Department of Housing and Urban Development
CoC GIS Toolkit for Communities: Mini Tutorials

INTRODUCTION **3**
FIGURE 1. LOCATING THE 'FIND' TOOL. 4
FIGURE 2. THE 'FIND' TOOL DIALOG BOX.. 5
FIGURE 3. THE 'LOCATIONS' TAB. 7
FIGURE 4. THE 'IDENTIFY' TOOL DIALOG BOX. 9
2. NAVIGATE THE MAP **11**
FIGURE 5. CONTROLLING THE MAP SCALE. 11
FIGURE 6. USING THE 'PAN' TOOL. 12
FIGURE 7. TURNING OFF LAYERS. 14
FIGURE 8. ACCESSING THE 'WORLD IMAGERY' LAYER. 15
3. UTILIZE THE MAP MARK-UP TOOLS **16**
FIGURE 9. USING THE 'MEASURE' TOOL. 16
FIGURE 10. USING THE 'HIGHLIGHTER' TOOL. 18
FIGURE 11. USING THE 'PEN' TOOL. 19
4. CREATE A ROUTE **20**
TABLE 1. SHELTER NAMES AND ADDRESSES FOR ROUTE FINDING EXERCISE. 20
FIGURE 12. MANAGING 'MY PLACES' 20
FIGURE 13. USING THE 'FIND ROUTE' TOOL.. 21
FIGURE 14. DISPLAYING CUSTOM DRIVING DIRECTIONS. 22
5. EXPLORE THE EMBEDDED CENSUS DATA **23**
FIGURE 15. SELECTING CENSUS GEOGRAPHIES. 23
FIGURE 16 SELECTING CENSUS GEOGRAPHIES. 24
TABLE 2. DEMOGRAPHIC AND ECONOMIC DATA AVAILABLE IN THE ACS 'BLOCK GROUP DATA' LAYER. 25
6. EXPLORE HOUSING INVENTORY COUNT (HIC) DATA **28**
FIGURE 17 QUERYING HIC DATA. 29
7. SUMMARY **30**

Introduction

HUD has developed a series of statewide Geographic Information Systems (GIS) datasets that utilize ESRI's ArcReader software to allow non-technical users to access, query and mark-up customized maps for their geographic area. The mini tutorials that follow are intended provide a basic introduction to some of the major features of ArcReader using a real HUD dataset similar to the ones that users will find in their individual state project files.

The tutorials that follow are intended to supplement the README Quickstart guide and 'HUD CoC GIS Toolkit for Communities – Overview' PDF documents that are contained in the folder 'README and Documentation' in the individual state download zip files available from the HUD HRE website. If you have not already done so, please read these documents first and follow the installation instructions to download and install the ArcReader program and open your data files to view the map.

The tutorials presented here utilize real sample data from HUD for the state of California. You will need to download the 2014 California GIS data file from the HUD HRE website to complete the tutorials. Please visit the HUD Exchange Continuum of Care GIS Tools index page to obtain the necessary data files (https://www.hudexchange.info/coc/gis-tools/).

1. Identify the HUD Geocode of an Address

Goals: In this tutorial, we learn how to:

- Use the 'Find' tool ( ) to locate a Continuum of Care.
- Use the 'Find' ( ) tool to locate an address on the map.
- Add a graphic symbol to the map.
- Save an Address to 'My Places' in the map project file.
- Use the Identify tool ( ) to determine the HUD Geocode for an address.

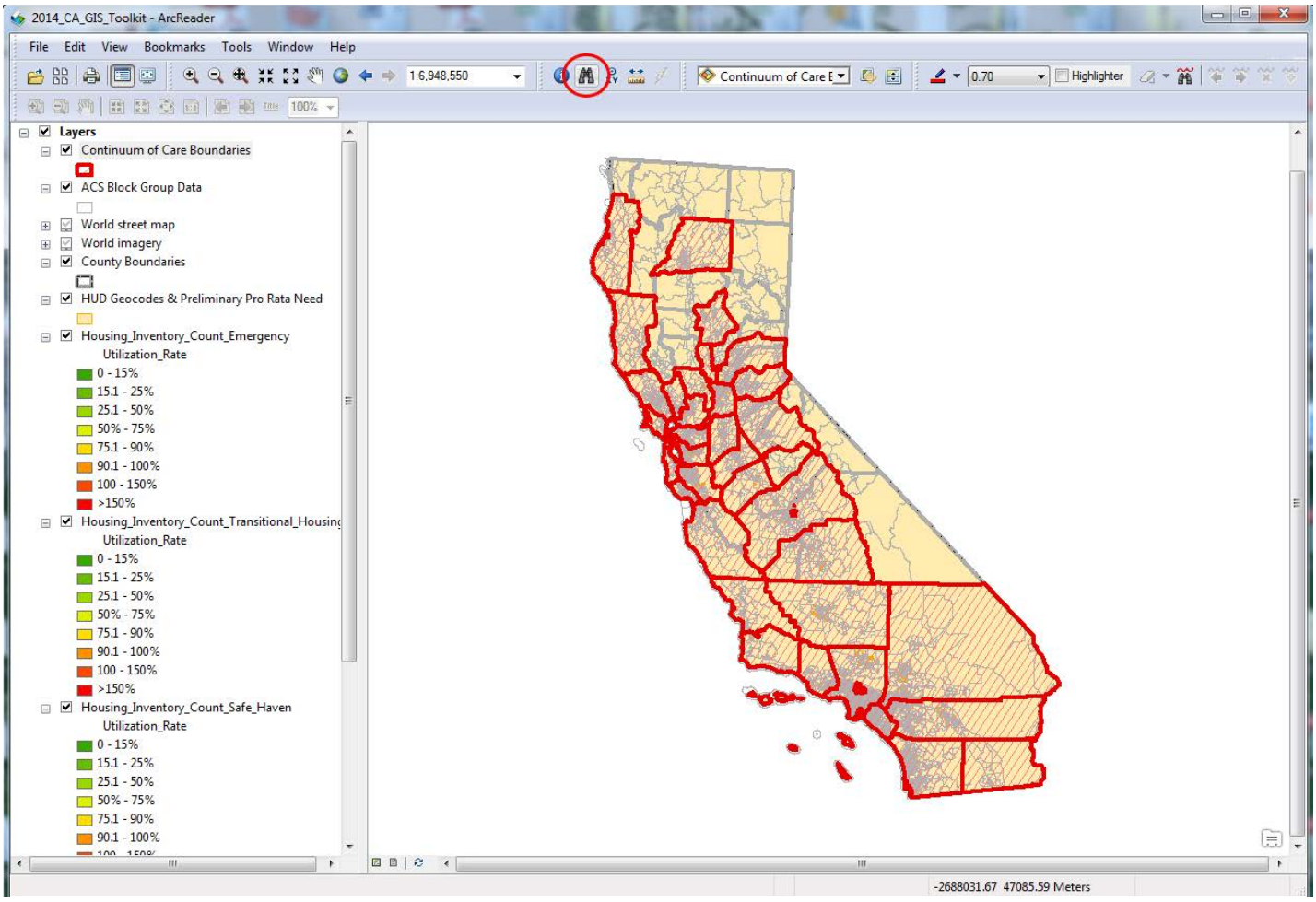

Figure 1. Locating the 'Find' Tool. After opening the GIS Tool with the California dataset the user is presented with a statewide overview. Click on the 'Find' tool ( ) on the menu bar to begin working with the map.

First we will use the 'Find' tool **(** **)** to locate a Continuum of Care.

1) Open the ArcReader Application and locate the 'Find' tool ( ) in the menu bar at the top.
2) Click the 'Find' tool **(** **)** to open the 'Find' tool dialog box.

The ‘Find’ tool dialog box is one of the most powerful ways to work with your maps. The ‘Features’ tab allows you to search any of the GIS Layers listed in the Table of Contents on the left hand side of the main application window. Each of these layers has ‘attribute’, or table, data associated with it. The ‘Locations’ tab will allow you to search for, label and save addresses to your map. Additionally, the Locations tab allows the user to search using the internet to find other points of interest that are not explicitly contained in the Table of Contents Layers, including towns, government buildings or private businesses, natural landmarks and many other features.

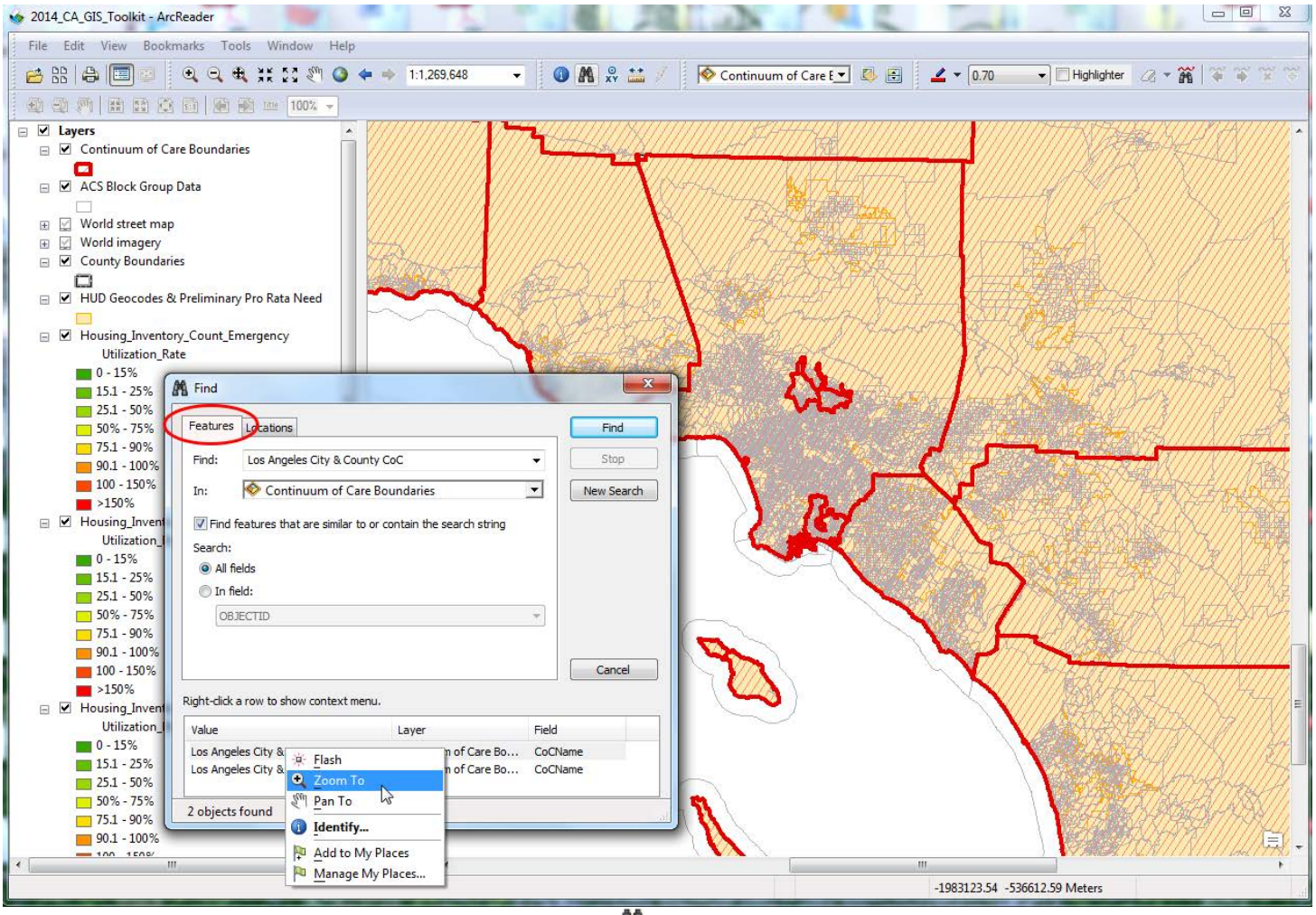

Figure 2. The ‘Find’ Tool Dialog Box. The ‘Find’ tool ( ) dialog box is opened to the ‘Features’ tab.

