



US EPA ARCHIVE DOCUMENT

SMART GROWTH INDEX[®] A Sketch Tool for Community Planning

Version 2.0 Getting Started Guide

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1. Introduction

Smart Growth INDEX (SGI) is a GIS-based sketch tool for supporting community planning. As shown in Figure 1.1, it is designed to analyze static (single point in time) sketches created by users. SGI evaluates sketches with a set of indicators that measure land-use, transportation, and environmental characteristics of the sketch area. Users may compare sketches to existing conditions, future goals, and to alternative sketches with weightings of indicator importance. Sketches may simulate a current point in time or a future year, such as a 20-year planning horizon.

The Getting Started Guide is intended to help new SGI users get up and running quickly. It is designed for both general and advanced users. Advanced users designated by their organizations as SGI "stewards" should also review the Steward Guide before installing and using the software.

The Getting Started Guide takes the new user through the following orientation steps:

- Sample sketch tour. This brief tour illustrates the tool's interface and highlights its major functions.
- Database preparation. This is a tutorial on populating SGI's database with local GIS shapefiles.
- Sketch creation and evaluation. The tutorial continues with step-by-step instruction on building sketches, running the model, and reporting results.
- Additional learning exercise. To test SGI skills, a six-step learning exercise is outlined.

In addition to the Getting Started Guide, new users should review the Indicator Dictionary and Community Process Guide to gain complete familiarity with SGI.

Land-Use Shapefile Terminology

Much of SGI's modeling deals with land-use shapefiles, and for that reason it is important that new users understand the terminology used to distinguish the following three types of land-use shapefiles used in SGI:

Base Land-Use. These parcel-level shapefiles are used in base sketches to represent baseline conditions that alternate sketches can be measured against. Base sketch land-use can either be existing land-use in an area, or it can be a baseline concept of proposed uses, e.g. an initial development proposal for a greenfield area.





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- Alternate Land-Use. These parcel-level shapefiles are used in alternate sketches to represent uses that are alternatives to base sketch uses. When the base sketch represents existing conditions, alternate sketch land-uses often represent alternative planning scenarios that can be compared to existing conditions. In cases where the base sketch represents a baseline development proposal for a greenfield area, alternate sketch uses often represent alternative designs of the development proposal.
- Planned Land-Use. The term "planned" is used to denote land-use shapefiles that represent official plan designations that govern development in a sketch area. These shapefiles are used by indicators that score sketch consistency with applicable plans. At the user's discretion, if these are parcel-level shapefiles they may also be used for the base or alternate land-use purposes described above, e.g. planned land-use could be used for base sketch land-use in evaluating an area's current adopted plan; or planned land-use could be used for alternate sketch land-use when the adopted plan is being reevaluated among several alternative plans.

GIS Software Requirements

SGI is built as a MapObjects/Visual Basic application that operates on its own without standard GIS platforms like ArcView or ArcGIS. However, SGI does require GIS files in shapefile format, so access to an ESRI GIS is necessary for efficient operations.

2. Installing SGI

Installation of SGI should be accomplished with the assistance of advanced users designated by the organizations as SGI "stewards." Detailed guidance on installation procedures is given in the Steward Guide.

3. <u>Touring SGI</u>

This section introduces the new user to SGI with a tour of its interface and main functions. This is not an exhaustive tour of all SGI details, but rather a quick orientation of highlights. The primary objective is familiarization with SGI's interface. A detailed step-by-step tutorial follows the tour. Both the tour and tutorial use illustrative data from South Burlington, Vermont.

Starting the Application

Start SGI by clicking on the desktop icon or SGI in your Windows list of installed programs. The startup screen will appear. The start-up screen provides entry points into SGI's two main components: 1) the Database that contains all shapefiles needed for supporting sketches; and 2) the Snapshot Sketch modeler that performs a static (single point in time) analysis of a user-created scenario.



Viewing the Database

Snapshot sketches are assembled from shapefile information in the Database. The Database can contain as much of the user organization's geography as desired. Click the Database icon and the Database window appears; the image shown below has been supplemented with labels explaining the major pieces of the SGI interface. This interface design is used throughout SGI. The Database window is empty because the first task in the following tutorial is populating the Database with shapefiles.



The Database menu bar has three pull-down menus: File, containing shapefile and exit commands; Map, for controlling map layers; and About, containing software registration information. The tool bar includes the following buttons:



Close the Database window to exit the Database and return to the start-up screen.

Viewing a Tour Sketch

On the startup screen, click the Snapshot Sketch icon and the Sketch Manager window appears. The sketch manager window gives access to the following functions: 1) all new sketches are started in the New Sketch Properties frame; 2) all Existing Sketches are listed with applicable metadata; 3) sketches can be Opened, Copied, Deleted, or Exited; and 4) the sketch rating and weighting (RAW) functionality can be applied through the Rating and Weighting frame.

Name	Description	Creator	Date Created	Last Viewed	Sketch Type	Base Sketch	Units
ïour Sketch	S: Burlington, VT- cit	Criterion	10/17/2002	10/17/2002	Base	*******	Metric (meter
<u>O</u> pen <u>11</u> 6	w Copy Delet	;	sit	Sketch Prop Name:	erties		
Open Ne Rating and Weigh Weight/Compare	w <u>Copy</u> Delet Sketches RAW 1	e E	st New	Sketch Prop Name: Creator:	erties		
Open Ne Rating and Weigh Weight / Compare Select a RAW Set to (None - use RAW M	w Copy Deleti ating Sketches RAW I Use for Sketch Comparison anager to create	€ E	gt New	Sketch Prop Name: Creator: Description:	erties		
Open Neigh Rating and Weigh Weight//Compere Select a BAW Set to [None - use RAW M	W Eopy Delek ting Sketches RAW Use for Sketch Comparison: anaget to create)	a E	sit New Sha	Sketch Prop Name: Creator: Description: spefile Units:	erties	(feet)	Metric (meters)
Open Meigh Rating and Weigh Weight//Compare Select a RAW Set to (None - use RAW M	W Gopy Delek ting Sketches RAW I Use for Sketch Comparison: anager to create)	e E	Sha	Sketch Prop Name: Creator: Description: pefile Units: ketch Type:	etties	(feet) f	Metric (meters) Alternate

Select the Tour Sketch in the Existing Sketches list box and click the Open button. The Sketch window appears. This window's layout is the same as the Database window. The exceptions are additional menus and tools in the menu and tool bars; and the treeview in the upper left pane is configured for the snapshot modeling process.



Menu Bar

> The Menu Bar contains the following pull-down menus:

Eile Sketch Shapefiles Sketch Area Parameters Model Indicators Map About

In addition to File, Map, and About that appeared on the Database menu bar, when working on a sketch the following additional menus are enabled: Sketch Shapefiles, Sketch Area, Parameters, Model, and Indicators. These menus access the same treeview nodes that are described below for the Sketch Treeview. In addition to the buttons found on the Database window, the Tool Bar now contains the following tools that are enabled when working on sketches:

	4	
Select	Draw	Clear
Active	Graphic	Selected
Layer		Feature
Feature		or Graphic

Sketch Treeview

The sketch treeview in the upper left pane is intended as the primary interface device for operating SGI. It is operated by single-clicking to expand (open) and collapse (close) its nodes; and by double-clicking on the lowest tier nodes to open files or dialogs. Holding the mouse

button down on a shapefile in the treeview allows it to be dragged and dropped elsewhere on the interface. When expanded, the treeview appears as follows:

The treeview contains the following nodes organized to follow the general sequence of sketching:

- Sketch shapefiles. The user populates this node with shapefiles from the read-only version of the Database for the vicinity where a sketch is intended.
- Sketch area. The user defines a specific sketch area boundary.
- User-defined parameters. These are non-spatial inputs for defining various sketch parameters.
- Apply model. Inputs are verified, and indicators are selected and calculated.
- Indicators. Indicator results are viewed in numeric and map form.
- Database. This is the read-only version of the Database used for retrieving shapefiles desired for a sketch.

👉 Smart Growt	h INDE	X 2.0			
Eile Sketch Shap	efiles	Sketch Area	Parameters	Model	Įn
2 Data	smle				
	× /1 ×				_
Snapshot Skel	Char	Flag			
Sketch	1 Shape	ernes			
	Lanu	Discondition	ad line .		
		Pase Land	Ilee		
		Employment	0.050		
-		Employmen	N Centers		
E E		Parks and	Schools		
E E		Schools an	d Daucare Cer	nters	
E E		Key Servic	e Amenities	noro-	
(F)		Central Bur	iness District		
- ·	Trave	1			
Ū 🗰	- 0	Street Cent	erlines		
Đ		Bicycle Ro	utes		
Đ	- 4	Transit Rou	ites		
	- 0	Transit Sto	ps		
Đ	- 0	Light Rail T	ransit Stations		
B *	Enviro	onment			
Ð	- 0	Hydrologic	Soils		
Ð		Stormwater	BMPs		
	Local	Govt Bounda	ries		
0	Other				
	Sketc	h			
E Sketch	n Area				
- 0	Sketc	h Boundary			
	Centra	al Nodes			
🕒 🖳 User D	efined	Parameters			
0	Snap	shot Year			
0	Popul	lation			
	Parce	I Developmer	nt		
	Reso	urces and Em	issions		
	SGW	ATER Applica	noite		
	Intras	tructure			
Apply I	Model				
	Venty	Inputs			
- Indeas	nunn	roder			
- Indica	India	Jor Coores			
	Land	Area Allocatio	-		
Datab	ace.		A 60		
	Land-	lise			
	Trave	4			
	Enviro	onment			
- •	Local	Govt Bounda	nies		
	Other				
Metadata					
Property	Val	ue		T	
Sketch Name:	To	ur Sketch			
Sketch Creator:	Crit	erion			

Viewing Maps

- On the treeview, expand the nodes for Sketch Shapefiles, Land-use, and Planned Land-Use. Single-click the PLU shapefile that you have exposed, hold the mouse button down, drag the shapefile over to the legend pane, and release the mouse button.
- Click the check box for the PLU shapefile on the legend pane and the PLU layer will now appear on the legend and map panes:

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Expand the Travel and Street Centerlines nodes in the treeview, and drag the STR_CL shapefile onto the legend pane. When you click the checkbox next to STR_CL in the legend pane, the map changes. The last shapefile dragged onto the legend pane is automatically placed as the uppermost map layer. Once a shapefile has been dragged onto the legend pane, the user can modify the order of layers by dragging and dropping layers vertically within the legend pane. In this way, you can build maps with several layers presented as you desire.



Clearing Maps

Under the Map menu, the map pane can be cleared of either single active layers or all layers. Click Remove All Layers and the map pane is now empty.

Loading Previously Saved Maps

> Under the Map menu, click the Load Map option and the following dialog appears:

	<u>⊇</u> ave:
Available Maps	Load
Parcels w/ streets, emps	Delete
	Cancel

Select the "Parcels with Streets, Emps" map, click the Load button, and the map and legend panes change to appear as follows:



Defining a Sketch Area

On the treeview, expand the Sketch node and drag the SKETCHBD file onto the legend pane. This illustrates a sketch area boundary previously created by selecting several adjoining features in the area of interest. SGI indicators are calculated for parcels inside the sketch boundary. However, users should supply shapefiles for a reasonable distance surrounding the sketch boundary because SGI searches for features relevant to a sketch that may lie outside the sketch boundary, e.g. a bus stop outside the boundary may be the closest transit stop for dwellings inside the boundary edge.



Setting User-Defined Parameters

On the sketch treeview, expand the User-Defined Parameters node, double-click the Population node, and the following dialog appears. This sample illustrates one of a series of forms that allow users to define sketches with either defaults or unique local values describing a variety of sketch parameters. Click the Cancel button to close the window.

Commuteshed Population:	146571	
Commuteshed Employment	79000	
verage Persons/Workers Per House	nold	
	Persons	Workers
Single Family	2.66	1.4
Mobile Home	2.08	1.4
Multi-Family 2-4 units	2.08	1.4
Multi-Family 5+ units	2.08	1.4
Group Quarters	: 2	0.4

Applying the Model

On the sketch treeview, expand the Apply Model node, double-click the Run Model node, and the following dialog appears. This illustrates the user's selection of indicators for a particular model run. Users may select any number of indicators for a particular run based on relevance to the sketch purpose and data availability. Click the Cancel button to close the window.

