LandView® 5 Tutorial

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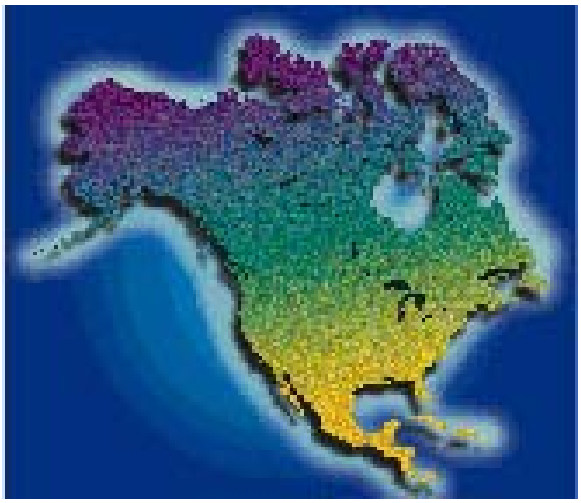


U.S. Census Bureau

U.S. Environmental Protection Agency

U.S. Geological Survey

National Oceanic and Atmospheric Administration

Introduction

The LandView ® 5 Tutorial provides instructions for accessing the LandView 5 databases, for using the MARPLOT ® mapping application and for performing basic navigational tasks. It is meant to be used in conjunction with the LandView 5 installation for *Prince William County, Virginia*[1], available from the installation CD/DVD. However, the Tutorial continues to be available for reference within your working copy of LandView 5 after you have completed the Tutorial. Prince William County may not be among the map and data sets that are available on your working copy, but the material can be applied out of context.

Additional LandView/MARPLOT usage information is available from the **LandView Help** and the **MARPLOT Help** files available at the Help MenuBar within these applications. These files may be updated periodically. You should check the LandView Web site for updated versions of these materials, at http://landview.census.gov.

Additional documentation for the MARPLOT application is available on-line. **MARPLOT Technical Documentation** is available for download at http://www.epa.gov/ceppo/cameo/support.htm. A **MARPLOT User's Manual** is available for download at http://www.epa.gov/ceppo/cameo/MARPLOT.htm.

What is LandView 5 ?

LandView 5 contains both database management software and mapping software that displays:

- Census 2000 demographic data from the U.S. Census Bureau
- MARPLOT maps based on Census 2000 TIGER/Line® files
- EPA-regulated site locations and information
- The U.S. Geological Survey's Geographic Names Information System (GNIS). The GNIS contains geographic names for all known places, features, and areas in the United States that are identified by a proper name

This information is presented in a geographic context that includes:

- Jurisdictional entities (states, counties, cities & towns, and congressional districts) and other statistical entities of the U.S. Census Bureau
- Detailed topological network of major and minor roads, rivers, and railroads
- Census 2000 block points, block groups and census tracts

[1] LandView is compatible with CAMEO®, an emergency planning and response software. Prince William County was chosen as the demonstration county in the LandView Tutorial to be compatible with the many illustrative examples developed for CAMEO software users since the introduction of CAMEO DOS in 1990. For further information about CAMEO software, go to http://www.epa.gov/ceppo/cameo/.

- Selected feature names from 1:24,000-scale U.S. Geological Survey (USGS) topographic maps.

Demographic and geographic information are integrated and are accessible through software that provides:

- Desktop mapping capabilities for displaying, searching, and identifying map objects
- Thematic mapping capabilities—choosing display attributes based on database information
- Calculation of Census 2000 population and housing unit counts within a user-defined radius
- Printed maps and reports

Background Information

LandView 5 has its roots in the CAMEO (for Computer-Aided Management of Emergency Operations) program of emergency planning and response software. CAMEO was developed by the Environmental Protection Agency (USEPA) and the National Oceanic and Atmospheric Administration (NOAA) to facilitate the implementation of the Emergency Planning and Community Right-to-Know Act (EPCRA, sometimes referred to as SARA Title III—for Title III of the Superfund Amendment and Reorganization Act of 1986). This is a far-reaching law requiring that communities develop emergency response plans to address chemical hazards, and to make information on chemical hazards in the community available to the public.

Mapping Systems, Spatial Information, and Layers

The LandView 5 product contains two software programs—the LandView 5 data viewer and the MARPLOT map viewer. These two programs work together to create a simple mapping system that will associate data records in LandView with their corresponding map objects displayed in MARPLOT.

For example, the LandView 5 U.S. EPA **ENVIROFACTS** database shows information for a database of EPA regulated sites, while the location of each site is stored on an assigned map layer in MARPLOT.

MARPLOT allows the user to access all or some of the stored spatial information. Layers can be shown or hidden to tailor the displayed objects to a user's needs. For example, if only the EPA layer is shown, a user will only see EPA objects displayed. However, without other layers in view, there is no context to see which roads or rivers or cities are nearby. By showing these relevant layers, a user can create a map that displays the EPA layer relative to roads, rivers and cities. One analogy frequently used to describe the **layer** concept is that layers can be thought of as a series of transparent sheets that are overlaid one on top of the other, so that each layer is visible either above or below the others. The power of the MARPLOT software lies in the user's ability to customize the

map view to display only layers of interest, as well as specify the desired scale for the map view, and then use LandView 5 to get information about the map objects.

For more detailed information regarding the LandView 5 databases, please go to **The LandView Databases** section of LandView Help. There you will find descriptions of the Census, EPA, and USGS databases plus links to each agency's Internet site.

Notes for Users of the CAMEO Program

The CAMEO suite of programs include CAMEOfm—its current release, ALOHA and a freestanding version of MARPLOT. As LandView has a 'sharing' relationship with its included MARPLOT application, the CAMEO applications have a sharing relationship with the freestanding MARPLOT. For the CAMEO suite to interact with LandView, it must use the version of MARPLOT used by LandView. The following explains how.

1. If CAMEO is presently accessing a version of MARPLOT other than that in LandView 5 (i.e., the freestanding MARPLOT or a previous version of LandView), the version must be hidden from CAMEO. This can be done by temporarily changing the name of the containing directory or temporarily hiding the directory inside of another directory.
2. In CAMEO, use **Sharing/Go to MARPLOT.** You will be asked, in a browse screen, to locate MARPLOT. Navigate to MARPLOT in the default directory, *c:\lv5*[2]. Confirm the linkage by using **Sharing/Go to CAMEO** to return to CAMEO. A similar procedure should be used to establish the ALOHA linkage.
3. CAMEO map objects are contained in CAMEO map nested in the CAMEO directory, and this data is immediately available to the new MARPLOT. If the older version of MARPLOT contains other data, this will need to be transferred to the newer MARPLOT. The User's Map folder should replace the User's Map in *c:\lv5*. If other map directories are nested in the older MARPLOT, these should be copied and pasted to *c:\lv5*. After all usable data has been extracted, if the older MARPLOT serves no useful purpose, it should be deleted.

Organization of the Tutorial

- Lesson 1—Starting LandView and MARPLOT
- Lesson 2—Exploring the LandView 5 databases
- Lesson 3—Navigating in MARPLOT
- Lesson 4—Interacting LandView and MARPLOT
- Lesson 5—Population and other searches at a radius around a point
- Lesson 6—Using other search methodologies

[2] The default directory for the LandView Demo is c:\lv5_demo. CAMEO can be linked either to the MARPLOT contained in the Demo program or to MARPLOT contained in the full install version of the program, c:\lv5, but not both.

Lesson 1

The objectives for Lesson 1 are:

- Learn how to start LandView 5
- Become familiar with the LandView 5 database management program
- Become familiar with LandView's mapping component—MARPLOT

Starting LandView 5

LandView 5 can be installed from the CD/DVD[3] diskettes purchased from the Census Bureau at http://landview.census.gov . The installation directory on the CD/DVD allows installation on either a Macintosh or PC computer.

The demonstration version of LandView 5 also contains its own installation program. It can be downloaded at http://landview.census.gov/geo/landview/lv5/lv5demo.html.

Both LandView 5 and the LandView 5 Demo can be installed at the same time. Each will install in its own directory, and each will have a shortcut icon installed on the Desktop. The Tutorial assumes that the user will first start the LandView 5 Demo.

Double click on the **LV5_Demo** icon on your Desktop to start the program. LandView opens to display the screen shown in Figure 1. We will refer to this screen as **Home**.

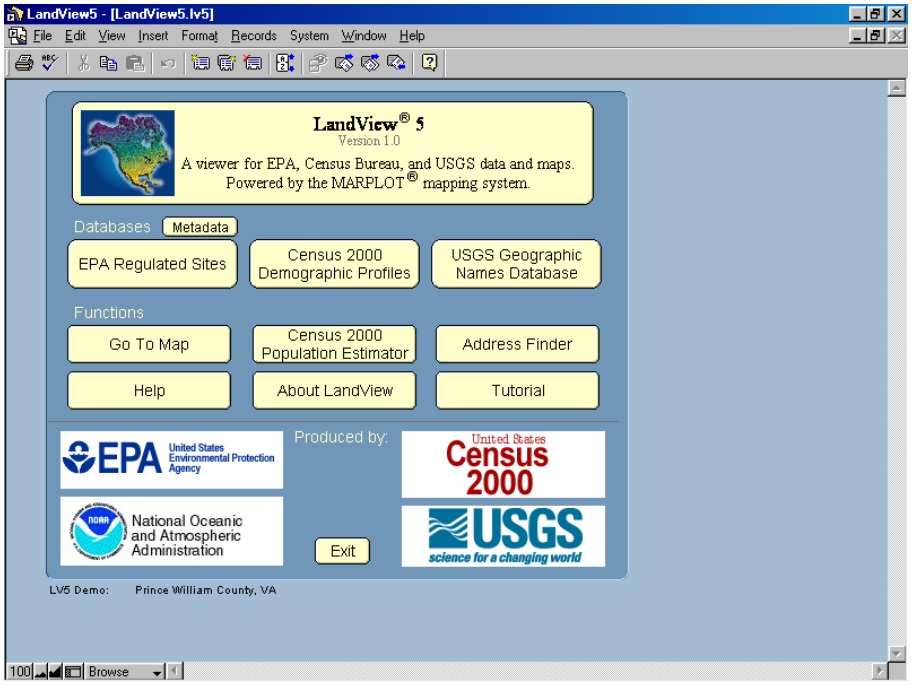


Figure 1—The LandView Opening Screen—The Home Screen

[3] LandView on CD is generally restricted to data and map files for a single state. A two DVD set contains data and map files for the entire United States, District of Columbia, and Puerto Rico.

Getting Comfortable with LandView 5

At this time, only the LandView database management program is running; MARPLOT, its mapping software, is not. The MARPLOT application does not start until **Go to Map** is invoked from the Home screen or **Show on Map** from one of its several database screens.

Buttons identify access to the three databases in LandView 5—the Census Bureau's 2000 Demographic Profiles, the U.S. EPA's database of regulated facilities and the Geographic Names Information System database maintained by the U. S. Geological Survey. A separate button provides Metadata—data about data—for the included databases.

An estimate of population around a point, which we will explore in Lesson 5, can be initiated either from within LandView or MARPLOT. In either case, the **Census 2000 Population Estimator** references the current position of the **Focus Point** in MARPLOT.

The mapped location of an address can be determined knowing both a street address and its ZIP Code. (If the street, displayed in MARPLOT, lacks address information, you can select an adjacent intersecting street to get a mapped location.) The **Address Finder** updates previous MARPLOT functionality that required also knowing the identity of the County containing the address. This subject is covered as part of Lesson 3.

The **Help** button in LandView 5 displays the screen shown in Figure 2 and provides linkage either to the PDF file installed on the hard drive as part of the installation of the LandView application or to a possibly more current version maintained on the Web at:

http://landview.census.gov/geo/landview/lv5help/lv5_tabcont.html

Throughout LandView and in MARPLOT, other **Help** buttons provide specific help information within the context of their location.

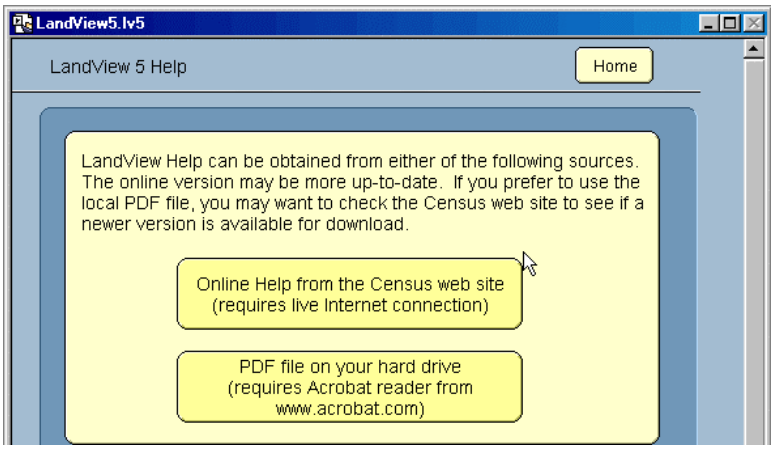
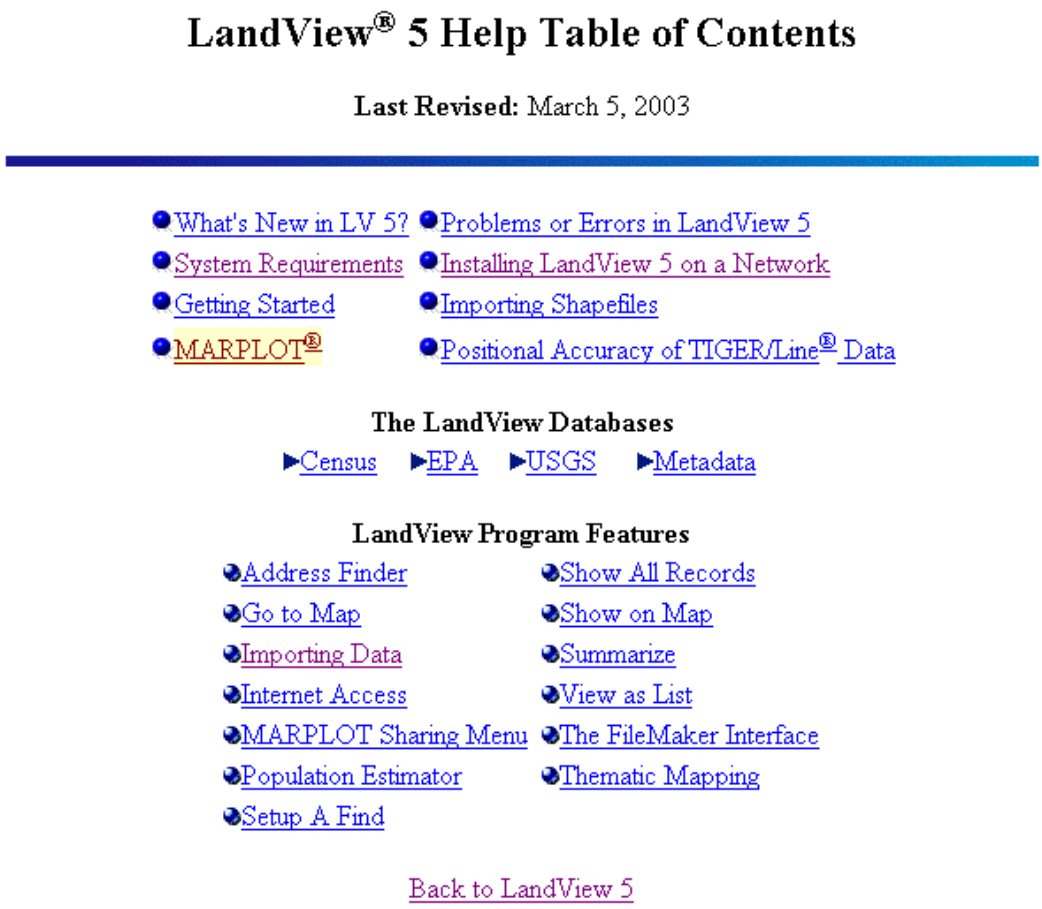


Figure 2—Help Is Available to LandView Users

The Table of Contents for the LandView Help is displayed in Figure 3. The user is particularly referred to the section entitled, The FileMaker Interface.



LandView® 5 Help Table of Contents

Last Revised: March 5, 2003

- What's New in LV 5?
- Problems or Errors in LandView 5
- System Requirements
- Installing LandView 5 on a Network
- Getting Started
- Importing Shapefiles
- MARPLOT®
- Positional Accuracy of TIGER/Line® Data

The LandView Databases

▶Census ▶EPA ▶USGS ▶Metadata

LandView Program Features

- Address Finder
- Go to Map
- Importing Data
- Internet Access
- MARPLOT Sharing Menu
- Population Estimator
- Setup A Find
- Show All Records
- Show on Map
- Summarize
- View as List
- The FileMaker Interface
- Thematic Mapping

Back to LandView 5

Figure 3—LandView Help's Table of Contents

Returning to Figure 1, the four logos at the bottom of the screen identify the federal agencies providing data and/or technical support to the LandView program. The logos act as buttons to access each agency's home page on the Internet. Other buttons within LandView provide Internet access to specific programs accessible within an agency's Home Page.

Getting Comfortable with MARPLOT

The **Go to Map** button starts MARPLOT or allows you to return to MARPLOT from LandView once MARPLOT has been started. In MARPLOT, the **Sharing** menu allows you to return to LandView[4]. Invoking **Go to Map** displays the MARPLOT opening screen, seen in Figure 4.

[4] An alternate navigation technique is to move between the two applications using the icons on the Windows **Start** MenuBar. If the **Start** MenuBar is not visible, the keystrokes [Control]-[Escape] will bring it into view.

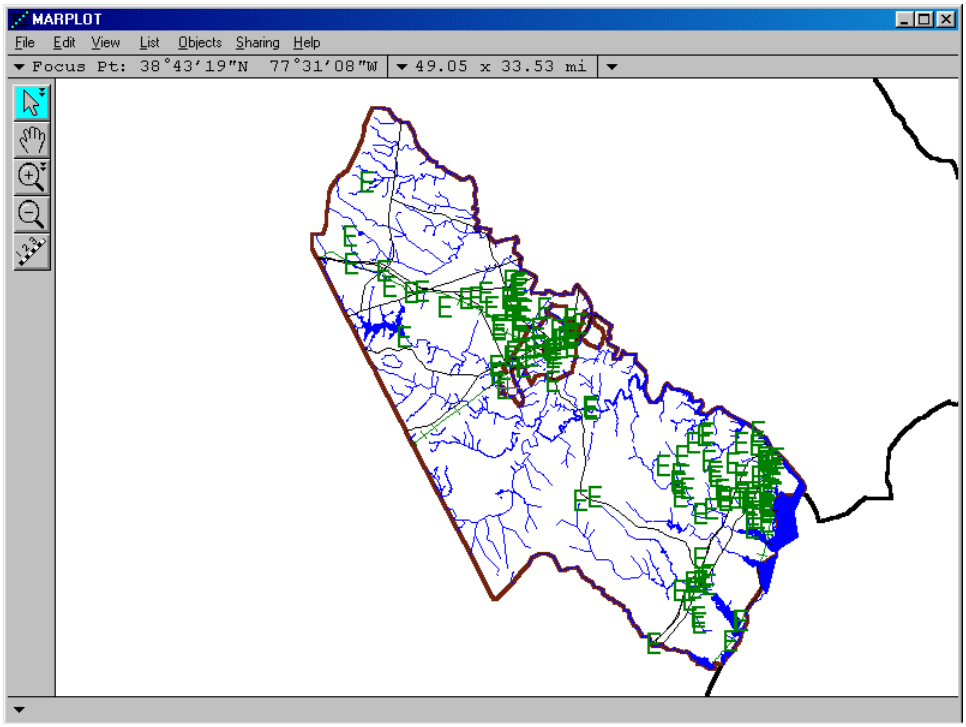


Figure 4—The MARPLOT Opening Screen

A small, flashing, cross-shaped icon called the **Focus Point,** is at screen center. The Focus Point marks the location of the most recent point of interest on the map. Each time you click on the map with the Arrow Tool,  , the Focus Point moves to the location of your click. The Focus Point also changes in response to other operations.

