

**To:** Erin Daughton (ComEd)  
**CC:** Jennifer Morris, Jordan Thomas (ComEd), Jeff Erickson (Navigant Consulting, Inc.)  
**From:** Emily Merchant, Wayne Leonard, Rob Neumann (Navigant Consulting, Inc.)  
**Date:** March 15, 2019  
**Re:** ComEd CY2018 LED Street Lighting Impact Evaluation - Preliminary Findings

## INTRODUCTION

This memo includes preliminary findings from the CY2018 LED Street Lighting impact evaluation in advance of the draft EM&V impact report that will be provided by March 22, 2019. The verified gross savings in Table 1 are subject to change prior to the EM&V report. This memo provides Navigant’s preliminary findings and includes a high-level summary of the savings, methodology and findings. The verified net savings for the program are 86,043,658 kWh.

**Table 1. CY2018 Total Annual Incremental Electric Savings**

Savings Category	Energy Savings (kWh)	Demand Savings (kW)	Summer Peak Demand Savings (kW)
<b>Electricity</b>			
Ex Ante Gross Savings	86,056,163	19,999	N/A
Program Gross Realization Rate	100%	100%	N/A
Verified Gross Savings	86,043,658	19,996	N/A
Program Net-to-Gross Ratio (NTG)	1.00	1.00	N/A
Verified Net Savings	86,043,658	19,996	N/A
<b>Converted from Gas*</b>			
Ex Ante Gross Savings	N/A	NA	NA
Program Gross Realization Rate	N/A	NA	NA
Verified Gross Savings	N/A	NA	NA
Program Net-to-Gross Ratio (NTG)	N/A	NA	NA
Verified Net Savings	N/A	NA	NA
<b>Total Electric Plus Gas</b>			
Ex Ante Gross Savings	86,056,163	19,999	NA
Program Gross Realization Rate	100%	100%	NA
Verified Gross Savings	86,043,658	19,996	NA
Program Net-to-Gross Ratio (NTG)	1.00	1.00	NA
Verified Net Savings	86,043,658	19,996	NA

\* Gas savings converted to kWh by multiplying therms \* 29.31 (which is based on 100,000 Btu/therm and 3,412 Btu/kWh).

† There were no reported gas or summer peak demand savings for this program

NA = Not applicable.

Source: ComEd tracking data and Navigant team analysis.

## METHODOLOGY

The evaluation team conducted an engineering review to verify the ex ante gross savings. This included a detailed review of the tracking data and a review of the savings calculators that were provided for four projects.

- **Savings Calculator Review:** Navigant compared the fixture quantities, existing lamp wattages, existing system wattages, new lamp wattages, and incentives in the savings calculators against the tracking data.
- **Tracking Data Review:** Navigant recalculated the savings based on the inputs included in the tracking data. Next, Navigant reviewed the tracking data for missing values, outliers, and reasonable values. Finally, Navigant compared the input assumptions in the tracking database against the LED Streetlighting Workpaper dated January 2, 2019.

## FINDINGS

The evaluation team verified gross savings as reported, with the exception of a few items, which are summarized by evaluation activity below.

### Savings Calculator Review

The fixture quantities and wattages in the savings calculator aligned with the tracking data with the exception of the new lamp wattages, which is discussed below.

**Finding:** The new lamp wattages in the savings calculator did not align with the tracking data for three of the four reviewed projects. Due to the limited project documentation available to Navigant to review, it was difficult to determine whether the tracking data was out of date or if the savings calculators were out of date.

**Recommendation:** Navigant recommends providing more transparency in the savings calculator about whether it is the final version. In addition, Navigant recommends that the implementer only provide the final version of the documentation that aligns with the tracking data.

### Tracking Data Review

Navigant did not find any significant discrepancies when reviewing the tracking data. A few minor discrepancies are summarized below.

**Finding 1:** Navigant was unable to reproduce the Watts Reduced in the tracking data for one of the 276 projects. The Watts Reduced value was listed as 1,289 watts in the tracking data, but recalculating the watts reduced value based on the Existing System Wattage, New Lamp Wattage, and Nbr of Heads on Pole (i.e. quantity) resulted in a Watts Reduced value of 1,077 watts.

**Recommendation 1:** Navigant suggests that the implementer do a cross-check of the individual fixture wattages and fixture quantities to confirm that they multiply out to the same Watts Reduced value as listed in the tracking data.

**Finding 2:** The Existing Lamp Wattage, Existing System Wattage, New Lamp Wattage, and Nbr of Heads on Pole were missing for three of the Public Sector Street Lights projects. There was a value for the Watts Reduced in the tracking data and Navigant was able to reproduce the ex ante gross energy savings using the Watts Reduced value instead of the individual fixture wattages.

**Recommendation 2:** Navigant recommends that the implementer verify that there are no missing fixture wattage or quantity values in the tracking database.

**Finding 3:** At least three of the projects have incorrect Wattages entered in the database field for Existing Lamp Wattage. For one such instance the lamp wattages increase by one watt for each row of the project, which is likely due to an error resulting in dragging down the value in a cell to multiple rows. The Existing System Wattage, which is used in the savings calculation, was a consistent and correct wattage therefore this did not affect the savings.

**Recommendation 4:** Navigant recommends that the implementer do spot-checks of the fixture wattages to confirm that no erroneous values have been entered.

**Finding 5:** One of the projects had the same wattage for the Existing Lamp Wattage and the Existing System Wattage column, which is unusual. The Existing System Wattage is typically higher or lower to account for the ballast factor. This is likely an issue with human error during the data entry process.

**Recommendation 5:** Navigant recommends that the implementer ensure that the ballast factor is accounted for when appropriate.

**Recommendation 6:** Navigant recommends that the implementer include some simple, yet automated data QC that notifies the user if inputs are in conflict, outside of a set range, or otherwise spurious due to a probable human error.

**Finding 6:** The incentive paid does not appear to track with energy savings achieved. More specifically, the incentive dollars invested per kWh ranges from a low of approximately 20 cents per kWh up to over one dollar per kWh. Perhaps Navigant is missing a key driver behind this variation, but the same observation holds true when the incentive is normalized by Baseline Lamp Watts as well as Total Watts Reduced per project.

**Recommendation 7:** Navigant recommends that the implementer confirm incentives are applied consistently and per program design.

**Finding 7:** Evaluation needs to report demand savings and this program has winter peak demand savings that are not reported in the tracking system.

**Recommendation 8:** ComEd should track and report winter peak demand savings in the tracking system so Navigant can evaluate and report those demand savings.