

# Creating Sales Territories

## *Sales territory design and balancing*

—by Fred L. Miller

## Introduction

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### Problem

Two years ago, Janice Brown and Steven Bent started three *Living in the Green Lane* stores in the Minneapolis–St. Paul area.<sup>1</sup> Their concept, a home center for environmentally concerned consumers, has been very successful. Their core customers have been "green" consumers who are motivated either by environmental concerns or the economic savings available from green technologies (Schaefer 2007). These consumers tend to have higher levels of income, education and home value than the general population of the United States (Kannan 2007).

To expand services and increase revenue, Janice and Steven have added organic lawn and garden services, as well as organic pest control services, in their product line. They plan to use a personal sales force of six sales representatives to offer these services to homeowners.

They wish to organize this sales force into a territory system with two territories assigned to each of the three stores. They have charged you, in your role as the firm's business geographic information system (GIS) analyst, to design this system of six territories with approximately the same level of sales potential in each.

Your task in this *SpatialLAB* is to design that territory structure.

### Location

Minneapolis-St. Paul core-based statistical area

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<sup>1</sup> The organizations and people in this *SpatialLAB* are fictional. Any resemblance to actual individuals or organizations is coincidental.

## Time to complete the lab

Four to six hours

## Prerequisites

An understanding of the importance of sales territory design and balancing in the sales management process

Access to Esri Business Analyst™ Desktop Premium 10

## Data used in this lab

- Demographic and consumer spending data at the *ZIP Code* level

# Student activity

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Sales territory design and balancing are core components of effective sales management. The objective of this process is to create territories with balanced sales potential, workloads, efficiency, and account service quality. Compact territories that are consistent with transportation infrastructure maximize the ratio between customer interaction time and drive time. Sales staff view territories that balance workload and sales potential as fair and conducive to consistent commitment to customer service levels across territories.

In revising established sales territories, you will use existing enterprise sales data to analyze and balance these factors. New market situations such as this one, however, lack sales data from existing customers and are based on measures of sales potential. In this case, you will estimate sales potential based on the number of households, the number of owner-occupied housing units, and total expenditures on lawn and garden services in a territory.

Using this data, you will design a sales territory solution consisting of six territories—two for each of *Living in the Green Lane's* three stores—by performing six tasks. You will

1. Create a territory solution using the homes of *Living in the Green Lane's* six sales representatives as seed points.
2. Create a new level in the territory solution using *Living in the Green Lane's* three stores as seed points.
3. Reassign territories between stores to achieve the goal of two sales territories for each store.

4. Reassign territories to achieve spatial balance within the system.
5. Adjust the assignment of ZIP Codes to sales territories to balance expenditures on lawn and garden services within the solution.
6. Create sales territory solution reports that provide detailed information on the solution you have designed as well as the comparative characteristics of that solution relative to an alternative sales territory solution based on population values.

At the conclusion of this lab, you may be required to submit written answers to the questions in this exercise as well as supporting copies of the reports you have created.

## Conventions used in the data

**CY** Current-year data

**FY** Future-year projections, which are five years beyond the current year

**HH** Household

**Seed points** Locations from which sales territories are developed such as sales offices; retail stores; warehouse facilities; or, as in this case, sales representatives' homes

## Prepare your workspace

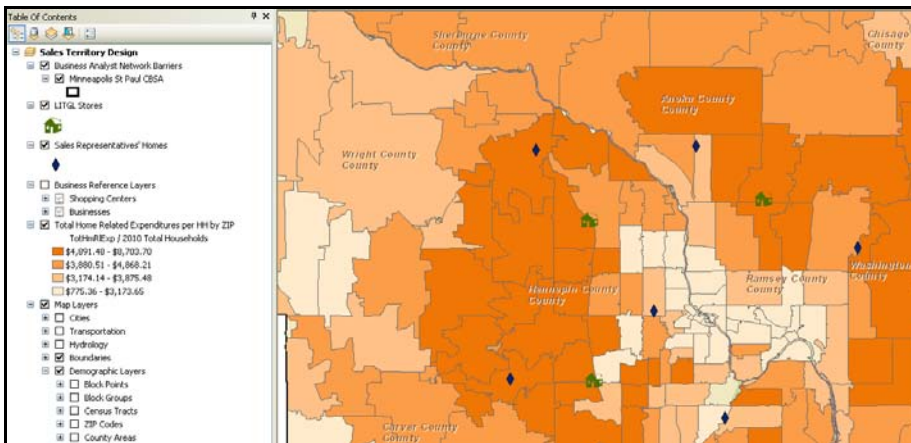
This lab uses Business Analyst™ Desktop Premium 10 software to perform the analysis. To prepare for it, you should confirm that this software is available on your workstation.

## OPEN TERRITORY DESIGN AND CREATE TERRITORY SOLUTION

The *Territory Design* extension provides a powerful tool for designing and balancing sales territory solutions. You will use it for this purpose in this lab.

- 1 If you have not already done so, copy the *LITGL Minneapolis St Paul* project folder to the *C:\My Output Data\Projects\* folder on your hard drive.
- 2 Click *Start » Programs » ArcGIS » Business Analyst » BusinessAnalyst.mxd* to run ArcMap™, load *Business Analyst Extension*, and then load *Business Analyst Message Center*.
- 3 Click *LITGL Minneapolis St Paul* under *Recent Projects* to select this project and load the business GIS default map.

- Click *File » Open*. Navigate to *C:\My Output Data\Projects\LITGL Minneapolis St Paul\CustomData\ChapterFiles\Chapter8\LITGLSalesMgt.mxd*. Click the map file to open it.

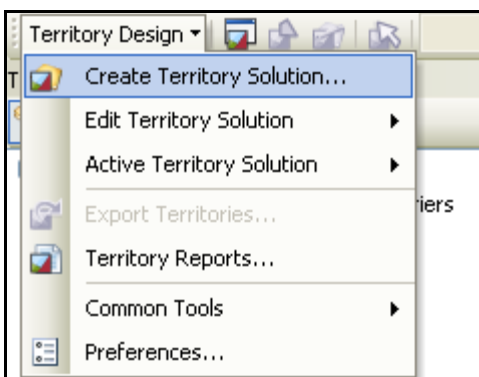


This map contains a layer displaying available *Living in the Green Lane Steiers, Mason, and Longwell* store locations over a thematic map of *Home Related Expenditures per Household by ZIP Code*. The data source for this layer is a shapefile customized for this project containing ZIP Codes data. ZIP Codes are a more useful geographic unit than block groups for defining sales territories. The *table of contents* also includes a *Sales Representatives' Homes* layer that is turned off. These are the geographic points around which you will build territories.

- From the main menu bar, click *Customize* and then *Toolbars* to open the *Toolbars* dialog box. Check *Territory Design* near the bottom of the list to open the *Territory Design* toolbar. When the toolbar appears, drag it to the top of the screen to dock it there, if necessary.

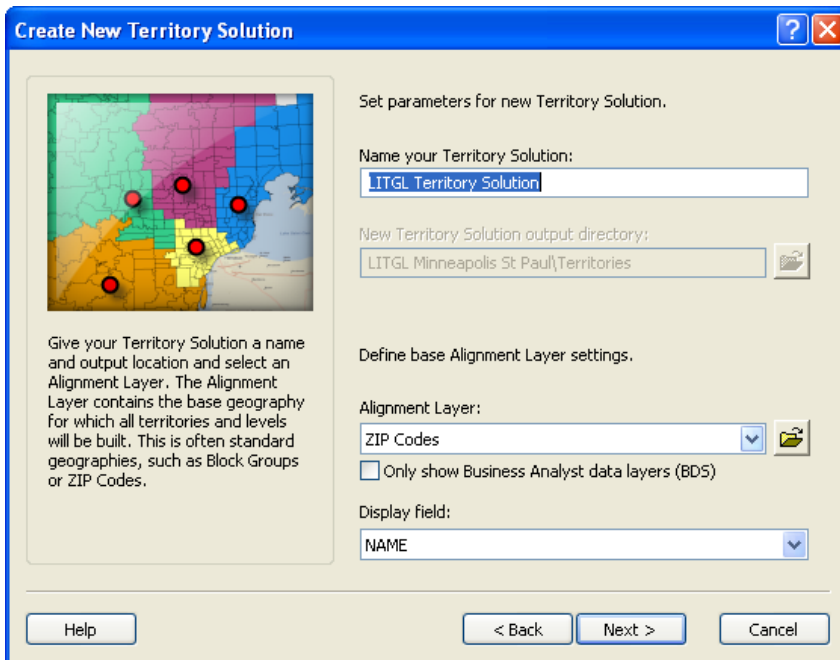
With the *Territory Design* toolbar in place, you are ready to begin the process of territory creation. The first step is to create a territory solution based on the seed points of sales representatives' homes.

- Click the drop-down arrow on the *Territory Design* toolbar and then click *Create Territory Solution*.



