Display Layers, Elements and Groups by Scale

The Display process in TNTgis lets you control which layers, geometric elements, and display groups are visible at different map scales. These settings allow you to automatically display low-resolution, generalized, or more prominent features when zoomed out and present more detailed, higher-resolution data when zoomed in. For example, in a transportation-themed display you might show only major highways at scales that show an entire state or province but progressively add local roads and city streets as the view is zoomed in. By carefully incorporating scale control in your display settings you can provide more meaningful displays as well as save redisplay time when zooming out.

Minimum and Maximum Map Scale

You set up scale control by specifying a *minimum* and *maximum* map scale for the display group, layer, geometric element type, or element attribute. Map scales are typically written in the form 1:10,000 (*i.e.*, 1 mm on screen = 10,000 mm on the ground). But it is important to realize that in mathematical terms map scales are *fractions*. Therefore a map scale of 1:1,000 (1/1,000, or 0.001) is *larger* than a scale of 1:100,000 (1/100,000, or 0.00001). Zooming in changes the display to a larger map scale while zooming out changes to a smaller map scale. So the minimum map scale you set controls how far out you can zoom and still see the feature, while the maximum map scale controls how far you can zoom in. You can set both scale limits, just a minimum scale, or just a maximum scale, depending on how you will use the data.
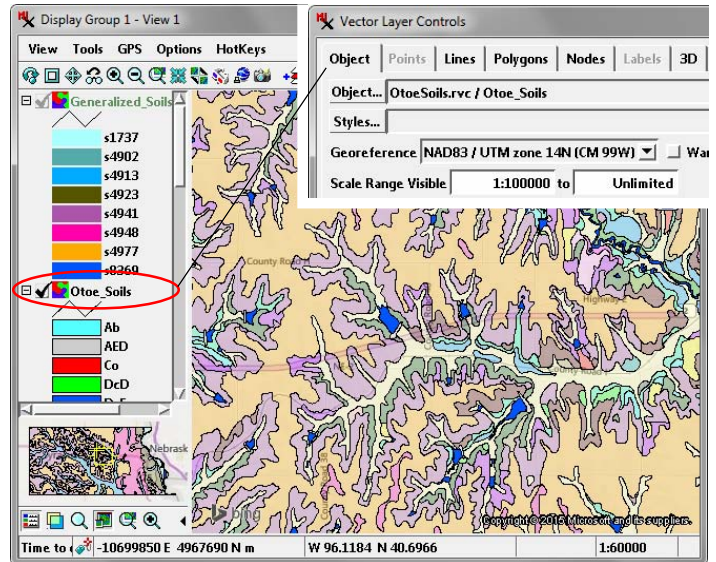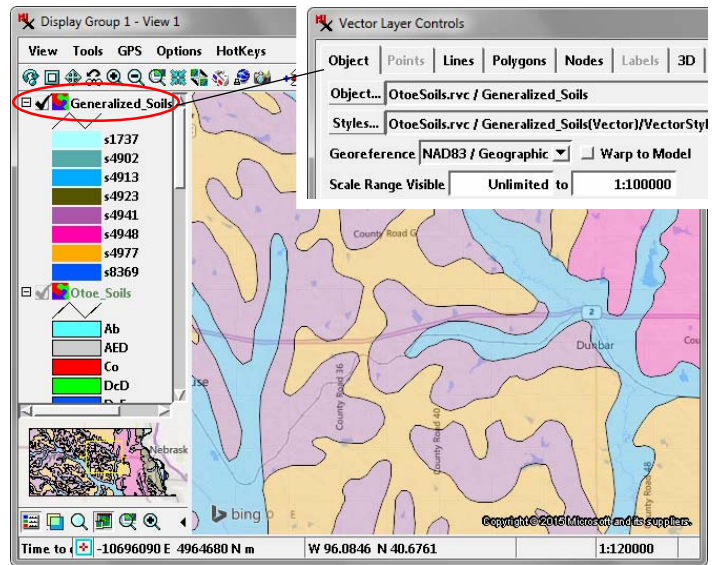
Scale Range by Layer

You can set a scale range for a spatial object using the Scale Range Visible fields in the Layer Controls window for that layer type (illustrated to the right for a vector layer). In Layer Controls windows with tabbed panels, the scale fields are on the first panel (left-most tab), which in most cases is the named the Object tabbed panel.
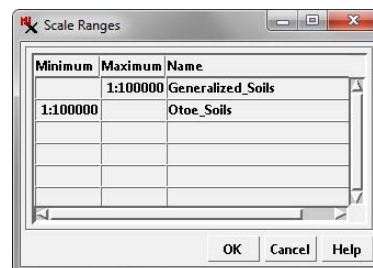
The Scale Range Visible fields by default are initially set to Unlimited. To set a map scale for either field, you can enter the full scale fraction (*e.g.*, 1:10000) or just the denominator of the scale fraction (*e.g.*, 10000); the resulting map scale fraction is then shown in the field. To reset a map scale field to Unlimited, enter 0. Layer scale range settings are automatically saved with the other display parameters you set for the object. When a layer is automatically hidden by map scale, its layer name is shown in green in the View window sidebar legend.

