

# Chapter 1

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## Introduction to AutoCAD Map 3D 2013



### Learning Objectives

**After completing this chapter, you will be able to:**

- *Understand various terms in this textbook*
- *Start AutoCAD Map 3D 2013*
- *Use workspaces*
- *Work with various components of AutoCAD Map 3D*
- *Use AutoCAD Map 3D Help*



## INTRODUCTION

AutoCAD Map 3D 2013 is a Geographic Information System (GIS) application developed by Autodesk. Along with the standard drafting tools, AutoCAD Map 3D is equipped with tools that are used to capture, edit, update, and analyze geospatial data. Moreover, the interoperability of AutoCAD Map 3D 2013 allows it to read, write, and convert data into data format used by other GIS applications.

AutoCAD Map 3D supports various raster and vector data formats such as \*.tif, \*.dem, \*.jpeg, \*.dwg, \*.shp, \*.dgn, and \*.tab. It also supports survey data in \*.xyz, \*.gps, and \*.csv file formats. The features in AutoCAD Map 3D also enable you to connect to the spatial data using the relational database management system (RDBMS). By using these features, the productivity and management of spatial data will be enhanced.

The various powerful tools and options available in AutoCAD Map 3D help you perform complex geospatial data analysis and obtain accurate results, thus making it an ideal tool for infrastructure planning, management, and decision making.

## GEOSPATIAL ANALYSIS

Application of statistical analysis and other analytical techniques (such as network analysis, buffer analysis, and overlay analysis) to interpret the data related to a geographical area is known as Geospatial Analysis. In general, geospatial analysis is used to represent various methods of data interpretation such as analyzing, interpreting, and presenting the GIS dataset using GIS software. This type of data analysis is widely used in urban planning, landscape designing, geographical mapping, utility management, navigation, and disaster management.

Various types of GIS data such as vector data, raster data, survey data, and point data are used in geospatial analyses. Different types of data are used for different types of geospatial analyses. Based on the project requirement, the type of GIS data to be used is selected. This may usually involve conversion of one type of data into another. Some of the commonly used GIS data are discussed next.

### Vector or Feature Data

A vector or feature dataset is used to represent the spatial information of a geographical location. This type of dataset helps to retain the attributes in a table format attached with geometry, create and edit dataset, access an existing dataset for analysis, and perform spatial analysis. In general, there are three kinds of feature data used in geospatial analysis. They are point, line, and polygon. These feature data are discussed next.

### Point Feature

A point feature represents a spatial point for a specific object. A post box, street lamp, fire hydrant, and tree are some of the geographical objects that are represented as point objects. The point feature represents only one geographical location.

## Line or Polyline Feature

A line or polyline feature is used to represent a linear feature or a streamlined feature data such as roads, transmission lines, streams, rivers, pipe networks, and boundaries.

## Polygon Feature

A polygon feature (parcel) is a closed polyline object with the attribute or property data attached to it. The polygon feature is used to represent an area feature such as council boundary, plots, farms, zones, wards, and water bodies such as lakes and ponds.

## Raster Data

Raster data consists of a matrix of cells, also known as pixels, organized into rows and columns. Each cell in a raster contains a value that represents information, such as elevation and temperature. You can graphically display the data in the raster by using various rendering techniques. These techniques help you to render data in various color schemes.

You can insert a raster file into the drawing and then use it to digitize vector data. In AutoCAD Map 3D 2013, you can also import point files and LiDAR data into the workspace and then generate 3D raster surfaces. You can also analyze and display the raster data using various tools.

## Drawing Object Data

The attribute data and properties attached to a geometry is called drawing object data. These data can be in the form of point, line, polyline, or dotted lines with the attribute or property data attached to them. Some of the terms used in this book, related to drawing objects, are explained next.

### Property

The property of a drawing object refers to the display parameters such as color of geometry, line thickness, and line pattern.

### Attribute

Attribute refers to the data that is attached to a drawing object and does not provide any information about the display parameters of the drawing object it is attached to. For example, the area and population of a state attached to a closed polyline object (polygon), records of births and deaths pertaining to a geographical place attached to a point object, number of accidents attached to a line or polyline object (roads, streets, highways, and motor ways).

### Data Table

Data table is the way of presentation of the property and attribute values in the form of a table. It is attached to an object, a layer, or a feature in a Workspace. Figure 1-1 shows various parts of a data table.

### Data Field

In a data table, the data field displays a group of attribute values related to a specific data object. A data field is also referred to as an attribute or property.

The diagram shows a table with three columns: 'Type of Road', 'No. of vehicles/hr', and an unlabeled column. The rows are labeled 'Line object 01', 'Line object 02', and 'Line object 03'. Arrows point from 'Data Fields' to the column headers, from 'Drawing Object' to the first column, and from 'Attribute values' to the values in the second and third columns.

	Type of Road	No. of vehicles/hr
Line object 01	Street	22
Line object 02	Motorway	157
Line object 03	Highway	89

Figure 1-1 Various parts of a data table

### Attribute Value

Attribute value of a drawing object is the value corresponding to this drawing object in various data fields. For example: attribute value of the **Line object02** drawing object in the **No. of vehicles/hr** data field is **157**, refer to Figure 1-1.

### Survey Data

Survey data is the point data obtained by locating specific survey points on the earth surface. The survey data can be obtained by using survey instruments such as total station, GPS, and so on.

### Industry Model Data

Industry Model Data is a new name given to the topobase database. Topobase is the database that includes features, parcels, and attribute data of a geographical location. Industry model data includes project settings, privileges, attribute data, and coordinate and projection systems related to a project. The projects such as infrastructure project management, utility designing, and facility management extensively use the industry model data for project management.



#### Note

For creating the industry model you will require **Autodesk Infrastructure Administrator** application installed in your system. To install this application select the check box corresponding to **Autodesk Infrastructure Administrator 2013** while installing the **AutoCAD Map 3D 2013** software.

## LAYERS

Layers are the overlays containing specific geometry, property, and attributes. You can transform data from one layer to another based on the file formats of data. In AutoCAD Map 3D, you can use layers in the form of the AutoCAD drawing layer and the vector or feature layer. These two layer types are discussed next.

### AutoCAD Layer

AutoCAD layer is a drawing layer that contains drawing objects (text, point, line, and polygon) and their properties. You can create and modify a drawing layer within a drawing file and it cannot be used as an independent layer in other software. If you want to use AutoCAD layer in any other software, then you need to export or save the AutoCAD drawing layer in the file format recognized by the software requirement.

## Vector or Feature Layer

Vector or feature layer is an independent layer that contains all feature data spatially related to a geographical location. Vector or feature layer can be in the SHP or SDF file format. It is easy to transfer feature data from one software to other using these types of layers.

## STARTING AutoCAD Map 3D 2013

To start AutoCAD Map 3D 2013 from the Windows taskbar, choose the **Start** button at the bottom-left corner of the screen; a menu will be displayed. In this menu, choose **Programs > Autodesk > AutoCAD Map 3D 2013 > AutoCAD Map 3D 2013**, as shown in Figure 1-2; the AutoCAD Map 3D 2013 application will start and the **Workspaces** page will be displayed.

