ArcGIS[®] 9 Using Territory Design for ArcGIS



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About Territory Design for ArcGIS

IN THIS CHAPTER

- Introduction to Territory Design for ArcGIS
- Creating, balancing, and managing territories
- Getting additional help for Territory Design for ArcGIS

Welcome to ESRI[®] Territory Design for ArcGIS[®]. By using your own custom boundaries or utilizing the geography layers within ArcGIS Business Analyst you can create, edit, and balance your sales regions, services areas, or franchise networks to benefit your business. Territory Design works with ArcGIS Desktop to create powerful yet easy-to-use software.

Territory Design represents the latest major product enhancement from earlier versions of ArcGIS Business Analyst. In addition to the familiar wizards for analyzing data for stores, customers, and trade areas in Business Analyst, Territory Design is also wizard driven, providing an easyto-use suite of tools to create and manage your territories.

Introduction to Territory Design for ArcGIS

Territory Design for ArcGIS offers an easy way to increase sales force productivity by designing, analyzing and managing geographic territories such as sales territories, franchise territories, distribution networks or services areas. Since territories are naturally geographic by design, utilizing this tool allows you to look at how your current territories are distributed. This capability is vital for revealing existing physical gaps in your distribution network, areas where your sales are saturating a market, and areas where your sales and customers are deficient. Once a sales manager identifies these areas, the next logical step is to fix the problem to increase sales and customer distribution. Territory Design offers several tools to import, create, manage, and balance territories:

Creating New Territories

- Based on a set of points to seed the territory creation
- · Based on an existing database of territory assignments
- Can be performed manually

Balancing Territories

- Based on customer data
- Based on existing geographic/territory data, as well as any data included with the Business Analyst extension
- · Based on distance

Managing Territories

- Importing and viewing existing territories
- · Adding/removing territories or any associated attributes
- · Organizing and creating hierarchies for territories
- · Benchmarking sales territories against demographics

Territory Design toolbar

Territory Design	×
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👯 Territory Extent	
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Remove Territory Level	
Create Territories	
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🐞 Balance Territories	
🚳 Balancing Options	
🗮 Import Variables	
🔯 Remove Variables	
🚺 Refresh Imported Variables	
🛷 Export Territories	
Reports 🕨	Territory Report
🙀 Refresh Territory Design Layer	Detailed Territory Report
Build Territory Index	Compare Territory Solutions Report
Martitory Layer Properties	

Creating New Territories

Territories are collections of geographic elements that are aggregated to create a larger unit. For example, a set of ZIP Codes around a service center can make up a territory for that service center. Collections of these territories can then further be summarized to create regions, districts, and the like. Territory Design lets you import, create, and define as many levels of territory hierarchy as you want.

Territory Design includes a suite of tools to create and optimize territories. You can import an existing territory assignment database and manually work with the Territory Design tools to adjust and balance the territory assignments. Territory Design includes a number of visualization windows (charts, data, and statistics) where you can view the impact of reassigning an element from one territory to another.

Territory Design includes a set of tools for automatically balancing your territories. You can also create a set of territories from scratch and optimize the territory distribution based on your own sales data or any attributes that are provided with the Business Analyst extension.

During the process of creating new territories you have several options to view your sales territories. Say, for example, that you have been tasked with streamlining the budget resources of your division and the first step is to increase your margins and customer base. The first part of this task is understanding where your sales and customers are coming from and making sure your sales force is appropriately distributed across your service area. Many sales managers have only seen their sales numbers associated with regions in spreadsheets and have never actually visualized them. When creating new territories, you can import in databases of sales and visualize your market. In the example on this page, you can see a breakdown of sales territories by ZIP Code with seed points that represent sales representatives. This map illustrates how the existing sales territories have large gaps between sales staff. In a market where your objective is to have complete coverage and no cannibalization, it is imperative to understand where your strengths and weaknesses are by visualizing your database of sales territories.



A map showing a poorly designed territory solution with large gaps between territories, overlapping sections, and nonadjacent areas.

Balancing Territories

Territory Design can be used to properly redistribute your sales territories and increase your customer base. For example, you can use a set of existing sales staff locations as seed points to create geographically balanced territories. Territories can be balanced using multiple criteria to ensure optimal balance for each sales person or franchisee. In the example at right, Territory Design was used to create sales territories for a set of sales offices and balanced with factors such as sales performance, household counts and distance to eliminate gaps and ensure an appropriate distribution of sales territories.

Territory Design includes many tools to manage your territories from adding or removing variables in the balancing process to exporting your database with your newly balanced territories to organizing your territories in hierarchies so you can better understand your market. Analyzing your territories starts first with analyzing the markets your territories fall within, and this can be displayed by creating higher levels of territories that collapse down into your sales territories. These higher levels of territories are typically used to further define your sales territories, and is beneficial to see and analyze these distributions as well.



A map showing sales territories balanced by sales performance and household counts.



A chart view of the map above showing how well sales performance (red line) and household counts (blue line) have been balanced within each of the territories.

Managing Territories

In the graphic below, Area represents your total market, each Region represents a sales manager, and Territory represents the territories your individual sales managers are responsible for.

With these hierarchies, you can a broader view of your market and your regions to better determine how to increase the marketability of your products. One easy way to do this is to export your regions as trade areas and analyze their demographics in Business Analyst using its multitude of built-in tools. With the trade area analysis tools in Business Analyst, you can run demographic reports to compare and contrast your sales against the base demographics in those areas such as household counts, median household income, adult population, etc, and create correlations between your sales output and the customer base and sales potential in your market.

What to read next

To begin learning about how to use Territory Design, proceed to Chapter 2, "Tutorial". This section gives a step-by-step walkthrough of the process of creating, balancing, and analyzing territories using the sample data provided.

For a detailed look at all the functionality of Territory Design proceed to chapter 3, "Using the Territory Design toolbar". In this chapter, you be introduced to all the functionality and tools associated with Territory Design.



Getting additional help for Territory Design for ArcGIS

ArcGIS Desktop Help

ArcGIS Desktop Help is available for Territory Design by pressing F1 or clicking the Help menu, clicking Extensions, clicking Business Analyst, then clicking Territory Design.

Getting help online

To browse the contents of ArcGIS Help Online, click the Help menu and click ArcGIS Desktop Help Online. On this page you can access the help by clicking the Extensions drop-down, clicking Business Analyst, then clicking Territory Design. You can also click the Business Analyst link under ArcGIS Extensions and click Territory Design.

Visit the online ESRI Knowledge Base for access to Business Analyst and Territory Design related product documentation, white papers, and system requirements at *http://support.esri.com/knowledgebase*.

Visit the online ESRI User Forums to share ideas and findings with other users at *http://support.esri.com/forums*.

Getting technical support from ESRI

Please see the product registration and support card that came with Business Analyst, or look at the ESRI Online Support Center section of ArcGIS Help Online.

ESRI training and education

ESRI provides educational opportunities related to geographic information science, GIS applications, and technology. You can choose among instructor-led courses, Web-based courses, and self-study workbooks to find education solutions that fit your learning style. For more information, go to *www.esri.com/education*.

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Tutorial

IN THIS CHAPTER

- Exercise 1: Creating a territory layer
- Exercise 2: Creating and balancing territories
- Exercise 3: Reassigning territories and creating a territory report

Welcome to the Territory Design for ArcGIS tutorial. This chapter takes you through the process of creating, balancing, and analyzing territories. When you install ArcGIS Business Analyst, the Territory Design toolbar is also installed. You will find sample data for this tutorial at \ArcGIS\Business Analyst\Datasets\Tutorial\sales_locations.shp.

In this tutorial, you're the VP of Metro Landscape, a major residential landscape services firm in the Detroit, Michigan area. Your business is rapidly growing, and you are in charge of overseeing the management of each of the five branch locations. With the growing business and increasing area population, problems have surfaced such as overlapping crews, uneven sales at each office, and a decline of new contracts. Your goal is to work with each of the five office managers to create new territories that will define boundaries for sales and marketing efforts and establish consistent service areas. Territory Design for ArcGIS can help you:

- Determine your market area.
- Locate your offices.
- Create and balance sales territories for each branch.

Here's a chance to use Territory Design for ArcGIS as part of your business solution.

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Exercise 1: Creating a territory Layer

Having an alignment layer is the foundation to creating territories. An alignment layer is a set of geographic boundaries, such as census tracts, ZIP Codes, or counties, commonly containing demographic information. Business Analyst provides many different levels of alignment layers for use in Territory Design, but you can also bring in your own data. With an alignment layer selected, a territory layer can be created in ArcMap.

In this exercise, you will zoom to an area and create a territory layer.

Getting started

1. Open Business Analyst from the icon on your Desktop. Alternatively, you can click Start, point to All Programs, point to ArcGIS, point to Business Analyst, then click Business Analyst.



- 2. ArcMap starts, and the Business Analyst dialog box appears giving you the option to automatically update your spatial reference. When enabled, this option automatically adjusts the coordinate system of the data frame to a custom Business Analyst projection whenever the map extent changes. If you want to set and maintain a fixed coordinate system, simply uncheck this feature. Click OK.
- 3. The Business Analyst Assistant docks on the right side of your screen. Review this tutorial to become familiar with the different functions of Business Analyst. You can work with the Assistant interactively, or if you are finished, click Close.

You are now ready to begin working with the map.

Note: The Business Analyst Assistant is not a traditional tutorial, such as this tutorial. The Business Analyst Assistant decribes common features within the product by business function and provides a direct link to each highlighted tool. The Business Analyst Assistant is not part of this tutorial.

4. Click the File menu and click Save As to save your map document under a new name. Navigate to C:\My Output Data. Create a new folder and name it "TD Tutorial." Save the map document as TD_Tutorial.mxd.

5. Add the Territory Design toolbar to ArcMap.

You will use both the Territory Design toolbar and the Business Analyst toolbar in this tutorial. Make sure you have both of them turned on and active in ArcMap.

To add the toolbars to ArcMap, click the View menu, point to Toolbars, then check both the Business Analyst and Territory Design check boxes. Make sure they are both checked on under Tools > Extensions. These toolbars are both dockable, meaning you can drag them anywhere on-screen or dock them at the side, top, or bottom areas of the ArcMap window.

Zoom to a location and create a territory layer

Business Analyst provides you with predefined spatial bookmarks that help you easily zoom to an area. You use these bookmarks to get to your market area. Once you settle on an area of interest, you can create a territory layer. When you create your territory layer you set up the basic parameters needed to later create and balance territories.

 Click the Business Analyst drop-down menu and point to Set Analysis Extent > Jump to a Location > States LA - MT > Michigan > Detroit.

Business Analyst will zoom to the desired location, the metropolitan Detroit area. You are now ready to create the territory layer.

2. On the Territory Design menu, click the Create Territory Layer icon.



The Create New Territory Layer wizard opens.

Create New Territory Layer		? 🛛
	Select parameters for new Territory Layer. Alignment Layer: ZIP Codes ✓ Only show Business Analyst data layers (BDS) Alignment Layer ID field: ID Number of territory levels in hierarchy: 2 Name Sad initial sizes of territory levels: Name Sizes Territories Sizes Regions 2	
	< <u>B</u> ack <u>N</u> ext >	Cancel

You can type new territory level names in the text boxes provided. For example you can change the default "Territories" to Franchise Areas or zones. 3. Choose ZIP Codes as your Alignment Layer.

