**Demand Builder:**

Demand Builder is a tool that automates the creation and alteration of demand files.

Demand files are used as inputs to the MARATHON model.

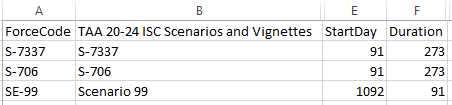
**Inputs:**

**Vignette Mapping File:**

The vignette mapping file describes the start and duration time for each vignette and each FORGE demand.

The header column needs to contain the fields: *ForceCode*, *StartDay*, and *Duration*. Additional columns can be present and do not need to be remove. The ordering of these columns does not matter.

*Example File*:

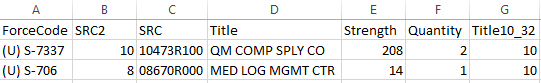


**Vignette Consolidated File:**

The vignette consolidated file describes the demand for SRCs when the quantity of units required is constant.

The header column needs to contain the fields: *ForceCode*, *SRC*, *Title*, *Strength*, *Quantity*, and *Title10\_32*. Additional columns can be present and do not need to be removed. The ordering of these columns does not matter.

*Example File:*



The Vignette Consolidated and Vignette Mapping file are joined on the ForceCode name. Sometimes the classification of the vignette unclassified (U)/ secrete (S) is given in front of the ForceCode; this is allowed and will not cause any issues. Apart from potentially having a classification in one file and not the other, the ForceCode values in Vignette Mapping file have to match exactly to what is in the Vignette Consolidated file. If there is a mismatch between the files, the all data for that Vignette or Scenario will not be in the final output file.

Only events listed in the map are put into the final file. If a vignette is not present in the mapping file, but exist in the consolidated file, it will not be in the final demand record. Similarly, if a vignette is listed in the map but there is not corresponding data in the consolidated file, it will not appear in the final demand record.

SRCs that are not in the MAP but are in the CONSOLIDATED, or not in the CONSOLIDATED but in the MAP will be logged in the *out-of-scope.txt* file in the output directory.

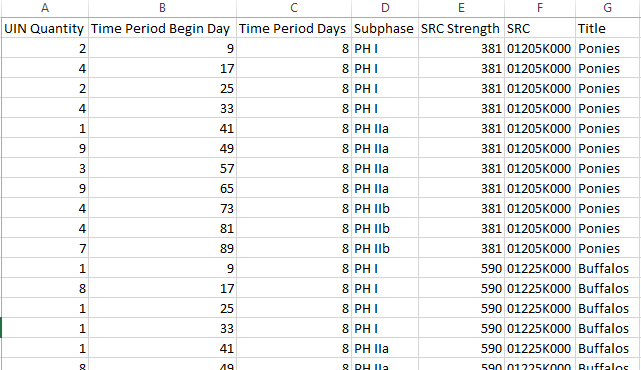
**FORGE Files:**

Each scenario (starts with SE) that has a demand must have its own FORGE file.

The FORGE files describe the quantity of SRCs needed over multiple periods of time. Typically, each time period is 8 days.

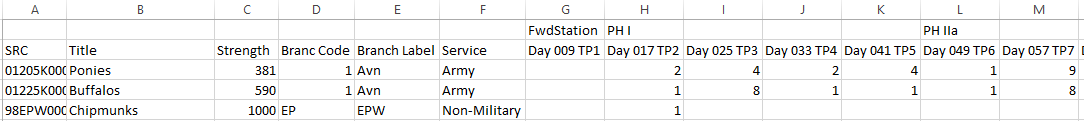
Demand Builder supports either the Unit\_Node\_Detail sheet (RECOMMENDED) or the SRC\_By\_Day sheet.

*Unit\_Node\_Detail sheet*:



\*The sheet name should be “Unit\_Node\_Detail”, which should be the default in the FORGE file.

*SRC\_By\_Day sheet:*



\*This sheet is supported, but should be used second to Unit\_Node\_Detail. Only use when Unit\_Node\_Detail is missing or corrupted.

\*The sheet name should be “SRC\_By\_Day”, which should be the default in the FORGE file.

**Working Directory:**

Once all files are in the correct format, they should all be moved to a single folder. This folder will be referred to as the working directory within demand builder.

**Running Demand Builder**

The use of \*remote VLOOKUP formulas and error cells are not supported.

To use demand builder, remove any columns containing VLOOKUPs that require values from a sheet from another workbook. This can be done by copying the column to a new column with the exact (Non-formula) values, then renaming the columns.

