Agenda
Village of Glen Ellyn
Special Workshop Meeting
Monday, October 19, 2015
6:30 PM
Glen Ellyn Civic Center, Room 301

Village Board Workshop Procedures Statement

Visitors are most welcome to attend all meetings of the Village Board and can find copies of the Agenda on their chairs or online at www.glenellyn.org prior to the meeting. Any individual with a disability requiring a reasonable accommodation in order to participate in a meeting should contact the Village of Glen Ellyn ADA Coordinator, 630-469-5000, at least five (5) business days in advance of the next scheduled meeting. All matters on the Agenda may be discussed, amended, and acted upon.

A. Call to Order

B. Roll Call

C. Pledge of Allegiance

D. Audience Participation

1. Open: Members of the public are welcome to speak to any item *not* specifically listed on tonight's agenda for up to three minutes. For those items which are on tonight's agenda, the public will have the opportunity to comment at the time the item is discussed. In either case, please complete the Audience Participation form and turn it in to the Village Clerk. It is requested that, if possible, one spokesman for a group be appointed to present the views of the entire group. Speakers who are recognized are requested to step to a microphone and state their name, address and the group they are representing prior to addressing the Village Board.

E. Central Business District LED Street Lights (Public Works Director Hansen)

1. Public Works Director Julius Hansen will lead the discussion regarding the potential replacement or upgrade of LED street lights in the Central Business District.

F. Fiscal Year 2016 Budget Discussion (Finance Director Coyle)

G. Other Items

H. Motion to adjourn to Executive Session for the purpose of discussing the appointment, employment, compensation, discipline, performance or dismissal of specific employees, without returning to open session thereafter. (Trustee Senak)

Glen Ellyn Village Board
535 Duane Street
Glen Ellyn, IL 60137

Meeting: 10/19/15 06:30 PM
Department: Public Works
Department Head: Julius Hansen
Category: Discussion Item
Prepared By: Julius Hansen

SCHEDULED

AGENDA ITEM (ID # 1954) DOC ID: 1954

Public Works Director Julius Hansen will lead the discussion regarding the potential replacement or upgrade of LED street lights in the Central Business District.

Staff is looking for some initial feedback and direction on the potential replacement or upgrade of the street lights in the Central Business District ("CBD"). This project has been identified in the Capital Improvement Plan (CIP) for the last few years and was budgeted this year to begin the program. However, there are many different alternatives and options to consider and we are simultaneously seeking input form the Capital Improvement Commission and Environmental Commission.

Background:

The existing street lights in the CBD were installed in 1985 and the fixtures are near the end of the useful life with repairs becoming more difficult. The 285 street lights and their specific locations in the CBD are depicted on the map (Exhibit B). These lights are a 150 high pressure sodium ("HPS") system that consumes 188 watts total per fixture while producing 1.5 foot candles of 2000 Kelvin warm of light. These lights cost more to operate and maintain than the Light Emitting Diode ("LED") street lights. Consequently, staff is seeking the Village Board's input on installing LED street lighting in the CBD in order to reduce annual maintenance costs and reduce electricity usage.

LED street lighting use 75% less electricity than the HPS street lighting the Village currently uses. Aside from the reduced electricity costs and overall benefits to the environment, less electrical consumption would also free up electricity capacity that the Village could use for other purposes in the CBD, such as for holidays and special events. Recall that the current electrical infrastructure in the CBD has limited capacity and adding more electrical demand to the existing circuits(s) would likely lead to overload. Changing to LED's would free up some much needed capacity in the short-term. For the long-term, additional electrical work would still need to be completed on the separate circuit that powers the 120 volt duplex receptacles to make the system more robust. Such work would include more duplex receptacles that could be installed by Public Works staff based on workload and Village priorities in order to defray those costs. However, contracting the work would likely allow the Village to complete the project more quickly.