Note: Check the Only show Business Analyst data layers (BDS) check box to limit which layers are displayed. The alignment layer forms the geographic building blocks for the sales territories. The alignment layer must have a unique ID. Choose ID from the Alignment Layer ID field drop-down list; this is already included in the ZIP Code database.

- 4. Determine the number of territory levels in your hierarchy, choose 2 from the drop-down menu. The levels are automatically added as Territories and Regions. You will make a total of five sales territories nested within two regions. Because territories are hierarchical, regions are created from the underlying territories. In the Size field, type "5" for Territories and "2" for Regions, then click Next.
- 5. Choose the variables that determine how you balance your territories. The variables become the attribute fields in your territory layer. For this exercise, you want to focus on the households in the Detroit area. In the Available variable(s) window, click the + sign next to BA Fields to expand the selection. Click <current year> Total Households and add it to the Selected variable(s) window by clicking the right arrow > button. Make sure this is the only variable chosen, Count is selected as a default placeholder, but let's remove it using the left < button and click Next.</p>



You can add as many variables as needed, but we will focus on one variable for this tutorial. Territory balancing allows for up to five different variables at a time.

6. Give the territory layer a name. Type "Metro Landscape" in the space provided and click Next.



Territories are automatically saved to your active Project in the Business Analyst My Output Data directory. You can find these territories here: C:\My Output Data\Projects\Default Project\Territories\metro landscape. Territories can easily be retrieved from the Project Explorer window.

7. Review the settings you applied and click Finish.



You can copy/paste review screen text into other programs. This is helpful when you are reproducing steps and want to communicate the exact path to take.

The territory layer is added to your ArcMap table of contents. The territory layer consists of the Territories and Regions levels you specified and a copy of the alignment layer. Default names (Territory 1, Territory 2, etc.) are used until you specify territory names when creating territories.



The ZIP Code layer used is available for the entire US, but we will focus on the Detroit area only.

8. In the table of contents, right-click Territories and choose Open Attribute Table to examine the contents. Notice that the <current year> Total Households field is added, but none of the information is populated. The information is populated when you create the territories in the next exercise. Close the table when you are finished.

Shape *	TerrOID	TerrName	OID *	Shape_Length	Shape_Area	2008 Total Households
Polygon	3	Territory 1	1	0	0	0
Polygon	4	Territory 2	2	0	0	0
Polygon	5	Territory 3	3	0	0	0
Polygon	7	Territory 4	4	0	0	0
Polygon	8	Territory 5	5	0	0	0

9. Save your work. Click the File menu, then click Save. Proceed to Exercise 2.

Exercise 2: Creating and balancing territories

Now that you have created a Territory layer, you are ready to create territories. You can create territories using a variety of methods, but for this tutorial you will create territories from locations. The locations, called seed points, are starting points around for territory areas. Seed points in this tutorial are your Metro Landscape branch offices. These offices contain equipment and are where all business activities are centered.

In this exercise, you will add seed points, create and balance territories and regions, set the territory extent, and view your regions in Edit Mode.

Add seed points

- 1. If you've exited ArcMap, click Start, point to Programs, point to ArcGIS, then click ArcMap. The ArcMap dialog box opens. Our map document should appear in the list, click TD_Tutorial.mxd, and then click OK. If the TD_Tutorial.mxd does not appear in the list, double-click Browse for maps... and navigate to the TD Tutorial folder in your My Output Data directory.
- 2. Click the Add Data button from the Standard toolbar and navigate to \ArcGIS\Business Analyst\Datasets\Tutorial.
- 3. Locate sales_locations.shp and click Add.

A geographic projection warning may appear, click Close. The shapefile is added to ArcMap in the table of contents and in the map view. In the table of contents, right-click sales_locations and choose Open Attribute Table. The attribute table contains information such as the office city location, the office manager and franchise ID, and the manager's yearly sales volume-to-date. Close the table when finished

	III Attributes of sales_locations							
	FID	Shape *	STATE	ZIP	CITY	NAME	SALESVOL	ID
E	0	Point	M	48353	Hartland	Howe	550000	146
	1	Point	M	48326	Auburn Hills	Conacher	300000	223
	2	Point	M	48038	Clinton Twnsp	Hull	350000	124
	3	Point	M	48104	Ann Arbor	Richard	125000	126
	4	Point	M	48034	Southfield	Bucyk	275000	275
	Record: II I I I I Show: All Selected Records (

Create territories

1. Click the Create Territories button on the Territory Design toolbar.



- 2. Choose Metro Landscape from the Territory layer drop-down menu.
- 3. Click Create territories from locations and click Next.
- 4. Choose Territories from the Territory level to create dropdown menu.
- 5. Choose Remove and replace existing terriories.



This option ensures that the empty territories you setup in your territory layer will be refreshed with new attributes and information from the seed point layer.

- 5. Choose sales_locations from the Point layer drop-down menu.
- 6. Choose NAME from the Attribute for naming territories dropdown menu. These names will replace the default names in your territory layer currently in the table of contents.
- 7. Choose Territories from the Territory level to create dropdown list. Be sure the number of territories to be created from seed points text box is "5", click Next. You will later create Regions.

8. This dialog focuses on how distance is measured from your seed points to your outer territory boundaries. To maximize efficiency, your fleet should never travel beyond 40 miles from each office. For Distance type, choose Straight line distance from the drop-down list and make sure the distance units are measured in miles. Type "40" in the text box provided for Maximum distance that a territory is away from its seed point or center. This will ensure each territory boundary is limited to 40 miles from each office. Leave the Minimum distance that a territory is away from another seed point or center of another territory unchecked. Choose Centroid of geography element in the Distance is measured to drop-down menu and click Next.



We will use Straight line distance in this tutorial to configure territory area, but Drive distance and Drive time can be used as well. The latter two options require more processing time because street networks are used instead of only factoring the adjacency of ploygons such as Straight line distance does.

9. Check Balance territories and click Next. The Balancing Options dialog box appears. Leave Set capacity value(s) for territories unchecked.

Note: Unbalanced territories are created if you do not choose to balance territories first. That is, distance is the determining factor in the territory shape.

reate New Territories	?⊠
	Define capacity if you want to ensure that a territory does not exceed a certain threshold value. For example, you want to ensure that each territory has no more than 10,000 households. Balance territories if you want to ensure that territories are equalized based on a set of weighted attributes (eg. population or sales), Balancing is applied after defining operation of the set of the set of the set of the set out of the may bet c tappative values. Simplifying the totals for the retrieval you specify. No threshold or maximum capacity will be used if you only choose to balance territories. If set capacity value(s) for territories Balance territories
Help	< <u>Back</u> <u>N</u> ext > Cancel

Although we will skip this option in the tutorial, you can choose to set capacity values when creating territories as well. Setting capacity values ensures your territories will not exceed a certain threshold value. For example if you know your franchises must meet, but not exceed a criteria of 100,000 people, you can set this as a capacity value.

10. You now want to choose the variables that will determine how your territories are balanced. The Available variable(s) window represents fields in the alignment layer. Since residential properties are your core clientele, you want to make sure that each territory you assign contains an equal number of households. If it is not selected already, choose the BA Fields <current year> Total Households and add it to the Balancing variables window using the right arrow > button. Click Next.

Balancing Options	? 🛛
Select variables for balancing territories. the solution.	These variables will be used to equalize totals for each territory in
Available variable(s):	Balancing variable(s):
- General	BA Fields 2008 Total Households
Count	>>
BA Fields	
	>

11. You want to make sure total households is more of a factor in the balancing method. The default variable ratio is set to 50, but you can change the importance dynamically using the pie chart. Click and drag the pie chart separator lines until you have reached 75 for <current year>Total Households Sum, 25 Distance. Click Next.

Note: You can manually edit the variable preferences, but the values must total 100.

Balancing Options		? 🛛
	Select preference for each variab	ole and for distance criteria.
and a t	Variable	Preference(%)
Tours La	2008 Total Households	75
	Distance	25
	Tocar	100
	Drag separator lines on the chart	to change preferences.
Help	< <u>B</u> ack	Next > Cancel

Distance is always included as a variable because area is always a factor in creating territories.

- 12. Check the boxes for Territories must be contiguous and No holes inside territories and click Next. This will ensure territories are compact and adjacent to one another and that there are no gaps between ZIP Codes.
- 13. Review the settings you applied and click Finish. The automatic creation and balancing process will continue through a series of dialogs. Once complete your territories have been created and the names of each office manager have been assigned to their respective territories.



The territories you created should look similar to the territories shown in the map above. There are many default territory colors so the territories you create may be slightly different.

Set the territory extent

- 1. Now that you have defined your market area, you can set a territory extent to ensure that only this area is used in your analysis. Click the Territory Design drop-down menu and click Territory Extent. The Territory Extent wizard opens.
- 2. Choose Metro Landscape from the Territory layer drop-down menu and select Boundary of a layer, then click Next.
- 3. Choose Territories from the drop-down menu and click Next.
- 4. Select Polygon centroid contained within extent, click Finish. This will ensure only the current ZIP Codes in your analysis are used.

Territory Design will draw a thick border around your territories to define the outermost boundary of your analysis. An Extent layer is also included in the table of contents.

Let's now divide our territories into regions.

Create regions

Creating regions requires many of the same steps as creating territories, except you are creating a higher level to which the underlying territories belong.

- 1. Click the Territory Design drop-down menu and click Create Territories.
- 2. Choose Metro Landscape from the Territory layer drop-down menu.
- 3. Choose Create territories from locations and click Next.
- 4. Choose Regions from the Territory level to create drop-down menu.
- 5. Choose Remove and replace existing terriories.
- 6. Choose sales_locations from the Point layer drop-down menu.
- 7. Choose CITY from the Attribute for naming territories dropdown menu. These names will replace the default names in your region layer currently in the table of contents. You have chosen CITY as the name because these locations will divide the two main command centers for all territories.
- Type "2" in the Number of territories to be created from seed points text box and click Next. This will ensure two regions are created.



9. Choose Straight line distance from the Distance type dropdown menu and make sure the distance units are measured in miles. Type "200" in the text box for Maximum distance that a territory is away from its seed point or center. This ensures all territories within the territory extent are included. Choose Centroid of geography element from the Distance is measured to drop-down menu and click Next.

Create New Territories	? 🛛
	Select parameters for creating new territories from seed points. Distance type: Straight line distance Miles Miles Maximum distance that a territory is away from its seed point or center of another territory. 200 Minimum distance that a territory is away from seed point or center of another territory. Distance is measured to: Centroid of geography element
Help	< Back Next > Cancel

- 10. Check Balance territories and click Next. The Balancing Options dialog appears. The BA Fields <current year> Total Households variable should remain selected; if not, add it to the Balancing variable(s) window using the right arrow > button. Click Next.
- 11. To remain consistent with the underlying territories, click and drag the pie chart separator lines until you have reached 75% for Total Households, 25% for Distance. Click Next.
- 12. Check the boxes for Territories must be contiguous and No holes inside territories and click Next.
- 13. Review the settings you applied and click Finish. Your regions have been created, and the city locations (Ann Arbor and Clinton Twnsp) have been assigned to each region.

View your regions in Edit Mode

Using Edit Mode will increase the thickness of your region outlines and temporarily make the underlying territories invisible. Edit Mode makes multiple levels of territories easily distinguishable without having to turn layers on or off in your table of contents.

- 1. Choose Regions from the territory level drop-down menu located on the right side of the Territory Design toolbar.
- 2. Click the Edit Mode button on the Territory Design toolbar and examine your new regions. The Ann Arbor and Clinton Twnsp regions are separated by color.



