4.47	-4.01	-3.90

## Visibility Level

STV = 4.079955

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Vis\_Level\_Bkgd\_Lum

-----		0.27	0.22	0.20	0.19	0.19	0.21	0.25	0.31	0.35	0.36	0.36	0.36	0.28	0.27	0.30
-----	-----	0.29	0.23	0.21	0.19	0.20	0.23	0.27	0.35	0.40	0.41	0.40	0.41	0.36	0.34	0.33
-----		0.30	0.24	0.21	0.20	0.22	0.26	0.32	0.38	0.44	0.47	0.48	0.47	0.46	0.44	0.41
-----		0.31	0.25	0.22	0.21	0.24	0.31	0.37	0.45	0.50	0.54	0.56	0.53	0.54	0.49	0.46
-----	→	0.31	0.26	0.23	0.24	0.28	0.37	0.47	0.56	0.62	0.66	0.66	0.63	0.57	0.49	0.47
-----	-----	0.31	0.27	0.24	0.26	0.35	0.51	0.61	0.69	0.78	0.83	0.77	0.72	0.59	0.49	0.46
-----	→	0.32	0.28	0.25	0.29	0.40	0.64	0.82	0.94	0.98	1.01	0.90	0.76	0.62	0.49	0.45
-----	-----	0.30	0.27	0.26	0.32	0.47	0.75	0.97	1.10	1.15	1.12	0.98	0.77	0.61	0.52	0.43
-----	→	0.28	0.26	0.26	0.33	0.49	0.80	1.02	1.14	1.19	1.13	0.97	0.73	0.58	0.53	0.39
-----	-----	0.26	0.24	0.23	0.27	0.39	0.63	0.84	0.99	1.03	0.99	0.89	0.67	0.53	0.45	0.36

### Background Luminance (Cd/SqM)

Average = 0.48

Maximum = 1.19

Minimum = 0.19

Avg/Min Ratio = 2.53

Max/Min Ratio = 6.26

Max/Avg Ratio = 2.48

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Vis\_Level\_Target\_Lum

-----	0.29	0.86	1.27	1.35	1.29	1.16	0.96	0.72	0.45	0.26	0.13	0.06	0.04	0.03	0.02	0.02	▶
-----	0.37	1.06	1.43	1.46	1.37	1.19	0.96	0.71	0.44	0.25	0.13	0.06	0.04	0.03	0.02	0.02	
-----	0.46	1.25	1.54	1.54	1.42	1.20	0.96	0.70	0.43	0.24	0.12	0.05	0.04	0.03	0.02	0.02	▶
-----	0.52	1.34	1.63	1.62	1.44	1.20	0.95	0.69	0.43	0.23	0.11	0.05	0.03	0.02	0.02	0.01	
-----	0.54	1.36	1.69	1.65	1.47	1.22	0.95	0.69	0.42	0.23	0.11	0.04	0.03	0.02	0.02	0.01	
-----	0.54	1.36	1.71	1.67	1.47	1.22	0.96	0.69	0.43	0.21	0.10	0.04	0.03	0.02	0.02	0.01	
-----	0.53	1.31	1.66	1.66	1.45	1.19	0.94	0.68	0.42	0.19	0.10	0.04	0.03	0.02	0.02	0.01	
-----	0.54	1.20	1.50	1.50	1.30	1.07	0.85	0.61	0.37	0.17	0.09	0.04	0.03	0.02	0.02	0.01	
-----	0.51	1.09	1.34	1.35	1.18	0.96	0.76	0.55	0.33	0.15	0.08	0.04	0.03	0.02	0.02	0.01	
-----	0.46	1.01	1.24	1.24	1.08	0.88	0.67	0.46	0.27	0.13	0.07	0.04	0.03	0.02	0.02	0.01	

### Target Luminance (Cd/SqM)

Average = 0.6

Maximum = 1.71

Minimum = 0.01

Avg/Min Ratio = 60

Max/Min Ratio = 171

Max/Avg Ratio = 2.85

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Veil\_Lum

-----	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.05	0.07	0.08	0.07	0.06	0.04	0.03	▶
-----	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.04	0.06	0.08	0.09	0.08	0.07	0.05	0.03	
-----	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.04	0.06	0.09	0.10	0.10	0.08	0.06	0.04	▶
-----	0.03	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.04	0.07	0.10	0.11	0.11	0.09	0.07	0.05	
-----	0.03	0.01	0.01	0.01	0.02	0.02	0.02	0.03	0.05	0.08	0.11	0.13	0.12	0.11	0.08	0.05	
-----	0.03	0.01	0.01	0.02	0.02	0.02	0.02	0.03	0.05	0.09	0.13	0.14	0.14	0.12	0.09	0.06	
-----	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.05	0.09	0.14	0.16	0.15	0.13	0.10	0.06	
-----	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.05	0.09	0.14	0.15	0.15	0.13	0.10	0.06	
-----	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.05	0.08	0.13	0.14	0.13	0.12	0.09	0.05	
-----	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.04	0.07	0.10	0.12	0.12	0.10	0.08	0.05	

### Veiling Luminance (Cd/SqM)

Average = 0.05

Maximum = 0.16

Minimum = 0.01

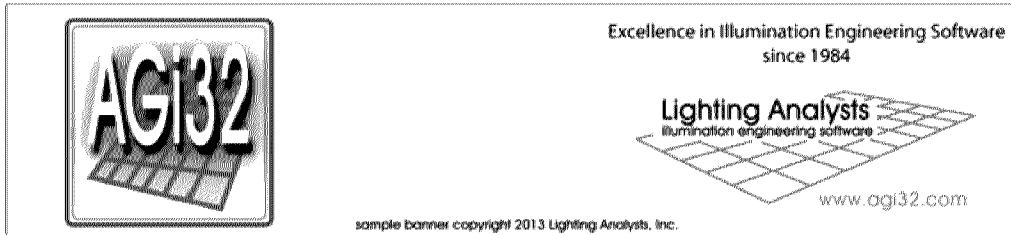
Avg/Min Ratio = 5

Max/Min Ratio = 16

Max/Avg Ratio = 3.2

MaxLv Ratio = 0.34

Threshold Increment (TI) = 19.03



## Roadway Optimizer - Layout 2

### General:

GE ERS4 LED Luminaire

Roadway Standard: IES RP-8-14-IDOT (entire roadway)

R-Table: R3 (Slightly Specular), QO=0.07 Actual QO Value: 0.07

### Roadway Layout:

Layout Type: One Row, Near Side; 1RNS

Roadway Width: 54 ft

Lanes In Direction Of Travel: 3 In Opposite Direction: 2

Driver's Side Of Roadway: Right

### Luminaire Information:

#### ers4 p3c1540-120-277v tcm201-

Description: ERS4\_P3C1540 -120-277V

File Name: ers4\_p3c1540-120-277v\_tcm201-95629.ies

Lumens Per Lamp: N.A.

Number Of Lamps: 1

Total Lamp Lumens: N.A.

Luminaire Lumens: 20600

Luminaire Watts: 222

Efficiency (%): N.A.

Total Light Loss Factor: 0.700

Luminaire Arrangement: SINGLE

Arm Length: 12.98225 ft

Offset: 0 ft

### Luminaire Location Summary:

Coordinates in ft

Spacing - Row 1: 250

Label	X-Coord	Y-Coord	Z-Coord	Orient	Tilt	Spin
ers4_p3c1540-120-27...	750	-6	40	90	0	0
ers4_p3c1540-120-27...	500	-6	40	90	0	0
ers4_p3c1540-120-27...	250	-6	40	90	0	0
ers4_p3c1540-120-27...	0	-6	40	90	0	0
ers4_p3c1540-120-27...	-250	-6	40	90	0	0
ers4_p3c1540-120-27...	-500	-6	40	90	0	0

Total Number of locations: 6

# Roadway Optimizer - Layout 2

## RoadOpt\_1\_Luminance

	0.35	0.33	0.30	0.23	0.20	0.19	0.20	0.20	0.20	0.23	0.24	0.26	0.30	0.34	0.35	0.36
	0.50	0.42	0.34	0.26	0.22	0.22	0.24	0.24	0.25	0.28	0.29	0.31	0.36	0.41	0.48	0.51
	0.63	0.49	0.38	0.29	0.24	0.24	0.27	0.29	0.31	0.33	0.35	0.38	0.46	0.51	0.58	0.65
	0.75	0.57	0.41	0.32	0.27	0.25	0.28	0.33	0.36	0.38	0.40	0.45	0.56	0.65	0.72	0.79
	0.70	0.53	0.38	0.32	0.26	0.27	0.31	0.36	0.41	0.45	0.44	0.51	0.66	0.68	0.72	0.77
	0.74	0.52	0.37	0.30	0.24	0.26	0.33	0.41	0.49	0.53	0.54	0.59	0.75	0.77	0.83	0.84
	0.79	0.54	0.37	0.30	0.25	0.27	0.34	0.41	0.53	0.64	0.65	0.73	0.85	0.84	0.91	0.90
	0.79	0.55	0.37	0.30	0.26	0.30	0.39	0.49	0.61	0.72	0.72	0.80	0.95	0.98	0.97	0.94
	0.77	0.54	0.36	0.29	0.26	0.30	0.39	0.51	0.62	0.72	0.77	0.83	0.94	0.99	0.97	0.94
	0.73	0.50	0.33	0.25	0.23	0.26	0.33	0.44	0.54	0.62	0.68	0.77	0.82	0.91	0.90	0.89

### Luminance (Cd/SqM)

Average = 0.49

Maximum = 0.99

Minimum = 0.19

Avg/Min Ratio = 2.58

Max/Min Ratio = 5.21

Max/Avg Ratio = 2.02

# Roadway Optimizer - Layout 2

RoadOpt\_1\_Illum

	1.09	0.96	0.71	0.46	0.30	0.24	0.22	0.21	0.21	0.22	0.24	0.30	0.46	0.71	0.96	1.09	▶
	1.59	1.26	0.85	0.53	0.35	0.26	0.24	0.23	0.23	0.24	0.26	0.35	0.53	0.85	1.26	1.59	
	1.95	1.50	0.98	0.62	0.39	0.29	0.25	0.24	0.24	0.25	0.29	0.39	0.62	0.98	1.50	1.95	▶
▶	2.34	1.75	1.10	0.66	0.41	0.29	0.25	0.24	0.24	0.25	0.29	0.41	0.66	1.10	1.75	2.34	
	2.24	1.63	1.04	0.66	0.39	0.26	0.23	0.22	0.22	0.23	0.26	0.39	0.66	1.04	1.63	2.24	
▶	2.42	1.66	1.04	0.64	0.35	0.25	0.22	0.19	0.19	0.22	0.25	0.35	0.64	1.04	1.66	2.42	
▶	2.58	1.69	1.01	0.61	0.35	0.23	0.19	0.16	0.16	0.19	0.23	0.35	0.61	1.01	1.69	2.58	
	2.62	1.73	0.99	0.56	0.30	0.20	0.16	0.14	0.14	0.16	0.20	0.30	0.56	0.99	1.73	2.62	
▶	2.56	1.65	0.92	0.51	0.28	0.18	0.14	0.12	0.12	0.14	0.18	0.28	0.51	0.92	1.65	2.56	
	2.44	1.55	0.88	0.46	0.28	0.17	0.13	0.11	0.11	0.13	0.17	0.28	0.46	0.88	1.55	2.44	

**Illuminance (Fc)**

Average = 0.78  
 Maximum = 2.62  
 Minimum = 0.11  
 Avg/Min Ratio = 7.09  
 Max/Min Ratio = 23.82  
 Max/Avg Ratio = 3.36

# Roadway Optimizer - Layout 2

## RoadOpt\_1\_Vis\_Level

	0.68	6.25	8.56	7.95	6.12	4.95	4.14	3.30	2.59	1.54	0.50	-0.76	-1.80	-2.51	-3.10	-3.28
	1.14	7.62	9.85	8.92	6.84	5.12	4.36	3.23	2.28	1.09	-0.14	-1.54	-2.67	-3.34	-3.84	-3.96
	1.25	8.68	10.99	9.96	7.46	5.33	4.12	3.02	1.79	0.36	-1.11	-2.25	-3.41	-4.03	-4.29	-4.28
	1.48	9.37	11.91	10.53	7.39	4.93	3.66	2.53	1.03	-0.41	-1.95	-2.90	-4.08	-4.74	-4.79	-4.71
	1.49	8.95	11.50	10.17	6.69	4.08	2.93	1.85	0.39	-1.34	-2.61	-3.48	-4.45	-4.85	-4.76	-4.63
	1.74	9.41	11.79	10.03	6.01	3.56	2.20	0.82	-0.81	-2.39	-3.45	-4.18	-4.91	-5.26	-5.03	-4.77
	1.86	9.31	11.34	9.27	5.76	2.91	1.24	-0.33	-2.07	-3.48	-4.18	-4.77	-5.23	-5.49	-5.18	-4.90
	1.94	9.40	10.76	7.92	4.19	1.64	0.27	-1.53	-2.81	-4.04	-4.68	-5.12	-5.54	-5.67	-5.35	-5.00
	1.93	9.08	10.07	7.05	3.69	1.28	-0.28	-2.03	-3.24	-4.28	-4.95	-5.28	-5.54	-5.70	-5.31	-5.01
	1.96	9.10	10.23	6.95	4.21	1.45	-0.01	-1.73	-3.00	-3.93	-4.69	-5.11	-5.32	-5.39	-5.18	-4.94

## Visibility Level

STV = 3.700536



# Roadway Optimizer - Layout 2

## RoadOpt\_1\_Vis\_Level\_Target\_Lum

-----	0.39	0.99	1.19	1.04	0.84	0.72	0.66	0.58	0.52	0.43	0.34	0.24	0.17	0.11	0.07	0.04	◀
-----	0.56	1.29	1.43	1.22	0.98	0.82	0.77	0.66	0.57	0.46	0.32	0.23	0.15	0.09	0.05	0.04	
-----	0.68	1.54	1.66	1.43	1.12	0.92	0.82	0.72	0.58	0.42	0.30	0.21	0.13	0.08	0.05	0.03	◀
-----	0.81	1.78	1.86	1.55	1.18	0.93	0.82	0.72	0.55	0.39	0.27	0.18	0.11	0.07	0.04	0.03	
-----	0.77	1.66	1.76	1.54	1.12	0.87	0.80	0.68	0.50	0.34	0.22	0.14	0.09	0.05	0.03	0.02	
-----	0.83	1.69	1.75	1.51	1.04	0.85	0.76	0.60	0.42	0.28	0.17	0.10	0.06	0.04	0.03	0.02	
-----	0.89	1.72	1.72	1.44	1.03	0.78	0.66	0.50	0.34	0.23	0.14	0.08	0.06	0.04	0.03	0.02	
-----	0.90	1.76	1.67	1.32	0.90	0.67	0.57	0.43	0.30	0.20	0.13	0.08	0.05	0.04	0.02	0.02	
-----	0.88	1.68	1.57	1.20	0.83	0.63	0.50	0.37	0.26	0.17	0.11	0.07	0.05	0.03	0.02	0.02	
-----	0.84	1.58	1.49	1.08	0.82	0.58	0.45	0.34	0.24	0.15	0.10	0.06	0.04	0.03	0.02	0.01	

### Target Luminance (Cd/SqM)

Average = 0.6

Maximum = 1.86

Minimum = 0.01

Avg/Min Ratio = 60

Max/Min Ratio = 186

Max/Avg Ratio = 3.1

## Roadway Optimizer - Layout 2

### RoadOpt\_1\_Veil\_Lum

-----	0.01	0.01	0.01	0.02	0.03	0.04	0.05	0.05	0.06	0.06	0.05	0.04	0.04	0.03	0.03	0.02	▶
-----	0.01	0.01	0.01	0.02	0.02	0.04	0.05	0.06	0.07	0.07	0.07	0.06	0.05	0.04	0.04	0.03	
-----	0.02	0.01	0.01	0.02	0.02	0.03	0.05	0.06	0.08	0.09	0.09	0.08	0.06	0.06	0.05	0.04	▶
-----	0.02	0.01	0.01	0.02	0.02	0.03	0.05	0.07	0.08	0.10	0.11	0.10	0.08	0.07	0.06	0.05	
-----	0.02	0.01	0.01	0.01	0.02	0.03	0.04	0.06	0.08	0.10	0.12	0.11	0.09	0.08	0.07	0.05	
-----	0.03	0.01	0.01	0.01	0.02	0.03	0.04	0.05	0.07	0.10	0.12	0.12	0.09	0.08	0.08	0.05	
-----	0.03	0.01	0.01	0.01	0.02	0.03	0.03	0.04	0.06	0.08	0.10	0.11	0.10	0.09	0.08	0.06	
-----	0.03	0.01	0.01	0.01	0.02	0.02	0.03	0.04	0.06	0.08	0.09	0.10	0.09	0.08	0.08	0.06	
-----	0.03	0.01	0.01	0.01	0.02	0.02	0.03	0.04	0.05	0.07	0.08	0.09	0.08	0.08	0.07	0.05	
-----	0.03	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.05	0.06	0.07	0.08	0.07	0.07	0.07	0.05	

### Veiling Luminance (Cd/SqM)

Average = 0.05

Maximum = 0.12

Minimum = 0.01

Avg/Min Ratio = 5

Max/Min Ratio = 12

Max/Avg Ratio = 2.4

MaxLv Ratio = 0.24

Threshold Increment (TI) = 13.80

## Roadway Optimizer - Layout Comparison

	Layout 1	Layout 2
Description	American Electric ATB2 LED Luminaire	GE ERS4 LED Luminaire
Roadway Standard	IES RP-8-14-IDOT (entire roadway)	IES RP-8-14-IDOT (entire roadway)
R-Table	R3	R3
Actual Q0 Value	0.07	0.07
Layout Type	1RNS	1RNS
Road Width	54	54
Median Width	N.A.	N.A.
Number Lanes	3	3
Number Lanes Opposite	2	2
Drivers Side	Right	Right
Calc Area	Bottom	Bottom
Label - Row 1	ATB2_80BLEDE7 0_XXXXX_R3	ers4_p3c1540-1 20-277v_tcm201-
MH - Row 1	40	40
Setback - Row 1	6	6
+Orient - Row 1	0	0
Tilt - Row 1	0	0
Spin - Row 1	0	0
Spacing - Row 1	250	250
<b>1_Luminance (Cd/SqM)</b>		
Average	0.47	0.49
Maximum	1.17	0.99
Minimum	0.19	0.19
Avg/Min Ratio	2.47	2.58
Max/Min Ratio	6.16	5.21
Max/Avg Ratio	2.49	2.02
<b>1_Illum (Fc)</b>		
Average	0.65	0.78
Maximum	1.57	2.62
Minimum	0.14	0.11

---

**Roadway Optimizer - Layout Comparison - Cont.**

	<b>Layout 1</b>	<b>Layout 2</b>
Avg/Min Ratio	4.64	7.09
Max/Min Ratio	11.21	23.82
Max/Avg Ratio	2.42	3.36
<b>1_Vis_Level</b>		
STV	4.08	3.7
<b>1_Vis_Level_Bkgd_Lum (Cd/SqM)</b>		
Average	0.48	0.49
Maximum	1.19	1.00
Minimum	0.19	0.19
Avg/Min Ratio	2.53	2.58
Max/Min Ratio	6.26	5.26
Max/Avg Ratio	2.48	2.04
<b>1_Vis_Level_Target_Lum (Cd/SqM)</b>		
Average	0.6	0.6
Maximum	1.71	1.86
Minimum	0.01	0.01
Avg/Min Ratio	60.00	60.00
Max/Min Ratio	171	186
Max/Avg Ratio	2.85	3.1
<b>1_Veil_Lum (Cd/SqM)</b>		
Average	0.05	0.05
Maximum	0.16	0.12
Minimum	0.01	0.01
Avg/Min Ratio	5.00	5.00
Max/Min Ratio	16.00	12.00
Max/Avg Ratio	3.2	2.4
MaxLV Ratio	0.34	0.24
Threshold Incr. (TI)	19.03	13.8

## LUMINAIRE PERFORMANCE SUMMARY

### 54' Section

**Date:** 6/6/2016

**Designer:** Joe Vondra

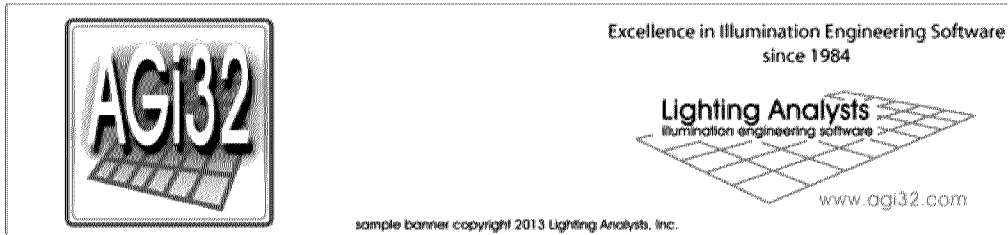
**Project:** Village of Mount Prospect - Corridor Lighting Evaluation

IES Roadway Classification:	Collector	Luminance				Sidewalk Area		
						Illuminance		
Pedestrian Conflict Classification:	Medium	$L_{avg}$	$L_{avg}/L_{min}$	$L_{max}/L_{min}$	$L_v/L_{avg}$	$E_{Havg}$	$E_{Vmin}$	$E_{avg}/E_{min}$
<b>IES Recommended Levels</b>		0.6	3.5	6.0	0.4	0.4	0.1	4.0
<b>Manufacturer:</b>	American Electric							
<b>Curve #:</b>		0.68	2.34	5.59	0.32	0.62	0.30	2.07
ATB2_80BLEDE10_XXXXX_R3								
<b>Manufacturer:</b>	GE Lighting							
<b>Curve #:</b>		0.63	2.52	4.92	0.24	0.41	0.20	2.05
ers4_t3c1540-120-277v_tcm201								

Note: Sidewalk Area values out of spec will improve for 90% spacing. Final values should be calculated during design.

## DESIGN PARAMETERS

Combined LLF	<u>0.7</u>	Spacing	<u>250'</u>
Lamp lumens	<u>23249/25400</u>	Light Pole Set Back $SB_{LP}$	<u>6'</u>
Roadway Width $W_R$	<u>54'</u>	Mounting Height	<u>40'</u>
Number of Lanes	<u>5</u>	Mast Arm	<u>12'</u>
Lane Width $W_L$	<u>10.8'</u>	Sidewalk Set Back $SB_{SW}$	<u>0'</u>
Layout	<u>Single Sided</u>	Sidewalk Width $W_{SW}$	<u>12'</u>



## Roadway Optimizer - Layout 1

### General:

American Electric ATB2 LED Luminaire

Roadway Standard: IES RP-8-14-IDOT (entire roadway)

R-Table: R3 (Slightly Specular), QO=0.07 Actual QO Value: 0.07

### Roadway Layout:

Layout Type: One Row, Near Side; 1RNS

Roadway Width: 54 ft

Lanes In Direction Of Travel: 3 In Opposite Direction: 2

Driver's Side Of Roadway: Right

### Luminaire Information:

#### ATB2 80BLEDE10 XXXXX R3

Description: ATB2 80BLEDE10 XXXXX R3

File Name: ATB2\_80BLEDE10\_XXXXX\_R3.ies

Lumens Per Lamp: N.A.

Number Of Lamps: 1

Total Lamp Lumens: N.A.

Luminaire Lumens: 30489

Luminaire Watts: 274

Efficiency (%): N.A.

Total Light Loss Factor: 0.700

Luminaire Arrangement: SINGLE

Arm Length: 12.76175 ft

Offset: 0 ft

### Luminaire Location Summary:

Coordinates in ft

Spacing - Row 1: 240

<u>Label</u>	<u>X-Coord</u>	<u>Y-Coord</u>	<u>Z-Coord</u>	<u>Orient</u>	<u>Tilt</u>	<u>Spin</u>
ATB2_80BLEDE10_XXXX...	-480	-6	40	90	0	0
ATB2_80BLEDE10_XXXX...	-240	-6	40	90	0	0
ATB2_80BLEDE10_XXXX...	0	-6	40	90	0	0
ATB2_80BLEDE10_XXXX...	240	-6	40	90	0	0
ATB2_80BLEDE10_XXXX...	480	-6	40	90	0	0
ATB2_80BLEDE10_XXXX...	720	-6	40	90	0	0

Total Number of locations: 6

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Luminance

	+0.37	+0.39	+0.40	+0.33	+0.30	+0.29	+0.30	+0.34	+0.40	+0.46	+0.50	+0.51	+0.50	+0.43	+0.32
	+0.45	+0.47	+0.43	+0.35	+0.31	+0.30	+0.32	+0.38	+0.44	+0.52	+0.56	+0.58	+0.57	+0.54	+0.46
	+0.59	+0.53	+0.45	+0.37	+0.32	+0.32	+0.34	+0.41	+0.50	+0.58	+0.62	+0.66	+0.66	+0.66	+0.64
	+0.66	+0.57	+0.46	+0.39	+0.33	+0.34	+0.39	+0.48	+0.57	+0.68	+0.72	+0.80	+0.78	+0.74	+0.70
→	+0.67	+0.58	+0.47	+0.40	+0.36	+0.38	+0.45	+0.57	+0.71	+0.82	+0.89	+0.96	+0.91	+0.82	+0.73
	+0.67	+0.56	+0.47	+0.41	+0.38	+0.42	+0.57	+0.76	+0.89	+1.03	+1.12	+1.15	+1.03	+0.92	+0.75
→	+0.66	+0.55	+0.46	+0.42	+0.40	+0.46	+0.67	+0.97	+1.22	+1.34	+1.38	+1.37	+1.14	+0.96	+0.75
	+0.67	+0.52	+0.43	+0.40	+0.41	+0.50	+0.78	+1.15	+1.42	+1.56	+1.57	+1.48	+1.23	+0.93	+0.79
→	+0.64	+0.49	+0.40	+0.38	+0.41	+0.52	+0.83	+1.22	+1.49	+1.61	+1.62	+1.49	+1.20	+0.89	+0.77
	+0.57	+0.45	+0.37	+0.35	+0.36	+0.43	+0.66	+0.97	+1.25	+1.41	+1.41	+1.33	+1.08	+0.81	+0.68

### Luminance (Cd/SqM)

Average = 0.68

Maximum = 1.62

Minimum = 0.29

Avg/Min Ratio = 2.34

Max/Min Ratio = 5.59

Max/Avg Ratio = 2.38

# Roadway Optimizer - Layout 1

RoadOpt\_1\_Illum

	1.14	1.15	1.02	0.77	0.58	0.45	0.37	0.36	0.37	0.45	0.58	0.77	1.02	1.15	1.14
	1.45	1.42	1.14	0.83	0.61	0.46	0.37	0.35	0.37	0.46	0.61	0.83	1.14	1.42	1.45
	1.83	1.67	1.22	0.88	0.63	0.46	0.37	0.34	0.37	0.46	0.63	0.88	1.22	1.67	1.83
	2.06	1.79	1.29	0.91	0.64	0.46	0.37	0.34	0.37	0.46	0.64	0.91	1.29	1.79	2.06
→	2.13	1.82	1.35	0.93	0.65	0.46	0.37	0.34	0.37	0.46	0.65	0.93	1.35	1.82	2.13
	2.16	1.82	1.36	0.95	0.65	0.46	0.37	0.34	0.37	0.46	0.65	0.95	1.36	1.82	2.16
→	2.12	1.75	1.33	0.94	0.64	0.45	0.36	0.33	0.36	0.45	0.64	0.94	1.33	1.75	2.12
	2.16	1.60	1.19	0.85	0.57	0.40	0.32	0.30	0.32	0.40	0.57	0.85	1.19	1.60	2.16
→	2.05	1.45	1.06	0.76	0.52	0.36	0.29	0.27	0.29	0.36	0.52	0.76	1.06	1.45	2.05
	1.82	1.34	0.99	0.70	0.47	0.33	0.25	0.22	0.25	0.33	0.47	0.70	0.99	1.34	1.82

**Illuminance (Fc)**

Average = 0.94  
 Maximum = 2.16  
 Minimum = 0.22  
 Avg/Min Ratio = 4.27  
 Max/Min Ratio = 9.82  
 Max/Avg Ratio = 2.3

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Vis\_Level

	+0.34	+6.51	+10.84	+12.39	+11.83	+9.73	+6.59	+3.54	+0.70	+1.53	+2.93	+3.25	+3.44	+3.49	+3.64
	-0.65	-7.69	-11.80	-13.15	-12.13	-9.52	-6.13	-2.95	-0.25	-2.01	-3.30	-3.71	-3.80	-3.93	-3.94
	+0.92	+8.83	+12.54	+13.48	+12.05	+8.84	+5.52	+2.37	+0.32	+2.51	+3.65	+4.21	+4.30	+4.41	+4.34
	+1.07	+9.11	+13.11	+13.55	+11.30	+8.00	+4.70	+1.67	+0.99	+3.17	+4.09	+4.66	+4.66	+4.67	+4.50
→	+1.14	+9.06	+13.21	+13.08	+10.53	+6.89	+3.71	+0.87	+1.93	+3.84	+4.64	+5.01	+4.85	+4.78	+4.55
	+1.19	+9.04	+13.05	+12.38	+8.89	+5.48	+2.56	+0.16	+2.95	+4.58	+5.20	+5.30	+5.00	+4.90	+4.54
→	+1.13	+8.54	+12.42	+11.53	+7.46	+3.97	+1.14	+1.60	+4.18	+5.41	+5.66	+5.64	+5.14	+4.92	+4.48
	+1.24	+7.88	+10.98	+9.66	+5.53	+2.44	+0.12	+2.96	+5.01	+6.00	+5.98	+5.79	+5.37	+4.84	+4.51
→	+1.22	+7.17	+9.66	+8.35	+4.46	+1.56	+1.05	+3.60	+5.35	+6.15	+6.05	+5.79	+5.39	+4.72	+4.46
	+1.10	+6.95	+9.65	+8.59	+4.95	+2.02	+0.73	+3.38	+5.11	+5.95	+5.79	+5.55	+5.10	+4.54	+4.22

## Visibility Level

STV = 4.35239

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Vis\_Level\_Bkgd\_Lum

-----		+0.37	+0.31	+0.30	+0.29	+0.31	+0.35	+0.44	+0.48	+0.50	+0.50	+0.50	+0.40	+0.37	+0.41	
-----	-----	+0.40	+0.33	+0.31	+0.30	+0.33	+0.38	+0.48	+0.54	+0.57	+0.57	+0.57	+0.51	+0.46	+0.45	+0.46
-----		+0.41	+0.34	+0.32	+0.32	+0.37	+0.44	+0.53	+0.61	+0.65	+0.65	+0.65	+0.64	+0.61	+0.57	+0.50
-----		+0.43	+0.35	+0.33	+0.35	+0.43	+0.51	+0.61	+0.70	+0.74	+0.78	+0.75	+0.75	+0.69	+0.64	+0.51
-----	→	+0.44	+0.37	+0.36	+0.40	+0.50	+0.63	+0.75	+0.85	+0.89	+0.92	+0.88	+0.80	+0.69	+0.65	+0.52
-----	→	+0.44	+0.38	+0.38	+0.47	+0.67	+0.83	+0.92	+1.08	+1.13	+1.09	+1.00	+0.82	+0.69	+0.64	+0.52
-----	→	+0.44	+0.40	+0.41	+0.52	+0.82	+1.09	+1.28	+1.35	+1.40	+1.27	+1.07	+0.88	+0.68	+0.63	+0.50
-----	→	+0.42	+0.39	+0.44	+0.59	+0.97	+1.28	+1.50	+1.58	+1.55	+1.40	+1.09	+0.85	+0.72	+0.61	+0.47
-----	→	+0.40	+0.38	+0.45	+0.61	+1.02	+1.35	+1.56	+1.64	+1.59	+1.38	+1.05	+0.81	+0.74	+0.55	+0.44
-----		+0.37	+0.35	+0.38	+0.50	+0.80	+1.10	+1.34	+1.43	+1.38	+1.26	+0.95	+0.74	+0.63	+0.51	+0.41

### Background Luminance (Cd/SqM)

Average = 0.68

Maximum = 1.64

Minimum = 0.29

Avg/Min Ratio = 2.34

Max/Min Ratio = 5.66

Max/Avg Ratio = 2.41

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Vis\_Level\_Target\_Lum

	+0.42	+1.22	+1.78	+1.86	+1.76	+1.56	+1.27	+0.93	+0.56	+0.31	+0.15	+0.08	+0.05	+0.04	+0.03
	+0.52	+1.49	+1.98	+2.01	+1.87	+1.60	+1.27	+0.92	+0.55	+0.30	+0.14	+0.07	+0.05	+0.03	+0.03
	+0.65	+1.75	+2.13	+2.12	+1.93	+1.61	+1.27	+0.90	+0.54	+0.29	+0.14	+0.06	+0.04	+0.03	+0.02
	+0.73	+1.87	+2.25	+2.21	+1.96	+1.61	+1.26	+0.89	+0.52	+0.27	+0.13	+0.06	+0.04	+0.03	+0.02
→	+0.76	+1.91	+2.34	+2.26	+1.98	+1.63	+1.26	+0.88	+0.52	+0.26	+0.12	+0.05	+0.04	+0.03	+0.02
	+0.77	+1.90	+2.36	+2.29	+1.99	+1.63	+1.26	+0.89	+0.52	+0.25	+0.12	+0.05	+0.04	+0.03	+0.02
→	+0.75	+1.83	+2.31	+2.27	+1.95	+1.59	+1.24	+0.87	+0.50	+0.23	+0.11	+0.05	+0.04	+0.03	+0.02
	+0.76	+1.68	+2.08	+2.05	+1.75	+1.43	+1.12	+0.78	+0.44	+0.20	+0.10	+0.05	+0.03	+0.03	+0.02
→	+0.73	+1.53	+1.85	+1.85	+1.59	+1.29	+1.00	+0.70	+0.40	+0.18	+0.09	+0.05	+0.03	+0.03	+0.02
	+0.65	+1.40	+1.72	+1.70	+1.45	+1.18	+0.88	+0.59	+0.33	+0.15	+0.08	+0.05	+0.03	+0.03	+0.02

### Target Luminance (Cd/SqM)

Average = 0.86

Maximum = 2.36

Minimum = 0.02

Avg/Min Ratio = 43

Max/Min Ratio = 118

Max/Avg Ratio = 2.74

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Veil\_Lum

	+0.03	+0.02	+0.01	+0.01	+0.02	+0.02	+0.02	+0.03	+0.05	+0.08	+0.10	+0.11	+0.09	+0.07	+0.05
	+0.04	+0.02	+0.01	+0.02	+0.02	+0.02	+0.02	+0.03	+0.06	+0.09	+0.12	+0.12	+0.11	+0.09	+0.06
	+0.05	+0.02	+0.02	+0.02	+0.02	+0.02	+0.03	+0.03	+0.06	+0.10	+0.13	+0.14	+0.13	+0.10	+0.07
	+0.05	+0.03	+0.02	+0.02	+0.02	+0.02	+0.03	+0.04	+0.07	+0.11	+0.14	+0.15	+0.15	+0.12	+0.09
→	+0.06	+0.03	+0.02	+0.02	+0.02	+0.02	+0.03	+0.04	+0.07	+0.12	+0.16	+0.18	+0.16	+0.14	+0.10
	+0.07	+0.03	+0.02	+0.02	+0.02	+0.03	+0.03	+0.04	+0.08	+0.13	+0.18	+0.20	+0.19	+0.15	+0.11
→	+0.07	+0.03	+0.02	+0.02	+0.03	+0.03	+0.03	+0.05	+0.08	+0.14	+0.20	+0.22	+0.20	+0.17	+0.12
	+0.07	+0.03	+0.02	+0.03	+0.03	+0.03	+0.03	+0.05	+0.08	+0.14	+0.20	+0.21	+0.20	+0.16	+0.12
→	+0.06	+0.03	+0.02	+0.03	+0.03	+0.03	+0.03	+0.05	+0.07	+0.13	+0.18	+0.19	+0.18	+0.15	+0.11
	+0.06	+0.03	+0.02	+0.03	+0.03	+0.03	+0.03	+0.04	+0.06	+0.10	+0.15	+0.17	+0.16	+0.13	+0.10

### Veiling Luminance (Cd/SqM)

Average = 0.08

Maximum = 0.22

Minimum = 0.01

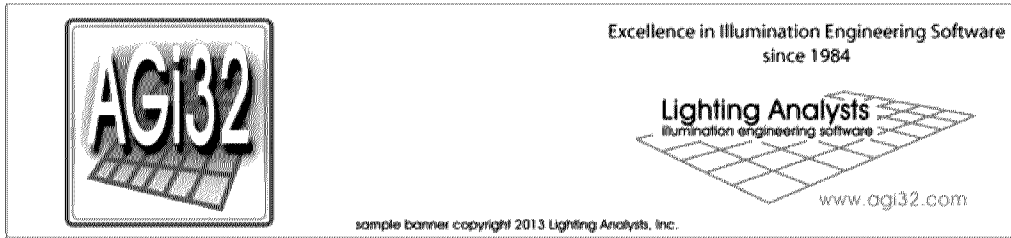
Avg/Min Ratio = 8

Max/Min Ratio = 22

Max/Avg Ratio = 2.75

MaxLv Ratio = 0.32

Threshold Increment (TI) = 19.47



## Roadway Optimizer - Layout 2

### General:

GE ERS4 LED Luminaire

Roadway Standard: IES RP-8-14-IDOT (entire roadway)

R-Table: R3 (Slightly Specular), QO=0.07 Actual QO Value: 0.07

### Roadway Layout:

Layout Type: One Row, Near Side; 1RNS

Roadway Width: 54 ft

Lanes In Direction Of Travel: 3 In Opposite Direction: 2

Driver's Side Of Roadway: Right

### Luminaire Information:

#### ers4 t3c1540-120-277v tcm201-

Description: ERS4 T3C1540 -120-277V

File Name: ers4\_t3c1540-120-277v\_tcm201-95633.ies

Lumens Per Lamp: N.A.

Number Of Lamps: 1

Total Lamp Lumens: N.A.

Luminaire Lumens: 25400

Luminaire Watts: 274

Efficiency (%): N.A.

Total Light Loss Factor: 0.700

Luminaire Arrangement: SINGLE

Arm Length: 12.98225 ft

Offset: 0 ft

### Luminaire Location Summary:

Coordinates in ft

Spacing - Row 1: 240

Label	X-Coord	Y-Coord	Z-Coord	Orient	Tilt	Spin
ers4_t3c1540-120-27...	720	-6	40	90	0	0
ers4_t3c1540-120-27...	480	-6	40	90	0	0
ers4_t3c1540-120-27...	240	-6	40	90	0	0
ers4_t3c1540-120-27...	0	-6	40	90	0	0
ers4_t3c1540-120-27...	-240	-6	40	90	0	0
ers4_t3c1540-120-27...	-480	-6	40	90	0	0

Total Number of locations: 6

## Roadway Optimizer - Layout 2

### RoadOpt\_1\_Luminance

	+0.44	+0.42	+0.38	+0.29	+0.26	+0.25	+0.26	+0.26	+0.28	+0.29	+0.32	+0.37	+0.43	+0.44	+0.44
	+0.62	+0.53	+0.43	+0.33	+0.29	+0.30	+0.31	+0.33	+0.35	+0.36	+0.39	+0.45	+0.52	+0.59	+0.63
	+0.78	+0.60	+0.47	+0.37	+0.33	+0.34	+0.36	+0.40	+0.42	+0.44	+0.46	+0.56	+0.64	+0.72	+0.81
	+0.93	+0.70	+0.52	+0.41	+0.35	+0.35	+0.41	+0.47	+0.48	+0.50	+0.55	+0.69	+0.80	+0.88	+0.98
→	+0.87	+0.65	+0.48	+0.41	+0.36	+0.38	+0.45	+0.52	+0.57	+0.56	+0.62	+0.80	+0.84	+0.89	+0.95
	+0.92	+0.64	+0.46	+0.39	+0.34	+0.40	+0.50	+0.60	+0.66	+0.67	+0.72	+0.92	+0.95	+1.02	+1.04
→	+0.98	+0.66	+0.47	+0.39	+0.36	+0.41	+0.50	+0.64	+0.79	+0.81	+0.88	+1.05	+1.04	+1.12	+1.11
	+0.99	+0.68	+0.46	+0.40	+0.38	+0.47	+0.59	+0.74	+0.88	+0.91	+0.97	+1.16	+1.21	+1.21	+1.17
→	+0.96	+0.67	+0.45	+0.38	+0.38	+0.47	+0.60	+0.76	+0.88	+0.96	+1.01	+1.15	+1.23	+1.21	+1.17
	+0.91	+0.62	+0.42	+0.33	+0.34	+0.40	+0.52	+0.66	+0.76	+0.83	+0.93	+0.99	+1.13	+1.12	+1.10

#### Luminance (Cd/SqM)

Average = 0.63

Maximum = 1.23

Minimum = 0.25

Avg/Min Ratio = 2.52

Max/Min Ratio = 4.92

Max/Avg Ratio = 1.95

# Roadway Optimizer - Layout 2

RoadOpt\_1\_Illum

	†1.35	†1.18	†0.86	†0.55	†0.37	†0.30	†0.28	†0.27	†0.28	†0.30	†0.37	†0.55	†0.86	†1.18	†1.35
	—†1.96	—†1.54	—†1.02	—†0.64	—†0.43	—†0.34	—†0.32	—†0.31	—†0.32	—†0.34	—†0.43	—†0.64	—†1.02	—†1.54	—†1.96
	†2.40	†1.83	†1.18	†0.73	†0.48	†0.37	†0.33	†0.34	†0.33	†0.37	†0.48	†0.73	†1.18	†1.83	†2.40
	†2.88	†2.11	†1.33	†0.79	†0.49	†0.36	†0.33	†0.33	†0.33	†0.36	†0.49	†0.79	†1.33	†2.11	†2.88
→	†2.75	†1.98	†1.25	†0.78	†0.46	†0.33	†0.31	†0.31	†0.31	†0.33	†0.46	†0.78	†1.25	†1.98	†2.75
	—†2.97	—†2.01	—†1.24	—†0.75	—†0.42	—†0.32	—†0.28	—†0.27	—†0.28	—†0.32	—†0.42	—†0.75	—†1.24	—†2.01	—†2.97
→	†3.17	†2.04	†1.21	†0.72	†0.41	†0.28	†0.24	†0.22	†0.24	†0.28	†0.41	†0.72	†1.21	†2.04	†3.17
	—†3.22	—†2.09	—†1.18	—†0.66	—†0.36	—†0.25	—†0.21	—†0.19	—†0.21	—†0.25	—†0.36	—†0.66	—†1.18	—†2.09	—†3.22
→	†3.14	†2.00	†1.10	†0.59	†0.33	†0.23	†0.18	†0.17	†0.18	†0.23	†0.33	†0.59	†1.10	†2.00	†3.14
	—†2.99	—†1.88	—†1.05	—†0.53	—†0.32	—†0.21	—†0.16	—†0.15	—†0.16	—†0.21	—†0.32	—†0.53	—†1.05	—†1.88	—†2.99

**Illuminance (Fc)**

Average = 1  
 Maximum = 3.22  
 Minimum = 0.15  
 Avg/Min Ratio = 6.67  
 Max/Min Ratio = 21.47  
 Max/Avg Ratio = 3.22

## Roadway Optimizer - Layout 2

### RoadOpt\_1\_Vis\_Level

	+0.82	+6.85	+9.15	+8.23	+6.36	+5.09	+4.07	+3.32	+2.38	+1.14	+0.02	+1.35	+2.31	+3.08	+3.50
	+1.31	+8.26	+10.42	+9.12	+6.90	+5.21	+4.32	+3.14	+1.93	+0.62	+0.96	+2.34	+3.25	+3.95	+4.18
	+1.43	+9.33	+11.59	+10.07	+7.38	+5.33	+3.98	+2.87	+1.29	+0.29	+1.79	+3.18	+4.13	+4.55	+4.69
	+1.66	+10.03	+12.67	+10.52	+7.16	+4.72	+3.54	+2.15	+0.55	+1.40	+2.68	+4.06	+4.97	+5.11	+5.06
→	+1.65	+9.51	+11.97	+10.00	+6.23	+3.74	+2.78	+1.48	+0.32	+2.21	+3.32	+4.52	+5.13	+5.13	+4.97
	+1.94	+10.01	+12.22	+9.60	+5.26	+3.05	+1.89	+0.32	+1.68	+3.21	+4.16	+5.08	+5.61	+5.45	+5.13
→	+2.06	+9.87	+11.69	+8.95	+4.93	+2.19	+0.69	+1.10	+3.15	+4.17	+4.89	+5.52	+5.88	+5.62	+5.29
	+2.12	+9.84	+10.82	+7.36	+3.29	+1.03	+0.57	+2.21	+3.80	+4.79	+5.34	+5.89	+6.11	+5.81	+5.41
→	+2.10	+9.50	+10.06	+6.43	+2.76	+0.65	+1.25	+2.83	+4.12	+5.10	+5.54	+5.92	+6.16	+5.79	+5.43
	+2.14	+9.59	+10.41	+6.38	+3.24	+0.87	+0.96	+2.55	+3.82	+4.84	+5.39	+5.68	+5.88	+5.65	+5.26

### Visibility Level

STV = 3.873082

# Roadway Optimizer - Layout 2

## RoadOpt\_1\_Vis\_Level\_Bkgd\_Lum

-----		+0.34	+0.27	+0.26	+0.26	+0.26	+0.26	+0.29	+0.31	+0.33	+0.39	+0.45	+0.45	+0.42	+0.44	+0.42
-----	-----	+0.38	+0.31	+0.29	+0.31	+0.32	+0.32	+0.36	+0.37	+0.41	+0.48	+0.56	+0.61	+0.60	+0.58	+0.49
-----		+0.43	+0.34	+0.32	+0.35	+0.38	+0.40	+0.43	+0.44	+0.50	+0.59	+0.66	+0.76	+0.80	+0.71	+0.56
-----		+0.47	+0.37	+0.34	+0.37	+0.44	+0.47	+0.48	+0.51	+0.58	+0.75	+0.81	+0.94	+1.03	+0.84	+0.59
-----	→	+0.45	+0.37	+0.36	+0.41	+0.48	+0.55	+0.56	+0.56	+0.65	+0.83	+0.86	+0.95	+1.01	+0.81	+0.55
-----	→	+0.43	+0.35	+0.35	+0.44	+0.56	+0.64	+0.65	+0.68	+0.77	+0.93	+0.99	+1.03	+1.14	+0.85	+0.55
-----	→	+0.44	+0.37	+0.37	+0.45	+0.56	+0.71	+0.81	+0.82	+0.96	+1.06	+1.09	+1.12	+1.23	+0.86	+0.57
-----	→	+0.43	+0.38	+0.41	+0.52	+0.66	+0.80	+0.92	+0.92	+1.05	+1.20	+1.21	+1.22	+1.19	+0.89	+0.57
-----	→	+0.42	+0.37	+0.41	+0.52	+0.68	+0.81	+0.92	+0.97	+1.07	+1.22	+1.22	+1.19	+1.18	+0.83	+0.57
-----		+0.38	+0.32	+0.35	+0.44	+0.59	+0.70	+0.80	+0.86	+0.95	+1.10	+1.13	+1.12	+1.02	+0.79	+0.51