3) Select the ‘Features’ tab in the ‘Find’ tool dialog box. (See Figure 2)

4) Using the drop down boxes, type ‘Los Angeles City & County CoC’ in the box labeled ‘Find:’, and select ‘Continuum of Care Boundaries’ from the box labeled ‘In:’

5) Click the ‘Find’ button.

6) Look for the search results to appear at the bottom of the ‘Find’ dialog box.

7) Highlight the result and right-click to see the options available in the context menu.

8) Choose ‘Zoom to’. The map view will now zoom to an overview of the Los Angeles City & County CoC.

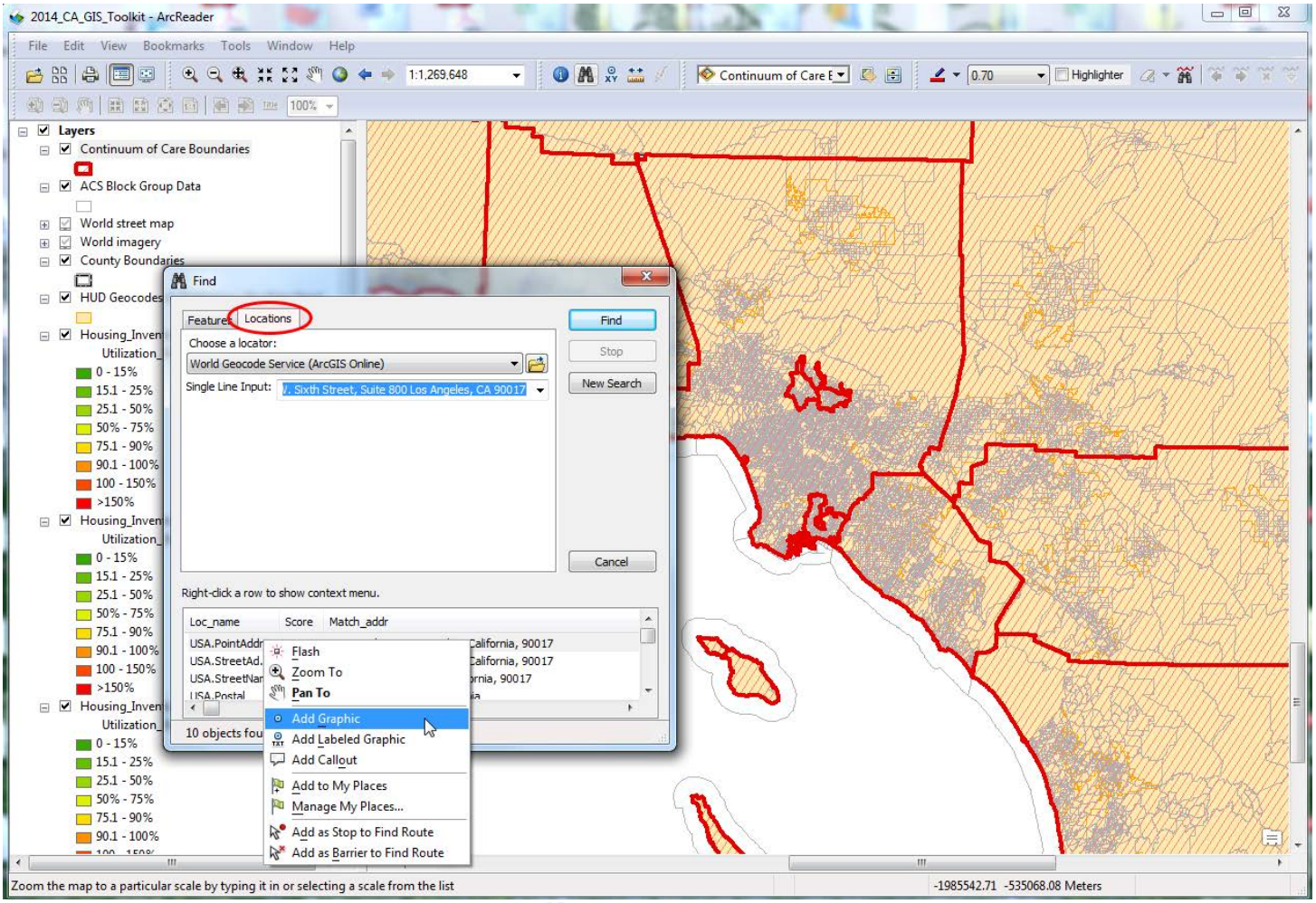

Figure 3. The 'Locations' Tab. The 'Find' tool ( ) dialog box is opened to the 'Addresses' Tab.

Next, we will use the 'Find' tool to locate an address on the map, in this case the HUD Field Office in Los Angeles.

1) Switch the active tab in the 'Find' tool to 'Locations' (see Figure 3)

2) Use the top drop down box to select the 'World Geocode Service (ArcGIS Online)' from the list of choices.

3) Enter the following address information for the HUD Field Office into the 'Single Line Input' field and click the 'Find' button:

   611 W. Sixth Street, Suite 800 Los Angeles, CA 90017

Now we will add a graphic symbol to the map.

1) Right-click on the top search result to see the options available in the context menu. This is the result most closely matched to the input address you entered.

2) Choose 'Add Graphic'. A dot is added to the map to show the location of the HUD Field Office.

3) Right-click in the top search result a second time and choose the ‘Zoom To’ option. The display will zoom in to a more detailed view of the HUD Field Office location.Now that we have added the graphic symbol, we will save the address to ‘My Places’ in the project file.

1) Right-click again on the search result and choose ‘Add to My Places’.
2) Right-click the search result once more and choose ‘Manage My Places’. The ‘My Places’ dialog box will now appear.
3) Select the address shown and double click to edit the address.
4) Change the name to ‘HUD Los Angeles Field Office’ or some other descriptive name that you will remember.
5) Close the ‘My Places’ dialog box.

The ‘Identify’ tool is another important way to extract information from your maps. You can think of the ‘Identify’ tool as a different way to access the same data that the ‘Find’ tool does when you search the Table of Contents Layers using the ‘Find’ tool’s ‘Features’ Tab. The difference is that the Identify tool allows you to interact with the map directly by clicking on it to see the table data for a particular location. Use the drop down box in the ‘Identify’ tool dialog box labeled ‘Identify From:’ to select the Table of Contents Layer that you want to see table information from, then click the map to identify any feature. The find tool will momentarily ‘flash’ the feature you have identified and will display the table information for that feature in the ‘Identify’ dialog box. In some cases, the table data may contain ‘drill down’ menus organized with ‘+’ and ‘-‘ signs that allow you to access more or less detailed table data.

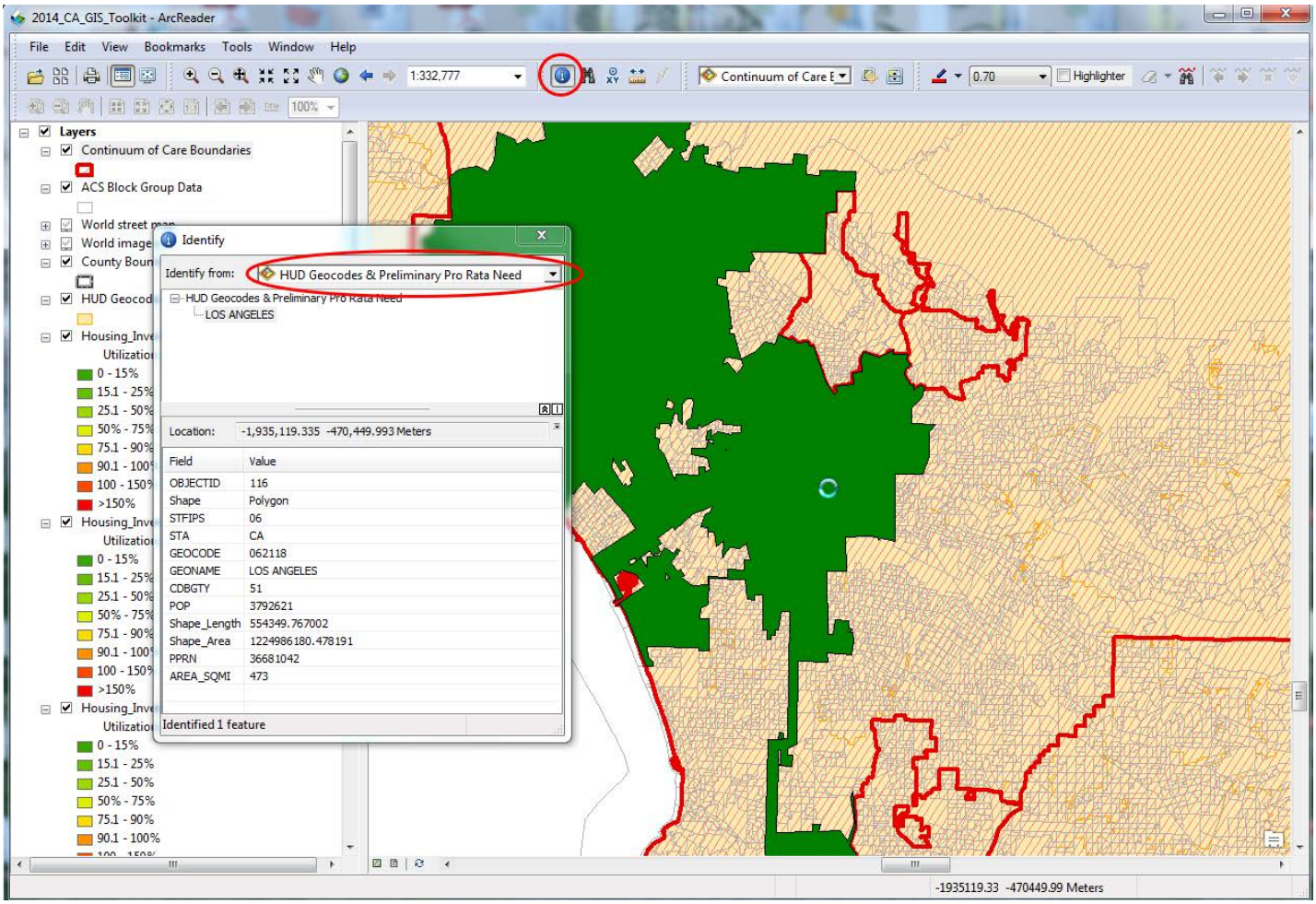

Figure 4. The ‘Identify’ Tool Dialog Box. The Table of Contents Layer ‘HUD Geocodes & Preliminary Pro Rata Need’ is selected for identification.

Finally, we will use the ‘Identify’ tool to determine the HUD Geocode for an address.

1) Locate the ‘Identify’ tool ( ) in the menu bar at the top.

2) Click the ‘Identify’ tool ( ). The cursor icon will now have a small ‘Identify’ tool symbol next to it when you move your mouse cursor over the map.

3) If a dialog box for the ‘Identify’ tool does not immediately appear, click anywhere on the map to bring up the ‘Identify’ tool dialog box (see Figure 4).

4) Choose the option for ‘HUD Geocodes & Initial Pro Rata Need’ from the ‘Identify from:’ drop down box at the top of the ‘Identify’ dialog box.

5) Click on the dot on the map that represents the location of the Los Angeles HUD Field Office.

6) The ‘Identify’ tool will now momentarily ‘flash’ the HUD Geocode of that location on the map in green and the ‘Identify’ dialog box will now show the corresponding table values for that HUD Geocode.

7) Review the dialog box information. You should be able to identify the following information:

    - the Geoname for that HUD Geocode is ‘Los Angeles’
    - the Preliminary Pro Rata Need (PPRN) was $36,681,042
    - the HUD Geocode (Key) is 062118

Refer to the ‘HUD CoC GIS Toolkit for Communities – Overview’ PDF documentation that is included in the GIS data download for a complete explanation of each of the data fields listed in the ‘Identify’ tool dialog box. You can close the ‘Identify’ dialog box when you are ready to move on to lesson two.