- 3. Click the Edit Mode button on the Territory Design toolbar to exit Edit Mode and show territories again.
- Save your work. Click the File menu, then click Save. Proceed to Exercise 3.

Exercise 3: Reassign territories and create a territory report

In previous exercises you created a territory layer, brought in seed points, and created and balanced territories and regions. You are now ready to determine how well you balanced your territories and manually reassign them. Then you can create a report to output the information about your territories.

In this exercise, you will examine the Territory Design window, manually reassign territories, and create a territory report.

View the Territory Design window

- 1. If you've exited ArcMap, click Start, point to Programs, point to ArcGIS, then click ArcMap. The ArcMap dialog box opens. Our map document should appear in the list, click TD_Tutorial.mxd, and then click OK. If the TD_Tutorial.mxd does not appear in the list, double-click Browse for maps... and navigate to the TD Tutorial folder in your My Output Data directory.
- 2. Click the Show/Hide TD Window button on the Territory Design toolbar.



The Territory Design Window opens at the bottom of the screen. The TD window is dockable so you may have to resize and move it to other locations within ArcMap if necessary. Notice that the window is separated into two panes: the Data and Hierachy tabs on the left side and the Statistics and Chart tabs on the right. You will focus on the Data and Chart tabs first, then examine the Hierachy tab.



3. Click the Data tab. The data view shows which attributes are included in each level of your analysis. Choose Metro Landscape as the Territory layer and click Territories from the Territory drop-down menu. Right-click the <current year> Total Households field header to select Sort Descending. Doing this shows the different ZIP Codes with the highest and lowest number of households assigned to each territory. You can right-click any data record to view the different data management options available, such as Zoom to Territory, Lock Territory, or Remove Territory.

×	Territory Layer: Territory:	Metro Landsca	pe	va va	riable(s) to dis
	🔒 Territory	ID	2008 Total	Households 🗸 🔼	100 000 L
	📃 🗖 Richard	48197	24803	New Empty Territory	
	🥅 🔲 Richard	48180	24150	i= Sort Ascending	
	🔲 🔲 Richard	48103	23363	_	
	🔽 🗖 Richard	48185	22384	Sort Descending	
	🔲 🗖 Bucyk	48228	21322	∑ Statistics	
	Hull	48066	20576		
	🗖 🗖 Bucyk	48219	20155	🙀 Refresh Territory Design	Layer
	Data Hierarchy	/		Territory Layer Propertie	·s

- 4. Click the Chart tab. The chart view is a visual guide to how well territories are balanced. A balancing line is included to show the mean value of a selected variable for all territories. The chart shows all five territories by name. They appear to be equally balanced by total households.
- 5. On the left pane, click the Hierarchy tab. The hierarchy view shows a graphic tree view of your territory levels. Expand the two regions to see their respective territories. The numbers in parentheses next to the territory names are the number of ZIP Codes in each territory. The numbers in parentheses next to the region names represent the count of territories in each region.

	Territory Layer: Metro Landscape			
Ш	Other Territories			
н	🗄 🔲 Ann Arbor (2)			
Ш	Richard (61)			
Ш	- Howe (69)			
Ш	🗄 🖳 Clinton Twnsp (3)			
н				
н	Conacher (62)			
	- Hull (45)			
Ш				
Ш				
	Data Hierarchy			

Click on a region name to see the chart view change, now displaying region information. You see two bars instead of five. Click any territory name to return the chart view to the territory information. Your territories seem to be equally balanced, but you notice by looking at the map some ZIP Codes from Mr. Howe's territory appear to 'snake' into Mr. Conacher's territory simply to satisfy the balance statistics. With that in mind, we also know that Mr. Howe is our highest grossing account manager and may not need such a large area. You will now manually reassign more ZIP Codes to decrease his territory area.



This area highlights a 'snaking' effect where factors such as shape and distance of territory elements can be compromised to satisfy automatic balancing parameters. Territory Design tries to minimize these situations, but manual interaction with the map helps solve these cases. 6. Click the Territory Select Tool from the Territory Design toolbar and select the 'snaked' ZIP Codes on the map.



 Right-click the selected ZIP Codes and point to Reassign To Territories at the bottom of the context menu, then choose Conacher.



Click and drag the Select Tool across territories to select multiple elements. You can also hold down the Shift key and select multiple adjacent or nonadjacent polygons.

You can see that the ZIP Codes have been added to Conacher's territory in the map view and on the chart. In the chart view the number of households in his column is more than the average level. Howe's are now lower. Reassign a few more territories using the same process. The territory balance chart and data is updated to reflect this change.



Create a territory report

- 1. Click the Territory Design drop-down menu, point to Reports, and click Territory Report. The Territory Report dialog box opens.
- 2. Type a name for your territory report.
- 3. Make sure Metro Landscape is selected in the Territory Layer drop-down menu and click OK.

Territory Report	Give a name and select the Territory Layer for which you wank to create a Territory Report. Report title: Territory Report Territory Layer: Metro Landscape
Help	OK Cancel

A report appears showing a map, balancing chart, and hierarchy of your territories and regions. You can export the file to PDF to share with your office managers.



There are three different types of territory reports available. This report presents a recap of the most common information about your territory solution, otherwise displayed in the software.

Now that you've completed all the tasks in the tutorial, you have a good idea of what's involved with using Territory Design for ArcGIS from creating and balancing territories to reassigning them and creating reports. Continue through the remainder of the user guide to learn about other things you can do with Territory Design. You can also use this guide as a reference and the specific sections as needed to complete your tasks.

Using the Territory Design toolbar

IN THIS CHAPTER

- Using the Territory Design toolbar
- Setting the Territory Extent
- Creating New Territory Layers
- Creating New Territories
- Setting Capacity Values
- Using the Balancing Options and Balancing Territories wizards
- Resolving Overlapped Territories
- Importing Variables and Removing Variables
- Refresh Variables and Refresh Territory Design Layer
- Exporting Territories
- Creating Territory Reports
- Using the Territory Design Window
- Working in Selection Mode and Edit Mode
- Setting the Territory Layer Properties

In this chapter, you will learn about the different functions of Territory Design for ArcGIS.

The Territory Design toolbar utilizes a drop-down menu and a wizard driven interface similar to the other tools in the Business Analyst extension. Many features of the two programs are interchangeable. For example you can use ZIP Codes found in Business Analyst to serve as a base layer for creating trade areas in Territory Design. Or you can export a Territory Design layer to Business Analyst to further study demographic information of newly created sales territories. All Territory Design features can be accessed from the toolbar or drop-down menu. This section gives step-by-step instructions for each Territory Design tool.

3

Using the Territory Design toolbar

Territory Design toolbar drop-down menu

If the Territory Design toolbar is not visible, click the View menu, click Toolbars, then click Territory Design. The dockable toolbar opens.



Territory Extent—Allows you to set different analysis extents such as the current map view, a selected boundary, or none defined

Active Layer—Allows you to make a different territory layer the active territory layer, as well as create a new territory layer

Add Territory Level—Allows you to add a new hierarchical level to your territory solution

Remove Territory Level—Allows you to remove a territory level from your territory solution

Create Territories—Launches the Create New Territories wizard to create new territories

Remove Territory-Allows you to quickly remove previously created territories

Balance Territories—Allows you to balance territories based on multiple criteria

Balancing Options—Launches the Balancing Options wizard to setup or alter the variables and associated weights used in the balancing process

Resolve Overlapped Territories—Allows you to view duplicate territory assignments and resolve their locations

Import Variables—Launches the Import Variables wizard to add attribute information from another database or location to a territory layer

Remove Variables—Allows you to delete attributes previously imported to a territory layer

Refresh Imported Variables—Allows you to reimport variables if a joined database is changed

Export Territories—Launches the Export Territories wizard to export territory databases and boundaries for use outside Territory Design

Reports-A shortcut to the three different territory reports

Refresh Territory Design Layer-Refreshes your territory solution parameters

Build Territory Index—Creates an adjacency index to more efficiently balance territories

Show/Hide TD Window—Launches the Territory Design window to manage layers and view statistics and chart information about your territories

Selection Mode-Allows you to view elements of selected territory features

Edit Mode-Allows you to view and work with the active territory level

Territory Layer Properties—Allows you to view or make changes to a variety of Territory Design settings

Territory Select Tool-Allows you to select elements on the map

Setting the Territory Extent

Setting the territory extent will ensure that your analysis will include only the areas you specify. This extent determines your overall market area. If you do not set a territory extent, territories will be created for the entire layer you are working with. The additional processing can be time consuming.

You must create a Territory Layer before being able to set the Territory Extent.

Tip

You can set different extents to limit where your analysis is performed.

Current map view: Limits the analysis to the area currently on your screen

Current selection: Limits the analysis to areas you have selected, such as a group of ZIP Codes

Business Analyst study area: Limits the analysis to areas you have predefined in Business Analyst

Boundary of layer: Limits the analysis to the overall boundary of a polygon or group of polygons No extent defined: Removes the analysis extent from your analysis Click Territory Extent from the Territory Design drop-down menu.

The Territory Design Extent dialog box opens.

- 2. Choose the territory layer you want to use from the Territory layer drop-down list.
- 3. Choose one of the options and click Next
- 4. Choose the extent calculation method and click Finish

If you choose Business Analyst study area, choose the study area you want from the drop-down list and click Finish.

If you choose Boundary of a layer, click Next. Choose the boundary layer you want from the drop-down list and click Finish.

You can select how the extent will be calculated. Those options being:

- Polygons that are completely contained within the extent
- Polygons with their centroids contained within the extent
- Polygons that intersect the extent



Territory Design Extent	? 🛛
Festures completely contained within the selected boundary will be included in the Territory Extent.	Select how extent will be calculated. Select a method: Polygon completely contained within extent Polygon centroid contained within extent Polygon intersects extent
Help	< Back Finish Cancel

Creating New Territory Layers



Territory layers must be set up first to perform an analysis in Territory Design for ArcGIS. By creating a territory layer you set important parameters such as your alignment layer (for example, ZIP Codes or block groups), hierarchy levels, and the number of territories. You also determine what variables are needed to later balance your territories. Once you have successfully set up your Territory Layer, it will be added to the map's table of contents as a layer with an empty attribute table. When you create and balance your territories, the attribute information is automatically populated. This section teaches the various options for creating territory layers. Here is some important information about territory layers.

• As a starting point Territory Design calls the first four levels Territories, Regions, Areas, and Divisions. These are standard terms for territory hierarchy. The remaining levels are named by level (such as Level 5, Level 6) You can set up to 10 territory levels and have the option to customize the level names to whatever you choose.

• You can use the standard geography boundaries provided in Business Analyst to create territories or use your own polygon layers. These boundaries are alignment layers.

• If you use your own boundaries, each polygon must have a unique ID and name associated with it.



Creating a New Territory Layer

Territory layers must be set up first to perform analysis in Territory Design for ArcGIS. These steps will give you instructions on how to set up a territory layer.

Tip

The alignment layer must have a unique ID. The alignment layer serves as the base geography layer from which all territories are created.

Tip

The New Territory Layer file path is the location where your Territory Design analyses are stored. By default the path is set to your My Output Data folder, but you can choose any location.