### Background Luminance (Cd/SqM)

Average = 0.63

Maximum = 1.23

Minimum = 0.26

Avg/Min Ratio = 2.42

Max/Min Ratio = 4.73

Max/Avg Ratio = 1.95

# Roadway Optimizer - Layout 2

## RoadOpt\_1\_Vis\_Level\_Target\_Lum

	+0.51	+1.24	+1.47	+1.26	+1.01	+0.87	+0.79	+0.71	+0.63	+0.50	+0.38	+0.27	+0.19	+0.12	+0.02
	+0.71	+1.61	+1.75	+1.47	+1.18	+0.99	+0.94	+0.80	+0.68	+0.52	+0.36	+0.25	+0.16	+0.10	+0.06
	+0.86	+1.92	+2.03	+1.72	+1.35	+1.12	+0.99	+0.87	+0.68	+0.48	+0.34	+0.23	+0.14	+0.08	+0.05
	+1.03	+2.21	+2.29	+1.87	+1.42	+1.12	+1.00	+0.86	+0.63	+0.44	+0.30	+0.19	+0.12	+0.07	+0.04
→	+0.98	+2.07	+2.15	+1.85	+1.34	+1.06	+0.97	+0.81	+0.57	+0.38	+0.25	+0.15	+0.09	+0.06	+0.04
	+1.05	+2.10	+2.16	+1.80	+1.25	+1.03	+0.91	+0.71	+0.48	+0.31	+0.19	+0.11	+0.07	+0.05	+0.03
→	+1.12	+2.14	+2.10	+1.73	+1.22	+0.94	+0.79	+0.58	+0.38	+0.25	+0.15	+0.09	+0.06	+0.04	+0.03
	+1.14	+2.19	+2.04	+1.59	+1.07	+0.82	+0.68	+0.50	+0.34	+0.22	+0.14	+0.08	+0.06	+0.04	+0.03
→	+1.10	+2.09	+1.91	+1.42	+0.99	+0.76	+0.59	+0.44	+0.30	+0.19	+0.12	+0.08	+0.05	+0.04	+0.02
	+1.05	+1.97	+1.83	+1.27	+0.97	+0.70	+0.53	+0.40	+0.27	+0.17	+0.11	+0.07	+0.05	+0.03	+0.02

### Target Luminance (Cd/SqM)

Average = 0.77

Maximum = 2.29

Minimum = 0.02

Avg/Min Ratio = 38.5

Max/Min Ratio = 114.5

Max/Avg Ratio = 2.97

## Roadway Optimizer - Layout 2

### RoadOpt\_1\_Veil\_Lum

	0.02	0.01	0.01	0.02	0.03	0.05	0.06	0.06	0.07	0.07	0.06	0.05	0.04	0.04	0.03
	0.03	0.01	0.01	0.02	0.03	0.05	0.06	0.08	0.09	0.09	0.08	0.07	0.06	0.05	0.04
	0.04	0.02	0.01	0.02	0.03	0.04	0.06	0.08	0.10	0.11	0.11	0.09	0.08	0.07	0.06
	0.05	0.02	0.01	0.02	0.03	0.04	0.06	0.09	0.10	0.12	0.13	0.11	0.09	0.08	0.07
→	0.05	0.02	0.01	0.02	0.03	0.04	0.06	0.08	0.11	0.13	0.14	0.13	0.10	0.10	0.08
	0.05	0.02	0.01	0.02	0.02	0.03	0.05	0.07	0.10	0.13	0.15	0.14	0.11	0.10	0.09
→	0.06	0.02	0.01	0.02	0.03	0.03	0.04	0.06	0.08	0.11	0.13	0.13	0.11	0.11	0.09
	0.06	0.02	0.01	0.02	0.02	0.03	0.04	0.05	0.08	0.10	0.12	0.12	0.10	0.10	0.09
→	0.06	0.02	0.01	0.02	0.02	0.03	0.04	0.05	0.07	0.09	0.10	0.11	0.10	0.09	0.09
	0.05	0.02	0.01	0.02	0.02	0.03	0.03	0.04	0.06	0.08	0.09	0.09	0.09	0.08	0.08

### Veiling Luminance (Cd/SqM)

Average = 0.06

Maximum = 0.15

Minimum = 0.01

Avg/Min Ratio = 6

Max/Min Ratio = 15

Max/Avg Ratio = 2.5

MaxLv Ratio = 0.24

Threshold Increment (TI) = 14.11

## Roadway Optimizer - Layout Comparison

	Layout 1	Layout 2
Description	American Electric ATB2 LED Luminaire	GE ERS4 LED Luminaire
Roadway Standard	IES RP-8-14-IDOT (entire roadway)	IES RP-8-14-IDOT (entire roadway)
R-Table	R3	R3
Actual Q0 Value	0.07	0.07
Layout Type	1RNS	1RNS
Road Width	54	54
Median Width	N.A.	N.A.
Number Lanes	3	3
Number Lanes Opposite	2	2
Drivers Side	Right	Right
Calc Area	Bottom	Bottom
Label - Row 1	ATB2_80BLEDE1 0_XXXXX_R3	ers4_t3c1540-1 20-277v_tcm201-
MH - Row 1	40	40
Setback - Row 1	6	6
+Orient - Row 1	0	0
Tilt - Row 1	0	0
Spin - Row 1	0	0
Spacing - Row 1	240	240
<b>1_Luminance (Cd/SqM)</b>		
Average	0.68	0.63
Maximum	1.62	1.23
Minimum	0.29	0.25
Avg/Min Ratio	2.34	2.52
Max/Min Ratio	5.59	4.92
Max/Avg Ratio	2.38	1.95
<b>1_Illum (Fc)</b>		
Average	0.94	1
Maximum	2.16	3.22
Minimum	0.22	0.15

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**Roadway Optimizer - Layout Comparison - Cont.**

	<b>Layout 1</b>	<b>Layout 2</b>
Avg/Min Ratio	4.27	6.67
Max/Min Ratio	9.82	21.47
Max/Avg Ratio	2.3	3.22
<hr/>		
<b>1_Vis_Level</b>		
STV	4.35	3.87
<hr/>		
<b>1_Vis_Level_Bkgd_Lum (Cd/SqM)</b>		
Average	0.68	0.63
Maximum	1.64	1.23
Minimum	0.29	0.26
Avg/Min Ratio	2.34	2.42
Max/Min Ratio	5.66	4.73
Max/Avg Ratio	2.41	1.95
<hr/>		
<b>1_Vis_Level_Target_Lum (Cd/SqM)</b>		
Average	0.86	0.77
Maximum	2.36	2.29
Minimum	0.02	0.02
Avg/Min Ratio	43.00	38.50
Max/Min Ratio	118	115
Max/Avg Ratio	2.74	2.97
<hr/>		
<b>1_Veil_Lum (Cd/SqM)</b>		
Average	0.08	0.06
Maximum	0.22	0.15
Minimum	0.01	0.01
Avg/Min Ratio	8.00	6.00
Max/Min Ratio	22.00	15.00
Max/Avg Ratio	2.75	2.5
MaxLV Ratio	0.32	0.24
Threshold Incr. (TI)	19.47	14.11

## LUMINAIRE PERFORMANCE SUMMARY

### 54' Section

**Date:** 6/6/2016

**Designer:** Joe Vondra

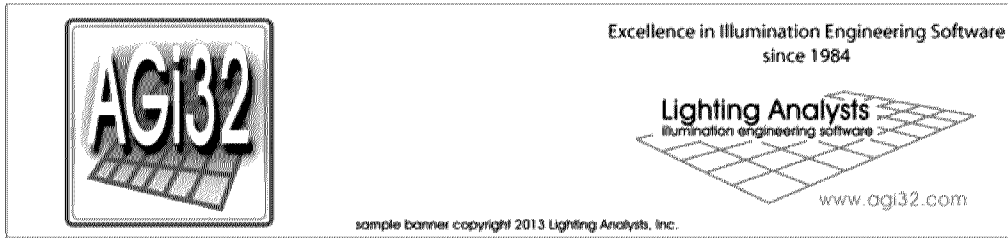
**Project:** Village of Mount Prospect - Corridor Lighting Evaluation

IES Roadway Classification:	Major	Luminance				Sidewalk Area		
						Illuminance		
Pedestrian Conflict Classification:	Low	$L_{avg}$	$L_{avg}/L_{min}$	$L_{max}/L_{min}$	$L_v/L_{avg}$	$E_{Havg}$	$E_{Vmin}$	$E_{avg}/E_{min}$
<b>IES Recommended Levels</b>		0.6	3.5	6.0	0.3	0.4	0.1	4.0
<b>Manufacturer:</b>	American Electric	0.73	2.15	4.82	0.3	0.67	0.40	1.68
<b>Curve #:</b>	ATB2_80BLEDE10_XXXXX_R3							
<b>Manufacturer:</b>	GE Lighting	0.67	2.39	4.43	0.22	0.45	0.20	2.25
<b>Curve #:</b>	ers4_t3c1540-120-277v_tcm201							

Note: Sidewalk Area values out of spec will improve for 90% spacing. Final values should be calculated during design.

## DESIGN PARAMETERS

Combined LLF	<u>0.7</u>	Spacing	<u>250'</u>
Lamp lumens	<u>23249/25400</u>	Light Pole Set Back $SB_{LP}$	<u>6'</u>
Roadway Width $W_R$	<u>54'</u>	Mounting Height	<u>40'</u>
Number of Lanes	<u>5</u>	Mast Arm	<u>12'</u>
Lane Width $W_L$	<u>10.8'</u>	Sidewalk Set Back $SB_{SW}$	<u>0'</u>
Layout	<u>Single Sided</u>	Sidewalk Width $W_{SW}$	<u>12'</u>



## Roadway Optimizer - Layout 1

### General:

American Electric ATB2 LED Luminaire

Roadway Standard: IES RP-8-14-IDOT (entire roadway)

R-Table: R3 (Slightly Specular), QO=0.07 Actual QO Value: 0.07

### Roadway Layout:

Layout Type: One Row, Near Side; 1RNS

Roadway Width: 54 ft

Lanes In Direction Of Travel: 3 In Opposite Direction: 2

Driver's Side Of Roadway: Right

### Luminaire Information:

#### ATB2 80BLEDE10 XXXXX R3

Description: ATB2 80BLEDE10 XXXXX R3

File Name: ATB2\_80BLEDE10\_XXXXX\_R3.ies

Lumens Per Lamp: N.A.

Number Of Lamps: 1

Total Lamp Lumens: N.A.

Luminaire Lumens: 30489

Luminaire Watts: 274

Efficiency (%): N.A.

Total Light Loss Factor: 0.700

Luminaire Arrangement: SINGLE

Arm Length: 12.76175 ft

Offset: 0 ft

### Luminaire Location Summary:

Coordinates in ft

Spacing - Row 1: 225

<u>Label</u>	<u>X-Coord</u>	<u>Y-Coord</u>	<u>Z-Coord</u>	<u>Orient</u>	<u>Tilt</u>	<u>Spin</u>
ATB2_80BLEDE10_XXXX...	900	-6	40	90	0	0
ATB2_80BLEDE10_XXXX...	675	-6	40	90	0	0
ATB2_80BLEDE10_XXXX...	450	-6	40	90	0	0
ATB2_80BLEDE10_XXXX...	225	-6	40	90	0	0
ATB2_80BLEDE10_XXXX...	0	-6	40	90	0	0
ATB2_80BLEDE10_XXXX...	-225	-6	40	90	0	0
ATB2_80BLEDE10_XXXX...	-450	-6	40	90	0	0

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## Roadway Optimizer - Layout 1 - Cont.

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### Luminaire Location Summary:

Coordinates in ft

Total Number of locations: 7

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Luminance

	0.37	0.40	0.41	0.35	0.34	0.35	0.39	0.45	0.49	0.51	0.51	0.50	0.43	0.38
	0.45	0.47	0.44	0.37	0.36	0.36	0.42	0.48	0.55	0.58	0.59	0.57	0.55	0.46
	0.59	0.54	0.45	0.39	0.38	0.39	0.46	0.54	0.60	0.64	0.67	0.66	0.66	0.61
	0.66	0.58	0.47	0.41	0.39	0.44	0.53	0.61	0.70	0.73	0.80	0.78	0.75	0.70
→	0.67	0.59	0.48	0.44	0.44	0.50	0.62	0.75	0.84	0.90	0.97	0.91	0.83	0.74
→	0.67	0.57	0.48	0.46	0.48	0.62	0.80	0.93	1.06	1.13	1.16	1.04	0.93	0.76
→	0.67	0.56	0.48	0.48	0.51	0.71	1.01	1.25	1.36	1.40	1.38	1.14	0.97	0.76
→	0.68	0.53	0.45	0.48	0.55	0.82	1.18	1.45	1.58	1.59	1.49	1.24	0.95	0.80
→	0.65	0.50	0.42	0.47	0.56	0.86	1.25	1.52	1.64	1.63	1.50	1.21	0.91	0.79
	0.58	0.46	0.39	0.42	0.47	0.69	1.00	1.27	1.42	1.42	1.33	1.09	0.83	0.69

### Luminance (Cd/SqM)

Average = 0.73

Maximum = 1.64

Minimum = 0.34

Avg/Min Ratio = 2.15

Max/Min Ratio = 4.82

Max/Avg Ratio = 2.25

# Roadway Optimizer - Layout 1

RoadOpt\_1\_Illum

	1.15	1.16	1.02	0.78	0.60	0.50	0.45	0.45	0.50	0.60	0.78	1.02	1.16	1.15
	1.45	1.42	1.14	0.83	0.63	0.50	0.45	0.45	0.50	0.63	0.83	1.14	1.42	1.45
	1.83	1.67	1.22	0.88	0.65	0.50	0.45	0.45	0.50	0.65	0.88	1.22	1.67	1.83
	2.06	1.79	1.29	0.92	0.66	0.50	0.44	0.44	0.50	0.66	0.92	1.29	1.79	2.06
→	2.13	1.82	1.34	0.94	0.67	0.50	0.44	0.44	0.50	0.67	0.94	1.34	1.82	2.13
	2.16	1.82	1.35	0.95	0.67	0.50	0.44	0.44	0.50	0.67	0.95	1.35	1.82	2.16
→	2.12	1.75	1.32	0.94	0.65	0.49	0.43	0.43	0.49	0.65	0.94	1.32	1.75	2.12
	2.16	1.60	1.19	0.85	0.58	0.44	0.39	0.39	0.44	0.58	0.85	1.19	1.60	2.16
→	2.05	1.45	1.06	0.76	0.53	0.40	0.35	0.35	0.40	0.53	0.76	1.06	1.45	2.05
	1.82	1.33	0.99	0.70	0.48	0.36	0.30	0.30	0.36	0.48	0.70	0.99	1.33	1.82

## Illuminance (Fc)

Average = 1

Maximum = 2.16

Minimum = 0.30

Avg/Min Ratio = 3.33

Max/Min Ratio = 7.2

Max/Avg Ratio = 2.16

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Vis\_Level

	+0.34	+6.18	+10.19	+11.37	+10.23	+7.96	+5.39	+2.78	+0.32	+1.77	+2.74	+3.19	+3.28	+3.44
	+0.64	+7.25	+11.12	+11.86	+10.47	+7.67	+4.80	+2.25	+0.20	+2.25	+3.24	+3.59	+3.75	+3.78
	+0.90	+8.25	+11.63	+12.08	+10.17	+7.09	+4.22	+1.60	+0.82	+2.70	+3.79	+4.14	+4.26	+4.18
	+1.04	+8.48	+12.03	+11.72	+9.43	+6.26	+3.44	+1.03	+1.62	+3.28	+4.29	+4.53	+4.54	+4.35
→	+1.09	+8.28	+11.96	+11.14	+8.35	+5.25	+2.53	+0.23	+2.44	+3.96	+4.67	+4.74	+4.66	+4.40
	+1.12	+8.15	+11.46	+9.71	+6.93	+4.01	+1.33	+0.93	+3.28	+4.64	+5.02	+4.91	+4.78	+4.39
→	+1.03	+7.58	+10.71	+8.50	+5.35	+2.38	+0.16	+2.42	+4.29	+5.24	+5.42	+5.05	+4.81	+4.32
	+1.10	+6.80	+9.09	+6.57	+3.61	+0.97	+1.41	+3.52	+5.08	+5.69	+5.60	+5.29	+4.74	+4.37
→	+1.06	+6.08	+7.83	+5.39	+2.67	+0.24	+2.24	+4.06	+5.34	+5.79	+5.62	+5.32	+4.63	+4.34
	+0.95	+6.04	+8.10	+5.88	+3.13	+0.61	+1.91	+3.90	+5.24	+5.58	+5.42	+5.03	+4.45	+4.10

## Visibility Level

STV = 3.99784

# Roadway Optimizer - Layout 1

RoadOpt\_1\_Vis\_Level\_Bkgd\_Lum

		†0.38	†0.34	†0.35	†0.36	†0.40	†0.47	†0.51	†0.51	†0.50	†0.51	†0.40	†0.37	†0.37	†0.42
		†0.41	†0.36	†0.36	†0.38	†0.43	†0.51	†0.56	†0.58	†0.58	†0.58	†0.51	†0.46	†0.46	†0.46
		†0.42	†0.38	†0.39	†0.41	†0.48	†0.57	†0.63	†0.66	†0.66	†0.65	†0.65	†0.61	†0.58	†0.51
		†0.44	†0.39	†0.41	†0.47	†0.55	†0.65	†0.72	†0.75	†0.78	†0.75	†0.75	†0.69	†0.65	†0.52
	→	†0.45	†0.43	†0.45	†0.54	†0.67	†0.78	†0.87	†0.90	†0.93	†0.89	†0.81	†0.70	†0.66	†0.53
	→	†0.45	†0.46	†0.52	†0.71	†0.87	†0.96	†1.10	†1.14	†1.10	†1.01	†0.84	†0.69	†0.65	†0.53
	→	†0.46	†0.49	†0.56	†0.85	†1.12	†1.32	†1.37	†1.41	†1.29	†1.08	†0.89	†0.69	†0.64	†0.51
	→	†0.45	†0.50	†0.62	†0.99	†1.31	†1.53	†1.60	†1.56	†1.41	†1.10	†0.87	†0.74	†0.62	†0.49
	→	†0.43	†0.50	†0.64	†1.04	†1.38	†1.59	†1.65	†1.60	†1.39	†1.06	†0.83	†0.75	†0.57	†0.46
	→	†0.40	†0.44	†0.53	†0.83	†1.12	†1.36	†1.44	†1.39	†1.28	†0.96	†0.76	†0.65	†0.53	†0.42

## Background Luminance (Cd/SqM)

Average = 0.73

Maximum = 1.65

Minimum = 0.34

Avg/Min Ratio = 2.15

Max/Min Ratio = 4.85

Max/Avg Ratio = 2.26

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Vis\_Level\_Target\_Lum

	†0.43	†1.23	†1.78	†1.86	†1.76	†1.56	†1.26	†0.92	†0.55	†0.30	†0.14	†0.08	†0.05	†0.04
	†0.53	†1.50	†1.99	†2.01	†1.87	†1.59	†1.26	†0.91	†0.54	†0.29	†0.14	†0.07	†0.05	†0.03
	†0.66	†1.76	†2.13	†2.12	†1.93	†1.60	†1.26	†0.89	†0.52	†0.28	†0.13	†0.06	†0.04	†0.03
	†0.74	†1.88	†2.25	†2.21	†1.95	†1.60	†1.26	†0.88	†0.51	†0.27	†0.12	†0.06	†0.04	†0.03
→	†0.76	†1.92	†2.35	†2.26	†1.98	†1.62	†1.25	†0.87	†0.50	†0.25	†0.12	†0.05	†0.04	†0.03
→	†0.77	†1.91	†2.37	†2.29	†1.99	†1.62	†1.26	†0.88	†0.50	†0.24	†0.11	†0.05	†0.04	†0.03
→	†0.76	†1.84	†2.31	†2.27	†1.95	†1.59	†1.23	†0.86	†0.48	†0.22	†0.10	†0.05	†0.04	†0.03
→	†0.77	†1.69	†2.08	†2.05	†1.75	†1.43	†1.11	†0.77	†0.43	†0.19	†0.09	†0.05	†0.03	†0.03
→	†0.73	†1.53	†1.86	†1.85	†1.59	†1.29	†1.00	†0.69	†0.39	†0.18	†0.09	†0.05	†0.03	†0.03
	†0.65	†1.41	†1.73	†1.70	†1.45	†1.17	†0.87	†0.58	†0.32	†0.15	†0.08	†0.05	†0.03	†0.03

### Target Luminance (Cd/SqM)

Average = 0.91

Maximum = 2.37

Minimum = 0.03

Avg/Min Ratio = 30.33

Max/Min Ratio = 79

Max/Avg Ratio = 2.6

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Veil\_Lum

	0.05	0.03	0.02	0.02	0.02	0.02	0.02	0.03	0.05	0.08	0.10	0.11	0.09	0.07
	0.06	0.04	0.02	0.02	0.02	0.02	0.03	0.03	0.06	0.09	0.12	0.12	0.11	0.09
	0.08	0.05	0.02	0.02	0.02	0.02	0.03	0.04	0.06	0.10	0.13	0.14	0.13	0.10
	0.09	0.06	0.03	0.02	0.02	0.02	0.03	0.04	0.07	0.11	0.15	0.16	0.15	0.12
→	0.10	0.06	0.03	0.02	0.02	0.03	0.03	0.04	0.08	0.12	0.17	0.18	0.17	0.14
→	0.11	0.07	0.03	0.02	0.03	0.03	0.03	0.05	0.08	0.14	0.19	0.20	0.19	0.16
→	0.12	0.07	0.03	0.03	0.03	0.03	0.03	0.05	0.09	0.15	0.21	0.22	0.20	0.17
→	0.12	0.07	0.04	0.03	0.03	0.03	0.04	0.05	0.08	0.14	0.20	0.22	0.20	0.17
→	0.11	0.06	0.03	0.03	0.03	0.03	0.04	0.05	0.08	0.13	0.18	0.20	0.18	0.15
→	0.10	0.06	0.03	0.03	0.03	0.03	0.04	0.05	0.07	0.11	0.15	0.17	0.16	0.14

### Veiling Luminance (Cd/SqM)

Average = 0.08

Maximum = 0.22

Minimum = 0.02

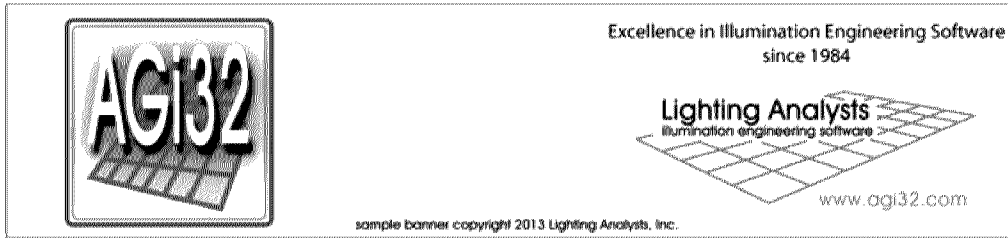
Avg/Min Ratio = 4

Max/Min Ratio = 11

Max/Avg Ratio = 2.75

MaxLv Ratio = 0.30

Threshold Increment (TI) = 18.39



## Roadway Optimizer - Layout 2

### General:

GE ERS4 LED Luminaire

Roadway Standard: IES RP-8-14-IDOT (entire roadway)

R-Table: R3 (Slightly Specular), QO=0.07 Actual QO Value: 0.07

### Roadway Layout:

Layout Type: One Row, Near Side; 1RNS

Roadway Width: 54 ft

Lanes In Direction Of Travel: 3 In Opposite Direction: 2

Driver's Side Of Roadway: Right

### Luminaire Information:

#### ers4 t3c1540-120-277v tcm201-

Description: ERS4 T3C1540 -120-277V

File Name: ers4\_t3c1540-120-277v\_tcm201-95633.ies

Lumens Per Lamp: N.A.

Number Of Lamps: 1

Total Lamp Lumens: N.A.

Luminaire Lumens: 25400

Luminaire Watts: 274

Efficiency (%): N.A.

Total Light Loss Factor: 0.700

Luminaire Arrangement: SINGLE

Arm Length: 12.98225 ft

Offset: 0 ft

### Luminaire Location Summary:

Coordinates in ft

Spacing - Row 1: 225

Label	X-Coord	Y-Coord	Z-Coord	Orient	Tilt	Spin
ers4_t3c1540-120-27...	900	-6	40	90	0	0
ers4_t3c1540-120-27...	675	-6	40	90	0	0
ers4_t3c1540-120-27...	450	-6	40	90	0	0
ers4_t3c1540-120-27...	225	-6	40	90	0	0
ers4_t3c1540-120-27...	0	-6	40	90	0	0
ers4_t3c1540-120-27...	-225	-6	40	90	0	0
ers4_t3c1540-120-27...	-450	-6	40	90	0	0

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## Roadway Optimizer - Layout 2 - Cont.

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### Luminaire Location Summary:

Coordinates in ft

Total Number of locations: 7

# Roadway Optimizer - Layout 2

## RoadOpt\_1\_Luminance

	0.46	0.44	0.40	0.32	0.29	0.28	0.28	0.29	0.31	0.33	0.38	0.44	0.46	0.45
	0.63	0.55	0.45	0.36	0.33	0.33	0.35	0.37	0.38	0.40	0.46	0.53	0.61	0.64
	0.79	0.62	0.50	0.41	0.37	0.39	0.42	0.45	0.46	0.47	0.57	0.65	0.74	0.81
	0.94	0.72	0.55	0.45	0.40	0.43	0.49	0.51	0.52	0.56	0.70	0.82	0.90	0.99
→	0.89	0.68	0.52	0.46	0.42	0.46	0.54	0.60	0.58	0.63	0.81	0.85	0.91	0.96
→	0.94	0.65	0.50	0.44	0.43	0.52	0.63	0.69	0.69	0.73	0.93	0.96	1.04	1.05
→	1.00	0.68	0.50	0.45	0.45	0.52	0.67	0.81	0.83	0.89	1.06	1.05	1.14	1.13
→	1.01	0.71	0.51	0.48	0.50	0.61	0.76	0.89	0.93	0.98	1.17	1.23	1.23	1.19
→	0.98	0.70	0.49	0.46	0.50	0.62	0.78	0.89	0.97	1.02	1.16	1.24	1.23	1.18
	0.93	0.64	0.45	0.40	0.43	0.54	0.67	0.77	0.84	0.94	1.00	1.14	1.14	1.11

### Luminance (Cd/SqM)

Average = 0.67

Maximum = 1.24

Minimum = 0.28

Avg/Min Ratio = 2.39

Max/Min Ratio = 4.43

Max/Avg Ratio = 1.85

# Roadway Optimizer - Layout 2

RoadOpt\_1\_Illum

	1.36	1.19	0.87	0.56	0.39	0.33	0.31	0.31	0.33	0.39	0.56	0.87	1.19	1.36
	1.96	1.54	1.03	0.65	0.45	0.37	0.36	0.36	0.37	0.45	0.65	1.03	1.54	1.96
	2.40	1.84	1.19	0.74	0.50	0.40	0.38	0.38	0.40	0.50	0.74	1.19	1.84	2.40
	2.88	2.11	1.33	0.80	0.51	0.39	0.38	0.38	0.39	0.51	0.80	1.33	2.11	2.88
→	2.75	1.97	1.25	0.78	0.48	0.37	0.37	0.37	0.37	0.48	0.78	1.25	1.97	2.75
	2.97	2.00	1.24	0.76	0.44	0.35	0.33	0.33	0.35	0.44	0.76	1.24	2.00	2.97
→	3.17	2.04	1.21	0.72	0.42	0.31	0.28	0.28	0.31	0.42	0.72	1.21	2.04	3.17
	3.22	2.09	1.17	0.66	0.37	0.27	0.24	0.24	0.27	0.37	0.66	1.17	2.09	3.22
→	3.13	2.00	1.10	0.59	0.34	0.25	0.21	0.21	0.25	0.34	0.59	1.10	2.00	3.13
	2.99	1.88	1.05	0.53	0.33	0.23	0.19	0.19	0.23	0.33	0.53	1.05	1.88	2.99

**Illuminance (Fc)**

Average = 1.06  
 Maximum = 3.22  
 Minimum = 0.19  
 Avg/Min Ratio = 5.58  
 Max/Min Ratio = 16.95  
 Max/Avg Ratio = 3.04

# Roadway Optimizer - Layout 2

## RoadOpt\_1\_Vis\_Level

	+0.86	+6.48	+8.63	+7.84	+5.95	+4.54	+3.74	+2.90	+1.87	+0.64	+0.43	+1.61	+2.59	+3.14
	+1.27	+7.73	+9.67	+8.47	+6.34	+4.57	+3.90	+2.61	+1.49	+0.13	+1.54	+2.61	+3.51	+3.94
	+1.36	+8.68	+10.64	+9.14	+6.63	+4.64	+3.47	+2.35	+0.77	+0.80	+2.48	+3.55	+4.22	+4.50
	+1.56	+9.34	+11.52	+9.33	+6.30	+4.08	+2.88	+1.68	+0.16	+1.84	+3.42	+4.53	+4.86	+4.92
→	+1.51	+8.66	+10.66	+8.69	+5.15	+3.15	+2.26	+0.90	+1.06	+2.56	+3.98	+4.77	+4.95	+4.86
→	+1.79	+9.04	+10.61	+7.94	+4.07	+2.41	+1.28	+0.26	+2.28	+3.51	+4.65	+5.35	+5.34	+5.04
→	+1.90	+8.89	+10.15	+7.36	+3.53	+1.37	+0.17	+2.04	+3.52	+4.41	+5.24	+5.70	+5.53	+5.22
→	+1.90	+8.71	+9.11	+5.76	+2.16	+0.23	+1.13	+2.95	+4.23	+4.96	+5.67	+5.96	+5.77	+5.37
→	+1.88	+8.33	+8.46	+4.82	+1.73	+0.16	+1.95	+3.38	+4.60	+5.23	+5.73	+6.06	+5.75	+5.42
	+1.96	+8.51	+8.86	+4.79	+2.22	+0.12	+1.73	+3.09	+4.33	+5.09	+5.50	+5.79	+5.60	+5.25

### Visibility Level

STV = 3.646212

## Roadway Optimizer - Layout 2

RoadOpt\_1\_Vis\_Level\_Bkgd\_Lum

-----		†0.36	†0.30	†0.29	†0.27	†0.27	†0.31	†0.32	†0.34	†0.40	†0.47	†0.47	†0.43	†0.46	†0.44
-----	-----	†0.41	†0.34	†0.33	†0.33	†0.34	†0.38	†0.39	†0.42	†0.49	†0.57	†0.63	†0.61	†0.59	†0.51
-----	-----	†0.46	†0.38	†0.38	†0.40	†0.42	†0.45	†0.46	†0.51	†0.61	†0.68	†0.78	†0.81	†0.73	†0.58
-----	-----	†0.51	†0.41	†0.41	†0.45	†0.50	†0.51	†0.53	†0.59	†0.76	†0.82	†0.95	†1.05	†0.86	†0.62
-----	→▷	†0.49	†0.43	†0.43	†0.50	†0.57	†0.59	†0.58	†0.66	†0.84	†0.87	†0.97	†1.03	†0.84	†0.59
-----	-----	†0.47	†0.42	†0.46	†0.57	†0.67	†0.67	†0.70	†0.78	†0.94	†1.00	†1.04	†1.15	†0.87	†0.57
-----	→▷	†0.47	†0.44	†0.47	†0.58	†0.73	†0.83	†0.83	†0.96	†1.07	†1.10	†1.13	†1.24	†0.88	†0.59
-----	-----	†0.49	†0.48	†0.54	†0.68	†0.81	†0.94	†0.93	†1.06	†1.22	†1.23	†1.24	†1.21	†0.91	†0.61
-----	→▷	†0.47	†0.47	†0.54	†0.70	†0.82	†0.93	†0.98	†1.08	†1.23	†1.23	†1.21	†1.20	†0.86	†0.60
-----	-----	†0.42	†0.40	†0.46	†0.60	†0.71	†0.81	†0.87	†0.96	†1.10	†1.14	†1.13	†1.04	†0.82	†0.54

### Background Luminance (Cd/SqM)

Average = 0.68

Maximum = 1.24

Minimum = 0.27

Avg/Min Ratio = 2.52

Max/Min Ratio = 4.59

Max/Avg Ratio = 1.82

## Roadway Optimizer - Layout 2

### RoadOpt\_1\_Vis\_Level\_Target\_Lum

	0.54	1.26	1.48	1.26	1.00	0.87	0.79	0.71	0.62	0.50	0.38	0.27	0.18	0.12
	0.74	1.63	1.76	1.47	1.18	0.99	0.93	0.80	0.67	0.51	0.36	0.25	0.16	0.09
	0.88	1.94	2.04	1.72	1.35	1.12	0.99	0.87	0.67	0.47	0.33	0.22	0.14	0.08
	1.04	2.22	2.30	1.86	1.41	1.11	1.00	0.85	0.62	0.43	0.29	0.19	0.11	0.07
→	0.99	2.08	2.16	1.84	1.33	1.06	0.97	0.80	0.56	0.37	0.24	0.15	0.09	0.06
→	1.07	2.11	2.16	1.80	1.24	1.03	0.91	0.70	0.47	0.31	0.18	0.11	0.07	0.05
→	1.13	2.15	2.11	1.72	1.22	0.94	0.78	0.57	0.38	0.25	0.15	0.09	0.06	0.04
→	1.15	2.19	2.04	1.58	1.06	0.82	0.67	0.49	0.34	0.22	0.13	0.08	0.06	0.04
→	1.12	2.10	1.91	1.42	0.99	0.76	0.58	0.43	0.29	0.19	0.12	0.07	0.05	0.03
	1.06	1.98	1.82	1.27	0.96	0.69	0.53	0.40	0.27	0.17	0.11	0.07	0.05	0.03

#### Target Luminance (Cd/SqM)

Average = 0.82

Maximum = 2.30

Minimum = 0.03

Avg/Min Ratio = 27.33

Max/Min Ratio = 76.67

Max/Avg Ratio = 2.8

## Roadway Optimizer - Layout 2

### RoadOpt\_1\_Veil\_Lum

	0.03	0.02	0.02	0.02	0.03	0.05	0.06	0.07	0.07	0.07	0.06	0.05	0.04	0.04
	0.04	0.03	0.02	0.02	0.03	0.05	0.06	0.08	0.09	0.09	0.08	0.07	0.06	0.05
	0.06	0.04	0.02	0.02	0.03	0.04	0.06	0.08	0.10	0.11	0.11	0.09	0.08	0.07
	0.07	0.05	0.02	0.02	0.03	0.04	0.06	0.09	0.11	0.13	0.13	0.11	0.09	0.08
→	0.08	0.05	0.02	0.02	0.03	0.04	0.06	0.08	0.11	0.13	0.14	0.12	0.10	0.10
→	0.09	0.05	0.02	0.02	0.03	0.03	0.05	0.07	0.10	0.13	0.15	0.13	0.11	0.10
→	0.09	0.06	0.03	0.02	0.03	0.03	0.04	0.06	0.08	0.11	0.13	0.13	0.11	0.11
→	0.09	0.06	0.03	0.02	0.02	0.03	0.04	0.06	0.08	0.10	0.12	0.12	0.10	0.10
→	0.09	0.06	0.03	0.02	0.02	0.03	0.04	0.05	0.07	0.09	0.11	0.11	0.10	0.10
→	0.08	0.06	0.02	0.02	0.02	0.03	0.03	0.04	0.06	0.08	0.09	0.10	0.09	0.09

### Veiling Luminance (Cd/SqM)

Average = 0.07

Maximum = 0.15

Minimum = 0.02

Avg/Min Ratio = 3.5

Max/Min Ratio = 7.5

Max/Avg Ratio = 2.14

MaxLv Ratio = 0.22

Threshold Increment (TI) = 13.43

## Roadway Optimizer - Layout Comparison

	Layout 1	Layout 2
Description	American Electric ATB2 LED Luminaire	GE ERS4 LED Luminaire
Roadway Standard	IES RP-8-14-IDOT (entire roadway)	IES RP-8-14-IDOT (entire roadway)
R-Table	R3	R3
Actual Q0 Value	0.07	0.07
Layout Type	1RNS	1RNS
Road Width	54	54
Median Width	N.A.	N.A.
Number Lanes	3	3
Number Lanes Opposite	2	2
Drivers Side	Right	Right
Calc Area	Bottom	Bottom
Label - Row 1	ATB2_80BLEDE1 0_XXXXX_R3	ers4_t3c1540-1 20-277v_tcm201-
MH - Row 1	40	40
Setback - Row 1	6	6
+Orient - Row 1	0	0
Tilt - Row 1	0	0
Spin - Row 1	0	0
Spacing - Row 1	225	225
<b>1_Luminance (Cd/SqM)</b>		
Average	0.73	0.67
Maximum	1.64	1.24
Minimum	0.34	0.28
Avg/Min Ratio	2.15	2.39
Max/Min Ratio	4.82	4.43
Max/Avg Ratio	2.25	1.85
<b>1_Illum (Fc)</b>		
Average	1	1.06
Maximum	2.16	3.22
Minimum	0.30	0.19

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**Roadway Optimizer - Layout Comparison - Cont.**

	<b>Layout 1</b>	<b>Layout 2</b>
Avg/Min Ratio	3.33	5.58
Max/Min Ratio	7.20	16.95
Max/Avg Ratio	2.16	3.04
<hr/>		
<b>1_Vis_Level</b>		
STV	4	3.65
<hr/>		
<b>1_Vis_Level_Bkgd_Lum (Cd/SqM)</b>		
Average	0.73	0.68
Maximum	1.65	1.24
Minimum	0.34	0.27
Avg/Min Ratio	2.15	2.52
Max/Min Ratio	4.85	4.59
Max/Avg Ratio	2.26	1.82
<hr/>		
<b>1_Vis_Level_Target_Lum (Cd/SqM)</b>		
Average	0.91	0.82
Maximum	2.37	2.30
Minimum	0.03	0.03
Avg/Min Ratio	30.33	27.33
Max/Min Ratio	79.00	76.67
Max/Avg Ratio	2.6	2.8
<hr/>		
<b>1_Veil_Lum (Cd/SqM)</b>		
Average	0.08	0.07
Maximum	0.22	0.15
Minimum	0.02	0.02
Avg/Min Ratio	4.00	3.50
Max/Min Ratio	11.00	7.50
Max/Avg Ratio	2.75	2.14
MaxLV Ratio	0.3	0.22
Threshold Incr. (TI)	18.39	13.43

## LUMINAIRE PERFORMANCE SUMMARY

### 64' Section

**Date:** 6/6/2016

**Designer:** Joe Vondra

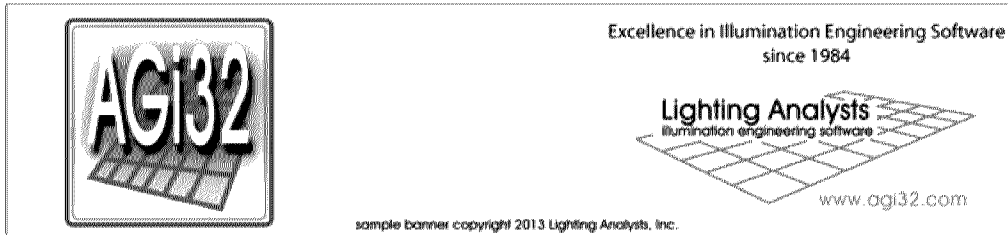
**Project:** Village of Mount Prospect - Corridor Lighting Evaluation

IES Roadway Classification:	Collector	Luminance				Sidewalk Area Illuminance		
		$L_{avg}$	$L_{avg}/L_{min}$	$L_{max}/L_{min}$	$L_v/L_{avg}$	$E_{Havg}$	$E_{Vmin}$	$E_{avg}/E_{min}$
<b>Pedestrian Conflict Classification:</b>	Low							
<b>IES Recommended Levels</b>		0.6	3.5	6.0	0.4	0.4	0.1	4.0
<b>Manufacturer:</b>	American Electric							
<b>Curve #:</b>		0.71	2.22	3.94	0.38	0.44	0.10	4.4
ATB2_40BLEDE10_XXXXX_R2								
<b>Manufacturer:</b>	GE Lighting							
<b>Curve #:</b>		0.67	2.79	5.67	0.28	0.5	0.10	5
ers3_m3c1540-120-277v_tcm201								

Note: Sidewalk Area values out of spec will improve for 90% spacing. Final values should be calculated during design.

## DESIGN PARAMETERS

Combined LLF	<u>0.7</u>	Spacing	<u>290'</u>
Lamp lumens	<u>15685/11266</u>	Light Pole Set Back $SB_{LP}$	<u>6'</u>
Roadway Width $W_R$	<u>64'</u>	Mounting Height	<u>40'</u>
Number of Lanes	<u>5</u>	Mast Arm	<u>12'</u>
Lane Width $W_L$	<u>12.8'</u>	Sidewalk Set Back $SB_{SW}$	<u>0'</u>
Layout	<u>Opposite</u>	Sidewalk Width $W_{SW}$	<u>12'</u>



## Roadway Optimizer - Layout 1

### General:

American Electric ATB2 LED Luminaire

Roadway Standard: IES RP-8-14-IDOT (entire roadway)

R-Table: R3 (Slightly Specular), QO=0.07 Actual QO Value: 0.07

### Roadway Layout:

Layout Type: Two Rows, Opposite; 2R\_OPP

Roadway Width: 64 ft

Lanes In Direction Of Travel: 3 In Opposite Direction: 2

Driver's Side Of Roadway: Right

### Luminaire Information:

#### ATB2 40BLEDE10 XXXXX R2

Description: ATB2 40BLEDE10 XXXXX R2

File Name: ATB2\_40BLEDE10\_XXXXX\_R2.ies

Lumens Per Lamp: N.A.

Number Of Lamps: 1

Total Lamp Lumens: N.A.

Luminaire Lumens: 15685

Luminaire Watts: 138

Efficiency (%): N.A.

Total Light Loss Factor: 0.700

Luminaire Arrangement: SINGLE

Arm Length: 10.76175 ft

Offset: 0 ft

### Luminaire Location Summary:

Coordinates in ft

Spacing - Row 1: 290

Spacing - Row 2: 290

<u>Label</u>	<u>X-Coord</u>	<u>Y-Coord</u>	<u>Z-Coord</u>	<u>Orient</u>	<u>Tilt</u>	<u>Spin</u>
ATB2_40BLEDE10_XXXX...	-290	-6	40	90	0	0
ATB2_40BLEDE10_XXXX...	0	-6	40	90	0	0
ATB2_40BLEDE10_XXXX...	290	-6	40	90	0	0
ATB2_40BLEDE10_XXXX...	580	-6	40	90	0	0
ATB2_40BLEDE10_XXXX...	870	-6	40	90	0	0
ATB2_40BLEDE10_XXXX...	-290	70	40	270	0	0

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## Roadway Optimizer - Layout 1 - Cont.