2. Navigate the Map

Goals: In this tutorial, we learn how to:

- Access the street map and digital imagery layers
- Use the Scale, Zoom ( ), Pan ( ) and Extent (,) tools to explore the map
- Turn GIS layers in the Table of Contents on and off

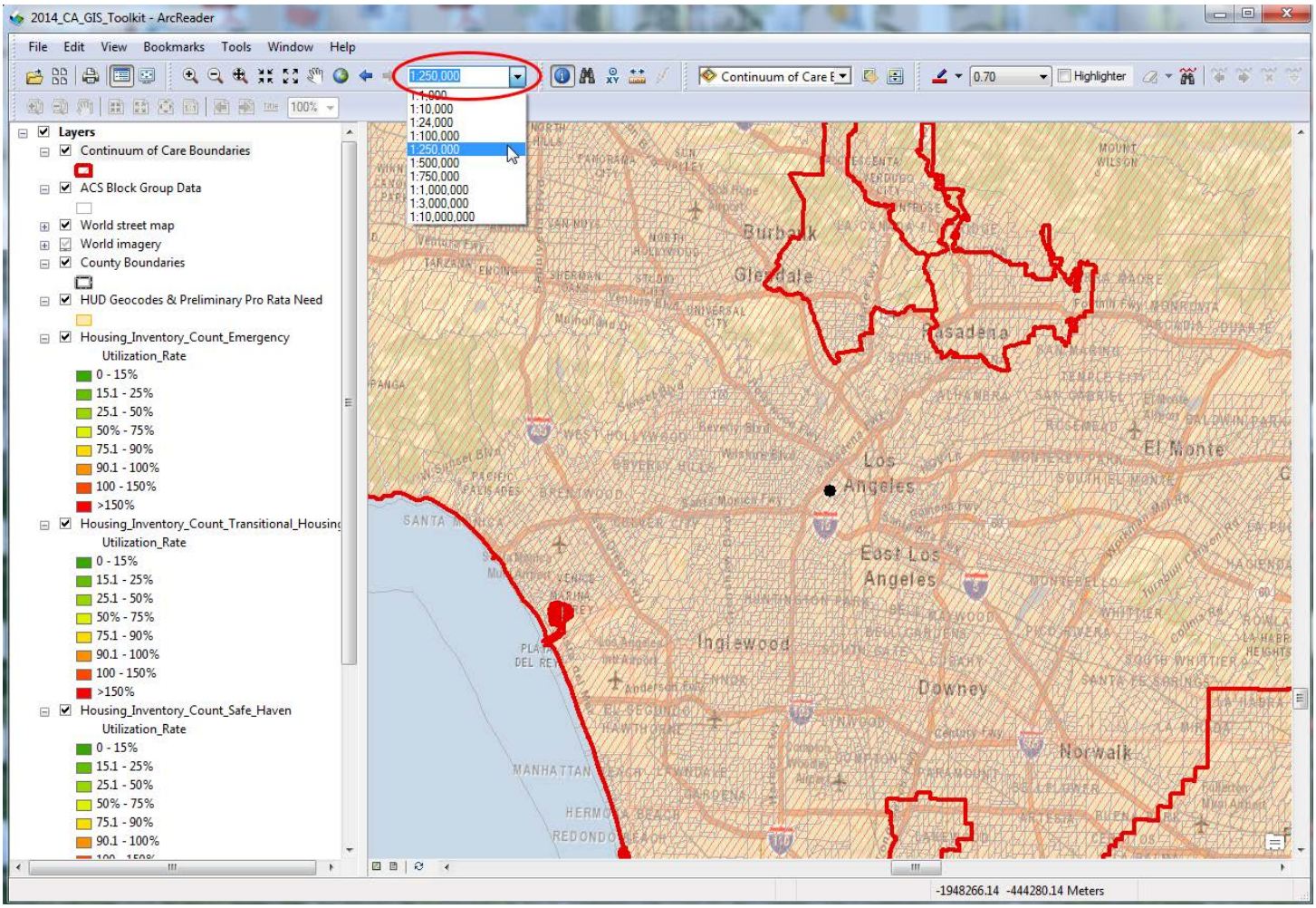

Figure 5. Controlling the Map Scale. Changing the map scale to access the World Street Map layer in the Table of Contents.

Two of the data layers labeled in the Table of Contents on the left-hand side of the application are only visible when zoomed in beyond a certain amount. These layers, labeled 'World Street Map' and 'World Imagery', are only accessible when your computer is connected to the internet and are only visible when zoomed beyond scales of 1:250,000 and 1:50,000, respectively. The detail level of these layers will continue to increase as you zoom farther in on the map.

First, let's access the Street Map data by zooming the map to a scale of 1:250,000.

1) Locate the drop down box that contains the map scale information in the menu bar at top.

2) Choose '1:250,000' (see Figure 5).

3) The map will now redraw and you will see that a road map is now being displayed along with the other data on the map. You can also select a 'custom' zoom level by selecting the 'Zoom' tool ( ) from the menu bar at the top of the screen.

Next, you will use the 'Pan' tool ( ), which will move the map around without changing the map scale or zoom level. To use the 'Pan' tool ( ):

1) Find the 'Pan' tool ( ) in the menu bar at the top of the screen (see Figure 6).

2) Select the Pan tool ( ). You should now notice that the cursor has changed to look like the white glove when you hover over the map with your mouse.

3) Hold down your mouse button to 'grab' the map and drag the mouse across the screen. The pan tool moves the map in whichever direction you drag, without changing the map scale, or zoom level.

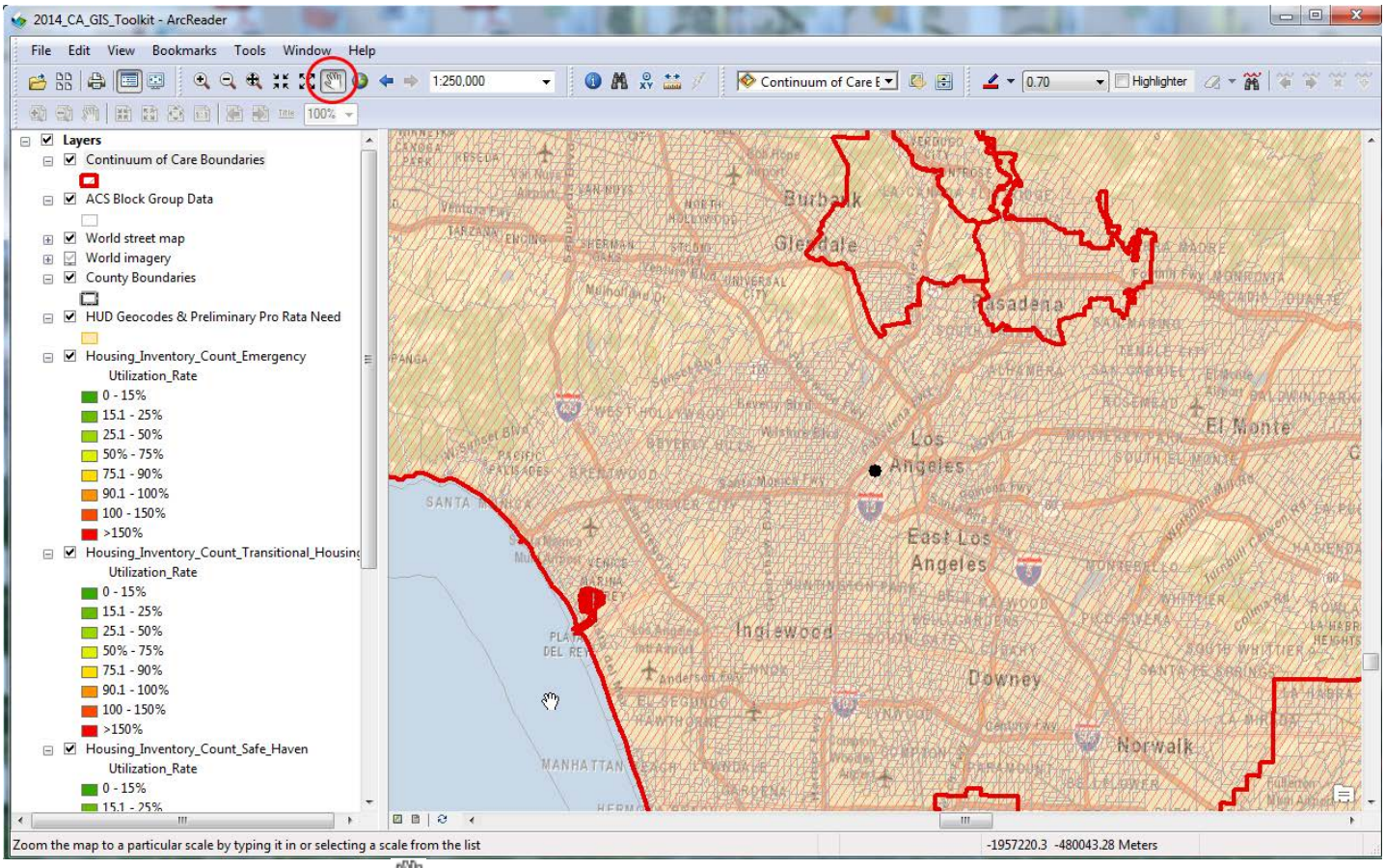

Figure 6. Using the 'Pan' Tool ( ). As you move the map toward the right with the 'Pan' tool, notice that the dot representing the HUD Field Office shifts right relative to Figure 6.

Sometimes you will find that you have changed the map zoom inadvertently or panned to a location that you did not want to go to and will need to return the map display to how it previously looked. The 'Extent' tools (,), which can be found in the menu bar at the top of the screen, will reset the map to its previous zoom level and/or pan position. Note that either of the 'Extent' tool arrows may be grayed out if there is no previous or next extent to return the view to.

To use the ‘Extent’ tools:

1) Click on the left-handed ‘Extent’ tool (, previous extent) to move the map back to the position it was in prior to using the ‘Pan’ tool.

2) The map should now once again look like the image in Figure 5.

Take a few moments to experiment with the different zoom and pan tools on the menu bar. These are all located between the first zoom tool ( ) and the drop down box where you previously specified the map scale (see Figure 5).

Once you have explored the ‘Pan’ and ‘Zoom’ tools, reset the map so that the dot representing the Los Angeles HUD Field Office is once again at the center of the map, and reset the map scale to 1:250,000, by following these steps:

1. Open the ‘My Places’ Dialog box by selecting the ‘Tools’ drop-down from the menu bar at the top of the screen and selecting ‘My Places’.

2. Highlight the ‘Los Angeles HUD Field Office’ in the list of places by clicking on the bullet point next to the name, under column ‘Type’.

3. Click on the ‘Zoom To’ Button on the right of the dialog box.

4. Close the ‘My Places’ dialog box.

5. Choose ‘1:250,000’ from the drop down box that contains the map scale information in the menu bar at top.

Next let’s take a look at a layer of overhead photography called ‘World Imagery’ that can be useful for identifying recognizable places. To access the Imagery data, you will need to zoom the map to a scale of at most 1:50,000.

1) Locate the drop down box that contains the map scale information in the menu bar at top (see Figure 5).

2) Choose ‘1:24,000’.

3) Review the redrawn map, and you will see that an aerial view is now being displayed along with the other data on the map.