Estimated Payback of LED's:

The Village currently spends on average $15,000 annually ($235,000 over 15 years) for parts and labor to maintain the 285 street lights in the CBD. Total electrical costs on average is $15,000 annual ($225,000 over 15 years). Electricity savings should total $170,000 over 15 years, given that LED uses 75% less electricity. Therefore, the total savings including electrical costs, parts and public works labor equals $375,000 over a 15 year period or $25,000 per year (see Exhibit C and Exhibit E), exclusive of any inflationary cost factors, and factoring in some minor maintenance costs with LED lights.

The capital cost to change from HPS to LED street lights in the CBD is estimated to be $100,000 to $484,000 depending on the type of the LED component selected to make the change. This cost does not include labor, but if Public Works can complete this project with in-house labor, then an estimated $100,000 could be saved.

Fixture Options

The LED street lights typically produce a modern "sharp" white light. One example of those lights are the relatively new street lights installed in the Duane/Glenwood Parking Lot. However, some new LED street lights have been created to further soften the white light to reproduce the warmer glow of HPS. The current CBD HPS lighting produces a traditional "soft" yellow light (see attached LED Color Temperature Correlation Example). **The variation of the color of light is a significant decision on this project because of the desire for the right complimentary look in the downtown.**

Retrofit Kits

To change the street lights from HPS to LED the Village can use a retro fit kit that changes the lighting components within the existing old luminaire. This option costs money initially with the price ranging from $400 to $1,000 (see Exhibit A). However, the retro fit kits are typically used more effectively with newer luminaires, and the Village's lights are closing in on a 25 year life span (i.e. the maximum effective life). The old luminaires, due to age and normal wear and tear, will continue to need repairs creating additional on-going expenses. These fixtures would continue to be exposed to the elements requiring continued repairs to the paint, welds, latches, and electrical components to keep them attractive and serviceable. When servicing the older luminaires, some of the smaller components break because of their age. The maximum effective life of a retro fit kit is less than that of a new fixture engineered and manufactured to be LED. Staff, therefore, **would not recommend the retrofit option.** Other maintenance issues could arise such as if the retro fit kit is not as compatible as advertised to the old luminaires, which could lead to unwanted exposure to rain or insufficient ventilation causing failure.

New Fixtures

The cost of a new LED fixture is more expensive than the retro kit options, the cost of which ranges from $550 to $1700 per street light (see Exhibit A). However, the maximum effective life of the new fixture is obviously longer, and should last at least 30 years based on our existing lights, which makes it a more attractive option. Note: It can be difficult to know how long LED lights will last as this is somewhat newer technology in the street lighting context, but most vendors nonetheless offer 5 or 10 year warranties. Given the different options being considered, the payback for these lights would range from 5 to 15 years, not including any grant funds. **The ultimate cost of this proposed lighting transition is driven by the type of LED that the Village Board selects for this project.**

CBD Street Light LED Prototypes Display on Duane

To help facilitate this decision, Public Works has assembled a display of **fixtures and luminaires that are all LED** to assist with the Board's evaluation of selecting a street light for the CBD. The display is located on both sides of Duane Street from Main Street to Forest directly in front of the Civic Center. Each street light is numbered 1 - 12 about four feet above the sidewalk corresponding

to the numbers on the map (see exhibit D) and the following descriptions. **Staff is seeking the Board's evaluation of these LED street lights on display**.

Evaluation Criteria:
As the Board evaluates the street lights on display, staff suggests that it consider the quality of a LED street light based upon the following factors:

1. Appearance & quality of the light: color, glare, uniformity, consistency.
2. Illumination of the surface: brightness, pattern, shadowing.
3. Quality of the underlying LEDs (company of origin).
4. Appearance of the Luminaire that displays the LED light.

Fixture/Luminaire Sample Types:
The sample numbers listed below are also shown on the map provided for easy identification of the location of each described LED street light. The map and numbering system starts at Main Street on the South side of Duane walking from the West to the East and then crossing the street at Forest and walking West from Forest to Main Street.

