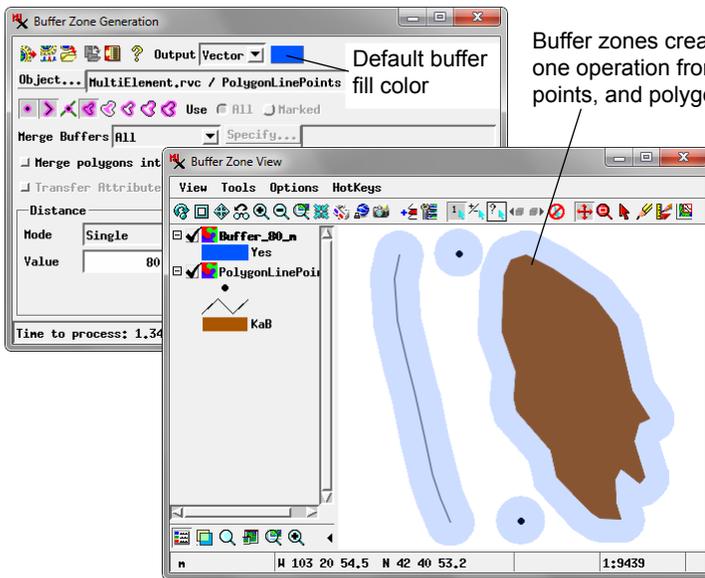
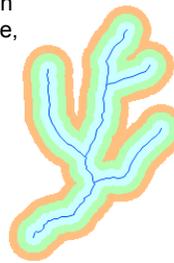


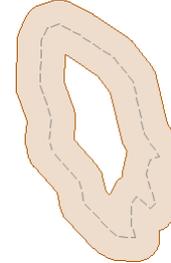
Buffer Zone Generation



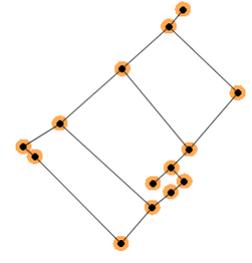
Buffer Zone Examples



Multiple equal-distance buffer zones from lines.



Border buffer (outer ring + inner ring) from a polygon (dashed gray line).



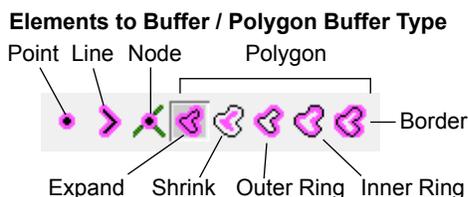
Buffer zones around nodes in a network vector object.

The Buffer Zone Generation process in TNTmips (Geometric / Spatial Analysis / Buffer Zones) lets you compute single or multiple buffer zones for elements in geometric objects (vector, CAD, shape, or region). You can create buffer zones for points, lines, vector nodes, or polygons, and simultaneously buffer more than one element type. The results can be created as one or more vector, CAD, or shape objects and are displayed automatically along with the input object in the Buffer Zone View window.

Input Object and Output Object Type

To select the input geometric object, press the Object pushbutton. Use the Output menu at the top of the Buffer Zone Generation window to set the type of output object(s) to create. Other options in the process may vary depending on the output object type, as described below.

The Buffer Zone Generation process automatically sets up polygon fill styling for the output object(s) using fill colors that are partially transparent by default. Separate colors are set automatically when you use multiple buffer distances. The color button next to the Output menu shows the color used as the default fill for single-distance buffer zones. Press this button to open a standard Choose Color window to select a different color and transparency.