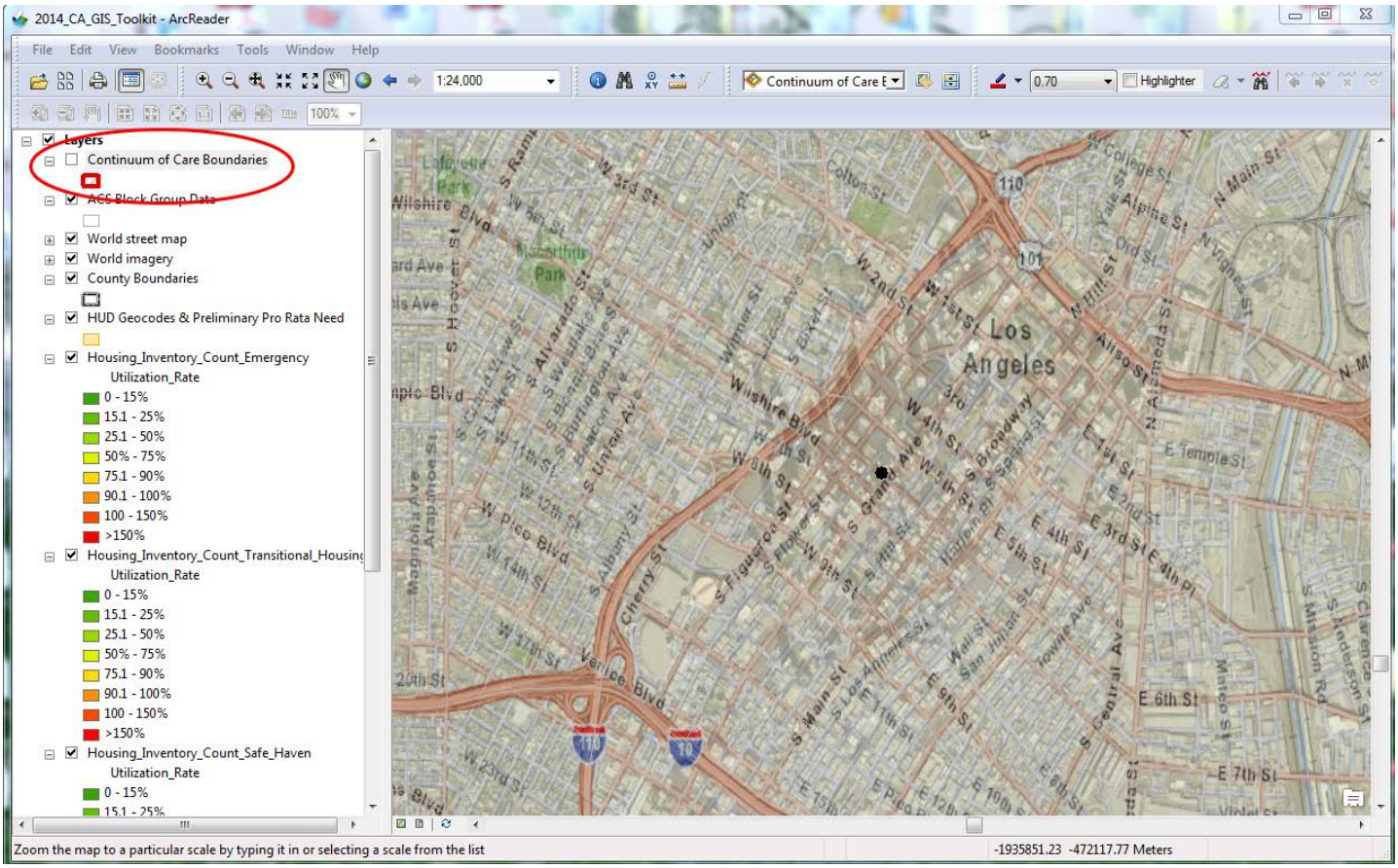

Figure 7. Turning Off Layers. The view is displaying the Los Angeles HUD Field Office location at a scale of 1:24,000 with the 'Continuum of Care Boundaries' layer in the Table of Contents turned off.

At this point, you may notice that the map looks cluttered. Now that we have zoomed to well within the boundary of the Los Angeles City & County CoC, we no longer need to display this layer. Turn off the CoC Boundary layer to get a better look at the World Imagery layer:

4) Click the check box next to the Table of Contents layer '2010 Continuum of Care Boundaries' to remove the check mark. The layer should disappear from the map (see Figure 7).

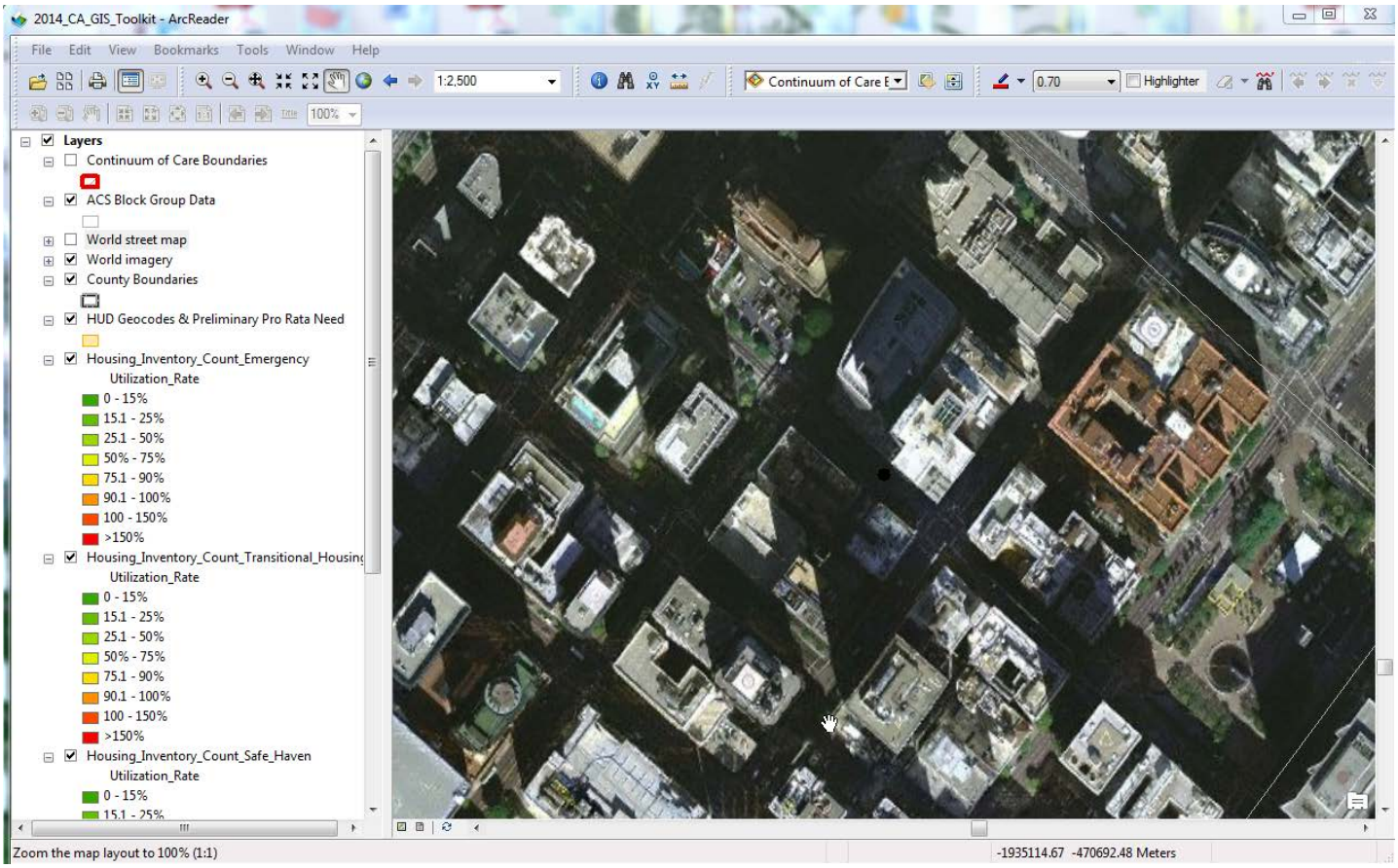

Figure 8. Accessing the 'World Imagery' Layer. An aerial view of the Los Angeles HUD Field Office at a scale of 1:2,500 with the 'World Street Map' layer in the Table of Contents turned off.

For US cities, the detail of the aerial view can be quite good. This can often be a useful tool for positively identifying locations on the street. To view this level of detail:

1) Type a scale value of 1:2500 into the menu bar's map scale drop down box.

2) Click off the 'World Street Map' layer in the Table of Contents (see Figure 8). Your map display should look like Figure 8.

It is important to remember that you can still use the 'Identify' ( ) and 'Find' ( ) tools on any layer in the Table of Contents, regardless of whether or not the layers are turned off or not visible on the map.

3. Utilize the Map Mark-Up Tools

Goals: In this tutorial, we learn how to:

- Use the 'Measure' tool ( ) to determine areas and distances on the map.
- Use the 'Highlighter' ( ) and 'Pen' tools to mark-up the map.
- Use the 'Eraser' tool ( ) to correct errors made with the other mark-up tools.

If it is not already, re-center your map on the Los Angeles HUD Field Office and zoom to a scale of 1:30,000 by entering '30,000' in the drop down box that contains the map scale information in the menu bar at the top of your screen (see Figure 5). Re-enable the World Street Map data layer.

Suppose we want to survey a one square mile area of downtown Los Angeles around the Los Angeles HUD Field Office. First, we need to determine what street boundaries to use that will give us approximately one square mile of downtown for our survey.

To accomplish this task, find the 'Measure' tool ( ) in the menu bar at the top of the screen and click it to open the 'Measure' tool dialog box. The 'Measure' tool icon looks like a ruler with a set of arrows above it.

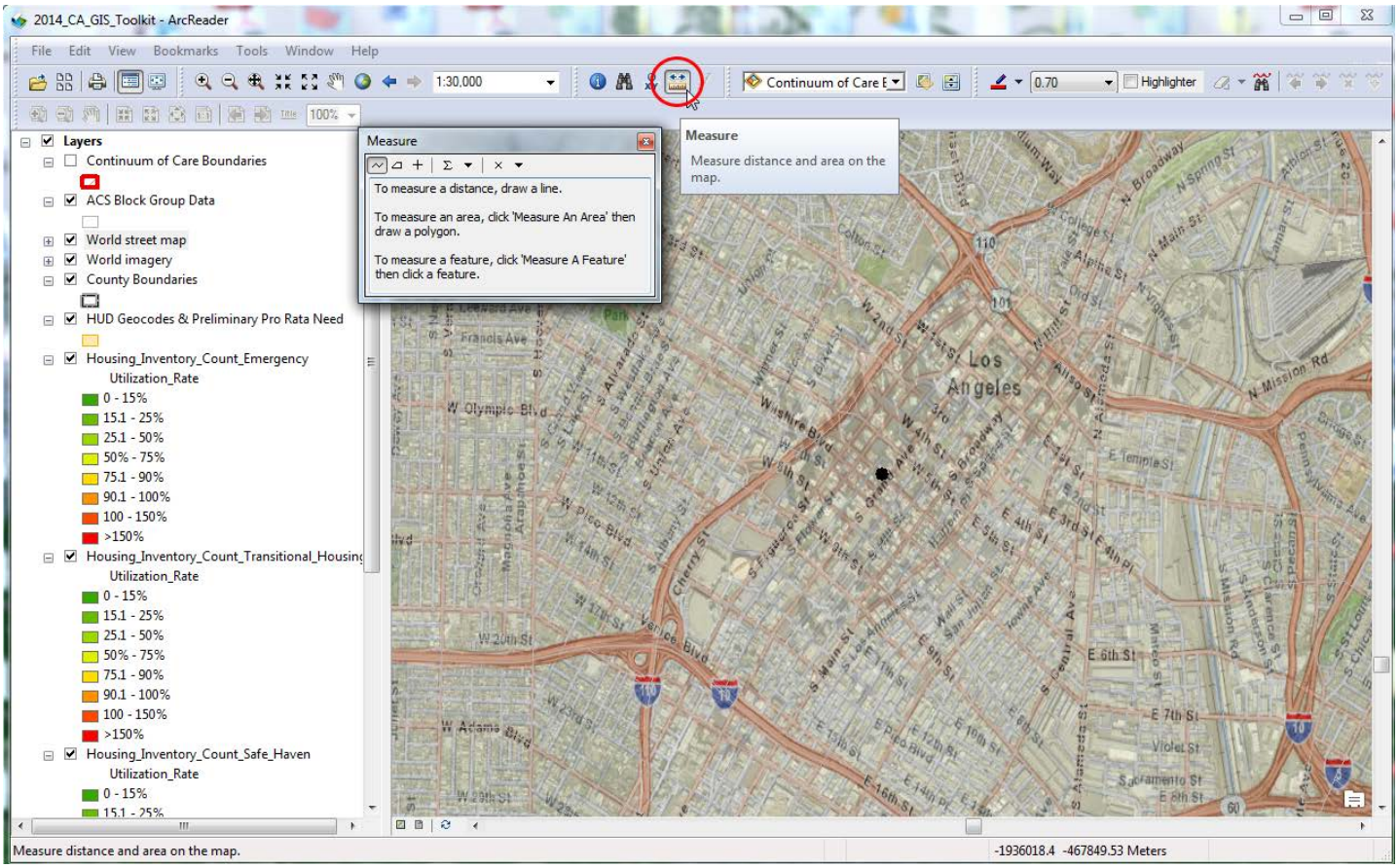

Figure 9. Using the 'Measure' Tool. The 'Measure' tool can help us to find a street network that encompasses one square mile around the Los Angeles HUD Field Office.

