

## GIS in Action

# Coop Norge AS Using ArcGIS Business Analyst to Refine Marketing Strategies

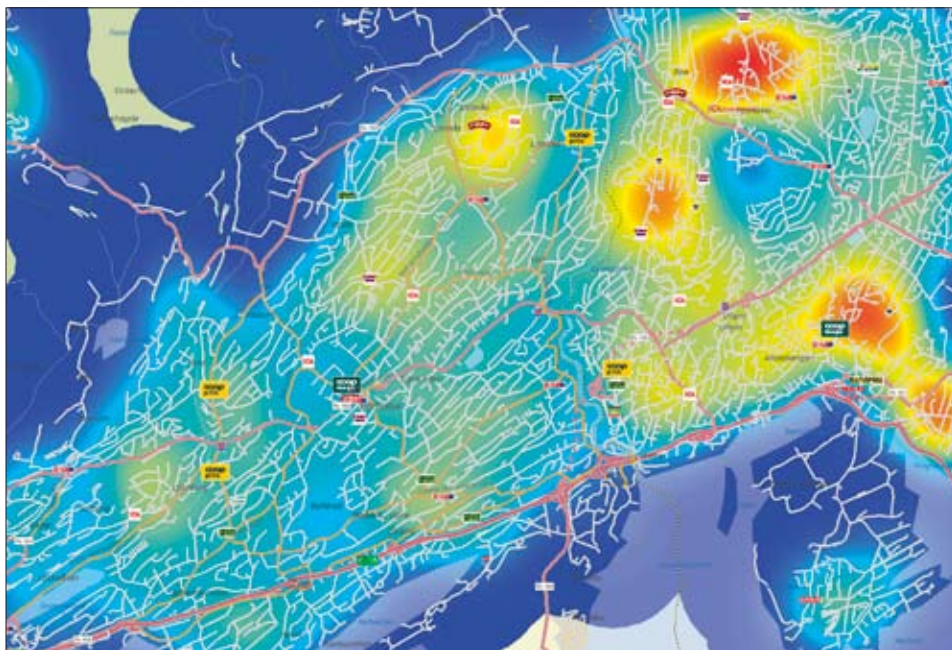
For nearly 150 years, cooperative societies have played an important role in the commerce of Norway and its Scandinavian neighbors. Coop Norge AS, the dominant retail market cooperative in the country, includes 165 individual cooperative societies and more than 1,000 shops. Coop Norge manages six distinct retail chain outlets that sell a variety of goods ranging from groceries to sports equipment. More than 25 percent of all groceries sold in Norway are purchased at one of Coop Norge's shops by its more than one million loyalty card customers.

Coop Norge has implemented a loyalty program that issues its shoppers unique identifica-

tion cards that provide them with greater discounts on their purchases. At the same time, the cooperative collects shopping habit information that allows the cooperative to understand its customers' needs and serve them better. The cooperative realized that if it analyzed this data geographically, it could better understand clientele in relation to specific regions and develop more focused and successful marketing campaigns for its products.

Coop Norge chose ESRI's ArcGIS Business Analyst desktop analysis software, which was provided by Geodata AS, ESRI's distributor

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This map displays the location of Coop Norge stores in relation to its competitors and the local road network. Warm colors depict the areas of highest population density.

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## Ravensdown

### ArcGIS Server Makes the Business of Farming More Profitable and Environmentally Sound

Ravensdown, New Zealand's largest manufacturer and distributor of fertilizers, supplies more than half of all the fertilizer used in New Zealand agriculture. One hundred percent owned by New Zealand farmers, Ravensdown is a cooperative that provides them with sound technical advice and a comprehensive range of key farming information, all at a sustainable cost. Ravensdown prides itself on its research, analysis, highly qualified field staff, extensive product range, and a customer service center that is always available to take queries and orders.

Ravensdown wanted to harness the latest technology to fertilize farmland to keep it both environmentally friendly and profitable to the farmer. The cooperative had been creating plans for fertilizing down to the block level of the land. Unfortunately, it had no way of ensuring that once the product left the stores, it was being applied to the planned block or at what rate it was being applied. Ravensdown was interested in using technology to capture this data. It also wanted to use this data to

create a georeferenced archive of nutrient and agricultural inputs per customer.

Ravensdown searched for a solution that would take into account the timeliness of reporting output—including the capability to efficiently and automatically process large volumes of data and ensure data accuracy. Ultimately, this data would be used as a referenced customer archive. Ravensdown's goal was to create an intelligent database of past transactions to improve service to its stakeholder farmers, increase profitability, and continue as a good corporate citizen.

Ravensdown worked with ESRI's New Zealand distributor, Eagle Technology Group, to design a solution built on ArcGIS, the ESRI software family that allows organizations to

build a comprehensive geographic information system (GIS). Using ArcGIS Server integrated with ArcSDE technology as the main platform, the solution integrates GIS, GPS, wireless transmission, Internet, and intranet technologies using ESRI ArcIMS and ArcGIS Explorer as well as data from many sources.

First, the raw spatial and attribute data, including fertilizer type and spreading data, is captured from GPS transceivers on the spreader trucks. Next, the data is transmitted wirelessly to Ravensdown's facility, where it is loaded into the GIS and processed in near real time.

