

GISMO BOUNDARY PLANNING



GISMO BOUNDARY PLANNING

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Gismo Version 5.0

GeBndPlan Version 1.9

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TABLE OF CONTENTS

TABLE OF CONTENTS	3
USING GISMO	7
ABOUT THIS MANUAL	9
THE GISMO BOUNDARY PLANNING WINDOW	10
CHANGING THE DISPLAY	11
Displaying Objects on the Map	11
Changing the Appearance of Objects	13
Labeling Objects	14
Zooming and Panning	17
Saving Map Views	19
Identifying Addresses	20
Searching for Addresses	20
Identifying Intersections	21
Searching for Intersections	21
Measuring Distances and Areas	22
VIEWING AND PRINTING A PLOT LAYOUT	23
DISPLAYING OBJECTS ACCORDING TO THEMES	27
Creating a Theme Using the Wizard	27
Creating a Theme Manually	31
Entering Expressions	32
Modifying a Theme	34
Deleting a Theme	36
Applying a Theme to Objects on the Map	36
Removing a Theme from Objects on the Map	38
SELECTING OBJECTS ON THE MAP	38
Selecting Objects Using the Mouse	38
Selecting Objects Using Expressions	40
Selecting Objects Using Other Objects	41
Changing the Appearance of Selected Objects	42
VIEWING AN ANALYSIS WINDOW	43
Using Queries and Producing Reports	45
Creating a New Query	47

Modifying a Query	49
Applying a Query	50
Printing a Report	52
Examining Regular Queries	54
Examining Group Queries	56
Examining Cross-tab Queries	58
Including an Overall Aggregate in a Query	59
Including a Group Aggregate in a Query	60
Including a Cumulative Aggregate in a Query	61
GISMO BOUNDARY PLANNING	63
USING DATASETS	64
Creating Datasets	65
Opening Datasets	71
Modifying Datasets	72
Copying Datasets	73
Refreshing Datasets	73
Closing Datasets	74
Deleting Datasets	75
DISPLAYING DATASET BOUNDARIES	75
DISPLAYING DATASET STUDENTS	77
TALLYING STUDENTS	78
PERFORMING AN ENROLLMENT ANALYSIS	81
Modifying a School's Grades, Classrooms, and Capacities	84
VIEWING ADDRESS RANGES	85
CREATING AND MODIFYING BOUNDARIES	86
Creating Boundaries	87
Modifying Boundaries	87
Snapping Points to Objects on the Map	89
Tracing Objects on the Map	90
Creating a Bounding Boundary	92
Creating Distance Boundaries	92
Sawtoothing Boundary Perimeters	95
Copying Boundaries	95
Renaming Boundaries	96
Splitting Boundaries	96
Joining Boundaries	96
Deleting Boundaries	97

Changing the Appearance of Edit Boundaries 97
Viewing an edit window 98
Updating your Master Data 99
CREATING AND MODIFYING BOUNDARY GROUPS..... 100
 Creating Boundary Groups 101
 Modifying Boundary Groups 103
 Deleting Boundary Groups..... 104
LEAVING GISMO BOUNDARY PLANNING 105

GISMO BOUNDARY PLANNING
TABLE OF CONTENTS

USING GISMO

ABOUT THIS MANUAL	9
THE GISMO BOUNDARY PLANNING WINDOW	10
CHANGING THE DISPLAY	11
Displaying Objects on the Map	11
Changing the Appearance of Objects	12
Labeling Objects	14
Zooming and Panning	17
Saving Map Views	19
Identifying Addresses	19
Searching for Addresses	20
Identifying Intersections	21
Searching for Intersections	21
Measuring Distances and Areas	22
VIEWING AND PRINTING A PLOT LAYOUT	23
DISPLAYING OBJECTS ACCORDING TO THEMES	26
Creating a Theme Using the Wizard	26
Creating a Theme Manually	30
Entering Expressions	31
Modifying a Theme	33
Deleting a Theme	35
Applying a Theme to Objects on the Map	35
Removing a Theme from Objects on the Map	37
SELECTING OBJECTS ON THE MAP	37
Selecting Objects Using the Mouse	37
Selecting Objects Using Expressions	39
Selecting Objects Using Other Objects	40
Changing the Appearance of Selected Objects	41
VIEWING AN ANALYSIS WINDOW	42
Using Queries and Producing Reports	44
Creating a New Query	46
Modifying a Query	47
Applying a Query	48
Printing a Report	50

Examining Regular Queries	52
Examining Group Queries	54
Examining Cross-tab Queries	56
Including an Overall Aggregate in a Query	57
Including a Group Aggregate in a Query	58
Including a Cumulative Aggregate in a Query	59

USING GISMO

Gismo (Geographic Information System Mapping Object) is our mapping and display application that you can use to perform a variety of tasks, such as producing plots and analyzing your geographic and transportation data. Gismo Boundary Planning is an extension of Gismo that allows you to perform planning and enrollment projection tasks using Gismo's standardized, easy-to-use mapping window. You can also create, modify, and optimize the boundaries in your system.

We use the term *geosource* to refer to applications such as Gismo Boundary Planning. A geosource (geographic data source) provides Gismo with the geographic information you want to examine or modify, such as school and student locations and attendance boundaries. The geosource also provides field information on data you have selected (such as student names, grades, schools, and so on).

The potential and diversity of Gismo is limitless. You can perform a variety of tasks, ranging from mapping students thematically by school, grade, and gender to selecting students by school and grade to obtain tally information. You can use boundaries to select stops and students or to produce reports and plots. The possibilities are endless. Feel free to experiment with the available functions and consider how you can use them to make your job easier.

ABOUT THIS MANUAL

This manual is divided into two main sections. The first section discusses the basic features of Gismo, including

- displaying objects on the map and adjusting the display
- displaying objects according to themes
- identifying and locating addresses and intersections on the map
- producing plots
- viewing an analysis window (like a spreadsheet) with selected data

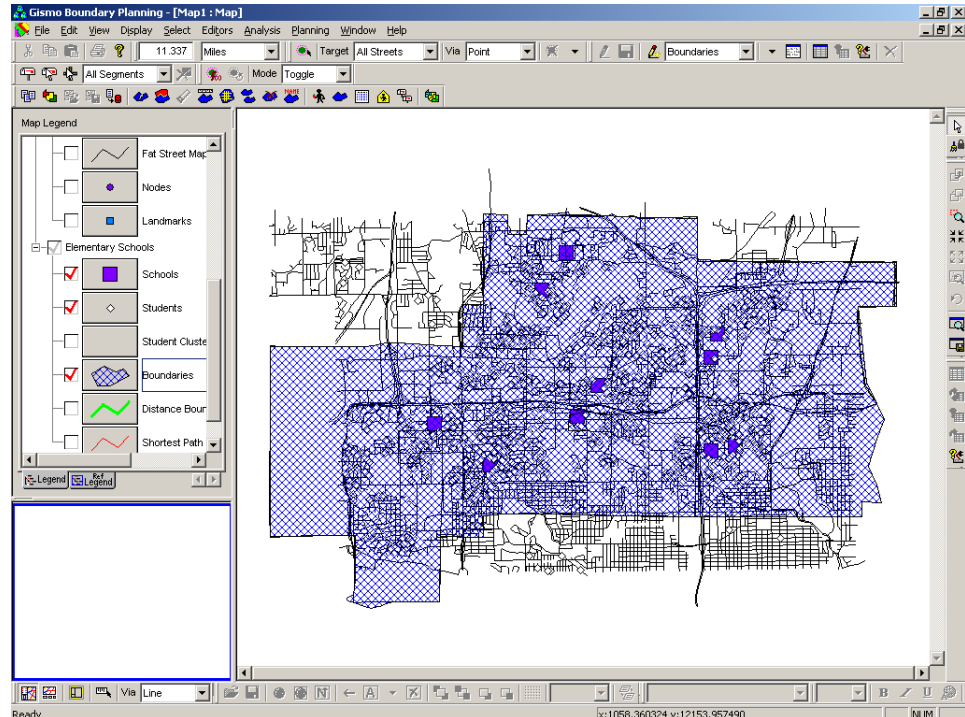
The second section (see “Gismo Boundary Planning” on page 64) discusses the features specific to Boundary Planning, including

- setting up *datasets* (the data you want to include in your different boundary planning tasks)

- creating student tallies and enrollment projections
- using the variety of new functions available for creating and modifying boundaries and boundary groups.

THE GISMO BOUNDARY PLANNING WINDOW

Before you start Gismo Boundary Planning, make sure the BPServer application is running. (If it isn't choose Start from the task bar, choose Programs, choose edulog.nt Server Software, then choose BPServer.) Start the GEBnd-Plan program (in the corresponding edulog.nt Client Software folder) and a window similar to the following appears.



The menu bar along the top of the window provides access to the various menu commands. Click the menu names to see those commands. The various Gismo tools appear beneath the menu bar and along right side and bottom of the window. You can see a description of a tool by pointing to it with the mouse for a moment. A small banner (called a *tooltip*) appears, listing the tool's function. A description also appears in the status bar at the bottom of the window.

The Gismo window is divided into three main sections (*panes*). The regular map display makes up the largest portion, with the map legend and reference map areas displayed to the left of the regular map. We have enlarged the window in this illustration for purposes of clarity. You can resize the window and its individual panes to suit your needs. We have also displayed the street network, schools, students, and boundaries on the regular map.

In the illustration, the students appear as dots on the map. The boundaries are the polygons. The object class representing the students appears under Dataset 1 (our sample boundary planning dataset) in the map legend on the left. We use the term *object class* to refer to each type of object (such as students, schools, or boundaries) that you can display on the map. You can change the order of the object class levels by dragging their names up or down the map legend.

Notice the two tabs at the bottom of the legend pane in the illustration. These correspond to the two types of legends you can view (the Map Legend and the Reference Map Legend). You use the Map Legend to display or hide objects on the regular map display, as well as to change the appearance of those objects. You use the Reference Map Legend to display objects on the reference map. At times, such as when you apply themes to displayed objects (see “Displaying Objects According to Themes” on page 27), additional tabs may appear.

CHANGING THE DISPLAY

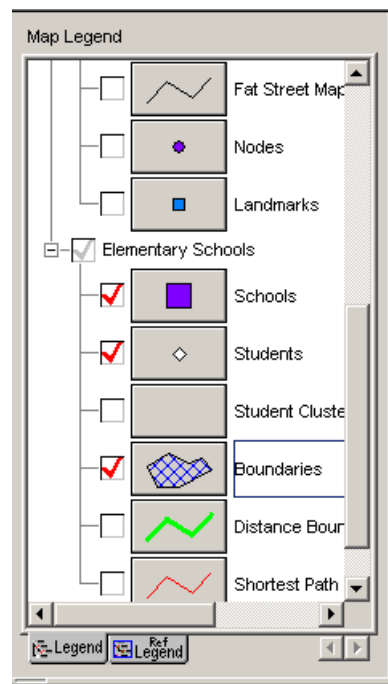
Once you are in Gismo, you have a wide variety of options for displaying objects and adjusting the display. You can zoom in to get a closer look at an area, pan to other parts of the map, then zoom back out when you are finished. You can also save zooms so that you can quickly return to that view later. You can display students, schools, boundaries, and a street map on both the regular and reference maps, as well as change the appearance of those objects.

You can change the background color for the Gismo window by choosing Display from the menu bar, then choosing Background Color from the Display menu. Select the desired color and choose OK.

Displaying Objects on the Map

You use the map legend (the list on the left side of the Gismo Boundary Planning window) to select the types of objects you want to display on the map.

To display objects on the regular map, first click the Legend tab at the bottom of the legend pane if the regular map legend does not appear in the pane.



Any object class with a check in its check box is selected for display. Select the check boxes next to the names of any other object classes you want to display. If you change your mind about displaying the object class you selected (such as the street network) and do not want to wait until it finishes displaying, you can press the ESC key on your keyboard to pause the display, then click the check box again to clear it and cancel the display.

In this example, we have selected All Segments under The Map, and schools, students, and boundaries under the Elementary Schools heading. Since not all of the objects under that heading are selected for display, a grey check appears in the box next to the heading. If all of the object classes under that heading were selected, the check would be solid red. You can display all of the objects under a heading by clicking the grey check to clear it, then clicking the box again to select it.

You follow similar steps to display objects on the reference map (in the lower-left corner of the Gismo window). The reference map provides a small display of the map at a slightly larger scale. You can display objects on the reference map just as you do on the regular map display. First click the Ref Legend tab, then select the desired objects in that legend.

Changing the Appearance of Objects

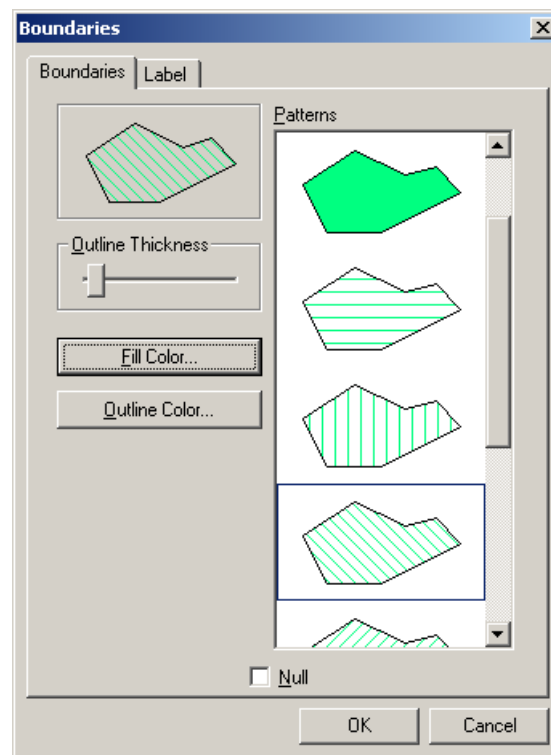
You use the buttons in the legend between the check boxes and the object class names to change the appearance of the objects on the map. The image on the button shows the current appearance.

To change the appearance of a class of objects, first choose the Map Legend tab (to change the appearance of objects on the regular map) or the Reference Map Legend tab (to change the appearance of objects on the reference map).

Choose the button next to the name of the object class you want to change. You use these buttons to change the symbols and lines used to display the objects.



Notice the button next to the Boundaries layer in the illustration. If you click this button, a dialog box appears with various options for changing the appearance of the object, similar to the following.



The illustration in the upper-left corner of the dialog box indicates the current appearance of the object class. The options for changing the appearance of objects vary according to whether the objects are points (such as students and stops), lines (such as streets, runs, and run directions), or polygons (such as boundaries).

In this case you can modify the outline and fill pattern of the displayed boundaries. You can change the thickness of the outlines using the Outline Thickness scroll bar. You can also select from the available fill patterns and change the color of boundary outlines and fill patterns using the two Color buttons. If you want to hide the objects, you can select the Null check box (you'll typically use this for analyzing data).

Notice that the dialog box also includes a Label tab. Options under that tab allow you to display labels next to objects on the map (see "Labeling Objects" on page 14 for further information).

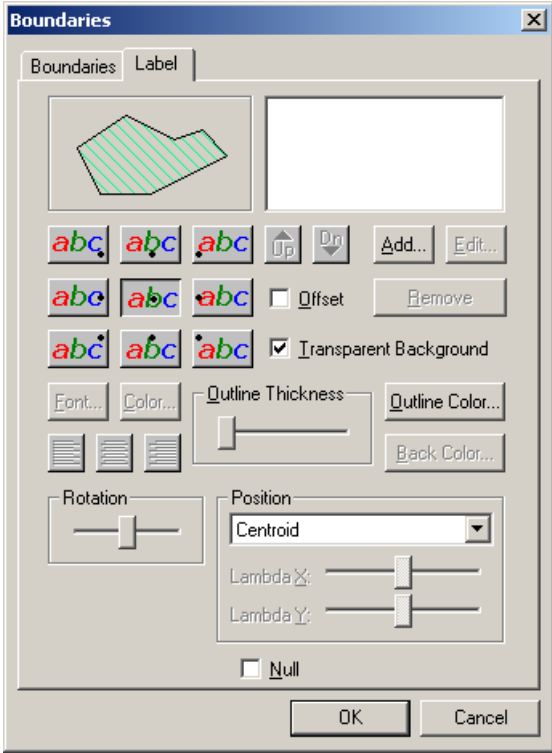
When the illustration in the corner of the dialog box reflects how you want the objects to appear, choose OK.

You can further distinguish between displayed objects by applying *themes*. Themes allow you to change the appearance of objects to differentiate them according to the information stored on those objects. For example, you can display students in grade six differently from those in all other grades, you can display streets with speeds greater than 45 mph differently, and so on. See "Displaying Objects According to Themes" on page 27 for further information.

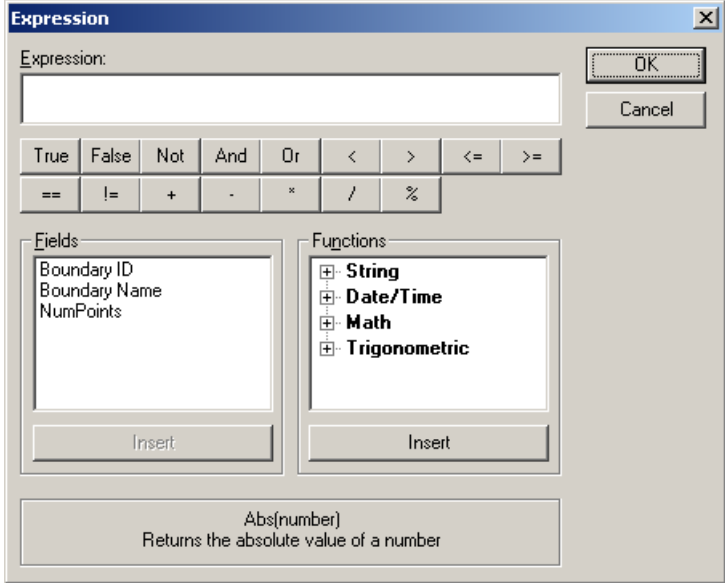
Labeling Objects

The dialog box for changing the appearance of objects includes a feature for displaying labels next to those objects on the map. This allows you to display street names next to streets or student names next to students. You can label objects on the regular map and on the reference map. You can also have the system place a label next to objects you select on the map, similar to an ID function. See "Changing the Appearance of Selected Objects" on page 42 for further information.

To include a label next to objects on the map, choose the Legend tab (if you want to label objects on the regular map) or the Ref Legend tab (to label objects on the reference map). Choose the button in the legend next to the object class you want to label. Choose the Label tab at the top of the dialog box for changing the appearance of the objects.



Choose the Add button.



In the Fields list, double-click the name of the field with the information you want to appear in the label (or select the field name and choose the Insert button beneath this list). As an example, if you want to display boundary descriptions next to boundaries on the map, double-click Description in the Fields list. Gismo adds the field to the Expression text box, indicating that it will appear in the label. You can include more than one field if you want. Repeat the process for each field you want to include.

To include additional text in the label, click the place in the Expression text box where you want the text to appear, then type the desired text surrounded by quotation marks. For example, if you wanted to include the word Description and a colon before the boundary name in the label, you would first enter "Description: " in the Expression text box, then double-click Description in the Fields list. Make sure to include inside the quotes the number of spaces you want to appear between the text and the field in the label.

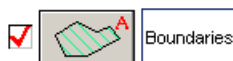
You have a variety of functions available for entering expressions to define the label. See "Entering Expressions" on page 32 for further information. When you have finished entering the label, choose OK from the Expression dialog box to return to the Labels tab.

The label expression you entered appears in the Lines list box. If you want to add other lines to the label, choose Add and repeat the process. If you decide you want to delete a line, select it from the list and choose Remove. If you want to modify a line, select it from the list and choose Edit.

To indicate the placement of the label in relation to the object on the map, you can select any of the buttons labeled with an "ABC." The black dot on the buttons indicates the object's position relative to the label. The illustration above these buttons indicates the current placement of the label. Select the desired label location. You can also drag the Rotation bar or use the Position fields to locate the label.

You can choose the Font or Color button to change the appearance of the label's text. Make the desired selections and choose OK. To left-justify, center, or right-justify the text, use the tools beneath the Font and Color buttons. You can also modify the thickness and color of the label outline.

When you are finished entering the label, choose OK from the dialog box. The label appears next to those objects on the map. Also, the button for the object class in the map legend now includes a letter symbol to indicate that those objects have labels. You can click this button again if you want to remove or change the label. Choose the Label tab in the displayed dialog box, then you can either delete the items in the Lines list box, or select the Null check box to remove the label.

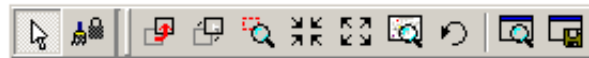


Again, you can use the label functions to identify selected objects on the map, similar to an ID function. See “Changing the Appearance of Selected Objects” on page 42 for further information.

Zooming and Panning

Gismo provides a wide variety of options for changing the map display. You can zoom in or out on the map and pan to other parts of the map to get a better view of the area where you want to work.

You can use the tools in the Display and Idle toolbars (or choose the corresponding commands from the Display menu) to perform these functions.



This is a combination of two toolbars: the Idle toolbar (containing the first two tools in the illustration) and the Display toolbar. If either of these toolbars does not appear in the window, you can display them by choosing the Show/Hide Toolbars tool at the bottom of the window or by choosing View from the menu bar, then choosing Toolbars. Select the check box next to the name of the toolbars you want to display, then choose OK. You can move the toolbars in by clicking inside the border of the toolbar (but not on one of the tools), then dragging it to the desired location.



The tools function as follows.



Choose the Idle tool after you have finished zooming, panning, or selecting objects on the map and want to deselect all of the tools. When you are modifying boundaries, you need to select this tool in order to continue working with boundary points after you have performed a task which requires you to choose another tool, such as when zooming or panning.



The Hold Refresh tool is a toggle switch which you can use to alternately refresh the screen and delay the refreshing of the screen, perhaps until after you have finished zooming or selecting all of the desired objects for display. This tool allows you to delay drawing the objects until you're ready without having to press ESC after each selection to pause the display. You can double click this tool if you want to refresh the display. Since Gismo automatically refreshes every time you change the display, the only time you would need to do this would be after you have pressed ESC to pause the display.



Use the Pan tool to move the view to other areas of the map after you have zoomed in. After choosing this tool, click and drag the map to display the

desired location. You can also drag the rectangle in the reference map to move the regular map display. Panning does not change the scale of the zoom.



Use the Pan Center tool to center your map around a point. Choose this tool, then click the location you want to be in the center. You can click any location on either the regular map or on the reference map to select your center point. Again, panning does not change the scale of the zoom.



Use the Zoom Rectangle tool to zoom in on an area inside a rectangle you draw. After selecting this tool, point to one corner of the area, hold down the mouse button, then drag the pointer to the opposite corner and release the mouse button. You can also zoom in by drawing a rectangle on the reference map. Depending on the shape of your rectangle, you may see a slightly larger area than you draw. Gismo automatically scales the display to fill the regular map pane.



Use the Zoom In tool to zoom in by fixed increments on the currently displayed area. You can hold this button down to zoom in progressively farther. The rectangle in the reference map automatically adjusts to reflect the new viewing area.



Use the Zoom Out tool to zoom out by fixed increments on the currently displayed area. You can hold this button down to zoom out progressively farther. The rectangle in the reference map automatically adjusts to reflect the new viewing area.



Use the Zoom Extents tool to display the entire map after you have zoomed in.



Use the Undo Zoom/Pan tool to return to the previous zoom or pan view. You can continue to choose this tool to move back through previous zooms and pans.

You can use the zooming and panning tools either on the reference map or on the regular map. When you zoom or pan on the reference map, Gismo automatically adjusts the view in the regular map pane.

To pan using the horizontal and vertical scroll bars next to the regular map display, click the arrows at either end of the scroll bar, drag the slider (the box inside the scroll bar), or click inside the scroll bar on either side of the slider. The slider shows where you are on the map and gives you an indication of the size of your viewing area relative to the entire map.



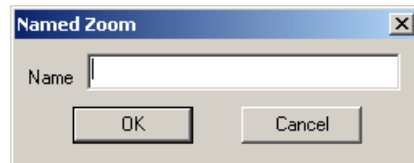
You can also zoom in or out using the Scale toolbar. Notice the text box listing a unit of measurement (such as Miles) at the top of the window. This indicates how Gismo is currently measuring distances. Click the arrow next to this text box to select from other units of measurement (such as Kilometers). The adjacent text box indicates the width of the current map view in those units.

You can enter a different width in this text box to change the map scale, which adjusts the map display just as if you zoomed in or out. The display will zoom to the new scale, maintaining the center of your map.

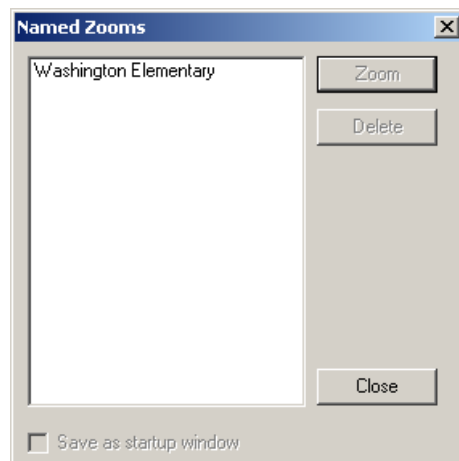
Saving Map Views



You may find you want to save the current map view after you have zoomed in on an area to quickly return to it later. To do so, choose the Save Named Zoom tool or choose Display from the menu bar, then choose Save Named Zoom.



Type a name for the view and choose OK. You can retrieve the view by choosing the Named Zoom tool or by choosing Named Zoom from the Display menu.



Select the desired view from the list box and choose Zoom. If you want to have Gismo automatically show a view when you start the program, select that view, then select the Save as Startup Window check box. To delete a saved view, select the view and choose Delete.

Identifying Addresses

Boundary Planning allows you to quickly identify the address associated with a location on the map. You need to have the street network displayed on the map before you can identify addresses.



To find out the address associated with a location, choose the ID Address tool or choose Display from the menu bar and choose Identify Address. Click the location on the map whose address you want to display. Boundary Planning labels the address on the map. You can click other locations to find out their addresses. Boundary Planning hides the previous label and displays the new one. If you want to hide the last label, choose the Hide Address tool or choose Display from the menu bar and choose Hide Address.



Searching for Addresses

Boundary Planning allows you to quickly find the address you're looking for. You need to have the street network displayed on the map before you can locate addresses. To find the location of a particular address, choose the Address Match tool or choose Display from the menu bar and choose Address Match.



The screenshot shows the 'Address Match' dialog box. It has a title bar with 'Address Match' and standard window controls. Below the title bar, there are two tabs: 'Address' and 'Intersection', with 'Address' selected. Under the 'Address' tab, there is a text input field for the address. Below the input field is a dropdown menu labeled 'Object Class' with 'All Segments' selected. To the right of the dropdown are a 'Match' button and a copy icon. Below these elements is a table with columns for 'Number', 'Prefix', 'Street Name', 'Type', 'Suffix', 'City', and 'State Zip'. The table is currently empty. Below the table is a large empty rectangular area.

The Address Match dialog box allows you to enter the address you want to find. Type all or a portion of the address and choose Match. Boundary Planning automatically parses your entry into the standard address fields (you can modify those entries and choose Match again to change your search). If there

is only one address that matches your entry, Boundary Planning labels it on the map display. (You may need to move the Address Match dialog box to see it. To do so, simply drag its title bar.) If more than one address matches your entry, the matches appear in the list box at the bottom of the dialog box. Select the desired address or address range to label its location on the map.

When you are finished, click the Close tool (labeled with an X) in the upper-right corner of the dialog box. The address remains labeled on the map until you choose the Hide Address tool or choose Display from the menu bar and choose Hide Address.



