TRANSIT
ASSET
MANAGEMENT

U.S. Department of Transportation
Federal Transit Administration

TERM Lite User Guide

Quick Start Guide for FTA's Transit Economic Requirements Model Lite (TERM Lite) Version 2.3

April 2025

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Table of Contents

1. Overview

The FTA Transit Economic Requirements Model (TERM Lite) is a Microsoft Access application designed to estimate an agency's transit capital investment needs over an extended time horizon.

The TERM Lite user guide provides a step-by-step walk-through of the tool to get a new user started. Users are encouraged to test the limits of TERM Lite by performing what-if analyses beyond what is presented in this guide.

1.1. TERM Lite

TERM Lite estimates the total amount of annual capital expenditures required over a twenty-year period or a thirty-year period to maintain or improve the physical condition and performance of the agency's transit infrastructure. The TERM Lite model is designed for use by asset management professionals at individual transit agencies.

These annual expenditure estimates are provided for each of two major capital investment categories—(1) asset rehabilitation and replacement, and (2) expansion assets—and are further subdivided by transit mode, asset type (e.g., vehicles, stations, structures, etc.) and urbanized area characteristics. The model output also includes estimates of the physical condition of the agency's transit asset base, both for the current year and for a 20 or 30-year forecast period. Asset condition forecasts are directly impacted by the asset condition replacement policies applied by the user.

The TERM Lite design allows you to control a wide range of model input parameters (e.g., asset replacement and rehabilitation assumptions, and financial assumptions) to facilitate the analysis of a wide range of investment scenarios.

TERM Lite can help with…

- Long term forecasting of capital needs,
- Estimating expenditures for asset rehabilitation, replacement, and expansion,
- Scenario analysis to reduce the state-of-good repair (SGR) backlog, and
- Strategic planning.

TERM Lite is NOT designed for…

- Near-term operational planning,
- Asset inventory management, or
- Detailed lifecycle planning and scheduling.

1.2. Prerequisites

TERM Lite is a PC-based Microsoft Access application. It is recommended that the machine on which TERM Lite is run meets the following prerequisites:

- Windows XP or newer
- 4GB RAM or higher
- Microsoft Access 2007 or newer
- Microsoft Excel 2007 or newer

Operating TERM Lite with lower specifications may result in slow performance.

1.3. Contact

The TERM Lite development team appreciates your feedback and questions. Please reach out with feature requests, found defects, or for user support by emailing TERM-help@dot.gov.

2. Using the TERM Lite Inventory Publisher

The Microsoft Excel-based TERM Lite Inventory Publisher is an optional but recommended resource to help TERM Lite users prepare their transit asset inventory for use in TERM Lite. The Inventory Publisher input file will allow the user to set up their inventory in Excel and transfer the inventory in the correct format to TERM Lite.

This section provides a step-by-step walk-through for a new user to prepare their agency's transit asset inventory data using Inventory Publisher. Regardless of whether you choose to use Inventory Publisher, the content in this section explains the asset inventory information that is imported into and used by TERM Lite.

2.1. Set Up Inventory Publisher

Download Inventory Publisher

Inventory Publisher can be downloaded from the FTA TERM Lite web page. Double click on the Inventory Publisher template and save the resulting new Excel file to a location of your convenience. It is recommended you save the file with an informative file name documenting the inventory date and, if applicable, the inventory scenario or variation that you are using.

Add and Remove Rows

To add blank rows, type the number of rows needed in the cell to the right of the "Add" button (Exhibit 1-A), then click the "Add" button (Exhibit 1-B). You can add more rows than needed as they can be easily removed later.

There are two ways to remove unused/unwanted records (Exhibit 1-C):

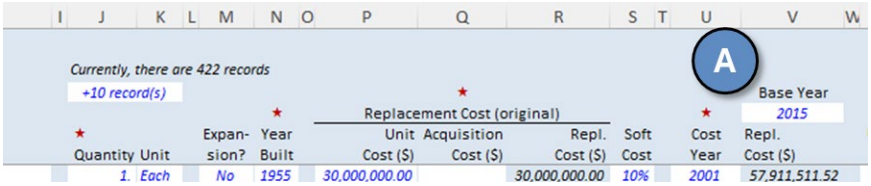
1. **Delete Records with No Description** – If you added more rows than were eventually needed, the surplus rows likely have no descriptions in them. This button will cause **all records** with no descriptions to be deleted. Therefore, it is important to ensure that all valid records have a description before using this option. All but the first record row can be deleted this way.
2. **Delete Selected Records** – To delete one or more contiguous rows, select a range of rows using any of the editable cells. Click this option and the entire rows corresponding to those cells will be deleted.

Exhibit 1 – Add or Delete Rows in Inventory Publisher

Update Base Year

In the cell labeled "Base Year" located above the Replacement Cost column (Exhibit 2-A), enter the dollar year in which all Planned Replacement Costs should be shown. TERM Lite will make all appropriate adjustments to account for construction cost index and inflation to present outputs in the base year's dollars.

Exhibit 2 – Update Base Year in Inventory Publisher



***Tip:** Base year is used for the inventory calculations. You will need to separately define base year and inflation assumptions in TERM Lite for the actual simulation.*

2.2. Update Inventory Records

The following steps walk through required and optional data fields in Inventory Publisher. Required fields are marked with a red asterisk (*) in Inventory Publisher. Optional fields do not have an asterisk in Inventory Publisher and are specifically labeled in the steps below. For awareness, Inventory Publisher requires more fields than are required for TERM Lite to run. However, the available fields in Inventory Publisher can serve as helpful documentation as you update your inventory over time.

***Tip**: In Inventory Publisher only white (no fill) cells are editable.*

Select Mode

In the "Mode" column, enter a mode for each asset record in Inventory Publisher by selecting from the drop-down menu of standard TERM Lite modes. Note that mode is distinct from asset classification, which will be entered in a separate column.

Inventory Publisher includes the following modes:

- BRT – Bus Rapid Transit
- CC – Cable Car
- CR – Commuter Rail
- DR – Demand Response
- FB – Ferry Boat
- HR – Heavy Rail
- JT – Jitney
- LR – Light Rail
- MB – Motor Bus
- MO – Monorail
- OR – Other
- SY – Systemwide Assets
- TB – Trolleybus
- TR – Aerial Tramway
- VP – Vanpool

For reference, FTA's National Transit Database (NTD) Glossary includes descriptions of many of these modes.

Tip: *When entering a new asset into Inventory Publisher, select the mode with which the asset is best associated. You can alternatively select "Sy – Systemwide Assets" if the asset cannot be associated with an individual mode. Ultimately, mode is used only to categorize assets for reporting at the end of a TERM Lite run and is for your reference.*

Enter Asset Description

In the "Description" column, enter an asset-specific description for each record. This field is free response. This field is required in Inventory Publisher though it is not used in the TERM Lite simulation. However, having a unique or otherwise descriptive name for each asset helps identify individual inventory assets and will simplify future inventory updates.

Select Asset Classification

In the "Asset Classification" column, use the drop-down menu to select a five-digit asset type code. Each code correlates to a Category, Sub-Category, Element, and Sub-Element, and you can choose the level of detail to use.

For example, you can code an asset as "50000" for "Vehicles", "51000" for "Vehicles, Revenue Vehicles", or, at the greatest level of detail, "52504" for "Vehicles, Revenue Vehicles, Rural". Using a detailed classification will allow you to better distinguish assets in the TERM Lite scenario and will enable more detailed grouping and analysis in reporting.

Appendix B lists all available asset types.

Enter Quantity and Unit of Measure

In the "Quantity" and "Unit" columns, enter a quantity and unit of measure for each asset. The quantity is mandatory and may range from one if the row represents a single asset up to a larger number if the row represents a fleet or other collection of similar assets. **The unit of measure is optional and only for your reference.**

Note: *The unit cost, if provided, will be multiplied by the quantity to arrive at a total replacement cost. See Enter Replacement Cost below for more information.*

Enter Expansion Status (Optional)

An expansion asset is one that is planned but that has not yet been procured. In the "Expansion?" column, select "Yes" or "No" from the drop-down menu to indicate whether the selected asset is an expansion asset. **This field is optional and only for your reference—TERM Lite will consider any asset with a future "Year Built" (see Enter Year Built) to be an expansion asset**.

Enter Year Built

In the "Year Built" column, enter the year the asset was built or rebuilt. This information is critical since TERM Lite relies heavily on condition decay curves to predict condition, rehabilitation, and replacement needs based on age.

You can also include in the inventory planned assets that have not yet been procured. For planned assets, type in a future year that the asset is expected to enter service.

Enter Replacement Cost

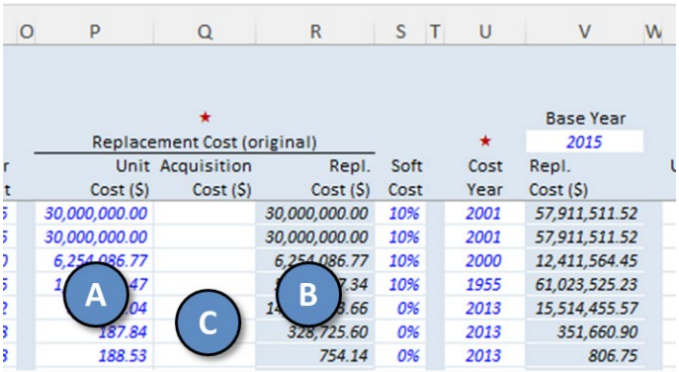
Inventory Publisher includes two methods to enter replacement cost. You can choose whichever method best aligns with your inventory tracking system:

A. **Enter a Unit Cost** – In the "Unit Cost ($)" column, enter the original cost of the asset (Exhibit 3-A). If this method is chosen, the final replacement cost auto-populated in the "Repl. Cost ($)" (Exhibit 3-B) column will be based on this unit cost times the asset quantity previously entered.
B. **Enter an Acquisition Cost** – In the "Acquisition Cost ($)" column, enter the total cost of all assets included in the individual record (Exhibit 3-C). Inventory Publisher will treat this total acquisition value as the base replacement cost.

If you enter values into both the "Unit Cost ($)" and "Acquisition Cost ($)" columns, Inventory Publisher will default to the unit cost method and will ignore the total cost from acquisition cost.

Note that in an upcoming step to Enter Cost Year, you will need to specify in which year the cost was applied.

Exhibit 3 – Enter Costs in Inventory Publisher



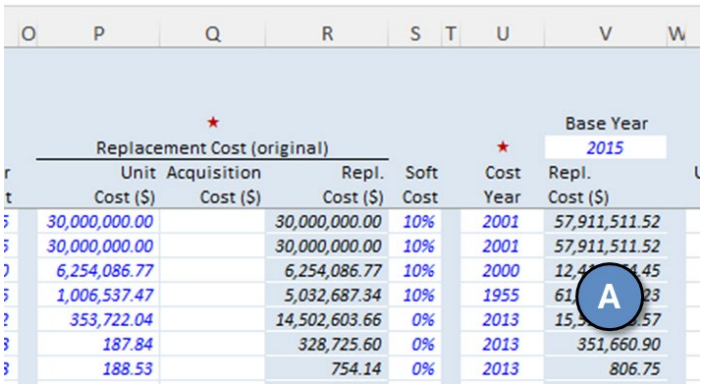
***Tip:** The entered costs can include any scope of work that you desire. For example, if your historical cost data includes soft-costs (procurement, design, engineering, construction management, etc.), you can include those costs in the "Unit Cost ($)" or "Acquisition Cost ($)" column and then decline to enter soft costs in the separate "Soft Cost" column (see Enter Agency Soft Costs).*

Enter Agency Soft Costs (Optional)

Agency soft costs represent the additional markups needed to cover the actual acquisition of a new asset. This may include demolition of the existing asset, procurement, design, engineering, construction management, etc. In the "Soft Cost" column, enter your agency's standard soft cost percentage. This percentage will be applied to the original "Repl. Cost ($)" column (Exhibit 3-B) to arrive at an expected total replacement cost (Exhibit 4-A) during the specified Base Year.

As mentioned in the previous section, you decide how you define and enter costs. If the "Unit Cost ($)" or "Acquisition Cost ($)" values already include soft costs, then enter 0% into the "Soft Cost" column or leave the column blank.