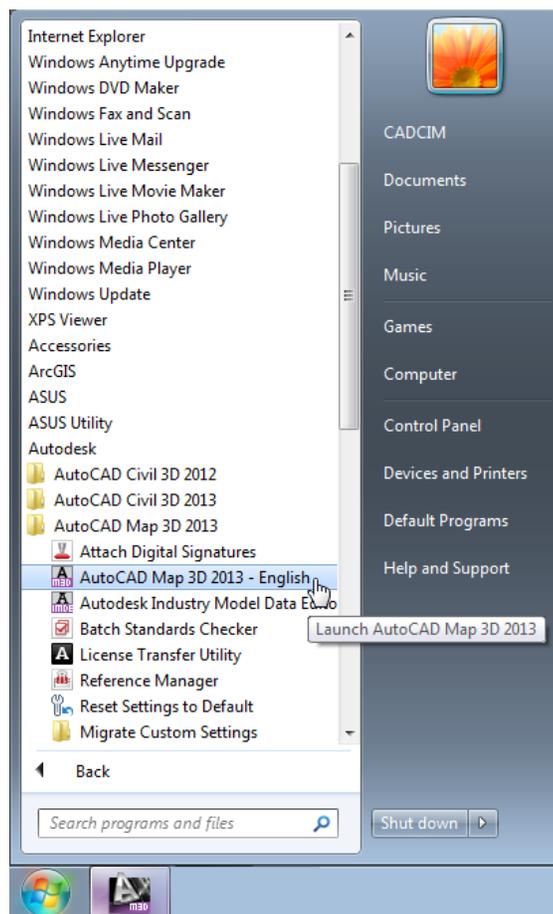


Figure 1-2 Starting AutoCAD Map 3D 2013 from the taskbar

## WORKSPACE

Workspace is a combination of menus, toolbars, ribbon, palettes, and control panels. It is used to represent a customized drawing environment based on user requirements. You can also customize a workspace to suit the working environment of a task.

When you start AutoCAD Map 3D 2013 for the first time, the **AutoCAD Map 3D - Select Your Default Workspace** window will be displayed, as shown in Figure 1-3. In this window, you can read information about the three predefined workspaces that are available in AutoCAD Map 3D. These workspaces are **Planning and Analysis Workspace**, **Maintenance Workspace**, and **2D Drafting Workspace**.



**Tip:** You can choose a different workspace at anytime after starting AutoCAD Map 3D 2013 application. To do so, select the required workspace options in the **Workspace** drop-down list in the **Quick Access Toolbar**.

To choose a workspace, select the radio button corresponding to the required workspace and then choose the **Select** button in the **AutoCAD Map 3D - Select Your Default Workspace** window; the window will be closed and the **AutoCAD Map 3D 2013** screen will be displayed with the selected workspace. The three predefined workspaces in AutoCAD Map 3D software are discussed next.

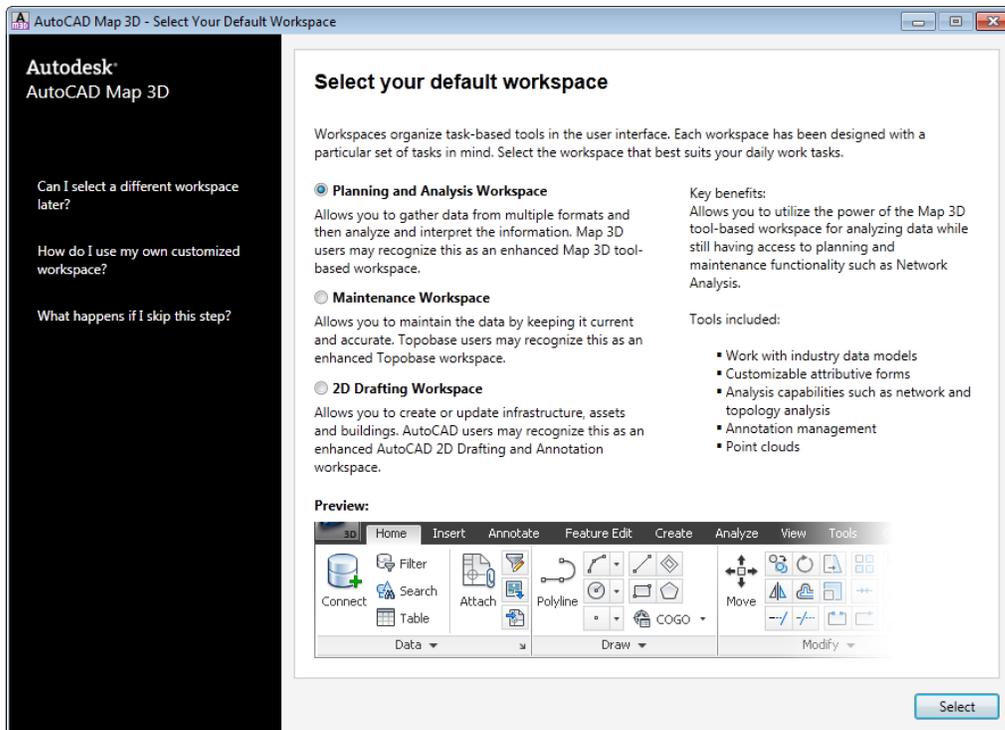
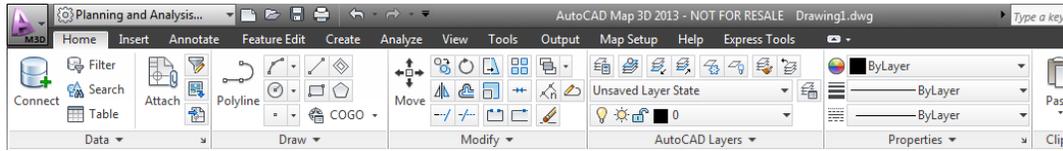


Figure 1-3 The AutoCAD Map 3D - Select Your Default Workspace window

## Planning and Analysis Workspace

By default, the **Planning and Analysis Workspace** radio button is selected in the **AutoCAD Map 3D - Select Your Default Workspace** window. As a result, when you choose the **Select** button in the window, AutoCAD Map 3D interface opens in **Planning and Analysis Workspace**. In this workspace, the tools are grouped in different categories based on their uses in layout

planning and GIS analyses. Figure 1-4 shows the ribbon displayed in the **Planning and Analysis Workspace**.



*Figure 1-4 Partial view of the ribbon in the **Planning and Analysis Workspace***

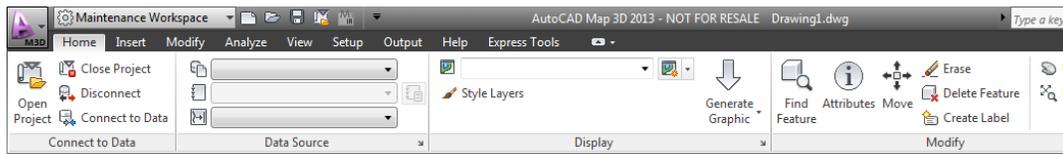


### Note

*The theory and tutorial sections of all chapters in this textbook are discussed based on the **Planning and Analysis Workspace** ribbon interface. Hence, it is recommended to retain default settings, unless otherwise instructed, while using this textbook.*

## Maintenance Workspace

The **Maintenance Workspace** is a ribbon interface in which tools are grouped in different panels based on their usage in an industry model or project. The tools in this interface are very useful when you are working with an industry model data, an infrastructure project, or a utility project. Also, it helps to administer an entire project by specifying the required privileges to each member of the team. To invoke this workspace, select the **Maintenance Workspace** radio button in the **AutoCAD Map 3D - Select Your Default Workspace** window and then choose the **Select** button; the **Maintenance Workspace** will be displayed in the AutoCAD Map 3D interface. Figure 1-5 shows the ribbon in the **Maintenance Workspace**. You can use various tools in this workspace to maintain an industry model data.



