AutoCAD Map 3D 2009

Workflow Guide

Autodesk®

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GOVERNMENT USE

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Workflow Guide

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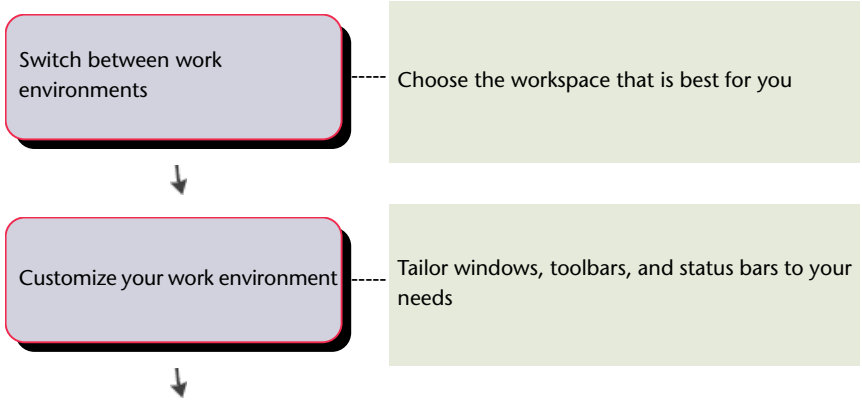
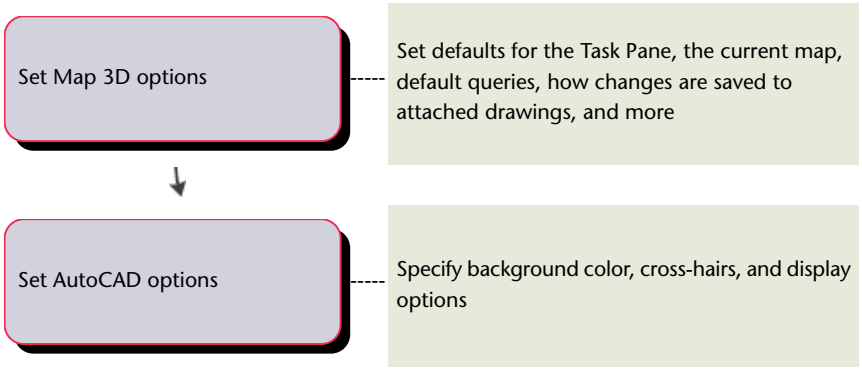
These workflows provide an overview of the steps to perform common GIS tasks.

Set Up

Set Up Your Work Environment

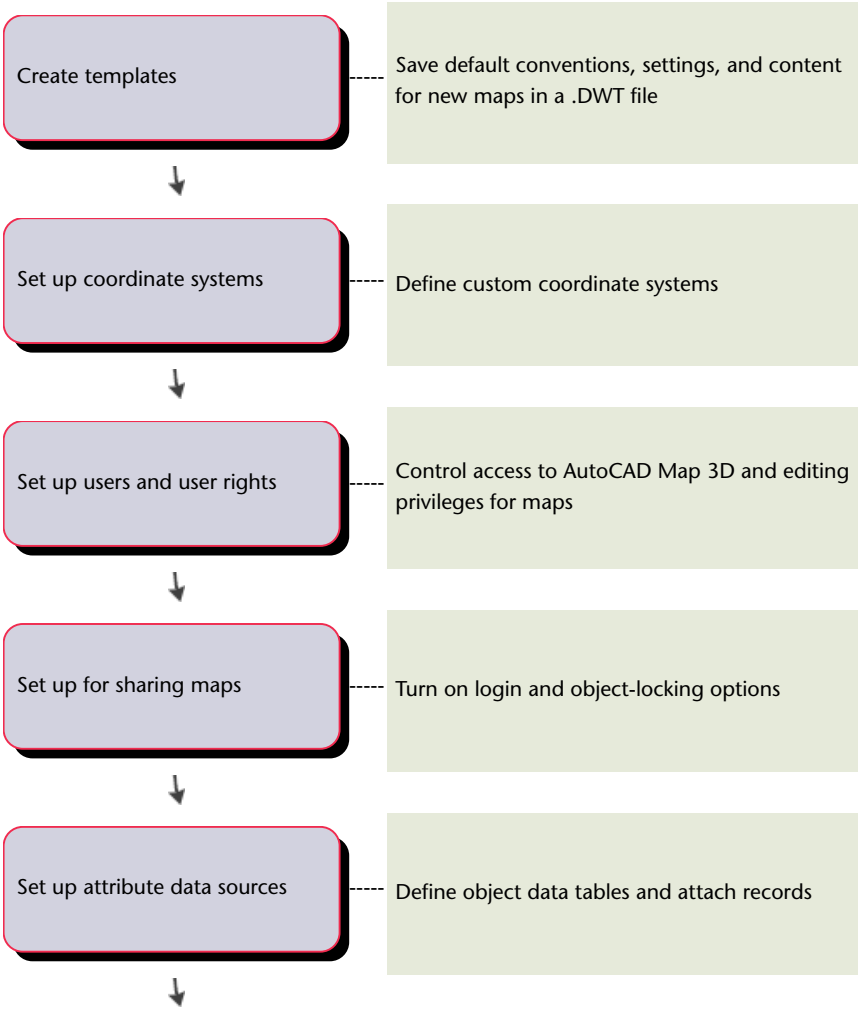
Customize the windows, menus, toolbars, and default settings for AutoCAD Map 3D to suit your work needs.

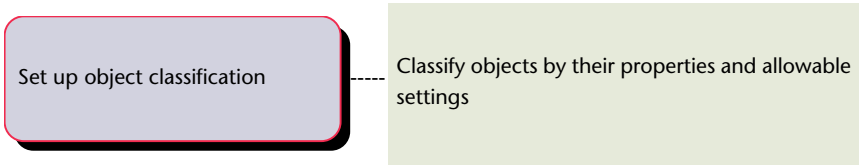



Set Map 3D options
Set defaults for the Task Pane, the current map, default queries, how changes are saved to attached drawings, and more
Set AutoCAD options
Specify background color, cross-hairs, and display options

Set Up Your DWG Data

Use templates to set the defaults for all new maps; create any custom coordinate systems you need; specify user rights and credentials and set up AutoCAD Map 3D for multi-user editing of drawing objects; define classification systems and attribute data sources for your drawing objects.

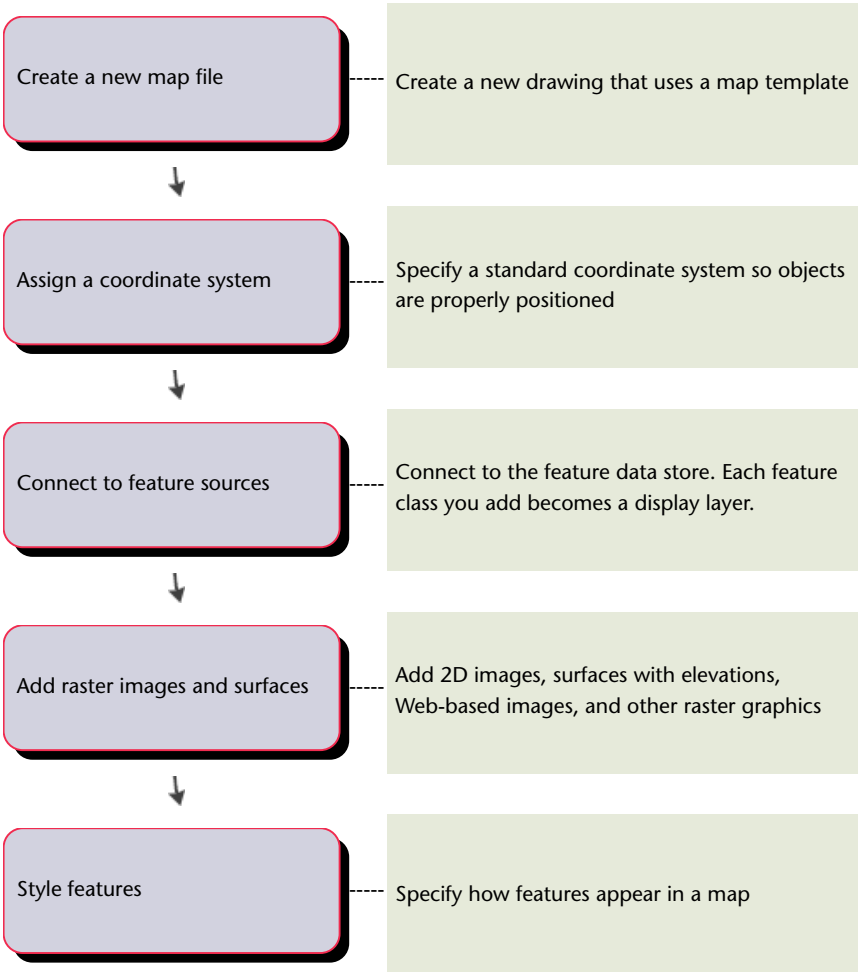


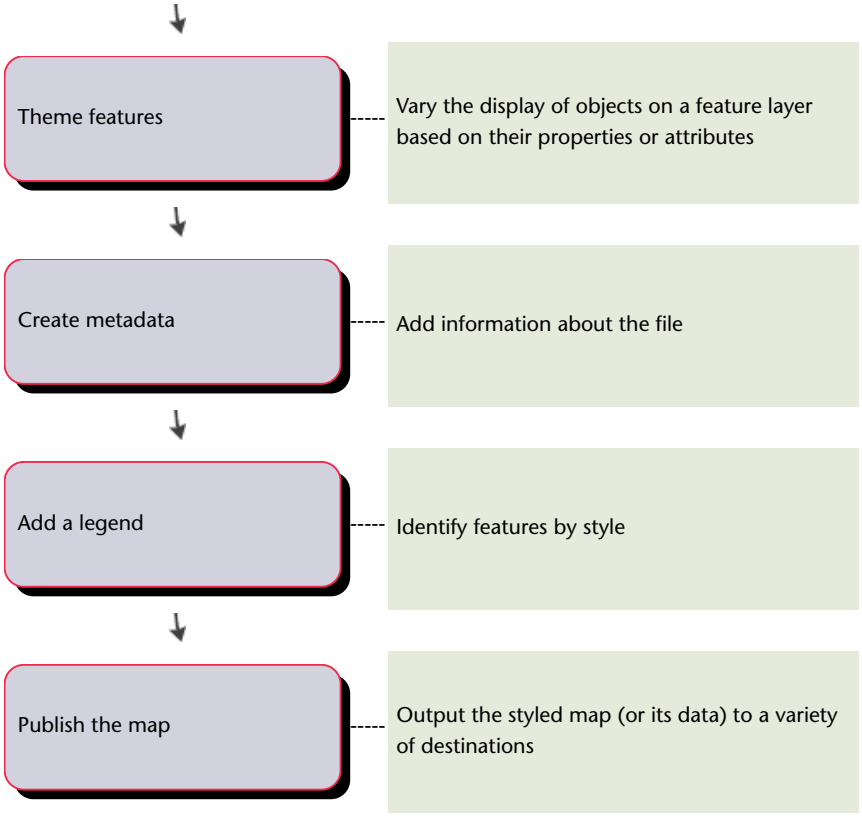

Set up object classification
Classify objects by their properties and allowable settings

Create a Map Start to Finish

Create a Map Using Feature Sources

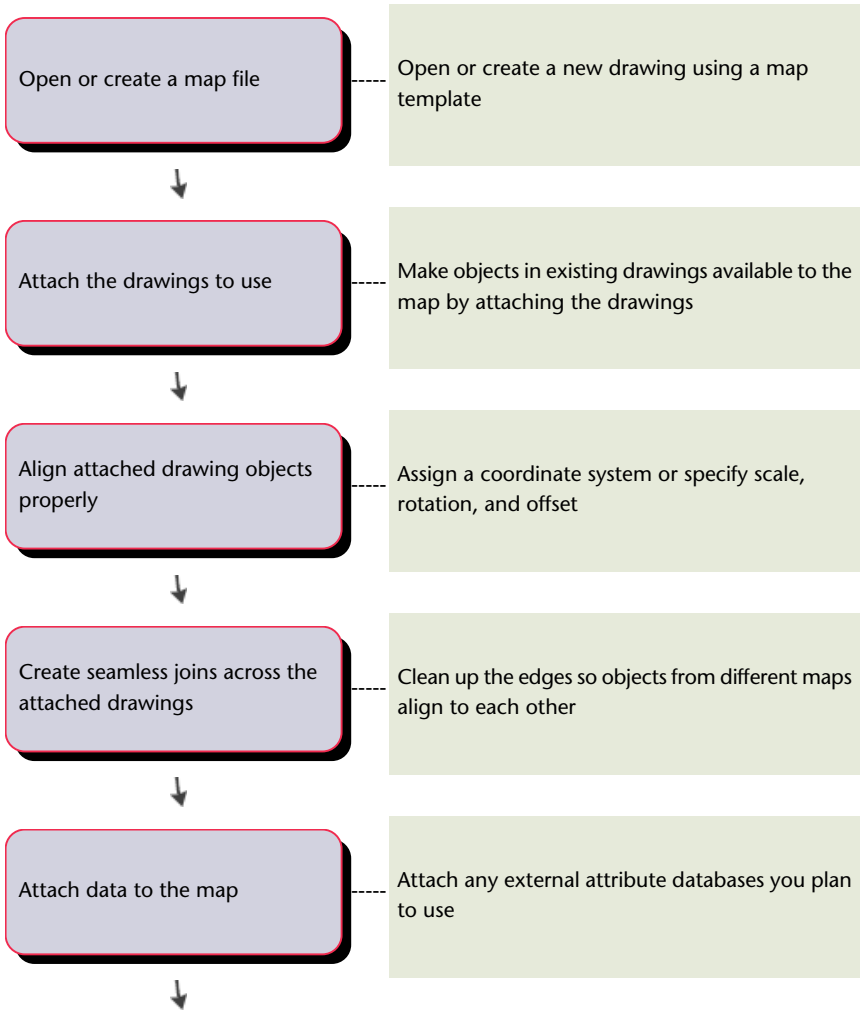
Connect to a geospatial data store, add feature class layers to your map, and style the layers. Create metadata and add a legend to your map.

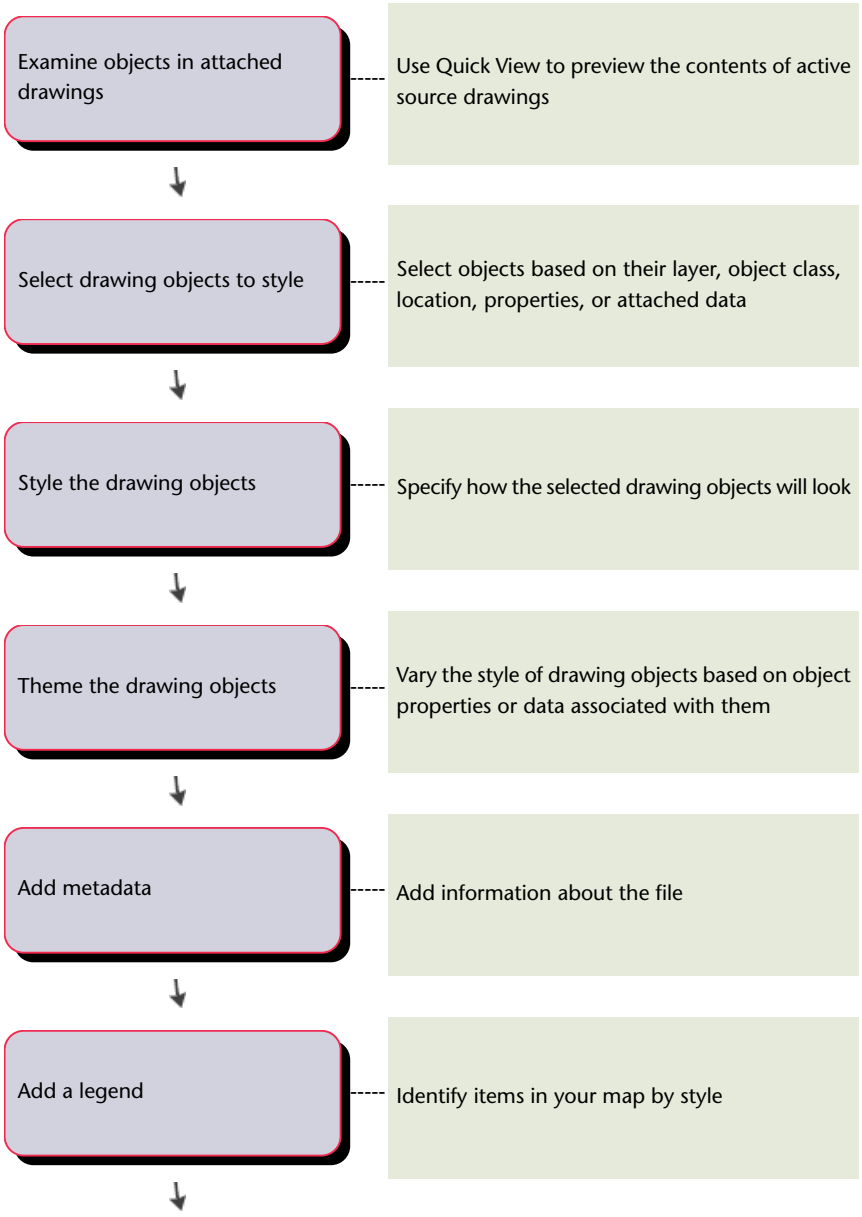


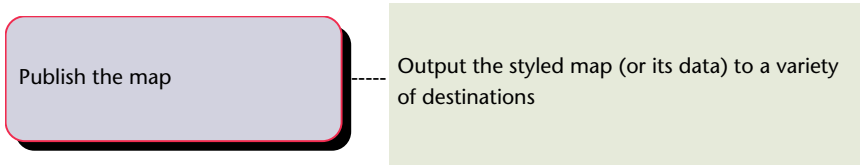

Theme features
Vary the display of objects on a feature layer based on their properties or attributes
Create metadata
Add information about the file
Add a legend
Identify features by style
Publish the map
Output the styled map (or its data) to a variety of destinations

Create a Map from CAD Data

Attach AutoCAD drawings, align them properly, attach attribute data, style the drawing objects, create metadata, and add a legend to your map.