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**Luminaire Location Summary:**

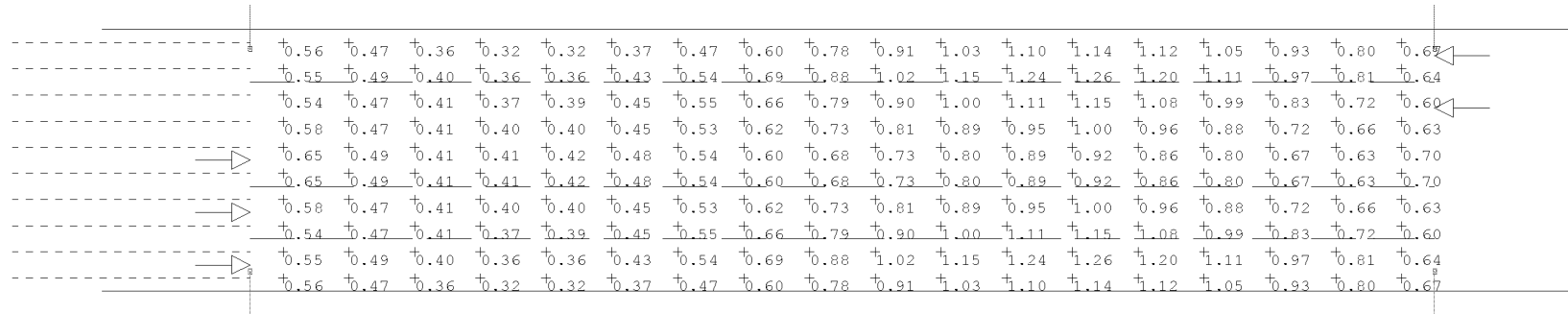
Coordinates in ft

ATB2_40BLEDE10_XXXX...	0	70	40	270	0	0
ATB2_40BLEDE10_XXXX...	290	70	40	270	0	0
ATB2_40BLEDE10_XXXX...	580	70	40	270	0	0
ATB2_40BLEDE10_XXXX...	870	70	40	270	0	0

Total Number of locations: 10

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Luminance



### Luminance (Cd/SqM)

Average = 0.71

Maximum = 1.26

Minimum = 0.32

Avg/Min Ratio = 2.22

Max/Min Ratio = 3.94

Max/Avg Ratio = 1.77

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Illum

	1.79	1.39	0.95	0.65	0.46	0.35	0.30	0.27	0.25	0.25	0.27	0.30	0.35	0.46	0.65	0.95	1.39	1.79
	1.77	1.47	1.06	0.73	0.53	0.43	0.36	0.31	0.29	0.29	0.31	0.36	0.43	0.53	0.73	1.06	1.47	1.77
	1.71	1.43	1.09	0.79	0.62	0.50	0.41	0.35	0.33	0.33	0.35	0.41	0.50	0.62	0.79	1.09	1.43	1.71
→	1.82	1.42	1.07	0.85	0.69	0.55	0.45	0.39	0.36	0.36	0.39	0.45	0.55	0.69	0.85	1.07	1.42	1.82
→	2.01	1.47	1.06	0.88	0.72	0.58	0.47	0.40	0.37	0.37	0.40	0.47	0.58	0.72	0.88	1.06	1.47	2.01
→	1.82	1.42	1.07	0.85	0.69	0.55	0.45	0.39	0.36	0.36	0.39	0.45	0.55	0.69	0.85	1.07	1.42	1.82
→	1.71	1.43	1.09	0.79	0.62	0.50	0.41	0.35	0.33	0.33	0.35	0.41	0.50	0.62	0.79	1.09	1.43	1.71
→	1.77	1.47	1.06	0.73	0.53	0.43	0.36	0.31	0.29	0.29	0.31	0.36	0.43	0.53	0.73	1.06	1.47	1.77
	1.79	1.39	0.95	0.65	0.46	0.35	0.30	0.27	0.25	0.25	0.27	0.30	0.35	0.46	0.65	0.95	1.39	1.79

### Illuminance (Fc)

Average = 0.8  
 Maximum = 2.01  
 Minimum = 0.25  
 Avg/Min Ratio = 3.2  
 Max/Min Ratio = 8.04  
 Max/Avg Ratio = 2.51

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Vis\_Level

	1.27	7.50	9.56	8.66	6.41	4.16	2.49	1.17	0.19	1.77	3.06	3.96	4.56	4.86	4.93	4.82	4.64	4.53
	1.14	7.61	9.95	9.02	7.00	5.04	3.04	1.46	0.06	1.76	3.10	4.05	4.69	5.00	4.99	4.86	4.68	4.34
	0.97	7.29	9.95	9.65	8.33	6.54	4.27	2.55	0.92	0.63	2.18	3.36	4.15	4.57	4.70	4.56	4.48	4.23
	1.05	7.00	9.61	10.34	9.70	7.79	5.33	3.46	1.79	0.39	1.30	2.54	3.53	4.15	4.44	4.45	4.39	4.28
▶	1.20	7.13	9.33	10.46	9.99	8.24	5.91	4.10	2.36	0.84	0.61	1.99	3.17	3.83	4.39	4.49	4.45	4.40
	1.20	7.13	9.33	10.46	9.99	8.24	5.91	4.10	2.36	0.84	0.61	1.99	3.17	3.83	4.39	4.49	4.45	4.40
▶	1.05	7.00	9.61	10.34	9.70	7.79	5.33	3.46	1.79	0.39	1.30	2.54	3.53	4.15	4.44	4.45	4.39	4.28
	0.97	7.29	9.95	9.65	8.33	6.54	4.27	2.55	0.92	0.63	2.18	3.36	4.15	4.57	4.70	4.56	4.48	4.23
▶	1.14	7.61	9.95	9.02	7.00	5.04	3.04	1.46	0.06	1.76	3.10	4.05	4.69	5.00	4.99	4.86	4.68	4.34
	1.27	7.50	9.56	8.66	6.41	4.16	2.49	1.17	0.19	1.77	3.06	3.96	4.56	4.86	4.93	4.82	4.64	4.33

## Visibility Level

STV = 3.842021

# Roadway Optimizer - Layout 1

RoadOpt\_1\_Vis\_Level\_Bkgd\_Lum

		0.35	0.31	0.33	0.40	0.52	0.66	0.84	0.96	1.06	1.13	1.14	1.10	1.01	0.88	0.74	0.62	0.53	0.43
		0.38	0.35	0.38	0.47	0.60	0.76	0.95	1.07	1.19	1.26	1.25	1.17	1.06	0.92	0.73	0.60	0.53	0.46
		0.39	0.37	0.41	0.48	0.60	0.70	0.85	0.94	1.04	1.14	1.13	1.05	0.92	0.80	0.67	0.58	0.52	0.45
		0.40	0.39	0.42	0.47	0.57	0.65	0.78	0.85	0.91	0.95	1.00	0.93	0.80	0.70	0.63	0.63	0.54	0.45
	▶	0.40	0.40	0.44	0.49	0.57	0.62	0.72	0.76	0.82	0.90	0.90	0.81	0.74	0.64	0.67	0.70	0.59	0.44
		0.40	0.40	0.44	0.49	0.57	0.62	0.72	0.76	0.82	0.90	0.90	0.81	0.74	0.64	0.67	0.70	0.59	0.44
	▶	0.40	0.39	0.42	0.47	0.57	0.65	0.78	0.85	0.91	0.95	1.00	0.93	0.80	0.70	0.63	0.63	0.54	0.45
		0.39	0.37	0.41	0.48	0.60	0.70	0.85	0.94	1.04	1.14	1.13	1.05	0.92	0.80	0.67	0.58	0.52	0.45
	▶	0.38	0.35	0.38	0.47	0.60	0.76	0.95	1.07	1.19	1.26	1.25	1.17	1.06	0.92	0.73	0.60	0.53	0.46
		0.35	0.31	0.33	0.40	0.52	0.66	0.84	0.96	1.06	1.13	1.14	1.10	1.01	0.88	0.74	0.62	0.53	0.43

**Background Luminance (Cd/SqM)**

Average = 0.71  
 Maximum = 1.26  
 Minimum = 0.31  
 Avg/Min Ratio = 2.29  
 Max/Min Ratio = 4.06  
 Max/Avg Ratio = 1.77

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Vis\_Level\_Target\_Lum

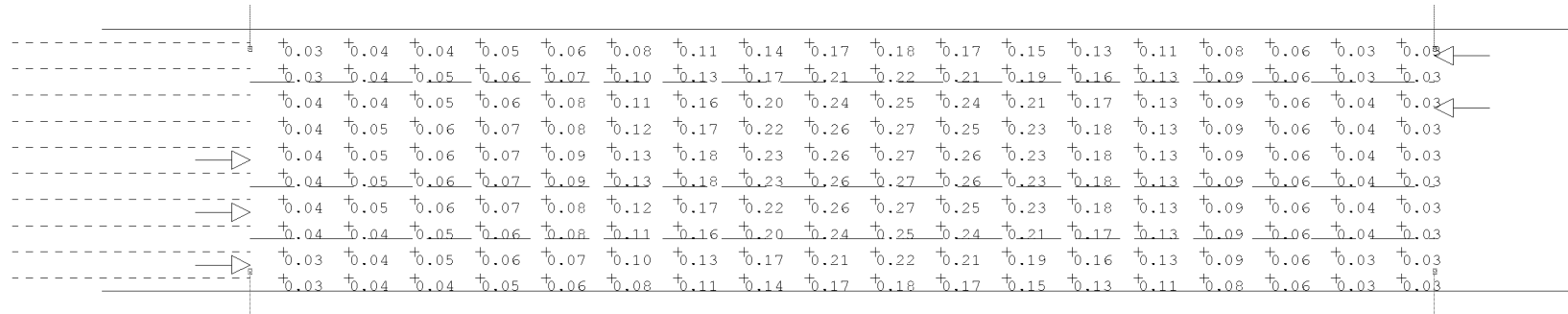
	0.65	1.47	1.66	1.59	1.40	1.25	1.15	1.04	0.89	0.70	0.52	0.38	0.26	0.17	0.12	0.08	0.06	0.04
	0.65	1.56	1.85	1.78	1.64	1.55	1.41	1.23	1.02	0.80	0.59	0.42	0.28	0.18	0.12	0.08	0.06	0.04
	0.62	1.52	1.91	1.93	1.90	1.81	1.62	1.39	1.15	0.90	0.66	0.46	0.29	0.18	0.11	0.08	0.06	0.04
	0.66	1.50	1.88	2.06	2.13	2.01	1.78	1.52	1.25	0.98	0.71	0.49	0.31	0.18	0.11	0.08	0.06	0.04
	0.73	1.56	1.86	2.13	2.21	2.10	1.85	1.58	1.30	1.02	0.75	0.52	0.32	0.18	0.11	0.08	0.06	0.04
	0.66	1.50	1.88	2.06	2.13	2.01	1.78	1.52	1.25	0.98	0.71	0.49	0.31	0.18	0.11	0.08	0.06	0.04
	0.62	1.52	1.91	1.93	1.90	1.81	1.62	1.39	1.15	0.90	0.66	0.46	0.29	0.18	0.11	0.08	0.06	0.04
	0.65	1.56	1.85	1.78	1.64	1.55	1.41	1.23	1.02	0.80	0.59	0.42	0.28	0.18	0.12	0.08	0.06	0.04
	0.65	1.47	1.66	1.59	1.40	1.25	1.15	1.04	0.89	0.70	0.52	0.38	0.26	0.17	0.12	0.08	0.06	0.04

### Target Luminance (Cd/SqM)

Average = 0.91  
 Maximum = 2.21  
 Minimum = 0.04  
 Avg/Min Ratio = 22.75  
 Max/Min Ratio = 55.25  
 Max/Avg Ratio = 2.43

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Veil\_Lum



### Veiling Luminance (Cd/SqM)

Average = 0.12

Maximum = 0.27

Minimum = 0.03

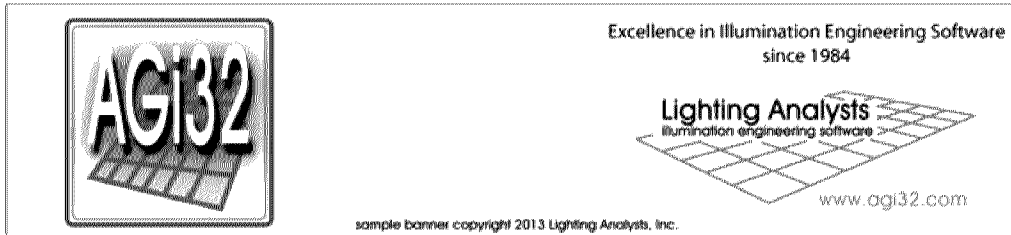
Avg/Min Ratio = 4

Max/Min Ratio = 9

Max/Avg Ratio = 2.25

MaxLv Ratio = 0.38

Threshold Increment (TI) = 23.08



## Roadway Optimizer - Layout 2

### General:

GE ERS4 LED Luminaire

Roadway Standard: IES RP-8-14-IDOT (entire roadway)

R-Table: R3 (Slightly Specular), QO=0.07 Actual QO Value: 0.07

### Roadway Layout:

Layout Type: Two Rows, Opposite; 2R\_OPP

Roadway Width: 64 ft

Lanes In Direction Of Travel: 3 In Opposite Direction: 2

Driver's Side Of Roadway: Right

### Luminaire Information:

#### ers3 m3c1540-120-277v tcm201-

Description: ERS3 M3C1540 -120-277V

File Name: ers3\_m3c1540-120-277v\_tcm201-95482.ies

Lumens Per Lamp: N.A.

Number Of Lamps: 1

Total Lamp Lumens: N.A.

Luminaire Lumens: 18100

Luminaire Watts: 196

Efficiency (%): N.A.

Total Light Loss Factor: 0.700

Luminaire Arrangement: SINGLE

Arm Length: 12.98225 ft

Offset: 0 ft

### Luminaire Location Summary:

Coordinates in ft

Spacing - Row 1: 290

Spacing - Row 2: 290

<u>Label</u>	<u>X-Coord</u>	<u>Y-Coord</u>	<u>Z-Coord</u>	<u>Orient</u>	<u>Tilt</u>	<u>Spin</u>
ers3_m3c1540-120-27...	870	-6	40	90	0	0
ers3_m3c1540-120-27...	580	-6	40	90	0	0
ers3_m3c1540-120-27...	290	-6	40	90	0	0
ers3_m3c1540-120-27...	0	-6	40	90	0	0
ers3_m3c1540-120-27...	-290	-6	40	90	0	0
ers3_m3c1540-120-27...	870	70	40	270	0	0

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## Roadway Optimizer - Layout 2 - Cont.

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**Luminaire Location Summary:**

Coordinates in ft

ers3_m3c1540-120-27...	580	70	40	270	0	0
ers3_m3c1540-120-27...	290	70	40	270	0	0
ers3_m3c1540-120-27...	0	70	40	270	0	0
ers3_m3c1540-120-27...	-290	70	40	270	0	0

Total Number of locations: 10

# Roadway Optimizer - Layout 2

## RoadOpt\_1\_Luminance

	0.77	0.58	0.40	0.29	0.25	0.24	0.24	0.28	0.35	0.44	0.55	0.64	0.71	0.78	0.84	0.98	0.98	0.91
	0.92	0.69	0.49	0.35	0.28	0.27	0.28	0.33	0.42	0.53	0.65	0.77	0.84	0.89	1.03	1.14	1.13	1.08
	1.03	0.76	0.54	0.38	0.29	0.28	0.30	0.34	0.42	0.51	0.63	0.76	0.81	0.88	1.05	1.11	1.18	1.15
	1.17	0.83	0.59	0.43	0.31	0.29	0.29	0.33	0.40	0.50	0.63	0.74	0.76	0.83	1.03	1.11	1.23	1.28
	1.25	0.91	0.63	0.45	0.33	0.30	0.32	0.36	0.41	0.50	0.61	0.69	0.72	0.79	1.03	1.16	1.26	1.36
	1.25	0.91	0.63	0.45	0.33	0.30	0.32	0.36	0.41	0.50	0.61	0.69	0.72	0.79	1.03	1.16	1.26	1.36
	1.17	0.83	0.59	0.43	0.31	0.29	0.29	0.33	0.40	0.50	0.63	0.74	0.76	0.83	1.03	1.11	1.23	1.28
	1.03	0.76	0.54	0.38	0.29	0.28	0.30	0.34	0.42	0.51	0.63	0.76	0.81	0.88	1.05	1.11	1.18	1.15
	0.92	0.69	0.49	0.35	0.28	0.27	0.28	0.33	0.42	0.53	0.65	0.77	0.84	0.89	1.03	1.14	1.13	1.08
	0.77	0.58	0.40	0.29	0.25	0.24	0.24	0.28	0.35	0.44	0.55	0.64	0.71	0.78	0.84	0.98	0.98	0.91

### Luminance (Cd/SqM)

Average = 0.67  
 Maximum = 1.36  
 Minimum = 0.24  
 Avg/Min Ratio = 2.79  
 Max/Min Ratio = 5.67  
 Max/Avg Ratio = 2.03

# Roadway Optimizer - Layout 2

## RoadOpt\_1\_Illum

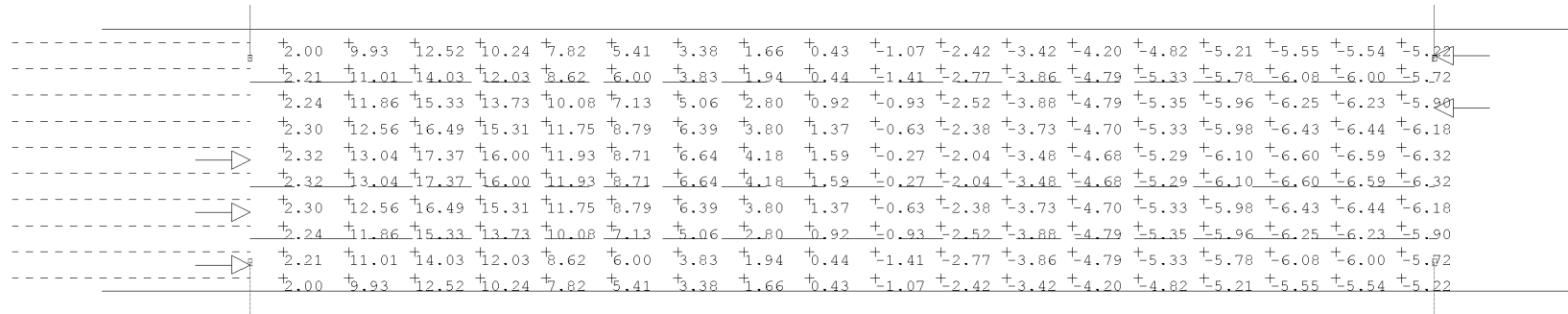
	2.57	1.78	1.10	0.61	0.38	0.26	0.20	0.16	0.15	0.15	0.16	0.20	0.26	0.38	0.61	1.10	1.78	2.57	
	3.09	2.15	1.33	0.76	0.44	0.31	0.24	0.19	0.18	0.18	0.19	0.24	0.31	0.44	0.76	1.33	2.15	3.09	
	3.40	2.43	1.50	0.88	0.51	0.35	0.28	0.22	0.20	0.20	0.22	0.28	0.35	0.51	0.88	1.50	2.43	3.40	
→	3.80	2.68	1.68	1.00	0.58	0.41	0.32	0.25	0.21	0.21	0.25	0.32	0.41	0.58	1.00	1.68	2.68	3.80	
→	4.03	2.90	1.81	1.07	0.62	0.42	0.34	0.27	0.22	0.22	0.27	0.34	0.42	0.62	1.07	1.81	2.90	4.03	
→	3.80	2.68	1.68	1.00	0.58	0.41	0.32	0.25	0.21	0.21	0.25	0.32	0.41	0.58	1.00	1.68	2.68	3.80	
→	3.40	2.43	1.50	0.88	0.51	0.35	0.28	0.22	0.20	0.20	0.22	0.28	0.35	0.51	0.88	1.50	2.43	3.40	
→	3.09	2.15	1.33	0.76	0.44	0.31	0.24	0.19	0.18	0.18	0.19	0.24	0.31	0.44	0.76	1.33	2.15	3.09	
	2.57	1.78	1.10	0.61	0.38	0.26	0.20	0.16	0.15	0.15	0.16	0.20	0.26	0.38	0.61	1.10	1.78	2.57	

### Illuminance (Fc)

Average = 1.07  
 Maximum = 4.03  
 Minimum = 0.15  
 Avg/Min Ratio = 7.13  
 Max/Min Ratio = 26.87  
 Max/Avg Ratio = 3.77

# Roadway Optimizer - Layout 2

## RoadOpt\_1\_Vis\_Level

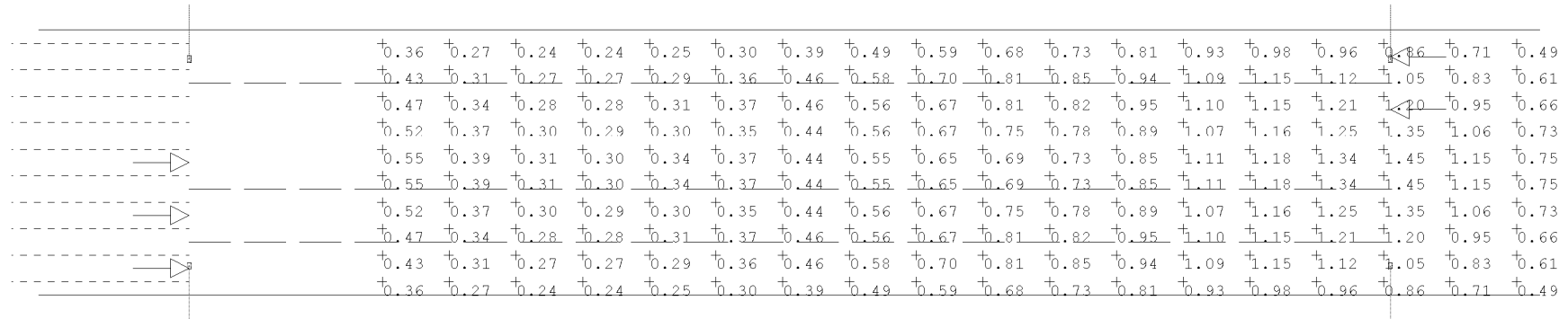


### Visibility Level

STV = 4.626036

# Roadway Optimizer - Layout 2

RoadOpt\_1\_Vis\_Level\_Bkgd\_Lum



**Background Luminance (Cd/SqM)**

Average = 0.68  
 Maximum = 1.45  
 Minimum = 0.24  
 Avg/Min Ratio = 2.83  
 Max/Min Ratio = 6.04  
 Max/Avg Ratio = 2.13

# Roadway Optimizer - Layout 2

## RoadOpt\_1\_Vis\_Level\_Target\_Lum

	0.91	1.87	1.92	1.47	1.16	0.93	0.76	0.63	0.54	0.43	0.32	0.24	0.19	0.13	0.09	0.05	0.03	0.01
	1.09	2.26	2.32	1.85	1.36	1.11	0.93	0.77	0.64	0.48	0.35	0.25	0.17	0.12	0.07	0.04	0.03	0.01
	1.20	2.56	2.62	2.14	1.59	1.28	1.13	0.91	0.71	0.53	0.36	0.24	0.16	0.10	0.06	0.04	0.02	0.01
	1.33	2.81	2.93	2.44	1.81	1.50	1.31	1.07	0.79	0.54	0.35	0.23	0.14	0.09	0.06	0.04	0.02	0.01
	1.41	3.05	3.16	2.61	1.93	1.54	1.39	1.17	0.82	0.56	0.37	0.23	0.14	0.09	0.05	0.03	0.02	0.01
	1.41	3.05	3.16	2.61	1.93	1.54	1.39	1.17	0.82	0.56	0.37	0.23	0.14	0.09	0.05	0.03	0.02	0.01
	1.33	2.81	2.93	2.44	1.81	1.50	1.31	1.07	0.79	0.54	0.35	0.23	0.14	0.09	0.06	0.04	0.02	0.01
	1.20	2.56	2.62	2.14	1.59	1.28	1.13	0.91	0.71	0.53	0.36	0.24	0.16	0.10	0.06	0.04	0.02	0.01
	1.09	2.26	2.32	1.85	1.36	1.11	0.93	0.77	0.64	0.48	0.35	0.25	0.17	0.12	0.07	0.04	0.03	0.01
	0.91	1.87	1.92	1.47	1.16	0.93	0.76	0.63	0.54	0.43	0.32	0.24	0.19	0.13	0.09	0.05	0.03	0.01

### Target Luminance (Cd/SqM)

Average = 0.86  
 Maximum = 3.16  
 Minimum = 0.01  
 Avg/Min Ratio = 86  
 Max/Min Ratio = 316  
 Max/Avg Ratio = 3.67

## Roadway Optimizer - Layout 2

### RoadOpt\_1\_Veil\_Lum

	0.01	0.01	0.02	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.09	0.08	0.08	0.07	0.06	0.04	0.01	0.00
	0.01	0.01	0.02	0.03	0.04	0.05	0.07	0.08	0.10	0.11	0.11	0.11	0.09	0.09	0.08	0.05	0.01	0.00
	0.01	0.01	0.02	0.03	0.04	0.06	0.07	0.09	0.11	0.13	0.14	0.13	0.11	0.11	0.09	0.05	0.01	0.00
	0.01	0.01	0.02	0.03	0.04	0.05	0.08	0.10	0.14	0.16	0.17	0.16	0.13	0.11	0.10	0.06	0.02	0.00
	0.00	0.01	0.02	0.03	0.04	0.06	0.09	0.12	0.15	0.18	0.19	0.17	0.14	0.13	0.10	0.06	0.02	0.00
	0.00	0.01	0.02	0.03	0.04	0.06	0.09	0.12	0.15	0.18	0.19	0.17	0.14	0.13	0.10	0.06	0.02	0.00
	0.01	0.01	0.02	0.03	0.04	0.05	0.08	0.10	0.14	0.16	0.17	0.16	0.13	0.11	0.10	0.06	0.02	0.00
	0.01	0.01	0.02	0.03	0.04	0.06	0.07	0.09	0.11	0.13	0.14	0.13	0.11	0.11	0.09	0.05	0.01	0.00
	0.01	0.01	0.02	0.03	0.04	0.05	0.07	0.08	0.10	0.11	0.11	0.11	0.09	0.09	0.08	0.05	0.01	0.00
	0.01	0.01	0.02	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.09	0.08	0.08	0.07	0.06	0.04	0.01	0.00

### Veiling Luminance (Cd/SqM)

Average = 0.07

Maximum = 0.19

Minimum = 0.00

Avg/Min Ratio = N.A.

Max/Min Ratio = N.A.

Max/Avg Ratio = 2.71

MaxLv Ratio = 0.28

Threshold Increment (TI) = 17.01

## Roadway Optimizer - Layout Comparison

	Layout 1	Layout 2
Description	American Electric ATB2 LED Luminaire	GE ERS4 LED Luminaire
Roadway Standard	IES RP-8-14-IDOT (entire roadway)	IES RP-8-14-IDOT (entire roadway)
R-Table	R3	R3
Actual Q0 Value	0.07	0.07
Layout Type	2R_OPP	2R_OPP
Road Width	64	64
Median Width	N.A.	N.A.
Number Lanes	3	3
Number Lanes Opposite	2	2
Drivers Side	Right	Right
Calc Area	Bottom	Bottom
Label - Row 1	ATB2_40BLEDE1 0_XXXXX_R2	ers3_m3c1540-1 20-277v_tcm201-
MH - Row 1	40	40
Setback - Row 1	6	6
+Orient - Row 1	0	0
Tilt - Row 1	0	0
Spin - Row 1	0	0
Spacing - Row 1	290	290
Label - Row 2	ATB2_40BLEDE1 0_XXXXX_R2	ers3_m3c1540-1 20-277v_tcm201-
MH - Row 2	40	40
Setback - Row 2	6	6
+Orient - Row 2	0	0
Tilt - Row 2	0	0
Spin - Row 2	0	0
Spacing - Row 2	290	290
<b>1 Luminance (Cd/SqM)</b>		
Average	0.71	0.67
Maximum	1.26	1.36

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**Roadway Optimizer - Layout Comparison - Cont.**

	<b>Layout 1</b>	<b>Layout 2</b>
Minimum	0.32	0.24
Avg/Min Ratio	2.22	2.79
Max/Min Ratio	3.94	5.67
Max/Avg Ratio	1.77	2.03
<b>1_Illum (Fc)</b>		
Average	0.8	1.07
Maximum	2.01	4.03
Minimum	0.25	0.15
Avg/Min Ratio	3.20	7.13
Max/Min Ratio	8.04	26.87
Max/Avg Ratio	2.51	3.77
<b>1_Vis_Level</b>		
STV	3.84	4.63
<b>1_Vis_Level_Bkgd_Lum (Cd/SqM)</b>		
Average	0.71	0.68
Maximum	1.26	1.45
Minimum	0.31	0.24
Avg/Min Ratio	2.29	2.83
Max/Min Ratio	4.06	6.04
Max/Avg Ratio	1.77	2.13
<b>1_Vis_Level_Target_Lum (Cd/SqM)</b>		
Average	0.91	0.86
Maximum	2.21	3.16
Minimum	0.04	0.01
Avg/Min Ratio	22.75	86.00
Max/Min Ratio	55.25	316
Max/Avg Ratio	2.43	3.67
<b>1_Veil_Lum (Cd/SqM)</b>		
Average	0.12	0.07
Maximum	0.27	0.19
Minimum	0.03	0.00
Avg/Min Ratio	4.00	N.A.

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**Roadway Optimizer - Layout Comparison - Cont.**

	<b>Layout 1</b>	<b>Layout 2</b>
Max/Min Ratio	9.00	N.A.
Max/Avg Ratio	2.25	2.71
MaxLV Ratio	0.38	0.28
Threshold Incr. (TI)	23.08	17.01

## LUMINAIRE PERFORMANCE SUMMARY

### 64' Section

**Date:** 6/6/2016

**Designer:** Joe Vondra

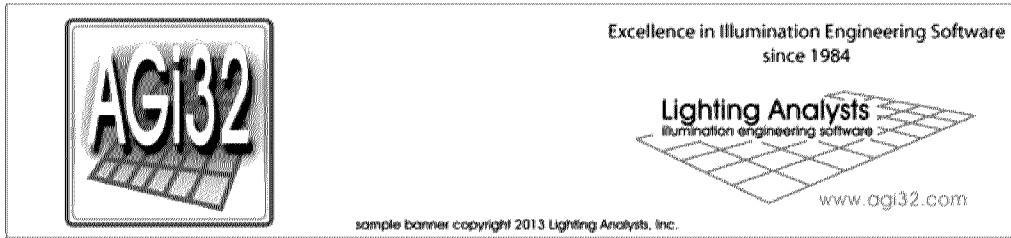
**Project:** Village of Mount Prospect - Corridor Lighting Evaluation

IES Roadway Classification:	Major	Luminance				Sidewalk Area Illuminance		
		$L_{avg}$	$L_{avg}/L_{min}$	$L_{max}/L_{min}$	$L_v/L_{avg}$	$E_{Havg}$	$E_{Vmin}$	$E_{avg}/E_{min}$
<b>Pedestrian Conflict Classification:</b>	Low							
<b>IES Recommended Levels</b>		0.6	3.5	6.0	0.3	0.4	0.1	4.0
<b>Manufacturer:</b>	American Electric							
<b>Curve #:</b>		0.66	1.43	2.11	0.3	0.42	0.20	2.1
ATB2_40BLEDE70_XXXXX_R2								
<b>Manufacturer:</b>	GE Lighting							
<b>Curve #:</b>		0.66	1.69	2.51	0.2	0.42	0.10	4.2
ers2_e3b1740-120-277v_tcm201								

Note: Sidewalk Area values out of spec will improve for 90% spacing. Final values should be calculated during design.

## DESIGN PARAMETERS

Combined LLF	<u>0.7</u>	Spacing	<u>225'</u>
Lamp lumens	<u>11266/11600</u>	Light Pole Set Back $SB_{LP}$	<u>6'</u>
Roadway Width $W_R$	<u>64'</u>	Mounting Height	<u>40'</u>
Number of Lanes	<u>5</u>	Mast Arm	<u>12'</u>
Lane Width $W_L$	<u>12.8'</u>	Sidewalk Set Back $SB_{SW}$	<u>0'</u>
Layout	<u>Opposite</u>	Sidewalk Width $W_{SW}$	<u>12'</u>



## Roadway Optimizer - Layout 1

### General:

American Electric ATB2 LED Luminaire

Roadway Standard: IES RP-8-14-IDOT (entire roadway)

R-Table: R3 (Slightly Specular), QO=0.07 Actual QO Value: 0.07

### Roadway Layout:

Layout Type: Two Rows, Opposite; 2R\_OPP

Roadway Width: 64 ft

Lanes In Direction Of Travel: 3 In Opposite Direction: 2

Driver's Side Of Roadway: Right

### Luminaire Information:

#### ATB2 40BLEDE70 XXXXX R2

Description: ATB2 40BLEDE70 XXXXX R2

File Name: ATB2\_40BLEDE70\_XXXXX\_R2.ies

Lumens Per Lamp: N.A.

Number Of Lamps: 1

Total Lamp Lumens: N.A.

Luminaire Lumens: 11266

Luminaire Watts: 91

Efficiency (%): N.A.

Total Light Loss Factor: 0.700

Luminaire Arrangement: SINGLE

Arm Length: 10.76175 ft

Offset: 0 ft

### Luminaire Location Summary:

Coordinates in ft

Spacing - Row 1: 225

Spacing - Row 2: 225

<u>Label</u>	<u>X-Coord</u>	<u>Y-Coord</u>	<u>Z-Coord</u>	<u>Orient</u>	<u>Tilt</u>	<u>Spin</u>
ATB2_40BLEDE70_XXXX...	900	-6	40	90	0	0
ATB2_40BLEDE70_XXXX...	675	-6	40	90	0	0
ATB2_40BLEDE70_XXXX...	450	-6	40	90	0	0
ATB2_40BLEDE70_XXXX...	225	-6	40	90	0	0
ATB2_40BLEDE70_XXXX...	0	-6	40	90	0	0
ATB2_40BLEDE70_XXXX...	-225	-6	40	90	0	0

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## Roadway Optimizer - Layout 1 - Cont.

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**Luminaire Location Summary:**

Coordinates in ft

ATB2_40BLEDE70_XXXX...	-450	-6	40	90	0	0
ATB2_40BLEDE70_XXXX...	900	70	40	270	0	0
ATB2_40BLEDE70_XXXX...	675	70	40	270	0	0
ATB2_40BLEDE70_XXXX...	450	70	40	270	0	0
ATB2_40BLEDE70_XXXX...	225	70	40	270	0	0
ATB2_40BLEDE70_XXXX...	0	70	40	270	0	0
ATB2_40BLEDE70_XXXX...	-225	70	40	270	0	0
ATB2_40BLEDE70_XXXX...	-450	70	40	270	0	0

Total Number of locations: 14

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Luminance

	0.48	0.47	0.47	0.53	0.63	0.72	0.80	0.85	0.88	0.86	0.81	0.72	0.62	0.52
	0.48	0.50	0.52	0.60	0.72	0.82	0.91	0.96	0.97	0.93	0.86	0.75	0.63	0.51
	0.47	0.48	0.52	0.58	0.67	0.75	0.81	0.88	0.90	0.85	0.77	0.65	0.56	0.47
	0.48	0.46	0.49	0.56	0.64	0.70	0.74	0.77	0.80	0.77	0.70	0.57	0.52	0.49
	0.54	0.48	0.49	0.54	0.61	0.64	0.68	0.73	0.74	0.70	0.65	0.54	0.51	0.54
	0.54	0.48	0.49	0.54	0.61	0.64	0.68	0.73	0.74	0.70	0.65	0.54	0.51	0.54
	0.48	0.46	0.49	0.56	0.64	0.70	0.74	0.77	0.80	0.77	0.70	0.57	0.52	0.49
	0.47	0.48	0.52	0.58	0.67	0.75	0.81	0.88	0.90	0.85	0.77	0.65	0.56	0.47
	0.48	0.50	0.52	0.60	0.72	0.82	0.91	0.96	0.97	0.93	0.86	0.75	0.63	0.51
	0.48	0.47	0.47	0.53	0.63	0.72	0.80	0.85	0.88	0.86	0.81	0.72	0.62	0.52

### Luminance (Cd/SqM)

Average = 0.66

Maximum = 0.97

Minimum = 0.46

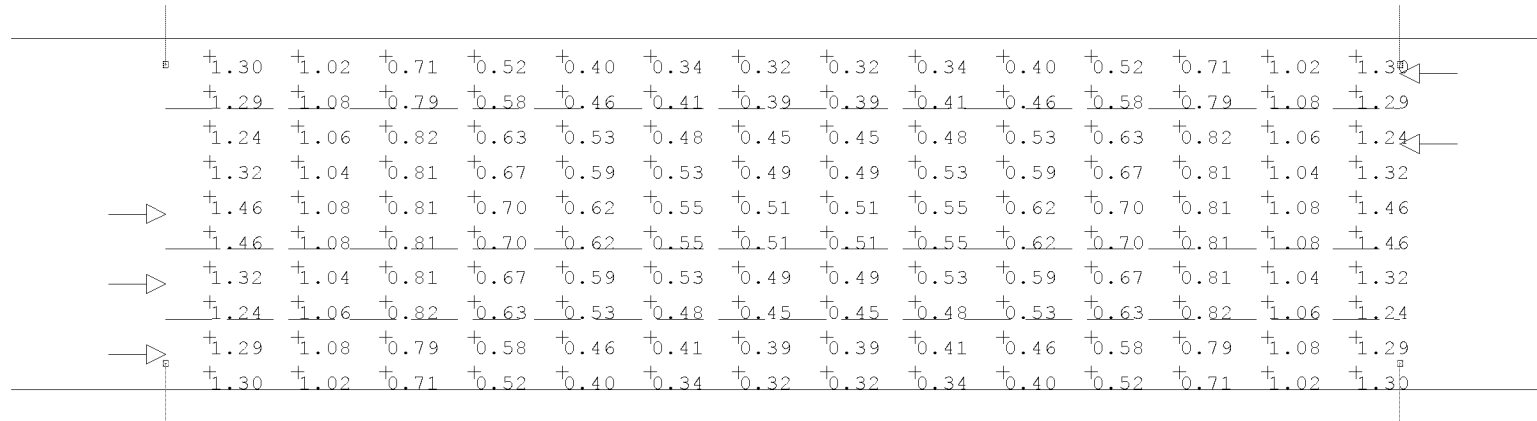
Avg/Min Ratio = 1.43

Max/Min Ratio = 2.11

Max/Avg Ratio = 1.47

# Roadway Optimizer - Layout 1

RoadOpt\_1\_Illum



## Illuminance (Fc)

Average = 0.74

Maximum = 1.46

Minimum = 0.32

Avg/Min Ratio = 2.31

Max/Min Ratio = 4.56

Max/Avg Ratio = 1.97

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Vis\_Level

	0.29	3.42	3.70	2.74	1.44	0.53	-0.01	-0.59	-1.16	-1.71	-2.15	-2.48	-2.83	-3.10
	0.09	3.30	3.75	2.81	1.67	0.96	0.36	-0.22	-0.92	-1.48	-1.89	-2.28	-2.76	-3.10
	0.03	3.37	4.23	3.74	3.01	2.21	1.41	0.68	0.11	-0.51	-1.17	-1.67	-2.41	-2.95
	0.22	3.50	4.40	4.54	4.24	3.43	2.35	1.57	0.86	0.25	-0.53	-1.31	-2.17	-2.93
→	0.33	3.69	4.52	5.14	4.94	4.07	3.01	2.12	1.30	0.66	-0.28	-1.23	-2.22	-3.08
	0.33	3.69	4.52	5.14	4.94	4.07	3.01	2.12	1.30	0.66	-0.28	-1.23	-2.22	-3.08
→	0.22	3.50	4.40	4.54	4.24	3.43	2.35	1.57	0.86	0.25	-0.53	-1.31	-2.17	-2.93
	0.03	3.37	4.23	3.74	3.01	2.21	1.41	0.68	0.11	-0.51	-1.17	-1.67	-2.41	-2.95
→	0.09	3.30	3.75	2.81	1.67	0.96	0.36	-0.22	-0.92	-1.48	-1.89	-2.28	-2.76	-3.10
	0.29	3.42	3.70	2.74	1.44	0.53	-0.01	-0.59	-1.16	-1.71	-2.15	-2.48	-2.83	-3.10

## Visibility Level

STV = 1.895719



# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Vis\_Level\_Target\_Lum

	0.53	1.10	1.22	1.16	1.02	0.91	0.84	0.75	0.65	0.51	0.38	0.28	0.19	0.13
	0.53	1.16	1.36	1.30	1.19	1.12	1.02	0.89	0.74	0.59	0.43	0.31	0.21	0.13
	0.51	1.14	1.40	1.41	1.38	1.31	1.17	1.01	0.84	0.66	0.48	0.34	0.22	0.13
	0.54	1.12	1.38	1.50	1.54	1.46	1.29	1.10	0.91	0.71	0.52	0.36	0.23	0.14
→	0.59	1.16	1.37	1.55	1.60	1.52	1.34	1.15	0.95	0.74	0.55	0.38	0.24	0.14
	0.59	1.16	1.37	1.55	1.60	1.52	1.34	1.15	0.95	0.74	0.55	0.38	0.24	0.14
→	0.54	1.12	1.38	1.50	1.54	1.46	1.29	1.10	0.91	0.71	0.52	0.36	0.23	0.14
	0.51	1.14	1.40	1.41	1.38	1.31	1.17	1.01	0.84	0.66	0.48	0.34	0.22	0.13
→	0.53	1.16	1.36	1.30	1.19	1.12	1.02	0.89	0.74	0.59	0.43	0.31	0.21	0.13
	0.53	1.10	1.22	1.16	1.02	0.91	0.84	0.75	0.65	0.51	0.38	0.28	0.19	0.13

### Target Luminance (Cd/SqM)

Average = 0.84  
 Maximum = 1.60  
 Minimum = 0.13  
 Avg/Min Ratio = 6.46  
 Max/Min Ratio = 12.31  
 Max/Avg Ratio = 1.9

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Veil\_Lum

	0.07	0.05	0.04	0.04	0.05	0.06	0.08	0.10	0.12	0.13	0.13	0.12	0.10	0.09
	0.08	0.06	0.04	0.05	0.05	0.08	0.10	0.13	0.15	0.16	0.16	0.14	0.12	0.10
	0.08	0.06	0.05	0.05	0.06	0.09	0.12	0.15	0.18	0.19	0.18	0.16	0.13	0.10
	0.08	0.06	0.05	0.05	0.06	0.09	0.13	0.17	0.19	0.20	0.19	0.17	0.14	0.11
→	0.07	0.06	0.05	0.06	0.07	0.10	0.14	0.17	0.19	0.20	0.19	0.17	0.14	0.10
	0.07	0.06	0.05	0.06	0.07	0.10	0.14	0.17	0.19	0.20	0.19	0.17	0.14	0.10
→	0.08	0.06	0.05	0.05	0.06	0.09	0.13	0.17	0.19	0.20	0.19	0.17	0.14	0.11
	0.08	0.06	0.05	0.05	0.06	0.09	0.12	0.15	0.18	0.19	0.18	0.16	0.13	0.10
→	0.08	0.06	0.04	0.05	0.05	0.08	0.10	0.13	0.15	0.16	0.16	0.14	0.12	0.10
	0.07	0.05	0.04	0.04	0.05	0.06	0.08	0.10	0.12	0.13	0.13	0.12	0.10	0.09

### Veiling Luminance (Cd/SqM)

Average = 0.11

Maximum = 0.20

Minimum = 0.04

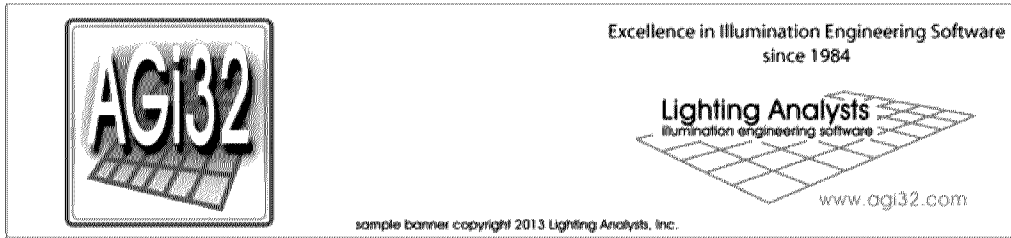
Avg/Min Ratio = 2.75

Max/Min Ratio = 5

Max/Avg Ratio = 1.82

MaxLv Ratio = 0.30

Threshold Increment (TI) = 18.13



## Roadway Optimizer - Layout 2

### General:

GE ERS4 LED Luminaire

Roadway Standard: IES RP-8-14-IDOT (entire roadway)

R-Table: R3 (Slightly Specular), QO=0.07 Actual QO Value: 0.07

### Roadway Layout:

Layout Type: Two Rows, Opposite; 2R\_OPP

Roadway Width: 64 ft

Lanes In Direction Of Travel: 3 In Opposite Direction: 2

Driver's Side Of Roadway: Right

### Luminaire Information:

#### ers2\_e3b1740-120-277v\_tcm201-

Description: ERS2 E3B1740 -120-277V

File Name: ers2\_e3b1740-120-277v\_tcm201-95325.ies

Lumens Per Lamp: N.A.

Number Of Lamps: 1

Total Lamp Lumens: N.A.

Luminaire Lumens: 11600

Luminaire Watts: 130

Efficiency (%): N.A.

Total Light Loss Factor: 0.700

Luminaire Arrangement: SINGLE

Arm Length: 10.607 ft

Offset: 0 ft

### Luminaire Location Summary:

Coordinates in ft

Spacing - Row 1: 225

Spacing - Row 2: 225

Label	X-Coord	Y-Coord	Z-Coord	Orient	Tilt	Spin
ers2_e3b1740-120-27...	900	-6	40	90	0	0
ers2_e3b1740-120-27...	675	-6	40	90	0	0
ers2_e3b1740-120-27...	450	-6	40	90	0	0
ers2_e3b1740-120-27...	225	-6	40	90	0	0
ers2_e3b1740-120-27...	0	-6	40	90	0	0
ers2_e3b1740-120-27...	-225	-6	40	90	0	0

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## Roadway Optimizer - Layout 2 - Cont.