Land-Use (S100 Series)	Environment (\$400 Series)		
S100: Population Density	S400: Imperviousness		
S101: Land-Use Mix	S401-S404: SGW/ATER Runoff/Pollutants		
S102: Parcel Size	S407: Open Space		
S103: Developed Acres	🔽 S408: Park Space Availability		
Housing (S200 Series)	Infrastructure (S500 Series)		
S200: Conforming Dwelling Density	S500: Residential Wastewater Production		
S201: Non-Conforming Dwelling Density	S501: Non-residential wastewater Production		
S202-S206: Housing Shares	S502: Street Centerline Distance		
S207: Proximity To Transit	Travel (S600 Series)		
S209: Proximity To Education	S600: Sidewalk Completeness		
S210: Proximity To Key Services/Amenities	S601: Pedestrian Boute Directness		
S211: Multi-Modal Access	S602: Street Network Density		
S212: Proximity to Employment Centers	S603: Street Connectivity		
S213: Water Consumption	S605: Bicycle Route Network.		
S214: Energy Consumption	S606: Transit Service Coverage		
and the set of the set	S607: Regional Accessibility		
Employment (S300 Series)	S608-S609. Vehicle Trips		
S300: Employment Count	S610-S611 Vehicle Miles Traveled		
S301: Jobs/Workers Balance	🖵 6612 Palking Demand		
S302: Conforming Employment Density	🞵 3613 Palking Supply		
S303: Non-Conforming Employment Density	S614: Transit Service Density		
S304: Proximity To Transit	S615: Light Rail Transit Boardings		
Land Area Allocation Summaries	Air Quality Climate Change (S700 Series		
🔽 Existing Land-Use 🔽 Planned Land-Use	S700-S704: Criteria Pollutants		
Add aslacted indicators to province run ast	S705: Greenhouse Gas Emissions		
Back Bun Cancel			

Viewing Indicator Results

Expand the Indicators node on the treeview, double-click the Indicator Scores node, and the Indicators window appears with results for the sample sketch:



The Indicators window presents calculated indicators according to their identification number, name, numeric score, unit of measurement, and a "Y/N" notation of indicator map availability. Double-clicking on any indicator denoted with a "Y" will automatically generate parcel-level mapping of indicator results. Double-click the Population Density indicator in the Indicators window. The Indicator window shifts its position and the map and legend panes are loaded with the Population Density map:



This completes the sample sketch tour. Close the Sketch and Sketch Manager windows, and return to the SGI start-up screen to begin the tutorial that follows.

4. <u>Preparing the Database</u>

Beginning with this section, the remainder of the Getting Started Guide presents a tutorial that leads the new user through all of SGI's components and functions. In the course of the tutorial, you will populate the Database, create a Base Sketch, an Alternate Sketch, and a RAW comparison of the two sketches.

The first step in the tutorial is preparing SGI's Database. The Database is intended to hold shapefiles for any area that may be the subject of a sketch. For example, cities or counties could load shapefiles for their entire jurisdiction and then be capable of sketching anywhere in their jurisdiction. Alternatively, areas can be added incrementally to the Database to support sketching on an as-needed basis.

Data requirements for sketches are determined by indicator selection. As with geography, users may populate the Database for the entire range of indicators that can be used in sketching, or shapefiles can be added on an as-needed basis according to sketch-by-sketch indicator selection. Each indicator's data requirements are itemized in the Indicator Dictionary. Table 4.1 lists all shapefiles and attributes, and the indicators they affect.

Aside from geographic and indicator considerations, the other task in populating the Database with local shapefiles is assigning local attributes to SGI's required shapefile fields. For example, of a locality's uniquely-named classifications for residential uses, SGI needs to know which are single-family and which are multi-family.

Each shapefile has a specific function and must be placed in a specific location in the Database. As mentioned above, some shapefiles also require assignment of their attributes to SGI's required fields. When adding land-use shapefiles to the Database, keep the following terminology distinctions in mind for the three types of land-use polygon shapefiles used by SGI:

- Base Land-Use. These parcel-level shapefiles are used in base sketches to represent baseline conditions that alternative sketches can be measured against. Base sketch land-use can either be existing land-use in an area, or it can be a baseline concept of proposed uses, e.g. an initial development proposal for a greenfield area.
- Alternate Land-Use. These parcel-level shapefiles are used in alternate sketches to represent uses that are alternatives to base sketch uses. When the base sketch represents existing conditions, alternate sketch land-uses often represent alternative planning scenarios that can be compared to existing conditions. In cases where the base sketch represents a baseline development proposal for a greenfield area, alternate sketch uses often represent alternative designs of the development proposal.

Table 4.1 INDICATORS BY SHAPEFILE AND ATTRIBUTE

Shapefile	Shapefile Attributes	-	
Bike route centerline (line)	Year of establishment (4-digit year).	S211:	Dwellings within 1/8 mi. of 3+ modes
		S605:	Bicycle network
Central business district (point)	None.	S615:	Rail transit boardings
Employment establishments	Employee count (integer).	S100:	Population density
(point)		S103:	Developed acres per capita
		S104:	Land-use diversity
		S300:	Employment
		S301:	Jobs/housed workers balance
		S302:	Conforming employment density
		S303:	Non-conforming employment density
		S304:	Employment proximity to transit
		S501:	Nonresidential wastewater production
		S608:	Home-based vehicle trips (alt case)
		S609:	Non-home-based vehicle trips (alt case)
		S610:	Home-based vehicle miles traveled (alt case)
		S611:	Non-home-based vehicle miles traveled (alt case)
		S615:	Rail transit boardings
Employment centers (point)	None.	S212:	Housing proximity to employment center
Key amenities (point)	Year of establishment (4-digit year).	S210:	Housing proximity to key amenities
Light rail stations (point)	Is terminal station (boolean: Y/N).	S615:	Rail transit boardings
	Has parking (boolean: Y/N).	S615:	Rail transit boardings
Parcel land-use (base &	Land-use class (string).	S101:	Use mix
alternate) (polygon)		S102:	Average parcel size
		S400:	Imperviousness
		S401:	Stormwater runoff
		S402:	Total suspended solids
		S403:	Phosphorus
		S404:	Nitrogen

Table 4.1 Continued

Shapefile	Shapefile Attributes	
Parcel land-use Continued	Land-use class Continued	S407: Open space
		S612: Parking demand
	Dwelling unit structure type (string).	S100: Population density
		S103: Developed acres per capita
		S202: Single-family housing share
		S203: Mobile home housing share
		S204: Multi-family 2-4 housing share
		S205: Multi-family 5+ units housing share
		S206: Group quarters housing share
		S214: Residential energy consumption
		S301: Jobs/housed workers balance
		S400: Imperviousness
		S500: Residential wastewater production
		S608: Home-based vehicle trips (alt case)
		S609: Non home-based vehicle trips (alt case)
		S610: Home-based vehicle miles traveled (alt case)
		S611: Non home-based vehicle miles traveled (alt case)
		S615: Rail transit boardings
	Dwelling unit count (integer).	S100: Population density
		S103: Developed acres per capita
		S200: Conforming dwelling density
		S201: Nonconforming dwelling density
		S202: Single-family housing share
		S203: Mobile home housing share
		S204: Multi-family 2-4 housing share
		S205: Multi-family 5+ units housing share
		S206: Group quarters housing share
		S207: Housing proximity to transit
		S208: Housing proximity to recreation
		S209: Housing proximity to education
		S210: Housing proximity to key amenities
Parcel land-use Continued	Dwelling unit count Continued	S211: Dwellings within 1/8 mi. of 3+ modes

Table 4.1 Continued

Shapefile	Shapefile Attributes	-
		S212: Housing proximity to employment center
		S213: Residential water consumption
		S214: Residential energy consumption
		S301: Jobs/housed workers balance
		S400: Imperviousness
		S408: Park space availability
		S500: Residential wastewater production
		S612: Parking demand
		S615: Rail transit boardings
	Off-street parking space count (integer).	S613: Parking supply
	Building floor area in sq.ft. (integer).	S612: Parking demand
	Shapefile only – no attribute required.	S304: Employment proximity to transit
		S601: Pedestrian route directness
Parks and schools (polygon)	Year of establishment (4-digit year).	S208: Housing proximity to recreation
		S408: Park space availability
Planned land-use (polygon)	Land-use class (string).	S200: Conforming dwelling density
		S302: Conforming employment density
Schools and daycare facilities (point)	Year of establishment (4-digit year).	S209: Housing proximity to education
Soils (polygon)	NRCS hydrologic group type (string: A, B,	S401: Stormwater runoff
	C, or D).	S402: Total suspended solids
		S403: Phosphorus
		S404: Nitrogen
Stormwater best management	Percent removal for each BMP/pollutant set	S402: Total suspended solids
practices (a polygon for each	(integer).	S403: Phosphorus
BMP/location set)		S404: Nitrogen
Street centerlines (line)	Street width in ft. (integer).	S211: Dwellings within 1/8 mi. of 3+ modes
		S400: Imperviousness
		S401: Stormwater runoff
		S402: Total suspended solids
		S403: Phosphorus

Table 4.1 Continued

Shapefile	Shapefile Attributes	Indicators Affected
	Street width in ft. Continued	S404: Nitrogen
Street centerlines Continued	Sidewalk presence (integer: 0 = none; 1 =	S600: Sidewalk completeness
	one side of street only; 2 = both sides).	S608: Home-based vehicle trips (alt case)
		S609: Non home-based vehicle trips (alt case)
		S610: Home-based vehicle miles traveled (alt case)
		S611: Non home-based vehicle miles traveled (alt case)
	On-street parking space count (integer).	S613: Parking supply
	Shapefile only – no attribute required.	S207: Housing proximity to transit
		S208: Housing proximity to recreation
		S209: Housing proximity to education facilities
		S210: Housing proximity to key amenities
		S212: Housing proximity to employment center
		S502: Street centerline distance
		S601: Pedestrian route directness
		S602: Street network density
		S603: Street connectivity
		S605: Bicycle network
		S608: Home-based vehicle trips (alt case)
		S609: Non home-based vehicle trips (alt case)
		S610: Home-based vehicle miles traveled (alt case)
		S611: Non home-based vehicle miles traveled (alt case)
Transit routes (line)	Transit vehicles per day on route (integer).	S211: Dwellings within 1/8 mi. of 3+ modes
		S614: Transit service density
	Year of route establishment (4-digit year).	S211: Dwellings within 1/8 mi. of 3+ modes
		S614: Transit service density
Transit stops (point)	None.	S207: Housing proximity to transit
		S304: Employment proximity to transit
		S606: Transit stop coverage

Note: 1. No nulls are allowed in any record.

2. The attribute "year of establishment" is the year a feature became, or will become, operable; this allows planned future features to be recognized during future year simulations. If year recognition is not needed, the attribute can be set to NONE.

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3. Street centerlines must have perfect connectivity to support indicator calculations.

4. Shapefile names must conform to 8.3 file name format.

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Planned Land-Use. The term "planned" is used to distinguish land-use shapefiles that represent designations contained in official plans that govern development in a sketch area. These shapefiles are used by indicators that score sketch consistency with applicable plans. At the user's discretion, if these shapefiles are parcel-level they may also be used for the base or alternate land-use purposes described above, e.g. planned land-use could be used for base sketch land-use in evaluating an area's current adopted plan; or planned land-use could be used for alternate sketch land-use when the adopted plan is being reevaluated among several alternative plans. When the same shapefile will be used for Planned Land-Use and Base or Alternate Land-Use, the shapefile should be copied and renamed. One copy of the shapefile can then be added as the Planned Land-Use and the other copy added as the Base or Alternate Land-Use.

Opening the Database

Start SGI and the startup screen will appear:



Click the Database icon and the Database window will open:



Adding Shapefiles to the Database

Expand the Land-Use node, double-click the sub-node Planned Land-Use and a Windows file dialog appears. Within the dialog, navigate to the SGI application folder (by default, "C:\Program Files\Criterion\Smart Growth 2"), open the "Tutorial Data" folder, and the dialog changes to appear as follows:



Select the shapefile called "PLU.shp", click Open, and the following dialog appears:

Note that the Filename text box contains the name of the file you just selected, without the extension ".shp". This will be the case with every shapefile you add.

Filename	PLU	
nienane,		
Description		
Attributes		
Planned Land-Use:	NONE	

Enter a file description. Then select the local attribute name ZONE in the combo box to the right of SGI's Planned Land-Use field. This will assign the local attribute ZONE to SGI's Planned Land-Use field:

Filename:	PLU
Description	S. Burlington, VT
Attributes	I
Planned Land-Use:	ZONE

🗃 Database

Land-Use

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Planned Land-Use PLU Base Land-Use Alternate Land-Use

Employment

 Click OK to save your entry. The Database treeview now shows the shapefile under the Planned Land-Use node:

Shapefiles may be added, deleted, or viewed using either the File menu or by right-clicking the
mouse to access a similar menu. If you make a mistake while choosing attributes for the fields
of a shapefile, you may double-click the shapefile in the Database treeview to edit shapefile
properties. If you do not discover a shapefile mistake until you are creating a sketch, you must
return to the Database to correct the mistake.

