

Tips for using the MSSLC Retrofit Financial Analysis Tool

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File compatibility

The MSSLC Retrofit Financial Analysis Tool was developed and tested using Excel 2010 for Windows. Based on information gathered from Excel's "Check Compatibility" feature, the tool should also work without problem in Excel 2007 for Windows. As for Mac support, the tool utilizes some formatting features that preclude 100% compatibility with versions of Excel for Mac prior to the 2011 version. Although not tested within Excel for Mac 2011, we believe that the file should work properly with that edition.

Multiple scenarios

If analysis of multiple scenarios is desired, multiple copies of this spreadsheet may be used, with one scenario per file.

Global vs. line-item (product-specific) inputs

There has been some discussion of the value and additional flexibility that would be provided if some of the global-level inputs were instead line-item/product-specific inputs. Examples of variables with which such flexibility might be useful include vehicle rate and labor rate, to reflect different crew and vehicle requirements for different products. It's also possible that there may be multiple utilities, and therefore electricity rates, within a municipality's boundaries. As a workaround, users may wish to use multiple copies of the spreadsheet if product-specific differences exist for some of these currently-global variables. For example, if multiple electricity rates are involved in a project, it may be necessary to use multiple copies of the tool, with fixtures subject to each rate included in separate files.

Group re-lamping or sensors/controls replacement

For "Lamp Rated Life" and "Controls Rated Life" in the Maintenance Page's Scheduled Maintenance section, if replacements will occur prior to rated life (i.e. due to group re-lamping), enter the hours of operation until scheduled replacement.

Show results for individual lighting products, in addition to the aggregated results shown on the Results Summary sheet

This would arguably be a useful additional feature, but it can currently be obtained relatively easily in the existing framework. By altering the numbers of fixtures entered in column E of Section Two of the

Input Page, a user can relatively quickly update the Results Summary sheet to show only results associated with a desired subset of the products.

Cutting and pasting from other sources

When pasting text from other documents, Excel's paste operation pastes HTML text by default. Essentially, this is formatted text, and the formatting of the source document comes along with it, overriding the formatting and at least some of the cell properties provided within MSSLC's Excel-based tool. These properties include fill color, number formatting (currency, percentage, etc.), and cell locking, the latter of which may affect the ability to subsequently edit a cell. There are two ways around this for the user:

1. After pasting text copied from another document, a little icon, known as a smart tag, will pop up. By clicking on that tag, the option "Match Destination Formatting" may be selected. This will remedy the problem, as only the text, and none of the source formatting, will remain.
2. Alternatively (and equivalently), Paste Special may be used to paste text. Paste Special is accessible by either right clicking or via the arrow at the bottom of the Paste button on Excel's Home Ribbon. By choosing either "Text" or "Unicode Text" with Paste Special, no formatting will be imported from the source document.

Purchasing variations

The tool, by default, essentially implicitly assumes that a system owner handles the purchasing and installation of the lighting products (see Scenario 1 below). However, the tool can be employed to analyze other scenarios as well, and allows for the input of data based on three typical methods of project construction. These typical scenarios are:

- **Scenario 1** – Per-unit cost for fixtures, hourly rate for installation (owner purchases fixtures and uses internal (or external) labor resources to install units at an hourly rate).
- **Scenario 2** – Per-unit cost for fixtures, per-unit cost for installation (owner purchases fixtures and uses external labor resources to install fixtures at a fixed per-unit cost).
- **Scenario 3** – Single lump sum (LS) cost for labor and materials (owner hires external resources to purchase and install fixtures at a fixed lump sum per-unit cost for labor and materials).

For each of these scenarios, pre-construction, construction engineering (including inspection), and project management costs may be entered in the Project Overhead and Implementation section, to capture all project labor costs.

Addressing the data entry for these scenarios on the Input Page

Installation Labor Rate (cell D20)

Identify the purchasing and installation scenario to be used and follow the steps provided below to determine the Installation Labor Rate to be entered in cell D20.

- **Scenario 1** – Hourly in-house (or external) rate for complete crew needed to install one unit.
- **Scenario 2** – Take the per-unit bid item cost from the labor vendor; multiply by the estimated total number of units to be installed per hour per crew. This is your hourly rate. For instance, if your contractor can install 5.5 units per hour (11 minutes each, 41 units per day) and the bid item cost is \$130 per unit, then your hourly rate is \$715.00/hr. (In this scenario, the more efficient the crew is, the higher the hourly rate. But the project will be completed in fewer hours.)
- **Scenario 3** – Add no value to the Installation Labor Rate (cell D20) with this scenario. Instead, place the total bid item costs for labor and materials, on a per-fixture basis, in the Current Fixture Cost field (Input Page, beginning in cell M59), found in the Installation subsection of Section One.

It may be helpful to document any additional calculations undertaken by entering them in the User Notes and Scratchpad section of the Input Page.

Project Overhead and Implementation (cells D34-D36)

In this section, users can estimate a project's pre-construction (PS&E – Plans (engineering and drafting), Specifications, and Estimates), construction engineering, and project management costs. Enter the appropriate factors as described below.

- **D34 – Overhead Labor** is the total number of staff typically needed to plan and manage a lighting retrofit project, including engineers, project managers, inspectors, etc.
- **D35 – Overhead Labor Rate** is the average fully-burdened hourly rate of all overhead staff members included in cell D34.
- **D36 – Overhead Work Year** is the estimated average number of hours worked per year for each staff member included in cell D34.

Note: Alternatively, overhead labor can be factored into the Installation Labor Rate (cell D20) when completed overhead costs are known or can be estimated closely. This number may then combined with the construction labor costs and entered in cell D20, as described below:

- Combine the total estimated expenses for overhead labor, divide by the number of units to be installed, and then multiply this number by the number of units per hour. This is an extrapolation of the pre-construction, construction engineering, and project management overhead labor rate.

Maintenance Page

Scheduled Maintenance

This is where the cost for system planned maintenance (i.e. group re-lamping, cleaning, etc.) is captured. If an agency relies solely on spot re-lamping on a per-call basis, this can be handled in the *Emergency Maintenance* section. If cleaning is part of the maintenance routine, it may not be necessary to include

additional time in this area for incumbent systems. However, many will find that the only likely scheduled maintenance for an LED system will be cleaning. If so, a value should be placed in Annual Cleaning Rate (%), found in column AJ. For example, if a fixture life of 65,700 hours is assumed (15 years at 4,380 hours/year) and cleaning is scheduled at $\frac{1}{2}$ life, then cleaning would occur only once over the life of the fixture, or 1/15. This could then be expressed as a 6.6% (or 7%) cleaning rate, thus capturing the cost for all fixtures to be cleaned over the life of the system.

Emergency Maintenance

This is where most of the maintenance expenses for LED streetlights will be captured. An estimated 1% annual failure rate in these categories would mean a total failure rate of 15% over a 15-year period.