U.S. Pat. No. 6,604,083

Petco

Retail Site Selection Based on Drive Time Areas

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(12) **United States Patent**

Bailey

(10) **Patent No.:** **US 6,604,083 B1**

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(54) **MARKET DETERMINATION BASED ON TRAVEL TIME BANDS**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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(22) Filed: **Jun. 11, 1998**

Related U.S. Application Data

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(51) **Int. Cl.**[7] **G06F 17/60**
(52) **U.S. Cl.** **705/10; 701/201**
(58) **Field of Search** 705/1, 10, 14; 700/200, 201; 707/10; 701/201

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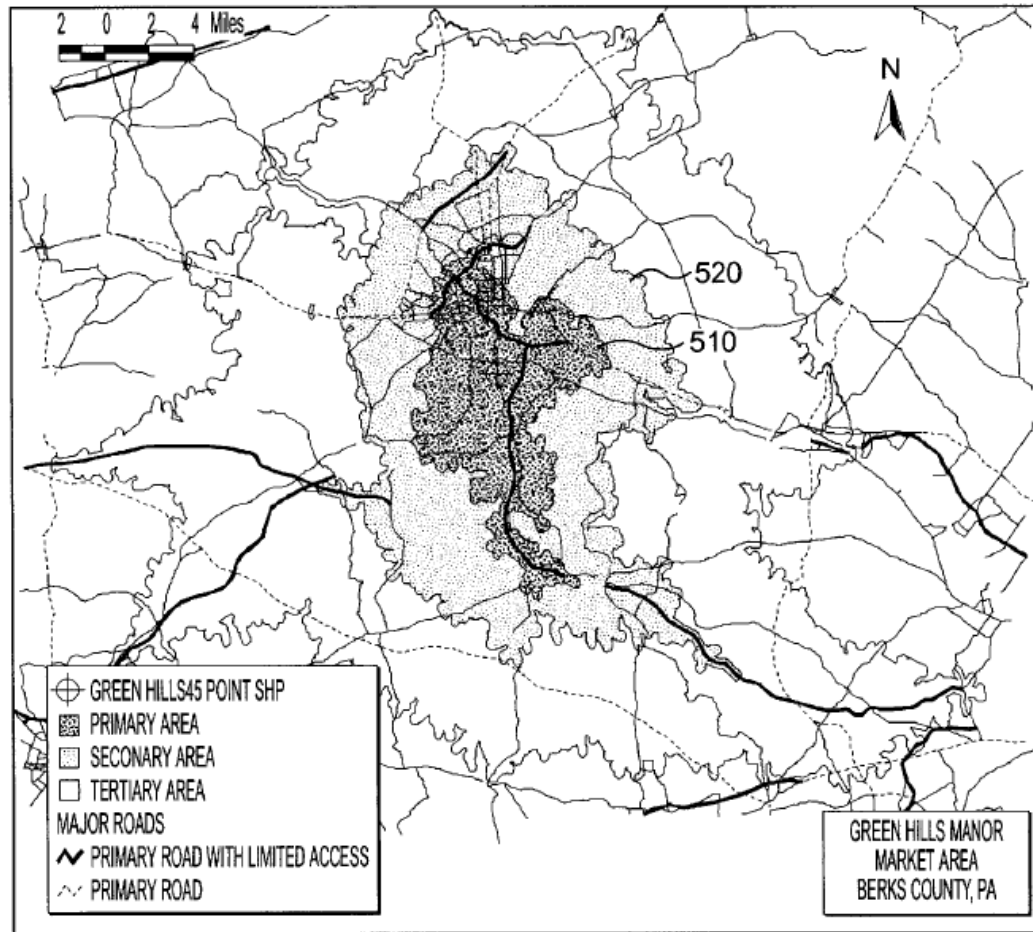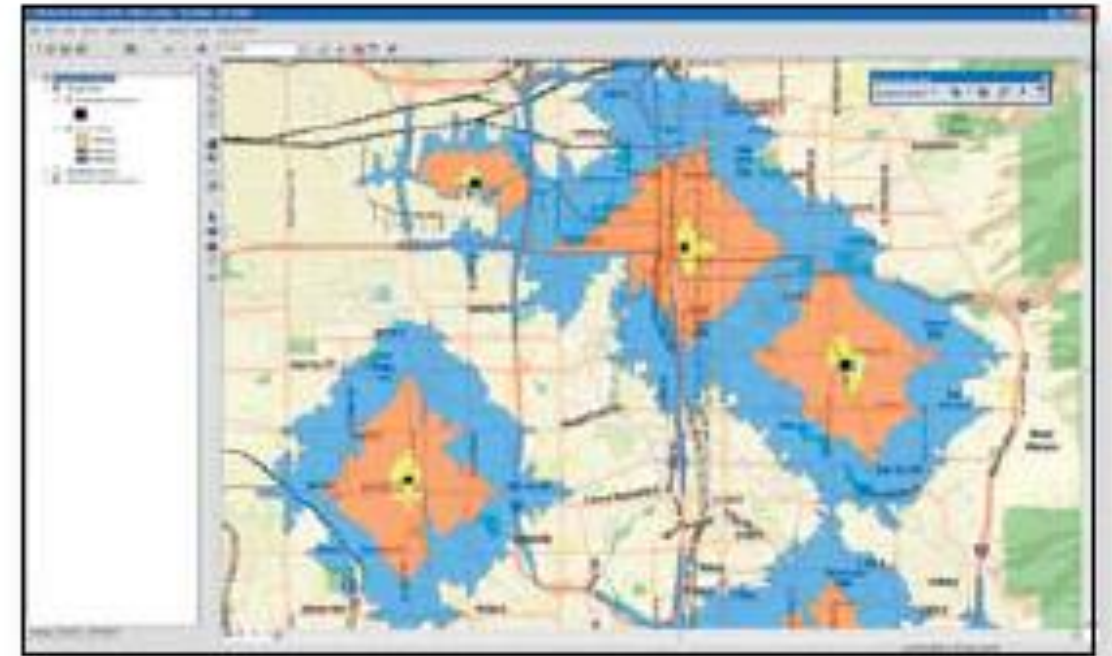
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FIG. 5b

