**TNT products 2012
Development Version**

63rd Release
January 2012

New Features in TNTmips 2012

Highlight Features:

Use popular color stereo viewing devices
Annotate, sketch, or edit features in stereo
Export geometric objects to vector tilesets.
Build Internet atlases using raster and vector tilesets
Export COLLADA tilesets to use a DEM in Google Earth
Assemble Lidar tilesets and use a layer in a view
Use diagram approach to designing SML scripts

Bing Maps: Your continued use of Bing Maps layers in TNTmips 2011 or 2012 until January 2013 is included in this upgrade at no additional charge. MicroImages pays Microsoft a license fee for the use of these materials by each TNTmips 2012 license.

Full Color Stereo *(major new capability)*

Overlay Geometric Layers and Layouts (major new capability)

Previous versions of TNTmips permit viewing any of your image or map rasters in stereo using MicroImages' free global or USA DEMs or your higher resolution DEM. In those versions you can also create a stereo view using one of these DEM objects to display any area of any standard web tileset published on the Internet. For example, MicroImages publishes Internet access in TNTmips to 1-meter annual color image coverage of the USA from 2003 to 2011. You can view any area of these color images in stereo at any scale using the 10- or 30-meter DEM objects provided free on DVDs in every TNTmips shipment. In TNTmips 2012 you can drape any local geometric object or linked-file onto a stereo view. Your geometric object or linked geodata file does not need Z coordinates to be viewed in stereo, their projection onto the stereo surface uses the DEM.

- automatic stereo views of any objects
  (i.e., use free global SRTM, 10- or 30-meter USA, or your DEM)
- use vector, CAD, shape, or Lidar point objects
- directly use linked geometric formats (e.g., shapefiles, DXF, …)
- add multiple contiguous and/or overlapping layers
- automatic conversion of CRS
- render with styling
- control of appearance of layer just the same as for 2D layers
- use any element selection method including queries

Draw in Stereo *(major new capability)*

Drawing on the surface in stereo in the sketch or new annotation tools is now a standard feature in TNTmips. Drawing tools operate directly on the surface in any composite stereo view. The cursor is on the surface defined by the DEM and stays on the surface as you draw. The features you draw in this fashion may be assigned Z coordinates interpolated from the DEM surface.

Color stereo significantly increases your ability to interpret features by creating a more real-world view. Here are just a couple of examples. High resolution imagery and DEMs obtained from Lidar missions offer even more stereo interpretation applications.

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<u>Hydrology.</u> Tracing a drainage feature and identifying its class (intermittent, flowing, …) is much easier in stereo and yields an XYZ line.

<u>Geologic Mapping.</u> There are many features that might look like a geologic outcrop in a 2D view. However, viewing in stereo focuses attention on those that occur on the side of a slope and even aids in their identification. You can then trace around these features on the surface in stereo to create a polygon with XYZ vertices.

Edit in Stereo

A 2D geometric layer added to a stereo view automatically interpolates Z values from the DEM used to create the view. The elements in the layer to be edited in the TNT spatial Editor process now project directly in stereo onto the surface and your reference layers. Your cursor actions using the edit tools to create new elements or edit existing elements occur directly on the stereo surface. The new elements or edited elements may have Z vertices interpolated from the DEM cells. If the layer being edited is a vector layer with 2D topology, this topology is maintained.

Popular Low-cost Stereo Display Hardware (pending capability)

At the moment MicroImages is determining which stereo viewing methods can be supported in the TNTmips 2012 release. Three methods, including active glasses, passive glasses, and no-glasses (i.e., autostereoscopy), are being examined. It is anticipated that all of these can be supported in TNTmips 2012 but all three may not be available in time for the official release in January and will require that you use your free access to DV2013 after January. Check with MicroImages for the most recent information on the status of the use of these stereo viewing methods in TNTmips.

Passive and active stereo viewing systems are widely available and range from portables to direct connection to large screen TVs. No-glasses stereo portables (from Toshiba, ASUS, and Sony) and computer monitors (from LG and Sony) have been promised for this year but are still not available for sale or do not yet have suitable display board drivers available. TNTmips already supports this advanced no-glasses color stereo viewing but is waiting for the release of display devices. For those who do not want to acquire full color display hardware, anaglyph viewing is fully supported for all TNTmips stereo capabilities.