Sample #1: The first LED street light example is on the southeast corner of Duane and Main. It is a new fixture that is LED and a **reproduction of the existing decorative lights**, which is manufactured by **Sternberg,** a local company in Roselle, Illinois. The cost is $1600.00 each (2700K color temperature), the fixture consumes 59 watts total, and produces 2.9 foot candles. **This fixture is night sky compliant**, and made by CREE a high quality producer of LED's. *Note*: Staff needed to blacken out the top glass panels to conceal the LED components.

Sample #2: Rather than a complete new fixture, **Sternberg** has a retro fit kit with the same specification but the price is $600/unit. Staff has this example displayed on the south side of Duane, and is the next street light east of Sample #1 above. The retro-fit luminaire would be installed in the existing old lighting fixtures. As described earlier in this memo with retro-fit kits, more labor will be needed to refurbish the remaining fixture components, and anticipated longevity is less than a completely new unit. Sample #2 yields a 3000K color temperature, and consumes 59 watts total, and produces 2.7 foot candles. *Note:* As in the above, staff needed to blacken out the top glass panels to conceal the LED components.

Sample #3: The next street light going eastward along Duane is a **Spring City** manufactured street light from Pennsylvania. **This is the same company that in 1992 manufactured the current street lights in the CBD.** The vendor has provided two LED examples. The first Spring City street light is the closest design they currently make in LED to replicate the existing HPS style street light the Village has currently. It is called the Jefferson model and can be made with frosted glass or with a clear lens. The unit is 70w at 2200K, producing 1.8 foot candles. **This output combination is the closest to the existing HPS warm color.** The unit could be made in a higher Kelvin temperature to change the color to be white, and can also be made with glass top panels or blackened panels. The cost is $1300/unit, and is also made by CREE.

Sample #4: The other **Spring City** manufactured street light is located next to the Civic Center parking lot entrance on Duane. It is a custom made conversion of the existing Nantucket street lights. This conversion kit, with Frosted Lens, yields 70W at 3000k producing 4.7 foot candles. It is a completely new fixture using the old attachment to the street light pole (see Spring City diagram), and has blackened rather than clear top panels. The cost is $1,000 each, and is made by CREE.

Sample #5: ANP is manufacturer from California, and this sample resembles the "Old Boston" style located between the Civic Center entrance and Forest. A few other manufacturers make this exact style including Sternberg. **This fixture is the LED version of the street lights currently located in the historical area of Stacy's Tavern at Main and St. Charles.** It is 4000K and 46 W producing 2.4 foot candles. The cost is $1355/unit.

Sample #6: A retro fit kit by Gennis Lighting produces .8 foot candles.

Sample #7: A retro fit kit by Matech; the cost is $360/unit and produces 2.5 foot candles.

Sample #8 & #9: A pair of LED street lights by **Holophane** (Acuity) at 70 watts is 3000K, produced 7.8 foot candles, and costs $1,072/unit. They represent a more contemporary version of the existing black decorative style the Village currently uses. LED's used in this fixture are from Nichia, a market leader like CREE.

Sample #10 & #11: Another pair of new fixtures that are LED. They are the glass acorn globe style of which there are two exact same style samples. It is supplied by **Holophane** (Acuity). It is only 40 watts & is 3000K producing 2.2 foot candles, and $550 for the new fixture. Although the most cost effective option, they represent a different style of lighting. LED's used in this fixture are also from Nichia.

Sample #12: Another **Sternberg** example is on the northeast corner of Duane and Main. **The fixture is the exact same as the fixtures installed in the permeable paver parking lot at Duane and Glenwood.** This example is made by Sternberg, and costs $1700.00 per unit The fixture produced 4500K color temperature, consumes 90 watts total, and produces 6.6 foot candles of light. This fixture is night sky compliant, and made by CREE. Note: Staff needed to blacken out the top glass panels to conceal the LED components.