Scale Range in Saved Groups and Layouts

When you are assembling groups and layouts to be saved for future use, you do not need to use the Layer Controls window for each individual layer to set map scale visibility. A Scale Ranges window (see illustration to the right) can be opened to set minimum and maximum scale values for any desired layers (and entire groups in a layout). The Scale Ranges window can be opened for a standalone group from the Display Manager by right-clicking on the listing for the group and choosing Set Scale Ranges from the pop-up menu. The same procedure can be used to open the Scale Ranges window for a layout. *(continued)*
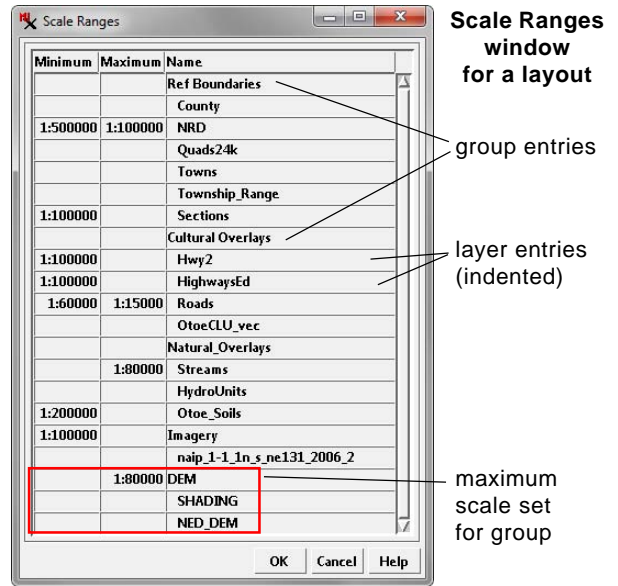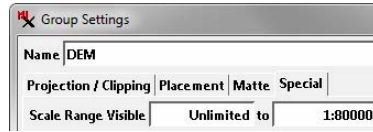

Display with two vector layers showing soil information with visibility set by map scale. The Generalized Soil layer (visible in the upper window at a scale of 1:120,000) has been set to be visible at map scales less than 1:100,000 (zoomed out beyond this scale). The Otoe Soils layer (visible in the lower window at a scale of 1:60,000) with more detailed soil map has been set to be visible at a scale of 1:100,000 or greater (zoomed in to this scale or farther). Note that the name of the layer that is automatically hidden by scale is shown in green in the sidebar legend.

Scale Ranges window for the group displayed above (opened by choosing Set Scale Ranges on the group's right mouse-button menu). Scale ranges can be set for any layer in the group from this window and saved with the group settings.

The Scale Ranges window for a standalone group has an entry for each layer, with the layer name shown in the Name column. The corresponding window for a layout (illustrated to the right) also has an entry for each group (layer names are indented below the group name in the Name column). You can add or edit Minimum and Maximum fields in the same way as in the Layer Controls windows (enter scale fraction or just the denominator). If scale range Minimum or Maximum values have already been set for a layer in its Layer Controls, these values are shown in the Scale Ranges window as default values but can be modified for use in the saved group or layout. All settings made in the Scale Ranges window are saved with the group or layout, and do not alter any scale range values previously set for standalone display of an individual layer.

You can also set a scale range for an entire group in a layout from the Group Settings window. Scale Range Visible fields are provided on the Special tabbed panel of the Group Settings window.
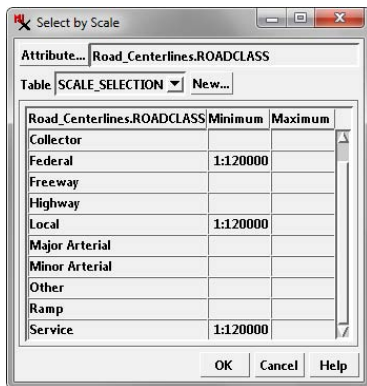

Scale Ranges window for a layout

group entries

layer entries (indented)

maximum scale set for group

Minimum	Maximum	Name
		Ref Boundaries
		County
1:500000	1:100000	NRD
		Quads24k
		Towns
		Township_Range
1:100000		Sections
		Cultural Overlays
1:100000		Hwy2
1:100000		HighwaysEd
1:60000	1:15000	Roads
		OtoeCLU_vec
		Natural_Overlays
	1:80000	Streams
		HydroUnits
1:200000		Otoe_Soils
1:100000		Imagery
		naip_1-1_1n_s_ne131_2006_2
	1:80000	DEM
		SHADING
		NED_DEM

