

Part 2 Hands-on Exercises

Chapter 1 Understanding Digital Maps

When you want to use a paper map, first you need to unfold it. You need a large space, probably an entire table, to do this. On the map you will find a careful representation of cities, roads, rivers, mountains, administrative boundaries, etc. The cities are represented by little dots or circles, the roads by black lines, the mountain peaks by tiny triangles and the lakes by small blue areas similar in shape to the real lakes.

A digital map is not much more difficult to use than a paper map, and takes much less space. As on the paper map, there are dots or points that represent features such as cities, lines that represent roads, and areas that represent lakes. A digital map takes less space because all the information—where the Dharahara is (point information), how long the road from Lagankhel to Jawalakhel is (line information), and how many square metres the Kamal Pokhari occupies (area information)—is stored in digital format.

Different digital geographic data in the form of layers, also called themes, can be laid on top of one another. This creates a stack of information about the same geographic area. Each layer can be turned on and off. You can control the amount of information that you want see about an area. If you turn off all the themes, you will have a blank screen. If you turn on the school theme, roads theme, lakes theme and so on you will have a map on your computer screen that pretty well matches a paper map.



We will use ArcExplorer—software used to create maps—to explore some themes in the Kathmandu area.

Exploration 1–Look at Kathmandu

In this first exploration you see a paper map from the Survey Department of the Government of Nepal that has been scanned into the computer. On this map, you can find the Pashupati forest, Bhandarkhal forest, Singha Durbar, Kamal Pokhari, part of the ring road, Bagmati Nadi (river), and the airport. You will look at the same area on a digital map to see how these things are represented as layers of digital geographic data.



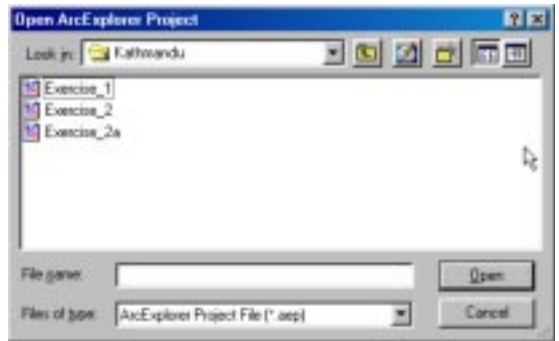
Step 1

Start ArcExplorer either by double clicking the shortcut on your desktop or by selecting Programs, ESRI, ArcExplorer from the Start menu.



Step 2

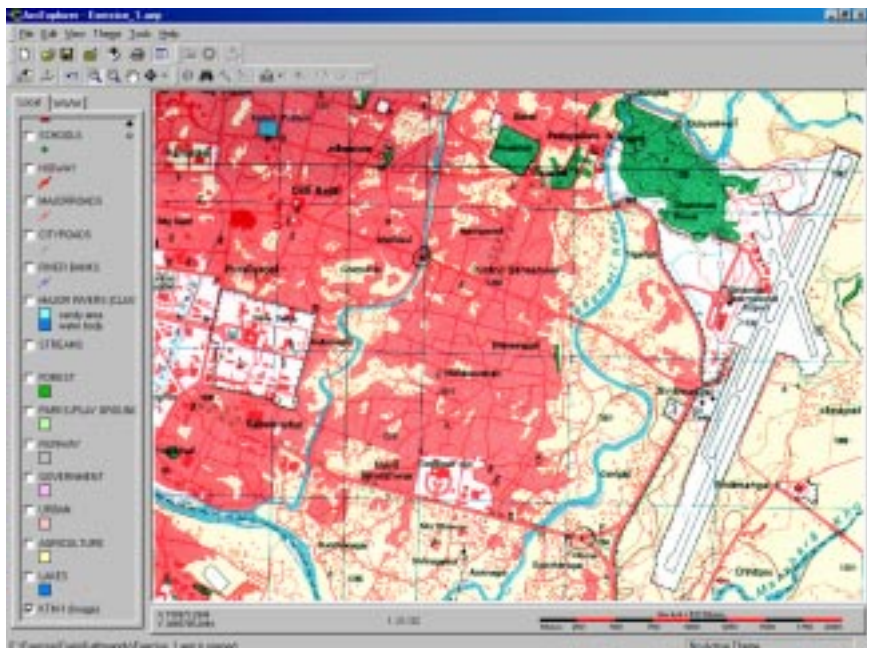
Click the Open Project button. In the dialogue box displayed, navigate to the *GIS Basics\Exercise\Data\Kathmandu* directory.



Step 3

Select the project file called *Exercise_1.AEP* and click Open. The AEP extension stands for ArcExplorer Project.