Additionally, any formulas the result in errors (cells that start with #) need to be removed/updated. Errors should either be removed or changed a standard cell type

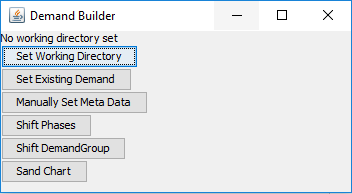
If a workbooks containing these issues is used as an input, an error message will be given listing the specific file and sheet which contained the error.



Standard Text Cell

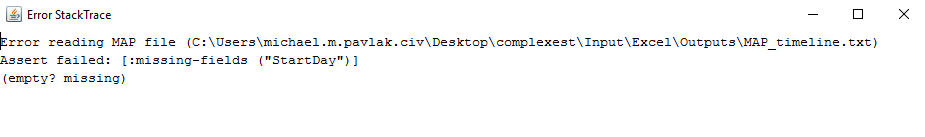
Error Cell

When demand builder is ran, the user should see this screen:



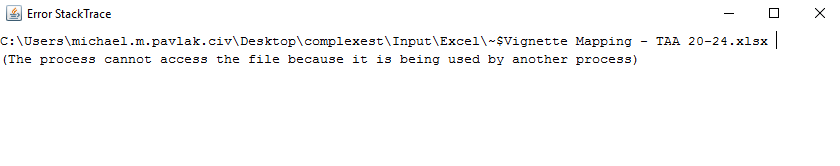
If any errors occur, any error message or stack trace will be displayed to the user in the error message GUI.

*Example of error message:*



If an error occurs while trying to build demand, without closing demand builder, the user can manually fix the inputs based on the error message.

\*If Excel is used to adjust an input file, make sure it is closed before trying to run again. Excel blocks all other processes from reading any open files.

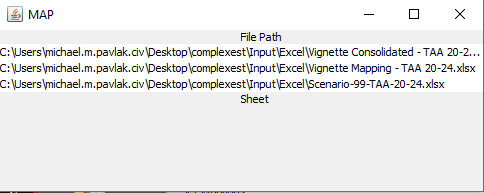


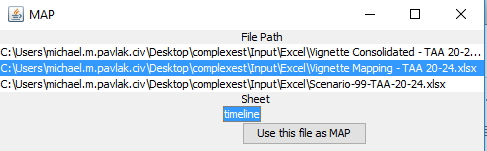
**Since the demand builder might fail to automatically build the meta data properly using the “Set Working Directory” button, the user can manually specify the meta data by using the “Manually Set Meta Data” button. If you would like to try the automatic method, scroll down.**

The first file select menu will ask the user to point to the working directory.

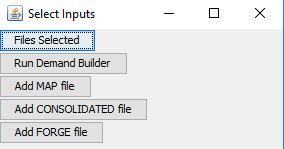
Pressing the “Files Selected” button will output the files and associated meta data currently listed.

The user must specify the MAP file first using the “Add MAP file” button.



Selecting a file will update the list of possible sheets:  


Select a sheet and then click the button.



Once the MAP has been selected, buttons to add the CONSOLIDATED and FORGE files will be available.

When clicking on the CONSOLIDATED file, it will take a second to load up.

These create similar screens to the MAP selection. Once a file has been used once, it will be removed as an option in subsequent screens.

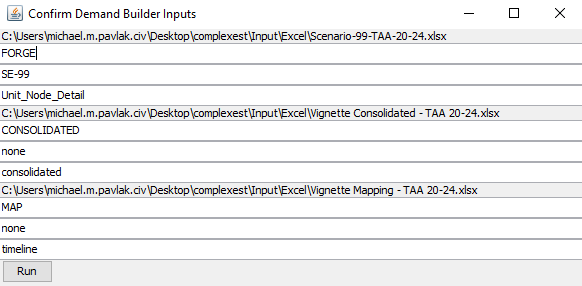
Once all files have been added, confirm the input by opening the “Files Selected” screen.

**In order to try automatically building meta data,**

The first step is to set the working director by clicking the “Set Working Directory” button. This will open a file select menu which the user should use to locate their working directory folder (or any file within that directory) where they moved all of the formatted inputs to.

The working directory can be changed at any point.

After locating the working directory, the user will be prompted to confirm that the auto-generated meta data associated with each file is correct. Pay attention here as the force codes are likely lined up with the wrong files.



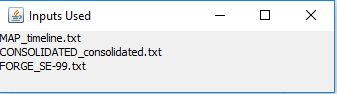
Each label list the full file path. The subsequent text fields are for the file type (FORGE, CONSOLIDATED, or MAP), ForceCode\*, and Excel sheet name.

