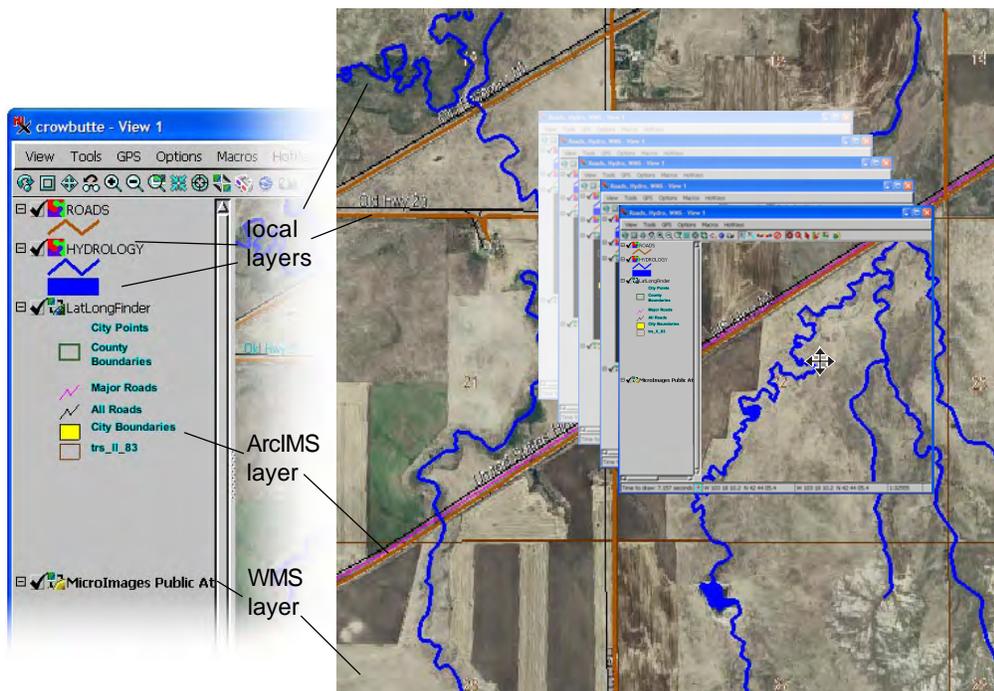# Real-Time Panning

Over the 22 years of TNT products development there has been a continuing trade-off in viewing of your geodata. Your desktop computer display, memory, and computing resources can be devoted to [1] real-time panning of the view of a layer or perhaps several layers with limitations (for example, same CRS, cell size, data type) or [2] efficiently preparing a static view from a large number of widely varying geodata sources and characteristics (for example, varying CRSs, cell sizes, data types, formats). Most other commercial and free geodata viewing capabilities have focused on the former [1]. A few have compromised and allowed panning of composite geodata views, not just images, but with severe limitations (for example, same CRS, only 2 or 3 layers). MicroImages chose to emphasize the second objective [2]—to automatically display a static view of many diverse geodata layers, handle progressively larger layer sizes, and to do this as fast as possible without requiring you to prepare your geodata in advance. Your requests to pan this complex composite view have always been answered by using your resources to further the latter objective [2] (for example, automatic links to other formats).

A trade-off in the use of your desktop resources is no longer necessary. Multi-threading, multicores, fast display chips, better operating systems, and other modern desktop computer features can be used to meet both objectives. These changes in computer technology have permitted Micro-Images to efficiently exploit new software developments such as multi-threaded layer management and JPEG2000 compression, raster pyramiding, tilesets, pipelining (for example, pipelining permits the new inline spatial filtering). Now you can pan your view with the cursor while still meeting your past expectations for the easy use of a complex composite view.

You can slide your view around in real time with any combination of local and web layers. Drawing of local layers and web layers are handled by separate threads so that a slow web response does not delay your real-time panning.

There are 3 general kinds of panning:

> On-Demand Panning. Specific user action to pan (icon, scroll bars, …)
> > (only panning available in your TNT 2007 products and earlier)
>
> Back-fill Panning. Cursor pans view, blank area automatically fills after movement
> > (common in many products, such as ArcView)
>
> Real-Time Panning. Cursor pans view without blank areas
> > (Google Maps and TNT 2008 use real-time panning)

TNT 2008 products provide real-time panning in all 2D views in TNTmips, TNTedit, TNTview, and TNTatlas. You can also pan 90% of the view in any direction using the arrow keys. If your computer can not sustain real-time panning, your TNT view will appear to use back-fill panning. This condition may result when you attempt to pan too fast (use the Locator to jump your view), use vector objects that are not optimized, direct display of slow historical formats such as JPEG, using a network or Internet sourced layer, and other similar factors. If your real-time panning of local layers is slow and automatically reverts to backfill panning, you may wish to consider a more powerful computer and/or await further developments from MicroImages.

Internet or other network map and image layers published by Web Map Service (WMS) or Arc Internet Map Server (ArcIMS) for your use can now also be included in any TNT 2D view. You can even pan a view with one or more of these Internet layers combined with any local layers. As you know from your use of your browser, web sites can be fast or slow in responding to your requests and the same is also the case with these map and image services. When you pan a TNT view containing an Internet layer(s), the local layers will pan in real time as expected. Separate independent threads manage the panning of the layers requested from these slower and indeterminate Internet services and will add them to the view when they are available.
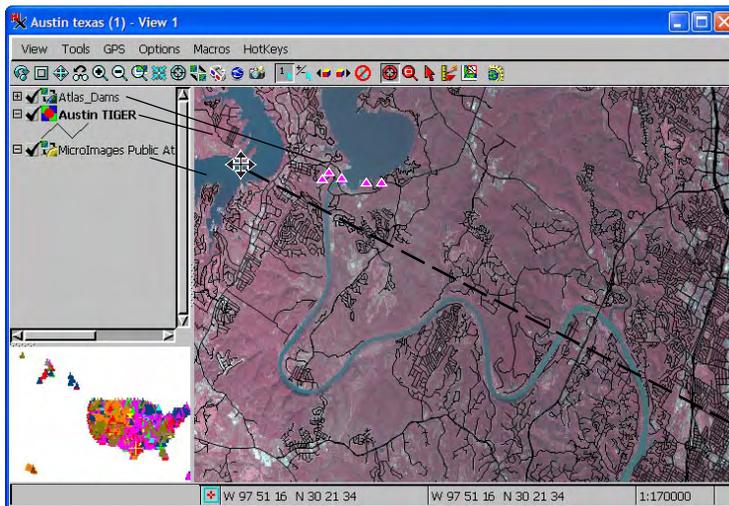
An ArcIMS layer is overlaid on a WMS layer and local vector layer, which together can be readily repositioned in the TNT products. Whether real-time or back-fill panning appears to be used when panning depends on the web services' speed of response.

- WMS layer is 1-m Texas NAIP color-infrared imagery from 2004 (see microimages.com/TNTmap/StateOrtho2.htm).

- The ArcIMS layer is the Dams layer available from geographynetwork.com. (This layer covers the entire United States and sets the extents of the Locator view.)

- The local layer shows direct display of a TIGER roads shapefile for Travis County, Texas.