In the map view is the scanned paper map of Kathmandu. It shows features such as forest, built-up areas, ring road, city roads, rivers, settlements, airport,

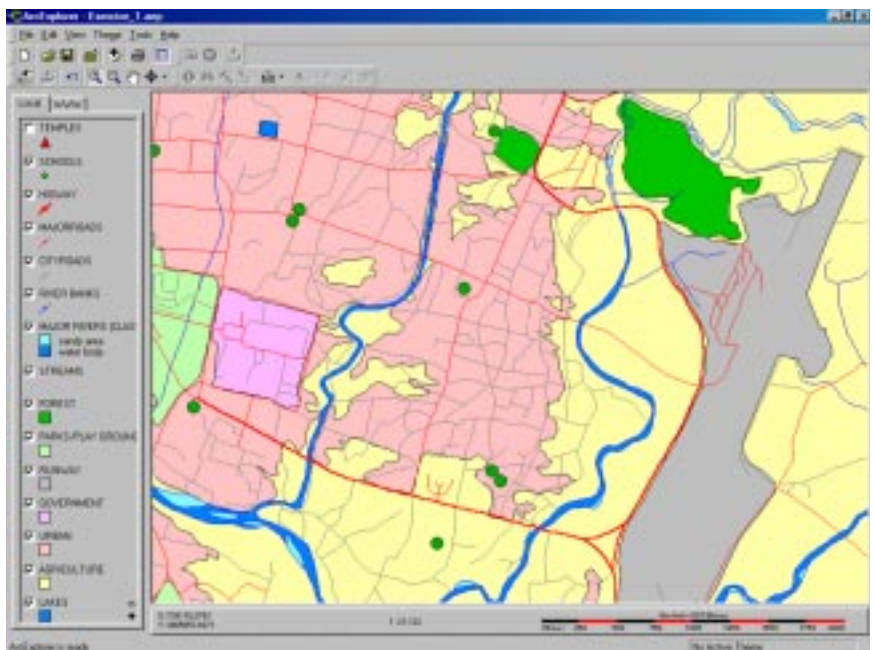


water bodies, etc. Although you can learn a lot from a paper map, the amount of information you can obtain is limited. You cannot exclude features that you do not want to see.

In ArcExplorer, each layer of digital data—the theme—is listed to the left of the map view; this is called the legend. The map view of Kathmandu contains a theme on highways, major roads, city roads, schools, temples, rivers, forests, urban areas, airport and other features.

Step 4

Use the down arrow at the bottom of the legend to scroll down. In the legend, turn off the KTM-1 (scanned image) map by unchecking the box next to the KTM-1 theme. This turns off the view of the scanned paper map. Turn on the HIGHWAY, MAJOR ROADS, CITY ROADS, RIVER BANKS, MAJOR RIVERS, STREAMS, AGRICULTURE, FOREST, PARK/PLAYGROUND, GOVERNMENT, URBAN, LAKES and RUNWAY themes by checking the appropriate boxes.



This digital map of the Kathmandu looks similar to the scanned paper map. In the digital map, you can look at the different features by turning themes on and off, whereas with the scanned paper maps, what you see is what you get.

Step 5

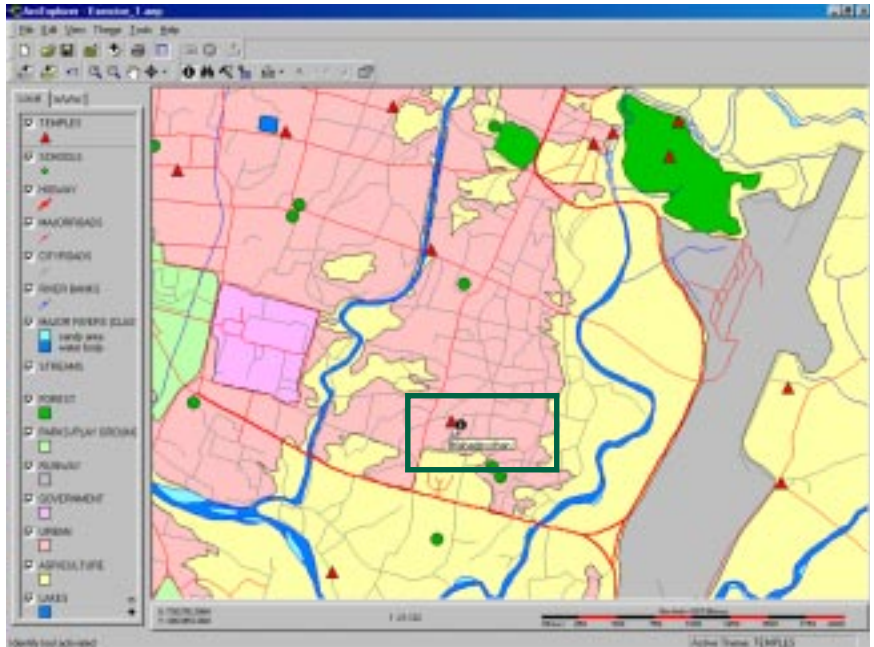
Turn on the TEMPLES and SCHOOLS themes by checking their boxes. Suddenly, several triangles and circles appear, each representing a different theme.