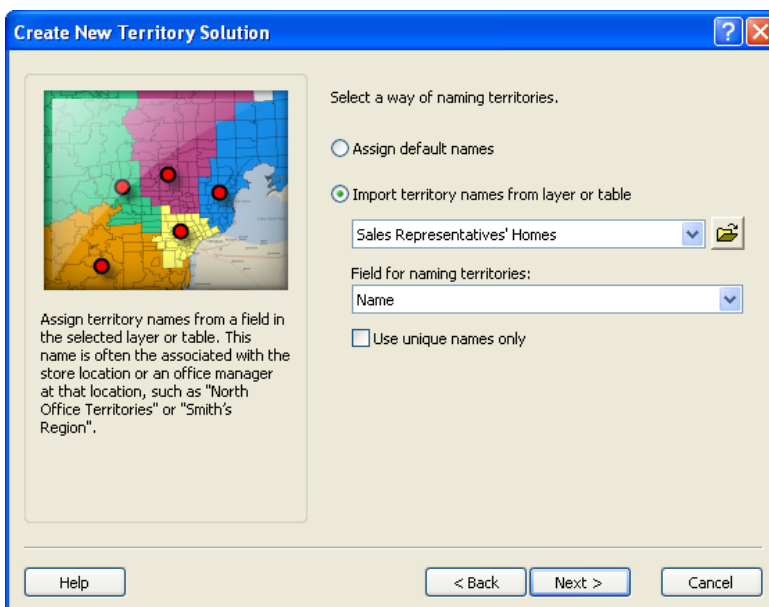
- In the resultant window, select the *Create territories from seed points* option and then click *Next*.

- 8 In the resultant window, enter **LITGL Territory Solution** in the *Name your Territory Solution* field and select **ZIP Codes** for *Alignment Layer*. When your screen resembles the one below, click *Next*.



- 9 In the resultant window, select *Sales Representatives' Homes* as the *Seed point* layer and then click *Next*.

- 10 In the resultant window, select the *Import territory names from layer or table* option and use the drop-down boxes to designate *Sales Representatives' Homes* as the layer and *Name* as the *Field for naming territories*. When your screen resembles the one below, click *Next*.

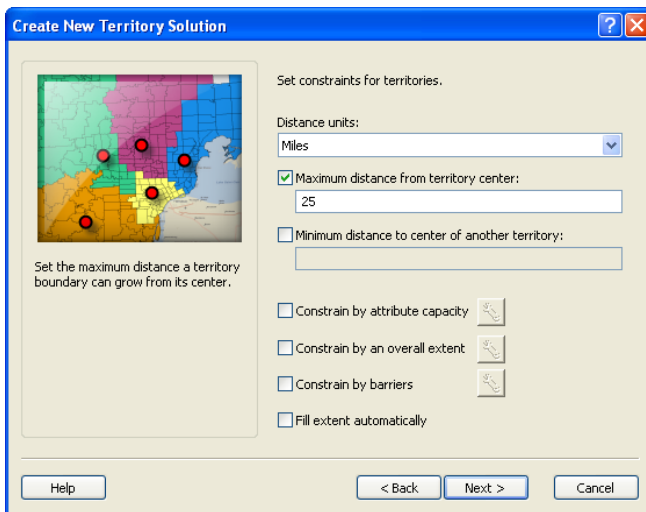


11 In the resultant window, select the *Automatically set the number of territories* option and, from the drop-down box, select the *Number of Seed Points* option. Use the drop-down box to select *Straight line distance* as the *Measure* type and then click *Next*.

12 In the resultant window, select *Miles* in the *Distance units* field and enter **25** as the *Maximum distance from territory center* value.

This value will create relatively compact territories, which is consistent with *Living in the Green Lane's* commitment to local service. If the firm wishes to expand its reach, it will add new territories.

13 Accept all the remaining defaults so that your screen looks like the one below. When it does, click *Next*.

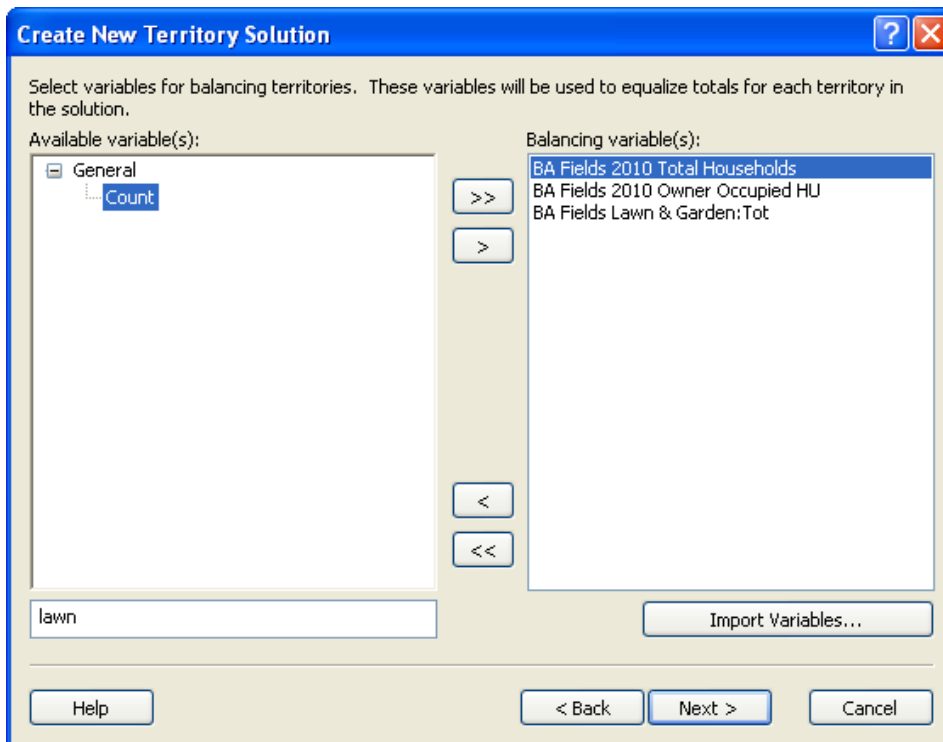


## BALANCE TERRITORIES

1 In the resultant window, select the *Balance territories* option and click *Next*.

2 In the resultant window, select *CY Total Households*, *CY Owner Occupied HU*, and *Lawn & Garden: Tot*, and then click the single right-facing arrow to add them to the list in the right box.

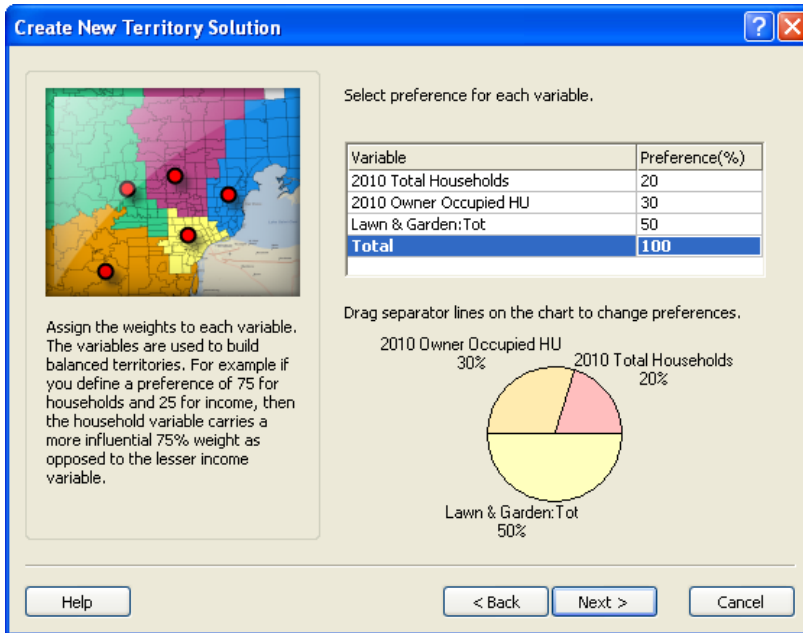
When your screen resembles the one below, click *Next*.



- 3 In the resultant window, enter weights for the three balancing variables by entering values in the table or using your mouse to adjust the boundary lines between factors in the pie chart at the bottom of the window.

If you choose the former method, be sure to enter values that add up to 100. You may adjust the balance of your territory system later, but for now, use initial weights of **20** for *CY Total Households*, **30** for *CY Owner Occupied HU*, and **50** for *Lawn & Garden: Tot*. Lawn and garden expenditures are weighted heavily, as they are the best measure of total expenditures for services *Living in the Green Lane's* sales force will be offering. The weighting of owner-occupied housing units above total households reflects Janice and Steven's view that homeowners are more likely than renters to purchase these services.