Grant Funding and Budget:

Earlier this year, staff received notice from the Illinois Clean Energy Community (ICE) Foundation that the grant application submitted for converting the Central Business District's HPS street lighting to an LED system, was approved for the maximum amount of $25,000. These funds must be allocated by June 2016. Staff has accepted the grant on behalf of the Village, based on having money budgeted for the project. The Department of Commerce and Economic Opportunity (DCEO) also offers a grant that the Village could be eligible for, but some predict those funds will no longer be available from the State of Illinois. Total available from DCEO could be up to $20,000.

Total costs for this project range from $100,000 to $485,000. The expected Return on Investment (ROI) is difficult to gage given the various different options available. Staff's best

estimate is that the Village would safe approximately $25,000 per year in labor, parts, and electricity. Total savings over 15 years would be approximately $375,000. **The Village has budgeted $85,000 in 2015 for this project with another $135,000 proposed in the 2016 budget.** The Board could choose to add additional funds to the 2016 budget, or the project could be deferred to 2017 to reduce the financial burden in 2016.

Summary/Next Steps:

Updating the lighting fixtures in the CBD, utilizing new LED technology, improving the look and feel of downtown, being more environmental conscious by reducing electricity use, and taking advantage of some nominal grant funding, are all reasons for the Village to consider updating the CBD street lighting. In addition, there is a significant upside if LED lights and fixtures have extended life cycles, as the annual savings would continue and improve the overall ROI. In summary, staff is seeking guidance from the Village Board, as well from various Commissions, on which specific luminaire is the best choice, and will take all this feedback into consideration before moving forward with a formal recommendation to the Village Board. Staff looks forward to receiving feedback and direction at the October 19 Workshop.

ATTACHMENTS:

- Exhibit A (PDF)
- Exhibit B (PDF)
- Exhibit C (PDF)
- Exhibit D (PDF)
- Exhibit E (PDF)
- Kelvin Chart (PDF)

CBD Streetllights to LED

COMPANY	TYPE	KELVIN	WATTS	WARRANTY	DARK SKY	UNIT COST/ PROJECT COST
1). Sternberg	New Luminaire	2700k	59w	5 years	yes	$1600/ $456,000
2). Sternberg	Retro Fit	3000k	59w	5 years	yes	$600/$171,000
3).Spring City	New Luminaire	2200k	70w	10 years	yes	$1300/ $370,500
4). Spring City	Retro Fit	3000k	70w	10 years	yes	$1000/$285,000
5). ANP	New Luminaire	4000k	46w	5 years	yes	$1355/ $386,175
6).Gennis	Retro Fit	unknown	unknown	unknown	yes	unknown
7).Matech	Retro Fit	unknown	unknown	5 years	yes	$360/102,600
8).Holophane	New Luminaire	3000k	70w or 40w	10 years	yes	$1072/$305,520
9). Holophane	Same as Above	Same as Above	Same as Above	Same as Above	Same as Above	Same as Above
10). Holophane	New Luminaire	3000k	40w	10 years	no	$550/$156,750
11). Holophane	Same as Above	Same as Above	Same as Above	Same as Above	Same as Above	Same as Above
12). Sternberg	New Luminaire	4500k	90w	5 years	yes	$1700/$484,500

Exhibit B

CBD Area

ANTHONY ST
WESTERN AV
PENNSYLVANIA AV
IL PRAIRIE PATH
DUANE ST
HILLSIDE AV
DEERPATH RD
PARK BL
FOREST AV
CRESCENT BL
GLENWOOD AV
PROSPECT AV
MELROSE AV
MAIN ST
APPIAN WAY