Scale Bar

A scale bar can be optionally added to any view
- automatically rescales when view altered
- select from various styles
- choose meters and feet or metric only
- specify position in view area

View Sidebar

Zoom to Location

The legend sidebar in the View window now provides five optional panes, including Show Zoom and Show Places, that let you zoom to the location of your choice using map scale, tileset zoom level, and geographic coordinates, or by a name search for a geographic feature or area of interest. It can also provide access to frequently-used views that you have named and saved. Each of these panes and the entire sidebar can be opened/closed with a single mouse click.

Show Places

- uses Bing Maps feature name lookup
  (i.e., address, city name, …)
- reposition any view using feature name
- uses new "Places" pane in sidebar

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Bookmark Views

The sidebar in the View window has an optional Places pane to permit you to name and bookmark your current viewing position.

> • save/restore location of any view as a bookmark
> • organize bookmarks (i.e., use folders, delete, …)

Zoom to Location

The sidebar in the View window provides simple scale setting options.

> • select from list of fixed scales
> • add favorite scales to the list
> • enter ground dimensions

Annotation Tools

This is a new set of simplified drawing tools accessed directly using icons on the View window toolbar. Use these to quickly add annotations or features to your 2D or stereo views. Your annotations are automatically saved as a CAD object in a project file as you create them. At any time you can open a full sketch layer showing your annotations. You can then apply the full suite of tools in the GeoToolbox to expand or add to your annotations, to attach attributes to new elements, use more complex styles, and use all the advanced features of the GeoToolbox to add to the CAD object.

> • direct, quick access to commonly used drawing tools
> • annotate using the following icons
> > points
> > circles
> > rectangles
> > polylines
> > polygons
> > text—choose font, solid or with second outline color
> • select from 64 common colors for all elements
> • specify a transparency for all elements
> • select from 5 line widths for lines and boundaries
> • open standard color selection window (i.e., define color manually, with sliders, change
> > models—RGB, HIS, CMY, CMYK, or palette, …)
> • use action / setting icon to
> > clear partially draw element
> > delete last element
> > save as sketch object
> > open existing sketch object

Simplified Raster Display Controls (pending capability)

The controls for color balance, contrast, and other frequently-used image display properties are being simplified and their capabilities extended. For example, you can now adjust each band in a color composite image. Development of these features is currently underway and a final list is not yet available.

Creating and Using a Lidar Tileset

Display Lidar Tileset Layer (new major capability)

Lidar surveys can cover large areas and record hundreds of millions to billions of points. Because the large size of the resulting merged data poses a challenge for further processing and analysis in most software, survey data are commonly subdivided into a set of separate

LAS files on a square tile grid. Individual tile files can then be processed, viewed, and analyzed separately.

It is also useful to be able to view and use the entire set of Lidar point files together in a convenient and seamless fashion. The Lidar Manager in TNTmips makes this possible by allowing you to create a single Lidar DataSet (LDS) file that links to an entire set of LAS files. You can create an LDS link for any set of LAS files, including LAS tile files and/or original flight line files that are mixed, contiguous, or disjoint.

Typically all the Lidar files for a Lidar survey would be kept in a single directory structure. When an LDS link file is available for the directory, it will show as a single LDS object in the TNTmips selection window and can be added with other layers as a single layer in any view and is shown in the view when it is zoomed to the scale specified for the LDS object. The layer is seamless and has the extents of the entire set of LAS files. Operations that can be performed in the display process on a single LAS file can be performed seamlessly on the LDS layer (e.g., real-time surface fitting, show a profile, …)

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Managing Lidar Files (new process)

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Lidar files provided to you by others as many LAS tiles or flight line files can vary widely in characteristics. These include a wide variety of CRSs, classified or unclassified, incorrect records, and a wide variety of conditions. Before you can link, display, and process these files into a single object in TNTmips, you need to determine if they can be treated as a project covering a larger area. The Lidar Manager process enables you to inspect the characteristics of one or all of your LAS files, alter or correct them, and link them into a single object for subsequent use in TNTmips. These are just a few of its capabilities:

- scan and link to large sets of point files in LAS format to allow direct use in TNTmips
- extract points to new LAS files by area or class
- reproject points to any coordinate reference system
- merge LAS point clouds into a single LAS file
- subdivide individual or merged inputs into tiled sets of LAS files
- change class numbers assigned to points
- correct errors in file header information

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Google Earth COLLADA 3D Geodata Modeling (*major new process***)**

(Drape your feature layers over your custom DEM)

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COLLADA models are commonly used to drape buildings and other 3D features in Google Earth. COLLADA = COLLAborative Design Activity = open interchange file format (XML schema) for interactive 3D interchange. You can now combine your detailed image and map surface layers and your accurate DEM into a COLLADA tileset. Each tile is a COLLADA model of a small area, or patch, of your new earth's surface that is stored in a KMZ file. A KML file is also made that indexes all the tiles and will load all the tile models into a contiguous surface in Google Earth at the correct geographic location.