*Figure 1-5 Partial view of the ribbon in the **Maintenance Workspace***

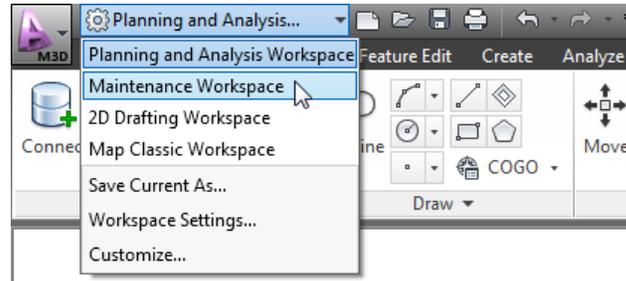
## 2D Drafting Workspace

The **2D Drafting Workspace** is a customized interface for drafters and designers. This workspace is very helpful for those who are familiar with AutoCAD ribbon and mostly work with the drawing data. In this workspace, the panels are customized based on the use of each tool in drafting. To invoke this workspace, select the **2D Drafting Workspace** radio button in the **AutoCAD Map 3D - Select Your Default Workspace** window and then choose the **Select** button; the **2D Drafting Workspace** will be displayed in the AutoCAD Map 3D 2013 interface. You can use various tools in this workspace to maintain an industry model data.

## SWITCHING WORKSPACES

After starting the AutoCAD Map 3D 2013 application, you can switch from one workspace to a different workspace. To switch from one workspace to another, select the required option

from the **Workspace** drop-down list located in the Quick Access toolbar, refer to Figure 1-6; the current workspace will be replaced by the selected workspace.



*Figure 1-6 Choosing the Maintenance Workspace option from the Workspace drop-down list*

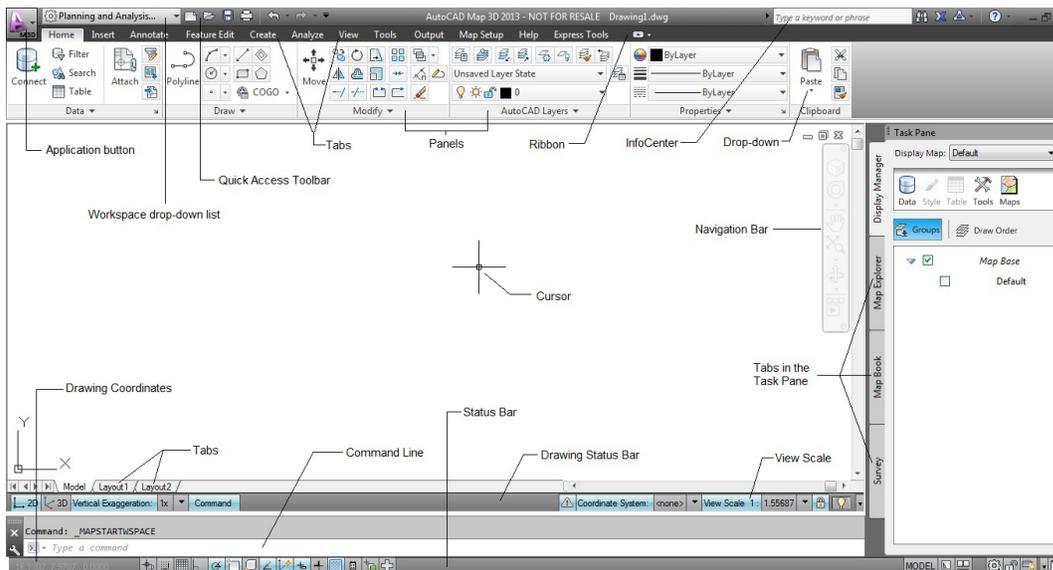


### Note

While reading this textbook, it is recommended not to invoke the **Map Classic Workspace** user interface, as the approach of accessing tools and the procedure of invoking various dialog boxes may differ from those explained in this textbook.

## AutoCAD Map 3D 2013 INTERFACE

AutoCAD Map 3D 2013 interface consists of drawing area, ribbon, command line, Quick Access toolbar, **Task Pane**, model and layout tabs, and status bar, refer to Figure 1-7. The header section of the application interface displays the name of the current drawing file. The different components of the AutoCAD Map 3D 2013 interface are discussed next.



*Figure 1-7 AutoCAD Map3D 2013 interface*

## Application Menu

The **Application** button is located at the top-left of the AutoCAD Map 3D 2013 screen. Choose the **Application** button; the Application Menu will be displayed, as shown in Figure 1-8. The menu contains some of the tools that are available in the **Standard** toolbar. Alternatively, press ALT+F to display the tools in the Application Menu. You can search a command using the search field on the top of the Application Menu. To search a command, enter the complete or partial name of the command in the search field; a list showing all possible commands will be displayed. You can click on the desired command from the list to activate it.

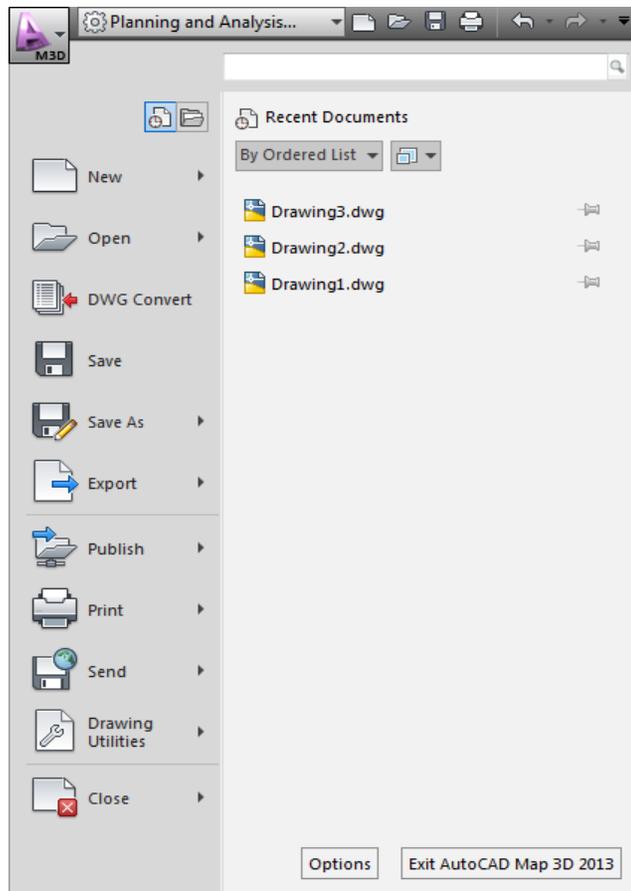


Figure 1-8 The Application Menu

By default, the **Recent Documents** button is chosen in the Application Menu. As a result, the recently opened drawings will be listed on the right in the Application Menu. Click on the required file name in the list to open the file. To open a file that is not listed in this menu, choose the **Open** button in the Application Menu; the **Select File** dialog box will be displayed. Browse to the location of the required file. Click on the file name and then choose the **Open** button; the selected file will be opened in the drawing area. In AutoCAD Map 3D 2013, you can specify the settings of the **Display**, **User Preferences**, **Files**, and **Drafting** parameters in

the **Options** dialog box. To invoke this dialog box, choose the **Options** button displayed at the bottom-right of the Application Menu. Next, use the options in this dialog box to specify the required parameters.

To exit AutoCAD Map 3D, choose the **Exit AutoCAD Map 3D 2013** button in the Application Menu.

## Ribbon

In AutoCAD Map 3D, the tools for creating, modifying, and annotating are available in different panels of the ribbon instead of being spread out in the entire drawing area in different toolbars and menus, refer to Figure 1-4.