Тір

When creating a new territory layer, a copy of your alignment layer is created as well. The copy is made so your original data is not altered. The alignment layer copy is added to the table of contents underneath your new territory layer. Note: The alignment **layer** is copied, not the actual datasource (original data) of the alignment layer. The datasource is shared. Select Create Territory Layer on the Territory Design toolbar. The Create New Territory

Layer dialog box opens.

- 2. Choose an alignment layer from the Alignment layer dropdown list.
- Choose the Alignment layer ID field from the drop-down list. This field must be a unique ID.
- 4. Determine how many territory levels you want to create using the drop-down list.
- 5. Rename your territory levels as needed and enter the size of each level. Click Next.
- Add the variables of each level that determine your balancing and click Next. These variables make up the fields in your territory databases. ►

Create New Territory Layer		? 🛛
	Select parameters for new Territory Layer. Alignment Layer: ZIP Codes ✓ Only show Business Analyst data layers (BDS) Alignment Layer ID field: ID Number of territory levels in hierarchy: 3 Names and initial sizes of territory levels: Name S Regions Regi	v v
Help	< <u>B</u> ack Next >	Cancel

Create New Territory Layer	? 🗵
Setup variables for the new layer levels. Available variable(s): General Banes Index AREA C008 Household Population C008 Family Pousehold Size C008 Average Household Size C008 Average Household Size C008 Family Households C008	Selected variable(s); Selected Courk BA Fields Pets: Tot Courses Course
Help	< Back Next > Cancel

Tip

An easy way to retrieve your territory layers is from the Business Analyst Project Explorer. Each territory solution you create is automatically saved to the Business Analyst My Output Data repository under the active Project. When you open the Project Explorer, each territory layer is listed under the Territories section.

- 7. Type a name in the New Territory Layer name text box. The location automatically saves to your Active Project that is set in Business Analyst. Click Next.
- 8. Review the settings that will be applied to the new territory layer, click Finish.



Create New Territory Layer	? 🛛
The f New Alg Alg Alg Alg Alg New New New New New New New New New New	ollowing settings will be applied: * Territory Layer name: New Layer * Territory Layer ICCades moret Layer: IDF Codes moret Layer: IDF field: ID ther of territory levels in hierarchy: 3 mes: And mikal acces of territory levels: name: Regions Size: 5 name: Areas Size: 2 cted variable(s): General Count BA Fields Pets: Tot
Help	< Back Finish Cancel

Saving Territory Layers

You can save your Territory Layers in a variety of ways. The most common options are to use the right-click context menus from the top level Territory Layer name in the ArcMap table of contents. This menu provides two key saving methods:

Save Territory Layer: Used to save the ongoing work, settings, and edits you make to the Territory Layer.

Save Territory Layer As...: Used to save all current changes within a new solution with a new name. The original territory solution is removed from the table of contents and your new territory solution is added.

The Save Territory Layer As feature is important when creating a Compare Territory Solutions Report. You can create a territory solution, save it, and then run a new territory solution with different options to compare the two.

Here is an example of the 'save territory' options.



Retrieving Territory Layers

You can retrieve your territory solutions from the Business Analyst Project Explorer. The territory solutions contain multiple files, including file geodatabases, .lyr file, metadata xml files, etc. Instead of adding these files through the ArcMap Add Data button, the Project Explorer allows you to bring in the territory layer from its storage location to the ArcMap TOC. All of your saved settings are maintained. When you initially setup your territory layer, it is automatically saved to your Business Analyst Active Project.

Here is an example of several territory solutions within the Project Explorer. The territory solutions are saved to my Default Project. This is located in the automatically generated location of: C:\My Output Data\Projects\Default Project\Territories



Creating New Territories



Properly allocated territories are a key component of any successful business. With Territory Design you can setup, modify, and manage territories in a variety of ways. You may have created stagnant territories years ago that you want to reexamine or start fresh with no inherent knowledge of your company's newly acquired region. You might want to base your territories from franchise or customer locations. You might have a simple list of sales people and their accounts by location. These are all scenarios you can solve with Territory Design. This section teaches the various options for creating territories.

Territory creation options

Creating new empty territories: This option can be used to add territories to a previously created Territory Layer. The new territories will update in the table of contents.

Creating territories from locations: This option can be used when you have a point layer with unique locations, called seed points.

Importing territories from a database: This option can be used if you have a territory layer table format such as a .dbf. This dialog will help you map the appropriate fields to ensure it is importing into each territory level correctly.

Manually creating territories: This option can be used to manually create territories by interacting with the map. As long as you have a territory layer created first, you can begin to build territories with the Select Tool.

Seed points

Seed Points are point locations used in Territory Design to determine starting points for creating territories. Seed points can be anything from franchise addresses and sales offices to distribution centers and are a common method for creating territories. For example, if you have a set of salespeople in offices around the Greater Chicago area, you can use this option to create and balance their respective sales territories using census tracts around each location.

The seed point locations can be any point file with geographic information tied to it. Territory Design uses the locations to determine the geographic centers for the creation of the territories. If you are creating fewer territories than the number of seed points, Territory Design uses clusters of your seed points as the geographic center for each territory.

About the Number of territories to be created from seed points option

• The default number of territories is equal to the number of territories at the level where you create new territories. If the level where you create new territories is empty, the default number of territories is equal to the number of geographic elements from the alignment layer overlapped by the seed points.

• If the number of territories is equal to the number of geographic elements in the alignment layer that overlap the seed points, territories are created for each geographic element of the alignment layer where the seed points are located.

• If the number of territories specified is greater than the number of geographic elements from the alignment layer overlapped by the seed points, all seed points are used to create territories and the remaining number of territories are created from the nearest geographic elements of the base layer.

• If there are fewer territories than the number of geographic elements overlapped with seed points, Territory Design uses clusters of your seed points as the geographic centers for each territory.

Creating New Territories

Creating new empty territories

This option can be used to add territories to a previously created Territory Layer. The new territories will be added to the table of contents.

Tip

You must create a new territory layer before before creating territories (see "Creating new territory layers" in this chapter).

Creating new empty territories

1. Click the Territory Design drop-down menu and click Create Territories.

The Create Territories dialog box opens.

- Choose the territory layer you want to use from the dropdown list.
- 3. Choose Create new empty territory and click Next
- 4. Choose the Territory level to create from the drop-down list.
- 5. Type the number of territories you want to add.

The new territory is added to the table of contents.

Create New Territories	? 🗙
This option can be used to add territories to a previously created Territory Layer.	Select Territory Layer and option to create new territories. Territory Layer: New Layer Create new empty territory Create territories from locations C Import territories from database Manually create territories
Help	< <u>B</u> ack Next > Cancel

Create New Territories	?×
	Select parameters for creating new empty territories. Territory level to create: Territories Number of territories to create: 1
Help	< <u>B</u> ack Finish Cancel

The example above will add one new territory to your existing territory solution. The territory will be empty, meaning an entry is added to the table of contents, but the attribute table is not populated. You can add a territory in a similar way using the Select Tool, Right-clicking a territory on the map and choosing New Territory, but this method automatically populates the attribute table of the new territory.

Creating New Territories

Creating territories from locations

The option can be used when you have a point layer with unique locations, seed points, around which you want to assign territories.

Tip

It may be the case that you want to use the 'Create territories from locations' method, but do not actually have a points file or you do not know where to locate each starting point. An example of this would be expanding into a new market and dividing territories so that each territory is near a certain distance of the competition. You can use the Business Analyst Mean Store Center tool to create these starting locations. To do so, first add competitor locations using the Add Business Listings wizard then use the Mean Store Center tool to create the desired number of mean center points using the competitor locations as your base.

Creating territories from locations

1. Click the Territory Design drop-down menu and click Create Territories.

The Create Territories dialog box opens.

- Choose the territory layer you want to use from the dropdown list.
- 3. Choose Create territories and from locations, click Next.
- 4. Choose the territory level you want to create from the dropdown list.

Choose one of the following methods:

- Remove and replace existing territories
- Add new territories to selected level
- Choose the point layer from the drop-down list (or click the browse button to navigate to it if it is not in the table of contents) to determine which seed point locations will build your territories.
- 6. Choose the attribute to name each territory.
- Type the number of territories you want to create and click Next. ►



Create New Territories	? 🛛
	Select parameters for creating new territories from seed points. Territories Remove and replace existing territories Add new territories to selected level Point layer: seles_locations Attribute for naming territories: MAME Number of territories to be created from seed points: 5
Help	< <u>B</u> ack <u>N</u> ext > Cancel

'Remove and replace existing territories' means that you will replace the default territories you setup in your territory layer. To 'Add new territories to selected level' means that you will keep the default territories and add to them with the parameters you will select during the remainder of the Create New Territories wizard.

Тір

The Drive distance and Drive time options are only available when the Business Analyst and ArcGIS Network Analyst extensions are installed. You also have the option to switch the drive time solver to the StreetMap algorithm for faster processing results. You can control these options in the Territory Layer Properties > Network tab.

Tip

For the Number of territories to be created from seed points option the default is the number of territories you specified when creating your territory layer. You can also have more seed points than territories. For example, if you have 300 different franchise locations, but only want to show 8 territories, Territory Design groups the seed points into clusters to determine the center point for each of the 8 territories.

Tip Measuring Distance

Centroid of a geography element refers to the distance between a seed point location and the geographic centroid of a polygon (such as ZIP Codes).

Nearest boundary of geography element refers to the distance between a seed point location and the edge of a polygon boundary closest to that seed point. 8. Set the distance requirements for your territories:

Choose the Distance type (Straight line distance, Drive distance, or Drive time) and corresponding distance units from the drop-down lists.

9. Set the maximum distance a territory can be from its seed point.

You can also choose to set the minimum distance a territory is from another seed point.

10. Choose whether distance is measured to the centroid of each geography element or to the nearest boundary of the geography element. Click Next. ►

Create New Territories		? 🗙
	Select parameters for creating new territories from seed points. Distance type: Straight line distance Miles Maximum distance that a territory is away from its seed point: 40 If Minimum distance that a territory is away from another seed point: Distance is measured to: Centroid of geography element	•
Help	< <u>B</u> ack <u>N</u> ext > Ca	ncel

11. You now have the option to set capacity values and balance territories. To create territories without setting capacity values or balancing them, uncheck both options and click Next. Unbalanced territories are created after you review your settings and click Finish.

Continue to the next page to set capacity values and balance territories.

Create New Territories	? 🔀
	Define capacity if you want to ensure that a territory does not exceed a certain threshold value. For example, you want to ensure that each territory has no more than 10,000 households. Balance territories if you want to ensure that territories are squalezed based on a set of weighted attributes (eg. opulation or sales). Balancing is applied after defining capacity and may affect capacity values. Balancing allows you to define weights and importance of different variables. You can also balance territories without defining capacity. In this case the territories will be created by equalating the totals for the criteria you specify. No threshold or maximum capacity will be used if you only choose to balance territories.
Help	< <u>B</u> ack <u>N</u> ext > Cancel

Create New Territories	? 🗵
	The following settings will be applied: Territory Layer: New Layer Point Neyer: Sales, Jocations Attribute for naming territoriaes: STATE Territory level to create: Territories Remove existent Territories from the selected level: Number of territories to be created from seed points Distance units: Miles Maximum distance that a territory is away from its se Minimum distance that a territory is away from its se Distance units: Miles Distance is measured to: Centroid of geography eler Use capacity value(s) for territories: No Balance territories: No
Help	< <u>B</u> ack Finish Cancel

Tip

To set capacity values AND balance territories at the same time, simply check both options in the dialog directly to the right. You will first complete the capacity section and then automatically move to the balancing section.

