

How to Create National HUD Assisted Housing Layers from A Picture of Subsidized Households

This document describes how to use ArcGIS to create GIS layers from the national level data files distributed as part of [A Picture of Subsidized Households](#). There are two ways to map HUD Assisted Housing – at the property level (by point) or at the census tract or place level (by polygon). When you map by point, you are using the latitude and longitude derived by HUD’s geocoding process to create a point that represents a Public Housing Development, Public Housing Authority, Multifamily Housing Property, or Low Income Housing Tax Credit Project. Information on HUD’s Housing Choice Voucher program (formerly known as Section 8) is not disseminated with discrete locations. Due to privacy concerns, these data are summarized and disseminated by area (census tract or place). Data associated with the Public Housing, Multifamily and Low Income Housing Tax Credit programs are also made available at the census tract or place level. When you map by polygon, you are joining the tract or place summary file from A Picture of Subsidized Households to a census tract or place layer. HUD does not provide these basemap layers. You can use public available basemap layers such as TIGER or your own COTS basemap layers such as those provided by TeleAtlas.

The vector data type (point or polygon) that you use to map the HUD assisted housing data will depend on how you intend to use the data. For example, if you need to know the discrete location of each housing development for a proximity analysis it would be useful to have the point location of assisted housing developments or projects. So you would want to use the [project summary file](#), keeping in mind that you will not be able to map point locations for the Housing Choice Voucher recipients. But if you need to know the total number of assisted housing units in a particular area you would be better off using the [tract summary file](#), which includes a summary of data for all program areas including the Housing Choice Voucher program.

Creating Point Layers

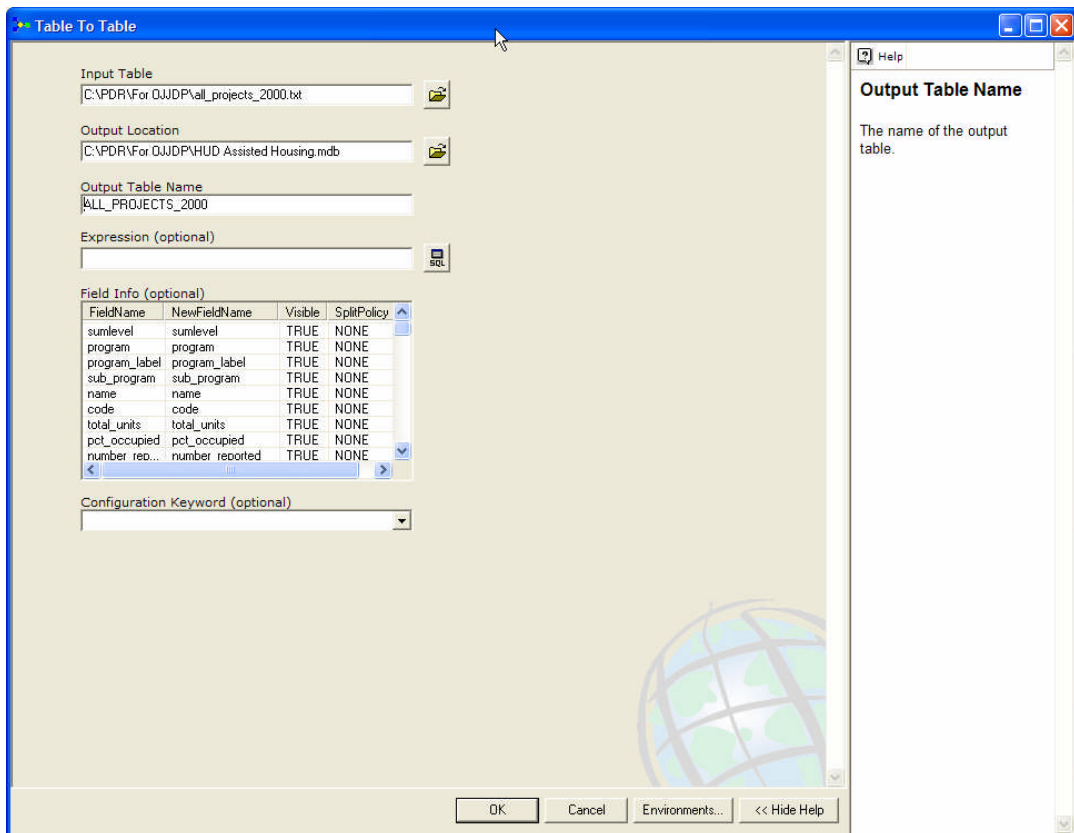
To create point layers for HUD Public Housing Developments and Low Income Housing Tax Credit Projects download the following file:

http://www.huduser.org/picture2000/all_projects_2000.exe

Extract the file “all_projects_2000.txt” to a local directory. This is a comma delimited text file, which can be imported into a GIS environment in a variety of ways. The following instructions describe how to do this using ArcGIS and the Personal geodatabase.