Identifying Intersections

Boundary Planning allows you to quickly identify the intersecting streets associated with a corner on the map. You need to have the street network displayed on the map before you can identify intersections.



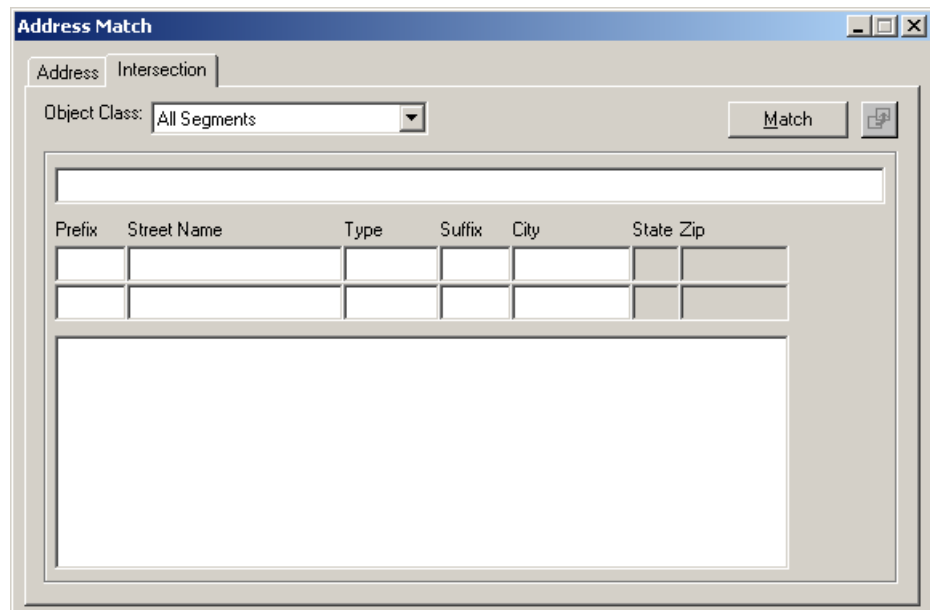
To find out the intersecting streets associated with a corner, choose the ID Intersection tool or choose Display from the menu bar and choose Identify Intersection. Click the corner on the map. Boundary Planning displays a label listing the streets associated with intersection. You can click other corners to find out their streets. Boundary Planning hides the previous label and displays the new one. If you want to hide the last label, choose the Hide Address tool or choose Display from the menu bar and choose Hide Address.



Searching for Intersections

Boundary Planning allows you to quickly find a street intersection on the map. You need to have the street network displayed on the map before you can locate intersections. To find the location of a particular intersection, choose the Address Match tool or choose Display from the menu bar and choose Address Match. The Address Match dialog box appears. Choose the Intersection tab at the top of the dialog box.





Type all or a portion of the two street names, separated by an ampersand (&), and choose Match. Boundary Planning automatically parses your entry into the standard street name fields (you can modify those entries and choose Match again if you want to change your search). If there is only one intersection that matches your entry, Boundary Planning labels it on the map display. (You may need to move the Address Match dialog box to see it. To do so, simply drag its title bar.) If more than one intersection matches your entry, the matches appear in the list box at the bottom of the dialog box. Select the desired intersection to label its location on the map.

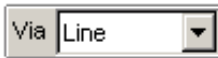
When you are finished, click the Close tool (labeled with an X) in the upper-right corner of the dialog box. The intersection remains labeled on the map until you choose the Hide Address tool (or choose Display from the menu bar and choose Hide Address).



Measuring Distances and Areas

Gismo allows you to measure distances and areas on the map, perhaps to find out the 'crow-flight' distance from a student's home to the school or the same distance traveling along the street network. You can also determine the area within a polygon (boundary), rectangle, or circle you draw. Note that the Measure tool is a toggle switch. You can measure distances and areas as long as that tool is selected (the button appears pressed down). If you click it again to deselect it, you leave the measure mode. The distances are measured in the units selected in the Units field in the Scale toolbar at the top of the window.





To measure a line, make sure Line appears in the Measure Method field next to the Measure tool at the bottom of the window (if it doesn't, click that field and choose Line). Choose the Measure tool (if it isn't already selected), then click one end of the line on the map. Move the mouse to the other end and click the mouse again. The length of the line (and the number of points you clicked) appears in the status bar at the bottom of the window. You can continue to click points on the map to define a polyline (a series of connected lines, such as a path along the street network). To stop measuring lines, click the right mouse key.



To measure the area inside a rectangle, click the Measure Method field and choose Rectangle. Choose the Measure tool, then point to one corner of the rectangle on the map. Hold down the mouse button, then drag the mouse to the other corner of the rectangle. The area inside the rectangle (as well as its width, height and the length of the perimeter line) appears in the status bar at the bottom of the window. Release the mouse button when finished.



To measure the area inside a polygon, click the Measure Method field and choose Polygon. Choose the Measure tool (if it isn't already selected), then click the starting point of the polygon on the map. Move the mouse to the end of the first line of the polygon's perimeter and click the mouse again. Continue clicking points in this manner to draw the polygon. After you define at least three polygon points, the status bar at the bottom of the window lists the area inside the polygon (as well as the length of the perimeter line). Click the right mouse key when finished.



To measure the area inside a circle, click the Measure Method field and choose Circle. Choose the Measure tool (if it isn't already selected), then point to the center of the circle on the map. Hold down the mouse button and drag the mouse until the circle is the desired size. The status bar at the bottom of the window lists the area inside the circle (as well as its radius and circumference). Release the mouse button when finished.

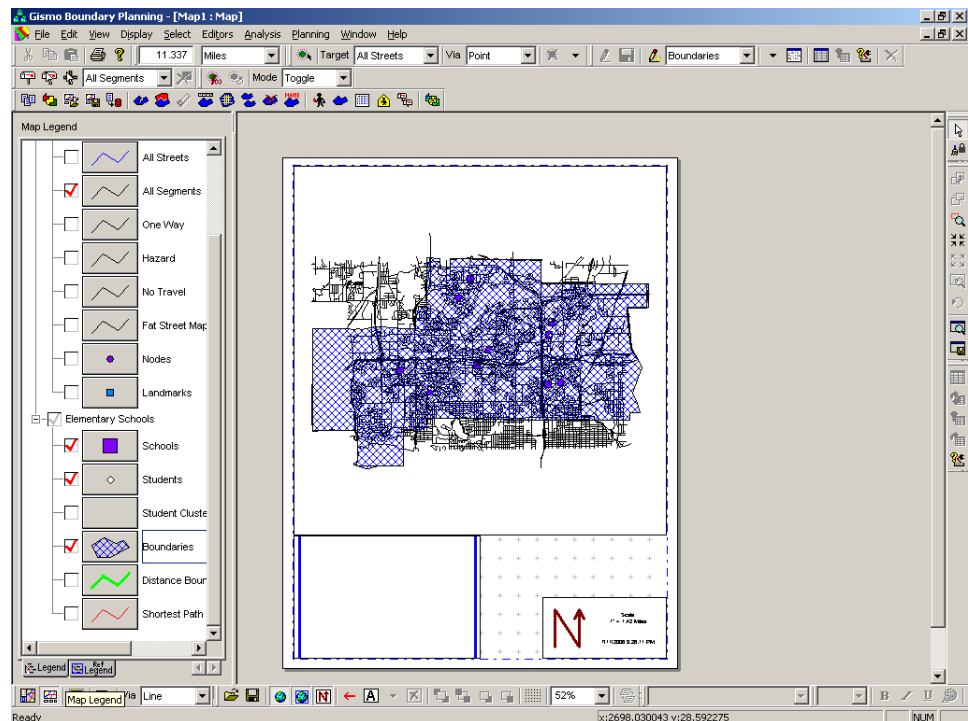
VIEWING AND PRINTING A PLOT LAYOUT

Gismo allows you to create plots of the objects on the map display which you can send to printers or plotters connected to your computer or network. Perhaps you want a plot of the street network superimposed over the map image, or maybe a plot displaying all stops and students for a particular school. You can use Gismo to create color plots of anything you display on the map.



To view a plot layout, choose the Plot Layout Tool at the bottom of the window (or choose View from the menu bar, then choose Plot Layout). The Gismo Boundary Planning window changes to indicate how the plot would look if you sent it to your computer's printer or plotter.

GISMO BOUNDARY PLANNING
USING GISMO



The reference map now appears at the bottom of the plot, along with a north arrow and map scale banner. The tools in the Plot toolbar at the bottom of the window are now available for modifying the plot.



If the Plot tool bar is not displayed, choose the Show/Hide Toolbars tool at the bottom of the window or choose View from the menu bar, then choose Toolbars. Select the check box next to Plot. The tools in the Plot toolbar function as follows.



The Open Layout tool allows you to return to a previously saved plot layout (see the next tool definition). Saved layouts include such things as whether and where the regular map, reference map, annotation banner, and north arrow are displayed. They do not save the contents of the various parts, though, so you can use the same plot layout for different plots and areas.



The Save Layout tool allows you to save the current plot layout. Again, saved layouts include such things as whether and where the regular map, reference map, annotation banner, and north arrow are displayed, but does not save the contents of the various parts.



The Regular Map tool is a toggle switch that alternately displays and hides the main map on the plot layout.



The Reference Map tool is a toggle switch that alternately displays and hides the reference map on the plot layout.



The North Arrow/Scale tool is a toggle switch that alternately displays and hides the banner with the north arrow and the map scale.



The Arrow tool allows you to draw an arrow on the plot in any of eight different compass directions. You might use an arrow in combination with an annotation window to indicate a point of interest (such as the location of a problem intersection). To draw an arrow, click this tool, then point to the location on the plot where you want the arrow to begin. Hold down the mouse button and drag the pointer to the other end. You can use the Properties tool (discussed later in this section) to change the direction and appearance of the arrow.



The Annotation tool allows you to add text, such as a title or date, to the plot layout. After you select this tool, draw a banner for the text on the plot by pointing to one corner of the text's location, holding down the mouse button, dragging the pointer to the other corner, and releasing the button. Click the banner, then type your text. You can use the Font toolbar (located next to the Plot toolbar) to format the text. These tools allow you to bold, italicize and underline text, as well as to change the font, size, and color. You can also left-justify, right-justify, or center the banner's text as desired.



The Properties tool allows you to change certain aspects of the various parts of the plot layout. To change an object's properties, first click the object on the plot, then choose this tool. Modify the properties as desired, then press ENTER.



The Remove tool removes an *active* item from the plot layout. An active item is simply an item that you click with the mouse. After you click an item (such as the north arrow banner) to make it active, it appears with a cross-hatched border (which you can drag to move the item) and black squares (which you can drag to resize the object). Click the item using the mouse, then choose the Remove tool to delete it from the layout.



The Bring to Front tool allows you to bring an active item to the front of all other displayed items. For example, if the map covers a portion of the north arrow banner, you can click the banner with the mouse, then choose this tool to have it appear superimposed over the map display.



The Send to Back tool allows you to send an active item to the back of all other displayed items. For example, if the map covers other displayed items, you can click the map with the mouse, then choose this tool to have it appear underneath all other items.



The Send Forward tool allows you to bring active items forward by one level. For example, if the north arrow banner covers part of the map, you can select the map, then choose this tool to display it over the banner.



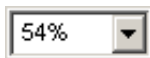
The Send Backward tool allows you to send an active item backward by one level. For example, if the north arrow banner covers a portion of the map, you can click the banner, then choose this tool to display it underneath the map.



The Layout Grid tool allows you to align the various items on your plot. After you choose this tool, the Layout Grid dialog box appears with options for setting the height and width of the grid sections. It also includes a check box for snapping objects to the grid. If you select that check box, Gismo will automatically snap objects to the grid when you move them.

You can move individual objects in the plot layout (such as the reference map or the north arrow banner) by clicking that object to activate it, then dragging its border to the desired location. You can change its size by dragging the black squares on that border.

The plot layout is fully interactive. You can do anything in the plot layout that you do in the normal layout, including zooming, panning, displaying objects, and hiding objects. Refer to the appropriate sections for further information.



To adjust the size of the plot layout relative to the window, use the text box in the Plot toolbar. Click the arrow next to the text box, then select the desired scale. This allows you to fine tune the plot as desired. You can get a close look (at 200%, for example) to check item placement, then reduce the view (perhaps to 40%) to check the overall layout of the plot. The appearance of the plot at 100% shows you what the plot will look like when printed. It is possible that smaller objects (such as streets) will show up in the 100% view, but will disappear at 40%. You can think of the plot layout as a print preview, except that you can modify all aspects of the plot just as when in the normal layout.



To send the image to a plotter or printer, just click the Print tool at the top of the window, or choose File from the menu bar, then choose Print. A dialog box appears for you to select the plotter or printer.

Under Printer, click the arrow next to Name, then select the desired plotter or printer. Under Copies, enter the number of copies of the plot you want to print. Choose OK when you are ready to print. You can select the High Quality Printing check box at the bottom of the dialog box if you want to see smoother lines in the printout.



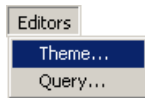
When you are finished, choose the Normal View tool at the bottom of the window (or choose View from the menu bar, then choose Normal) to return to the normal layout.

DISPLAYING OBJECTS ACCORDING TO THEMES

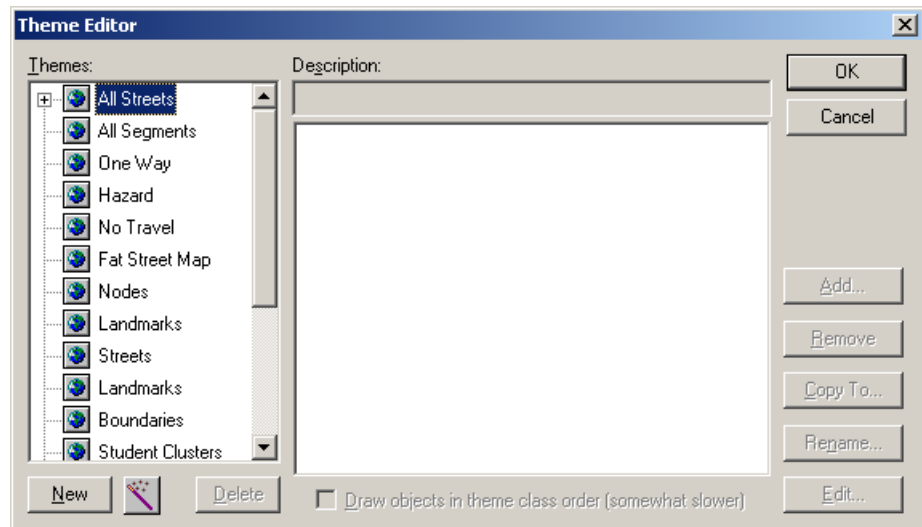
Boundary Planning provides access to various types of non-geographic information on displayed objects. For example, you may have access to student grade levels, street speeds, boundary IDs, and so on. You can use this information to discriminate between various subsets of objects and display them differently on the map. As an example, if you have a group of elementary students, you might want to define a theme to display first grade students in blue, second grade students in red, and so on.

Themes do not store any actual data. They contain a set of criteria and record the appearance of objects matching those criteria.

Creating a Theme Using the Wizard



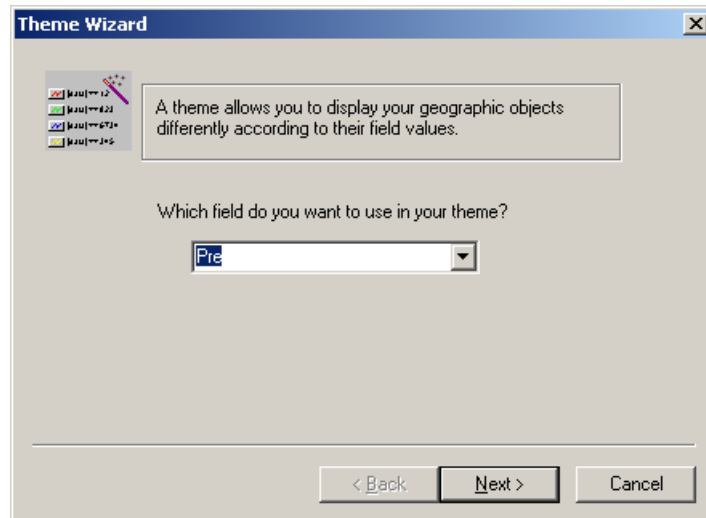
You can create themes manually or use the Theme Wizard to guide you through the process. To create a new theme using the wizard, choose Editors from the menu bar, then choose Theme.



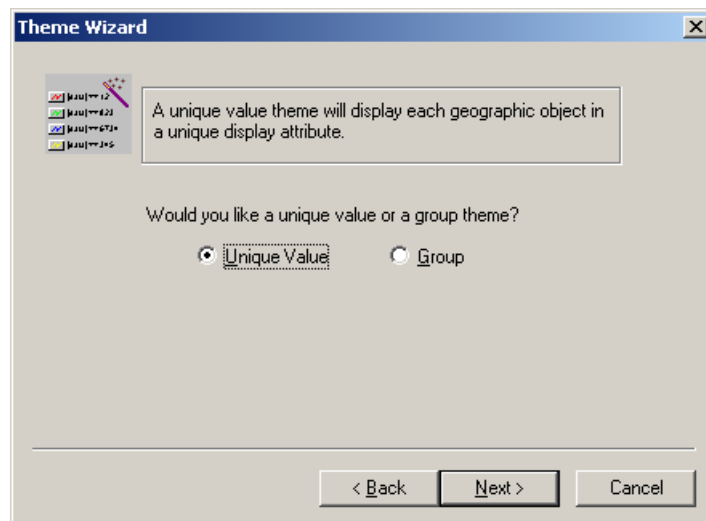
The Theme Editor dialog box lists the object classes available for creating a theme. A plus sign next to an object class indicates that one or more themes exist for that group (see All Streets in the illustration).



Select the object class for which you want to create a theme, then choose the Wizard tool. The Theme Wizard window appears.



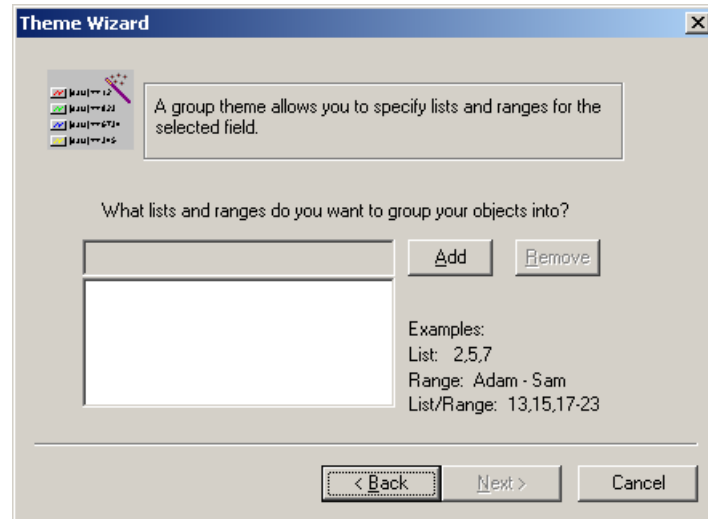
Click the arrow next to the field and select the field you want to use to define the theme (such as Grade). Choose Next.



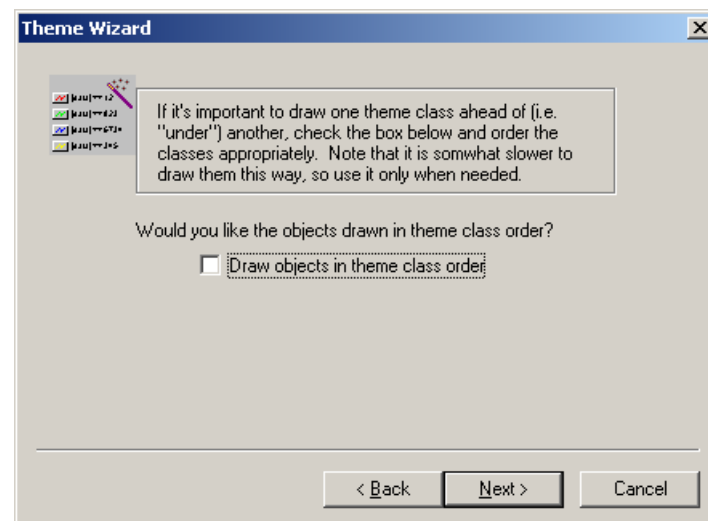
If you want each object with a different value in the field you selected to appear differently (for example all students in grade 1 to appear one way, all students in grade 2 to appear in a different way, and so on), select Unique Value.

If you want to define groups of values you want to appear a certain way, select Group. For example, you may want all schools with codes ranging from 100 - 199 to appear one way, all schools with codes from 200 - 299 to appear

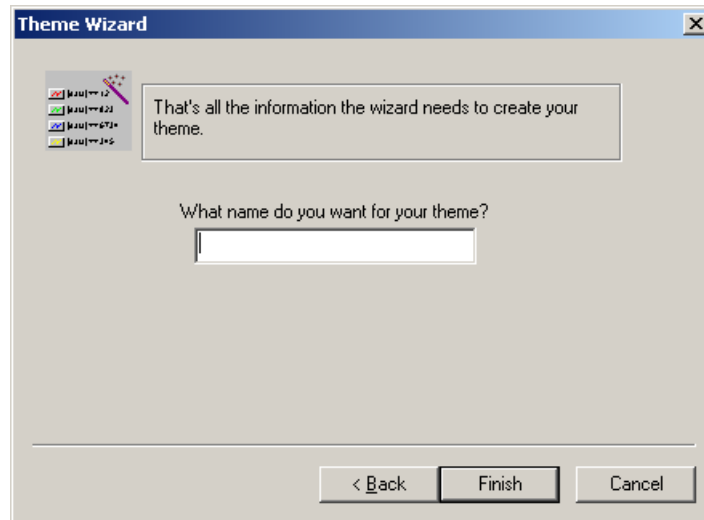
another way, and so on. Choose Next. If you are creating a unique value theme, skip the next illustration and paragraph. If you are creating a Group theme, the window provides functions for defining the groups.



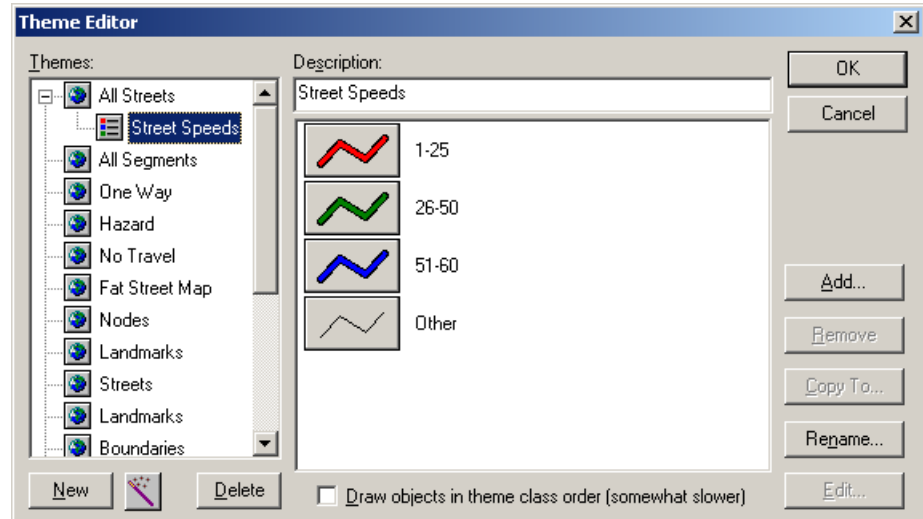
Choose the Add button, then enter the first group definition (such as 100-199). You can define groups as lists (such as 102, 202, 330), ranges (such as Adam - Sam), or a combination of the two (such as 1, 2, 5-7). Choose Add again if you want to define another group. Repeat the process for each group you want to include in the theme. Choose Next when finished.



Select this check box only if you need to display objects in same order as the theme class list. Choose Next.



Type a name for the new theme and choose Finish. You return to the Theme Editor window which displays your new theme.



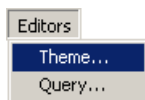
The buttons next to each of the theme's criteria (theme classes) allow you to change the appearance of matching objects. These buttons function like the buttons next to objects in the map legend. See "Changing the Appearance of Objects" on page 13 for further information. The dialog boxes for changing the appearance of objects always include a "Null" check box. You can select that check box if you want to hide objects corresponding to any of the theme's classes.

Objects matching each of the theme classes will appear as indicated on the corresponding buttons when the theme is applied. All others will appear as indicated on the button next to “Other.” A theme always includes an “Other” theme class at the end of the list to provide a means of displaying objects that do not match any of the theme’s criteria.

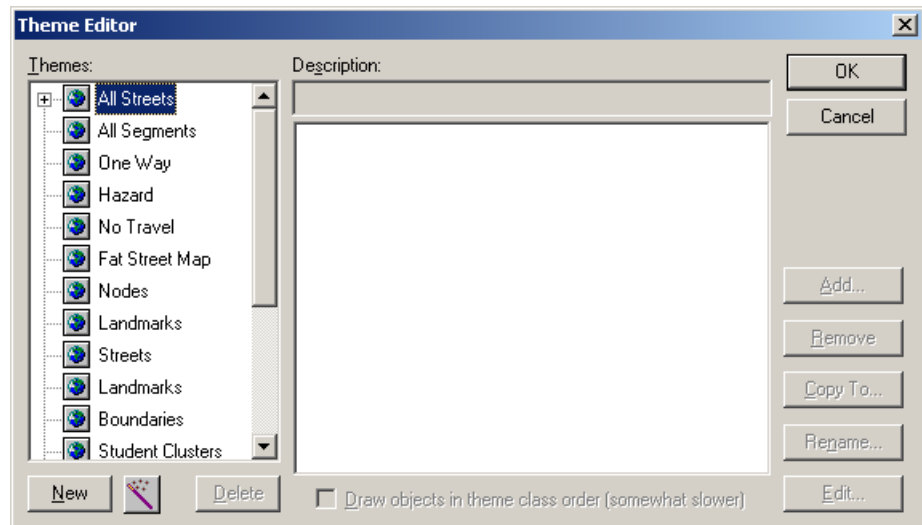
You can remove a theme class by selecting it from the list box and choosing Remove. You can rename a theme class by selecting it from the list box and choosing Rename. This may be useful when using a theme to create a plot. The name appears in the theme legend instead of the expression.

When you are finished working with themes, choose OK to close the Theme Editor dialog box.

Creating a Theme Manually

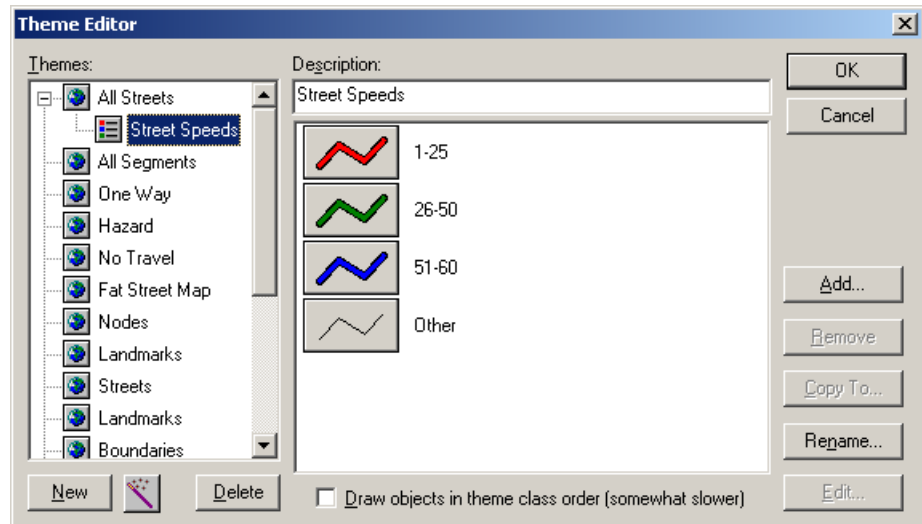


To create a new theme manually, choose Editors from the menu bar, then choose Theme.