Adding Remaining Shapefiles to Database

The balance of this section contains dialogs for adding remaining shapefiles in the Tutorial Data folder to the Database. When making entries in the following dialogs, no nulls are allowed in any attribute field. The attribute "Year" is the four-digit year that a feature became or will become operable. This allows users to have certain planned future features recognized if a future year is being simulated; setting the field to NONE will result in a feature always being recognized regardless of the sketch year.

Base Land-Use	Base Land-Use	X
	FILL BASE	_
	Filename: 1222-0402	
	Description:	
The tutorial data purposely does not	Attributes	
include off-street parking spaces or	DU Lype DUTYPE	
non-residential building square footage, so	Base Land-Use: LANDUSE	
both attribute fields must be set to NONE	Off-Street Parking: NONE	
	NonHes Sq. Feet: NONE	
	<u>DK</u> <u>Cancel</u>	
Employment		
Employment	<pre>Employment</pre>	XI
	Filename: EMP_BASE	
	Description: B. Burlington, VT	
	Attributes	
	Employee Count: EMPCOUNT	
Employment Centers	Employment Centers	V
		2
	Filename: EMPCT	2
	Filename; EMPCT Description: S. Burlington, VT	
	Filename; EMPCT Description: S. Burlington, VT	4
	Filename: EMPCT Description: S. Burlington, VT	ব
	Filename; EMPCT Description: S. Burlington, VT	4
	Filename: EMPCT Description: S. Burlington, VT	(
	Filename: EMPCT Description: S. Burlington, VT	< 1
	Filename: EMPCT Description: S. Burlington, VT	<
	Filename; EMPCT Description: S. Burlington, VT	
Parks and Schools	Filename: EMPCT Description: S. Burlington, VT QK Qancel Parks and Schools	X
Parks and Schools	Filename: EMPCT Description: S. Burlington, VT QK Cancel Parks and Schools EKSCH	X
Parks and Schools	Filename: EMPCT Description: S. Burlington, VT QK Qancel Parks and Schools Filename: PKSCH B. Burlington, VT	X
Parks and Schools	Filename: EMPCT Description: S. Burlington, VT QK Cancel Parks and Schools Filename: Filename: FKSCH Description: B. Burlington, VT	X
Parks and Schools	Filename: EMPCT Description: S. Burlington, VT QK Qancel Parks and Schools Filename: Filename: PKSCH Description: S. Burlington, VT Attributes Employee	X
Parks and Schools	Filename: EMPCT Description: S. Burlington, VT QK Cancel ✓ Parks and Schools Filename: Filename: PKSCH Description: B. Burlington, VT Attributes Year: Year: YEAR	X
Parks and Schools	Filename: EMPCT Description: S. Burlington, VT QK Çancel Parks and Schools Filename: Filename: PKSCH Description: B. Burlington, VT	X
Parks and Schools	Filename: EMPCT Description: S. Burlington, VT QK Cancel Parks and Schools Filename: Filename: PKSCH Description: B. Burlington, VT Attributes Year: Year: YEAR	X
Parks and Schools	Filename: EMPCT Description: S. Burlington, VT	X

Schools and Davcare Centers	Schools and Daycare Centers
	Element SCHDC
	Description: S. Burlington, VT
	Attributes
	Year: NONE
	0K Cancel
Key Services and Amenities	Key Service Amenities
	Filename: KEYSV
	Description: 5. Builington, 41
	Attributes
	Tear (YEAR
	<u> </u>
Central Business District	Central Business District
Central Business District	Central Business District Filename: CBD
Central Business District	Central Business District
Central Business District	Central Business District Filename: CBD Description: S. Burlington, VT
Central Business District	Central Business District Filename: CBD Description: S. Burlington, VT
Central Business District	Central Business District
Central Business District	Central Business District
Central Business District	Central Business District Filename: CBD Description: S. Burlington, VT
Central Business District	Central Business District Filename, CBD Description: S.Burlington, VT DK Qancel
Central Business District Street Centerlines	
Central Business District Street Centerlines Street centerlines must have perfect connectivity to support indicator	
Central Business District Street Centerlines Street centerlines must have perfect connectivity to support indicator calculations. The tutorial data set	
Central Business District Street Centerlines Street centerlines must have perfect connectivity to support indicator calculations. The tutorial data set purposely does not include on-street	
Central Business District Street Centerlines Street centerlines must have perfect connectivity to support indicator calculations. The tutorial data set purposely does not include on-street parking spaces, so that attribute field must be set to NONE for the tutorial.	✓ Central Business District Piename; Description: S. Burlington, VT Description: S. Burlington, VT ■K Cancel ✓ Street Centerlines S Filename; STR_CL Description: S. Burlington, VT Street Vidth STR_VDTH Street Width STRWIDTH Sidewalk Count: SIDEWALK On-Street Parking: NDNE

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Bicycle Routes	Bicycle Routes
.,	Filename BIKERTS
	Description: S. Burlington, VT
	<u>DK</u> <u>Cancel</u>
Transit Routes	Transit Routes
	Filename TRANRTS
	Description: S. Burlington, VT
	Yean VEAR
Transit Routes should include bus and rail	Vehicles/24hrs.: HEADWAYS
transit routes.	
	<u>D</u> K <u>C</u> ancel
Transit Stops	Transit Stops
Transit Stops	Transit Stops
Transit Stops	Transit Stops Filename: BUSSTOP Description: S. Burlington, VT.
Transit Stops	Transit Stops Filename: BUSSTOP Description: S. Burlington, VT
Transit Stops	Transit Stops Filename: BUSSTOP Description: S. Burlington, VT
Transit Stops Transit Stops should include bus and rail	Filename: BUSSTOP Description: S. Burlington, VT
Transit Stops Transit Stops should include bus and rail transit stops.	Transit Stops Filename: BUSSTOP Description: S. Burlington, VT
Transit Stops Transit Stops should include bus and rail transit stops.	Transit Stops Filename: BUSSTOP Description: S. Burlington, VT
Transit Stops Transit Stops should include bus and rail transit stops.	
Transit Stops Transit Stops should include bus and rail transit stops.	
Transit Stops Transit Stops should include bus and rail transit stops. Light Rail Transit Stations	
Transit Stops Transit Stops should include bus and rail transit stops. Light Rail Transit Stations	
Transit Stops Transit Stops should include bus and rail transit stops. Light Rail Transit Stations	
Transit Stops Transit Stops should include bus and rail transit stops. Light Rail Transit Stations	
Transit Stops Transit Stops should include bus and rail transit stops. Light Rail Transit Stations	▲ Transit Stops Filename: BUSSTOP Description: S. Burlington, VT Description: DK Cancel ✓ Light Rail Transit Stations Filename: LRT_STP Description: S. Burlington, VT Filename: LRT_STP Description: S. Burlington, VT Terminus: TEEMINUS
Transit Stops Transit Stops should include bus and rail transit stops. Light Rail Transit Stations	
Transit Stops Transit Stops should include bus and rail transit stops. Light Rail Transit Stations	✓ Transit Stops × Filename: ØUSSTOP Description: S. Burlington, VT DK Cancel
Transit Stops should include bus and rail transit stops. Light Rail Transit Stations	Filename: BUSSTOP Description: S: Burlington, VT DK Cancel
Transit Stops should include bus and rail transit stops. Light Rail Transit Stations	▼ Transit Stops × Filename: BUSSTOP: Description: S. Burlington, VT DK Çancel

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Hydrologic Soils	🍦 Hydrologic Soils		×
	Filename	HYDRO	
	Description	S. Burlington, VT	
	Attributes		
	NRCS hydrologic soil class:	HYDROGROUP	
		<u>DK</u> <u>Cancel</u>	

When you first double-click the Hydrologic Soils node, the following information dialog appears advising you that the NRCS group type must be entered as A, B, C, or D:

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٩	The NRCS soil class field should contain A, B, C or D. If multiple classes are present (e. n. $A(n, r, B(C), the right-most character (i.e., D, or C) will be assumed to be valid for all calculations.$
	СК

Click OK and complete the soil file description and attribute dialog.

Stormwater Best Mgmt. Practices	💣 Stormwater BMPs		×
	Filename	STORMBMP	
Stormwater best management practices	Description	S. Burlington, VT	
(BMPs) are user-created features defined	Attributes		
in three ways: 1) BMP type, e.g. grass	Percent TSS Removal:	TSS_EFF •	
swales, constructed wetlands, porous	Percent Phosphorus Removal:	Phos_EFF	
pavement; 2) spatial extent of the BMP in	Percent Nitrogen Removal:	Nit_Eff	
polygon form; and pollutant removal			
efficiency (%) of the BMP for each of three			
pollutants. The tutorial BMPs include			
infiltration trenches, constructed wetlands,		<u>OK</u> <u>C</u> ancel	
and water quality inlets at the removal		2 22 2	
efficiencies listed in Table 4.2.			

The Local Government node is not used in the tutorial. It is used when sketches are large enough to encompass multiple jurisdictions and users want to report results by jurisdiction. It is also possible to use a local government boundary as a sketch area boundary if the local government boundary coincides with the purpose of the sketch.

Table 4.2 STORMWATER BEST MANAGEMENT PRACTICE GUIDANCE

(BMP types and % pollutant removal)

ВМР Туре	Total Suspended Solids	Total Phosphorus	Total Nitrogen
Wet Ponds	90	65	48
Extended Detention Ponds	80	45	35
Grassed Swales	70	30	25
Filter Strips	70	40	30
Infiltration Trenches	85	65	60
Infiltration Basins	85	65	60
Sand Filters	80	60	40
Constructed Wetlands	90	65	48
Water Quality Inlets	30	5	5
Porous Pavement	90	65	85

Source: EPA/GKY

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The Other node in the Database is a location for shapefiles that may be used to supplement SGI-required shapefiles. For example, SGI does not require a "rivers and streams" shapefile, but you may wish to add such a feature to enhance SGI maps. Another use for the Other folder is storing shapefiles that coincidentally represent desired sketch area boundaries, e.g. traffic analysis zones or census tracts. For purposes of the tutorial, traffic analysis zones will be used to assemble a sketch boundary.

🛷 Other		2
Filename	SBurTAZ	
Description	5. Burlington, VT	
	DK Canod	

With the Database now prepared, close the Database window and return to the startup screen.

5. <u>Creating a Sketch</u>

You should now be back at the SGI startup screen, which displays the Database and Snapshot icons. If this is not open, start SGI and this screen will appear.

Creating a New Sketch

Click the Snapshot Sketch icon and the Sketch Management window will appear:

The Sketch Management window contains four functional areas:

- New Sketch Properties frame. Metadata is entered here for all new sketches, including sketch name; user creating the sketch; a brief description of the sketch; local shapefile units (SGI can accept U.S. or metric shapefiles, but results are only reported in U.S. units); type of sketch (base or alternate); and a listing of previous base sketches to which new alternate sketches can be linked.
- Sketch management buttons. These buttons add new sketches to the stored roster of existing sketches, and allow for opening, copying, deleting, and exiting sketches.
- Existing sketches list. This is a roster of all existing sketches and their metadata. Selecting an existing sketch and clicking the Open button allows access to the sketch.
- Rating and Weighting frame. These buttons and selection list enable access to SGI's rating and weighting function, which is detailed in Section 11 of the Guide.

lame	Description		Creator	Date Created	Last Viewed	Sketch Type	Base Sketch	Units
our Sketch	5. Burlingtor	n, V I - Cit	Unterion	10/17/2002	10/18/2002	Base		Metric (meter
Open New	Сору	Delete	E;	sit	Sketch Prop Name:	erties		
Open New ating and Weightin Weight//Compare Sk	g etohes	Delete RAW M	E:	st	Sketch Prop Name: Creator:	erties		
Open Mew ating and Weightin Weight //Compare Sk elect a RAW Set to Us Master Template) (2), b	g etches e for Sketch Comp. y Criterion	Delete RAW M arison;	anager	st	Sketch Prop Name: Creator: Description:	erties		
Open New ating and Weightin Weight // Compare Sk alect a RAW Set to Us Master Template) (2), b	g etches e for Sketch Comp. y Criterion	Delete RAW M arison:	anager	st New Sha	Sketch Prop Name: Creator: Description: spefile Units:	c U.S.	(feet)	Metric (meters)
Open New Rating and Weightin Weight/Compare Sk Select a RAW Set to Us (Master Template) (2), b	g etches e for Sketch Comp. y Criterion	Delete RAW M arison:	anager	Sha	Sketch Prop Name: Creator: Description: spefile Units:	erties	(feet)	Metric (mete

In the New Sketch Properties frame, enter "Tutorial" as the sketch name; enter your name as the creator; enter a description of the sketch as a tutorial; select Metric as the shapefile units; and select sketch type as Base. The Base Sketch combo box remains empty until one or more base sketches have been completed, at which point the box is used for selecting a base sketch that any number of alternate sketches can be linked to.