Before we use the Measure tool, we need to determine how to display the distance and area measurements. To set these measurements:

1) Find the 'Units' drop down menu in the 'Measure' Tool dialog box (it is a small black down pointing arrow to the right of the greek 'sum' symbol '∑')

2) Click the arrow to open the menu and set the distance and area units to 'miles'.

Next, we will trace the outline of the area to be surveyed. For our example, we will use the one square mile area bounded by Highway 101 to the north, Highway 110 to the west, W. Olympic Blvd. to the south and S. Spring St. to the east.

1) Select the 'Polygon' icon from the 'Measure' tool dialog box. The 'Polygon' icon is the second from the right in the 'Measure' tool dialog box, and looks like a white trapezoid.

2) Begin tracing the outline of the streets around the Los Angeles HUD Field Office to determine the area you want to survey. The 'Measure' tool will keep a running tally of the length, in miles, of each segment of the shape you draw, as well as the total area of the shape you have drawn.

3) Single click your mouse at an intersection to start a new line segment and double click you mouse to end the measure process.

4) Close the 'Measure' tool dialog box when you are done.

Finally, we will mark up the map using the 'Highlighter' tool.

1) Find the 'Highlighter' tool ( ) on the menu bar at the top of the screen.

2) Click the tool and set the thickness of the highlighter line (using the drop down box next to the 'Highlighter' icon) to 8.

3) Verify that the check box to the right of the 'Highlighter' tool ( ) icon and drop down menu is checked (see Figure 10).

4) Highlight the street area to create a transparent shaded area that represents the survey boundary (see Figure 10).

5) Correct any mistakes you may make with the 'Eraser' tool ( ), which is located to the right of the highlighter tool on the menu bar at the top of your screen. Clicking on the 'Eraser' tool ( ) will provide you with a drop down where you can choose the thickness and type of eraser that you would like to use.

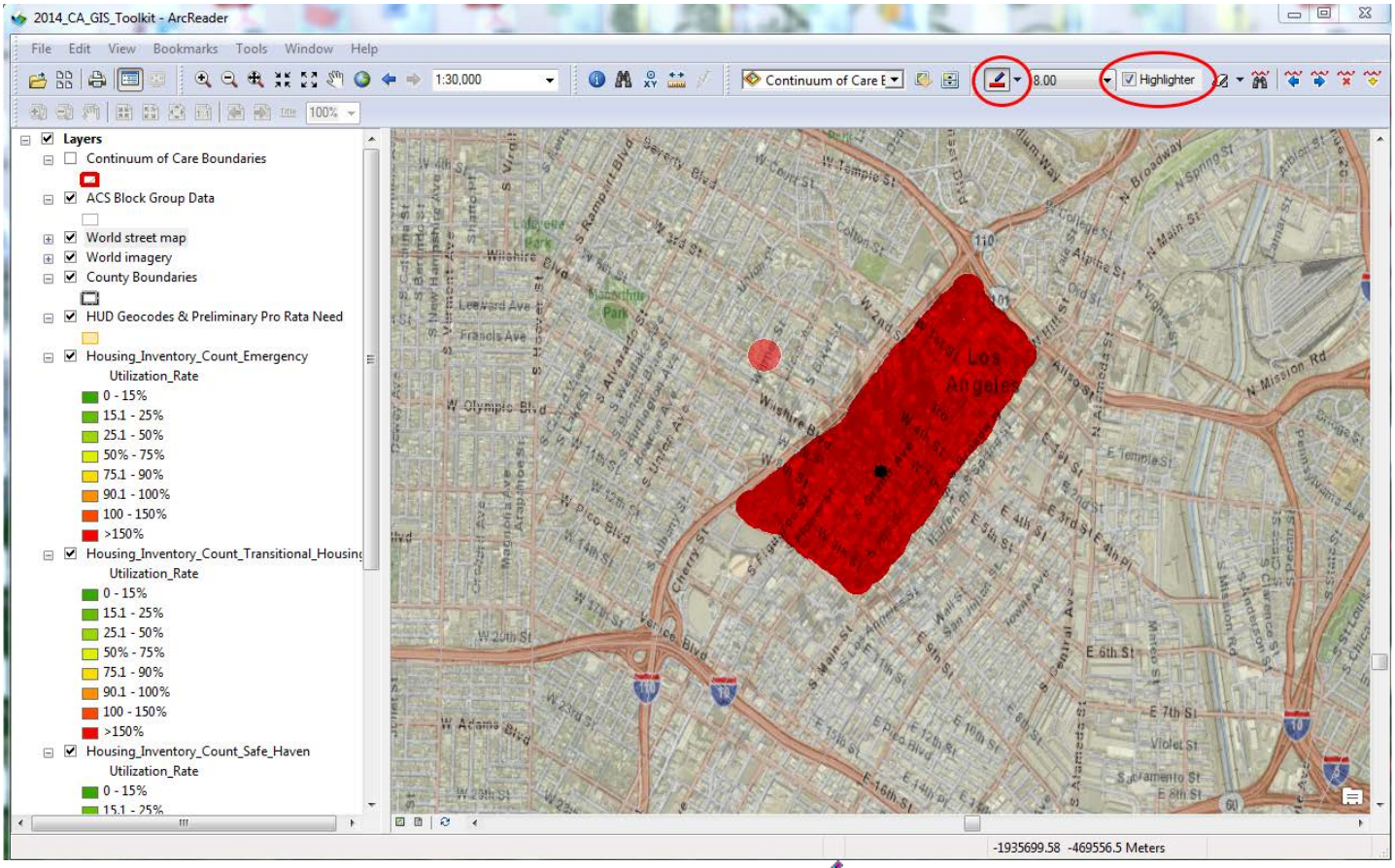

Figure 10. Using the 'Highlighter' Tool. Use the 'highlighter' tool ( ) to highlight a one square mile street network around the Los Angeles HUD Field Office.

Now we will divide the highlighted area into four quadrants of approximately equal area. To do this, we need to find the length dimensions of our survey area with the measure tool.

1) Open the 'Measure' tool dialog box again and select the 'Line Measure' icon (the 'Line Measure' icon is the first icon on the left in the 'Measure' tool dialog box).

2) Use the 'Line Measure' tool to determine the width (0.74 miles) and length (1.4 miles) of the survey area on the map.

3) From these measurements, we can determine that dividing the study area along N. Grand Ave. from north to south and along (approximately) W. 6th St. from east to west will result in four approximately equal 1/4 square mile portions of our survey area.

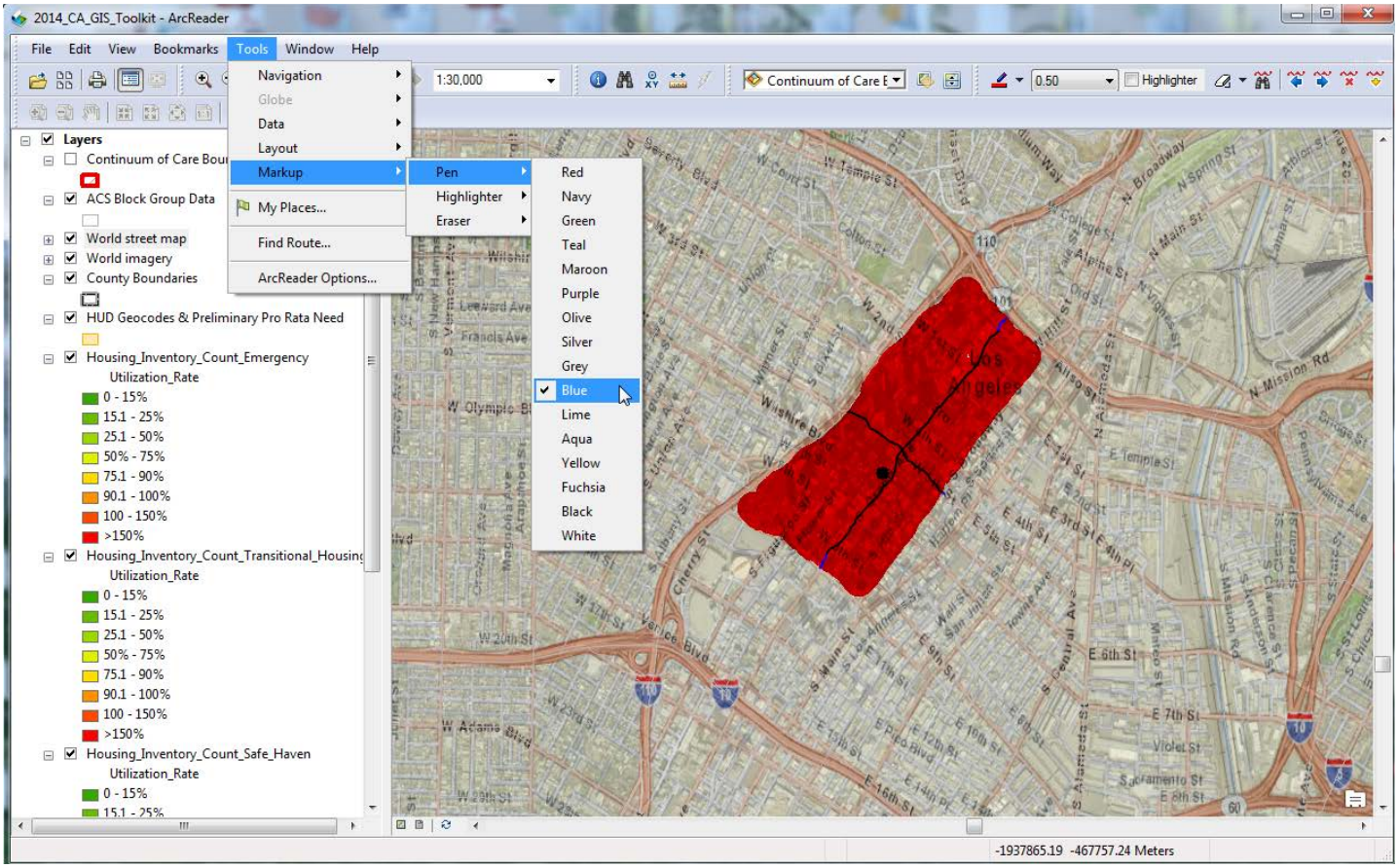

Figure 11. Using the 'Pen' Tool. Create divisions in the survey area of ¼ square mile quadrants with the 'Pen' tool.

Finally, let's use the 'Pen' tool to draw a line down N. Grand Ave. and W. 5th St. to illustrate the four quadrants of the study area.

1) Find the 'Pen' tool by choosing the 'Tools' drop down menu from the menu bar at the top of the screen, then choosing the 'Markup' sub-menu item and finally 'Pen'.

2) Choose the color 'Blue' for the 'Pen' tool and out line the quadrant divisions of the study area on the map.

3) Adjust the line thickness of the pen tool to 0.50 using the drop-down menu next to the 'Highlighter' icon

4) Don't forge that you can correct any mistakes you may make by using the 'Eraser' tool ( ) located to the right of the highlighter tool on the menu bar at the top of your screen.

