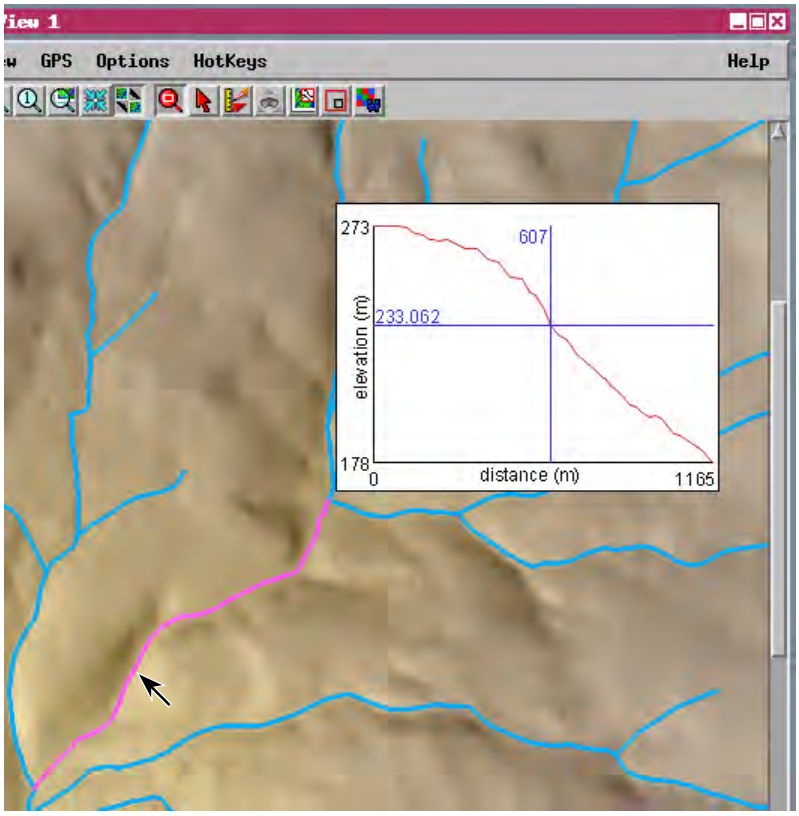
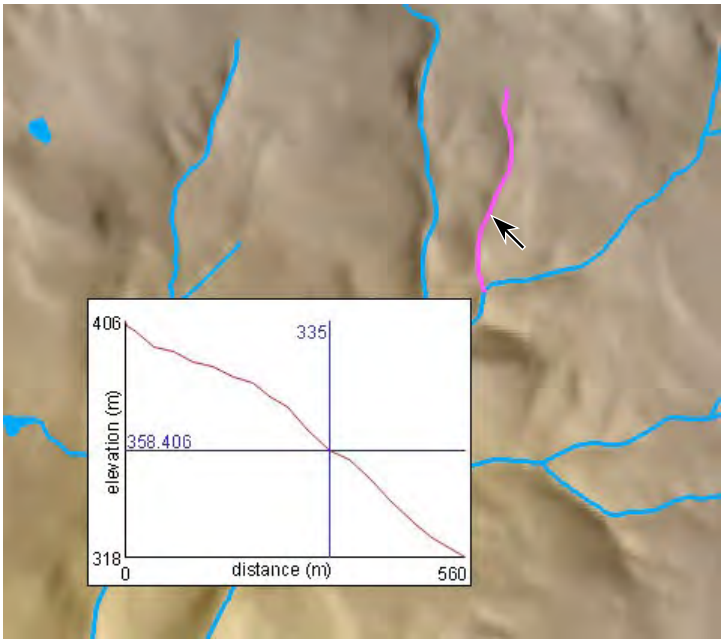
Sample GraphTip Script