In this example, to balance territories make sure you check 'Balance territories' in step 12. After completing step 15 the balancing dialog automatically appears. Please visit the Using the Balancing Options and Balance Territories wizards section, step 8 to continue the balancing dialogs.

- 12. In this example, we will choose not to balance territories. To set capacity values, check Set capacity value(s) for territories and click Next. You can also set capacity values and balance territories at the same time by checking both options.
- 13. Choose the variables you want to define capacity with. The variable fields you set while preparing your Territory Layer remain the default variables selected. You can select more from the Available variables window. Click next. ►

Create New Territories	? 🔀
	Define capacity if you want to ensure that a territory does not exceed a certain threshold value. For example, you want to ensure that each territory has no more than 10,000 households. Balance territories if you want to ensure that territories are equaled based on a set of weighted attributes (e.go. population or sales). Balancing is applied after defining capacity and may effect capacity values. Balancing allows you to define weights and importance of different variables. You can also balance territories without defining capacity. In this case the territories without defining capacity. In this case the territories without balance territories. If Set capacity value(s) for territories Balance territories
Help	< <u>B</u> ack Next > Cancel

411	Constant distant	
valiable valiable(s):	Capacity variable(s):	
2008 Houshold opulation 2008 Houth / actuation 2008 Houth / actuation 2008 Houth / actuation 2008 Houth / Buscholds 2008 Pactage Housholds 2008 Pactage Housholds 2008 Houth / actuation 2008 Houth / actuation 2008 United Housholds 2008 Worth / actuation 2008 Worth / actuation 2008 North / hourholds 2008 North / hourholds 2008 North / hourholds 2008 North / hourholds 2008 North / hourholds	<	
	Jimport Vana	des

Tip

The capacity value is used in creating territories, but also passed to the balancing process. The balancing process will track the capacity values, but will not exceed the values set. This behavior works when both the 'capacity value' and 'balance territories' options are checked on.

Tip

'Optimize shape and compactness of territories' allows territories without holes and more accurate boundaries, but capacity values may not equal what was exactly specified.

Tip

For more information about capacity values, please see the next page. If you have more than one variable selected, the following options will be activated:

- Each variable reaches capacity value
- Any variable reaches capacity value

Once you have selected how you want to determine territory capacity, you must now set the Capacity value (or threshold) and optionally set the tolerance percentage.

- 14. Type in each variable Capacity value in the space provided. Capacities can be set to limit the growth of each territory to a value, such as capping territories when they meet a criteria of 10.000 households.
- 15. Optionally check on "Optimize shape and compactness of territories" and click Next.
- 16. Review the settings that will be applied and click Finish.

Create New Territories			?	×
	Specify the territor could set a capacity in sales for each ter Define how you wa	y capacity values. For o of 10,000 Total House rritorv. Int to determine territory eaches capacity value aches capacity value d tolexance(ontional) fo	example, you holds or \$25,000 y capacity: r each variable:	
	Variable	Capacity	Tolerance	
and a second sec	Count	400	50%	
Martine	Pets:Tot	200000	15000	
	Optimize shape (may affect cap	and compactness of ter acity values)	ritories]	
Help		: Back Next >	Cancel	

For more information about capacity and threshold values on this dialog, please see the next page.

How to determine territory capacity: Early variable re Capacity variable(s): Variable: Count(; Capacity: 4000; Tolerance: 50% Variable: Pest'rot(Capacity: 20000) Tolerance: Optimize shape and compactness of territories: Yes	Point layer: Businesses Attribute for naming territories: CONAME Territory level to create: Regions Remove existent Territories from the selected level: Number of territories to be created from seed points Distance trips: Straight line distance Distance trips: Miles Maximum distance that a territory is away from its se Minimum distance that a territory is away from seed Distance trips: Miles Maximum distance that a territory is away from seed Distance is measured to: Centroid of geography elen Use capacity value(s) for territories: Yes	
	How to determine territory capacity: Each Vanadie re Capacity variable(s): Variable: Count; Capacity: 400; Tolerance: 50% Variable: Pets: Tot; Capacity: 200000; Tolerance: Optimize shape and compactness of territories: Yes	~

Setting Capacity Values

Setting capacity values is an important feature to customize your territories. A capacity value is a threshold you can set to ensure a territory does not exceed one or more variable limits. For example, you can specify that all territories must stop growing in area when a population of 150,000 is reached. The 150,000 figure is the capacity value. You can also set a tolerance value if more than one variable is used to create territories. A tolerance value gives a plus-or-minus range of the capacity value and allows for more overall balanced territories. For example if a the capacity value is a population of 150,000 and the tolerance is set at 20,000 people, then the range is 130,000 as a floor and 170,000 as a ceiling. This page provides more information about creating territories by setting capacity and tolerance values.

Option 1: Each variable reaches capacity value

Territory creation is stopped only if all variables reach their Specified Values. As result some variables can be much greater than specified.

Option 1 with Tolerance activated: Territory creation stops if some variable(s) reach the Specified Value and some variable(s) reach the floor boundary (Specified Value minus Tolerance).



Tolerance values can be in numeric or percent form. Just add a % symbol to use a percent value.

Option 2: Any variable reaches capacity value

Territory creation is stopped if any variable reaches their Specified Values. As result some variables can be much less than specified.

Option 2 with Tolerance activated: The territory creation will continue while any variable hasn't yet reached the ceiling boundary (Specified Value plus Tolerance) or all variable hasn't yet reached Specified Value.


Creating New Territories

Importing territories from database

The option can be used if you have a territory layer table such as a .dbf file. This dialog box will help you map the appropriate fields to ensure it is importing into each territory level correctly. An example of this would be that organizations may have a set of ZIP Codes assigned to salespeople. These ZIP Codes can be imported into Territory Design as sales territories. Once you have the data in Territory Design, further analysis can be performed.

Тір

The alignment layer ID must link uniquely with the ID in the imported database. This forms the join. The example on the right links a county BDS layer to county IDs contained in the table.

Tip

A variety of tables formats are supported, such as Excel and dbf.

Tip

The territory levels in hierarchy refers to how many nested levels you have in your database. For example you may have a census tract level at the lowest level that belong to a county level set of regions. This example shows 2 levels.

Importing territories from a database

1. Click the Territory Design drop-down menu and click Create Territories.

The Create New Territories dialog box opens.

- Choose the territory layer you want to use from the dropdown list.
- 3. Choose Import territories from database and click Next.

The Create New Territories dialog box opens. Your alignment layer is already selected and grayed out.

- In the drop-down menu, choose the ID field in the alignment layer that will join to the ID field in the imported table.
- 5. Choose the table or database file that you are importing from the drop-down list or by clicking the browse button to navigate to it. Note: If you added your table in to ArcMap you can view it in the Source tab in the Table of Contents. These tables may appear at the bottom of the 'Table to import territories' menu. ►



Create New Territories	2
	Select parameters for importing territories from database. Alignment Layer: Nationwide Territories.County Areas Field in Alignment Layer to join with imported table: D Table to import territories: Territories\$ Field in imported table to join with Alignment Layer: FIPS Number of territory levels in hierarchy: 2
Help	< <u>B</u> ack <u>N</u> ext > Cancel

The alignment layer entry is automatically grayed out in this example, because the alignment belongs to the territory layer specified in the previous step.

Tip

Territory level number 1 refers to the lowest territory in your database. For example if your territories are based on block groups, then block groups is your territory level number 1. If those block groups are nested within census tracts, then census tracts is your territory level number 2, and so on.

Tip

Each of your territory levels are produced from your original territory table. As long as your alignment layer database is linked to the table by ID, each possible level to import will populate in the dialog drop-down menus.

- 6. Choose the ID field in the imported table that will join to the ID field back to the alignment layer.
- 7. Choose the number of territory levels and click Next.
- Choose the database field that contains the names of your territories.
- Optionally select if the territory ID field has a unique ID for each territory. The name field selected in the previous step will act as the territory ID if this remains unselected. This if important if you have different geographies assigned to specific sales people. Click Next.
- 10. Repeat step 9 for each territory level you want to import.
- 11. Review your settings and click finish.



Create New Territories	? 🛛
	Select parameters for importing territories from database. Import territory level number 2. Field for naming territories: ACCOUNT_MA Field for naming territory ID field with unique ID for each territory. Name field is used as the territory identifier if ID field is not selected. REGION_ID Territory level name: Regions
Help	< <u>B</u> ack <u>N</u> ext > Cancel

The option to select a Territory ID field with a unique ID for each territory is important when the names of your territories are different than each record. For example, you may want to display the names of the account manager assigned to each region, or display the region name associated with each territory.

Creating New Territories

Creating territories manually

This option allows you to manually create territories by interacting with the map. As long as you have a territory layer created first, you can begin to build territories with the Select Tool.

Tips

You can click and drag the Select Tool over many alignment layer polygons to select multiple geographies. You can also hold down the Shift key while clicking individual polygons to select many nonadjacent polygons at once.

After assigning a territory you can reassign it to another by selecting the polygon and using the rightclick context menu command: Reassign To Territory.

Manually create territories

1. Click the Territory Design drop-down menu and click Create Territories.

The Create New Territories dialog box opens.

- Choose the territory layer you want to use from the dropdown list.
- Choose the territory level to edit from the drop-down list and click Finish.

The Select Tool is now active. Begin adding territories from the map using the right-click options.

Create New Territories	? 🛛
This option can be used to manually assign new territories.	Select Territory Layer and option to create new territories. Territory Layer: New Layer Create new empty territory Create territories from locations Import territories from database Manually create territories
Нер	< Back Next > Cancel

Create New Territories	?×
	Select level to edit and dick Finish to activate the Select Tool and manually create new territories from the map. Territories Warning: Some territory levels are not available for selection because their base levels do not contain territories.
Help	< <u>B</u> ack Finish Cancel



Using the Balancing Options and Balance Territories wizards



A powerful aspect of Territory Design for ArcGIS is its territorybalancing capabilities. Balancing sales territories, service areas, or franchise boundaries is a key component to any successful business. With Territory Design, it is possible to balance areas based on multiple factors such as the size of each territory, the projected sales figures across your region, or the distance traveled between each store.

The two main components of balancing are the Balancing Options and Balance Territories wizards. Balancing Options is used to set up the parameters for how a particular territory should be balanced. For instance, you can choose ZIP Code Population and Sales Revenue Per Store Location as variables and allocate more importance to whichever variable should have a greater weight in determining the makeup of your territories. Once the balancing options are finalized the Balance Territories wizard is used to apply the parameters to your territories. This section provides insight into balancing territories using Territory Design.

Setting Balancing Options and Balance Territories parameters

This section provides instruction on how to balance territories. Before proceeding with this section it is assumed you already created a territory layer and created territories.

Тір

Checking the do not reassign polygons that contain seed points check box will ensure that the polygons where seed point locations overlap are not changed to another territory. This is especially important when you have more seed points than the territories. 1. Click the Territory Design drop-down menu and lick Balancing Options.

The Balancing Options wizard opens.

- 2. If you have already created a territory layer, choose the Territory Layer you want to want to work with from the drop-down list.
- 3. Choose the level you want balance and click Next.
- 4. If you are balancing territories with seed points, check the Use seed points box and choose the point layer from the drop-down list..