Exhibit 4 – Replacement Cost in Base Year in Inventory Publisher



Enter Cost Year

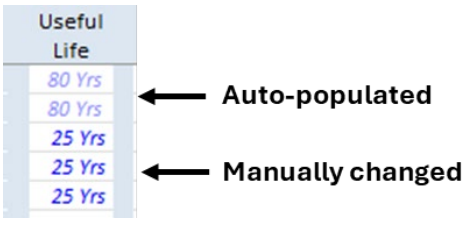
In the "Cost Year" column, enter the cost year for all costs provided. If historical data is used, the cost year will typically be the year in which the asset was built, installed, or procured as new. TERM Lite will automatically inflate costs from this cost year to the Base Year previously entered.

Note: *The base year replacement cost (Exhibit 4-A) is presented for your reference only. This value is calculated using the cost factors provided plus soft costs and adjusted for inflation to the chosen base year. You will need to separately define base year and inflation assumptions in TERM Lite for the actual simulation.*

Review and Update Useful Life

Each asset entered in the Select Asset Classification step above will be matched to a default estimated useful life. This value will be auto-populated in light blue text for review. If desired, overwrite the auto-populated useful life with a custom asset-specific useful life in years. The new value entered will be shown in darker blue text (Exhibit 5).

Exhibit 5 – Update Useful Life in Inventory Publisher



Select Priority Status

The "Priority Status" column tells TERM Lite how to prioritize an asset for funding in the simulation, in conjunction with additional prioritization criteria and weights in the TERM Lite application. Use the drop-down menu to select one of the following four priority statuses for each asset:

- **Normal** – asset will undergo standard TERM Lite prioritization. This is the default for new rows added to Inventory Publisher.
- **Deficient** – asset will be prioritized for funding regardless of asset age. TERM Lite will replace the asset as soon as possible.
- **Funded** – asset will be assigned maximum priority though TERM Lite won't attempt to replace it until the end of the asset's useful life.
- **Exclude** – asset will be excluded from the TERM Lite analysis. It will not be funded or included in backlog calculations.

Tip: *The priority status affects only the first replacement of an asset. After the first replacement, the asset receives the standard TERM Lite prioritization based on age and useful life. All assets are subject to available budget regardless of priority status.*

Enter Delayed Replacement Age (Optional)

The "Delayed Replacement Age" column lets you set a replacement age **greater than** the useful life for an asset's first replacement. Then, after the first replacement, TERM Lite will use the value in the "Useful Life" column.

Leave the "Delayed Replacement Age" field blank to use the value in the "Useful Life" column for all replacements. If a value less than the useful life is entered into "Delayed Replacement Age", TERM Lite, will use the useful life.

Enter Additional Notes (Optional)

In the "Additional Notes" column, add any additional information that you would like to document for an asset. These fields will be carried forward into TERM Lite's full set of results, described in How to View Raw Outputs (Advanced Users).

Enter Data Year and Data Source (Optional)

In the furthest-right two columns of Inventory Publisher, enter the year asset data were collected and data source for each asset record. This optional field can provide helpful documentation of where to obtain updated information in future years. This information will be carried forward into TERM Lite's raw output table.

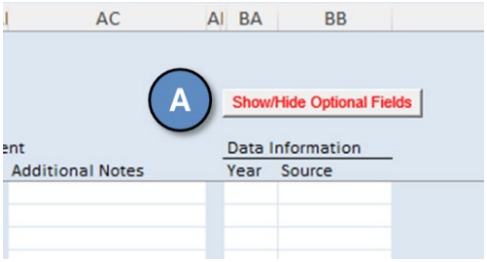
Provide Additional Information (Optional)

Click the "Show/Hide Optional Fields" button (Exhibit 6-A) to expand or hide additional columns where you can optionally add the following information:

- Department/Owner
- Project Number
- Project Category
- Project Description
- Asset Type
- Make/Model
- Asset ID
- Area
- Sub-Area
- Line/Route
- Start
- End
- Latitude
- Longitude
- Address
- Location 1
- Location 2
- Location 3
- Location 4

These fields are for your information only and will not be used by TERM Lite. However, they will be carried forward into TERM Lite's raw output table.

Exhibit 6 – Show/Hide Optional Fields in Inventory Publisher

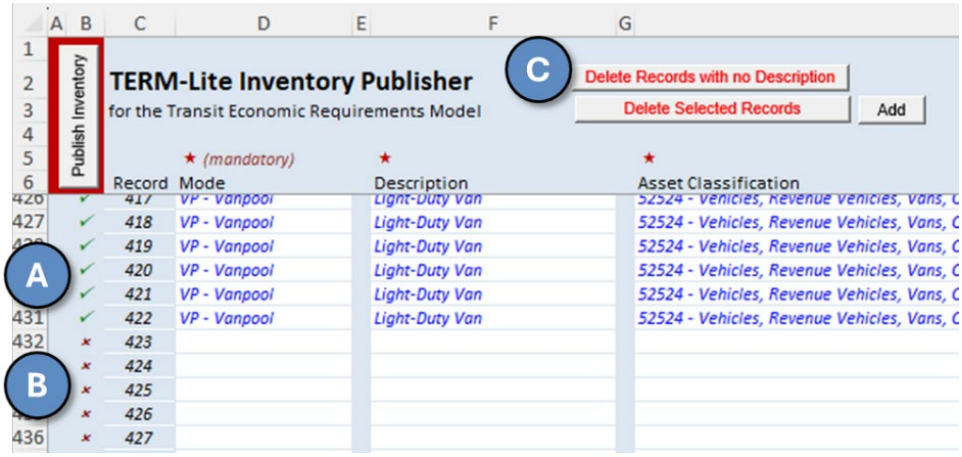


2.3. Verify and Publish Data

Checking for Invalid Entries

To finalize the inventory for use in TERM Lite, valid entries must be provided for all required fields. Look at the left side of the worksheet, near the "Mode" column. Valid records are designated by a checkmark (Exhibit 7-A) while invalid records are designated by an "x" (Exhibit 7-B). If a record is marked invalid, double-check that all required fields are complete for that row. In addition, you will need to delete any empty rows. You can do this by clicking the button to "Delete Records with no Description" (Exhibit 7-C).

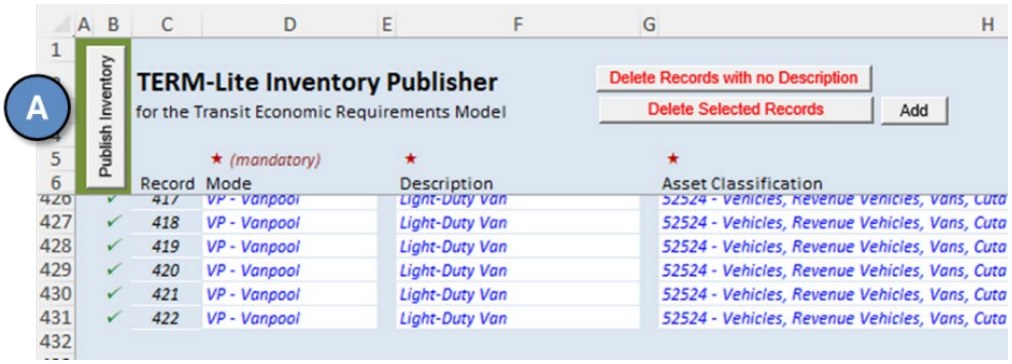
Exhibit 7 – Valid and Invalid Entries in Inventory Publisher



Publishing Inventory

If all records are valid, the area around the "Publish Inventory" button in the upper-left corner will change from red to green (Exhibit 8-A). You can bring Inventory Publisher data into TERM Lite either manually or using the built-in import features. See Import Inventory in the next section on Running TERM Lite for instructions on importing Inventory Publisher data into TERM Lite.

Exhibit 8 – Publish Inventory Button in Inventory Publisher



***Note**: If you encounter any problems while transferring data to TERM Lite, please email the Help Desk at TERM-help@dot.gov.*

3. Running TERM Lite

This section provides a step-by-step walk-through for a new user to

- Import their agency's transit asset inventory from Inventory Publisher (see Using the TERM Lite Inventory Publisher above) into TERM Lite,
- Set and modify scenario settings, and
- Run a simulation in the TERM Lite model.

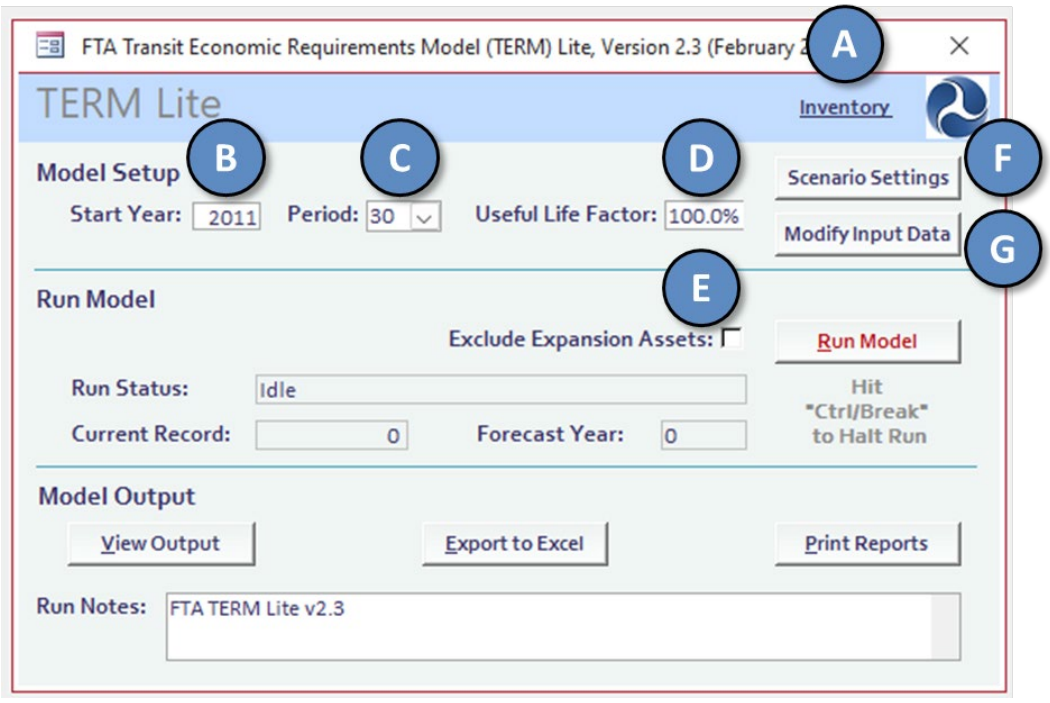
The TERM Lite model can be downloaded from the top of the FTA TERM Lite web page.

> ***Note**: TERM Lite comes preloaded with many default values, particularly in the menus detailed in Input Scenario Settings and Review and Modify Other Inputs. The extent to which you amend these values is up to you and your agency, but it is recommended you review the default values to ensure that they reasonably reflect your agency's policy and assumptions about asset management.*

3.1. Set Up a New Scenario File

Locate and open the TERM Lite model in Access. The TERM Lite splash screen will appear followed by the Main Menu (Exhibit 9) as the file opens.

Exhibit 9 – TERM Lite Main Menu: Model Setup



File Management with TERM Lite

TERM Lite is an MS Access-based analysis tool. Once a simulation is run on the model, the Access file contains all the data, tables, queries, and results that make up a single analysis. If a simulation is rerun on the same file, all results are overwritten.

Therefore, it is recommended that you create a copy of the model file for each separate analysis that you run and wish to retain. There is no limit to the number of copies of TERM Lite you can maintain. To create a copy, open TERM Lite in Access, select "File" (above the ribbon), select "Save As," and save the file as an Access Database (*.accdb) with a unique and descriptive name for your scenario.