Step 6

Click on the theme TEMPLES in the legend to make the theme active. When the theme is active, it will appear raised above the surface of the legend.

Step 7

Move your mouse pointer over one of the red triangles (temples). Since the theme is active, the name of the temples (or the name of the location where the temple is situated) will appear above the triangle. See if you can find Pashupati Nath and Guhyeshwari temples.

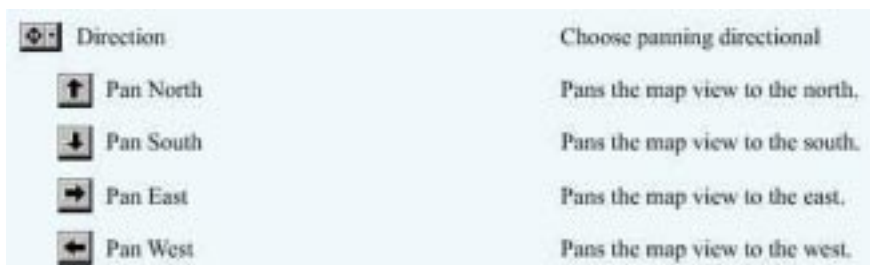


Try to explore some other themes by activating them.

You have identified some features. Now it is time to move around the map. First you will explore Kathmandu with the Direction button.

Step 8

Choose a direction using the down arrow at the right of the Direction button. An arrow appears on the button to indicate the direction you selected. Click the Direction button to move in that direction. Try other directions as well.



Notice that your map view changes in easy, controlled steps.

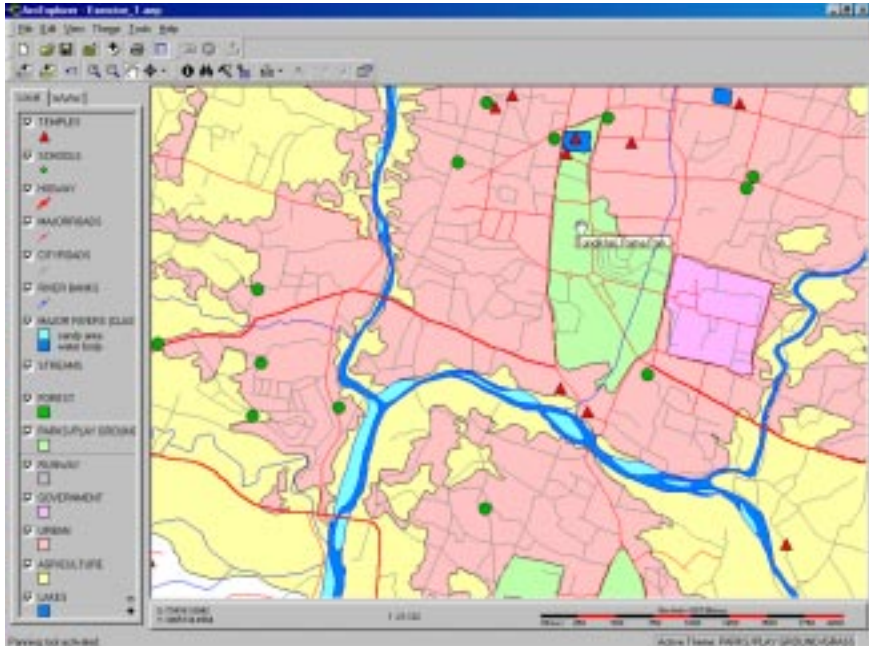
Now, you will try to move around the map with the Pan button. With it, you grab the display and drag it in any direction.



Step 9

Click the Pan button. Move your mouse pointer into the map view, hold down the mouse button and drag. When you get to where you want to be, release the button.

Go ahead and move in any direction you want.