4. Create a Route

Goals: In this tutorial, we learn how to:

- Employ skills used in lesson one by adding shelter locations using the 'Find' and 'My Places' tools.
- Create a route with driving directions between multiple addresses stored in 'My Places'.
- Create a printable set of driving directions with an overview map.

First, re-center your map on the Los Angeles HUD Field Office and zoom to a scale of 1:60,000 by entering '60,000' in the drop down box that contains the map scale information in the menu bar at the top of your screen (see Figure 5).

Next, open up the 'Find' tool ( ) dialog box and use the 'Locations' tab to map the locations of the Emergency Shelters listed in Table 1 (see Lesson 1).

Table 1. Shelter Names and Addresses for Route Finding Exercise.

Shelter Name	Shelter Type	Shelter Address
La Posada	Emergency	1320 Pleasant Ave., Los Angeles, CA 90033
Faithful Services Outreach	Emergency	1412 W. 37th Dr., Los Angeles, CA 90018

Now open the 'My Places' dialog box and rename the addresses that you just added, using the name and shelter type information from Table 1 (see Figure 12).

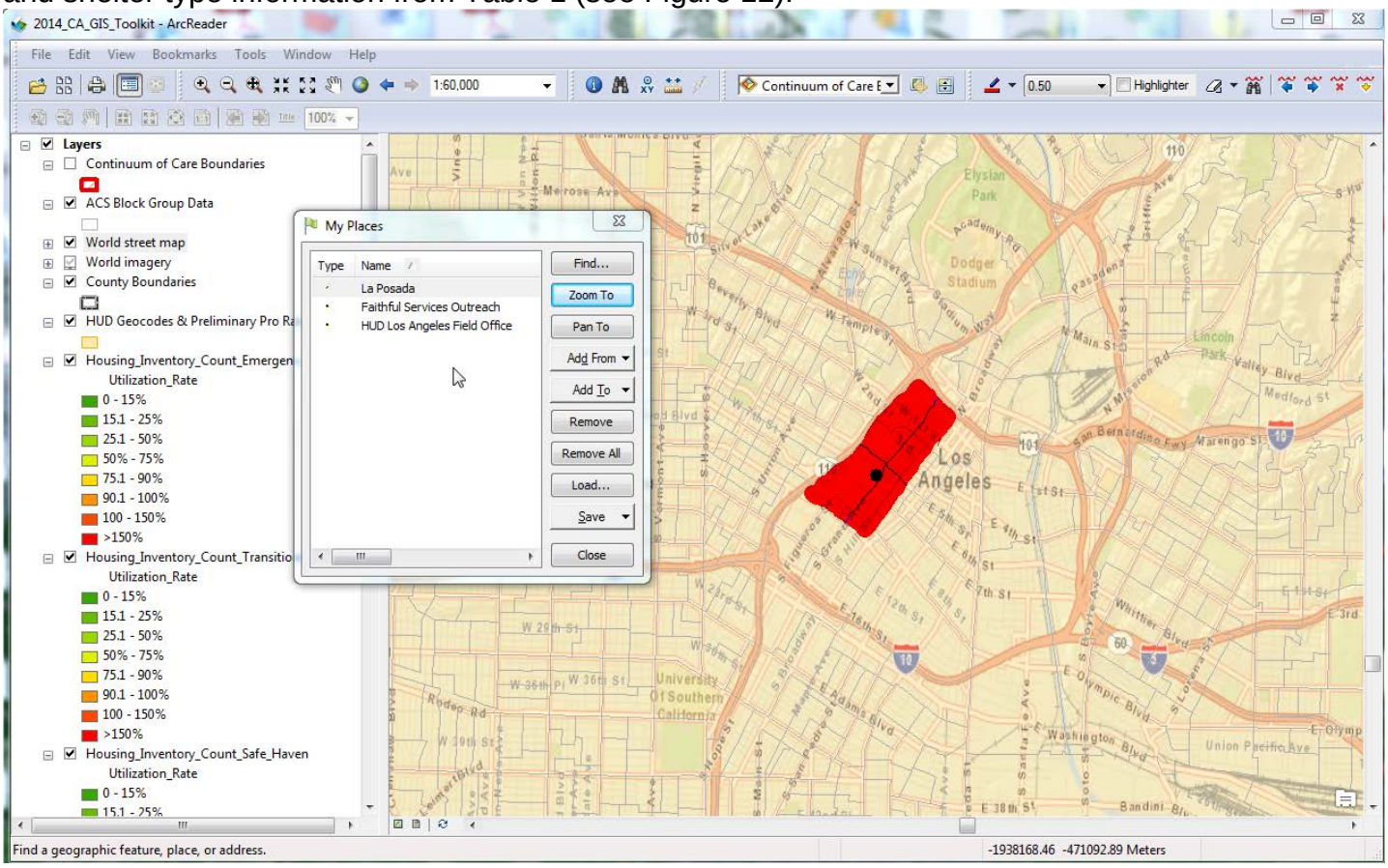

Figure 12. Managing 'My Places'. Add additional addresses and names to the 'My Places' dialog box.

In the next few steps we will use the 'Find Route' tool to make a set of round trip driving directions that start at the Los Angeles HUD Field Office and visit the La Posada and Faithful Services Outreach shelters, in that order, and then return to the Field Office.

To do this, we need to first access the 'Find Route' dialog box.

1) Open the 'Find Route' dialog box by selecting the 'Tools' drop-down from the menu bar at the top of the screen

2) Select 'Find Route'

Now we will add the places that we want our route to visit, in the order that we want to visit them.

1) Locate the 'My Places' button in the 'Find Route' dialog box and click it. The familiar 'My Places' dialog box is displayed.

2) Add a graphic for each of the new addresses so that we can see them on the map (right click each address and choose 'Add Graphic').

3) To highlight each of the places that we want to add to the route, right-click each place and choose 'Add to Route As Stop' from the pop-up context menu. The address is added to the 'Find Route' dialog box (see Figure 13).

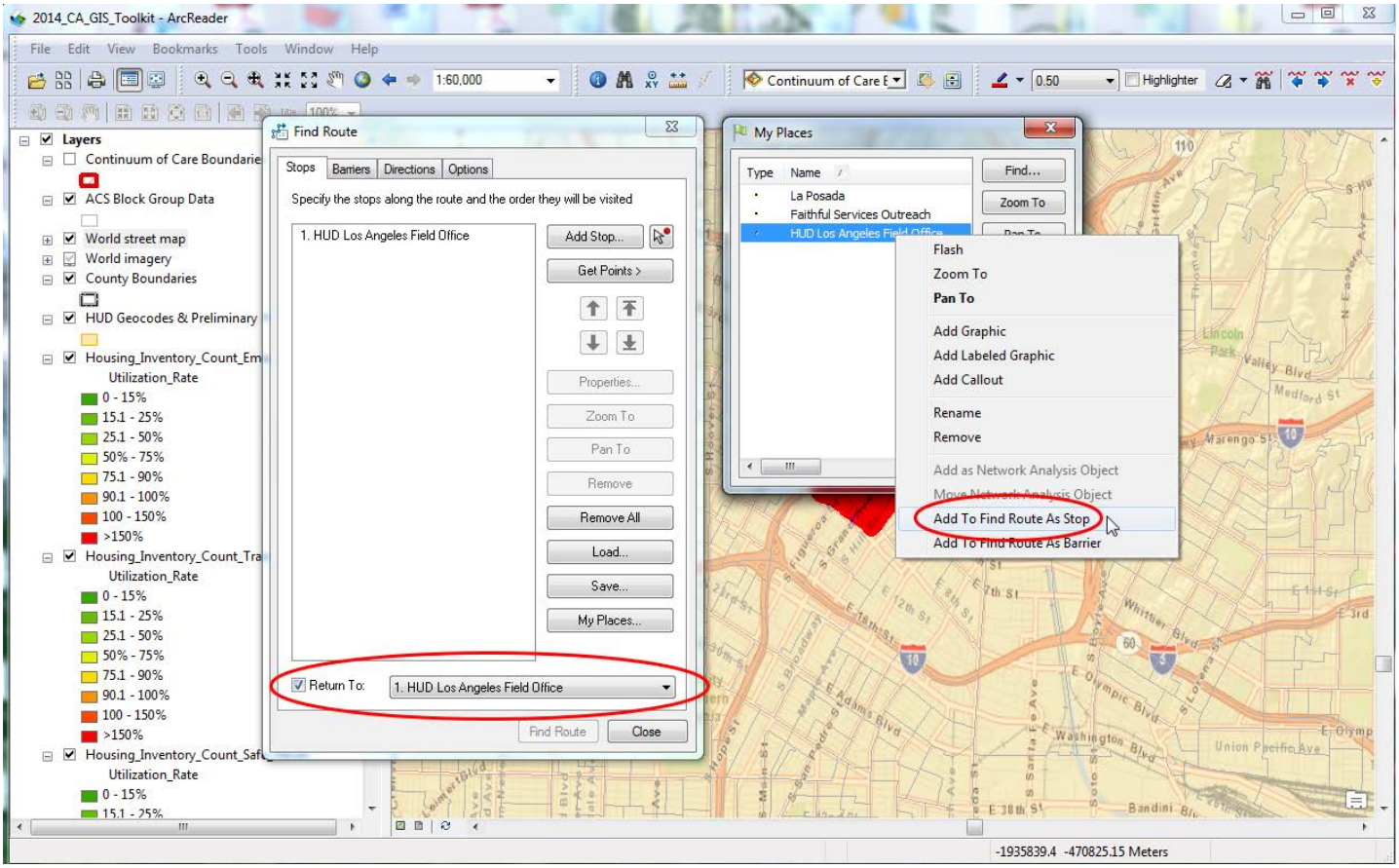

Figure 13. Using the 'Find Route' Tool. Add locations from the 'My Places' Dialog box to the 'Find Route' tool to create driving directions on the map.

4) Click the 'Return To' check box at the bottom of the 'Find Route' dialog box and make sure that 'Los Angeles HUD Field Office' is listed in the drop down box.

5) Click the 'Find Route' button and ArcReader will create the route you have specified and draw it on the map.

6) Click the 'View Directions' Tab in the 'Find Route' dialog box to see a list of turn-by-turn directions for the route you have specified (see Figure 14).