The Theme Editor dialog box lists the object classes available for creating a theme. A plus sign next to an object class indicates that one or more themes exist for that group. Select the object class for which you want to create a theme and choose New.

Enter a name for the theme in the Description text box. Choose the Add button to begin entering criteria (theme classes) for the theme. See “Entering Expressions” on page 32 for further information on defining a theme class.



The buttons next to each of the theme's criteria (theme classes) allow you to change the appearance of matching objects. These buttons function like the buttons next to objects in the map legend. See "Changing the Appearance of Objects" on page 13 for further information. The dialog boxes for changing the appearance of objects always include a "Null" check box. You can select that check box if you want to hide objects corresponding to any of the theme's classes.

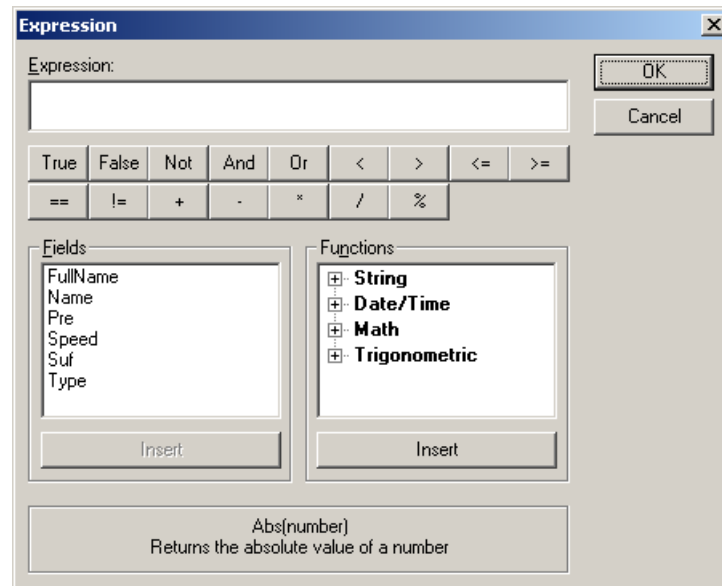
Objects matching each of the theme classes will appear as indicated on the corresponding buttons when the theme is applied. All others will appear as indicated on the button next to "Other." A theme always includes an "Other" theme class at the end of the list to provide a means of displaying objects that do not match any of the theme's criteria.

You can remove a theme class by selecting it from the list box and choosing Remove. You can rename a theme class by selecting it from the list box and choosing Rename. This may be useful when using a theme to create a plot. The name appears in the theme legend instead of the expression.

When you are finished working with themes, choose OK to close the Theme Editor dialog box.

Entering Expressions

You use the Expression dialog box to enter criteria for themes, to create labels for objects on the map, and to select objects for analysis. The following is an illustration of the Expression dialog box that appears when you are performing these tasks.



The list box on the left contains the fields available for the type of objects you are working with. To enter an expression, double-click a field name in the list (see Grade in the illustration), or select it and choose Insert to add the field name to the Expression text box.

When you are creating labels for objects, you typically only need to select the field or fields you want to appear in the label (such as student first and last name). You may also want to add text to the label (such as “Student name: ”). To do so, click the position in the Expression text box where you want the text to appear, then type the text surrounded by quotation marks. (If you are creating a label, skip the next two paragraphs.)

Choose an operator (such as equal to, greater than, or less than) by choosing the appropriate button beneath the Expression text box (such as == for equals, > for greater than, or < for less than) or by clicking the Expression text box and typing the operator or function. You can also select from the Functions list if you want to define a more complex expression. Click the plus sign next to String, Date/Time, Math, or Trigonometric to display the desired category of functions, then select the desired function from the list. When you select a function, a description appears at the bottom of the dialog box. You can double-click the function name to add it to the expression or select the function and choose the Insert button beneath this list.

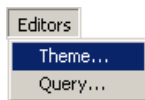
Enter a value in the Expression text box for comparison. If you want to enter a string of text for comparison, make sure to type quotation marks around the text. You can enter a combination of criteria in the expression by inserting a connector between them (such as Grade == 06 And School == 100). If you choose the And connector, the object must match both criteria to be included

in the theme or the object selection. If you choose Or, the object must match either criteria. You can use the buttons under the Expression text box to enter connectors.

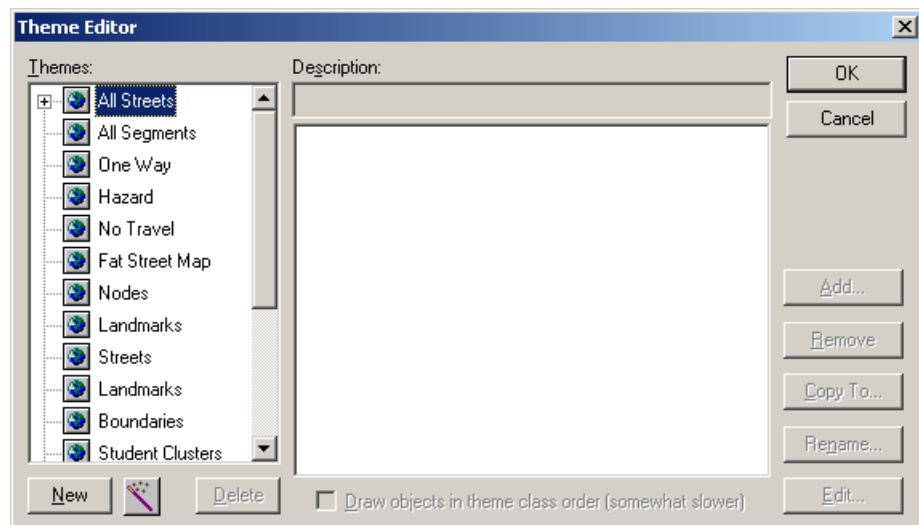
Choose OK when finished. When you are defining a theme or selecting objects using expressions, the expressions need only evaluate to True or False. For example, if you enter the expression `Grade = 06 And School = 100`, the system will evaluate the expression for each student to either True (the student will be included in the theme class or object selection) or False (the student will not be included).

The Expression dialog box provides a wide variety of mathematical functions which allow you to define as complex or as simple a set of criteria as you want. Gismo's expression language is fully algebraic, meaning the operands (the things you're comparing) can be complex expressions themselves, parenthetical expressions, functions from the list box, arithmetic operations (sums, differences, products), and so on. If you can imagine the formula, you can construct an expression to implement it, but you may also be able to achieve the desired results using a simpler approach.

Modifying a Theme

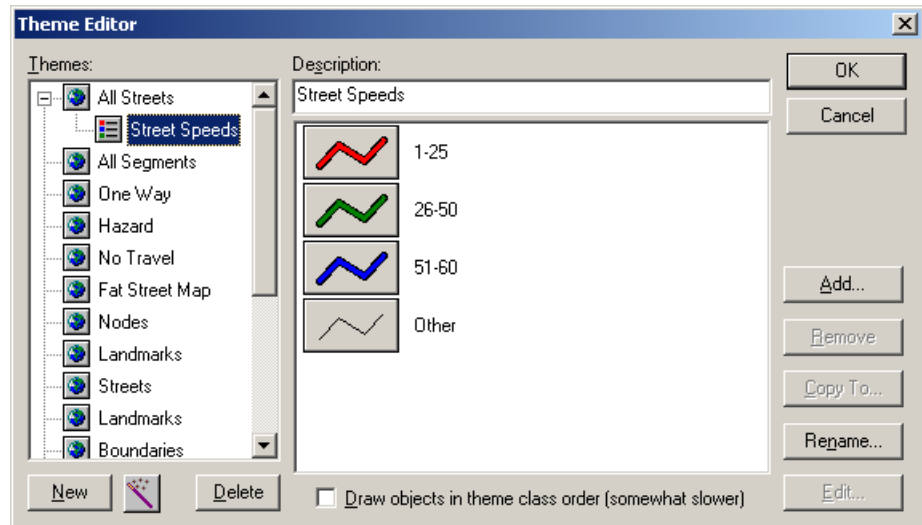


After you have created a theme, you can use the Theme Editor to modify it if you wish. To modify a theme, choose Editors from the menu bar, then choose Theme.



The Theme Editor dialog box lists the available object classes. A plus sign next to an object class indicates that one or more themes exist for that group.

Double-click the object class name with the theme you want to modify, then select the desired theme.



The Theme Editor displays the theme’s description, which you can modify if you wish, and a list of the theme classes that define the theme. The button next to each theme class allows you to change the appearance of objects matching that criteria. These buttons function like the buttons in the map legend. See “Changing the Appearance of Objects” on page 13 for further information.

When you apply the theme, objects matching each of the theme classes will appear as indicated on the corresponding button. All others will appear as indicated on the button next to “Other.” A theme always includes an “Other” theme class at the end of the list to provide a means of displaying objects that do not match any of the theme’s criteria.

The dialog boxes for changing the appearance of objects always include a “Null” check box. You can click the button for a theme class and select the Null check box if you want to hide objects corresponding to any of the theme’s classes.

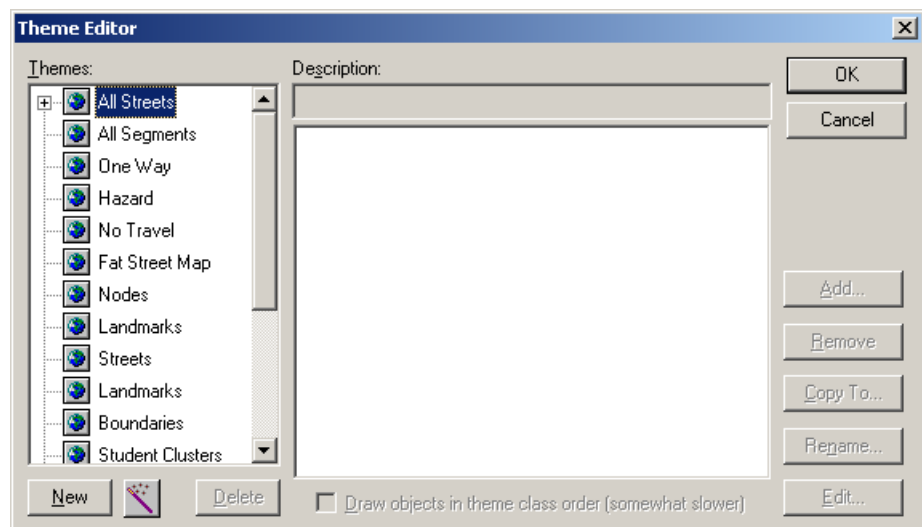
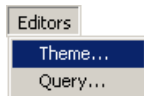
To add a theme class, choose the Add button. See “Entering Expressions” on page 32 for information on defining the criteria. To modify a theme class, select it from the list box (make sure to click the text and not the button next to the theme class), then choose the Edit button. To remove a theme class, select it from the list box and choose Remove. You can rename a theme class by selecting it from the list box and choosing Rename. This can be helpful when using a theme to create a plot. The name appears in the theme legend instead of the expression.

When you are finished, choose OK from the Theme Editor dialog box to save your changes. You can also modify a theme after you apply it to objects on the map (see “Applying a Theme to Objects on the Map” on page 36). The button for the object class in the map legend changes to indicate that it has a theme applied. You can click this button to open the Theme Editor dialog box and modify the theme.



Deleting a Theme

To delete a theme, choose Editors from the menu bar, then choose Theme.



In the Theme Editor dialog box, a plus sign next to an object class indicates that it has one or more themes. Click the plus sign next to the object class with the theme you want to delete (or double-click the object class name), then select the desired theme. Choose Delete.

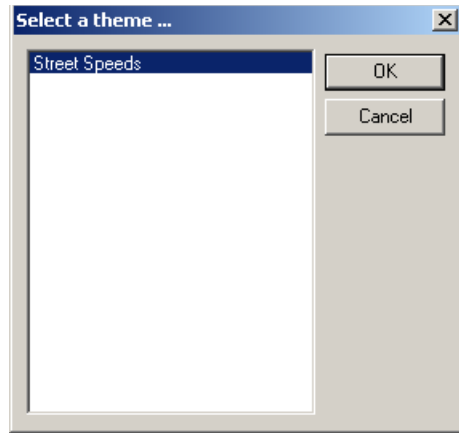
Choose OK when finished to close the Theme Editor dialog box.

Applying a Theme to Objects on the Map

To apply a theme to objects on the regular map or the reference map, click the Map Legend or Reference Map Legend tab (depending on where you want to apply the theme) under the legend pane.



Point to the button representing the object class (such as Students) to which you want to apply the theme and click the right mouse button. Select Apply Theme from the pop-up menu.

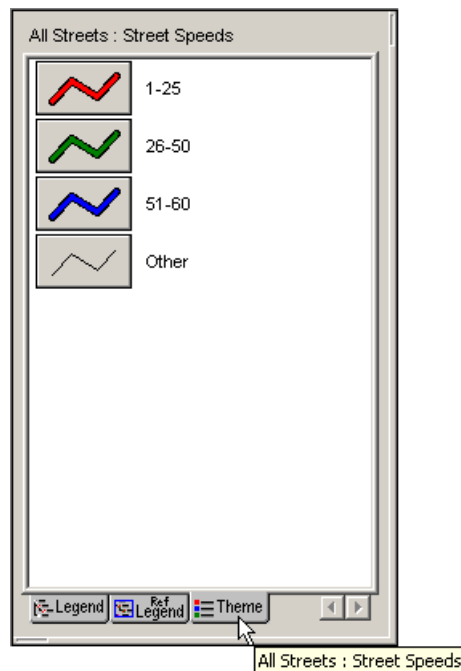


Select the theme you want to apply and choose OK. Objects matching each of the theme's classes appear as indicated on the buttons in the Theme Editor when you created or last modified the theme.



Notice that the object class button in the map legend has changed its appearance to indicate that it has a theme applied. You can click this button to open the Theme Editor dialog box and modify the theme (see "Modifying a Theme" on page 34).

Also, a new Theme tab appears under the legend pane. If you click this tab, the theme legend appears.



You can use the buttons in this legend to change the appearance of objects matching each theme class. If you want to hide objects matching any of the theme classes, you can select the Null check box in the dialog box. See “Changing the Appearance of Objects” on page 13 for further information.

You can also apply themes by choosing Apply Themes from the Display menu. Select the desired theme and choose Apply. Choose Close when finished. Keep in mind that themes do not store any actual data. They contain a set of criteria and record the appearance of objects matching those criteria.

Removing a Theme from Objects on the Map



To remove a theme from displayed objects, point to the button in the map legend that corresponds to the object class with the theme applied and click the right mouse button. Choose Remove Theme from the pop-up menu. Gismo removes the theme from the object class.

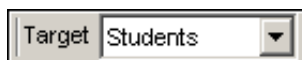
You can also remove themes by choosing Apply Themes from the Display menu. Select the applied theme and choose Remove. Choose Close when finished.

SELECTING OBJECTS ON THE MAP

Before you analyze your data, perform tallies, or modify objects on the map, you need to select the objects that you want to work with. You have three ways to select objects. You can:

- use the mouse to select objects on the map display (such as all students inside a rectangle you draw)
- select objects by entering expressions (such as student Grade = 06)
- select objects using other objects (such as all students inside a boundary).

Selecting Objects Using the Mouse



To select objects on the map with the mouse, first display the objects on the regular map. Click the Target field and select the type of objects you want to include in the selection. This tells Gismo what you want to select on the map display (such as when you want to select students but not boundaries at a location).



Gismo automatically activates the Select tool in the Selection toolbar. (You can also enter Select mode by choosing Select from the menu bar, then choosing Objects.)

Gismo stores a subset of selected objects (simply called “the Selection”) for each object class. The Select tool provides a “point-and-click” way to select those objects using the mouse.



Click the arrow next to the Via text box in the Selection toolbar (or choose Select from the menu bar, and choose Via), then select the desired option: Point, Line, Rectangle, Polygon, or Circle.

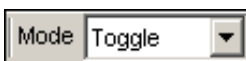
Point allows you to select individual items by pointing and clicking them with the mouse. Gismo selects the object closest to the location you click.

Line allows you to select items by drawing a line (or a series of connected lines) through them with the mouse. Point to one end of the line, click the mouse, then point to the other end and click the mouse again. You can continue to define lines in this manner. When finished, click the right mouse button. Gismo selects only those objects that touche the line.

Rectangle allows you to select items by drawing a rectangle around them (just as when zooming via rectangle). Point to one corner of the area, then hold down the mouse button and drag the pointer to the opposite corner and release the button. Gismo selects only those objects that are entirely included in the rectangle. If you draw a rectangle around only a portion of a boundary, for example, it will not be selected.

Polygon allows you to select items by drawing a polygon around them. Point and click to define the first point of the polygon’s perimeter. A line segment extends from the point to help you envision the area you are defining. Continue to click points to define the perimeter. When you are finished, click the right mouse button to close the polygon. Gismo selects only those objects that are entirely included in the polygon.

Circle allows you to select items by drawing a circle around them. Point to the center of the circle on the map. Hold down the mouse button and drag the pointer until the circle is at the desired location, then release the mouse button. Gismo selects only those objects that are entirely included in the circle.



The selection *mode* indicates how the newly selected objects are combined with any objects that are already selected. To change the selection mode, click the Mode field and select the desired mode: Add, Remove, Toggle, or Replace (or choose Select from the menu bar, choose Mode, then select the desired mode). Toggle is the default selection mode.

- Add** adds the objects you select to the current selection.
- Remove** removes the objects you select from the current selection.
- Replace** replaces the objects in the current selection with your new selection.
- Toggle** selects objects not currently selected and deselects any objects that you have already selected.

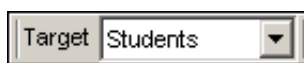
The selection mode applies to “point-and-click” selections as well as to selections made using expressions or other objects. You can easily manipulate the selection in any way you like. If you want to deselect all objects and start over, choose the Clear Selection tool in the Selection toolbar or choose Select from the menu bar and choose Clear.



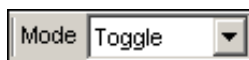
Use the mouse to select the objects on the map according to the options you chose. As you select items, you may want to add objects to the selection, remove objects, replace the current selection with other objects, or toggle the current selection status of the objects. You can select the desired “point-and-click” method, select the desired mode, then select the desired objects on the map.

Selecting Objects Using Expressions

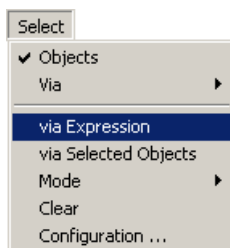
In addition to selecting objects with the mouse, you can also select them using expressions. Gismo has access to field information (such as student grades, street speeds, and so on) which allows you to select objects that match the expressions you enter, such as all students in grade 06.



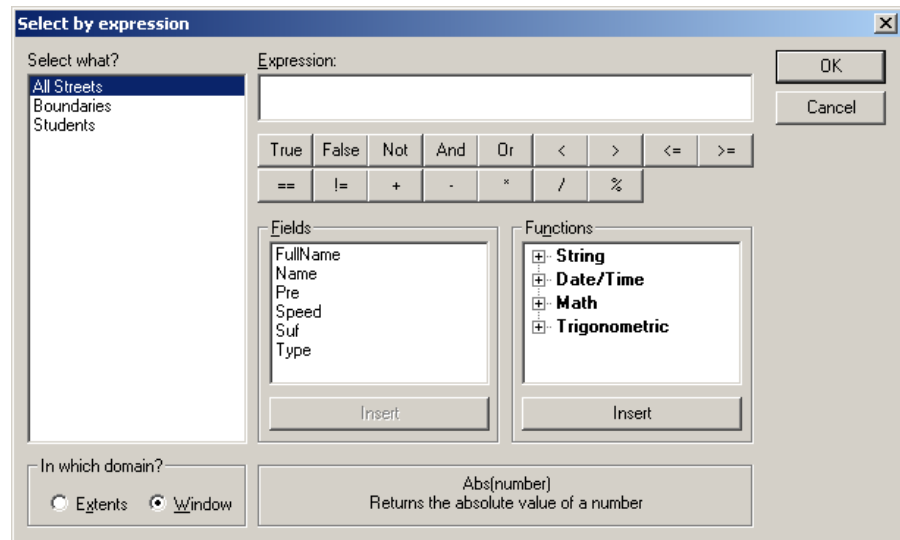
To select objects via expression, first display the objects you want to select. Click the Target field and select the type of objects you want to include in the selection.



If you want to change the selection mode, click the Mode field and select the desired mode: Add, Remove, Toggle, or Replace (or choose Select from the menu bar, choose Mode, then select the desired mode). See page 40 for further information.



Choose Select from the menu bar, then choose Via Expression.

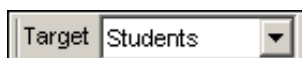


See “Entering Expressions” on page 32 for information on entering the expression you want to use. Under In Which Domain in the lower-left corner of the dialog box, select Window if you want to select only matching objects in the current map view or select Extents if you want the matching objects in the entire map area. Choose OK to have Gismo select the objects that match the expression.

Selecting Objects Using Other Objects

In addition to selecting objects using the mouse and with expressions, you can also select objects using other objects. For example, you can use a boundary to select students inside the boundary.

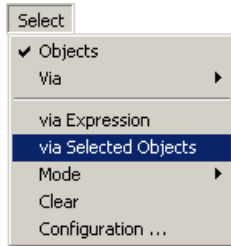
If you use point objects (such as students) to make selections, it’s as if you selected the objects by pointing and clicking those locations. If you use line objects (such as streets), it’s as if you had drawn a line through them. If you use polygon objects (such as boundaries), it’s as if you had drawn a polygon around them. You can use multiple objects (and multiple object classes for that matter) to select other objects.



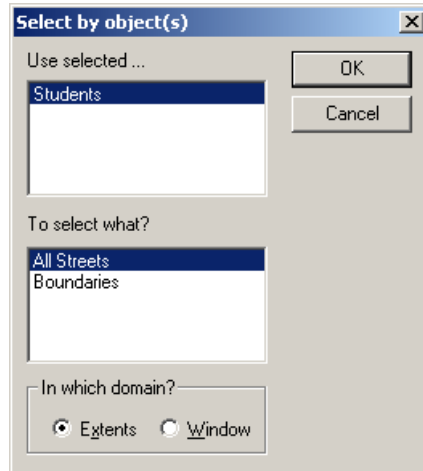
To select objects using other objects, first display all the necessary objects on the map. Click the Target field and select the type of objects you want to use to select the other objects (such as the boundaries you want to use). Select those objects (boundaries in our example) using the mouse or via expression (see “Selecting Objects Using the Mouse” on page 38 or “Selecting Objects Using Expressions” on page 40).



If you want to change the selection mode, click the Mode field and select the desired mode: Add, Remove, Toggle, or Replace (or choose Select from the menu bar, choose Mode, then select the desired mode). See page 40 for further information.



Choose Select from the menu bar, then choose Via Selected Objects.

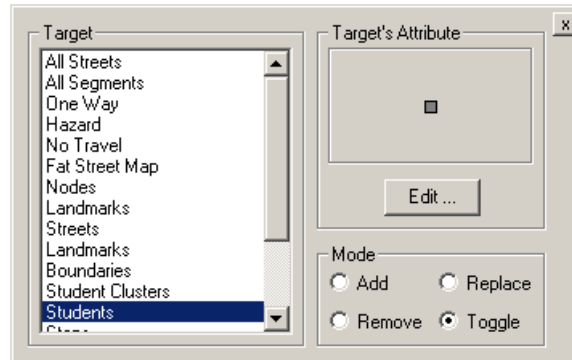


Under Use Selected, select the type of objects you want to use to select the other objects. Under To Select What, select the type of objects you want to select. Under In Which Domain at the bottom of the dialog box, select Window if you want to select only matching objects in the current map view or select Extents if you want to select matching objects in the entire map area. Choose OK to have Gismo include or exclude the appropriate objects according to your choices.

Changing the Appearance of Selected Objects



If you want to change the appearance of selected objects, you can choose the Select Config arrow in the Selection toolbar, or choose Select from the menu bar, then choose Configuration.



Under Target, select the class of objects whose appearance you want to modify, then choose the Edit button. See “Changing the Appearance of Objects” on page 13 for further information. You can also use the label feature to identify the objects you select. Click the Label tab and define a label for the objects (see “Labeling Objects” on page 14). Click the Close tool in the (upper-right corner of the dialog box) when finished to close the dialog box. Now when you select objects on the map, the label appears next to those objects, just as when using the ID Address feature.

VIEWING AN ANALYSIS WINDOW

Gismo provides a wide range of features for analyzing your data. After you display data on the map, you select the objects you want to analyze (see “Selecting Objects on the Map” on page 38 for further information). You then send that data to the Analysis window (like a spreadsheet), where you can use queries to analyze your data and produce reports.



To view an analysis window, first select the objects you want to analyze (see page 38). Choose the Analysis Window tool (or choose Analysis from the menu bar, then choose Window).

GISMO BOUNDARY PLANNING
USING GISMO

The screenshot shows the GISMO software interface with the Analysis window open. The window displays a spreadsheet with columns for Street, Full Street Name, Prefix, Name, Type, Suffix, Zone, SegmentID, Left From, Left To, Right From, Right To, Left Speed, and Right Speed. The data includes various street names like IONA CT N, 45IONA LN W, CTY RD C2 W, CHRISTOPHER LN, HIGH CT, HIGHPOINTE CV, HILLSCOURT S, HILLSCOURTE N, OWASSO HILL DR, CHURCHILL ST, CHURCHILL ST N, INGERSON RD W, LEXINGTON AV, and OWASSO ST.

Street	Full Street Name	Prefix	Name	Type	Suffix	Zone	SegmentID	Left From	Left To	Right From	Right To	Left Speed	Right Speed
1	IONA CT N		IONA	CT	N		50334696	2761	2781	2760	2780	20	
2	45IONA LN W	45	IONA	LN	W		50334699	236	266	237	265	20	
3	45IONA LN W	45	IONA	LN	W		50334700	268	298	267	297	20	
4	45IONA LN W	45	IONA	LN	W		50334701	300	328	299	329	20	
5	45IONA LN W	45	IONA	LN	W		50334702	330	356	331	357	20	
6	45IONA LN W	45	IONA	LN	W		50334703	358	384	359	385	20	
7	IONA LN		IONA	LN			50334697	30	100	31	101	20	
8	45IONA LN W	45	IONA	LN	W		50334698	204	234	205	235	20	
9	CTY RD C2 W		CTY RD C2		W		50333060	1014	1038	1015	1037	20	
10	CTY RD C2 W		CTY RD C2		W		50333061	1040	1074	1039	1073	20	
11	CTY RD C2 W		CTY RD C2		W		50333062	1076	1104	1075	1105	20	
12	CTY RD C2 W		CTY RD C2		W		50333063	1106	1120	1107	1121	20	
13	CHRISTOPHER LN		CHRISTOP	LN			50332514	3121	3199	3120	3198	20	
14	CTY RD C2 W		CTY RD C2		W		50333058	886	986	885	985	20	
15	CTY RD C2 W		CTY RD C2		W		50333059	988	1012	987	1013	20	
16	CTY RD C2 W		CTY RD C2		W		50333056	324	352	325	353	20	
17	CTY RD C2 W		CTY RD C2		W		50333057	354	370	355	371	20	
18	HIGH CT		HIGH	CT			50334149	2941	2999	2940	2998	20	
19	HIGHPOINTE CV		HIGHPOINT	CV			50334151	2971	2999	2970	2998	20	
20	HIGHPOINTE CV		HIGHPOINT	CV			50334152	3001	3099	3000	3098	20	
21	HILLSCOURT S		HILLSCOU		S		50334156	2801	2845	2800	2844	20	
22	HILLSCOURTE N		HILLSCOU		N		50334157	472	506	471	505	20	
23	OWASSO HILL DR		OWASSO HI	DR			50336060	0	0	0	0	20	
24	OWASSO HILL DR		OWASSO HI	DR			50336061	410	446	411	447	20	
25	OWASSO HILL DR		OWASSO HI	DR			50336062	448	458	449	459	20	
26	OWASSO HILL DR		OWASSO HI	DR			50336063	468	508	469	509	20	
27	CHURCHILL ST		CHURCHIL	ST			50332524	3411	3431	3410	3434	20	
28	CHURCHILL ST		CHURCHIL	ST			50332525	3433	3475	3436	3476	20	
29	CHURCHILL ST N		CHURCHIL	ST	N		50332526	1037	1039	1043	1045	20	
30	INGERSON RD W		INGERSON	RD	W		50334694	970	1064	969	1063	20	
31	INGERSON RD W		INGERSON	RD	W		50334695	1066	1096	1065	1095	20	
32	LEXINGTON AV		LEXINGTO	AV			50335232	3481	3599	3480	3598	20	
33	OWASSO ST		OWASSO	ST			50336050	3371	3499	3370	3498	20	

At the bottom of the Analysis window, select the tab corresponding to the type of data you want to examine (see the “Students” tab in the illustration). The Analysis window displays the fields of information for the selected objects in a spreadsheet format. Since you can include more than one type of object in the selection, you need to select the tab corresponding to the type of objects you want to view in the Analysis window. If you selected different classes of objects, you can examine any of the different data types in the same Analysis window by selecting the appropriate tab. You can use the scroll arrows to the left of the tabs to see any tabs outside the current view.