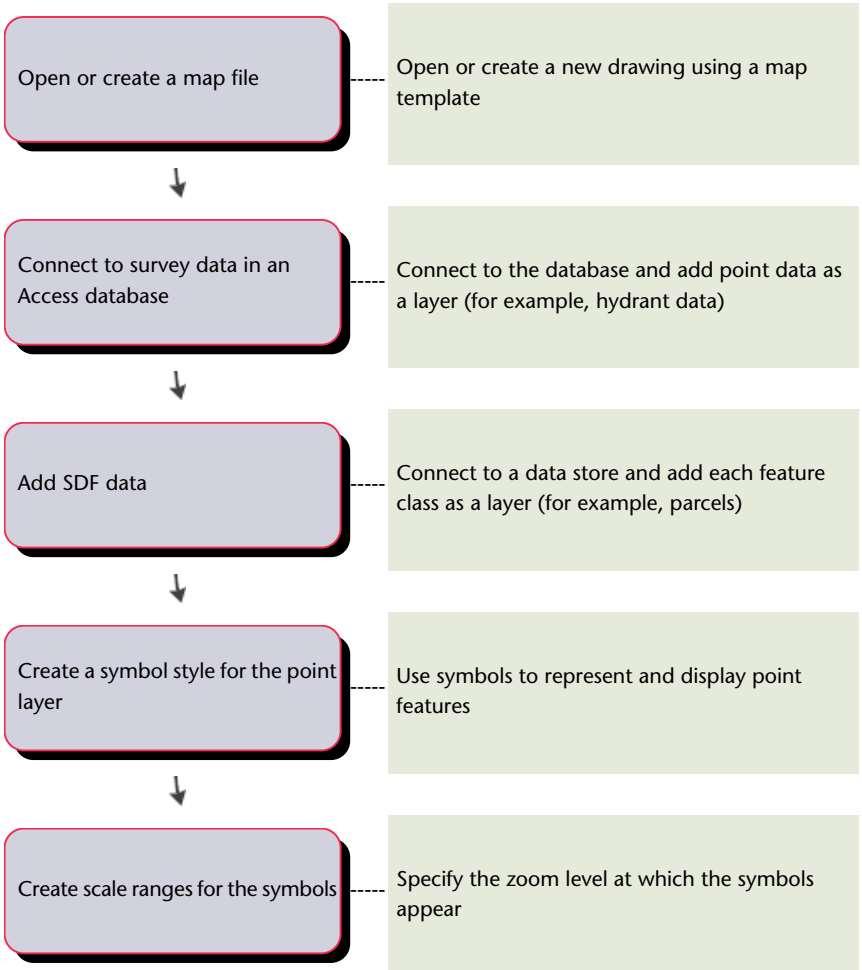


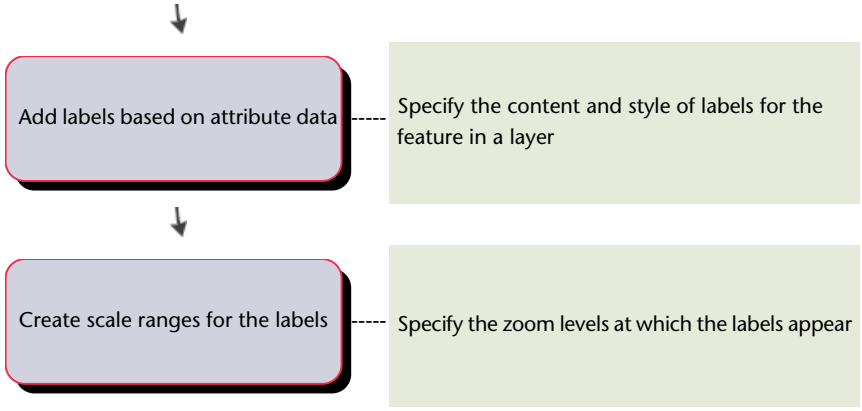

Examine objects in attached drawings
Use Quick View to preview the contents of active source drawings
Select drawing objects to style
Select objects based on their layer, object class, location, properties, or attached data
Style the drawing objects
Specify how the selected drawing objects will look
Theme the drawing objects
Vary the style of drawing objects based on object properties or data associated with them
Add metadata
Add information about the file
Add a legend
Identify items in your map by style


Publish the map
Output the styled map (or its data) to a variety of destinations

Create a Utility Map

Add survey data to a map and overlay it on a feature-for example, show hydrants and parcels. Style the hydrants using symbols, and assign scale ranges so the symbols appear only at certain zoom levels. Style the parcels to include labels based on their attribute data, and assign scale ranges so the labels appear only at certain zoom levels.



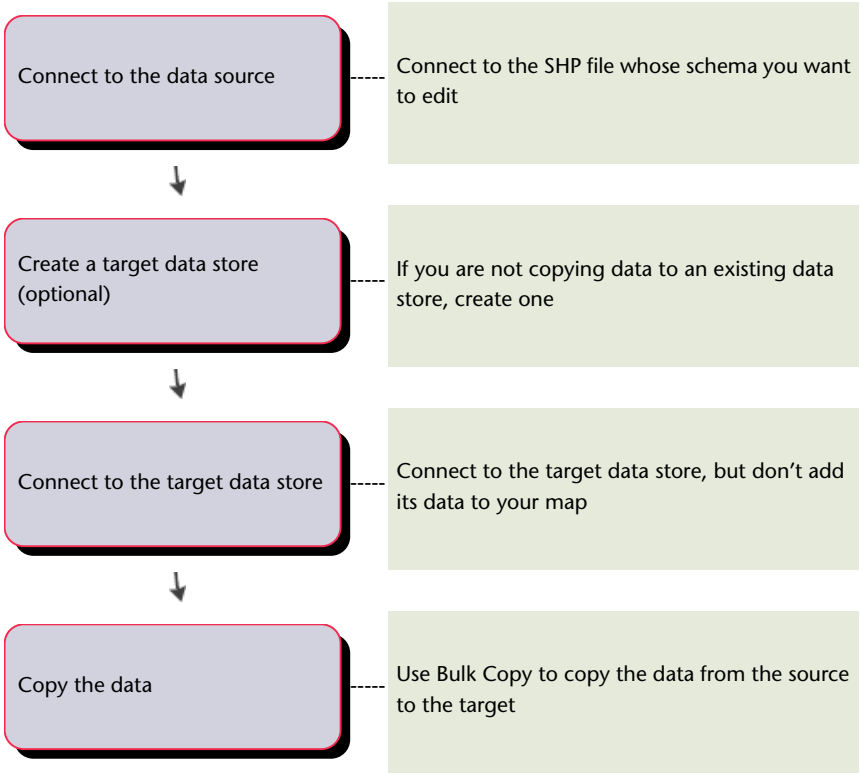

Add labels based on attribute data
Specify the content and style of labels for the feature in a layer
Create scale ranges for the labels
Specify the zoom levels at which the labels appear

Manage Data

Copy SHP File Data to Microsoft SQL Server, MySQL, or Oracle

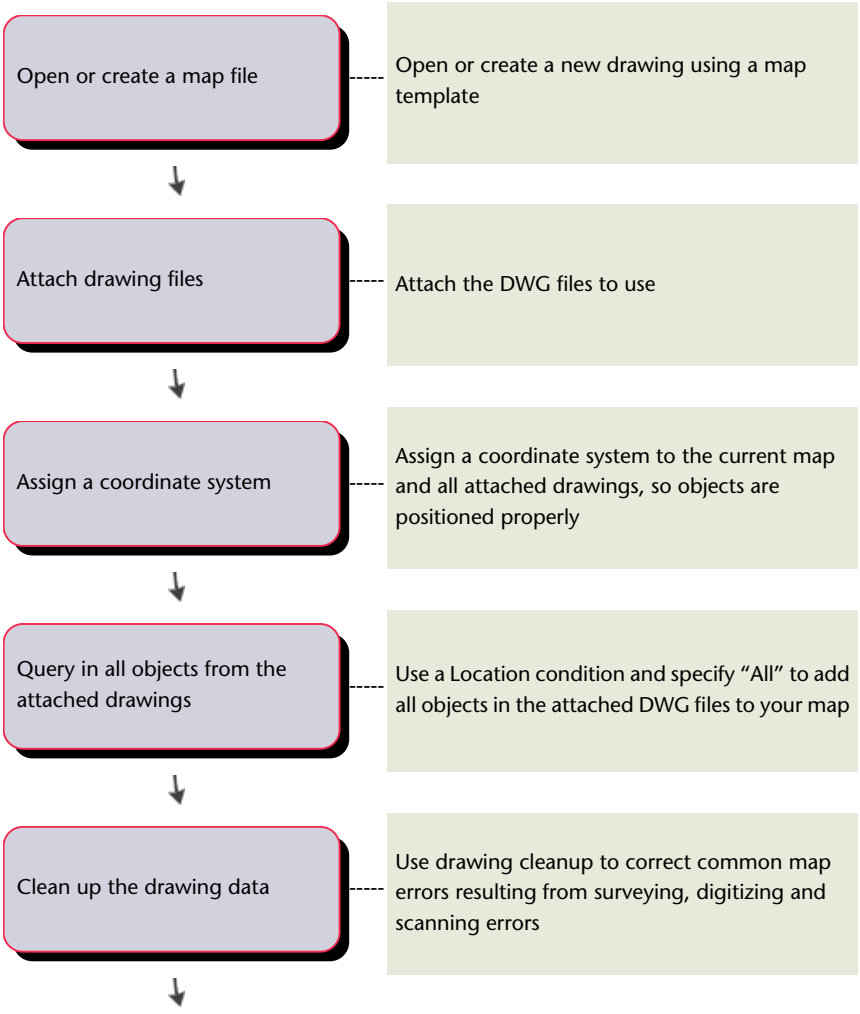
Copy data from one geospatial format to another.

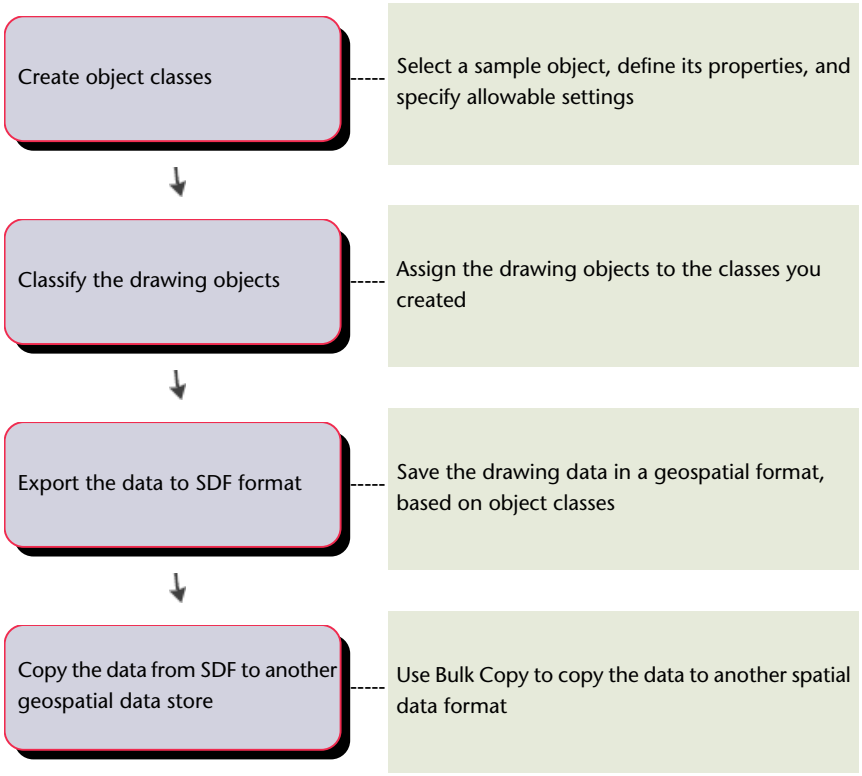
NOTE If you are copying data to SHP format, create a folder as the target data store, rather than a file.



Create ArcSDE Features from Unclassified Drawings

Bring in an unstructured DWG file that needs to be cleaned up and georeferenced. Repair and classify the data, and export it to a geospatial file format (SDF). Then copy the resulting geospatial data to a central GIS repository (ArcSDE).

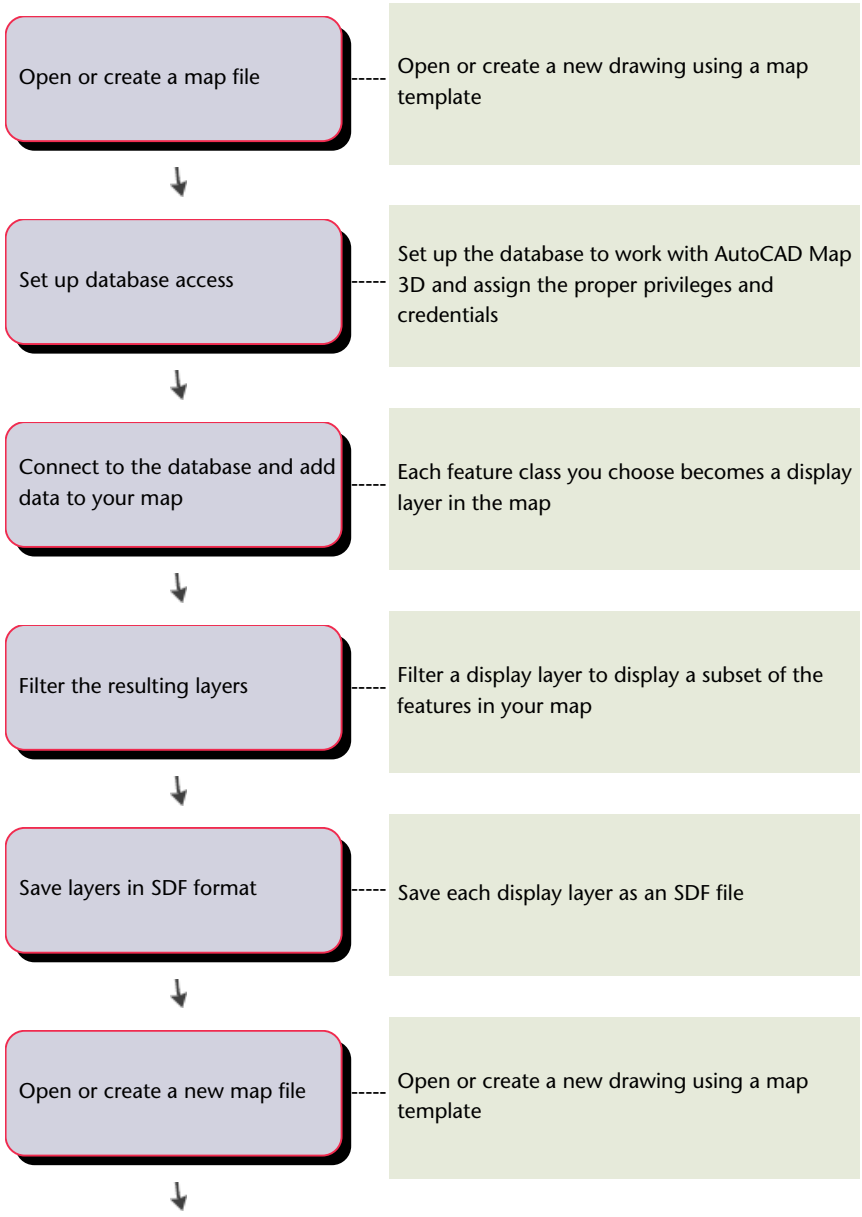


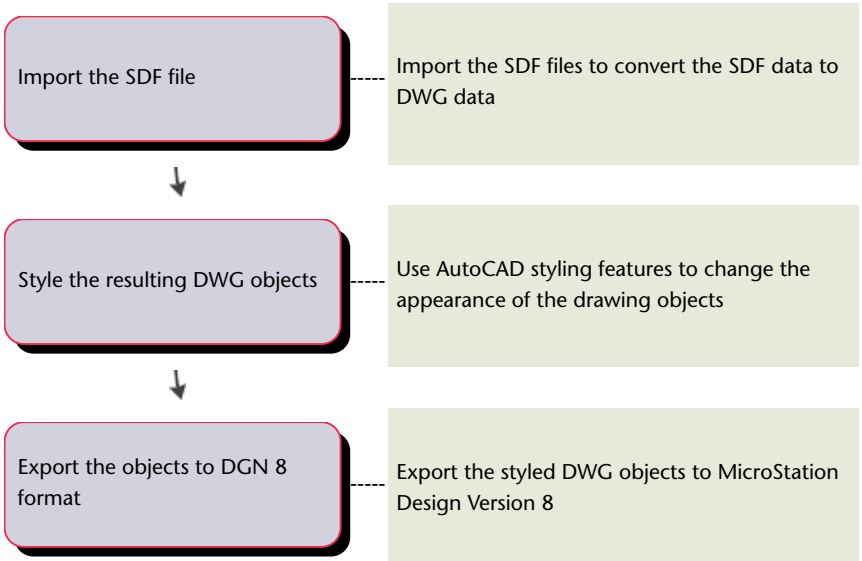


Copy Features from an FDO Feature Source to a DGN File

Get features and related attributes from a database and export them to DGN 8 format.