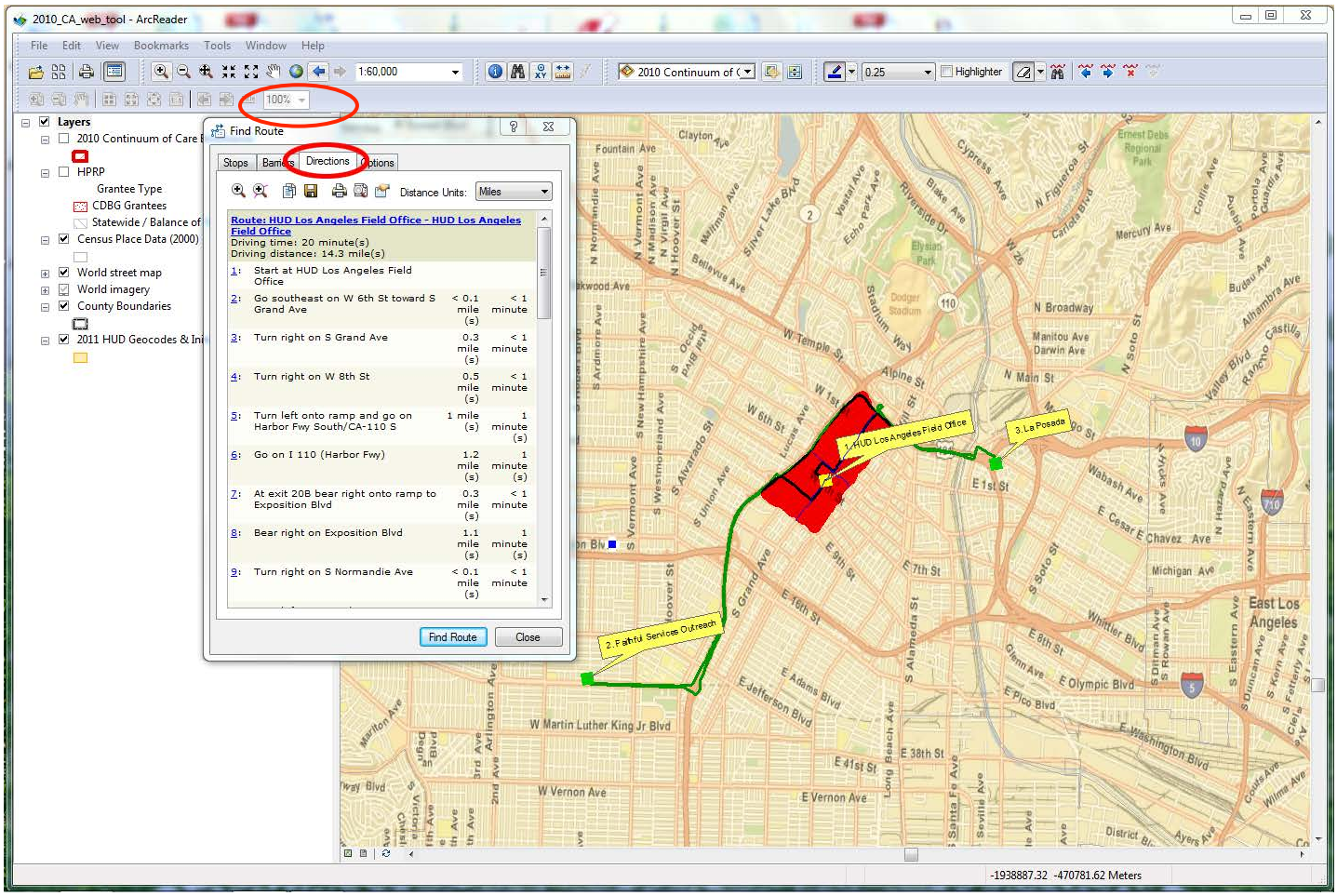

Figure 14. Displaying Custom Driving Directions. The 'Find Route' dialog box allows you to create custom driving directions between any of the locations stored in 'My Places'.

Now click the button that looks like a printer icon to open a print dialog page that enables printing easy to read driving directions and an overview map.

5. Explore the Embedded Census Data

Goals: In this tutorial, we learn how to:

- Explore and interpret the included American Community Survey (ACS) data for areas of interest.

A variety of valuable ACS data is included in each project file. A summary of the available ACS tables appears below in Table 2, and a comprehensive list of the ACS tables and each of the table variables included in this data layer is available in the ACS Metadata file included in the GIS Toolkit download (ACSMetadata2013.xls).

The data is contained in the Table of Contents layer 'ACS Block Group Data'. You can access this data using the 'Identify' tool in the same way as it was used in the earlier tutorials. First, re-center your map on the Los Angeles HUD Field Office and check that you have zoomed the display to a scale of 1:60,000.

Next, turn off the 'Continuum of Care Boundaries' and 'World Street Map' layers by un-checking the boxes next to these layer's names in the Table of Contents. You should now have an unobstructed view of the Census geographies available for query on the map.

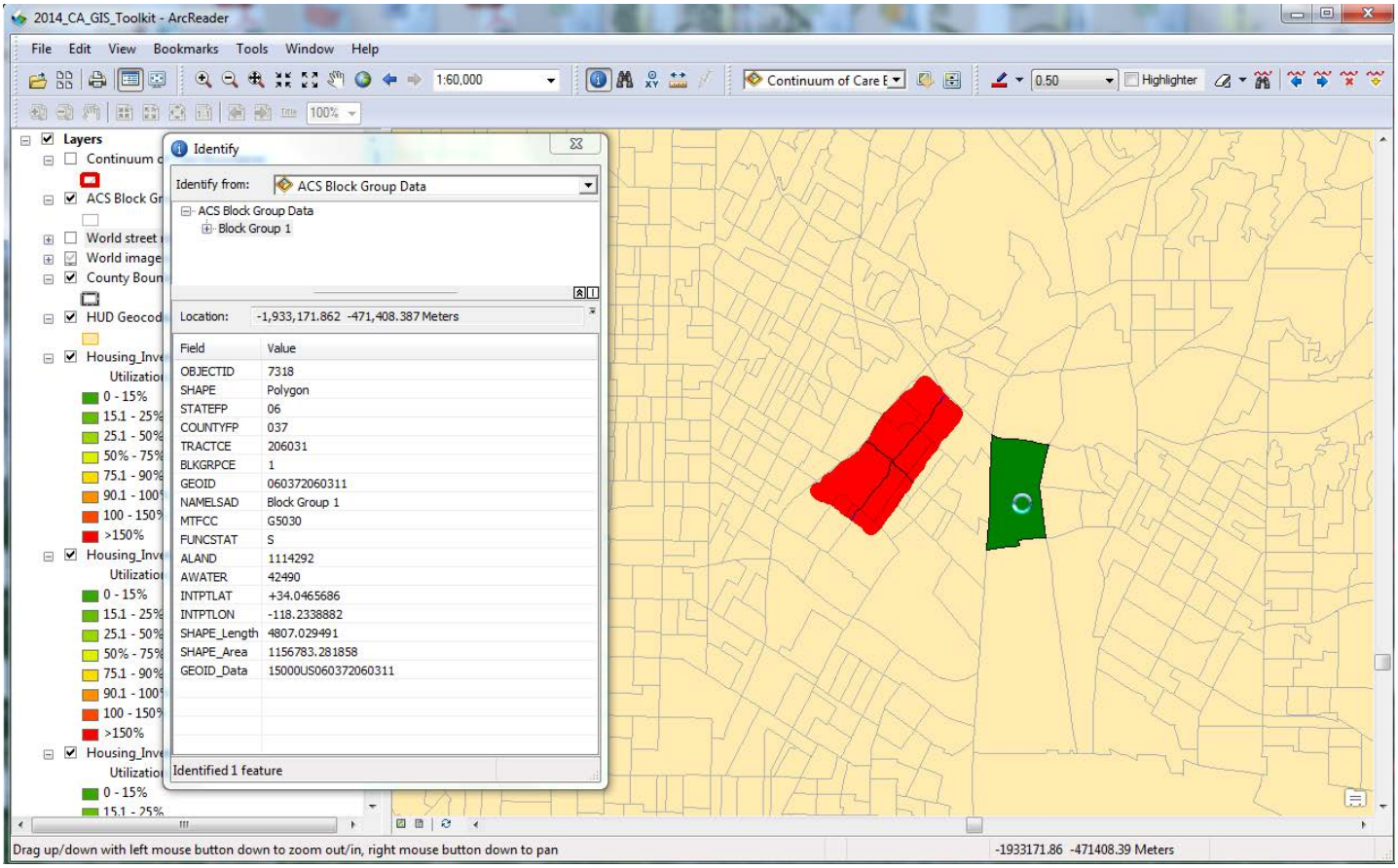

Figure 15. Selecting census geographies. The 'ACS Block Group Data' layer contains block-group level census geography.

Block groups are clusters of blocks within the same census *tract*. A block group usually covers a contiguous area. Each census tract contains at least one block group and block groups are uniquely numbered within a census tract. Within the standard census geographic hierarchy, block groups never cross county or census tract boundaries, but may cross the boundaries of county subdivisions, places, urban areas, voting districts, congressional districts, and American Indian, Alaska Native, and Native Hawaiian areas.

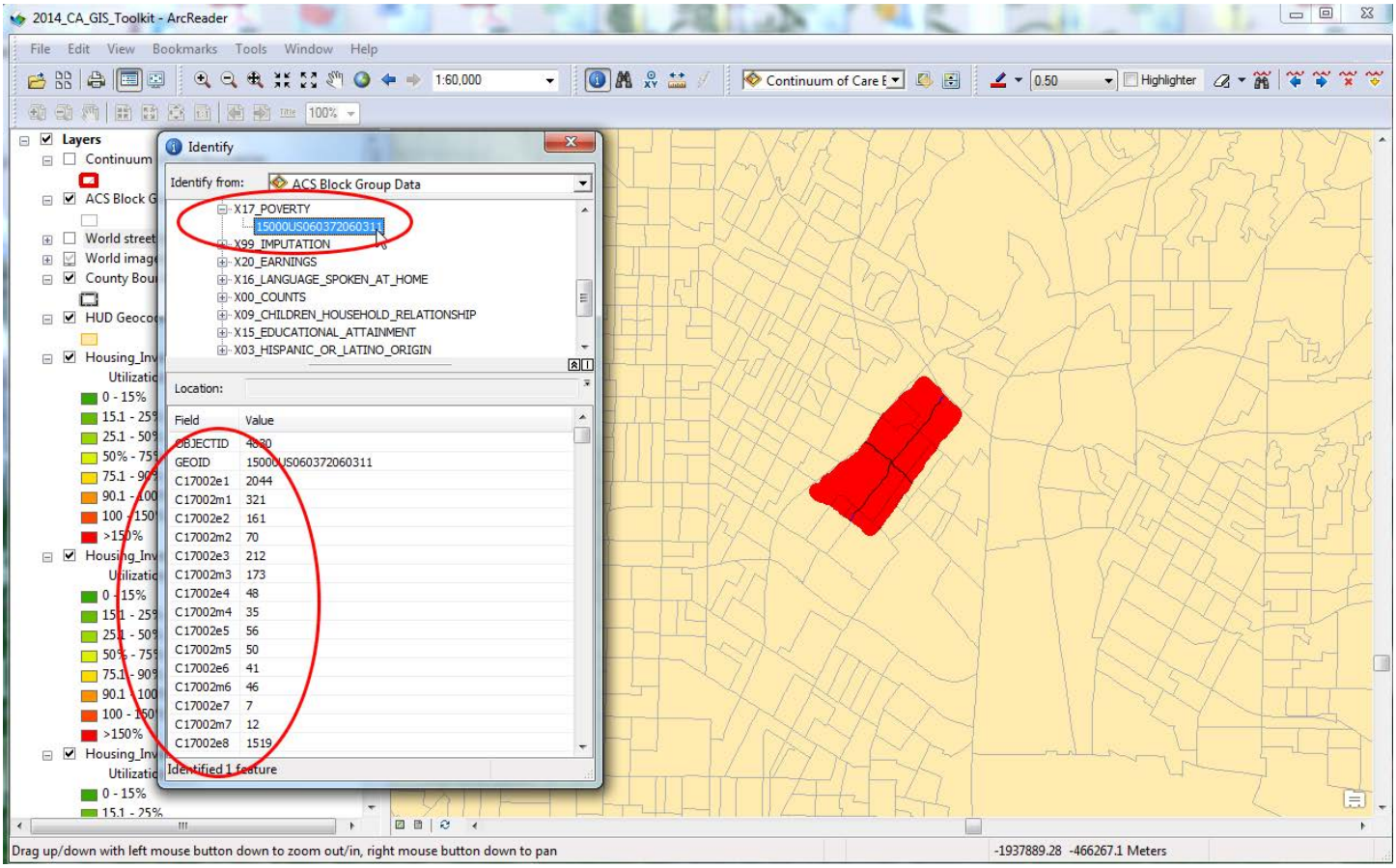

Figure 16 Selecting census geographies. The table 'X17_Poverty' in the 'ACS Block Group Data' layer contains detailed poverty statistics for the area selected.

To explore the ACS data for an area of interest:

1) Use the 'Identify' tool to click on the large block group geography directly to the east of the survey area created earlier in Lesson 4 (Figure 12 & Figure 15). Examine the available information in the dialog box. Make certain that the 'Identify From' drop down menu is showing 'ACS Block Group Data' in the Identify dialog box. The 'Identify Tool' will momentarily flash the area green and the dialog box GEOID field will contain the unique ID value for the block group identified (see Figure 15).

2) Click the '+' sign next to the label 'Block Group 1' in the upper portion of the 'Identify' dialog box. You should see a list of items with '+' signs next to them. These items correspond to the ACS tables for the topics listed.