Check the Do not reassign polygons that contain seed points check box if you do not want polygons that overlap seed points to change. ►



Balancing Options	?
5	Select parameters for balancing territories.
Help	< <u>B</u> ack <u>N</u> ext > Cancel

Tip

Measuring Distance

Centroid of a geography element refers to the distance between the center of a territory or seed point location (if specified) and the edge of a polygon boundary closest to that seed point.

Nearest boundary of geography element refers to the distance between the center of a territory or seed point location (if specified) and the edge of a polygon boundary closest to that seed point. 5. Set the distance requirements for your territories:

Choose the distance type (Straight line, Drive distance, or Drive time) and corresponding Distance units from the drop-down lists.

6. Set the maximum distance a territory can be from its center or seed point.

You can also choose to set the minimum distance a territory is from seed points.

 Choose whether distance is measured to the centroid of each geography element or to the nearest boundary of the geography element. Click Next. ►

	X
Select parameters for balancing territories. Distance type: Straight line distance Distance units: Miles Maximum distance that a territory is away from its seed point or center? IIII Minimum distance that a territory is away from seed point or center of another territory: Distance is measured to: Centroid of geography element	
Help < Back Next > Cancel	

Balancing using the drive time or drive distance options drastically increases the processing time.

You can use the available fields filter to quickly find a variable to balance.

Тір

Using the preferences pie chart

By default, all variables are weighted equally. The pie chart is a way to change the variable importance of the territories you are creating. Click and drag the separator lines to dynamically change the percentages. The numbers will automatically change in the field view. The percentage must total 100. The distance weight is a significant factor in the development of territories. If you want to balance your territories based on an attribute, such as sales, make sure you minimize the distance weight in the pie chart.

For example, you are a cable TV provider looking to redistrict your franchise areas, which are based on ZIP Codes. You know that having an equal population distribution is key to adequately support your customer base, but you also know that as long as you have enough technicians on hand, the size of the area is not relevant. In this case, you may want to set the population importance variable at a higher percentage and leave the distance factor low. This will increase the probability that the underlying ZIP Codes will be combined to form weighted territories with equal population.

8. Add the balancing variables that will weight your areas and click Next.

You can bring in other variables by clicking Import Variable. For more information, see "Importing variables and removing variables" later in this chapter.

 Determine the importance each variable has toward balancing the territories.

> To do this, under the Preference(%) column, type the percentage or drag the pie chart lines to the left or right. Click Next. ►

vailable variable(s):		Balancing vari	able(s):	
AREA 2008 Total Population 2008 Household Population 2008 Family Population 2008 Group Quarters Population 2008 Total Household Size 2008 Average Household Size 2008 Average Family Size 2008 Average Family Size 2008 Over Qopta Income 2008 Over Qopta Income 2008 Over Occupied HUS 2008 Venet Occupied HUS 2008 Venet Occupied HUS 2008 Venet Occupied HUS	>>	BA Fields Pet	s:Tot	
			Import \	/ariables

Up to five variables are supported in the automatic balancing process.

Balancing Options		? 🛛
	Select preference for each Variable <u>Count</u> Pets:Tot Distance Total Drag separator lines on the Pets:Tot 65%	e chart to change preference(%) 20 65 15 100 e chart to change preferences. Count 20% Distance 15%
Help	< <u>B</u> ack	Next > Cancel

Click and drag the pie chart separator lines to dynamically change the balancing percentages. This helps detemine the importance one variable has over another.

Geographic Balancing Options

Territories must be contiguous: Checking this option ensures that all geographic objects adjacent to balanced territories are included in balancing.

No holes inside territories: Checking this option ensures that the balancing algorithm does not create blank areas wholly contained inside territories. Any unassigned elements are appended to the surrounding territory. The balancing algorithm does not remove holes that were present before starting the Balance command.

Use unassigned territories: Checking this option ensures that currently unassigned geographic elements are added to territories to improve the balance. Uncheck this option if you only want to swap geographic elements between territories.

Tip

Balancing Territories

You should set your parameters on the Balancing Options wizard before choosing to balance territories. When you choose to balance territories, you are applying the parameters set on the Balancing Options wizard.

If you are trying to balance a set of unassigned geographic elements (eg, ZIP Codes, census tracts) into territories, you must first create territories.

- 10. Check the boxes for geographic options for balancing territories and click Next.
- 11. Review the settings that will be applied and click Finish.

The Balancing Options dialog box closes. With the balancing options set, you are now ready to balance territories. ►



Balancing Options	?	X
	The following settings will be applied: Territory Layer: New Layer Territory layer: New Layer Territory layer to balance: Territories Seed points: sales_locations Do not reassign polygons that contain seed points: Y Distance types: Straight line distance Distance units: Pilles Minimum distance that a territory is away from its se Minimum distance that a territory is away from its se Minimum distance that a territory is away from seed j Distance type: centroid of distance criteri Variable: Count, Preference: 05.000 Variable: Piestrich, Preference: 15.000 Territories must be contiguous: Yes Use unassigned territories: Yes Use unassigned territories: Yes	
Help	< Back Finish Cancel	

You can open the Balance Territories dialog and click OK to balance territories (shown in the dialog at right). However you may need to set or modify your balancing options first. This process is outlined step-by-step in this section. On the Balance Territories dialog, you can create a report to compare your territory solutions before and after the balancing. 12. Click the Territory Design menu and click Balance Territories.

The Balance Territories dialog box opens.

- 13. Choose the territory layer you want to work with from the drop-down list.
- 14. Choose the territory level you want to balance and click OK.

Optionally choose to generate a Compare Territory Solutions Report.

The attribute table and map are updated based on the balancing options you have set.



Resolving overlapped territories

It is possible that more than one territory can contain the same unique element. For example, one ZIP Code could belong to two different territories. Territory Design provides the Resolve Overlapped Territories utility to solve this.

Тір

The overlapping of territories is supported only at the alignment layer level.

Territories can be created to overlap each other by importing territories, from a selection on the map, and by copying/pasting.

Within the Resolve Overlapped Territories dialog box, Concurrent elements refers to territories at each hierarchy level that belong to more than one territory at the higher level. The Overlapped territories listing contains upper-level territories, which incorporate currently selected unresolved territories. You can check on/off the upper-level territories to resolve the overlapping.

Tip

If you have overlapped territories, they will appear in the table of contents as a new layer. Overlapped territories appear hatched in the map. Click the Territory Design drop-down menu and choose Resolve Overlapped Territories.

The Resolve Overlapped Territories dialog box opens.

- Choose the territory layer you want to use from the dropdown list.
- Only one box under the Overlapped territories column corresponding to the Concurrent elements column should be checked to ensure territories are not overlapped. Check only the boxes where territories belong to concurrent elements.



Uncheck the entries to remove overlapped territories.



This example shows overlapped territories. They are 'hatched' on the map. They also appear as a new territory layer feature in the ArcMap table of contents until they are resolved.

Importing variables and removing variables

Territory Design provides options to bring new attributes into an existing territory layer. For example, you may want to join newly compiled sales figures before readjusting your company territories. Once you bring in selected variables, you can refine the list using the Remove Variables dialog box.

Tip

You can import point or polygon layers to Territory Design. When you choose a polygon layer and click Join by locations, the values to the imported variables are divided in proportion of the imported polygons that overlap the polygons of the alignment layer.

You can also import a Business Analyst Dataset (BDS). The Business Analyst apportionment method is used to calculate the values of the imported variables.

Тір

To view your imported variables in the territory level attribute table, open the Territory Layer Properties and add the desired variables from the Data tab.

Importing Variables

1. Click the Territory Design drop-down menu and click Import Variables.

The Import Variables wizard opens.

- 2. Choose the input feature class or table you want to import from the drop-down list or click the browse button to navigate to it.
- Select the territory layer you want to import the variables to.
- 4. Choose the database join method.

a. If you choose Join by attribute, do the following:

- Choose the alignment layer field you want to join from the drop-down list.
- Choose the input table field you want to join from the drop-down list and click Next.
- b. If you choose Join by locations, click the button and click Next.
- Choose the variables you want to import to the territories and use the right-facing arrows to add them.
- 6. Confirm the settings that will be applied and click Finish.



vallable variable(s): 2008 Per Capita Income 2008 Total Housing Units 2008 Owner Occupied HUs 2008 Avert Pocupied HUs 2008 Vacant Housing Units 2013 Total Population 2013 Total Household 2013 Average Households 2013 Average Households 2013 Average Family Size	Variable(s) to import: >> BA Fields 2013 Total Housing Units >>
2013 Per Capita Income 2013 Owner Occupied HUs 2013 Renter Occupied HUs	<

If an imported variable record does not match an alignment layer record ID, the variable will be zero.

Choosing to remove variables will remove the joins between the external tables of the imported variable and the territory database. It is assumed you have already imported variables before choosing to remove them. Note: If you move your joined external table, the join will be broken and you will not be able to access the imported attributes in Territory Design.

Tip

The performance of the balancing operations can be reduced when imported variables are present.

Removing Variables

1. Click the Territory Design drop-down menu and click Remove Variables.

The Remove Variables dialog box opens.

2. Choose the variables you want to remove by clicking the right arrows. Click OK.

The variables are removed from the territory database.

Remove Variables			?
Select variables to remove. Only impo	rted variables can be ren	noved.	
Territory Layer:			
New Layer	-		
Available variable(s):	V.	ariable(s) to remove:	
	>>	sri_bg_gen_bds.2008 Total Popula	tion
	<		
,			
Help		ок	Cancel

Refresh Territory Design Layer vs. Refresh Imported Variables

Territory Design can dynamically link to external databases using the Import Variables feature. Doing so allows users to continuously update sales statistics outside of ArcMap without having to rebuild territory layers. This page discusses the difference between the Refresh Territory Design Layer and Refresh Imported Variables commands. Both are available from the Territory Design toolbar.

Refresh Imported Variables:

- 1. Reimports all imported variables from external table for individual territory levels
- 2. Recalculates territory statistics for imported variables

Refresh Territory Design Layer:

- 1. Rebuilds territory geometry
- 2 Recalculates territory statistics for imported variables
- 3 Clears cache and indexes

Since the alignment layer is the base for all variables in the Territory Design Layer, if content is changed the Refresh Territory Design Layer command recalculates all variables on all levels.



Exporting territories

Territory Design provides multiple options to export your territories for analysis in other programs. For example, you can create a set of territories in Territory Design, then export them for use in Business Analyst.

Tip

Exporting territories as trade areas allows Business Analyst to read the territory polygons within the Trade Area wizard. You can then use these trade areas in subsequent reports and analysis in Business Analyst.

Exporting territories to Business Analyst Trade Areas

 Click the Territory Design drop-down menu and click Export Territories.

The Export Territories wizard opens.

- Click Export territories to Business Analyst Trade Areas and click Next.
- Choose the territory level or individual territories you want to export from the drop-down list.
- 4. Give the trade area a name.
- 5. Review the settings that will be applied.
- 6. Click Finish.



Export Territories		? 🗙
Territory 2 Territory 1 Territory 1	Select Territory Layer or individual Territory to export. Territory: Territories	•
Help	< Back Next > Ca	incel

You can export the whole territory solution (such as all territories, regions, areas, etc), a whole territory level (such as only territories or only regions), or individual territories within a level (such as only the 'West Region' within the regions level). You can control these within the drop-down menu above. Use the +/- buttons to select your entries, then click Next.

Exporting a territory database creates a territory assignment table. The assignment table contains names and unique IDs for each hierarchy level, such as Territories, Regions, and Areas.