Selecting Element Types to Buffer

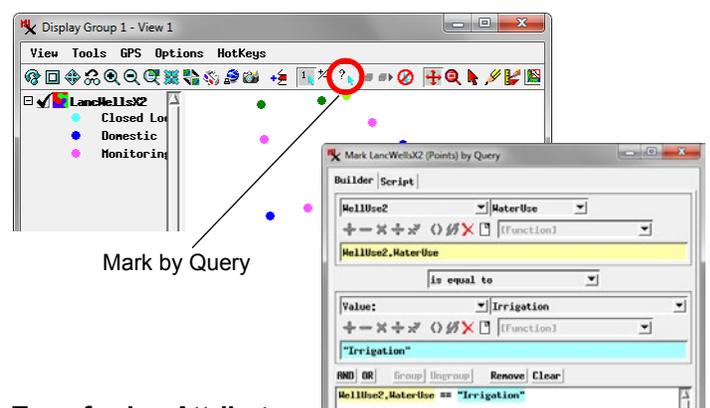
You can create buffer zones for one or more types of element that are available in the input object. Select the element type(s) to buffer by turning on the relevant icon button(s) in the button row below the Object listing. (Element buttons are dimmed and disabled if that element type is not present in the input object.) There are five separate polygon icon buttons, corresponding to different types

of polygon buffer zone result: Expand, Shrink, Outer Ring, Inner Ring, and Border. These options are described and illustrated in the Technical Guide entitled *Polygon Buffer Zone Options*. You can only choose one of the polygon buffer types at a time, though you can use any polygon buffer type while also buffering other available element types.

Use All or Marked Elements



When you are buffering a single type of element, the *Use* radio buttons next to the element icon button row let you choose whether to apply the buffer zone operation to *All* elements of the selected type or only to those currently *Marked* in the Buffer Zone View. (The *All* setting is mandatory when you buffer multiple element types.) You can mark elements manually in the View using the Select tool or the tools in the standard GeoToolbox. You can also mark elements using a database query. To do so, press the Mark by Query icon button in the View window toolbar. The Mark by Query window then opens to let you construct the query (see illustration below). Use of the Mark by Query window is described in the Tech Guide entitled *Interactive Query Builder*.



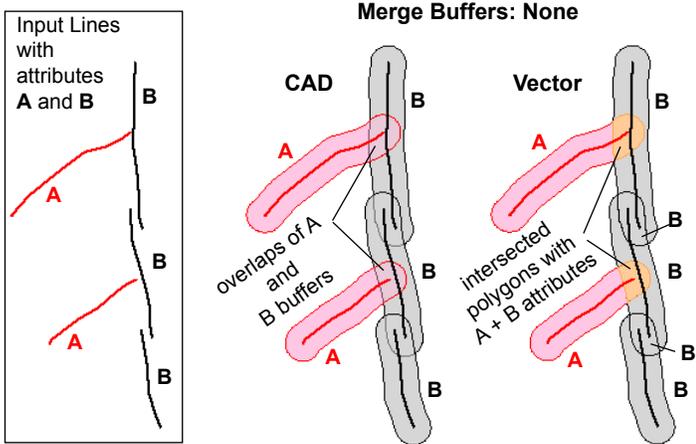
Transferring Attributes

Turn on the Transfer Attributes checkbox to have database attributes transferred from the individual input elements to their respective buffer zone polygons. This option is available when you are buffering to a vector or CAD object. It is not available when you choose Region as the output object type because region objects cannot have attribute tables. You also cannot transfer attributes when you choose to merge all buffers (see following section).

(continued)

Merging Buffer Zones

Buffer zones generated from nearby geometric elements may overlap each other. The results will differ depending on the type of output object you select. Because CAD objects allow elements to overlap, such overlapping buffer zones in a CAD result remain as separate individual elements. In the vector result, polygonal topology requires that the overlapping buffer zones must intersect to form separate polygons for the overlap areas (see illustration below). If you use the Transfer Attributes option, the overlap polygons have multiple records attached if their parent elements had different attributes.



In CAD result (left) buffer polygons overlap without intersecting. In vector result (right) overlapping buffer polygons intersect to form new polygons, two of which result from intersecting B buffers and two from intersecting A and B buffers. If attributes are transferred, the latter intersect polygons receive both A and B attributes.