The latitude/longitude coordinates of the Focus Point are shown in the upper left corner of the map window. The dimensions of the map window are shown in the upper middle part of the map window.

The opening screen appears very busy. As we will see, MARPLOT has a 'ranging' feature, available at List/Layer List . . . , that automatically displays certain map features depending upon the viewing scale. This feature can be over-ridden by user selections. In addition to State and County boundaries, also displayed are: major roads, railroads and water features. The LandView Demo version contains data on only one State—Virginia and one County—Prince William County[5].

Note four inverted triangles in the Header Bar and at the base of the map screen. These display drop down menus that replicate MenuBar commands. As you become a more comfortable MARPLOT user, you may prefer these to other navigational pathways.

[5] A sharp eye will detect two 'independent' cities within Prince William County—Manassas and Manassas Park In four states (Maryland, Missouri, Nevada, and Virginia), there are one or more incorporated places that are independent of any county organization and thus constitute primary divisions of their states. These incorporated places are known as ''independent cities'' and are treated as equivalent to counties for data presentation purposes.

The MARPLOT Navigation Tools

We have already discussed the Arrow Tool,  , but it has an additional function. It is used to 'select'. Selection is the process where one or more[6] MARPLOT map objects are selected from available objects so that MARPLOT can employ a procedure. When selected, the object is highlighted by a series of red, square points. When a single object is in select mode, the identity of the object—its name, its containing layer and its containing map—displays at the bottom of the screen.

Notice the two triangles[7] on the  icon. These indicate an additional function—multiple selection within a defined area. Clicking and dragging with  will place multiple map objects in select mode. A dialogue box will ask you to identify the layer or layers that you wish to include in your selection.

The Hand Tool,  , is used for making minor adjustments of your map display.

The Zoom In Tool,  , and the Zoom Out,  , Tool will be discussed together. Clicking on the map screen with either of these tools changes the scale of the map by a factor of two, and the click point becomes the center of the new display.

The Zoom In Tool,  , also has a secondary function. Clicking and dragging with the tool opens a new map window zooming-in to the dragged area. It is the preferred method for zooming in to a new map area.

The Tape Measure Tool,  , as its name implies, measures distances. When used, the distance between two map points and the bearing in compass degrees between the first and second point display at the bottom of the screen.

Practice switching back and forth from LandView 5 to MARPLOT. When you feel comfortable, switch back to MARPLOT so that you will be ready for the next step.

Some notes on the File Menu

Save as a Picture . . . The MARPLOT map screen can be saved as an image file. There are two options: 1) Saving as a bitmap image saves the map screen pixel by pixel as displayed and 2) Saving as a Windows metafile saves each displayed map object as a **vector** image. MARPLOT map objects are vector images—a format that allows enlargement or reduction of the image without distortion.

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[6] Multiple 'selection' or 'deselection' can be accomplished by holding down the [Shift] key while using the  tool.

[7] The triangles are actually buttons that allow the user to specify the selection area as either a circle or a rectangle.

Print . . . allows sizing of the printed map. To best replicate the display screen, **Print Setup . . .** should first be set to 'Landscape'.

Import . . . and **Export . . .** are powerful MARPLOT functions. The user is referred to the MARPLOT documentation for further information.

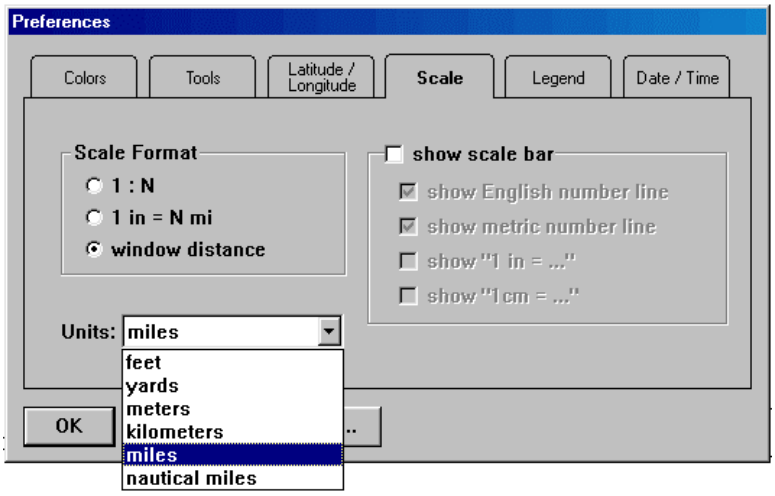


Figure 5—The Preference Dialogue

Preferences . . . provides a number of options for customizing the MARPLOT display. The option displayed in Figure 5 is the option to change map scale.

The MARPLOT default for Scale is **Window Distance**—the distance in selected map units from west to east in the map display window. A scale shown as **1:N** interprets as one inch on the map relates to an equivalent ground distance of N inches, e.g., 1:24,000. A scale of **1 in = N mi** is notation typical of a road atlas, e.g., 1″ = 5 miles. The Scale Format currently checked in Preferences is the default scale format—window distance.

Most of the other options in **Preferences . . .** relate to enhancement of printed maps for display purposes.

List/Layer List . . .

The menu command **List/Layer List . . .** opens the dialogue box displayed in Figure 6. This is an important MARPLOT work area, and we will provide detailed notes.

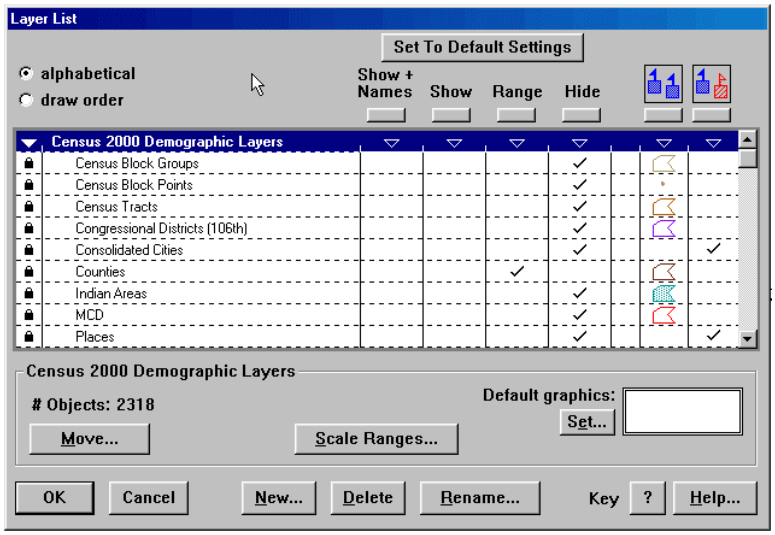


Figure 6—The Layer List Dialogue

Note that there are two layer display options—**alphabetical**, the default setting, and **draw order**. Draw order needs only to be invoked if you suspect that there are map objects hidden from view. If you were to have a Boats layer and a Lakes layer, and Boats drew before Lakes, the boats would be at the bottom of the lake and would not display. In **draw order**, the **Move . . .** button would allow you to make the necessary corrections.

Figure 6 opens to display the **default layer settings**. As you make changes in MARPLOT, some displayed layers will be hidden and others will be placed in display mode. **Set to Default Settings** returns the user to the original display options.

The Layer List, itself, can be seen to be of two types—**Group** headers and individual **Layers**. The Group header is identified by a triangle icon, which changes direction to indicate either an open or closed group. Clicking on the triangle acts to display or hide the layers contained within a group. Layers are identified by a padlock symbol. Unlocking a padlock places that layer into an active mode where objects on the layer can be added to, deleted or modified**.** *Note: Layers stored on read-only media (CD-ROM or DVD-ROM) can not be unlocked.*

Figure 7 provides a new view of the Layer List Dialogue. Here, all Groups but the Census TIGER/Line 2000 group are closed. Note the reference to Federal Lands. The GNIS from the USGS is included on all released versions of LandView 5, including this Tutorial. MARPLOT data for Federal Lands is included only on the national two-DVD release of LandView 5; corresponding LandView data files are not included. They are included here as empty layers to show content that is available on the national DVDs.

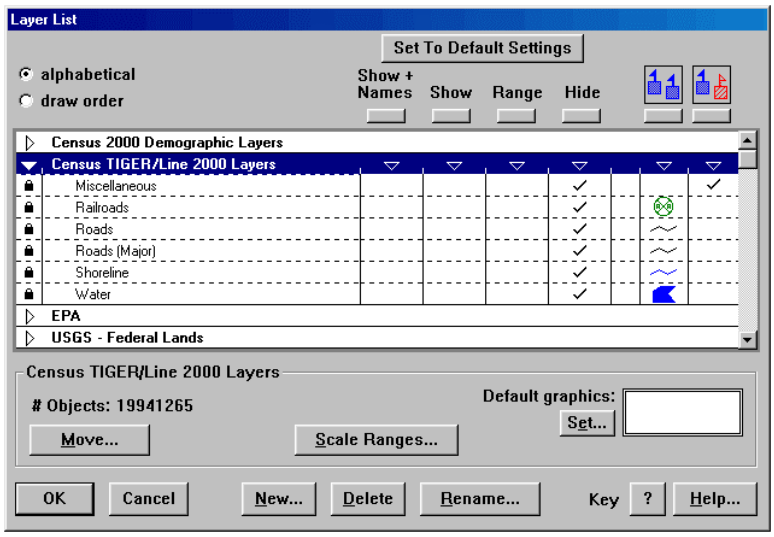


Figure 7—Only the TIGER/Line Layers Display

Notice in both Figure 6 and Figure 7 that when a Group header is in select mode, a screen message identifies the group and the number of map objects on all layers within the group. Similarly, if a layer were in select mode, the message area would identify the selected layer and both the number of map objects on the layer and the number of maps contributing map objects to the layer.

The six buttons, [ ], heading six columns of display options are global buttons—invoking one of the buttons acts on all layers below it to place them in the specified display mode. Notice that each Group header has inverted triangles, ▽, similarly positioned over the columns. These triangles act as buttons to bring all layers of a group into the selected display option.

Three of the headings—**Show with Names**, **Show** and **Hide** are rather self-explanatory. The others need some discussion.

Range is a user option that allows selected layers to **Show** or **Hide** automatically. If you were viewing an entire state, you would not want the Roads layer to show, as the roads would be indistinguishable from each other. Similarly, if you were looking for a street address, you might not want the Places layer to show, as it would obscure details of the neighborhood. Users can adjust **Range** with the **Scale Ranges . . .** button. The **Scale Ranges . . .** dialogue is shown in Figure 8.

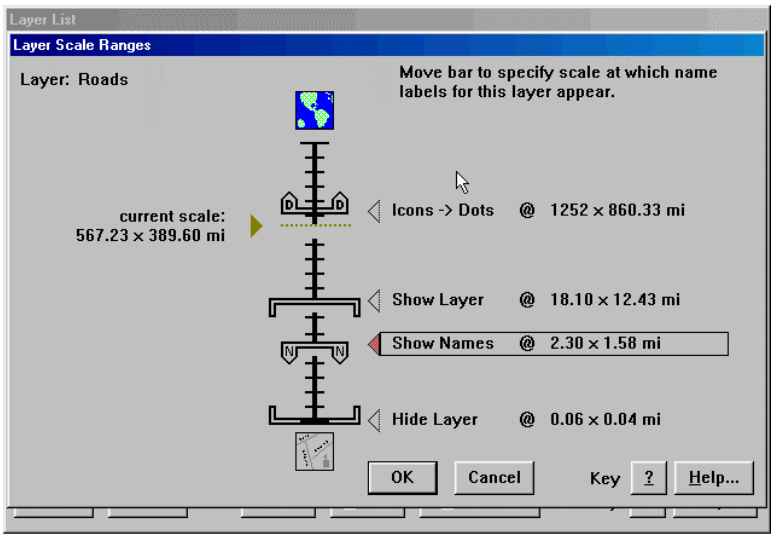


Figure 8—The Scale Ranges Dialogue

Figure 8 displays the current setting for Roads. When Range is selected as the display option, Roads will display from a window width of 0.06 miles (MARPLOT 's maximum zoom-in) to 18 mile. Identifying names will display for the selected layer at all window width settings below 2.3 miles. If the user wanted road names to display only at window setting below one mile, the **Show Names** bar could be dragged to that setting.

Blue-Blue and **Blue-Red** provide additional display options. **Blue-Red** can be thought of as the Designer mode—if the designer of the original map data wanted to make one object on a layer blue and another red to emphasis a point, the designer could do so. **Blue-Blue** is known as **Graphic Override**. Using Graphic Override, all objects on a layer can be set to display options chosen by the user. The **Set . . . (Default Graphics)** button provides the pathways.

Other options available from the Layer List include the ability to create new layers or groups, delete existing layers or groups or rename layers or groups. An **OK** is necessary to confirm changes and return to the map display. **Cancel** will cancel all changes made while in the dialogue box. Layers can be moved into and out of Groups with the **Move** button.

List/Map List . . .

Before we try some exercises, let us look at **List/Map List . . .** This is another important MARPLOT work area, and it is shown in Figure 9.

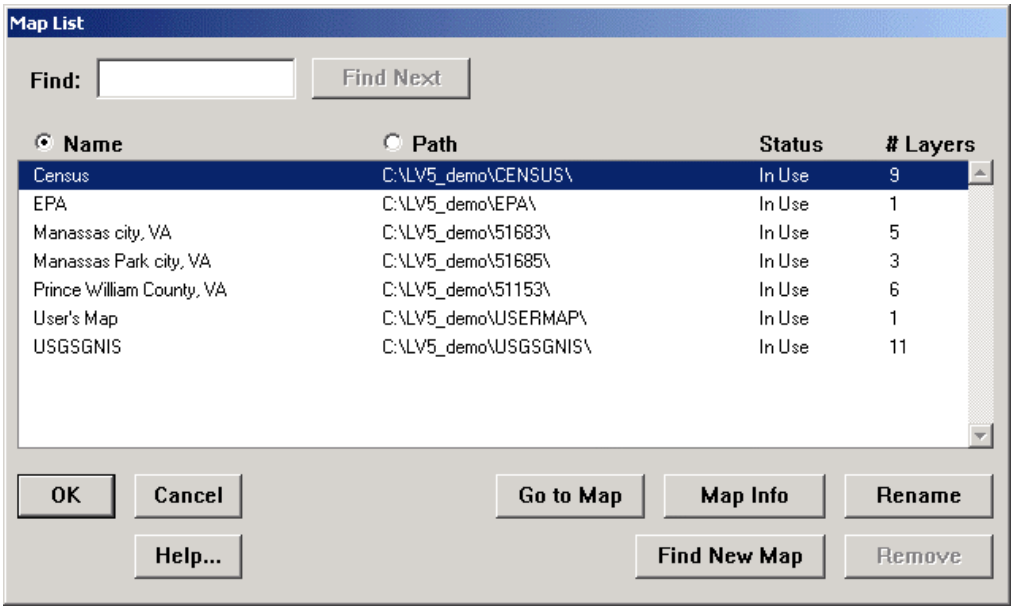


Figure 9—The Map List Screen

The map list displayed in Figure 9 lists only those maps included on the tutorial. As can be seen from the path statement, these maps are nested inside the directory containing the Demo program—c:\lv5_demo. For either a single state version on CD or the national version on DVD, the map list is long. A MAPS directory, on the CD/DVD or ported to a server for LAN access, contains the primary agency maps—Census, EPA and USGS GNIS and a sub-directory, TIGER, contains additional sub-directories each dedicated to a set of state maps included on the CD/DVD. These are maps for each of the counties contained within the state. Each counties is identified by its FIPS[8] code. Note, in Figure 9, that the FIPS code for Prince William County is 51153. MARPLOT is programmed to find all maps on an alternate drive containing a LandView application.

When the map list is long, the **Find:** dialogue is very helpful. Enter the first few characters of a County name, and the list will scroll to that name.

With the Census map highlighted, we will use the **Map Info** button to display detailed information about the Census map. This is shown in Figure 10.

[8] FIPS Code, for Federal Information Processing Standard, is a shorthand and indexing system used to identify levels of geography. FIPS Codes assign a numerical value to an alphabetical listing. Here, the first two digits identify the State of Virginia, and the following three digits identify Prince William County.

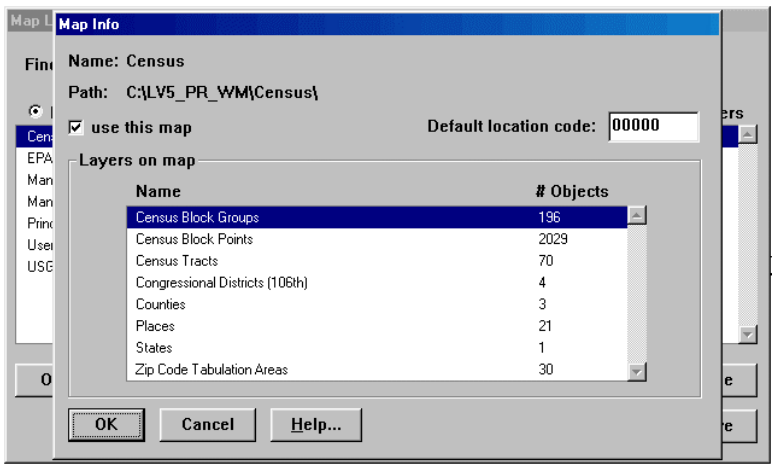


Figure 10—The Map Info Dialogue within the Map List Screen

Map Info identifies the layers included on the selected map and the number of map objects on each layer. Notice, that for the abbreviated Census map included with the Tutorial, there is one State—Virginia and three Counties—Prince William County and the two independent Cities of Manassas and Manassas Park (considered as Counties, as they are primary political divisions within the State).

The **User's Map** is a special place. Map objects created by the user and not specifically assigned to another map are placed on the User's Map by default. **User's Map** always nests in the directory containing the MARPLOT application. (See Figure 9.)

The **Go To Map** button returns the user to a screen displaying the complete area for the selected map. The **OK** button returns the user to the same screen that was displayed on entering the dialogue.

Some Definitions

Other than special map objects used for display or reference (circle, rectangle and text), **Map Objects** are of three types—**Points**, **(Poly)lines** and **Polygons**.

Points are map objects represented by a single value of latitude and longitude, a point, that may represent physical objects of greater magnitude, e.g., a city represented by its centroid.