1. Open ArcCatalog and create a new personal geodatabase or open an existing one.
2. In ArcCatalog, navigate to the directory containing the all_projects_2000.txt file.
3. Right click on the all_projects_2000.txt and select Export > To Geodatabase (single)...
4. Select the personal geodatabase that you just created as the Output Location.

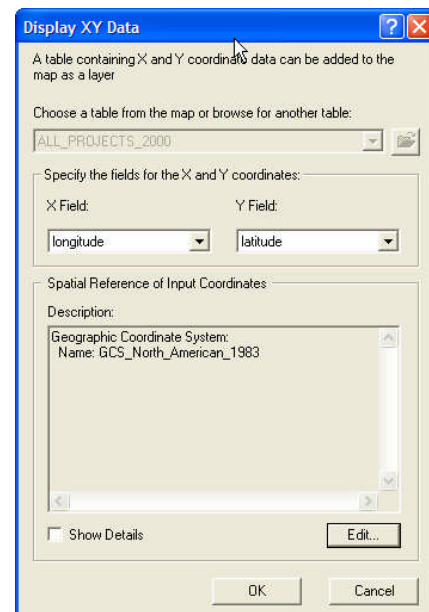
5. Specify an Output Table Name, i.e. all_projects_2000, as in the example below.



6. Open ArcMap and add the all_projects_2000 table that you just loaded into your personal geodatabase to the map document.

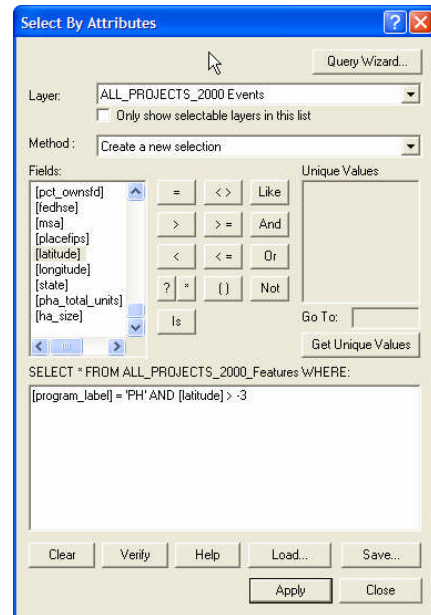
7. Right click on the table and select Display XY Data...

8. ArcGIS will automatically assign the longitude and latitude fields to the X and Y fields respectively. Click on the Edit... button to specify the spatial reference of the input coordinates. Select the following coordinate system: \Geographic Coordinate Systems\North America\North American Datum 1983.prj. Click OK to generate a point layer for all the HUD Assisted Projects.

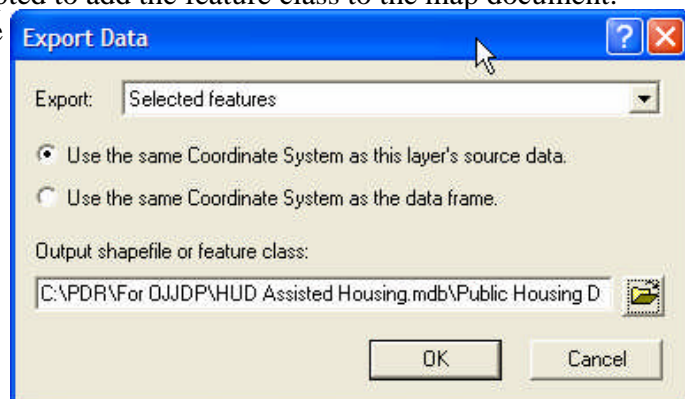


In the following steps you will create 2 different datasets from this point layer: one for Public Housing Developments and one for Low Income Housing Tax Credit Projects.

