

# Use Global Public Reference Layers

TNTgis allows you to display global reference web tileset layers licensed from Microsoft Bing Maps and MapQuest to provide a geographic context to any display of your local geodata. These tiled, multiresolution, web reference layers can be selected from the Add Public Layer icon button in the Display Manager (in TNTmips Display and TNTview) or the Layer Manager (in the TNTmips Editor/TNTedit and other TNTmips processes that provide a View window). You can also display geographic feature labels from Open Street Maps. The theme layers available are:

**Microsoft Bing Maps**

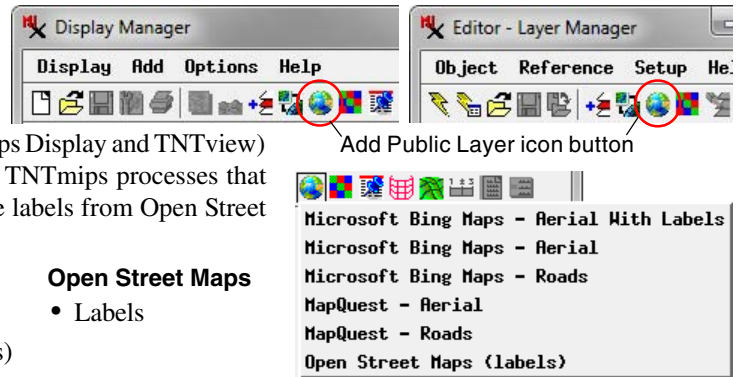
- Aerial (imagery)
- Roads (map features + labels)
- Aerial with Labels

**MapQuest**

- Aerial (imagery)
- Roads (map features + labels)

**Open Street Maps**

- Labels

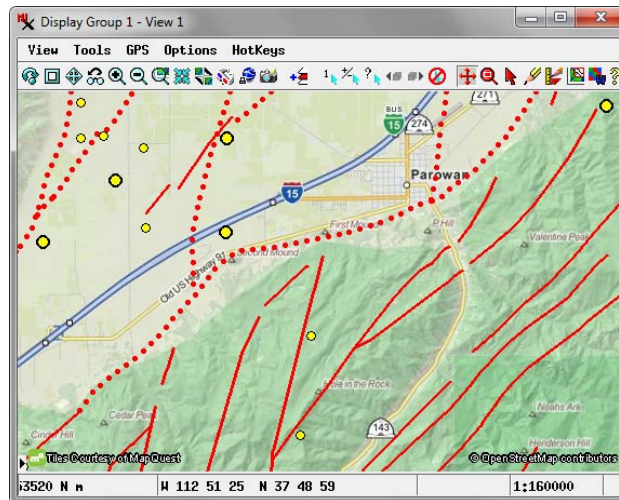


The Roads themes from Bing and MapQuest include roads, other map features, and labels over a subdued shaded-relief background. The Aerial themes include satellite and aerial orthoimagery from coarse to fine spatial resolution. The Bing Maps Aerial with Labels theme is a combination of the Aerial and Roads content.

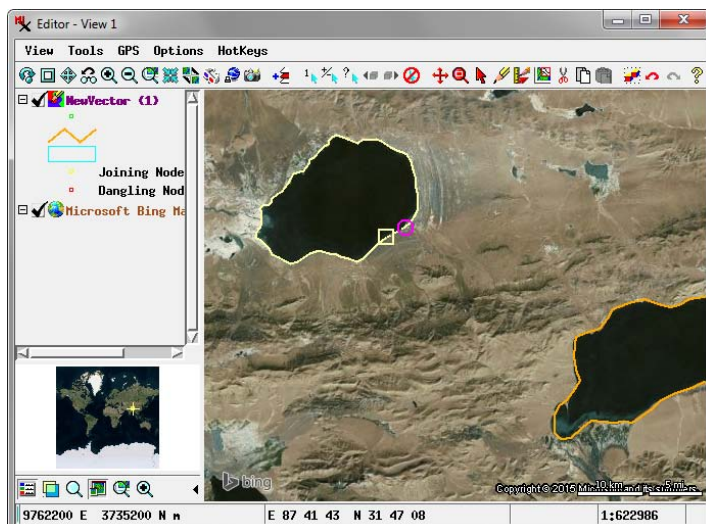
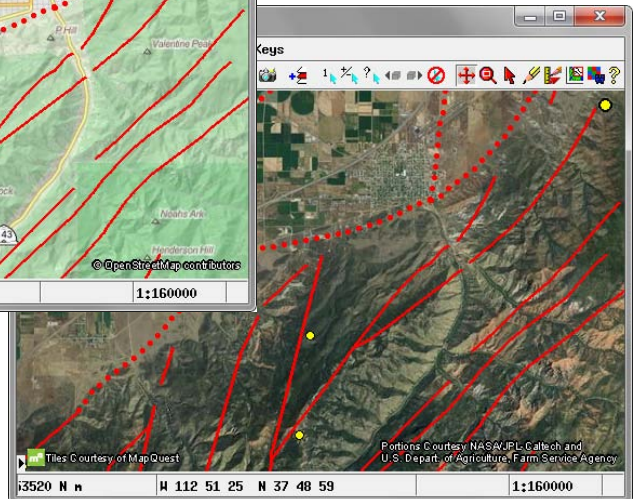
You can use the Bing Maps and MapQuest reference layers to:

- provide a reference frame for any layer or layout;
- trace and draw features using the Annotate and Sketch tools;
- create and update geometric elements in the Editor;
- add control points in the Georeference process.

In short, you can use the Bing Maps and MapQuest layers as a reference for almost any visual application in TNTgis, including printing and stereo rendering. (Web tilesets, including the Bing Maps and MapQuest reference layers, cannot be rendered in 3D perspective views at this time.)



MapQuest Roads (left) and Aerial (below) reference layers for an area in Utah, USA. The geometric overlays show geologic fault lines (red) and earthquake epicenter locations (circles).



Bing Maps Aerial with Labels layer used as a reference for mapping lakes in Tibet in the Editor.

Bing Maps reference layers are available in TNTmips, TNTedit, and TNTview for registered users of the current release version. MapQuest and Open Street Maps reference layers are available in TNTmips Basic and TNTmips Free in addition to TNTmips, TNTedit, and TNTview.

The first time you choose to add a Bing Maps or MapQuest reference layer in TNTgis you are presented with the Terms of Use license for that product. Simply read these terms and press the Accept button to initiate use of this feature.

**Georeferencing**

An important use of the Bing Maps and MapQuest layers is to provide a visual reference for adding control points to georeference your local geodata. In the Georeference process, open the geospatial object you want to georeference, which is shown in the Georeference Input View. From the Options menu in the Georeference window, turn on the toggle to Show Reference View. You can then add a global reference layer to the Georeference Reference View in one of two ways:

(continued)

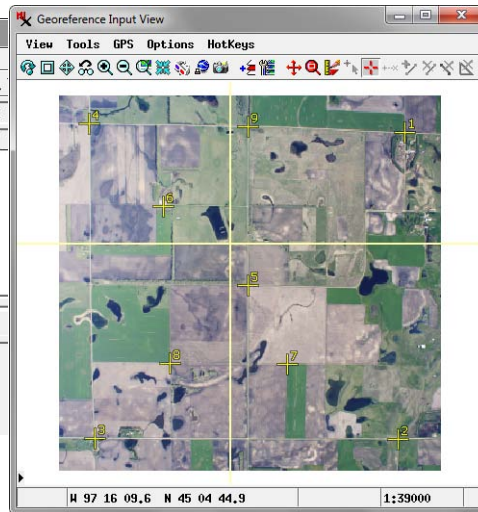
Georeference (Plot370\_07.rvc / plot370\_07.comp)

File Control Points Options Help


Model... Plane Projective Reference to... NAD83 / UTM


ID	Column	Row	Easting	Northing	Residual (m)
1	2563.50	278.35	637763.71	4994804.65	4.05
2	2513.78	2552.44	637829.88	4991593.68	5.84
3	264.18	2548.10	634624.26	4991548.99	6.34
4	222.21	212.15	634551.84	4994779.82	7.56
5	1402.71	1409.49	636191.68	4993193.46	4.51
6	769.08	827.10	635312.55	4993966.65	11.40
7	1689.94	1996.87	636608.89	4992391.40	15.31
8	823.08	1990.92	635410.88	4992370.21	13.39

9 Control Points  
 Cell Size (meters): X = 1.3955 Y = 1.3931  
 Projection Angle: 1.5112 North Angle: 2.7368  
 RMS Residual (m): X = 6.26 Y = 6.70 XY = 9.17  
 Mean Absolute Residual (m): X = 5.22 Y = 6.26



The Bing Maps and MapQuest layers can be used as visual reference to manually locate georeference control points.

 press the Layer Manager icon button on the Reference View toolbar to open the Layer Manager, then use the Add Public Layer icon button

 press the Add Layer icon button on the Reference View toolbar, then click on Public Layer in the menu to open a submenu with the Bing Maps and MapQuest layer choices.