(Poly)lines are map objects best represented by a line, e.g., a road or a river. The term, **Polylines**, references the fact that the line is really a series of points (**Vertex or Vertices**) connected by line segments.

Polygons represent an area, such as the boundaries of a city. Again, the polygon is a series of points connected by line segments.

A **Layer** is a collection of similar map objects that can be viewed alone or in relation to map objects contained on other layers—a layer of EPA regulated facilities can be viewed in relation to the road network.

A **Map** is the smallest rectangle, defined by latitude and longitude, that will contain all of the map objects assigned to the map. The map of Virginia touches the east and west boundaries of the display screen while a map of Illinois would touch the north and south boundaries of the display screen.[9]

A **Map** can contain many **Layers**—as the Census map, viewed in Figure 10, shows.

The same **Layer** can be contained on many **Maps**. All County maps contain a Roads layer, and roads are continuous between Counties.

Some Exercises

First, use **File/Preferences . . . /Legend** to display the **Legend** on screen. This will help to identify new layers as they appear. As you become a more familiar MARPLOT user, you may reserve this step for only your printed maps.

From the entry screen—Prince William County, zoom-in on the two independent cities of Manassas and Manassas Park, shown at the center of the screen, using each of the following three methods:

For the first method, use the  tool to zoom-in until their images almost fills the screen. Notice the increased map detail within the County as scale increases. Use  to approximate the original screen.

Next, again use the  tool, this time to drag a rectangle around these sites.

[9] **Map** and **Layer** can also be defined as elements of the MARPLOT application program. To MARPLOT, a **map** is any directory accessible to the MARPLOT application that contains a *name.map* file. Objects on a **layer** are defined by one or more sets of similarly named files contained in one or more MARPLOT map directories. Generically, a file set would include *filename.lyr, filename.obj* and *filename.sum*.

Finally, we will use **List/Map List . . .** as a navigation tool. Highlight Prince William County in the Map List and use the Go to Map button to return to a full view of the County. This is the view shown in Figure 11.

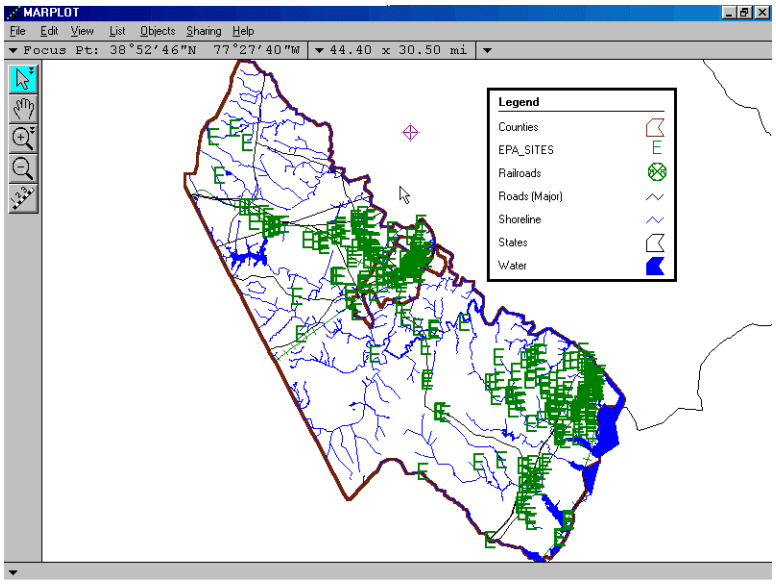


Figure 11—Prince William County Displaying the Default Scale Range Values

In Figure 11, we still see the boundary for the State of Virginia. We also see the boundary for Prince William County defined in the Graphic Override mode as a heavy brown line. We see only the **Major Roads** in the County. A number of '**E**' icons are identified as EPA Sites. At the moment, these provide map clutter, so go to **List/Layer List . . .** to **Hide** the EPA_sites layer.

Manassas and Manassas Park are separately identified areas within Prince William County. Use the tool, again, to further zoom-in on these Cities. Now, place Manassas Park in select mode by clicking on its boundary. You will know when it is properly selected, as its name will appear at the bottom of your screen. This is the view shown in Figure 12.

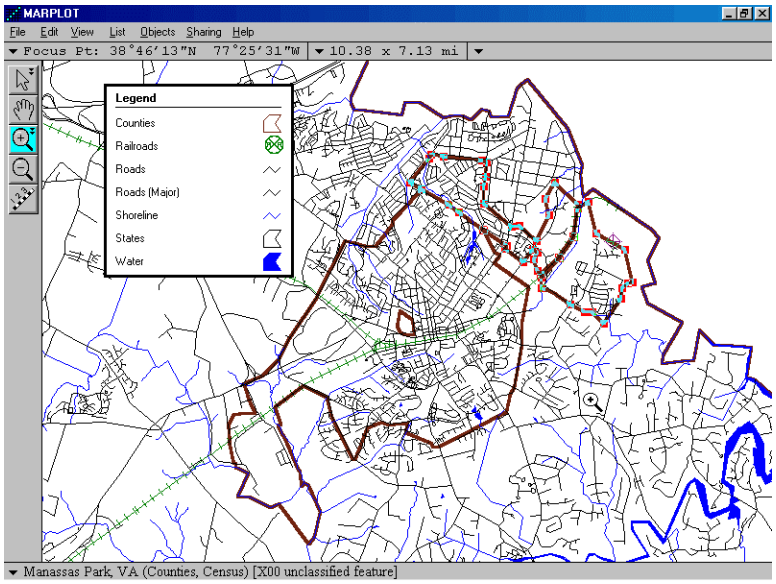


Figure 12—Zoomed in on Manassas and Manassas Park (in Select mode)

We now see a greater depth of detail including both Major Roads and the local road network. Notice that the selected map object—Manassas Park—is identified at the bottom of the screen.

Note: If the system seems to be taking too long to draw the map, you can press the [Escape] key, which causes MARPLOT to stop drawing. It displays the message [DRAW INCOMPLETE] at the bottom of the map window to remind you that drawing was stopped while the map was incomplete. You can still click on the map and use the tools to continue to zoom in or out. The map will be completely redrawn if you change scale. (You can also use **Redraw** under the **View** menu to force the same view to be redrawn completely.)

You may now continue with Lesson 2 or close LandView and resume the Tutorial later. As mentioned earlier, the LandView 5 product consists of two separate computer programs, so you need to separately close the MARPLOT map viewer and the LandView 5 data viewer. Each program can be closed from the **File** menu or by using the close symbol, **X**, in the upper right hand corner of the screen.

You are currently in MARPLOT. If you wish to continue with Lesson 2, click on **Sharing**/**LandView**/**Go to LandView** to return to the LandView screen. Alternately, you could access the LandView screen from the Start bar at the bottom of your screen.

Lesson 2

The objectives for Lesson 2 are:

- Become familiar with the contents of the LandView 5 database management program
- Explore LandView's database search procedure—'Setup a **Find'** leading to a sub-set of the data—a **Found Set**

You can access a wide range of information using LandView 5—including Census 2000 population and demographic data, EPA information on air facilities, hazardous waste facilities, and Superfund sites, and information on geographic landmarks from the USGS Geographic Names Information System (GNIS).

To start this exercise, you will need to be in LandView 5. If you closed LandView at the end of Lesson 1, restart LandView as described at the beginning of Lesson 1.

Census 2000 Data

Click on the **Census 2000 Demographic Profiles** button. It opens up the screen shown in Figure 13. At the States level, LandView contains only one data record—the State of Virginia which contains Prince William County. Correspondingly, MARPLOT contains map objects for all fifty States, although only one, Virginia, is linked to LandView.

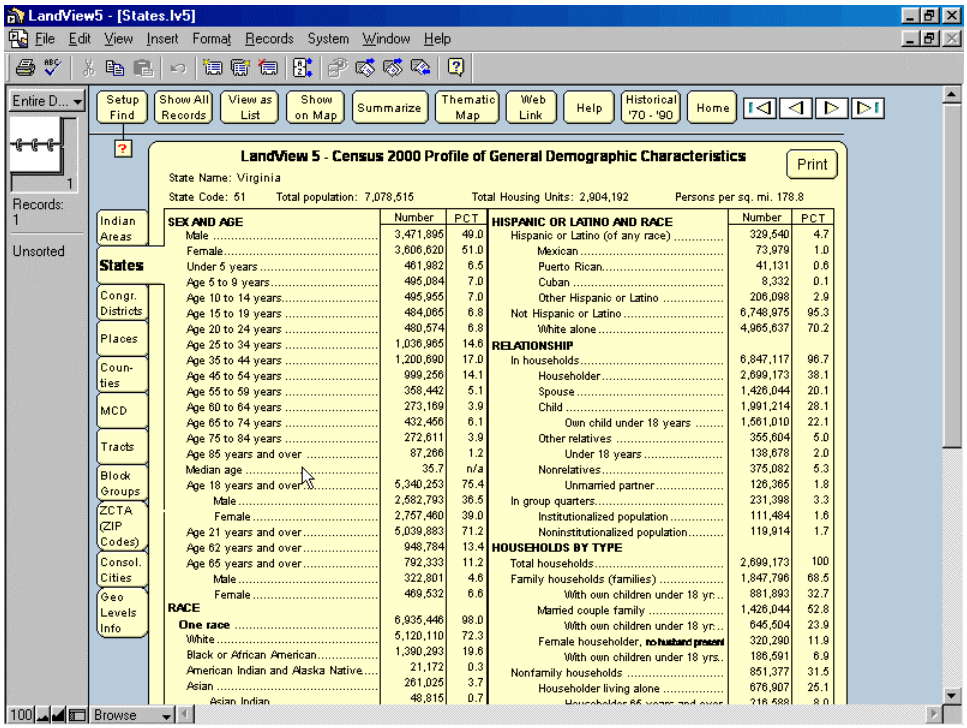


Figure 13—Census Demographic Profile for the State of Virginia

At a glance, the depth of data is obvious, and a vertical scroll bar is required to fully explore the data offering. This screen presents Census 2000 data for various legal or political boundaries and for Census statistical areas. The tabs along the left side of the form correspond to the levels of geography for which data are presented. Clicking on a tab brings up the first alphabetical record in the Census 2000 data set for that level of geography. The political/statistical areas that nest hierarchically within one another are: state, counties, minor civil divisions[10] (MCDs), census tracts, census block groups and census blocks. Because of privacy issues, only a more limited set of data is available for census blocks. The primary source for accessing block data is the **Population Estimator**. Places and 106th congressional districts nest only within a state; as their boundaries can cross county lines. Indian Lands[11] and ZIP Code Tabulation Areas (ZCTAs) can and do cross state boundaries. Please note that whenever an Indian Land or ZCTA entity crosses a state boundary the Census 2000 Demographic profile will present separate data records for each state portion. This hierarchical order is shown graphically under the **Geo Level Info** tab. These geographic concepts are further discussed in LandView **Help** under Census Databases.

For this Tutorial, the LandView databases are limited to Prince William County, Virginia (and its two included independent cities of Manassas and Manassas Park).

The nine buttons across the top of the data screen perform customized FileMaker scripts to accomplish specific tasks.

The 'Setup a **Find**' button allows a user to define criteria for searching the database and so limit browsing and other actions to a subset of records based on the **'**Setup a **Find'** parameters. Once criteria are established, the **Find** button in the **Status Area** initiates the search. The search results are known as the **Found Set**

The **Show All Records** clears the **Found Set** and allows the user to see all records in the data set.

The **View as List** presents each record on a separate line so a user can view multiple records for a geographic area at a time. Horizontal scrolling permits viewing the contents of individual fields[12].

LandView 5 allows a user to connect to selected LandView 5 support sites on the Internet. To use the **Web Link** function, a user must have both a connection to the Internet as well as an installed Internet browser. Clicking on the **Web Link** button opens up a dialogue box that lets the user choose among selected Census Bureau sites. The first selection connects to the Census 2000 page, shown in Figure 14, a site dedicated to the explication of information relating to the 2000 Decennial Census. The second selection,

---

[10] Although Virginia does contain minor civil divisions (magisterial districts), LandView does not present them because they are not well known to the average citizen. Clicking on this tab displays a message box listing those states that do.

[11] Virginia contains no Indian Lands—clicking on this tab displays a message box listing those states that do.

[12] A field of interest can be 'dragged' to better display the field name or to place it adjacent to the identifying name field for the database. Closing the database restores original settings.

Figure 15, connects to a potpourri of Population and Household Economic Topics. The user can use these functions to either get more up-to-date population figures or get additional Census 2000 information not found in LandView 5. A third choice brings the user to the **Home** screen for the U.S. Census Bureau.

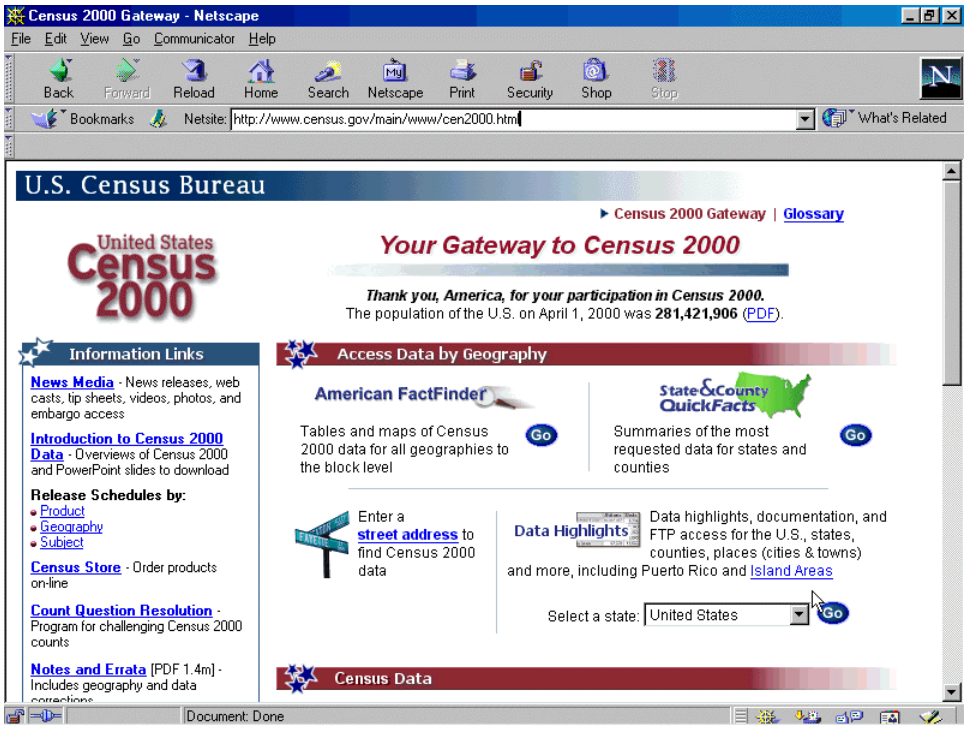


Figure 14—The Census 2000 screen accessed using **Web Link**

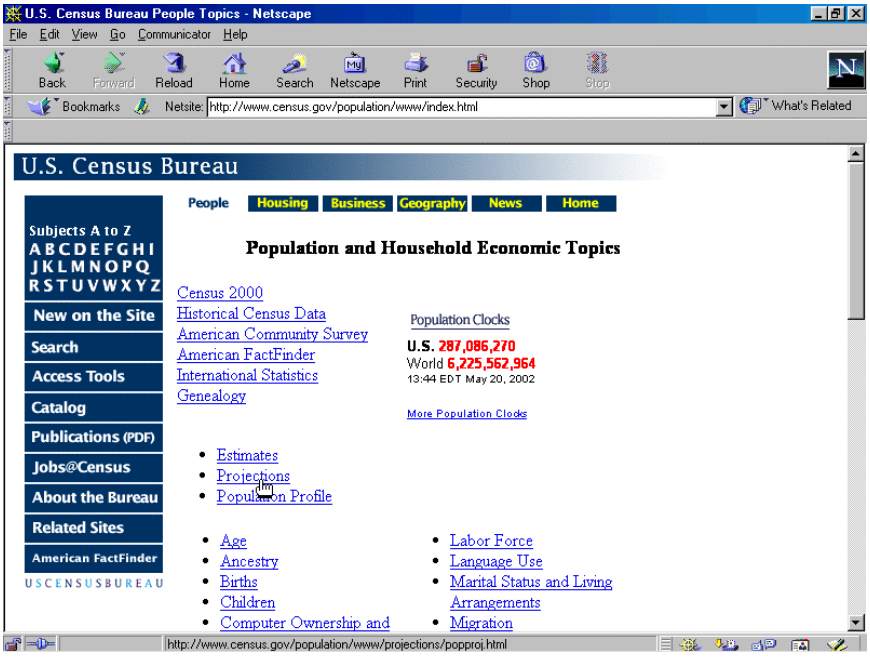


Figure 15—Other Internet Census Searches from LandView

Refer back to Figure 13 for the following features:

The **Show on Map** button will open a MARPLOT map that shows the geographic area selected on the database form.

The **Summarize** button totals the numerical fields for records in the Found Set.

The **Thematic Map** button creates a thematic map based on a selected Census 2000 data field.

Historical 70–90 provides an historical reference for key data points. Historical data is available in LandView for states and counties only.

For further details about each of these functions, see the LandView Help. Some of the functions will be covered in more detail later in the Tutorial.

Click on the **Home** button to return to the LandView Startup window.

Using the Census 2000 Data

There are many methods for extracting useful information from the Census Database. Significant ones are explored in Lessons 3 to 6. Here, let us give one example of how **Sort Order** in the database can aid in extracting information. We wish to identify those clusters of population (we will use Census Block Groups as our search unit) in Prince William County that contain the largest percentage of people that are 65 years of age and older.

With the Census Block Group tab in show mode, use **Records/Sort . . .** and the **Clear All** button to remove any data that might be in the **Sort Order** column. In the left hand column, scroll to "Age_65_years_and_over". (The first entry of the term—the second and third entries, as can be seen from the database, refer to males and females.) Highlight it and use the **Move** button to move it to the right hand column. As we want the oldest, we need to **Sort** in **Descending** order. Highlight the data field in the right hand column. Select **Descending** as the Sort order, and use the **Sort** button. We return to the database with the records sorted by the Age 65 and over field. In our first record, 27.7% of the population in the first displayed record of the Census Block Group Sort List are aged 65 or older!

U. S. Environmental Protection Agency Data

From the Home screen, click on the **EPA Regulated Sites** button. The screen shown in Figure 16 appears.