- create COLLADA models to drape your raster or vector object over a custom DEM
- create COLLADA models from your DEM and its representation as an image
    (i.e., shaded relief, color-coded elevation, …)
- render complex layers to drape into COLLADA models
- each COLLADA model covers a small rectangular patch of the DEM
- automatically build a contiguous tileset of COLLADA models (i.e., to cover larger areas)
- automatically detect and processes common area of drape layer and DEM (i.e., null areas in drape layer defining irregular boundaries and holes will be transparent in Google Earth)

- set vertical offset of draped layer to avoid intersection with Google Earth's surface
- specify vertical relief to be used in the models and therefore in Google Earth
- select the maximum ground patch size of each COLLADA model (i.e., each tile or patch is typically 1024 by 1024 DEM cells)
- automatically reconcile differing CRSs of drape and DEM inputs
- use an SML script to build COLLADA tileset
   (this is available for your modification)

Publish Geometric Data on the Internet *(major new capability)*
(Use in Google Maps, Google Earth, and Open Layers)

Export Vector Tilesets *(major new capability)*

Two different geometric descriptions of your geometric elements are supported as vector tile formats: KML (Keyhole Markup Language) and SVG (Scalable Vector Graphics). You can export any linked geometric file format or geometric objects (vector, CAD, and shape) to either of these tileset structures. Exporting to a vector tileset permits you to use your complex geometric objects covering a large geographic area as a layer in your geoviewer—features that are impossible or impossibly slow if these layers were presented to these geoviewers as a single KML or SVG layer.

MicroImages' creation of large vector tilesets for use in these geoviewers is unique. Why use them? Because it does not require the set up and maintenance of any special server-side software, an activity that is not only complex but usually outside of your control or interests. Alas, use of these public formats in Bing Maps in this fashion is severely lagging as Microsoft promotes its Silverlight API for these objectives.

What is SVG?

SVG (Scalable Vector Graphics) is a rich content text description of geographic elements. SVG is now supported by the latest release of all popular browsers including their cell phone and tablet versions. SVGz is also supported and is the compressed form of an SVG file and is used to reduce bandwidth requirements. SVGz is decompressed automatically by the browser. SVG and SVGz files and, thus, tilesets require the use of version 3 of the Google Maps API (further discussion below).

SVG descriptions are cached and interpreted locally on your computer. Thus the points, line vertices, polygon vertices, styles, attributes, … that you are currently viewing in the geoviewer for an SVG layer are available locally for further use. For example

- elements can be redrawn from their locally cached descriptions as you change scale
- an element can be selected locally
   (i.e., it is not necessary to make a request to a special server for its properties
- a specific element can be highlighted, selected, and its attributes shown
- all elements of a common type can be selected and turned on / off

SVG Tilesets

Large, complex geometric objects can be created in TNTmips. Converting these to a single SVG file would create a huge file that would be very slow to fetch over the Internet and impossibly slow to render by a browser. MicroImages has designed a unique SVG tileset structure that breaks a geometric object or linked file into small SVG tiles representing small, contiguous ground patches. This structure is automatically created when you export the geometric object or file to an SVG tileset.

The most important attribute of an SVG tileset is that it is fast when viewed over the Internet. Similar to the use of raster tilesets, the view of an SVG tileset requires fetching only the 10 to 20 very small tiles that the browser and computer use to render the view at the current scale. When an SVG tileset is created, the vertices in the elements are automatically thinned

to reduce the size of the element's description and still preserve all the complexity in the element that can be viewed at the scale it represents The large coordinates required to preserve accuracy in these large objects are also rescaled to be much smaller since they only need to represent the position of these vertices within that georeferenced tile. These and other compressions inherent in an SVG description can greatly reduce the size of your elements in each tile. However, these very small SVG tiles or even smaller SVGz tiles preserve all the viewable details in the tileset at each zoom level. Thus, exporting a very large geometric layer with highly detailed features merely increases the overall size of the SVG tileset, not its performance as a layer in the geoviewers and browser. It does not increase the number of tiles fetched at any view scale. It does not decrease the detail in the layer. It does not affect how fast the layer is added to the view.