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**Luminaire Location Summary:**

Coordinates in ft

ers2_e3b1740-120-27...	-450	-6	40	90	0	0
ers2_e3b1740-120-27...	900	70	40	270	0	0
ers2_e3b1740-120-27...	675	70	40	270	0	0
ers2_e3b1740-120-27...	450	70	40	270	0	0
ers2_e3b1740-120-27...	225	70	40	270	0	0
ers2_e3b1740-120-27...	0	70	40	270	0	0
ers2_e3b1740-120-27...	-225	70	40	270	0	0
ers2_e3b1740-120-27...	-450	70	40	270	0	0

Total Number of locations: 14

## Roadway Optimizer - Layout 2

### RoadOpt\_1\_Luminance

	0.54	0.45	0.39	0.44	0.57	0.67	0.74	0.81	0.83	0.67	0.60	0.62	0.63	0.65
	0.71	0.57	0.47	0.49	0.60	0.71	0.81	0.88	0.88	0.84	0.71	0.76	0.83	0.80
	0.77	0.61	0.49	0.47	0.50	0.58	0.68	0.76	0.78	0.76	0.71	0.71	0.85	0.83
	0.81	0.65	0.50	0.45	0.46	0.52	0.57	0.61	0.66	0.63	0.67	0.71	0.87	0.87
→	0.93	0.76	0.56	0.46	0.46	0.47	0.51	0.56	0.60	0.61	0.67	0.80	0.93	0.98
	0.93	0.76	0.56	0.46	0.46	0.47	0.51	0.56	0.60	0.61	0.67	0.80	0.93	0.98
→	0.81	0.65	0.50	0.45	0.46	0.52	0.57	0.61	0.66	0.63	0.67	0.71	0.87	0.87
	0.77	0.61	0.49	0.47	0.50	0.58	0.68	0.76	0.78	0.76	0.71	0.71	0.85	0.83
→	0.71	0.57	0.47	0.49	0.60	0.71	0.81	0.88	0.88	0.84	0.71	0.76	0.83	0.80
	0.54	0.45	0.39	0.44	0.57	0.67	0.74	0.81	0.83	0.67	0.60	0.62	0.63	0.65

### Luminance (Cd/SqM)

Average = 0.66

Maximum = 0.98

Minimum = 0.39

Avg/Min Ratio = 1.69

Max/Min Ratio = 2.51

Max/Avg Ratio = 1.48

# Roadway Optimizer - Layout 2

RoadOpt\_1\_Illum

	1.46	0.96	0.56	0.34	0.27	0.26	0.23	0.23	0.26	0.27	0.34	0.56	0.96	1.46
	2.02	1.35	0.74	0.45	0.37	0.31	0.28	0.28	0.31	0.37	0.45	0.74	1.35	2.02
	2.24	1.57	0.88	0.56	0.44	0.36	0.33	0.33	0.36	0.44	0.56	0.88	1.57	2.24
	2.42	1.77	1.02	0.65	0.47	0.41	0.37	0.37	0.41	0.47	0.65	1.02	1.77	2.42
→	2.74	2.10	1.24	0.73	0.53	0.43	0.39	0.39	0.43	0.53	0.73	1.24	2.10	2.74
	2.74	2.10	1.24	0.73	0.53	0.43	0.39	0.39	0.43	0.53	0.73	1.24	2.10	2.74
→	2.42	1.77	1.02	0.65	0.47	0.41	0.37	0.37	0.41	0.47	0.65	1.02	1.77	2.42
	2.24	1.57	0.88	0.56	0.44	0.36	0.33	0.33	0.36	0.44	0.56	0.88	1.57	2.24
→	2.02	1.35	0.74	0.45	0.37	0.31	0.28	0.28	0.31	0.37	0.45	0.74	1.35	2.02
	1.46	0.96	0.56	0.34	0.27	0.26	0.23	0.23	0.26	0.27	0.34	0.56	0.96	1.46

**Illuminance (Fc)**

Average = 0.89  
 Maximum = 2.74  
 Minimum = 0.23  
 Avg/Min Ratio = 3.87  
 Max/Min Ratio = 11.91  
 Max/Avg Ratio = 3.08

# Roadway Optimizer - Layout 2

RoadOpt\_1\_Vis\_Level

	0.65	3.56	2.81	1.17	0.30	-0.21	-1.02	-1.60	-2.18	-2.41	-2.98	-3.49	-3.56	-3.61
	1.03	5.15	4.25	2.22	1.40	0.32	-0.53	-1.46	-2.18	-2.99	-3.49	-3.92	-4.20	-4.13
	1.27	6.47	6.15	4.39	3.20	1.90	0.85	-0.23	-1.35	-2.53	-3.32	-3.70	-4.25	-4.18
	1.50	7.61	7.87	6.07	4.52	3.44	2.10	0.88	-0.45	-1.88	-2.98	-3.48	-4.23	-4.25
→	1.59	8.78	9.77	7.57	5.90	4.19	2.74	1.35	0.07	-1.68	-3.03	-3.74	-4.55	-4.60
	1.59	8.78	9.77	7.57	5.90	4.19	2.74	1.35	0.07	-1.68	-3.03	-3.74	-4.55	-4.60
→	1.50	7.61	7.87	6.07	4.52	3.44	2.10	0.88	-0.45	-1.88	-2.98	-3.48	-4.23	-4.25
	1.27	6.47	6.15	4.39	3.20	1.90	0.85	-0.23	-1.35	-2.53	-3.32	-3.70	-4.25	-4.18
→	1.03	5.15	4.25	2.22	1.40	0.32	-0.53	-1.46	-2.18	-2.99	-3.49	-3.92	-4.20	-4.13
	0.65	3.56	2.81	1.17	0.30	-0.21	-1.02	-1.60	-2.18	-2.41	-2.98	-3.49	-3.56	-3.61

## Visibility Level

STV = 2.710148



## Roadway Optimizer - Layout 2

### RoadOpt\_1\_Vis\_Level\_Target\_Lum

	0.57	1.03	0.97	0.78	0.72	0.73	0.62	0.49	0.41	0.32	0.22	0.16	0.12	0.09
	0.78	1.45	1.30	1.04	1.00	0.88	0.76	0.61	0.48	0.36	0.25	0.19	0.14	0.10
	0.86	1.68	1.53	1.31	1.20	1.06	0.90	0.73	0.54	0.39	0.29	0.22	0.16	0.12
	0.92	1.89	1.77	1.50	1.29	1.20	1.01	0.80	0.60	0.44	0.33	0.24	0.18	0.13
→	1.04	2.23	2.15	1.68	1.46	1.25	1.05	0.84	0.65	0.49	0.36	0.26	0.18	0.13
	1.04	2.23	2.15	1.68	1.46	1.25	1.05	0.84	0.65	0.49	0.36	0.26	0.18	0.13
→	0.92	1.89	1.77	1.50	1.29	1.20	1.01	0.80	0.60	0.44	0.33	0.24	0.18	0.13
	0.86	1.68	1.53	1.31	1.20	1.06	0.90	0.73	0.54	0.39	0.29	0.22	0.16	0.12
→	0.78	1.45	1.30	1.04	1.00	0.88	0.76	0.61	0.48	0.36	0.25	0.19	0.14	0.10
	0.57	1.03	0.97	0.78	0.72	0.73	0.62	0.49	0.41	0.32	0.22	0.16	0.12	0.09

#### Target Luminance (Cd/SqM)

Average = 0.77

Maximum = 2.23

Minimum = 0.09

Avg/Min Ratio = 8.56

Max/Min Ratio = 24.78

Max/Avg Ratio = 2.9

## Roadway Optimizer - Layout 2

RoadOpt\_1\_Veil\_Lum

	0.05	0.04	0.03	0.03	0.04	0.05	0.06	0.07	0.09	0.10	0.10	0.10	0.08	0.06
	0.06	0.05	0.04	0.04	0.05	0.06	0.07	0.08	0.10	0.12	0.12	0.12	0.10	0.08
	0.06	0.06	0.04	0.04	0.05	0.06	0.08	0.09	0.10	0.12	0.13	0.12	0.10	0.08
	0.07	0.06	0.04	0.04	0.05	0.07	0.08	0.09	0.11	0.12	0.13	0.12	0.10	0.08
→	0.07	0.06	0.04	0.04	0.05	0.07	0.08	0.10	0.11	0.12	0.12	0.12	0.10	0.09
	0.07	0.06	0.04	0.04	0.05	0.07	0.08	0.10	0.11	0.12	0.12	0.12	0.10	0.09
→	0.07	0.06	0.04	0.04	0.05	0.07	0.08	0.09	0.11	0.12	0.13	0.12	0.10	0.08
	0.06	0.06	0.04	0.04	0.05	0.06	0.08	0.09	0.10	0.12	0.13	0.12	0.10	0.08
→	0.06	0.05	0.04	0.04	0.05	0.06	0.07	0.08	0.10	0.12	0.12	0.12	0.10	0.08
	0.05	0.04	0.03	0.03	0.04	0.05	0.06	0.07	0.09	0.10	0.10	0.10	0.08	0.06

### Veiling Luminance (Cd/SqM)

Average = 0.08

Maximum = 0.13

Minimum = 0.03

Avg/Min Ratio = 2.67

Max/Min Ratio = 4.33

Max/Avg Ratio = 1.63

MaxLv Ratio = 0.20

Threshold Increment (TI) = 11.78

## Roadway Optimizer - Layout Comparison

	Layout 1	Layout 2
Description	American Electric ATB2 LED Luminaire	GE ERS4 LED Luminaire
Roadway Standard	IES RP-8-14-IDOT (entire roadway)	IES RP-8-14-IDOT (entire roadway)
R-Table	R3	R3
Actual Q0 Value	0.07	0.07
Layout Type	2R_OPP	2R_OPP
Road Width	64	64
Median Width	N.A.	N.A.
Number Lanes	3	3
Number Lanes Opposite	2	2
Drivers Side	Right	Right
Calc Area	Bottom	Bottom
Label - Row 1	ATB2_40BLEDE7 0_XXXXX_R2	ers2_e3b1740-1 20-277v_tcm201-
MH - Row 1	40	40
Setback - Row 1	6	6
+Orient - Row 1	0	0
Tilt - Row 1	0	0
Spin - Row 1	0	0
Spacing - Row 1	225	225
Label - Row 2	ATB2_40BLEDE7 0_XXXXX_R2	ers2_e3b1740-1 20-277v_tcm201-
MH - Row 2	40	40
Setback - Row 2	6	6
+Orient - Row 2	0	0
Tilt - Row 2	0	0
Spin - Row 2	0	0
Spacing - Row 2	225	225
<b>1 Luminance (Cd/SqM)</b>		
Average	0.66	0.66
Maximum	0.97	0.98

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**Roadway Optimizer - Layout Comparison - Cont.**

	<b>Layout 1</b>	<b>Layout 2</b>
Minimum	0.46	0.39
Avg/Min Ratio	1.43	1.69
Max/Min Ratio	2.11	2.51
Max/Avg Ratio	1.47	1.48
<hr/>		
<b>1_Illum (Fc)</b>		
Average	0.74	0.89
Maximum	1.46	2.74
Minimum	0.32	0.23
Avg/Min Ratio	2.31	3.87
Max/Min Ratio	4.56	11.91
Max/Avg Ratio	1.97	3.08
<hr/>		
<b>1_Vis_Level</b>		
STV	1.9	2.71
<hr/>		
<b>1_Vis_Level_Bkgd_Lum (Cd/SqM)</b>		
Average	0.66	0.66
Maximum	0.98	0.99
Minimum	0.46	0.40
Avg/Min Ratio	1.43	1.65
Max/Min Ratio	2.13	2.48
Max/Avg Ratio	1.48	1.5
<hr/>		
<b>1_Vis_Level_Target_Lum (Cd/SqM)</b>		
Average	0.84	0.77
Maximum	1.60	2.23
Minimum	0.13	0.09
Avg/Min Ratio	6.46	8.56
Max/Min Ratio	12.31	24.78
Max/Avg Ratio	1.9	2.9
<hr/>		
<b>1_Veil_Lum (Cd/SqM)</b>		
Average	0.11	0.08
Maximum	0.20	0.13
Minimum	0.04	0.03
Avg/Min Ratio	2.75	2.67

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**Roadway Optimizer - Layout Comparison - Cont.**

	<b>Layout 1</b>	<b>Layout 2</b>
Max/Min Ratio	5.00	4.33
Max/Avg Ratio	1.82	1.63
MaxLV Ratio	0.3	0.2
Threshold Incr. (TI)	18.13	11.78

## LUMINAIRE PERFORMANCE SUMMARY

### 64' Section

**Date:** 6/6/2016

**Designer:** Joe Vondra

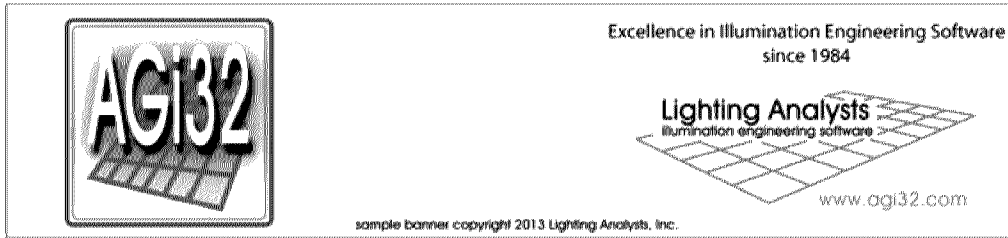
**Project:** Village of Mount Prospect - Corridor Lighting Evaluation

IES Roadway Classification:	Major	Luminance				Sidewalk Area		
						Illuminance		
Pedestrian Conflict Classification:	Medium	$L_{avg}$	$L_{avg}/L_{min}$	$L_{max}/L_{min}$	$L_v/L_{avg}$	$E_{Havg}$	$E_{Vmin}$	$E_{avg}/E_{min}$
<b>IES Recommended Levels</b>		0.9	3.0	5.0	0.3	0.5	0.2	4.0
<b>Manufacturer:</b>	American Electric							
<b>Curve #:</b>		0.92	1.46	2.16	0.3	0.59	0.20	2.95
ATB2_40BLEDE10_XXXXX_R2								
<b>Manufacturer:</b>	GE Lighting							
<b>Curve #:</b>		0.91	1.65	2.78	0.24	0.55	0.20	2.75
ers3_j3a1540-120-277v_tcm201								

Note: Sidewalk Area values out of spec will improve for 90% spacing. Final values should be calculated during design.

## DESIGN PARAMETERS

Combined LLF	<u>0.7</u>	Spacing	<u>225'</u>
Lamp lumens	<u>15685/14000</u>	Light Pole Set Back $SB_{LP}$	<u>6'</u>
Roadway Width $W_R$	<u>64'</u>	Mounting Height	<u>40'</u>
Number of Lanes	<u>5</u>	Mast Arm	<u>12'</u>
Lane Width $W_L$	<u>12.8'</u>	Sidewalk Set Back $SB_{SW}$	<u>0'</u>
Layout	<u>Opposite</u>	Sidewalk Width $W_{SW}$	<u>12'</u>



## Roadway Optimizer - Layout 1

### General:

American Electric ATB2 LED Luminaire

Roadway Standard: IES RP-8-14-IDOT (entire roadway)

R-Table: R3 (Slightly Specular), QO=0.07 Actual QO Value: 0.07

### Roadway Layout:

Layout Type: Two Rows, Opposite; 2R\_OPP

Roadway Width: 64 ft

Lanes In Direction Of Travel: 3 In Opposite Direction: 2

Driver's Side Of Roadway: Right

### Luminaire Information:

#### ATB2 40BLEDE10 XXXXX R2

Description: ATB2 40BLEDE10 XXXXX R2

File Name: ATB2\_40BLEDE10\_XXXXX\_R2.ies

Lumens Per Lamp: N.A.

Number Of Lamps: 1

Total Lamp Lumens: N.A.

Luminaire Lumens: 15685

Luminaire Watts: 138

Efficiency (%): N.A.

Total Light Loss Factor: 0.700

Luminaire Arrangement: SINGLE

Arm Length: 10.76175 ft

Offset: 0 ft

### Luminaire Location Summary:

Coordinates in ft

Spacing - Row 1: 225

Spacing - Row 2: 225

<u>Label</u>	<u>X-Coord</u>	<u>Y-Coord</u>	<u>Z-Coord</u>	<u>Orient</u>	<u>Tilt</u>	<u>Spin</u>
ATB2_40BLEDE10_XXXX...	-450	-6	40	90	0	0
ATB2_40BLEDE10_XXXX...	-225	-6	40	90	0	0
ATB2_40BLEDE10_XXXX...	0	-6	40	90	0	0
ATB2_40BLEDE10_XXXX...	225	-6	40	90	0	0
ATB2_40BLEDE10_XXXX...	450	-6	40	90	0	0
ATB2_40BLEDE10_XXXX...	675	-6	40	90	0	0

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## Roadway Optimizer - Layout 1 - Cont.

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**Luminaire Location Summary:**

Coordinates in ft

ATB2_40BLEDE10_XXXX...	900	-6	40	90	0	0
ATB2_40BLEDE10_XXXX...	-450	70	40	270	0	0
ATB2_40BLEDE10_XXXX...	-225	70	40	270	0	0
ATB2_40BLEDE10_XXXX...	0	70	40	270	0	0
ATB2_40BLEDE10_XXXX...	225	70	40	270	0	0
ATB2_40BLEDE10_XXXX...	450	70	40	270	0	0
ATB2_40BLEDE10_XXXX...	675	70	40	270	0	0
ATB2_40BLEDE10_XXXX...	900	70	40	270	0	0

Total Number of locations: 14

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Luminance

	0.67	0.65	0.65	0.74	0.88	1.00	1.12	1.18	1.22	1.20	1.13	1.00	0.86	0.75
	0.67	0.69	0.73	0.84	1.01	1.15	1.26	1.34	1.36	1.29	1.19	1.04	0.88	0.71
	0.65	0.67	0.73	0.81	0.94	1.04	1.13	1.23	1.26	1.18	1.07	0.90	0.79	0.66
	0.68	0.63	0.68	0.78	0.89	0.98	1.03	1.07	1.12	1.07	0.97	0.80	0.73	0.69
→	0.76	0.67	0.68	0.76	0.85	0.89	0.95	1.01	1.04	0.97	0.90	0.75	0.71	0.76
	0.76	0.67	0.68	0.76	0.85	0.89	0.95	1.01	1.04	0.97	0.90	0.75	0.71	0.76
→	0.68	0.63	0.68	0.78	0.89	0.98	1.03	1.07	1.12	1.07	0.97	0.80	0.73	0.69
	0.65	0.67	0.73	0.81	0.94	1.04	1.13	1.23	1.26	1.18	1.07	0.90	0.79	0.66
→	0.67	0.69	0.73	0.84	1.01	1.15	1.26	1.34	1.36	1.29	1.19	1.04	0.88	0.71
	0.67	0.65	0.65	0.74	0.88	1.00	1.12	1.18	1.22	1.20	1.13	1.00	0.86	0.75

### Luminance (Cd/SqM)

Average = 0.92  
 Maximum = 1.36  
 Minimum = 0.63  
 Avg/Min Ratio = 1.46  
 Max/Min Ratio = 2.16  
 Max/Avg Ratio = 1.48

# Roadway Optimizer - Layout 1

RoadOpt\_1\_Illum

	1.81	1.42	0.99	0.72	0.55	0.47	0.45	0.45	0.47	0.55	0.72	0.99	1.42	1.81
	1.80	1.50	1.11	0.81	0.64	0.57	0.55	0.55	0.57	0.64	0.81	1.11	1.50	1.80
	1.73	1.47	1.15	0.88	0.74	0.67	0.62	0.62	0.67	0.74	0.88	1.15	1.47	1.73
	1.84	1.45	1.13	0.94	0.82	0.73	0.68	0.68	0.73	0.82	0.94	1.13	1.45	1.84
→	2.04	1.51	1.13	0.97	0.86	0.77	0.71	0.71	0.77	0.86	0.97	1.13	1.51	2.04
	2.04	1.51	1.13	0.97	0.86	0.77	0.71	0.71	0.77	0.86	0.97	1.13	1.51	2.04
→	1.84	1.45	1.13	0.94	0.82	0.73	0.68	0.68	0.73	0.82	0.94	1.13	1.45	1.84
	1.73	1.47	1.15	0.88	0.74	0.67	0.62	0.62	0.67	0.74	0.88	1.15	1.47	1.73
→	1.80	1.50	1.11	0.81	0.64	0.57	0.55	0.55	0.57	0.64	0.81	1.11	1.50	1.80
	1.81	1.42	0.99	0.72	0.55	0.47	0.45	0.45	0.47	0.55	0.72	0.99	1.42	1.81

## Illuminance (Fc)

Average = 1.04

Maximum = 2.04

Minimum = 0.45

Avg/Min Ratio = 2.31

Max/Min Ratio = 4.53

Max/Avg Ratio = 1.96

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Vis\_Level

	0.34	3.96	4.28	3.17	1.66	0.60	-0.01	-0.68	-1.33	-1.96	-2.47	-2.85	-3.27	-3.58
	0.10	3.82	4.33	3.24	1.92	1.10	0.41	-0.25	-1.05	-1.69	-2.17	-2.62	-3.18	-3.59
	0.03	3.91	4.88	4.31	3.46	2.54	1.61	0.78	0.12	-0.59	-1.34	-1.92	-2.78	-3.40
	0.25	4.05	5.09	5.24	4.89	3.94	2.69	1.80	0.99	0.29	-0.61	-1.51	-2.51	-3.38
→	0.38	4.28	5.24	5.95	5.70	4.69	3.46	2.44	1.49	0.76	-0.32	-1.42	-2.56	-3.56
	0.38	4.28	5.24	5.95	5.70	4.69	3.46	2.44	1.49	0.76	-0.32	-1.42	-2.56	-3.56
→	0.25	4.05	5.09	5.24	4.89	3.94	2.69	1.80	0.99	0.29	-0.61	-1.51	-2.51	-3.38
	0.03	3.91	4.88	4.31	3.46	2.54	1.61	0.78	0.12	-0.59	-1.34	-1.92	-2.78	-3.40
→	0.10	3.82	4.33	3.24	1.92	1.10	0.41	-0.25	-1.05	-1.69	-2.17	-2.62	-3.18	-3.59
	0.34	3.96	4.28	3.17	1.66	0.60	-0.01	-0.68	-1.33	-1.96	-2.47	-2.85	-3.27	-3.58

## Visibility Level

STV = 2.146972

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Vis\_Level\_Bkgd\_Lum

		0.68	0.79	0.94	1.06	1.15	1.20	1.22	1.18	1.08	0.94	0.80	0.69	0.66	0.65
		0.77	0.90	1.08	1.20	1.30	1.36	1.35	1.26	1.14	0.99	0.79	0.67	0.67	0.70
		0.76	0.85	1.00	1.08	1.16	1.25	1.24	1.14	1.01	0.87	0.73	0.65	0.66	0.68
		0.72	0.81	0.95	1.01	1.04	1.07	1.11	1.03	0.88	0.77	0.69	0.69	0.66	0.65
→		0.71	0.79	0.89	0.92	0.96	1.02	1.02	0.91	0.82	0.72	0.73	0.77	0.73	0.66
		0.71	0.79	0.89	0.92	0.96	1.02	1.02	0.91	0.82	0.72	0.73	0.77	0.73	0.66
→		0.72	0.81	0.95	1.01	1.04	1.07	1.11	1.03	0.88	0.77	0.69	0.69	0.66	0.65
		0.76	0.85	1.00	1.08	1.16	1.25	1.24	1.14	1.01	0.87	0.73	0.65	0.66	0.68
→		0.77	0.90	1.08	1.20	1.30	1.36	1.35	1.26	1.14	0.99	0.79	0.67	0.67	0.70
		0.68	0.79	0.94	1.06	1.15	1.20	1.22	1.18	1.08	0.94	0.80	0.69	0.66	0.65

### Background Luminance (Cd/SqM)

Average = 0.91

Maximum = 1.36

Minimum = 0.65

Avg/Min Ratio = 1.4

Max/Min Ratio = 2.09

Max/Avg Ratio = 1.49

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Vis\_Level\_Target\_Lum

	0.74	1.53	1.70	1.62	1.42	1.26	1.17	1.05	0.90	0.71	0.53	0.39	0.27	0.18
	0.74	1.62	1.89	1.81	1.66	1.56	1.42	1.25	1.04	0.82	0.60	0.43	0.29	0.18
	0.71	1.58	1.95	1.96	1.92	1.83	1.63	1.41	1.16	0.92	0.67	0.47	0.30	0.19
	0.75	1.56	1.92	2.09	2.15	2.03	1.79	1.53	1.27	1.00	0.73	0.51	0.32	0.19
	0.81	1.61	1.90	2.16	2.23	2.11	1.87	1.60	1.32	1.03	0.76	0.53	0.33	0.19
	0.81	1.61	1.90	2.16	2.23	2.11	1.87	1.60	1.32	1.03	0.76	0.53	0.33	0.19
	0.75	1.56	1.92	2.09	2.15	2.03	1.79	1.53	1.27	1.00	0.73	0.51	0.32	0.19
	0.71	1.58	1.95	1.96	1.92	1.83	1.63	1.41	1.16	0.92	0.67	0.47	0.30	0.19
	0.74	1.62	1.89	1.81	1.66	1.56	1.42	1.25	1.04	0.82	0.60	0.43	0.29	0.18
	0.74	1.53	1.70	1.62	1.42	1.26	1.17	1.05	0.90	0.71	0.53	0.39	0.27	0.18

### Target Luminance (Cd/SqM)

Average = 1.17

Maximum = 2.23

Minimum = 0.18

Avg/Min Ratio = 6.5

Max/Min Ratio = 12.39

Max/Avg Ratio = 1.91

# Roadway Optimizer - Layout 1

## RoadOpt\_1\_Veil\_Lum

	0.10	0.07	0.06	0.06	0.06	0.09	0.12	0.15	0.17	0.18	0.18	0.16	0.14	0.14
	0.11	0.08	0.06	0.06	0.07	0.11	0.14	0.18	0.21	0.23	0.22	0.20	0.17	0.14
	0.11	0.08	0.06	0.07	0.08	0.12	0.16	0.21	0.25	0.26	0.25	0.22	0.19	0.15
	0.11	0.08	0.07	0.07	0.09	0.13	0.18	0.23	0.27	0.28	0.27	0.24	0.20	0.15
→	0.10	0.08	0.07	0.08	0.09	0.14	0.19	0.24	0.27	0.28	0.27	0.24	0.20	0.15
	0.10	0.08	0.07	0.08	0.09	0.14	0.19	0.24	0.27	0.28	0.27	0.24	0.20	0.15
→	0.11	0.08	0.07	0.07	0.09	0.13	0.18	0.23	0.27	0.28	0.27	0.24	0.20	0.15
	0.11	0.08	0.06	0.07	0.08	0.12	0.16	0.21	0.25	0.26	0.25	0.22	0.19	0.15
→	0.11	0.08	0.06	0.06	0.07	0.11	0.14	0.18	0.21	0.23	0.22	0.20	0.17	0.14
	0.10	0.07	0.06	0.06	0.06	0.09	0.12	0.15	0.17	0.18	0.18	0.16	0.14	0.14

### Veiling Luminance (Cd/SqM)

Average = 0.15

Maximum = 0.28

Minimum = 0.06

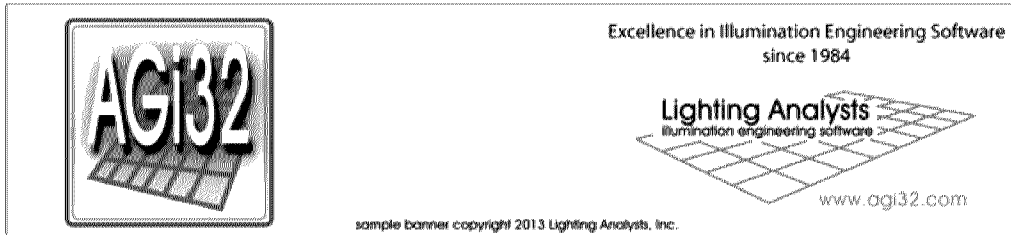
Avg/Min Ratio = 2.5

Max/Min Ratio = 4.67

Max/Avg Ratio = 1.87

MaxLv Ratio = 0.30

Threshold Increment (TI) = 19.46



## Roadway Optimizer - Layout 2

### General:

GE ERS3 LED Luminaire

Roadway Standard: IES RP-8-14-IDOT (entire roadway)

R-Table: R3 (Slightly Specular), QO=0.07 Actual QO Value: 0.07

### Roadway Layout:

Layout Type: Two Rows, Opposite; 2R\_OPP

Roadway Width: 64 ft

Lanes In Direction Of Travel: 3 In Opposite Direction: 2

Driver's Side Of Roadway: Right

### Luminaire Information:

#### ers3 j3a1540-120-277v tcm201-

Description: ERS3 J3A1540 -120-277V

File Name: ers3\_j3a1540-120-277v\_tcm201-95469.ies

Lumens Per Lamp: N.A.

Number Of Lamps: 1

Total Lamp Lumens: N.A.

Luminaire Lumens: 14000

Luminaire Watts: 151

Efficiency (%): N.A.

Total Light Loss Factor: 0.700

Luminaire Arrangement: SINGLE

Arm Length: 10.98225 ft

Offset: 0 ft

### Luminaire Location Summary:

Coordinates in ft

Spacing - Row 1: 225

Spacing - Row 2: 225

Label	X-Coord	Y-Coord	Z-Coord	Orient	Tilt	Spin
ers3_j3a1540-120-27...	-450	-6	40	90	0	0
ers3_j3a1540-120-27...	-225	-6	40	90	0	0
ers3_j3a1540-120-27...	0	-6	40	90	0	0
ers3_j3a1540-120-27...	225	-6	40	90	0	0
ers3_j3a1540-120-27...	450	-6	40	90	0	0
ers3_j3a1540-120-27...	675	-6	40	90	0	0

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## Roadway Optimizer - Layout 2 - Cont.

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**Luminaire Location Summary:**

Coordinates in ft

ers3_j3a1540-120-27...	900	-6	40	90	0	0
ers3_j3a1540-120-27...	-450	70	40	270	0	0
ers3_j3a1540-120-27...	-225	70	40	270	0	0
ers3_j3a1540-120-27...	0	70	40	270	0	0
ers3_j3a1540-120-27...	225	70	40	270	0	0
ers3_j3a1540-120-27...	450	70	40	270	0	0
ers3_j3a1540-120-27...	675	70	40	270	0	0
ers3_j3a1540-120-27...	900	70	40	270	0	0

Total Number of locations: 14

## Roadway Optimizer - Layout 2

### RoadOpt\_1\_Luminance

	0.93	0.85	0.73	0.80	0.99	1.20	1.39	1.43	1.32	1.04	0.85	0.99	1.14	1.05
	1.05	0.91	0.79	0.85	1.05	1.28	1.49	1.53	1.34	1.01	0.87	1.03	1.24	1.16
	0.97	0.86	0.73	0.74	0.85	1.02	1.17	1.21	1.05	0.82	0.77	0.88	1.13	1.02
	0.83	0.78	0.65	0.62	0.68	0.77	0.83	0.82	0.77	0.68	0.71	0.80	1.01	0.87
→	0.67	0.74	0.58	0.55	0.59	0.62	0.65	0.68	0.67	0.61	0.64	0.68	0.84	0.68
	0.67	0.74	0.58	0.55	0.59	0.62	0.65	0.68	0.67	0.61	0.64	0.68	0.84	0.68
→	0.83	0.78	0.65	0.62	0.68	0.77	0.83	0.82	0.77	0.68	0.71	0.80	1.01	0.87
	0.97	0.86	0.73	0.74	0.85	1.02	1.17	1.21	1.05	0.82	0.77	0.88	1.13	1.02
→	1.05	0.91	0.79	0.85	1.05	1.28	1.49	1.53	1.34	1.01	0.87	1.03	1.24	1.16
	0.93	0.85	0.73	0.80	0.99	1.20	1.39	1.43	1.32	1.04	0.85	0.99	1.14	1.05

### Luminance (Cd/SqM)

Average = 0.91

Maximum = 1.53

Minimum = 0.55

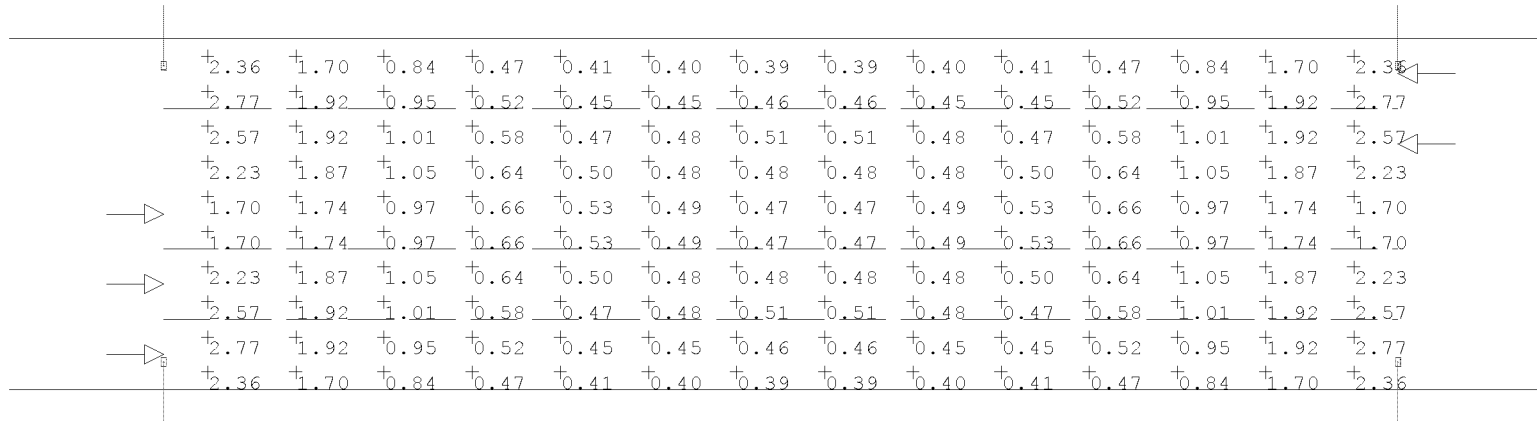
Avg/Min Ratio = 1.65

Max/Min Ratio = 2.78

Max/Avg Ratio = 1.68

# Roadway Optimizer - Layout 2

RoadOpt\_1\_Illum



**Illuminance (Fc)**

Average = 1.01  
 Maximum = 2.77  
 Minimum = 0.39  
 Avg/Min Ratio = 2.59  
 Max/Min Ratio = 7.1  
 Max/Avg Ratio = 2.74

# Roadway Optimizer - Layout 2

RoadOpt\_1\_Vis\_Level

	+0.40	+4.33	+2.41	+0.02	+0.85	+0.98	+1.32	+1.56	+2.15	+2.87	+3.35	+3.91	+4.74	+4.75
	+0.67	+4.91	+2.82	+0.14	+0.80	+0.76	+0.73	+0.85	+1.63	+2.39	+3.11	+3.87	+4.81	+4.89
	+0.81	+5.76	+4.17	+1.57	+0.61	+0.71	+0.91	+0.76	+0.04	+1.17	+2.40	+3.14	+4.43	+4.44
	+0.92	+6.47	+5.68	+3.46	+2.31	+2.31	+2.05	+1.72	+0.71	+0.23	+1.72	+2.52	+3.82	+3.86
→	+0.69	+6.46	+5.87	+4.67	+3.75	+3.32	+2.78	+2.22	+1.31	+0.35	+1.03	+1.79	+3.13	+3.24
	+0.69	+6.46	+5.87	+4.67	+3.75	+3.32	+2.78	+2.22	+1.31	+0.35	+1.03	+1.79	+3.13	+3.24
→	+0.92	+6.47	+5.68	+3.46	+2.31	+2.31	+2.05	+1.72	+0.71	+0.23	+1.72	+2.52	+3.82	+3.86
	+0.81	+5.76	+4.17	+1.57	+0.61	+0.71	+0.91	+0.76	+0.04	+1.17	+2.40	+3.14	+4.43	+4.42
→	+0.67	+4.91	+2.82	+0.14	+0.80	+0.76	+0.73	+0.85	+1.63	+2.39	+3.11	+3.87	+4.81	+4.89
	+0.40	+4.33	+2.41	+0.02	+0.85	+0.98	+1.32	+1.56	+2.15	+2.87	+3.35	+3.91	+4.74	+4.75

## Visibility Level

STV = 2.183641

## Roadway Optimizer - Layout 2

RoadOpt\_1\_Vis\_Level\_Bkgd\_Lum

		†0.75	†0.87	†1.08	†1.30	†1.43	†1.41	†1.22	†0.93	†0.89	†1.09	†1.14	†0.97	†0.96	†0.79
		†0.80	†0.92	†1.14	†1.39	†1.53	†1.49	†1.21	†0.91	†0.94	†1.15	†1.22	†1.08	†1.04	†0.84
		†0.72	†0.76	†0.92	†1.09	†1.21	†1.17	†0.95	†0.76	†0.83	†1.02	†1.15	†0.98	†1.01	†0.79
		†0.63	†0.63	†0.72	†0.80	†0.84	†0.79	†0.74	†0.66	†0.75	†0.89	†1.01	†0.86	†0.89	†0.72
→		†0.55	†0.55	†0.61	†0.64	†0.65	†0.68	†0.65	†0.59	†0.65	†0.75	†0.82	†0.70	†0.73	†0.65
		†0.55	†0.55	†0.61	†0.64	†0.65	†0.68	†0.65	†0.59	†0.65	†0.75	†0.82	†0.70	†0.73	†0.65
→		†0.63	†0.63	†0.72	†0.80	†0.84	†0.79	†0.74	†0.66	†0.75	†0.89	†1.01	†0.86	†0.89	†0.72
		†0.72	†0.76	†0.92	†1.09	†1.21	†1.17	†0.95	†0.76	†0.83	†1.02	†1.15	†0.98	†1.01	†0.79
→		†0.80	†0.92	†1.14	†1.39	†1.53	†1.49	†1.21	†0.91	†0.94	†1.15	†1.22	†1.08	†1.04	†0.84
		†0.75	†0.87	†1.08	†1.30	†1.43	†1.41	†1.22	†0.93	†0.89	†1.09	†1.14	†0.97	†0.96	†0.79

### Background Luminance (Cd/SqM)

Average = 0.91

Maximum = 1.53

Minimum = 0.55

Avg/Min Ratio = 1.65

Max/Min Ratio = 2.78

Max/Avg Ratio = 1.68

# Roadway Optimizer - Layout 2

## RoadOpt\_1\_Vis\_Level\_Target\_Lum

	0.93	1.83	1.46	1.05	1.05	1.11	1.04	0.89	0.71	0.54	0.40	0.30	0.21	0.15
	1.09	2.06	1.64	1.16	1.14	1.23	1.20	1.06	0.83	0.63	0.47	0.35	0.25	0.18
	1.03	2.07	1.74	1.28	1.18	1.28	1.30	1.18	0.93	0.72	0.54	0.40	0.28	0.20
	0.92	2.02	1.81	1.42	1.25	1.28	1.25	1.13	0.92	0.75	0.58	0.43	0.31	0.22
→	0.74	1.89	1.68	1.47	1.34	1.31	1.21	1.09	0.93	0.76	0.57	0.43	0.31	0.23
	0.74	1.89	1.68	1.47	1.34	1.31	1.21	1.09	0.93	0.76	0.57	0.43	0.31	0.23
→	0.92	2.02	1.81	1.42	1.25	1.28	1.25	1.13	0.92	0.75	0.58	0.43	0.31	0.22
	1.03	2.07	1.74	1.28	1.18	1.28	1.30	1.18	0.93	0.72	0.54	0.40	0.28	0.20
→	1.09	2.06	1.64	1.16	1.14	1.23	1.20	1.06	0.83	0.63	0.47	0.35	0.25	0.18
	0.93	1.83	1.46	1.05	1.05	1.11	1.04	0.89	0.71	0.54	0.40	0.30	0.21	0.15

### Target Luminance (Cd/SqM)

Average = 0.96

Maximum = 2.07

Minimum = 0.15

Avg/Min Ratio = 6.4

Max/Min Ratio = 13.8

Max/Avg Ratio = 2.16

## Roadway Optimizer - Layout 2

### RoadOpt\_1\_Veil\_Lum

	0.08	0.08	0.06	0.06	0.07	0.09	0.12	0.14	0.17	0.19	0.19	0.17	0.13	0.09
	0.09	0.09	0.07	0.07	0.09	0.11	0.14	0.17	0.20	0.22	0.22	0.19	0.14	0.09
	0.09	0.09	0.07	0.07	0.09	0.12	0.15	0.18	0.21	0.22	0.22	0.18	0.13	0.09
	0.08	0.08	0.07	0.08	0.10	0.12	0.14	0.17	0.18	0.19	0.18	0.15	0.12	0.09
→	0.08	0.08	0.07	0.08	0.09	0.11	0.13	0.15	0.17	0.17	0.16	0.14	0.11	0.09
	0.08	0.08	0.07	0.08	0.09	0.11	0.13	0.15	0.17	0.17	0.16	0.14	0.11	0.09
→	0.08	0.08	0.07	0.08	0.10	0.12	0.14	0.17	0.18	0.19	0.18	0.15	0.12	0.09
	0.09	0.09	0.07	0.07	0.09	0.12	0.15	0.18	0.21	0.22	0.22	0.18	0.13	0.09
→	0.09	0.09	0.07	0.07	0.09	0.11	0.14	0.17	0.20	0.22	0.22	0.19	0.14	0.09
	0.08	0.08	0.06	0.06	0.07	0.09	0.12	0.14	0.17	0.19	0.19	0.17	0.13	0.09

### Veiling Luminance (Cd/SqM)

Average = 0.13

Maximum = 0.22

Minimum = 0.06

Avg/Min Ratio = 2.17

Max/Min Ratio = 3.67

Max/Avg Ratio = 1.69

MaxLv Ratio = 0.24

Threshold Increment (TI) = 15.42

## Roadway Optimizer - Layout Comparison

	Layout 1	Layout 2
Description	American Electric ATB2 LED Luminaire	GE ERS3 LED Luminaire
Roadway Standard	IES RP-8-14-IDOT (entire roadway)	IES RP-8-14-IDOT (entire roadway)
R-Table	R3	R3
Actual Q0 Value	0.07	0.07
Layout Type	2R_OPP	2R_OPP
Road Width	64	64
Median Width	N.A.	N.A.
Number Lanes	3	3
Number Lanes Opposite	2	2
Drivers Side	Right	Right
Calc Area	Bottom	Bottom
Label - Row 1	ATB2_40BLEDE1 0_XXXXX_R2	ers3_j3a1540-1 20-277v_tcm201-
MH - Row 1	40	40
Setback - Row 1	6	6
+Orient - Row 1	0	0
Tilt - Row 1	0	0
Spin - Row 1	0	0
Spacing - Row 1	225	225
Label - Row 2	ATB2_40BLEDE1 0_XXXXX_R2	ers3_j3a1540-1 20-277v_tcm201-
MH - Row 2	40	40
Setback - Row 2	6	6
+Orient - Row 2	0	0
Tilt - Row 2	0	0
Spin - Row 2	0	0
Spacing - Row 2	225	225
<b>1 Luminance (Cd/SqM)</b>		
Average	0.92	0.91
Maximum	1.36	1.53

---

**Roadway Optimizer - Layout Comparison - Cont.**

	<b>Layout 1</b>	<b>Layout 2</b>
Minimum	0.63	0.55
Avg/Min Ratio	1.46	1.65
Max/Min Ratio	2.16	2.78
Max/Avg Ratio	1.48	1.68
<b>1_Illum (Fc)</b>		
Average	1.04	1.01
Maximum	2.04	2.77
Minimum	0.45	0.39
Avg/Min Ratio	2.31	2.59
Max/Min Ratio	4.53	7.10
Max/Avg Ratio	1.96	2.74
<b>1_Vis_Level</b>		
STV	2.15	2.18
<b>1_Vis_Level_Bkgd_Lum (Cd/SqM)</b>		
Average	0.91	0.91
Maximum	1.36	1.53
Minimum	0.65	0.55
Avg/Min Ratio	1.40	1.65
Max/Min Ratio	2.09	2.78
Max/Avg Ratio	1.49	1.68
<b>1_Vis_Level_Target_Lum (Cd/SqM)</b>		
Average	1.17	0.96
Maximum	2.23	2.07
Minimum	0.18	0.15
Avg/Min Ratio	6.50	6.40
Max/Min Ratio	12.39	13.80
Max/Avg Ratio	1.91	2.16
<b>1_Veil_Lum (Cd/SqM)</b>		
Average	0.15	0.13
Maximum	0.28	0.22
Minimum	0.06	0.06
Avg/Min Ratio	2.50	2.17

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**Roadway Optimizer - Layout Comparison - Cont.**

	<b>Layout 1</b>	<b>Layout 2</b>
Max/Min Ratio	4.67	3.67
Max/Avg Ratio	1.87	1.69
MaxLV Ratio	0.3	0.24
Threshold Incr. (TI)	19.46	15.42

## LUMINAIRE PERFORMANCE SUMMARY

### 76' Section

**Date:** 6/6/2016

**Designer:** Joe Vondra

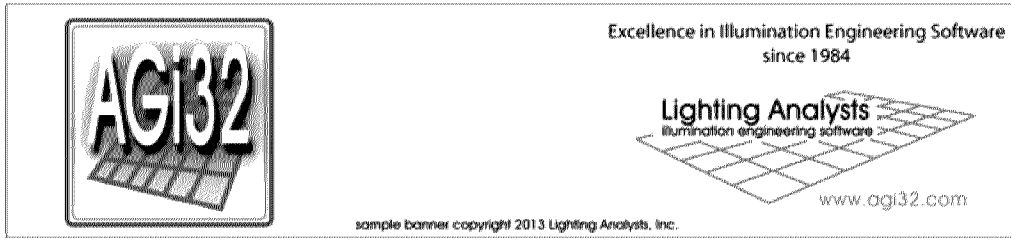
**Project:** Village of Mount Prospect - Corridor Lighting Evaluation

IES Roadway Classification:	Collector	Luminance				Sidewalk Area		
						Illuminance		
Pedestrian Conflict Classification:	Low	$L_{avg}$	$L_{avg}/L_{min}$	$L_{max}/L_{min}$	$L_v/L_{avg}$	$E_{Havg}$	$E_{Vmin}$	$E_{avg}/E_{min}$
<b>IES Recommended Levels</b>		0.4	4.0	8.0	0.4	0.4	0.1	4.0
<b>Manufacturer:</b>	American Electric	0.58	2.07	3.82	0.28	0.39	0.20	1.95
<b>Curve #:</b>	ATB2_60BLEDE70_XXXXX_R3							
<b>Manufacturer:</b>	GE Lighting	0.55	1.83	3.07	0.24	0.39	0.10	3.9
<b>Curve #:</b>	ers2_f3b1740-120-277v_tcm201							

Note: Sidewalk Area values out of spec will improve for 90% spacing. Final values should be calculated during design.

## DESIGN PARAMETERS

Combined LLF	<u>0.7</u>	Spacing	<u>260'</u>
Lamp lumens	<u>17127/13100</u>	Light Pole Set Back $SB_{LP}$	<u>6'</u>
Roadway Width $W_R$	<u>76'</u>	Mounting Height	<u>40'</u>
Number of Lanes	<u>6</u>	Mast Arm	<u>10'</u>
Lane Width $W_L$	<u>12.7'</u>	Sidewalk Set Back $SB_{SW}$	<u>0'</u>
Layout	<u>Opposite</u>	Sidewalk Width $W_{SW}$	<u>12'</u>



## Roadway Optimizer - Layout 1

### General:

American Electric ATB2 LED Luminaire

Roadway Standard: IES RP-8-14-IDOT (entire roadway)

R-Table: R3 (Slightly Specular), QO=0.07 Actual QO Value: 0.07

### Roadway Layout:

Layout Type: Two Rows, Opposite; 2R\_OPP

Roadway Width: 76 ft

Lanes In Direction Of Travel: 3 In Opposite Direction: 3

Driver's Side Of Roadway: Right

### Luminaire Information:

#### ATB2 60BLEDE70 XXXXX R3

Description: ATB2 60BLEDE70 XXXXX R3

File Name: ATB2\_60BLEDE70\_XXXXX\_R3.ies

Lumens Per Lamp: N.A.

Number Of Lamps: 1

Total Lamp Lumens: N.A.