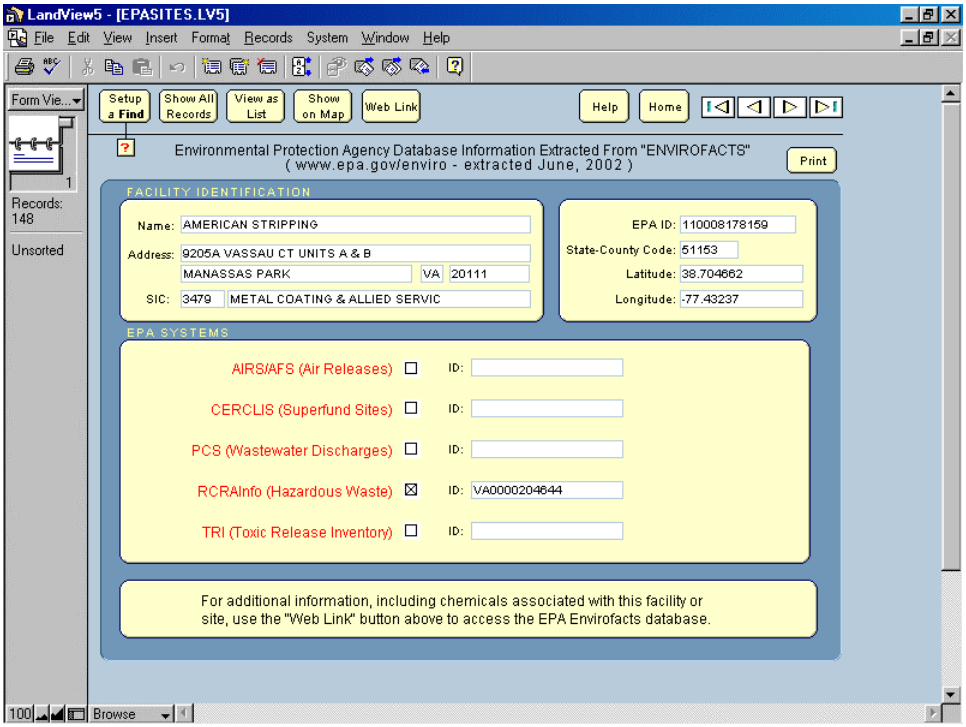


Figure 16—An EPA Regulated Facility in the LandView EPA Database

The EPA database contains information on EPA regulated sites throughout the country. Some of the information included are: the address of the site, the latitude and longitude and the EPA ID number. The database also identifies the EPA media program or programs under which the facility is regulated as well as chemicals subject to regulation. For further information about these databases, see EPA Databases in the LandView 5 **Help** Section.

By clicking on the **Web Link** button shown in Figure 16, the user is taken to the U.S. EPA's **Envirofacts Warehouse** where additional information, and more current information, on the displayed facility can be obtained. The opening screen is displayed in Figure 17.

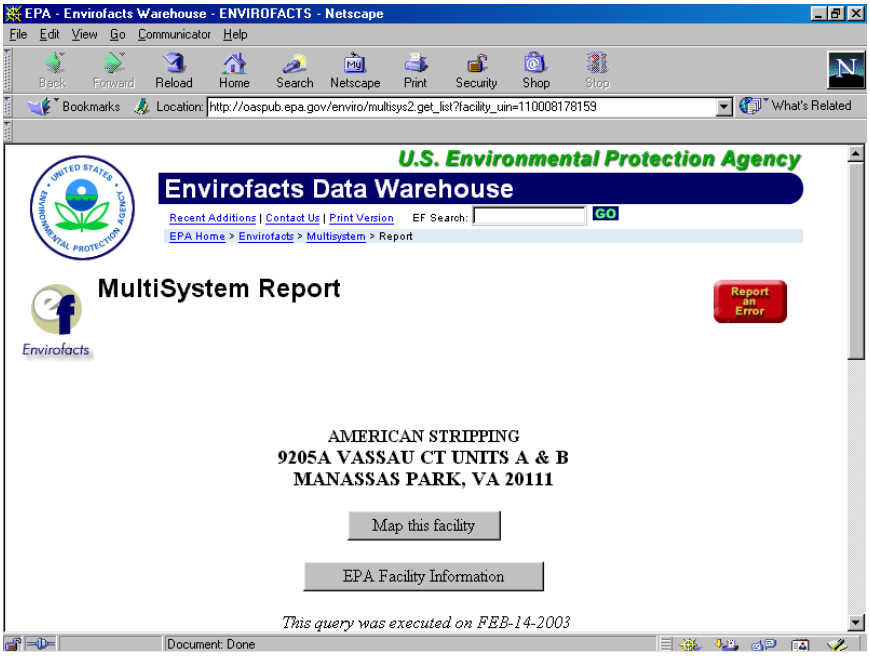


Figure 17—USEPA Envirofacts Warehouse Record for the Facility in Figure 16

Besides the Internet access button there are six other buttons that appear across the top of the screen that perform FileMaker scripts to accomplish specific tasks.

The **'**Setup a **Find'** button allows you to limit browsing and other actions to a subset of database records based on the query conditions you specify.

The **Show All Records** allows you to see all records by cancelling the query conditions.

The **View as List** presents each record on a line so you can view multiple records for a geographic area at a time.

The **Show on Map** button allows the user to map the site(s) in MARPLOT. More details about this feature and how it can be used in conjunction with the Query function can be found in the LandView **Help**.

Using the EPA Database

Let's suppose that you want to find the number of Hazardous Waste sites (RCRA) in Manassas, Virginia. We will use this as our first example of LandView searching—initiated with the 'Setup a **Find**' button and completed by invoking the **Find** command. This **Find** presents an anomaly, since, in Virginia, there is both a City of Manassas and a City of Manassas Park. We want to limit our **Find** only to the City of Manassas. This requires use of LandView's menu of **Boolean** characters.

Use 'Setup a **Find**' to enter your search criteria. The screen that appears contains all field headings from the database, but no data. Entering data criteria in appropriate fields creates the **Find** specification. Figure 18 illustrates the data entered to complete the above search criteria.

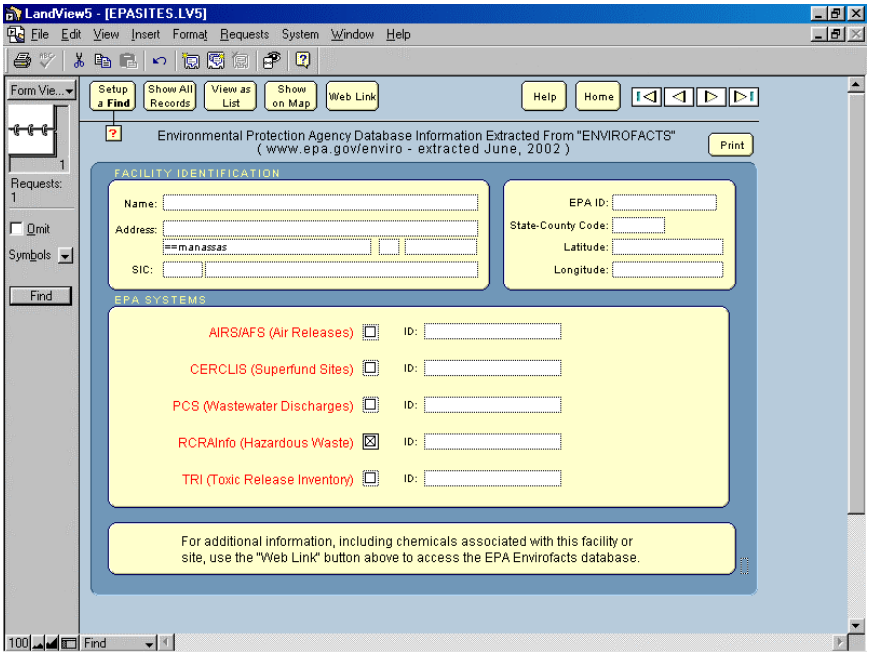


Figure 18—'Setup a **Find**' for RCRA Facilities in Manassas City

Our criteria requires entry of a city and state[13] identifier and identifying that part of the EPA database the we wish to search. This requires entering a check mark in the RCRAInfo (Hazardous Waste) checkbox. Notice, though, that our city identifier is preceded by a double equal sign (= =). The entry is selected from the LandView menu of **Boolean** search symbols displayed in Figure 19 and limits our **Find** to records which exactly match the chosen text. The Symbols menu is available from the LandView **Status Area** by mouse clicking on the **Symbols** button. It is also available by right-mouse clicking in the data field of choice.

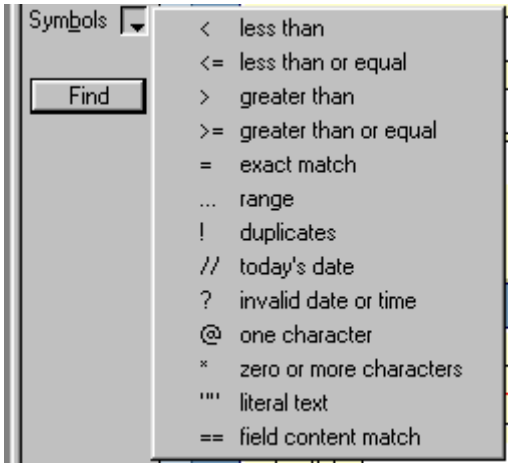


Figure 19—LandView's Menu of Boolean Search Characters

[13] We can omit redundant information, if we know it to be redundant. Since the LandView 5 dataset that we are working with contains data only for Virginia, we can omit the State identifier.

Notice, that for this for this **Find**, neither '= exact match' or '" " literal text' will work. These capture all data fields containing the word, "Manassas". Only ' = = field content match' limits our search to fields that exactly match the entered text.

Use the **Find** button to initiate the search. The **Found Set**, shown in Figure 20, displays the number of 27 facilities found in the Status area. These can be viewed as individual records using the flip chart icon in the Status area, or they can be viewed as a list by clicking on the dialogue button immediately above the flip chart. If you wish to map one or more sites, click the **Show on Map** button and a map will be displayed in MARPLOT. A dialogue box allows selection of map display options.

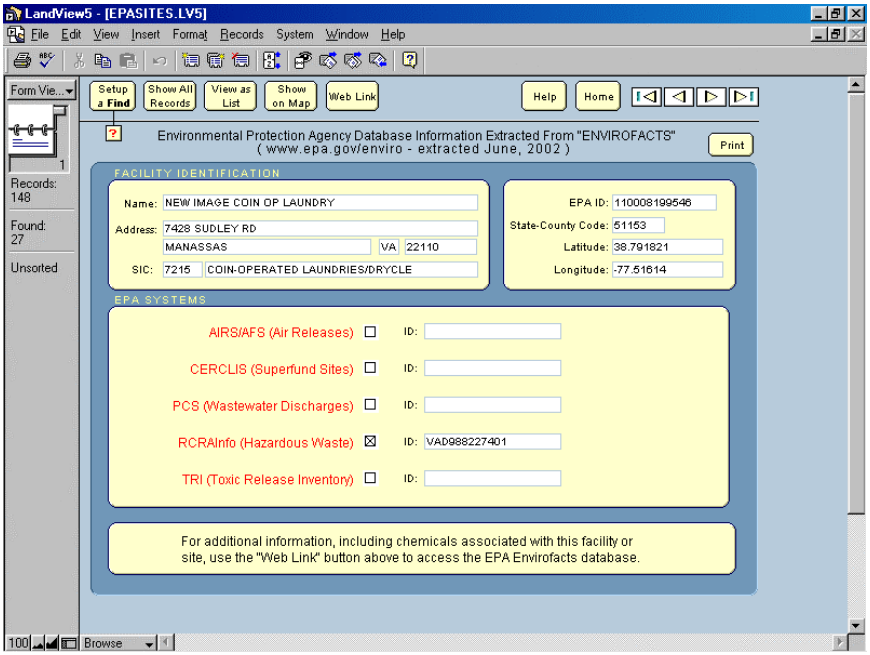


Figure 20—Found Set for RCRA Facilities in the City of Manassas

United States Geological Survey (USGS) Data

The **USGS Geographic Names Information System** database is accessed from the LandView **Home** screen. The screen, shown in Figure 21, is displayed.

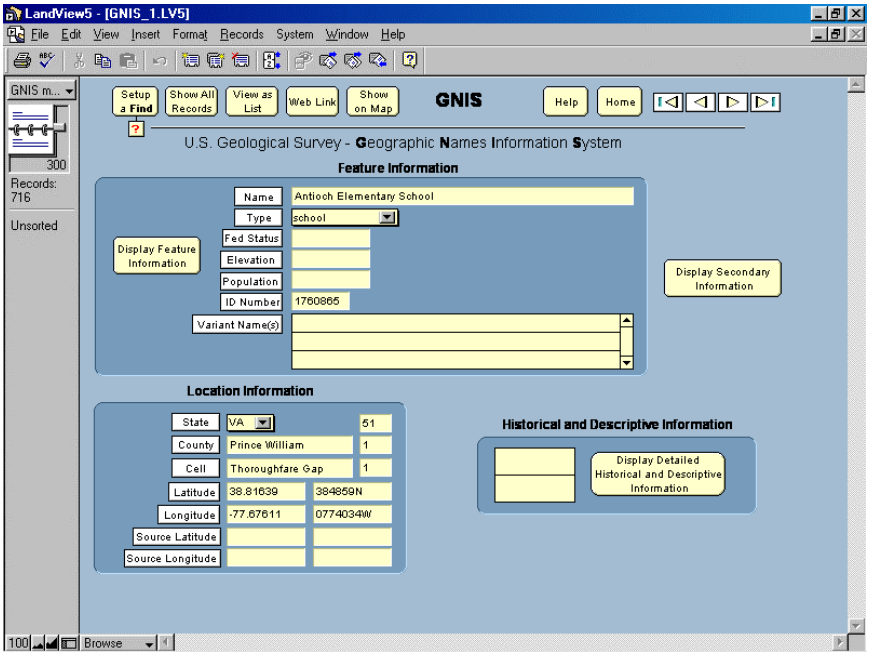


Figure 21 —First Record in GNIS Dataset for LV5_Demo—A School Record

The Geographic Names Information System (GNIS), developed by the USGS in cooperation with the U.S. Board on Geographic Names (BGN), contains information about some 2 million physical and cultural geographic features in the United States. The federally recognized name of each feature described in the database is identified, and references are made to a feature's location by state, county, and geographic coordinates. The GNIS is our Nation's official repository of domestic geographic names information.

As can be seen in Figure 21, not all information fields contain data for all features. If the **Historical and Descriptive Information** button was accessed for Antioch-McCrae School, it would show the School to be an abandoned site. **Type** is a dropdown menu identifying features by descriptive categories, e.g., schools or harbors. For Prince William County and its included independent cities, the **Status** area shows the GNIS to contain 716 feature records.

Using the USGS GNIS Database

Let’s look at an example of using the GNIS. We wish to determine the number of schools included in the Prince William County (not Manassas or Manassas Park) and to find out how many of these schools can be classed as elementary.

This requires two separate Finds. First, use the ‘Setup a **Find**’ button to enter our first criteria—schools as the Type and choose Prince William for the County since it is the geographic area for which we want to confine our search. Figure 22 illustrates our ‘Setup a **Find**’. On Clicking the **Find** button, we see an answer of 71.

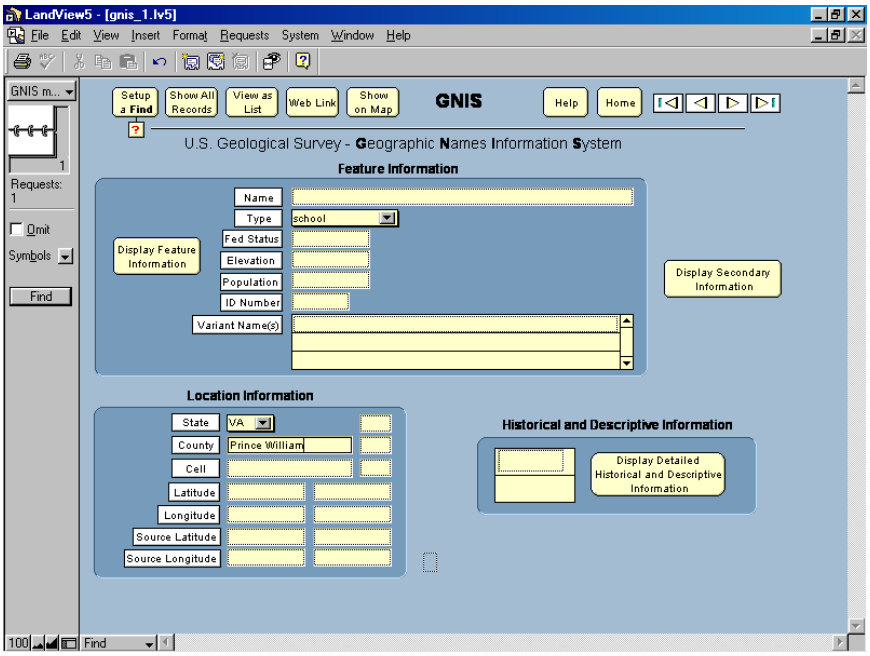


Figure 22—Searching GNIS for the Category—Schools in Prince William County

We can repeat this search. This time our 'Setup a **Find**' criteria will include an additional term[14]. In addition to our two previous terms—Schools and Prince William County, we enter the term, "elementary" in our **Name** field. This **Found** set includes 24 data records. It should be remembered that we have not found all elementary schools in Prince William County—only those whose name includes the term, "elementary". Church schools that could be classed as 'elementary', such as St. Peter's Parochial School, would not be found.

From here we proceed to Lesson 3. In Lesson 3, we take a new look at MARPLOT mapping and its interaction with LandView.

[14] A LandView **Find** does not search the previously **Found** set. The starting point for every **Find** is the complete LandView database.

Lesson 3

The objectives for Lesson 3 are:

- Use the **Address Finder** in LandView and the TIGER/Line map files in MARPLOT to locate a street address
- Determine the state, county, Census 2000 tract number and block group codes for a location
- Use the MARPLOT **Search** function to locate a road intersection

In LandView, the new **Address Finder** function allows users to quickly map a specified street address located within a ZIP Code Tabulation Area (ZCTA). ZCTAs are a new statistical entity developed by the U.S. Census Bureau for tabulating summary statistics from Census 2000. ZCTAs are generalized area representations of U.S. Postal Service (USPS) ZIP Code three or five-digit service areas. The term ZCTA was originated to differentiate between true USPS ZIP Codes and these approximations.

> We have been referred to a medical specialist whose office is at 7950 Ashton Avenue in Bull Run, VA 20109. We wish to locate the office on a MARPLOT map.

From the **LandView Home** page, click on the **Address Finder** button. The LandView 5 **Address Finder** window opens. Enter the first few letters of Street Name—Ashton and in the 5-digit ZIP Code—20109. Click on the **Find Street** button. The **Address Finder** dialogue box is shown as Figure 23.

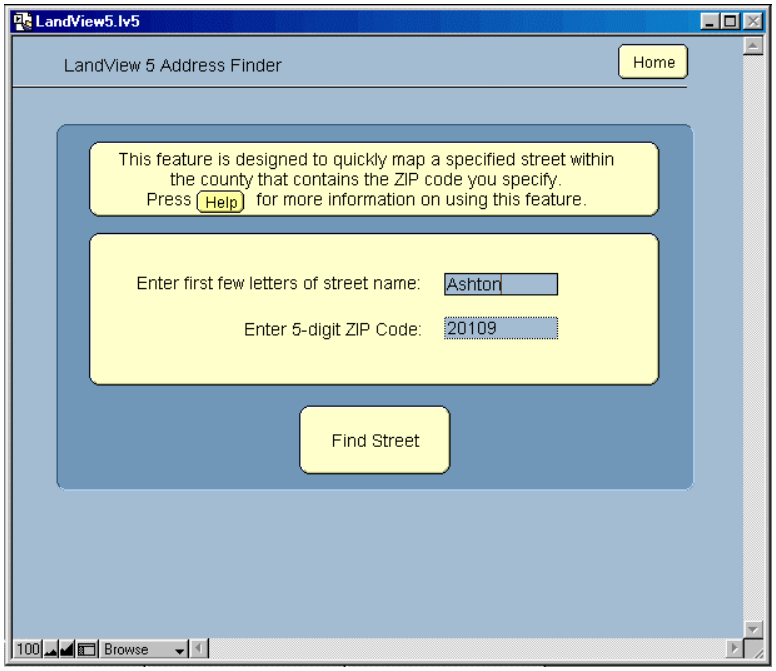


Figure 23—The Address Finder Dialogue Box in LandView

The **Find Street** button returns the program to MARPLOT where a **Search** is initiated. (More on MARPLOT 's Search function later.) The resulting **Search Collection** is shown in Figure 24.