► The New button will become active after you choose your sketch type. Click it and the sketch is added to the Existing Sketches list box. Select the Tutorial sketch, click Open, and the following Sketch window appears:



The layout of the Sketch window matches the Database window except for additional menus and tool buttons, and treeview nodes that correspond to the sketch modeling process. The main steps you will follow in using the treeview to execute a sketch include:

- Moving shapefiles from the read-only version of the Database at the bottom of the treeview up to the Sketch Shapefiles node at the top of the treeview.
- Defining the sketch area boundary.
- Setting parameters for various elements of a sketch.
- Selecting indicators and running the model.
- Viewing results.

The remainder of this section describes the first step of moving shapefiles from the read-only Database up to the Sketch Shapefiles node. Regardless of the method used for moving shapefiles (double-clicking or dragging and dropping), SGI automatically places Database shapefiles into the correct sub-node of the Sketch Shapefiles node.

Adding the Planned Land-Use Shapefile to the Sketch

Expand the Database, Land-Use, and Planned Land-Use nodes, and double-click the PLU shapefile. After the shapefile is copied to the Sketch Shapefiles node and its contents analyzed, the Planned Land-Use Properties dialog will appear prompting you to classify the values in the land-use fields for this sketch. In this step you are classifying unique local field values to SGI's planned land-use classes of Residential and/or Non-Residential. Using the Reset button on this or other dialogs will reset inputs to the last saved entries. For purposes of the tutorial, default settings have already been made in the dialog.

Filename: PLU		
Description: S. Burli	ngton, VT	
Land-Use field: ZONE		
Planne	ed Land-Use Classifications	
Residential:	Non-Residential:	
A		
□ AI	I AI	
C	I I C	
□ C1	C1	-
🗆 C1A	C1A	
□ C2	C2	
🗆 CD1	CD1	
🗆 CD2	CD2	
🗆 CD 3	CD3	
	💌 🗹 CD 4	
	[]	54 55

Using the Reset button on this or other dialogs will reset inputs to the last saved entries.

Click OK and the Land-Use Properties dialog will close and the shapefile is now in the sketch.

Adding the Base Land-Use Shapefile to the Sketch

Expand the Database and the Base Land-Use nodes, double-click the ELU_BASE shapefile, and the following dialog appears:

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In this step you are classifying unique local field values to SGI's housing type and open space classes. Under Housing Type, check the classifications as shown in the dialog below. Under Open Space, check VACANT in addition to the two checks shown in the dialog below.



Click OK to save your settings and close this dialog.

Adding Remaining Shapefiles to the Sketch

Using the same procedure as described above, you may now move the remaining shapefiles needed for the sketch from the read-only Database up to the Sketch Shapefiles node of the treeview. None of the remaining shapefiles require the kind of classification dialogs you just completed; after double-clicking on a remaining shapefile in the Database node, you will be advised by a message box that no further setup is required for moving the shapefile up to the Sketch Shapefiles node. Add the following shapefiles to the sketch by either double-clicking on them in the read-only Database at the bottom of the treeview, or by dragging them from the Database up to the Sketch Shapefiles node:

- Employment (EMP_BASE).
- Employment centers (EMPCT).
- Parks and schools (PKSCH).
- Schools and daycare (SCHDC).
- Key service amenities (KEYSV).
- Central business district (CBD).
- Street centerlines (STR_CL).
- Bicycle routes (BIKERTS).
- Transit routes (TRANRTS).
- Transit stops (BUSSTOP).
- Light rail transit stations (LRT_STP).
- Hydrologic soils (HYDRO).
- Stormwater best management practices (STORMBMP).
- Other (SBURTAZ).

You have now assembled all of the shapefiles needed for the tutorial sketch in the Snapshot Sketches node. You may always return to the read-only Database node to collect any shapefiles that may have been missed.

It is important to note that the version of SGWATER presently embedded in SGI is configured for evaluating urban land-uses under antecedent moisture condition (AMC) 2 that applies to average soil moisture levels. If the sketch involves either non-urban land-uses and/or AMC 1 or 3 levels, your SGI steward must update the methodology's curve numbers. This procedure is explained in the Steward Guide, and should only be performed by a steward that has reviewed separate SGWATER documentation and is familiar with the methodology.

6. <u>Saving Maps and Legends</u>

When shapefiles are dragged onto the legend pane, a legend is automatically created for that shapefile layer. Individual legends for single layers can be customized and saved as default legends. One or more layers can be assembled into custom maps that can be saved as default maps. This section describes the procedure for customizing maps and legends to suit local preferences for presentation purposes. This is only intended to help comprehension of sketch maps; indicator calculations are not affected by presentation styles. Absent user-selected default maps and legends, SGI assigns gray to polygons, black to lines, and red to points for each map and legend.

Modifying and Saving a Default Legend

- From the Sketch Shapefiles node in the treeview, drag the ELU_BASE shapefile onto the legend pane.
- Double-click the ELU map layer in the legend pane and the Symbol Properties window is displayed. This window contains three tabs: 1) Single for one color and style for all features; 2) Unique for a different color for each unique value in the chosen field; and 3) Classes for a range of colors corresponding to a range of values in the chosen field. When using dialogs such as this and others with Apply and OK buttons, click Apply to add inputs incrementally while leaving the dialog open, and click OK to save all inputs and close the dialog.

Single	ľ_	Unique	Y	Classes
Fill (Color:	-1	:Outlin	e Color
		Draw outlines?		
	Style: Soli	d fill	-	
Outline v	vidth. 1			

Click the Unique tab to view Unique display options:

Single	Unique	Cla	sses
Legend Preview		Field:	
		AREA	
		Style:	
		Solid fill	12
		🔽 Draw outlin	es?
		Reset leg	gend

In the Field combo box, select LANDUSE, then click Reset Legend to preview the new display colors. Double-clicking on individual symbols (colors) opens a Windows color palette for selecting preferred colors.

Si	ingle j Unic	que	1 Classes
ELU - LAI	NDUSE		Field.
Symbol	Value	4	LANDUSE
	WATER_RAIL	100	-
	VACANT		Style:
	COMMERCIAL		Solid fill
-	RESIDENTIAL_SF		
	INDUSTRIAL		Dimension of the second
	RESIDENTIAL_CONDO		Je Draw outlines?
	RECREATION		Development
	PARKING		rieset legend
	MASS_ASSEMBLY		
	UTILITY		
	ROW		
	INSTITUTIONAL	-	
	DECIDENTIAL INC.	100	

Select new colors for a few of the land-use classes. Click Apply and then OK, and the ELU shapefile's appearance on the map and legend panes is changed as illustrated below (your colors will vary from the example below depending on the colors you selected):

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Saving and Viewing a Default Legend

- From the Map menu choose Save Default Shapefile Legend to save the legend created above.
- From the Map menu choose Remove All Layers.
- Drag the ELU_BASE shapefile from the treeview to the legend pane. The map is now shown with the custom default legend created above.

Saving a Map

- Add employment points to the map by dragging the EMP_BASE shapefile from the treeview to the legend pane.
- From the Map menu choose Save Map.
- Enter the name "Tutorial Map" in the New Map text box and click Save.

Loading a Saved Map

- From the Map menu choose Remove All Layers.
- From the Map menu choose Load Map.
- Click the "Tutorial Map" file you created.
- Click Load and the saved Tutorial Map appears.

7. Defining a Sketch Boundary and Central Nodes

A key task in creating a sketch is the definition of its boundary. This defines the area for which indicators are calculated and mapped. Because the boundary can significantly influence indicator results, its selection should be based on the purpose of the analysis and should consider relevant community features that may be present or absent in the vicinity of the sketch, e.g. in a housing study you might want to include a neighborhood park situated close to a residential area. Additional guidance on setting boundaries is given in the Community Process Guide. Sketch boundaries may be set in SGI using one of two methods:

- Adopting a shapefile originally created for another purpose. This approach uses a polygon shapefile created for another purpose, e.g. traffic analysis zone or census tract, when it favorably coincides with the purpose of the sketch.
- Aggregating features to create a new unique boundary. SGI drawing tools are used in this approach to select as many features as desired from any map layer, other than base or alternative land-use, to assemble a unique sketch boundary.

Before defining a boundary using either of these methods, the Sketch Shapefiles node in the treeview must be populated with a base land-use shapefile if a base sketch is being prepared, or an alternate land-use shapefile if an alternate case is being prepared; and an employment shapefile in either type of sketch. These shapefiles must be in the Sketch Shapefiles node before boundary definition because SGI automatically trims them to the boundary when it is created.

The vicinity surrounding a sketch boundary is also important because SGI measures street centerline distances to certain features that may lie outside the boundary as well as inside. As shown in Figure 7.1, all of the proximity indicators and the rail transit boarding indicator will search both inside and outside the boundary for relevant features. Therefore, you should not pre-trim shapefiles to the intended sketch boundary when populating the Database. Instead, use shapefiles that extend a reasonable distance beyond the intended sketch boundary, e.g. a transit stop shapefile should extend at least a quarter mile beyond the sketch boundary since residents inside the boundary edge may walk to a stop outside the boundary because the outside stop is closer to their homes than any stop inside the boundary.

Defining a Sketch Area Boundary

- From the Map menu choose remove all layers.
- Drag the SBURTAZ shapefile to the legend pane from the Other/Polygon sub-node in the Sketch Shapefiles node.





* Vicinity shapefiles should contain the following features when considered relevant to the sketch purpose: transit stops, schools, parks, employment centers, and other user-defined "key amenities." If a light rail transit system is part of the sketch area, vicinity shapefiles should also contain the closest central business district (point shapefile) served by the rail system. Expand the Sketch Area node in the treeview and double-click the Sketch Boundary node. The Sketch Area Boundary dialog will open allowing you to add features incrementally to create the sketch boundary:



Leave the Sketch Area Boundary dialog open, and click on the Select Feature tool:



> When the Select Feature button is clicked, four additional tool buttons become active:



Using any one of these tools, select the pre-highlighted features on the map (a group of traffic analysis zones have been pre-highlighted to guide you in setting a boundary that matches the remainder of the tutorial).



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When you have selected the highlighted features using the tool button, click the Add Features button and then OK on the Boundary dialog. Note that a new shapefile, SKETCHBD, has appeared in the treeview under the Sketch node.

Adding Central Nodes to the Sketch

If you intend to run the Pedestrian Route Directness indicator, you must designate one or more central destination nodes in the sketch area. SGI uses these nodes for calculating pedestrian route directness from randomly-selected origin points within a one-half mile radius of the central nodes. You may designate as many central nodes as desired to adequately reflect important social gathering spots or activity centers in the sketch area. Once you have finished this step, it is not possible to return and add additional nodes incrementally; instead, it is necessary to return, delete all original nodes, and redesignate the new entire set.

- > Drag the ELU_BASE shapefile from the treeview to the legend pane.
- > Double-click the Central Nodes node in the treeview and the Central Nodes dialog appears:



With the Central Nodes dialog box open, click the Graphic Tool button to activate the following five draw buttons:



Select the Point button and click on a location near the center of the map to illustrate a central destination node:

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After designating the central node with the Point button, click OK. Note that a new shapefile, CNTRNDS, has appeared in the treeview under the Sketch node.

8. <u>Setting User-Defined Parameters</u>

The next step is setting a variety of user-defined parameters (UDPs) that are non-spatial and therefore not contained in the shapefiles already loaded. These parameters include:

- Snapshot year. This is the year assumed for the sketch analysis, which can either be a current or future year. Sketches assumed for a future year automatically use shapefiles for facilities that are operable at that future point in time, e.g. a sketch simulating conditions in 2020 would use all bicycle routes designated through that year.
- Population. This sets the sketch area's commuteshed population and household sizes.
- Parcel development. These include parking rates, imperviousness, and non-point source pollutant loadings for each land-use class.
- Resources and emissions. These address a variety of transportation, energy, water, and air pollutant assumptions.
- SGWATER stormwater analysis. Rainfall data is selected and loaded into the U.S. EPA SGWATER stormwater application.
- Infrastructure. This sets wastewater production rates for residential and non-residential uses.

SGI is pre-loaded with UDP default values for the tutorial only. These tutorial defaults appear below in UDP dialogs and are documented further in the Steward Guide. Once you are generally familiar with operating SGI, an important task will be changing the UDP defaults to better match local conditions or data. Modifying UDP defaults should be done with the assistance of your SGI steward.

Snapshot Year

Expand the User-Defined Parameters node in the treeview, double-click the Snapshot Year node, and the following dialog appears:

🛷 Snapshot Year			×
Select Snapshot Sketch Year:		[]2(002
	Reset	OK	Cancel

Click OK to accept the tutorial default.

Population

Double-click the Population node and the following dialog appears. The equivalent of a "household" for Group Quarters should be determined using local norms.

Population		
Commuteshed Population:	146571	
Commuteshed Employment	79000	
Average Persons/Workers Per House	hold	
	Persons	Workers
Single Famil	y: 2.8	1.4
Mobile Home	e: 2.6	1.4
Multi-Family 2-4 unit	s: 2.4	1.4
Multi-Family 5+ unit	¢ 2.2	1.4
Group Quarter	s: 2	0.4

Click the OK button to accept the tutorial defaults.