3) Expanding a sub-menu will show the matching GEOID for the item selected. Click on the plus sign next to the GEOID (in the Figure 16 example, the 'Poverty' table is selected) to bring up all of the table data for that subject area in the lower portion of the dialog box (see Figure 16).

4) Interpret the columnar data by referencing the field codes shown in Figure 16 against the field names in the included 'ACSMetadata2013.xls' file. The data fields with an 'e' in the code always corresponds to the estimate and the data fields with an 'm' always corresponds to the margin of error. Each estimate will always be accompanied by a margin or error.

A wide-variety of demographic and economic data from the ACS are included in the 'ACS Block Group Data' layer. Table 2, below, lists each of the tables for your reference. To gain a detailed understanding of each of the included tables as well as their usage and data caveats, refer to The 2009-13 ACS 5-year Summary File Technical Documentation, available from the US Census Bureau website at http://www2.census.gov/acs2013_1yr/summaryfile/ACS_2013_SF_Tech_Doc.pdf.

Table 2. Demographic and Economic data available in the ACS 'Block Group Data' layer. Data are a subset of the 2009-13 American Community Survey 5-year Estimates and compiled by the US Census Bureau.

ID	Table
B01001	Sex By Age
B01002	Median Age By Sex
B02001	Race
B02008	White Alone Or In Combination With One Or More Other Races
B02009	Black Or African American Alone Or In Combination With One Or More Other Races
B02010	American Indian And Alaska Native Alone Or In Combination With One Or More Other Races
B02011	Asian Alone Or In Combination With One Or More Other Races
B02012	Native Hawaiian And Other Pacific Islander Alone Or In Combination With One Or More Other Races
B02013	Some Other Race Alone Or In Combination With One Or More Other Races
B03002	Hispanic Or Latino Origin By Race
B03003	Hispanic Or Latino Origin
B08301	Means Of Transportation To Work
B08303	Travel Time To Work
B09002	Own Children Under 18 Years By Family Type And Age
B09017	Relationship By Household Type (Including Living Alone) For The Population 65 Years And Over
B11001	Household Type (Including Living Alone)
B11016	Household Type By Household Size
B12001	Sex By Marital Status For The Population 15 Years And Over
B15002	Sex By Educational Attainment For The Population 25 Years And Over
B16004	Age By Language Spoken At Home By Ability To Speak English For The Population 5 Years And Over
B17017	Poverty Status In The Past 12 Months By Household Type By Age Of Householder
B17021	Poverty Status Of Individuals In The Past 12 Months By Living Arrangement
B19001	Household Income In The Past 12 Months (In 2011 Inflation- Adjusted Dollars)
B19013	Median Household Income In The Past 12 Months (In 2011 Inflation-Adjusted Dollars)
B19051	Earnings In The Past 12 Months For Households
B19052	Wage Or Salary Income In The Past 12 Months For Households

B19053	Self-Employment Income In The Past 12 Months For Households
B19054	Interest, Dividends, Or Net Rental Income In The Past 12 Months For Households
B19055	Social Security Income In The Past 12 Months For Households
B19056	Supplemental Security Income (Ssi) In The Past 12 Months For Households
B19057	Public Assistance Income In The Past 12 Months For Households
B19059	Retirement Income In The Past 12 Months For Households
B19060	Other Types Of Income In The Past 12 Months For Households
B19101	Family Income In The Past 12 Months (In 2011 Inflation-Adjusted Dollars)
B19113	Median Family Income In The Past 12 Months (In 2011 Inflation- Adjusted Dollars)
B19201	Nonfamily Household Income In The Past 12 Months (In 2011 Inflation-Adjusted Dollars)
B19202	Median Nonfamily Household Income In The Past 12 Months (In 2011 Inflation-Adjusted Dollars)
B19301	Per Capita Income In The Past 12 Months (In 2011 Inflation-Adjusted Dollars)
B21001	Sex By Age By Veteran Status For The Civilian Population 18 Years And Over
B21002	Period Of Military Service For Civilian Veterans 18 Years And Over
B23025	Employment Status For The Population 16 Years And Over
B25001	Housing Units
B25002	Occupancy Status
B25003	Tenure
B25004	Vacancy Status
B25006	Race Of Householder
B25010	Average Household Size Of Occupied Housing Units By Tenure
B25014	Tenure By Occupants Per Room
B25017	Rooms
B25018	Median Number Of Rooms
B25024	Units In Structure
B25034	Year Structure Built
B25035	Median Year Structure Built
B25040	House Heating Fuel
B25041	Bedrooms
B25044	Tenure By Vehicles Available
B25047	Plumbing Facilities For All Housing Units
B25051	Kitchen Facilities For All Housing Units
B25056	Contract Rent
B25061	Rent Asked
B25063	Gross Rent
B25064	Median Gross Rent (Dollars)
B25075	Value
B25077	Median Value (Dollars)
B25081	Mortgage Status
B25085	Price Asked
B25087	Mortgage Status And Selected Monthly Owner Costs
C17002	Ratio Of Income To Poverty Level In The Past 12 Months
C24010	Sex By Occupation For The Civilian Employed Population 16 Years And Over

C25095	Household Income By Selected Monthly Owner Costs As A Percentage Of Household Income In The Past 12 Months

6. Explore Housing Inventory Count (HIC) Data

HIC data depict utilization rates for each of four Program Types; Emergency Shelter, Transitional Housing, Safe Haven and Permanent Housing (includes PSH, DEM, OPH and RRH programs) by geocode. The associated table data contains detailed summary information from the 2014 HIC including bed types, populations served and sheltered PIT count.

Note: Geocodes without program beds for a particular Program Type will not display on the map. Care should be taken to turn off layers in the table of contents 'below' the HIC data of interest to ensure that you are not viewing another layer's data.

Goals: In this tutorial, we learn how to:

- Employ skills learned in Lesson 1 to explore CoC HIC data.
- Use the Identify tool ( ) to query the HIC data for a given geocode.

First, let's take a broad look at the utilization data by zooming the map to a scale of 1:500,000.

1) Turn off the 'Continuum of Care Boundaries' and 'HUD Geocodes & Preliminary Pro-Rata Need' layers in the table of contents.

2) Locate the drop down box that contains the map scale information in the menu bar at top. Choose '1:500,000' as the new map scale.

3) The map will now redraw and you will see that the map is now displaying a color coded visualization for the Housing Inventory Count Emergency layer (see Figure 17).

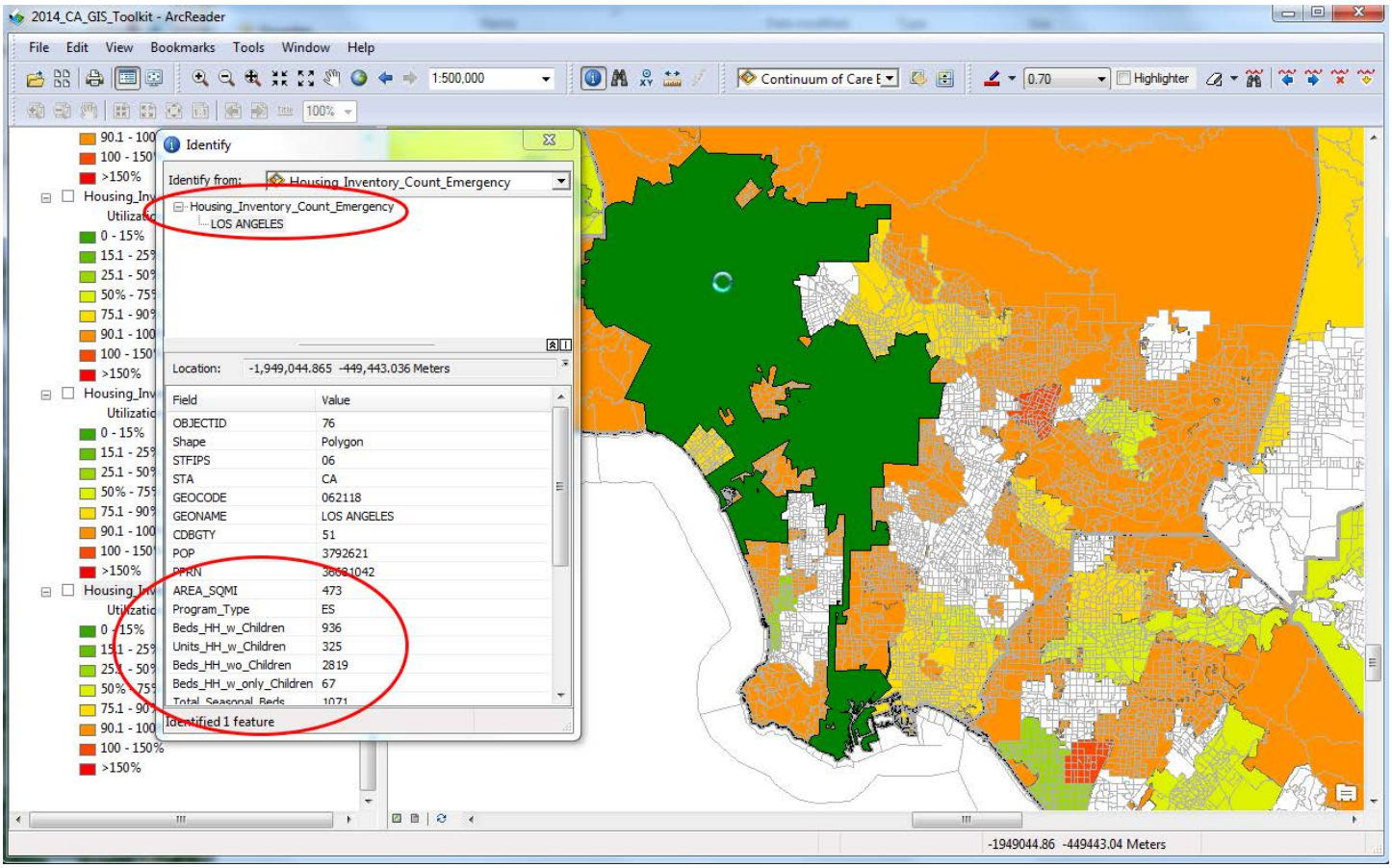

Figure 17 Querying HIC data. The 'Housing Inventory Count Emergency' layer contains detailed bed count data from the HIC. Areas in white (transparent areas) are geocodes that have no Emergency Shelter data reported on the HIC.

Next, use the identify tool to click on the geocode for 'Los Angeles'. You should be able to identify this area by locating the map mark-up created in Lesson 3 (see Figure 12). Verify that the drop down menu at the top of the Identify dialog box is displaying 'Housing Inventory County Emergency'. The bottom portion of the dialog box shows all of the HIC summary bed data for the geocode 062118 Los Angeles. Scroll through the data to see what in available. There were 936 ES beds reported on the HIC for Households with Children. There were 2,819 beds reported for ES Households without Children and 67 beds reported for Households with Only Children. The average utilization rate for ES beds was 85%, the total number of beds reported on the HIC was 4,919 and the PIT count was 4,179 (Figure 17).

7. Summary

Congratulations! You have now finished the HUD CoC GIS Toolkit for Communities Mini Tutorials. You should now have a good understanding of the major features of the ArcReader software and HUD data that is available to you. Please take a moment to verify that you understand how to:

- Use the 'Find' tool ( ) to search the map for places and addresses
- Use the Identify tool ( ) to see information about a specific place by clicking on the map
- Add a graphic symbol to the map
- Save address to 'My Places' in the map project file
- Use the Scale, Zoom ( ), Pan ( ) and Extent (,) tools to navigate around the map
- Turn GIS layers in the Table of Contents on and off
- Use the 'Measure' ( ), 'Highlighter' ( ), 'Pen' and 'Eraser' ( ) tools to annotate the map
- Create a route with driving directions between multiple addresses stored in 'My Places'
- Access and interpret the included ACS census data for areas of interest

As you continue to work with the data, try to experiment with using the skills you have learned on the other data layers available in the Table of Contents. There is a wealth of information available in each data layer and now you have the skills to access it all!