Import Inventory

If preparing your inventory in Inventory Publisher (recommended to ensure a matching schema), you can import assets in the following ways:

A. **Built-In Import Feature** –
    1. Verify that Inventory Publisher is closed.
    2. Click the Inventory link (Exhibit 9-A) in the upper-right corner of the TERM Lite Main Menu to open the Inventory Input window.
    3. Click the "Import Inventory Publisher" button on the "Inventory Input" window.
    4. Browse to and select your Inventory Publisher file and click the "Open" button. You may need to select "Excel (*.xls)" from the drop-down menu next to the file name field to see your inventory file, depending on how it is saved.
    5. If the TERM Lite Access file already contained asset inventories, you will have the choice to replace the existing data (selecting "yes" on the pop-up window) or append the new assets to the current inventory (selecting "no").
    6. This process might take a few seconds.

B. **Manual** –
    1. In Inventory Publisher, click the "Publish" button (Exhibit 8-A). The data will be copied to the computer clipboard.
    2. Click the Inventory link (Exhibit 9-A) in the upper-right corner of the TERM Lite Main Menu to open the Inventory Input window.
    3. In the "Inventory Input" window,
        i To replace the existing data, select the existing records, press the "Delete" key, select the * row, and press "Ctrl+V" to paste the data from the clipboard.
        ii To append the data to the existing inventory, select the * row at the bottom of the inventory and press "Ctrl+V" to paste the data from the clipboard.

***Tip**: It is recommended that you keep an unmodified version of the Access file with inventory imported in case you wish to return to the original data.*

Set Start Year

Return to the Main Menu. Enter the "Start Year" for your model run (Exhibit 9-B). This is "year 0" for the simulation. Ideally, the start year is set to the year of your most recent inventory update. The current

SGR backlog is measured from this date. In addition, in Set Inflation Assumptions, you will have the option to convert all costs to the start year's dollars considering built-in inflation assumptions. This start year is independent of the base year specified in Inventory Publisher.

Set Period

Use the drop-down "Period" menu (Exhibit 9-C) to select a 20-year or 30-year simulation.

Set Useful Life Factor

Also on the Main Menu, enter the "Useful Life Factor" (Exhibit 9-D). This factor will cause TERM Lite to reduce or extend the time that all assets are retained prior to replacement. This does not impact an asset's useful life, only the timing of its replacement relative to its useful life. In addition, the factor does NOT interact with delayed replacement age, i.e., delayed replacement age will not be scaled.

***For Example**: If the factor is set to 125%, a bus with a 12-year useful life still exceeds useful life after age 12 (and enters the backlog), but it is not replaced until age 15 years (12x1.25) subject to funding availability.*

***In Addition:** TERM Lite will replace an asset at the larger number of years when comparing (i) the scaled useful life and (ii) the delayed replacement age. If the example bus above has a delayed replacement age of 13 years, TERM Lite would replace the asset at 13 years if the useful life scaling is 100% or at 15 years if the useful life scaling factor is 125%.*

Review Exclude Expansion Assets Checkbox

TERM Lite considers any asset with a future "Year Built" (see Enter Year Built) relative to the scenario Start Year to be an expansion asset, i.e., an asset planned for future procurement. You can exclude expansion assets from your simulation using the "Exclude Expansion Assets" checkbox (Exhibit 9-E).

3.2. Input Scenario Settings

Click the button labeled "Scenario Settings" (Exhibit 9-F) to open the "Scenario Settings" window. The "Scenario Settings" window has three tabs:

- Prioritization Settings
- Expenditure Constraints
- Backlog Target Seek

Review and Update Prioritization Criteria Settings

Most transit agencies' annual budgets are not large enough to address all unmet SGR needs (i.e., there is insufficient funding to complete all outstanding rehab and replacement activities). In simulations with such constrained funding, TERM Lite uses the five investment criteria found in the "Prioritization Settings" tab (Exhibit 10) to assign a weighted prioritization score to each reinvestment need. TERM Lite then reinvests in assets, starting with the highest prioritization scores, subject to (i) the assumed level of

annual funding set for the scenario (see Edit Expenditure Constraints below) and (ii) for the first replacement only, the asset's priority status (see Select Priority Status).

The five investment criteria used in TERM Lite are:

- Asset Condition
- Safety & Security
- Reliability
- O&M Cost Impact
- User Defined Criterion

All five criteria are scored on a 1 to 5 scale for each asset, with a score of 5 representing the highest risk or impact associated with an asset being out of SGR for a given criterion and a score of 1, the lowest. TERM Lite combines these five criteria scores into a weighted prioritization score (out of 100) for each asset to determine which assets should be prioritized when funding is constrained.

The **Asset Condition** ratings are calculated from the age of the asset (based on the Year Built from Inventory Publisher), the asset's Priority Status selected in Inventory Publisher or otherwise modified in Import Inventory, and asset-specific condition decay curves built into TERM Lite. In TERM Lite's output reports, the Asset Condition ratings are mapped to labels for Worn/Poor, Marginal, Adequate, Good, and Excellent. An asset will be replaced when the condition rating is around 2.5 (considered "Marginal" condition) out of 5, subject to available funding.

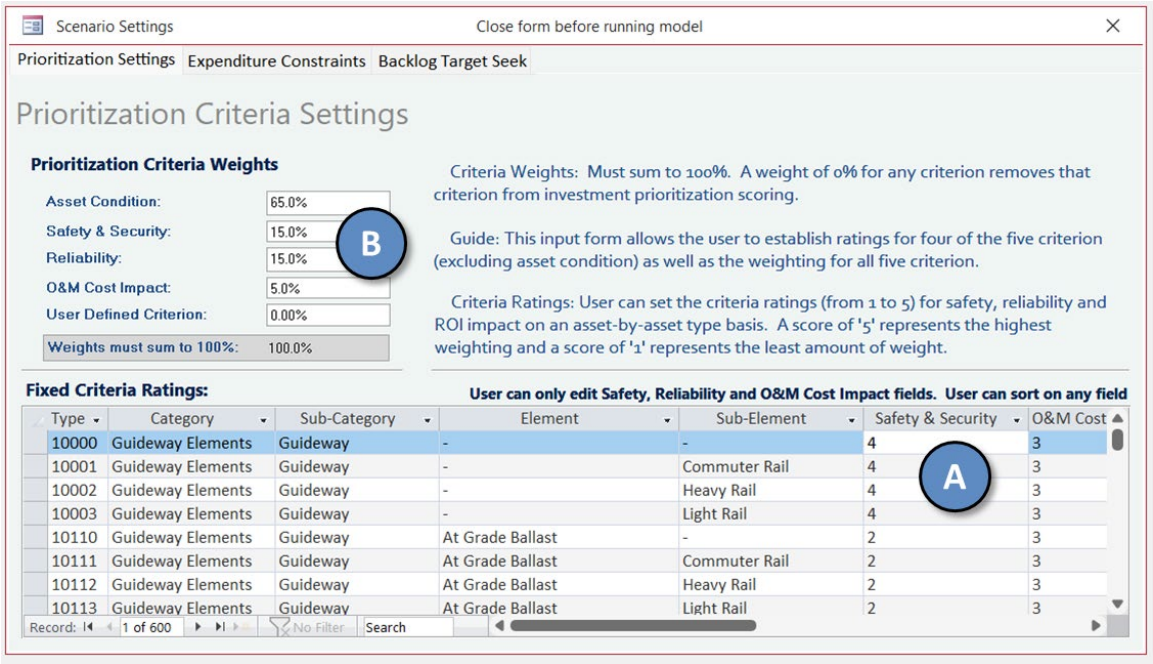
***Note**: The Asset Condition ratings generated and used by TERM Lite are distinct from the TERM Scale ratings used for evaluating and reporting the condition of facilities.*

The asset level ratings for the remaining four criteria (**Safety & Security**, **Reliability**, **O&M Cost Impact**, and the **User Defined Criterion**) are stored in the "Fixed Criteria Ratings" table (Exhibit 10-A). You can revise these four criteria scores for each asset type. The scores must be whole numbers between 1 and 5. The User Defined Criterion is an optional field that you can use for a custom priority category. The User Defined criterion defaults to an asset level rating of "1" for each asset type.

You can also revise how the five prioritization criteria factor into the overall weighted prioritization score (Exhibit 10-B). You may assign 100 percent of the weight to a single criterion, but the total of all weights must be equal to 100 percent. A weight of 0 percent means that TERM Lite will ignore that criterion for all asset types.

***For Example**: If your agency values safety and security above all other considerations, adjust the weight for that criterion higher than the other criteria.*

Exhibit 10 – Prioritization Criteria Settings

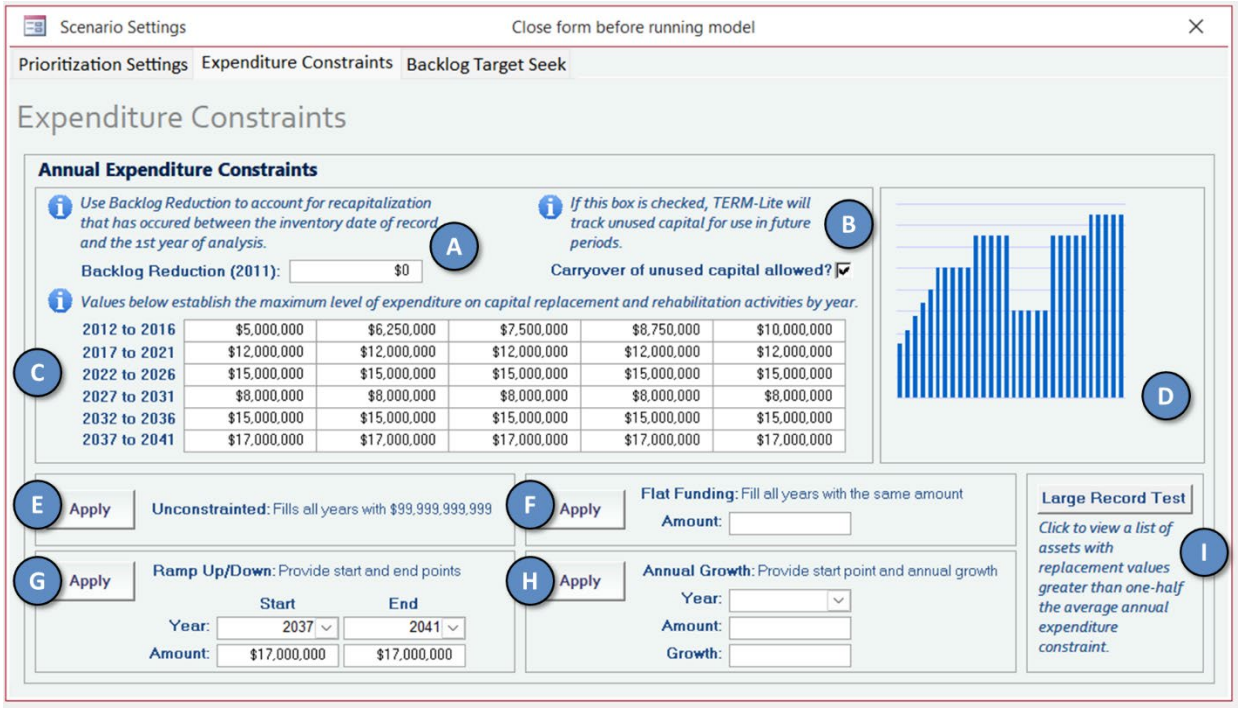


Set Expenditure Constraints

The "Expenditure Constraints" tab (Exhibit 11) of the "Scenario Settings" window allows you to set annual capital replacement and rehabilitation budgets for each year of your scenario. When funding is less than the amount required to address all outstanding needs, TERM Lite will use the prioritization criteria (see Review and Update Prioritization Criteria Settings above) to determine which reinvestment actions are addressed (and which assets enter the SGR backlog). By varying the level of annual expenditures, you can execute "what if" scenarios to illustrate various conditions. Suggested funding scenarios can be found in Appendix A.