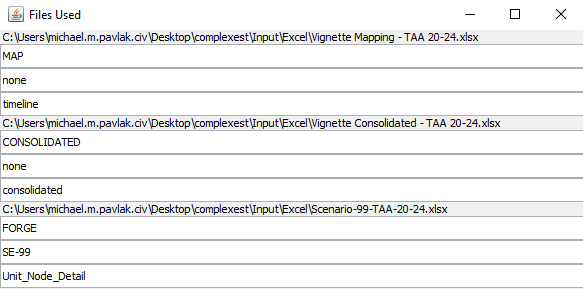
\*The ForceCode only applies to FORGE/Scenario data and should match what is listed in the MAP file.

Pressing run will generate the Demand Record and additional logs and re-formatted inputs. This file will be located in the working directory, which will be listed at the top of the demand builder GUI.

If the file was successful built, a dialog box will appear indicating which files were used as inputs.

New file will be created in the set working directory with the name [path]\_DEMAND.txt, where path is the last subfolder in the working directory path.





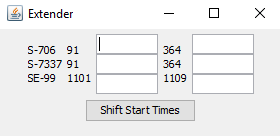
Once the inputs are confirmed, demand builder can be ran using the “Run Demand Builder” button.

**To change the working directory to the newly created files, use the “Set Existing Demand” button and locate the new output directory.**

Users can also import existing Demand Records by using the ‘Set Existing Demand’ button, which will prompt the use for the location of the Demand file.

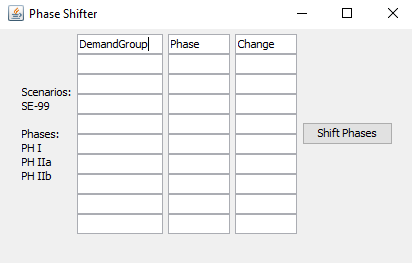
**In addition to creating new demand files, demand builder can change the newly created or already existing demand files in two different ways:**

The first demand file adjustment that a user can specify is a systematic change in the start day of duration of a demand group. This can be done by clicking the Shift Times button while in a working directory that contains an existing demand file. A new window will appear;

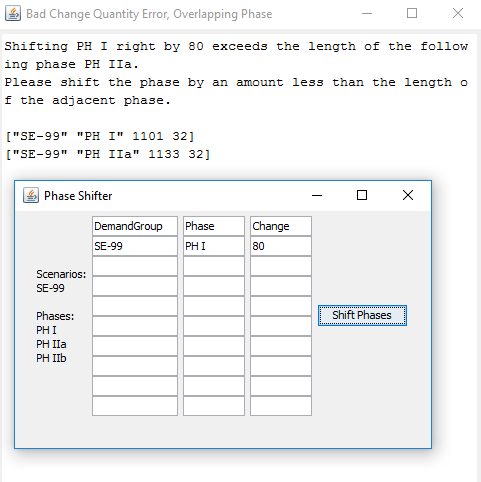


The first column indicates the demand group. The second column indicates the starting time. The final column indicates the ending time. The first text box will allow the user to adjust all start times by a given amount. The second text box will shift ending times by any given amount (NOTE: shifting end times is currently not working properly). Negative values are used to bring something forward in time. Positive values shift something to a later point. Empty cells have no effect and will be ignored. Clicking the Shift Start Times button will update the existing demand file. If at any point the original file needs to be restored, it can be rebuilt by going back to the build demand step.

If phase timings within a scenario need to be updated, the user can do so through the phase shifter tool. Clicking the Shift Phases button will open a new window:



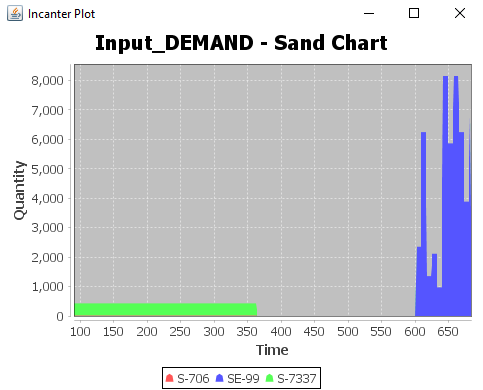
The DemandGroup column is the Scenario to be adjusted. The phase is the phase. The Change is the amount to shift (sign indicates direction). \*Do not edit the first column. Changes to phases are done in order and are cascaded. For more specific information about how phase shifter works, see phase shifter documentation [https://github.com/fsdonks/demand\_builder/tree/master/documentation]. If there are any errors shifting the phases, the user will be notified with a new window with the detailed error message.



If no error message occur, the change will be made to the demand file and the phase shifter window will disappear.

**The final functionality of Demand Builder is the ability to generate sand charts which indicate total personnel over time, grouped by demand group. This can be done by clicking the Sand Chart button.**

The total personnel over time is pulled from the Strength field in the demand.



Charts are not automatically save. The image can be save by right clicking save-as on the plot window.