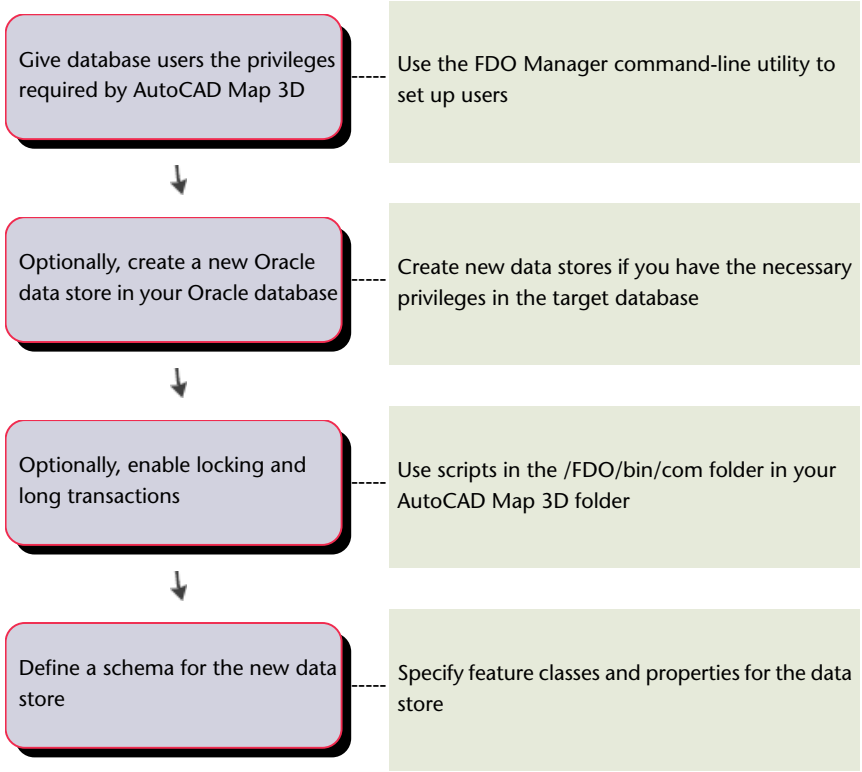
NOTE The coordinate system for the map will automatically match your database. You don't need to assign a coordinate system to the map itself, unless you want to transform the data to a different coordinate system. Generally, you should edit in the same coordinate system as your database. If the data is in different coordinate systems, edit one layer at a time so you are always editing in a coordinate system that matches your data.


Open or create a map file
Open or create a new drawing using a map template
Set up database access
Set up the database to work with AutoCAD Map 3D and assign the proper privileges and credentials
Connect to the database and add data to your map
Each feature class you choose becomes a display layer in the map
Filter the resulting layers
Filter a display layer to display a subset of the features in your map
Save layers in SDF format
Save each display layer as an SDF file
Open or create a new map file
Open or create a new drawing using a map template


Import the SDF file
Import the SDF files to convert the SDF data to DWG data
Style the resulting DWG objects
Use AutoCAD styling features to change the appearance of the drawing objects
Export the objects to DGN 8 format
Export the styled DWG objects to MicroStation Design Version 8

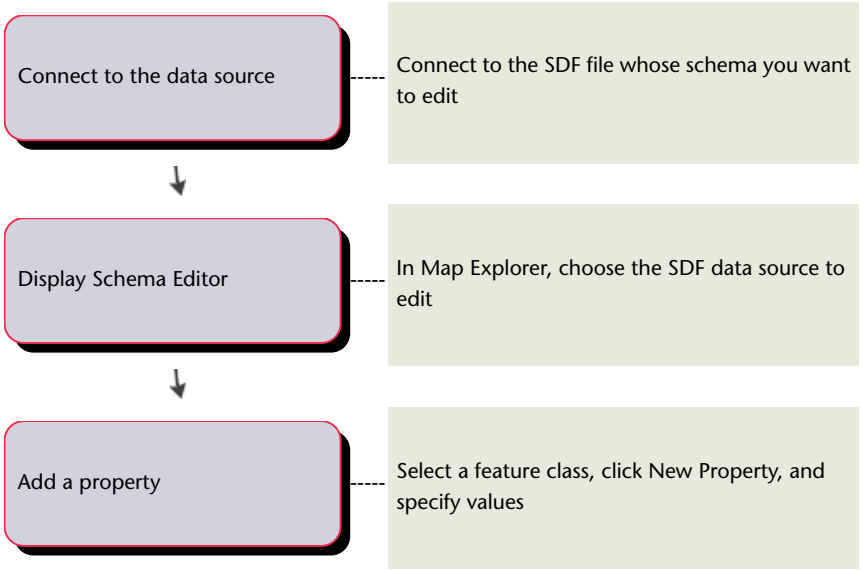
Prepare an Existing Oracle Database for Use with Map 3D

Set up user access and run scripts to enable functionality. Create schemas for use with your data.



Add a Property to an SDF Schema

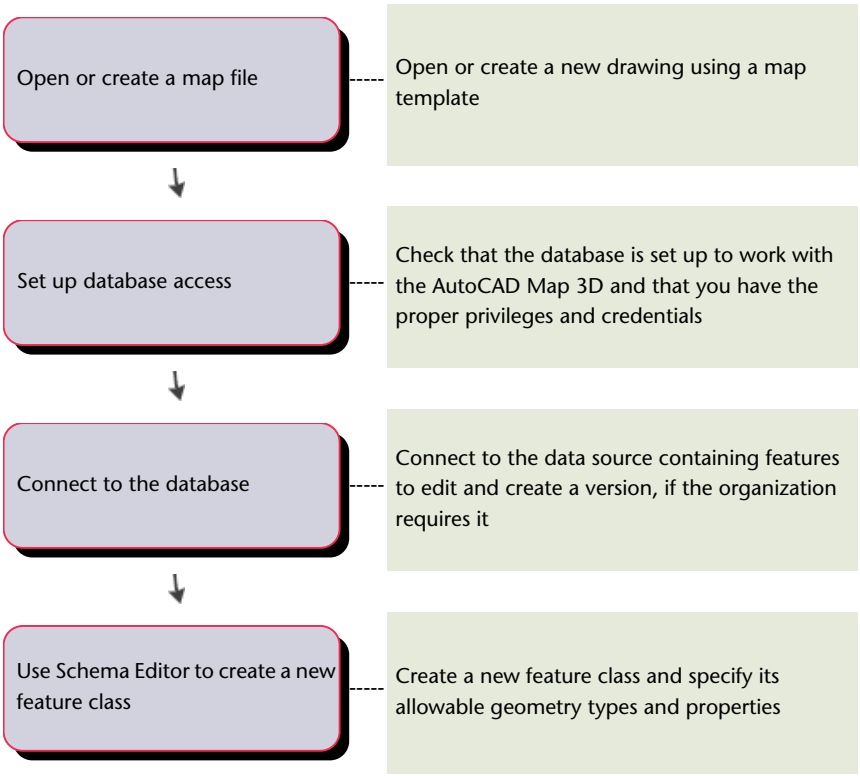
The set of feature classes and their properties is called a schema. Properties are characteristics of all objects in the feature class. For example, a property of a Roads feature class might specify the number of lanes it has, or its speed limit. You can add a property to an SDF schema.



Add a New Feature Class to an FDO Data Source

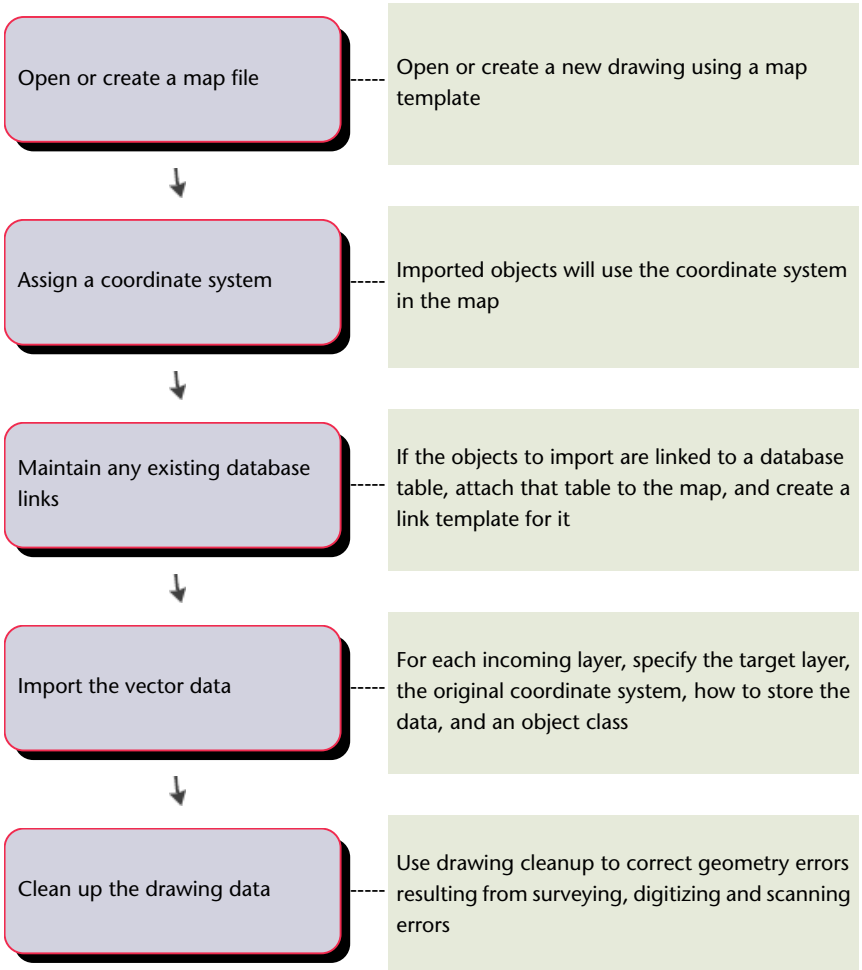
Use Schema Editor to create a new feature class and define its properties.

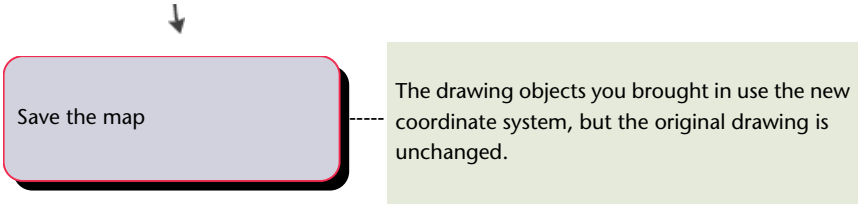
NOTE The coordinate system for the map will automatically match your database. You don't need to assign a coordinate system to the map itself, unless you want to transform the data to a different coordinate system. Generally, you should edit in the same coordinate system as your database. If the data is in different coordinate systems, edit one layer at a time so you are always editing in a coordinate system that matches your data.



Import Vector Data from Another File Format

If you have map data that is not in DWG format, you can import it into AutoCAD Map 3D. Importing converts data to drawing objects, while maintaining coordinate system information and links to data. You can limit the import to a specific area in the map or assign incoming data to existing AutoCAD Map 3D object classes.

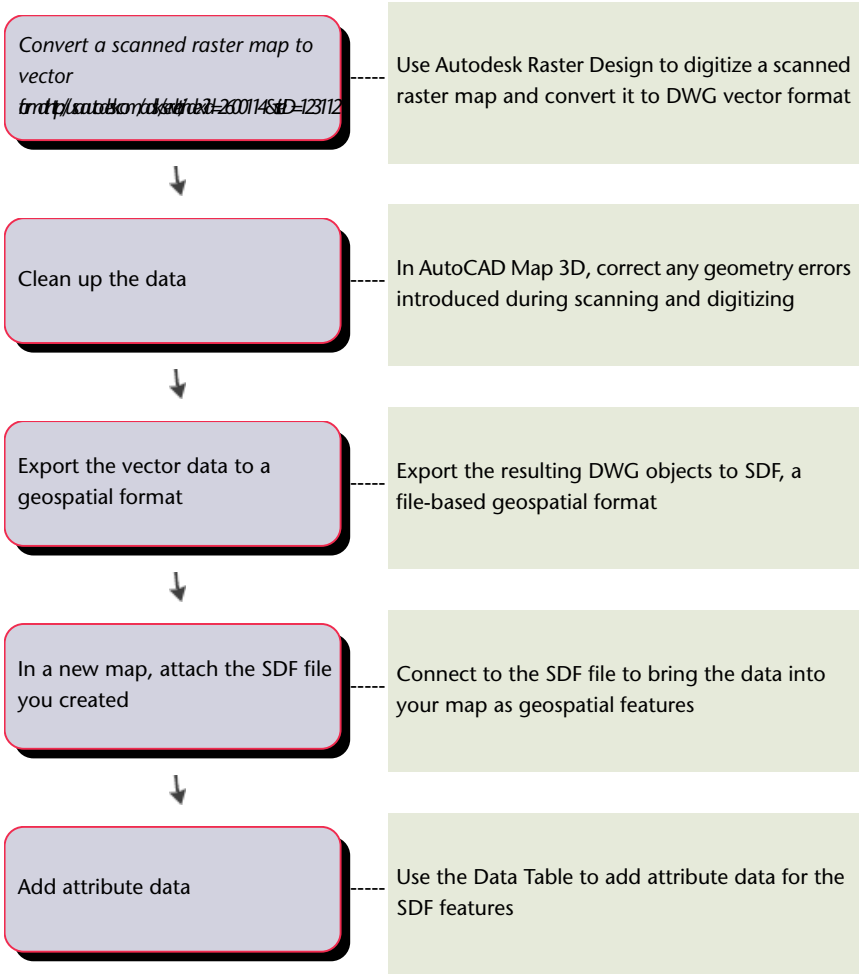




NOTE Changes you make to imported objects do not affect the original map. To edit features and update the original source with your changes, connect to the data rather than import it. See Bringing in GIS Features in the AutoCAD Map 3D Help.

Digitize a Scanned Paper Map

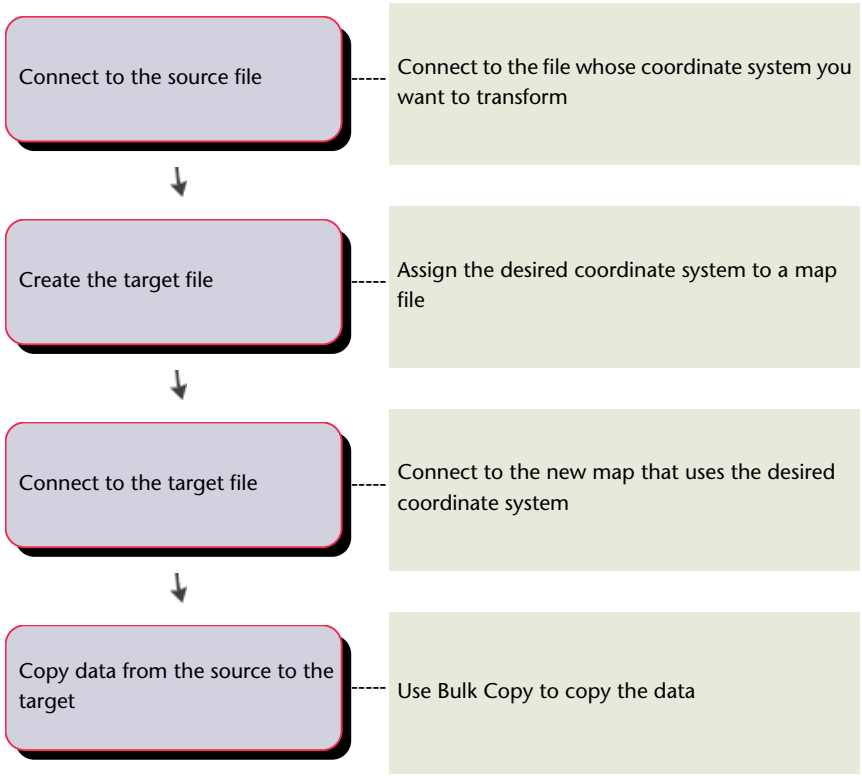
Use Autodesk Raster Design to convert a scanned raster map to vector (DWG) format, and then use AutoCAD Map 3D to clean up any geometry errors and export the data in a geospatial format. Once you connect to the new geospatial data store, you can add attribute data.