You can use the Bing Maps and MapQuest layers only for manually locating control points; you cannot use them with the Auto-Register operation in Georeference.

### Display Options

When you add a MapQuest or Bing Maps global reference layer to a view containing your local layers, the reference layer is automatically added as the first (bottom) layer in the group, so your existing data layers overlay the reference layer and are not obscured by it. By default the scale and spatial extents of the view (and group) are not changed by adding a global reference layer; this means that you cannot pan to see parts of the global reference layer that are outside the group extents. (The group Coordinate Reference System [CRS] is, however, changed to the Spherical Web Mercator CRS used by these global web tileset layers.)

In some cases you may want to automatically zoom to a global view when you add a global reference layer and to view any portion of this layer. To make this the default option, toggle off the *Exclude from group extents* entry on the reference layer's right mouse button menu in the Display/Layer Manager. This menu also lets you quickly switch to another layer option within the Bing Maps or MapQuest layer sets (see illustration to the right).

Additional options are available on the Layer Controls windows for the Bing Maps and MapQuest layers, which you can open by clicking on the layer icon in the Display/Layer Manager. The Theme menu at the top of the Layer Controls window (illustrated to the right) provides another way to switch between themes. The Enlargement Method menu provides choices that govern how the reference layer tiles are displayed when the view scale does not exactly coincide with one of the zoom levels native to the tileset. Tiles from the next, more detailed zoom level are used and are resampled to match the larger screen pixels. The Enlargement Method menu provides a standard

set of resampling methods used to produce the colors for the larger screen pixels: Nearest Neighbor, Bilinear, Bicubic, Bicubic Sharper, or Bicubic Smoother.

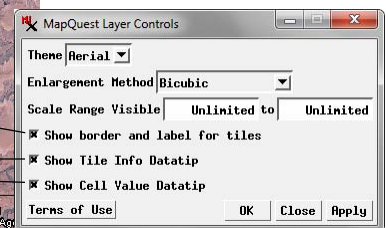
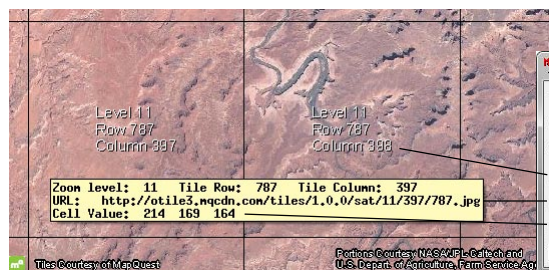
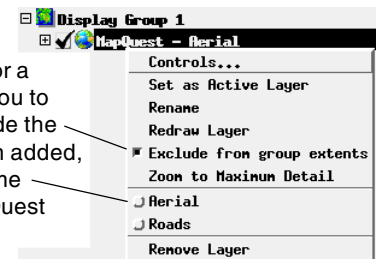
You can use the Scale Range Visible fields to set a range of map scales within which the reference layer will be visible in the view, as you can for any type of display layer. The toggle buttons in the lower part of the window provide access in the view to information related to the tiles: you can choose to show tile boundaries and labels, show tile information (zoom level, tile row, tile column, and URL) in the DataTip, and show the cell value in the DataTip.

The Open Street Maps Labels layer is added as an overlay over the active layer in the group. The Layer Controls window allows you to set the text style for the labels and to choose the types of feature labels to show; the options include Cities, Parks, Places of Worship, Counties, and Bicycle Parking.



County and city labels in the Open Street Maps Labels layer.

The right mouse button menu for a global reference layer allows you to choose whether or not to include the layer in the group extents when added, and to choose an alternate theme within the Bing Maps and MapQuest reference layer sets.



The Layer Controls for the Bing Maps and MapQuest public layers let you show tile information in the DataTip and to display tile boundaries and labels if desired.