You can choose to merge overlapping buffer zones from separate input elements. The Merge Buffers menu offers the options None (no buffers are merged), All (all buffers are merged), and By Attribute. With the latter option, you are prompted to select a database table and field from the input elements; only buffers from elements with the same value in the designated field are merged. Sample results from these options are illustrated above.



Merge options are limited in some cases depending on the result object type and your process settings:

- all buffers must be merged for a Region result;
- the By Attribute option is not available for vector input if you choose to buffer more than one element type.

When you merge polygon buffer zones, you have the option to merge polygons into a region before buffering. This option is discussed in detail in the TechGuide entitled *Polygon Buffer Zone Options*.

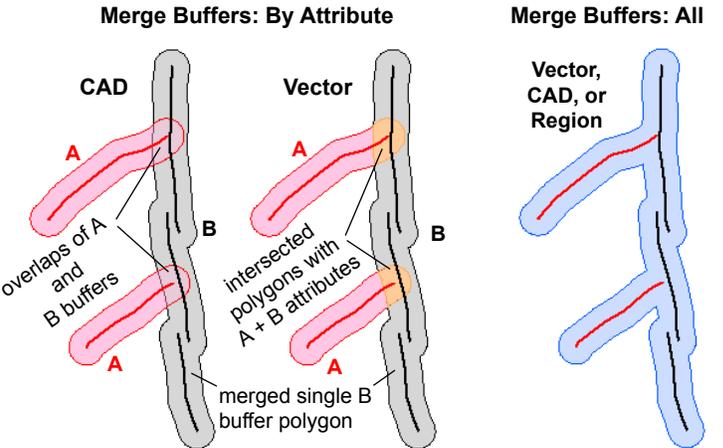
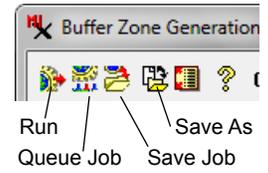
Buffer Zone Distance Options

Controls for setting the buffer zone distance are provided in the Distance box on the Buffer Zone Generation window. Several methods are provided for setting single or multiple buffer zone distances. These options are selected from the Mode menu: Sin-

gle, Multiple Equal, Multiple Unequal, By Attribute, or By Script. The multiple distance options allow or in certain cases require the results for different distances to be placed in separate output objects. These options are described in detail in the TechGuide entitled *Buffer Zone Distance Options*.

Running the Buffer Zone Process

After you set the desired buffer zone options, press the Run icon button to run the process immediately. (Standard Queue Job and Save Job icon buttons are also provided to use Job Processing: see the TechGuide entitled



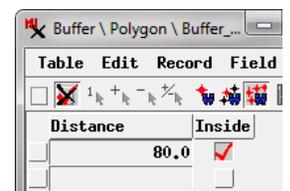
Only buffers from B lines overlap each other and are merged into a single buffer polygon. In CAD result (left), the buffer polygons from the two A lines overlap the B buffer polygon. In the vector result (right), the A and B buffers intersect to form new polygons, which receive both A and B attributes.

All buffer zones are merge into a single polygon. Transfer of attributes is disallowed for this option.

System: TNTmips Job Processing System). A Select Object window then appears to allow you to designate a Project File and name for the result object or objects. When only a single result object is being created, a Skip button is provided on the Select Objects window. Pressing this button creates a temporary result object that is displayed in the Buffer Zone View. If the result is satisfactory, press the Save As icon button to save it to a permanent location. Otherwise, you can then make any desired adjustments in the buffer settings and run the process again (you are first prompted whether or not to save the current temporary result).

Buffer Table

When your buffer result is a vector or CAD object, a Buffer table is automatically created for the buffer polygons. For single-distance results this table contains a single record attached to the buffer polygons that shows the buffer distance (in the Distance field). In a vector object the Buffer table also includes a logical field (Inside) that indicates which polygons are inside the buffer zone. In multiple-distance buffer results saved to a single CAD object, the Buffer table includes a record for each buffer distance. (Multiple-distance vector buffers must be separated to different output objects by distance).



Vector Buffer table