Work with Coordinate Systems

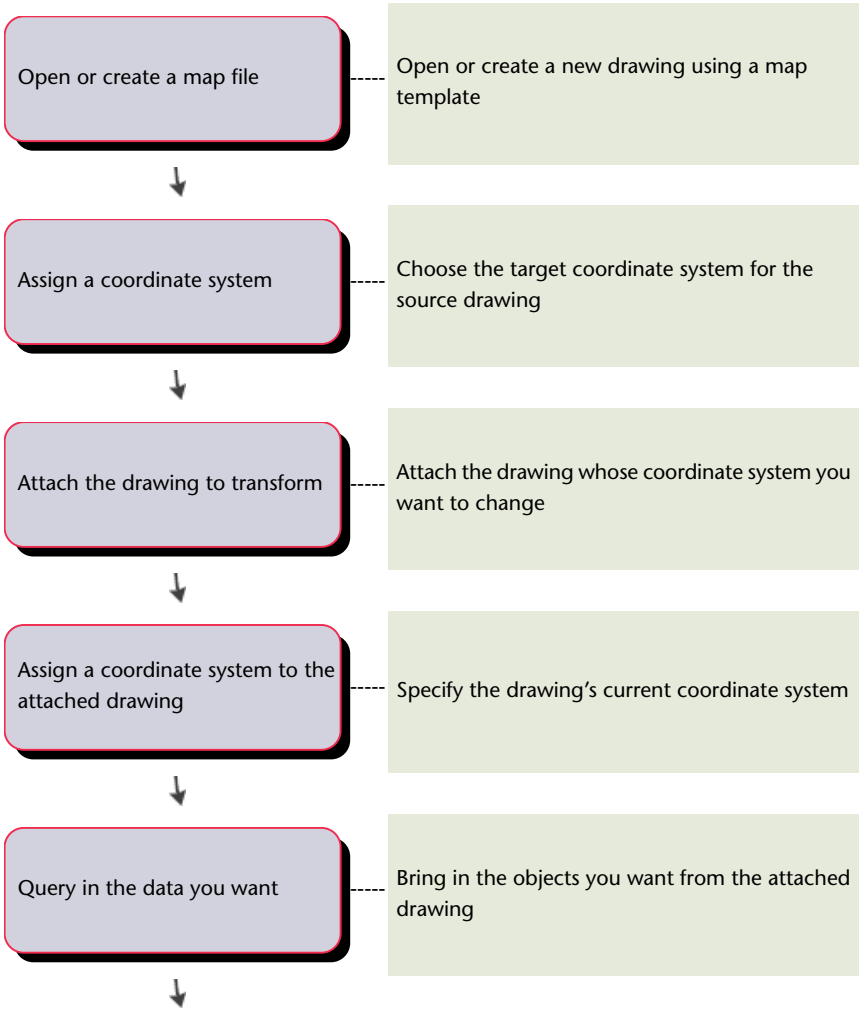
Transform a Geospatial Feature to a Different Coordinate System

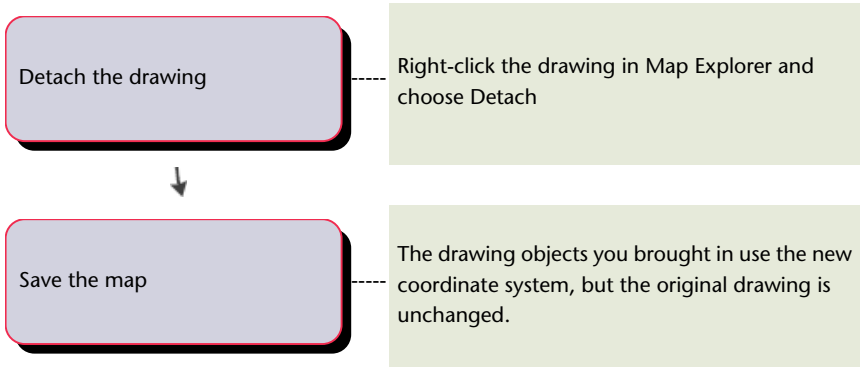
Bulk Copy provides an easy way to transform the coordinate system of a feature source from any provider. This example transforms a SHP file's coordinate system.



Transform a DWG File to a Different Coordinate System

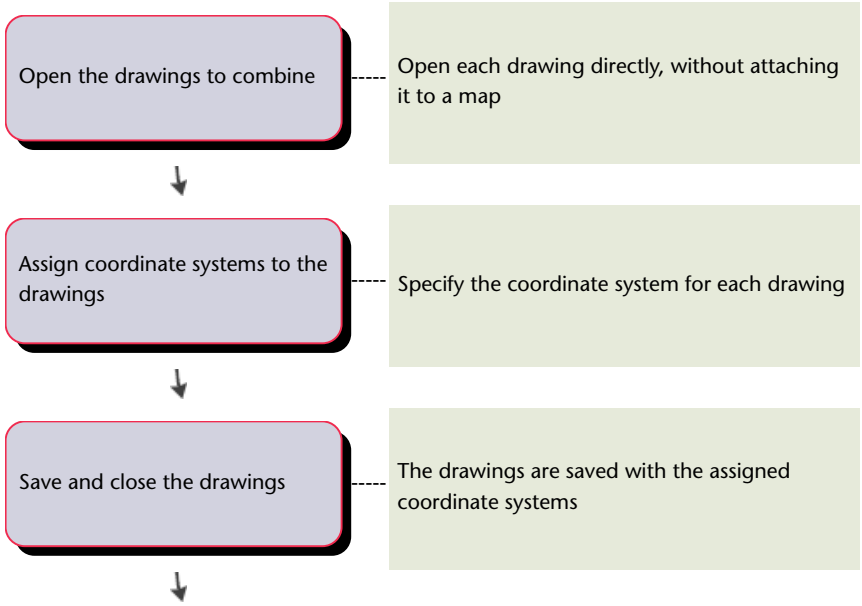
You can transform the coordinate system for drawing objects by adding them to a map that uses a different coordinate system.

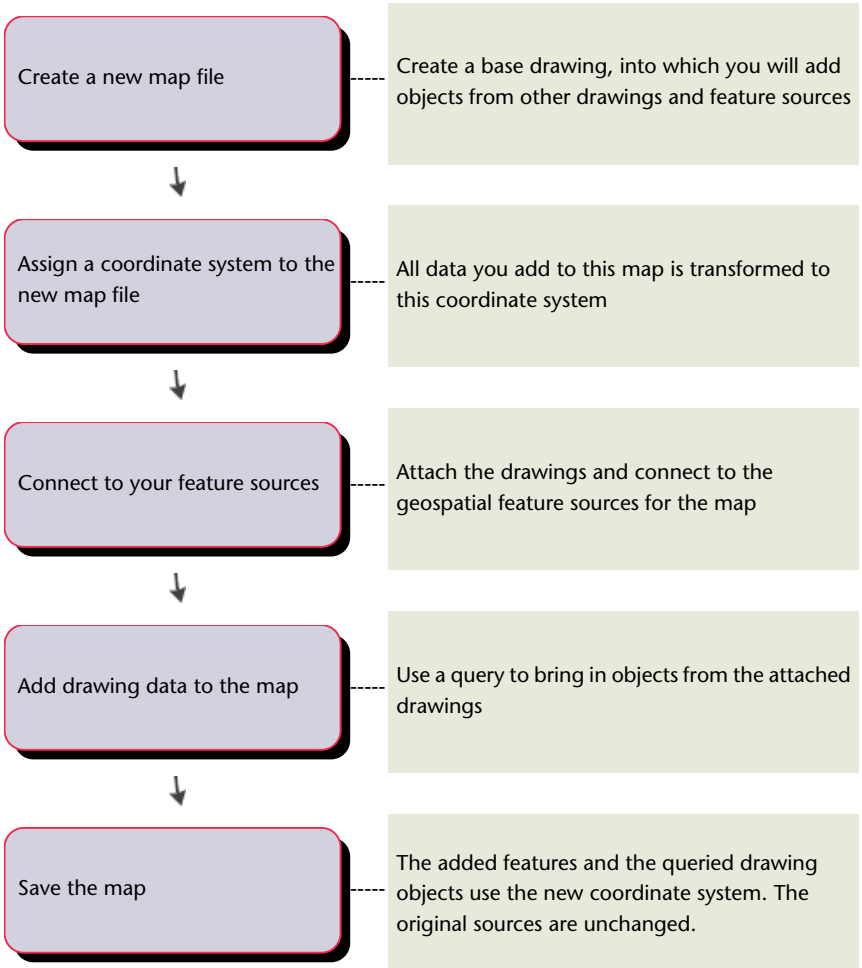




Combine Data with Different Coordinate Systems

Map files and feature sources you use may be created with different coordinate systems. When you bring objects into a map from other sources, AutoCAD Map 3D automatically transforms those objects to the coordinate system of the current drawing.

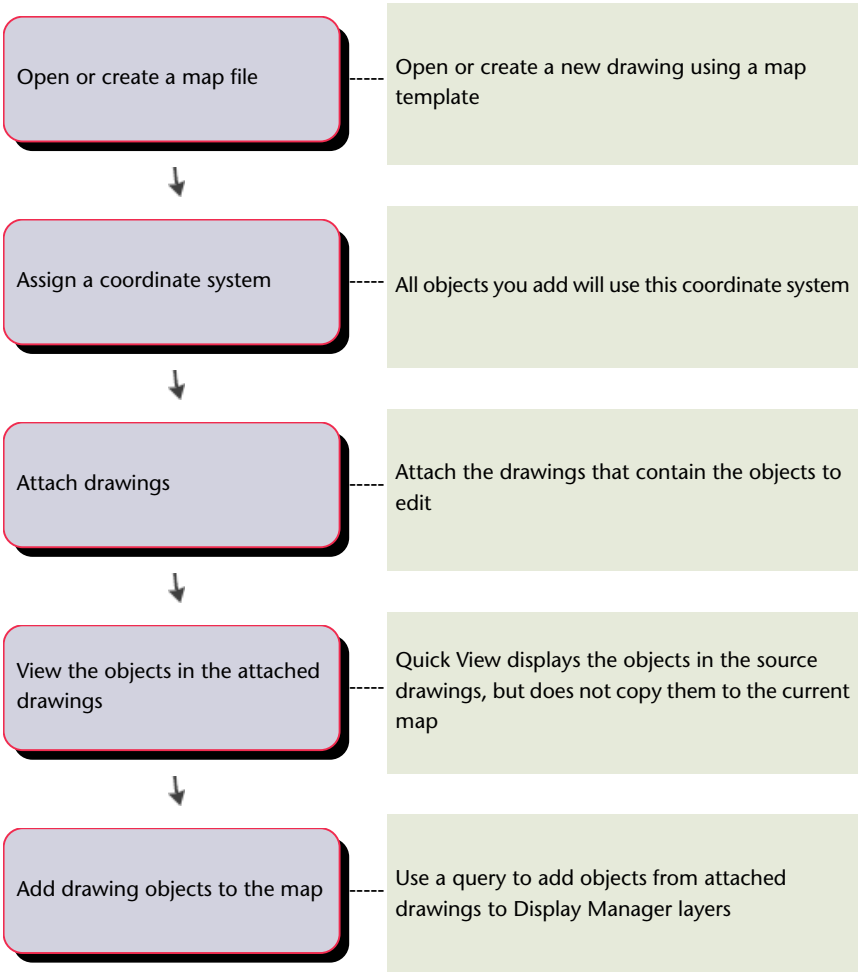


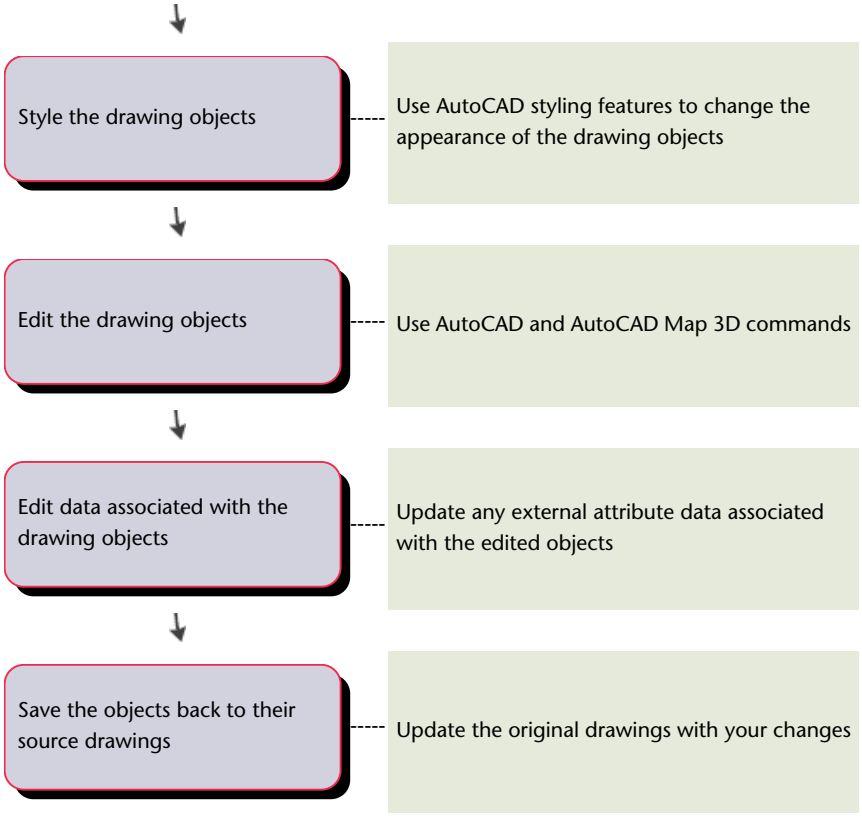

Create a new map file
Create a base drawing, into which you will add objects from other drawings and feature sources
Assign a coordinate system to the new map file
All data you add to this map is transformed to this coordinate system
Connect to your feature sources
Attach the drawings and connect to the geospatial feature sources for the map
Add drawing data to the map
Use a query to bring in objects from the attached drawings
Save the map
The added features and the queried drawing objects use the new coordinate system. The original sources are unchanged.

Create and Edit Data

Find and Edit Objects in Attached Drawings

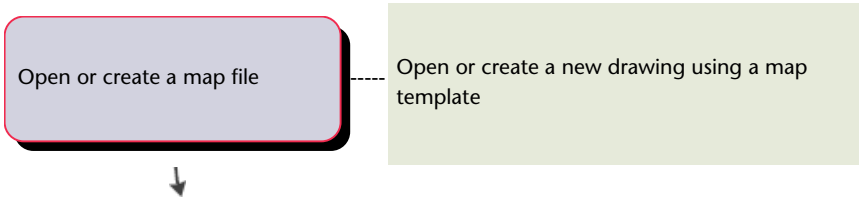
You can edit objects in related drawing by attaching those drawings to the current map and querying in the objects you want.

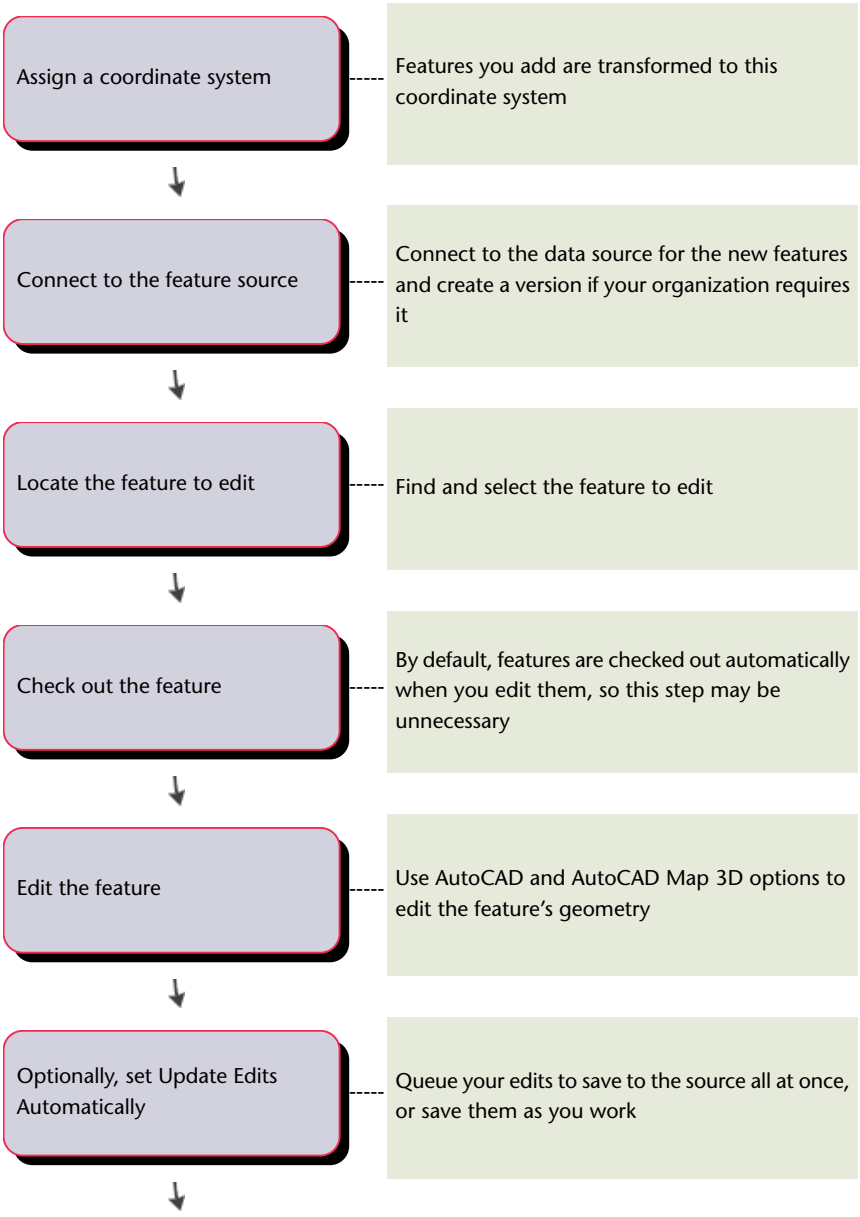


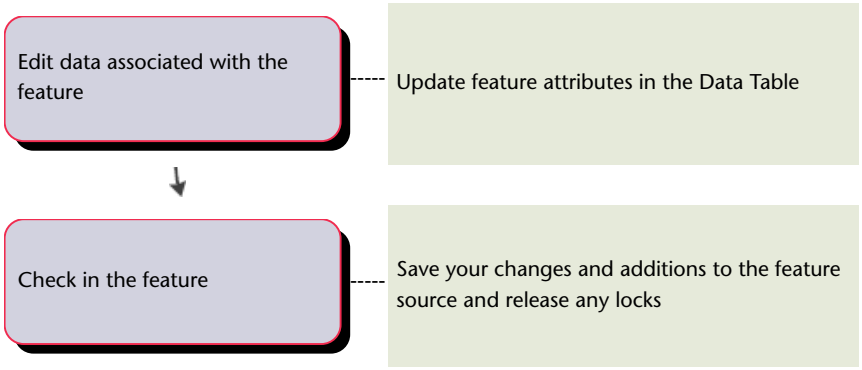


Edit Features in a Geospatial Feature Source

Connect to geospatial feature sources to display the features in your map. You can then check out a feature, edit its geometry and data, and check it back in to update the feature source with your changes.