Maintained By
- VGE
- CBD
- Com Ed
- UPRR
- Other
- Power Center

CBD LED Streetlight Cost Analysis

Exhibit C

	Cost	Life	Years	Parts Cost Per Light	Parts Cost for 285 Lights	Labor/per change	Labor Cost Per Light	Labor Cost for 285 Lights	HPS Total	LED
Bulb	$10.29	5	15	$30.87	$8,797.95	$25.00	$75.00	$21,375.00	$30,172.95	$0.00
Ballast	$177.19	5	15	$531.57	$151,497.45	$25.00	$75.00	$21,375.00	$172,872.45	$0.00
Fuse	$11.30	3	15	$56.50	$16,102.50	$10.00	$50.00	$14,250.00	$30,352.50	$0.00
Electric Cost (285 lights for 15 Years)									$225,000.00	$56,250.00
Cost of Fixture									$0.00	$370,500.00
Totals					$176,397.90			$57,000.00	$458,397.90	$426,750.00

N
Exhibit D
AV
424
450
546-48
540-42
534
530-32
443-45
DUANE ST
535
HPS
HPS
427-33
427
ST
O
428
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.

The current operational costs of the 150 watt High Pressure Sodium (HPS)

The electrical cost of the HPS street lighting ranges from $15,000 - $20,000 annually for the 285 fixtures we want to convert to LED in the Central Business District. Therefore, an assumption can be made that in a 15 year period $225,000 would be spent on electrical cost for HPS. The change to LED results in a 75% reduction in electrical cost for a savings of $168,750 in a 15 year period.

The current maintenance costs of the 150 watt High Pressure Sodium (HPS)

- A HPS bulb costs us $10.29 and is changed every 5 years per fixture so $10.29 x 2 bulb changes per fixture = $20.58 (10 years) x 285 = a savings of $5,865.30 or $8797.95 in 15 years. The labor cost is $25.00 per bulb per fixture with 3 bulbs in 15 years equals $75 x 285 fixtures equaling $21,375.

- A Ballast costs us $177.19 and is changed every 5 years per fixture so $177.19 x 2 ballast changes per fixture= $354.38 (in 10 years) x 285 = a savings of $100,998.30 or $151,497.45 in 15 years. The labor cost is $25.00 per ballast per fixture with 3 ballast in 15 years equals $75 x 285 fixtures equaling $21,375.