When you start the AutoCAD session for the first time, by default the ribbon is displayed horizontally below the Quick Access toolbar. The ribbon consists of various tabs. These tabs have different panels, which in turn have tools arranged in rows. Some of the tools have a small black down arrow. This arrow indicates that the tools having similar functions are grouped together. To choose a tool, click on the down arrow next to them; a drop-down will be displayed. Choose the required tool from the drop-down displayed. Note that if you choose a tool from the drop-down, the corresponding command will be invoked and the tool that you have chosen will be displayed in the panel. For example, to draw a circle using the **2-Point** option, click on the down arrow next to the **Center, Radius** tool in the **Draw** panel of the **Home** tab; a drop-down will be displayed. Choose the **2-Point** tool from the drop-down and then draw the circle. You will notice that the **2-Point** tool is displayed in place of the **Center, Radius** tool. In this textbook, the tool selection sequence will be written as choose the **2-Point** tool from **Home > Draw > Circle** drop-down.

To expand a panel, you can choose the down arrow next to it. The panel will be expanded and you will notice that a push-pin is available at its left end. Click on the push-pin to keep the panel in the expanded state. Also, some of the panels have an inclined arrow at the lower-right corner. When you click on the inclined arrow, a dialog box is displayed. You can define the settings of the corresponding panel in this dialog box.



You can reorder the panels in the tab. To do so, press and hold the left mouse button on the panel to be moved and drag it to the required position. To undock the ribbon, right-click on the blank space in the ribbon and choose the **Undock** option. You can move, resize, anchor, and auto-hide the ribbon using the shortcut menu that will be displayed when you right-click on the heading strip. To anchor the floating ribbon to the left or right of the drawing area in the vertical position, right-click on the heading strip of the floating ribbon; a shortcut menu is displayed. Choose the required option from this shortcut menu. The **Auto-hide** option will hide the ribbon into the heading strip and will display it only when you move the cursor over this strip.

You can also customize the display of tabs and panels in the ribbon. To customize the ribbon, right-click on any one of the tools in it; a shortcut menu will be displayed. On moving the cursor over one of the options, a flyout will be displayed with a tick mark before all options. Also, the corresponding tab or panel will be displayed in the ribbon. Select/clear the appropriate option to display/hide a particular tab or panel.

## Drawing Area

The drawing area covers the major portion of the screen. In this area, you can draw objects by using various tools/commands. To draw an object, you need to define coordinate points. You can do so by using the pointing device. The cursor represents the position of the pointing device on the screen. There is a coordinate system icon at the lower-left corner of the drawing area.

## Drawing Status Bar

The **Drawing Status Bar** is displayed between the drawing area and the command window. To display the **Drawing Status Bar**, if it is not displayed, choose the **Application Status Bar Menu** button displayed on the **Status Bar**, refer to Figure 1-13, and choose the **Drawing Status Bar** option from the flyout displayed; the **Drawing Status Bar** will be displayed, as shown in Figure 1-9. The **Drawing Status Bar** displays the **Coordinate System**, **Vertical Exaggeration**, **Isolate Object**, and **View Scale** buttons. Various options in the **Drawing Status Bar** are discussed next.

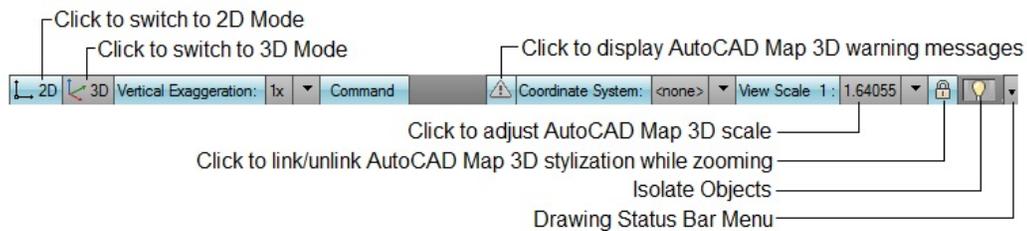


Figure 1-9 The options in the **Drawing Status Bar**

### 2D Button

 The **2D** button is used to switch from 3D to 2D working environment. When you apply the *map2d.dwt* template settings to the current drawing, you will enter the 2D drafting and designing environment and the **2D** button will be activated. The *map2d.dwt* is a template file that contains the settings of the 2D drawing environment.

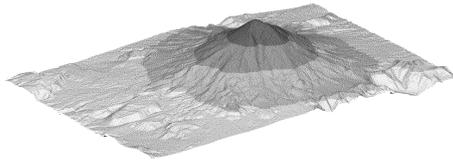
### 3D Button

 The **3D** button is used to switch from 2D to 3D working environment. When you apply the settings from the *map3d.dwt* template file, you will enter the 3D designing environment and the **3D** button will be activated.

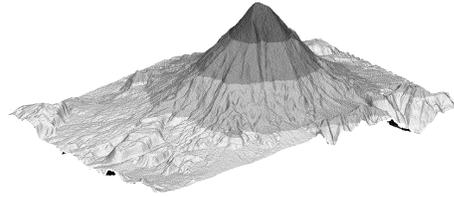
### Vertical Exaggeration

The **Vertical Exaggeration** option is used to change the vertical scale of the drawing. The vertical exaggeration is used to raise or lower the vertical features which might appear too small or big relative to the horizontal scale in the drawing. To specify the exaggeration factor for visual enhancement, left-click on the down-arrow next to the **Vertical Exaggeration** button in the **Drawing Status Bar**; a flyout will be displayed. In this flyout, choose an option; the

display of the raster image will be enhanced based on the factor selected. Figure 1-10 shows the view of a raster image at the default vertical exaggeration (**1x**). Figure 1-11 shows an enhanced view of the raster image at vertical exaggeration of **2x**.

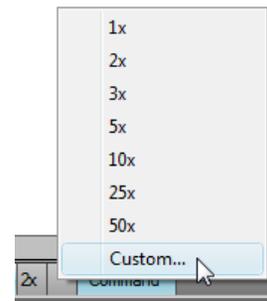


*Figure 1-10 Model vertically exaggerated to 1x*



*Figure 1-11 Model vertically exaggerated to 2x*

You can also specify a value of your choice for vertical exaggeration. To do so, left-click on the down-arrow corresponding to the **Vertical Exaggeration** option; a flyout will be displayed. In this flyout, choose the **Custom** option, as shown in Figure 1-12; a window will be displayed. In this window, enter the desired value in the **Enter Exaggeration Value** edit box and then choose the **OK** button; the window will be closed and the raster image will be vertically exaggerated to the specified value.



*Figure 1-12 Choosing the Custom option for vertical exaggeration*

### Command Button

The **Command** button is used to display or hide the **Command Line**. By default, the **Command Line** is displayed. To hide the **Command Line**, choose the **Command** button; the **Command Line-Close Window** message window will be displayed. In this window, choose the **Yes** button; the **Command Line** will be removed from the screen. Choose the **Command** button again to display the **Command Line**. Alternatively, you can press CTRL + 9 to show or hide the **Command Line**.

### Warning Button

The **Warning** button is used to display the details of errors that have occurred while performing an action. By default, this button is inactive. When an error occurs, this button becomes active (it will be highlighted in yellow color). To view the description of the error occurred, click on the **Warning** button; the **AutoCAD Map Messages** dialog box will be displayed. This dialog box has two areas: **Messages** and **Message details**. Next, select a message in the **Messages** area; the details pertaining to the selected message will be displayed in the **Message details** area. You can use the **Show Log File** button to view additional information about the selected option. On choosing this button, the log file of the error will be displayed in a notepad.

### Isolate Objects

This button is used to hide or isolate objects from the drawing area. On choosing this button, a flyout will be displayed with two options: **Isolate Objects** and **Hide Objects**.