Parcel Development

If parking or stormwater indicators are desired for a sketch, each base or alternate land-use class must be given certain parcel development standards, including parking rates, amount of imperviousness, and non-point source pollutant loadings. Tables 8.1 and 8.2 are excerpted from SGWATER documentation as guidance for setting imperviousness and pollutant loading UDPs by land-use class (also see the Steward Guide for assistance.) All parcel development parameters must be set for all land-use classes when first used in any sketch. SGI automatically checks every time a sketch is created to make sure all land-use classes have previously set parcel development parameters. If any land-use class is found to be new, or to have parameters missing, SGI warns the user that additional settings are necessary. For purposes of the tutorial, a missing land-use class has been included.

> Double-click the Parcel Development node in the treeview and the following dialog appears:

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(i	There are one or more new Parcel Land Use classes in this shapefile that were not found in the regular system defaults. The parameters for any new classes have been set to zero.
	ОК

Table 8.1 IMPERVIOUSNESS GUIDANCE

		Cu b	irve I y Soi	Numi il Typ	ber De
Land Use Category	Characteristics	Α	В	С	D
Residential	Average lot 1/8 acre or less, 65% average impervious area	77	85	90	92
	Average lot 1/4 acre, 38% average impervious area	61	75	83	87
	Average lot 1/3 acre, 30% average impervious area	57	72	81	86
	Average lot 1/2 acre, 25% average impervious area	54	70	80	85
	Average lot 1 acre, 20% average impervious area	51	68	79	84
Commercial and business areas	85% impervious	81	88	91	93
Mixture of above land uses	85% impervious	89	92	94	95
Industrial districts	72% impervious	81	88	91	93

Source: EPA/GKY

Table 8.2 NONPOINT SOURCE POLLUTANT LOADING GUIDANCE

		Pollutants					
B&J Land-Use	Description	Units	Nitrogen	Total Phosphorus	Suspended Solids		
Residential	Single-family residential	mg/L	1.82000	0.57000	41.00000		
	Mobile home park	mg/L	1.82000	0.57000	41.00000		
	Multi-family residential, moderate density	mg/L	1.82000	0.57000	41.00000		
	Multi-family residential, high density	mg/L	1.82000	0.57000	41.00000		
	Other residential	mg/L	1.82000	0.57000	41.00000		
Commercial	Commercial, office	mg/L	1.34000	0.32000	55.50000		
	Commercial, retail or service	mg/L	1.34000	0.32000	55.50000		
Mixed	Commercial/office/residential mix	mg/L	1.57000	0.35000	57.90000		
	Commercial/residential mix	mg/L	1.57000	0.35000	57.90000		
	Commercial/office mix	mg/L	1.57000	0.35000	57.90000		
	Shopping Center	mg/L	1.57000	0.35000	57.90000		
Industrial	Light industrial	mg/L	1.26000	0.28000	60.50000		
	Heavy industrial	mg/L	1.26000	0.28000	60.50000		
	Warehouse/storage	mg/L	1.26000	0.28000	60.50000		
Commercial	Public Assembly	mg/L	1.34000	0.32000	55.50000		
	Institutional	mg/L	1.34000	0.32000	55.50000		
	School	mg/L	1.34000	0.32000	55.50000		
Open/	Park	mg/L	1.50000	0.12000	70.00000		
Undeveloped	Open space	mg/L	1.50000	0.12000	70.00000		
Agricultural	Agricultural, general	mg/L	4.40000	1.30000	107.00000		
	Agriculture, livestock	mg/L	0.70000	0.01000	1.00000		
	Agricultural, crops	mg/L	4.40000	1.30000	107.00000		
Transportation	Rights-of-way	mg/L	1.86000	0.22000	73.50000		
	Parking	mg/L	1.86000	0.22000	73.50000		
Open/	Vacant	mg/L	1.50000	0.12000	70.00000		
Undeveloped	Other/miscellaneous	mg/L	0.00000	0.00000	0.00000		

Source: EPA/GKY

Click OK and the following form appears:



 Select the NATURAL_RESOURCE_ACT land-use class. You will see the parameters are all zero:

👉 Parcel Development	
Land-Use Classes:	Parking Demand
COMMERCIAL INDUSTRIAL INSTITUTIONAL MASS_ASSEMBLY MIXED_COMM_AND_RES NATURAL_RESOURCE_ACT PARKING RECREATION RESIDENTIAL_CONDO RESIDENTIAL_GQ RESIDENTIAL_GQ RESIDENTIAL_MF RESIDENTIAL_SF ROW UTILITY VACANT WATER_RAIL	Parking Deniatid Residential (spaces/DU): Non-Residential (spaces/1000 sqft floor area): Imperviousness Average % of LandUse Class Area That is Impervious (excluding streets): NonPoint Source Pollutants (mg/L) Total Suspended Solids: Phosphorus:
	Treat as Undeveloped (Indicator S103)
	Save as Defaults Reset OK Cancel

➤ Fill in the UDP form as indicated below for Non-Point Source Pollutants and Undevelopable status. Using the checkbox "Treat as Undevelopable" categorizes a land-use class as non-buildable for purposes of the Developed Acres Per Capita indicator (S103).

Getting Started Guide



- Since SGI encountered a new land-use class in this example, save it to the default table for later use by clicking Save as Defaults.
- Click OK to proceed.

Resources and Emissions

Double-click the Resources and Emissions node in the treeview and the following dialog appears. Visit the four tabs of Energy, Transportation, Emissions, and Water to view and accept the default settings as shown below. On the Water tab, choose the Water Requirement Region in the combo box that most closely corresponds to your region.

Energy	🛷 Resources 8	: Emissions			×
	Energy	Transportation	Emissions	Water	
	Climate Zo C unc C unc C unc C unc C ove	ne ler 2k CDD, over 7k HDD ler 2k CDD, 5,5k-7k HDD ler 2k CDD, 4k-5,5k HDD ler 2k CDD, under 4k HDD r 2k CDD, under 4k HDD	Emissions Base Energy Usag 124 34 % 66 % 0 %	water e (0-13 DU/Acre) MMBtu/DU/yr Electricity Natural Gas Heating Oil	
	a	Be	eset OK	Cancel	Apply

iergy [[1]	ransportation	E missions	water
Light Vehicle Data Fuel Usage 19.8	mpg		
Base Sketch Travel			1
Vehicle Miles Traveled:	Home Based	Non Home Base	daily per capita
Vehicle Trips	3	1.5	daily per capita
Accessibility	20	mean minutes to	regional destinations

Emissions

Energy	Trans	portation	Emiss	sions	Wate	1
– Building (lb. E Nat	/MMBtu) NO lectricity: 0.413 ural Gas: 0.133 eating Oil: 0.140	x SOx 3 0.6514 7 0.0005 08 0.5528	HC 0.003 0.0005 0.0004	CO 0.0206 0.034 0.0352	CO2 125.65 115 170	PM 0.0653 0.003 0.0140
Trans	portation (g/mi) Light Vehicle:	NOx 1.7	HC 3.3 2	CO (25.5 4	CO2 F 53.6 0	PM

Domestic Wate

Energy Transportation Emissions Water Household Internal Water Use: 64.6 gal. per capita per day Typical Landscaping: Water Requirement Region 50 % Grass Alabama: Gulf (Mobile) 25 % Strubs and trees
Household Internal Water Use: 64.6 gal. per capita per day Typical Landscaping: Water Requirement Region 50 % Grass Alabama: Gulf (Mobile) 25 % Groundcovers 25 % Shrubs and trees
Household Internal Water Use: 64.6 gal. per capita per day Typical Landscaping: Water Requirement Region 50 % Grass Alabama: Gulf (Mobile) 25 % Groundcovers 25 % Shrubs and trees
Household Internal Water Use: [54,6] gal. per capita per day Typical Landscaping: Water Requirement Region 50 % Grass Alabama: Gulf (Mobile) 25 % Groundcovers 25 % Shrubs and trees
Typical Landscaping: Water Requirement Region 50 % Grass Alabama: Gulf (Mobile) 25 % Groundcovers 25 % Shrubs and trees
50 % Grass Alabama: Gulf (Mobile) 25 % Groundcovers 25 % Shrubs and trees
25 % Groundcovers 25 % Shrubs and trees
25 % taroundcovers 25 % Shrubs and trees
25 % Shrubs and trees

Click OK to accept your water region choice and the other tutorial defaults.

SGWATER Stormwater Analysis

SGI employs a U.S. EPA methodology called SGWATER to calculate indicators of imperviousness, stormwater runoff, and non-point source pollution from the runoff. It is important to note that SGWATER as presently embedded in SGI is configured for evaluating urban land-uses under antecedent moisture condition (AMC) 2 that applies to average soil moisture levels. If the sketch involves non-urban land-uses, you must obtain steward assistance to update the methodology's curve numbers prior to sketching. This procedure is described in the Steward Guide, and should only be performed by a steward that has reviewed separate SGWATER documentation and is familiar with the methodology. To run SGI indicators, you must first populate the embedded SGWATER application with rainfall data (distinct from the domestic water usage selection made earlier).

> Double-click the SGWATER Application node in the treeview and the following dialog appears:

he SGWATER application requision of the second s It least 10 years (3650 rows) of the second	ires a rainfall text data file date, rainfall (inches). Th data in this file.	ere must be	
hease identity the location of thi browse for file)	s hainfall (ext data file	Delow.	Browse
Populate SGWATER			
To get Runoif and Pollutant Co you must first populate the SGV	oncentration indicators, VATER application with	Populate S	GWATER

Click the Browse button and the following dialog appears:



Click OK and then locate the rainSB.txt file in your Tutorial Data folder:



Click Open.

- Click OK to return to the SGWATER application manager.
- Click the Populate SGWATER button and the following warning appears:

This warning cautions users that populating the SGWATER application can add significant time to the normal sketch process depending on sketch area size. Users not intending to evaluate stormwater in their sketch should skip the SGWATER application to expedite set-up. If the SGWATER application is populated, the selected rainfall data will continue to be used for all subsequent sketches unless changed by the user. If for some reason the population process is interrupted by a complete shut-down of SGI, you must restart the process from the beginning.

Smart Growth INDEX 2.0	×
	JCEEUr

Click OK to proceed with populating SGWATER with rainfall data; for the tutorial, this will take approximately 10 minutes using a 1.7 GHz processor. At the conclusion of populating SGWATER, a dialog will appear advising that the step has been satisfactorily completed, or the following dialog will appear advising that voids were found in the soils coverage and they have been assigned soil type D. This is only an advisory message to alert users to the potential need for upgrading their soils coverage; it does not stop the user from completing SGWATER calculations.



> When finished, click the OK button on the SGWATER Application dialog.

Infrastructure

> Double-click the Infrastructure UDP node in the treeview and the following dialog appears:

Single Family:	180
Mobile Home:	170
Multi-Family 2-4 units:	160
Multi-Family 5+ units:	150
Group Quarters:	130
	- 1

Click OK to accept the tutorial defaults.

9. <u>Running the Model</u>

SGI is now ready to run the tutorial sketch and calculate indicator scores. Most sketch run times will vary from several minutes up to a few hours depending on: 1) sketch area size and complexity; 2) number and type of indicators selected for calculation; and 3) computer hardware specifications. The tutorial requires approximately 20 minutes using a 1.7 GHz processor. Users will need to gain run time experience with their particular hardware and data conditions. Time-intensive indicators are those measuring proximities and stormwater. Running the model is a two-step process: 1) verifying required inputs for indicators; and 2) selecting indicators to be calculated. Consideration of which indicators are relevant to an analysis should occur early in planning a sketch, particularly because of impacts on data requirements.

Verifying Inputs

Expand the Apply Model node in the treeview and double-click the Verify Inputs node. After completing its check, the following dialog appears:



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Indicators with green lights are ready to run and indicators with red are not ready. Expand nodes with red lights to see what shapefiles, attributes, and/or UDPs are missing or configured improperly. In the tutorial sketch, Parking Demand and Parking Supply indicators will be unavailable because attributes for non-residential building square feet and on-street parking spaces were purposely not supplied for the base land-use and street centerline shapefiles. Input verification at this point gives you a chance to return to earlier steps and provide missing items. For purposes of the tutorial, the parking indicators will not be calculated.



Click the Next button to proceed.

Running the Model

Upon clicking the Next button, the Indicator Calculator dialog appears showing all indicators that are ready for calculation. Unavailable indicators are disabled and will remain so until all required shapefiles or settings are supplied. You may also unselect any indicators that you do not want to calculate even if their inputs are satisfactory. If you have already completed a run and are returning to add more indicators in a subsequent run, you can select the "Add selected indicators to last run set" checkbox to preserve previous indicator results and add scores for the newly selected indicators. The previous run's scores and newly calculated scores will appear together in a consolidated list shown in the next section. Users should exercise caution when making changes to sketches between runs if this feature is used because results are presented in a consolidated list that does not differentiate scores according to which run produced them.



