

Building Data

Overview

In this section we are going to discuss the steps for ingesting building data into a format that MAEviz can understand and use in the building analyses. Before we launch the software, we will go over the MAEviz building data format so that if any changes need to be made, we can make those now.

Data Format

We will need two datasets for running a building damage analysis, a building dataset ingested into MAEviz and a Fragility Mapping dataset ingested into MAEviz. The building dataset will contain columns such as structure type, year built, etc and the fragility mapping dataset tells MAEviz which fragility curves should be used for which buildings.

Building Data

Let's start out by looking at the building data requirements. The building data for MAEviz needs to be in ESRI's Shapefile format. Below you will find the column names, a short description and the column types that MAEviz requires. Only the column types (e.g. integer, double, string, etc) must explicitly match what is listed in the table. We do not need to worry about column names matching because when we ingest the dataset, MAEviz will ask you to map your columns to the columns that MAEviz needs. For example, your structure type information might be in a column called **s_type** and MAEviz expects it to be called **str_type** so you can tell MAEviz that **s_type** maps to **str_type** and thus no changes need to be made to your dataset. The columns are categorized into three categories: Very Important, Less Important and Least Important.

Building Columns:

Very Important

| Field Name | Field Description | Field Type |
|------------|--|------------|
| STRUCT_TYP | General structure type of the building | string |

Less Important

| Field Name | Field Description | Field Type |
|------------|---|------------|
| OCC_TYPE | Broad HAZUS Occupancy Category (e.g. RES3 - multi-family residential) | string |
| APPR_BLDG | Appraised value for the building | double |
| SQ_FOOT | total building area in square feet | integer |
| DWELL_UNIT | total number of dwelling units in the building | integer |
| NO_STORIES | total number of stories for the building | integer |
| CONT_VAL | value of building contents | double |
| STR_TYP2 | detailed structure type as per HAZUS MR-3 specifications | string |
| EFACILITY | essential facility designation | string |

Least Important

| Field Name | Field Description | Field Type |
|------------|--|------------|
| PAR_ID | parcel identifier | string |
| PARID_CARD | improvement identifier | string |
| BLDG_ID | building identifier (unique) | string |
| STR_PROB | probability that the structure type specified is correct | double |
| YEAR_BUILT | the year the structure was built | integer |
| A_STORIES | the number of above ground stories | integer |
| B_STORIES | the number of below ground stories | integer |
| BSMT_TYPE | the basement type | string |
| GSQ_FOOT | total ground floor area of the building in square feet | integer |

| | | |
|------------|--|--------|
| OCC_DETAIL | specific occupancy category, describing the detailed use of the building | string |
| MAJOR_OCC | major occupancy category for the parcel in which the building is sited | string |
| BROAD_OCC | general occupancy categories | string |
| REPL_CST | replacement cost for the building from R.S. means square foot cost | double |
| STR_CST | structural component of the replacement cost | double |
| NSTRA_CST | acceleration sensitive component of replacement cost | double |
| NSTRD_CST | drift sensitive component of replacement cost | double |
| DGN_LVL | design level for the building as per HAZUS MR-3 specifications | string |
| OCC_TYP2 | detailed HAZUS occupancy category for the building | string |
| TRACT_ID | census tract identifier | string |

Now, it's ok if you don't have all of the above information for your buildings; however, the more detail you have about your building means you can be more explicit in mapping your fragilities to your buildings for the damage analysis. Only in the more advanced analyses will MAEviz start requiring some of those other attributes (e.g. estimating structural damage cost requires the **APPR_BLDG** column since the cost of the structure needs to be known). One stipulation, all of these columns do need to be present in the dataset, even if they contain no data because MAEviz will expect all of the columns to be there upon ingestion. In the next version of MAEviz, this restriction of all columns being present, even with no data, should be eliminated.