Assign a coordinate system
Features you add are transformed to this coordinate system
Connect to the feature source
Connect to the data source for the new features and create a version if your organization requires it
Locate the feature to edit
Find and select the feature to edit
Check out the feature
By default, features are checked out automatically when you edit them, so this step may be unnecessary
Edit the feature
Use AutoCAD and AutoCAD Map 3D options to edit the feature's geometry
Optionally, set Update Edits Automatically
Queue your edits to save to the source all at once, or save them as you work

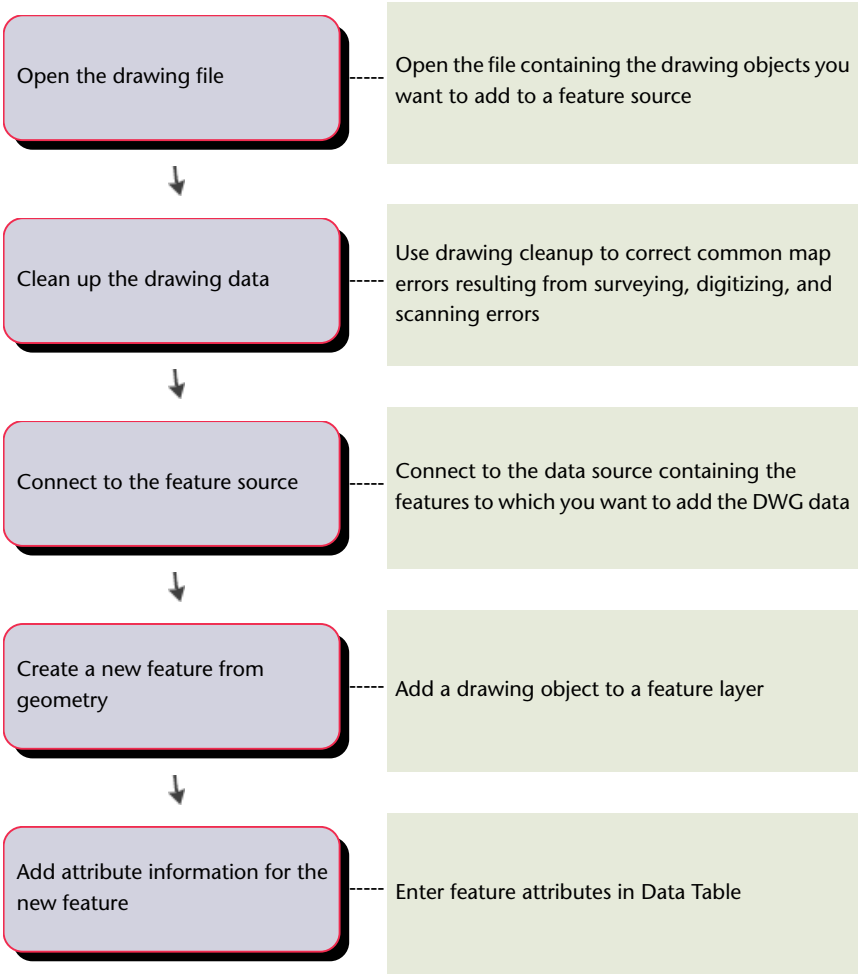


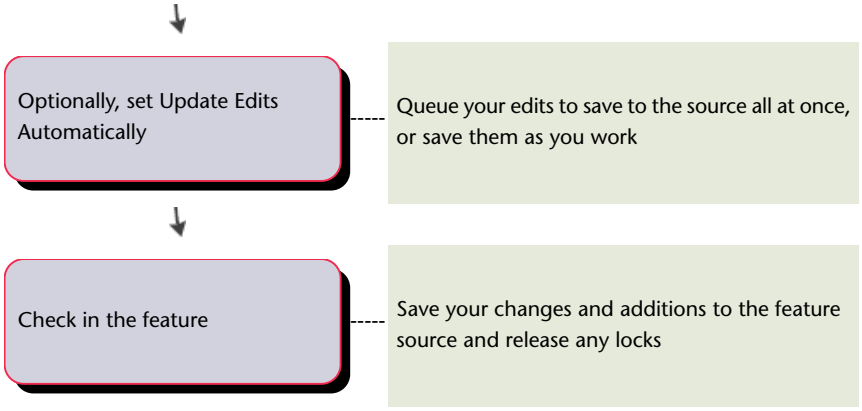
NOTE The coordinate system for the map will automatically match your database. You don't need to assign a coordinate system to the map itself, unless you want to transform the data to a different coordinate system. Generally, you should edit in the same coordinate system as your database. If the data is in different coordinate systems, edit one layer at a time so you are always editing in a coordinate system that matches your data.

Add DWG Data to an Existing Feature Source

You can add drawing objects to a geospatial feature source.

NOTE Use this workflow to add a few objects. To add many objects, use the workflow for exporting to SDF and then bulk copying to SDE, or export drawing data directly to Oracle.

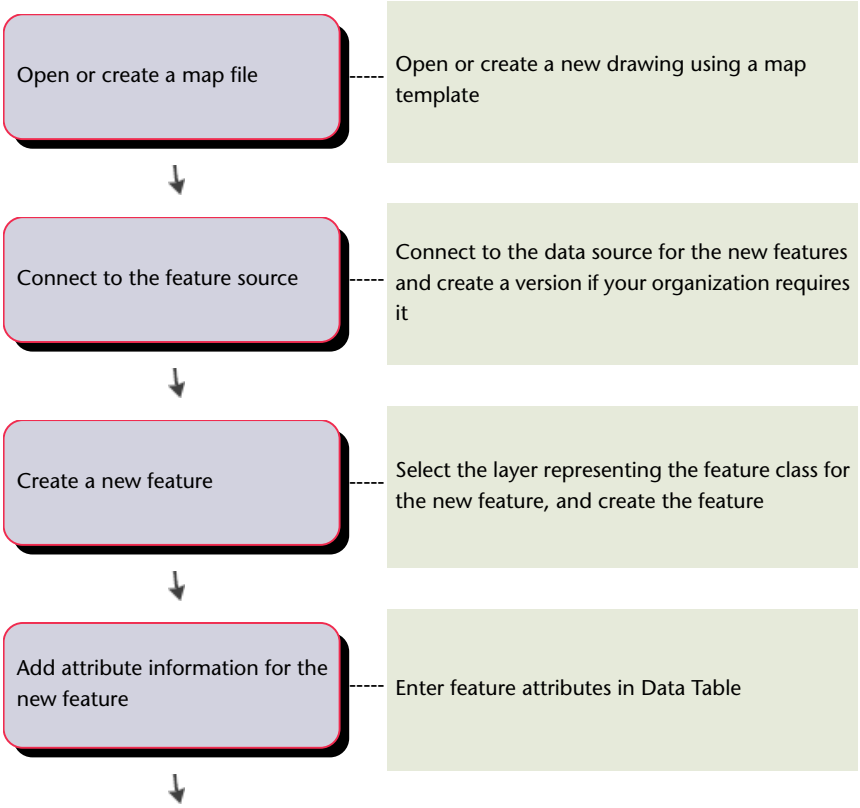


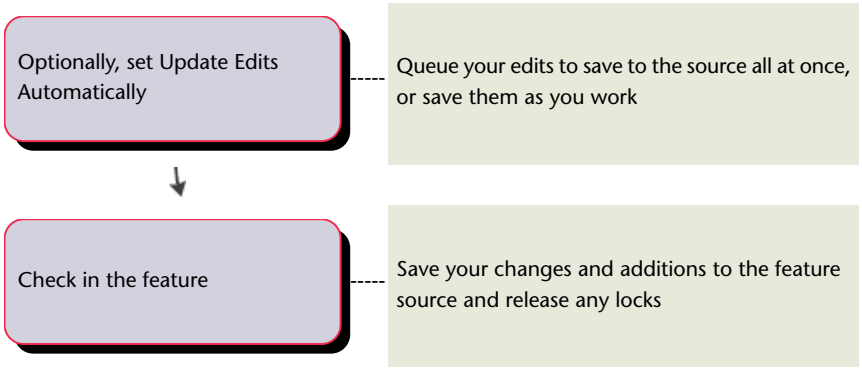

Optionally, set Update Edits Automatically
Queue your edits to save to the source all at once, or save them as you work
Check in the feature
Save your changes and additions to the feature source and release any locks

Add Features to an Existing ArcSDE Feature Class

You can add a new feature to an existing feature class in an ArcSDE database.

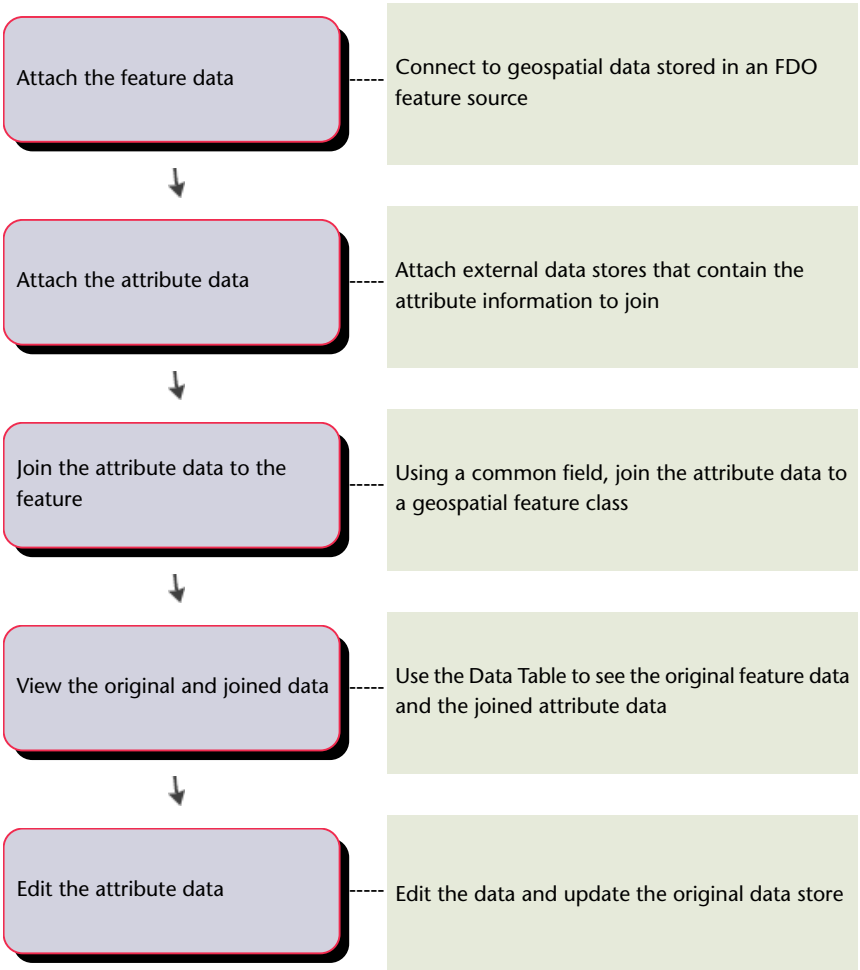
NOTE The coordinate system for the map will automatically match your database. You don't need to assign a coordinate system to the map itself, unless you want to transform the data to a different coordinate system. Generally, you should edit in the same coordinate system as your database. If the data is in different coordinate systems, edit one layer at a time so you are always editing in a coordinate system that matches your data.




Optionally, set Update Edits Automatically
Queue your edits to save to the source all at once, or save them as you work
Check in the feature
Save your changes and additions to the feature source and release any locks

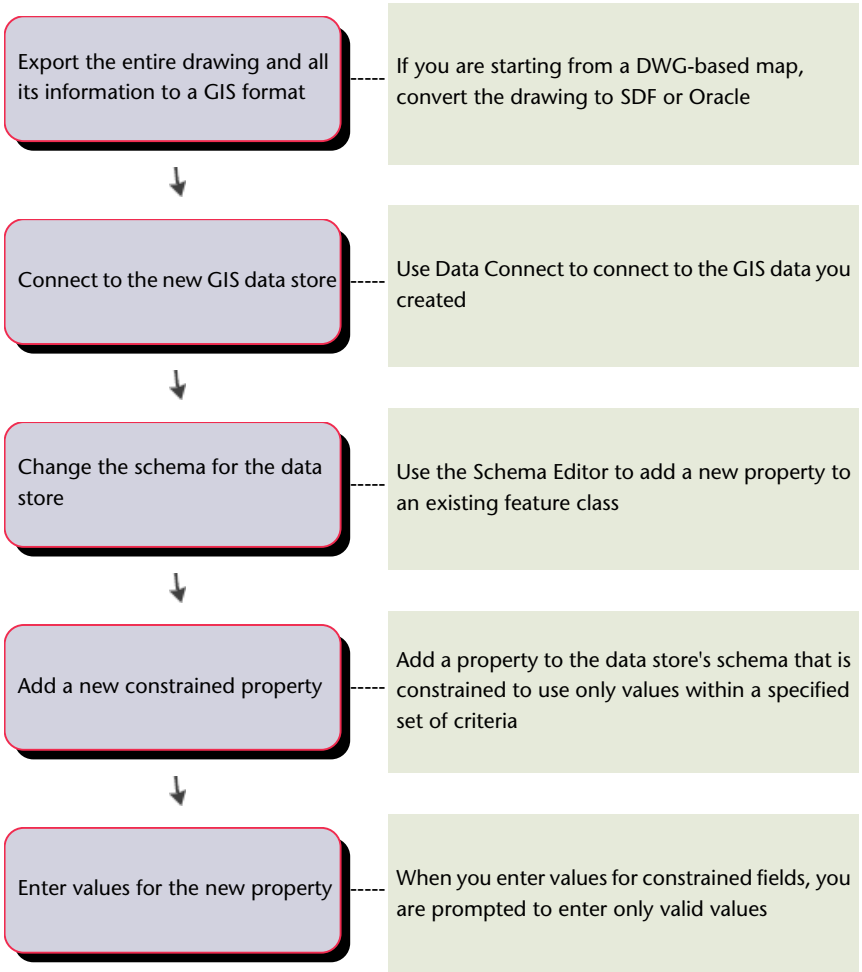
Join Attribute Data to a Geospatial Feature

You can temporarily attach external data to a feature class in your map by specifying a field that the two data sources have in common. For example, you can add assessment data to a parcel layer, using the APN as the common field. You can view and edit the original feature data and the joined attribute data in the Data Table.



Add Attribute Data Based on Constraints

For a GIS data store, add a property that has a limited set of values. For example, add a zoning property whose possible values are limited to a set you specify, or add a numeric property whose value must be within a range you specify.

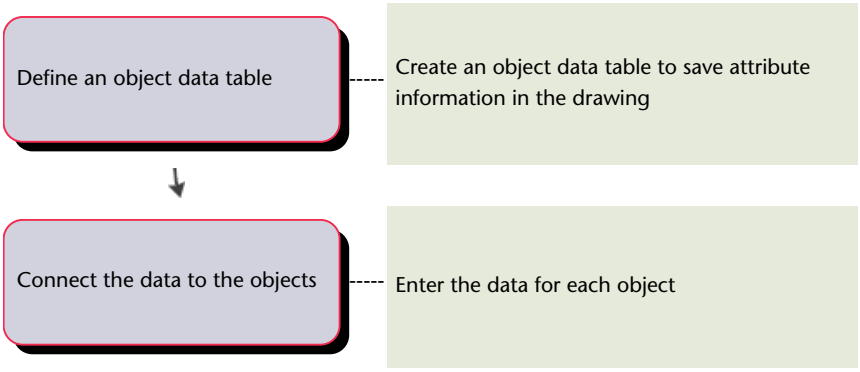


Attach Attribute Data to Drawing Objects

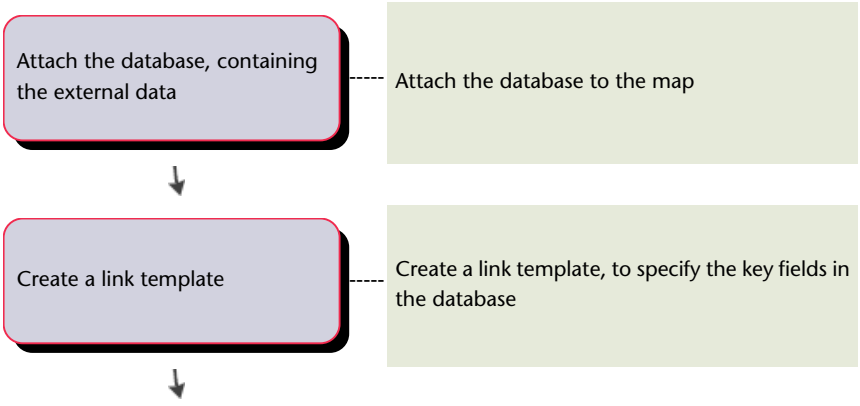
You can attach data to objects in your drawings. The data can be stored in the map itself (which makes it easier to send the map and its data to another user), or in an external database like Microsoft Access or Excel (which makes it easier to share an existing data store with other maps and other users).

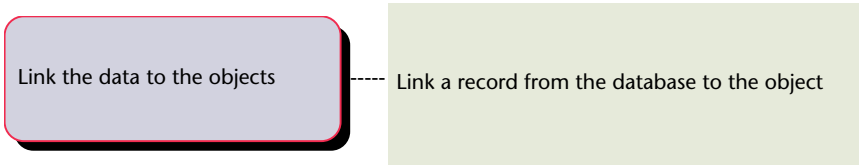
NOTE This procedure applies only to drawing objects. It does not apply to geospatial features.