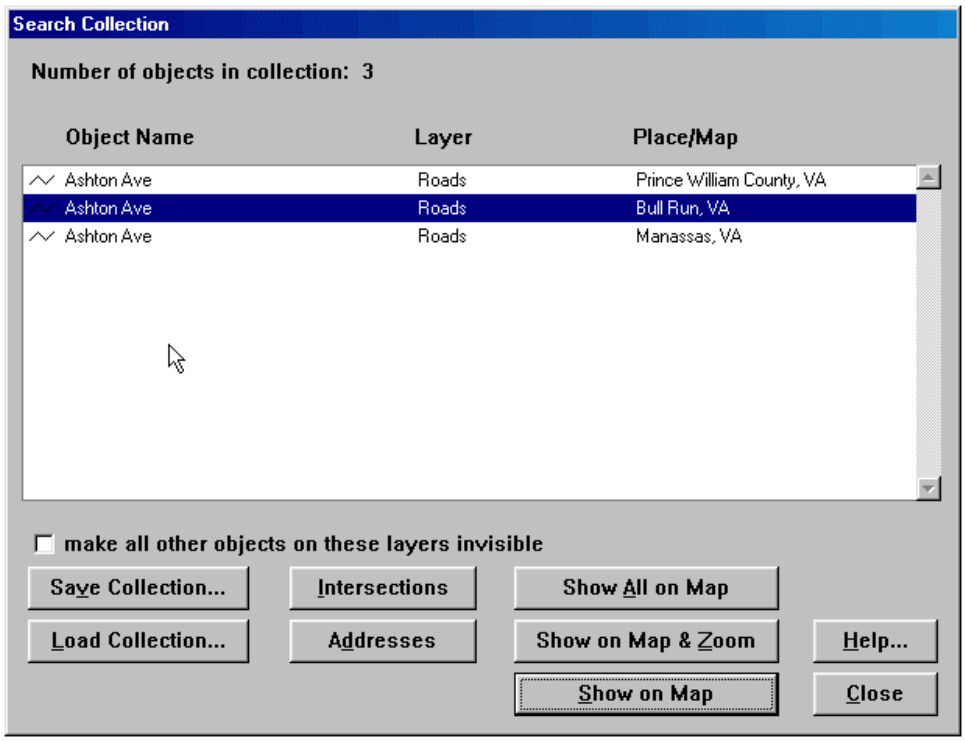


Figure 24—We have located Ashton Avenue in Bull Run VA

The **Search Collection** displays a list of all streets meeting our search criteria. Within ZIP Code 20109. Ashton Avenue passes through two communities and a section of unincorporated Prince William County. We need to highlight that section passing through Bull Run. To locate our street address of 7950, click on the **Addresses** button, and a new dialogue box opens. See Figure 25.

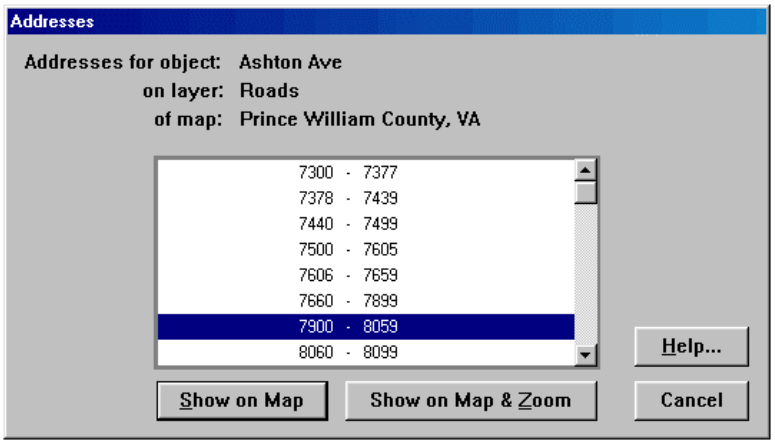


Figure 25—Address Ranges on Ashton Avenue in Bull Run VA

MARPLOT identifies address **ranges** along each block face. A block face, generally, is the line segment contained between two intersections. However, if the roadway should be curving along the block face, two or three segments may define the block face—more on that in a moment. Once you have identified the address range containing your address, use the button option, **Show on Map & Zoom**. This returns you to the map display screen with all of Ashton Avenue in **Select** mode and with the **Focus Point** on a segment of Ashton Avenue containing our address range. This is shown in Figure 26.

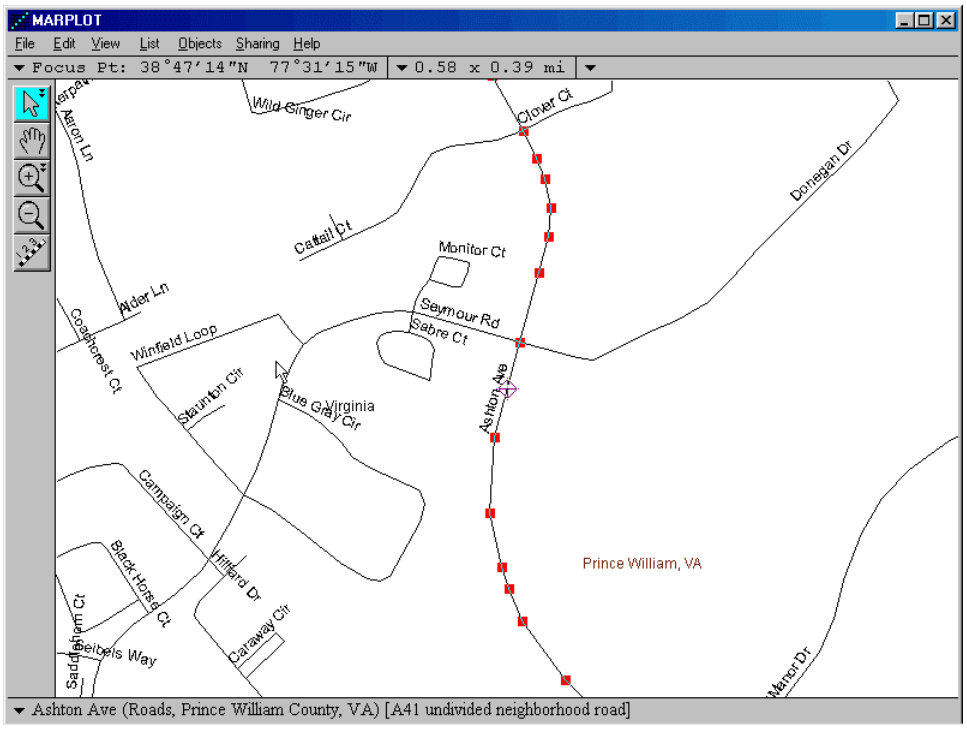


Figure 26—This segment contains 7950 Ashton Avenue, Bull Run VA 20109

We still have questions. Is 7950 on the east side of the street or on the west side? Do the street addresses range upward from north to south or from south to north? To answer these questions, we need to get more information. Use **Objects/Segment Settings . . .** to obtain this information. A new dialogue box opens. See Figure 27.

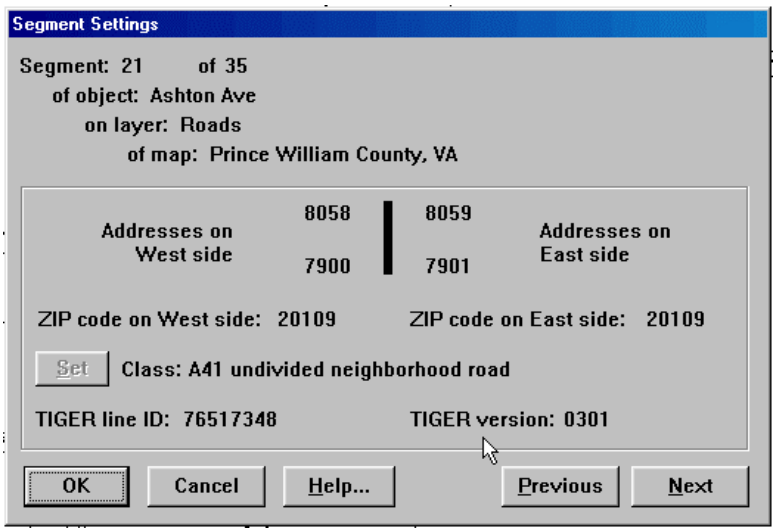


Figure 27—Address Matching using Objects/Segment Settings . . .

Remembering the advisory, above, about curving block faces, we need to examine each segment adjacent to our selected segment. We can do this by either returning to the map and examining selected adjacent segments, or we can use the **Previous** and **Next** buttons to move to adjacent records. Doing so, we will find that four segments contain identical address range information—7900 to 8059. To properly locate the address we need to consider all four segments as a unit. Our target address will lie on the west side of the roadway (even numbers). Presuming that the house addresses are evenly spaced along the four segments, we will spot the address approximately one-third of the distance from south to north.

Before displaying this address on the map, let us call on another bit of MARPLOT functionality—the **Marked Point**. Use **View/Marked Point/Mark Focus Point** to identify our address location. The Marked Point will remain until removed or until a new Marked Point is chosen, even after MARPLOT is shutdown and restarted. Our located address is shown in Figure 28.

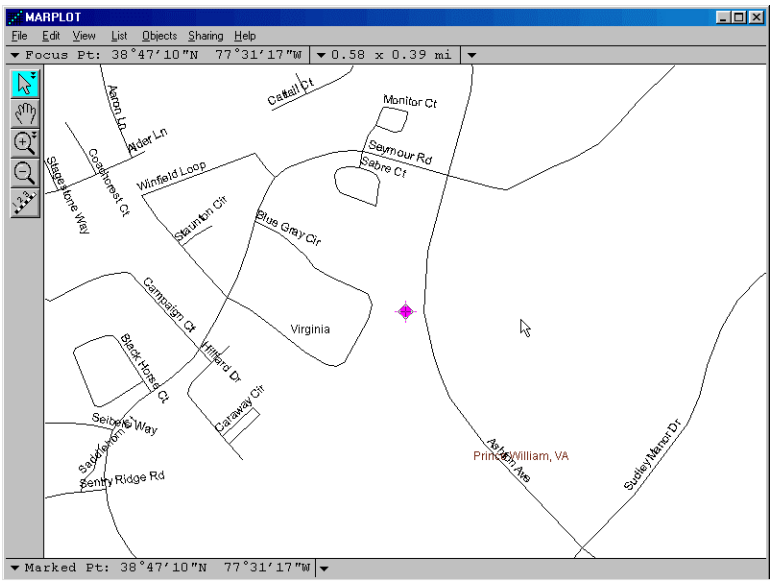


Figure 28—The Marked Point locates our address on Ashton Road

Determining the Census 2000 Tract and Block Group

There are reasons to know additional information about the physical location of a map point. For example, census tract and block group numbers can be required information in applying for a federal assistance grant in various Federal programs. We could, perhaps, go to our **List/Layer List . . .** and selectively **Show** individual layers until we had accumulated the data, but there is an easier way. Use **Sharing/LandView/Identify Census Areas at Current Map Pointer,** On returning to LandView, an information screen, shown in Figure 29, provides the data.

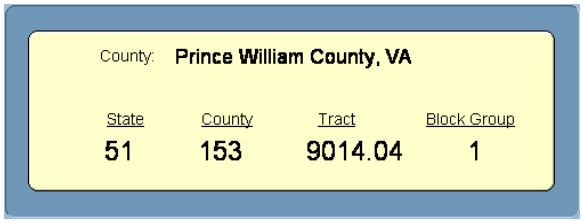


Figure 29—Locational information for our Marked Point

It is again useful to point out that the displayed numbers associated with State and County are referred to as **FIPS Codes**—for Federal Information Processing Standard. The FIPS Code identifier for Prince William County, VA is 51153. The FIPS Code for our two independent cities of Manassas and Manassas Park can be found in MARPLOT by referring to their names in **List/Map List . . .** They are, respectively, 51683 and 51685. Alternately, they could be found in LandView by setting up a **Find** in the Counties database. The FIPS Code identifier is shown in the Database header.

While the above address search was initiated in LandView, MARPLOT 's **Search** functionality could have been used instead. Additionally, from MARPLOT, we can locate the intersection of two roads. One proviso—for an address or an intersection search in MARPLOT, it is important to know the County containing the address. For example,

many of the three thousand and some counties in the country contain some variation of a Washington Street, and, without identifying the Search county, we could be deluged with many false positives. We will search for the intersection of Ashton Avenue and Donegan Drive in Bull Run, Virginia. But, first a principle:

> In every MARPLOT search, we are looking for *one or more objects* on *one or more layers* of *one or more maps*.

To start the Search, use **List/Search . . .** to open the Search dialogue. Figure 30 shows the dialogue with our information entered.

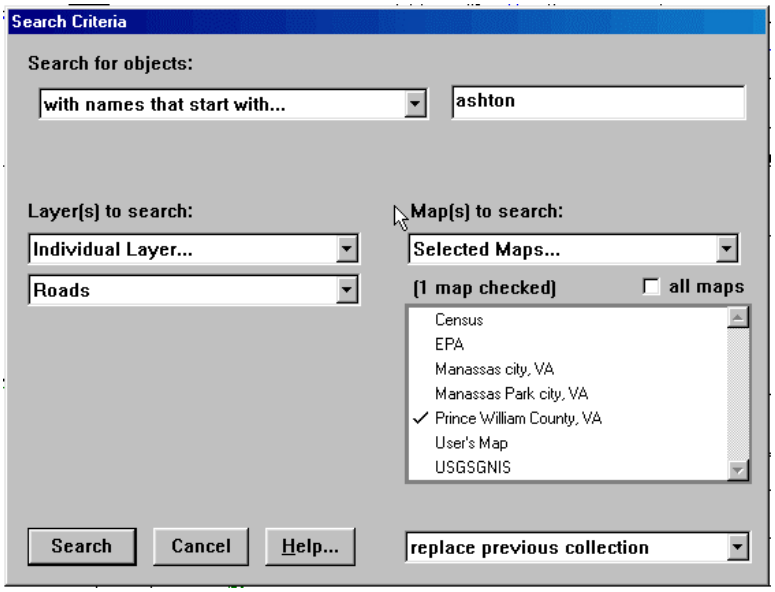


Figure 30—MARPLOT Search for a Road

The Search dialogue reflects our principle—object, layer and map. In searching for an object there is a dropdown menu that allows multiple methods for describing the object. We can specify individual or multiple layers, or all layers. If we are confident that our layer name is contained on only one map, we can default to "Maps in View". However, when searching for a street name we need to be careful to specify the containing County—therefore, Prince William County. The **Search** button initiates the Search.

The results of the Search are displayed in the **Search Collection**—a similar information screen to that in which we viewed the results of our LandView Search. This is displayed in Figure 31.

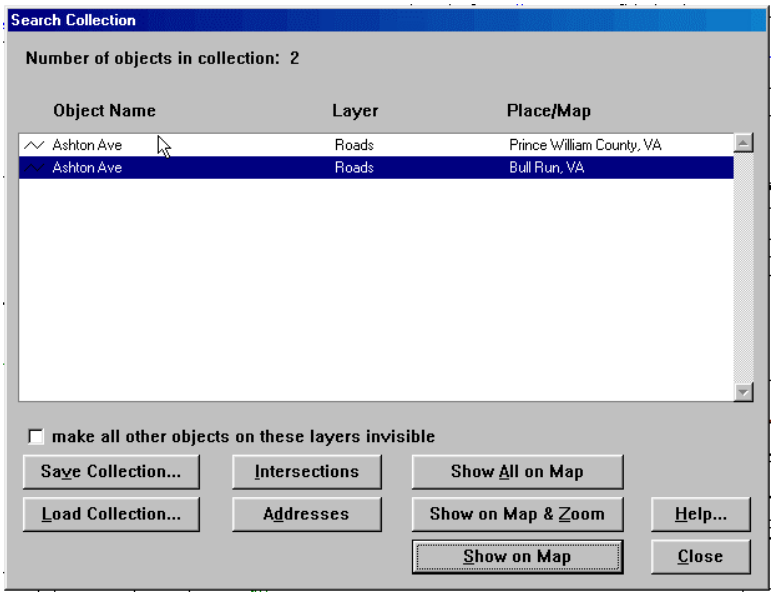


Figure 31—**Search Collection** for Ashton Avenue **Search**

This time, our interest is in those roads intersecting with Ashton Avenue, so we use the **Intersections** button. This brings up the screen shown in Figure 32.

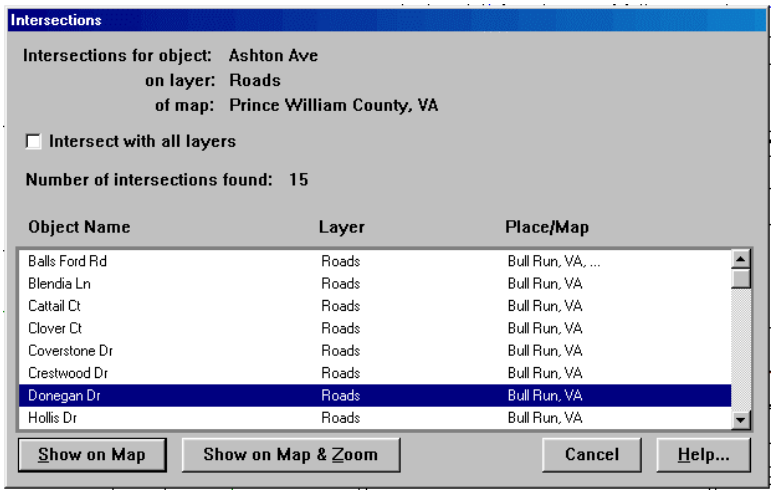


Figure 32—Donegan Road intersects with Ashton Avenue

Using **Show on Map & Zoom**, we return to the screen with the view shown in Figure 33.