Ingest Building Dataset

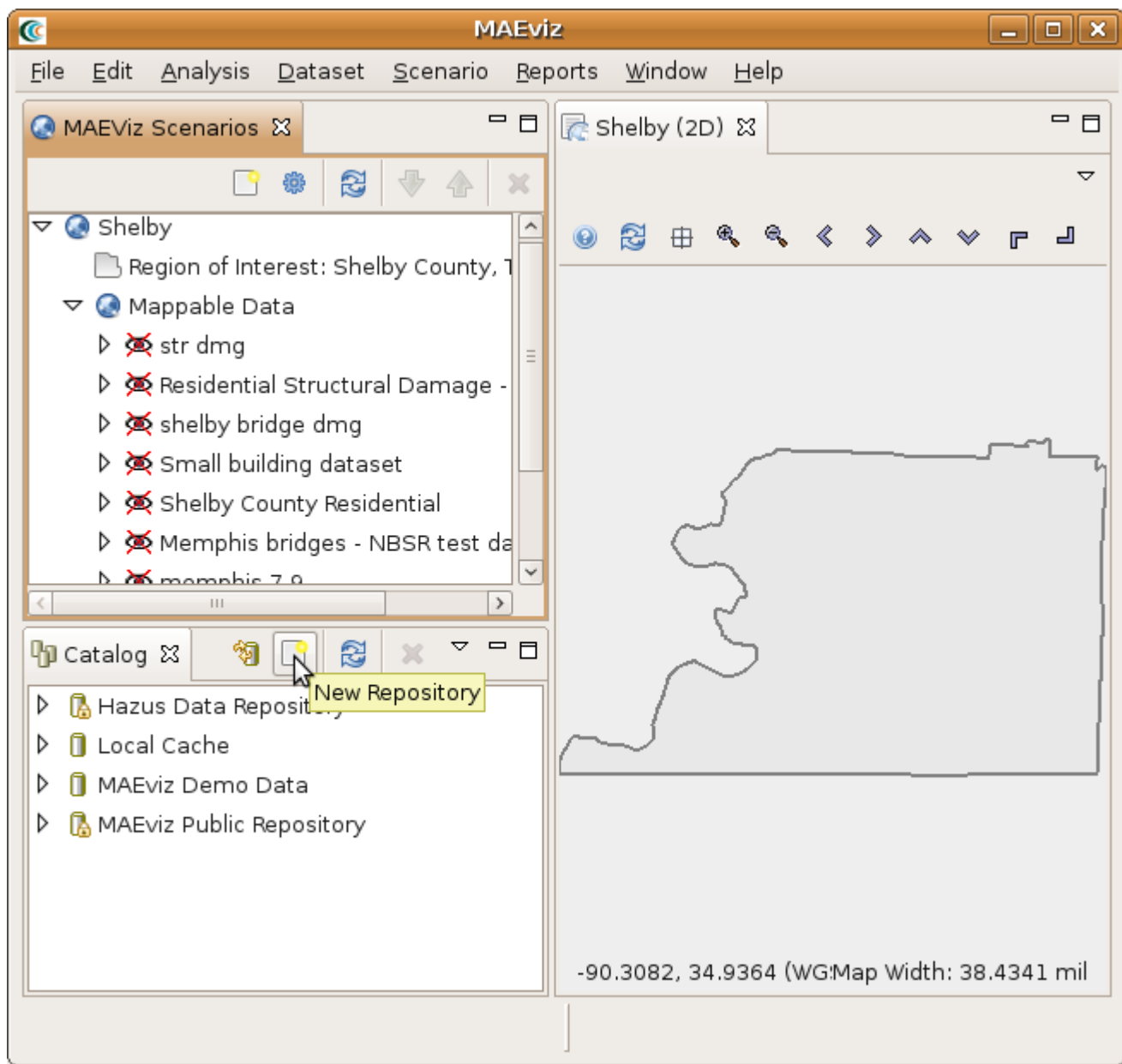
First, we will need to launch the MAEviz application. The default installation directory for MAEviz is a folder with the same name, "MAEviz" so you should be able to launch the software by going to Start -> Programs -> MAEviz.

Ingestion Steps

In this section we will go through the steps to create a new local data repository for ingesting data into and then through the steps to ingest a building dataset and a fragility mapping dataset.