For object data:



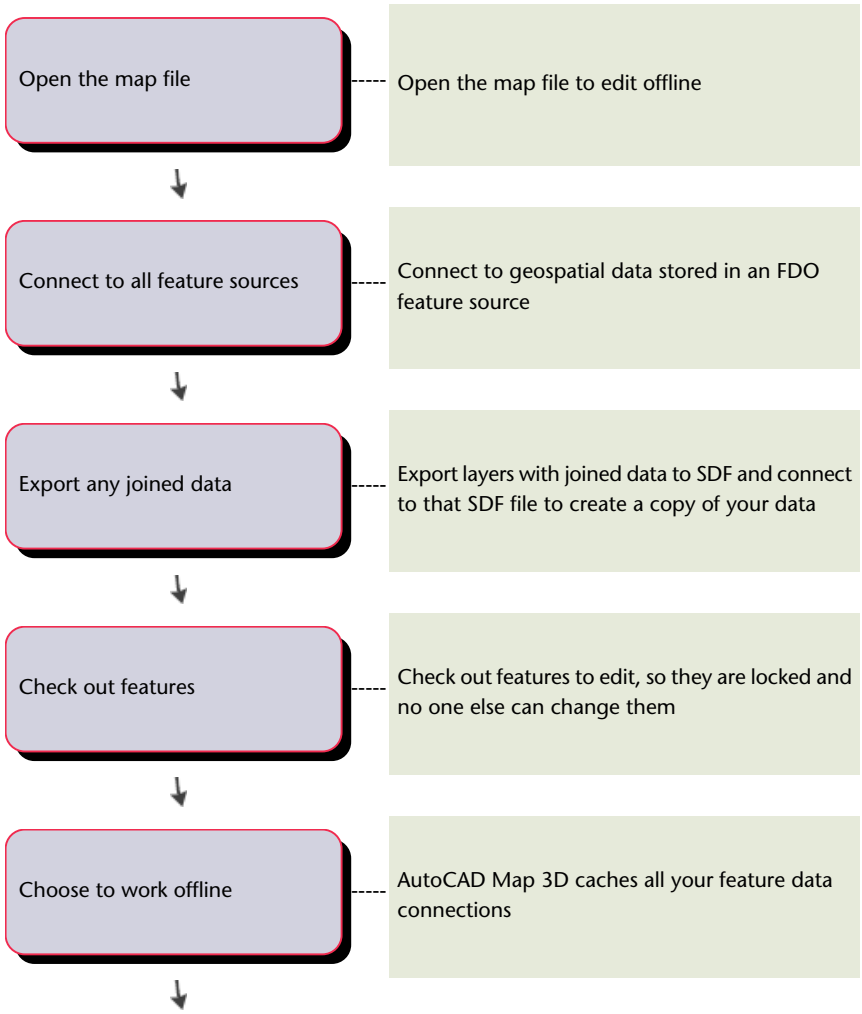
For external data:




Link the data to the objects
Link a record from the database to the object

Work Offline from Enterprise Database

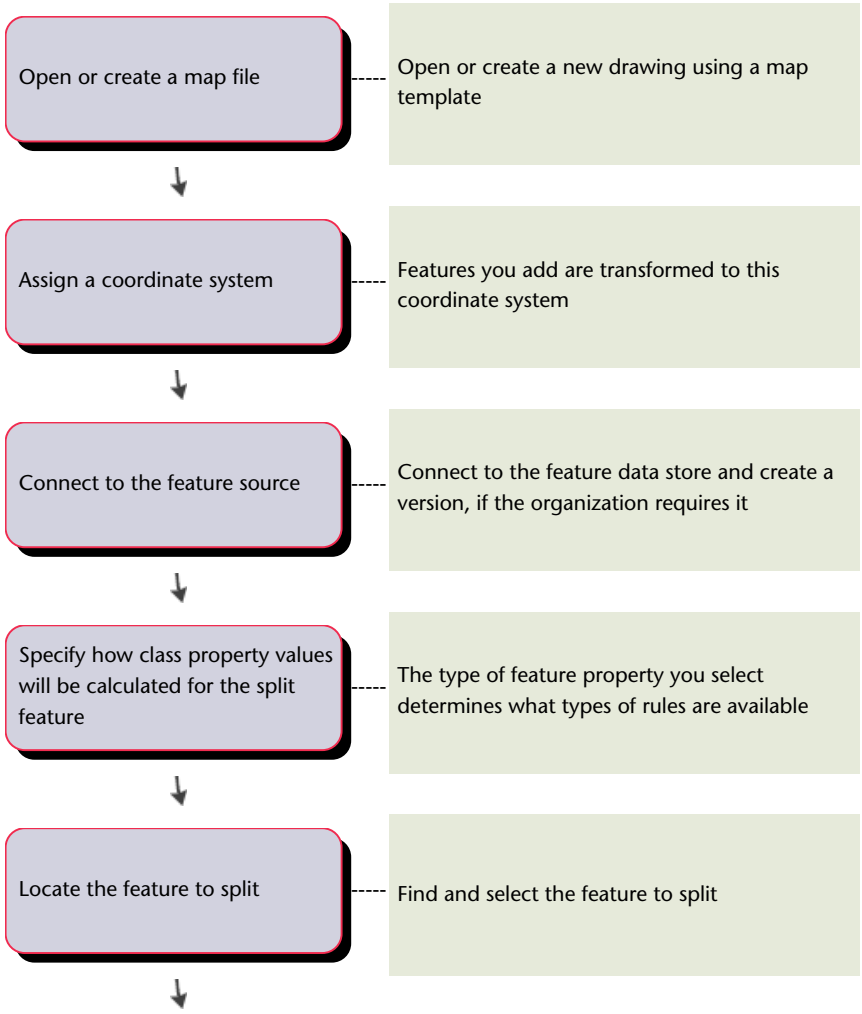
If you need to disconnect from the data sources in your map (for example, to work off-site), you can set up your map for offline editing.

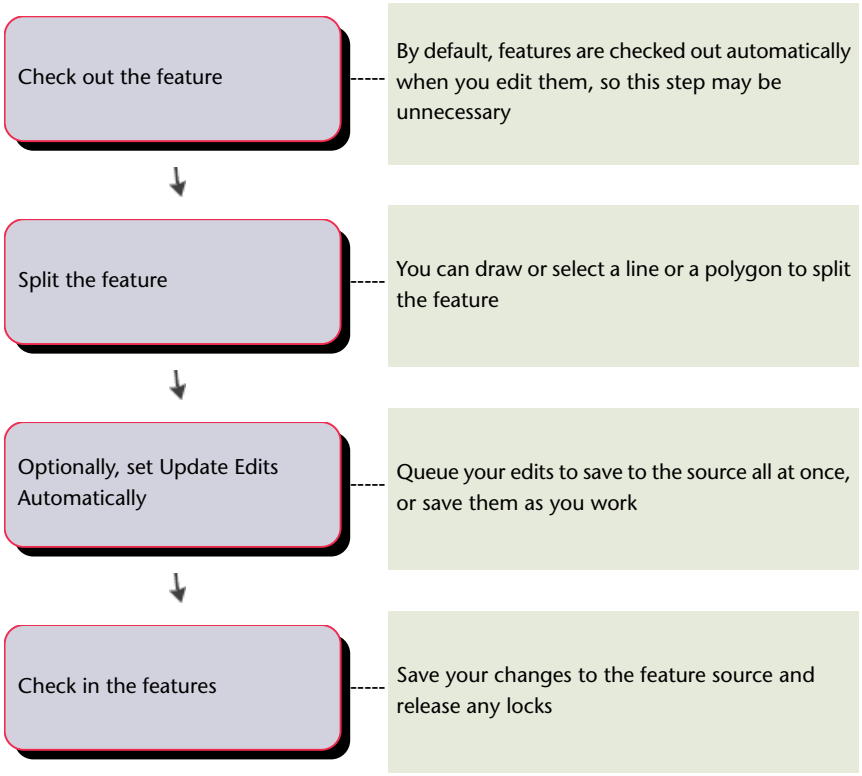



Check in your edited features
When you are back online, save your changes to the feature source and release any locks

Split a Feature

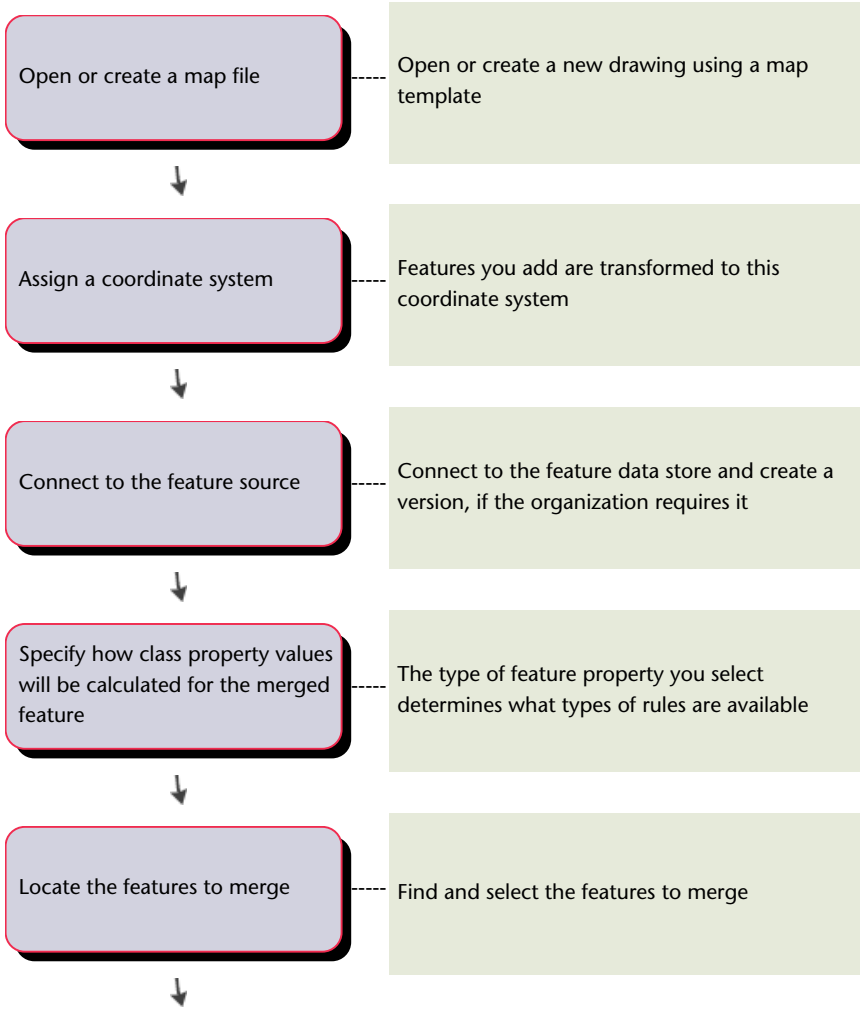
When you split a feature, you can draw or select line or polygon to split the feature geometry. The resulting feature property values are determined by rules you specify in the Split and Merge Rules dialog box.

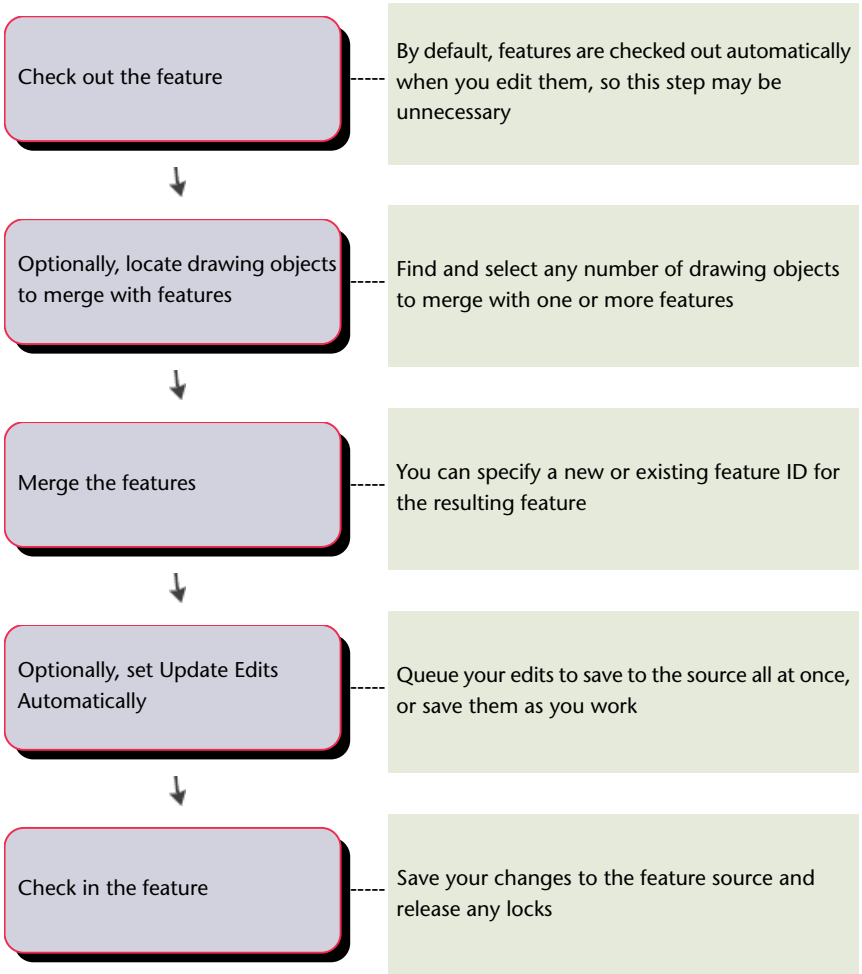



Check out the feature
By default, features are checked out automatically when you edit them, so this step may be unnecessary
Split the feature
You can draw or select a line or a polygon to split the feature
Optionally, set Update Edits Automatically
Queue your edits to save to the source all at once, or save them as you work
Check in the features
Save your changes to the feature source and release any locks

Merge Features

You can merge two or more features of the same class into one feature. You can also merge features with drawing objects. The resulting feature property values are determined by rules you specify in the Split and Merge Rules dialog box.

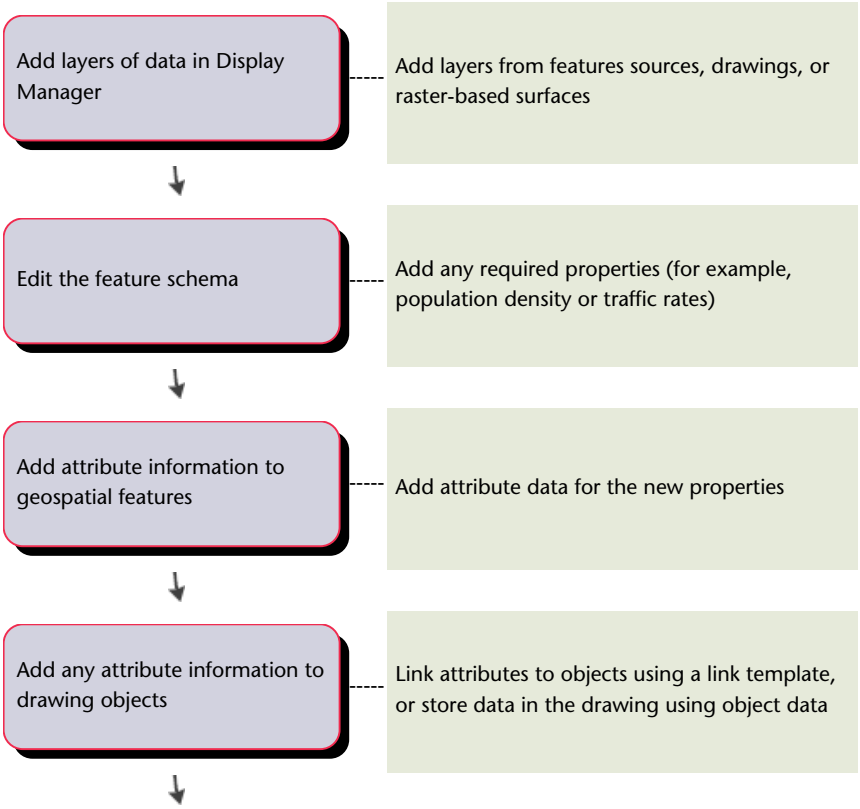


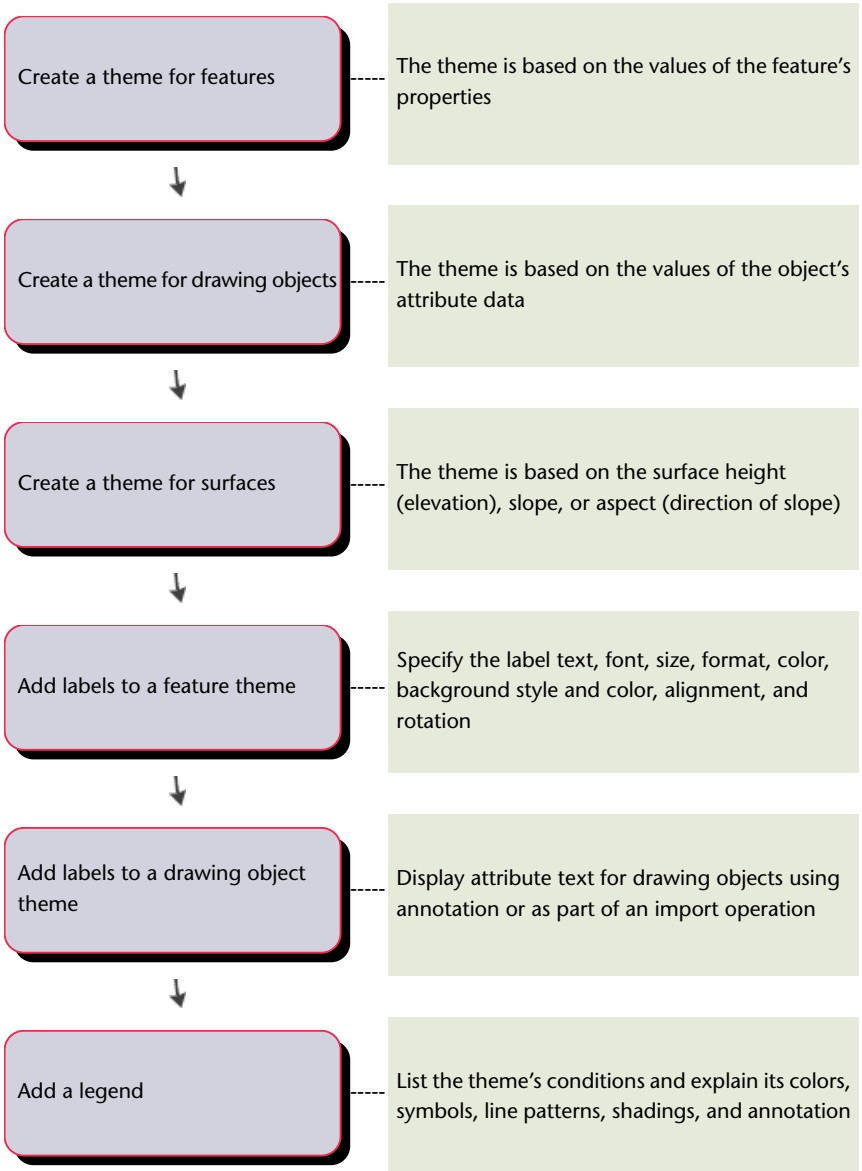

Check out the feature
By default, features are checked out automatically when you edit them, so this step may be unnecessary
Optionally, locate drawing objects to merge with features
Find and select any number of drawing objects to merge with one or more features
Merge the features
You can specify a new or existing feature ID for the resulting feature
Optionally, set Update Edits Automatically
Queue your edits to save to the source all at once, or save them as you work
Check in the feature
Save your changes to the feature source and release any locks