When you export an SVG or SVGz tileset the process automatically creates the HTML files you can select to launch it as an overlay in Google Maps and Open Layers. Each TNT operation that modifies an SVG tileset updates and maintains these HTML files, ready for immediate use. An SVG or SVGz tileset can be used directly as created in a geoviewer and can also be added as a layer along with other vector and raster tilesets in a geomashup.

KML Limitations

KML (Keyhole Markup Language) has simpler content but is a more widely used XML description of geographic elements. KML is the primary means of adding smaller rasters and collections of elements to Google Earth and by extension to Google Maps. The principal impediment to using KML is that it can not represent many kinds of features used in geometric objects. For example, line styles are restricted to thickness and color, there is no dashed line style, cartoscripts can not be described, bit mapped polygon fill patterns are too complex, and so on. SVG supports all these features and many more. Another important limitation is that all the vertices in a KML tile must be in latitude and longitude producing a much larger tile than the very compact coordinates used in an SVG tile. Thus, fetching KML tiles uses more download time. However, KML is widely used and, thus, has many uses as long as its limitations are taken into account in the design of the elements to be used.

Browsers do not render KML directly. The Google Maps, Google Earth, and Open Layers API and the Google Earth plug-in render KML layers. This limits the kind of local selection and evaluation tools that can be used for features, such as legend control of element visibility and TNTmips DataTips for elements as Google's information balloons.

Exporting KML Tilesets

Large, complex geometric objects can be created in TNTmips. Converting these object to KML would create a huge file that would be very slow to fetch over the Internet and impossibly slow to render in your browser. MicroImages has designed a unique KML tileset structure that breaks these objects into small KML tiles representing small contiguous ground patches. This structure is automatically created when you export a TNT geometric object or linked file to a KML tileset. It is also important to remember that you may have designed cartographic styling features into your geometric objects that can not be defined in a KML file or tile. While dashed lines can be include by converting each segment to a short line, this inflates the KML and slows its use. Pattern fills for polygons are not supported. Only line color and width can be specified. Keep these and other similar limitations of the KML format in mind when you design your geometric object or use an SVG tileset. If you have such features in a geometric object, they will not appear in your KML file and you will need to simplify them using TNTmips.

The most important attribute of a KML tileset, similar to an SVG tileset, is that it is fast when viewed over the Internet. Similar to the use of raster tilesets, the view of a KML tileset requires fetching only the 10 to 20 very small tiles for the current view area and scale.   When a

KML tileset is created, the vertices in the elements are automatically thinned to reduce the size of the element's description and still preserve all the complexity in the element that can be viewed at the scale it represents. Exporting a very large geometric layer with highly detailed features merely increases the overall size of the KML tileset. It does not increase the number of tiles fetched at any view scale. It does not decrease the detail in the layer. It does not affect how fast the layer is added to the view.

When you export a KML tileset, the process automatically creates the HTML files you can select to launch it as an overlay in Google Maps and Open Layers. Any operation that modifies a KML tileset updates and maintains these HTML files, ready for immediate use. A KML tileset can be used directly as created in a geoviewer and can also be added as a layer along with other vector and raster tilesets in a geomashup.

Export to a Single KML

A single KML file can be exported from a geometric object with simple, limited content (e.g., several thousand styled points or a few hundred polygons). Google Earth and Google Maps will not render larger KML files or they are so slow as to be useless. However, a single, conventional KML file may be required by some non-TNT activity and, therefore, a KML tileset can not be provided. A common TNT application of a single KML file would be to add a reference layer of a few points or polygon boundaries using the Geomashup process.

The KML export process has been expanded to support new features encountered in geometric objects prepared in TNTmips.

- Preserving many-element-to-one style and attribute relationships (previously many-to-one relationships were converted to one-to-one, thus inflating the file)
- Specifying the coordinate accuracy and its units (the high precision coordinates in a geometric object may not be needed in KML)
- Selecting the element type to be exported (i.e., choose points, lines, or polygons to be exported from an object that has all 3)

GeoMashup - Building Internet Atlases
(creates mashups for Google Maps, Google Earth, Bing Maps, and Open Layers)

Use Vector Tilesets (major new capability)

TNTmips 2010 and 2011 perfected and extended the tools used to prepare your large or small scanned map and image raster materials into standard raster tilesets. These raster tilesets can be immediately viewed via the Internet with fast performance in all popular geoviewers and in TNTmips. No extra, complicated, server-side software is required to access these materials via the Internet. The 2011 interactive Geomashup process allowed you to assemble multiple raster tilesets into an Internet atlas of raster layers (i.e., mashup) for use in these same geoviewers and add tools and other features.