When ready, click the Run button to calculate indicators. As the run proceeds, you can refer to the status bar at the bottom of the dialog to see how much of the run has been completed. Depending on your computer specifications, the tutorial will require approximately 20-30 minutes to run. A message box will advise you when the run is complete.

10. Viewing Results

Viewing Indicator Scores

Expand the Indicators node in the treeview, double-click the Indicator Scores node, and the following window appears. Detailed information on indicator definitions and calculation formulas is given in the Indicator Dictionary. To export indicator scores for presentation purposes, click the Print button, save as RTF, and import to any spreadsheet program.

Stool Population density 8.58 persons per acre Y S101 Use mix 0.44 0-1 scale Y S102 Average parcel size 29,847 square feet Y S103 Developed acres per capita 0.104 gross acres/capita Y S200 Conforming dwelling density 5.19 dwellings/net acre Y S201 Non-conforming dwelling density 4.89 dwellings/net acre Y S201 Molie home housing share 0 percent MH Y S202 Multi-family 2-4 units housing share 0 percent MF5up Y S206 Group quatters housing share 0 percent MF5up Y S207 Housing proximity to recreation 3,250 avg. distance to a stop (ft.) Y S208 Housing proximity to key amenities 2,218 avg. dist to a key amenity (ft.) Y S211 Dwellings within 1/8 mile of 3+ modes 80 percent of DUs Y S211 Buesing proximity to emp centers 6.450 <t< th=""><th>ID (</th><th>Indicator</th><th>Score</th><th>Units</th><th>Map</th><th></th></t<>	ID (Indicator	Score	Units	Map	
S101 Use mix 0.44 0-1 scale Y S102 Average parcel size 29,847 square feet Y S103 Developed acres per capita 0.104 gross acres/capita Y S200 Conforming dwelling density 5.19 dwellings/net acre Y S201 Non-conforming dwelling density 4.89 dwellings/net acre Y S202 Single-family housing share 0 percent SF Y S203 Mobile home housing share 0 percent MF2to4 Y S204 Multi-family 2-4 units housing share 0 percent MF5up Y S205 Multi-family 5+ units housing share 0 percent MF5up Y S206 Group quarters housing share 0 percent MF5up Y S207 Housing proximity to transit 1,79 avg. distance to a stop (ft.) Y S208 Housing proximity to recreation 3,250 avg. dist to a school/daycare center (ft.) Y S210 Housing proximity to emp centers 6,450 avg. dist to a emp centers (ft.) Y S211 Dwellings within 1/8 mile of 3+ modes 80 ayd/day/capita, parcels < 15,000 sq.ft.	5100	Population density	8.58	persons per acre	Y	Γ
S102 Average parcel size 29,847 square feet Y S103 Developed acres per capita 0.104 gross acres/capita Y S200 Conforming dwelling density 5.19 dwellings/net acre Y S201 Non-conforming dwelling density 4.89 dwellings/net acre Y S202 Single-family housing share 96 percent KF Y S203 Mobile home housing share 0 percent MF Y S204 Multi-family 2-4 units housing share 0 percent MF5up Y S205 Multi-family 5-4 units housing share 0 percent MF5up Y S206 Group quarters housing share 0 percent MF5up Y S207 Housing proximity to transit 1,179 avg. dist nace to a stop (ft.) Y S208 Housing proximity to reaction 3,391 avg. dist to a school/daycare center (ft.) Y S211 Dwelings within 1/8 mile of 3+ modes 80 percent of DUs Y S211 Devige proximity to emp centers 6,450 avg. dist to a emp centers (ft.) Y S211 Dwelings within 1/8 mile of 3+ modes 80 percent of DUs Y S211 Devige proximity to emp centers	5101	Use mix	0.44	0-1 scale	Y	
S103 Developed acres per capita 0.104 gross acres/capita S200 Conforming dwelling density 5.19 dwellings/net acres Y S201 Non-conforming dwelling density 4.89 dwellings/net acres Y S202 Single-family housing share 96 percent SF Y S203 Mobile home housing share 0 percent MH Y S204 Multi-family 2-4 units housing share 0 percent MFSup Y S205 Multi-family 5-4 units housing share 0 percent MFSup Y S206 Group quarters housing share 0 percent GQ Y S207 Housing proximity to transit 1,179 avg. distance to a stop (ft.) Y S208 Housing proximity to recreation 3,250 avg. dist to a school/daycare center (ft.) Y S211 Dowelings within 1/8 mile of 3+ modes 80 percent of DUs Y S211 Dusing proximity to empcontents 6,450 avg. dist to a emp centers (ft.) Y S211 Dusing proximity to empcontents 6,450 avg. dist to a emp centers (ft.) Y S214 Residential energy consumption 83 gal/day/capita, parcels < 15,000 sq.ft.	5102	Average parcel size	29,847	square feet	Y	
S200 Conforming dwelling density 5.19 dwellings/net acre Y S201 Non-conforming dwelling density 4.89 dwellings/net acre Y S202 Single-family housing share 96 percent SF Y S203 Mobile home housing share 0 percent MH Y S204 Multi-family 2-4 units housing share 0 percent MF2to4 Y S205 Group quaters housing share 0 percent MF2to4 Y S206 Group quaters housing share 0 percent MF2to4 Y S207 Housing proximity to transit 1,179 avg. distance to a stop (ft.) Y S208 Housing proximity to recreation 3,250 avg. distance to a stop (ft.) Y S210 Housing proximity to education 3,311 avg. dist to a key amenity (ft.) Y S211 Dwellings within 1/8 mile of 3+ modes 80 percent of DUs Y S211 Dwellings within 1/8 mile of 3+ modes 80 avg. dist to a emp centers (ft.) Y S211 Dwellings within 1/8 mile of 3+ modes 80 avg. dist to a emp centers (ft.) Y S211 Besidential energy consumption 104 MBtu/yr/capita (housing & travel) S203 <td< td=""><td>5103</td><td>Developed acres per capita</td><td>0.104</td><td>gross acres/capita</td><td></td><td></td></td<>	5103	Developed acres per capita	0.104	gross acres/capita		
S201 Non-conforming dwelling density 4.89 dwellings/het acre Y S202 Single-family housing share 96 percent SF Y S203 Mobile home housing share 0 percent MF Y S204 Multi-family 2-4 units housing share 0 percent MF5up Y S205 Multi-family 2-4 units housing share 0 percent MF5up Y S206 Group quarters housing share 0 percent MF5up Y S207 Housing proximity to transit 1,179 avg. distance to a stop (ft.) Y S208 Housing proximity to recreation 3,250 avg. dist to a key amenity (ft.) Y S210 Housing proximity to key amenities 2,218 avg. dist to a key amenity (ft.) Y S211 Dwellings within 1/8 mile of 3- modes 80 percent of DUs Y S211 Dwellings within 1/8 mile of 3- modes 80 avg. dist to a key amenity (ft.) Y S211 Dwellings within 1/8 mile of 3- modes 80 avg. dist to a emp centers (ft.) Y S211 Besidential energy consumption 104 MBtu/yr/capita, parcels < 15,000 sq. ft.	5200	Conforming dwelling density	5.19	dwellings/net acre	Y	
S202 Single-family housing share 96 percent SF Y S203 Mobile home housing share 0 percent MF Y S204 Multi-family 2-4 units housing share 0 percent MF2to4 Y S205 Multi-family 2-4 units housing share 0 percent MF5up Y S206 Group quarters housing share 0 percent MF5up Y S207 Housing proximity to transit 1,179 avg. distance to a stop (ft.) Y S208 Housing proximity to recation 3,391 avg. dist to a school/daycare center (ft.) Y S211 Dwelings within 1/8 mile of 3+ modes 80 percent of DUs Y S212 Housing proximity to emp centers 6,450 avg. dist to a emp centers (ft.) Y S213 Residential energy consumption 83 gal/day/capita, parcels < 15,000 sq.ft.	5201	Non-conforming dwelling density	4.89	dwellings/net acre	Y	
S203 Mobile home housing share 0 percent MH Y S204 Multi-family 2-4 units housing share 4 percent MF2to4 Y S205 Multi-family 5-4 units housing share 0 percent MF5up Y S206 Group quarters housing share 0 percent GQ Y S206 Housing proximity to transit 1,179 avg. distance to a stop (ft.) Y S209 Housing proximity to recreation 3,250 avg. dist to a school/daycare center (ft.) Y S201 Housing proximity to education 3,391 avg. dist to a school/daycare center (ft.) Y S211 Dwellings within 1/8 mile of 3+ modes 80 percent of DUs Y S212 Residential energy consumption 83 gal/day/capita, parcels < 15,000 sq.ft.	5202	Single-family housing share	96	percent SF	Y	
S204 Multi-family 2-4 units housing share 4 percent MF2to4 Y S205 Multi-family 2-4 units housing share 0 percent MF5up Y S206 Group quarters housing share 0 percent MF5up Y S207 Housing proximity to transit 1,179 avg. distance to a stop (ft.) Y S208 Housing proximity to recreation 3,250 avg. distance to a park/schoolyard (ft.) Y S209 Housing proximity to tecreation 3,291 avg. dist to a key amenity (ft.) Y S210 Housing proximity to education 3,391 avg. dist to a key amenity (ft.) Y S211 Dwellings within 1/8 mile of 3+ modes 80 percent of DUs Y S211 Dwellings within 1/8 mile of 3+ modes 80 avg. dist to a emp centers (ft.) Y S211 Residential energy consumption 104 MBtu/yr/capita (housing & travel) S211 Residential energy consumption 104 MBtu/yr/capita (housing & travel) S200 Employment 1,988 employees Y S301 Jobs/housed workers balance 1,52 jobs/workers Y S303 Non-conforming employment density 8.60 employees/net acre Y S400<	5203	Mobile home housing share	0	percent MH	Y	
S205 Multi-family 5+ units housing share 0 percent MF5up Y S206 Group quarters housing share 0 percent GQ Y S207 Housing proximity to transit 1,179 avg. distance to a stop (ft.) Y S208 Housing proximity to recreation 3,250 avg. distance to a park/schoolyard (ft.) Y S209 Housing proximity to key amenities 2,218 avg. dist to a school/daycare center (ft.) Y S211 Dwellings within 1/8 mile of 3+ modes 80 percent of DUs Y S211 Dwellings within 1/8 mile of 3+ modes 80 percent of DUs Y S211 Dwellings within 1/8 mile of 3+ modes 80 avg. dist to a school/daycare center (ft.) Y S211 Besidential energy consumption 104 MBtu/yr/capita, parcels < 15,000 sq. ft.	5204	Multi-family 2-4 units housing share	4	percent MF2to4	Y	
S206 Group quarters housing share 0 percent GQ Y S207 Housing proximity to transit 1,179 avg. distance to a spark/schoolyard (ft.) Y S208 Housing proximity to recreation 3,291 avg. dist to a school/daycare center (ft.) Y S210 Housing proximity to education 3,391 avg. dist to a school/daycare center (ft.) Y S211 Dwellings within 1/8 mile of 3+ modes 80 percent of DUs Y S212 Housing proximity to emp centers 6,450 avg. dist to a emp centers (ft.) Y S213 Residential energy consumption 83 gal/day/capita, parcels < 15,000 sq.ft.	5205	Multi-family 5+ units housing share	0	percent MF5up	Y	
S207 Housing proximity to transit 1,179 avg. distance to a stop (ft.) Y S208 Housing proximity to recreation 3,250 avg. distance to a park/schoolyard (ft.) Y S209 Housing proximity to education 3,391 avg. dist to a school/daycare center (ft.) Y S210 Housing proximity to key amenities 2,218 avg. dist to a key amenity (ft.) Y S211 Dwellings within 1/8 mile of 3+ modes 80 percent of DUs Y S212 Housing proximity to map centers 6,450 avg. dist to a school/daycare centers (ft.) Y S213 Residential energy consumption 104 MMBtu/yr/capita, parcels < 15,000 sq.ft.	5206	Group quarters housing share	0	percent GQ	Y	
S208 Housing proximity to recreation 3,250 avg. distance to a park/schoolyard (ft.) Y S209 Housing proximity to recreation 3,391 avg. dist to a school/daycare center (ft.) Y S210 Housing proximity to key amenities 2,218 avg. dist to a key amenity (ft.) Y S211 Dwellings within 1/8 mile of 3+ modes 80 percent of DUs Y S212 Housing proximity to emp centers 6,450 avg. dist to a emp centers (ft.) Y S213 Residential water consumption 83 gal/day/capita, parcels < 15,000 sq.ft.	5207	Housing proximity to transit	1,179	avg. distance to a stop (ft.)	Y	
S209 Housing proximity to education 3.391 avg. dist to a school/daycare center (it.) Y S210 Housing proximity to key amenities 2.218 avg. dist to a school/daycare center (it.) Y S211 Dwellings within 1/8 mile of 3+ modes 80 percent of DUs Y S212 Housing proximity to emp centers 6.450 avg. dist to a emp centers (it.) Y S213 Residential energy consumption 104 MMBtu/yr/capita, parcels < 15.000 sq. ft.	5208	Housing proximity to recreation	3,250	avg. distance to a park/schoolyard (ft.)	Y	
S210 Housing proximity to key amenities 2,218 avg. dist to a key amenity (ft.) Y S211 Dwellings within 1/8 mile of 3+ modes 80 percent of DUs Y S211 Dwellings within 1/8 mile of 3+ modes 80 percent of DUs Y S212 Housing proximity to emp centers 6,450 avg. dist to a emp centers (ft.) Y S213 Residential energy consumption 83 gal/day/capita, parcels < 15,000 sq.ft.	5209	Housing proximity to education	3,391	avg. dist to a school/daycare center (ft.)	Y	
S211 Dwellings within 1/8 mile of 3+ modes 80 percent of DUs Y S212 Housing proximity to emp centers 6,450 avg. dist to a emp centers (ft.) Y S213 Residential energy consumption 83 gal/day/capita, parcels < 15,000 sq.ft.	5210	Housing proximity to key amenities	2,218	avg. dist to a key amenity (ft.)	Y	
S212 Housing proximity to emp centers 6,450 avg. dist to a emp centers (ft.) Y S213 Residential water consumption 83 gal/day/capita, parcels < 15,000 sq.ft.	5211	Dwellings within 1/8 mile of 3+ modes	80	percent of DUs	Y	
S213 Residential water consumption 83 gal/day/capita, parcels < 15,000 sq.ft.	5212	Housing proximity to emp centers	6,450	avg. dist to a emp centers (ft.)	Y	1
S214 Residential energy consumption 104 MMBtu/yr/capita (housing & travel) S300 Employment 1,988 employees Y S301 Jobs/housed workers balance 1,52 jobs/workers Y S302 Conforming employment density 18,00 employees/het acre Y S303 Non-conforming employment density 8,60 employees/het acre Y S400 Imperviousness 0,22 impervious acres per DU Y S401 Stormwater runoff 12,556, cubic feet per year Y S402 Total suspended solids 33,546,4 kilograms per year Y S403 Norcon 04,649,7 kilograms per year Y	5213	Residential water consumption	83	gal/day/capita, parcels < 15,000 sq.ft.		
\$300 Employment 1,988 employees Y \$301 Jobs/housed workers balance 1,52 jobs/workers 5 \$302 Conforming employment density 18,00 employees/net acre Y \$303 Non-conforming employment density 8,60 employees/net acre Y \$304 Employment proximity to transit 585 avg. distance to a stop (ft.) Y \$400 Impervious acres per DU Y \$401 Stormwater runoff 12,556, cubic feet per year Y \$402 Total suspended solids 33,546.4 kilograms per year Y \$403 Nitrogen 649.7 kilograms per year Y	5214	Residential energy consumption	104	MMBtu/yr/capita (housing & travel)		
5301 Jobs/housed workers balance 1.52 jobs/workers 5302 Conforming employment density 18.00 employees/net acre Y 5303 Non-conforming employment density 8.60 employees/net acre Y 5304 Employment proximity to transit 585 avg. distance to a stop (it.) Y 5400 Imperviousness 0.22 impervious acres per DU Y 5401 Stormwater runoff 12,556 cubic feet per year Y 5402 Total suspended solids 33,546.4 kilograms per year Y 5403 Phosphorus 104.6 kilograms per year Y 5404 Nitrogen 649.7 kilograms per year Y	5300	Employment	1,988	employees	Y	
5302 Conforming employment density 18.00 employees/net acre Y 5303 Non-conforming employment density 8.00 employees/net acre Y 5304 Employment proximity to transit 585 avg. distance to a stop (it.) Y 5400 Imperviousness 0.22 impervious acres per DU Y 5401 Stormwater runoff 12,556 cubic feet per year Y 5402 Total suspended solids 33,546.4 kilograms per year Y 5403 Phosphorus 104.6 kilograms per year Y 5404 Nitrogen 649,7 kilograms per year Y	5301	Jobs/housed workers balance	1.52	jobs/workers		
5303 Non-conforming employment density 8.60 employees/net acre Y 5304 Employment proximity to transit 585 avg. distance to a stop (t.) Y 6400 Imperviousness 0.22 impervious acres per DU Y 6401 Stormwater runoff 12,556, cubic feet per year Y 6402 Total suspended solids 33,546.4 kilograms per year Y 6403 Phosphorus 104.6 kilograms per year Y 6404 Nitrogen 649.7 kilograms per year Y	5302	Conforming employment density	18.00	employees/net acre	Y	
5304 Employment proximity to transit 585 avg. distance to a stop (ft.) Y 5400 Imperviousness 0.22 imperviousness per DU Y 5401 Stormwater runoff 12,556, cubic feet per year Y 5402 Total suspended solids 33,546.4 kilograms per year Y 5403 Phosphorus 104.6 kilograms per year Y 5404 Nitrogen 649.7 kilograms per year Y	6303	Non-conforming employment density	8.60	employees/net acre	Y	
5400 Imperviousness 0.22 impervious acres per DU Y 5401 Stormwater runoff 12,556, cubic feet per year Y 5402 Total suspended solids 33,546.4 kilograms per year Y 5403 Phosphorus 104.6 kilograms per year Y 5404 Nitrogen 649.7 kilograms per year Y	5304	Employment proximity to transit	585	avg. distance to a stop (ft.)	Y	
6401 Stormwater runoff 12,556, cubic feet per year Y 6402 Total suspended solids 33,546.4 kilograms per year Y 6403 Phosphorus 104.6 kilograms per year Y 6404 Nitrogen 649,7 kilograms per year Y	5400	Imperviousness	0.22	impervious acres per DU	Y	
S402 Total suspended solids 33,546.4 kilograms per year Y S403 Phosphorus 104.6 kilograms per year Y S404 Nitrogen 649.7 kilograms per year Y	5401	Stormwater runoff	12,556,	cubic feet per year	Y	
\$403 Phosphorus 104.6 kilograms per year Y \$404 Nitrogen 649.7 kilograms per year Y	5402	Total suspended solids	33,546.4	kilograms per year	Y	
S404 Nitrogen 649.7 kilograms per year Y	5403	Phosphorus	104.6	kilograms per year	Y	
	5404	Nitrogen	649.7	kilograms per year	Y	
5407 Upen space 14 percent total land area Y	5407	Open space	14	percent total land area	Y	ĺ