Luminaire Lumens: 17127

Luminaire Watts: 133

Efficiency (%): N.A.

Total Light Loss Factor: 0.700

Luminaire Arrangement: SINGLE

Arm Length: 10.76175 ft

Offset: 0 ft

### Luminaire Location Summary:

Coordinates in ft

Spacing - Row 1: 260

Spacing - Row 2: 260

<u>Label</u>	<u>X-Coord</u>	<u>Y-Coord</u>	<u>Z-Coord</u>	<u>Orient</u>	<u>Tilt</u>	<u>Spin</u>
ATB2_60BLEDE70_XXXX...	780	-6	40	90	0	0
ATB2_60BLEDE70_XXXX...	520	-6	40	90	0	0
ATB2_60BLEDE70_XXXX...	260	-6	40	90	0	0
ATB2_60BLEDE70_XXXX...	0	-6	40	90	0	0
ATB2_60BLEDE70_XXXX...	-260	-6	40	90	0	0
ATB2_60BLEDE70_XXXX...	-520	-6	40	90	0	0

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## Roadway Optimizer - Layout 1 - Cont.

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**Luminaire Location Summary:**

Coordinates in ft

ATB2_60BLEDE70_XXXX...	780	82	40	270	0	0
ATB2_60BLEDE70_XXXX...	520	82	40	270	0	0
ATB2_60BLEDE70_XXXX...	260	82	40	270	0	0
ATB2_60BLEDE70_XXXX...	0	82	40	270	0	0
ATB2_60BLEDE70_XXXX...	-260	82	40	270	0	0
ATB2_60BLEDE70_XXXX...	-520	82	40	270	0	0

Total Number of locations: 12

# Roadway Optimizer - Layout 1

## RoadOpt\_2\_Luminance

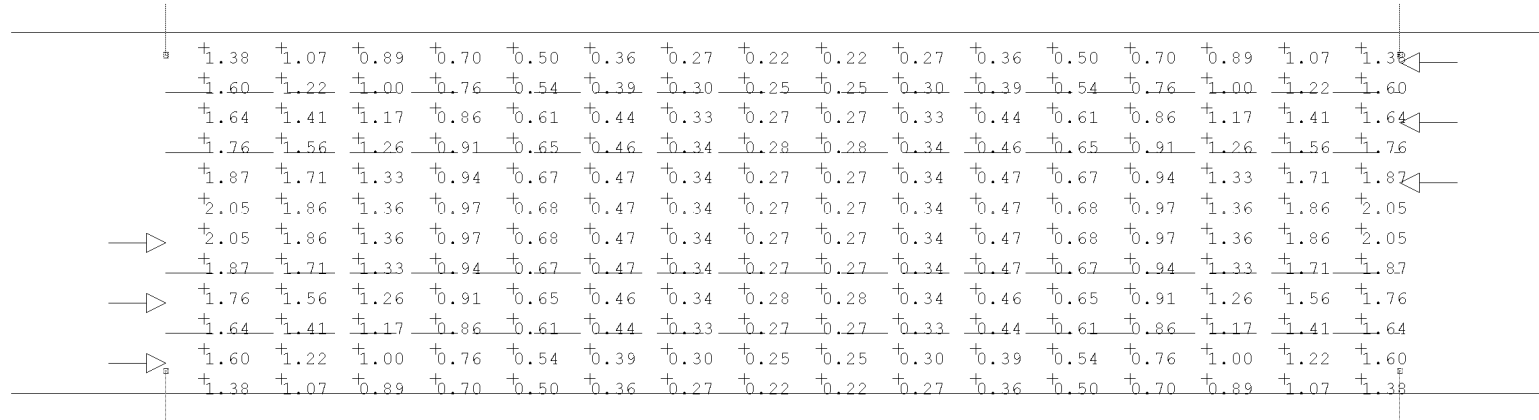
	0.45	0.38	0.35	0.34	0.29	0.29	0.33	0.47	0.70	0.88	1.00	1.03	0.99	0.81	0.60	0.58
	0.51	0.42	0.38	0.36	0.31	0.30	0.35	0.52	0.76	0.93	1.04	1.07	1.02	0.86	0.67	0.60
	0.52	0.47	0.43	0.38	0.32	0.30	0.34	0.46	0.66	0.84	0.96	1.01	1.00	0.87	0.73	0.58
	0.54	0.50	0.46	0.39	0.33	0.30	0.31	0.40	0.54	0.67	0.78	0.87	0.90	0.83	0.74	0.60
	0.59	0.55	0.48	0.40	0.33	0.29	0.29	0.34	0.44	0.57	0.68	0.76	0.82	0.78	0.71	0.63
	0.65	0.59	0.49	0.40	0.33	0.28	0.28	0.32	0.41	0.52	0.64	0.71	0.76	0.75	0.74	0.68
	0.65	0.59	0.49	0.40	0.33	0.28	0.28	0.32	0.41	0.52	0.64	0.71	0.76	0.75	0.74	0.68
	0.59	0.55	0.48	0.40	0.33	0.29	0.29	0.34	0.44	0.57	0.68	0.76	0.82	0.78	0.71	0.63
	0.54	0.50	0.46	0.39	0.33	0.30	0.31	0.40	0.54	0.67	0.78	0.87	0.90	0.83	0.74	0.60
	0.52	0.47	0.43	0.38	0.32	0.30	0.34	0.46	0.66	0.84	0.96	1.01	1.00	0.87	0.73	0.58
	0.51	0.42	0.38	0.36	0.31	0.30	0.35	0.52	0.76	0.93	1.04	1.07	1.02	0.86	0.67	0.60
	0.45	0.38	0.35	0.34	0.29	0.29	0.33	0.47	0.70	0.88	1.00	1.03	0.99	0.81	0.60	0.58

### Luminance (Cd/SqM)

Average = 0.58  
 Maximum = 1.07  
 Minimum = 0.28  
 Avg/Min Ratio = 2.07  
 Max/Min Ratio = 3.82  
 Max/Avg Ratio = 1.84

# Roadway Optimizer - Layout 1

RoadOpt\_2\_Illum



**Illuminance (Fc)**

Average = 0.85  
 Maximum = 2.05  
 Minimum = 0.22  
 Avg/Min Ratio = 3.86  
 Max/Min Ratio = 9.32  
 Max/Avg Ratio = 2.41

# Roadway Optimizer - Layout 1

## RoadOpt\_2\_Vis\_Level

	0.75	6.04	10.10	11.09	9.63	6.09	3.18	0.39	2.57	4.32	5.01	4.98	4.82	4.56	4.13	4.02
	0.91	6.69	11.03	11.82	10.11	6.52	3.47	0.58	2.51	4.34	5.11	5.12	4.95	4.75	4.35	4.25
	0.82	7.55	12.51	13.44	11.86	8.34	4.80	1.44	1.77	3.98	4.91	5.06	4.97	4.70	4.55	4.32
	0.94	8.31	13.25	14.40	13.12	9.82	6.06	2.46	0.86	3.28	4.41	4.83	4.79	4.67	4.62	4.43
	0.96	8.90	13.80	15.15	14.07	11.10	7.07	3.06	0.21	2.74	4.08	4.58	4.71	4.68	4.67	4.50
	1.08	9.57	14.11	15.67	14.65	11.56	7.56	3.45	0.09	2.51	3.91	4.42	4.69	4.76	4.84	4.73
→	1.08	9.57	14.11	15.67	14.65	11.56	7.56	3.45	0.09	2.51	3.91	4.42	4.69	4.76	4.84	4.73
	0.96	8.90	13.80	15.15	14.07	11.10	7.07	3.06	0.21	2.74	4.08	4.58	4.71	4.68	4.67	4.56
→	0.94	8.31	13.25	14.40	13.12	9.82	6.06	2.46	0.86	3.28	4.41	4.83	4.79	4.67	4.62	4.43
	0.82	7.55	12.51	13.44	11.86	8.34	4.80	1.44	1.77	3.98	4.91	5.06	4.97	4.70	4.55	4.32
→	0.91	6.69	11.03	11.82	10.11	6.52	3.47	0.58	2.51	4.34	5.11	5.12	4.95	4.75	4.35	4.25
	0.75	6.04	10.10	11.09	9.63	6.09	3.18	0.39	2.57	4.32	5.01	4.98	4.82	4.56	4.13	4.02

## Visibility Level

STV = 4.593209

# Roadway Optimizer - Layout 1

## RoadOpt\_2\_Vis\_Level\_Bkgd\_Lum

		†0.35	†0.32	†0.28	†0.30	†0.36	†0.57	†0.77	†0.93	†1.03	†1.02	†0.94	†0.72	†0.56	†0.61	†0.42	†0.36
		†0.38	†0.34	†0.29	†0.32	†0.39	†0.61	†0.83	†0.98	†1.06	†1.06	†0.98	†0.78	†0.61	†0.56	†0.46	†0.40
		†0.42	†0.36	†0.30	†0.31	†0.37	†0.53	†0.73	†0.89	†0.98	†1.02	†0.97	†0.83	†0.67	†0.64	†0.51	†0.45
		†0.43	†0.36	†0.31	†0.30	†0.34	†0.45	†0.59	†0.70	†0.82	†0.88	†0.86	†0.82	†0.66	†0.56	†0.53	†0.49
		†0.45	†0.37	†0.31	†0.29	†0.31	†0.36	†0.48	†0.62	†0.73	†0.76	†0.80	†0.78	†0.69	†0.61	†0.58	†0.52
		†0.46	†0.37	†0.31	†0.27	†0.29	†0.34	†0.43	†0.56	†0.67	†0.73	†0.75	†0.74	†0.73	†0.68	†0.64	†0.55
→		†0.46	†0.37	†0.31	†0.27	†0.29	†0.34	†0.43	†0.56	†0.67	†0.73	†0.75	†0.74	†0.73	†0.68	†0.64	†0.55
		†0.45	†0.37	†0.31	†0.29	†0.31	†0.36	†0.48	†0.62	†0.73	†0.76	†0.80	†0.78	†0.69	†0.61	†0.58	†0.52
→		†0.43	†0.36	†0.31	†0.30	†0.34	†0.45	†0.59	†0.70	†0.82	†0.88	†0.86	†0.82	†0.66	†0.56	†0.53	†0.49
		†0.42	†0.36	†0.30	†0.31	†0.37	†0.53	†0.73	†0.89	†0.98	†1.02	†0.97	†0.83	†0.67	†0.54	†0.51	†0.45
→		†0.38	†0.34	†0.29	†0.32	†0.39	†0.61	†0.83	†0.98	†1.06	†1.06	†0.98	†0.78	†0.61	†0.56	†0.46	†0.40
		†0.35	†0.32	†0.28	†0.30	†0.36	†0.57	†0.77	†0.93	†1.03	†1.02	†0.94	†0.72	†0.56	†0.51	†0.42	†0.36

### Background Luminance (Cd/SqM)

Average = 0.58  
 Maximum = 1.06  
 Minimum = 0.27  
 Avg/Min Ratio = 2.15  
 Max/Min Ratio = 3.93  
 Max/Avg Ratio = 1.83

# Roadway Optimizer - Layout 1

## RoadOpt\_2\_Vis\_Level\_Target\_Lum

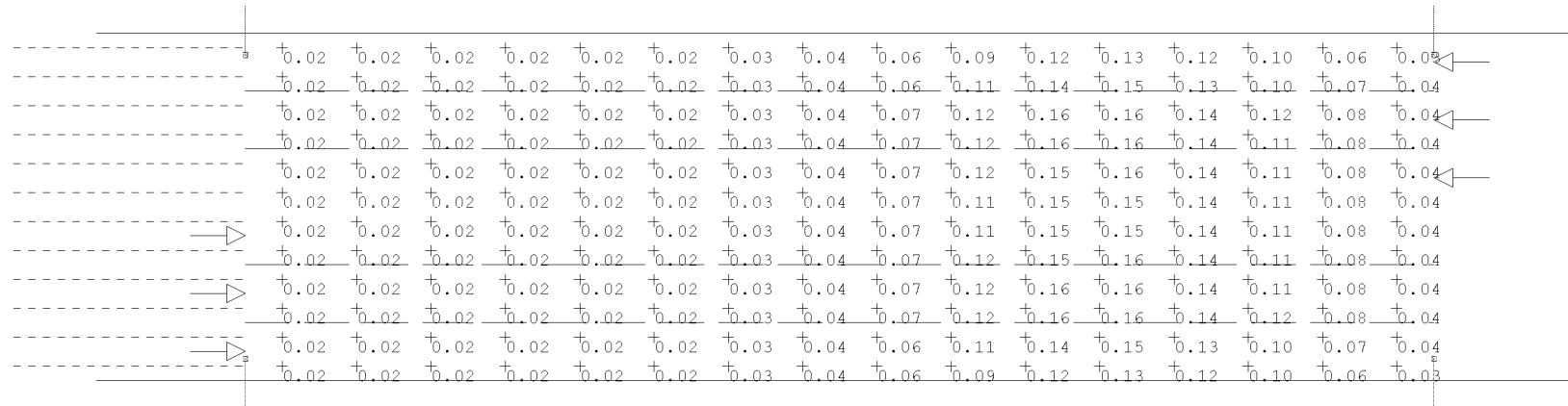
	0.51	1.15	1.58	1.72	1.57	1.33	1.09	0.78	0.47	0.24	0.12	0.08	0.05	0.04	0.03	0.02
	0.58	1.30	1.77	1.88	1.70	1.46	1.21	0.87	0.51	0.26	0.12	0.07	0.05	0.04	0.03	0.02
	0.60	1.51	2.08	2.13	1.91	1.65	1.34	0.95	0.56	0.27	0.12	0.07	0.05	0.04	0.03	0.02
	0.64	1.67	2.23	2.24	2.03	1.73	1.38	0.97	0.57	0.28	0.13	0.07	0.05	0.04	0.03	0.02
	0.68	1.82	2.35	2.33	2.10	1.76	1.38	0.97	0.56	0.29	0.13	0.07	0.05	0.03	0.03	0.02
	0.74	1.98	2.40	2.38	2.14	1.77	1.38	0.97	0.55	0.29	0.13	0.07	0.05	0.03	0.03	0.02
	0.68	1.82	2.35	2.33	2.10	1.76	1.38	0.97	0.56	0.29	0.13	0.07	0.05	0.03	0.03	0.02
	0.64	1.67	2.23	2.24	2.03	1.73	1.38	0.97	0.57	0.28	0.13	0.07	0.05	0.04	0.03	0.02
	0.60	1.51	2.08	2.13	1.91	1.65	1.34	0.95	0.56	0.27	0.12	0.07	0.05	0.04	0.03	0.02
	0.58	1.30	1.77	1.88	1.70	1.46	1.21	0.87	0.51	0.26	0.12	0.07	0.05	0.04	0.03	0.02
	0.51	1.15	1.58	1.72	1.57	1.33	1.09	0.78	0.47	0.24	0.12	0.08	0.05	0.04	0.03	0.02

### Target Luminance (Cd/SqM)

Average = 0.83  
 Maximum = 2.40  
 Minimum = 0.02  
 Avg/Min Ratio = 41.5  
 Max/Min Ratio = 120  
 Max/Avg Ratio = 2.89

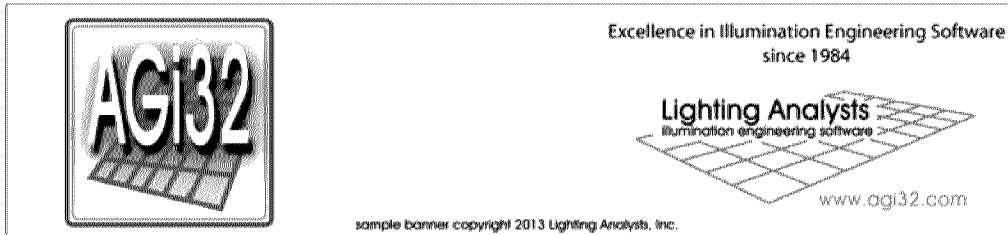
# Roadway Optimizer - Layout 1

## RoadOpt\_2\_Veil\_Lum



### Veiling Luminance (Cd/SqM)

Average = 0.06  
 Maximum = 0.16  
 Minimum = 0.02  
 Avg/Min Ratio = 3  
 Max/Min Ratio = 8  
 Max/Avg Ratio = 2.67  
 MaxLv Ratio = 0.28  
 Threshold Increment (TI) = 16.08



## Roadway Optimizer - Layout 2

### General:

GE ERS4 LED Luminaire

Roadway Standard: IES RP-8-14-IDOT (entire roadway)

R-Table: R3 (Slightly Specular), QO=0.07 Actual QO Value: 0.07

### Roadway Layout:

Layout Type: Two Rows, Opposite; 2R\_OPP

Roadway Width: 76 ft

Lanes In Direction Of Travel: 3 In Opposite Direction: 3

Driver's Side Of Roadway: Right

### Luminaire Information:

#### ers2\_f3b1740-120-277v\_tcm201-

Description: ERS2 F3B1740 -120-277V

File Name: ers2\_f3b1740-120-277v\_tcm201-95326.ies

Lumens Per Lamp: N.A.

Number Of Lamps: 1

Total Lamp Lumens: N.A.

Luminaire Lumens: 13100

Luminaire Watts: 148

Efficiency (%): N.A.

Total Light Loss Factor: 0.700

Luminaire Arrangement: SINGLE

Arm Length: 10.607 ft

Offset: 0 ft

### Luminaire Location Summary:

Coordinates in ft

Spacing - Row 1: 260

Spacing - Row 2: 260

Label	X-Coord	Y-Coord	Z-Coord	Orient	Tilt	Spin
ers2_f3b1740-120-27...	780	-6	40	90	0	0
ers2_f3b1740-120-27...	520	-6	40	90	0	0
ers2_f3b1740-120-27...	260	-6	40	90	0	0
ers2_f3b1740-120-27...	0	-6	40	90	0	0
ers2_f3b1740-120-27...	-260	-6	40	90	0	0
ers2_f3b1740-120-27...	-520	-6	40	90	0	0

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## Roadway Optimizer - Layout 2 - Cont.

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**Luminaire Location Summary:**

Coordinates in ft

ers2_f3b1740-120-27...	780	82	40	270	0	0
ers2_f3b1740-120-27...	520	82	40	270	0	0
ers2_f3b1740-120-27...	260	82	40	270	0	0
ers2_f3b1740-120-27...	0	82	40	270	0	0
ers2_f3b1740-120-27...	-260	82	40	270	0	0
ers2_f3b1740-120-27...	-520	82	40	270	0	0

Total Number of locations: 12

# Roadway Optimizer - Layout 2

## RoadOpt\_2\_Luminance

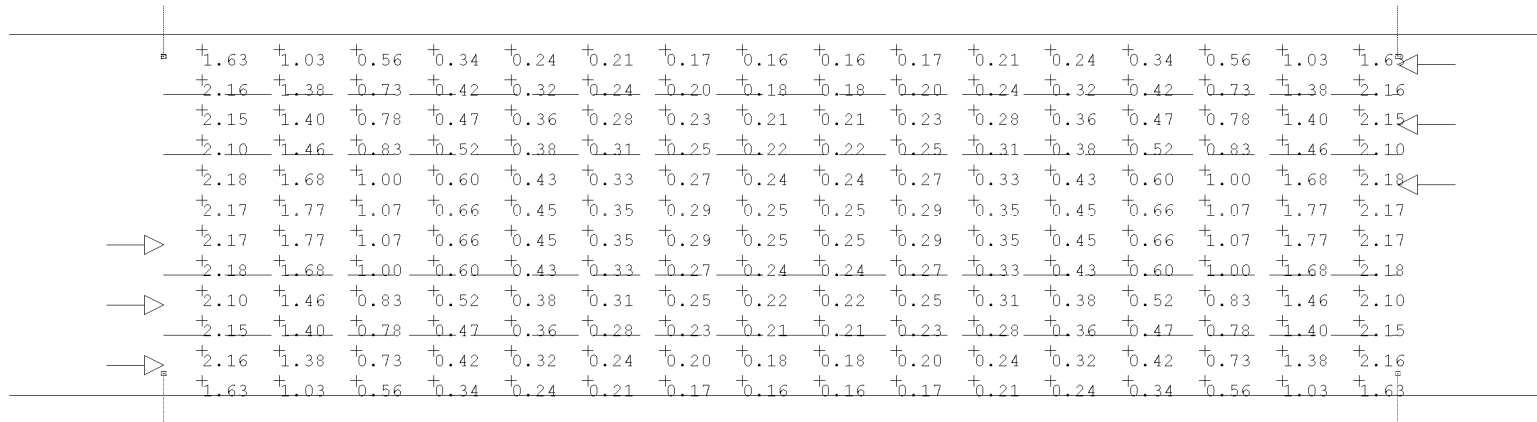
	0.53	0.39	0.30	0.30	0.33	0.43	0.57	0.68	0.78	0.85	0.89	0.71	0.62	0.62	0.64	0.63
	0.69	0.49	0.35	0.33	0.37	0.45	0.57	0.70	0.83	0.91	0.92	0.88	0.73	0.76	0.83	0.81
	0.69	0.49	0.36	0.33	0.36	0.40	0.45	0.54	0.65	0.74	0.77	0.75	0.68	0.66	0.79	0.78
	0.67	0.50	0.36	0.32	0.31	0.34	0.37	0.44	0.50	0.54	0.60	0.58	0.58	0.60	0.74	0.74
	0.71	0.57	0.41	0.33	0.31	0.31	0.33	0.35	0.39	0.45	0.49	0.52	0.55	0.62	0.72	0.75
	0.72	0.60	0.44	0.34	0.30	0.30	0.31	0.31	0.35	0.41	0.46	0.47	0.53	0.59	0.72	0.74
	0.72	0.60	0.44	0.34	0.30	0.30	0.31	0.31	0.35	0.41	0.46	0.47	0.53	0.59	0.72	0.74
	0.71	0.57	0.41	0.33	0.31	0.31	0.33	0.35	0.39	0.45	0.49	0.52	0.55	0.62	0.72	0.75
	0.67	0.50	0.36	0.32	0.31	0.34	0.37	0.44	0.50	0.54	0.60	0.58	0.58	0.60	0.74	0.74
	0.69	0.49	0.36	0.33	0.36	0.40	0.45	0.54	0.65	0.74	0.77	0.75	0.68	0.66	0.79	0.78
	0.69	0.49	0.35	0.33	0.37	0.45	0.57	0.70	0.83	0.91	0.92	0.88	0.73	0.76	0.83	0.81
	0.53	0.39	0.30	0.30	0.33	0.43	0.57	0.68	0.78	0.85	0.89	0.71	0.62	0.62	0.64	0.63

### Luminance (Cd/SqM)

Average = 0.55  
 Maximum = 0.92  
 Minimum = 0.30  
 Avg/Min Ratio = 1.83  
 Max/Min Ratio = 3.07  
 Max/Avg Ratio = 1.67

# Roadway Optimizer - Layout 2

RoadOpt\_2\_Illum



**Illuminance (Fc)**

Average = 0.74  
 Maximum = 2.18  
 Minimum = 0.16  
 Avg/Min Ratio = 4.63  
 Max/Min Ratio = 13.63  
 Max/Avg Ratio = 2.95

# Roadway Optimizer - Layout 2

## RoadOpt\_2\_Vis\_Level

	1.38	5.81	5.14	2.94	1.45	0.87	-0.58	-2.02	-2.75	-3.08	-3.76	-3.78	-3.97	-4.24	-4.12	-3.99
	1.80	7.30	6.48	4.00	2.74	1.24	-0.04	-1.59	-2.66	-3.35	-3.82	-4.26	-4.42	-4.63	-4.71	-4.48
	1.78	7.48	7.32	5.53	4.40	2.70	1.32	0.05	-1.51	-2.61	-3.06	-3.65	-4.09	-4.31	-4.58	-4.32
	1.74	8.09	8.31	6.83	5.46	4.31	2.69	1.25	-0.09	-1.25	-2.20	-2.94	-3.63	-3.97	-4.44	-4.24
	1.66	8.83	10.16	8.46	7.08	5.59	3.97	2.22	0.91	-0.38	-1.60	-2.72	-3.54	-3.95	-4.46	-4.40
	1.52	9.25	10.82	9.69	7.85	6.57	4.82	2.87	1.16	0.07	-1.24	-2.35	-3.45	-3.80	-4.50	-4.45
→	1.52	9.25	10.82	9.69	7.85	6.57	4.82	2.87	1.16	0.07	-1.24	-2.35	-3.45	-3.80	-4.50	-4.45
	1.66	8.83	10.16	8.46	7.08	5.59	3.97	2.22	0.91	-0.38	-1.60	-2.72	-3.54	-3.95	-4.46	-4.40
→	1.74	8.09	8.31	6.83	5.46	4.31	2.69	1.25	-0.09	-1.25	-2.20	-2.94	-3.63	-3.97	-4.44	-4.24
	1.78	7.48	7.32	5.53	4.40	2.70	1.32	0.05	-1.51	-2.61	-3.06	-3.65	-4.09	-4.31	-4.58	-4.32
→	1.80	7.30	6.48	4.00	2.74	1.24	-0.04	-1.59	-2.66	-3.35	-3.82	-4.26	-4.42	-4.63	-4.71	-4.48
	1.38	5.81	5.14	2.94	1.45	0.87	-0.58	-2.02	-2.75	-3.08	-3.76	-3.78	-3.97	-4.24	-4.12	-3.99

### Visibility Level

STV = 3.291436

# Roadway Optimizer - Layout 2

RoadOpt\_2\_Vis\_Level\_Bkgd\_Lum

	0.29	0.30	0.36	0.48	0.63	0.72	0.80	0.90	0.84	0.65	0.62	0.62	0.65	0.64	0.48	0.34
	0.33	0.34	0.40	0.50	0.63	0.76	0.86	0.94	0.90	0.83	0.74	0.79	0.86	0.78	0.64	0.43
	0.34	0.34	0.37	0.41	0.48	0.59	0.69	0.76	0.77	0.76	0.65	0.71	0.81	0.77	0.64	0.42
	0.34	0.31	0.33	0.35	0.40	0.47	0.51	0.56	0.61	0.58	0.56	0.65	0.74	0.70	0.64	0.43
	0.36	0.32	0.31	0.32	0.34	0.37	0.40	0.47	0.50	0.52	0.54	0.67	0.76	0.68	0.69	0.50
	0.39	0.32	0.30	0.30	0.31	0.32	0.36	0.43	0.47	0.49	0.53	0.63	0.76	0.65	0.71	0.54
→	0.39	0.32	0.30	0.30	0.31	0.32	0.36	0.43	0.47	0.49	0.53	0.63	0.76	0.65	0.71	0.54
	0.36	0.32	0.31	0.32	0.34	0.37	0.40	0.47	0.50	0.52	0.54	0.67	0.76	0.68	0.69	0.50
→	0.34	0.31	0.33	0.35	0.40	0.47	0.51	0.56	0.61	0.58	0.56	0.65	0.74	0.70	0.64	0.43
	0.34	0.34	0.37	0.41	0.48	0.59	0.69	0.76	0.77	0.76	0.65	0.71	0.81	0.77	0.64	0.42
→	0.33	0.34	0.40	0.50	0.63	0.76	0.86	0.94	0.90	0.83	0.74	0.79	0.86	0.78	0.64	0.43
	0.29	0.30	0.36	0.48	0.63	0.72	0.80	0.90	0.84	0.65	0.62	0.62	0.65	0.64	0.48	0.34

**Background Luminance (Cd/SqM)**

Average = 0.55  
 Maximum = 0.94  
 Minimum = 0.29  
 Avg/Min Ratio = 1.9  
 Max/Min Ratio = 3.24  
 Max/Avg Ratio = 1.71

# Roadway Optimizer - Layout 2

## RoadOpt\_2\_Vis\_Level\_Target\_Lum

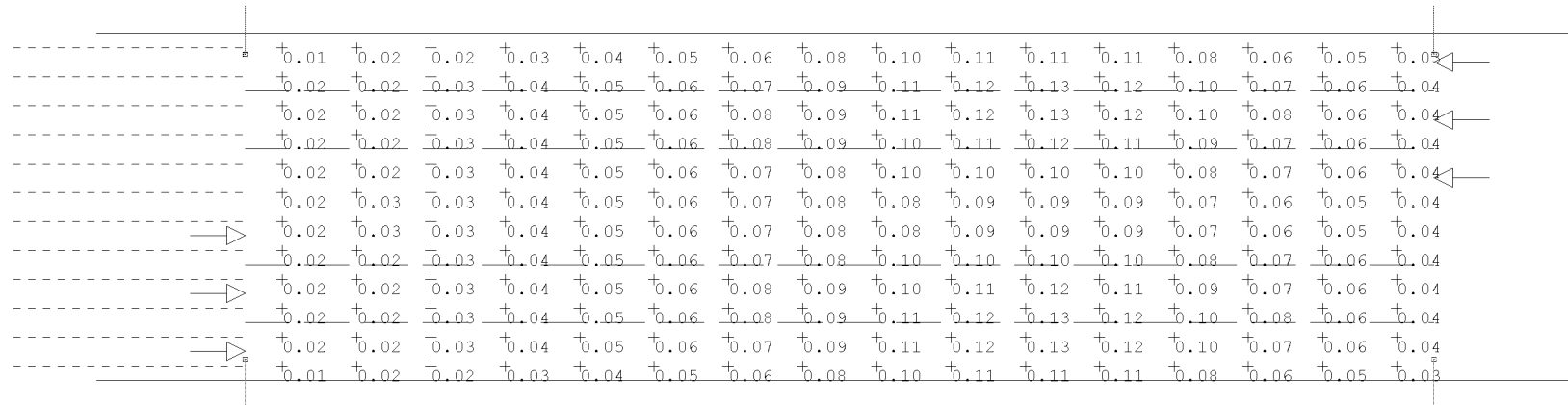
	0.61	1.11	1.00	0.81	0.71	0.73	0.61	0.49	0.39	0.30	0.20	0.14	0.11	0.09	0.07	0.05
	0.80	1.48	1.28	1.01	0.95	0.83	0.71	0.58	0.45	0.34	0.24	0.17	0.13	0.10	0.08	0.06
	0.80	1.51	1.37	1.15	1.08	0.94	0.81	0.66	0.50	0.36	0.27	0.20	0.15	0.11	0.08	0.06
	0.78	1.57	1.46	1.25	1.12	1.06	0.87	0.71	0.54	0.40	0.30	0.23	0.17	0.12	0.09	0.07
	0.81	1.80	1.76	1.44	1.29	1.12	0.95	0.76	0.59	0.44	0.32	0.24	0.18	0.13	0.10	0.07
	0.81	1.90	1.87	1.60	1.33	1.19	1.00	0.79	0.59	0.46	0.35	0.26	0.19	0.13	0.10	0.07
→	0.81	1.90	1.87	1.60	1.33	1.19	1.00	0.79	0.59	0.46	0.35	0.26	0.19	0.13	0.10	0.07
	0.81	1.80	1.76	1.44	1.29	1.12	0.95	0.76	0.59	0.44	0.32	0.24	0.18	0.13	0.10	0.07
→	0.78	1.57	1.46	1.25	1.12	1.06	0.87	0.71	0.54	0.40	0.30	0.23	0.17	0.12	0.09	0.07
	0.80	1.51	1.37	1.15	1.08	0.94	0.81	0.66	0.50	0.36	0.27	0.20	0.15	0.11	0.08	0.06
→	0.80	1.48	1.28	1.01	0.95	0.83	0.71	0.58	0.45	0.34	0.24	0.17	0.13	0.10	0.08	0.06
	0.61	1.11	1.00	0.81	0.71	0.73	0.61	0.49	0.39	0.30	0.20	0.14	0.11	0.09	0.07	0.05

### Target Luminance (Cd/SqM)

Average = 0.65  
 Maximum = 1.90  
 Minimum = 0.05  
 Avg/Min Ratio = 13  
 Max/Min Ratio = 38  
 Max/Avg Ratio = 2.92

# Roadway Optimizer - Layout 2

## RoadOpt\_2\_Veil\_Lum



### Veiling Luminance (Cd/SqM)

Average = 0.07

Maximum = 0.13

Minimum = 0.01

Avg/Min Ratio = 7

Max/Min Ratio = 13

Max/Avg Ratio = 1.86

MaxLv Ratio = 0.24

Threshold Increment (TI) = 13.63

## Roadway Optimizer - Layout Comparison

	Layout 1	Layout 2
Description	American Electric ATB2 LED Luminaire	GE ERS4 LED Luminaire
Roadway Standard	IES RP-8-14-IDOT (entire roadway)	IES RP-8-14-IDOT (entire roadway)
R-Table	R3	R3
Actual Q0 Value	0.07	0.07
Layout Type	2R_OPP	2R_OPP
Road Width	76	76
Median Width	N.A.	N.A.
Number Lanes	3	3
Number Lanes Opposite	3	3
Drivers Side	Right	Right
Calc Area	Bottom	Bottom
Label - Row 1	ATB2_60BLEDE7 0_XXXXX_R3	ers2_f3b1740-1 20-277v_tcm201-
MH - Row 1	40	40
Setback - Row 1	6	6
+Orient - Row 1	0	0
Tilt - Row 1	0	0
Spin - Row 1	0	0
Spacing - Row 1	260	260
Label - Row 2	ATB2_60BLEDE7 0_XXXXX_R3	ers2_f3b1740-1 20-277v_tcm201-
MH - Row 2	40	40
Setback - Row 2	6	6
+Orient - Row 2	0	0
Tilt - Row 2	0	0
Spin - Row 2	0	0
Spacing - Row 2	260	260
<b>1 Luminance (Cd/SqM)</b>		
Average	0.58	0.55
Maximum	1.07	0.92

---

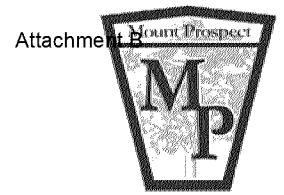
**Roadway Optimizer - Layout Comparison - Cont.**

	<b>Layout 1</b>	<b>Layout 2</b>
Minimum	0.28	0.30
Avg/Min Ratio	2.07	1.83
Max/Min Ratio	3.82	3.07
Max/Avg Ratio	1.84	1.67
<hr/>		
<b>1_Illum (Fc)</b>		
Average	0.85	0.74
Maximum	2.05	2.18
Minimum	0.22	0.16
Avg/Min Ratio	3.86	4.63
Max/Min Ratio	9.32	13.63
Max/Avg Ratio	2.41	2.95
<hr/>		
<b>1_Vis_Level</b>		
STV	4.59	3.29
<hr/>		
<b>1_Vis_Level_Bkgd_Lum (Cd/SqM)</b>		
Average	0.58	0.55
Maximum	1.06	0.94
Minimum	0.27	0.29
Avg/Min Ratio	2.15	1.90
Max/Min Ratio	3.93	3.24
Max/Avg Ratio	1.83	1.71
<hr/>		
<b>1_Vis_Level_Target_Lum (Cd/SqM)</b>		
Average	0.83	0.65
Maximum	2.40	1.90
Minimum	0.02	0.05
Avg/Min Ratio	41.50	13.00
Max/Min Ratio	120	38.00
Max/Avg Ratio	2.89	2.92
<hr/>		
<b>1_Veil_Lum (Cd/SqM)</b>		
Average	0.06	0.07
Maximum	0.16	0.13
Minimum	0.02	0.01
Avg/Min Ratio	3.00	7.00

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**Roadway Optimizer - Layout Comparison - Cont.**

	<b>Layout 1</b>	<b>Layout 2</b>
Max/Min Ratio	8.00	13.00
Max/Avg Ratio	2.67	1.86
MaxLV Ratio	0.28	0.24
Threshold Incr. (TI)	16.08	13.63



Village of Mount Prospect  
Street Lighting Capital Program  
Corridor Lighting Evaluation

**Appendix C – Photometric Calculations for Areas that Required Further Investigation**

Appendix C-1

6/20/2016

## LUMINAIRE PERFORMANCE SUMMARY

### Northwest Highway (U.S. Route 14) - Central Road to Fairview Avenue (Existing)

**Date:** 6/6/2016

**Designer:** Joe Vondra

**Project:** Village of Mount Prospect - Corridor Lighting Evaluation

IES Roadway Classification: Collector		Luminance				Sidewalk Area		
						Illuminance		
Pedestrian Conflict Classification: Medium		$L_{avg}$	$L_{avg}/L_{min}$	$L_{max}/L_{min}$	$L_v/L_{avg}$	$E_{Havg}$	$E_{Vmin}$	$E_{avg}/E_{min}$
<b>IES Recommended Levels</b>		0.6	3.5	6.0	0.4	0.5	0.2	4.0
<b>Manufacturer:</b> GE Lighting		1.07	3.96	7.37	0.21	0.53	0.40	1.33
<b>Curve #:</b> GE451002	<b>Distribution:</b> M-III							

### DESIGN PARAMETERS

Combined LLF	<u>0.7</u>	Spacing	<u>160'</u>
Lamp lumens	<u>50,000</u>	Light Pole Set Back $SB_{LP}$	<u>7.5'</u>
Roadway Width $W_R$	<u>70'</u>	Mounting Height	<u>40'</u>
Number of Lanes	<u>6</u>	Mast Arm	<u>15'</u>
Lane Width $W_L$	<u>11.67'</u>	Sidewalk Set Back $SB_{SW}$	<u>0'</u>
Layout	<u>Single Sided</u>	Sidewalk Width $W_{SW}$	<u>7'</u>

## Luminaire Schedule

Symbol	Qty	Label	Arrangement	Total Lamp Lumens	LLF	Description
—	7	ge451002_tcm201-66198	SINGLE	51000	0.700	GE M-400A 400W HPS TYPE MC3 -15' ARM

## Numeric Summary

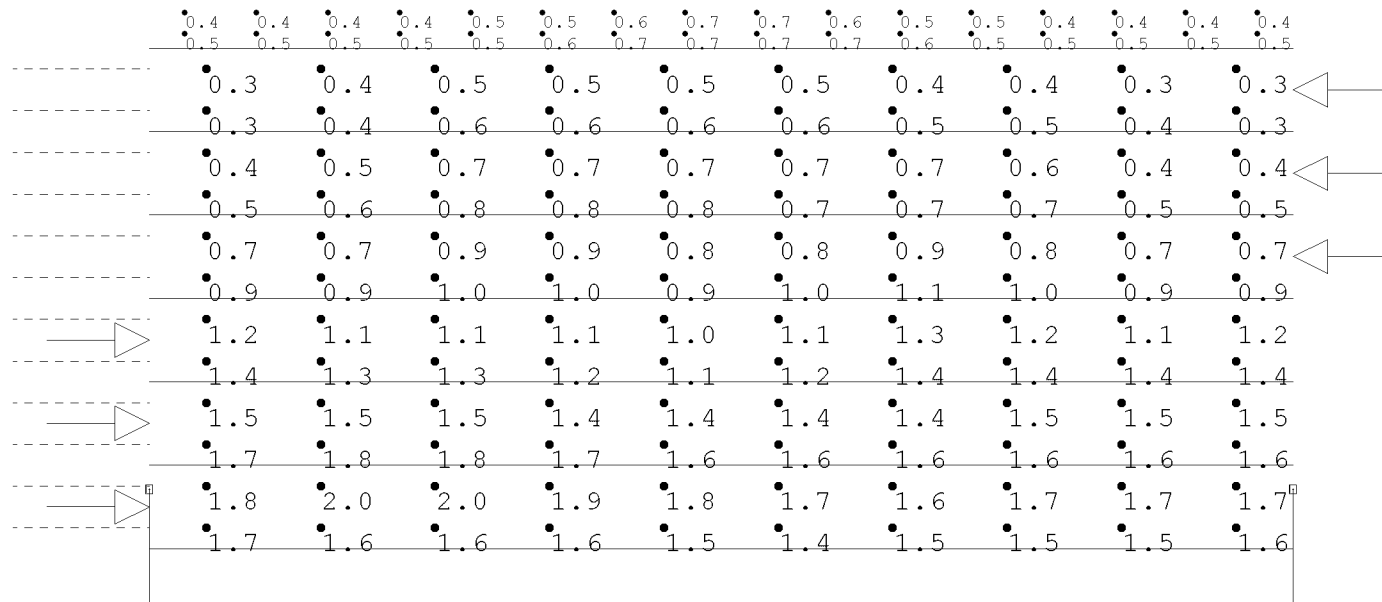
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
Pedestrian_Area	Illuminance	Fc	0.53	0.7	0.4	1.33	1.75
RoadOpt_1_Luminance	L_Roadway	Cd/Sq	1.07	2.0	0.3	3.57	6.67
RoadOpt_1_Veil_Lum	L_Veiling_Roadwa	Cd/Sq	0.11	0.23	0.01	11.00	23.00

## Luminaire Location Summary

LumNo	Label	X	Y	Z	Orient	Tilt
1	ge451002_tcm201-66198	-320	-7.5	40	90	0
2	ge451002_tcm201-66198	-160	-7.5	40	90	0
3	ge451002_tcm201-66198	0	-7.5	40	90	0
4	ge451002_tcm201-66198	160	-7.5	40	90	0
5	ge451002_tcm201-66198	320	-7.5	40	90	0
6	ge451002_tcm201-66198	480	-7.5	40	90	0
7	ge451002_tcm201-66198	640	-7.5	40	90	0

**Village of Mount Prospect**  
**Corridor Lighting Evaluation**  
 Northwest Highway (U.S. Route 14)  
 Central Road to Fairview Avenue  
 Existing Lighting Calculations

**Ciorba Group, Inc.**  
 5507 N. Cumberland Ave  
 Chicago, IL 60656  
 (773) 775-4009  
 www.ciorba.com



View of point by point

<p><b>Village of Mount Prospect</b>  <b>Corridor Lighting Evaluation</b>          Northwest Highway (U.S. Route 14)          Central Road to Fairview Avenue          Existing Lighting Calculations</p>	<p><b>Ciorba Group, Inc.</b>          5507 N. Cumberland Ave          Chicago, IL 60656          (773) 775-4009          www.ciorba.com</p>
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## LUMINAIRE PERFORMANCE SUMMARY

### Northwest Highway (U.S. Route 14) - Central Road to Fairview Avenue (LED)

**Date:** 6/6/2016

**Designer:** Joe Vondra

**Project:** Village of Mount Prospect - Corridor Lighting Evaluation

IES Roadway Classification: Collector		Luminance				Sidewalk Area		
						Illuminance		
Pedestrian Conflict Classification: Medium		$L_{avg}$	$L_{avg}/L_{min}$	$L_{max}/L_{min}$	$L_v/L_{avg}$	$E_{Havg}$	$E_{Vmin}$	$E_{avg}/E_{min}$
<b>IES Recommended Levels</b>		0.6	3.5	6.0	0.4	0.5	0.2	4.0
<b>Manufacturer:</b> American Electric		0.88	2.75	5.72	0.26	0.69	0.60	1.15
<b>Curve #:</b> ATB2_80BLEDE10_XXXXX_MC-III	<b>Distribution:</b>							

### DESIGN PARAMETERS

Combined LLF	<u>0.7</u>	Spacing	<u>160'</u>
Lamp lumens	<u>30,491</u>	Light Pole Set Back $SB_{LP}$	<u>7.5'</u>
Roadway Width $W_R$	<u>70'</u>	Mounting Height	<u>40'</u>
Number of Lanes	<u>6</u>	Mast Arm	<u>15'</u>
Lane Width $W_L$	<u>11.67'</u>	Sidewalk Set Back $SB_{SW}$	<u>0'</u>
Layout	<u>Single Sided</u>	Sidewalk Width $W_{SW}$	<u>7'</u>

## Luminaire Schedule

Symbol	Qty	Label	Arrangement	Total Lamp Lumens	LLF	Description
—	7	ATB2_80BLEDE10_XXXXX_R3	SINGLE	N.A.	0.700	ATB2 80BLEDE10 XXXXX R3

## Numeric Summary

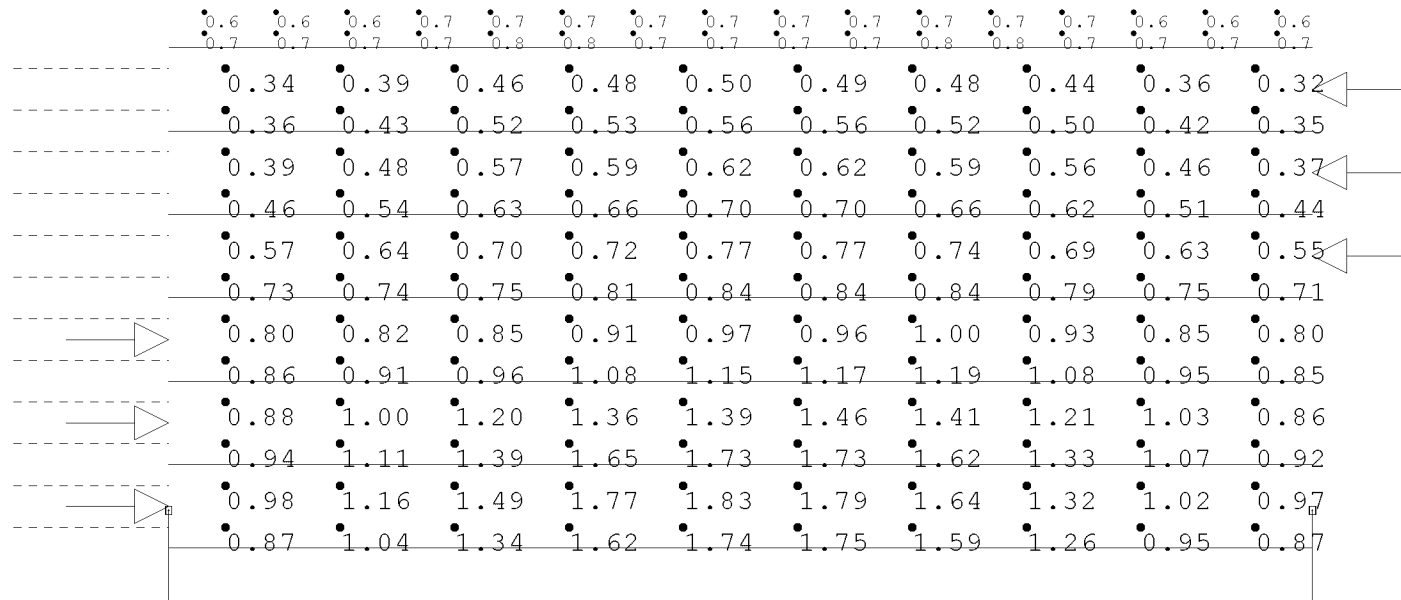
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
Pedestrian_Area	Illuminance	Fc	0.69	0.8	0.6	1.15	1.33
RoadOpt_1_Luminance	L_Roadway	Cd/Sq	0.88	1.83	0.32	2.75	5.72
RoadOpt_1_Veil_Lum	L_Veiling_Roadwa	Cd/Sq	0.10	0.23	0.02	5.00	11.50