Exporting a territory database

1. Click the Territory Design drop-down menu and click Export Territories.

The Export Territories wizard opens.

- 2. Click Export territories database and click Next.
- Specify your alignment layer ID field from the drop-down menu.
- Click the browse button to navigate to a location where you want to save the file. Name your file and click Save.
- 5. Click Finish.



Export Territories	?	
Territory 2 Territory 1 Territory 1	Specify Alignment Layer ID field and output file. Alignment Layer ID field: OBECTID Output file: C:I/My Output Data(Exported_databes.dbf	
Help	< Back Finish Cancel	

You can export your territory database to the following formats:

- dBASE Tables

- File and personal geodatabase tables

- SDE tables

Exporting both territory database and alignment layer records

1. Click the Territory Design drop-down menu and click Export Territories.

> The Export Territories wizard opens.

- 2. Click Export territory database and alignment layer records and click Next.
- 3. Add the variables you want to export by clicking the right arrows and click Next.
- 4. Click the browse button to navigate to a location where you want to save the file. Name your file and click Save. Click Next.
- 5. Review the settings that will be applied.
- 6. Click Finish.





Export Territories	? 🛛
Select fields to export.	
Available field(s): OBECTID ID NAME State Name State Abbreviation AREA 2008 Total Households 2008 Total Household Size 2008 Average Household Size 2008 Parcl Households 2008 Parcl Household Size 2008 Parcl Household Size 2008 Parcl Household Hus 2008 Over Orcupied Hus 2008 Over Orcupied Hus 2008 Rotel	Field(s) to export: 2008 Total Population 2008 Household Population 2008 Group Quarters Population 2008 Group Quarters Population
Help	< <u>B</u> ack <u>N</u> ext > Cancel

Tip

Exporting the territory alignment layer is helpful, especially if you *have joined attributes from another* database. The exported file shows the selected variables from both the original database and the externally joined table.

Tip

You can export your territory database and alignment records to the following formats:

- Shapefile

- File and personal geodatabase tables

- SDE tables

Tip

By exporting the territory level and corresponding variables, you have the option to select any of the summarized fields including Sum, Max, Min, Average, Median, Standard Deviation, and Percent of Total. These summarized fields represent the apportioned data within a territory boundary. For example, if you export a territory layer created from ZIP Codes and select Sum for a population variable, Territory Design will export the boundary of the *territory with the aggregated total* population within the ZIP Codes that make up the new territory.

Tip

You can export your territory database and alignment records to the following formats:

- Shapefile

- File and Personal Geodatabase tables
- SDE tables

Exporting territory boundaries and variables

 Click the Territory Design drop-down menu and click Export Territories.

The Export Territories wizard opens.

- 2. Click Export territory boundaries and variables and click Next.
- 3. Choose the territory level to export from the drop-down list.
- 4. Add the variables you want to export by clicking the right arrows and click Next.
- Click the browse button to navigate to a location where you want to save the file. Name your file and click Save. Click Next.
- 6. Review the settings that will be applied.
- 7. Click Finish.



Export Territories	? 🗙
Export territory boundaries and selected variables to a layer.	Select Territory Layer and option to export territories. Territory Layer: Vew Layer C Export territories to Business Analyst Trade Areas C Export territories database C Export territory database and Alignment Layer records C Export territory boundaries and variables
Help	< Back Next > Cancel

Creating Reports

Territory Design offers three reports to help organize and present your territory solutions. Each of the reports is available in a presentation quality Crystal Reports format and also utilizes the export formats available in Business Analyst, such as PDF, RTF, Microsoft Word, etc.

The three reports options are:

- Territory Report
- Detailed Territory Report
- Compare Territory Solutions Report



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Territory: Conacher

Preview Preview Territories Howe - Conacher Hull BusivessOhje

Creating a Territory Report

You can generate a report showing the main elements of creating territories. This document serves as a summary for the work you have done to create and balance your territories. The territory report is accessed through the Crystal Reports viewer, but you can export to various formats such as PDF, Word, or HTML.

The territory report includes the following information:

- · Hierarchy of territories
- Map of territories
- Territory variable statistics
- Chart view of territory statistics

 Click the Territory Design drop-down menu, navigate to Reports and click Territory Report.

The Territory Report dialog box opens.

- 2. Type name for your territory report in the text box provided.
- Choose the territory layer you want to report on from the drop-down list and click OK.

The Territory Report is displayed on screen.

Territory Report		×
	Give a name and select the Territory Layer for which you want to create a Territory Report. Report title: Territory Legort Territory Layer: DRW Territories	
Help	OK Cancel	

Creating a Detailed Territory Report

You can generate a report showing a whole level or individual territories within a territory level. This is essential to show a quick snapshot of selected territories and their levels. The detailed territory report includes the following information:

- Map of each territory
- Total and list of child territories with variables
- Statistics for each territory

 Click the Territory Design drop-down menu, navigate to Reports and click Detailed Territory Report.

The Detailed Territory Report dialog box opens.

- 2. Type name for your report in the text box provided.
- Choose the territory layer you want to report on from the drop-down list.
- Select the territory level(s) or individual territory(ies) to include in your report. Click OK.

The Detailed Territory Report is displayed on screen.

Detailed Territory Report		×
Vou have selected 3 terrtory(es), this report will have at least 3 page(s).	Give a name and select the Territory Layer for which you want to create a Territory Report. Report Itile: Detailed Territory Report Territory Layer: DRW Territories Select Territory Leve(S) or individual Territory(ies) to report: Ferritories Ritchard (S6) Butchard (S6) Butchar	
Help	OK Cancel	

Tip

You can select a whole territory level or individual territories within their level. To select individual territories use Ctrl-Left-click to select the territories or Shift-leftclick to select all elements. They are selected when highlighted.

Creating a Compare Territory Solutions Report

You can generate a report that shows the key differences or similarities between two territory solutions. For example you can build a territory solution, save it, then rebalance the solution with different parameters and run the report to compare the two. Or you can compare 'last year's territory assignments' with this year's version. The Compare Territory Solutions Report is accessed through the Crystal Reports viewer, but you can export to various formats such as PDF, Word, or HTML.

The territory report includes the following information:

- · Hierarchy of territories
- Number of elements in each territory
- Selected parameters in each territory
- Map of territories
- · Territory variable statistics
- Chart view of territory statistics

• A compactness score to show how well your territories are balanced Click the Territory Design drop-down menu, navigate to Reports and click Compare Territory Solutions Report.

The Compare Territory Solutions Report dialog box opens.

- 2. Type name for your report in the text box provided.
- Choose the first territory layer from the drop-down list or browse to it.
- 4. Choose the second territory layer from the drop-down list or browse to it.

The Compare Territory Solutions Report is displayed on screen.

Compare Territory Design Solutions	s Report	X
l vs. 2	Give a name and select the Territory Layers to compare. Report title: Compare Territory Design Solutions Report First Territory Layer: PRW Territories Second Territory Layer: New Layer	
Help	OK Cancel	

Тір

You can also generate a Compare Territory Solutions Report from the Balance Territories dialog. The concept here is when you have a territory solution created, you can rebalance it and automatically generate a report to show the differences.



The Territory Design window is the central location for viewing your territory information and adjusting properties. The window is dockable and is divided into two main panes. The first pane contains two views, Data and Hierarchy. The second pane also contains two views, Statistics and Chart. The window can be accessed from the Territory Design toolbar and is designed to be interactive as you perform your analysis within Territory Design. The different views will help show how well your territories are balanced. You can customize the window using the options in the Territory Layer Properties dialog box. Since the window is dockable, it can be resized and move it to different parts of the screen. This section explains the different parts of the Territory Design window.



Data view

The data view is a table view of objects that make up your territories. The data view is synchronized with the hierarchy view. The territory layer and selected territories are applied in both views. You can perform many behind-the-scenes analysis in the data view.

Tips

- You can sort fields in ascending or descending order by clicking any of the attribute field headers.
- You can add more attribute fields to the data view by opening the Territory Layer Properties dialog box, and choosing from the available variables.
- You can quickly reassign territories by clicking a field under Territory. The Territory drop-down list allows you to select other territories.
- Right-clicking a Territory field provides many different territory management options.
- Double-clicking any data record zooms to that element on the map.
- Selection of multiple territories is supported in the data view by holding down the Shift or Ctrl key and clicking fields.

Working in data view

 Click Show/Hide TD Window from the Territory Design toolbar.

The Territory Design window opens. Dock it as necessary.

- 2. Click the Data tab.
- 3. Choose the Territory layer you want to work with from the Territory layer drop-down list.
- Choose the territory level you want to work with from the Territory drop-down list.

The territory attributes are displayed in the data window.





Hierarchy view

The Hierarchy view is a graphical view of your territory levels. The hierarchy view of territories is displayed in a tree view. The Hierarchy view is synchronized with the Data view.

Tips

- Each geographic element contains sub-objects when applicable. For example, lower territories are connected to their higher regions in a tree view.

- You can drag and drop lower-level elements to higher categories. For example, you can move a territory assigned to Region 1 into Region 2.

- Right-clicking any geographic element provides many different territory management options.

- Double-clicking any geographic element record in the hierarchy view zooms to that element on the map.

- Double-clicking the territory symbols (colored rectangles) opens the standard ArcGIS Symbol Selector dialog box. Right-clicking the territory symbols will open the ArcGIS Color Pick dialog box.

Working in hierarchy view

 Click Show/Hide TD Window from the Territory Design toolbar.

The Territory Design window opens. Dock it as necessary.

- 2. Click the Hierarchy tab.
- Choose the Territory layer you want to work with from the Territory layer drop-down menu.

All geographic elements of the territory layer are shown in the hierarchy window.



Statistics view

The Statistics view displays the statistics for selected levels of your territory hierarchy. The available statistics are summarizations of the territory attribute fields.

Tips

- Statistics are shown as count, sum, min, max, average, median, standard deviation, and balance index. The balance index indicates how close the created territories are to the parameters defined in the Balancing Options dialog box.

- You can add more statistic fields to the statistics view by opening the Territory Layer Properties, and choosing from the available variables for each territory level. Clicking +/- expands or collapses your territory level tree views.

- You can view statistics by overall territory level or individual geographic elements by choosing the desired layer from the Territories Level drop-down menu.

- Right-clicking any place in the statistics view and clicking "Statistics..." opens the standard ArcGIS Statistics dialog box.

Working in statistics view

 Click Show/Hide TD Window from the Territory Design toolbar.

The Territory Design window opens. Dock it as necessary.

- 2. Click the Statistics tab.
- Choose the territory level you want to work with from the Territories Level drop-down list.

The statistics for the selected geographic elements are displayed.

Statistic	Field	Value
Sum	Count	280.0000
Max	Count	56.0000
Min	Count	56.0000
Average	Count	56.0000
Standard De	Count	0.0000
Count		5.0000
Sum	2008 Total Population	5629488.0000

Chart view

The chart view displays balancing information for territories. The chart provides a visual guide to how well territories are balanced. A balancing line is included to show the mean value of a selected variable for all territories.

Tips

- You can add more attribute fields to the chart view by opening the Territory Layer Properties doalog box, and choosing from the available variables in the Chart tab.

- Add the balancing line in the Chart tab in the Territory Layer Properties dialog box.

- Territory names may not be visible or are truncated in the chart view if there are too many characters in a territory name or if there are many territory columns.

- Right-clicking a territory chart column provides many different territory management options.