Create Themed Maps and Analyze Data

Create a Theme to Reveal Patterns in Your Data

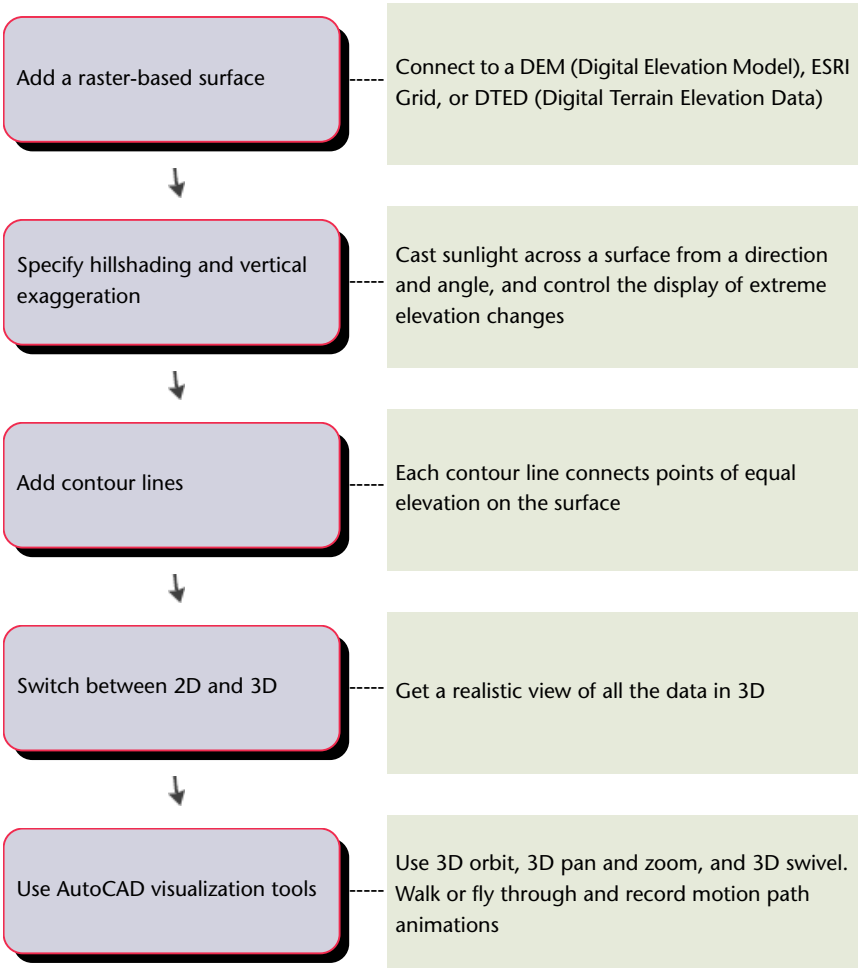
A theme can help you analyze map data and reveal patterns or trends in the data. Themes vary the display of your data based on properties or attributes of the data. For example, you can use different colors for different soil conditions or bigger dots for larger cities. The procedure varies, depending on whether you are theming features, drawing objects, or surfaces.

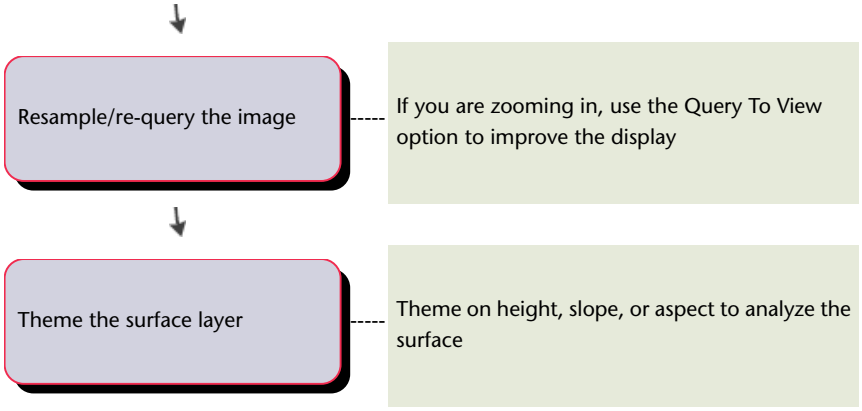



Create a theme for features
The theme is based on the values of the feature's properties
Create a theme for drawing objects
The theme is based on the values of the object's attribute data
Create a theme for surfaces
The theme is based on the surface height (elevation), slope, or aspect (direction of slope)
Add labels to a feature theme
Specify the label text, font, size, format, color, background style and color, alignment, and rotation
Add labels to a drawing object theme
Display attribute text for drawing objects using annotation or as part of an import operation
Add a legend
List the theme's conditions and explain its colors, symbols, line patterns, shadings, and annotation

Use Surfaces, Rasters, and Contour Lines

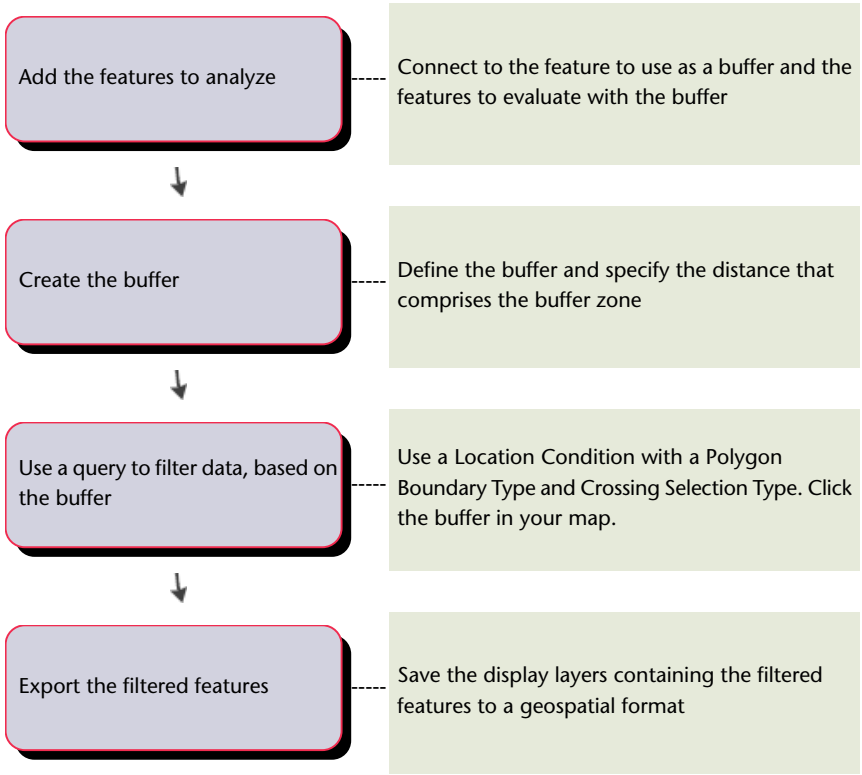
Style a raster-based surface using hillshading, vertical exaggeration, and contour lines to show elevation. View the map in 3D, which realistically drapes any 2D data on the surface. Use AutoCAD visualization tools to display different views in 3D, so you can analyze the surface from different perspectives. Theme on height, slope, or aspect.




Resample/re-query the image
If you are zooming in, use the Query To View option to improve the display
Theme the surface layer
Theme on height, slope, or aspect to analyze the surface

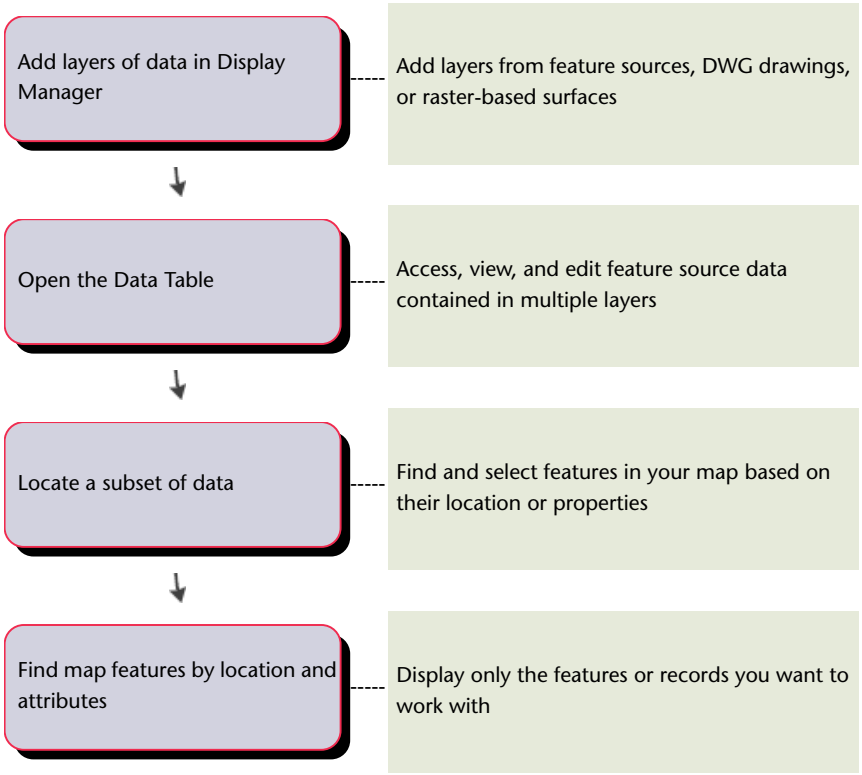
Find and Select Features Within a Buffer Zone

Create a buffer that defines an area within a certain distance of a feature in your map. Then use a query to select the features on a particular layer that lie within that buffer zone.



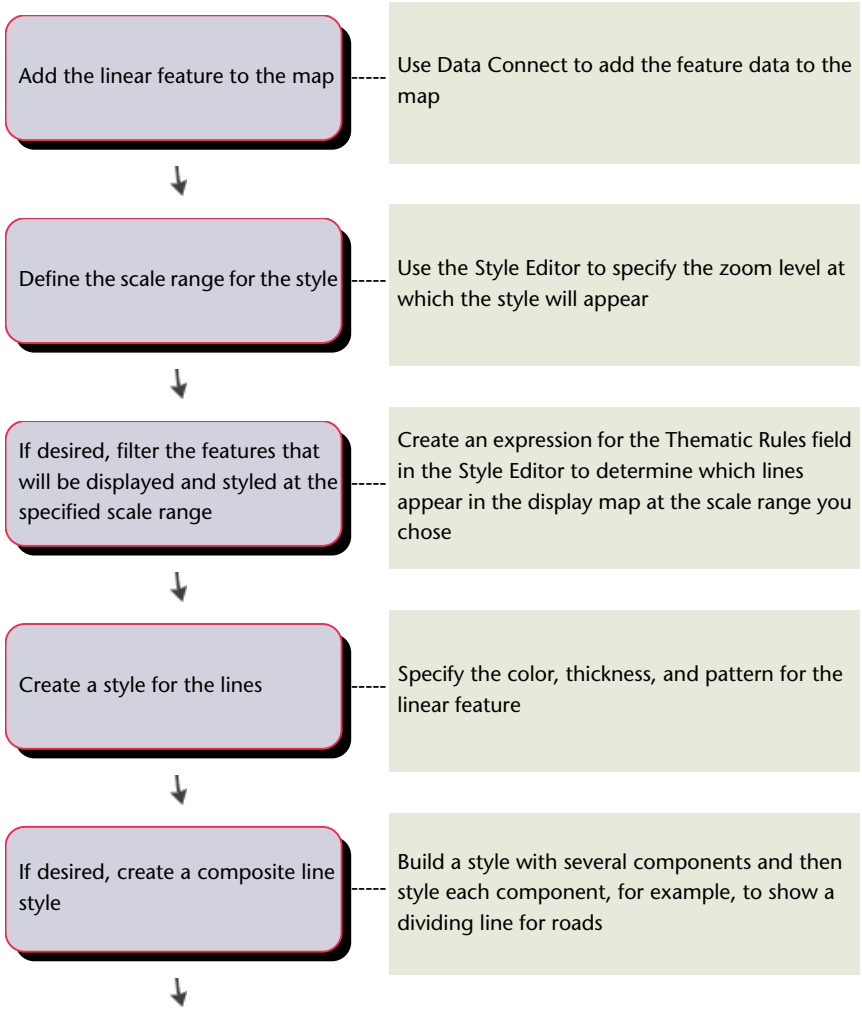
Find and Select Features By Attribute and Location

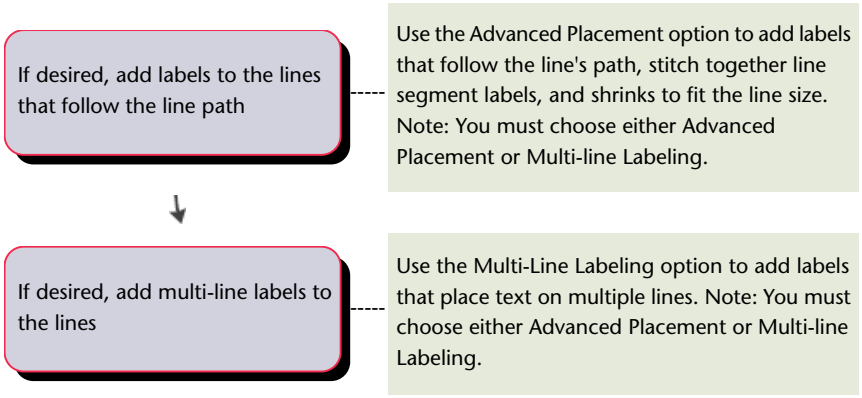
You can find, filter, and select a specific subset of features using the Data Table.



Style and Label a Linear Feature

Specify the visual appearance of lines in a map. You can include composite lines to show a solid background with a dashed or solid midline. You can add intelligently placed labels that follow the linear path, or you can use multi-line labels that appear next to the lines.

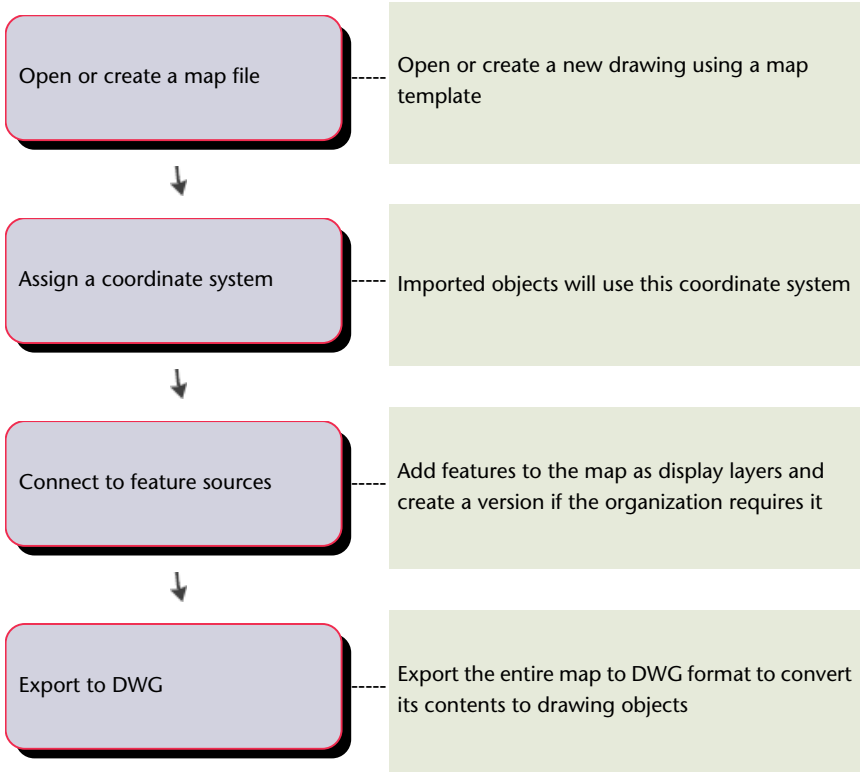



If desired, add labels to the lines that follow the line path
Use the Advanced Placement option to add labels that follow the line's path, stitch together line segment labels, and shrinks to fit the line size. Note: You must choose either Advanced Placement or Multi-line Labeling.
If desired, add multi-line labels to the lines
Use the Multi-Line Labeling option to add labels that place text on multiple lines. Note: You must choose either Advanced Placement or Multi-line Labeling.