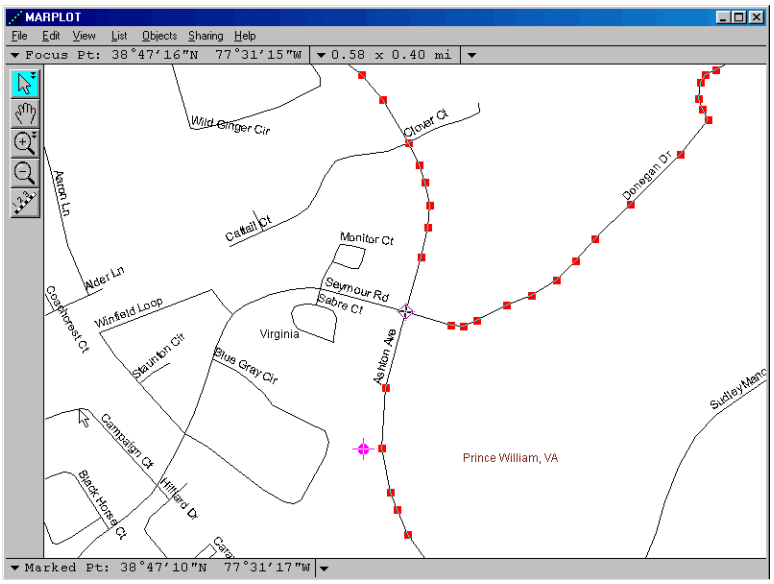


Figure 33—Donegan Road Intersects with Ashton Avenue

Notice that we now have two roads in select mode, and our map centers on the intersection of the two roads. Since we have not changed our Marked Point, it still displays the results of our previous Search.

Lesson 4

The objectives for Lesson 4 are:

- Use LandView to examine a subset of population within a geographic area
- Examine data crossing multiple jurisdictions
- Examine the extracted data as a **Thematic** map

Examining a Subset of the Population

In Lesson 2, we used **Sort** order to find instances of older population—those 65 years of age and older. Let us return to that theme. This time, we ask—what areas of Prince William County and its included independent cities contain older population greater than 10% of the total population. We will want to view this data thematically in MARPLOT. We will be using census block groups—groupings of census blocks that show a wider range of demographic data than census blocks—as our search unit.

LandView data for Prince William County is maintained separately from that of Manassas and Manassas Park, and our **Find** must include all three[15]. In LandView, each search of an additional dataset is counted as a **New Request**. However, the multiple requests are folded into a single **Find** operation.

In LandView, access the data for census block groups. We need to 'Setup a **Find**'. This is shown in Figure 34.

[15] Since the dataset includes *only* the three jurisdictions, a single search of the entire database would give the same results. However, in dealing with the state and national datasets, each added jurisdictional unit would require separate identification.

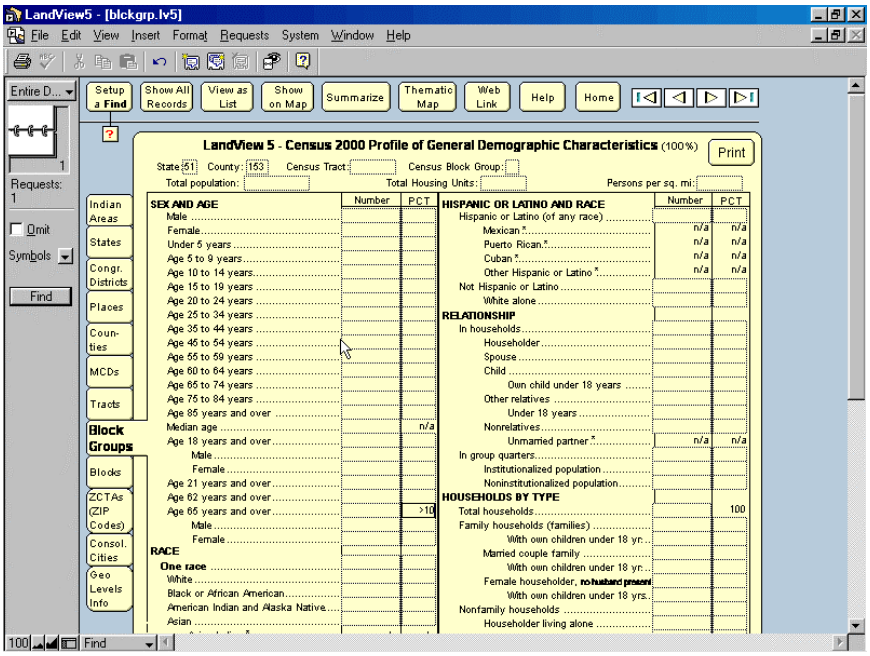


Figure 34—First Request (of three) in 'Setup a **Find**' for Age 65 Years and Older, Greater Than 10%

In the **Status Area**, this **Find** request is identified as *Request 1*. For our State and County identifiers, we must use their FIPS Code designations[16]. The substance of our **Find** is shown in the **Percentage** column for the field designation, "Age 65 years and over". The Boolean character for 'greater than', >, can be entered from the keyboard, or it can be entered from the **Symbols** menu. *Do not press the **Find** button!* We have yet to enter our second and third requests. Use **Request/Add New Request** to open a new, blank 'Setup a **Find**' sheet. Again, we need to enter the State designation. This time, enter the FIPS Code for Manassas—683. We need to re-enter our data request for populations 65 years and older. When complete, a third request for Manassas Park—685—is necessary. Now, we can use **Find** to initiate our Search!

The results are shown in Figure 35. Out of 175 Block Groups, 19 meet our criteria. But, where are these groups, and which groups contain the very highest percentage of older people? **Thematic Mapping** provides the answers to these questions.

[16] To determine the appropriate FIPS Code, you can return to the County tab. There, each named county displays its associated FIPS Code.

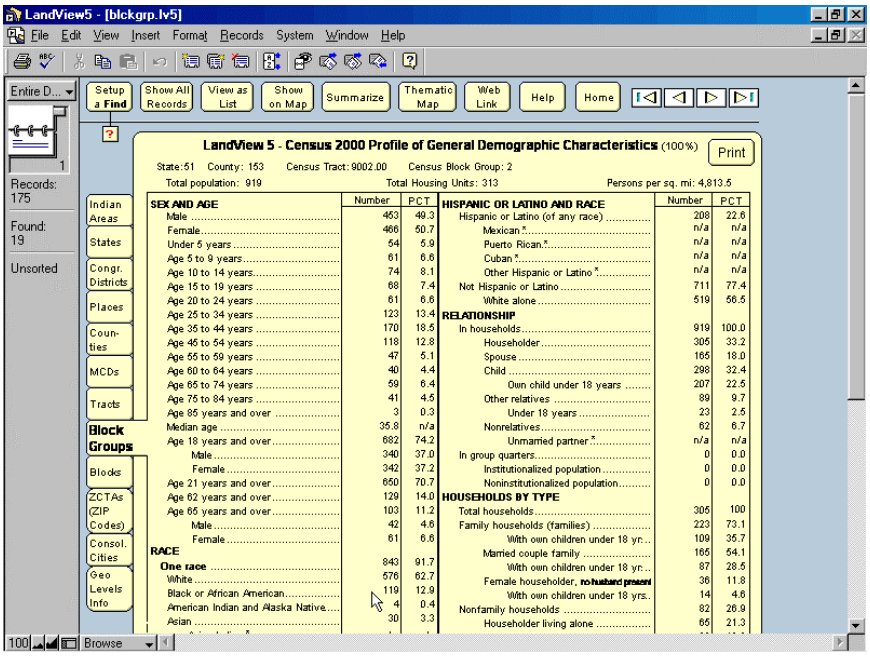


Figure 35—The Found Set for Census Block Groups with Older Populations Greater than 10%

With the **Found Set** of records displayed, first click in the data field of interest—Percentage population 65 year of age and older—and click the **Thematic Map** button. The dialogue box in Figure 36 appears.

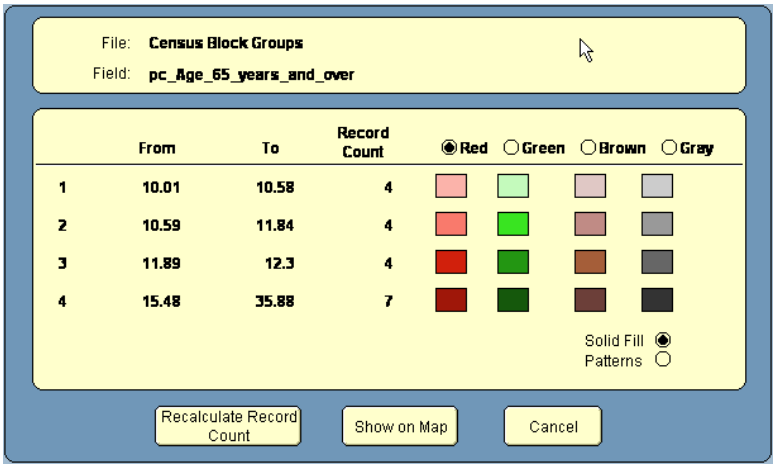


Figure 36—Default Distribution for Thematic Mapping

Our nineteen records are divided evenly into four parts, **quartiles**, with the overflow going into the last **quartile**. The **Show on Map** button brings us to MARPLOT with only our nineteen **Found** Census Block Groups displayed. The automatically displayed **Legend** provides a key to the Graphics. This is shown in Figure 37.

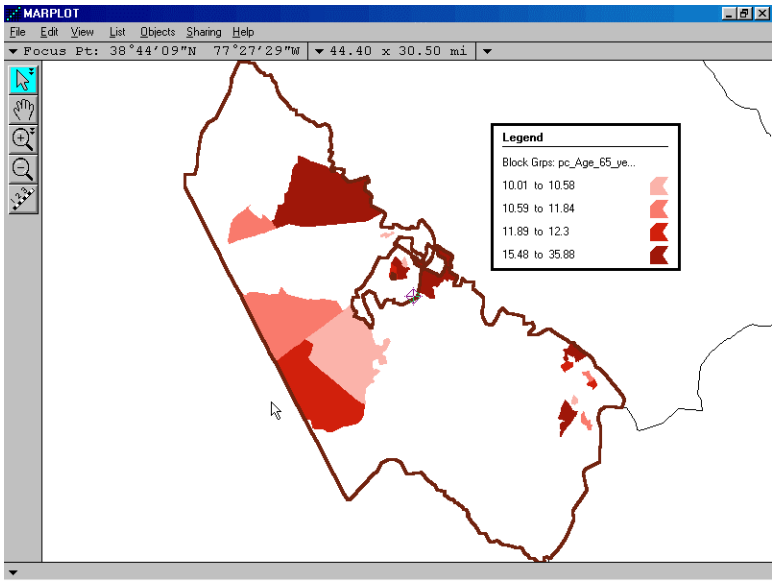


Figure 37—High Percentages of 65 Years and Older Populations in PWC, Manassas and Manassas Park

While LandView does all of the work in calculating the above display, you may be more comfortable with creating number ranges to which a user may more easily relate. The range information in Figure 36 can be edited. Figure 38 displays a more meaningful set of range data. LandView needs to be told to **Recalculate Record Count** before the new distribution occurs. It is important to remember that the ranges must be continuous; data can be lost if there are breaks in the data ranges.

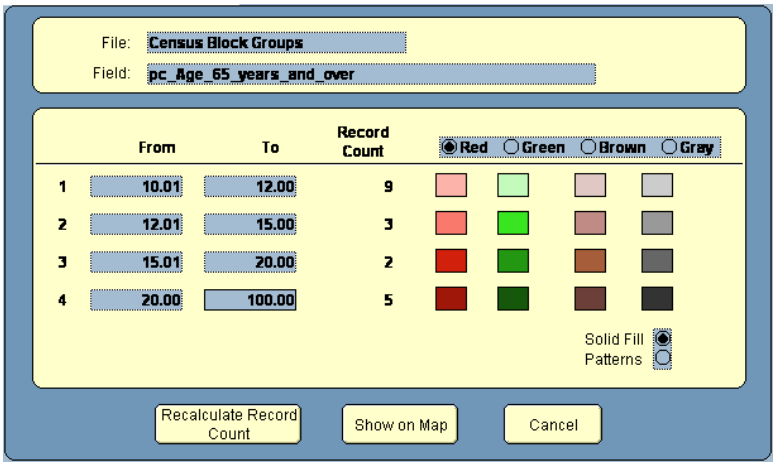


Figure 38—Revised Data Ranges for Thematic Display

When you are finished reviewing the map, return to LandView 5 and select the **Cancel** button in the Quartiles dialogue box. This will clear the thematic map and return you to the Census Block Group data form.

Lesson 5

The objectives for Lesson 5 are:

- Determine the population within a radius of a mapped point
- Use MARPLOT 's **Search** to search for other mapped objects within a radius

In an earlier discussion, we pointed out that a population estimate could be initiated either from LandView or from MARPLOT. In LandView, there is the option to enter a text value for latitude and longitude. However, LandView relies on MARPLOT to identify the units of population—this at a radius about the **Focus Point**. LandView is continually aware of the location of the **Focus Point** in MARPLOT. The actual units of population captured in MARPLOT are census blocks.

> Let us consider our Doctor's office of Lesson 3. The Doctor is aware that much of his practice comes from patients living within two miles of his Office. He is interested in how many people meet this condition.

In MARPLOT, our Marked Point is still set at the Doctor's office. Use **View/Marked Point/Center on Marked Point** to return our Focus Point to the Doctor's Office. For a visual representation of our Search, use **List/Layer List** to turn off all layers except Census Block Points and Counties layers. Use **View/Set Scale** to set our window distance to 6 miles. This is the view shown in Figure 39. Each displayed point represents a census block containing either population and/or housing units[17]. Now, we need to use LandView/MARPLOT functionality to capture this data as a population estimate.

[17] One-third of the 8.2 million Census Blocks do not contain either population or housing units. These are excluded from LandView 5. Doing this conserves file space and improves mapping performance.

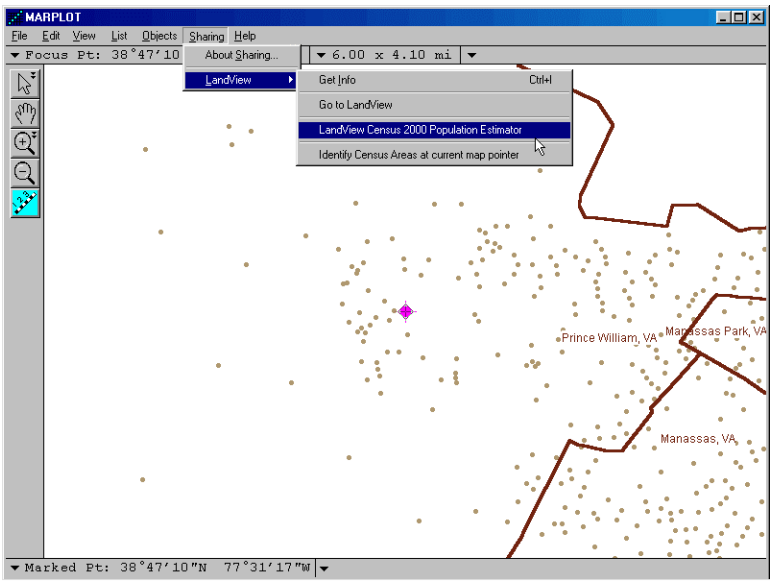


Figure 39—Census Block Distribution Prior to Accessing the Population Estimator

Use **Sharing/LandView/Census 2000 Population Estimator** to go from MARPLOT to the Population Estimator within LandView. In LandView, we need to specify a search radius before invoking the **Calculate Population** button. The results are displayed in Figure 40.

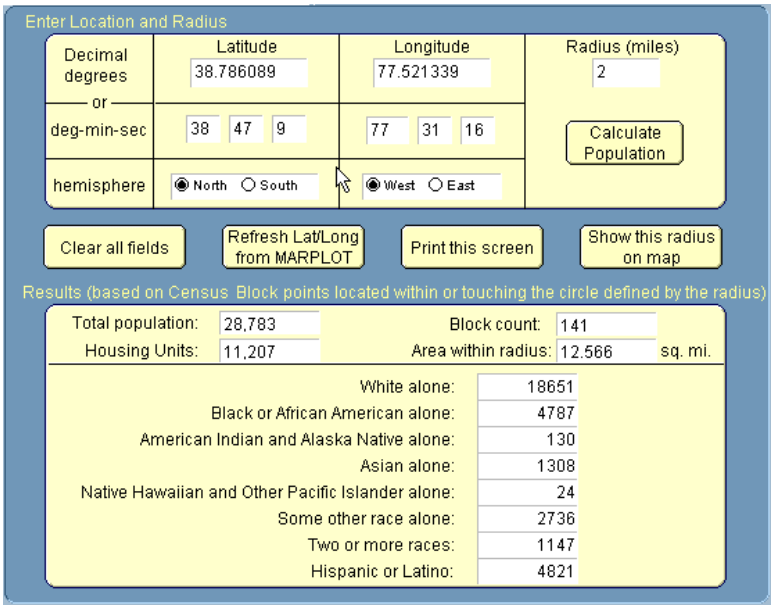


Figure 40—Population Statistics at a Radius of Two Miles of Doctor's Office

Shown are Total Population, Housing Units and Block Count. The calculated area of our Search circle is also displayed. This detailed information of block by block census count comes at a price—privacy! Title 13, United States Code Section 9 prohibits the Census Bureau from publishing results in which an individual's data can be directly or indirectly identified. For this reason, the same depth of demographic data displayed for larger statistical and political units is not available for census block data.

Notice the **Show This Radius on Map** button. Figure 41 shows the Search Circle in MARPLOT. The circle is a map object and can be used to gather additional information regarding our area of interest—road nets, schools, EPA regulated facilities, etc. The circle is contained in a special MARPLOT layer called the **LV Work Layer** in a Layer Group called **Other**. Like the **Temporary Layer**, also in the **Other** Group, its objects will disappear on shutdown unless other means are used to save the data. Notice, too, that our **Reference Circle** extends into neighboring Fairfax County, for which no data is available in this Tutorial version of LandView. If your search area extends beyond the data available in LandView/MARPLOT, you will have incomplete data, and you may draw unwarranted conclusions.

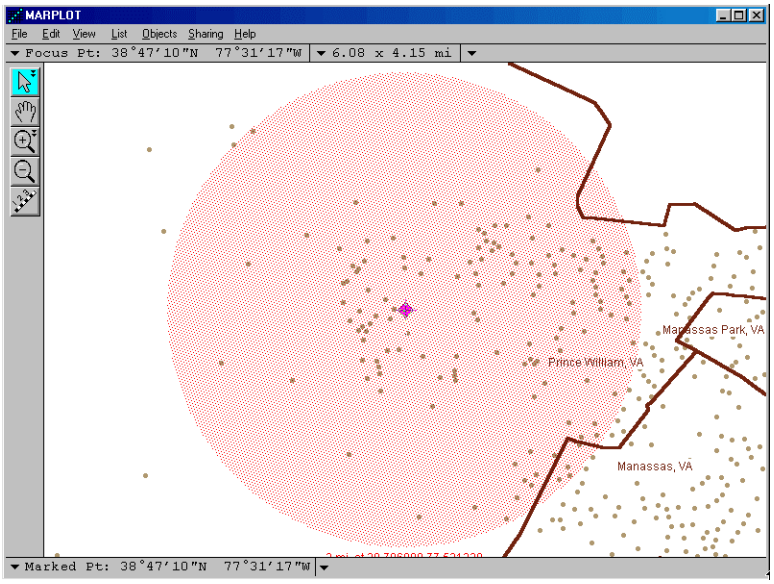


Figure 41—The Population Estimator Displays Its Search Area in MARPLOT

More on MARPLOT Searches

MARPLOT **Search** is a particularly powerful tool. We have used it once to search for objects by name. We will now use it to search for map objects at a radius around a point. For simplicity, since we still have a **Marked Point**, we will continue to use that as our point of interest. **List/Search . . .** opens the **Search** dialogue. Figure 42 displays various methods for characterizing our search objects. Note that ellipsis (. . .) indicates that that choice will open a new dialogue box in which to provide additional information.