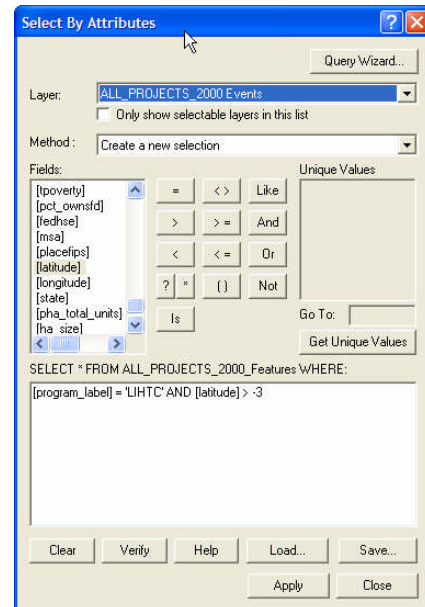
- Go to the Selection menu and click on Select by Attributes... On the form, double click on the field [program_level] and then click on Get Unique Values. Click on the equal operator and then double click on the value 'PH'. Click on the AND operator. Double click on the [latitude]. Click on the greater than operator (>). Type in -3 to end the query expression. Your query expression should match the one in the image to the right. Click Apply to run the query. The query should result in 13,808 selected records. Close the Select by Attributes form. **The features with a latitude or longitude of -3 did not geocode well enough for a street-level geocode. These features will not be included in the results.



- Right click on the all_projects_2000 Event layer and go to Data > Export Data... On the Export Data form, make sure that Selected Features is selected from the drop down list and that the radio button labeled 'Use the same Coordinate System as the layer's source data' is selected. Type in a name for the feature class, i.e. Public Housing Developments. Make sure that you save the layer as a feature class in your personal geodatabase. ** Note at this step you have the option to export as a shapefile or SDE feature class. Click OK to export the selected features. You will be prompted to add the feature class to the map document. Click Yes. Verify that there are Public Housing Developments layer.



11. Go to the Select menu again and click on Select by Attributes... Your previous query will appear. Simply change the value in the query expression from 'PH' to 'LIHTC'. Leave the [latitude] > -3 part of the query alone. You do not want to the non-geocodable projects in the resulting layer. Click Apply to run the query. The results should show 17,716 features selected.



12. Right click on the all_projects_2000 Event layer (NOT the Public Housing Developments layer that you just created and added to the map) and go to Data > Export Data... On the Export Data form and make sure that Selected Features is selected from the drop down list, that the radio button labeled 'Use the same Coordinate

System as the layer's source data' is selected. Type in a name for the feature class, i.e. LIHTC Projects. Make sure that you save the layer as a feature class in your personal geodatabase. ** Note at this step you have the option to export as a shapefile or SDE feature class. Finally click OK to export the selected features. The resulting feature class contains all the Low Income Housing Tax Credit projects in the country. You will be prompted to add the feature class to the map document. Click Yes. Verify that there are 17,716 features in the LIHTC layer.

The remaining records in the file, those that do not have the program label 'PH' or 'LIHTC', are Multifamily properties. Multifamily properties are duplicated in the project summary file because the data are reported by program type. It is possible for Multifamily projects to have tenants participating in different types of assistance programs. Since the data are reported at the program level, you may see the same Multifamily properties appear more than once. In each case the characteristics of the tenants participating in each program at that location is unique, but the attributes of the property (i.e. latitude and longitude) are duplicated because it's the same property. So if you were to map these cases you would end up with multiple points representing the same property. This in itself may cause users to believe that there are, for instance, three Multifamily properties at a particular location when there is really only one. It gets more complicated if you wanted to calculate the actual number of assisted units for this property. You would have to sum the units for each program for that particular property.

Additionally, the Multifamily Housing Property universe represented in A Picture of Subsidized Households is not the complete universe of Multifamily housing. A Picture of Subsidized Households only includes the Multifamily properties that have tenants participating in some kind of housing assistance programs. The Multifamily Housing Property that are FHA insured without any assistance contracts may have

low-income units but they are not required to report data on the tenants. Consequently, there about 1/3 of the Multifamily Housing Properties are not represented in A Picture of Subsidized Households.