You can adjust the width of the columns by dragging the dividing lines between the column headings, adjust the thickness of rows by dragging the dividing line between row labels, and view columns or rows that do not fit in the window using the scroll bars.

After you send information to the Analysis window, you can switch back and forth between the map display and the Analysis window either by pressing CTRL + TAB on your keyboard or by choosing Window from the menu bar, then choosing either the Map or the Analysis window. If you tile windows in the application, you can click anywhere on a window to make it active.

When you select a row in the Analysis window (by clicking the line number at the beginning of the row), the corresponding object is highlighted on the map. You can hold down the mouse button and drag the pointer down the column

of line numbers to select multiple rows in the query and highlight those objects on the map. This allows you to correlate the data in the analysis window with the data displayed on the map.

You can change the records included in the analysis window simply by changing which objects are selected (see “Selecting Objects on the Map” on page 38). After you change the object selection, return to the analysis window. If the Refresh tool in the Analysis toolbar is selected, the window will automatically include the objects in the new selection.



The Refresh tool is a toggle switch. If it is selected (the button appears pressed down), the window will automatically refresh when you change the selection. We refer to this as the *dynamic* mode. Any changes made to the object selection are immediately reflected in the analysis window. If the button is turned off, the window is in snapshot mode and shows the objects in the selection when the Analysis window was last refreshed. If you change the object selection, the records in the analysis window will not be refreshed until you select the Refresh tool. This allows you to delay the refresh and keep the current analysis while changing the object selection. You can then double-click the Refresh tool to refresh the analysis window and return to snapshot mode. The Refresh command is also available in the Analysis menu (choose Analysis from the menu bar then choose Refresh).

You can change which fields of information are included in the analysis window (these fields correspond to the column headings in the Analysis window), change the order in which records are sorted, and select from a variety of other layout options using the Query functions. Choose the Query tool in the Analysis toolbar or choose Analysis from the menu bar, then choose Edit Query. See the following sections for further information on using queries.



You can choose the Include Unattached tool in the Analysis toolbar if you want to include geographic objects (such as boundaries you have created) that are not yet attached to the actual data provided by the geosource (the *master* data).



When you want to close the Analysis window, click the Close tool (labeled with an “X”) in the upper-right corner of the window.

Using Queries and Producing Reports

After you select a group of objects and send them to the analysis window, you can use queries to modify the layout of the analysis window and change which fields of information are listed for objects. (You filter which objects are included in the query by changing the object selection.) After you have set up the query, you can send the information in the analysis window to the printer and create reports.



To modify the information and layout in the analysis window, first select the objects you want to analyze (see “Selecting Objects on the Map” on page 38). Choose the Analysis Window tool or choose Analysis from the menu bar, then choose Window.

Gismo - [Map1 : Analysis]

File Edit View Editors Analysis Window Help

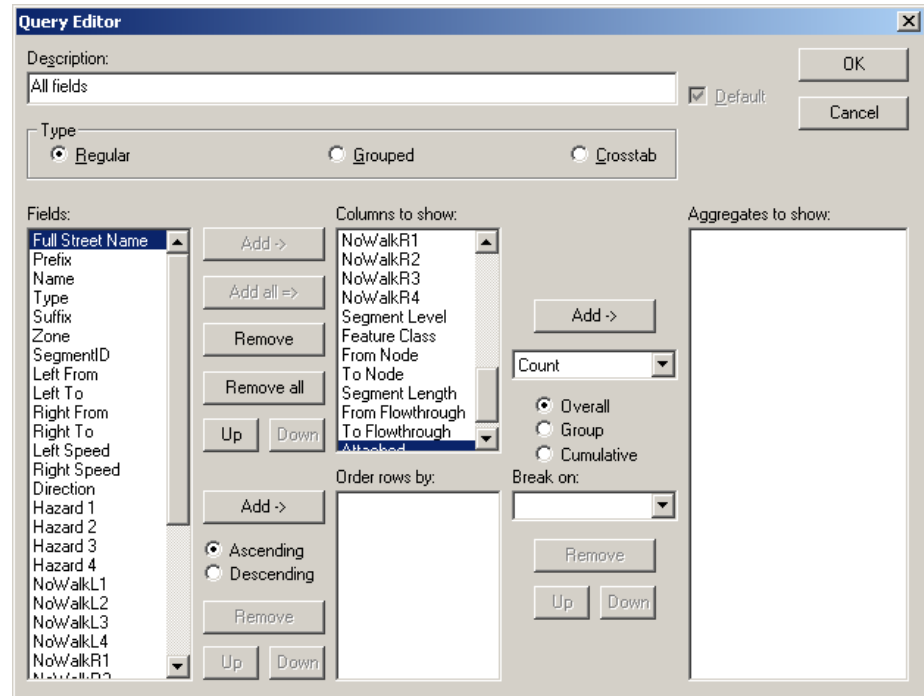
Miles 2.7790 Target Streets Vis Polygon

Street	Full Street Name	Prefix	Name	Type	Suffix	Zone	SegmentID	Left From	Left To	Right From	Right To	Left Speed	Right Sp
1	IONA CT N		IONA	CT	N		50334696	2761	2781	2760	2780	20	
2	45IONA LN W	45	IONA	LN	W		50334699	236	266	237	265	20	
3	45IONA LN W	45	IONA	LN	W		50334700	268	298	267	297	20	
4	45IONA LN W	45	IONA	LN	W		50334701	300	328	299	329	20	
5	45IONA LN W	45	IONA	LN	W		50334702	330	356	331	357	20	
6	45IONA LN W	45	IONA	LN	W		50334703	358	384	359	385	20	
7	IONA LN		IONA	LN			50334697	30	100	31	101	20	
8	45IONA LN W	45	IONA	LN	W		50334698	204	234	205	235	20	
9	CTY RD C2 W		CTY RD C2		W		50333060	1014	1038	1015	1037	20	
10	CTY RD C2 W		CTY RD C2		W		50333061	1040	1074	1039	1073	20	
11	CTY RD C2 W		CTY RD C2		W		50333062	1076	1104	1075	1105	20	
12	CTY RD C2 W		CTY RD C2		W		50333063	1106	1120	1107	1121	20	
13	CHRISTOPHER LN		CHRISTOP	LN			50332514	3121	3199	3120	3198	20	
14	CTY RD C2 W		CTY RD C2		W		50333058	886	986	885	985	20	
15	CTY RD C2 W		CTY RD C2		W		50333059	988	1012	987	1013	20	
16	CTY RD C2 W		CTY RD C2		W		50333056	324	352	325	353	20	
17	CTY RD C2 W		CTY RD C2		W		50333057	354	370	355	371	20	
18	HIGH CT		HIGH	CT			50334149	2941	2999	2940	2998	20	
19	HIGHPOINTE CV		HIGHPOINT	CV			50334151	2971	2999	2970	2998	20	
20	HIGHPOINTE CV		HIGHPOINT	CV			50334152	3001	3099	3000	3098	20	
21	HILLSCOURT S		HILLSCO		S		50334156	2801	2845	2800	2844	20	
22	HILLSCOURTE N		HILLSCO		N		50334157	472	506	471	505	20	
23	OWASSO HILL DR		OWASSO HI	DR			50336060	0	0	0	0	20	
24	OWASSO HILL DR		OWASSO HI	DR			50336061	410	446	411	447	20	
25	OWASSO HILL DR		OWASSO HI	DR			50336062	448	458	449	459	20	
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27	CHURCHILL ST		CHURCHIL	ST			50332524	3411	3431	3410	3434	20	
28	CHURCHILL ST		CHURCHIL	ST			50332525	3433	3475	3436	3476	20	
29	CHURCHILL ST N		CHURCHIL	ST	N		50332526	1037	1039	1043	1045	20	
30	INGERSON RD W		INGERSON	RD	W		50334694	970	1064	969	1063	20	
31	INGERSON RD W		INGERSON	RD	W		50334695	1066	1096	1065	1095	20	
32	LEXINGTON AV		LEXINGTO	AV			50335232	3481	3599	3480	3598	20	
33	OWASSO ST		OWASSO	ST			50336050	3371	3499	3370	3498	20	

Ready



At the bottom of the Analysis window, select the tab corresponding to the type of data you want to examine. Choose the Query tool (or right-click on the Analysis window and choose Edit Query from the displayed menu).



Enter or modify the text in the Description field if you want to change the query’s name. Under Type, select the type of query layout you want to view. The options for defining the query vary according to the type of query you are creating. (The fields vary according to the type of objects you are examining.) See “Examining Regular Queries” on page 54, “Examining Group Queries” on page 56, or “Examining Cross-tab Queries” on page 58 for information on completing the dialog box for the type of query you want to define. We recommend you experiment with the three query types to become accustomed to the different features that are available. Once you are familiar with the various options, you will be able to quickly and easily achieve the desired results.

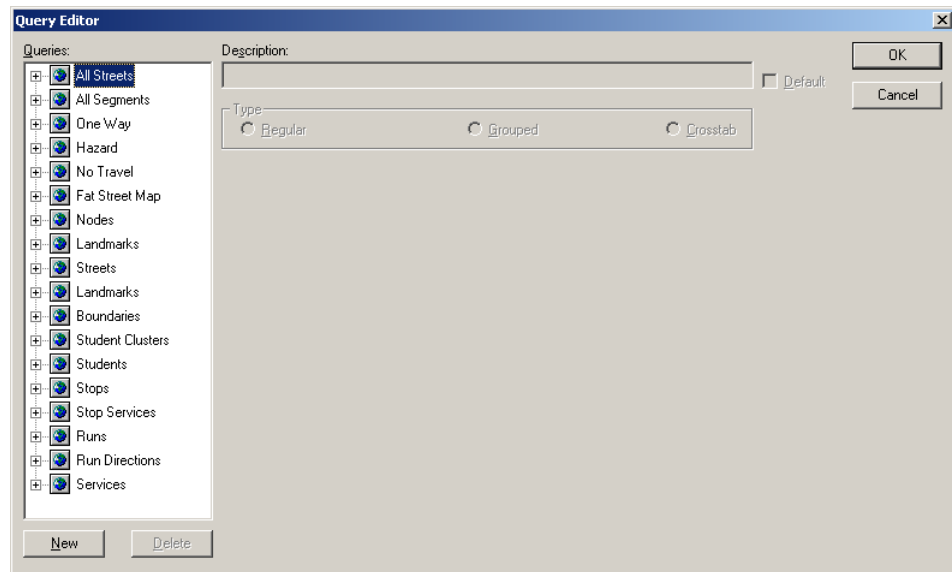
Choose OK when you are finished to save your changes and apply the query to the data in the analysis window. Keep in mind that queries do not store any actual data. They contain your layout, sorting, and summary choices which you can apply to the information in the analysis window.

Creating a New Query

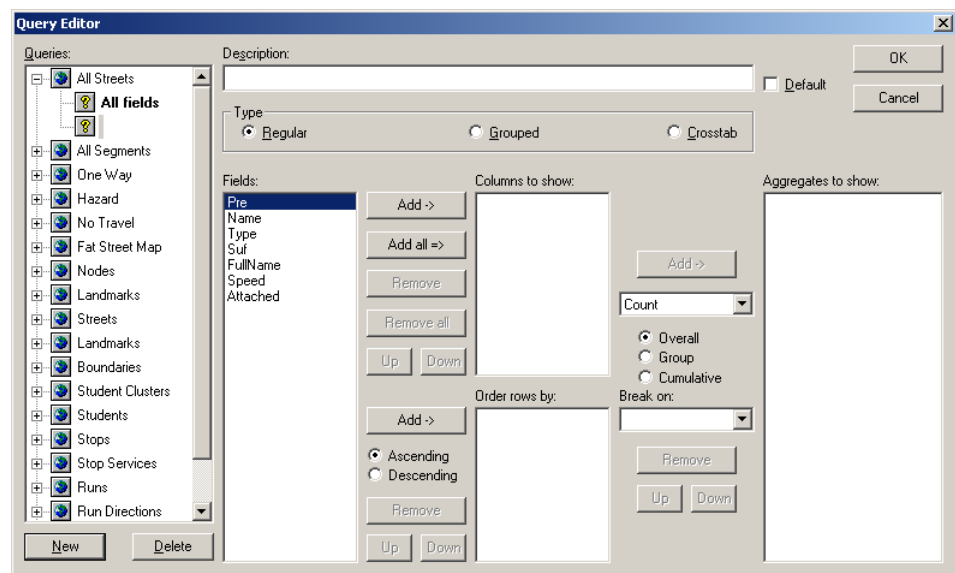
To create a new query, choose Editors from the menu bar, then choose Query.



GISMO BOUNDARY PLANNING
USING GISMO



Select the object class for the type of query you want to create from the list on the left side of the dialog box. Choose New.



Enter a title for the query in Description text box. The description appears under the object class heading as you type. Under Type, select the type of query layout you want to create. The options for defining the query vary according to the type of query you are creating. (The fields vary according to

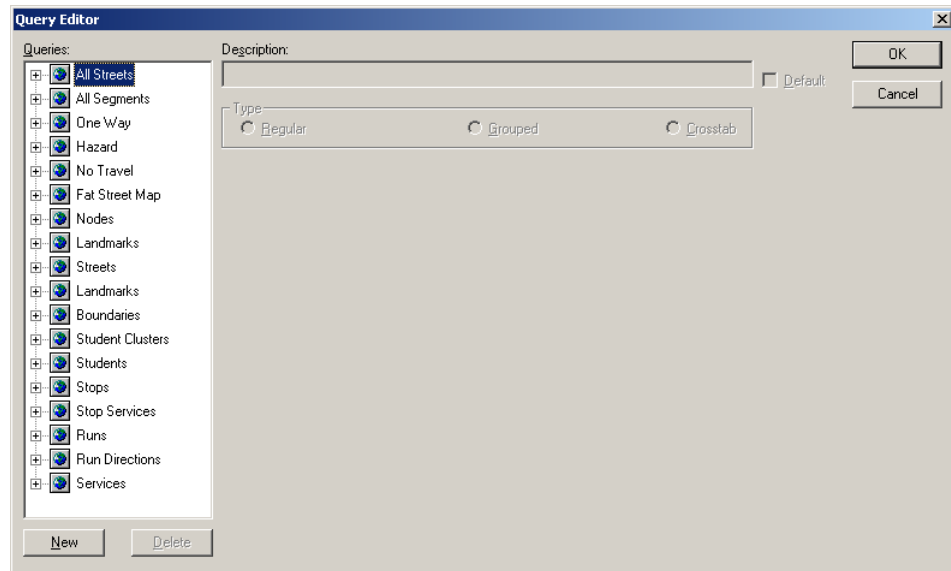
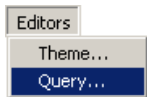
the object class.) See “Examining Regular Queries” on page 54, “Examining Group Queries” on page 56, or “Examining Cross-tab Queries” on page 58 for information on completing the dialog box for the type of query you want to define.

Choose OK when you are finished defining the query. See “Applying a Query” on page 50 for information on using a query to modify the layout and field choices in an Analysis window. If you want to modify a query already applied to an Analysis window, you can choose the Query tool (or right-click on the analysis window and choose Edit Query from the pop-up menu). Queries do not store any actual data. They contain your layout, sorting, and summary choices which you can apply to the information in the analysis window.



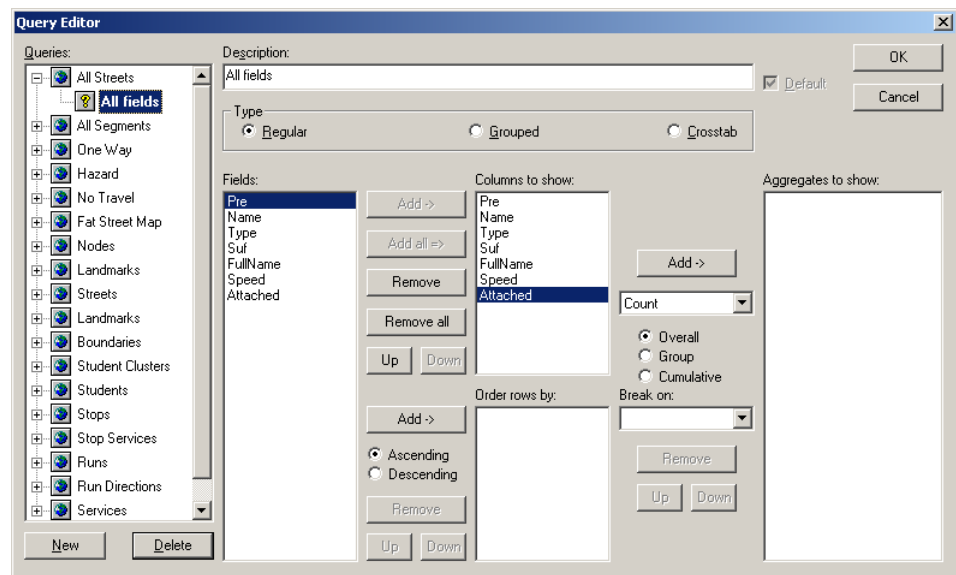
Modifying a Query

To modify an existing query, choose Editors from the menu bar, then choose Query.



The Query Editor dialog box lists the object classes available for creating or modifying queries. A plus sign next to an object class indicates that one or more queries exist for that group. Click the plus sign next to the object class with the query you want to modify or double-click the object class name to expand the list. Select the query you want to modify.

Options appear for modifying the query, similar to the following.



Modify the text in the Description field if you want to change the query's name. Under Type, select the type of query layout you want to view.

The options for defining the query vary according to the type of query you are creating. (The fields vary according to the object class.) See “Examining Regular Queries” on page 54, “Examining Group Queries” on page 56, or “Examining Cross-tab Queries” on page 58 for information on completing the dialog box for the type of query you want to create.

Choose OK when you are finished defining the query. See “Applying a Query” on page 50 for information on using a query to modify the layout and field choices in an analysis window. If you want to modify a query already applied to an Analysis window, you can choose the Query tool (or right-click on the analysis window and choose Edit Query from the pop-up menu).



Applying a Query

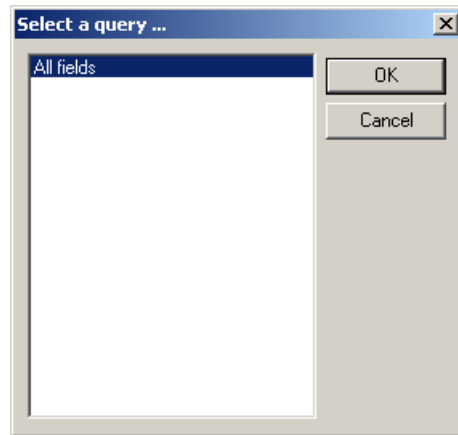
After you have created or modified a query using the Query Editor, you can use that query to modify the layout and field choices in an Analysis window. To apply a query, first select the objects you want to analyze (see “Selecting Objects on the Map” on page 38). Choose the Analysis Window tool or choose Analysis from the menu bar, then choose Window.



GISMO BOUNDARY PLANNING
VIEWING AN ANALYSIS WINDOW

Street	Full Street Name	Prefix	Name	Type	Suffix	Zone	SegmentID	Left From	Left To	Right From	Right To	Left Speed	Right Sp
1	IONA CT N		IONA	CT	N		50334696	2761	2781	2760	2780	20	20
2	45IONA LN W	45	IONA	LN	W		50334699	236	266	237	265	20	20
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5	45IONA LN W	45	IONA	LN	W		50334702	330	356	331	357	20	20
6	45IONA LN W	45	IONA	LN	W		50334703	358	384	359	385	20	20
7	IONA LN		IONA	LN			50334697	30	100	31	101	20	20
8	45IONA LN W	45	IONA	LN	W		50334698	204	234	205	235	20	20
9	CTY RD C2 W		CTY RD C2		W		50333060	1014	1038	1015	1037	20	20
10	CTY RD C2 W		CTY RD C2		W		50333061	1040	1074	1039	1073	20	20
11	CTY RD C2 W		CTY RD C2		W		50333062	1076	1104	1075	1105	20	20
12	CTY RD C2 W		CTY RD C2		W		50333063	1106	1120	1107	1121	20	20
13	CHRISTOPHER LN		CHRISTOP	LN			50332514	3121	3199	3120	3198	20	20
14	CTY RD C2 W		CTY RD C2		W		50333058	886	986	885	985	20	20
15	CTY RD C2 W		CTY RD C2		W		50333059	988	1012	987	1013	20	20
16	CTY RD C2 W		CTY RD C2		W		50333056	324	352	325	353	20	20
17	CTY RD C2 W		CTY RD C2		W		50333057	354	370	355	371	20	20
18	HIGH CT		HIGH	CT			50334149	2941	2999	2940	2998	20	20
19	HIGHPOINTE CV		HIGHPOINT	CV			50334151	2971	2999	2970	2998	20	20
20	HIGHPOINTE CV		HIGHPOINT	CV			50334152	3001	3099	3000	3099	20	20
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23	OWASSO HILL DR		OWASSO HI	DR			50336060	0	0	0	0	20	20
24	OWASSO HILL DR		OWASSO HI	DR			50336061	410	446	411	447	20	20
25	OWASSO HILL DR		OWASSO HI	DR			50336062	448	458	449	459	20	20
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27	CHURCHILL ST		CHURCHIL	ST			50332524	3411	3431	3410	3434	20	20
28	CHURCHILL ST		CHURCHIL	ST			50332525	3433	3475	3436	3476	20	20
29	CHURCHILL ST N		CHURCHIL	ST	N		50332526	1037	1039	1043	1045	20	20
30	INGERSON RD W		INGERSON	RD	W		50334694	970	1064	969	1063	20	20
31	INGERSON RD W		INGERSON	RD	W		50334695	1066	1096	1065	1095	20	20
32	LEXINGTON AV		LEXINGTO	AV			50335232	3481	3599	3480	3598	20	20
33	OWASSO ST		OWASSO	ST			50336050	3371	3499	3370	3498	20	20

At the bottom of the Analysis window, select the tab corresponding to the type of data you want to examine. Point to the Analysis window and click the right mouse key, then choose Apply Query from the displayed menu. (You can also choose the Apply tool in the Analysis toolbar, or choose Analysis from the menu bar then choose Apply.)



Select the query you want to apply and choose OK. Gismo applies the query to the data in the Analysis window.

Printing a Report

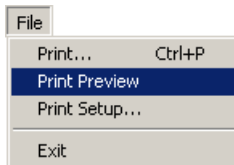
After you set up data in an Analysis window, you can print that information to create a report. First, select the objects you want to analyze (see “Selecting Objects on the Map” on page 38). Choose the Analysis Window tool (or choose Analysis from the menu bar, then choose Window).



Street	Full Street Name	Prefix	Name	Type	Suffix	Zone	SegmentID	Left From	Left To	Right From	Right To	Left Speed	Right Spd
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5	45IONA LN W	45	IONA	LN	W		50334702	330	356	331	357	20	
6	45IONA LN W	45	IONA	LN	W		50334703	358	384	359	385	20	
7	IONA LN		IONA	LN			50334697	30	100	31	101	20	
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11	CTY RD C2 W		CTY RD C2		W		50333062	1076	1104	1075	1105	20	
12	CTY RD C2 W		CTY RD C2		W		50333063	1106	1120	1107	1121	20	
13	CHRISTOPHER LN		CHRISTOP		LN		50332514	3121	3199	3120	3198	20	
14	CTY RD C2 W		CTY RD C2		W		50333058	886	986	885	985	20	
15	CTY RD C2 W		CTY RD C2		W		50333059	988	1012	987	1013	20	
16	CTY RD C2 W		CTY RD C2		W		50333056	324	352	325	353	20	
17	CTY RD C2 W		CTY RD C2		W		50333057	354	370	355	371	20	
18	HIGH CT		HIGH		CT		50334149	2941	2999	2940	2998	20	
19	HIGHPOINTE CV		HIGHPOINT		CV		50334151	2971	2999	2970	2998	20	
20	HIGHPOINTE CV		HIGHPOINT		CV		50334152	3001	3099	3000	3098	20	
21	HILLSCOURT S		HILLSCO		S		50334156	2801	2845	2800	2844	20	
22	HILLSCOURTE N		HILLSCO		N		50334157	472	506	471	505	20	
23	OWASSO HILL DR		OWASSO HI		DR		50336060	0	0	0	0	20	
24	OWASSO HILL DR		OWASSO HI		DR		50336061	410	446	411	447	20	
25	OWASSO HILL DR		OWASSO HI		DR		50336062	448	458	449	459	20	
26	OWASSO HILL DR		OWASSO HI		DR		50336063	468	508	469	509	20	
27	CHURCHILL ST		CHURCHIL		ST		50332524	3411	3431	3410	3434	20	
28	CHURCHILL ST		CHURCHIL		ST		50332525	3433	3475	3436	3476	20	
29	CHURCHILL ST N		CHURCHIL		ST	N	50332526	1037	1039	1043	1045	20	
30	INGERSON RD W		INGERSON		RD	W	50334694	970	1064	969	1063	20	
31	INGERSON RD W		INGERSON		RD	W	50334695	1066	1096	1065	1095	20	
32	LEXINGTON AV		LEXINGTO		AV		50335232	3481	3599	3480	3598	20	
33	OWASSO ST		OWASSO		ST		50336050	3371	3499	3370	3498	20	

At the bottom of the Analysis window, select the tab corresponding to the type of data you want to examine. If necessary, apply the appropriate query to the analysis window (see the previous section for further information).

If you want to examine the pages in the report as they will appear when printed, you can choose Print Preview from the File menu.