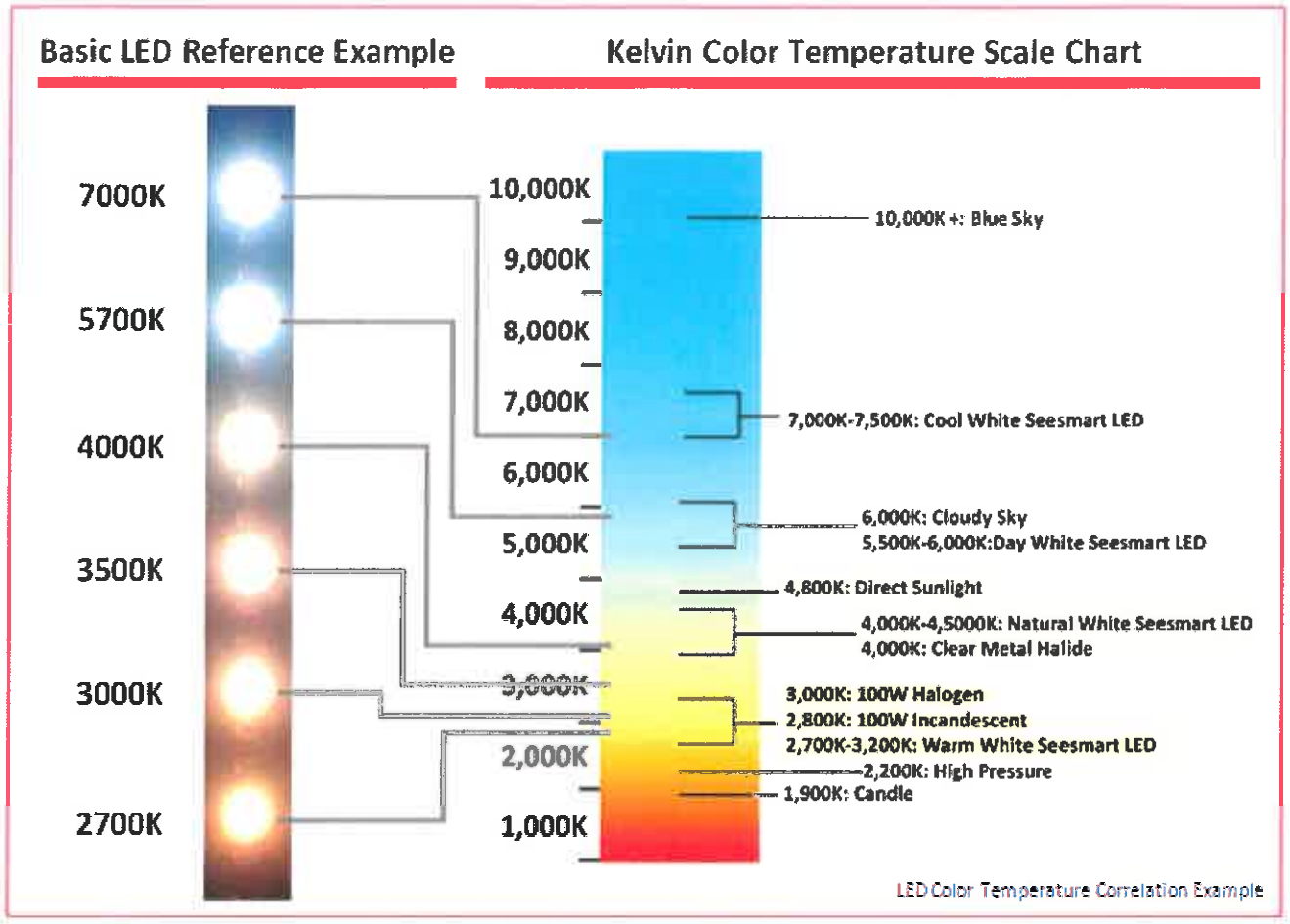
- A fuse costs us $5.65 with 2 in each fixture is $11.30 changed every 3 years so $11.30 x 3 changes per fixture = $ 33.90 (in 9-10 years) x 285 = a savings of $9,661.50 or $16,102.50 in 15 years. The labor cost is $10.00 per fuse change with 5 fuse changes in 15 years equals $50 x 285 fixtures equaling $14,250.

- The total estimated cost of labor for 15 years at $25.00 per hour is $57,000

- The total estimated cost of parts for 15 years equals $176,397.90

- The total estimated cost of the electrical costs are $225,000 over a 15 year period.

The grand total for 15 years of operational and maintenance costs for the current HPS street lights is $458,397.90. The total cost for the LED street lights after purchasing an average priced Luminaire ($1300 x 285= $370,500) and consuming 15 years of electricity ($56,250) equals $426,750.


Basic LED Reference Example
Kelvin Color Temperature Scale Chart
7000K
5700K
4000K
3500K
3000K
2700K
10,000K
9,000K
8,000K
7,000K
6,000K
5,000K
4,000K
3,000K
2,000K
1,000K
10,000K +: Blue Sky
7,000K-7,500K: Cool White Seesmart LED
6,000K: Cloudy Sky
5,500K-6,000K:Day White Seesmart LED
4,800K: Direct Sunlight
4,000K-4,5000K: Natural White Seesmart LED
4,000K: Clear Metal Halide
3,000K: 100W Halogen
2,800K: 100W Incandescent
2,700K-3,200K: Warm White Seesmart LED
2,200K: High Pressure
1,900K: Candle
LED Color Temperature Correlation Example