Multiple Drive Times in Salt Lake City, Utah

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Claim 5

A method for preparing a market study comprising:

defining a geographic area around a selected location, the geographic area corresponding to a market based on a selected maximum travel time;

defining a plurality of bands based on increasing travel time from the location;

selecting geographic units in the bands;

defining market-related variables for the market;

calculating values corresponding to the market-related variables for each of the selected geographic units; and

calculating a net demand for a service or a commodity in the market based on the values.

Mitigating the Risks of Expansion

Petco™ is a leading national pet specialty retailer, with more than 1,200 Petco and Unleashed by Petco store locations nationwide.

What did they do?

Petco staff members began using an Esri® geographic information system (GIS)-based site selection solution to mitigate the risks associated with expanding its network of stores. As the number of stores has grown, so have the risks of selecting inappropriate or marginal locations or new stores that have the potential to cannibalize the sales of existing stores. Petco sought to improve its ability to assess both the sales potential for new locations and any risks. Investing in the Esri solution provided scientific analysis that gave leaders more confidence in their decisions.

Do I need this?

Opening a new store often requires a long-term property rental contract and significant construction-related capital expenditures. Minimize costly mistakes and improve the performance of sites with accurate site selection using Esri GIS technology.

"With the Esri solution, we have successfully avoided the downside risk associated with several locations, which more than pays for the investment."