Streets

Street	Full StreetName	Post	Name	Type	Sumt	Zone
1	DNA CT N		DNA	CT	N	
2	45DNA LN W	45	DNA	LN	W	
3	45DNA LN W	45	DNA	LN	W	
4	45DNA LN W	45	DNA	LN	W	
5	45DNA LN W	45	DNA	LN	W	
6	45DNA LN W	45	DNA	LN	W	
7	DNA LN		DNA	LN	W	
8	45DNA LN W	45	DNA	LN	W	
9	CTY RD C2W		CTY RDC2		W	
10	CTY RD C2W		CTY RDC2		W	
11	CTY RD C2W		CTY RDC2		W	
12	CTY RD C2W		CTY RDC2		W	
13	CHRISTOPHER LN		CHRISTOP	LN		
14	CTY RD C2W		CTY RDC2		W	
15	CTY RD C2W		CTY RDC2		W	
16	CTY RD C2W		CTY RDC2		W	
17	CTY RD C2W		CTY RDC2		W	
18	HGH CT		HGH	CT		
19	HGH PNT CV		HGH PNT	CV		
20	HGH PNT CV		HGH PNT	CV		
21	HILSCOURTS		HILSCOU		S	
22	HILSCOURTE N		HILSCOU		N	
23	OWASSO HILL DR		OWASSO H	DR		
24	OWASSO HILL DR		OWASSO H	DR		
25	OWASSO HILL DR		OWASSO H	DR		
26	OWASSO HILL DR		OWASSO H	DR		
27	CHURCH LST		CHURCH L	ST		
28	CHURCH LST		CHURCH L	ST		
29	CHURCH LST N		CHURCH L	ST	N	
30	INGERSON RD W		INGERSON	RD	W	
31	INGERSON RD W		INGERSON	RD	W	
32	LEXINGTON AV		LEXINGTO	AV		
33	OWASSO ST		OWASSO	ST		
34	OWASSO ST		OWASSO	ST		
35	OWASSO HEG DR		OWASSO H	DR		
36	OWASSO HEG DR		OWASSO H	DR		
37	OWASSO HEG RD		OWASSO H	RD	N	
38	OWASSO HEG RD		OWASSO H	RD	N	
39	OWASSO HEG RD		OWASSO H	RD	N	
40	OWASSO HEG RD		OWASSO H	RD	N	
41	OWASSO HEG RD		OWASSO H	RD	N	
42	OWASSO LN N	E	OWASSO	LN	N	
43	OWASSO LN N	E	OWASSO	LN	N	
44	VADNARS BLVD W		VADNARS	BLVD	W	
45	KERELS ST		KERELS	ST		
46	VADNARS BLVD E		VADNARS	BLVD	E	
47	VADNARS RD		VADNARS	RD		

07/11/06 1354D4 165

Use the Zoom In and Zoom Out buttons to adjust the view as needed. Choose Close when finished.



Choose the Print tool at the top of the window (or choose Print from the File menu) to display the Print dialog box.

Print [?] [X]

Printer

Name: [Properties...]

Status: Ready

Type: HP LaserJet 5

Where: Documentation

Comment: Documentation - LaserJet 5 Print to file

Print range

All

Pages from: to:

Selection

Copies

Number of copies:

Collate

[1] [2] [3] [1] [2] [3]

[OK] [Cancel]

If you want to send the report to the printer, click the arrow next to the Name text box and select the desired printer. You can choose the Properties button next to this text box to change the page and printer setup. If you want to send the report to a disk file, select the Print to File check box. Under Print Range, indicate which pages of the report you want to print. Under Copies, enter the number of copies you want to print. Choose OK.

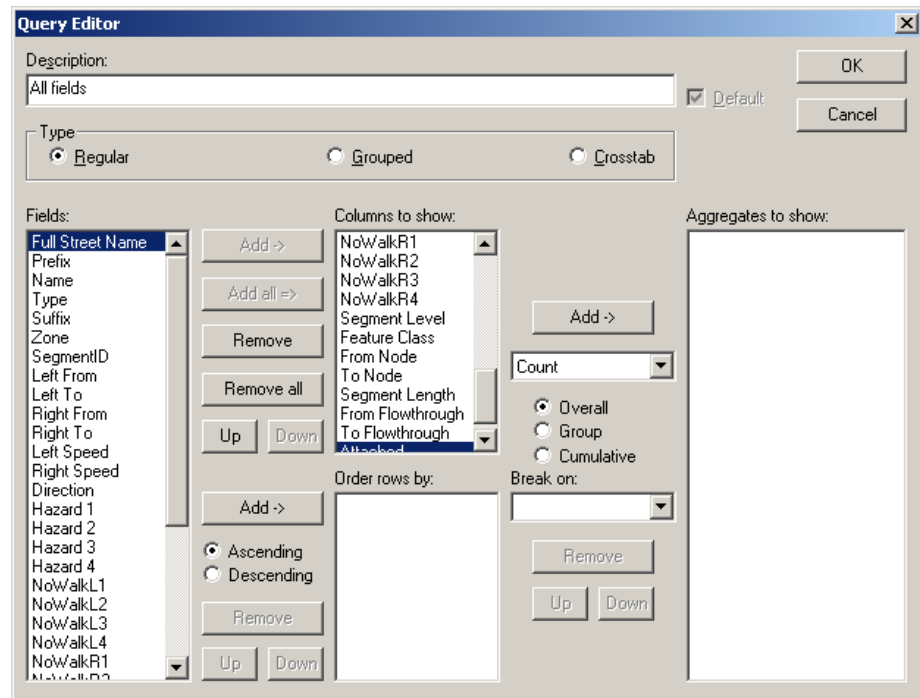
If you sent the report to a file, enter the path and name of the file in the Print to File dialog box, then choose Save. The report is printed or stored in a file according to your selections.

Examining Regular Queries

The Regular query option produces a column layout report, similar to the following.

Street	Full Street Name	Prefix	Name	Type	Suffix	Zone	SegmentID	Left From	Left To	Right From	Right To	Left Speed	Right Speed
1	IONA CT N		IONA	CT	N		50334696	2761	2781	2760	2780	20	
2	45IONA LN W	45	IONA	LN	W		50334699	236	266	237	265	20	
3	45IONA LN W	45	IONA	LN	W		50334700	268	298	267	297	20	
4	45IONA LN W	45	IONA	LN	W		50334701	300	328	299	329	20	
5	45IONA LN W	45	IONA	LN	W		50334702	330	356	331	357	20	
6	45IONA LN W	45	IONA	LN	W		50334703	358	384	359	385	20	
7	IONA LN		IONA	LN			50334697	30	100	31	101	20	
8	45IONA LN W	45	IONA	LN	W		50334698	204	234	205	235	20	
9	CTY RD C2 W		CTY RD C2		W		50333060	1014	1038	1015	1037	20	
10	CTY RD C2 W		CTY RD C2		W		50333061	1040	1074	1039	1073	20	
11	CTY RD C2 W		CTY RD C2		W		50333062	1076	1104	1075	1105	20	
12	CTY RD C2 W		CTY RD C2		W		50333063	1106	1120	1107	1121	20	
13	CHRISTOPHER LN		CHRISTOP	LN			50332514	3121	3199	3120	3198	20	
14	CTY RD C2 W		CTY RD C2		W		50333058	886	986	885	985	20	
15	CTY RD C2 W		CTY RD C2		W		50333059	988	1012	987	1013	20	
16	CTY RD C2 W		CTY RD C2		W		50333056	324	352	325	353	20	
17	CTY RD C2 W		CTY RD C2		W		50333057	354	370	355	371	20	
18	HIGH CT		HIGH	CT			50334149	2941	2999	2940	2998	20	
19	HIGHPOINTE CV		HIGHPOINT	CV			50334151	2971	2999	2970	2998	20	
20	HIGHPOINTE CV		HIGHPOINT	CV			50334152	3001	3099	3000	3098	20	
21	HILLSCOURT S		HILLSCOU		S		50334156	2801	2845	2800	2844	20	
22	HILLSCOURTE N		HILLSCOU		N		50334157	472	506	471	505	20	
23	OWASSO HILL DR		OWASSO HI	DR			50336060	0	0	0	0	20	
24	OWASSO HILL DR		OWASSO HI	DR			50336061	410	446	411	447	20	
25	OWASSO HILL DR		OWASSO HI	DR			50336062	448	458	449	459	20	
26	OWASSO HILL DR		OWASSO HI	DR			50336063	468	508	469	509	20	
27	CHURCHILL ST		CHURCHIL	ST			50332524	3411	3431	3410	3434	20	
28	CHURCHILL ST		CHURCHIL	ST			50332525	3433	3475	3436	3476	20	
29	CHURCHILL ST N		CHURCHIL	ST	N		50332526	1037	1039	1043	1045	20	
30	INGERSON RD W		INGERSON	RD	W		50334694	970	1064	969	1063	20	
31	INGERSON RD W		INGERSON	RD	W		50334695	1066	1096	1065	1095	20	
32	LEXINGTON AV		LEXINGTO	AV			50335232	3481	3599	3480	3598	20	
33	OWASSO ST		OWASSO	ST			50336050	3371	3499	3370	3498	20	

To set up a regular query, first open the Query Editor dialog box by either creating or modifying the desired query (see “Creating a New Query” on page 47 or “Modifying a Query” on page 49). Under Type, select Regular.



Select the fields of information you want to include in the report from the Fields list on the left. These fields appear as column headings in the report. If you want to add all of the available fields, choose Add All next to the Columns to Show list box. You can select multiple fields listed consecutively in the Fields list by clicking the first field in the range, holding down the SHIFT key, then clicking the last field in the range. You can select multiple fields that are not listed consecutively by holding down the CTRL key and selecting them with the mouse. Choose the Add button next to the Columns to Show list box.

If you decide you want to remove any of the fields from the Columns to Show list, select one or more from the list (in the same manner as when adding fields) and choose the Remove button next to that list. You can choose Remove All next to this list to deselect all of the fields and start over (but make sure to add one or more fields before saving the query). If you want to change the order in which a field appears in the report (as a column, from left to right), select a field then choose the Up or Down button next to the Columns to Show list box until the field is at the desired location.

If you want the report sorted in a particular order (such as numerically by grade, then alphabetically by last name), first select either Ascending (for lowest to highest values) or Descending (for highest to lowest values) next to the Order Rows By list. Select the field you want to sort on from the Fields list box. Choose the Add button next to the Order Rows By list box.

The fields you use to sort do not have to be included in the query output (listed in the Columns to Show box). Also, you can sort the report using more than one field. For instance, you may want student records sorted first by school, then by grade, then by last name. You can select multiple fields from the Fields list just as when selecting fields to include in the report, or you can repeat the step for each field. Make sure to select Ascending or Descending before you choose the Add button. You can change the order in which fields are used to sort the query by selecting a field and choosing Up or Down next to the Order Rows By list until the field is at the desired location. You can also remove fields selected for the sort by selecting them from the Order Rows by list, then choosing Remove next to this list.

If you want to include aggregates (such as totals, counts, or averages) in the query, see “Including an Overall Aggregate in a Query” on page 59, “Including a Group Aggregate in a Query” on page 60, or “Including a Cumulative Aggregate in a Query” on page 61.

Choose OK when finished to save your changes and close the Query Editor dialog box.

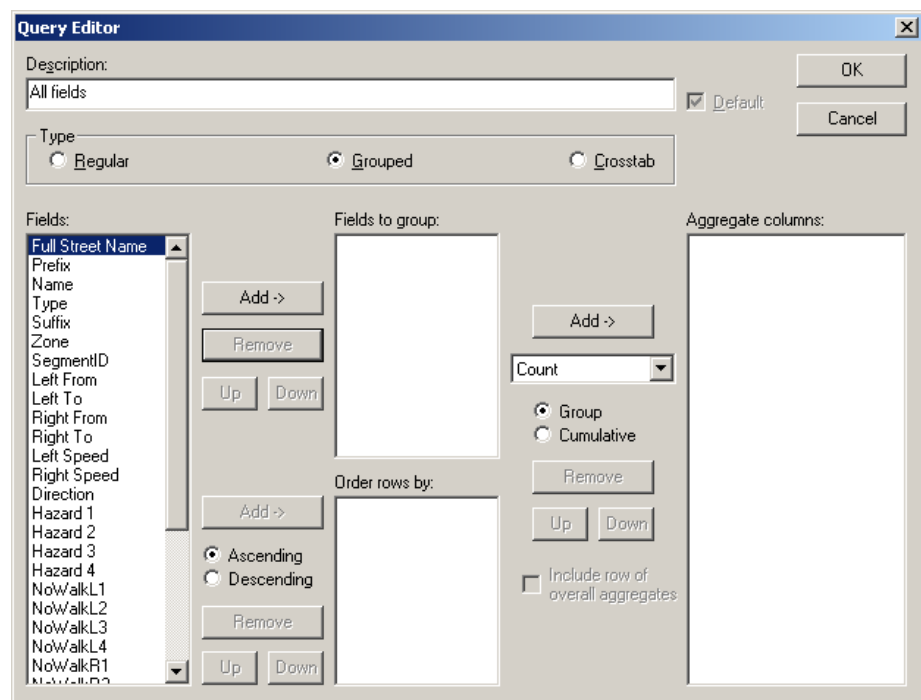
Examining Group Queries

The Group query option produces a column layout report with grouped categories, similar to the following.

Stude	School	Grade	Count()
1	102	01	4.0000
2	102	02	4.0000
3	102	03	2.0000
4	102	04	1.0000
5	102	05	2.0000
6	102	06	2.0000
7	102	KA	2.0000
8	102	KP	1.0000
9	103	01	25.0000
10	103	02	23.0000
11	103	03	21.0000
12	103	04	27.0000
13	103	05	22.0000
14	103	06	21.0000
15	103	KA	9.0000
16	103	KP	23.0000
17	104	03	1.0000
18	200	01	11.0000
19	200	02	4.0000
20	200	03	2.0000
21	200	04	7.0000
22	200	05	3.0000
23	200	06	8.0000
24	200	07	3.0000
25	200	08	4.0000
26	200	KA	6.0000
27	300	07	36.0000
28	300	08	41.0000
29	300	09	42.0000
30	400	10	37.0000
31	400	11	40.0000
32	400	12	40.0000
			474.0000

Unlike the regular query in which there is a one-to-one correspondence between the rows and the objects they refer to, the grouped query combines all of the objects that share the same grouped field values into one row. In this example, all of the students in school 102 and grade 01 are combined into the first row of the query. The aggregate column (Count) reflects all the data for the students in each row.

To set up a group query, first open the Query Editor dialog box by either creating or modifying the desired query (see “Creating a New Query” on page 47 or “Modifying a Query” on page 49). Under Type, select Grouped.



In the Fields list, select the fields you want to use to group the report. You can select multiple fields listed consecutively in the Fields list by clicking the first field in the range, holding down the SHIFT key, then clicking the last field in the range. You can select multiple fields that are not listed consecutively by holding down the CTRL key and clicking them with the mouse. Choose Add next to the Fields to Group list box.

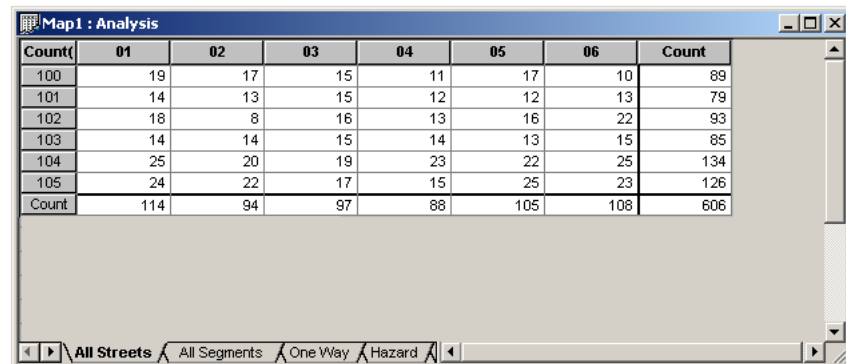
If you want the report rows sorted in a particular order, first select the Ascending (for lowest to highest values) or Descending (for highest to lowest values) check box next to the Order Rows By list box. Select the field you want to sort on from the Fields to Group list box, then choose the Add button next to the Order Rows By list box.

To include a column with an aggregate quantity (such as a count or sum) for groups in the report, select the field or fields you want to use from the Fields list box. Select the Group (see “Including a Group Aggregate in a Query” on page 60) or Cumulative (see “Including a Cumulative Aggregate in a Query” on page 61) check box. Click the arrow next to the text box adjacent to the Aggregate Columns list box and select the desired summary option. Choose the Add button next to the Aggregate Columns list box. You can also include an overall count at the end of the report by selecting the Include Row of Overall Aggregates check box.

Choose OK when finished to save your changes and close the Query Editor dialog box.

Examining Cross-tab Queries

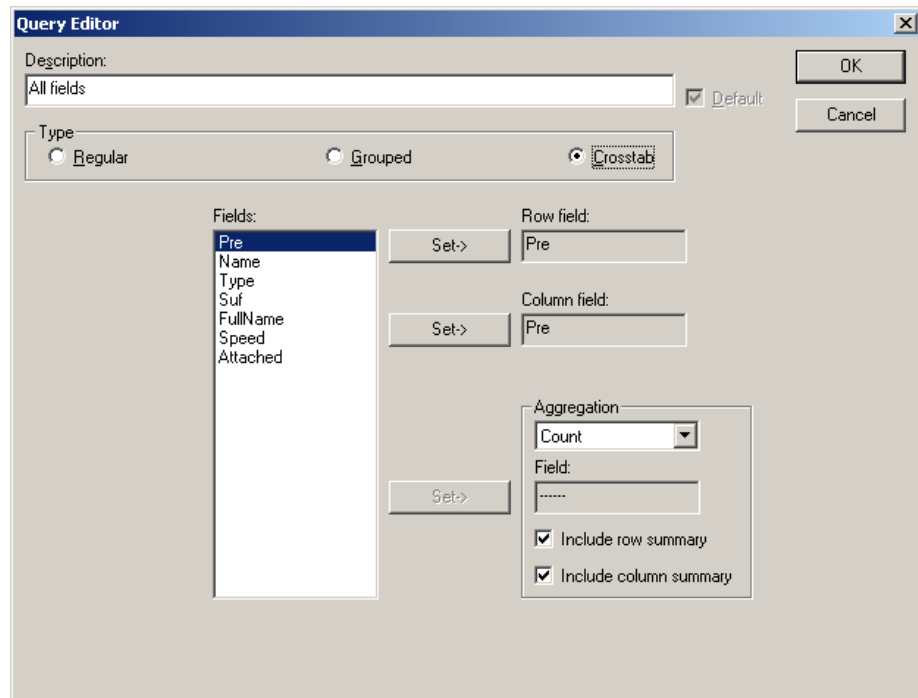
The Cross-tab query option produces a report similar to the following.



Count	01	02	03	04	05	06	Count
100	19	17	15	11	17	10	89
101	14	13	15	12	12	13	79
102	18	8	16	13	16	22	93
103	14	14	15	14	13	15	85
104	25	20	19	23	22	25	134
105	24	22	17	15	25	23	126
Count	114	94	97	88	105	108	606

As with the grouped query, there is not a one-to-one correspondence between the rows of a cross-tab query and the objects they refer to. In this case, all the objects that share the same grouped field values are combined into one cell. In this example, all of the students in school 100 and grade 01 are combined into the cell that intersects row 1 and column 1 of the query. Any aggregate columns accumulate all the data for the records in that row.

To set up a cross-tab query, first open the Query Editor dialog box by either creating or modifying the desired query (see “Creating a New Query” on page 47 or “Modifying a Query” on page 49). Under Type, select Crosstab.



Under Fields, select the field you want to appear horizontally in the rows of the report. Choose the Set button next to the Row Field text box. Select the field you want to appear in the columns of the report. Choose the Set button next to the Column Field text box.

To define the aggregate quantity (such as sum or count) that will appear in the cells of the query, select the field or fields you want to use from the Fields list box. Click the arrow next to the Aggregation check box and select the desired aggregate. Choose the Set button next to the aggregation Field text box.

Select the Include Row Summary check box if you want to include the quantity at the end of each row or select the Include Column Summary check box if you want to include the aggregate at the end of each column.

Choose OK when finished to save your changes and close the Query Editor dialog box. Each cell of the grid will include the aggregate value corresponding to the row and column. For example, there are 19 students in grade 01 at school 100 in the cross-tab query illustration at the beginning of this section.

Including an Overall Aggregate in a Query

Aggregates are quantities relating to records in a query that you can include in the report, such as the total number of students, the total distance of each of the students to their schools, or the average number of students in each school.

If you are creating or modifying a regular query, you can add an Overall aggregate to evaluate all of the records in the query (such as the total number of students). You can also include Group aggregates and Cumulative aggregates.

To include an Overall aggregate on records in a regular query, first open the Query Editor dialog box by either creating or modifying the desired query (see “Creating a New Query” on page 47 or “Modifying a Query” on page 49). In the Columns to Show list, select the field you want to evaluate in the aggregate.

If you are including a Count aggregate (such as the number of students in a query), this field selection only indicates the column under which the aggregate will appear. The Count will list the total number of records in the query regardless of which field you select. If you were including a different type of aggregate (such as the Average distance to school) the aggregate would make a calculation using the values in the selected field.

Select the Overall check box next to the Aggregates to Show list box. Click the arrow next to the text box just above the Overall check box and select the calculation you want to use (such as Count, Sum, or Average). Not all of the aggregates apply to all of the numeric fields. For example, you can use the Average aggregate to obtain an average Distance from School, but not an average of Schools. Choose the Add button next to the Aggregates to Show list box. Choose OK to apply the query.

Including a Group Aggregate in a Query

Aggregates are quantities relating to records in a query, such as the total number of students, the total distance of each of the students to their schools, or the average number of students in each grade at a school. *Group* aggregates evaluate subsets within the query (such as the number of students in each grade in the query). You can also include an Overall aggregate (if you are working with a regular query) or a Cumulative aggregate (if you are working with a regular or grouped query).

To include a Group aggregate, first open the Query Editor dialog box by either creating or modifying the desired query (see “Creating a New Query” on page 47 or “Modifying a Query” on page 49). Before you can define a group aggregate, you first need to make sure that the field you want to use for the group aggregate (such as Grade) is used to sort the query.

In the Columns to Show list, select the field you want to evaluate from the list box (to continue with the example, Grade). Select the Group check box next to the Aggregates list. Click the arrow next to the text box above these check boxes and select the desired aggregate (such as Count).

Not all of the aggregates (such as Count, Sum, or Average) are available for all fields. For instance, you can't obtain an average of Schools. You could get an average of distances to school, however. The Count aggregate will always list the number of records, no matter which field you choose to aggregate. The other aggregates will use the numeric contents of the selected field to calculate the aggregate.

Click the arrow next to the Break On text box and select the field you want to use to group the query (again, Grade). Breaks in the query (places where the aggregates appear) will occur wherever the value changes for the field you select (that is, between groups). If you select Grade to break on, aggregates will appear wherever the grade changes in the query (for example, where grade 1 records end and grade 2 records begin). Choose the Add button next to the Aggregates list box. Choose OK to apply the query.

Including a Cumulative Aggregate in a Query

Aggregates are quantities relating to records in a query that you can include in the report, such as the total number of students, the total distance of each of the students to their schools, or the average number of students in each grade at a school. Like Group aggregates, *Cumulative* aggregates evaluate subsets (such as students in each grade in the query), but these aggregate values accumulate as you move through the groups (that is, the quantity for each group is added to the quantities for all previous groups).

As an example, suppose you have a query listing all students in an elementary school (grades 1 - 6) and you select Grade for the aggregate field and Count as the aggregate. You would get a listing of students in grade 1 followed by the total number of students in grade 1, then a listing of students in grade 2 followed by the total number of students in grade 2 *plus* the number of students in grade 1, and so on. You can also include an Overall aggregate (if you are working with a regular query) or a Group aggregate (if you are working with a regular, grouped, or cross-tab query).

To include a Cumulative aggregate, first open the Query Editor dialog box by either creating or modifying the desired query (see "Creating a New Query" on page 47 or "Modifying a Query" on page 49). Before you can define a cumulative aggregate, you first need to make sure that the field you want to use for the aggregate (such as Grade) is used to sort the query.

In the Columns to Show list, select the field you want to evaluate from the list box (to continue with the example, Grade). Select the Cumulative check box next to the Aggregates list. Click the arrow next to the text box above these check boxes and select the desired aggregate (such as Count).

Not all of the aggregates (such as Count, Sum, or Average) are available for all fields. For instance, you can't obtain an average of Schools. You could get

an average of distances to school, however. The Count aggregate will always list the number of records, no matter which field you choose to aggregate. The other aggregates will use the numeric contents of the selected field to calculate the aggregate.

Click the arrow next to the Break On text box and select the field you want to use to group the query (again, Grade). Breaks in the query (places where the aggregates appear) will occur wherever the value changes in the field you select (that is, between groups). If you select Grade to break on, aggregates will appear wherever the grade changes in the query (for example, where grade 1 records end and grade 2 records begin). Choose the Add button next to the Aggregates list box. Choose OK to apply the query.

GISMO BOUNDARY PLANNING

USING DATASETS	62
Creating Datasets	63
Opening Datasets	67
Modifying Datasets	67
Copying Datasets	68
Refreshing Datasets	68
Closing Datasets	69
Deleting Datasets	70
DISPLAYING DATASET BOUNDARIES	70
DISPLAYING DATASET STUDENTS	72
TALLYING STUDENTS	73
PERFORMING AN ENROLLMENT ANALYSIS	75
Modifying a School's Grades, Classrooms, and Capacities	78
VIEWING ADDRESS RANGES	79
CREATING AND MODIFYING BOUNDARIES	80
Creating Boundaries	80
Modifying Boundaries	81
Snapping Points to Objects on the Map	82
Tracing Objects on the Map	84
Creating a Bounding Boundary	85
Creating Distance Boundaries	86
Sawtoothed Boundary Perimeters	88
Copying Boundaries	89
Renaming Boundaries	89
Splitting Boundaries	90
Joining Boundaries	90
Deleting Boundaries	90
Changing the Appearance of Edit Boundaries	90
Viewing an edit window	91
Updating your Master Data	93
CREATING AND MODIFYING BOUNDARY GROUPS	94
Creating Boundary Groups	94
Modifying Boundary Groups	96
Deleting Boundary Groups	97
LEAVING GISMO BOUNDARY PLANNING	98

GISMO BOUNDARY PLANNING

Gismo Boundary Planning allows you to perform boundary planning and enrollment projection tasks using Gismo's standardized, easy-to-use mapping window. You can also create, modify, and optimize the boundaries in your system. This section discusses

- setting up *datasets* (the data you want to include in your different boundary planning tasks)
- creating student tallies and enrollment projections
- using the variety of new functions available for creating and modifying boundaries and boundary groups.

USING DATASETS

We refer to the regular edulog data as the *master* data. In Boundary Planning, you work with snapshots of that master data called datasets. A dataset simply indicates which schools, boundaries, and students you are currently working with. You can set up a variety of datasets for your different boundary planning goals. Datasets allow you to freeze the data in its current state for planning purposes. Any changes made to the master data during this planning will not impact your work (and vice versa).

Datasets also allow you to work with only part of the master data at a time (such as only high school students or only elementary students) so that you can narrow your focus and improve performance. You can also limit the number of student fields included in your dataset, using only those fields needed for your planning task, further limiting the scope and reducing the size of the planning scenario to suit your needs.

You can set up multiple datasets to perform a variety of tasks. You can view student tallies, analyze school enrollments, create plots, generate reports, and even update your master data if you wish. You might use one dataset to create high school attendance boundaries and another for middle schools. You may want to set up multiple scenarios for high school attendance boundaries. The possibilities are endless.