Choose an option from this flyout and then select the objects to hide or isolate. To end isolation or display a hidden object, choose this button again and choose the **End Object Isolation** option.

### Click to link/unlink AutoCAD Map 3D stylization while zooming



After a style has been applied to a vector data, you can use this button to link or unlink the AutoCAD Map 3D stylization while zooming. If the lock in this button is closed, the style applied to the vector layer will be displayed at different zooming scales (stylization linked). If the lock in this button is open, the style applied to a vector layer will not be displayed (stylization is not linked).

### Drawing Status Bar Menu

The **Drawing Status Bar Menu**, refer to Figure 1-9, contains a list of options that can be added to the **Drawing Status Bar**. To add an option from this menu to the **Drawing Status Bar**, click on the **Drawing Status Bar Menu** button; a menu is displayed. Select the required option from the displayed menu; the selected option will be added to the **Drawing Status Bar**. The options in the **Drawing Status Bar Menu** are discussed next.

#### Annotation Scale



The **Annotation Scale** option has a drop-down list that displays all annotation scales available for the current drawing. The annotation scale is used to control the size and display of the annotative objects in the model space.

#### Annotation Visibility



This option is used to control the visibility of annotative objects that do not support the current annotation scale in the drawing area.

#### Automatically Add Scale



If this option is chosen, then the annotated objects in the drawing are scaled automatically based on the scale selected in the **Annotation Scale** drop-down list.

### Command Line

The **Command Line** is located at the bottom of the drawing area, where you can enter commands to execute an action. It also displays the subsequent prompt sequences and messages. You can change the size of the **Command Line**. To do so, place the cursor on the top edge of the command line; the cursor will change into a double line bar known as the grab bar. Click and drag the command line to change the size. This way you can increase its size to see all the previously used commands. By default, the command window displays only three lines. You can also press the F2 key to display the **AutoCAD Text window**, which displays the previous commands and messages.

### Status Bar

The **Status Bar**, which is also called as the **Application Status Bar**, is displayed at the bottom of the screen. It contains tools and buttons that are used to perform various AutoCAD Map 3D functions, refer to Figure 1-13. You can toggle most of the options on or off by choosing them. These options are discussed next.

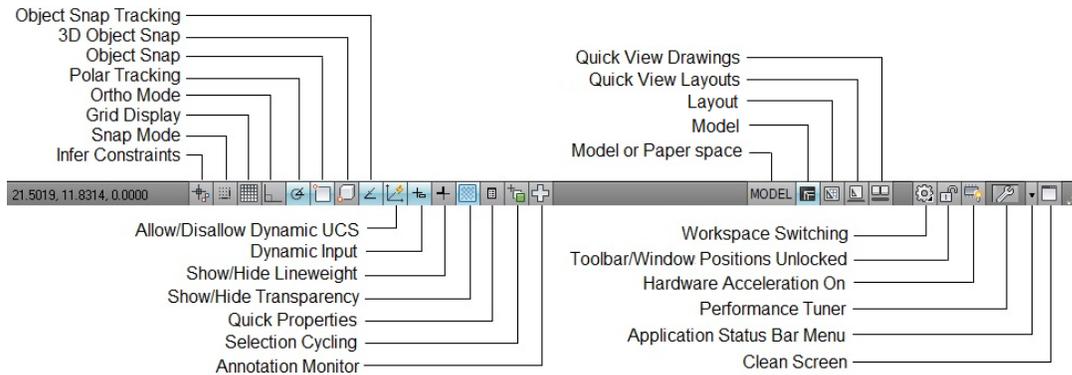


Figure 1-13 The options in the Status Bar

## Drawing Coordinates

The information about the coordinates is displayed on the left side of the **Status Bar**. You can set the display of coordinates in the **Status Bar** to static or dynamic. To change the coordinate display settings in the **Status Bar**, enter **COORDS** in the command line; you will be prompted to specify the new value. Specify the **COORDS** value in the command line. If the value is set to 0, the coordinate display will be static, which means that the coordinate values displayed in the **Status Bar** will change only when a point is specified. Setting the value of the **COORDS** variable to 1, 2, or 3 will display the coordinate in dynamic mode. If the variable is set to 1, AutoCAD Map 3D constantly displays the absolute coordinates of the graphics cursor with respect to the UCS origin.



### Note

When you assign a global coordinate system to the Workspace, the coordinates of a spatial point with reference to the assigned coordinate system will be displayed in the **Drawing Coordinates** area.

## Infer Constraints



You can choose the **Infer Constraints** button to automatically apply the geometric constraints while you create or edit a geometric object.

## Snap Mode



The **Snap Mode** button is chosen to activate the grid snap mode. If this mode is activated, the cursor will move in fixed increments using the current settings of the snap grid. The F9 key acts as a toggle key to turn the snap mode off or on. To change the snap spacing, right-click on the **Snap Mode** button; a shortcut menu will be displayed. Choose the **Settings** option from the menu; the **Drafting Settings** dialog box will be displayed with the **Snap and Grid** tab chosen by default. In the **Snap spacing** area of this tab, specify the required snap spacing along the X and Y axes in the corresponding edit boxes. Next, choose the **OK** button to apply the settings.

## Grid Display



The grid lines are used as reference lines to draw objects in AutoCAD Map 3D. Choose the **Grid Display** button to toggle the display of the grid in the drawing area. Alternatively,

you can use the F7 key to toggle the grid display. To change the spacing of the grid lines, right-click on the **Snap Mode** button; a shortcut menu will be displayed. Choose the **Settings** option from the menu; the **Drafting Settings** dialog box will be displayed with the **Snap and Grid** tab chosen. In the **Grid spacing** area of this tab, specify the required spacing along the X and Y axes in the corresponding edit boxes. Next, choose the **OK** button to apply the settings.

### Ortho Mode



This button is used to activate or deactivate the ortho mode. When this mode is active, you can draw lines at right angles only. Alternatively, choose the F8 key to turn this mode on or off.

### Polar Tracking



If you turn the polar tracking on, the movement of the cursor is restricted along a path determined by the angle set as the polar angle. Choose the **Polar Tracking** button to turn the polar tracking on or off. You can also use the F10 key to turn this option on or off. Note that turning the polar tracking on, automatically turns off the ortho mode.

### Object Snap



You can use the **Object Snap** button to turn the object snap mode on or off. Alternatively, you can use the F3 key to turn the object snap mode on or off. Note that the status of **OSNAP** (off or on) does not prevent you from using the immediate mode object snaps.

### 3D Object Snap



When this button is chosen, you can snap the key point on a solid or a surface. You can also use the F4 key to turn the 3D object snap on or off.

### Object Snap Tracking



When you choose this button, the inferencing lines will be displayed. Inferencing lines are dashed lines that are displayed automatically when you select a sketching tool and track a particular key point on the screen. Choosing this button turns the object snap tracking on or off.

### Allow/Disallow Dynamic UCS



On choosing this button, you are allowed or disallowed the use of dynamic UCS. Allowing the dynamic UCS ensures that the XY plane of the UCS is dynamically aligned with the selected face of the model. You can also use the F6 key to turn the **DUCS** button on or off.

### Dynamic Input



The **Dynamic Input** button is used to turn the **Dynamic Input** on or off. Turning it on facilitates the heads-up design approach because all commands, prompts, and dimensional inputs will now be displayed in the drawing area and you do not need to look at the Command prompt all the time. This saves the design time and also increases the efficiency of the user. If the **Dynamic Input** mode is turned on, you will be allowed to enter the commands through the **Pointer Input** boxes and the numerical values through the **Dimensional Input**

boxes. You will also be allowed to select the command options through the **Dynamic Prompt** options in the graphics window. To turn the **Dynamic Input** on or off, use the CTRL+D keys.

