

**Appendix K**  
**Cost Model**

## **A. Overview of the Transit Fleet Cost Model**

This model allows for individual fleet analysis of baseline and scenario costs. The detailed input assumptions are in the "Input" tab and the baseline and scenario calculations with some key user inputs in the "Main" tab to allow for assessing fleet specific information. All cells that are shaded blue can be modified by the user without overwriting any calculations.

Bus costs and battery electric bus infrastructure costs are shown in section 1, and any other infrastructure costs, like shop chargers, hydrogen stations, inductive charging, are shown in section 2. Users who are interested in viewing the detailed calculation results or in the cash flow for any category the sheet can be expanded (and collapses) by clicking on the numbers 1 and 2 at the top left (as shown on the right).

## **B. Section 1 - Bus and Variable Infrastructure Costs**

The model calculates life cycle costs for buses purchases in any year for each row in Section 1. This allows the user to input their existing fleet by entering the number of buses of each model year from model year 2000, and to project any number of new bus purchases in future years out to 2050. The model is set up to allow the user to input the total number of buses in the fleet and will model future purchases as a constant number of buses per year like other models. However, the user can also vary the number of future bus purchases in any year. The model is capable of evaluating multiple bus purchases of different types and from different manufacturers in any year (by using multiple rows for the same model year) if the data is added to the input sheet. Rows can be inserted or deleted as needed to model any combination of new purchases for more sophisticated scenarios by copying from an existing row and pasting the contents into a new row. "All in" battery electric bus cost estimates include all associated charger and infrastructure costs except for shop chargers or supplemental equipment like inductive chargers to extend range.

## **C. Section 2 - Infrastructure Capital Costs**

The model separately adds capital costs for infrastructure that is not directly associated with bus purchases like shop chargers, hydrogen station, fuel station upgrades, or site specific conditions, or supplemental chargers. These values need to be input by the user if applicable.

## **D. Baseline and Scenarios**

The scenario section is below the baseline section and uses the same inputs at the top of the page and uses the exact same calculations. The sheet is collapsed to show the key input values and total cost of ownership for each row. The Scenario section defaults to the same number of bus purchases in the baseline section. It is set up to

identify the number of zero emission bus purchases in a given year and the remaining purchases will default to the same bus type in the baseline or the user can identify a second bus type for the same year (like low-NOx engines or another bus type).

Note: Spreadsheet areas that are shaded in rose uses the same assumptions for fuel economy, annual miles, and bus useful life for each bus model year based on averages input by the user. In most cases these values should not be changed. However, if users are interested in modeling varying annual bus miles, fuel economy, or useful life by model year, these values can be overwritten but will no longer linked to the user input values at the top of the page. The lookup formulas can be reinstated by copying them from other rows that are not modified.

### **E. Statewide Cost Analysis**

Based on the transit fleet cost model, staff developed a spreadsheet to estimate statewide cost for different scenarios in ISOR, including the baseline, current conditions, proposed ICT regulation, and two alternatives.