Group Settings

Name DEM

Projection / Clipping | Placement | Matte | Special

Scale Range Visible | Unlimited to | 1:80000
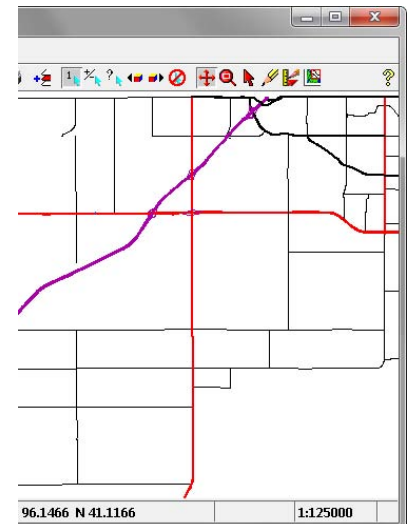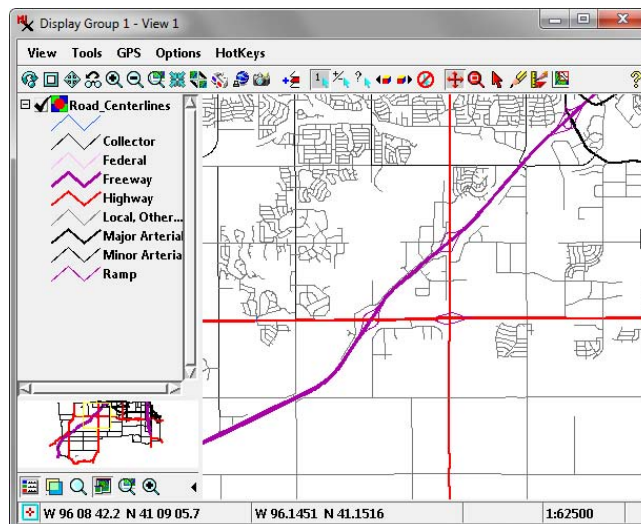
Scale Range by Attribute

When you display vector, CAD, or shape objects that have element attributes, you can set scale ranges for groups of elements by attribute value. In the Layer Controls window choose By Map Scale from the Show menu (which determines which elements are available for display) and press the Specify button. These controls are on the Elements tabbed panel for CAD and shape objects and on the individual element tabbed panels for a vector layer. You are first prompted to choose a table and field containing the attribute values for which you wish to set scale ranges. The Select by Scale window then opens and lists the attribute values in the selected field, along with a Minimum and Maximum field for each.

Spatial Layer Controls - Road_Centerlines

Object | Elements | Labels

Show By Map Scale ▾ Specify...
Style Style_Road_Centerlines_ROADCLASS ▾ Specify...

In the example illustrated below for a shape object with street centerlines, local roads and city streets that would be crowded together in small-scale displays are set to be shown only when zoomed in beyond a map scale of 1:120000. Other road types, such as freeways, highways, and arterial roads, are not limited by map scale.

Right Mouse-button Menu Options for Layers Hidden by Scale

When a layer is hidden at the current view scale because of its scale range settings, the right mouse-button menu for the layer (opened from the Display Manager or the View window sidebar legend) has one or more special options that allow you to quickly change the view scale to make the layer visible.

Zoom to Make Visible: Zooms the View to a scale at which the layer becomes visible. If the view is zoomed in beyond the visible scale range set for the layer, this option zooms to the maximum visible scale. If zoomed out beyond the layer's visible scale range, it zooms to the minimum visible scale.

Zoom to Maximum Detail [present if the layer has a Maximum map scale set]: Zooms the View to the map scale set as the maximum visible scale for the layer.

Zoom to Minimum Detail [present if the layer has a Minimum map scale set]: Zooms the View to the map scale set as the minimum visible scale for the layer (setting in the Layer Controls window).

(continued)

Select by Scale

Attribute... Road_Centerlines.ROADCLASS
Table SCALE_SELECTION ▾ New...

Road_Centerlines.ROADCLASS	Minimum	Maximum
Collector		
Federal	1:120000	
Freeway		
Highway		
Local	1:120000	
Major Arterial		
Minor Arterial		
Other		
Ramp		
Service	1:120000	

OK | Cancel | Help

Select by Scale window with minimum map scales set for local road types. In the illustrations to the right, local roads (gray) are visible at a map scale of 1:62,500 but hidden automatically at a scale of 1:125,000.

Element DataTips and Dynamic Labels by Scale

The DataTip controls in the Layer Settings windows also include Scale Range Visible fields that allow you to set a scale range in which DataTips are visible for the object. You can also set DataTip visibility by scale for individual element types in vector objects. For points, lines, and polygon elements in vector objects you can also control the appearance of dynamic labels by setting a scale range using the Scale Range Visible fields in the Dynamic Labels controls.