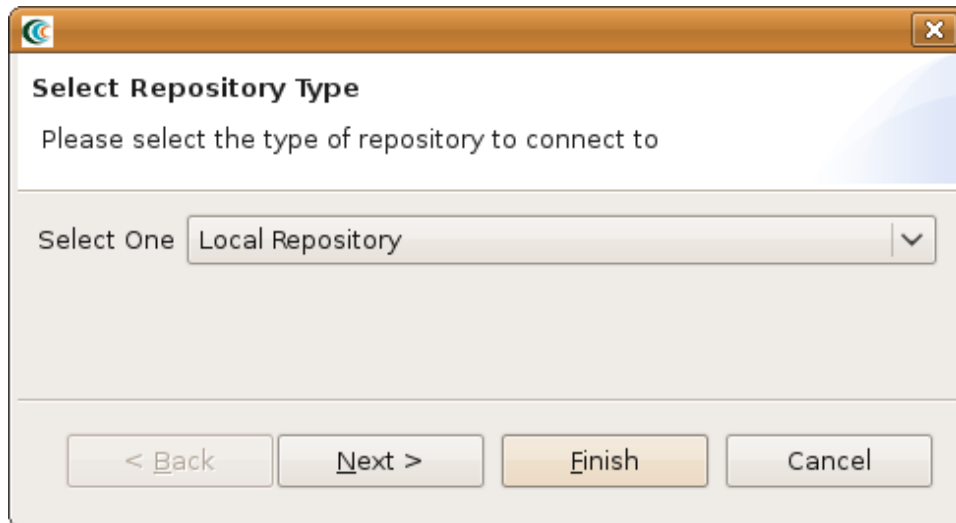
Create Local Repository

This step is optional if you have already created a local repository to ingest your data into, otherwise the steps below will take you through the process of creating a local repository for MAEviz. With MAEviz open, you should see a *Catalog View* similar to the one in the image below:



Steps to create repository:

1. Click on the *New Repository* button that is highlighted by the mouse in the above image and a dialog box similar to the one in the image below should open and walk you through the steps of creating a new repository.



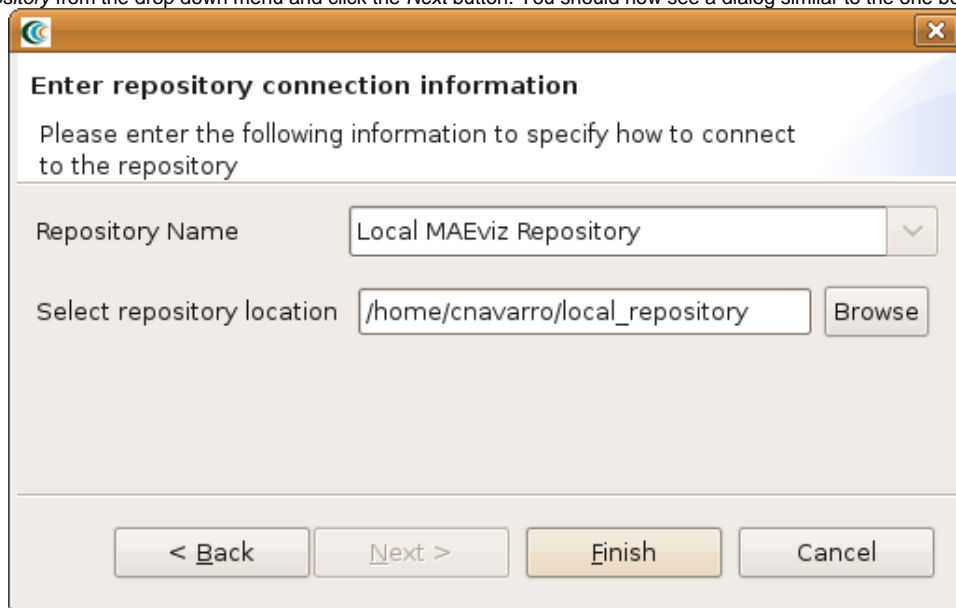
Select Repository Type

Please select the type of repository to connect to

Select One

< Back Next > Finish Cancel

2. Select *Local Repository* from the drop down menu and click the *Next* button. You should now see a dialog similar to the one below.