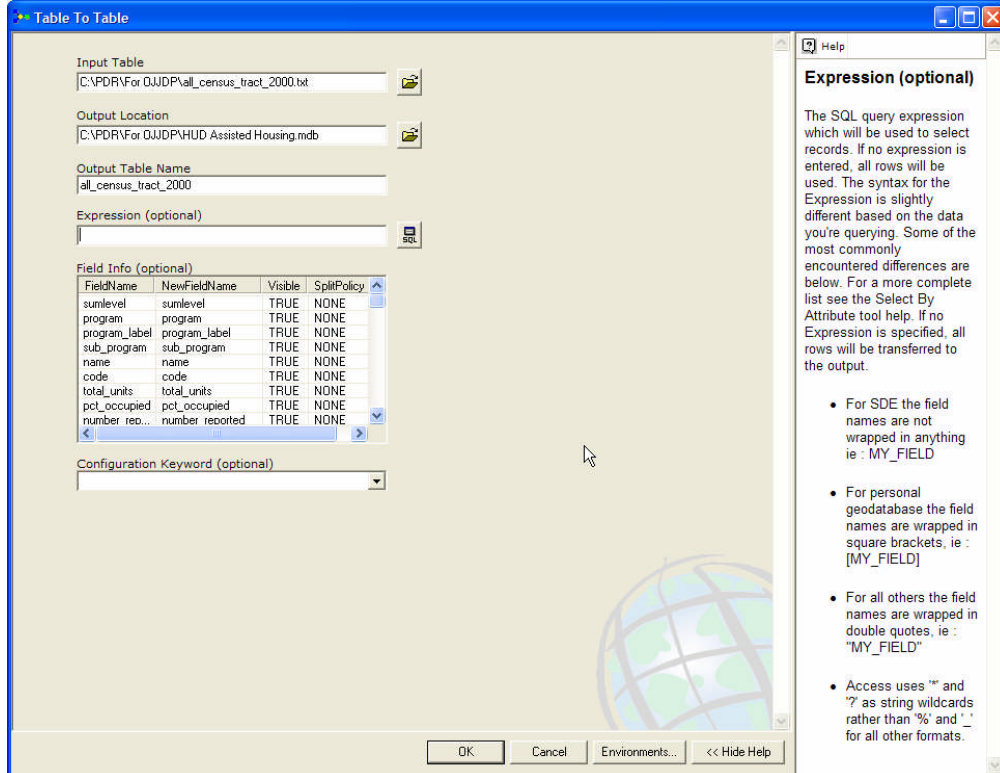
Creating Polygon Layers

To create a census tract layer that can display summarized data about **ALL** HUD Assisted housing download the following file:

http://www.huduser.org/picture2000/all_census_tract_2000.exe

Extract the file “all_census_tract_2000.txt” to a local directory. This is a comma delimited text file, which can be imported into a GIS environment in a variety of ways. The following instructions describe how to do this using ArcGIS and the personal geodatabase.

1. In ArcCatalog, navigate to the directory containing the all_census_tracts_2000.txt file.
2. Right click on the all_census_tracts_2000.txt and select Export > To Geodatabase (single)...
3. Select the personal geodatabase that you just created in the previous steps as Output Location.
4. Specify an Output Table Name, i.e. all_census_tracts_2000, as in the example



5. Open ArcMap and add the all_projects_2000 table that you just loaded into your personal geodatabase to the map document.

***In order to continue to the next step, you need to have a national census tract layer available to join the assisted housing summary data to. HUD does not provide base map layers.*

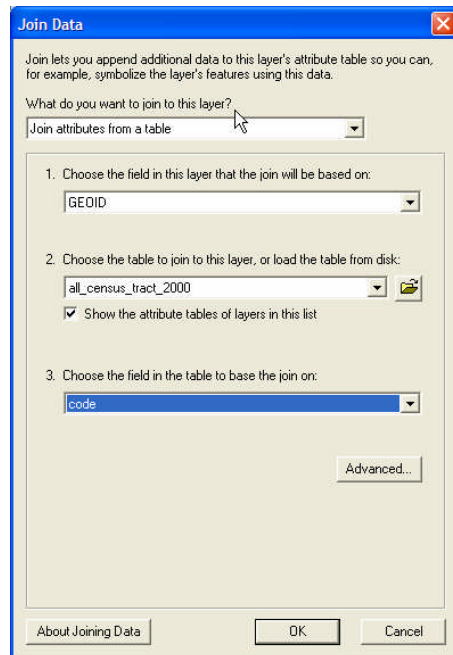
6. Add the census tract layer to your ArcMap document.

7. Right click on the census tract layer and select Join...

8. Select a field in this layer the join will be based on. This field should be the 11 character code comprised of the State FIPS + County FIPS + 2000 Tract code (leading and trailing 0s preserved – no decimals included).

9. Select the table to join to the census tract layer. This would be the all_census_tract_2000 table that you loaded into your personal geodatabase.

10. Choose the field in the table to base the join on. In this case, the field is code. Click OK to perform the join.



11. Right click on the census tract layer that you just joined the all_census_tract_2000 table to and open the attribute table. Verify that you have the fields from that table and that they contain data. If you are not seeing any data, something went wrong with the join most likely because the key field in the census tract layer is not formatted property (State FIPS + County FIPS + 2000 Tract code (leading and trailing 0s preserved – no decimals included)).

At this point, you can export the layer with the desired fields to a new shapefile or feature class. If you want to map the total number of assisted households by tract use the *number_reported* column. Any other questions about the data see the [codebook](#).

To create a census tract layer that can display data about **ONLY the Housing Choice Voucher** recipients, download the following file and repeat the steps above:

http://www.huduser.org/picture2000/certs_vouchers_census_tract_2000.exe