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Tip

Drive time

Drive time trade areas are created around your stores, including all areas accessible along the street network given your maximum travel time or distance.
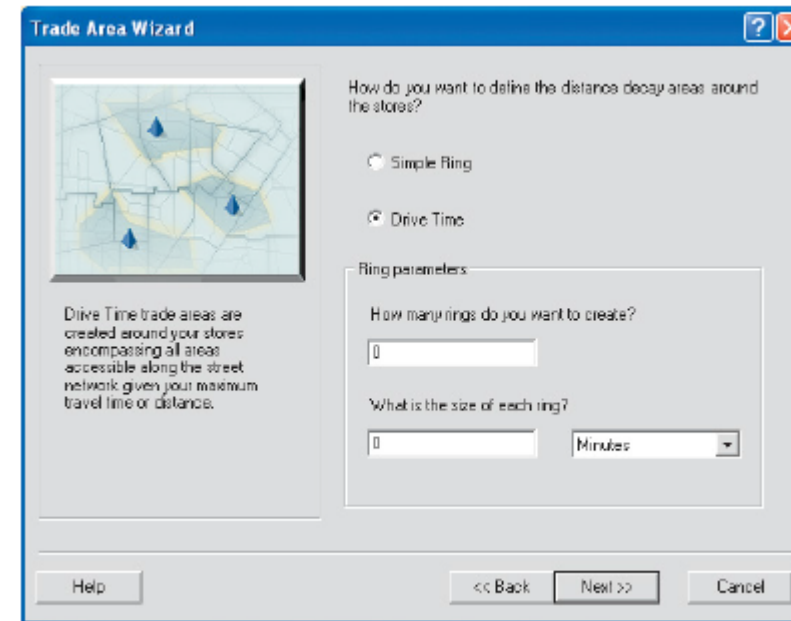
b. If you choose Drive Time, do the following:

Choose how many drive time trade areas you want to create.

Choose the size of the rings you want to create for each store.

Click the Measure Units drop-down menu to choose a time or distance from the list.

Click Next.

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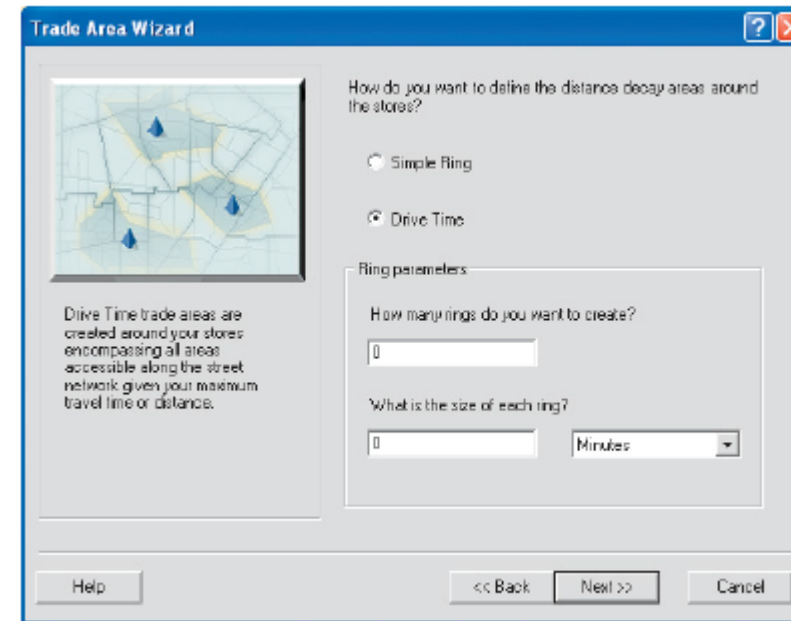

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Business Analyst

1. **How is data calculated for a trade area?**
   ESRI uses a sophisticated Weighted Block Centroid geographic retrieval methodology to calculate data for rings and other trade areas. This method provides the most accurate information for rings and polygons.

   The basic principle - A geographic retrieval methodology determines how data is gathered and then summarized or aggregated for each ring. For standard geographic units, such as counties or ZIP Codes, the link between a designated area — called a trade area — and its attribute data is a simple one-to-one relationship; if a trade area contains a selection of ZIP Codes, the data retrieval is a simple process of gathering the data for those ZIP Codes.