***Tip**: If you want to determine the annual funding required to reduce the SGR backlog by a certain amount within a certain timeframe, you do not need to enter any information into the "Expenditure Constraints" tab and can instead proceed to the Enable Backlog Target Seek (Optional) section.*

Exhibit 11 – Expenditure Constraints



The following steps will help you accurately establish the limits of your scenario:

- **Backlog Reduction** – If time has passed between when your asset inventory was completed (see Enter Data Year and Data Source (Optional) above) and the starting year of your scenario (Exhibit 9-B), there may have been investment in capital replacements and rehabilitations. Use the "Backlog Reduction" field (Exhibit 11-A) to record the amount of money spent on capital replacements and rehabilitations between the completion of the asset inventory and scenario start date. Note this investment will be applied to assets in Year 0 according to TERM Lite's prioritization methods.
- **Capital Carryover** – If selected, the "Carryover of unused capital allowed?" checkbox (Exhibit 11-B) allows unused funds from one year to be carried over and added to subsequent years' budgets. Unselected, this checkbox will prevent unused funds from being carried over.
- **Annual Expenditure Constraints** – Under "Annual Expenditure Constraints", populate each year in the table (Exhibit 11-C) with the maximum funding that you want TERM Lite to spend on capital replacement and rehabilitation. Each year has an individual field, with the first five years of the scenario occupying the five cells in the first row, the next five years using the five fields in the second row and so on. The graph to the right of the table (Exhibit 11-D) displays the relative yearly maximum expenditures for the entire scenario. TERM Lite includes convenience features to help you quickly enter funding scenarios:
    A. **Manually** – Manually enter funding levels, year-by-year, directly in the table fields (Exhibit 11-C).
    B. **Unconstrained** – Applying the "Unconstrained" funding option (Exhibit 11-E) sets the funding level for all scenario years to approximately $100 billion. See Appendix A for more information on using this option.

C. **Flat Funding** – The "Flat Funding" funding option (Exhibit 11-F) allows you to set the funding level for all scenario years to the same value, as defined in the "Amount" field.
D. **Ramp Up/Down** – The "Ramp Up/Down" funding option (Exhibit 11-G) allows you to enter a starting and ending year and funding amount that TERM Lite uses to calculate funding levels for the intervening years. TERM Lite will evenly and linearly increase or decrease the funding amount from the starting year funding amount to the ending year funding amount.
E. **Annual Growth** – The "Annual Growth" funding option (Exhibit 11-H) allows you to increase (or decrease) annual funding by a fixed percentage (entered in the "Growth" field) from a given funding level (entered in the "Amount" field) in a given starting year (entered in the "Year" field) through the end of the scenario timeframe.

Finally, the "Large Record Test" button (Exhibit 11-I) displays a table of assets with replacement costs greater than half of the average funding level for the whole scenario. **This table is only generated after the simulation has been run**.

***Tip**: The "Ramp Up/Down" funding option can also be used to set a flat funding level for a selected range of years. This can be helpful when entering a complex and variable funding scenario.*

Enable Backlog Target Seek (Optional)

"Backlog Target Seek" is a feature of TERM Lite that determines the annual funding required to reduce the SGR backlog by a certain percentage in a certain number of years. Using the "Backlog Target Seek" feature will cause TERM Lite to ignore information entered on the "Expenditure Constraints" tab (Exhibit 11). Instead, the model will compute the funding needed to achieve a linear reduction in the SGR backlog (down to the desired amount) over a given period and then maintain that backlog level for the remaining duration of the analysis.

To use the "Backlog Target Seek" feature, click on the "Backlog Target Seek" tab, then:

1. **Check the "Apply Backlog Target Seek"** checkbox.
2. **Set the desired "Backlog Target"** as a percentage of the current SGR backlog. For example, if the existing backlog is $100 million, and the desired backlog is $65 million, enter a value of 65 percent. A value of 100 percent would maintain the existing backlog level.
3. **Set the "Target Year"** of the analysis (1 to 30) at which the desired backlog will be achieved.

3.3. Review and Modify Other Inputs

From the Main Menu, click on the "Modify Input Data" button (refer to Exhibit 9-G) to open the "Modify Input Data" window. The "Modify Input Data" window has three tabs:

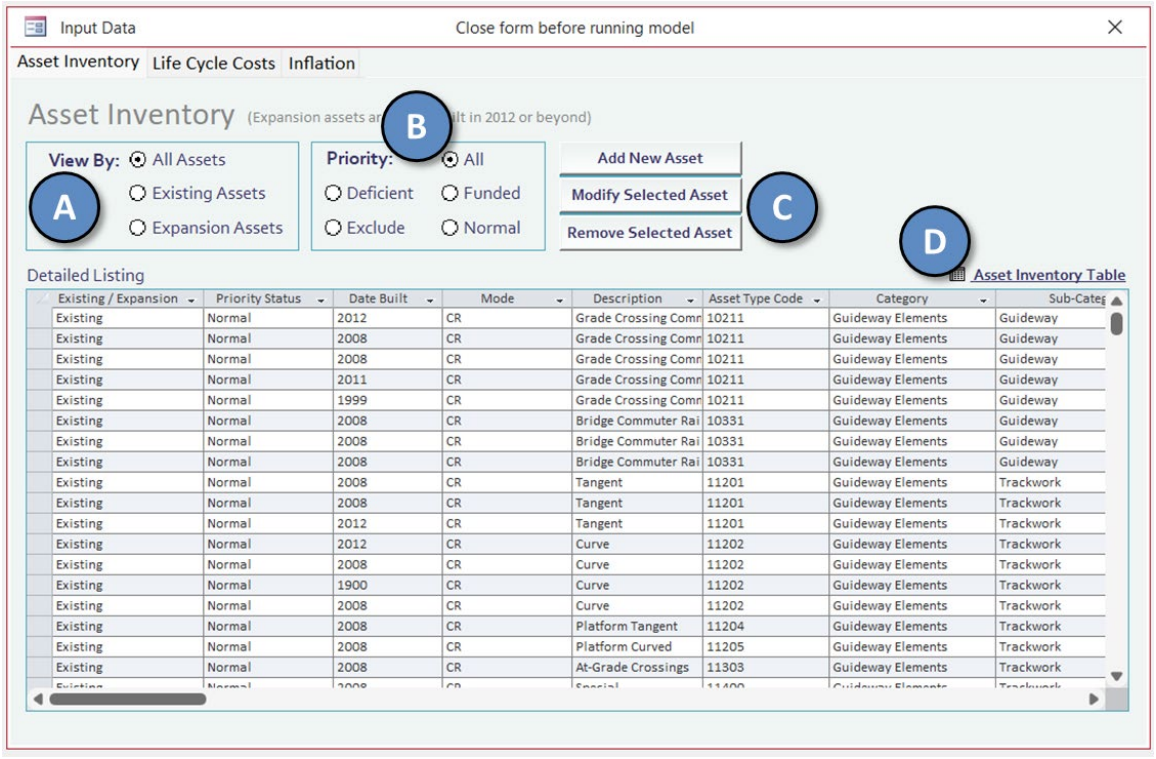
- Asset Inventory
- Life Cycle Costs
- Inflation

Edit Asset Inventory (Optional)

The “Asset Inventory” tab (Exhibit 12) displays the asset inventory with the options to view assets by existing versus expansion status (Exhibit 12-A) and/or by their priority status (Exhibit 12-B). This tab also allows you to add, modify, or delete inventory records, one asset at a time (Exhibit 12-C), as needed.

Click the “Asset Inventory Table” link (Exhibit 12-D) to manually edit the inventory if needed. Alternatively, you can make changes to your inventory in Inventory Publisher (or other inventory list) and repeat the Import Inventory step.

Exhibit 12 – Asset Inventory Tab

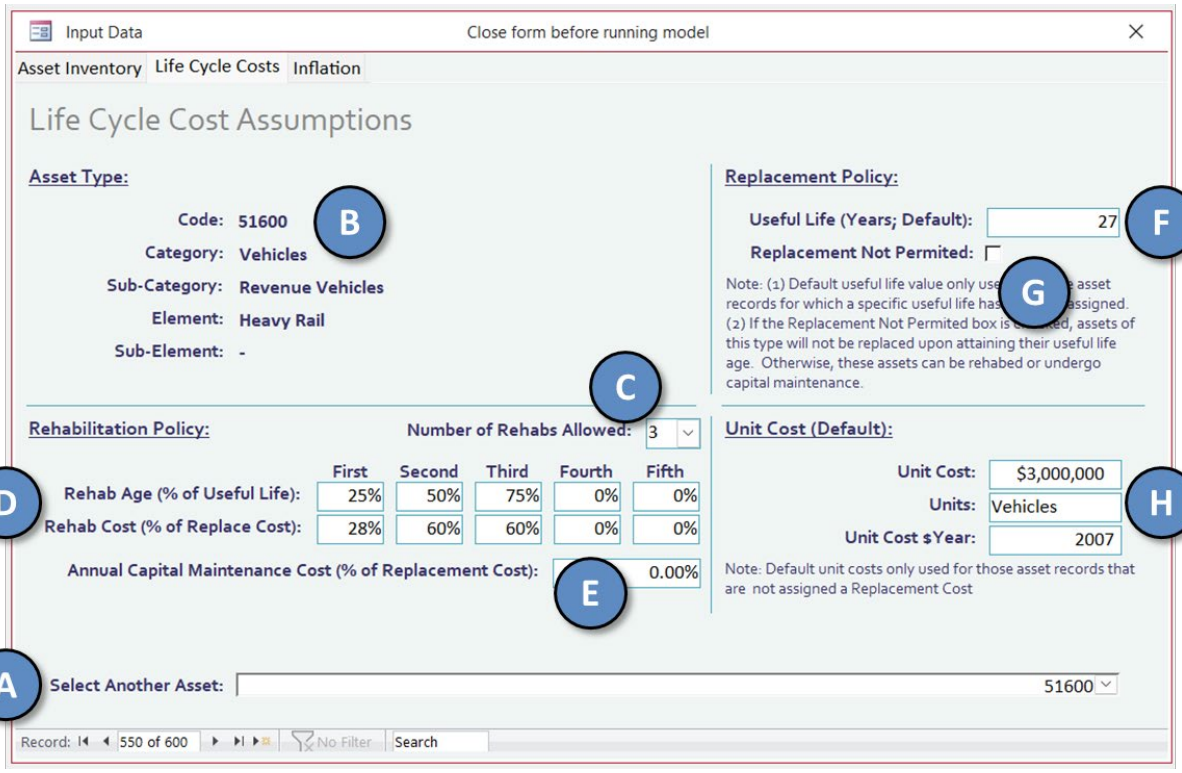


Review and Update Life Cycle Costs

The “Life Cycle Costs” tab defines the timing and cost of all life cycle events for each asset type, separately. You can alter the pre-defined life cycle events to align with your agency’s rehab and replacement policy or to design a scenario. The available life cycle events include:

- Rehabs (up to five)
- Replacement
- Annual Capital Maintenance Cost

Exhibit 13 – Life Cycle Costs



Use the "Select Another Asset" drop-down menu (Exhibit 13-A) or the arrows at the bottom left of the window to select from the list of asset types. When an asset type is selected, the asset code, category, and element type will display in the top left **"Asset Type"** section of the window (Exhibit 13-B).

The **"Rehabilitation Policy"** section (bottom left) defines the number of life cycle rehabs (zero to five; Exhibit 13-C) and the timing and cost for each rehab (Exhibit 13-D) for a given asset type. The timing of each rehab is expressed as a percentage of the asset's useful life and the cost is expressed as a percentage of the asset's replacement cost.

"Annual Capital Maintenance Costs" can also be entered (as a percentage of asset replacement cost) in the "Rehabilitation Policy" section (Exhibit 13-E). The "Annual Capital Maintenance Cost" is an annual level of expenditure intended to cover low cost and frequent capital reinvestment needs.

The **"Replacement Policy"** section (top right) defines the default "Useful Life" for each asset type (Exhibit 13-F). The default useful life will be used for assets that do not have a useful life provided in the inventory.

The "Replacement Policy" section also includes the "Replacement Not Permitted" checkbox (Exhibit 13-G) for assets which undergo ongoing rehabilitation but are unlikely to ever be outright replaced (e.g., tunnels).

The **"Unit Cost (Default)"** section (bottom right) provides the default unit replacement cost, unit of measure, and cost basis year (Exhibit 13-H) for the asset type. The "Unit Cost (Default)" will be used for assets that do not have a "Unit Replacement Cost" provided in the inventory.