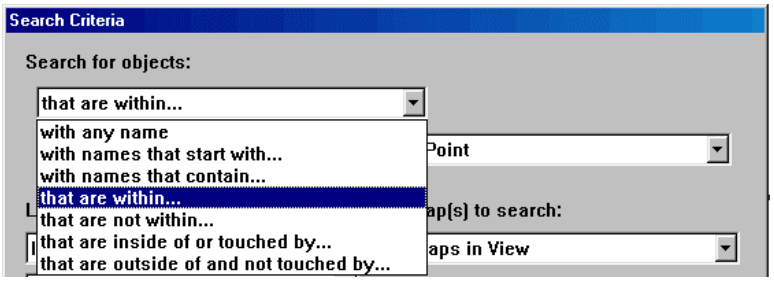


Figure 42—Search Dialogue for Radius Around a Point

On selecting **that are within . . .** as the search methodology, a new dialogue box opens asking for additional information. The information provided is shown in Figure 43.

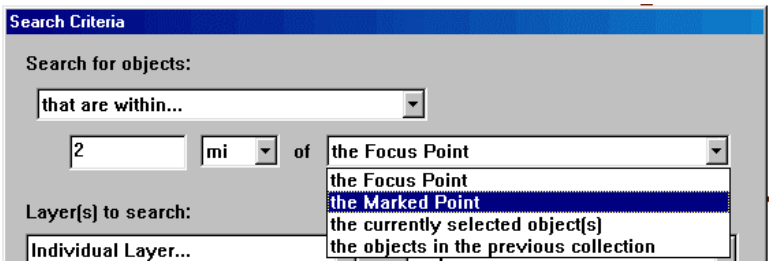


Figure 43—Further Defining the Search Criteria

As you can see, we can specify any radius, and we can specify a number of ways of defining the center points of the search. Our completely defined search is shown as Figure 44. The Search Collection resulting from the Search is shown as Figure 45.

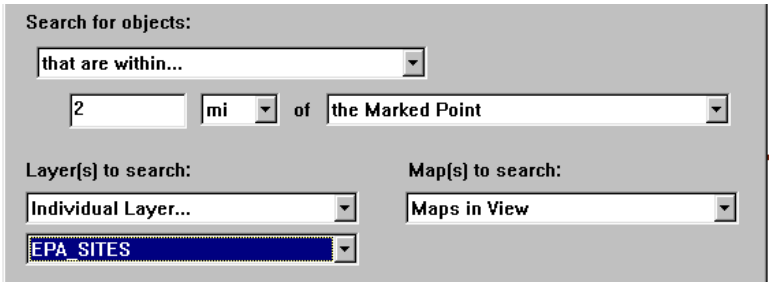


Figure 44—A MARPLOT Search Completely Defined

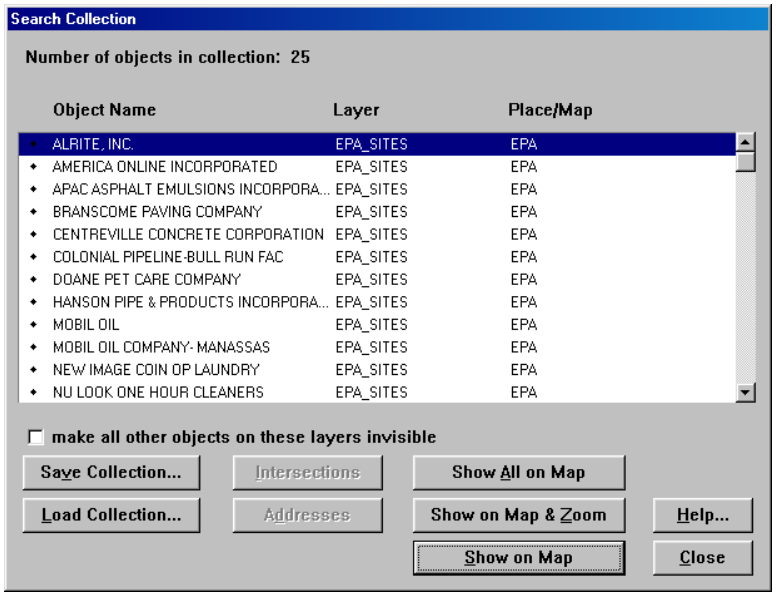


Figure 45—The Search Collection for Figure 44

Defining a MARPLOT Search provides a number of options, and users have flexibility in defining searches. Refer back to Figure 41. Displayed is the defining area as used by the Population Estimator. This is a map object. Clicking on it places it in **Select** mode. Since

this circle is centered on our Marked Point and since this circle has a radius equal to our search radius in the previous example, it duplicates the conditions of the previous example. We could have as easily defined the previous search as shown in Figure 46.

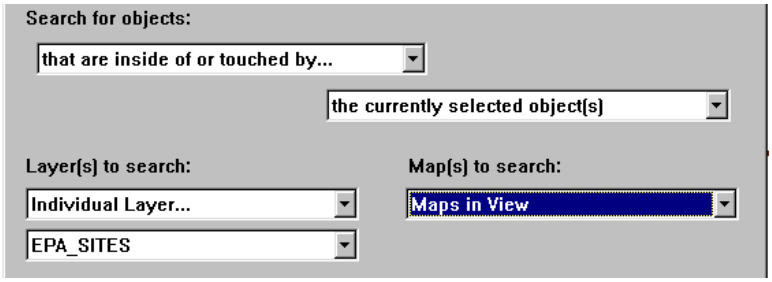


Figure 46—An Alternate Specification for our Previous Search

Lesson 6

The objectives for Lesson 6 are:

- Determine the population within an irregular polygon as a map feature
- Get additional demographic data on a determined population
- Introduce the concept of Urban Area

Our LandView/MARPLOT experience centers around Census data, and our concerns are most likely to be people concerns. The final lesson in the Tutorial will explore other methods of obtaining population data and improved demographics.

Population Contained Within an Irregular Polygon

There are times when it becomes important to determine the population living within the boundaries of an irregular polygon—a school district, a fire district, etc. There are methodologies for creating such polygons, but, for the moment, our concern is using such irregular polygons to determine population. For this example, let us use a polygon already created for us—the **Washington DC Urbanized Area**.

Urban Areas is a Census Bureau statistical concept newly introduced into the LandView series with the publication of LandView 5. It is a precursor to enhanced demographic information for Urban Areas that will be available with the next iteration of LandView—LandView 6. In LandView 5, only the MARPLOT polygons defining urbanized areas and urban clusters are available. However, these polygons can be used in conjunction with census block data to determine population count and housing units within the area. For definitions and other details on urban areas go to:

http://www.census.gov/geo/www/ua/ua_2k.html.

Prince William County and the Cities of Manassas and Manassas Park contribute only part of their areas to the Washington DC Urbanized Area—which extends into Maryland as well as into Virginia. On State CDs[18] and the National DVD set, data will be available to calculate the entire population of an Urbanized Area. For this Demo version, we can calculate only that part of their total population these Virginia entities contribute to the Washington DC Urbanized Area.

First, let us look at Prince William County in relation to the Washington DC Urbanized Area. Use your MARPLOT skills to hide all layers except Urban Areas and Counties and zoom in to a view that just contains both entities. This is the view shown in Figure 47. To replicate the screen, use Graphic Override (Blue-Blue) to change **Color** to pink, **Line** to heavy and **Fill** to dots.

[18] Only for those Urban Areas contained entirely within the State.

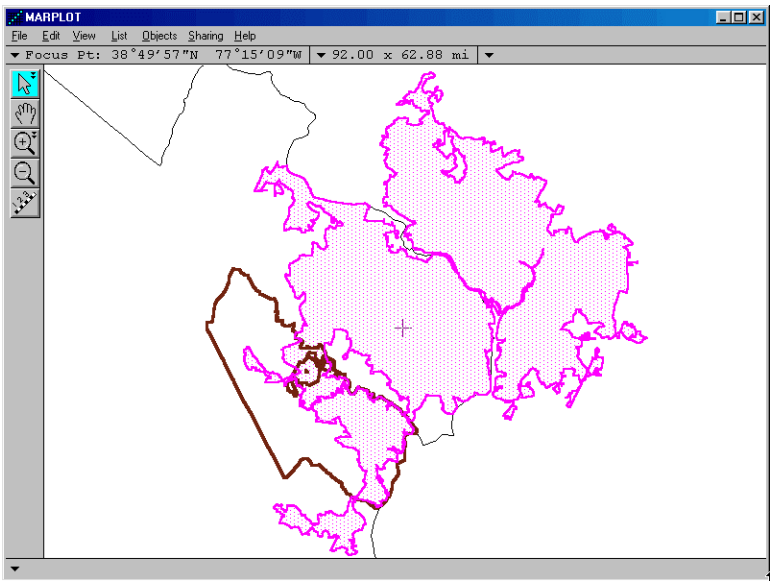


Figure 47—The Washington DC Urbanized Area overlaid on Prince William County

Place the Washington DC Urbanized Area in Select mode by clicking anywhere in the polygon. We now want to search for census block points contained within our polygon. Our Search is shown in Figure 48 and the resulting Search Collection, in Figure 49. Please note that on some computers due to the size of the search collection the program may take a bit of time to process.

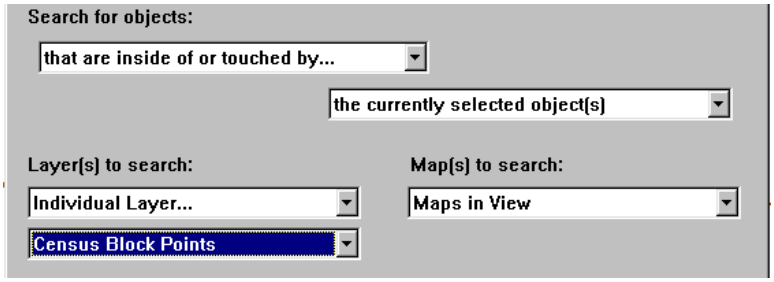


Figure 48—Block Points Inside an Irregular Polygon

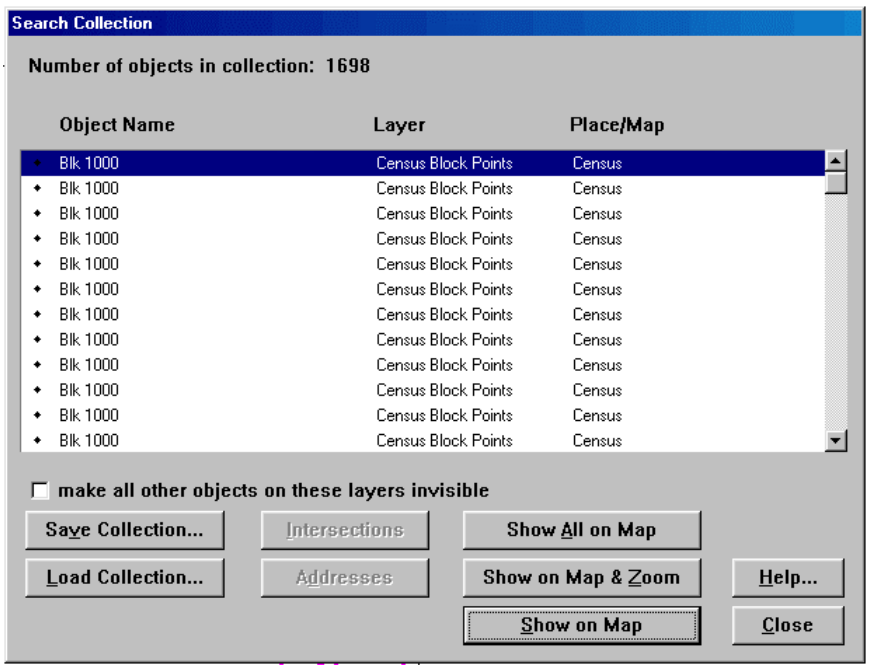


Figure 49—Census Block Points in the Search Collection

We now need to show all of the objects in the Search Collection in **Select** mode on the map. To do this we need to use the **Show All on Map** button. With the objects in **Select** mode in MARPLOT, we can use **Sharing/GetInfo** to ask LandView for Information. This view is shown as Figure 50.

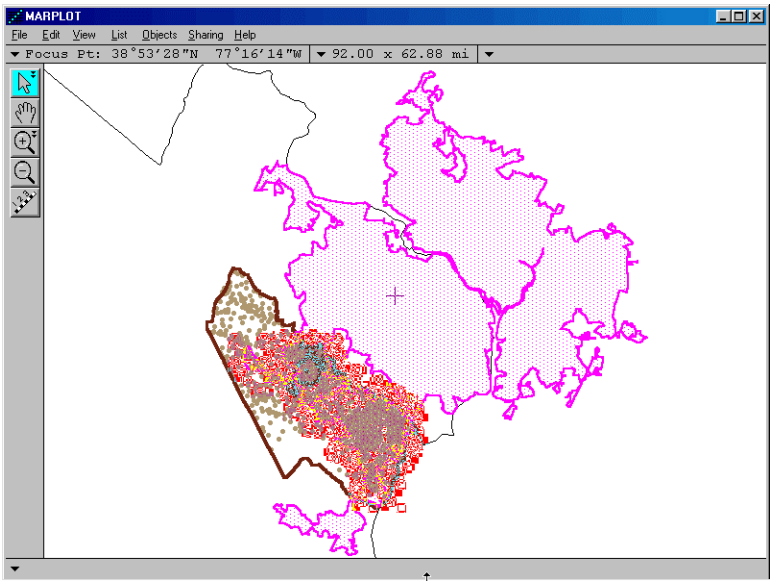
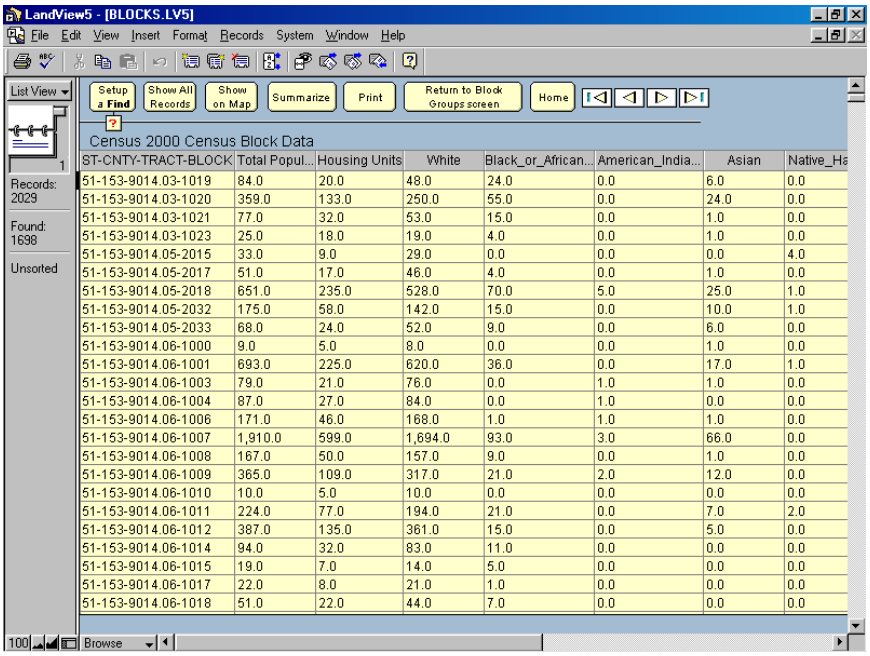


Figure 50—Prince William County's Contribution to the Washington Urbanized Area in Select Mode

LandView processes the request using the census blocks database. Results are shown in Figure 51.



ST-CNTY-TRACT-BLOCK	Total Popul...	Housing Units	White	Black_or_African...	American_India...	Asian	Native_Ha
51-153-9014.03-1019	84.0	20.0	48.0	24.0	0.0	6.0	0.0
51-153-9014.03-1020	359.0	133.0	250.0	55.0	0.0	24.0	0.0
51-153-9014.03-1021	77.0	32.0	53.0	15.0	0.0	1.0	0.0
51-153-9014.03-1023	25.0	18.0	19.0	4.0	0.0	1.0	0.0
51-153-9014.05-2015	33.0	9.0	29.0	0.0	0.0	0.0	4.0
51-153-9014.05-2017	51.0	17.0	46.0	4.0	0.0	1.0	0.0
51-153-9014.05-2018	651.0	235.0	528.0	70.0	5.0	25.0	1.0
51-153-9014.05-2032	175.0	58.0	142.0	15.0	0.0	10.0	1.0
51-153-9014.05-2033	68.0	24.0	52.0	9.0	0.0	6.0	0.0
51-153-9014.06-1000	9.0	5.0	8.0	0.0	0.0	1.0	0.0
51-153-9014.06-1001	693.0	225.0	620.0	36.0	0.0	17.0	1.0
51-153-9014.06-1003	79.0	21.0	76.0	0.0	1.0	1.0	0.0
51-153-9014.06-1004	87.0	27.0	84.0	0.0	1.0	0.0	0.0
51-153-9014.06-1006	171.0	46.0	168.0	1.0	1.0	1.0	0.0
51-153-9014.06-1007	1,910.0	599.0	1,694.0	93.0	3.0	66.0	0.0
51-153-9014.06-1008	167.0	50.0	157.0	9.0	0.0	1.0	0.0
51-153-9014.06-1009	365.0	109.0	317.0	21.0	2.0	12.0	0.0
51-153-9014.06-1010	10.0	5.0	10.0	0.0	0.0	0.0	0.0
51-153-9014.06-1011	224.0	77.0	194.0	21.0	0.0	7.0	2.0
51-153-9014.06-1012	387.0	135.0	361.0	15.0	0.0	5.0	0.0
51-153-9014.06-1014	94.0	32.0	83.0	11.0	0.0	0.0	0.0
51-153-9014.06-1015	19.0	7.0	14.0	5.0	0.0	0.0	0.0
51-153-9014.06-1017	22.0	8.0	21.0	1.0	0.0	0.0	0.0
51-153-9014.06-1018	51.0	22.0	44.0	7.0	0.0	0.0	0.0

Figure 51—LandView's Display of the Get Information Request from MARPLOT

What we see in Figure 51 is a table of records for each of the census block points contained within our irregular polygon. To reduce this to meaningful data, there is a **Summarize** button. Invoking **Summarize** results in the display screen shown in Figure 52.

population	housing units	white	black	indian	asian	pacific	other	multi_race	hispanic
300,479	104,368	203,295	56,759	1,185	11,997	392	15,613	11,238	33,513

Figure 52—Prince William County, Manassas and Manassas Park's Contribution to Washington UA

The above demonstrated method for population search has general applicability. Any MARPLOT map objects that is linked to information attributes in LandView can be captured in a Search, and its LandView data component can be examined. We could, as well, have searched for EPA regulated sites within the Washington DC Urbanized Area. If so, our first LandView record would appear as Figure 53.