## Luminaire Location Summary

LumNo	Label	X	Y	Z	Orient	Tilt
1	ATB2_80BLEDE10_XXXXX_R3	-320	-7.5	40	90	0
2	ATB2_80BLEDE10_XXXXX_R3	-160	-7.5	40	90	0
3	ATB2_80BLEDE10_XXXXX_R3	0	-7.5	40	90	0
4	ATB2_80BLEDE10_XXXXX_R3	160	-7.5	40	90	0
5	ATB2_80BLEDE10_XXXXX_R3	320	-7.5	40	90	0
6	ATB2_80BLEDE10_XXXXX_R3	480	-7.5	40	90	0
7	ATB2_80BLEDE10_XXXXX_R3	640	-7.5	40	90	0

**Village of Mount Prospect**  
**Corridor Lighting Evaluation**  
 Northwest Highway (U.S. Route 14)  
 Central Road to Fairview Avenue  
 LED Lighting Calculations

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View of point by point

<p><b>Village of Mount Prospect</b>  <b>Corridor Lighting Evaluation</b>          Northwest Highway (U.S. Route 14)          Central Road to Fairview Avenue          LED Lighting Calculations</p>	<p><b>Ciorba Group, Inc.</b>          5507 N. Cumberland Ave          Chicago, IL 60656          (773) 775-4009          www.ciorba.com</p>
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## LUMINAIRE PERFORMANCE SUMMARY

### Northwest Highway (U.S. Route 14) - Evergreen Avenue to Mount Prospect Road (Existing)

**Date:** 6/6/2016  
**Designer:** Joe Vondra  
**Project:** Village of Mount Prospect - Corridor Lighting Evaluation

IES Roadway Classification: Collector		Luminance				Sidewalk Area		
						Illuminance		
Pedestrian Conflict Classification: Medium		$L_{avg}$	$L_{avg}/L_{min}$	$L_{max}/L_{min}$	$L_v/L_{avg}$	$E_{Havg}$	$E_{Vmin}$	$E_{avg}/E_{min}$
<b>IES Recommended Levels</b>		0.6	3.5	6.0	0.4	0.5	0.2	4.0
<b>Manufacturer:</b> GE Lighting	<b>Distribution:</b> M-III	1.08	3.27	5.7	0.22	1.36	0.90	1.51
<b>Curve #:</b> GE451002								

## DESIGN PARAMETERS

Combined LLF	<u>0.7</u>	Spacing	<u>170'</u>
Lamp lumens	<u>50,000</u>	Light Pole Set Back $SB_{LP}$	<u>7.5'</u>
Roadway Width $W_R$	<u>54'</u>	Mounting Height	<u>40'</u>
Number of Lanes	<u>4</u>	Mast Arm	<u>10'</u>
Lane Width $W_L$	<u>13.5'</u>	Sidewalk Set Back $SB_{SW}$	<u>0'</u>
Layout	<u>Single Sided</u>	Sidewalk Width $W_{SW}$	<u>14'</u>

## Luminaire Schedule

Symbol	Qty	Label	Arrangement	Total Lamp Lumens	LLF	Description
—	13	ge451002_tcm201-66198	SINGLE	51000	0.700	GE M-400A 400W HPS TYPE MC3 -15' ARM

## Numeric Summary

Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
Pedestrian_Area	Illuminance	Fc	1.53	3.4	0.5	3.06	6.80
RoadOpt_1_Luminance	L_Roadway	Cd/Sq	1.65	2.00	1.22	1.35	1.64
RoadOpt_1_Veil_Lum	L_Veiling_Roadwa	Cd/Sq	0.16	0.25	0.10	1.60	2.50

## Luminaire Location Summary

LumNo	Label	X	Y	Z	Orient	Tilt
1	ge451002_tcm201-66198	-400	-8	40	90	0
2	ge451002_tcm201-66198	-200	-8	40	90	0
3	ge451002_tcm201-66198	0	-8	40	90	0
4	ge451002_tcm201-66198	200	-8	40	90	0
5	ge451002_tcm201-66198	400	-8	40	90	0
6	ge451002_tcm201-66198	600	-8	40	90	0
7	ge451002_tcm201-66198	800	-8	40	90	0
8	ge451002_tcm201-66198	-300	80	40	270	0
9	ge451002_tcm201-66198	-100	80	40	270	0
10	ge451002_tcm201-66198	100	80	40	270	0
11	ge451002_tcm201-66198	300	80	40	270	0
12	ge451002_tcm201-66198	500	80	40	270	0
13	ge451002_tcm201-66198	700	80	40	270	0

**Village of Mount Prospect  
Corridor Lighting Evaluation**  
Rand Road at  
Mount Prospect Road  
Existing Lighting Calculations

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	0.5	0.6	0.6	0.7	0.9	1.2	1.6	2.2	2.9	3.2	3.2	2.9	2.2	1.6	1.2	0.9	0.7	0.6	0.6	0.5
	0.7	0.7	0.7	0.8	1.0	1.3	1.8	2.5	3.2	3.4	3.4	3.2	2.5	1.8	1.3	1.0	0.8	0.7	0.7	0.7
-----	1.65	1.59	1.53	1.65	1.73	1.80	1.54	1.52	1.27	1.25	1.42	1.64	1.67							
-----	1.90	1.85	1.81	1.79	1.85	1.98	1.71	1.66	1.45	1.50	1.75	2.00	1.96							
-----	1.75	1.76	1.82	1.84	1.88	1.97	1.72	1.67	1.46	1.50	1.68	1.83	1.76							
-----	1.55	1.60	1.76	1.76	1.87	2.00	1.68	1.74	1.44	1.41	1.49	1.58	1.56							
-----	1.44	1.50	1.72	1.76	1.81	1.76	1.58	1.64	1.49	1.47	1.48	1.46	1.40							
-----	1.47	1.47	1.67	1.68	1.61	1.63	1.39	1.59	1.52	1.60	1.54	1.49	1.50							
====>	1.66	1.55	1.52	1.60	1.50	1.49	1.29	1.48	1.55	1.78	1.65	1.64	1.70							
-----	1.78	1.57	1.45	1.49	1.50	1.43	1.31	1.46	1.63	1.82	1.78	1.83	1.86							
====>	1.83	1.52	1.39	1.43	1.59	1.57	1.51	1.55	1.75	1.75	1.79	1.88	1.93							
-----	1.80	1.56	1.43	1.58	1.80	1.78	1.74	1.74	1.78	1.83	1.85	1.94	1.93							
====>	1.67	1.54	1.43	1.60	1.92	1.98	1.93	1.86	1.83	1.76	1.84	1.94	1.89							
-----	1.61	1.38	1.22	1.32	1.55	1.65	1.66	1.63	1.55	1.60	1.67	1.78	1.76							

View of point by point

<p><b>Village of Mount Prospect</b>  <b>Corridor Lighting Evaluation</b>          Rand Road at          Mount Prospect Road          Existing Lighting Calculations</p>	<p><b>Ciorba Group, Inc.</b>          5507 N. Cumberland Ave          Chicago, IL 60656          (773) 775-4009          www.ciorba.com</p>
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## LUMINAIRE PERFORMANCE SUMMARY

**Rand Road (U.S. Route 12) - Elmhurst Road to Henry Street (Existing)**

**Date:** 6/6/2016

**Designer:** Joe Vondra

**Project:** Village of Mount Prospect - Corridor Lighting Evaluation

IES Roadway Classification: Major		Luminance				Sidewalk Area		
						Illuminance		
Pedestrian Conflict Classification: Low		$L_{avg}$	$L_{avg}/L_{min}$	$L_{max}/L_{min}$	$L_v/L_{avg}$	$E_{Havg}$	$E_{Vmin}$	$E_{avg}/E_{min}$
IES Recommended Levels		0.6	3.5	6.0	0.3	0.4	0.1	4.0
<b>Manufacturer:</b>	GE Lighting	1.65	1.35	1.64	0.15	1.53	0.50	3.06
<b>Curve #:</b>	<b>Distribution:</b>							
GE451002	M-III							

### DESIGN PARAMETERS

Combined LLF	<u>0.7</u>	Spacing	<u>200'</u>
Lamp lumens	<u>50,000</u>	Light Pole Set Back $SB_{LP}$	<u>8'</u>
Roadway Width $W_R$	<u>72'</u>	Mounting Height	<u>40'</u>
Number of Lanes	<u>6</u>	Mast Arm	<u>15'</u>
Lane Width $W_L$	<u>12'</u>	Sidewalk Set Back $SB_{SW}$	<u>0'</u>
Layout	<u>Single Sided</u>	Sidewalk Width $W_{SW}$	<u>12'</u>

## Luminaire Schedule

Symbol	Qty	Label	Arrangement	Total Lamp Lumens	LLF	Description
—e	14	ge451002_tcm201-66198-10	SINGLE	51000	0.700	GE M-400A 400W HPS TYPE MC3 -10' ARM

## Numeric Summary

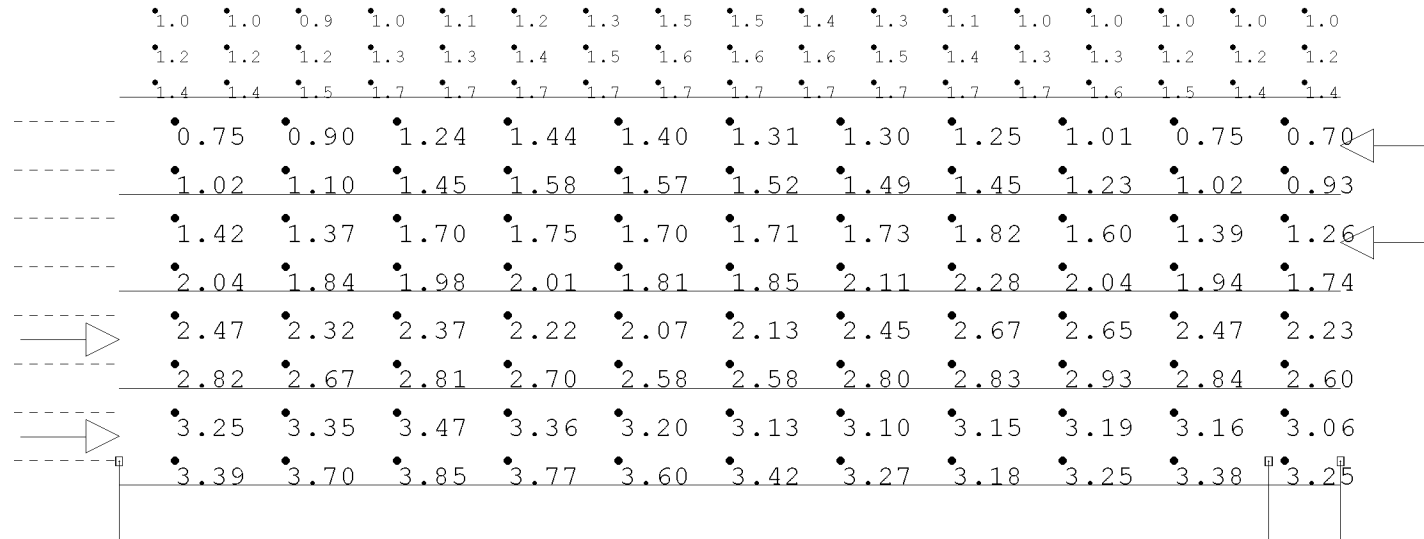
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
Pedestrian_Area	Illuminance	Fc	1.36	1.7	0.9	1.51	1.89
RoadOpt_1_Luminance	L_Roadway	Cd/Sq	2.22	3.85	0.70	3.17	5.50
RoadOpt_1_Veil_Lum	L_Veiling_Roadwa	Cd/Sq	0.23	0.49	0.03	7.67	16.33

## Luminaire Location Summary

LumNo	Label	X	Y	Z	Orient	Tilt
1	ge451002_tcm201-66198-10	-320	-7.5	40	90	0
2	ge451002_tcm201-66198-10	-160	-7.5	40	90	0
3	ge451002_tcm201-66198-10	0	-7.5	40	90	0
4	ge451002_tcm201-66198-10	160	-7.5	40	90	0
5	ge451002_tcm201-66198-10	320	-7.5	40	90	0
6	ge451002_tcm201-66198-10	480	-7.5	40	90	0
7	ge451002_tcm201-66198-10	640	-7.5	40	90	0
8	ge451002_tcm201-66198-10	-340	-7.5	40	90	0
9	ge451002_tcm201-66198-10	-170	-7.5	40	90	0
10	ge451002_tcm201-66198-10	0	-7.5	40	90	0
11	ge451002_tcm201-66198-10	170	-7.5	40	90	0
12	ge451002_tcm201-66198-10	340	-7.5	40	90	0
13	ge451002_tcm201-66198-10	510	-7.5	40	90	0
14	ge451002_tcm201-66198-10	680	-7.5	40	90	0

**Village of Mount Prospect**  
**Corridor Lighting Evaluation**  
 Northwest Highway (U.S. Route 14)  
 Evergreen Avenue to Mount Prospect Road  
 Existing Lighting Calculations

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 (773) 775-4009  
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View of point by point

<p><b>Village of Mount Prospect</b>  <b>Corridor Lighting Evaluation</b>          Northwest Highway (U.S. Route 14)          Evergreen Avenue to Mount Prospect Road          Existing Lighting Calculations</p>	<p><b>Ciorba Group, Inc.</b>          5507 N. Cumberland Ave          Chicago, IL 60656          (773) 775-4009          www.ciorba.com</p>
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Village of Mount Prospect  
 Street Lighting Capital Program  
 Corridor Lighting Evaluation

**Appendix D – VOMP Police Department Correspondence**

**From:** Joseph M. Vondra, PE, LC  
**Sent:** Monday, June 06, 2016 11:12 AM  
**To:** 'Eterno, Mike'  
**Subject:** RE: VOMP Street Lighting

Mike,

Thank you for the response. No worries in the delay, your timing is perfect as I just received a request to meet with Public Works tomorrow. I will incorporate your response into the report and discuss tomorrow.

Thanks again!

Joe

**From:** Eterno, Mike [<mailto:MEterno@mountprospect.org>]  
**Sent:** Monday, June 06, 2016 10:56 AM  
**To:** Joseph M. Vondra, PE, LC  
**Subject:** RE: VOMP Street Lighting

Joe,

I apologize for the delay in responding to your email, but I was out of the office a good portion last week, due to meetings and other commitments. We did speak and while it would be great to install street lights in all of these locations we understand that's not a logistical possibility. And as such we believe the following locations, based on the volume of pedestrian and/or bicycle traffic, would benefit from the installation of street lights:

- Busse Road
  - I-90 to Algonquin Road
  - Dempster Street to Golf Road
- Dempster Street
  - Redwood Drive to Elmhurst Road
- Golf Road (IL 58)
  - Goebbert Road to Mount Prospect Road
- Main Street (IL 83)
  - Central Road to Camp McDonald Road
- Rand Road
  - Central Road to Euclid Avenue

Village of Mount Prospect  
Street Lighting Capital Program  
Corridor Lighting Evaluation

I hope this helps and again, I apologize for the late response. Please let me know if you need any additional information or any other assistance.

Mike

**Mike Eterno**  
***Deputy Chief of Police***  
***Field Operations Division***



***Mount Prospect Police Department***  
*112 E. Northwest Highway*  
*Mount Prospect, IL 60056*  
**(847) 870-5679**  
**(847) 392-1070 - fax**  
[meterno@mountprospect.org](mailto:meterno@mountprospect.org)

**From:** Joseph M. Vondra, PE, LC [<mailto:jvondra@ciorba.com>]  
**Sent:** Wednesday, June 01, 2016 2:52 PM  
**To:** Eterno, Mike  
**Subject:** RE: VOMP Street Lighting

Mike,

Just checking in to see if you have had a chance to discuss this. I'd like to submit to Public Works next week and want to make sure my ducks are in a row.

Thank you,

Joe

**From:** Eterno, Mike [<mailto:MEterno@mountprospect.org>]  
**Sent:** Monday, May 23, 2016 5:51 PM  
**To:** Joseph M. Vondra, PE, LC  
**Subject:** RE: VOMP Street Lighting

Joseph,

Village of Mount Prospect  
Street Lighting Capital Program  
Corridor Lighting Evaluation

I wanted to let you know I have received your email and I will be meeting with my supervisory staff later this week. Once we've had a chance to sit down and discuss, I'll let you know what we come up with.

Mike

**Mike Eterno**  
**Deputy Chief of Police**  
**Field Operations Division**



**Mount Prospect Police Department**  
112 E. Northwest Highway  
Mount Prospect, IL 60056  
(847) 870-5679  
(847) 392-1070 - fax  
[meterno@mountprospect.org](mailto:meterno@mountprospect.org)

**From:** Joseph M. Vondra, PE, LC [<mailto:jvondra@ciorba.com>]  
**Sent:** Thursday, May 19, 2016 1:30 PM  
**To:** Eterno, Mike  
**Subject:** VOMP Street Lighting

Deputy Chief Eterno,

My company is working for the VOMP Public Works department, studying the potential installation of new street lighting along several key routes within the Village. At this time, there are no definite plans to install additional lights, but Public Works has asked us to identify the potential cost as well as recommend a plan for installation. This study will be included in the Village's 2016-21 strategic planning process. We recently completed a survey of the key routes and have identified the locations listed below for the installation of street lighting.

As part of our recommendation, we would like to include input from the VOMP Police Department. Your input will be considered along with traffic volumes, adjacent land use and roadway configuration to prioritize these potential improvements. **Can you review the list below and identify locations that, in your opinion, will benefit the most from the installation of street lighting?** Feel free to add other comments such as high accident locations or other concerns that you may be aware of.

- Algonquin Road
  - Busse Road to Elmhurst Road

Appendix D-3

6/20/2016

Village of Mount Prospect  
Street Lighting Capital Program  
Corridor Lighting Evaluation

- Busse Road
  - I-90 to Algonquin Road
  - Dempster Street to Central Road
- Central Road
  - Emerson Street to Edward Street
- Dempster Street (IL 59)
  - Redwood Drive to Elmhurst Road
- Euclid Avenue
  - Rand Road to Des Plaines River Road
- Golf Road (IL 58)
  - Goebbert Road to Mount Prospect Road
- Main Street (IL 83)
  - Oakton Street to Sunset Road
  - Central Road to Camp McDonald Road
- Rand Road
  - Central Road to Euclid Avenue
  - Euclid Avenue to Camp McDonald Road

Please contact me with any questions of if you prefer to discuss this over the phone.

Thank you for your assistance with this study.

Joe

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**Joseph M. Vondra, PE, LC**  
Lighting, Traffic Signal & ITS Project Engineer

**CIORBA GROUP** | Consulting Engineers  
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[www.ciorba.com](http://www.ciorba.com)  
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Village of Mount Prospect  
 Street Lighting Capital Program  
 Corridor Lighting Evaluation

**Appendix E – Electricity Charges Calculations**

**Average Monthly Electricity Charges (2015)**

<b>Month</b>	<b>Amount</b>
January	\$ 8,998.82
February	\$ 6,694.76
March	\$ 6,598.78
April	\$ 5,028.99
May	\$ 4,693.42
<del>June</del>	<del>\$ 1,253.26</del>
<del>July</del>	<del>\$ 1,523.97</del>
August	\$ 4,692.25
September	\$ 5,015.68
October	\$ 5,866.08
November	\$ 6,354.91
December	\$ 7,216.99
Average:	\$ 6,200.00
Year (Avg. x 12):	\$ 75,000.00

Note that the months of June and July were not included in the average because they were abnormally low when compared to all other months.

Village of Mount Prospect  
 Street Lighting Capital Program  
 Corridor Lighting Evaluation

**Dollar per Watt Calculation**

Currently installed inventory:

Type	Wattage	Quantity (1)	Input Watts (2)	Extended Watts
HPS	50	44	64	2,816
	70	21	87	1,827
	100	7	120	840
	150	232	183	42,456
	175	1	208	208
	200	52	240	12,480
	250	191	305	58,255
	400	244	478	116,632
MV	150	88	175	15,400
	175	2	208	416
	200	2	244	488
	250	24	291	6,984
	400	1	456	456
LED	100 equiv.	5	100	500
	200 equiv.	2	150	300
	250 equiv.	65	200	13,000
Halogen	50	20	70	1,400
	250	1	305	305
MH	50	11	70	770
	250	7	291	2,037
<b>Totals:</b>		<b>1,013</b>		<b>275,533</b>

**Installed Load**  
**(Watts):**           **275,533**  
**Yearly Electric Cost:**   **\$ 75,000.00**  
                                   **\$/W**   **\$     0.28**

Note 1 – lamps of an unknown wattage were assigned to the most common wattage for that light source type.

Note 2 – input watts are based on GE ballast data at 240 volts.

Village of Mount Prospect  
 Street Lighting Capital Program  
 Corridor Lighting Evaluation

**Proposed Street Lighting Annual Electricity Charges Calculation**

Corridor	# of Luminaires	Input Watts	Extended Watts
Algonquin Road	65	130	8,450
Busse Road	34	151	5,134
	38	148	5,624
	14	222	3,108
	55	88	4,840
Central Road	22	189	4,158
Dempster Street	48	196	9,408
Euclid Avenue	77	196	15,092
	79	274	21,646
Golf Road	91	274	24,934
Main Street	123	130	15,990
	36	222	7,992
	66	151	9,966
	19	274	5,206
Rand Road	77	151	11,627
	12	274	3,288
	48	130	6,240
<b>Totals:</b>	<b>904</b>		<b>162,703</b>

**Extended Watts: 162,703**  
**Number of New Luminaires: 904**  
**Watts/Luminaire: 180**

Luminaires	Quantity	Watts per Luminaire	\$/W	Annual Cost
New	904	180	0.28	\$ 45,600.00
Retrofit	1,013	180	0.28	\$ 51,100.00

**\$ 96,700.00**

Village of Mount Prospect  
 Street Lighting Capital Program  
 Corridor Lighting Evaluation

**Appendix F – Maintenance Expense Calculations**

Year	Work Order #	# of Electrician Hours with No Cost	Electrician Labor (\$36.52/hr)	Other Labor (from Work Order)	Total Labor	Benefits	Vehicle & Materials	Total
2014	869899	24.0	\$ 876.48	\$ 3,283.44	\$ 4,159.92	\$ 4,159.92	\$ 1,733.68	\$ 10,053.52
2014	869900		\$ -	\$ 1,026.60	\$ 1,026.60	\$ 1,026.60	\$ 606.25	\$ 2,659.45
2014	869913	4.0	\$ 146.08	\$ 170.96	\$ 317.04	\$ 317.04	\$ 336.81	\$ 970.89
2014	869914	2.0	\$ 73.04	\$ 85.48	\$ 158.52	\$ 158.52	\$ 168.40	\$ 485.44
2014	877293	1.5	\$ 54.78	\$ 64.11	\$ 118.89	\$ 118.89	\$ 277.53	\$ 515.31
2014	877295	0.5	\$ 18.26	\$ 21.37	\$ 39.63	\$ 39.63	\$ 61.99	\$ 141.25
2014	901396		\$ -	\$ 2,257.68	\$ 2,257.68	\$ 2,257.68	\$ 1,896.64	\$ 6,412.00
2014	901397				\$ -	\$ -		\$ -
2014	901398				\$ -	\$ -		\$ -
2014	901399				\$ -	\$ -		\$ -
2014	901400		\$ -	\$ 2,154.60	\$ 2,154.60	\$ 2,154.60	\$ 5,879.72	\$ 10,188.92
2014	907477	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 68.26	\$ 226.78
2014	907478	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 124.45	\$ 282.97
2014	907479	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 78.07	\$ 236.59
2014	907480	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 134.26	\$ 292.78
2014	907586	0.5	\$ 18.26	\$ 21.37	\$ 39.63	\$ 39.63	\$ 39.05	\$ 118.31
2014	907587	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 331.69	\$ 490.21
2014	907595	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 331.69	\$ 490.21
2014	907816	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 83.08	\$ 241.60
2014	907904	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 83.08	\$ 241.60
2014	907910	0.5	\$ 18.26	\$ 21.37	\$ 39.63	\$ 39.63	\$ 41.29	\$ 120.55
2014	907916	0.5	\$ 18.26	\$ 21.37	\$ 39.63	\$ 39.63	\$ 41.29	\$ 120.55
2014	907992	1.5	\$ 54.78	\$ 64.11	\$ 118.89	\$ 118.89	\$ 566.94	\$ 804.72
2014	907994	2.0	\$ 73.04	\$ 85.48	\$ 158.52	\$ 158.52	\$ 359.25	\$ 676.29
2014	907995	2.0	\$ 73.04	\$ 85.48	\$ 158.52	\$ 158.52	\$ 359.25	\$ 676.29
2014	908002	1.0	\$ 36.52	\$ 51.34	\$ 87.86	\$ 87.86	\$ 126.64	\$ 302.36
2014	908003	1.0	\$ 36.52	\$ 51.34	\$ 87.86	\$ 87.86	\$ 126.64	\$ 302.36
2014	908005	1.5	\$ 54.78	\$ -	\$ 54.78	\$ 54.78	\$ 328.94	\$ 438.50
2014	908006	2.0	\$ 73.04	\$ 85.48	\$ 158.52	\$ 158.52	\$ 174.46	\$ 491.50
2014	908192	0.75	\$ 27.39	\$ 32.06	\$ 59.45	\$ 59.45	\$ 56.30	\$ 175.20
2014	908194	0.75	\$ 27.39	\$ 32.06	\$ 59.45	\$ 59.45	\$ 56.30	\$ 175.20
2014	908195	0.75	\$ 27.39	\$ 32.06	\$ 59.45	\$ 59.45	\$ 56.30	\$ 175.20
2014	908196	0.75	\$ 27.39	\$ 32.06	\$ 59.45	\$ 59.45	\$ 56.30	\$ 175.20

Village of Mount Prospect  
 Street Lighting Capital Program  
 Corridor Lighting Evaluation

Year	Work Order #	# of Electrician Hours with No Cost	Electrician Labor (\$36.52/hr)	Other Labor (from Work Order)	Total Labor	Benefits	Vehicle & Materials	Total
2014	908257	0.75	\$ 27.39	\$ 32.06	\$ 59.45	\$ 59.45	\$ 87.23	\$ 206.13
2014	908260	1.5	\$ 54.78	\$ 64.12	\$ 118.90	\$ 118.90	\$ 232.80	\$ 470.60
2014	908262	1.5	\$ 54.78	\$ 64.12	\$ 118.90	\$ 118.90	\$ 246.64	\$ 484.44
2015	909861	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 71.23	\$ 229.75
2015	909862	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 71.23	\$ 229.75
2015	909863	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 71.23	\$ 229.75
2015	909864	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 71.23	\$ 229.75
2015	909865	2.5	\$ 91.30	\$ 106.86	\$ 198.16	\$ 198.16	\$ 307.26	\$ 703.58
2015	909866	2.0	\$ 73.04	\$ 85.48	\$ 158.52	\$ 158.52	\$ 276.96	\$ 594.00
2015	910336	2.0	\$ 73.04	\$ 85.48	\$ 158.52	\$ 158.52	\$ 276.96	\$ 594.00
2015	910337	1.0	\$ 36.52	\$ 51.33	\$ 87.85	\$ 87.85	\$ 71.23	\$ 246.93
2015	910339	2.0	\$ 73.04	\$ 85.48	\$ 158.52	\$ 158.52	\$ 276.96	\$ 594.00
2015	910341	3.0	\$ 109.56	\$ 128.22	\$ 237.78	\$ 237.78	\$ 337.58	\$ 813.14
2015	910342	3.0	\$ 109.56	\$ 128.22	\$ 237.78	\$ 237.78	\$ 337.58	\$ 813.14
2015	910686	2.0	\$ 73.04	\$ 85.48	\$ 158.52	\$ 158.52	\$ 187.28	\$ 504.32
2015	910697	2.0	\$ 73.04	\$ 85.48	\$ 158.52	\$ 158.52	\$ 172.56	\$ 489.60
2015	910698	2.0	\$ 73.04	\$ 85.48	\$ 158.52	\$ 158.52	\$ 172.56	\$ 489.60
2015	910700	2.0	\$ 73.04	\$ 85.48	\$ 158.52	\$ 158.52	\$ 172.56	\$ 489.60
2015	910701	2.0	\$ 73.04	\$ 85.48	\$ 158.52	\$ 158.52	\$ 172.56	\$ 489.60
2015	910704	3.0	\$ 109.56	\$ 128.22	\$ 237.78	\$ 237.78	\$ 449.49	\$ 925.05
2015	910931		\$ -	\$ 64.11	\$ 64.11	\$ 64.11	\$ 48.45	\$ 176.67
2015	911036		\$ -	\$ 256.44	\$ 256.44	\$ 256.44	\$ 449.49	\$ 962.37
2015	913520	2.5	\$ 91.30	\$ 106.86	\$ 198.16	\$ 198.16	\$ 217.58	\$ 613.90
2015	913521	3.75	\$ 136.95	\$ 160.29	\$ 297.24	\$ 297.24	\$ 494.94	\$ 1,089.42
2015	913522	42.0	\$ 1,533.84	\$ 1,795.08	\$ 3,328.92	\$ 3,328.92	\$ 1,384.04	\$ 8,041.88
2015	914432	6.0	\$ 219.12	\$ 256.44	\$ 475.56	\$ 475.56	\$ 1,208.61	\$ 2,159.73
2015	914433	6.0	\$ 219.12	\$ 256.44	\$ 475.56	\$ 475.56	\$ 1,236.78	\$ 2,187.90
2015	914436	5.0	\$ 182.60	\$ 85.48	\$ 268.08	\$ 268.08	\$ 187.28	\$ 723.44
2015	914448	2.0	\$ 73.04	\$ 85.48	\$ 158.52	\$ 158.52	\$ 184.14	\$ 501.18
2015	914449	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 60.63	\$ 219.15
2015	914542	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 78.82	\$ 237.34
2015	917908	4.0	\$ 146.08	\$ 205.32	\$ 351.40	\$ 351.40	\$ 2,561.77	\$ 3,264.57
2015	917909	4.0	\$ 146.08	\$ 205.32	\$ 351.40	\$ 351.40	\$ 476.93	\$ 1,179.73
2015	918291	2.0	\$ 73.04	\$ 85.48	\$ 158.52	\$ 158.52	\$ 169.42	\$ 486.46
2015	918292	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 72.71	\$ 231.23

Appendix F-2

6/20/2016

Village of Mount Prospect  
 Street Lighting Capital Program  
 Corridor Lighting Evaluation

Year	Work Order #	# of Electrician Hours with No Cost	Electrician Labor (\$36.52/hr)	Other Labor (from Work Order)	Total Labor	Benefits	Vehicle & Materials	Total
2015	918293	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 72.71	\$ 231.23
2015	918304	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 72.71	\$ 231.23
2015	918305	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 72.71	\$ 231.23
2015	925672	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 72.71	\$ 231.23
2015	925673	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 74.11	\$ 232.63
2015	925674	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 71.46	\$ 229.98
2015	925738	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 60.63	\$ 219.15
2015	925739	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 70.75	\$ 229.27
2015	925740	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 72.40	\$ 230.92
2015	925741	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 70.75	\$ 229.27
2015	925742	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 76.01	\$ 234.53
2015	925743	1.0	\$ 36.52	\$ 21.37	\$ 57.89	\$ 57.89	\$ 41.14	\$ 156.92
2015	925745	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 70.75	\$ 229.27
2015	925747	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 70.75	\$ 229.27
2015	925748	0.5	\$ 18.26	\$ 21.37	\$ 39.63	\$ 39.63	\$ 40.43	\$ 119.69
2015	925951	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 70.75	\$ 229.27
2015	925958	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 70.75	\$ 229.27
2015	925959	2.0	\$ 73.04	\$ 85.48	\$ 158.52	\$ 158.52	\$ 169.42	\$ 486.46
2015	925960	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 71.23	\$ 229.75
2015	925963	2.0	\$ 73.04	\$ 85.48	\$ 158.52	\$ 158.52	\$ 184.14	\$ 501.18
2015	923273	2.0	\$ 73.04	\$ 85.48	\$ 158.52	\$ 158.52	\$ 142.45	\$ 459.49
2015	926310	2.0	\$ 73.04	\$ 85.48	\$ 158.52	\$ 158.52	\$ 153.05	\$ 470.09
2015	926311	4.0	\$ 146.08	\$ 170.96	\$ 317.04	\$ 317.04	\$ 398.20	\$ 1,032.28
2015	926312	3.0	\$ 109.56	\$ 128.22	\$ 237.78	\$ 237.78	\$ 229.58	\$ 705.14
2015	927396	3.0	\$ 109.56	\$ 128.22	\$ 237.78	\$ 237.78	\$ 426.78	\$ 902.34
2015	927397	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 70.75	\$ 229.27
2015	925598	4.0	\$ 146.08	\$ 170.96	\$ 317.04	\$ 317.04	\$ 293.52	\$ 927.60
2015	925599	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 69.95	\$ 228.47
2015	928600	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 69.95	\$ 228.47
2015	928601	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 73.77	\$ 232.29
2015	928604	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 70.96	\$ 229.48
2015	928620	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 70.96	\$ 229.48
2015	934481	1.5	\$ 54.78	\$ 64.11	\$ 118.89	\$ 118.89	\$ 101.10	\$ 338.88
2015	934482	1.5	\$ 54.78	\$ 64.11	\$ 118.89	\$ 118.89	\$ 101.10	\$ 338.88
2015	934483	1.5	\$ 54.78	\$ 64.11	\$ 118.89	\$ 118.89	\$ 101.10	\$ 338.88

Village of Mount Prospect  
 Street Lighting Capital Program  
 Corridor Lighting Evaluation

Year	Work Order #	# of Electrician Hours with No Cost	Electrician Labor (\$36.52/hr)	Other Labor (from Work Order)	Total Labor	Benefits	Vehicle & Materials	Total
2015	934484	1.5	\$ 54.78	\$ 64.11	\$ 118.89	\$ 118.89	\$ 101.10	\$ 338.88
2015	934500	1.5	\$ 54.78	\$ 64.11	\$ 118.89	\$ 118.89	\$ 101.27	\$ 339.05
2015	934501	4.0	\$ 146.08	\$ 170.96	\$ 317.04	\$ 317.04	\$ 418.82	\$ 1,052.90
2015	934502	1.5	\$ 54.78	\$ 64.11	\$ 118.89	\$ 118.89	\$ 101.10	\$ 338.88
2015	934503	1.5	\$ 54.78	\$ 64.11	\$ 118.89	\$ 118.89	\$ 101.27	\$ 339.05
2015	934504	1.5	\$ 54.78	\$ 64.11	\$ 118.89	\$ 118.89	\$ 101.27	\$ 339.05
2015	934505	3.0	\$ 109.56	\$ 128.22	\$ 237.78	\$ 237.78	\$ 270.04	\$ 745.60
2015	934506	1.5	\$ 54.78	\$ 64.11	\$ 118.89	\$ 118.89	\$ 101.27	\$ 339.05
2015	934507	1.5	\$ 54.78	\$ 64.11	\$ 118.89	\$ 118.89	\$ 101.27	\$ 339.05
2015	934513	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 69.95	\$ 228.47
2015	934515	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 69.95	\$ 228.47
2015	934516	2.0	\$ 73.04	\$ 85.48	\$ 158.52	\$ 158.52	\$ 170.60	\$ 487.64
2015	936197	3.0	\$ 109.56	\$ 128.22	\$ 237.78	\$ 237.78	\$ 231.22	\$ 706.78
2015	936198		\$ -		\$ -	\$ -	\$ 711.24	\$ 711.24
2015	936199	3.0	\$ 109.56	\$ 128.22	\$ 237.78	\$ 237.78	\$ 358.20	\$ 833.76
2015	936201	4.0	\$ 146.08	\$ 170.96	\$ 317.04	\$ 317.04	\$ 716.66	\$ 1,350.74
2015	937419	2.5	\$ 91.30	\$ 235.18	\$ 326.48	\$ 326.48	\$ 2,438.47	\$ 3,091.43
2015	937420		\$ -	\$ 363.50	\$ 363.50	\$ 363.50	\$ 2,637.64	\$ 3,364.64
2015	937447		\$ -	\$ 683.84	\$ 683.84	\$ 683.84	\$ 185.74	\$ 1,553.42
2015	937448		\$ -	\$ 683.84	\$ 683.84	\$ 683.84	\$ 185.74	\$ 1,553.42
2015	937449		\$ -	\$ 683.84	\$ 683.84	\$ 683.84	\$ 185.74	\$ 1,553.42
2015	942316	20.0	\$ 730.40	\$ 1,881.40	\$ 2,611.80	\$ 2,611.80	\$ 1,628.80	\$ 6,852.40
2015	942537	2.0	\$ 73.04	\$ 85.48	\$ 158.52	\$ 158.52	\$ 151.96	\$ 469.00
2015	942539	2.0	\$ 73.04	\$ 85.48	\$ 158.52	\$ 158.52	\$ 175.50	\$ 492.54
2015	942543	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 70.96	\$ 229.48
2015	942544	2.0	\$ 73.04	\$ 85.48	\$ 158.52	\$ 158.52	\$ 297.58	\$ 614.62
2015	942546	8.0	\$ 292.16		\$ 292.16	\$ 292.16	\$ 98.84	\$ 683.16
2015	942547	108.0	\$ 3,944.16		\$ 3,944.16	\$ 3,944.16	\$ 1,253.88	\$ 9,142.20
2015	942548	108.0	\$ 3,944.16		\$ 3,944.16	\$ 3,944.16	\$ 1,253.88	\$ 9,142.20
2015	942602	3.0	\$ 109.56	\$ 128.22	\$ 237.78	\$ 237.78	\$ 202.54	\$ 678.10
2015	942603	40.5	\$ 1,479.06	\$ 1,730.97	\$ 3,210.03	\$ 3,210.03	\$ 2,734.29	\$ 9,154.35
2015	942604	40.5	\$ 1,479.06	\$ 1,730.97	\$ 3,210.03	\$ 3,210.03	\$ 4,835.70	\$ 11,255.76
2015	942605	40.5	\$ 1,479.06	\$ 1,730.97	\$ 3,210.03	\$ 3,210.03	\$ 4,556.79	\$ 10,976.85
2015	942606	3.0	\$ 109.56	\$ 128.22	\$ 237.78	\$ 237.78	\$ 202.54	\$ 678.10
2015	942607	40.5	\$ 1,479.06	\$ 1,730.97	\$ 3,210.03	\$ 3,210.03	\$ 2,455.38	\$ 8,875.44

Village of Mount Prospect  
 Street Lighting Capital Program  
 Corridor Lighting Evaluation

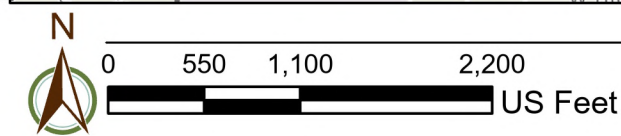
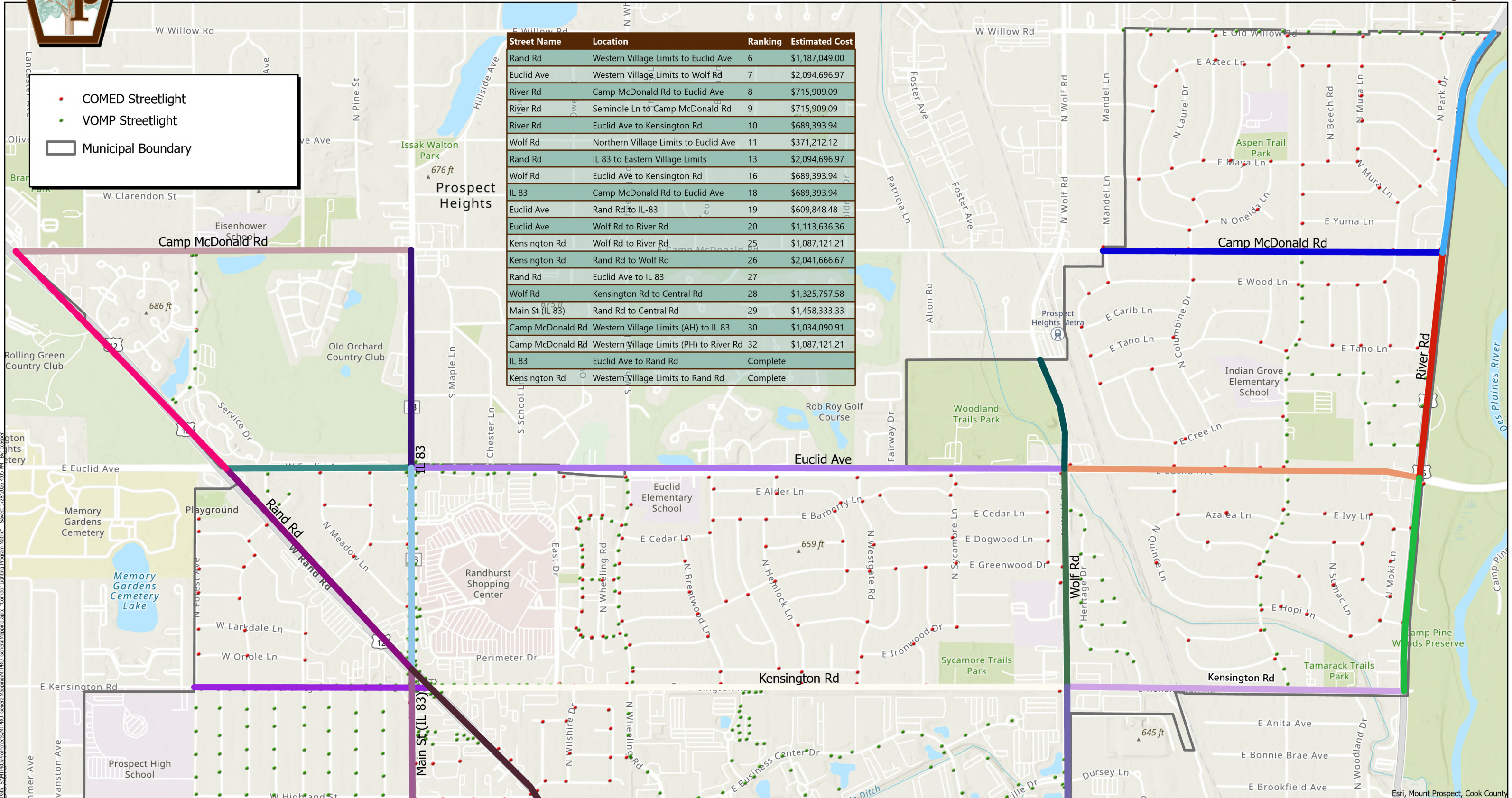
Year	Work Order #	# of Electrician Hours with No Cost	Electrician Labor (\$36.52/hr)	Other Labor (from Work Order)	Total Labor	Benefits	Vehicle & Materials	Total
2015	948982	8.0	\$ 292.16	\$ 683.84	\$ 976.00	\$ 976.00	\$ 485.01	\$ 2,437.01
2015	948986	8.0	\$ 292.16	\$ 1,094.48	\$ 1,386.64	\$ 1,386.64	\$ 780.19	\$ 3,553.47
2015	957175	1.0	\$ 36.52	\$ 42.74	\$ 79.26	\$ 79.26	\$ 109.96	\$ 268.48
2015	958162		\$ -	\$ 51.33	\$ 51.33	\$ 51.33	\$ 11.61	\$ 114.27
2015	959004	2.0	\$ 73.04	\$ 85.48	\$ 158.52	\$ 158.52	\$ 262.58	\$ 579.62
2015	959142	2.0	\$ 73.04	\$ 85.48	\$ 158.52	\$ 158.52	\$ 85.63	\$ 402.67
2015	959438	0.5	\$ 18.26	\$ 25.67	\$ 43.93	\$ 43.93	\$ 42.84	\$ 130.70
2015	959439	2.0	\$ 73.04	\$ 102.66	\$ 175.70	\$ 175.70	\$ 627.96	\$ 979.36
2015	959440	2.0	\$ 73.04	\$ 102.66	\$ 175.70	\$ 175.70	\$ 1,492.74	\$ 1,844.14
2015	959441	1.0	\$ 36.52	\$ 51.33	\$ 87.85	\$ 87.85	\$ 63.61	\$ 239.31
2015	959442	2.0	\$ 73.04	\$ 102.66	\$ 175.70	\$ 175.70	\$ 172.28	\$ 523.68
2015	959443	3.0	\$ 109.56	\$ 153.99	\$ 263.55	\$ 263.55	\$ 1,284.48	\$ 1,811.58

