Network Analysis

TNTmips has long provided a simple routing tool as part of its Spatial Data Display process. Now this tool has evolved into a separate process (Network Analysis) with many additional control functions, such as turn impedance at nodes and the ability to designate the carrying capacity and one-way traffic patterns of selected lines. In addition to determining optimal routes that include any number of designated stops, you can use the process to model allocation networks for any number of designated distribution centers. All nodes in the vector object used for network analysis must have attributes assigned to ensure the validity of the results (otherwise your route may go the wrong way on a one-way street or cross a barrier). Tools to assist you in assigning attributes are provided in the Network Analysis process. One such tool lets you assign time delays to all nodes based on the turn angle between the incoming and outgoing lines. You can then modify these times for the few intersections you know to be exceptions.
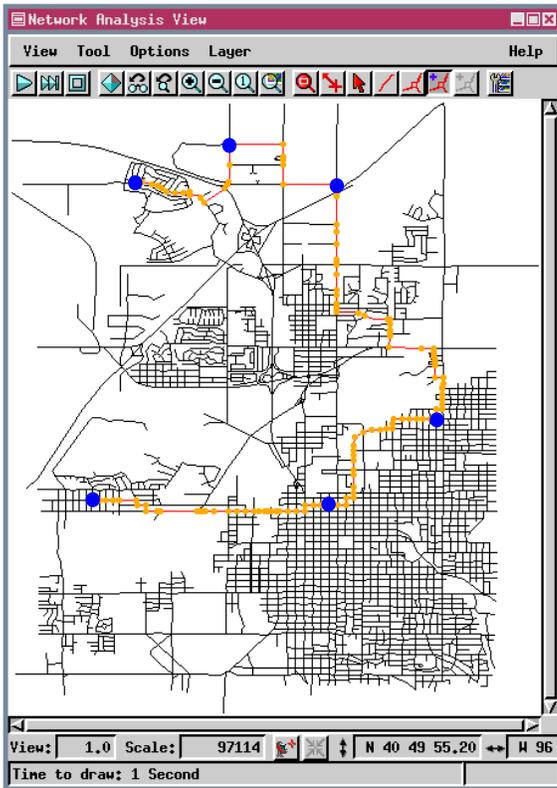
In Routing mode, the Network Analysis process lets you designate the location of stops you need to make and then figures out the optimum path based on line and node attributes. Line length is the most obvious line attribute to consider when determining the optimum path, but other factors, such as speed limits and passibility, are also important. The allowable directions for turning and turn time delays are important node attributes for routing. All nodes and lines along the route are identified and drawn in a specified color. [These colors are fixed in this prototype version as green for nodes and cyan for lines (although they have been modified here to orange and red, respectively), but you will be able to define colors and styles as the process is further developed. The stops are shown larger in blue in the illustration at the left to help you distinguish them on the printed page.]

As you assign attributes to nodes and lines, an enlarged view of the selected node and the lines attached to it or the selected line and its terminal nodes, respectively, is shown in the appropriate attribute assignment window. These views are color coded so you can easily identify the directionality of lines, which is important for one-way streets.

In Allocation mode, you enter the location of centers, then the Network Analysis process identifies the linear components of the network that should feed that center (Allocate In) or that the center should service (Allocate Out). These lines are colored to match the point that represents the center. Demand is an important attribute of lines in an allocation system. If the centers are schools, for example, the demand along a particular line is the number of students living along the street.