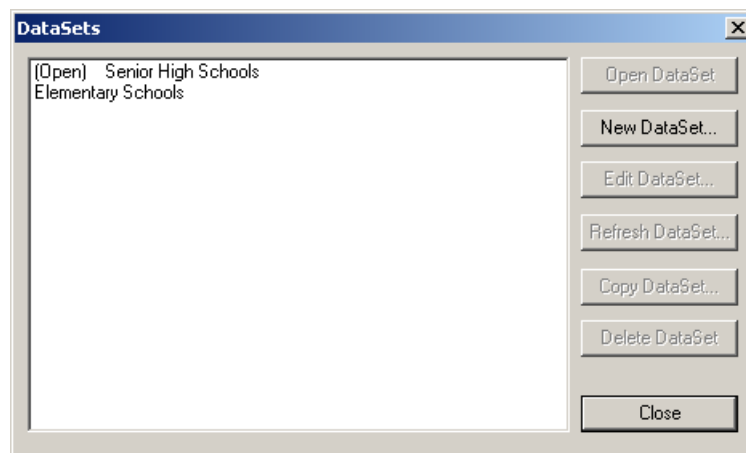
The datasets you create are available to others who use your transportation system, though only one person can use a particular dataset at a time. The DataSets dialog box shows any datasets currently in use as "(Open)." You can't open such datasets, but you can make copies of them and use the copies as desired.

When you are satisfied with your boundaries, you can save them as your actual (master) data. Up to that point, all your work is limited to the Boundary Planning dataset. When you update your master data (see “Updating your Master Data” on page 99), you can use those boundaries to determine student transportation eligibility.

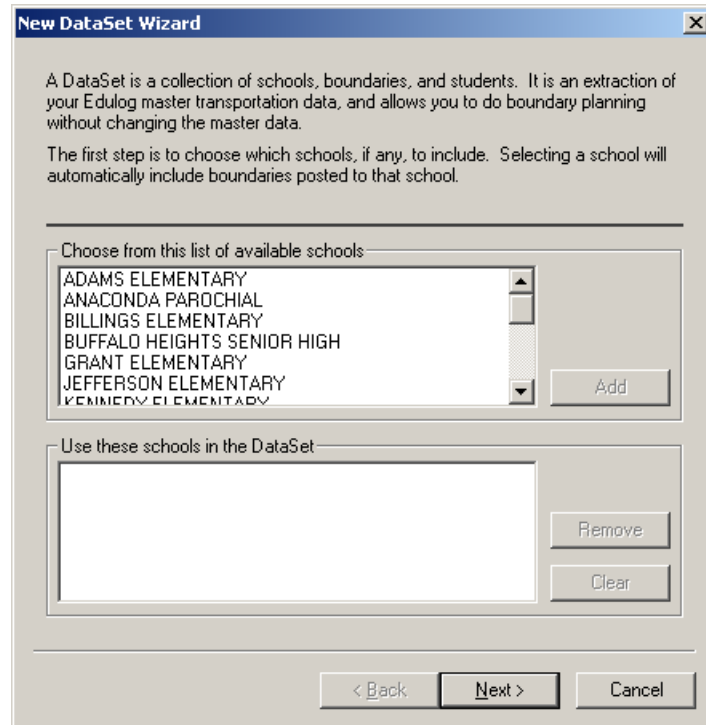
Creating Datasets



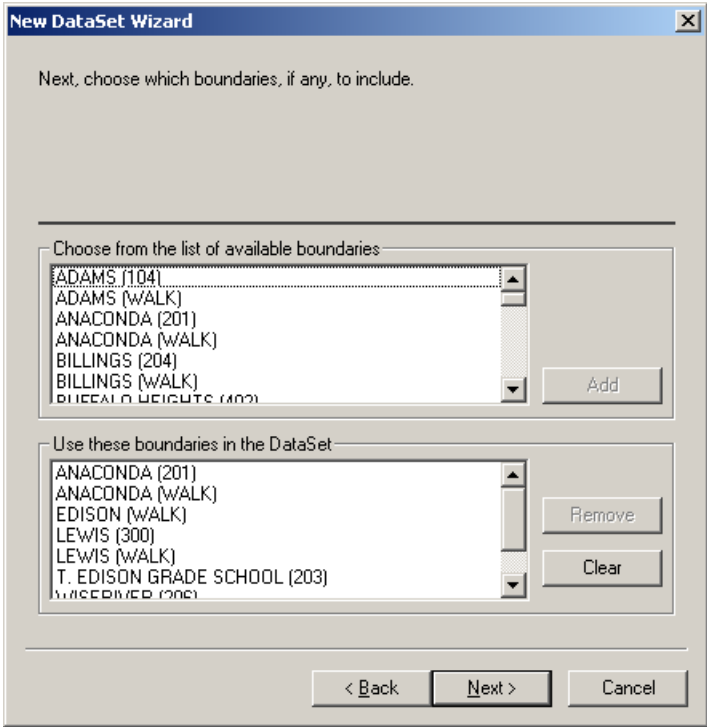
We’ve developed a dataset “wizard” to help you through the process of creating a dataset. Start the dataset wizard by choosing the DataSets tool or by choosing Planning from the menu bar and choose DataSets.



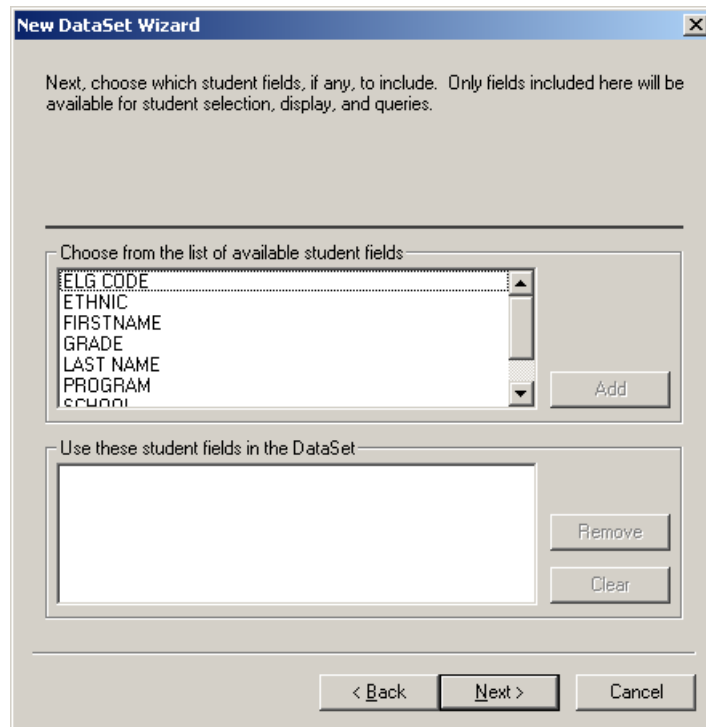
The DataSets dialog box lists any existing datasets. Choose New DataSet.



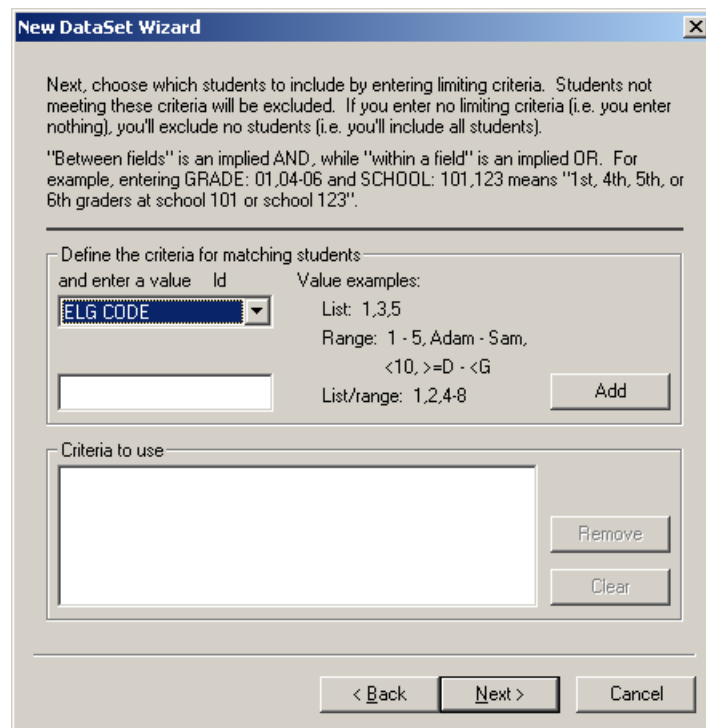
In the first page of the New DataSet Wizard, select the schools you want to include and choose Add. You can double-click schools in the top list to add them or select them and choose Add. (You can also select multiple schools by CTRL + clicking and SHIFT + clicking.) If you decide you want to remove a school, select it from the second list and choose Remove. Choose Next to proceed to the next page.



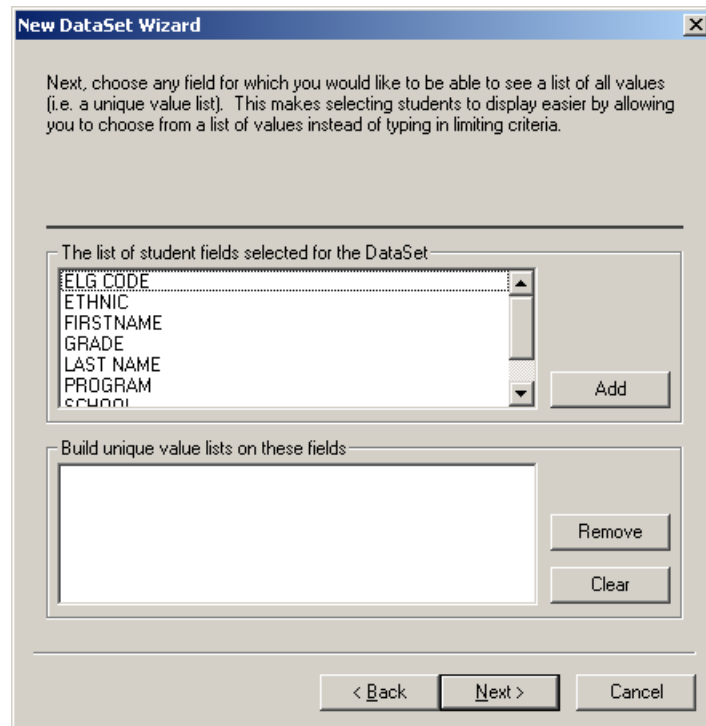
Select the boundaries you want to include in the dataset. The wizard automatically selects all the boundaries posted to the schools you selected, but you can add or remove boundaries as needed (using the same process as when adding or removing schools). Choose Next.



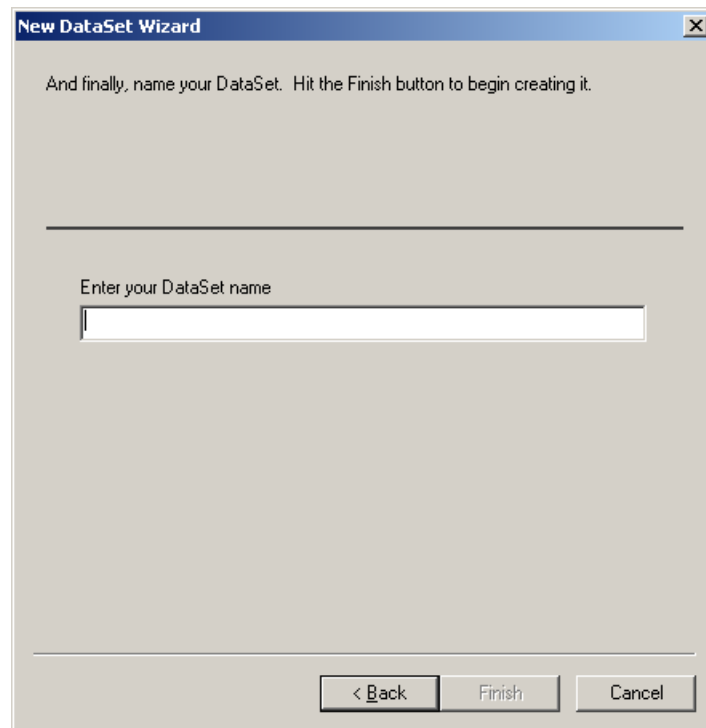
Select the student fields you want to include in the dataset (using the same process as when adding or removing schools and boundaries). Keep in mind that only the fields you select will be available for tallies, labels, themes, and reports. If you want to perform an enrollment analysis, make sure to include the Grade field. Other fields you may want to include are Last Name, First Name, School, Ethnic, Elg Code, and Sex. Choose Next.



Select the students you want to include in the dataset. The wizard provides many options for entering field criteria to select students. (If you don't enter any criteria, all the students will be included.) To define field criteria, click the field at the top and select the desired student field. In the next field, enter the values for the students you want to include. For example, if you selected School as the field, you might enter 101, 102, and 103 in the value field. You can enter values as lists (such as 1, 2, 3), ranges (1 - 5 or Adam - Sam), or any combination of the two. You can also include operators (such as < for less than and > for greater than) in the values. Choose Next.



Select any fields you want to use to build unique value lists of students. Such lists provide categories into which you can group students. For example, if you included students in schools 101-103, you could create unique value lists for School to get three separate lists (for students in school 101, 102, and 103). This can greatly speed the process of analyzing the desired students during boundary planning. The Grade, Ethnic, and Sex fields are also useful for creating unique value lists. You wouldn't want to create lists for Last Name or First Name, though, since each student with a different name would be placed in a separate list. Choose Next.



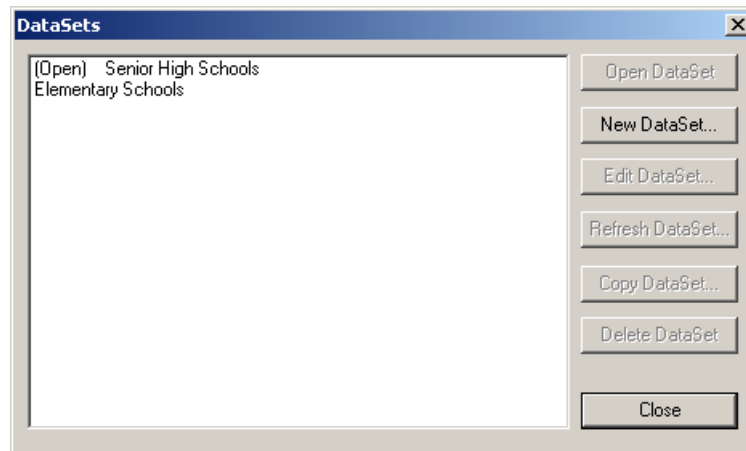
Type a name for your new dataset and choose Finish. You can include dots in the name if you wish.

Boundary Planning automatically opens your new dataset, but only displays the schools on the map. See “Displaying Dataset Students” on page 77 and “Displaying Dataset Boundaries” on page 75 for information on displaying the desired students and boundaries.

Opening Datasets



When you want to open an existing dataset, choose the DataSets tool or choose Planning from the menu bar and choose DataSets.

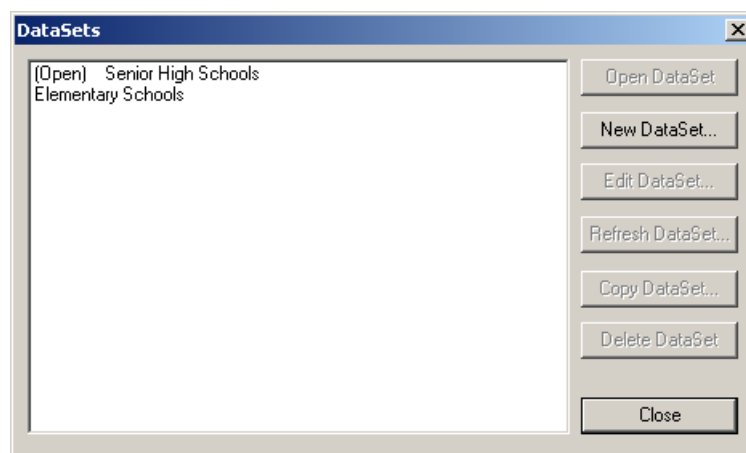


The DataSets dialog box lists any existing datasets. Select the desired dataset from the list and choose Open DataSet. Choose Close. Boundary Planning opens your new dataset, but only displays the schools on the map. See “Displaying Dataset Students” on page 77 and “Displaying Dataset Boundaries” on page 75 for information on displaying the desired students and boundaries.

Modifying Datasets



Before you can to modify a dataset, you first need to open that dataset (see the previous section for further information). Choose the DataSets tool or choose Planning from the menu bar and choose DataSets.



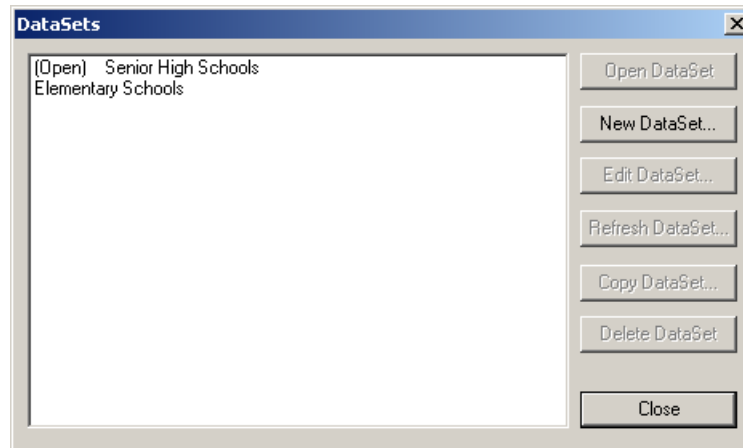
Select the dataset you opened from the list and choose Edit DataSet. The first page of the dataset wizard appears. See “Creating Datasets” on page 65 for

information on defining the dataset.

Copying Datasets



To copy a dataset, choose the DataSets tool or choose Planning from the menu bar and choose DataSets.



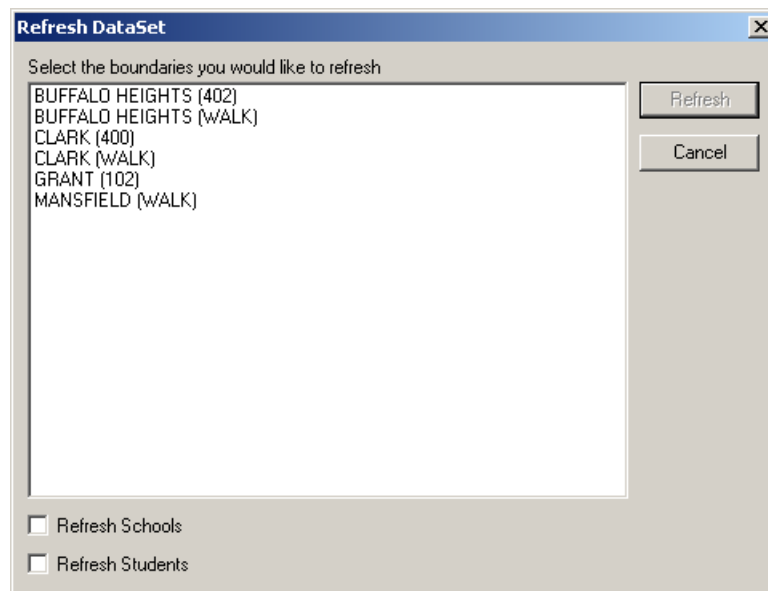
Select the dataset you want to copy from the list and choose Copy DataSet. Enter a name for the new dataset and choose OK. Notice that the list of datasets now includes the copy. Choose Close when finished.

Refreshing Datasets

If you make changes to a boundary in your master data, you can refresh your dataset to get those changes from the master data and include them in your dataset. You can also refresh school and student data.



To refresh a dataset, choose the DataSets tool or choose Planning from the menu bar and choose DataSets. Select the dataset you want to refresh from the list of datasets and choose Refresh DataSet. The Refresh DataSet dialog box appears, listing the available boundaries.

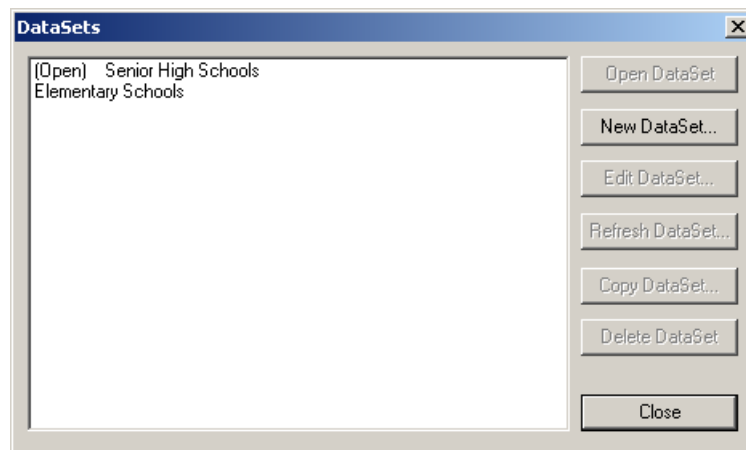


Select the boundary or boundaries you want to refresh. (You can select multiple boundaries by CTRL + clicking and SHIFT + clicking.) If you want to refresh school data, select the Refresh Schools check box. If you want to refresh student data, select the Refresh Students check box. Choose Refresh. Choose Close when finished.

Closing Datasets



To close a dataset, choose the DataSets tool or choose Planning from the menu bar and choose DataSets.

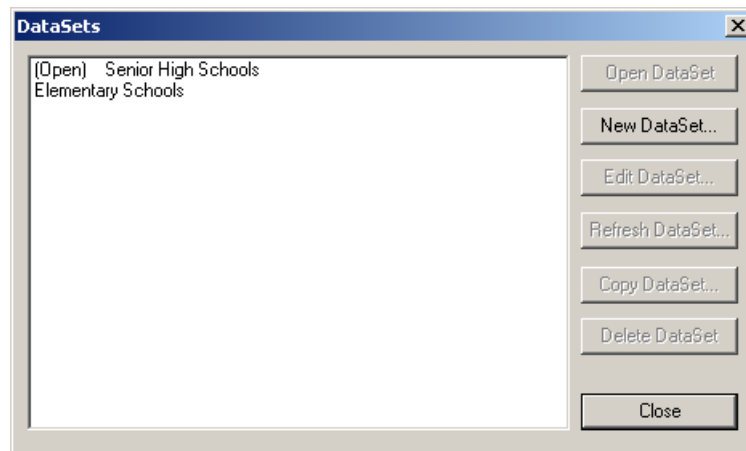


Select the dataset you want to close from the list and choose Close DataSet.
Choose Close when finished.

Deleting Datasets



To delete a dataset, choose the DataSets tool or choose Planning from the menu bar and choose DataSets.



Select the dataset you want to delete from the list and choose Delete DataSet.
Choose Yes from the message box asking for confirmation. Choose Close
when finished.

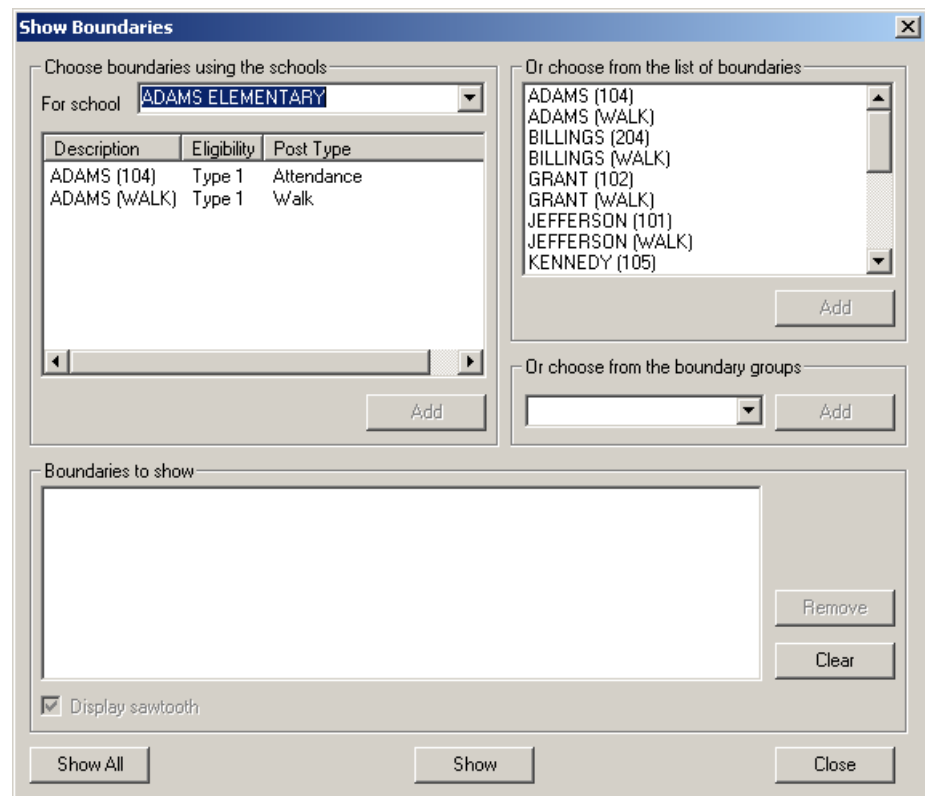
DISPLAYING DATASET BOUNDARIES

After you open a dataset (see “Opening Datasets” on page 71), Boundary Planning allows you to select the specific boundaries you want to display for your work session. Boundary groups can be useful for selecting boundaries to display. See “Creating Boundary Groups” on page 101 for further information.

Only displayed boundaries can be modified or used to produce tallies.
(Boundaries you create are automatically added to the group of displayed boundaries.)



To display dataset boundaries, choose the Show Boundaries tool or choose Planning from the menu bar and choose Show Boundaries.



You have several options for selecting boundaries to display.

- If you want to display all the boundaries in the dataset, choose the Show All button.
- If you want to select boundaries from the list of dataset boundaries in the upper-right corner of the dialog box, you can double-click boundaries in the list or single-click them and choose the Add button under that list (you can CTRL + click and SHIFT + click to select multiple boundaries).
- If you want to display only boundaries posted to a certain school, click the For School field and select the desired school. Select the boundaries you want to display from the list under that field. You can double-click boundaries in the list or single-click them and choose the Add button under that list.

The boundaries you selected appear in the Boundaries to Show list. You can add other boundaries if you wish. If you decide you want to remove a boundary, select it from the list and choose Remove. If you decide you want to remove all of the boundaries, choose Clear.

When you've selected the desired boundaries, choose Show. In the map legend, select the check box next to Boundaries (if it is not already selected). The boundaries you selected appear on the map.

DISPLAYING DATASET STUDENTS

After you open a dataset (see "Opening Datasets" on page 71), Boundary Planning allows you to select the specific group of students you want to display so that you can limit the focus to only those students you want to work with. For example, if you are working with high school boundaries, you may want to display only high school students (such as all students in 400 schools or in grades 10 - 12). You might want to further limit the students to those with special transportation needs or those that are in a particular program to get a tally of only those students.

Only displayed students will be included in tallies. You do not need to display any students if you only want to create boundaries.



To display dataset students, choose the Show Students tool or choose Planning from the menu bar and choose Show Students.

The screenshot shows a dialog box titled "Show Students". It contains the following elements:

- Define criteria** section:
 - A dropdown menu labeled "Using the field".
 - A text input field labeled "enter a value".
 - A "Value examples:" section with the following text:
 - List: 1,3,5
 - Range: 1 - 5, Adam - Sam.
 - <10, >=D - <G
 - List/range: 1,2,4-8
 - A large text area labeled "Or choose the field values" with an "Add" button to its right.
- Criteria to use** section:
 - A large text area.
 - "Remove" and "Clear" buttons to the right of the text area.
- Bottom buttons: "Show All", "Show", and "Close".

If you want to display all students, choose the Show All button. If you want to display only students that match certain field criteria, click the field under "Using the field" and select the field you want to use. You can select field val-

ues for the students from the list in the center of the dialog box or enter values in the field under “Enter a Value.” For example, if you selected School as the field, you might enter 101, 102, and 103 as the values. You can enter values as lists (such as 1, 2, 3), ranges (1 - 5 or Adam - Sam), or any combination of the two.