TNTmips 2012 provides a new Export to Vector tileset process to convert your large complex geometric layers to SVG and KML tilesets. Similar to raster tilesets, these unique vector tileset structures are designed to provide fast performance via the Internet for large materials in popular browsers and geoviewers. In the 2012 Geomashup process you can select and combine both vector and raster tilesets as layers to create a complete atlas as a mashup. You can also add layers to your atlas that are published as a single KML file; standard raster tileset; or WFS, WMS, GML, GeoRSS, or GPX layers linked-in to your mashup from some other public web site. Then simply copy your mashup and associated tilesets and external links to a web server (local or rented). Your atlas is now published for anyone to use via the Internet in their popular geoviewer.

Want to prove how well this works? Simply select your favorite geoviewer and mashup example that uses both vector and raster tilesets from the geomashup gallery reached from the front page of our web site.

Vector Tileset Features (major new capability)

The tiles in a KML or SVG tileset contain text descriptions of each and all of the individual elements in the source geometric object(s). The vector tiles fetched for use in your current view are cached locally. This provides direct access to the geometric elements in these tiles from local memory to enable local selection and analysis of these elements—no return trip to the web server is required.

You are already familiar with the extensive uses made of KML to plot location-based services and present detailed information about them as overlays and sidebars with selection options in Google Maps and Google Earth. Very large server-side databases are queried to construct the KML (or Flash, SVG, …) descriptions required for these additions to your current view. The publication of your large, static geometric layers as vector tilesets obviates the need for setting up a server-side database and associated services.

The Assemble Geomashup process can add element selection features for use with a layer added as a vector tileset. These interactive selection actions are performed using the local cached descriptions of the elements. Only the cached descriptions of the tiles used in the current view are searched. There are no delays since there is no need to recontact the tileset web source. However, since a tile structure is used, very large geometric layers can be used with no change in performance.

TNTmips permits you to design and view complicated DataTips for the elements in your geometric layers. A DataTip can present attribute field names and values, computed field results (e.g., queries), snapshots, ... in your geometric object or linked files. DataTips are viewed in TNTmips for each element using an HTML template you design to select and control how its attributes will appear in your TNT view (i.e., titling, field labels, font, font styling, layout, colors, sizing, …). The DataTip and these styling parameters become part of the element's description in each tile in a vector tileset. Your mashup can then search for and test for element properties in the locally cached tiles. In this fashion it can draw an element, all similar elements, show a name, … as you interact with the view or legend. The element's unique properties converted from the DataTips can be shown in an information balloon.

Only the cached HTML descriptions of the elements are searched so there are no delays associated with contacting and fetching additional information from the web source. Moreover, large areas do not slow the process since the element descriptions (vertices, styling, balloon content, …) are fetched for only those few tiles covering the area and scale in the current view.

Current selection features that can be used in your mashup include

- highlight any element when the cursor is near it
- pop in the element's name when the cursor is near it
    (this is its name field in the DataTip)
- click an element to expose its information balloon
    (i.e., present the equivalent of the element's DataTip)
    show the formatted HTML text and values
    present a photo
    provide live URL links to a unique web page for each element
    have a specified size, and
    automatically add scroll bars for oversize content
- click on an element to open a unique URL page
- show all elements with a like-name

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Sidebar Panel

A panel can be added to a geoview to create an area in your mashup for a legend; tool and mode selection; to report results; present instructions, advertisements or logos; to list and select element types, etc. Internet atlases (i.e., multi-layer mashups) may require all these plus layer legends to select which layer(s) to expose and use for these other activities.