**2014-2015 Total: \$ 184,379.67**  
**\$/yr: \$ 92,189.84**  
**Say: \$ 95,000.00**



# Corridor Lighting Program Matrix

Map 1 of 4

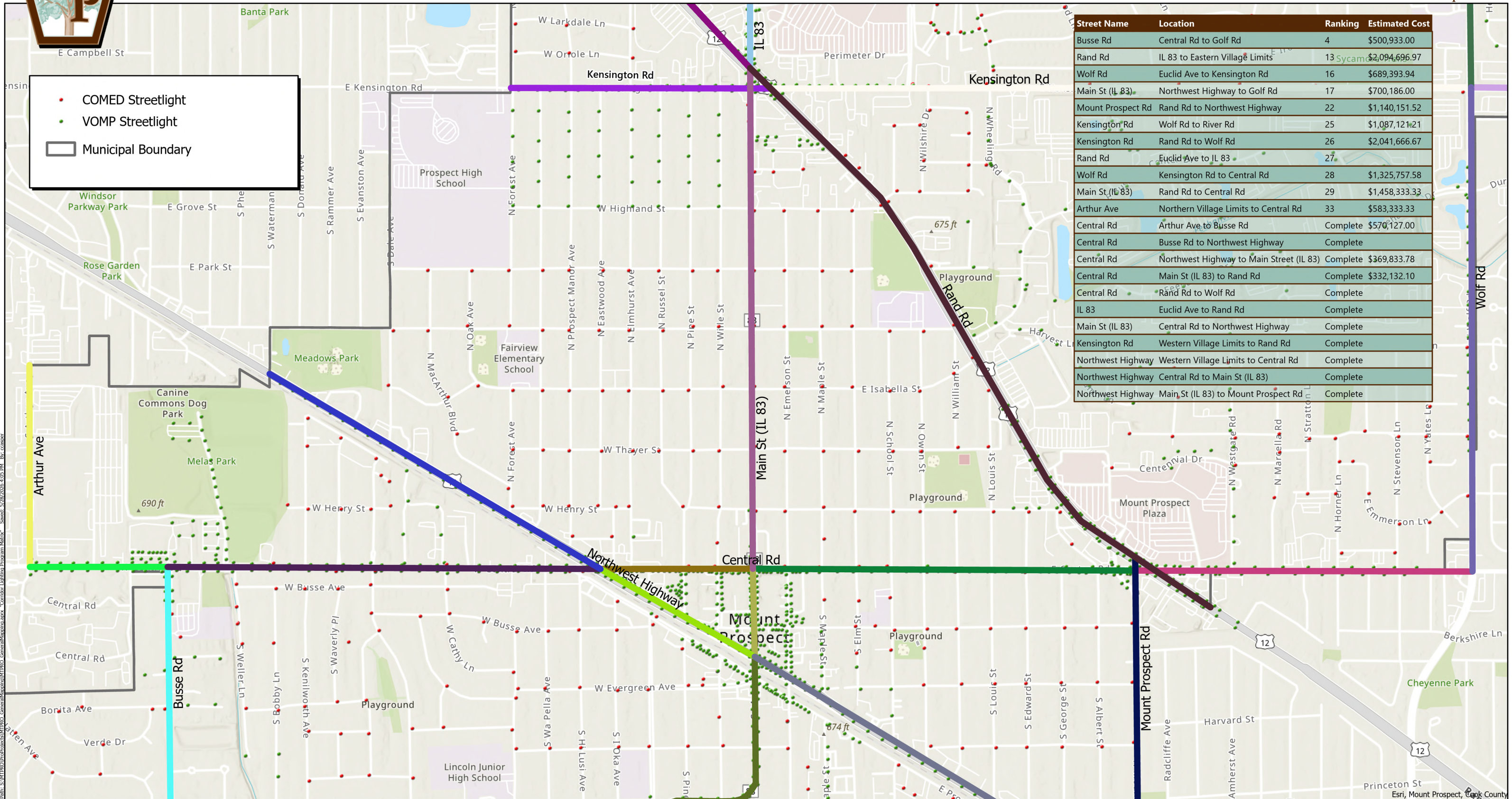


May 28, 2026  
Village of Mount Prospect, IL



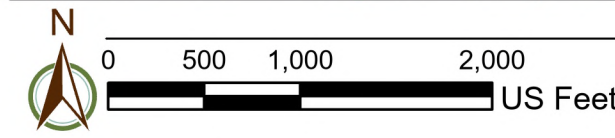
# Corridor Lighting Program Matrix

Map 2 of 4



Street Name	Location	Ranking	Estimated Cost
Busse Rd	Central Rd to Golf Rd	4	\$500,933.00
Rand Rd	IL 83 to Eastern Village Limits	13	\$2,094,696.97
Wolf Rd	Euclid Ave to Kensington Rd	16	\$689,393.94
Main St (IL 83)	Northwest Highway to Golf Rd	17	\$700,186.00
Mount Prospect Rd	Rand Rd to Northwest Highway	22	\$1,140,151.52
Kensington Rd	Wolf Rd to River Rd	25	\$1,087,121.21
Kensington Rd	Rand Rd to Wolf Rd	26	\$2,041,666.67
Rand Rd	Euclid Ave to IL 83	27	
Wolf Rd	Kensington Rd to Central Rd	28	\$1,325,757.58
Main St (IL 83)	Rand Rd to Central Rd	29	\$1,458,333.33
Arthur Ave	Northern Village Limits to Central Rd	33	\$583,333.33
Central Rd	Arthur Ave to Busse Rd	Complete	\$570,127.00
Central Rd	Busse Rd to Northwest Highway	Complete	
Central Rd	Northwest Highway to Main Street (IL 83)	Complete	\$369,833.78
Central Rd	Main St (IL 83) to Rand Rd	Complete	\$332,132.10
Central Rd	Rand Rd to Wolf Rd	Complete	
IL 83	Euclid Ave to Rand Rd	Complete	
Main St (IL 83)	Central Rd to Northwest Highway	Complete	
Kensington Rd	Western Village Limits to Rand Rd	Complete	
Northwest Highway	Western Village Limits to Central Rd	Complete	
Northwest Highway	Central Rd to Main St (IL 83)	Complete	
Northwest Highway	Main St (IL 83) to Mount Prospect Rd	Complete	

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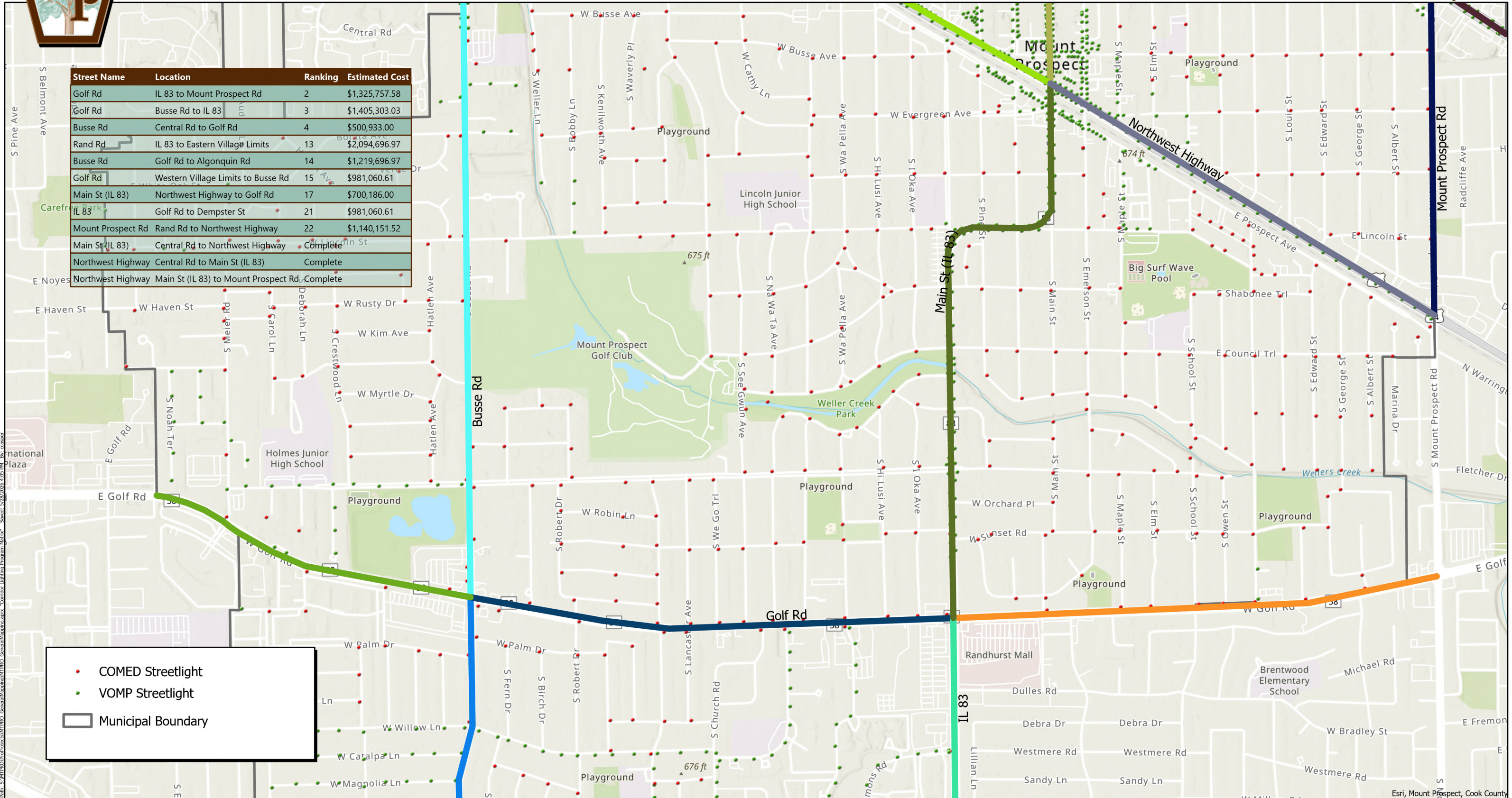
May 28, 2026  
Village of Mount Prospect, IL



# Corridor Lighting Program Matrix

Map 3 of 4

Street Name	Location	Ranking	Estimated Cost
Golf Rd	IL 83 to Mount Prospect Rd	2	\$1,325,757.58
Golf Rd	Busse Rd to IL 83	3	\$1,405,303.03
Busse Rd	Central Rd to Golf Rd	4	\$500,933.00
Rand Rd	IL 83 to Eastern Village Limits	13	\$2,094,696.97
Busse Rd	Golf Rd to Algonquin Rd	14	\$1,219,696.97
Golf Rd	Western Village Limits to Busse Rd	15	\$981,060.61
Main St (IL 83)	Northwest Highway to Golf Rd	17	\$700,186.00
IL 83	Golf Rd to Dempster St	21	\$981,060.61
Mount Prospect Rd	Rand Rd to Northwest Highway	22	\$1,140,151.52
Main St (IL 83)	Central Rd to Northwest Highway	Complete	
Northwest Highway	Central Rd to Main St (IL 83)	Complete	
Northwest Highway	Main St (IL 83) to Mount Prospect Rd	Complete	

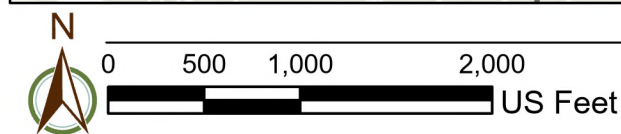


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Esri, Mount Prospect, Cook County

May 28, 2026

Village of Mount Prospect, IL

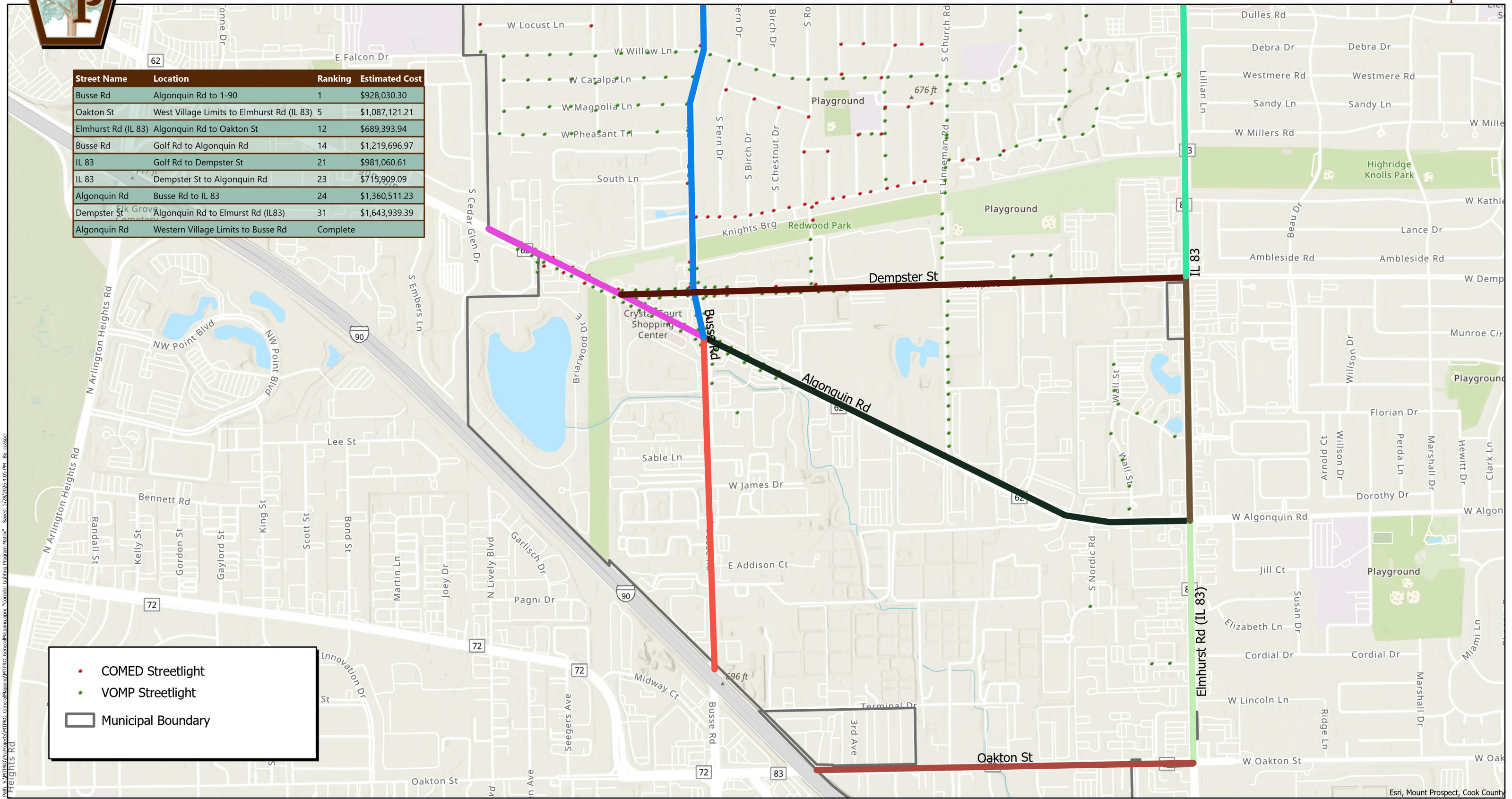




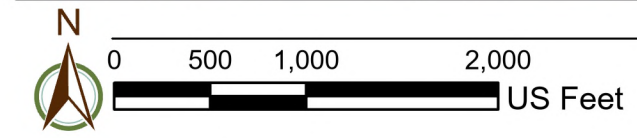
# Corridor Lighting Program Matrix

Map 4 of 4

Street Name	Location	Ranking	Estimated Cost
Busse Rd	Algonquin Rd to 1-90	1	\$928,030.30
Oakton St	West Village Limits to Elmhurst Rd (IL 83)	5	\$1,087,121.21
Elmhurst Rd (IL 83)	Algonquin Rd to Oakton St	12	\$689,393.94
Busse Rd	Golf Rd to Algonquin Rd	14	\$1,219,696.97
IL 83	Golf Rd to Dempster St	21	\$981,060.61
IL 83	Dempster St to Algonquin Rd	23	\$715,909.09
Algonquin Rd	Busse Rd to IL 83	24	\$1,360,511.23
Dempster St	Algonquin Rd to Elmhurst Rd (IL83)	31	\$1,643,939.39
Algonquin Rd	Western Village Limits to Busse Rd	Complete	



- COMED Streetlight
- VOMP Streetlight
- Municipal Boundary



Esri, Mount Prospect, Cook County

May 28, 2026

Village of Mount Prospect, IL

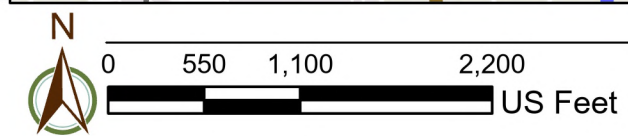
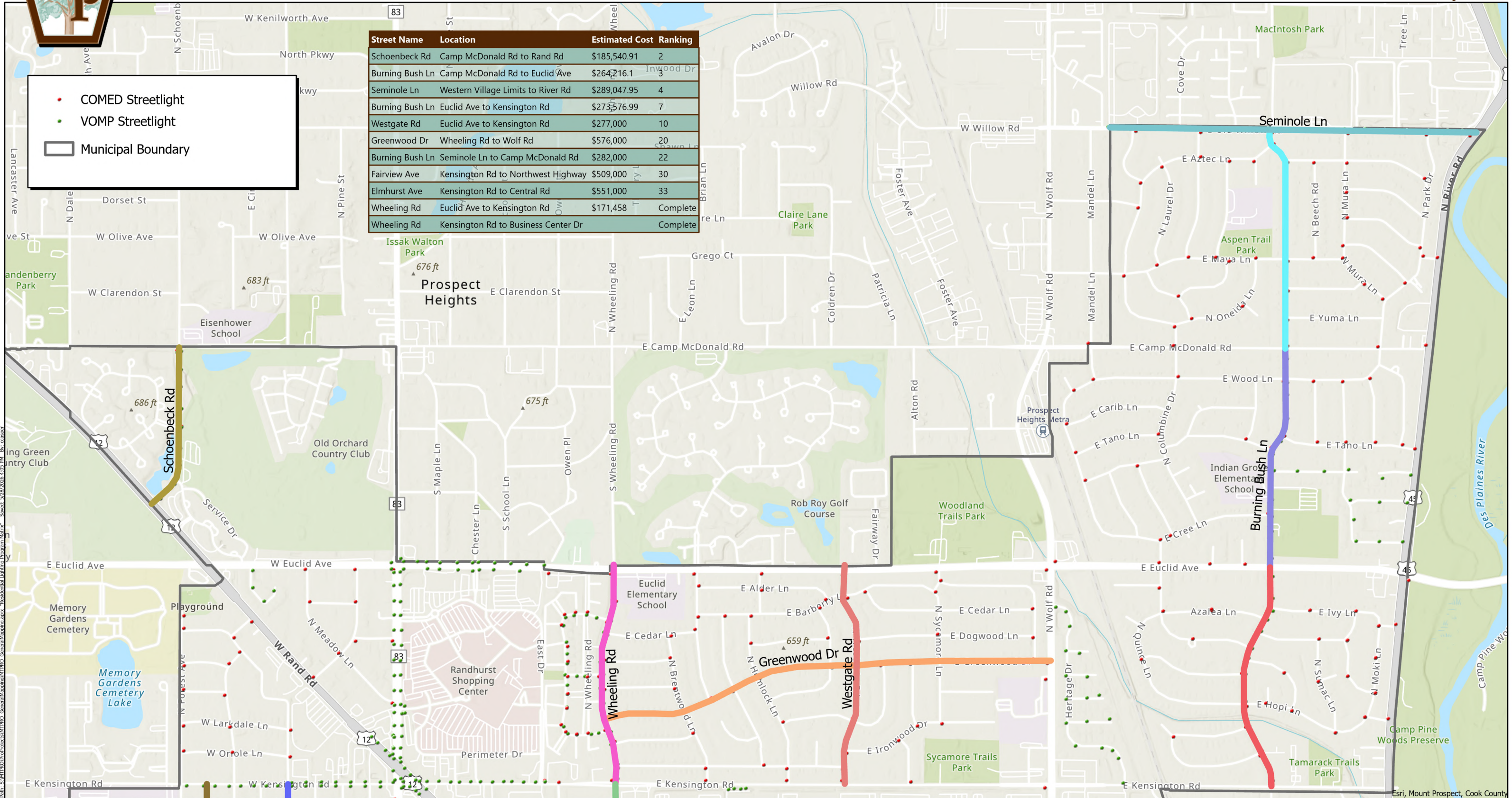


# Residential Lighting Program Matrix

Map 1 of 4

Street Name	Location	Estimated Cost	Ranking
Schoenbeck Rd	Camp McDonald Rd to Rand Rd	\$185,540.91	2
Burning Bush Ln	Camp McDonald Rd to Euclid Ave	\$264,216.1	3
Seminole Ln	Western Village Limits to River Rd	\$289,047.95	4
Burning Bush Ln	Euclid Ave to Kensington Rd	\$273,576.99	7
Westgate Rd	Euclid Ave to Kensington Rd	\$277,000	10
Greenwood Dr	Wheeling Rd to Wolf Rd	\$576,000	20
Burning Bush Ln	Seminole Ln to Camp McDonald Rd	\$282,000	22
Fairview Ave	Kensington Rd to Northwest Highway	\$509,000	30
Elmhurst Ave	Kensington Rd to Central Rd	\$551,000	33
Wheeling Rd	Euclid Ave to Kensington Rd	\$171,458	Complete
Wheeling Rd	Kensington Rd to Business Center Dr		Complete

- COMED Streetlight
- VOMP Streetlight
- Municipal Boundary

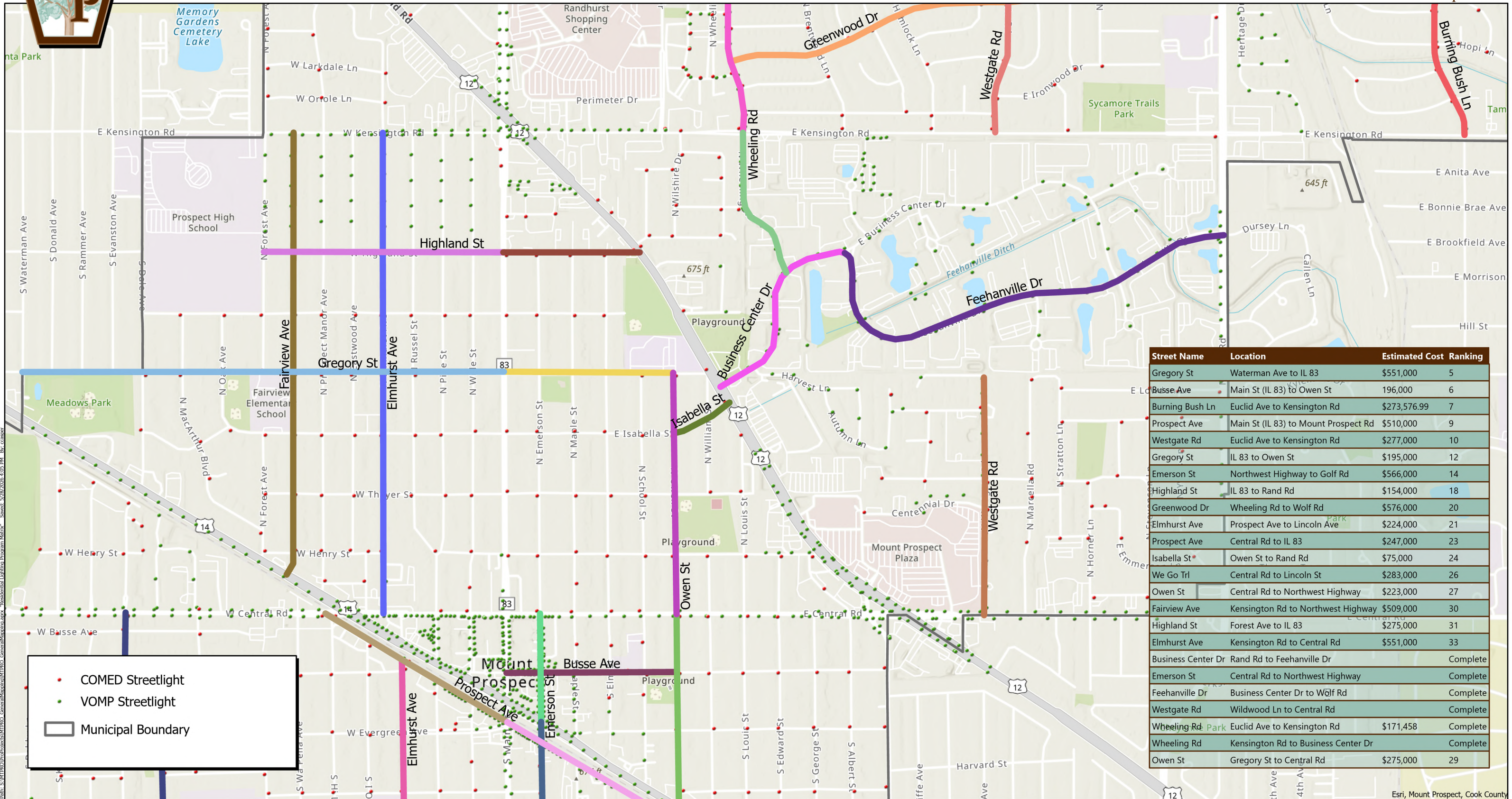


May 28, 2026  
Village of Mount Prospect, IL



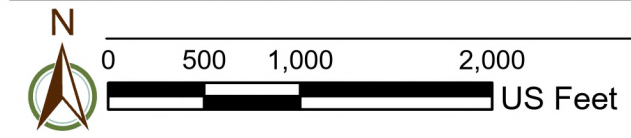
# Residential Lighting Program Matrix

Map 2 of 4



Street Name	Location	Estimated Cost	Ranking
Gregory St	Waterman Ave to IL 83	\$551,000	5
Busse Ave	Main St (IL 83) to Owen St	196,000	6
Burning Bush Ln	Euclid Ave to Kensington Rd	\$273,576.99	7
Prospect Ave	Main St (IL 83) to Mount Prospect Rd	\$510,000	9
Westgate Rd	Euclid Ave to Kensington Rd	\$277,000	10
Gregory St	IL 83 to Owen St	\$195,000	12
Emerson St	Northwest Highway to Golf Rd	\$566,000	14
Highland St	IL 83 to Rand Rd	\$154,000	18
Greenwood Dr	Wheeling Rd to Wolf Rd	\$576,000	20
Elmhurst Ave	Prospect Ave to Lincoln Ave	\$224,000	21
Prospect Ave	Central Rd to IL 83	\$247,000	23
Isabella St	Owen St to Rand Rd	\$75,000	24
We Go Trl	Central Rd to Lincoln St	\$283,000	26
Owen St	Central Rd to Northwest Highway	\$223,000	27
Fairview Ave	Kensington Rd to Northwest Highway	\$509,000	30
Highland St	Forest Ave to IL 83	\$275,000	31
Elmhurst Ave	Kensington Rd to Central Rd	\$551,000	33
Business Center Dr	Rand Rd to Feehanville Dr	Complete	
Emerson St	Central Rd to Northwest Highway	Complete	
Feehanville Dr	Business Center Dr to Wolf Rd	Complete	
Westgate Rd	Wildwood Ln to Central Rd	Complete	
Wheeling Rd	Euclid Ave to Kensington Rd	\$171,458	Complete
Wheeling Rd	Kensington Rd to Business Center Dr	Complete	
Owen St	Gregory St to Central Rd	\$275,000	29

- COMED Streetlight
- VOMP Streetlight
- Municipal Boundary



Esri, Mount Prospect, Cook County

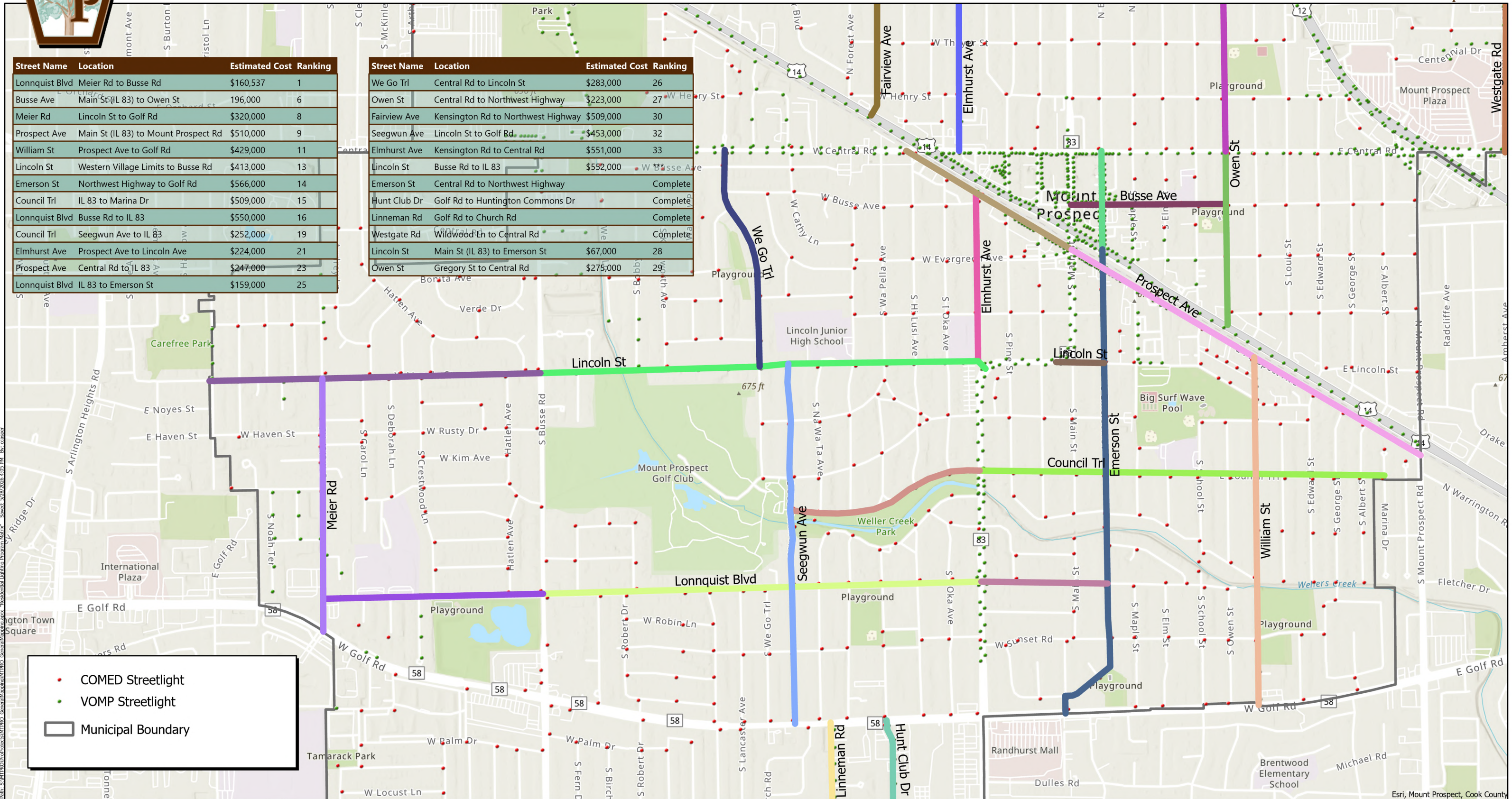
May 28, 2026

Village of Mount Prospect, IL



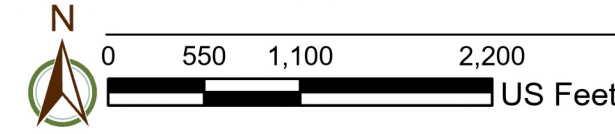
# Residential Lighting Program Matrix

Map 3 of 4



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Esri, Mount Prospect, Cook County



May 28, 2026  
Village of Mount Prospect, IL

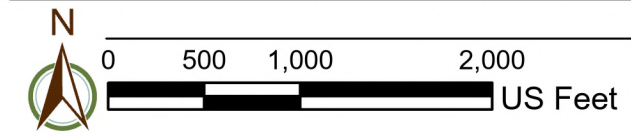
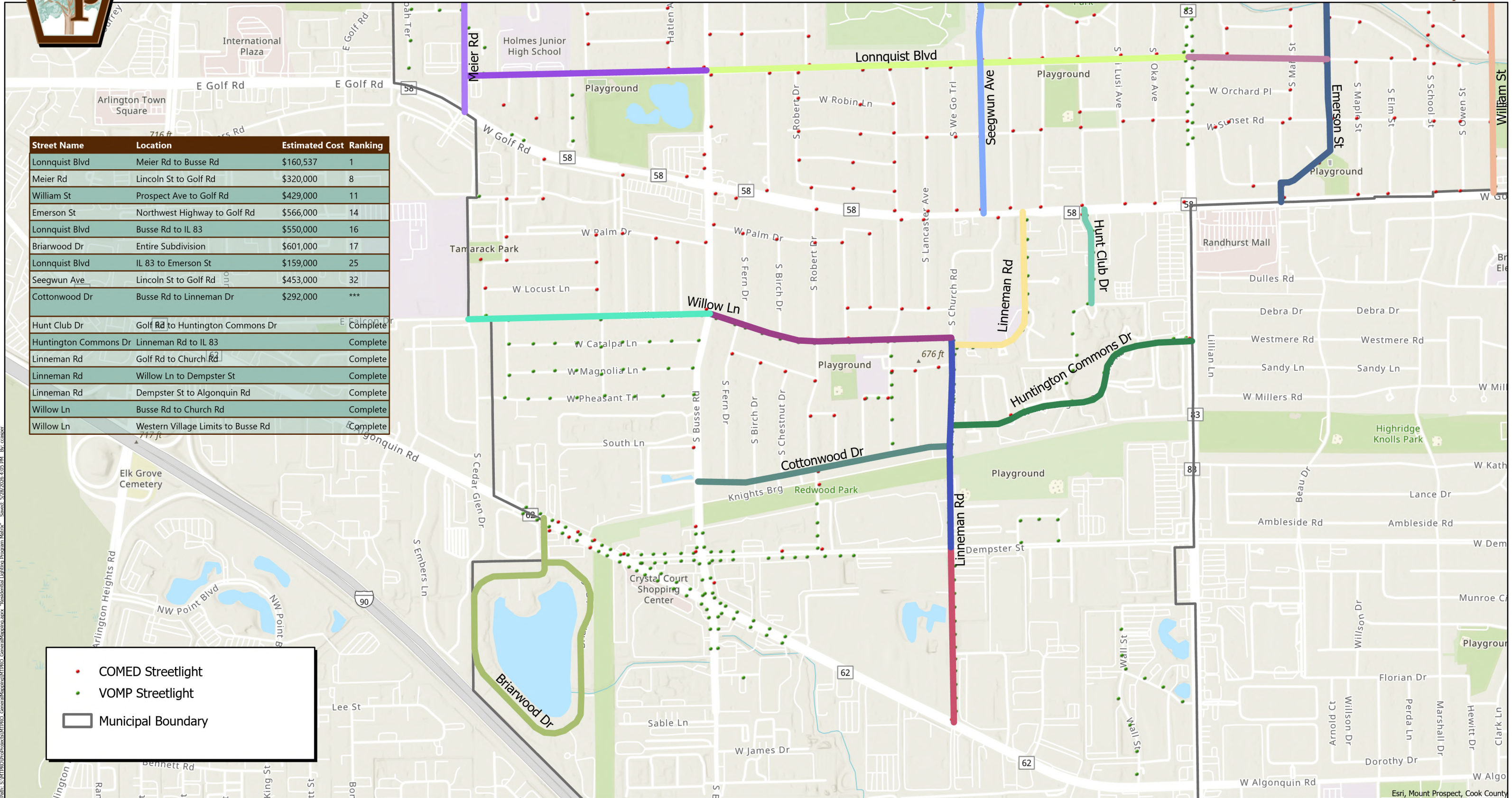


# Residential Lighting Program Matrix

Map 4 of 4

Street Name	Location	Estimated Cost	Ranking
Lonnquist Blvd	Meier Rd to Busse Rd	\$160,537	1
Meier Rd	Lincoln St to Golf Rd	\$320,000	8
William St	Prospect Ave to Golf Rd	\$429,000	11
Emerson St	Northwest Highway to Golf Rd	\$566,000	14
Lonnquist Blvd	Busse Rd to IL 83	\$550,000	16
Briarwood Dr	Entire Subdivision	\$601,000	17
Lonnquist Blvd	IL 83 to Emerson St	\$159,000	25
Seegwun Ave	Lincoln St to Golf Rd	\$453,000	32
Cottonwood Dr	Busse Rd to Linneman Dr	\$292,000	***
Hunt Club Dr	Golf Rd to Huntington Commons Dr	Complete	Complete
Huntington Commons Dr	Linneman Rd to IL 83	Complete	Complete
Linneman Rd	Golf Rd to Church Rd	Complete	Complete
Linneman Rd	Willow Ln to Dempster St	Complete	Complete
Linneman Rd	Dempster St to Algonquin Rd	Complete	Complete
Willow Ln	Busse Rd to Church Rd	Complete	Complete
Willow Ln	Western Village Limits to Busse Rd	Complete	Complete

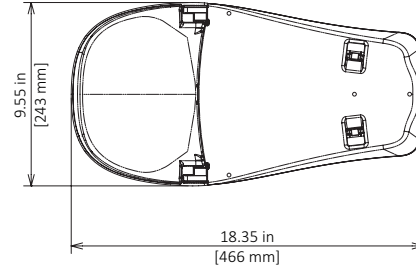
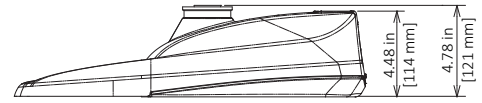
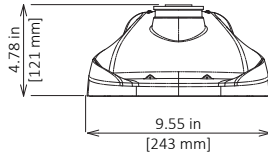
- COMED Streetlight
- VOMP Streetlight
- Municipal Boundary



# ComfortView™ Neighborhood LED Streetlight (CV)

## Luminaire Data

**Weight** 8lbs [3.6kg]  
**EPA** 0.39 ft<sup>2</sup>



## Ordering Information

Sample Catalog No. CV1-H-MV-40K-2R-GY-045-FOC

Product	LED Code	Voltage	Color Temperature	Distribution	Finish <sup>1</sup>	Output Code <sup>2</sup>	Options
<b>CV1</b>	<b>H</b>	<b>MV</b> 120-277V <b>HV</b> 347-480V	<b>22K</b> 2200K <b>27K</b> 2700K <b>30K</b> 3000K <b>40K</b> 4000K	<b>2R</b> Type 2 <b>3R</b> Type 3	<b>GY</b> Gray <b>DB</b> Dark Bronze <b>BK</b> Black	<b>025</b> <b>030</b> <b>035</b> <b>040</b> <b>045</b> <b>050</b> <b>055</b> <b>060</b> <b>070</b> <b>075</b> <b>080</b>	<b>FOC</b> <sup>3</sup> Fixed Output Code <b>LPCR</b> Less Photocontrol Receptacle <b>PCR7</b> <sup>4</sup> ANSI 7-wire Photocontrol Receptacle <b>PCR7-CR</b> <sup>5</sup> Control Ready 7-wire PC Receptacle <b>WL</b> Utility Wattage Label <b>4B</b> 4-Bolt Mounting Bracket <b>RWG</b> Rubber Wildlife Guard <b>SWTB</b> Straight Wire Terminal Block <b>BBL</b> Bubble Level <b>CF</b> <sup>6</sup> Coastal Paint Finish

### Notes:

- Gray, Black, and Dark Bronze standard. Consult factory for other finishes.
- Specified output code is the factory set lumen performance. Field adjustable is standard via an eight-position output selector. Refer to output data table on this spec sheet. An illustration of the output selector and its label is shown on page 2. Consult factory if special output setting is required.
- Non-field adjustable, fixed lumen output. Specify required output code. Not available with PCR7-CR option.
- Includes output selector that enables field adjustability of light levels. Includes connectors to allow easy upgrade of wireless dimming via PCR7. Wireless node by others.
- Control-ready wired at factory for wireless node dimming (node by others). Output selector not included in the fixture. Not able to adjust above specified drive current.
- Specify the CF Option for coastal installation. See warranty for details.
- Flush mounted Cul-de-Sac Shield cuts light off at 1 times the mounting height behind the luminaire, 1¼ in front, and 2¼ times the mounting height laterally.
- Flush mounted Front Side Shield cuts light off at approximately 1½ times the mounting height in front of the luminaire (street side) and 2¼ times the mounting height laterally.
- Flush mounted House Side Shield cuts light off at 1 times the mounting height behind the luminaire and 2¼ times the mounting height laterally.
- 80 Degree Cutoff Shield mitigates high angle glare above 80 degrees from nadir and cuts light off at 1½ times the mounting height behind and 2½ times the mounting height laterally.
- Specify Color (GY, DB, BK)
- Specify MV (120-277V) or HV (347-480V).

### Accessories\*

<b>CSSCV</b> <sup>7</sup>	Cul-De-Sac Side Shield, Snap-On*
<b>FSSCV</b> <sup>8</sup>	Front Side Shield, Snap-On*
<b>HSSCV</b> <sup>9</sup>	House Side Shield, Snap-On*
<b>VHCS</b> <sup>10</sup>	80 Degree Cutoff Shield, Grey*
<b>PTB</b> <sup>11</sup>	Pole Top Tenon Horizontal Arm Bracket
<b>PTB2</b> <sup>11</sup>	Pole Top Tenon Horizontal Arm Bracket (2@180°)
<b>RPB</b> <sup>11</sup>	Round Pole Horizontal Arm Bracket
<b>SPB</b> <sup>11</sup>	Square Pole Horizontal Arm Bracket
<b>WB</b> <sup>11</sup>	Wall Horizontal Arm Bracket
<b>LLPC</b> <sup>12</sup>	Long-Life Twist Lock Photocontrol
<b>SC</b>	Twist Lock Shorting Cap
<b>BSK</b>	Bird Deterrent Spider Kit

\*Accessories are ordered separately and not to be included in the catalog number. For factory installed HSSCV, CSSCV, FSSCV and VHCS specify as option in luminaire catalog number. HSSCV, CSSCV, FSSCV can be installed without a tool, but a tool is required for removal. 80 Degree Cutoff Shield (VHCS) requires a Phillips head screwdriver for installation.



## Luminaire Specifications

### Housing

Die cast aluminum housing with universal two-bolt slip fitter mounts to 1-1/4" to 2" (1-5/8" to 2-3/8" O.D.) diameter mast arm. One-piece aluminum housing provides passive heat-sinking of the LEDs and has upper surfaces that shed precipitation. Four-bolt mounting bracket (4B option) is available. Mounting provisions meet 3G vibration per ANSI C136.31-2010 Normal Application, Bridge & Overpass by independent lab. Mounting has leveling adjustment from  $\pm 5^\circ$  in 2.5° steps. All hardware is stainless steel. Electrical components are accessed without tools via die cast aluminum door with stainless steel quick release latches. Provided standard with removable polycarbonate wild life guard. For additional protection, optional rubber wildlife guard (RWG) which conforms snugly to the mast arm is offered.

### Light Emitting Diodes

Hi-flux/Hi-power white LEDs produce a minimum of 90% of initial intensity at 100,000 hours of life based on IES TM-21 (L90  $\geq$  100k hours). LEDs are tested in accordance with IES LM-80 testing procedures. LEDs have correlated color temperature of 2200K (22K), 2700 (27K), 3000 (30K), 4000 (40K), and 70 CRI minimum. LEDs are 100% mercury and lead free.

### Field Adjustability

LED lumen output can be changed in the field to adjust light output for local conditions (not available with PCR7-CR option). The specified output code will be the factory set output. Field adjustments can be made with the output selector included in the fixture. Field adjustable range shown in performance data table.

### Quality Control

Every luminaire is performance tested before and after a 2-hour burn-in period. Assembled in the USA.

### Optical Systems

Two-stage reflective optics produce IESNA Type 2 or Type 3 distributions and are fully sealed to maintain an IP66 rating. Luminaire produces 0% total lumens above 90° (BUG Rating, U=0). Optional house side shield cuts light off at 1/2 mounting height behind luminaire. Cul-de-sac shield provides back and side light control for end of cul-de-sac applications. Front side shield cuts light off at approximately one mounting height in front of luminaire (street side). 80 degree cutoff shield eliminates very high angle glare above 80 degrees from nadir. All shields are field installable without tools.

### Electrical

Rated life of electrical components is 100,000 hours. Uses isolated power supply that is 1-10V dimmable. Power supply is wired with quick-disconnect terminals. Power supply features a minimum power factor of .90 and <20% Total Harmonic Distortion (THD). EMC meets or exceeds FCC CFR Part 15. Terminal block accommodates 6 to 14 gauge wire. Surge protection complies with IEEE/ANSI C62.41 Category C High, 20kV/10kA and ANSI C136.2-2015, 20kV/10kA.

### Controls

3-Wire photocontrol receptacle is standard. ANSI C136.41 7-wire (PCR7) photocontrol receptacles is available. All photocontrol receptacles have a tool-less rotatable base. Wireless control module is provided by others.

### Finish

Housing receives a durable, fade-resistant polyester powder coat finish with 3.0 mil nominal thickness. Standard finish tested to withstand 5000 hours in salt spray exposure per ASTM B117 and Coastal Finish per ASTM G85. Finish meets scribe creepage rating 8 per ASTM D1654. Finish tested 500 hours in UV exposure per ASTM G154 and meets ASTM D523 gloss retention.

### Listings/Ratings/Labels

Luminaires are UL listed for use in wet locations in the United States and Canada. International Dark Sky Association listed. 2700 and 3000K ComfortView fixtures are certified as Community Friendly Lighting Equipment by the Smart Outdoor Lighting Alliance (SOLA). Luminaire is qualified to operate at ambient temperatures of -40°C to 40°C.

### Photometry

Luminaires photometrics are tested by certified independent testing laboratories in accordance with IES LM-79 testing procedures.

### Warranty

10-year limited warranty is standard on luminaire and components.

### Vandal Resistance

Housing and optics rated to IK10

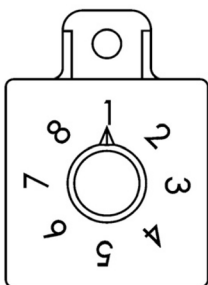
### Standards

Luminaire complies with:

**ANSI:** C136.2, C136.3, C136.10, C136.13, C136.15, C136.22, C136.31, C136.35, C136.37, C136.41, C62.41, C78.377, C82.77

**Other:** FCC 47 CFR, IEC 60598, ROHS II, UL 1449, UL 1598

## Example of ComfortView™ Output Selector and Label:



Refer to the Performance Data Tables (below) for the lumen output corresponding to the output selector value.

**Performance Data<sup>1</sup>**

All data nominal. IES files for all CCTs available at leotek.com.