4 When your window resembles the one below, click *Next*.



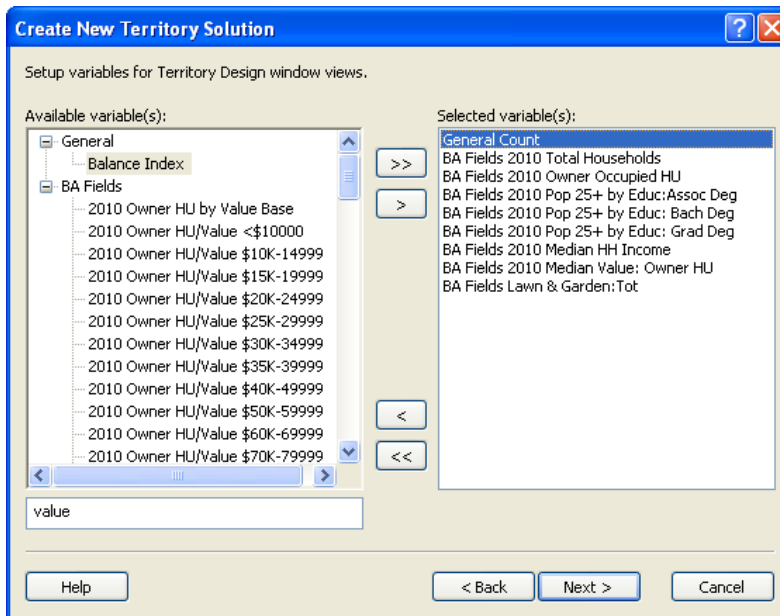
5 In the resultant window, select the *Territories must be contiguous* and *Do not reassign polygons that contain territory centers* options, leave the remaining options unselected, and then click *Next*.

6 In the resultant window, select the *Count* variable and then click the single right-facing arrow between the boxes to add this variable to the list of setup variables in the right box. Continue this process to add the following variables to the list in the right box.

- *General Count*
- *CY Total Households*
- *CY Owner Occupied HU*
- *CY Pop 25+ by Educ: Assoc Deg*
- *CY Pop 25+ by Educ: Bach Deg*
- *CY Pop 25+ by Educ: Grad Deg*
- *CY Median HH Income*
- *CY Median Value: Owner HU*
- *Lawn & Garden: Tot*

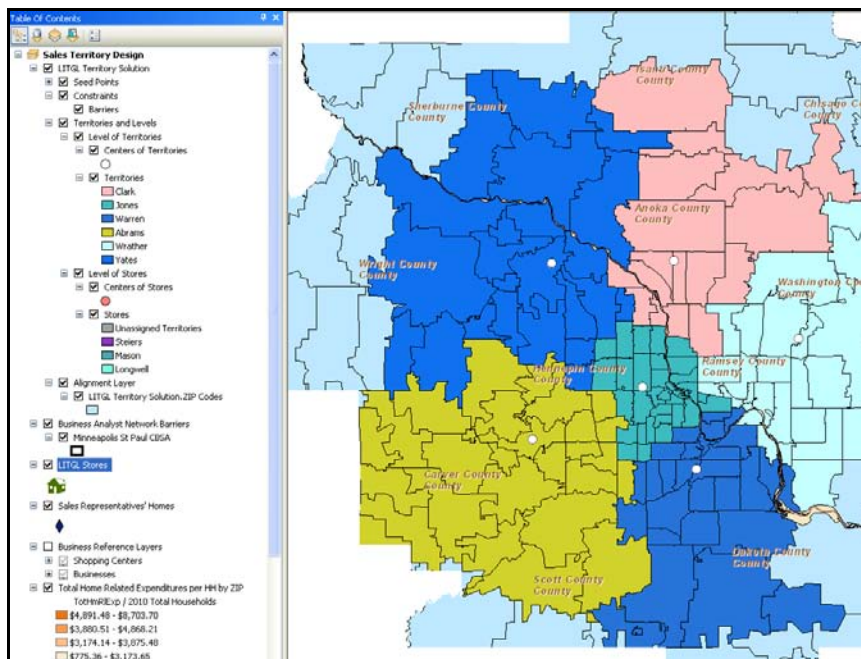


When your screen resembles the one below, click *Next*.



- 7 In the resultant window, review the settings for the wizard, and then click *Finish* to create the territory solution.

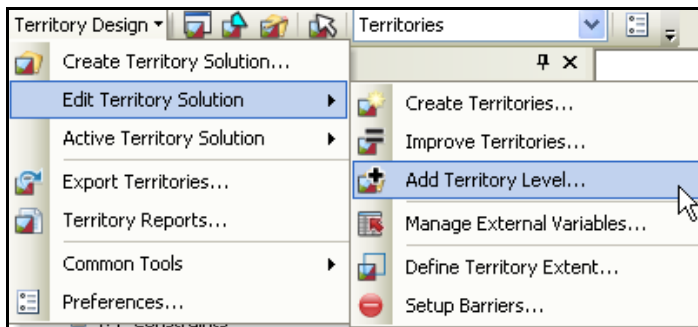
*Territory Design* creates a territory solution with six territories based on the locations of the homes of the six sales representatives and displays the territories on a map, which should resemble the one below. These territories must now be assigned to *Living in the Green Lane* stores, with each of the three stores supporting two territories.



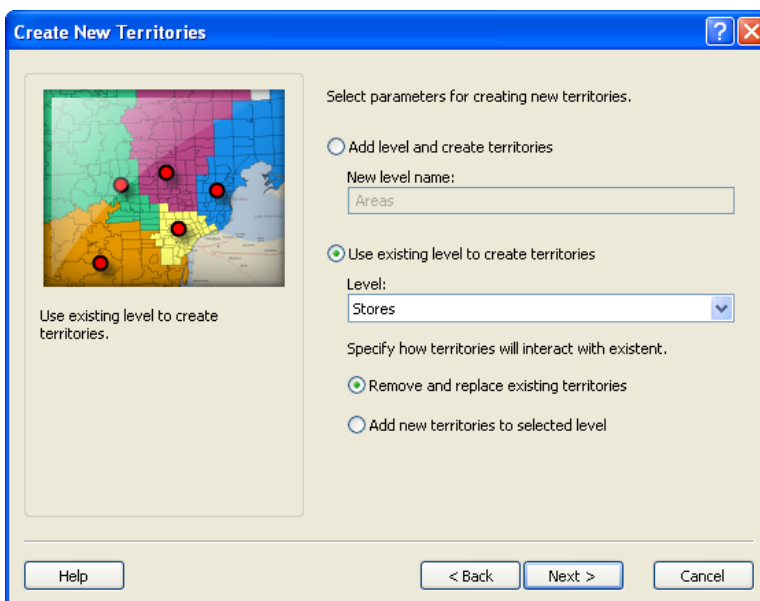
## CREATE REGIONS AROUND STORES

Each of *Living in the Green Lane's* three stores in your territory system supports two sales territories. You will create this association by repeating the *Create Territories* procedure using the *LITGL Stores* layer to supply seed points.

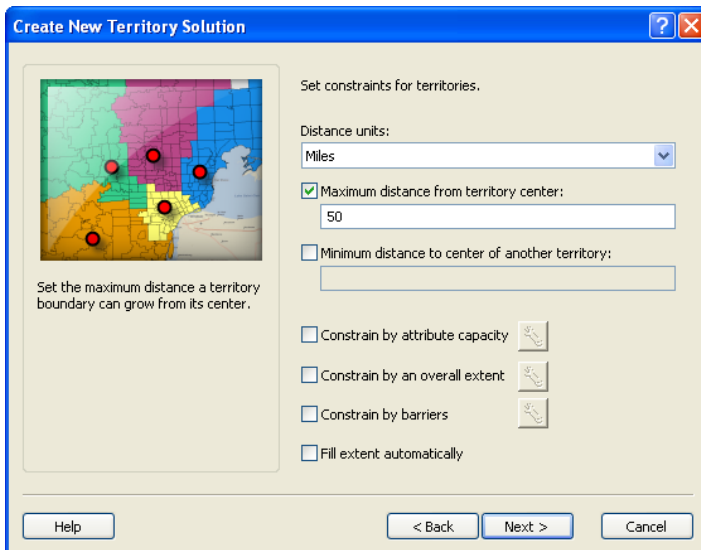
- 1 Click the *Territory Design* drop-down menu, select *Edit Territory Solution*, and then click *Add Territory Level*. Enter **Stores** as the name for the new level and click *OK*.



- 2 When asked if you wish to use the *Create New Territory Solution* wizard for this operation, click *Yes*.
- 3 In the resultant window, select the *Create territories from seed points* option and click *Next*.
- 4 In the resultant window, select the *Use existing level to create territories* option, select *Stores* in the *Level* field, and then select the *Remove and replace existing territories* option. When your screen resembles the one below, click *Next*.