A sidebar can be added into your mashup for Google Maps or Google Earth with these features
- add to left or right side of view area
- control width to be proportional to window width
- specify a fixed width
- automatically add scroll bars
    (i.e., when content exceeds currently allotted height or width)
- set background color
- automatically display layer legend
    (i.e., selection list of raster and vector tilesets [SML or KML]; individual KMLs; and links to WFS, GML, GeoRSS, and GPX layers)
- insert your HTML text files of any length and URL links
    (i.e., add instructions, advertisements, links to other sites, … scroll bars added automatically)
- insert your logo image that links out to a web page
- add credit for each layer source
    (i.e., hovering cursor over layer name in legend gives popin showing credit)
- style legend entries
- turn on and off layers in legend in additive fashion
    (i.e., provides check boxes for each layer)
- turn on and off layers in legend in mutually exclusive fashion
    (i.e., provides check circles [radio buttons] for selecting only one layer—e.g., show only 1 date at a time for multidate image coverage of an area)
- control display of subgroups of layers in Legend
    (i.e., create subgroups of layers and use check boxes and circles for groups of layers and in each group)

Select Element Types in Layer Using a Tree-Type Legend (pending capability)

The layer legend for a vector tileset or KML layer in a sidebar can be expanded in a tree fashion to show an entry for each group or type of elements in that layer. Using check boxes this sub legend list can be used to turn on or off (i.e., select) all elements matching that type in the current view. For example, check on only one entry in the list to view the distribution of that type of soil, geologic unit, crop field condition, … in that vector tileset overlay. The element types shown in this list correspond to each style that you see in a TNTmips display of the source geometric layer that is exported into a vector tileset or exported to KML.

- expand vector tileset legend entry to show sub legend of polygon types (i.e., expose sub legend of soil type, geology unit, crop condition… of each polygon type in layer)
- expand vector tileset legend entry to show sub legend of line type (i.e., expose sub legend of road type, drainage or river category, … of each line type in layer)
- expand vector tileset layer entry to show sub legend of point types (i.e., expose sub legend of sample value… of each point type in layer)
- select or deselect a polygon, line, or point type shown in a tileset's sub legend (i.e., to turn off or on matching types in layer in view)
- select or deselect all polygons, lines, or points in an expanded legend (e.g., turn off all

geologic unit types in the list for a layer and then turn on only the polygons of a single geologic unit type to show in the view)
- select/deselect matching polygon types in view
  (e.g., expose list and select/deselect polygon types with matching styles such as soil type, geology units, …)
- expand layer to expose list of polygon types
  (e.g., show list of polygon types, such as soil type, geology units, … with matching styles…)

New MicroImages Parser for Google Maps API Version 3

Why? Version 3 was released to expand support for Google Maps use on smart phones and tablets and to support other new features. Google Maps has deprecated (no support or error fixes) API version 2, but it remains available for use. To support this change and add new features, MicroImages' parser used in the Geomashup process supports only Version 3. MicroImages' parser is also published as open source on the web for use and modification for other users.

What MicroImages' Parser Permits You to Do in Google Maps
(i.e., features not supported by the Google Maps parser)

- use KML files that are password protected
- access local files (e.g., KMLs, KML and SVG tilesets, GML, and GPX)
  (note: this is subject to browser security limits—yes for I Explorer, Firefox, and Safari—no for Opera and Chrome)
- follow relative links in Icon SRCs (sources) and SRC tags in descriptions
  (e.g., use links in information balloons for features–image tags can be local, moving files does not require full URL)
- run JavaScript from info balloon content (e.g., the JavaScript could alter sidebar content when the info balloon opens—JavaScript is stripped out by the Google Maps parser so that you do not run JavaScript on their web site for security reasons)
- use KML tileset (i.e., use MI's KML Super Overlay structure)
- use SVG files (uses rendering support of SVG now built into all popular browsers)
- use SVG or SVGz tileset (i.e., use MI's SVG Super Overlay structure)
- use WMS, WFS, GML, and GPX data directly from web sites
- specify size of an icon
- allows targeting of the same window by links in content (e.g., will replace map with link or open in a separate window)
- interprets data every time HTML page is loaded (i.e., ignores data that is cached server-side, thus, automatically updating view for local or remote layers that are changing)
- displays messages while loading
- provides sidebar (see other section above)

Google's Built-in Parser May Be Used by Default

The following special features are only enabled by using the Google Maps parser. If you select these control options in the Geomashup process for a layer, the Google Maps parser will be automatically substituted for MicroImages' parser. If you plan to use these options for a layer in your mashup, please be clear that you will not be able to use the extended features for this layer that are noted above for the MicroImages parser.

- for cross domain access to KML files (i.e., when HTML and/or KML of a layer are located on a remote site, they must be parsed before Google Maps' API is used)

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- for caching parsed results server-side (i.e., this gives faster access to data but may not be current if data layer is dynamic)
- to use KMZ files (these require decompression in the Google API)

Auto-georeferencing *(added features)*

The following TNTmips 2012 features marked with an * have also been retro fitted into the TNTmips 2011 release version. Update your 2011 version now to use them.