Choose Add and the values you selected appear in the Criteria to Use list. Add any other criteria you want to use to select students. If you decide you want to remove any of the criteria, select it from the bottom list and choose Remove. If you decide you want to remove all of the criteria, choose Clear.

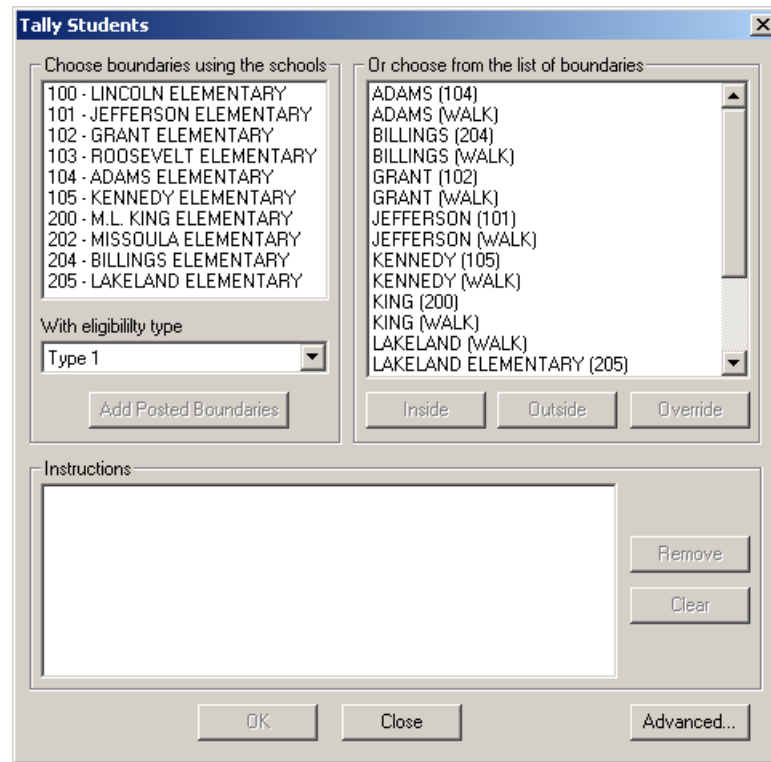
Choose Show when you’ve entered the desired criteria. In the map legend, select the check box next to Students (if it is not already selected). The students that match your criteria appear on the map.

TALLYING STUDENTS

Boundary Planning includes a feature for tallying students. You set up a list of tally instructions (such as inside Adams attendance boundary, outside Adams walk boundary, and override Adams hazard north of railroad tracks). You can include a variety of instructions using the boundaries posted to schools.

To tally students, first display the students you want to tally and the boundaries you want to use (see the previous two sections for further information). Choose the Tally Students tool or choose Planning from the menu bar and choose Tally Students. The Tally Students dialog box appears for you to begin entering your tally instructions.





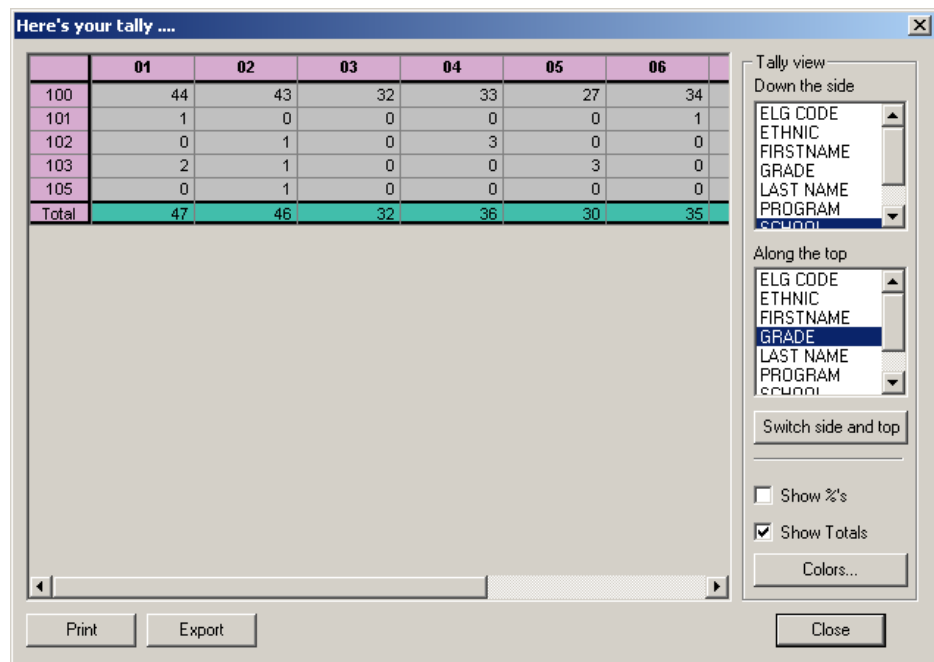
To add tally instructions for the boundaries posted to a particular school, select the school from the list box in the upper-left corner of the dialog box. You can double-click schools or single-click them and choose Add Posted Boundaries. You can select multiple schools by CTRL + clicking and SHIFT + clicking. (Note: if your district uses different boundaries to determine transportation eligibility for particular grades at a school, you need to select the eligibility type before selecting boundaries. Click the With Eligibility Type field and select the eligibility type corresponding to the boundaries you want to use. Most districts use only Type 1).

Instructions for the school's boundaries appear in the list box at the bottom of the dialog box. To add tally instructions for any of the displayed boundaries, select the boundary from the list box in the upper-right corner of the dialog box. Choose Inside if you want to tally students inside the selected boundary, Outside if you want students outside the boundary, or Override if you want to override with a hazard boundary. (Students in an override boundary will be included in the tally regardless of the other criteria).

The system adds the tally instruction to the list at the bottom of the dialog box. If you decide you want to remove an instruction, select it from the list and choose Remove. If you want to remove all instructions and start over, choose Clear.

If you are more experienced with this feature and would like to use additional operators and edit the expression directly, choose Advanced. Choose Close when finished.

When you have entered all the necessary instructions and are ready to view the tally, choose OK. The Tally window appears for you to select the fields you want to include in the tally.



The system automatically selects the students in the tally. You can view them in the analysis window if you wish (see "Viewing an Analysis Window" on page 43).

In the list box under Down the Side, select the student field you want to appear down the left side of the tally. In the list box under Along the Top, select the student field you want to appear along the top of the tally. You can choose the Switch Side and Top button if you want to exchange the position these two fields (this may be useful if your tally has just a few rows and many columns).

The traditional tally is School down the side and Grade along the top. You can choose multiple fields to appear down the side or along the top as needed. This provides a nice extension of the alternate tally field feature. Perhaps you want to include School and Sex down the side and Grade and Ethnic along the top to see School-Grade, School-Ethnic, Sex-Grade, and Sex-Ethnic tallies at once.

If you want to include percentages in the tally, select the Show %'s check box. The percentages appear for each row. The non-total percentages are “% of the row total,” as are the column total percentages (whose row total is the grand total). Only the row total percentages are column-oriented. They are “% of the column total” (again, the grand total).

If you want to include totals in the tally, make sure the Show Totals check box is selected.

You can choose Print if you would like to send the tally to the printer or choose Export if you want to send the tally to a file data source. Choose Close to return to the Tally Students dialog box. You can further modify the tally there and choose OK again to see the new version.

When you are finished, choose Close from the Tally Students dialog box.

PERFORMING AN ENROLLMENT ANALYSIS

The Enrollment Analysis feature lets you see how a student tally fits into the available classrooms at a school. This is useful when planning for next year's enrollment. You can simulate adding or removing grades for a school and see the effects on enrollment of altering a boundary slightly.

To perform an enrollment analysis, you first need to display and select the students you want to include in the analysis. You select students either by performing a student tally (see the previous section) or by selecting them on the map (see “Selecting Objects on the Map” on page 38).



After you select the desired students, choose the Enrollment Analysis tool or choose Planning from the menu bar, then choose Enrollment Analysis.

Grade	#Rms	RmCap	TotCap	Count	Over	%of Cap
KA	1	25	25	16	+0	64.00
KP	1	25	25	27	+2	108.00
01	1	25	25	47	+22	188.00
02	1	25	25	46	+21	184.00
03	1	25	25	32	+7	128.00
04	1	25	25	36	+11	144.00
05	1	25	25	30	+5	120.00
06	1	25	25	35	+10	140.00
24	1	25	25	0	+0	0.00
25	1	25	25	0	+0	0.00
Total	10		250	269	+78	107.60

Count from other grades : 0

Click the For School field and select the school whose enrollment you want to analyze. All the selected students are included, not just the ones that have a school code matching the school you selected. They are listed in the enrollment chart by grade only. This allows you to simulate moving students from one school to another. You can change which students are selected and see the numbers immediately updated in the Enrollment Analysis window.

You can project the grades forward a year (or more) to simulate what next year's enrollment might look like. Enter the number of years you want to project in the Project # Years field. The values automatically change to reflect that school year. Entering a 0 keeps students in their current grade's classrooms, entering a 1 puts them in the next grade's classrooms, and so on. The Enrollment Analysis window shows the number of rooms used for each grade, the capacity of each room, the total capacity, the number of students in that grade for the current projection, the number of students over the total capacity, and the percent of the total capacity currently in use. The Total row at the bottom shows the totals for each of these values. The Count from Other Grades value shows the number of students in grades (actual or projected) that are not included in the chart.

The school's default grades are taken from your edulog school transportation data files. You can simulate adding and removing grades in your analysis (see the next section) without changing your actual data files. Enrollment Analysis

uses settings in the initialization files to determine the order of grade promotion and the default room capacities. Contact your System Administrator or our Software Support Department if you have any questions on changing that information.

If you want to see the effects of moving students to another school, just remove those students from the selection (see “Selecting Objects on the Map” on page 38). The Enrollment Analysis window immediately updates the numbers. Typically, you perform an Enrollment Analysis with the tally from a school’s attendance boundary, then make any desired changes. If you add or remove students, you can change the attendance boundary as needed.

As an example of an enrollment analysis scenario, suppose it's mid-summer and you've rolled your students over to the next grade and entered all the new kindergartners and transfer students. You want to see if the previous year's classroom allocation will still work. You display the students (presumably only the ones that go to a particular school). You perform a tally using that school's attendance boundary, then perform an Enrollment Analysis on that school and see how it looks. If you find that some classrooms are overloaded, you have several possible remedies.

- You can simulate sending some of them to another school by removing those students from the selection. If the classroom loads are acceptable, you can change the attendance boundary accordingly.
- You can simulate sending all the students in a certain grade to a different school by removing that grade from the current school.
- You can simulate allocating more classrooms for one or more grades at the school if they are any available. If not, you might check to see whether any of the other grades are underloaded enough to consolidate into fewer classrooms.

NOTE

The first two options will cause a corresponding increase to the other school, so make sure you check that school’s enrollment as well.

As another example, suppose it's March and you want to examine next year's enrollment at your middle school to see how many teachers and classrooms you will need. The school services grades seven through nine. Three feeder elementary schools send their sixth grade graduates into your grade seven. You first display the students in the three elementary schools and your middle school. You then select the sixth graders from the three elementary schools

and the seventh and eighth graders from your middle school. Next, you perform an Enrollment Analysis on your middle school, setting your Project # Years to 1. The sixth graders go into your seventh grade classrooms, seventh into eighth, and eighth into ninth.

You can choose Print at any time if you would like to send the analysis to the printer or choose Export if you want to send it to a file data source. When you are finished, choose Close from the Enrollment Analysis dialog box.

Modifying a School's Grades, Classrooms, and Capacities

If you want to simulate adding or removing grades for the school or changing the number of available classrooms and the classroom capacities, choose Configure from the Enrollment Analysis window (see the previous section).

The screenshot shows the 'Enrollment Configuration' dialog box for 'LINCOLN ELEMENTARY'. It includes a 'Rooms' section with three input fields: 'Available' (10), 'Used' (10), and 'Unused' (0). Below this is a table with columns for 'Grade', 'Rooms', and 'Capacity'. The table lists grades from KA to 25, each with 1 room and a capacity of 25. There are 'Add' and 'Remove' buttons to the right of the table.

Grade	Rooms	Capacity
KA	1	25
KP	1	25
01	1	25
02	1	25
03	1	25
04	1	25
05	1	25
06	1	25
24	1	25
25	1	25

In the Available field under Rooms, enter the total number of rooms (including those that are not used as classrooms). The number of classrooms entered for each grade in the list box indicates how many rooms are actually used as classrooms.

If you want to simulate adding a grade to the school, choose Add. In the three fields at the bottom of the window, enter the Grade number, the number of rooms used to service the grade, and the total capacity of the rooms.

To simulate removing one or more grades from the school, select the grades from the list and choose Remove. To modify the values for one or more grades already entered for the school, select the grade from the list box, then modify the Grade number, the number of rooms used to service the grade, and the total number of students the room can hold in the fields at the bottom of the window as desired.

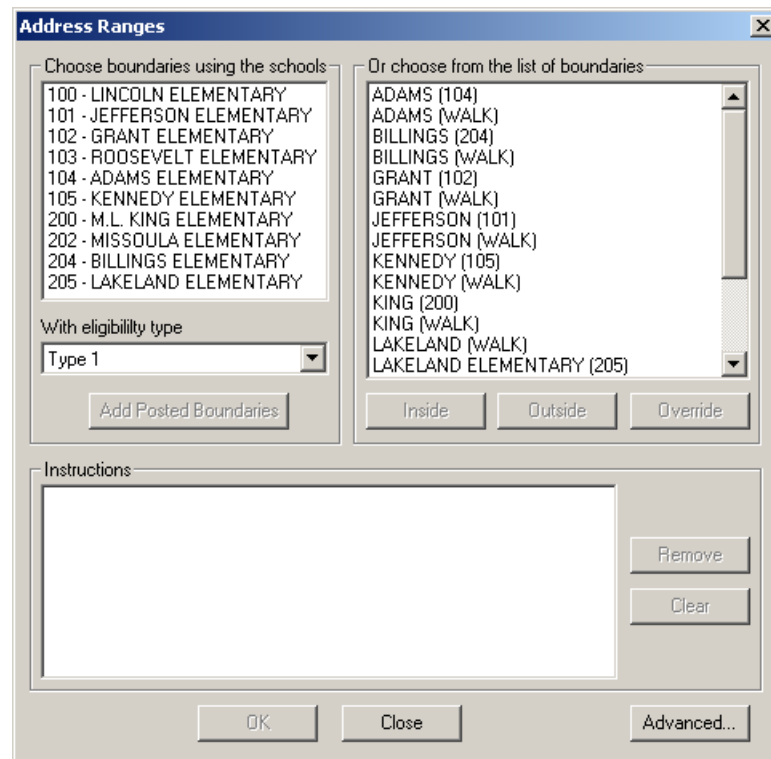
Choose OK when finished. The values in the Enrollment Analysis window automatically change to reflect the changes.

VIEWING ADDRESS RANGES

Boundary Planning allows you to quickly view the addresses ranges of street segments according to the boundaries in which they're located. You can print these lists or save them as files on your computer.



Choose the Address Ranges tool or choose Planning from the menu bar, then choose Address Ranges.



To use the boundaries associated with one or more schools, select the schools in the list in the upper-left corner. (You can SHIFT+click and CTRL+click to

select multiple boundaries.) If your district uses different boundaries to determine transportation eligibility for particular grades at a school, click the With Eligibility Type field and select the eligibility type corresponding to the boundaries you want to use. (Most districts use only Type 1). Choose Add Posted Boundaries to include the selected boundaries. The boundary criteria appear in the Instructions list.

You can also select the boundaries from the list of dataset boundaries in the upper-right corner of the dialog box. Choose Inside if you want to tally students inside the selected boundary, Outside if you want students outside the boundary, or Override if you want to override with a hazard boundary. (Address ranges in an override boundary will appear regardless of the other criteria). The boundary criteria appear in the Instructions list.

You can add other boundary criteria using either of these approaches. If you decide you want to remove a boundary, select it from the Instructions list and choose Remove. If you decide you want to remove all of the boundaries, choose Clear.

If you are more experienced with this feature and would like to use additional operators and edit the expression directly, choose Advanced. Choose Close when finished.

When you have entered all the necessary instructions and are ready to view the ranges, choose OK . The list of address ranges for the boundary criteria you entered appears. You can choose Print to send the list to a printer or choose Export to send the report to one of a variety of database files (such as a text file, an Excel spreadsheet, or a FoxPro table). Choose Close when finished.

CREATING AND MODIFYING BOUNDARIES

Gismo allows you to create and modify boundaries in your system, perhaps to achieve better student distributions resulting from your student analysis (boundary planning). You have a variety of tools available for working with boundaries. You can define points “free form” simply by pointing and clicking, or you can have Gismo “snap” boundary points to the nearest street or boundary.

You can also trace objects to define all or part of a boundary. For example, you may want to trace an adjacent boundary to make sure there are no gaps between the two boundaries and that no overlaps exist. If you have a situation in which students on one side of a street attend one school and students on the other side attend a different school, you can trace the street to define the boundary so that the appropriate students fall in the correct attendance areas.

Creating Boundaries

Gismo allows you to create boundaries in your system as needed. After you create the initial boundary (with at least three boundary points), you can switch to boundary edit mode to take advantage of the functions available for modifying boundaries (such as tracing and snapping to objects).



To create a new boundary, first make sure Boundaries appears in the Object Class field in the Edit toolbar. If it doesn't, click the field and select Boundaries from the list. Choose the Create Objects tool.

Begin defining the boundary perimeter by pointing and clicking on the map display. After you define the last point of the boundary, click the right mouse button to close the boundary.

A boundary needs to have at least three points. If you do not define three points before closing the boundary, Gismo will automatically delete any remaining points. This also happens if you delete all but two points of a boundary.



If you want to trace or snap to objects to define any part of the polygon or take advantage of any of the other boundary modification functions, switch to edit mode by clicking the Create Objects tool again to deselect it (only the Edit Objects tool should be selected now as in the illustration to the left). See “Modifying Boundaries” on page 87, “Tracing Objects on the Map” on page 90, or “Snapping Points to Objects on the Map” on page 89 for further information.

Remember that if you are not satisfied with the boundary, you can cancel it by pressing CTRL + Z on your keyboard. Remember also that if you perform an action that requires you to select another tool (such as zooming, panning, or selecting objects with the mouse), make sure to select the Idle tool when you want to continue working with boundaries.



To save your new boundary, either click the Save tool in the Edit toolbar or choose Save Changes from the Edit menu.

Modifying Boundaries

Gismo provides a variety of functions that allow you to define precise boundary perimeters. You can add, move, and delete boundary points, as well as trace and snap to other objects.

Keep in mind that if you are ever unsatisfied with a change you make to a boundary, you can undo the change by pressing CTRL + Z on your keyboard. You can continue to press this key combination to undo previous changes. Also, if you perform an action that requires you to select a tool (such as zoom-



ing, panning, or selecting objects with the mouse), make sure to select the Idle tool when you want to continue working with boundary perimeters.

To modify a boundary in your system, first display and select the boundary (or boundaries) you want to modify. See “Selecting Objects on the Map” on page 38 for further information.



Make sure Boundaries appears in the Object Class field in the Edit toolbar. If it doesn't, click the field and select Boundaries from the list. Choose the Edit Objects tool (or choose Edit Selected Objects from the Edit menu) to switch to the Edit mode.

Gismo highlights the selected boundary or boundaries. You can change the appearance of the boundaries you are creating or modifying using the Edit Configuration dialog box (see “Changing the Appearance of Edit Boundaries” on page 97). Gismo also displays an Edit Info dialog box which will provide information on the objects you edit.

To move a boundary point, simply click and drag it to the desired location. When you click a point, it is highlighted to indicate that it is active. If multiple objects share the same point, those points will all be modified in unison. You can also activate multiple boundary points for simultaneous modification by holding down the SHIFT key while clicking them with the mouse.

To add a boundary point, place the mouse pointer on the boundary perimeter near the location where you want the new point and click the right mouse button. Gismo inserts a new boundary point, which you can move to the desired location.



To remove a boundary point, click the point you want to delete and press DELETE on your keyboard or click the Delete Objects tool in the Edit toolbar.

You can also trace objects to define portions of the boundary (see “Tracing Objects on the Map” on page 90) and snap boundary points to objects (see “Snapping Points to Objects on the Map” on page 89) as you modify the perimeter.

As you modify a boundary, you may notice the highlighted area inside the boundary appears as it did when you first selected the boundary. The area inside the boundary will match the new perimeter when you save your changes. To save your changes, choose the Save tool in the Edit toolbar or choose Save Changes from the Edit menu.



Snapping Points to Objects on the Map

As you are creating or modifying a boundary, you may find it useful to snap boundary points to objects on the map, such as streets or adjacent boundaries. When you elect to snap to certain objects, the boundary points you define will automatically go to the object of the selected type nearest the mouse pointer. For example, if you are tracing a street, the point will snap to the node or shape node nearest the pointer. This limits the places where you can move or create points.

While you can snap to certain objects (such as streets) even if they are not displayed on the map, you will probably want to display them so that you will have a visual reference as you define boundary points (see “Displaying Objects on the Map” on page 11 for further information).

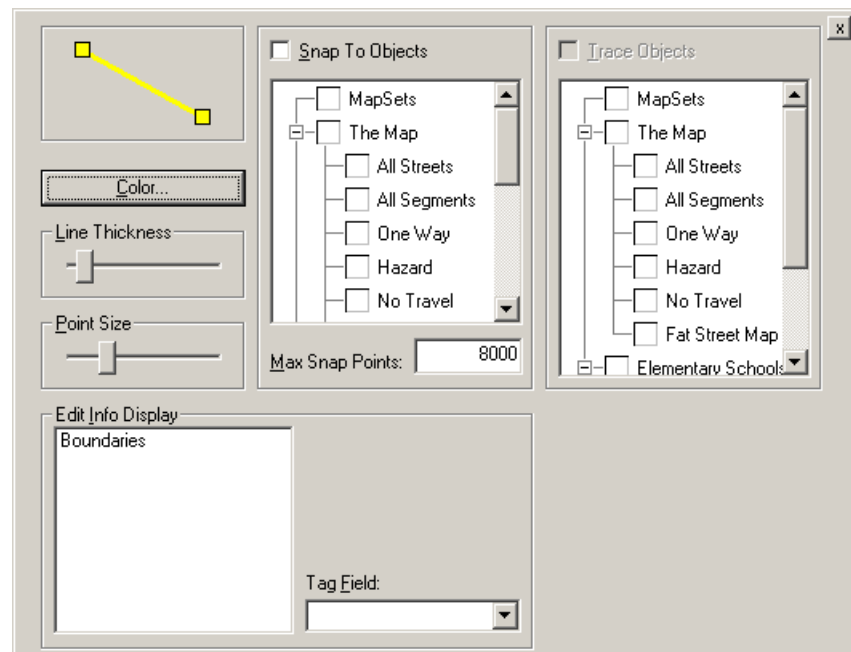
To snap boundary points to objects on the map, first display and select the boundary (or boundaries) you want to modify. (See “Selecting Objects on the Map” on page 38.)



Make sure Boundaries appears in the Object Class field (in the Edit toolbar). If it doesn't, click the field and select Boundaries from the list. Choose the Edit Objects tool (or choose Edit Selected Objects from the Edit menu) to change to the Edit mode.



Click the Edit Configuration arrow in the Edit toolbar (or choose Edit from the menu bar and choose Edit Configuration).



Select the Snap to Objects check box to indicate that you want to snap boundary points to objects on the map. In the list under Snap to Objects, select the check box next to the objects you want to snap to (such as streets or other boundaries).

Click the Close tool (labeled with an X) in the upper-right corner of the dialog box. Now, when you add or move boundary points, the points will automatically snap to the selected types of objects nearest the mouse pointer. You can hold down the CTRL key to temporarily leave the snap mode while working with boundaries. To stop snapping to objects entirely, choose the Edit Configuration command once again, clear all of the check boxes, then click the Close tool.



To save your changes, choose the Save tool in the Edit toolbar or choose Save Changes from the Edit menu.

Tracing Objects on the Map

As you are creating or modifying boundaries, you may find it useful to trace objects on the map, such as streets or adjacent boundaries, to define portions of your boundary.

While you can trace certain objects (such as streets) even if they are not displayed on the map, you will probably want to display them so that you will have a visual reference as you define boundary points (see “Displaying Objects on the Map” on page 11 for further information).

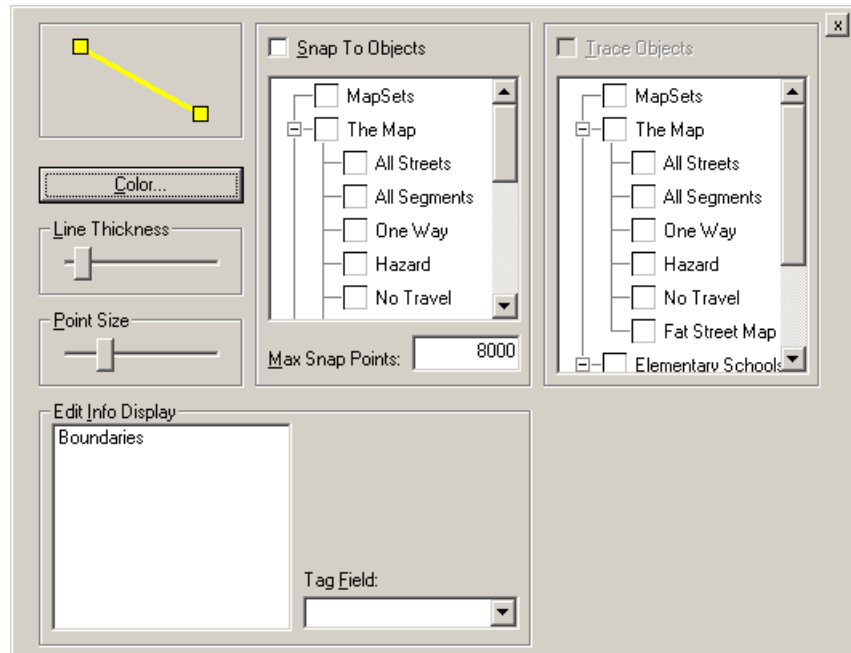
To trace objects on the map, first display and select the boundary (or boundaries) you want to modify. (See “Selecting Objects on the Map” on page 38.)



Make sure Boundaries appears in the Object Class field (in the Edit toolbar). If it doesn't, click the field and select Boundaries from the list. Choose the Edit Objects tool (or choose Edit Selected Objects from the Edit menu) to switch to the Edit mode.



Click the Edit Configuration arrow in the Edit toolbar (or choose Edit from the menu bar and choose Edit Configuration).



In order to trace objects, you need to select those objects as “snap to” objects. Select the Snap to Objects check box. In the list under Snap to Objects, select the check box next to the objects you want to trace (such as streets or other boundaries).

Select the Trace Objects check box, then select the objects you want to trace from the list under Trace Objects. Click the Close tool (labeled with an X) in the upper-right corner of the dialog box.

Now when you add or move boundary points, the affected parts of the boundary will automatically trace the object of the selected type nearest the mouse pointer. The trace begins whenever a point is placed. If you’re extending a line, it attempts to trace from the last point to the new point. If you’re editing a line or polygon, it attempts to trace to the two neighboring points. Keep in mind that if a trace does not turn out the way you expected, you can press CTRL + Z to cancel one or more changes and try again.

If you want to temporarily stop tracing or snapping to objects when defining boundary points, you can hold down the CTRL key to leave the snap/trace mode. To stop tracing entirely, choose the Edit Configuration tool once again, clear the appropriate check boxes, then click the Close tool.