### Show/Hide Lineweight



Choose this button to turn on or off the display of lineweights in the drawing. If this button is not chosen, the display of lineweight will be turned off.

### Show/Hide Transparency



This button is used to turn on or off the transparency set for a drawing. You can set the transparency in the **Properties** panel or in the layer in which the sketch is drawn.

### Quick Properties



If you select a sketched entity when this button is chosen in the **Status Bar**, the properties of the selected entity will be displayed in a panel.

### Selection Cycling



You can use this button to select an object from a group of two or more overlapping or closely placed entities. To select an object from the overlapping entities, choose the **Selection Cycling** button in the **Status Bar**; the selection cycling mode will be activated. Next, click at the required location to select an object; a list box will be displayed. This list box contains a list of objects at the selected location. Choose the required object from the list to proceed.

### Model



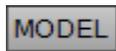
You can choose the **Model** button in the **Status Bar** to invoke the model space environment in the drawing window. In the model space environment, you can create, edit, and update the drawing objects in the drawing model.

### Layout



You can choose the **Layout** button to switch into the layout space environment. In this environment, you can create a new or modify an existing layout. You can use these layouts for creating and publishing maps.

### Model or Paper source



The **Model or Paper source** button is used to switch between the model space and paper space while in the layout space environment. Switching to model space while in the layout environment will enable you to work on the drawing objects in the model. To switch to model space in the layout environment, choose the **Model or Paper source** button; the drawing objects in the model will become editable and the text on the button will change from **PAPER** to **MODEL**. To switch back to paper space, choose the **Model or Paper source** button; the paper space will be invoked and now you can work with the map elements in the layout.

## Quick View Layouts



On choosing this button, thumbnails of the layouts in the current drawing are displayed. To choose a layout, click on the required layout thumbnail.

## Quick View Drawings



On choosing this button, thumbnails of the active drawings are displayed. When you place the cursor over the thumbnails, they are enlarged and you can choose the drawing that you need to invoke.

## Toolbar/Window Positions Unlocked



The **Toolbar/Window Positions Unlocked** button is used to lock and unlock the positions of toolbars and windows. When you choose this button, a shortcut menu is displayed. Choosing the **Floating Toolbars/Panels** option allows you to lock the current position of the floating toolbars. Also, a check mark is displayed against those toolbars in the shortcut menu that are currently locked. Choosing the **Docked Toolbars/Panels** option from the shortcut menu allows you to lock the current position of all the docked toolbars. Similarly, you can lock or unlock the position of floating and docked windows such as the **Properties** window or the **Tool Palettes**. If you move the cursor on the **All** option, a cascading menu is displayed that provides the option to lock and unlock all the toolbars and windows.



### Note

The *LOCKUI* system variable is used for the locking and unlocking of the toolbars and windows. The following are the values of the system variable:

- Lockui*<0> No toolbar or window locked
- Lockui*<1> Locks all docked toolbars
- Lockui*<2> Locks all docked windows
- Lockui*<4> Locks all floating toolbars
- Lockui*<8> Locks all floating windows

## Hardware Acceleration On



This button is used to set the performance of the software at an acceptable level.

## Task Pane

The **Task Pane** is displayed on the right of the AutoCAD Map 3D 2013 screen, as shown in Figure 1-14. To hide/show the **Task Pane** in the interface, choose the **Map Task Pane** button in the **Palettes** panel of the **View** tab.

You will find alternative options to the ribbon interface in the **Task Pane**. In the **Task Pane**, there are four tabs: **Display Manager**, **Map Explorer**, **Map Book**, and **Survey**. These tabs are explained next.

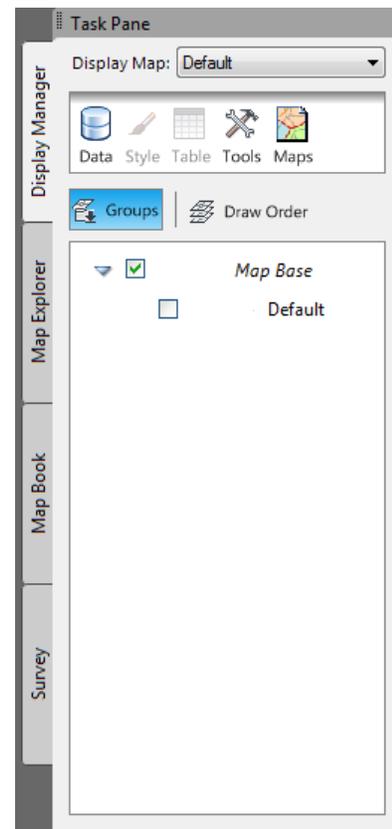


Figure 1-14 The Task Pane

## Display Manager Tab

The options in the **Display Manager** tab are used to connect and display feature layers and then perform various types of analyses on these feature layers.

## Map Explorer Tab

The options in the **Map Explorer** tab are used to assign the rights of a drawing to a user, attach new drawings to the current drawing, define queries, and so on.

## Map Book Tab

The options in the **Map Book** tab are used to divide a large map into small tiles. You can then render each tile on a separate page. You can publish map book online or can have paper print.

## Survey Tab

The options in the **Survey** tab are used to import and export the survey data, and create a data store.

## Navigation Bar

In AutoCAD Map 3D 2013, the commonly used tools for navigation are grouped together in a tool bar known as the **Navigation Bar**. By default, this toolbar is placed on the right hand top corner in the drawing area. Figure 1-15 shows the **Navigation Bar** available in the AutoCAD Map 3D 2013. The tools in the **Navigation Bar** are discussed next.

### ViewCube

The **ViewCube** tool is used to switch between the standard and isometric views or to roll the current view.

### Navigation Wheel

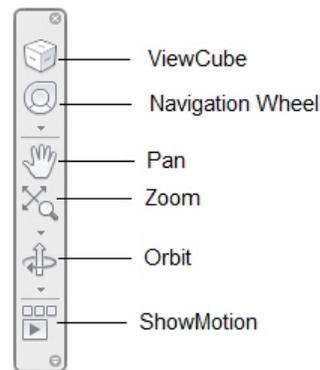
The **Navigation Wheel** has a set of navigation tools such as pan, zoom, and orbit. You can use any of these options to set the view of a drawing in the drawing window.

### Pan

This tool allows you to view the portion of the drawing that is outside the current display area. To view the outside portion, choose this tool, press and hold the left mouse button, and then drag the drawing area. Press ESC to exit this tool.

### Zoom

A list of various zoom tools are displayed in the **Zoom** drop-down. The options in the **Zoom** drop-down are used to enlarge or reduce a view in the drawing window without affecting the actual shape and size of the objects in this view.



*Figure 1-15 The tools in the Navigation Bar*

## Orbit

The tools in the **Orbit** drop-down are used to rotate a view in the drawing window in the 3D space.

## ShowMotion

Choose this button to capture different views in a sequence and animate them when required.

## AutoCAD Map 3D DIALOG BOXES

There are certain commands, which when invoked, display a dialog box. A dialog box is a secondary window that allows the users to specify attributes and parameters to perform various tasks. It is also used to provide the users with information or progress feedback. A typical dialog box has a name, radio buttons, text or edit boxes, check boxes, slider bars, image boxes, and command buttons. Figure 1-16 shows some of the components in a dialog box.