Profile of Nearest Line



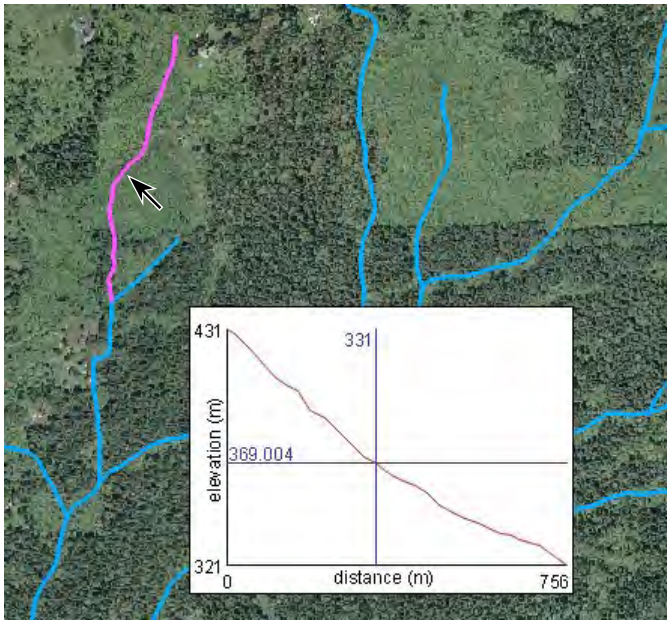
A GraphTip can include multiple graphic elements including text, with each element independently positioned. In this example the vertical and horizontal cross-hair lines indicate the position of the cursor along the line in both distance and elevation.



In this example the position of the GraphTip is also varied depending on the position of the cursor in the View in order to prevent it from obscuring the highlighted line element.

The illustrations on this page show a GraphTip example that executes automatically whenever the cursor is near a vector line. The line nearest the cursor is highlighted and a GraphTip pops-in automatically to show an elevation profile computed along the line using values from an elevation raster. Excerpts of the Display Control Script that creates this GraphTip are shown on the opposite side of this page, and the complete script is available for download.

Creating GraphTips for your saved groups, layouts, and atlases provides a data exploration capability that is available automatically to anyone using the data. A GraphTip can access and process data from several layers in the view and pop-in a graphical presentation of the information for the current cursor position. It can even detect the nearest point, line, or polygon in a vector layer and compute characteristics of that feature from some other layer (or from an object that is not currently part of the Group or Layout). For example, a Graph tip could find the vector polygon that encloses the cursor location, use that area to determine some statistical properties of a raster layer or off-line raster object, and present a graph of the result (such as a frequency histogram of elevation values from an elevation raster).



This GraphTip obtains elevation values from a raster object that is the bottom layer in the group, and highlights vector lines in the top layer in the group. Intervening layers can be turned off or on without affecting the operation of the GraphTip, as shown by the photo layer turned on in this illustration.

Many sample scripts have been prepared to illustrate how you might use the features of the TNT products' scripting language for scripts and queries. These scripts can be downloaded from www.microimages.com/freestuf/scripts.htm.

Script Excerpt for Line Profile GraphTip

(LineProfileGraphTip.sml)

procedure to draw the graph with the given polyline

```
proc drawGraph (class POLYLINE graphLine, numeric vertexNum) {

   drawGraphAxes(graphLine);
```

plot out the axes first

```
   gc.SetColorRGB(200, 50, 50);
```

set profile color and plot point zero

```
   local class POINT2D linePoint = graphLine.GetVertex(0);
   local class POINT2D graphPoint = transPointToGraph(linePoint, graphLine);
   gc.DrawPoint(graphPoint.x, graphPoint.y);

   local numeric i;
   for i=1 to graphLine.GetNumPoints()-1 {
      linePoint = graphLine.GetVertex(i);
      graphPoint = transPointToGraph(linePoint, graphLine);
```

plot the rest of the profile vertices

```
      if (isNull(linePoint.y)) {
```

if null skip point and move to next

```
         linePoint = graphLine.GetVertex(i+1);
         graphPoint = transPointToGraph(linePoint, graphLine);
         gc.MoveTo(graphPoint.x, graphPoint.y);
         }
      else gc.DrawTo(graphPoint.x, graphPoint.y);
      }

   local class COLOR horizLineColor, vertLineColor;
   horizLineColor.red = 20;
   horizLineColor.green = 20;
   horizLineColor.blue = 80;
   vertLineColor.red = 20;
   vertLineColor.green = 20;
   vertLineColor.blue = 80;
   local class POINT2D graphCircle = graphLine.GetVertex(vertexNum);
   graphCircle = transPointToGraph(graphCircle, graphLine);
```

draw crosshairs marking the point on the graph nearest to cursor

```
   gc.SetColorRGB(vertLineColor.red, vertLineColor.green,
         vertLineColor.blue, 100);
   gc.MoveTo(graphCircle.x, topGraphOffset);
   gc.DrawTo(graphCircle.x, getHeight() - bottomGraphOffset);
```