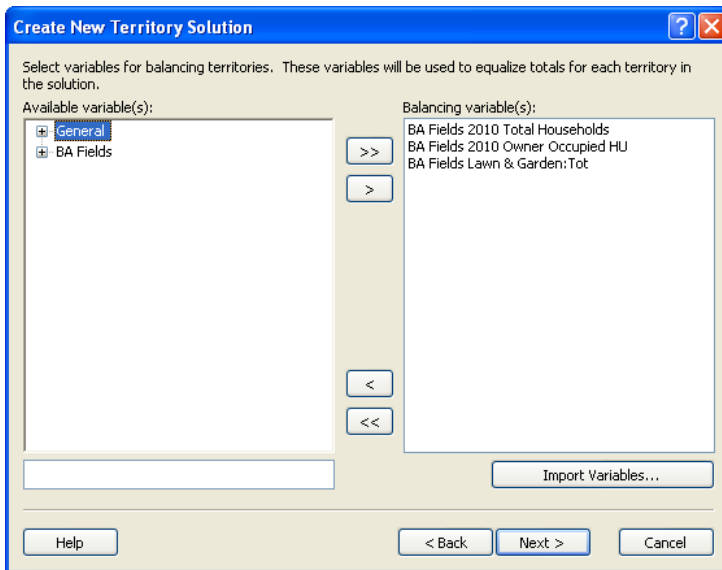


- 5 In the resultant window, select *LITGL Stores* as the *Seed point* layer and click *Next*.
- 6 In the resultant window, select the *Import territory names from layer or table* option, use the drop-down boxes to designate *LITGL Stores* as the layer and *Name* as the *Field* for naming territories, and then click *Next*.
- 7 In the resultant window, select the *Automatically set the number of territories* option and, from the drop-down box, select the *Number of Seed Points* option. Use the drop-down box to select *Straight line distance* as the *Measure* type, and then click *Next*.
- 8 In the resultant window, select *Miles* in the *Distance units* field and enter **50** as the *Maximum distance from territory center* value. Accept all the remaining defaults so that your screen looks like the one below. When it does, click *Next*.

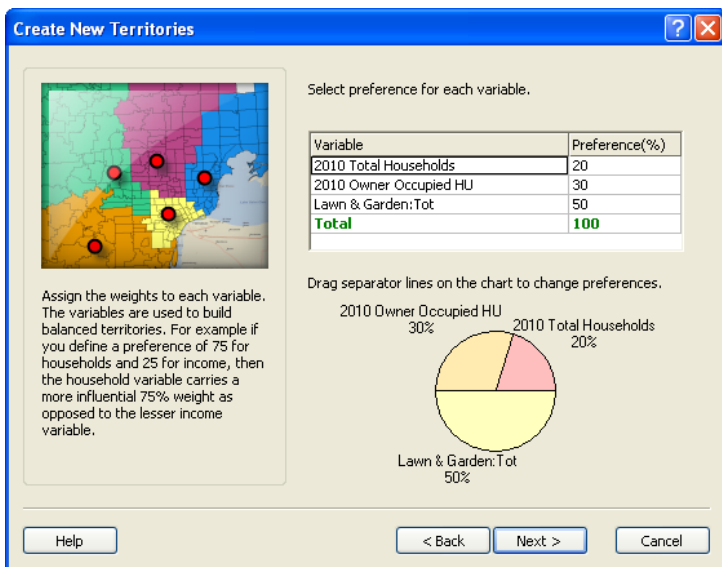


- 9 In the resultant window, select the *Balance territories* option and click *Next*.

- In the resultant window, if necessary, select *CY Total Households*, *CY Owner Occupied HU*, and *Lawn & Garden: Tot*, and then click the single right-facing arrow to add them to the list in the right box. When your screen resembles the one below, click *Next*.



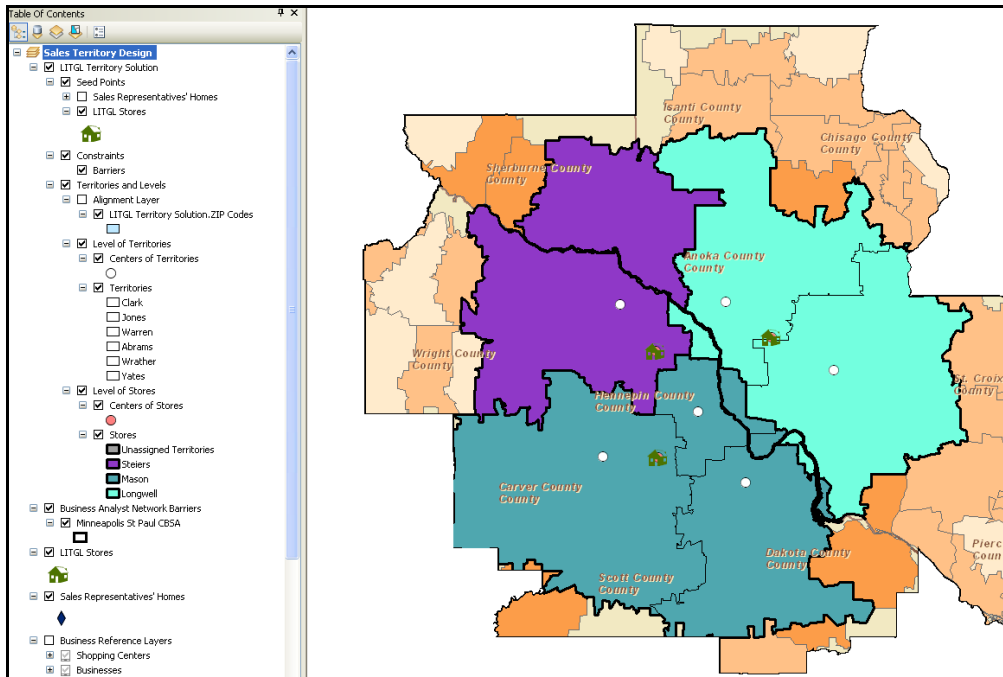
- In the resultant window, the weights of the three balancing variables should match those you entered earlier. If they do not, adjust them to match those values of **20** for *CY Total Households*, **30** for *CY Owner Occupied HU*, and **50** for *Lawn & Garden: Tot*. When your window resembles the one below, click *Next*.



- In the resultant window, select the *Territories must be contiguous* and *Do not reassign polygons that contain territory centers* options, leave the remaining options unselected, and then click *Next*.

- In the resultant window, review the settings for the wizard and then click *Finish* to create the territory solution.


The system applies your settings, designs a territory structure at the store level, and displays it on a map that should resemble the one below, though the colors may vary.




Note that three territories have been assigned to the *Mason* store and only one to the *Steiers* store. You must correct this allocation and balance the territories more exactly from both statistical and spatial perspectives.

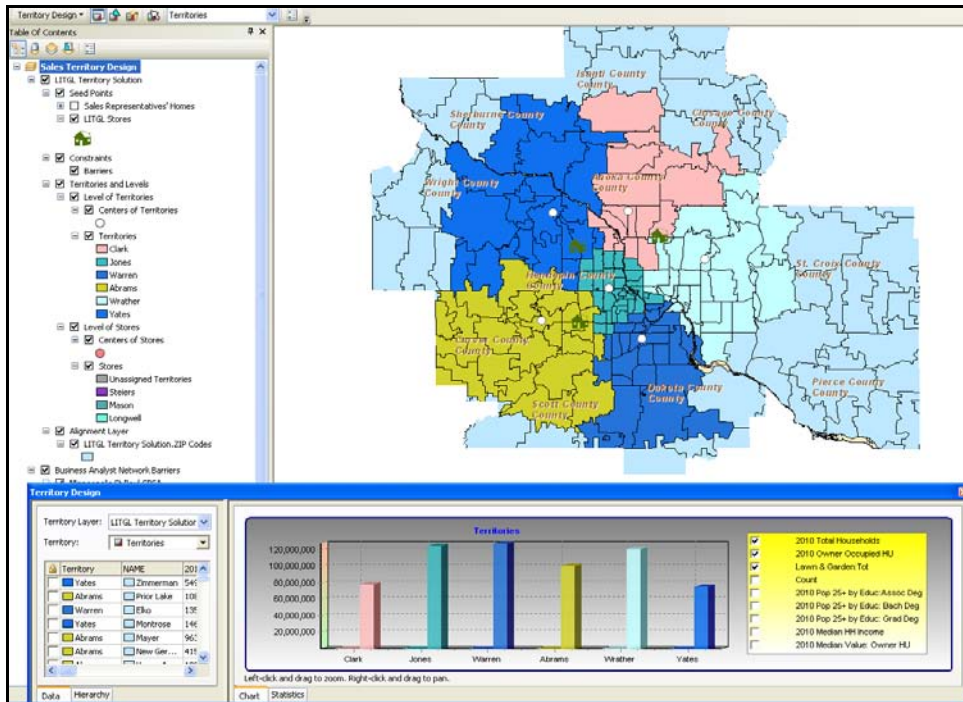
## REFINE A TERRITORY SOLUTION

The next step in the territory design process is to review the initial system produced by *Territory Design* and refine it to meet *Living in the Green Lane's* objectives more closely. The *Territory Design* window and *Edit* process allow you to assess the current balance among territories and move ZIP Codes between territories and territories between stores to improve the overall solution.