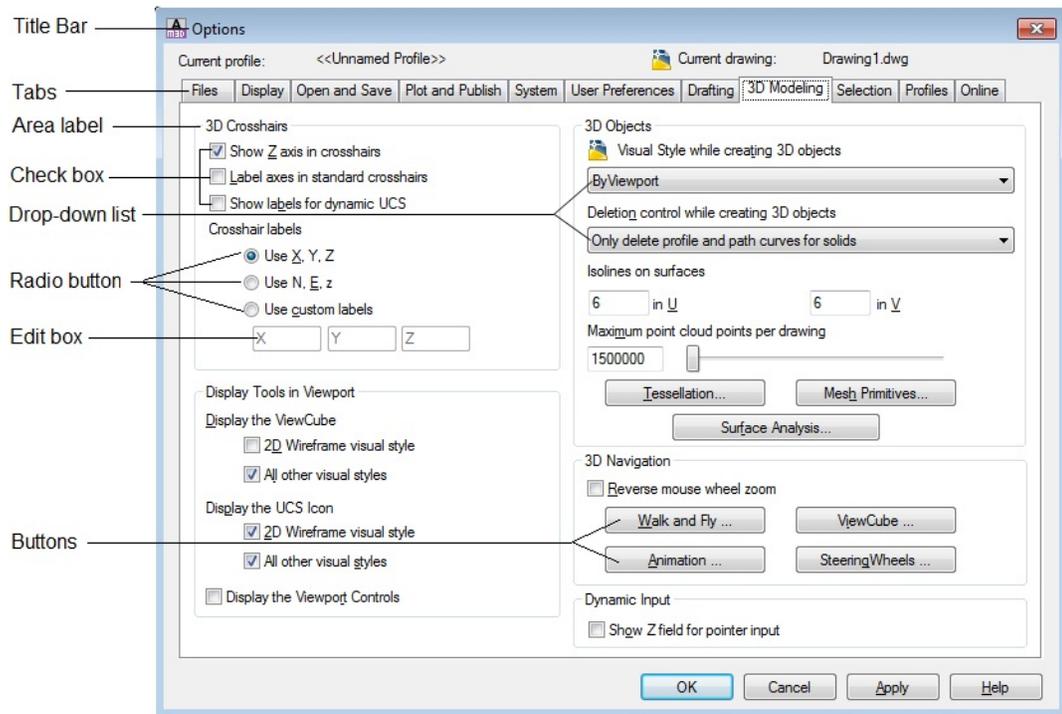


Figure 1-16 Components of a dialog box

The Title Bar displays the name of a dialog box. Tabs contain various sections with a group of related options under them. The check boxes are toggle buttons for making a particular option available or unavailable. The drop-down list displays a list of items to choose from; only one item can be selected at a time. The text box is an area where you can enter any text like a file name. It is also called an edit box because you can make changes to the text entered in

it. In some dialog boxes, there is the [...] button, which when chosen displays another related dialog box. There are certain command buttons (**OK**, **Cancel**, and **Help**) at the bottom of the dialog box. The names of these buttons imply their functions. The button with a dark border is the default selected button. A dialog box may also have a **Help** button which when clicked will show related help on various features of the dialog box.

## AutoCAD Map 3D HELP

You can get online and offline help regarding the use and working of AutoCAD Map 3D 2013 commands by using various options such as command line, help menu or, the F1 key on the keyboard.

You can also access the help topic by using the search option in the **InfoCenter** bar. The **InfoCenter** bar also provides links to other online resources which are useful in exploring AutoCAD Map 3D. Some of the options in the **InfoCenter** bar are discussed next.

### InfoCenter Bar

By default, the **InfoCenter** bar is located on the right side in the AutoCAD Map 3D application title bar. Various options to search for help and web links for direct access to online information resources are given in the **InfoCenter** bar. Figure 1-17 shows various tools and options in the **InfoCenter** bar. Some of the options in this bar are discussed next.

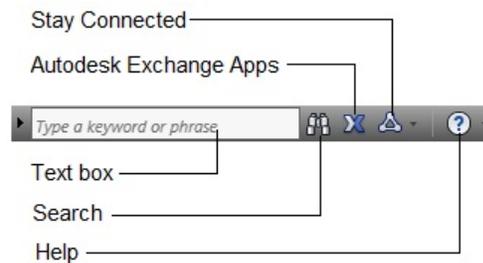


Figure 1-17 The InfoCenter bar

### InfoCenter Text Box and Search Button

To access help, click in the text box of the **InfoCenter** bar and enter the keywords or questions to be searched for and then choose the **Search** button; the **AutoCAD Map 3D Help** window will be displayed, refer to the Figure 1-18.



#### Note

You can directly invoke the **AutoCAD Map 3D Help** window by pressing the **F1** key.

### Autodesk Exchange Apps

On choosing the **Autodesk Exchange Apps** button from the **InfoCenter** bar, the Autodesk Exchange Apps website will be opened. This website is an online resource from where you can browse and download e-books, models, training materials, and add-ons for your AutoCAD product. Some of the products available are free to download.

### Stay Connected

You can use the options in the **Stay Connected** drop-down list to verify whether the AutoCAD product is up-to-date and also connect to the **Autodesk Subscription Center** which is the online community for AutoCAD.

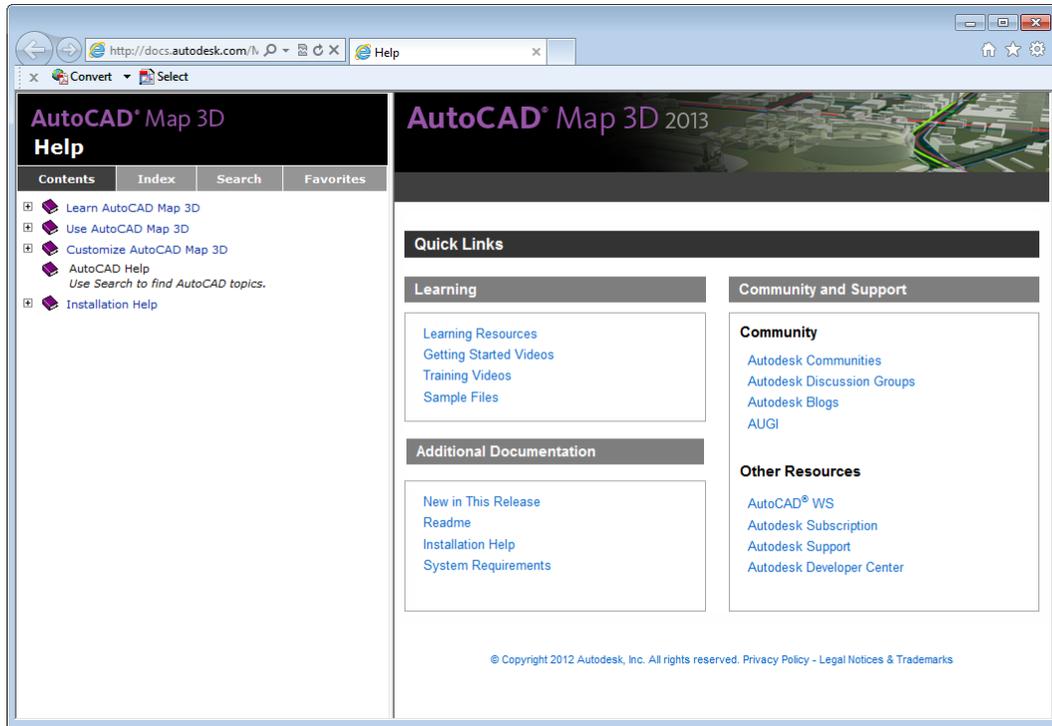


Figure 1-18 The AutoCAD Map 3D Help window

### Help

The **Help** drop-down list contains options that provide links to various useful resources. Figure 1-19 shows options in the **Help** drop-down list of the **InfoCenter** bar. These options are discussed next.