draw the vertical line

```
   gc.DrawTextSetColors(vertLineColor);
```

draw label

```
   string dist = NumToStr(int(graphLine.GetVertex(vertexNum).x));
   local numeric x, y;
```

set x position of measurement label

```
   if (graphCircle.x < (leftGraphOffset + gc.TextGetWidth(dist) + 1))
      x = graphCircle.x + 1;
```

draw on right

```
   else   x = graphCircle.x - gc.TextGetWidth(dist) - 1;
```

draw on left

```
   y = topGraphOffset + fontHeight;
```

set y position of measurement label

```
   gc.DrawTextSimple(dist, x, y);
```

draw distance measurement label

```
   if (!isNull(graphCircle.y)) {
```

draw horizontal line

```
      gc.SetColorRGB(horizLineColor.red, horizLineColor.green,
            horizLineColor.blue, 100);
```

set the line color

```
      gc.MoveTo(leftGraphOffset, graphCircle.y);
      gc.DrawTo(getWidth() - rightGraphOffset, graphCircle.y);
```

draw line

```
      gc.DrawTextSetColors(horizLineColor);
      string elev = NumToStr(graphLine.GetVertex(vertexNum).y);
      if(graphCircle.x > (getWidth() - rightGraphOffset - leftGraphOffset)/2) {
         gc.DrawTextSimple(elev, leftGraphOffset+1, graphCircle.y-1);
         }
```

draw label

draw on left

```
      else   {
         gc.DrawTextSimple(elev, getWidth() - rightGraphOffset -
            gc.TextGetWidth(elev)-1, graphCircle.y-1);
         }
      }
   }
```

draw on right

procedure to convert the polyline from obj to map coordinates

```
func class POLYLINE convertObjectToMap(class POLYLINE line) {
   local class POLYLINE ret;
   local class POINT2D obj, map;

   local numeric i;
   for i=0 to line.GetNumPoints()-1 {
      obj = line.GetVertex(i);
      map = ObjectToMap(lineVector, obj.x, obj.y, vecGeoref);
      ret.AppendVertex(map);
      }

   return ret;
   }


func OnViewDataTipShowRequest (
   class GRE_VIEW view,
   class POINT2D point,
   class TOOLTIP datatip) {
```

predefined function called when the cursor pauses triggering a datatip action event

```
   datatip.Delay = 500;
   local class POINT2D cursor = point;
```

store the cursor position

get the cursor position in map coords

```
   local class TRANSPARM screenToView = ViewGetTransViewToScreen(view, 1);
   local class TRANSPARM viewToMap =
      ViewGetTransMapToView(view, vectorLayer.Projection, 1);
   point = TransPoint2D(point, screenToView);
   point = TransPoint2D(point, viewToMap);
```

translate 16 pixel distance to map projected distance

```
   local class POINT2D tmppoint0;
   tmppoint0.x = 0; tmppoint0.y = 0;
   tmppoint0 = TransPoint2D(tmppoint0, screenToView);
   tmppoint0 = TransPoint2D(tmppoint0, viewToMap);

   local class POINT2D tmppoint;
   tmppoint.x = sqrt(128); tmppoint.y = sqrt(128);
   tmppoint = TransPoint2D(tmppoint, screenToView);
   tmppoint = TransPoint2D(tmppoint, viewToMap);

   local numeric dist = computeDistance(tmppoint0, tmppoint);
```

get the line from the cursor position

```
   local numeric lineNum =
      FindClosestLine(lineVector, point.x, point.y, vecGeoref, dist);
   if (lineNum == 0) return -1;
```

if not close enough, don't display graph

```
   local class POLYLINE line = GetVectorLine(lineVector, lineNum);
   line = convertObjectToMap(line);

   vectorLayer.line.HighlightSingle(lineNum);
   view.RedrawLayer(vectorLayer);
```

highlight the line

get the closest vertex for display

```
   local numeric vertexNum = line.FindClosestVertex(point);
```

get the line to graph - x-dimension is distance, y is elevation

```
   local class POLYLINE graphLine = constructGraphLine(line);

   createGC();
   drawGraph(graphLine, vertexNum);
```

create the graphics context to draw the graph to

draw the graph

```
   local class POINT2D offset;
   offset = computeOffset(line, view, cursor);
   datatip.SetImageTip(imagedev, maskdev, offset);
   return 1;
}
```

compute Image tip offset and display