Enter repository connection information

Please enter the following information to specify how to connect to the repository

Repository Name

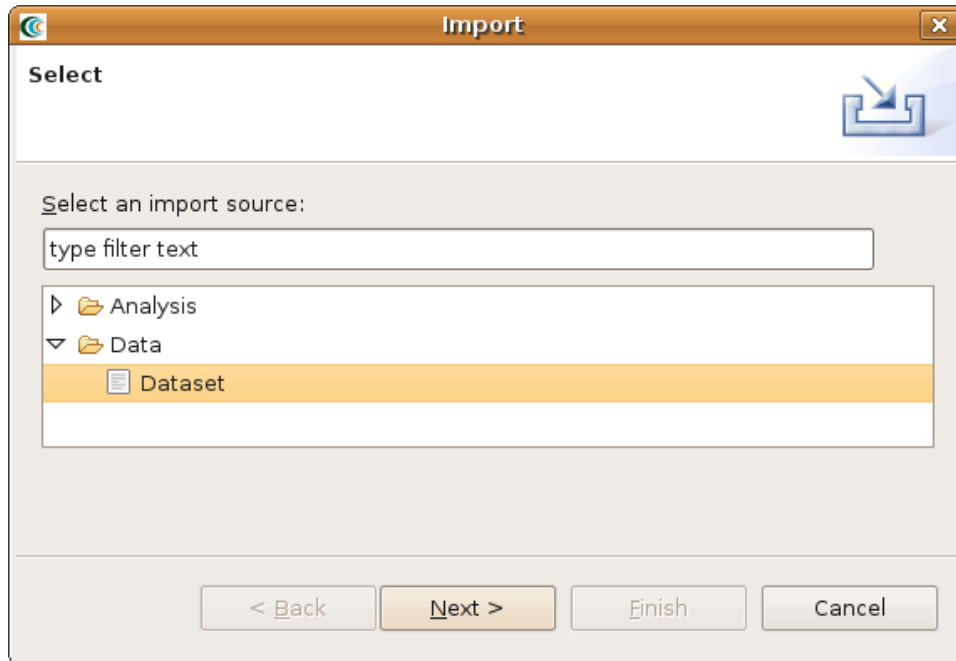
Select repository location

< Back Next > Finish Cancel

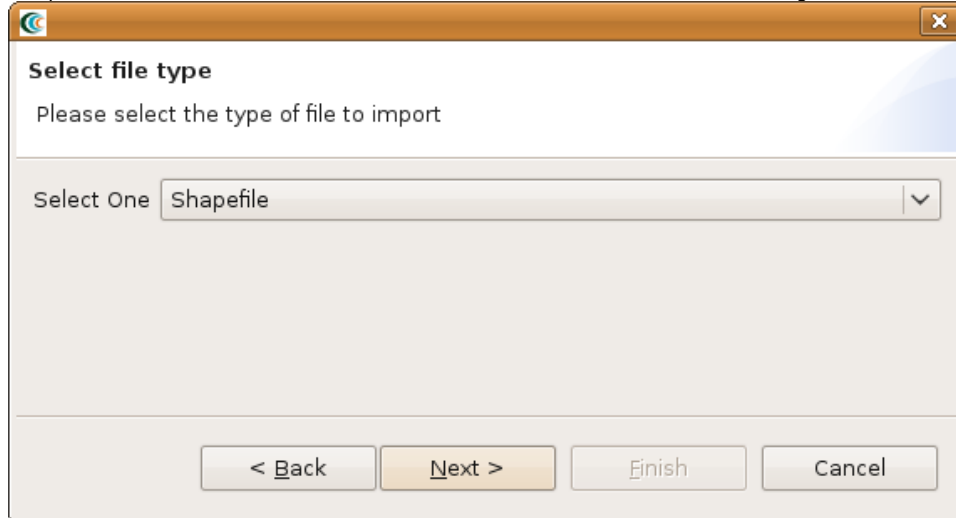
3. Enter a name for the repository and browse for a directory to use to store ingested datasets. Click *Finish* to create the new repository. You should now see your new repository in the *Catalog View* and it is ready to store data.