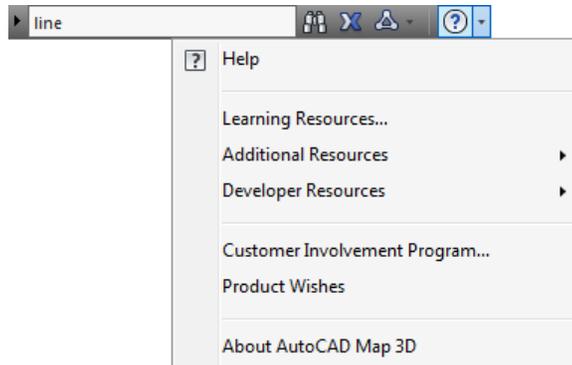


Figure 1-19 The options in the Help drop-down list

### Help

On choosing the **Help** option from the drop-down list, the **AutoCAD Map 3D Help** window will be displayed, as shown in Figure 1-18. You can use this window to access help

on different topics and commands. Using the instructions in this window, you can easily understand various tools and methods used in AutoCAD Map 3D 2013. Additionally, you can access online help documentation as well as local (offline) help documentation.

In this window, you can access the help files related to certain keywords. To do so, choose the **Search** tab in the left pane. Next, enter any keyword in the **Search** edit box located in the left pane; topics containing the searched keyword will be displayed in a list below the **Search** edit box. Choose the required topic from the search result; the right pane will display the content within the selected topic. You can also search the help topics by the relevance of the contents. To do so, choose the **Contents** tab; the AutoCAD Map 3D contents are logically grouped and displayed in a hierarchical order in the left pane. Some heads in the hierarchy may contain subhead. To view the contents within these subheads, expand the nodes corresponding to the subhead by choosing the + symbol displayed to the corresponding node. To view the content of the topic, choose the topic name; the right pane will display the content of the selected topic.

### **Learning Resources**

AutoCAD Map 3D provides some basic learning resources to the user. To view these resources, select the **Learning Resources** option from the **Help** drop-down list; the **AutoCAD Map 3D help** window will be displayed with links to the learning resources. In this window, you can click on the desired link to display information for the required topic.

### **Additional Resources**

The links in this option can be used to access the **Autodesk User Group International** and **AutoCAD Map 3D** websites. These websites can be used as additional resources and forums to discover information about AutoCAD Map 3D.

### **Developer Resources**

The **Developer Resources** option contains link to connect to the Autodesk Developer Network web page. This web page provides access to the blog and forums that can be useful for software developers working with Autodesk Infrastructure Modeling technologies.

### **Customer Involvement Program**

This option is used to share information about your system configuration and usage of products with Autodesk. The collected information is used by Autodesk for the improvement of Autodesk software.

### **Product Wishes**

This option is used to display the discussion forum of the Authorized Developer Network group.

### **About AutoCAD Map 3D**

This option gives you information about the release, serial number, licensed to, and the legal description about AutoCAD Map 3D 2013.

## More Help

1. Almost all dialog boxes in AutoCAD Map 3D have a **Help** button. You can access help on various topics by choosing this button. In case, the **Help** button is not displayed in a dialog box, press the F1 key on the keyboard; the help window for the dialog box will be displayed.
2. Some of the dialog boxes have a question mark (?) button at the top right corner just adjacent to the **close** button. When you choose this button, the '?' symbol gets attached to the cursor. You can then drop this symbol on any item in the dialog box to display information about that particular item.
3. Help regarding various tools and buttons is also displayed in form of tool tips. Hover the pointer over a tool or button; a short description related to the chosen button or tool will be displayed in a tooltip. To activate or deactivate a tooltip, invoke the **Options** dialog box by entering the **OP** command in the command line. Next, choose the **Display** tab in the **Options** dialog box. Next, in the **Window Elements** area of the **Display** tab, select or clear the **Show ToolTips** check box to activate or deactivate the tool tip, refer Figure 1-20.

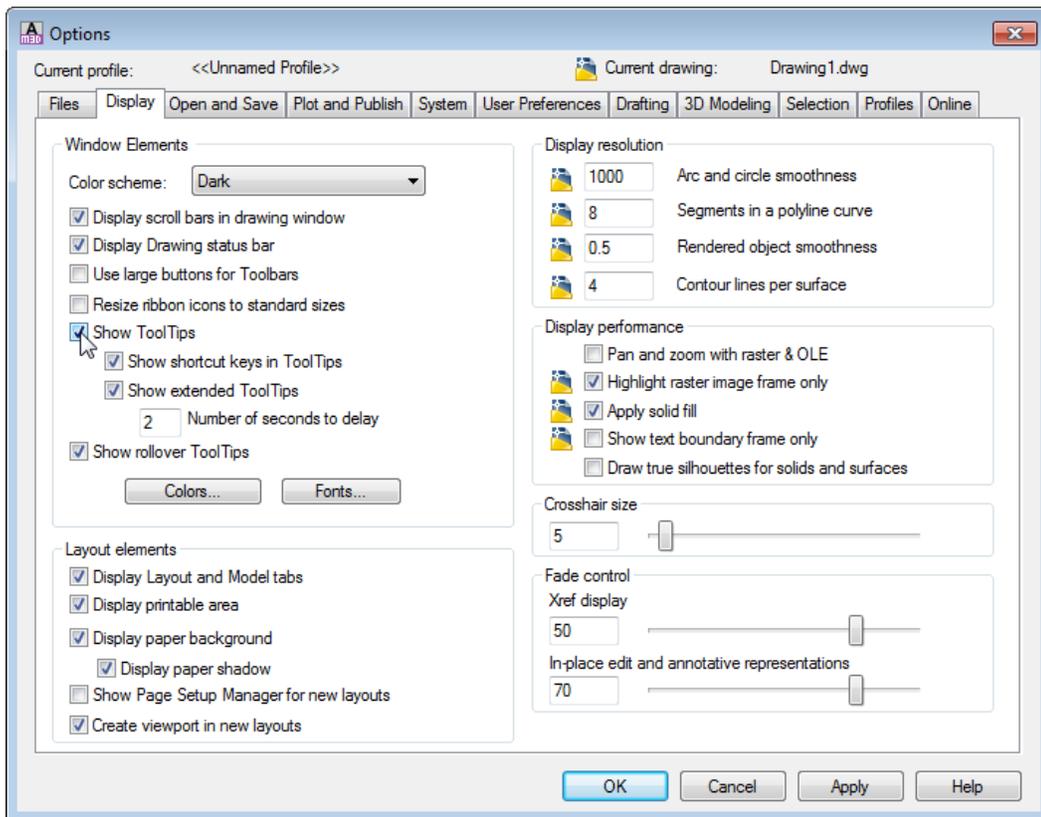


Figure 1-20 Selecting the **Show ToolTips** check box from the **Options** dialog box

## ABBREVIATIONS OF THE FILE FORMATS

In this textbook, some of the vector layers have been specified by their respective file formats. The description of abbreviation of the file formats used in this text book is given below.

Abbreviation	Description
DWG	Drawing file (AutoCAD file format)
DWT	Drawing template file (AutoCAD file format)
DWF	Drawing Web Format (AutoCAD file format)
SHP	Shape file ( ESRI file format)
SDF	Spatial Data File ( Autodesk file format)
CSV	Comma Separated Variables ( MS Excel file format)
TXT	Text file
JPEG	Joint Photographic Experts Group (Image file)
TiFF	Tagged Image Format File (Image file)
ISD	Index file generated for point cloud data
LAS and LSD	LiDAR data file format
GPS	Global Positioning System