Exchange CAD and Geospatial Data

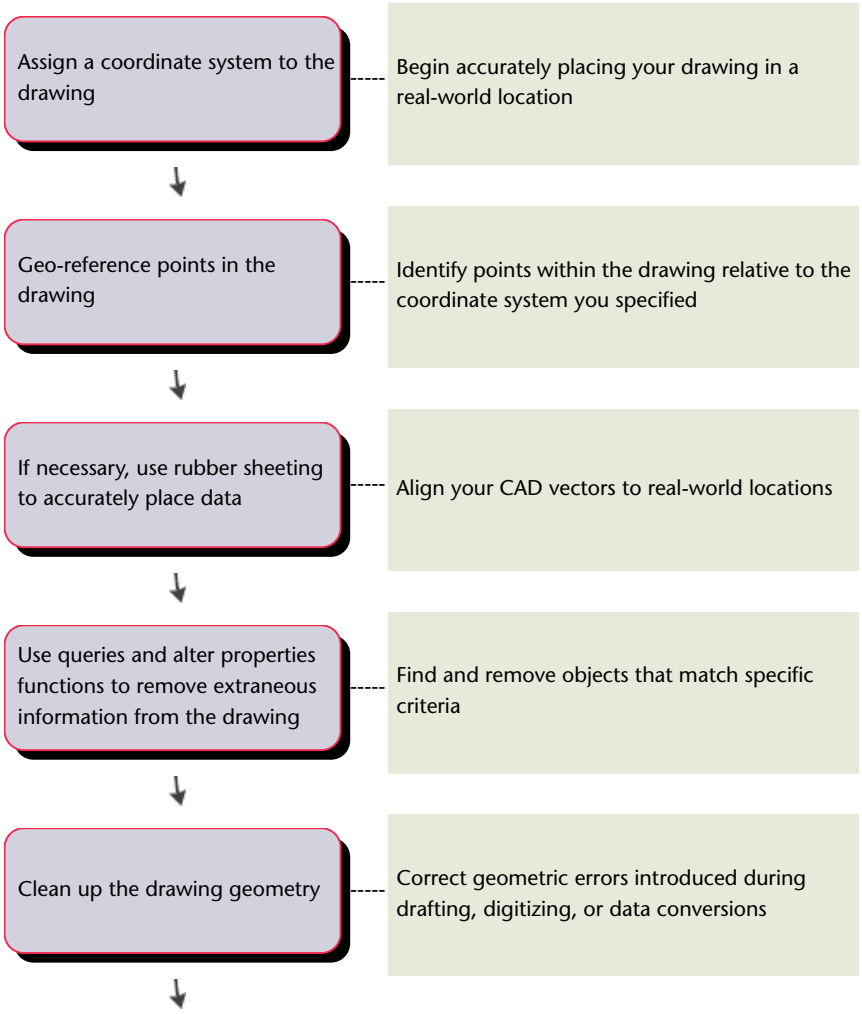
Send GIS Data to AutoCAD

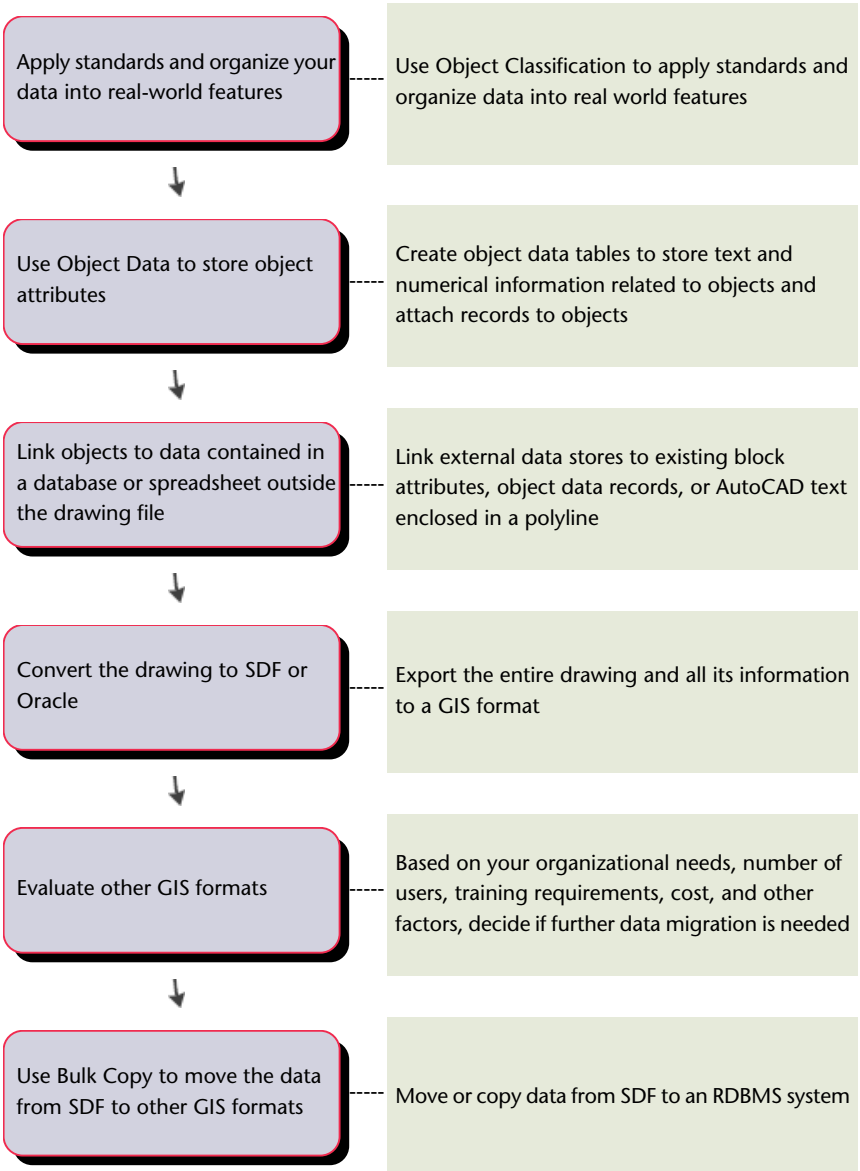
You can convert feature data to drawing objects by attaching the feature sources to your map, adding the features you want, and then exporting the map to DWG format.



Move CAD Data to GIS

Migrate data from a file-based DWG data store to a relational database management system, locating the data in real space and organizing objects into real-world categories.

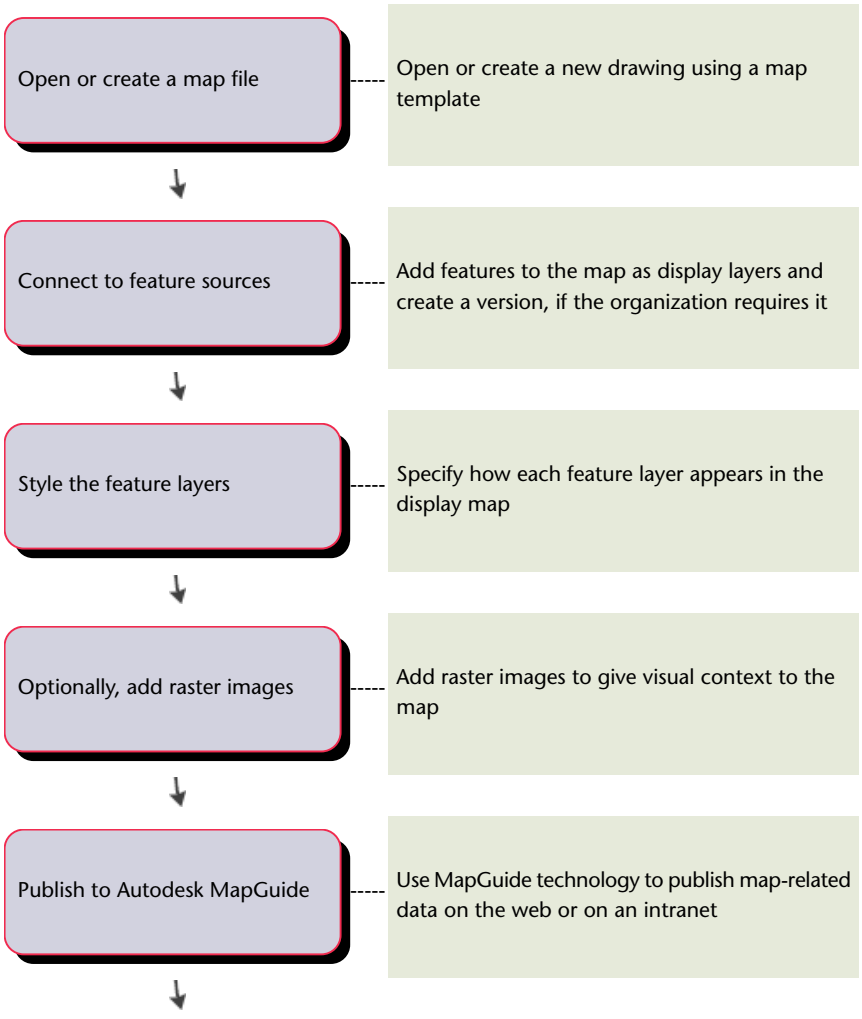


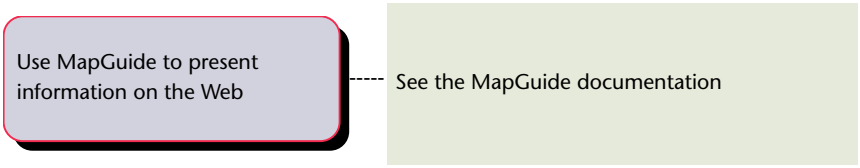

Apply standards and organize your data into real-world features
Use Object Classification to apply standards and organize data into real world features
Use Object Data to store object attributes
Create object data tables to store text and numerical information related to objects and attach records to objects
Link objects to data contained in a database or spreadsheet outside the drawing file
Link external data stores to existing block attributes, object data records, or AutoCAD text enclosed in a polyline
Convert the drawing to SDF or Oracle
Export the entire drawing and all its information to a GIS format
Evaluate other GIS formats
Based on your organizational needs, number of users, training requirements, cost, and other factors, decide if further data migration is needed
Use Bulk Copy to move the data from SDF to other GIS formats
Move or copy data from SDF to an RDBMS system

Print and Publish Data

Publish to the Web

You can publish your styled map to MapGuide for display on a Website.

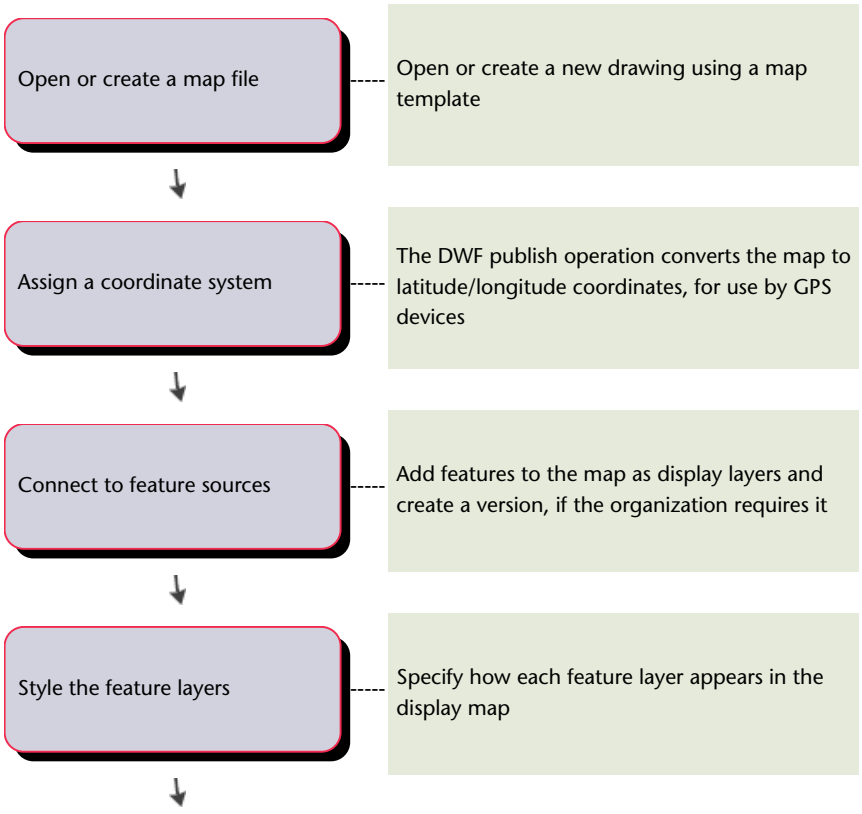


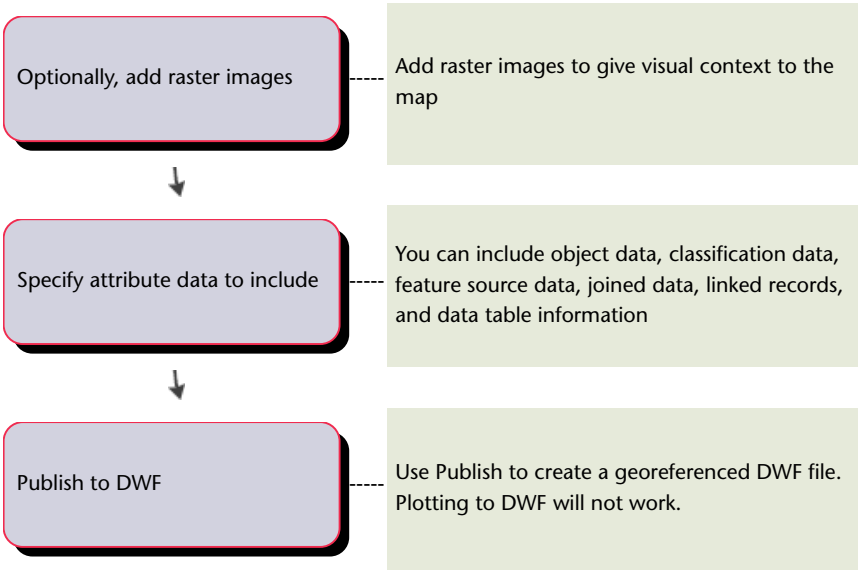

Use MapGuide to present information on the Web
See the MapGuide documentation

Publish to a Georeferenced DWF

DWF (Design Web Format™) is an open, secure file format developed by Autodesk for sharing engineering design data.

When you publish to DWF, you create an electronic version of the map that can be displayed using Autodesk® Design Review, which you can download from the Autodesk Website. The DWF format can include attribute data and graphical elements, including any draped raster files. All layers and styles are published, with no loss of information.

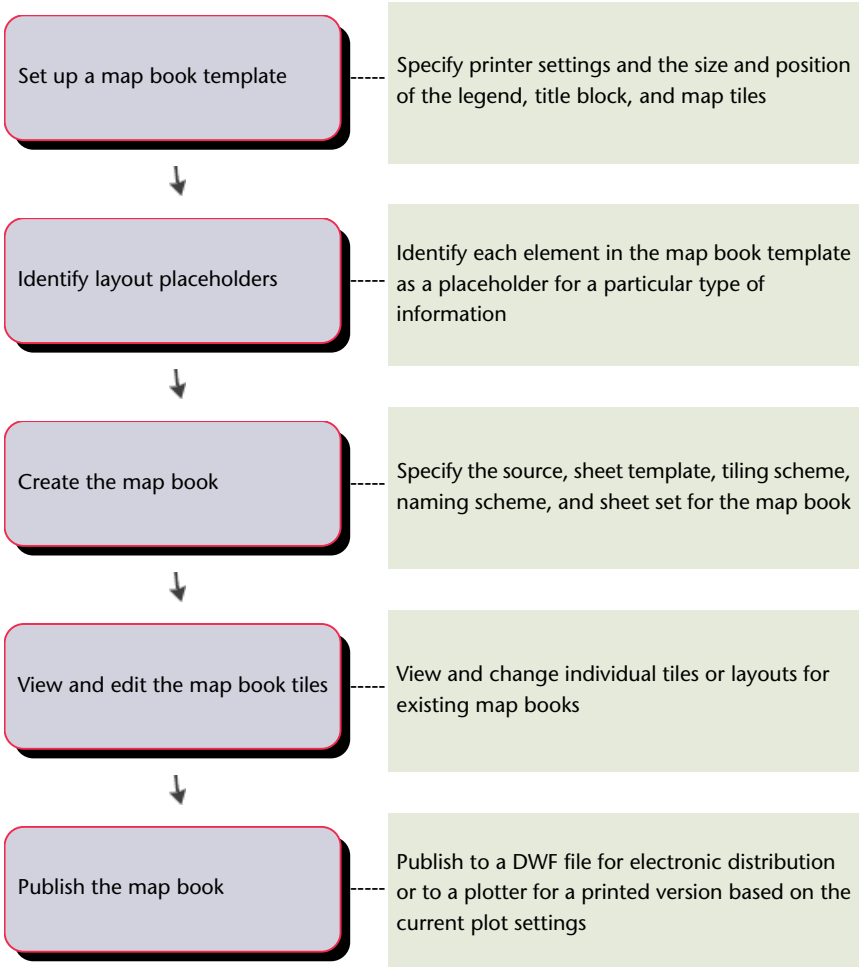




As long as you have assigned a coordinate system to all the maps in your DWF file, the publishing operation will automatically convert the coordinate information to latitude/longitude coordinates. GPS devices that use the NMEA 0183 protocol and the Autodesk DWF Viewer can use the georeferencing information, for example, to pan and center maps dynamically.

Publish to a Map Book

A map book divides your map into multiple "tiles" and displays each tile on a separate page. Picture a grid overlaying your map. Each section of the grid represents a tile. Once you create a map book, you can publish it to a plotter or to DWF.



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