- Double-clicking any territory chart column opens the ArcGIS Symbol Selector. Changing the color or symbol in the chart view is also reflected on the map and in the data and hierarchy views.

Working in chart view

 Click Show/Hide TD Window from the Territory Design toolbar.

The Territory Design window opens. Dock it as necessary.

2. Click the Chart tab.

The contents of the chart view are controlled by what is selected in the Territory layer drop-down list of the data or hierarchy views or by the current level selected on the drop-down list on the TD toolbar (not the Territory Design drop-down menu, but the hierarchy level drop-down list on the right side of the toolbar).



Working in Selection Mode



Selection Mode is a way of working with selections of your territories and displaying the results for only those selections. You can access Selection Mode from the Territory Design toolbar. Selection Mode works in the data view, statistics view, and chart view.

Selection Mode relates to selections made by the Territory Select Tool found on the Territory Design toolbar. Selections made by the standard ArcGIS Select Feature tool do not affect the Territory Design views when in Selection Mode. It does, however, turn off Selection Mode.

If you are using Selection Mode for the data view, data are shown only for elements that are selected in the map. If you are using Selection Mode for the statistics view, statistics are shown only for elements that are selected in the map.

If you are using the Selection Mode for the chart view, the chart is will shown only for elements that are selected in the map.

You can use the Territory Select Tool to work with the map. With it, you can select data management options such as create a new territory, reassign a territory, copy, and remove a territory.

Selected geographic elements

(ZIP Codes) within territories



Chart representing selected items only within territories

A map showing a set of territories with Selection Mode turned on. The TD Window chart shows only the information for the selected areas.

Working in Edit Mode



Edit Mode is a way of working with territories having multiple hierarchies. When in Edit Mode, Territory Design increases the thickness of the boundary lines for the active level of territories and shows geography elements of its base layer, making the hierarchy levels easily distinguishable. Also, other territory levels on the map

Geographic elements (such as ZIP

become temporarily invisible. You can edit territories in Edit Mode using the standard Territory Design editing features including the Territory Select Tool, and data view and by draging and dropping territories. The visibility of the territory levels is restored after turning off Edit Mode.



A map showing a set of territories. Regions are created from these territories, but will not be shown until Edit Mode is turned on.



A map showing a set of regions in Edit Mode. The underlying territories are made invisible.

Setting the territory layer properties



The Territory Layer Properties dialog box is accessed from the Territory Design toolbar. It can be used to control a variety of settings for working with the software.

Throughout this section, you will learn more about the different tabs on the Territory Layer Properties dialog box, including:

- Data tab
- Statistics tab
- Chart tab
- Map Display tab
- Network tab
- Summary tab
- About tab

Data tab

The Data tab allows you to control what attributes are included in each level of your analysis.

Tip

If you add available variables to the displayed variables window in the Data tab, the displayed variables are automatically added to the territory level database you are working with. Conversely if you remove any displayed variables, they will be removed from the territory level database.

Setting territory layer Properties on the Data tab

1. Click the Territory Layer Properties button from the Territory Design toolbar.

- 2. Click the Data tab.
- Choose the available variables and use the arrows to move them to the Displayed variable(s) area and make them active.
- Click Apply to continue to work with the territory layer properties, or click OK to save your new settings and close the dialog box.



Statistics tab

The Statistics tab allows you to control what attribute statistics are shown in each level of your analysis.

Tip

The variables that you add on the Statistics tab will show up in Territory Design Window.

Setting territory layer properties on the Statistics tab

1. Click the Territory Layer Properties button from the Territory Design toolbar.

- 2. Click the Statistics tab.
- 3. Click Add to see a list of variables.
- 4. Choose the type of statistic you want to see from the dropdown list.
- 5. Choose the variable you want to show in the Field area and click OK.
- 6. Click Apply to continue to work with territory layer properties or click OK to save your new settings and close the dialog box.

rritory Layer Prope	rties	?
ata Statistics Chart	Map Display Data Source Network Summary About	
Select statistics to displa Displayed statistics	φ.	[
Statistics	variables	Add
Sum	Count	
Max	Count	Remove
Min	Count	Remove all
Average	Count	Kelliove all
Standard Deviation	Count	
Count		
1	OK Cance	l Apply

Add Statistics	X
Statistic:	
Sum	•
Field:	
🖃 General	^
Count	-
Balance Index	
BA Fields	
AREA	
- 2008 Total Population	
- 2008 Household Population	
- 2008 Family Population	
2008 Group Quarters Population	
2008 Total Households	
2008 Average Household Size	~
	_
1	
Help OK Cancel	

Chart tab

The Chart tab allows you to control what attributes are included in the Territory Design charting. You can view the chart information in the Territory Design Window on the Chart tab.

Tip

By checking on the Show balancing lines check box a line is displayed in the Territory Design Window chart showing the mean value of the attributes you choose. This provides a visual guide to how well a territory has been balanced. You can show more than one attribute at a time; a balancing line is shown for each attribute.

Tip

Clicking Chart Properties opens the standard ArcGIS Advanced Chart Properties dialog box. You can further customize your chart using this dialog box.

Setting territory layer properties on the Chart tab

1. Click the Territory Layer Properties button from the Territory Design toolbar.

- 2. Select the Chart tab.
- Choose the available variables and click the right arrows to move them to the Displayed variable(s) area and make them active.
- Click Apply to continue to work in the territory layer properties or click OK to save your new settings and close the dialog box.



Map Display tab

The Map Display tab allows you to control which territory levels are shown with internal boundaries in ArcMap. For example, if you have two territories created from a set of 30 ZIP Codes, the ZIP Code boundaries are displayed within each territory. When a territory is created, the alignment layer boundary files are dissolved to form a contiguous territory polygon. Displaying the boundaries can be helpful if you want to show the total boundaries within each territory or the size distribution of the boundaries.

Setting territory layer properties on the Map Display tab

1. Click the Territory Layer Properties button from the Territory Design toolbar.

- 2. Click the Map Display tab.
- 3. Check the territory levels where you want to display internal boundaries.
- Click Apply to continue to work with territory layer properties or click OK to save your new settings and close the dialog box.

Territory Layer Properties	? 🛛
Data Statistics Chart Map Display Data Source Network Summary About	
Data Statistics Chart Map USBMP Data Source Network Summary About Check.territory levels where internal boundaries are displayed. Image: Territories Image: Territories Image: Territories Image: Territories	
OK Cancel A	pply

Data Source tab

The Data Source tab allows you to control where your Territory Design analyses are saved. The information is stored in a filebased geodatabase. Past territory solutions can easily be loaded from the Business Analyst Project Explorer.

Тір

By default, the Territory Design workspace is set to C:\My Output Data\Projects\Default Project\Territories, but you have the option to save it to any location you choose.

Setting territory layer properties on the Data Source tab

1. Click the Territory Layer Properties button from the Territory Design toolbar.

- 2. Click the Data Source tab.
- 3. Type your workspace file location or click the browse button to navigate to a location.
- Click Apply to continue to work with territory layer properties or click OK to save your new settings and close the dialog box.

Territory Layer Properties	? 🛛
Data Statistics Chart Map Display Data Source Network Summary About	
Set current datasource.	
Workspace file path:	
C:\My Output Data\Projects\Default Project\Territories\drw territories	2
OK Cancel	Spply

Network tab

The Network tab allows you to control which drive-time methods Territory Design uses. You have the option to use StreetMapTM or Network Analyst.

Tip

Drive-times can be used in Territory Design when you balance territories. For instance you can set parameters so that a location can't exceed a 25-minute drive-time. In this scenario you, have the option to choose Network Analyst or StreetMap to solve the drive-time.

- Network Analyst yields highly detailed drive-time polygons but may take longer to create.

- StreetMap produces more generalized drive-time boundaries, but works very fast.

Setting territory layer properties on the Network tab

1. Click the Territory Layer Properties button from the Territory Design toolbar.

The Territory Layer Properties dialog box opens.

- 2. Click the Network tab.
- Choose the network solver type from the drop-down list.
- 4. You included barriers in your territory creation process, check Use barriers and load the point file.
- Click Apply to continue to work with territory layer properties or click OK to save your new settings and close the dialog box.

For more information on barriers, proceed to the following page.



Using barriers in Territory Design

What are barriers? Barriers are point locations that restrict the traversability of a network element (such as a road) in a network dataset. Barriers are important to Territory Design because they can restrict or limit the formation of territories beyond certain points. This is valuable when territories are geographically adjacent to one another, but are separated by a natural feature, such as a river. You can insert barriers on the bridges that cross the river to limit one territory from spilling over the boundary.

How do I add barriers? You can add barriers to ArcMap in a variety of ways. Barriers must be points, so an easy way to add them is to zoom to the street segments you intend to block and create a shapefile of them. You would then reference this barrier layer in the Territory Layer Properties Network tab.

Will barriers work when "straightline distance" is used? No, the barriers need a street network to work properly. Thus, the straight-line distance method will ignore barriers.

To the right are graphic examples of territories created with and without barriers. You can clearly see that adding the barrier points to the bridge street segments will shield one territory (green/east) from entering into the other (orange/west).

Tips

For barriers to work correctly they must be placed on the street segment that you intend to block. If the barriers are placed 'in the vicinity' of the street segment, in this case a bridge, the barriers will not have influence on territory creation. This means if there are multiple lanes for the bridge, a barrier point should be placed on each segment to ensure the blockage. if not, the territory will flow past the segment to satisfy the parameters set.




Territory Layer Properties:

Summary tab

The Summary tab allows you to determine the different parameters chosen in the territory creation process. You can view the Summary tab at any time to look up information about your territories.

Тір

The summary information is stored in the metadata.xml file that is written to the same location your territories are saved.

Setting territory layer properties on the Summary tab

1. Click the Territory Layer Properties button from the Territory Design toolbar.

The Territory Layer Properties dialog box opens.

2. Click the Summary tab.

Examine your territory solution parameters and type any comments if needed.

 Click Apply to continue to work with territory layer properties or click OK to save your new settings and close the dialog box.

Territory Layer Properties	?
Data Statistics Chart Map Display Data Source Network Summary About	
Territory layer sammary: Territory layer name: DRW Territories Creation time: 2008/10/13, 11:05:56 Last modification time: 2008/10/13, 11:06:06 Territory layer datasource path: C:\Program Eles\ArcGIS\Business Analyst\Data\Broject\Territories\drw territor Algment layer name: DRW Territories.21C Codes Algment layer dataset path: C:\Program Files\ArcGIS\Business Analyst\Data\Brojecta\Broject\Territories\drw territor Network dataset: C:\Program Files\ArcGIS\Business Analyst\Data\Tele Atlas Street Data\trans\stree Preferred network solver: Network Analyst Number of territory levels in hierarchy: 2	0
Level name: Territories	
Comments:	
I created these territories for the financial services Project. (JG)	~
OK Cancel A	pply

Territory Layer Properties:

About tab

The About tab shows the current Territory Design build version and copyright information.

Тір

The Business Analyst build version and Territory Design build version are not the same. You can find the Business Analyst build verison by clicking the BA drop-down menu > Preferences > General tab.

Setting territory layer properties on the About tab

1. Click the Territory Layer Properties button from the Territory Design toolbar.

The Territory Layer Properties dialog box opens.

2. Click the About tab.

Examine the Territory Design version number.

 Click Apply to continue to work with territory layer properties or click OK to save your new settings and close the dialog box.

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Data	Statistics	Chart	Map Display	Data Source	Network	Summary	About		
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