Set Inflation Assumptions

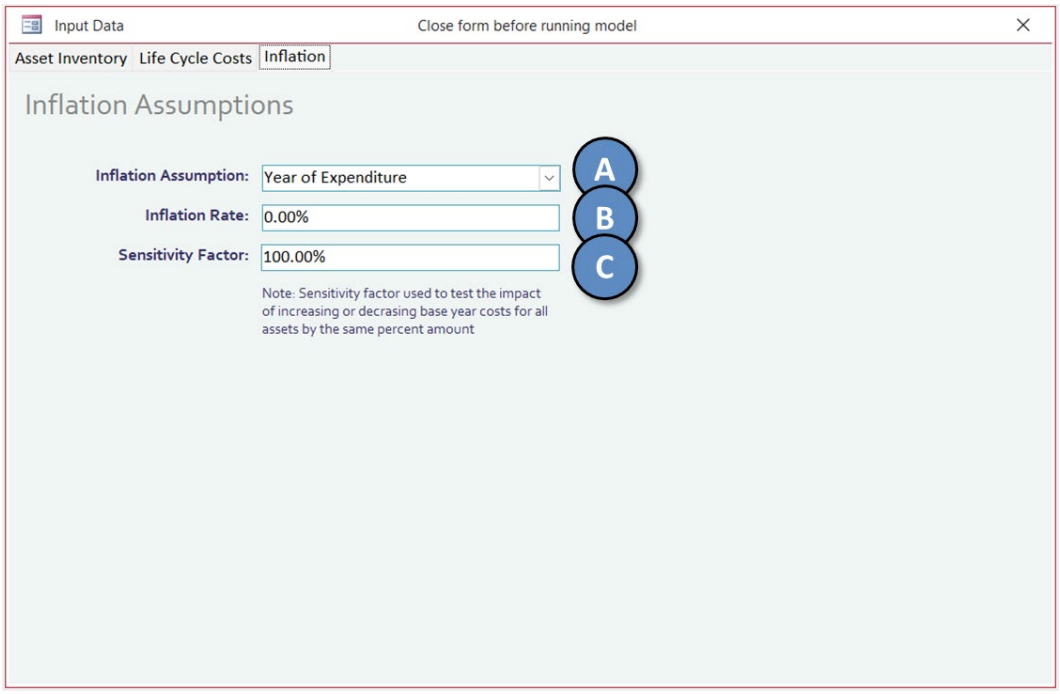
The "Inflation" tab (Exhibit 14) allows you to adjust how TERM Lite handles inflation for your scenario. There are two inflation behavior options you can select from the "Inflation Assumption" drop-down menu (Exhibit 14-A):

A. **Base year dollars –** Expenditures are denominated in "start year" dollars based on the Start Year entered on Main Menu (Exhibit 9-B). (This start year is independent of the base year specified in Inventory Publisher.) TERM Lite uses built in inflation assumptions to convert costs to the start year dollars and then assumes no inflation going forward. TERM Lite can accommodate start years from 1850 to 2050.
B. **Year of Expenditure** – TERM Lite will use a user-defined annual inflation rate. Enter the annual "Inflation Rate" (Exhibit 14-B). The "Inflation Rate" applies the same annual rate of inflation to all forecast years and is only applied to future year reinvestment costs (it does not impact budget constraint or other measures).

***Tip**: If you choose "base year dollars," the User Rate of annual inflation field will not be available. All costs will be shown in the year entered for the "Start Year" entered on the Main Menu (Exhibit 9-B).*

Enter a "Sensitivity Factor" (Exhibit 14-C) to increase or decrease all replacement costs by the same percentage. This is useful if you need to assess the sensitivity of analysis results to future costs. Entering 200% would double all costs in all analysis years.

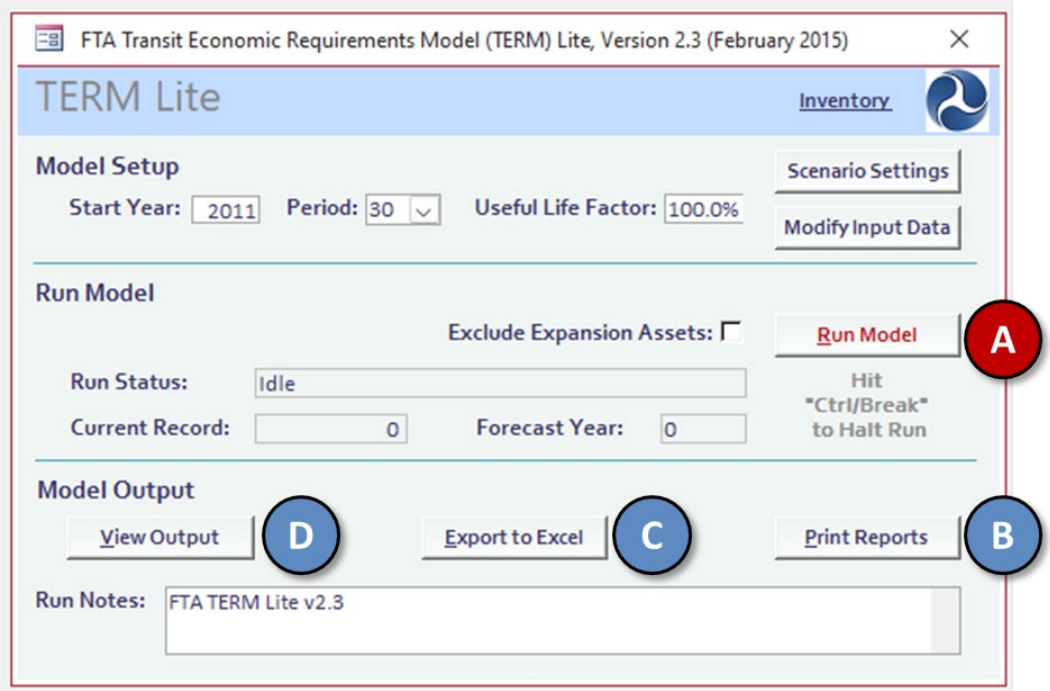
Exhibit 14 – Inflation



3.4. Run the Model

From the Main Menu, click the "Run Model" button (Exhibit 15-A). You can track the progress of the model by observing the "Run Status" indicator, the "Current Record" counter, and the "Replacement Year" counter. The duration of a single simulation will vary from a few seconds to several minutes depending on the quantity of data and the computer hardware used to run the model.

Exhibit 15 – TERM Lite Main Menu: Run Model and Model Output



3.5. Review Model Outputs

TERM Lite's simulation outputs are available as PDF and Excel summary reports, and for users interested in digging into the raw output and individual data elements, as Access data tables.

Tip: *Some of the auto-generated PDF and Excel reports classify asset conditions into categories. For users familiar with the raw outputs in Access, note that the condition ratings (on a scale of 1 to 5) map to condition categories in the following way: Poor (1.0-1.9999), Marginal (2.0-2.7499), Adequate (2.75-3.4999), Good (3.5-4.4999), and Excellent (4.5-5.0).*

How to View PDF Reports

Clicking the "Print Reports" button (Exhibit 15-B) on the Main Menu will allow you to select and view reports based on your simulation. A list of available TERM Lite reports is provided below in Exhibit 16. After selecting a report from the list in the Print Reports pop-up menu, there are two options to view it, by clicking either "**Report**" or "**Data (Read Only)**."

Selecting "**Report**" will open a print preview window in Access with a formatted table of data. From this window, you can read the report in Access, print it, or export it to a variety of file types (including PDF, Excel, text file, etc.) from the top ribbon.

Selecting "**Data (Read Only)**" will open a window in Access with the data underlying the selected report. This data can be copied and pasted into a workbook for further analysis.

Exhibit 16 – List of available PDF reports

Report Name	Description
Asset Inventory Record Ages	Provides the replacement values (in dollars and as a percentage of the total) for the rehab and replacement of existing assets, expansion assets, and a total of both existing and expansion assets.
Asset Inventory Replacement Value	Provides replacement values for existing and expansion assets by mode class (non-rail, rail, and systems) and asset category.
Asset Types	Provides the complete list of asset type codes along with their associated category, sub-category, element, sub-element, and asset description for every possible asset type in TERM Lite. This report will be the same for any given simulation run in TERM Lite.
Asset Rehab-Replace Policy	Provides the rehab policy and replacement policy for each asset type as set on the Life Cycle Costs tab.
Current Condition Distribution	Provides the useful life, replacement value, and distribution of condition assessments for assets down to the element level at the start of the scenario's year 0 (prior to considering user-provided initial backlog reduction) and separated by mode.
Condition Distribution Forecast*	Provides the forecasted percentage of assets in each condition assessment category by year of the simulation.
Expenditures Forecast*	Provides five-year totals and five-year annual averages (both in millions of dollars) for (1) rehabs and replacements for existing assets, (2) acquisition of expansion assets, and (3) rehabs and replacements for expansion assets, separated by asset categories and mode.
Expenditures Forecast – Asset Level Detail (10 Yr)	Provides ten-year investment needs by asset type and asset inventory line-item.
Over Age Asset Forecast*	Provides the forecasted percentage of assets in each asset category that exceeds their useful life each simulation year.
Priority Scores: Backlog Investment by Asset Type (Base 100)	Provides the prioritization criteria scores (individual and weighted total) and the next lifecycle action for each asset sub-category by mode for scenario year 0. Note this report includes only assets not in backlog by the start of year 1.

Report Name	Description
Priority Scores: Summary Scores by Asset Type for Next 10 Years	Provides the weighted prioritization criteria score totals for each asset sub-category by mode for the first ten years of the scenario as well as year 0. Note this report includes only assets not in backlog by the start of year 1.
SGR Backlog Forecast*	Provides the value of the SGR backlog (in millions of dollars) for each asset category by mode for each simulation year.

Note: *For reports marked with an asterisk (*) in the table above, the "Report" version only displays data for every other year (or five-year totals and averages for "Expenditures Forecast") while the "Data (Read Only)" version displays data for every year.*

How to Export Reports to Excel

Clicking the "Export to Excel" button (Exhibit 15-C) on the Main Menu will open a new Excel workbook with a series of charts that present select analyses reports of your simulation. These charts can be copied and used in reports and presentations. A list of available TERM Lite Excel reports is provided below in Exhibit 17.

Exhibit 17 – List of available Excel reports

Workbook Tab	Chart Title
NeedsByExistingversusExpansion	Investment Expenditures by Existing Verus Expansion Assets
NeedsByCategory	Investment Expenditures by Category
SGRBacklog	SGR Backlog by Category
PAEUL	Percent of Replaceable Assets That Exceed Their Useful Life: by Category
CondDist	Assets in Marginal or Poor Condition
FCI	Facilities Condition Index (FCI) (Ratio of Backlog to Total Replacement Value)
SPSAT	Prioritization Score Summary for Assets Requiring Reinvestment
NeedsByMode	Investment Expenditures by Mode
SystemsBacklog	Systems SGR Backlog by Subcategory
GuidewayBacklog	Guideway SGR Backlog by Subcategory & Element
VehiclesBacklog	Vehicles SGR Backlog by Element
StationsBacklog	Stations SGR Backlog by Subcategory & Element
FacilitiesBacklog	Facilities SGR Backlog by Subcategory

How to View Raw Outputs (Advanced Users)

Click the "View Output" button (Exhibit 15-D) on the Main Menu to display the tables "qryAssetNeedsForecastOutput_20" (for 20-year simulations) or qryAssetNeedsForecastOutput_30" (for 30-year simulations) in a new Access window. These tables include detailed, asset-level information including asset information from the user-provided inventory table as the following results **for each asset and simulated year:**

- **Prioritization score** – considers prioritization weightings, and is calculated out of 100
- **Age** – age of the asset in years. Returns to 0 when the asset is replaced.
- **Investment** – money invested into the asset in "start year" dollars
- **Condition rating** – calculated on a 1 to 5 scale, based on the asset age, useful life, and any rehabilitations
- **Backlog** – backlog in "start year" dollars accrued by the asset due to deferred maintenance
- **Action** – label for the action taken that year, selected from "None", "Rehab", "Replace", "ACM" (Annual Capital Maintenance), "Acquisition" (when expansion assets enter service), or "Backlog". Note that "Backlog" appears only in the "BacklogAction" column and only if sufficient backlog reduction is applied.