Building Dataset

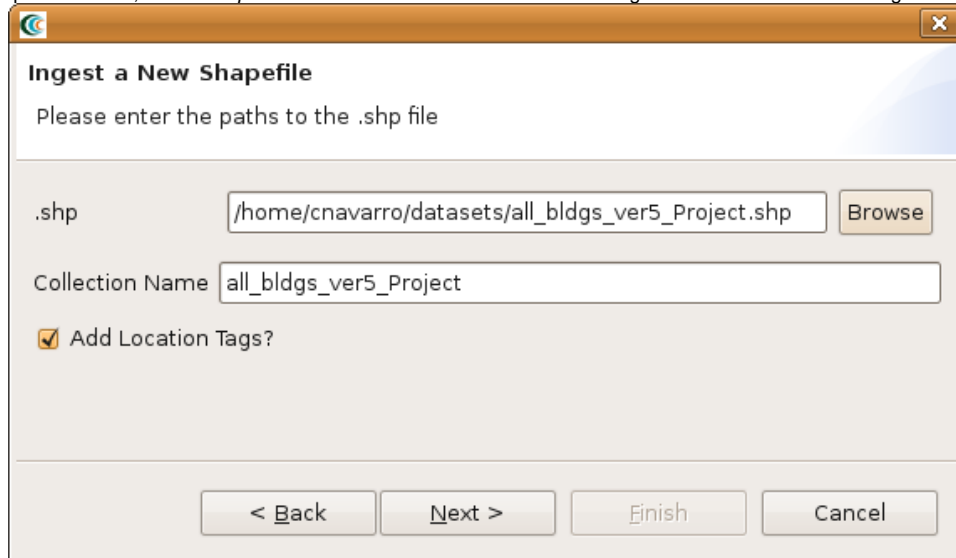
1. Go to the *File* menu near the top of the application and select *Import*. This should bring up the dialog seen below.



2. From the dialog box, expand the *Data* selection and select *Dataset* and click *Next*. You should see something similar to the image below.



3. From the dialog drop down menu, select *Shapefile* and click *Next*. You should see a dialog similar to the one in the image below.



4. From the dialog, click the *Browse* button and select the building shapefile you want to ingest and click the *Next* button. You should see a dialog similar to the one below.

Select data type

Please select the type of data for this file

Select the data type for this file Building Inventory v5.0

< Back Next > Finish Cancel

5. From the dialog drop down menu, select *Building Inventory v5.0* and click *Next*. You should see a dialog similar to the one below.

Set attribute mappings

Please select the attribute columns to map to the MAEviz standard columns. You can hold your mouse over a column name for detail.

| | |
|------------|---|
| the_geom | the_geom |
| parid | PID |
| parid_card | PID_CARD |
| bldg_id | BLDG_ID |
| struct_typ | BLDG_TYP |
| str_prob | STR_PROB Unit: Decimal |
| year_built | YR_BUILT |
| no_stories | STORIES |
| a_stor | Number of Stories Must be a numeric value |

< Back Next > Finish Cancel

6. From this dialog, you will notice each field has a drop down menu next to it. The field name on the far left is the field MAEviz expects to find in your dataset and the drop down menu next to the field contains all of the fields in your dataset that you could map it to. Select the appropriate mappings (e.g. as we mentioned above, you could map **s_type** to **struct_typ**). For some fields, there will also be a unit type drop down selection (e.g. dollars for building value). Currently, if other currency types besides *dollar* and *turkish lira* are required we will need to add the conversion to MAEviz. When finished, click *Next*.
7. If other fields are present, the next dialog screen will give you some options to assign friendly names and units to those fields. You can safely ignore this and click the *Next* button. You should now see the dialog below.

Descriptive Data

Please enter the following descriptive information

Repository to ingest to: MAEviz Demo Data

Descriptive name for this dataset: Memphis Building Data

Version number of data: 1.0

< Back Next > Finish Cancel

8. From this dialog you can select the repository to ingest the dataset to, provide a descriptive name for the dataset (e.g. Memphis Residential Buildings), and a version number. After entering the required information, click the *Finish* button.

If your dataset is large, you may need to wait a few minutes for MAEviz to ingest the dataset. A progress bar will indicate if MAEviz is still working on the dataset. Once that finishes, your dataset should now be available in the repository you ingested to.

Conclusion

At this point, you should have all of the data required to be able to use the [building damage tutorial](#) to create a building damage result from your ingested buildings provided they default fragilities and fragility mapping files work with your dataset. If not, you will need to create a set of fragilities and fragility mappings for your dataset. You can find more information about that [here](#).