- Click the *Territory Design* toolbar and click the *Show/Hide Territory Design Window* icon  to open this window at the bottom of the screen. Drag the window to the bottom horizontally if it opens vertically next to the *table of contents*. If necessary, adjust the boundary of the window so it is visible.

- Use the drop-down box for the *Territory* field at the top left of the *Territory Design* window at the bottom of the screen to display the values for each of the six territories. Your screen should resemble the one below.

If the window does not display all territories, confirm that the Selection Mode button  is not depressed. If it is, click it to display all territories.



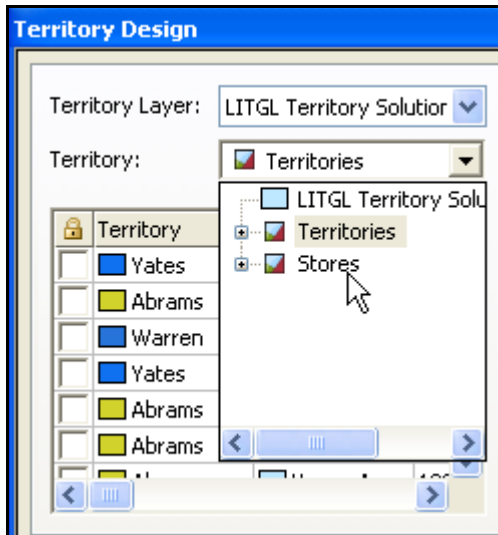
This window provides a rich environment for exploring and revising your territory structure. Take a moment to review some of its main features.



Review the bar charts in the main window. These represent the values of each territory for the variables selected in the list on the right. Changing this selection allows you to compare territories using all these attributes.

- Confirm that the *Territories* level is selected in the *Territory* field toward the top left of the *Territory Design* window.
- Select *CY Total Households*, *CY Owner Occupied HU*, and *Lawn & Garden: Tot* to match the screen above.

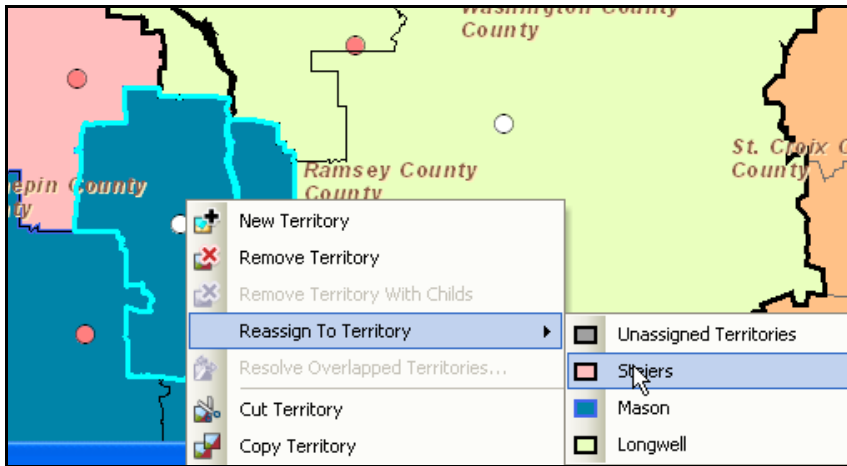
**The high relative values for Lawn & Garden: Tot make it difficult to compare the other two values. Experiment with the selection process to view the values for each territory for these variables.**

- 5 In the *Territory* drop-down box at the left of the window, select the *Stores* level (see below) to display similar data at this level. Select the *Lawn & Garden: Tot* variable at the right of the window, as this is the primary measure you will use to adjust the balance of territories.



- 6 This view confirms that the *Mason* store has been assigned three territories and the *Steiers* store only one, resulting in a significant imbalance in lawn and garden expenditures. You will correct this problem by reassigning the *Jones* territory to the *Steiers* store.
- 7 If necessary, turn off the *Level of Territories* group layer to display the *Stores* layer on the map. Click the *Edit Mode* button  on the *Territory Design* toolbar to enable territory editing.
- 8 Click the *Select Tool*  on the *Territory Design* toolbar. Pause the pointer over the *Jones* territory in the center of the map until the *Tip* content displays both the name of the territory and the store to which it has been assigned.

- 9 Click this territory to highlight it. Right-click the territory, select *Reassign To Territory*, and then select *Steiers* as the store to which the territory should be reassigned (see below).



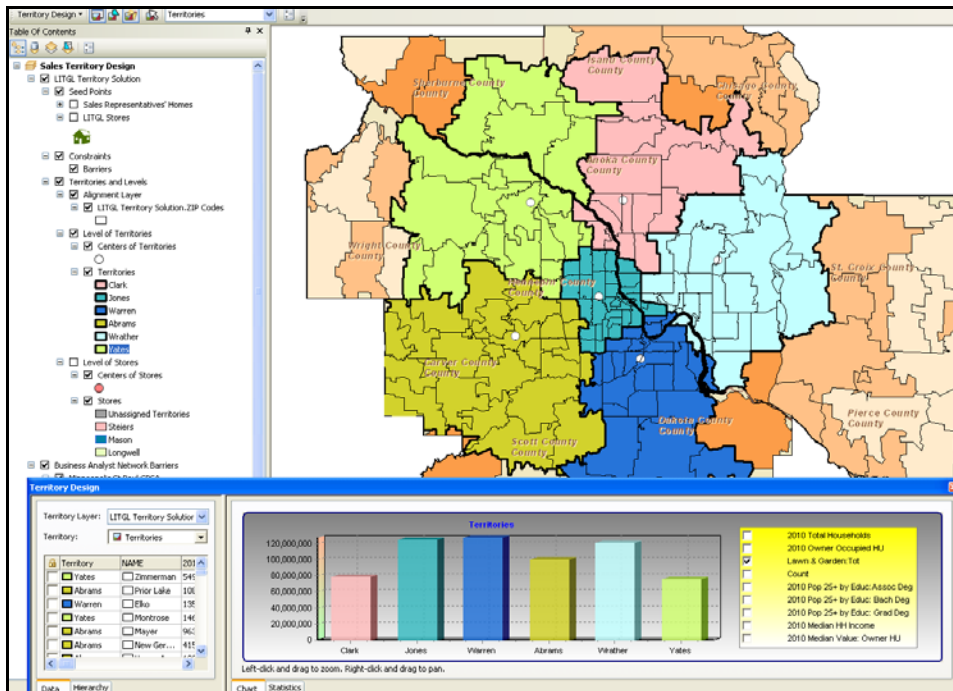
The system reassigns the *Jones* territory to the *Steiers* store and updates the chart in the *Territory Design* window. The resultant balance of lawn and garden expenditures is much more favorable. The assignment of territories to stores is now complete. You will use these analysis and editing tools to improve the statistical and spatial balance of the six territories.

### IMPROVE TERRITORY BALANCE

- 1 Reset the *Territory* field at the left of the *Territory Design* window to *Territories* and select only the *Lawn and Garden: Tot* attribute.