Appendix A. Example Funding Scenarios

Below are four funding scenarios (see Set Expenditure Constraints) that you may find useful to use with your agency's data. Most of the settings mentioned below will be found on the "Expenditure Constraints" tab of "Scenario Settings" menu.

Maintain Current Spending

This scenario will help you understand the SGR backlog and prioritization impacts of continued reinvest at the current (historical) rate.

- Set "Backlog Reduction" (Exhibit 11-A) to $0.
- Populate each year in the "Annual Expenditure Constraints" table (Exhibit 11-C) with your agency's average level of annual capital reinvestment for the past 5 to 10 years.
    - You may want to take inflation into account when assigning annual expenditure values.

Maintain Backlog

This scenario will help you understand the level of investment required to maintain the current size of the backlog (in dollars).

- Enable the "Backlog Target Seek" feature by checking the "Apply Backlog Target Seek" checkbox on the "Backlog Target Seek" tab of the "Scenario Settings" menu. (See Enable Backlog Target Seek (Optional) for more details.)
- Set the "Backlog Target" to 100%.
- Set the "Target Year" to the final year of your analysis (either 20 or 30, depending on simulation length you selected for the "Period" (Exhibit 9-C) on the Main Menu).

SGR in 20 Years

This scenario will help you understand what level of annual reinvestment is required to eliminate the SGR backlog in 20 years. This approach can be used to determine the level of investment required to attain SGR in 10 years, 15 years, 30 years, or other time frame.

- Enable the "Backlog Target Seek" feature by checking the "Apply Backlog Target Seek" checkbox on the "Backlog Target Seek" tab of the "Scenario Settings" menu. (See Enable Backlog Target Seek (Optional) for more details.)
- Set the "Backlog Target" to 0%. (This represents complete elimination of the SGR backlog.)
- Set the "Target Year" to 20.

Unconstrained

This scenario will illustrate (1) the level of investment required to attain SGR in a single year and (2) The average annual reinvestment needed to maintain SGR after eliminating the backlog.

- Set “Backlog Reduction” (Exhibit 11-A) to approximately $99 billion.
- Apply the “Unconstrained” funding option (Exhibit 11-E) on the “Expenditure Constraints” tab.

***Tip**: The average annual reinvestment needed to maintain SGR after eliminating the backlog is an important quantity to be aware of as your agency’s investment profile must be higher than this amount to reduce any existing SGR backlog.*

Appendix B. Asset Classification

Guideway Elements

Type	Sub-Category	Element	Sub-Element
10000	Guideway	-	-
10001	Guideway	-	Commuter Rail
10002	Guideway	-	Heavy Rail
10003	Guideway	-	Light Rail
10110	Guideway	At Grade Ballast	-
10111	Guideway	At Grade Ballast	Commuter Rail
10112	Guideway	At Grade Ballast	Heavy Rail
10113	Guideway	At Grade Ballast	Light Rail
10120	Guideway	At Grade Ballast	-
10121	Guideway	At Grade Ballast	Expressway Commuter Rail
10122	Guideway	At Grade Ballast	Expressway Heavy Rail
10123	Guideway	At Grade Ballast	Expressway Light Rail
10200	Guideway	At Grade-In-Street	-
10205	Guideway	At Grade-In-Street	Ductbank
10206	Guideway	At Grade-In-Street	Manhole
10210	Guideway	At Grade-In-Street	Grade Crossing
10211	Guideway	At Grade-In-Street	Grade Crossing Commuter Rail
10212	Guideway	At Grade-In-Street	Grade Crossing Heavy Rail
10213	Guideway	At Grade-In-Street	Grade Crossing Light Rail
10215	Guideway	At Grade-In-Street	Grade Crossing - Panelled
10216	Guideway	At Grade-In-Street	Grade Crossing - Embedded
10310	Guideway	Elevated Structure	-
10311	Guideway	Elevated Structure	Commuter Rail
10312	Guideway	Elevated Structure	Heavy Rail
10313	Guideway	Elevated Structure	Light Rail
10320	Guideway	Elevated Structure	Steel Viaducts
10321	Guideway	Elevated Structure	Steel Viaducts Commuter Rail
10322	Guideway	Elevated Structure	Steel Viaducts Heavy Rail
10323	Guideway	Elevated Structure	Steel Viaducts Light Rail
10330	Guideway	Elevated Structure	Bridge
10331	Guideway	Elevated Structure	Bridge Commuter Rail
10332	Guideway	Elevated Structure	Bridge Heavy Rail
10333	Guideway	Elevated Structure	Bridge Light Rail
10340	Guideway	Elevated Structure	Foot Walk
10400	Guideway	Elevated Fill	-
10401	Guideway	Elevated Fill	Commuter Rail
10402	Guideway	Elevated Fill	Heavy Rail

Type	Sub-Category	Element	Sub-Element
10403	Guideway	Elevated Fill	Light Rail
10500	Guideway	Underground	-
10501	Guideway	Underground	Commuter Rail
10502	Guideway	Underground	Heavy Rail
10503	Guideway	Underground	Light Rail
10510	Guideway	Underground	Tunnel
10511	Guideway	Underground	Tunnel Commuter Rail
10512	Guideway	Underground	Tunnel Heavy Rail
10513	Guideway	Underground	Tunnel Light Rail
10520	Guideway	Underground	Cut & Cover
10521	Guideway	Underground	Cut & Cover Commuter Rail
10522	Guideway	Underground	Cut & Cover Heavy Rail
10523	Guideway	Underground	Cut & Cover Light Rail
10530	Guideway	Underground	Foot Walk
10540	Guideway	Underground	Tube
10541	Guideway	Underground	Tube Commuter Rail
10542	Guideway	Underground	Tube Heavy Rail
10543	Guideway	Underground	Tube Light Rail
10600	Guideway	Retained Cut	-
10601	Guideway	Retained Cut	Commuter Rail
10602	Guideway	Retained Cut	Heavy Rail
10603	Guideway	Retained Cut	Light Rail
10605	Guideway	Retained Cut	Box Culvert
11000	Trackwork	-	-
11100	Trackwork	Direct Fixation	-
11101	Trackwork	Direct Fixation	Tangent
11102	Trackwork	Direct Fixation	Curve
11103	Trackwork	Direct Fixation	Guarded
11104	Trackwork	Direct Fixation	Platform Tangent
11105	Trackwork	Direct Fixation	Platform Curved
11106	Trackwork	Direct Fixation	Platform Guarded
11200	Trackwork	Ballasted	-
11201	Trackwork	Ballasted	Tangent
11202	Trackwork	Ballasted	Curve
11203	Trackwork	Ballasted	Guarded
11204	Trackwork	Ballasted	Platform Tangent
11205	Trackwork	Ballasted	Platform Curved
11206	Trackwork	Ballasted	Platform Guarded
11211	Trackwork	Ballasted	Tangent - Concrete Tie
11212	Trackwork	Ballasted	Tangent - Wood Tie
11213	Trackwork	Ballasted	Curve - Concrete Tie
11214	Trackwork	Ballasted	Curve - Wood Tie

Type	Sub-Category	Element	Sub-Element
11300	Trackwork	Embedded	-
11301	Trackwork	Embedded	Tangent
11302	Trackwork	Embedded	Curve
11303	Trackwork	Embedded	At-Grade Crossings
11400	Trackwork	Special	-
11401	Trackwork	Special	Diamond Crossover
11402	Trackwork	Special	Direct Fixation Diamond Crossover
11403	Trackwork	Special	Ballasted Diamond Crossover
11404	Trackwork	Special	Single Crossover
11405	Trackwork	Special	Direct Fixation Single Crossover
11406	Trackwork	Special	Ballasted Single Crossover
11407	Trackwork	Special	Turnout
11408	Trackwork	Special	Direct Fixation Turnout
11409	Trackwork	Special	Ballasted Turnout
11410	Trackwork	Special	Turntable
11500	Trackwork	Yard	-
11600	Trackwork	Ties	-
11601	Trackwork	Ties	Wood
11602	Trackwork	Ties	Concrete
12000	Special Structures	-	-
12100	Special Structures	Fencing	-
12200	Special Structures	Retaining Walls	-
13000	Bus Guideway	-	-
13100	Bus Guideway	At Grade	-
13200	Bus Guideway	Turnaround	-
13300	Bus Guideway	Elevated Fill	-
13400	Bus Guideway	Elevated Structure	-
13410	Bus Guideway	Elevated Structure	Elevated Roadway
13420	Bus Guideway	Elevated Structure	Bridge
13500	Bus Guideway	Subway	-

Facilities

Type	Sub-Category	Element	Sub-Element
20000	-	-	-
21000	Buildings	-	-
21100	Buildings	Administration	-
21120	Buildings	Administration	Police
21200	Buildings	Maintenance	-
21210	Buildings	Maintenance	Bus
21211	Buildings	Maintenance	Bus Stratum 1 < 200 Vehicles
21212	Buildings	Maintenance	Bus Stratum 1 200 to 300 Vehicles

Type	Sub-Category	Element	Sub-Element
21213	Buildings	Maintenance	Bus Stratum 1 > 300 Vehicles
21214	Buildings	Maintenance	Bus Stratum 2 < 200 Vehicles
21215	Buildings	Maintenance	Bus Stratum 2 200 to 300 Vehicles
21216	Buildings	Maintenance	Bus Stratum 3 < 200 Vehicles
21217	Buildings	Maintenance	Bus Stratum 3 200 to 300 Vehicles
21218	Buildings	Maintenance	Bus Stratum 4 < 200 Vehicles
21219	Buildings	Maintenance	Bus Stratum 4 200 to 300 Vehicles
21220	Buildings	Maintenance	Rail
21221	Buildings	Maintenance	Rail Commuter Rail
21222	Buildings	Maintenance	Rail Heavy Rail
21223	Buildings	Maintenance	Rail Light Rail
21230	Buildings	Maintenance	Utilities
21500	Buildings	-	-
21501	Buildings	Building Components	Electrical
21502	Buildings	Building Components	Fire Alarm
21503	Buildings	Building Components	Plumbing
21504	Buildings	Building Components	Drainage
21505	Buildings	Building Components	HVAC
21506	Buildings	Building Components	Boiler
21507	Buildings	Building Components	Roof
21508	Buildings	Building Components	Exterior
21509	Buildings	Building Components	Access and Parking
21510	Buildings	Building Components	Elevators and Conveying Systems
21511	Buildings	Building Components	Built-in Equipment and Specialties
21512	Buildings	Building Components	Generators
21513	Buildings	Building Components	Interior
21514	Buildings	Building Components	Fencing
21515	Buildings	Building Components	Other
22000	Storage Yard	-	-
22200	Storage Yard	-	-
22210	Storage Yard	Rail	-
22211	Storage Yard	Rail	Commuter Rail
22212	Storage Yard	Rail	Heavy Rail
22213	Storage Yard	Rail	Light Rail
22300	Storage Yard	Bus	Bus Parking
22400	Buildings	Bus Turnaround Facility	-
23000	Equipment	-	-
23100	Equipment	MIS/IT/Network Systems	-
23101	Equipment	MIS/IT/Network Systems	Software
23102	Equipment	MIS/IT/Network Systems	Computers/Hardware
23200	Equipment	Furniture	-
23300	Equipment	Maintenance	-

Type	Sub-Category	Element	Sub-Element
23301	Equipment	Maintenance	Bus
23310	Equipment	Maintenance	Rail
23311	Equipment	Maintenance	Rail Commuter Rail
23312	Equipment	Maintenance	Rail Heavy Rail
23313	Equipment	Maintenance	Rail Light Rail
23400	Equipment	Maintenance	Pollution Treatment
23402	Equipment	Maintenance	Bus Washer
23403	Equipment	Maintenance	Train Washer
23404	Equipment	Maintenance	Vehicle Paintbooth
23405	Equipment	Maintenance	Fuel Island
23406	Equipment	Maintenance	Dynamoneters
23407	Equipment	Maintenance	Lifts - Portable
23408	Equipment	Maintenance	Lifts - Fixed
23409	Equipment	Maintenance	Wheel truing machines
23410	Equipment	Maintenance	Brake Lathe
23411	Equipment	Maintenance	Fuel Tank
23412	Equipment	Maintenance	Lifts - Fixed: In Floor
23413	Equipment	Maintenance	Lifts - Fixed: Parallelogram
23414	Equipment	Maintenance	Wheel Presses
23415	Equipment	Maintenance	Turntables, Truck
23416	Equipment	Maintenance	Air Compressor
23417	Equipment	Maintenance	Cart
23418	Equipment	Maintenance	Hoist
23419	Equipment	Maintenance	Scrubber, Sprayer
23420	Equipment	Maintenance	Misc Equip
23430	Equipment	Maintenance	CNG Refueling Station
24000	Major Shops	-	-
24100	Major Shops	Rail	-
24101	Major Shops	Rail	Commuter Rail
24102	Major Shops	Rail	Heavy Rail
24103	Major Shops	Rail	Light Rail
24200	Major Shops	Bus	-
25000	Central Control	-	-