Product	Color Temperature (CCT)	Output Code	Dial Selection	System Wattage (W)	Delivered Lumens (Lm) <sup>2</sup>	Efficacy (Lm/W)	Field Adjustable Output Range	
CV1-H	2200 (22K)	020	1	19	2087	110	↕	
		025	2	24	2693	112		
		030	3	29	3224	111		
		040	4	34	3876	114		
		043	5	38	4222	111		
		045	6	43	4653	108		
		050	7	48	5101	106		
		065	8	66	6722	102		
	2700K (27K)	Mid Block	025	1	19	2242		118
			030	2	24	2892		120
			035	3	29	3463		119
			040	4	34	4163		122
			045	5	38	4535		119
			050	6	43	4998		116
			055	7	48	5479		114
			070	8	66	7220		110
	3000K (30K)	Intersection	025	1	19	2412		127
			030	2	24	3073		128
			035	3	29	3676		127
			045	4	35	4423		128
			050	5	38	4777		126
			055	6	45	5561		124
			060	7	49	5800		118
			075	8	67	7722		115
	4000K (40K)		025	1	19	2675		139
			035	2	24	3294		137
			040	3	29	3930		136
			045	4	34	4561		134
			050	5	38	5059		133
			055	6	43	5594		130
			060	7	48	6147		128
			080	8	67	8227		123

**Notes:**

- 1 Data shown above is for type 2 optic. For type 3 optic, consult IES files for specific data at Leotek.com
- 2 Nominal lumens. Normal tolerance ± 10% due to factors including LED bin variance, and ambient temperatures.

**BUG Ratings**

All data nominal. IES files for all CCTs available at leotek.com.

Product	Color Temperature (CCT)	Output Code	Dial Selection	Type 2R	Type 3R
				BUG Rating	BUG Rating
CV1-H	2200K (22K)	020	1	B1-U0-G1	B1-U0-G1
		025	2	B1-U0-G1	B1-U0-G1
		030	3	B1-U0-G1	B1-U0-G1
		040	4	B1-U0-G1	B1-U0-G1
		043	5	B1-U0-G1	B1-U0-G1
		045	6	B1-U0-G1	B2-U0-G1
		050	7	B1-U0-G1	B2-U0-G1
		065	8	B2-U0-G1	B2-U0-G2
	2700K (27K)	025	1	B1-U0-G1	B1-U0-G1
		030	2	B1-U0-G1	B1-U0-G1
		035	3	B1-U0-G1	B1-U0-G1
		040	4	B1-U0-G1	B1-U0-G1
		045	5	B1-U0-G1	B2-U0-G1
		050	6	B1-U0-G1	B2-U0-G1
		055	7	B1-U0-G1	B2-U0-G1
		070	8	B2-U0-G1	B2-U0-G2
	3000K (30K)	025	1	B1-U0-G1	B1-U0-G1
		030	2	B1-U0-G1	B1-U0-G1
		035	3	B1-U0-G1	B1-U0-G1
		045	4	B1-U0-G1	B1-U0-G1
		050	5	B1-U0-G1	B2-U0-G1
		055	6	B1-U0-G1	B1-U0-G1
		060	7	B1-U0-G1	B2-U0-G1
		075	8	B2-U0-G1	B2-U0-G2
	4000K (40K)	025	1	B1-U0-G1	B1-U0-G1
		035	2	B1-U0-G1	B1-U0-G1
		040	3	B1-U0-G1	B1-U0-G1
		045	4	B1-U0-G1	B2-U0-G1
		050	5	B1-U0-G1	B2-U0-G1
		055	6	B1-U0-G1	B2-U0-G1
		060	7	B2-U0-G1	B2-U0-G1
		080	8	B2-U0-G1	B3-U0-G2



## Item Cover Page

**Subject**                                **Sidewalk Programs Update**

Meeting                                    June 9, 2026 - "ON THE ROAD" MEETING OF THE MOUNT PROSPECT COMMITTEE OF THE WHOLE

Fiscal Impact

Dollar Amount

Budget Source

Category                                 DISCUSSION ITEMS

Type                                        Presentation

**Information**

This memorandum transmits an update on the status of Village sidewalk improvement programs pursuant to the Policy Agenda of the 2027 Strategic Plan.

The Village continues to invest in maintaining and improving its sidewalk infrastructure through resurfacing, grinding, panel replacement, ADA improvements, mudjacking, and full sidewalk replacement projects. Between 2021 and 2025, approximately 1,209,425 square feet of sidewalk were improved, representing approximately 20.0% of the Village’s 6,034,324-square-foot sidewalk network. During this same period, staff inspected 4,400,880 square feet of sidewalk or approximately 73% of the Village's sidewalk inventory.

Staff utilizes a variety of methods to maintain and improve sidewalks. The table below summarizes these methods:

<b>Repair Type</b>	<b>Description</b>	<b>Typical Use</b>
Cut	Saw-cut and bevel a raised sidewalk edge to eliminate a trip hazard	Minor to moderate vertical offsets
Grind	Grind down the higher panel to create a smooth transition.	Small vertical offsets

Mudjack	Lift a settled sidewalk panel back to grade	Sunken but structurally sound panels.
Remove & Replace	Remove a defective panel and install a new one.	Severely cracked, broken, offset, or deteriorated concrete.
Ramp	Install a temporary asphalt wedge over a trip hazard	Immediate, temporary safety measure.

Sidewalks are repaired or replaced for several important reasons. These reasons include elimination of vertical offsets that create trip hazards, alleviation of ponding and drainage issues, elimination of significant cross-slope deficiencies, removal of significantly cracked, settled, heaved, or deteriorated panels, and to improve accessibility for individuals with mobility challenges.

Since 2021, the Village has expended an average of \$1,619,503 per year on sidewalk improvement programs.

In addition, the Village also installs new sidewalks each year to fill gaps in the existing network. The New Sidewalk program prioritizes gap infill to improve the Village's pedestrian transportation networks and promote safe and efficient non-vehicular travel. The Village installs new sidewalks every year based on our criteria ([Priority Matrix](#)) and available funds.

A sidewalk prioritization matrix exists to determine the schedule for installing new sidewalks. Priority is given to locations along arterial streets followed by collectors and then local roads. The priority matrix will rank missing sidewalk segments based on a number of factors including traffic volume, driveways, bus stops, bike routes and lighting. Factors also include nearby destinations such as schools, parks, churches, shopping and restaurants.

New sidewalk projects currently in progress include Oakton Street, Schoenbeck Road, and Wolf Road.

Attached please find maps depicting the location and rankings, and estimated cost of projects in the New Sidewalk Priority Matrix.

Also attached is a summary of new sidewalk construction projects since 2022.

**Discussion**

**Alternatives**

## **Staff Recommendation**

### **Attachments**

1. Sidewalk Information 2021-2025 Summary
2. Sidewalk Information Spreadsheet
3. Arterial Sidewalk Matrix 2025\_P1
4. Arterial Sidewalk Matrix 2025\_P2
5. Arterial Sidewalk Matrix 2025\_P3
6. Arterial Sidewalk Matrix 2025\_P4
7. New Sidewalk 2022\_2026

# SIDEWALK PROGRAM OVERVIEW

Accomplishments and Infrastructure Investment | 2021–2025

<b>6,034,324</b>	<b>1,209,425</b>	<b>20.0%</b>	<b>4,400,880</b>	<b>72.9%</b>
Total Sidewalk Network (SF)	Sidewalk Improved (SF)	Network Improved	Sidewalks Surveyed (SF)	Sidewalks Surveyed

## Executive Summary

The Village continues to invest in maintaining and improving its sidewalk infrastructure through resurfacing, grinding, panel replacement, ADA improvements, mudjacking, and full sidewalk replacement projects. Between 2021 and 2025, approximately 1,209,425 square feet of sidewalk were improved, representing approximately 20.0% of the Village’s 6,034,324-square-foot sidewalk network.

## Why Sidewalks Are Repaired or Replaced

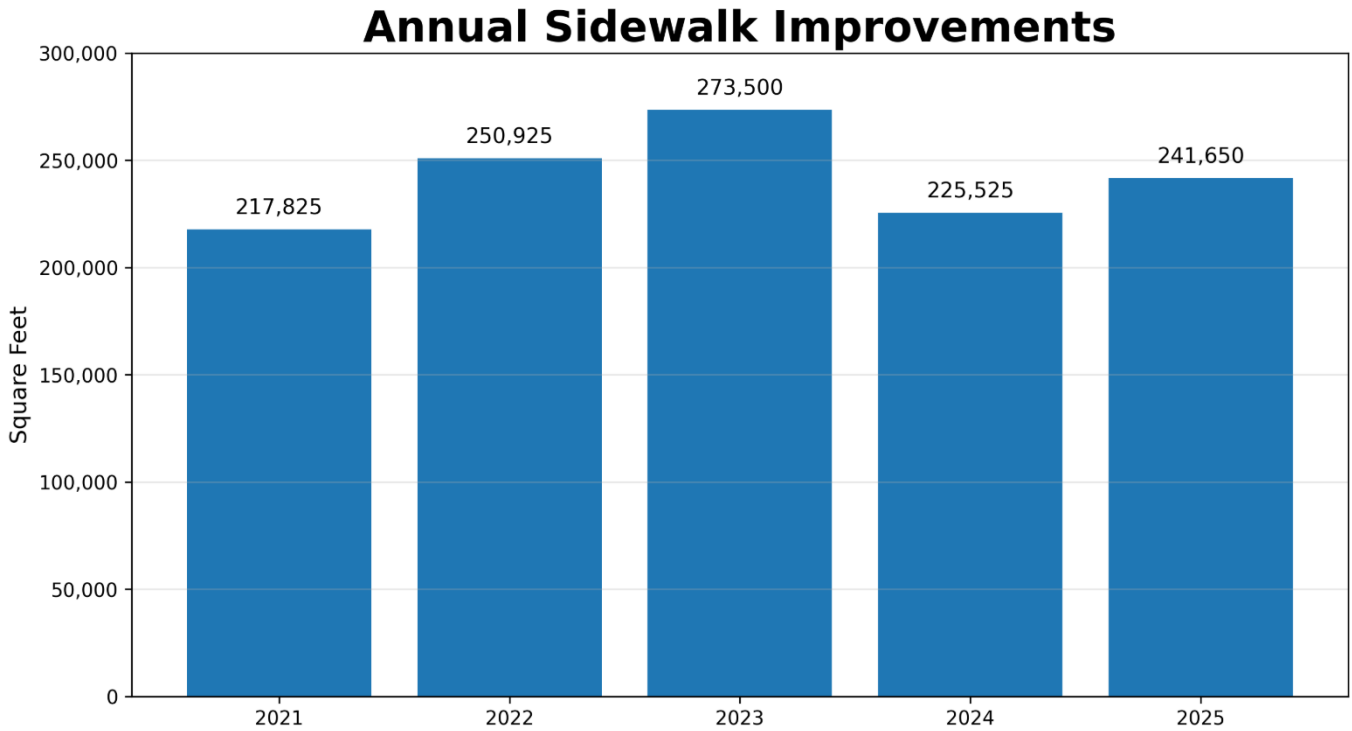
- Vertical offsets that create trip hazards
- Ponding and drainage issues
- Significant cross-slope deficiencies resulting in ADA compliance concerns
- Cracked, settled, heaved, or deteriorated panels
- Locations requiring ADA accessibility improvements

## Key Takeaways

- Preventative maintenance extends the useful life of the sidewalk network and reduces long-term replacement costs.
- The Village improved an average of approximately 241,885 square feet of sidewalk per year from 2021 through 2025.
- The highest annual sidewalk cost occurred in 2024 due to higher per-square-foot replacement costs, resulting in fewer square feet completed than 2023.

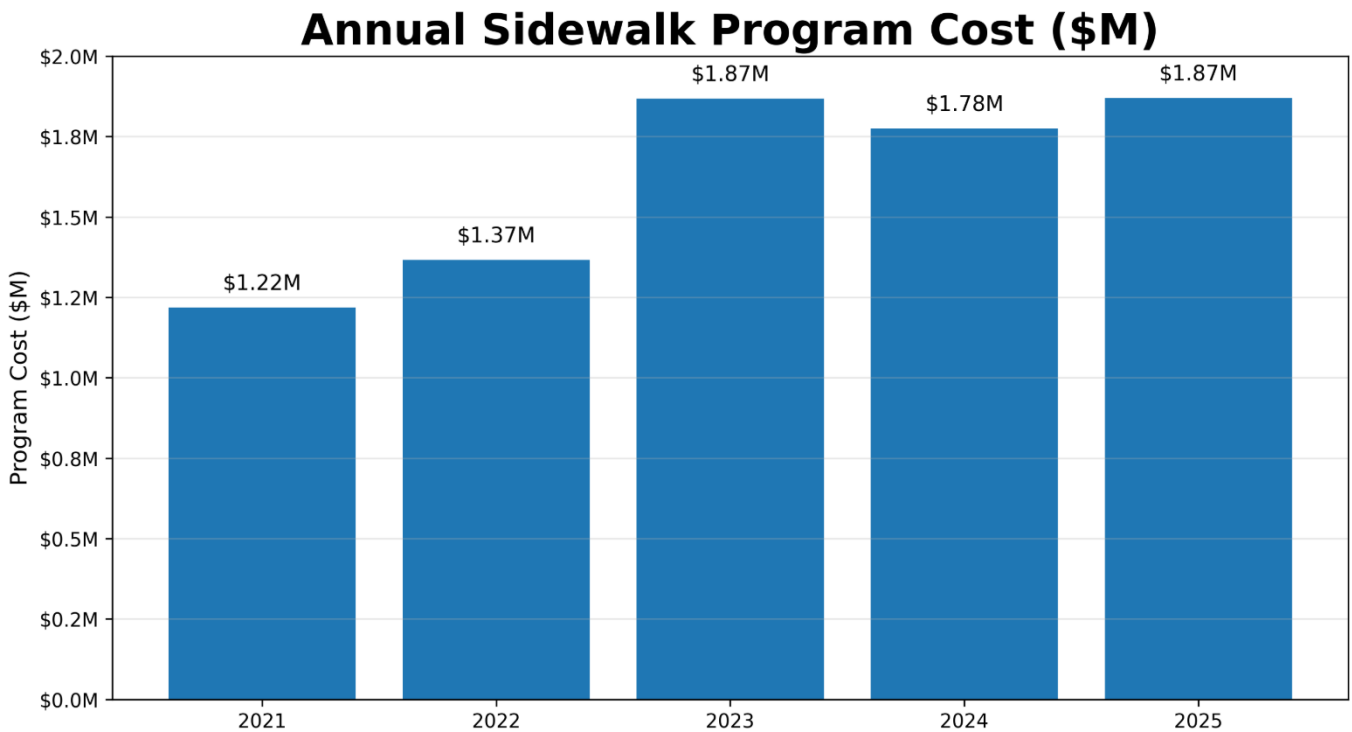
## Annual Sidewalk Improvements

Total square feet of sidewalk improved each year through replacement, resurfacing, grinding, mudjacking, and ADA improvements.



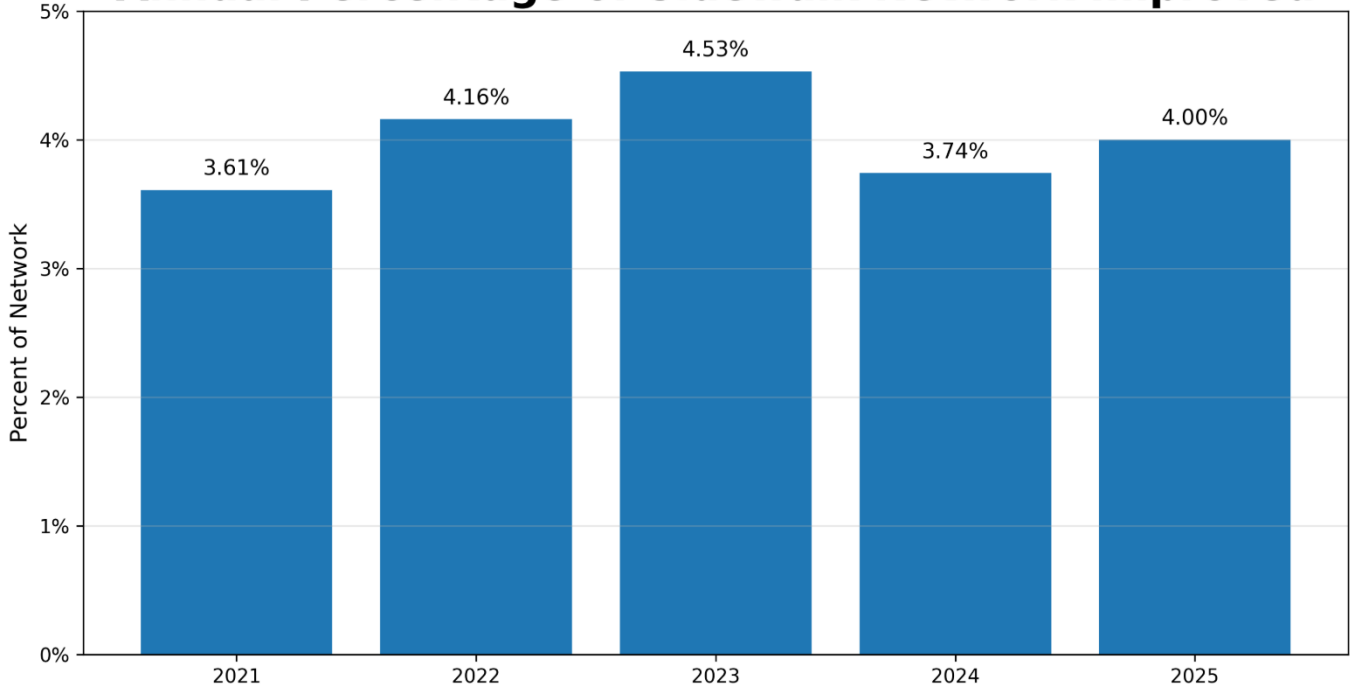
## Annual Sidewalk Program Cost (\$M)

Annual investment in sidewalk improvements displayed in millions of dollars.



Annual Percentage of Sidewalk Network Improved Percentage of the Village’s total sidewalk network improved each year.

## Annual Percentage of Sidewalk Network Improved



## Annual Summary

Year	Square Feet Improved	Program Cost	Percent of Network
2021	217,825	\$1,218,250.60	<b>3.61%</b>
2022	250,925	\$1,366,168.50	<b>4.16%</b>
2023	273,500	\$1,868,792.56	<b>4.53%</b>
2024	225,525	\$1,775,125.30	<b>3.74%</b>
2025	241,650	\$1,869,176.25	<b>4.00%</b>

## Conclusion

The Village has made significant progress in preserving and improving its sidewalk system through a balanced approach of preventative maintenance and targeted replacement. Continued investment in these programs will help maintain accessibility, improve pedestrian safety, and reduce future infrastructure costs.

Year	In-House Grind (Qty)	In-House Grind (Sq Ft)	In-House Ramp (Qty)	In-House Ramp (Sq Ft)	Mudjacking (Qty)	Mudjacking (Sq Ft)	Mudjacking Cost/Sq Ft	Total Mudjacking Cost	Remove & Replace (Qty)	Remove & Replace (Sq Ft)	R&R Cost/Sq Ft	Total R&R Cost	Cut Panels (Qty)	Cut Panels (Sq Ft)	Cut Cost/Panel	Total Cut Cost	Resurfacing (Qty)	Resurfacing (Sq Ft)	Resurfacing Cost/Sq Ft	Total Resurfacing Cost	CDBG (Qty)	CDBG (Sq Ft)	CDBG Cost/Sq Ft	Total CDBG Cost	Total Sq Ft Treated	Total Program Cost
2021	25	625	116	2900	388	9700	\$2.05	\$19,885.00	808	20200	\$6.00	\$121,200.00	188	4700	\$48.70	\$9,155.60	5498	137450	\$5.75	\$790,337.50	1806	45150	\$6.15	\$277,672.50	217825	\$1,218,250.60
2022	563	14075	24	600	438	10950	\$2.10	\$22,995.00	992	24800	\$6.18	\$153,264.00	2	50	\$39	\$78.00	7028	175700	\$5.85	\$1,027,845.00	1014	25350	\$6.39	\$161,986.50	250925	\$1,366,168.50
2023	646	16150	5	125	355	8875	\$2.25	\$19,968.75	712	17800	\$8.25	\$146,850.00	79	1975	\$37.39	\$2,953.81	8066	201650	\$7.50	\$1,512,375.00	1082	27050	\$6.90	\$186,645.00	273500	\$1,868,792.56
2024	77	1925	75	1875	548	13700	\$2.25	\$30,825.00	1992	49800	\$9.75	\$485,550.00	394	9850	\$48.70	\$19,187.80	6010	150250	\$8.25	\$1,239,562.50	0	0	\$0.00	\$0.00	225525	\$1,775,125.30
2025	49	1225	19	475	346	8650	\$2.25	\$19,462.50	1487	37175	\$10.04	\$373,237.00	0	0	0	0	7021	175525	\$7.50	\$1,316,437.50	763	19075	\$8.39	\$160,039.25	241650	\$1,869,176.25

Budget for R & R

2021	\$160,000.00
2022	\$149,000.00
2023	\$153,000.00
2024	\$504,000.00
2025	\$349,444.00

\$1,315,444.00

Budget for CDBG

2021	\$300,000.00
2022	\$300,000.00
2023	\$190,897.00
2024	\$0.00
2025	\$165,792.00

\$956,689.00

Total sidewalk inventory of **6,034,323.913 sq ft**, the percentages replaced each year:

Year	Total Sq Ft Treated	% of Sidewalk Network	Total Program Cost
2021	217,825	3.61%	\$1,218,250.60
2022	250,925	4.16%	\$1,366,168.50
2023	273,500	4.53%	\$1,868,792.56
2024	225,525	3.74%	\$1,775,125.30
2025	241,650	4.00%	\$1,869,176.25
	<b>1,209,425</b>	<b>20.04%</b>	<b>\$8,097,513.21</b>

**Five-Year Total**

Total Sq Ft Treated: 1,209,425 sq ft

Percent of Entire Sidewalk Network: **20.04%**

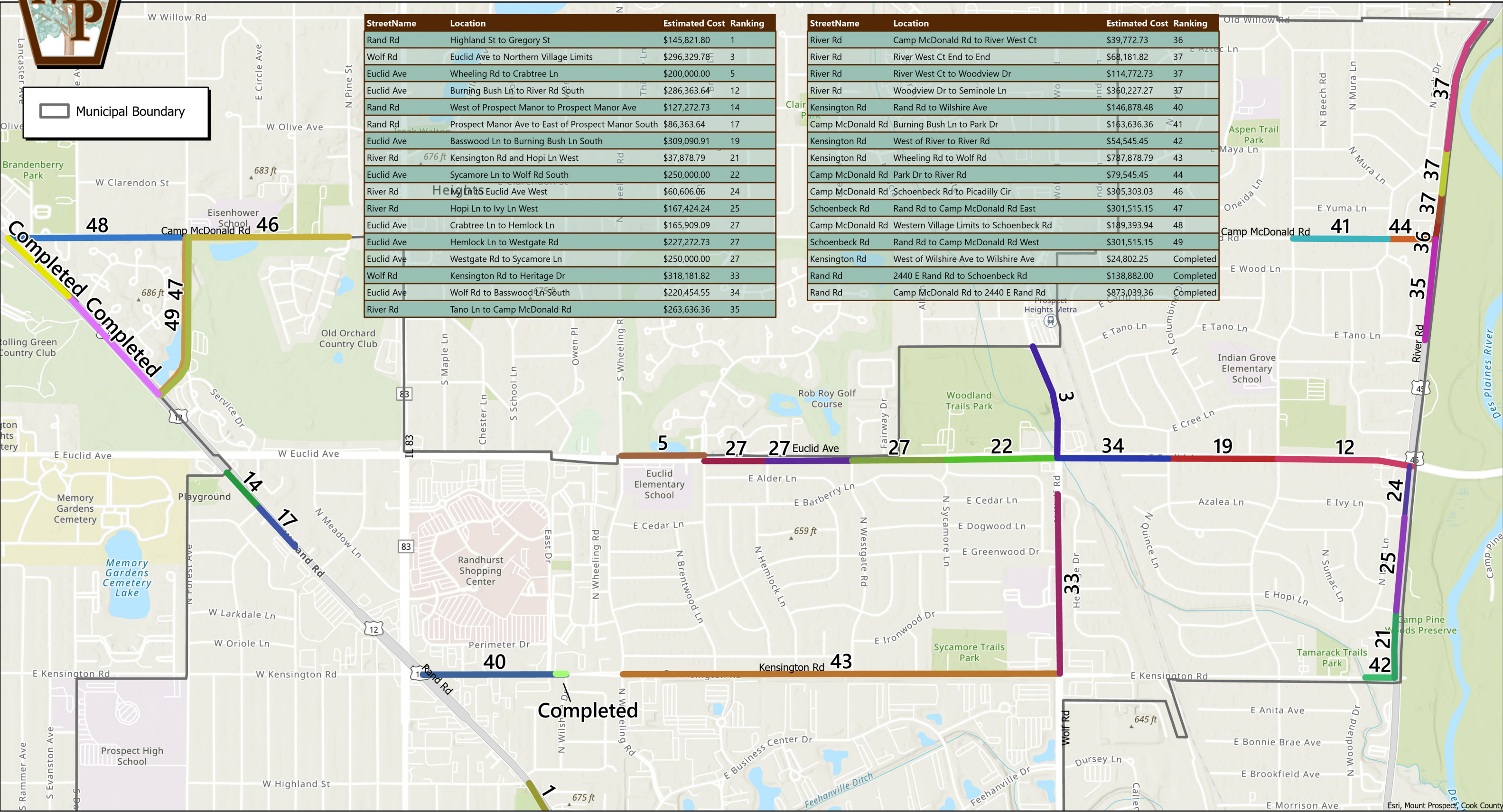
From 2021 through 2025, the Village improved approximately 1.21 million square feet of sidewalk, representing 20.0% of the Village's 6.03 million square foot sidewalk network. Annual treatment rates ranged from 3.6% to 4.5% of the network, with the highest production occurring in 2023, when approximately 273,500 square feet (4.53%) of sidewalk was improved.

Sidewalk improvements are completed to address vertical offsets, ponding issues, significant cross-slope deficiencies causing ADA compliance concerns, deteriorated concrete panels, and other conditions that impact pedestrian safety and accessibility.



# Arterial Sidewalk Matrix 2025

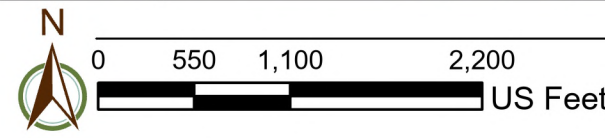
Map 1 of 4



StreetName	Location	Estimated Cost	Ranking
Rand Rd	Highland St to Gregory St	\$145,821.80	1
Wolf Rd	Euclid Ave to Northern Village Limits	\$296,329.78	3
Euclid Ave	Wheeling Rd to Crabtree Ln	\$200,000.00	5
Euclid Ave	Burning Bush Ln to River Rd South	\$286,363.64	12
Rand Rd	West of Prospect Manor to Prospect Manor Ave	\$127,272.73	14
Rand Rd	Prospect Manor Ave to East of Prospect Manor South	\$86,363.64	17
Euclid Ave	Basswood Ln to Burning Bush Ln South	\$309,090.91	19
River Rd	Kensington Rd and Hopi Ln West	\$37,878.79	21
Euclid Ave	Sycamore Ln to Wolf Rd South	\$250,000.00	22
River Rd	Euclid Ave West	\$60,606.06	24
River Rd	Hopi Ln to Ivy Ln West	\$167,424.24	25
Euclid Ave	Crabtree Ln to Hemlock Ln	\$165,909.09	27
Euclid Ave	Hemlock Ln to Westgate Rd	\$227,272.73	27
Euclid Ave	Westgate Rd to Sycamore Ln	\$250,000.00	27
Wolf Rd	Kensington Rd to Heritage Dr	\$318,181.82	33
Euclid Ave	Wolf Rd to Basswood Ln South	\$220,454.55	34
River Rd	Tano Ln to Camp McDonald Rd	\$263,636.36	35

StreetName	Location	Estimated Cost	Ranking
River Rd	Camp McDonald Rd to River West Ct	\$39,772.73	36
River Rd	River West Ct End to End	\$68,181.82	37
River Rd	River West Ct to Woodview Dr	\$114,772.73	37
River Rd	Woodview Dr to Seminole Ln	\$360,227.27	37
Kensington Rd	Rand Rd to Wilshire Ave	\$146,878.48	40
Camp McDonald Rd	Burning Bush Ln to Park Dr	\$163,636.36	41
Kensington Rd	West of River to River Rd	\$54,545.45	42
Kensington Rd	Wheeling Rd to Wolf Rd	\$787,878.79	43
Camp McDonald Rd	Park Dr to River Rd	\$79,545.45	44
Camp McDonald Rd	Schoenbeck Rd to Picadilly Cir	\$305,303.03	46
Schoenbeck Rd	Rand Rd to Camp McDonald Rd East	\$301,515.15	47
Camp McDonald Rd	Western Village Limits to Schoenbeck Rd	\$189,393.94	48
Schoenbeck Rd	Rand Rd to Camp McDonald Rd West	\$301,515.15	49
Kensington Rd	West of Wilshire Ave to Wilshire Ave	\$24,802.25	Completed
Rand Rd	2440 E Rand Rd to Schoenbeck Rd	\$138,882.00	Completed
Rand Rd	Camp McDonald Rd to 2440 E Rand Rd	\$873,039.36	Completed

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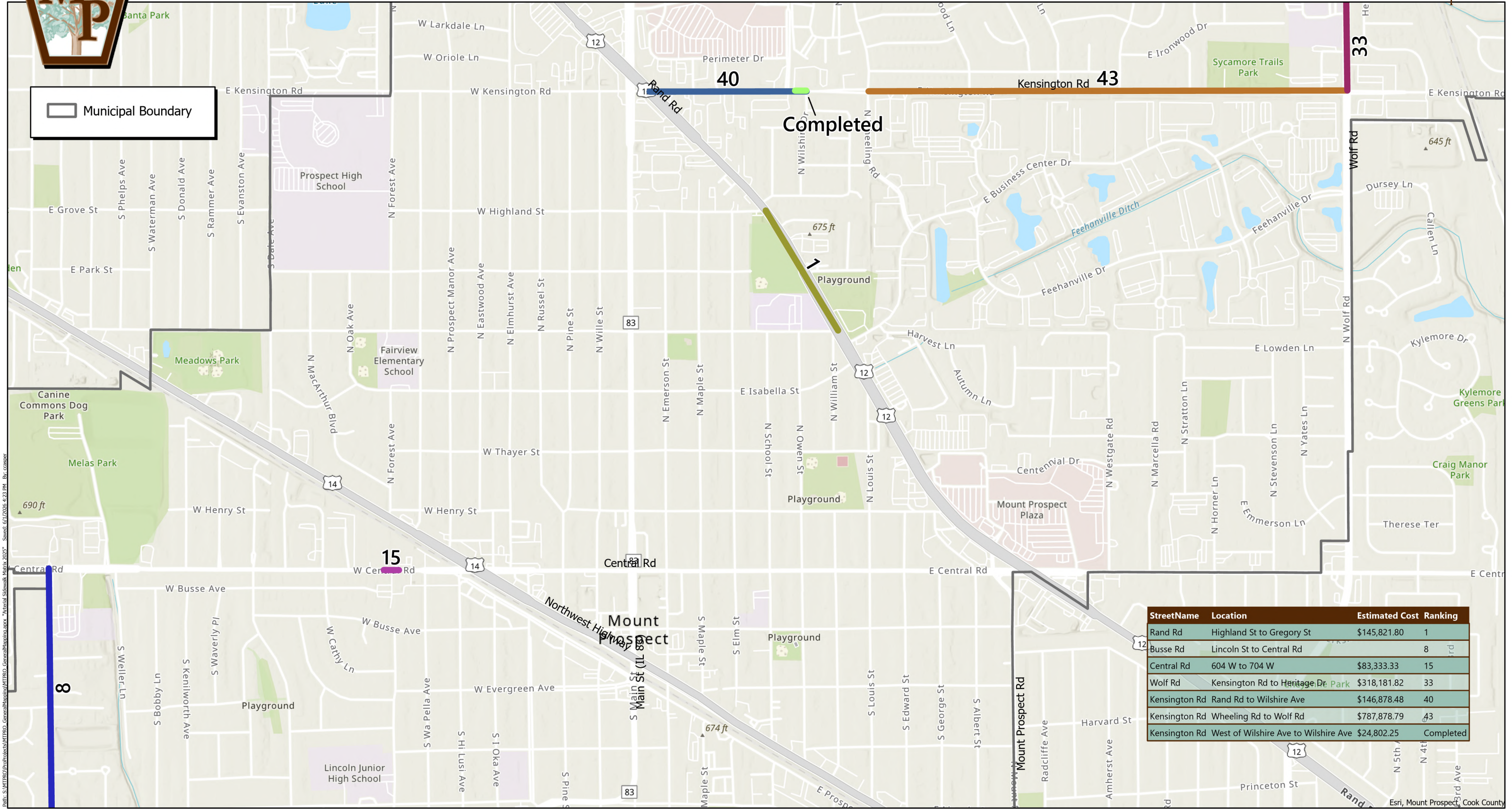


June 1, 2026  
Village of Mount Prospect, IL



# Arterial Sidewalk Matrix 2025

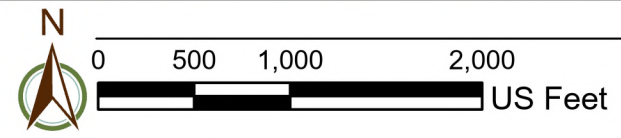
Map 2 of 4



□ Municipal Boundary

StreetName	Location	Estimated Cost	Ranking
Rand Rd	Highland St to Gregory St	\$145,821.80	1
Busse Rd	Lincoln St to Central Rd		8
Central Rd	604 W to 704 W	\$83,333.33	15
Wolf Rd	Kensington Rd to Heritage Dr	\$318,181.82	33
Kensington Rd	Rand Rd to Wilshire Ave	\$146,878.48	40
Kensington Rd	Wheeling Rd to Wolf Rd	\$787,878.79	43
Kensington Rd	West of Wilshire Ave to Wilshire Ave	\$24,802.25	Completed

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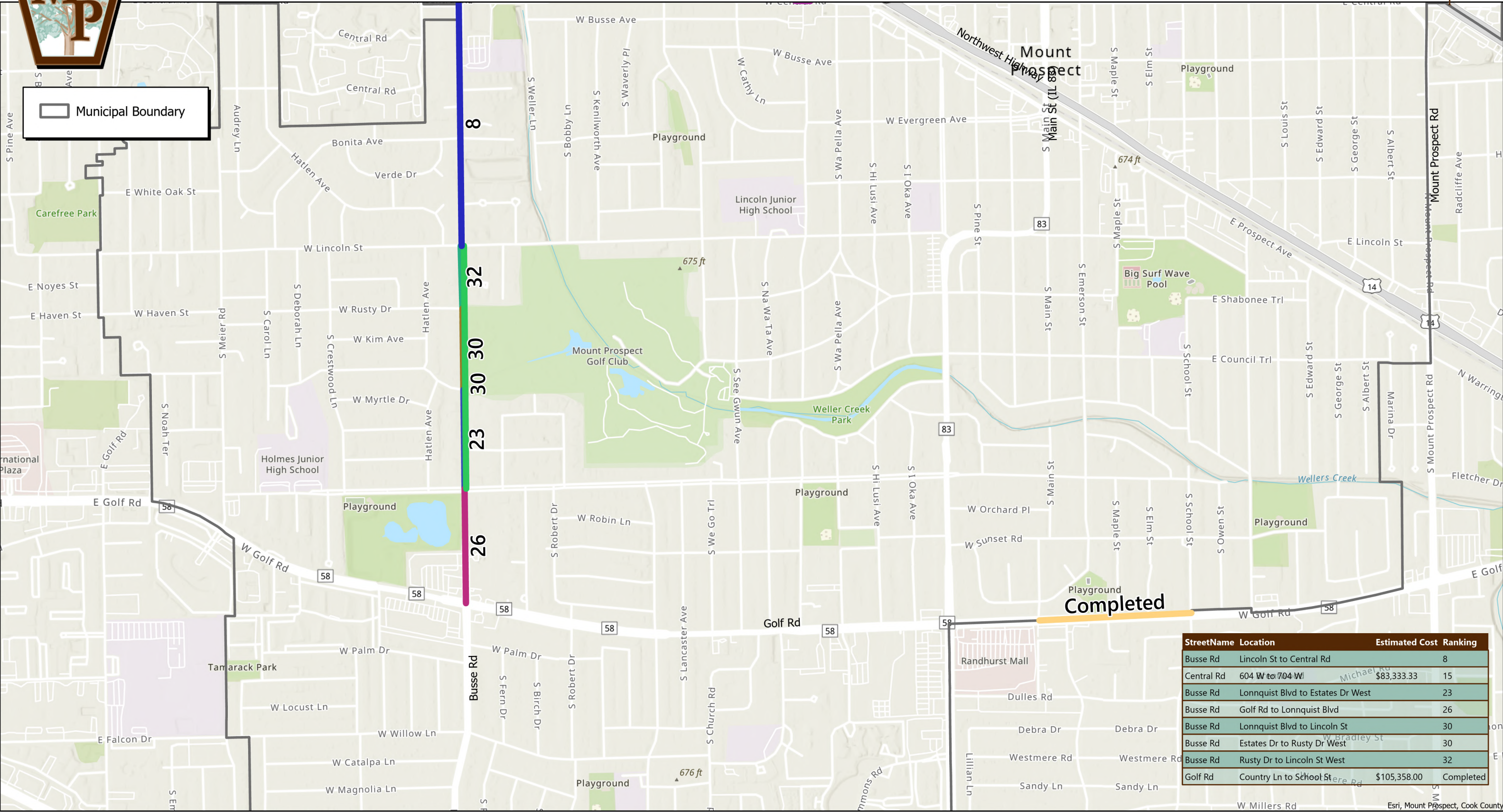


June 1, 2026  
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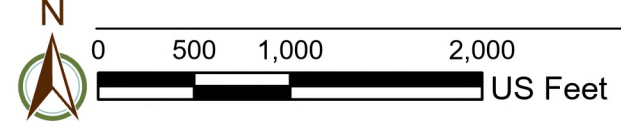
# Arterial Sidewalk Matrix 2025

Map 3 of 4



Municipal Boundary

StreetName	Location	Estimated Cost	Ranking
Busse Rd	Lincoln St to Central Rd		8
Central Rd	604 W to 704 W	\$83,333.33	15
Busse Rd	Lonnquist Blvd to Estates Dr West		23
Busse Rd	Golf Rd to Lonnquist Blvd		26
Busse Rd	Lonnquist Blvd to Lincoln St		30
Busse Rd	Estates Dr to Rusty Dr West		30
Busse Rd	Rusty Dr to Lincoln St West		32
Golf Rd	Country Ln to School St	\$105,358.00	Completed

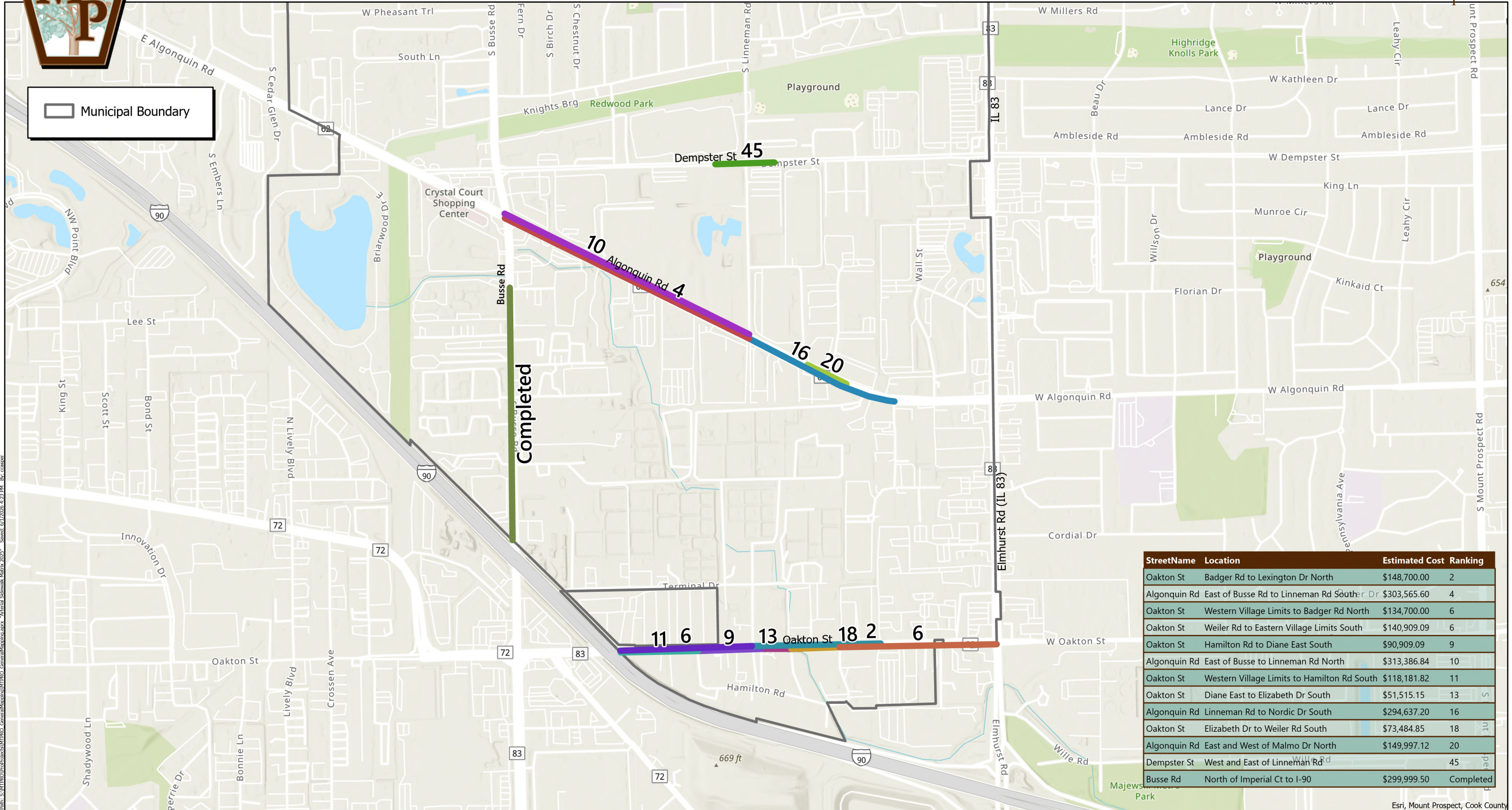


June 1, 2026  
Village of Mount Prospect, IL

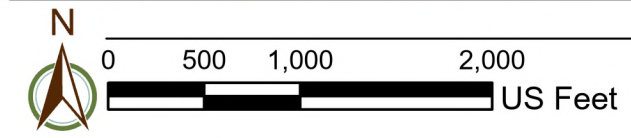


# Arterial Sidewalk Matrix 2025

Map 4 of 4



StreetName	Location	Estimated Cost	Ranking
Oakton St	Badger Rd to Lexington Dr North	\$148,700.00	2
Algonquin Rd	East of Busse Rd to Linneman Rd South	\$303,565.60	4
Oakton St	Western Village Limits to Badger Rd North	\$134,700.00	6
Oakton St	Weiler Rd to Eastern Village Limits South	\$140,909.09	6
Oakton St	Hamilton Rd to Diane East South	\$90,909.09	9
Algonquin Rd	East of Busse to Linneman Rd North	\$313,386.84	10
Oakton St	Western Village Limits to Hamilton Rd South	\$118,181.82	11
Oakton St	Diane East to Elizabeth Dr South	\$51,515.15	13
Algonquin Rd	Linneman Rd to Nordic Dr South	\$294,637.20	16
Oakton St	Elizabeth Dr to Weiler Rd South	\$73,484.85	18
Algonquin Rd	East and West of Malmo Dr North	\$149,997.12	20
Dempster St	West and East of Linneman Rd		45
Busse Rd	North of Imperial Ct to I-90	\$299,999.50	Completed



Esri, Mount Prospect, Cook County

June 1, 2026

Village of Mount Prospect, IL

**New Sidewalk Construction 2022 through 2026**

<b>Year</b>	<b>Road</b>	<b>From</b>	<b>To</b>	<b>Square Ft</b>	<b>Linear Ft</b>	<b>Cost</b>
2026	Oakton St	Lexington Dr	I90	10,100	2,020	\$ 283,400
2026	Schoenbeck Rd	Rand Rd	Camp McDonald Rd	10,560	2,112	
2026	Wolf Rd	Euclid Av	Prospect Heights Train Station	4,250	850	
2024	Busse Rd (east Side)	Algonquin Rd	I90	15,500	3,100	\$ 299,995
2023	Rand Rd (north side)	Metro Credit Union	Camp McDonald Rd	6,000	1,200	\$ 221,900
2022	Rand Rd (north side)	Schoenbeck	Metro Credit Union	7,325	1,465	\$ 148,638
2022	Golf Rd	Country Ln	School St	5,980	1,196	\$ 121,346
<b>Totals:</b>				<b>59,715.00</b>	<b>11,943.00</b>	<b>\$ 791,879.00</b>



## Item Cover Page

<b>Subject</b>	<b>Review and Discuss Next Steps for the MP2040 Comprehensive Plan.</b>
Meeting	June 9, 2026 - "ON THE ROAD" MEETING OF THE MOUNT PROSPECT COMMITTEE OF THE WHOLE
Fiscal Impact	N/A
Dollar Amount	
Budget Source	
Category	DISCUSSION ITEMS
Type	Presentation

### Information

The Village is currently updating its Comprehensive Plan through the MP2040 planning process. The Comprehensive Plan establishes the long-term vision for Mount Prospect and provides a policy framework to guide growth, reinvestment, land use, and capital decisions through the year 2040. It addresses major topic areas including land use, housing and neighborhoods, commercial and industrial areas, community facilities, transportation and mobility, and parks and environment.

### Discussion

The MP2040 Comprehensive Plan is in its final stages of preparation. Staff is working with the steering committee to review a first draft of the plan document and is ready to advance the project toward adoption. The following schedule outlines next steps in the process:

- **June 2026** – Steering Committee Meeting #3 to review the full draft plan and provide final direction prior to public release
- **June 30, 2026** – Public Open House to present the draft plan to the community and solicit feedback in the Farley Community Room
- **July 2026** – 30-day public comment period; staff to receive public comments and update the plan as appropriate
- **August 2026** – Target Planning and Zoning Commission public hearing and recommendation
- **September 2026** – Target Village Board consideration and adoption

Staff will discuss work completed to this point and these next steps with the Village board.

### Alternatives

N/A

### Staff Recommendation

N/A

**Attachments**

None