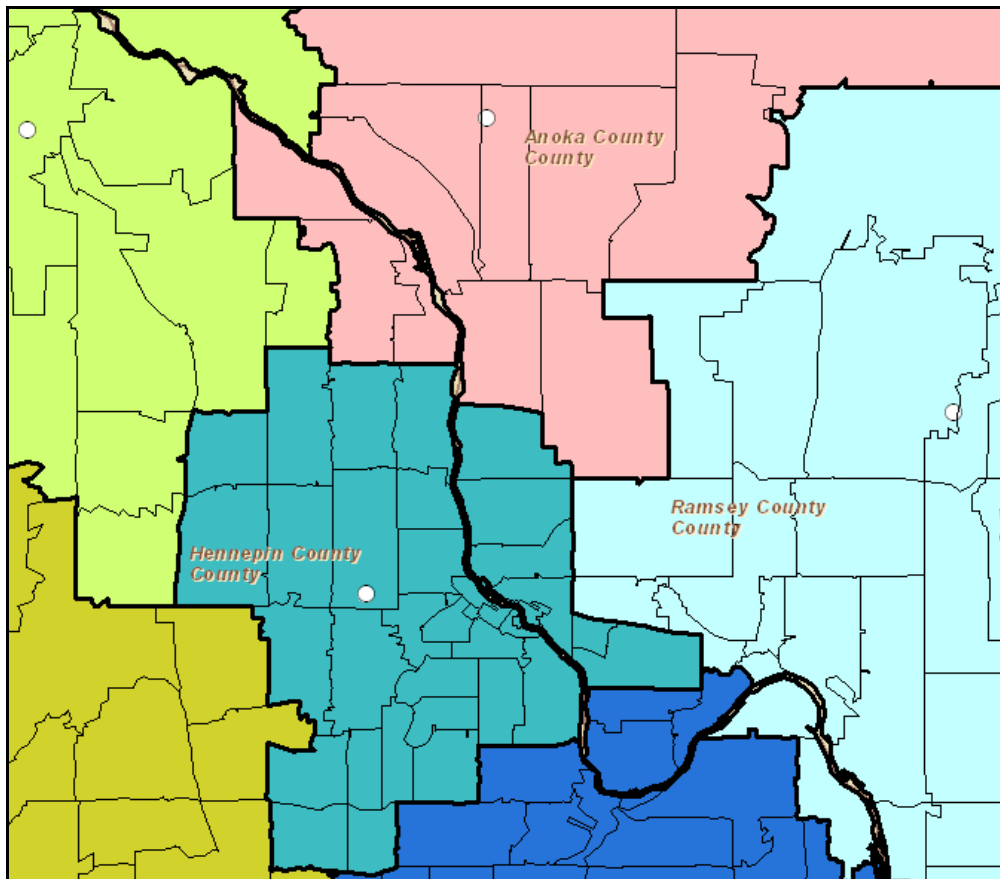


- Confirm that the *Edit Mode* and *Select Tool* icons are activated. This will display the values of this attribute for each territory. Your screen should resemble the one below. When it does, you are ready to begin the process of refining territory balance.



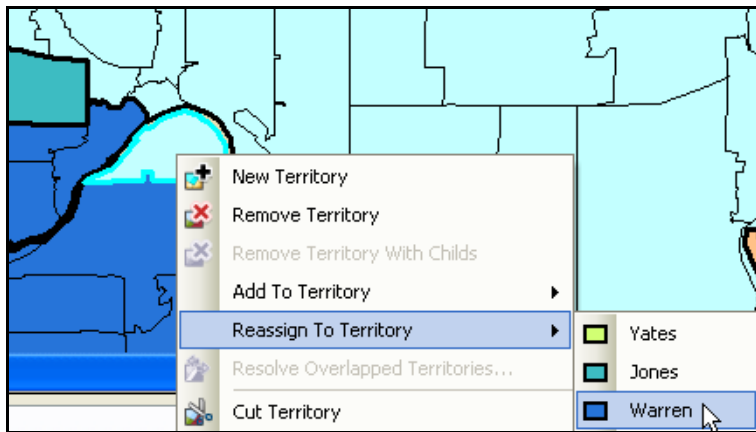
In this view, you may observe two things about this territory solution. First, there are relatively large variations in lawn and garden expenditures between territories. Second, five territories cross the Mississippi River in the middle portion of the market area. This means that four sales representatives must cross the river frequently to serve their clients, resulting in longer drive times and potential delays. You will begin the rebalancing process by reassigning ZIP Codes to minimize the number of territories that span the river.

- 3 Zoom to the approximate scale of the map below. This view displays the five territories that span the river as well as the ZIP Codes in each territory. You will select and reassign ZIP Codes to address this problem.



- 4 With the *Select Tool* activated, select the two ZIP Codes in the *Wrather* territory that are south of the river. You may do so with either a click-and-drag method or by pressing the *SHIFT* key and clicking within each individual ZIP Code.

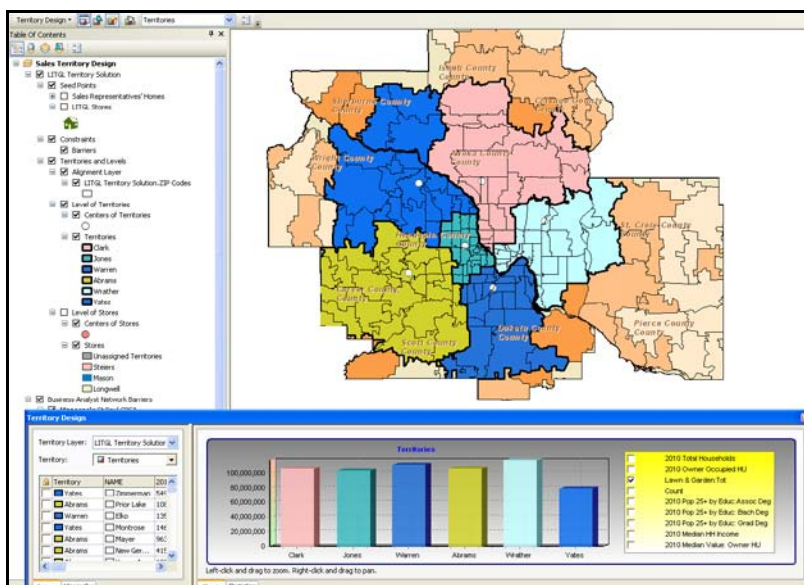
- 5 Right-click, select *Reassign To Territory*, and then select *Warren* (see below) to reassign these ZIP Codes to the *Warren* territory.



The system reassigns the ZIP Codes, recalculates values for the new territory structure, and updates the graph in the *Territory Design* window. Each reassignment you make will affect the overall balance of lawn and garden expenditures between territories. You will reassign ZIP Codes to eliminate cross-river territories and address this imbalance in expenditures.

- 6 Repeat the selection and reassignment procedure to reach a structure that eliminates as many cross-river territories as possible. As you do so, note the impact of each reassignment on the levels of lawn and garden expenditures within each territory. Consider these values as you select the territories to which ZIP Codes should be reassigned.

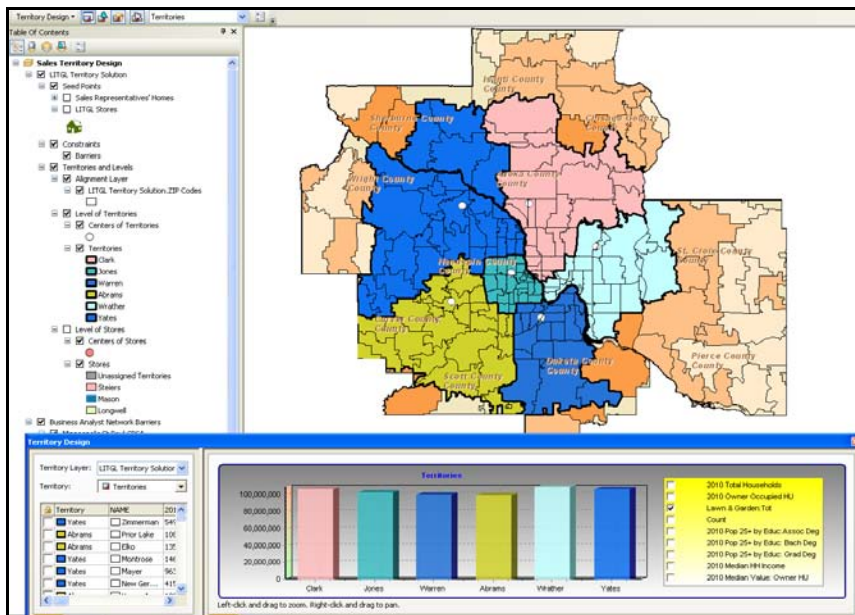
While there are multiple possible approaches to this process, the map below illustrates one solution. Note that only one—the *Yates* territory—spans the river, but the territory has substantial coverage area on both sides, allowing *Yates* to schedule daily calls completely on one side of the river or the other.



Review the chart in the *Territory Design* window. Though much improved, the distribution of lawn and garden expenditures is still uneven across territories, with the *Yates* territory significantly below the other five. You will continue to refine the balance of the territory solution by reassigning ZIP Codes between contiguous territories and observing the impact on the graph.

- Using the *Select* tool and *Reassign To Territory* process, continue to reassign ZIP Codes to improve the overall balance of lawn and garden expenditures across territories.

While your solution may vary, the map below represents a much-improved balance of lawn and garden expenditures across the six territories.



- Review the statistics for the territories by pausing your pointer over the bars in the graph or the territories in the map. They are reasonably well balanced relative to the key attribute of lawn and garden expenditures.
- Select the *CY Owner Occupied HU* variable and deselect *Lawn & Garden: Tot* to change the attribute displayed in the chart. Observe the balance of this attribute and review the statistics for each territory.

From this perspective, this territory system is acceptable. You also wish to assess territory balance as measured by purchases of lawn and garden maintenance services, which is measured by the attribute *Lawn & Garden: Tot*.


- In the *Variable(s) to display* drop-down box, select *Lawn & Garden: Tot* and review the resultant graph.