Systems

Type	Sub-Category	Element	Sub-Element
30000	-	-	-
30001	CR	-	-
30002	HR	-	-
30003	LR	-	-
31000	Train Control	-	-

Type	Sub-Category	Element	Sub-Element
31001	Train Control	Commuter Rail	-
31002	Train Control	Heavy Rail	-
31003	Train Control	Light Rail	-
31100	Train Control	Wayside Train Control	-
31101	Train Control	Wayside Train Control	Commuter Rail
31102	Train Control	Wayside Train Control	Heavy Rail
31103	Train Control	Wayside Train Control	Light Rail
31110	Train Control	Wayside Train Control	Signals & Train Stops
31111	Train Control	Wayside Train Control	Signals & Train Stops Commuter Rail
31112	Train Control	Wayside Train Control	Signals & Train Stops Heavy Rail
31113	Train Control	Wayside Train Control	Signals & Train Stops Light Rail
31114	Train Control	Wayside Train Control	Automatic Transfer Panel
31115	Train Control	Wayside Train Control	Battery Equip
31116	Train Control	Wayside Train Control	Bonds
31117	Train Control	Wayside Train Control	Control Panel (local)
31118	Train Control	Wayside Train Control	Intrusion Detection Warning System
31119	Train Control	Wayside Train Control	Logical Controller
31120	Train Control	Wayside Train Control	Marker Coil
31121	Train Control	Wayside Train Control	Train Control Cable
31122	Train Control	Wayside Train Control	Signal Bridge
31123	Train Control	Wayside Train Control	Power Supplies
31124	Train Control	Wayside Train Control	Power Supplies-UPS
31125	Train Control	Wayside Train Control	Receiver
31126	Train Control	Wayside Train Control	Relays
31127	Train Control	Wayside Train Control	Relay Cabinet
31128	Train Control	Wayside Train Control	Relay House (Bungalow)
31129	Train Control	Wayside Train Control	Repeater Signal
31130	Train Control	Wayside Train Control	RTU
31131	Train Control	Wayside Train Control	Signals
31132	Train Control	Wayside Train Control	STAP (Station Processor)
31133	Train Control	Wayside Train Control	TPSS Feeds
31134	Train Control	Wayside Train Control	Track Circuit
31135	Train Control	Wayside Train Control	Train Control Cable
31136	Train Control	Wayside Train Control	Train Stop
31137	Train Control	Wayside Train Control	Programmed Station Stop System
31138	Train Control	Wayside Train Control	Other
31200	Train Control	Onboard Train Control (cab signaling)	-
31201	Train Control	Onboard Train Control (cab signaling)	Onboard Computer Systems
31202	Train Control	Onboard Train Control (cab signaling)	Receiver

Type	Sub-Category	Element	Sub-Element
31203	Train Control	Onboard Train Control (cab signaling)	Other
31250	Train Control	Communications	-
31251	Train Control	Communications	Data Transmission Unit
31252	Train Control	Communications	Train Wayside Comm
31253	Train Control	Communications	Transmitter
31300	Train Control	Centralized Train Control	-
31301	Train Control	Centralized Train Control	Commuter Rail
31302	Train Control	Centralized Train Control	Heavy Rail
31303	Train Control	Centralized Train Control	Light Rail
31305	Train Control	Centralized Train Control	Control Room (central)
31306	Train Control	Centralized Train Control	Logical Controller
31307	Train Control	Centralized Train Control	Power Supplies
31308	Train Control	Centralized Train Control	Receiver
31400	Train Control	Roadway Crossings	-
31401	Train Control	Roadway Crossings	Commuter Rail
31402	Train Control	Roadway Crossings	Heavy Rail
31403	Train Control	Roadway Crossings	Light Rail
31404	Train Control	Roadway Crossings	Grade Crossing System
31405	Train Control	Roadway Crossings	Crossing Gate Arm
31410	Roadway Traffic Signals	-	-
31500	Train Control	Interlockings	-
31510	Train Control	Interlockings	Switch Machine
31511	Train Control	Interlockings	Switch Machine - Manual Ballasted
31512	Train Control	Interlockings	Switch Machine - Motorized Ballasted
31513	Train Control	Interlockings	Switch Machine - Manual Embedded
31514	Train Control	Interlockings	Switch Machine - Motorized Embedded
31515	Train Control	Interlockings	Switch Heaters
32000	Electrification	-	-
32001	Electrification	-	Commuter Rail
32002	Electrification	-	Heavy Rail
32003	Electrification	-	Light Rail
32100	Electrification	Catenary	-
32101	Electrification	Catenary	Commuter Rail
32102	Electrification	Catenary	Heavy Rail
32103	Electrification	Catenary	Light Rail
32104	Electrification	Catenary Poles	Light Rail
32200	Electrification	Substations	-
32201	Electrification	Substations	Commuter Rail
32202	Electrification	Substations	Heavy Rail

Type	Sub-Category	Element	Sub-Element
32203	Electrification	Substations	Light Rail
32204	Electrification	Substations	AC Switchgear
32205	Electrification	Substations	DC Switchgear
32206	Electrification	Substations	Rectifier
32207	Electrification	Substations	Building
32208	Electrification	Substations	Battery
32209	Electrification	Substations	Charger
32210	Electrification	Substations	SCADA RTUs
32211	Electrification	Substations	Transformer
32212	Electrification	Substations	Generator
32213	Electrification	Substations	High Tension Towers
32214	Electrification	Substations	Building Electrical
32215	Electrification	Substations	Fire Alarm
32216	Electrification	Substations	Plumbing
32217	Electrification	Substations	Drainage
32218	Electrification	Substations	HVAC
32219	Electrification	Substations	Roof
32220	Electrification	Substations	Exterior
32221	Electrification	Substations	Access
32222	Electrification	Substations	Elevators and Conveying Systems
32223	Electrification	Substations	Built-in Equipment and Specialties
32300	Electrification	Breaker House	-
32301	Electrification	Breaker House	Commuter Rail
32302	Electrification	Breaker House	Heavy Rail
32303	Electrification	Breaker House	Light Rail
32400	Electrification	Contact Rail	Contact Rail, Chairs, Anchor and Incline
32401	Electrification	Contact Rail	Contact Rail, Chairs, Anchor and Incline Commuter Rail
32402	Electrification	Contact Rail	Contact Rail, Chairs, Anchor and Incline Heavy Rail
32403	Electrification	Contact Rail	Contact Rail, Chairs, Anchor and Incline Light Rail
32404	Electrification	Contact Rail	Protection Boards
32405	Electrification	Contact Rail	3rd. RAIL DISCONNECT SWITCHES
32406	Electrification	Contact Rail	SHORT TIE EXTENSION BRACKETS
32407	Electrification	Contact Rail	REACTORS
32408	Electrification	Contact Rail	Heaters
32500	Electrification	Power Cable	-
32501	Electrification	Power Cable	Substations
32502	Electrification	Power Cable	Contact Rail
32600	Electrification	Building	Electrical Systems

Type	Sub-Category	Element	Sub-Element
32602	Electrification	Bridge	Electrical System
32603	Electrification	SIGNAL LOAD	-
32604	Electrification	C-Case	-
32700	Electrification	Overhead Catenary	-
32701	Electrification	Overhead Catenary	Trolley Wire
32702	Electrification	Overhead Catenary	Decorative Streetlighting
32703	Electrification	Overhead Catenary	Ductbank
32704	Electrification	Overhead Catenary	Feed Span (+ and -)
32705	Electrification	Overhead Catenary	Manhole
32706	Electrification	Overhead Catenary	Poles and Foundation
32707	Electrification	Overhead Catenary	Pulleys
32708	Electrification	Overhead Catenary	Pole Grounding
32709	Electrification	Overhead Catenary	Tangent Span
33000	Communications	-	-
33001	Communications	-	Commuter Rail
33002	Communications	-	Heavy Rail
33003	Communications	-	Light Rail
33100	Communications	Cable Transmission System (CTS)	-
33101	Communications	Cable Transmission System (CTS)	Fiber Optic Cable Transmission System (FOCS)
33102	Communications	Cable Transmission System (CTS)	Cable
33103	Communications	Cable Transmission System (CTS)	Nodes
33104	Communications	Cable Transmission System (CTS)	MIS/IT/Network Systems
33200	Communications	Passenger Communications Systems	-
33201	Communications	Passenger Communications Systems	Public Address (PA)
33202	Communications	Passenger Communications Systems	Transit Passenger Information Systems (TPIS)
33203	Communications	Passenger Communications Systems	Variable Message Signs (VMS)
33204	Communications	Passenger Communications Systems	On-board vehicle
33205	Communications	Passenger Communications Systems	Passenger Emergency (Blue Light) Phones
33300	Communications	Safety and Security	-
33301	Communications	Safety and Security	Emergency Location System
33302	Communications	Safety and Security	Emergency Management Panel (EMP)
33303	Communications	Safety and Security	Fire & Emergency Management System (F&EM)

Type	Sub-Category	Element	Sub-Element
33304	Communications	Safety and Security	Fire Management Panel
33305	Communications	Safety and Security	Gas Monitoring System
33306	Communications	Safety and Security	Gas fire suppression system
33307	Communications	Safety and Security	Intrusion Detection System (IDS)
33308	Communications	Safety and Security	Seismic Monitoring System
33309	Communications	Safety and Security	CCTV
33310	Communications	Safety and Security	CCTV -- Fixed
33311	Communications	Safety and Security	CCTV -- On-board vehicle
33400	Communications	Phone System	-
33401	Communications	Phone System	Phone System
33402	Communications	Phone System	PBX
33403	Communications	Phone System	Telephones
33404	Communications	Phone System	Fax
33500	Communications	Radio	-
33600	Communications	Radio	Bus Radio
33700	Communications	Radio	Base Radio Stations
33701	Communications	Radio	Radio Antenna
33702	Communications	Radio	Mobile Radios
33703	Communications	Radio	Mobile Radios, Handpack
33704	Communications	Radio	Transmitter
33800	Communications	SCADA	-
33801	Communications	SCADA	Programmable Logic Controller (PLC)
33815	Communications	SCADA	RTU
33816	Communications	SCADA	Rectifier
33817	Communications	SCADA	AIM
33818	Communications	SCADA	ATC
33819	Communications	SCADA	IDS
33820	Communications	SCADA	TRACS
33821	Communications	SCADA	Other
33850	Communications	Communications Huts	Hut
33851	Communications	Communications Huts	Room
34000	Revenue Collection	Central Revenue Collection	-
34001	Revenue Collection	Central Revenue Collection	Commuter Rail
34002	Revenue Collection	Central Revenue Collection	Heavy Rail
34003	Revenue Collection	Central Revenue Collection	Light Rail
34100	Revenue Collection	Central Revenue Collection	Coin Counters
34101	Revenue Collection	Central Revenue Collection	Coin Counters - Commuter Rail
34102	Revenue Collection	Central Revenue Collection	Coin Counters - Heavy Rail
34103	Revenue Collection	Central Revenue Collection	Coin Counters - Light Rail
34104	Revenue Collection	Central Revenue Collection	Bill Counters
34105	Revenue Collection	Central Revenue Collection	Vault
34106	Revenue Collection	Central Revenue Collection	Software