To save your changes, choose the Save tool in the Edit toolbar or choose Save Changes from the Edit menu.

Creating a Bounding Boundary

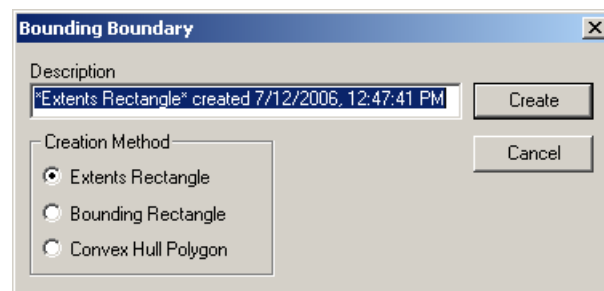
Boundary Planning allows you to create a boundary that encloses the whole map. You typically use the Bounding Boundary function to create a starting point boundary for a partition of planning zones. (A partition is a set of planning zones that covers the entire district area without overlaps.). You can also create the boundary freehand.

You have the option of creating the boundary in one of three ways:

- from a rectangle encompassing the entire extent of the map
- from a bounding rectangle (calculated to barely enclose all the segments)
- from a convex hull polygon (also calculated to barely enclose all the segments).



To create a bounding boundary, choose the Bounding Boundary tool or choose Planning from the menu bar and choose Bounding Boundary.



Under Creation Method, select the type of boundary you want to create (Extents Rectangle, Bounding Rectangle, or Convex Hull Polygon).

The Description field lists the default name for the boundary. You can change this name if you wish. Choose Create when you are ready to create the bounding boundary.

Creating Distance Boundaries

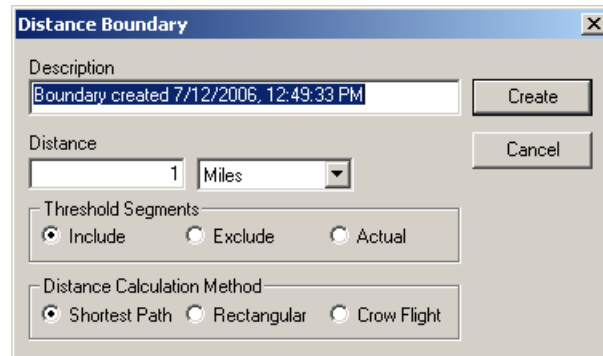
In many cases, schools have a maximum walking distance. Students within that vicinity can walk to school, while those outside require transportation. Boundary Planning includes features for automatically building boundaries that extend a certain distance from a school.

To create a distance boundary, first select the node or nodes you want to use as the origin of the distance, such as the node representing the school or the

nodes representing the corners of the school yard. See “Selecting Objects on the Map” on page 38 for further information.



Choose the Distance Boundary tool or choose Planning from the menu bar and choose Distance Boundary.



The Distance Boundary dialog box automatically enters a default boundary name in the Description field. You can enter a different description if desired.

Click the second text box under Distance and select the units of measure you want to use, such as miles or kilometers. In the first text box under Distance, enter the number of those units you want the boundary to extend from the node(s) of origin.

Under Threshold Segments, indicate how you want to handle each of the segments at the outer extents of the distance boundary:

- Include – includes the whole segment
- Exclude – excludes the whole segment
- Actual – calculates the actual threshold point on the segment

Under Distance Calculation method, indicate how you want to build the boundary:

- Shortest Path – extends the prescribed walking distance along the street network
- Rectangular – creates a boundary in the shape of a diamond (or union of diamonds if you used multiple origin nodes)
- Crow Flight – builds a circular boundary (or the union of circles if you used multiple origin nodes).

Choose Create. The system automatically builds the boundary according to your specifications. The distance boundary includes distance boundary segments. You can display those segments by selecting the check box next to Distance Boundary Segments in the map legend. You may want to examine the boundary and make changes if necessary. See “Modifying Boundaries” on page 87 for further information.

When using the crow-flight and rectangular methods, the distance boundary segments are the segments (and partial segments) that are within the distance from the origin nodes. Suppose you have those segments displayed in green and the street map in blue. If you used actual threshold points, every segment (and partial segment) inside the boundary is green and everything outside the boundary is blue. If you included entire threshold segments, the boundary extends out to the other end of the partial segments. If you excluded the threshold segments, the boundary is shrunk back to the near end of the partial segments. To get a better idea of how the system handles threshold segments, it may be useful to build three distance boundaries each alike except for the actual/include/exclude setting and see how they differ. It may also be helpful to build three alike except for the crow-flight/rectangular/shortest-path setting.

When you use the shortest path method, the distance boundary segments appear slightly differently. The path emanates away from the origin(s) until it extends the prescribed distance. Any “reached” point is reached by exactly one path (the shortest path) indicated by the distance boundary segments. You can pick any green point and follow the green segments back to the origin. There will be only one path to get there. As a result, there will be blue segments in the boundary that are reachable but are not included in the shortest path from the origin.

There is another difference between the shortest path and the other two methods. With shortest-path, the threshold segments are determined first, then the boundary is built around those segments. With the crow flight and rectangular methods, the boundary is built first (the circle or diamond), then it is used to find the threshold segments. Finally, the boundary is extended or shrunk back to include the appropriate threshold segments. This difference is subtle but it does show up in cases where you run off the map, such as when your origin is about 3/4 mile from the edge of the map and you build a 1 mile boundary. With the crow-flight and rectangular methods, the circle/diamond will extend out 1/4 mile, while the shortest-path will not (since there are no threshold points out there from which to build the boundary).

Sawtoothing Boundary Perimeters

Boundary Planning allows you to sawtooth boundary perimeters, saving you time and increasing accuracy when you want both sides of a street to be included in or excluded from a boundary (or from two adjacent boundaries).

To sawtooth a boundary perimeter, first display the boundaries you want to sawtooth (see “Displaying Dataset Boundaries” on page 75), making sure the Display Sawtooth check box is selected in the Show Boundaries dialog box.



Select the street segments where you want the sawtooth (see “Selecting Objects on the Map” on page 38). Choose the Sawtooth tool or choose Planning from the menu bar and choose Sawtooth. The first time you choose this command, the sawtooth perimeter is set to exclude both sides of the segment. Choose the command again to include both sides. Choose it a third time to split the segment. You can continue to choose the command to cycle through the three options.

The system takes the street segments, finds the affected boundary pieces, and replaces those pieces with a sawtoothed perimeter. The changes are immediately visible (you may want to zoom in to get a better look) and are saved in your dataset.

NOTE

Sawtooths do not actually appear in the polygon. Sawtooth boundaries provide a way to indicate whether you want to include or exclude the sides of a segment. The appearance of the boundary is for display purposes only, showing whether the segment is an exception segment and, if so, which side is included or excluded. The system does not use the visual coordinates of a sawtooth boundary when testing students against that boundary. If a student is located on a boundary’s exception segment, the system uses the exception segment information to determine whether the student is inside or outside the boundary. Neither the student’s nor the polygon’s x,y coordinates affect this determination.

Copying Boundaries

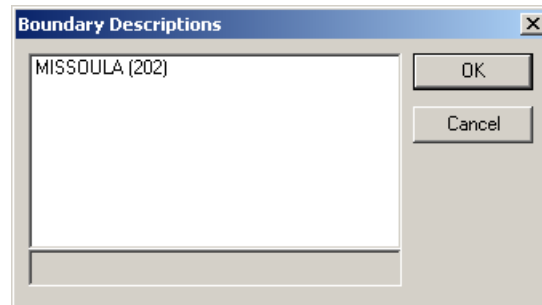


To make a copy of an existing boundary, first select the boundary or boundaries you want to copy (see “Selecting Objects on the Map” on page 38). Choose the Copy Boundaries tool or choose Planning from the menu bar and choose Copy Boundaries. Gismo Boundary Planning makes a copy of each selected boundary, giving them the name “Copy of [name of original boundary].” You can use the Boundary Descriptions command to change the names (see the next section).

Renaming Boundaries



To rename an existing boundary, choose the Boundary Descriptions tool or choose Planning from the menu bar and choose Boundary Descriptions.



Select the boundary you want to rename. The boundary name appears in the text box at the bottom of the dialog box. Modify the name as desired and choose OK.

Splitting Boundaries

Boundary Planning allows you to split boundaries into smaller boundaries if you wish. The Split function automatically creates new names for the resulting boundaries. If you split a boundary into four pieces, you will get four boundaries with names like Split Boundary 0, 5/6/02, 12:50pm, Split Boundary 1, 5/6/02, 12:50pm, and so on.

To split a boundary, first display the boundary and the street segments. Select the streets or segments where you want to split the boundary (see “Selecting Objects on the Map” on page 38).



Choose the Split tool or choose Planning from the menu bar and choose Split. Boundary Planning divides the boundary along the streets or segments you selected.

Joining Boundaries

Boundary Planning allows you to join boundaries into a single boundary if you wish. To join boundaries, first display and select the boundaries you want to join (see “Selecting Objects on the Map” on page 38).



Choose the Join tool or choose Planning from the menu bar and choose Join. Boundary Planning combines the boundaries you selected.

Deleting Boundaries

Boundary Planning allows you to delete boundaries you no longer need. To delete boundaries, first display and select the boundaries you want to delete (see “Selecting Objects on the Map” on page 38).



Choose the Delete Boundaries tool or choose Planning from the menu bar and choose Delete Boundaries. In the Delete Boundaries dialog box, select the desired boundaries and choose Delete. Choose Yes from the message box asking for confirmation.

Changing the Appearance of Edit Boundaries

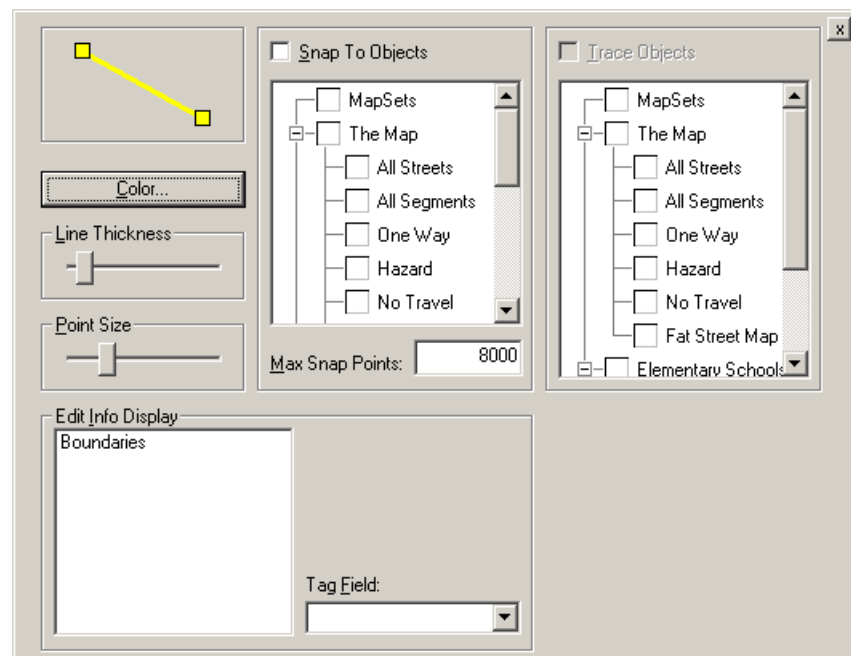
You can use the Edit Configuration dialog box to change the appearance of the boundaries you are creating or modifying. First, display and select the boundary (or boundaries) you want to modify. (See “Selecting Objects on the Map” on page 38 for further information.)



Make sure Boundaries appears in the Object Class field in the Edit toolbar. If it doesn't, click the field and select Boundaries from the list. Choose the Edit Objects tool (or choose Edit Selected Objects from the Edit menu) to change to the Edit mode.



Click the Edit Configuration arrow in the Edit toolbar (or choose Edit from the menu bar and choose Edit Configuration).



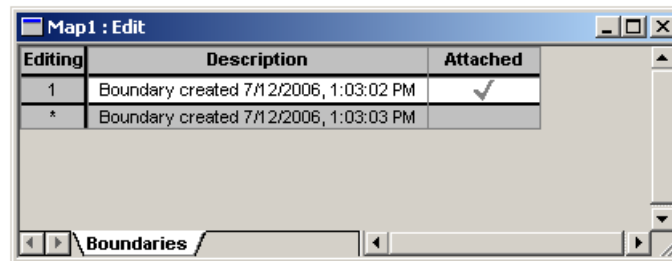
The current appearance of the lines and points used to display the boundary appears in the illustration in the upper-left corner of the Edit Configuration dialog box.

To change the color of the boundary, choose the Color button, then select the desired color and choose OK. To change the thickness of the boundary lines, drag the Line Thickness bar until the lines in the illustration are at the desired thickness. To change the size of boundary points, drag the Point Size bar.

Click the Close tool (labeled with an X) in the upper-right corner of the dialog box when the illustration in the dialog box reflects how you want the boundaries to appear.

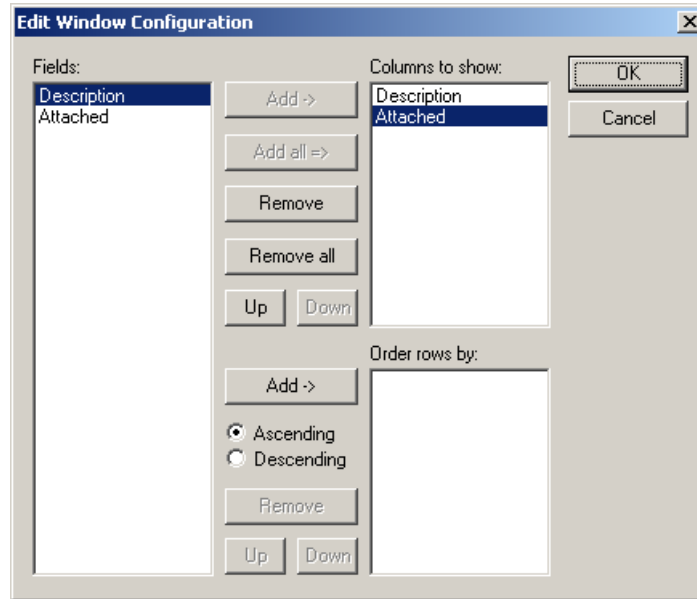
Viewing an edit window

As you are editing or creating geographic objects, you can use the Edit window to examine the fields of information associated with those objects. To view an edit window, choose the Edit Window tool in the Edit toolbar or choose Window from the Edit menu.



The Edit Window lists information on the objects you are editing or creating in a layout similar to an analysis window with a regular query (see “Viewing an Analysis Window” on page 43). If you want to modify the layout of the edit window, choose the Configure Edit Window tool in the Edit toolbar or choose Window Configuration from the Edit menu.





The Edit Window Configuration dialog box functions like the Query Editor. See “Examining Regular Queries” on page 54 for further information on making your field, sort, and layout choices.

After you have opened the Edit window, you can switch back and forth between the map display and the Edit window either by pressing CTRL + TAB on your keyboard, or by choosing Window from the menu bar, then choosing either the Map or the Edit window from the Window menu. If you tile windows in the application, you can click anywhere on either window to make it active.

When you want to close the Edit window, click the Close tool (labeled with an “X”) in the upper-right corner of the window.

Updating your Master Data

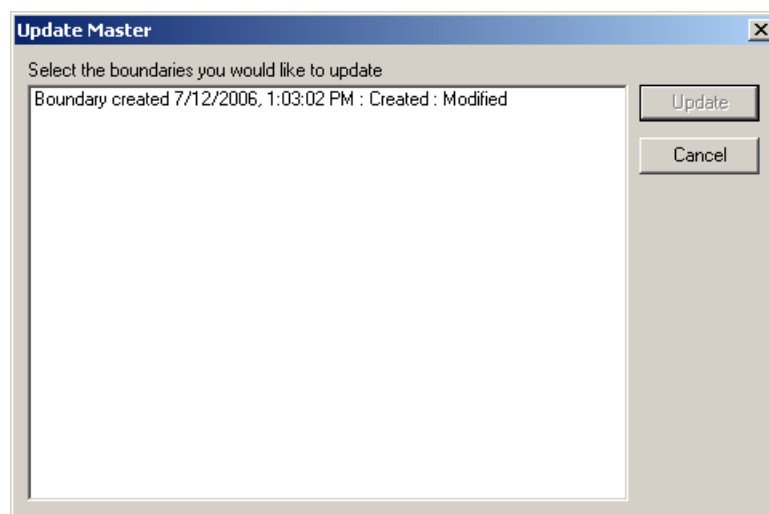
We refer to the regular edulog data as the master data. In Boundary Planning, you work with snapshots of that master data called datasets. A dataset simply indicates which schools, boundaries, and students you are currently working with. You can set up a variety of datasets for your different boundary planning goals. Datasets allow you to freeze the data in its current state for planning purposes. Any changes made to the master data during this planning will not impact your work (and vice versa).

When you are satisfied with your boundaries, you can save them as your actual (master) data. Up to that point, all your work is limited to the Boundary

Planning dataset. When you update your master data, you can use those boundaries to determine student transportation eligibility.



To update your master data, choose the Update Master tool or choose Planning from the menu bar and choose Update Master.



The Update Master dialog box lists any boundaries you created or modified. Select the boundaries you want to update from the list (you can CTRL + click and SHIFT + click to select multiple boundaries). Choose Update.

Your boundaries are saved in your master data, replacing the boundaries you modified with those in the dataset and adding any boundaries you created. It does not affect the boundaries that were not included in the dataset.

CREATING AND MODIFYING BOUNDARY GROUPS

Boundary Planning allows you to define groups of boundaries for quick access. For example, you may want to display scenario 1 attendance boundaries then scenario 2 attendance boundaries or you may want to display them both at once to compare the two versions. You may want to display attendance boundaries and walk boundaries together to perform eligibility tallies. You may also want to display attendance boundaries when drawing planning zones to avoid splitting zones between two boundaries. The possibilities are endless.

Boundary groups are not global. That is, they are not part of your regular data. They are only part of the dataset and each dataset can have its own boundary groups. For example, if you include schools 100-105 in a dataset, you might

create boundary groups for all boundaries, attendance boundaries, walk boundaries, attendance boundaries for scenario 1, and attendance boundaries for scenario 2 in that dataset. You can use boundary groups to display dataset boundaries (see “Displaying Dataset Boundaries” on page 75).

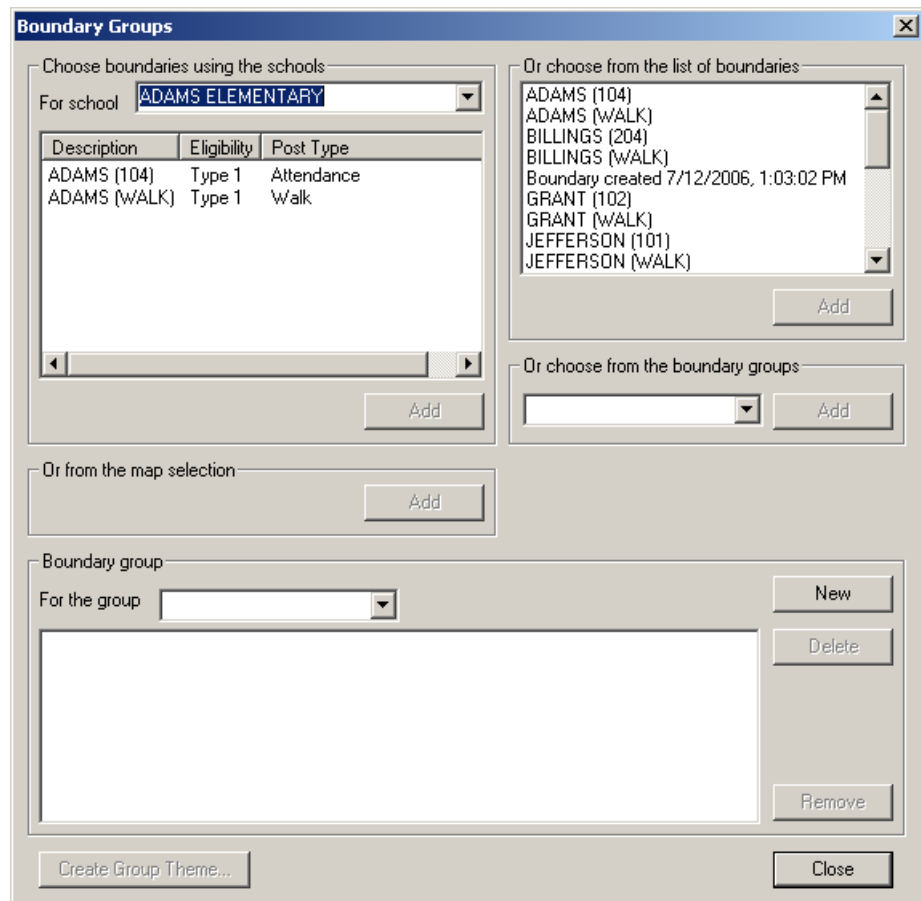
Creating Boundary Groups

You have several ways of choosing which boundaries to include in a group. You can add boundaries:

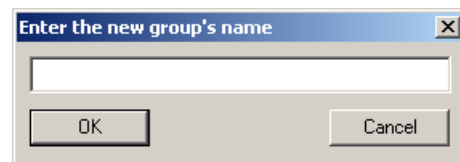
- from the entire list of boundaries
- from the boundaries posted to a particular school
- from boundaries selected on the map (you will first need to display and select the desired boundaries—see “Selecting Objects on the Map” on page 38)
- from other boundary groups.



To create a boundary group, choose the Boundary Groups tool or choose Planning from the menu bar, then choose Boundary Groups.



Choose the New button.



Type a name for the new group and choose OK. If you want to add the boundaries for a particular school, click the arrow next to the From School field in the Boundary Groups window and select the desired school. The boundaries for that school appear in the list box beneath the field. Select the desired boundaries from the list. You can select multiple boundaries by CTRL + clicking or SHIFT + clicking. Choose the Add button beneath the list. As you add boundaries, they appear in the list at the bottom of the dialog box.

If you want to add boundaries from the list of all the boundaries in the dataset, select the desired boundaries from the list in the upper-right corner of the dialog box. Again, you can select multiple boundaries by CTRL + clicking or SHIFT + clicking. Choose the Add button under this list.

If you want to add boundaries from other boundary groups, click the field under “Or choose from the boundary groups” and select the desired boundary group. Choose the Add button next to this field. If you want to add boundaries from those selected on the map, choose the Add button under “Or from those selected on the map.”

If you decide you want to remove a boundary from the group, select it from list at the bottom of the window and choose Remove. Choose Close when you are finished.

Modifying Boundary Groups



To modify a boundary group, choose the Boundary Groups tool or choose Planning from the menu bar, then choose Boundary Groups.

Description	Eligibility	Post Type
ADAMS (104)	Type 1	Attendance
ADAMS (WALK)	Type 1	Walk

Click the For the Group field toward the bottom of the dialog box and select the desired boundary group.

If you want to add boundaries for a particular school, click the arrow next to the From School field and select the desired school. The boundaries for that school appear in the list box beneath the field. Select the desired boundaries from the list. You can select multiple boundaries by CTRL + clicking or SHIFT + clicking. Choose the Add button beneath the list. As you add boundaries, they appear in the list at the bottom of the dialog box.

If you want to add boundaries from the list of all the boundaries in the dataset, select the desired boundaries from the list in the upper-right corner of the dialog box. Again, you can select multiple boundaries by CTRL + clicking or SHIFT + clicking. Choose the Add button under this list.

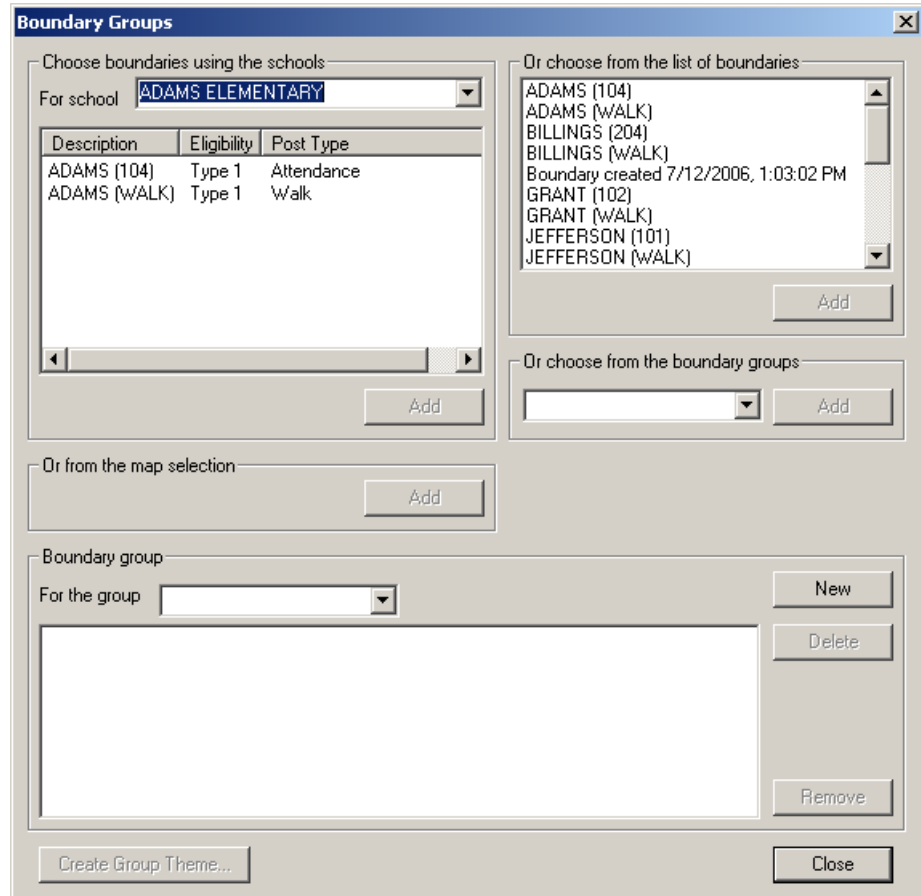
If you want to add boundaries from other boundary groups, click the field under “Or choose from the boundary groups” and select the desired boundary group. Choose the Add button next to this field. If you want to add boundaries from those selected on the map, choose the Add button under “Or from those selected on the map.”

If you want to remove a boundary from the group, select it from list at the bottom of the dialog box and choose Remove. Choose Close when you are finished.

Deleting Boundary Groups

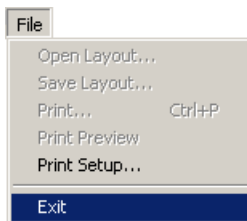


To delete a boundary group, choose the Boundary Groups tool or choose Planning from the menu bar, then choose Boundary Groups.



Click the For the Group field toward the bottom of the dialog box and select the boundary group you want to delete. Choose the Delete button. Choose Yes from the message box asking for confirmation. Choose Close when you are finished.

LEAVING GISMO BOUNDARY PLANNING



When you want to exit the Boundary Planning program, choose File from the menu bar, then choose Exit. If you changed any objects or created new ones, a message box appears asking if you want to save them. Choose Yes if so.

Switch to the BPServer window. Wait for a moment for BPServer to close any datasets you had open. Make sure all datasets are closed (the list box appears empty) before you exit BPServer. Click the Close tool (labeled with an X) in the upper-right corner of the dialog box to close the BPServer window.

The potential and diversity of Gismo is evident. You can perform a variety of tasks, ranging from mapping students thematically by school, grade, and grade-point average to selecting students by school and grade to obtain tally information. You can use boundaries to select stops and students or to produce reports and plots. You can produce a plot displaying runs that take longer than 30 minutes, then print a report listing those runs. The possibilities are endless. Feel free to experiment with the available functions and consider how you can use them to make your job easier.