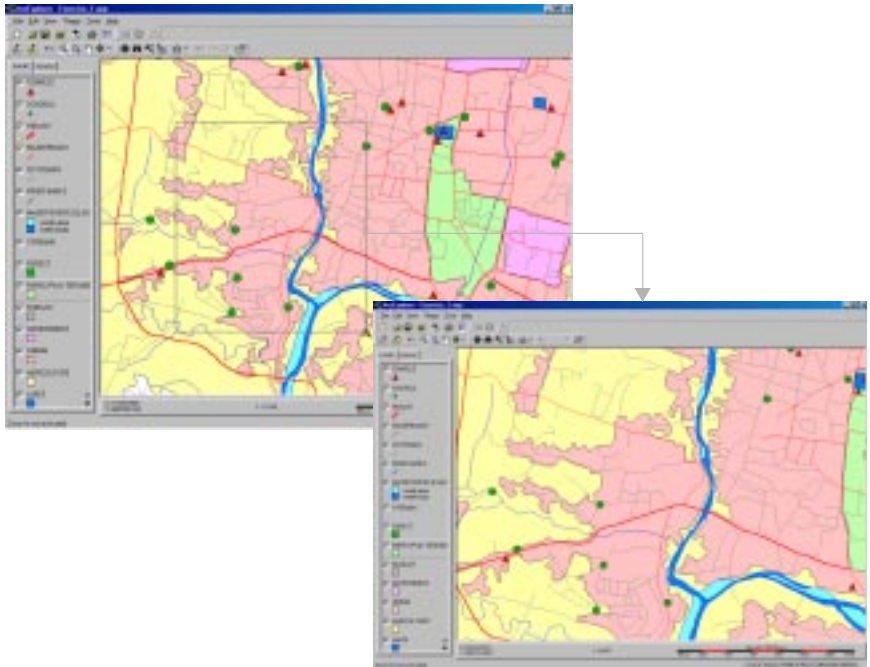
Some themes represent features located all over the map; some represent features located in one area. In either case, you can zoom to the area covered by a particular feature. To see the whole map—the area covered by all the themes—you can click the Zoom to Full Extent button. Or you can zoom to the active theme with the Zoom to Active Theme button. Also, you can zoom in and out. Don't worry if you become lost; the Zoom to Full Extent button will bring you back to a view of the entire map.

	Zoom to Full Extent	Zooms to the extent of all themes.
	Zoom to Active Theme	Zooms to the extent of the active theme. (Local mode only.)
	Zoom to Previous Extent	Zooms to the last previous extent. (Local mode only.)
	Zoom In	Zooms in on the position you click or the box you drag on the map view.
	Zoom Out	Zooms out from the position you click or the box you drag on the map view.



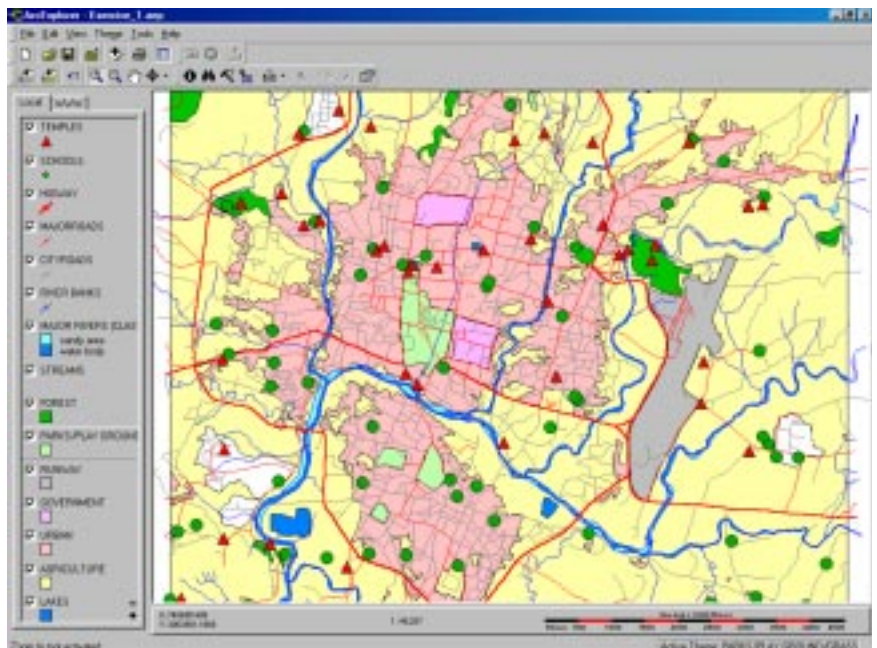
Step 10

Click the Zoom In button. Click once somewhere in the map view to zoom in on that area. Click again to zoom in even more. You can also drag a box over an area to zoom in on it, as shown below.