Type	Sub-Category	Element	Sub-Element
35000	Revenue Collection	-	-
35001	Revenue Collection	-	Commuter Rail
35002	Revenue Collection	-	Heavy Rail
35003	Revenue Collection	-	Light Rail
35100	Revenue Collection	In-Station	-
35101	Revenue Collection	In-Station	Commuter Rail
35102	Revenue Collection	In-Station	Heavy Rail
35103	Revenue Collection	In-Station	Light Rail
35104	Revenue Collection	In-Station	Turnstiles
35110	Revenue Collection	In-Station	System
35111	Revenue Collection	In-Station	System Commuter Rail
35112	Revenue Collection	In-Station	System Heavy Rail
35113	Revenue Collection	In-Station	System Light Rail
35115	Revenue Collection	In-Station	TVMs
35116	Revenue Collection	In-Station	Encoding Machine
35117	Revenue Collection	In-Station	Parking Meters
35118	Revenue Collection	In-Station	Change Machines
35120	Revenue Collection	In-Station	Fare Control System
35121	Revenue Collection	In-Station	Fare Control System Commuter Rail
35122	Revenue Collection	In-Station	Fare Control System Heavy Rail
35123	Revenue Collection	In-Station	Fare Control System Light Rail
35130	Revenue Collection	In-Station	Passenger Counters
35131	Revenue Collection	In-Station	Passenger Counters Commuter Rail
35132	Revenue Collection	In-Station	Passenger Counters Heavy Rail
35133	Revenue Collection	In-Station	Passenger Counters Light Rail
35200	Revenue Collection	On-Vehicle	-
35201	Revenue Collection	On-Vehicle	Fareboxes
36000	Utilities	-	-
36100	Utilities	Lighting	-
36101	Utilities	Lighting	Subway
36102	Utilities	Lighting	Yard
36103	Utilities	Lighting	Station
36200	Utilities	Drainage	-
36201	Utilities	Drainage	Subway
36202	Utilities	Pump Rooms	Subway
36203	Utilities	Deep Wells	Subway
36204	Utilities	Sump Pumps	Subway
36205	Utilities	Sump Pump Discharge Pipes	Subway
36206	Utilities	Fire Protection Plumbing	Subway
36301	Utilities	Ventilation	Subway
36302	Utilities	Fan Plants	Subway
36303	Utilities	Compressed Air Pipes	Subway

Type	Sub-Category	Element	Sub-Element
36304	Utilities	Air Conditioning/HVAC	Subway
36400	Utilities	Emergency Exits	Subway
36401	Utilities	Emergency Exits	Tunnel Handrail
37000	ITS	-	-
37001	ITS	APC	-
37002	ITS	AVL	-
37003	ITS	CAD	-
37004	ITS	GPS	-

Stations

Type	Sub-Category	Element	Sub-Element
40000	-	-	-
41000	Complete Station	-	-
41001	Complete Station	Commuter Rail	-
41002	Complete Station	Heavy Rail	-
41003	Complete Station	Light Rail	-
41004	Complete Station	Bus	-
41005	Complete Station	Transfer Center	Bus
41006	Complete Station	Bus Stop Shelters	Bus
41200	Building	-	-
41201	Building	Commuter Rail	-
41202	Building	Heavy Rail	-
41203	Building	Light Rail	-
41204	Building	Bus	Bus
41210	Building	At-Grade / Center Platform	At-Grade / Center Platform
41211	Building	At-Grade / Center Platform	At-Grade / Center Platform Commuter Rail
41212	Building	At-Grade / Center Platform	At-Grade / Center Platform Heavy Rail
41213	Building	At-Grade / Center Platform	At-Grade / Center Platform Light Rail
41214	Building	At-Grade / Center Platform	At-Grade / Center Platform Bus
41220	Building	At-Grade / Center Platform	At-Grade / Side Platform
41221	Building	At-Grade / Center Platform	At-Grade / Side Platform Commuter Rail
41222	Building	At-Grade / Center Platform	At-Grade / Side Platform Heavy Rail
41223	Building	At-Grade / Center Platform	At-Grade / Side Platform Light Rail
41224	Building	At-Grade / Center Platform	At-Grade / Side Platform Bus
41230	Building	At-Grade / Center Platform	Elevated / Center Platform
41231	Building	At-Grade / Center Platform	Elevated / Center Platform Commuter Rail
41232	Building	At-Grade / Center Platform	Elevated / Center Platform Heavy Rail
41233	Building	At-Grade / Center Platform	Elevated / Center Platform Light Rail
41234	Building	At-Grade / Center Platform	Elevated / Center Platform Bus
41240	Building	At-Grade / Center Platform	Elevated / Side Platform
41241	Building	At-Grade / Center Platform	Elevated / Side Platform Commuter Rail

Type	Sub-Category	Element	Sub-Element
41242	Building	At-Grade / Center Platform	Elevated / Side Platform Heavy Rail
41243	Building	At-Grade / Center Platform	Elevated / Side Platform Light Rail
41244	Building	At-Grade / Center Platform	Elevated / Side Platform Bus
41250	Building	At-Grade / Center Platform	Subway / Center Platform
41251	Building	At-Grade / Center Platform	Subway / Center Platform Commuter Rail
41252	Building	At-Grade / Center Platform	Subway / Center Platform Heavy Rail
41253	Building	At-Grade / Center Platform	Subway / Center Platform Light Rail
41254	Building	At-Grade / Center Platform	Subway / Center Platform Bus
41260	Building	At-Grade / Center Platform	Subway / Side Platform
41261	Building	At-Grade / Center Platform	Subway / Side Platform Commuter Rail
41262	Building	At-Grade / Center Platform	Subway / Side Platform Heavy Rail
41263	Building	At-Grade / Center Platform	Subway / Side Platform Light Rail
41264	Building	At-Grade / Center Platform	Subway / Side Platform Bus
41270	Building	Building Components	Shelter
41280	Building	Building Components	Token Booth
41281	Building	Building Components	-
41282	Building	Building Components	Lighting
41283	Building	Building Components	Station Attendant Booth
41284	Building	Building Components	Interior
41290	Building	Building Components	Building Electrical
41291	Building	Building Components	Fire Alarm
41292	Building	Building Components	Plumbing
41293	Building	Building Components	Drainage
41294	Building	Building Components	HVAC
41295	Building	Building Components	Roof
41296	Building	Building Components	Exterior
41297	Building	Building Components	Emergency backup system: UPS
41298	Building	Building Components	Emergency backup system: Generator
41299	Building	Building Components	Other
41400	Access	Elevators	-
41500	Access	Escalators	-
41600	Access	Parking	-
41601	Access	Parking	Garage
41602	Access	Parking	Lot
41603	Access	Parking	Park & Ride
41604	Access	Parking & Equipment	-
41605	Access	Misc. Parking	-
41650	Access	Roadway Access	-
41700	Access	Pedestrian Walkway	-
41701	Access	Pedestrian Walkway	Elevated
41702	Access	Pedestrian Walkway	Subway
41800	Platform	Platform	-

Type	Sub-Category	Element	Sub-Element
41801	Platform	At-Grade	Center Platform
41802	Platform	At-Grade	Side Platform
41803	Platform	Elevated	Center Platform
41804	Platform	Elevated	Side Platform
41805	Platform	Subway	Center Platform
41806	Platform	Subway	Side Platform
41807	Platform	Platform	Concrete
41808	Platform	Platform	Asphalt
41809	Platform	Platform	Tile
41810	Platform	Platform	Wood
41811	Platform	Platform	Lighting
41812	Platform	Canopy	-
41813	Platform	Canopy	Commuter Rail
41814	Platform	Canopy	Heavy Rail
41815	Platform	Canopy	Light Rail
41816	Platform	Canopy	Bus
41900	Signage & Graphics	-	-
41901	Signage & Graphics	Electronic	-
41902	Signage & Graphics	Static	-
43000	Ferry	-	-
43010	Ferry	Building	-
43020	Ferry	Dock	-

Vehicles

Type	Sub-Category	Element	Sub-Element
50000	-	-	-
51000	Revenue Vehicles	-	-
51100	Revenue Vehicles	Automated Guideway	-
51101	Revenue Vehicles	Automated Guideway	AGT
51102	Revenue Vehicles	Automated Guideway	Monorail
51200	Revenue Vehicles	Cable Car	-
51201	Revenue Vehicles	Cable Car	Cable Car
51300	Revenue Vehicles	Commuter Rail	-
51301	Revenue Vehicles	Commuter Rail	Revenue Locomotive
51302	Revenue Vehicles	Commuter Rail	Passenger Car
51303	Revenue Vehicles	Commuter Rail	Self-Propelled Passenger Car
51500	Revenue Vehicles	Ferry Boat	-
51501	Revenue Vehicles	Ferry Boat	Ferry Boat
51600	Revenue Vehicles	Heavy Rail	-
51601	Revenue Vehicles	Heavy Rail	Heavy Rail
51900	Revenue Vehicles	Bus	-

Type	Sub-Category	Element	Sub-Element
51901	Revenue Vehicles	Bus	Articulated Bus (60 ft)
51902	Revenue Vehicles	Bus	BRT Vehicle
51903	Revenue Vehicles	Bus	Bus (40 ft)
51904	Revenue Vehicles	Bus	Bus (35 ft)
51905	Revenue Vehicles	Bus	Bus (30 ft)
51906	Revenue Vehicles	Bus	Bus (<30 ft)
51907	Revenue Vehicles	Bus	Double Decker Bus
51908	Revenue Vehicles	Bus	School Bus
51911	Revenue Vehicles	Bus	Motor Bus - Other
51912	Revenue Vehicles	Bus	Over-the-Road Coach
51921	Revenue Vehicles	Bus	Articulated Bus (60 ft) - Diesel
51922	Revenue Vehicles	Bus	BRT Vehicle - Diesel
51923	Revenue Vehicles	Bus	Bus (40 ft) - Diesel
51924	Revenue Vehicles	Bus	Bus (35 ft) - Diesel
51925	Revenue Vehicles	Bus	Bus (30 ft) - Diesel
51926	Revenue Vehicles	Bus	Bus (<30 ft) - Diesel
51931	Revenue Vehicles	Bus	Articulated Bus (60 ft) - Hybrid
51932	Revenue Vehicles	Bus	BRT Vehicle - Hybrid
51933	Revenue Vehicles	Bus	Bus (40 ft) - Hybrid
51934	Revenue Vehicles	Bus	Bus (35 ft) - Hybrid
51935	Revenue Vehicles	Bus	Bus (30 ft) - Hybrid
51936	Revenue Vehicles	Bus	Bus (<30 ft) - Hybrid
51941	Revenue Vehicles	Bus	Articulated Bus (60 ft) - CNG
51942	Revenue Vehicles	Bus	BRT Vehicle - CNG
51943	Revenue Vehicles	Bus	Bus (40 ft) - CNG
51944	Revenue Vehicles	Bus	Bus (35 ft) - CNG
51945	Revenue Vehicles	Bus	Bus (30 ft) - CNG
51946	Revenue Vehicles	Bus	Bus (<30 ft) - CNG
52000	Revenue Vehicles	Light Rail	-
52001	Revenue Vehicles	Light Rail	LRV
52002	Revenue Vehicles	Light Rail	Street Car
52003	Revenue Vehicles	Light Rail	Historic Street Car
52100	Revenue Vehicles	Trolleybus	-
52101	Revenue Vehicles	Trolleybus	Trolleybus
52301	Revenue Vehicles	Vans, Cutaways and Autos	Automobile
52521	Revenue Vehicles	Vans, Cutaways and Autos	Heavy-Duty Van
52522	Revenue Vehicles	Vans, Cutaways and Autos	Super Medium-Duty Van
52523	Revenue Vehicles	Vans, Cutaways and Autos	Medium-Duty Van
52524	Revenue Vehicles	Vans, Cutaways and Autos	Light-Duty Van
52525	Revenue Vehicles	Vans, Cutaways and Autos	Mini-Van
52526	Revenue Vehicles	Vans, Cutaways and Autos	Raised Roof Van
52527	Revenue Vehicles	Vans, Cutaways and Autos	SUV

Type	Sub-Category	Element	Sub-Element
53000	Non-Revenue Vehicles	-	-
53001	Non-Revenue Vehicles	Car	-
53002	Non-Revenue Vehicles	Truck	-
53003	Non-Revenue Vehicles	Special	-
53004	Non-Revenue Vehicles	Locomotive, Switch	-
54000	Equipment/Parts	-	-