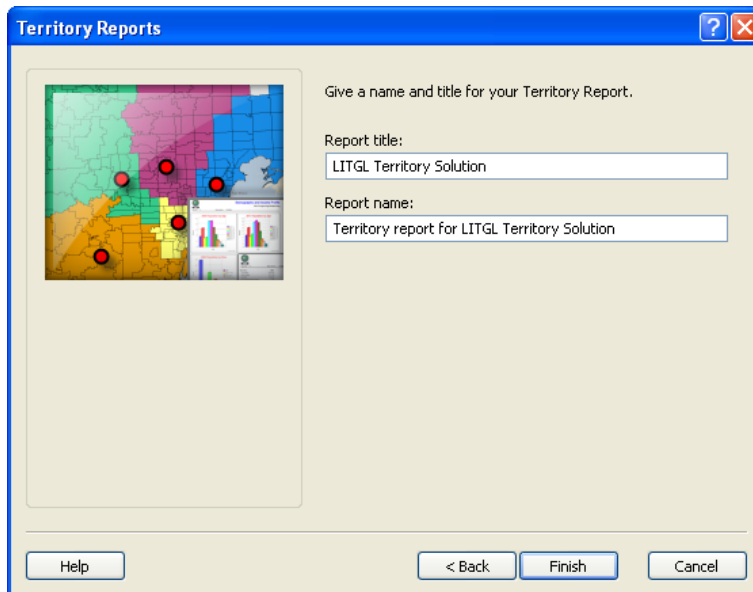
Relative to this measure, the territories could be balanced more favorably. This will be one of your objectives as you refine the territory system to correct for this as well as spatial problems that must be resolved.

**Question 1:** *How balanced are the six sales territories relative to the number of owner-occupied housing units? Relative to expenditures on lawn and garden services? Which territory has the highest level of such expenditures? The lowest? What is the difference between these expenditure levels?*

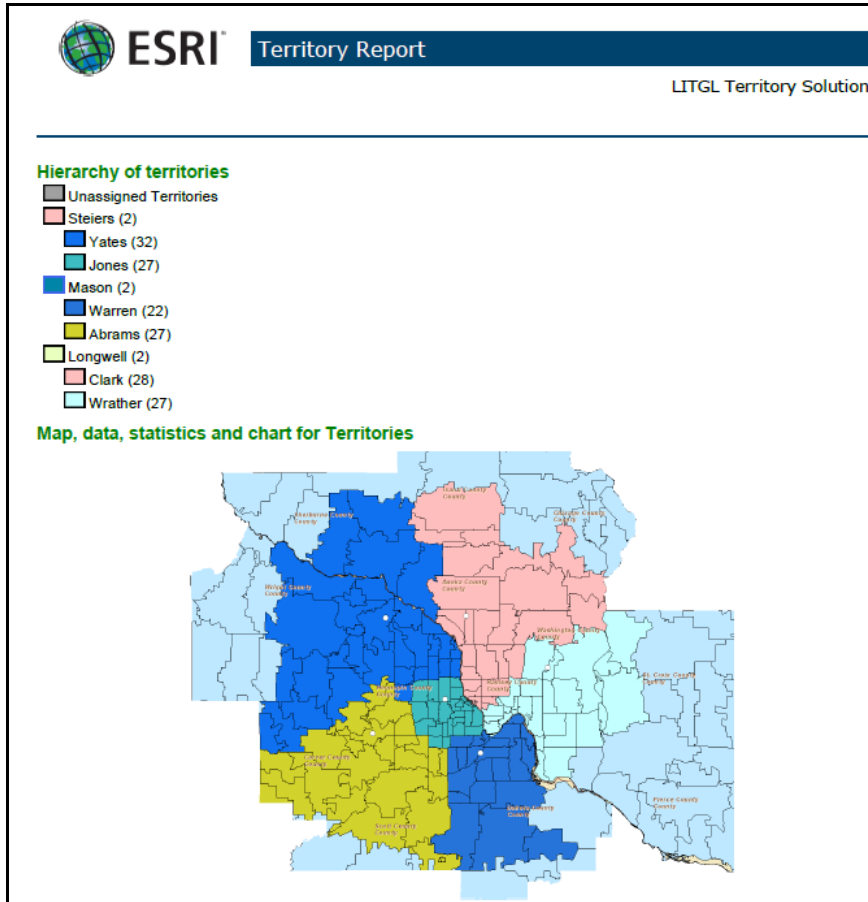
## PRODUCE TERRITORY SOLUTION REPORTS

Territory solution reports present information on each of the territories you have designed at the *Territories and Stores* level, as well as comparative information on different territory schemes. You will produce the general report first.

- 1 Click the *Edit Mode* button  to disable the editing features. On the main menu bar, click *Selection* and then click *Clear Selected Features* to remove any remaining selections.
- 2 In the drop-down box on the *Territory Design* toolbar, click *Territory Reports* to open the *Territory Reports* wizard. Select the *Territory* report option and then click *Next*.
- 3 In the resultant window, retain the default values for the *Report title* and *Report name* fields. When your screen resembles the one below, click *Finish*.



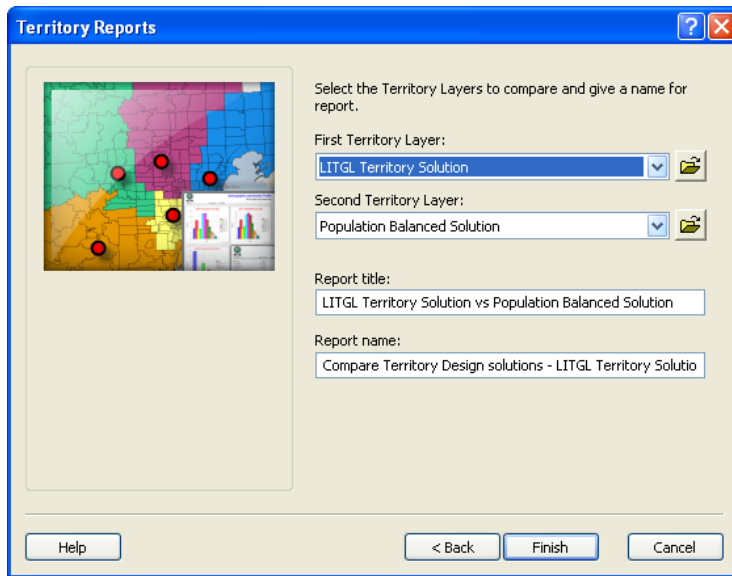
The system generates a report on your territory solution that resembles the one below. It includes maps of the territory and store layers as well as statistics on the attributes you have included in the solution. Save a copy of this report to submit with your answers to the questions for this SpatialLAB.



*Territory Design* also offers a report that facilitates the comparison of territory solutions. You will use it to compare your solution with one designed to balance territories by population.

- 4 In the drop-down box on the *Territory Design* toolbar, click *Territory Reports* to open the *Territory Reports* wizard. Select the *Compare Territory Solutions* report option and then click *Next*.
- 5 In the resultant window, confirm that *LITGL Territory Solution* and *Population Balanced Solution* are selected as *First Territory Layer* and *Second Territory Layer*, respectively, and retain the default values for the *Report title* and *Report name* fields.

When your screen resembles the one below, click *Finish*.



Territory Design performs a comprehensive comparison of the two territory schemes and creates a report that presents this information with maps, charts, tables, and data. The first page of the report resembles the one below. Comparative information on all layer attributes is provided by territory and by store.

**ESRI** Compare Territory Design Solutions

LITGL Territory Solution vs Population Balanced Solution

**Solution1: LITGL Territory Solution**  
**Solution2: Population Balanced Solution**

**Hierarchy**

Level name	Territories number in Solution1	Territories number in Solution2
Territories	6	6
Stores	4	4

**Level: Territories**

**Parameters**

Parameter	Solution1	Solution2
Territories creation type	From Locations	From Locations
Manual correction	Yes	No
Territory create options		
Territories naming	Import territory names from table	Import territory names from table
Table for naming territories	C:\My Output Data\Projects\LITGL Minneapolis St Paul\Custom Data\MapFiles\Ch8SalesRepHomes	C:\My Output Data\Projects\LITGL Minneapolis St Paul\Custom Data\MapFiles\Ch8SalesRepHomes
Unique names only	No	No
Remove and replace existing territories	Yes	Yes
Seed points layer	C:\My Output Data\Projects\LITGL Minneapolis St Paul\Custom Data\MapFiles\Ch8SalesRepHomes	C:\My Output Data\Projects\LITGL Minneapolis St Paul\Custom Data\MapFiles\Ch8SalesRepHomes
Distance type	Straight line distance	Straight line distance
Distance units	Miles	Miles
Maximum distance that a territory is away from its seed point or center	25	25
Minimum distance that a territory is away from seed point or center of another territory	Not specified	Not specified
Fill extent automatically	No	No
Preferences for each balancing variable	Variable: 2010 Total Households, Preference: 20.00 Variable: 2010 Owner Occupied HU, Preference: 30.00 Variable: Lawn & Garden:Tot, Preference: 50.00	Variable: 2010 Total Population, Preference: 100.00

This report facilitates the territory design process by supporting detailed comparison of alternative territory systems. Use it to answer the questions below.