   Census Blocks are the smallest unit of census geography. They are used to create all other levels of census geography. For example, one or many blocks are aggregated to create a Block Group. In the third map, the blue dots represent the geographic centroids for the 13 blocks that make up the highlighted (yellow) Block Group. Unfortunately, only a small subset of data (households, population, housing units, and number of businesses) is available at the Census Block level and, therefore, cannot be used to aggregate most data for a trade area.

   Block centroids within a trade area are used to calculate a weight for the highlighted Block Group. These weights are then used to more accurately gather and aggregate demographic data for rings and other polygons.

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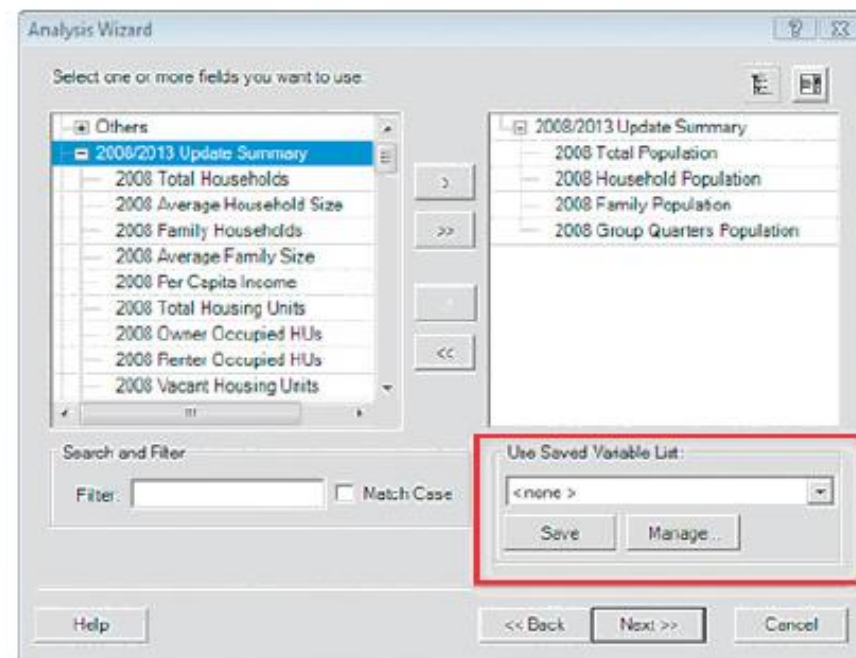selecting geographic units in the bands;

defining market-related variables for the market;

calculating values corresponding to the market-related variables for each of the selected geographic units; and

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About custom variable lists

In various dialog boxes, you can create and save custom variable lists for use in reports, analyses, trade areas, and tools. This is helpful when you are repeating tasks with the same demographic variable outputs. In addition to creating customized lists, the variables are provided in each standard Summary Report—for example, you can run a Spatial Overlay for a trade area and use every variable included in the Demographic and Income Report. The variables will appear as fields in the attribute table so you don't have to manually load each variable individually.

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Analysis layer setup

Business Analyst allows your data to be used in any of the wizards and creates reports with this data. All layers included with Business Analyst are already set up; however, you can revise setup on layers on your map by using the Analysis Layer Setup Wizard.

Analysis layer setup is often used to import custom data, such as sales volumes, and joins it to a standard level of geography such as ZIP Codes. You can also use your own demographic data, estimates, projections, business statistics, or consumer expenditure information. This data must have a geographic identifier associated with it since this tool is designed to join your custom data with an existing polygon or point layer—for example, if you want to report on your sales data at the ZIP Code level, make sure that a valid ZIP Code field was included in your database. This allows you to join your database to our ZIP Code boundary or your own ZIP Code boundary file, if added in the table of contents. ▶