*Add Reference Images via the Internet ***

- reference image can be any standard web tileset * (i.e., select the 1-meter USA images at microimages.com)
- operates efficiently over Internet * (i.e., with broadband connection operates at about the same rate as using a local reference image)

[Note: using Bing Maps or Google Maps image tilesets as reference image tilesets for auto-georeferencing uses them as "data" and , thus, violates their licenses. Bing Maps may be used as a reference image when you are locating control points.]

*Production Operation Using SML scripts ***
(use as model scripts for automated processing of many similar images)

- use a local reference image
- use any standard web tileset via the Internet

Analysis Tools

- control points added as overlay layer *
- toggle overlay point layer on and off *
- set style and color of control points
- control point labels automatically thinned by scale (i.e., avoids obscuring points when zoomed out)
- color-code points by magnitude of residuals (i.e., view distribution of how points fit the model)
- set new maximum residual and recompute *

SML Script Builder *(new process)*

Scripts for processing rasters can now be designed using an interactive graphical approach. The new Script Builder process is used to interactively lay out your script logic on a drawing canvas. It uses MicroImages raster pipeline classes to simplify your design. At any time click on one icon in this Script Builder to save your current diagram as a small *.SMLb file; convert it to an SML script; and run it to evaluate its syntax, logic, and result. Any SML script created in this tool can be edited and used in the normal SML script writing design tools. For this initial release of the Builder you will need to use the script writing tools to add conditional logic (i.e., branching, such as if-then-else statements and loops) to your script.

Any SMLb file can be selected to reopen its diagram for further interactive modification. Thus you can use this tool to reopen and graphically modify a script saved as a *.SMLb file in this tool, created by others in the tool, or provided as samples from MicroImages. An SML script created or altered outside of the Builder can be not converted to a diagram in this new tool.

Graphical Approach

- object-oriented visual interface for constructing scripts
- interactively lay out the script on a large canvas
- select from list of classes and functions

- drag lines to connect script components
- minimize components for overview of script structure
- maximize components to see full details of structure
- easy to change order in which components appear in script
- streamlined methods to set up selection of script inputs and outputs
- use menus to select class methods and predefined parameter values
- add methods to a class
- easy set up of error reporting for individual or all components

Script Management

- save and reload compact diagram version of script (*.SMLb file)
- resume working on saved diagram
- load and modify an existing diagram
- view script code for individual components or entire script at any time
- immediately make test run on script represented by diagram
- view code for individual components or entire script at any time

Sample Builder Files

A good way to get started to understand and use the SML Builder is by modifying the diagrammed scripts (*.SMLb files) provided by MicroImages. You simply select the sample script in the Builder process and the canvas panel it opens will show the script diagram ready for your modifications, just as if you had created it. For example, a Builder diagram (i.e., a small *.SMLb file) is available that creates a script that permits its user to select a TIFF file and output a JP2 file. Select this *.SMLb file in the Builder to open the diagram it defines. Without modifying the diagram you can create and use the SML script it represents. However, you can also easily modify this diagram to change the input and / or output file formats to create a script that converts to and from some other raster file formats that TNTmips supports.

Convert Polygons to Points (pending capability)

Polygons in a vector object can be converted to points in a new vector object. These points can then be used as a simpler representation of the data in a database, other software, a simpler KML layer in a web application, etc.

- point is placed at centroid of polygon
- point is moved into area of polygon if centroid falls outside
- attributes of polygon transferred to point
- DataTip of polygon transferred to point

2011 USA State Imagery

New 1-meter color imagery of the USA was collected in the summer of 2011 by the USDA NAIP program. Tilesets of all this new 2011 coverage, in addition to previous coverage for all years back through 2003, has been published on the Internet for anyone to view in Google Maps, Bing Maps, and Google Earth at microimages.com. Using TNTmips' selection window you can select any of these standard web tilesets for your TNT views via the Internet, to add and use them just as you would select local objects.

New 2011 color composite images were acquired and are available for:

Alabama	Illinois	Montana	South Carolina
Colorado	Iowa	New Mexico	Utah
Delaware	Maine	New York	Virginia
Idaho	Maryland	Oregon	Washington
			West Virginia

MicroImages
microimages.com