**Question 2:** Which of the territory solutions provides the best balance relative to owner-occupied housing units? Relative to total lawn and garden expenditures? Which is the most balanced spatially?

**Question 3:** Which of the territory solutions would you recommend to Janice and Steven? Explain the rationale for your recommendation.

You have completed this SpatiaLAB on designing and balancing sales territories.



# Submit your work

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Submit answers to the following questions in a Microsoft Word document:

**Question 1:** *How balanced are the six sales territories relative to the number of owner-occupied housing units? Relative to expenditures on lawn and garden services? Which territory has the highest level of such expenditures? The lowest? What is the difference between these expenditure levels?*

**Question 2:** *Which of the territory solutions provides the best balance relative to owner-occupied housing units? Relative to total lawn and garden expenditures? Which is the most balanced spatially?*

**Question 3:** *Which of the territory solutions would you recommend to Janice and Steven? Explain the rationale for your recommendation.*

## Credits

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### Data

Data displayed in screen captures of Business Analyst is courtesy of Esri; the US Census Bureau; Infogroup; the Bureau of Labor Statistics; Applied Geographic Solutions, Inc.; Directory of Major Malls, Inc.; GfK Mediamark Research & Intelligence, LLC (GfK MRI); and Market Planning Solutions, Inc.

## Instructor resources

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### Contextual information

This SpatialLAB is written for business students in an integrated business GIS course at the undergraduate or graduate level. It may be used to replace the exercises in chapter 8 of *Getting to Know ESRI Business Analyst* in labs with Business Analyst Desktop Premium 10 installed. The emphasis is on using spatial analysis to design and manage sales territories for an organization with a field sales force. Thus, this lab could also be used as a stand-alone exercise in personal selling or sales management courses.

This lab demonstrates how to design sales territory solutions and balance them using the tools of the *Territory Design* extension of Business Analyst Desktop Premium 10.

Upon completion of the lab, students may be required to submit answers to several questions as well as copies of the reports on which their answers are based.

## Analysis and visualization tools

Business Analyst Desktop Premium 10 and the *LITGL Minneapolis St Paul* project file are required to complete this exercise.

## Data information

All the data for this exercise is provided by Business Analyst Desktop.

### Data sources

Esri® Business Analyst data

## Answer key

**Question 1:** *How balanced are the six sales territories relative to the number of owner-occupied housing units? Relative to expenditures on lawn and garden services? Which territory has the highest level of such expenditures? The lowest? What is the difference between these expenditure levels?*

*These results will vary depending on the solution crafted by each student. However, the numbers submitted in the answers here should be supported by the attached Territory Report. In the territories used for illustration in the lab, the answers are as follows: The territories are only moderately balanced relative to owner-occupied housing units, with a range of 112,977 to 162,092. The balance is better for lawn and garden expenditures, which range from \$99.4 million for the Abrams territory to \$109.2 million for Wrath, a difference of approximately \$9.8 million. Students' answers to these questions should be consistent with the data in the Territory Report for the LITGL Territory Solution.*

**Question 2:** *Which of the territory solutions provides the best balance relative to owner-occupied housing units? Relative to total lawn and garden expenditures? Which is the most balanced spatially?*

*While the degree of balance might vary based on students' individual solutions, their solutions will almost certainly be more balanced for both measures, with much less variance among territories than the population balanced solution. Their answers should be consistent with the data in the Compare Territory Design Solutions Report. In terms of spatial balance, students' solutions will be superior to the population balanced solution, which has several territories that span the Mississippi River, creating drive-time problems and delays.*

**Question 3:** *Which of the territory solutions would you recommend to Janice and Steven? Explain the rationale for your recommendation.*

*Students should recommend the solutions they have designed based on the superior spatial and statistical balance cited above.*

## Additional notes

1. The *Territory Design* extension is a powerful tool for managing sales territories. The application here is a simplified, new-to-market exercise to illustrate the value of the application for initial territory design. For already-established systems with existing relationships, internal sales data can be integrated into the system to improve its precision.
2. The allocation of ZIP Codes to territories is dependent on the balancing variables selected and the relative weight assigned to each. In this lab, these factors are specified in instructions to students. Encourage them to rerun these procedures with differing variables and weights and review the impact on the resultant territory solutions.
3. The solution developed in this lab is well balanced spatially relative to lawn and garden expenditures. However, it produces territories that vary significantly in size, creating potentially difficult logistics problems for sales representatives in larger territories. Direct students' attention to this dimension of the solution and encourage them to explore ways to overcome it. Adding this factor to the balancing effort illustrates the difficulty of creating perfectly balanced territories across a range of factors, a key challenge of sales territory design.
4. In this lab, students reassign both territories and ZIP Codes that are already in the solution, but they do not incorporate ZIP Codes that are not part of the original solution. However, the same techniques they employ in this lab can be used to add new territories to the solution or new ZIP Codes to existing territories. This can help in the rebalancing process but also support future expansion of the existing solution.
5. The spatial balancing component of this lab uses a manual process to minimize the presence of sales territories that span the Mississippi River. This type of consideration may also be incorporated into the system by designating map layers as barriers that territories cannot cross. While this functionality is not part of the exercise, it can be a useful way to constrain the process of creating solutions, especially for large-scale solutions for national or regional organizations.
6. The solution in this exercise has only two levels, *Territories* and *Stores*. However, the procedures used to create them could also create multilevel territory solutions with local, state, regional, and national levels. The US military case described in the *Territory Design* white paper listed in the Business GIS references section exemplifies this approach.

## Business GIS references

*BusinessGeoInfo* newsletter.

<http://www.esri.com/industries/business/community/newsletter.html>

*Directions* Magazine (Articles on business applications of GIS).

<http://www.directionsmag.com/>

Esri Business GIS site—Resources for business applications of GIS.

<http://www.esri.com/industries/business/index.html>

Esri. 2010. *Esri Demographic Update Methodology: 2010–2015*, an Esri white paper.

<http://www.esri.com/library/whitepapers/pdfs/demographic-update-methodology-2010.pdf>

Esri. 2010. *Esri Trend Analysis: 2010–2015*, an Esri white paper.

<http://www.esri.com/library/whitepapers/pdfs/trend-analysis-2010-2015.pdf>

Esri. 2010. *Territory Design*, an Esri white paper.

<http://www.esri.com/library/whitepapers/pdfs/territory-design.pdf>

Esri. 2005. *The Washington Times: GIS increases newspaper subscriptions*.

<http://www.esri.com/library/casestudies/washingtontimes.pdf>

*GIScafe* newsletter—Electronic GIS newsletter (Look for business applications of GIS).

<http://www.giscafe.com/>

Kannan, Shyam. 2007. "Unveiling the Green Homebuyer." *Urban Land*, June: 106–09.

Maantay, Juliana and John Ziegler. 2006. *GIS for the Urban Environment*. Redlands, CA: Esri Press.

Maguire, David, Victoria Kouyoumjian, and Ross Smith. 2008. *The Business Benefits of GIS: An ROI approach*. Redlands, CA: Esri Press.

Miller, Fred L. 2007. *GIS Tutorial for Marketing*. Redlands, CA: Esri Press.

Pick, James. 2008. *Geo-Business: GIS in the digital organization*. New York: Wiley.

Pick, James. 2005. *Geographic Information Systems in Business*. Hershey, PA: Idea Group Publishing.

Pyke, Chris. 2010. GIS Assists Green Building (podcast).

[http://www.esri.com/news/podcasts/podcast.html#user\\_pyke](http://www.esri.com/news/podcasts/podcast.html#user_pyke)

Roderick, Brent. 2009. "Discover Retail Opportunities with Esri's Retail Marketplace Data."

*ArcWatch*, August.

<http://www.esri.com/news/arcwatch/0809/retail-marketplace-data.html>

Romeo, Jim. 2005. "Target Marketing with GIS." *Geospatial Solutions*, May: 3–5.

<http://www.tetrad.com/pub/documents/geospatial.pdf>

Schaefer, Paul. 2007. "New Study: Americans Reach Environmental Turning Point, Companies Need to Catch Up." *Environmental News Network*, August 22.

[http://www.enn.com/top\\_stories/article/22186](http://www.enn.com/top_stories/article/22186)

Thompson, Simon. 2011. Does the Best Retail Location Guarantee Success? (podcast).

[http://www.esri.com/news/podcasts/podcast.html#staff\\_thompson\\_retail](http://www.esri.com/news/podcasts/podcast.html#staff_thompson_retail)

Thompson, Simon. 2011. The Geography of Retail Operations (podcast).

[http://www.esri.com/news/podcasts/podcast.html#staff\\_thompson\\_operations](http://www.esri.com/news/podcasts/podcast.html#staff_thompson_operations)

Thompson, Simon. 2010. Why GIS Is Important to Retailers (podcast).

[http://www.esri.com/news/podcasts/podcast.html#staff\\_s-thompson-3](http://www.esri.com/news/podcasts/podcast.html#staff_s-thompson-3)