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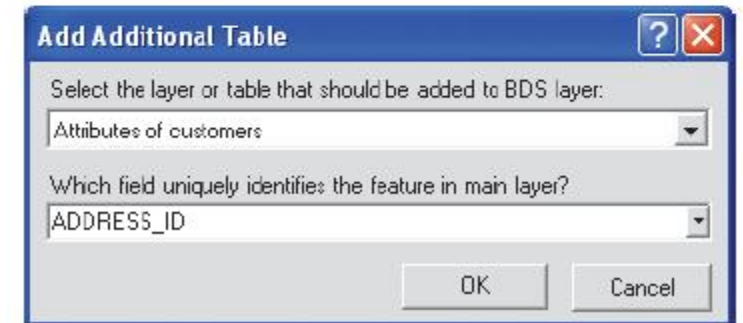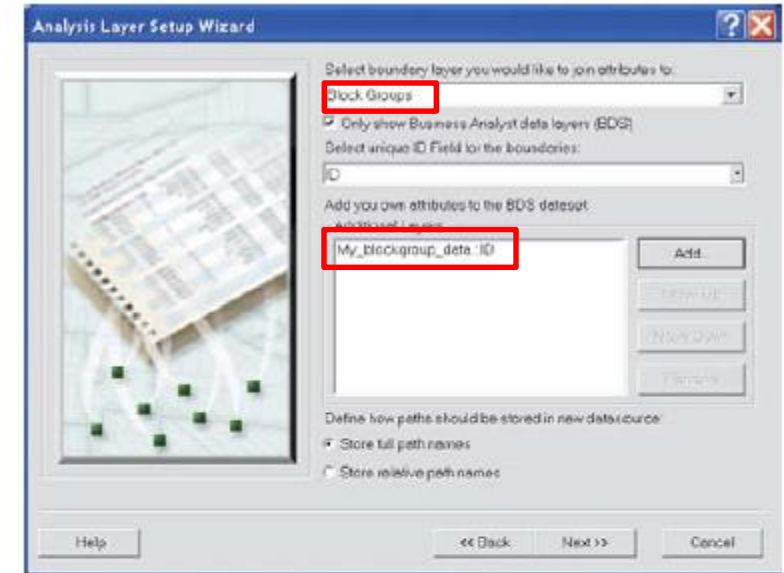
defining market-related variables for the market;

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Field descriptions

Variable: Shows all variables you have selected for setup.

3. Click the drop-down menu and click the boundary layer for which you want to join attributes.

4. Click the second drop-down menu and click the unique ID field for the boundaries.

5. Add your own attributes to the BDS dataset. Click the Add button and the Add Additional Table dialog box opens. Click the first drop-down menu and click the layer or table that you want to add to the BDS layer. Click the second drop-down menu and click the field that uniquely identifies the feature in the main layer, then click OK.

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Field descriptions

Variable: Shows all variables you have selected for setup.

Aggregation method: Combines variable values. The options are to sum the value; average the values; use the min value; use the max value; or calculate the median, standard deviation, or variance.

Weight: Weight the variable based on another variable that is in the Block Group layer. You could choose to weight consumer expenditures on furniture by 2003 Total Households. This provides you with the amount spent per household on furniture in a trade area.

Apportionment method: Use in apportioning a variable to a portion of geography when an analysis cuts across a geography. The analysis includes only the value of the variable that falls inside the analysis area. Depending on the variable, you have the choice of apportioning by AREA or one of the three primary demographics at the block point level (Population, Households, or Housing units).

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PETCO mitigates the risk associated with opening new locations by using ESRI Business Analyst for site selection solution.

In an effort to mitigate the risk associated with opening a new location and maximize the return on the invested capital it takes to build a store, PETCO decided to implement a GIS-based site selection solution in 2006. "We sought to improve our ability to assess the sales potential for new locations, which was born of a desire to be more risk averse with capital," says Hanna. "The investment would give us a more scientific basis to feel confident in our process." In addition to the significant construction-related capital expenditures, opening a new store often requires a long-term real estate lease. Improving the performance of sites with accurate site selection helps to minimize costly mistakes.

http://www.esri.com/library/articles/petco-case-study.pdf