Viewing Indicator Maps

Indicators with a "Y" in the Map column of the scores window also have maps depicting parcel-level indicator results. Double-clicking on these automatically generates the indicator map. Double-click the Population Density indicator in the scores window and the following appears:



Viewing Land Allocation Results

In addition to indicator scores and maps, SGI produces a tabulation of land and housing allocations in a sketch. Double-click the Land Allocations node in the treeview and the following appears. If local government boundary shapefiles were provided for the sketch, the combo box at the top of this dialog will contain those jurisdictions by name, and when selected, results are shown for the selected jurisdiction.

🛷 Land Area Allocations							
Results for:			Ν	lote: All land trimmed	area alloca to the curre	tion results ent sketch	are area
Entire Sketch Area							•
Planned Land-Use Alloca	tions						
Use Type	Land-Use				Acres	%	
Residential Res. Subtotal Non-Residential Non-Residential Non-Residential Non-Residential Non-Residential Non-Residential Non-Residential Non-Residential	R4 R7 C1 C2 CD1 CD2 CD3 CD4 C0S				250 65 315 0 56 0 53 16 5 9 28 28	47 12 59 0 10 0 10 3 1 2 5 2	
Base Land-Use Allocation	ns			Base Hou	ising by T	уре	
Land-Use		Acres	▲	Туре	DU:	s	%
COMMERCIAL INDUSTRIAL INSTITUTIONAL MASS_ASSEMBLY MIXED_COMM_AND_RES RECREATION RESIDENTIAL_CONDO RESIDENTIAL_MF RESIDENTIAL_SF PDW		68 29 13 2 1 6 48 12 164		SF MF2TO4 Total	89; 4(93;	7) 7 1	96 4 00
		⁸⁶	• •	9		<u>C</u> lose	

11. <u>Comparing Sketches</u>

Multiple sketches can be compared in two ways: 1) indicator scores can be directly compared as calculated by SGI without any post-processing; or 2) an additional processing step can convert indicator scores for each sketch into a single overall score using rating and weighting (RAW) settings provided by users. The RAW function applies user-defined acceptability ratings to possible indicator scores and weightings of relative importance to indicators. This produces a single overall score for each sketch based on user opinions or local standards for issues being measured. Additional information on using the RAW function is provided in the Community Process Guide.

To demonstrate the RAW function, an alternate sketch must be prepared so it can be compared against the just completed base sketch. For this purpose, you will find the ELU_ALT shapefile containing alternate land-use, and the EMP_ALT shapefile containing employment, in the Tutorial Data folder. For illustrative purposes, these alternate land-use and employment shapefiles simulate residential and commercial infill in the sketch area. These will be the only changes you need to make for the alternate sketch to be sufficiently different from the base sketch. Essentially, you will be repeating the procedures described in Sections 4 through 9 of the Getting Started Guide.

Return to the main Database and load the alternate land-use and employment shapefiles, and then create an alternate sketch following the same procedure that was used for the base sketch. Be sure to check Metric units, select the Alternate sketch type, and identify the Tutorial base sketch when setting the new sketch properties. Once indicator scores have been calculated for the alternate sketch, you will be ready to compare the base and alternate sketches using the RAW function in a two-step procedure:

- Selecting a RAW set. A RAW "set" is a group of saved rating and weighting settings that can be retrieved and applied to multiple sketches as desired. Users may want to develop and save multiple RAW sets depending on the topical focus of a sketch, its location, or stakeholder group, e.g. one RAW set for urban sketches and another for suburban sketches.
- Applying RAW. After the user selects a RAW set and sketches to compare, the model calculates their weighted scores and produces a chart and table ranking the sketches.

Accessing the RAW Sets

Open the SGI startup screen, click the Snapshot Sketch button, and the Sketch Manager window appears:

Name	Description	Creator	Date Created	Last Viewed	Sketch Type	Base Sketch	Units
Four Sketch Futorial Futorial Alternative	S. Burlington, VT- cit S. Burlington tutorial S. Burlington alterna	Criterion your na your na	10/17/2002 10/18/2002 10/18/2002	10/18/2002 10/18/2002 10/18/2002	Base Base Alternate	Tutorial	Metric (meters Metric (meters Metric (meters
<u>Open</u> <u>M</u> ew	Delete	E)	șt New	Sketch Prop Name:	erties		
Open New Rating and Weighting Weight / Compare Sket	Copy Delete	E1	ø	Sketch Prop Name: Creator:	erties		
Open New Rating and Weighting Weight //Compare Sket Select a RAW Set to Use (None - use RAW Manag	Copy Delete	anager	e New	Sketch Prop Name: Creator: Description:			
Open Itew Rating and Weighting Weighting Weight // Compare Strett Select a RAW Set to Use (None - use RAW Manag Select a RAW Manag	Copy Delete Cobes RAW M for Sketch Comparison: er to create	anager	st New Sha	Sketch Prop Name: Creator: Description: spefile Units:	erties	(feet) C t	detric (meters)
Open New Rating and Weighting Weight / Compare Steet Select a RAW Set to Use (None - use RAW Manag	Copy Delete Ches RAW M for Sketch Comparison: er to create)	anager	sk New Sha	Sketch Prop Name: Creator: Description: pefile Units: ketch Type:	erties	(feet) C f	Metric (meters)

Click the RAW Manager button and the following window appears:

Initial Snapshot Default Set - All Indicators	Criterion	1/1/2002	1/1/2002

Creating a RAW Set from the SGI Master Template

SGI has a master template of RAW settings that are used for creating user-defined default RAW sets. Select the master template, click the Create New From Selected button, and enter your name in the following dialog:

Smart Growth INDEX 2.0	×
Enter your name below:	Cancel
My Name	

Click OK and the following message appears:

Smart Growth INDEX 2.0
Created new RAW set called '(Default Template) (2)' from existing RAW Set '(Default Template)'
Use the Edit Selected button to modify your new RAW Set.
ОК

Click OK and the newly-created RAW Set is listed in the RAW manager window:

Ratings and Weighting	js Manager			
elect One of the Follow				
Set	Description	Creator	Date Created	Last Edited
(Master Template) (2)	click Edit Selected to update set	My Name	10/18/2002	10/18/2002
(Master Lemplate)	i ninai Shapshot Derauit Set - Ali indicators	Citerion	17172002	17172002
<u>E</u> dit Selected		ected		Esit

Editing a RAW Set

Select the RAW set you just created, click the Edit Selected button, and the following dialog appears:

Set Name:	(Master Template) (2)
Description:	
Creator:	My Name
Date Created:	10/18/2002
Date Last Saved	10/18/2002

Fill in the Set Name, Description, and Creator fields as indicated below:

Set Name:	Custom RAW Set 1				
Description:	Getting Started Guide - Tutorial Sketches				
Creator:	My Name				
Date Created:	10/18/2002				

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- Click the Apply button to save your changes and remain on this form.
- To edit the rating and weighting settings, click the Edit Ratings/Weightings button. You are presented with the following form showing the first indicator (Population Density) and its default settings (inherited from the template on which you created this RAW set):



Click the Increase tab and the dialog changes to show that you have identified Population Density as an indicator for which increasing scores are considered favorable:

Getting Started Guide



Click the Decrease tab and the dialog changes to show that you have identified Population Density as a indicator for which decreasing scores are considered favorable:



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Click the Not Applicable/Exclude tab and the dialog changes to show that you have identified Population Density as an indicator to be excluded from the RAW set:

Increase .	Centralize Y	Decrease	lot Applicable/Evolut
Indicators rating calc comparisor situations: 1. The in ascessed be Total 2. The in plannet. 3. You w you want	associated with this RAW Typ ulations, and will not contribut is using this RAW Set. Use th as either good or bad, regardless of Population. ficator calculates something that is o an example might be Average Month int to perform sketch comparisons o to exclude an otherwise valuable inc	e will be excluded fro te to any sketch is option in the follow are, and not one that can its value. An example mi putside of the control of th aly Rainfall. n a limited set of indicator dicator.	m ving ght s, and
Weighting ndicator Weight 0	All included indicators must ha	ve a weight. The	ОК
Weighting ndicator Weight: 0 Sum of Weights: 98	All included indicators must ha more important the indicator, th weight. The sum of all indicato	ve a weight. The ne higher its rs' weights	OK. Apply

- Click the Next and Previous buttons to change the indicator you are reviewing, thus changing the contents of the combo box at the top of the form and potentially the selected tab and weighting. Note that each indicator needs a weight indicating its importance relative to other indicators. When Not Applicable/Exclude is chosen, the weighting section is disabled because an excluded indicator cannot have a weight.
- Click the Cancel button to leave the RAW set and return to the RAW Manager.

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Click the Exit button to return to the Project Manager window. The newly created RAW set is displayed in the RAW frame:

Name	Description	Creator	Date Created	Last Viewed	Sketch Type	Base Sketch	Units
Tour Sketch Tutorial Tutorial Alternative	S. Burlington, VT- cit S. Burlington tutorial S. Burlington alterna	Criterion your na your na	10/17/2002 10/18/2002 10/18/2002	10/18/2002 10/18/2002 10/18/2002	Base Base Alternate	Tutorial	Metric (meter: Metric (meter: Metric (meter:
<u>O</u> pen <u>N</u> ew	Delete	E2	git New	Sketch Prop Name:	erties		
Open New Rating and Weighting	Delete	E2	gtNew	Sketch Prop Name: Creator:	erties		
Open Liew Rating and Weighting Weight / Compare Sket Select a RAW Set to Use Custom RAW Set 1, by M	Copy Delete Cohes RAW M for Sketch Comparison Iy Name	lanager	et New	Sketch Prop Name: Creator: Description:	erties		
Qpen New Rating and Weighting Weight//Compare Sket Select a BAW Set to Use Custom BAW Set 1, by M	Copy Delete RAW M for Sketch Companison: Iy Name	anager	et New Sha	Sketch Prop Name: Creator: Description: spefile Units:	erties	(feet) C	Metric (meters)
Open Mew Mading and Weighting Waght// Compare Site Select a RAW Set to Use Custom RAW Set 1, by M	Copy Delete	lanager	st New Sha	Sketch Prop Name: Creator: Description: apefile Units: iketch Type:	erties	(feet)	Metric (meters) Alternate

Comparing Multiple Sketches

- Select your newly created RAW set from the Project Manager window.
- Using the Ctrl or Shift keys, select both the base and alternate tutorial sketches. The Weight/Compare Sketches button becomes enabled only when you have selected both a RAW set and more than one sketch:

vanie	Description	Creator	Date Created Last Viewed	Sketch Type	Base Sketch	Units
our Sketch	S. Burlington, VT	- cit Criterion	10/17/2002 10/18/2002	Base	* * * * * * * * *	Metric (meters
itorial	S. Burlington tuti	orial your na	10/18/2002 10/18/2002	Base	********	Metric (meters
itorial Alternative	S. Burlington alte	erna. your na	10/18/2002 10/18/2002	Alternate	Tutorial	Metric (meters
Barry The Real	i an i s	р.ш. Ì г.	A New Sketch Prop	perties		
Open New ating and Weighting Weight / Compare Sket	Copy	Delete E	New Sketch Proj Name: Creator:	perties		
Öpen New ating and Weighting Weight / Compare Sket slect a RAW Set to Use Gistom RAW Set 1, by M	Copy ches F for Sketch Compariso y Name	Delete E: RAW Manager	New Sketch Prop Name: Creator: Description:	perties		
Üpen <u>Hew</u> ating and Weighting Weight / Compare Skel alect a RAW Set to Use ustom RAW Set 1, by M	Copy ches F for Sketch Compariso y Name	<u>Delete</u> RAW Manager n:	New Sketch Proj Name: Creator: Description: Shapefile Units:	etties	(feet) C M	Aetric (meters)
Üpen <u>Hew</u> ating and Weighting Weight / Compare Skel alect a RAW Set to Use ustom RAW Set 1) by M	ches F for Sketch Compariso y Name	<u>Delete</u> RAW Manager rv	New Sketch Proj Name: Creator: Description: Shapefile Units: Sketch Type:	© U.S. C Base	(feet) C M	fetric (meters) Viernate

Click the Weight/Compare Sketches button and the following results window appears:

If needed, adjust the column widths as required by dragging the list box header dividers left or right.

					Sketch Score	/ Hating Detail		
SeiedD	Industry	their	RangTase	Wege	Some Turned	Riving Tutnis	Score Tunind Ar.	Ravey Tubane Al
istua)	Population density	persona per dicer.	Centralize	12.54	858	100.05	8.42	100.00
5101	Uzermix	0-1 scale	Increase	2	0.44	04.33	0.41	78.7%
\$102	Average grantel star	occusio feed	Certrater	2	22.683	96.75	22.6ED	96.75
\$101	Developed actes per capital	contractan/capita	Decreate	2	0.008	100.01	0.095	100.032
\$200	Conforming dwelling density.	dvellops/net acre	Contration	3	6.75	38.93	6.52	46.22
\$201	Mon-conforming dualing day	charafferen Indt acces	Contraint	3	6.22	65.81	6.30	F23.7%
\$207	Simple-family incoment many	concernent SIF	Certaine	2	98	21.33	95	45.52
\$ 202	Adaptic Adapte Receipting three	menned http:	Contration	- 5	0	0.077	1	77.62
6204	McRidamby 2.4 units housing	named MEDical	Carpoline	3		21.30	0	0.00
5205	Mr. A. Lands for cashs instants	instant MEN at	Cereranare.	- 51	- initial - initiana - initial - initial - initial - initial - initial - ini	0.0%	2	99.02
0.000	Part of the states in the state of the state	bounded for one	Complete	1.5		0.0%		0.00
2208	moup diverses notional man	percent un	Sectoration	- 5-1		0.01	5 June 1	0.0%
5207	Processing processing to transfer	and denance to e stop in 1	Decrease	-51	1.127	12,00	1,052	36.63
5,000	Housing proventy to recreation	avg. distance to a pay/sche	Decleme	- 4	3.130	40.010	3,200	44.04
\$108	Housing provinty to education	avit diet to a school/delicate	Decronom	15	3,544	41,422	3,222	44.4%
3210	Housing proximity to key arrie	avg. dist to a key amendu m.)	Decreate	- 21	2,176	20.7%	2,153	19.25
\$211	Divelings within 1/8 rale of 3	precient of DEIs	Increase		π	100.02	78.	100.02
\$212	Housing preamity to emp cieri	avg. did to a enp centers (It.)	Decrease	- P	6,403	0.0%	6,472	0.0%
5213	Residential solen consumption	gal/dag/japita_parcels < 15	Decreate	22.0	83	100.02	82	100.02
\$214	Residential energy consumpti	MMBhu/yr/capite (houring 5	Decrease	2	104	72.991	104	72.9%
\$300	Employment	employees	Exclude	0				
\$301	Jobs/housed workets balance	jobu/workers	Centralize	23	1.52	53.8%	1.52	52.87
\$362	Conforming employment dems	employees/net acce	Centralize	3	18.00	100.01:	17.99	100.0%
\$303	Non-conforming employment	muphismuthet accur	Cermaker	- 3	6 60	0.022	9.01	8.0%
5304	Employment proximity to transit	ava, distance to a stop (IV.)	Dectence	2	505	100.83	678	100.04/
\$400	Indexectorea	improvement acress and DEL	December	2	0.19	0.02	0.19	8.05
5401	Stomwales turolt	cubic foet per som	Exclude	Ő.				
5.402	Fold surgersteril colule	References time (mile)	Freihalte	100				
5475	Plannkarn	A Shore shore more sub-sh	Exclude	10				
CAILA	Alderson	A death and the set of a	Exchange					
2102	Construction of the second	consponent introduced and	Contractor		2411	in phy-		0.05
0.400	Cole is a second at the	perpena tora tana area	Consider.	3	20.2	0.0%	10.0	6.04
2400	F do, space anadulary	auteur i deu personi	Cerriality	1	400.8	0.04	10.8	8.25
2204	Street centerarie datrance	logite space councilie der tu 1	E-KCRUK90	14	No.	10.000		10.00
255N	Side+talk, competeness	s of seven norrage w/ sidew	Increase	1.1	62	66.71%	44	44.8%
2601	Predecision rouse detectment	PREWORK GELMOOP/ARENV-GELTA	Decreate	14	1.6.7	0.04	1,04	0.02
PRIM	Sheet network density	street contenine m. 7 ac m.	20036-816		13.8	3.7.2	11.0	9.28
10003	Stinet connectivity	0.1 10.00	Incidente	1	0.78	733.474	0.78	V13.426
1005	Bicjele network	S street centerine dist. w/ bi	Increase	- Z.	13	ZZ-41	13	22.44
SERIE	Transit stop coverage	slops per sig tole	Incidentel	2	37.1	1100.003	31:1	100.02
\$607	Regional accessibility	mean minutes to all region de	Dectepse:	- Z	20	66.7%	20	86.7%
\$608	Horop-based vehicle trips	VT/day/capita	Decrease	2	2.2	100.03	2.1	100.03:
5609-	Non home-based vehicle tips	VT/day/copita	Decrease	2	1.5	50.03	1.5	50.51
1200		and the second s	72		1.0.00	The second	- Children and Children	
01						Run Compa	E GR FAAM 1	Int Freizer

Click the Run Compare button and the Weighted Results window appears with sketches ranked in bar chart form and overall weighted scores in a list box:



12. <u>An Extra-Credit Learning Exercise</u>

Now that you have successfully completed the Getting Started tutorial, you can populate SGI's main Database with local shapefiles and begin to create your own test sketches for more experience with the model. Since this is still a learning experience, you may want to improve your skills by focusing on one of the tool's basic applications: is a proposed development project favorable or unfavorable for an area? An example would be a partially-developed neighborhood where you conceptualize a hypothetical infill development project, e.g. a new residential subdivision, and evaluate its impacts.

Using data describing existing conditions in the vicinity, and shapefiles representing a hypothetical development project, you can exercise SGI's capabilities with the following six steps:

- 1. Determine which indicators are relevant to hypothetical project issues.
- 2. Measure existing conditions in the proposed project vicinity <u>without</u> the project. Calculate indicator scores for a reasonable impact area around the proposed project site, or for an already-established local boundary that encompasses the project site.
- 3. Measure build-out scores for the existing official land-use plan for the area <u>without</u> the project. Build-out indicator scores are the equivalent of plan goals. If an official plan doesn't apply to the area, measure a set of tentative objectives and goals.
- 4. Measure the area <u>with</u> the project included (modify #2 to include the project).
- 5. Gauge the type, direction, and magnitude of change in indicator scores between the baseline area (#2) and the area with the project (#4). Which indicator scores change, in what direction, and by how much?
- 6. Gauge the consistency of the project scores (#4) with the area's goals (#3). Does the project move indicator scores in the direction of the area's goals and if so, which indicators and by how much?