Step 11

Click the Zoom Out button. Click once somewhere in the map view to zoom out from that location. Click the Zoom Out button once more.



Step 12

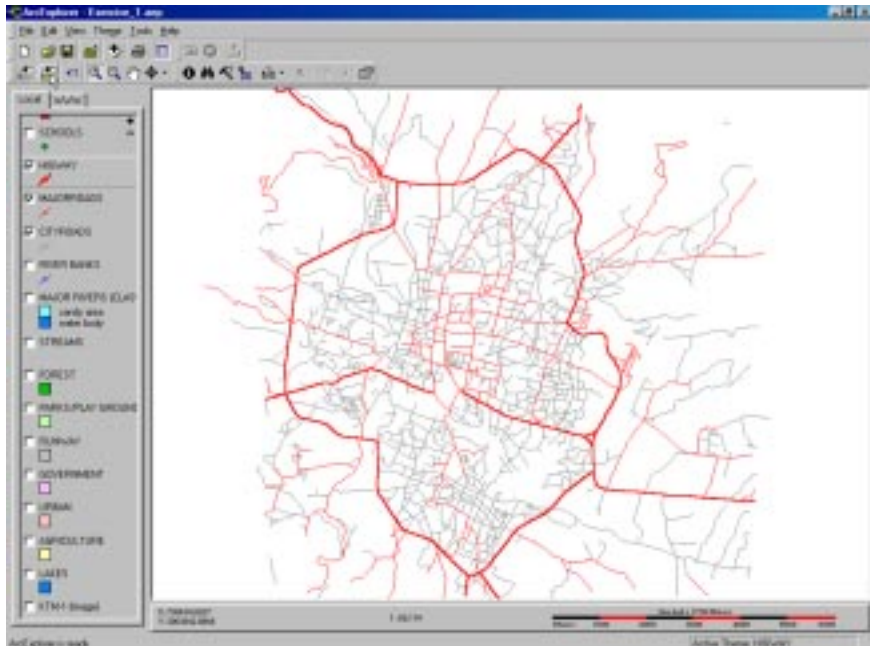
Turn off all the themes except HIGHWAY.

Step 13

Zoom to the extent of the HIGHWAY theme. (Activate the theme HIGHWAY and click Zoom to Active Theme button.)

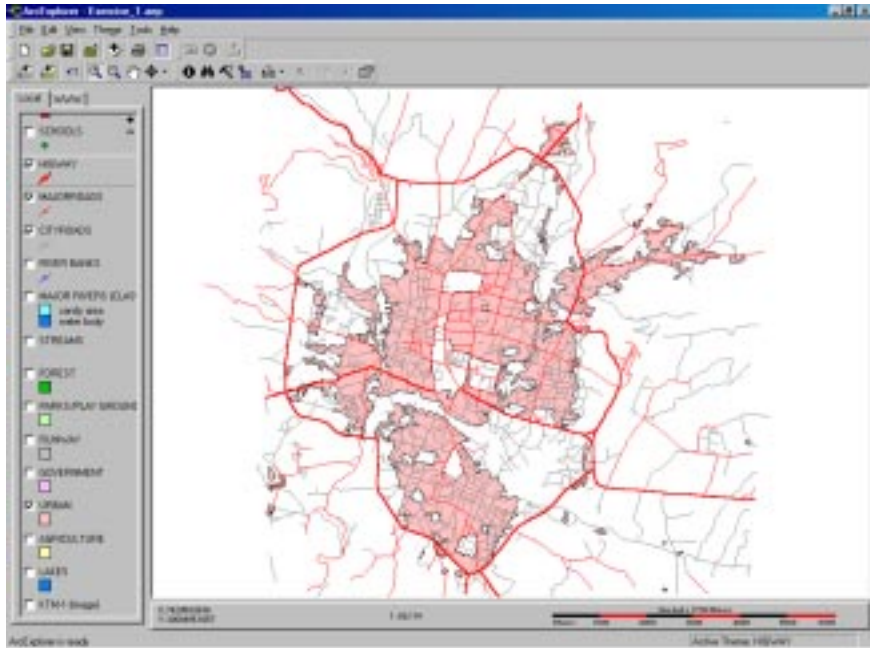
Step 14

Turn on the themes CITY ROADS and MAJOR ROADS. With this, you have just changed the subject of your map to road map showing different types of road within the Kathmandu area.



Step 15

Turn on the theme URBAN. You can see that most of the people live within the ring road. The land and housing prices reflect this although this is not a theme here.



Step 16

Click the Close Project button. Choose No when asked if you want to save any changes.