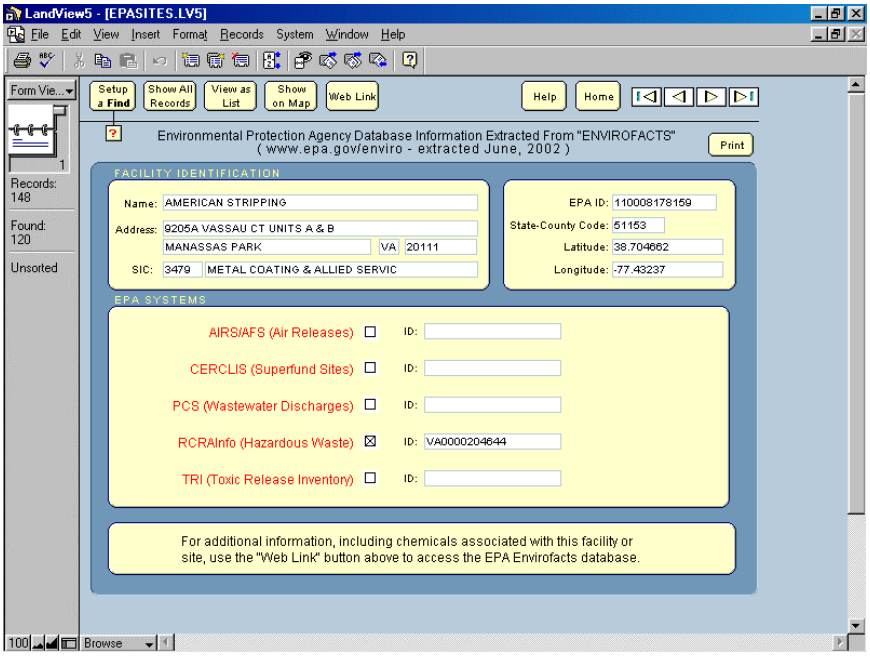


Figure 53—A U.S. EPA Site within the Washington DC Urbanized Area

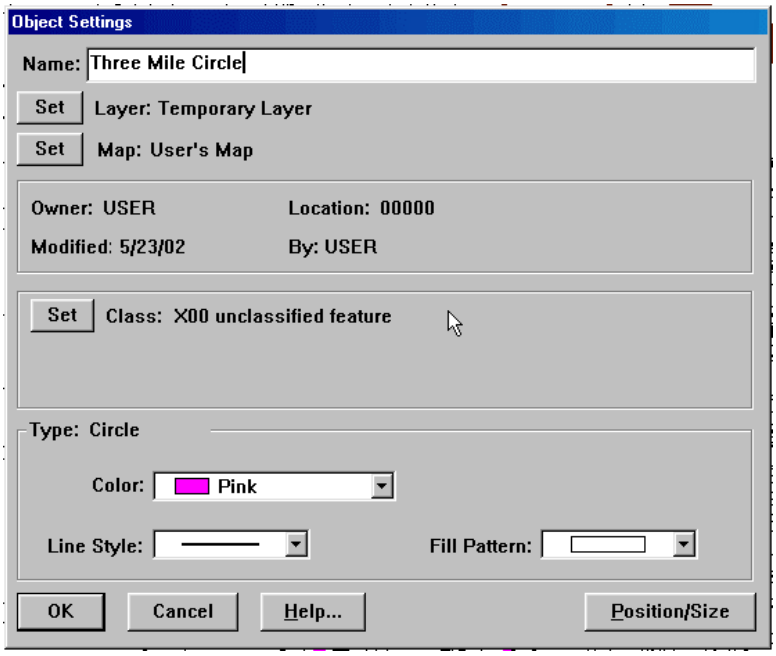
To Obtain Demographic Data, Use Census Block Groups

As previously stated, only limited demographic data is associated with census block points. However, there are times when we wish to obtain a broader demographic profile of a mapped area. Most appropriate to this end is the use of census block groups[19]. Consider the following scenario:

> A merchant plans to open a new retail outlet at the corner of Dale Boulevard and Hoadly Road in Dale City, Virginia (Prince William County). Most of his customers will live within a three mile radius of his establishment. He wishes to know the demographic makeup of the community.

To start, we need to do some preparation. We need to locate the intersection of Dale Boulevard and Hoadly Road. To do this, we will use **Search**. Once found, **Mark** the point for easy retrieval. We should also create a new map object—a 'Reference Circle'. In **List/Layer List . . .** , unlock the **Temporary** layer contained in the **[Other]** group. On returning to the map screen, we see that map drawing tools are now available to us. Set the map scale to a window distance of 10 miles. Use the Circle tool,  , to draw a circle from the Marked Point to a radius of three miles. On releasing the mouse, an Object Settings . . . dialogue box appears. MARPLOT wants information about your new map object. An annotated dialogue box appears in Figure 54.

[19] A close examination of the data displays for block groups and tracts in LandView will show that not all data fields implemented in tracts are available at the block group level.



54—The Object Setting Dialogue Box for the Reference Circle

We can identify our object as "Three Mile Circle". It is on the **Temporary Layer** (Objects on the Temporary Layer disappear on exiting from MARPLOT [20]) and the **User's Map**. Specify the **Color** as Pink, the **Line Style** as 'double' and the **Fill Pattern** as 'empty'. An **OK** returns us to the map screen shown in Figure 55 with the Reference Circle still in select mode.

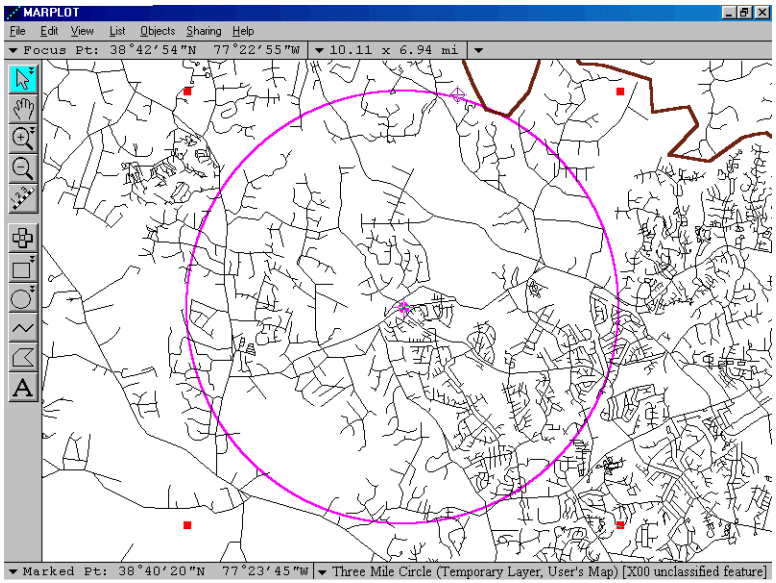


Figure 55—Reference Circle around Dale Boulevard and Hoadly Road

[20] Objects can be moved from a temporary layer to a permanent layer if both layers are unlocked. Place the objects in Select mode and use **Objects/Move objects to layer . . .** .

We still have several steps of preparation before we initiate a **Search** for the Census Block Groups that meet our **Search** conditions. First, let us hide our Roads layer and place the Census Block Group layer in Show mode. These polygons are 'unfilled', as shown in Figure 56.

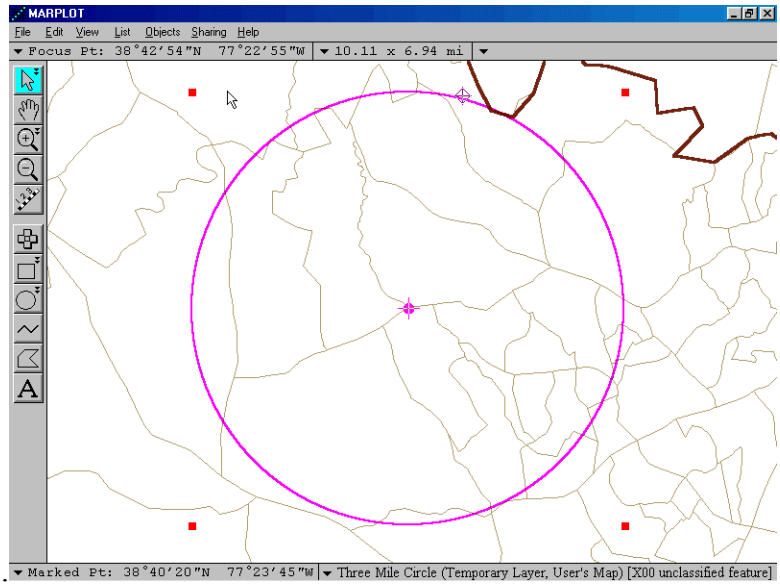


Figure 56—Census Block Groups Displayed as Unfilled Polygons

Polygon selection is easier using filled polygons. Return to **List/Layer List . . .** to place the Census Block Group layer in **Graphic Override** mode (Blue-Blue), and use the **Set (Default Graphics)** to set the fill pattern to a crosshatched selection. When we return to the screen, our view will appear as in Figure 57.

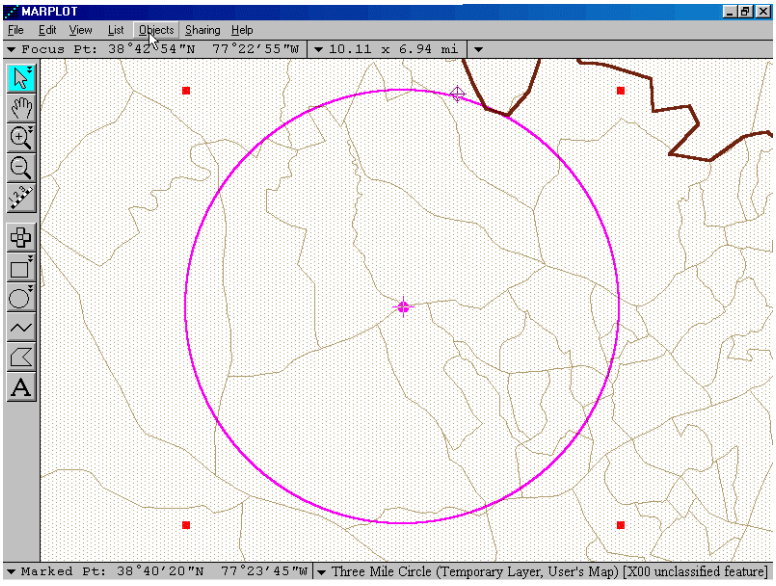


Figure 57—Census Block Groups as Filled Polygons

We now use our Reference Circle to ‘capture ‘ those Census Block Groups that are inside of or touched by our Reference Circle. Our search statement is shown in Figure 58.

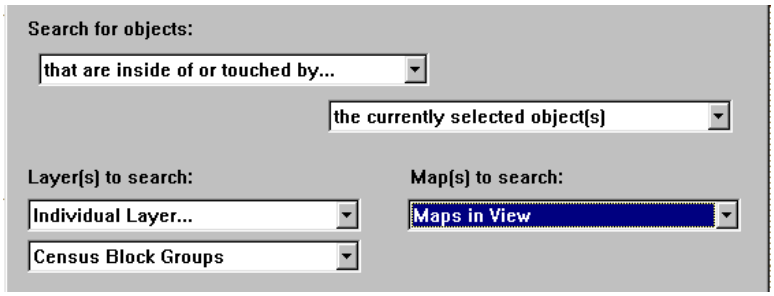


Figure 58—Identifying Census Block Groups Touched By the Reference Circle

We will use the **Show All on Map** option to display the Search Collection. This view is shown in Figure 59.

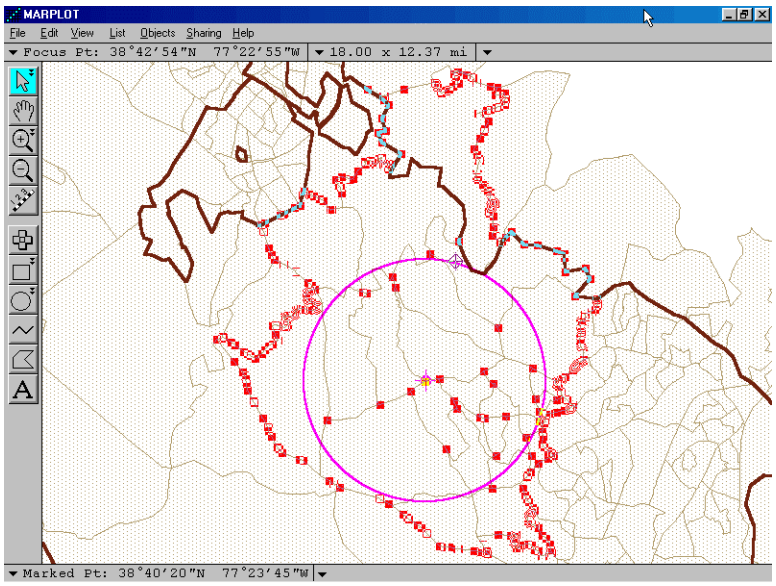


Figure 59—CBGs Inside Of or Touched By the Reference Circle.

As can be seen in Figure 59, the selected CBGs greatly exceed the area of our reference circle. To obtain a more meaningful answer, we will use a modification of a Search technique called **Centroid Capture**. A centroid is a centroid of an area. In theory, if a centroid is captured, more than 50% of the area lies within the capture. If a centroid is not captured, more than 50% of the area lies outside the capture. As we do not have an available centroid layer, we will mimic the technique visually. By holding down the **[Shift]** key while selecting or deselecting, we can selectively remove Census Block Groups that do not contribute half their area to the reference circle. Using this technique, we have the revised view of Figure 59 that is shown in Figure 60.

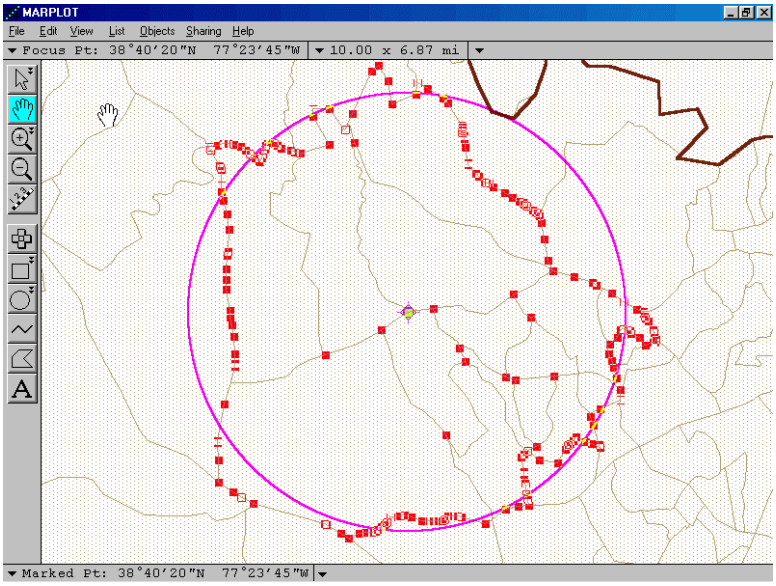


Figure 60—[Shift]-Select used to Deselect Inappropriate Census Block Groups

In Figure 60, we have a selection of census block groups which closely represent those contained within our Reference Circle. We can use these to get a reasonable approximation for the demographics of population at our desired radius of three miles. Use **Sharing/LandView/Get Info** to get Census Block Group data for the selected objects. Again, we need to use the **Summarize** button to sum up the individual records in the Found Set. A partial printout of the data is shown as Figure 61. Note that this is Summarized data for 15 Census Block Group records.

LandView 5 - Census 2000 Profile of General Demographic Characteristics

Summary of Census Block Groups — # records summarized 15

Total population 33,808 — Total Housing Units 10,218 — Persons per sq. mi: 1,375.5

SEX AND AGE	Number	PCT
Male	16,853	49.8
Female	16,955	50.2
Under 5 years	2,484	7.3
Age 5 to 9 years	3,184	9.4
Age 10 to 14 years	3,475	10.3
Age 15 to 19 years	3,047	10.3
Age 20 to 24 years	1,564	4.6
Age 25 to 34 years	4,130	12.2
Age 35 to 44 years	6,988	20.7
Age 45 to 54 years	5,438	16.1
Age 55 to 59 years	1,581	4.7
Age 60 to 64 years	839	2.5
Age 65 to 74 years	752	2.2
Age 75 to 84 years	264	0.8
Age 85 years and over	62	0.2
Median age	n/a	n/a
Age 18 years and over	22,567	66.8
Male	11,152	33.0
Female	11,415	33.8
Age 21 years and over	21,281	62.9
Age 62 years and over	1,529	4.5
Age 65 years and over	1,078	3.2
Male	476	1.4
Female	602	1.8
RACE		
One race	32,553	96.3
White	22,485	66.5
Black or African American	7,482	22.1
American Indian and Alaska Native	111	0.3
Asian	1,396	4.1
Asian Indian	n/a	0
Chinese	n/a	0.0

HISPANIC OR LATINO AND RACE	Number	PCT
Hispanic or Latino (of any race)	2,480	7.3
Mexican	0	0.0
Puerto Rican	0	0.0
Cuban	0	0.0
Other Hispanic or Latino	0	0.0
Not Hispanic or Latino	31,328	92.7
White alone	21,408	63.3
RELATIONSHIP		
In households	33,743	99.8
Householder	10,012	29.6
Spouse	7,739	22.9
Child	12,804	37.9
Own child under 18 years	10,221	30.2
Other relatives	1,977	5.8
Under 18 years	780	2.3
Nonrelatives	1,211	3.6
Unmarried partner	0	0.0
In group quarters	65	0.2
Institutionalized population	65	0.2
Noninstitutionalized population	0	0.0
HOUSEHOLDS BY TYPE		
Total households	10,012	100
Family households (families)	8,930	89.2
With own children under 18 yr:	5,272	52.7
Married couple family	7,739	77.3
With own children under 18 yr:	4,503	45.0
Female householder, no husband present	835	8.3
With own children under 18 yrs	564	5.6
Nonfamily households	1,082	10.8
Householder living alone	724	7.2
Householder 65 years and over	109	1.1

Figure 61—Demographic data at a Radius around a Point

Where Do You Go From Here

This concludes the LandView Tutorial. During the six lessons, we have covered the major features and functions of the LandView 5 product.

As stated at the start of the Tutorial, users should look at the MARPLOT User's Guide for examples of more advanced MARPLOT mapping features as well as refer to the LandView 5 and MARPLOT Help systems for more detailed explanations of specific program features.

Users are encouraged to visit the LandView Help page on the Internet. A link there provides a path for users questions and comments. Such feedback, where appropriate, will be incorporated into future versions of both the Tutorial and the Help files. The Tutorial and the Help files available on your copy of the CD/DVD are those that were available at the time of publication of the CD/DVD. As new information is developed and corrections are made, more up-to-date versions for both the Tutorial and the Help files are available through Internet access. Buttons on the LandView Home page provide pathways to either the CD/DVD version or to a revised Internet version.

Source: U.S. Census Bureau, Geography Division Revised: March 31, 2003