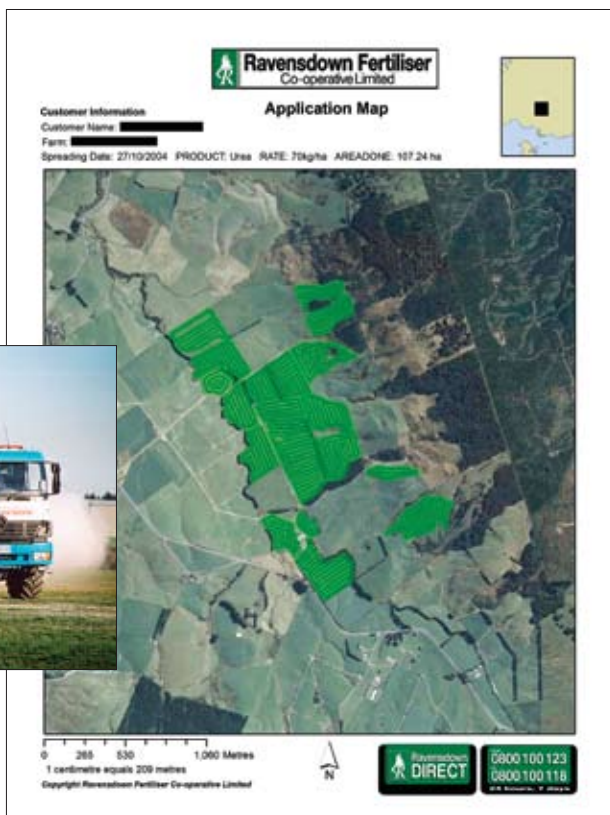
The GIS creates a map-based display that shows fertilizer application data as a series of color-coded "snail trails" that are overlaid on the map, giving a very good representation of the process. This information is then merged with digital orthophotos and the farm's relationship databases to create a comprehensive picture of the farm's overall soil sustainability as well as where and how much fertilizer is applied to certain areas.

Once the data has been uploaded and processed, Ravensdown field staff members can log on to the system from a remote location via the Internet using ESRI ArcGIS Explorer or ArcIMS to look up a customer's farm, see the results of earlier soil tests and what types of fertilizers have been applied, and make recommendations about which types of fertilizers are appropriate. During this same automated process, a representation of the work completed is published as a map to Ravensdown's customer extranet.

The company's call center representatives have access to the same information and can immediately access this information from the customer relationship management (CRM) system, StayinFront Visual Elk, again in a map format. This integration was built by Eagle developers using the .NET framework to build an easily accessible interactive map viewer. Service representatives can query the database; manipulate the display; and deliver maps to customers via print, e-mail, or fax. Questions from clients, such as whether a job has been completed, what product has been used, and at what rate the product was applied to a particular block,



Ravensdown has equipped a number of its fertilizer application trucks with GPS-controlled guidance systems and spreaders that capture location, fertilizer type, and spreading data.



Once the data has been uploaded and processed, Ravensdown field staff members can log on to the system from a remote location via the Internet. They can call up a customer's farm, see the results of earlier soil tests, see what types of fertilizers have been applied, then make recommendations about which types of fertilizers are appropriate.

can be answered easily. Currently, Ravensdown sends close to 1,000 maps to its customers per annum.

Today, one administrator runs the system with two data processing staff members. They support 400 end users who have basic map viewing and editing capabilities as well as thousands of customers who may access a secure extranet site to view the maps.

By using geospatial technology to apply fertilizers, Ravensdown is helping New Zealand farmers save money and protect the environment. GIS and GPS direct the application of fertilizers, so farmers are reducing the amount of potentially harmful runoff of fertilizers into streams and waterways. Ravensdown currently provides spreading services to 4,000 of its 15,000 transacting customers. Average expenditures for customers are approximately \$25,000 (U.S.) per annum, with the potential to reduce the total expenditures of fertilizers by up to 10 percent per annum. This means an aggregate savings of \$10 million (U.S.) for the cooperative's farmers.

The system also helps farmers ensure they are in step with regional Resource Management Acts, which regulate the amounts of fertilizer that can be applied, determine where exclusion zones around waterways and sloping land exist, and monitor nutrient levels in groundwater. As regulations become more stringent and have a greater impact on farming methods, Ravensdown is able to keep up-to-date easily.

Ravensdown has also found that the system can be used as evidence of "proof of placement" to demonstrate that the fertilizer has been spread in a manner consistent with environmental best practices.

"Ravensdown selected ESRI GIS through a thorough selection process based on its depth of functionality, strong international reputation, and respected development and support providers in New Zealand," says Mark McAtamney, chief information officer, Ravensdown Fertiliser Cooperative Limited. "The flexibility of the toolset allows Ravensdown to create complex processing and workflows and ensure tight integration with existing systems."

Decking the cockpit of the spray rig with computerized controllers and GIS navigation systems has proved both friendly to the environment and profitable to the farmer. Now, Ravensdown accurately captures and utilizes GIS for each farmer and can plan for the future.

For more information on ESRI's solutions for business, visit [www.esri.com/business](http://www.esri.com/business).



## Business Sense

*Simon Thompson*

*Commercial Business Industry Manager, ESRI*

The use of GIS in retailing is about to undergo major changes. Retailers have historically been focused on using GIS technology on the desktop to do geomarketing, site selection, and market analysis, often in isolation from other departments.

Today's GIS servers and open enterprise technologies are changing this, and ESRI is leading the way with its enterprise suite of software known as ArcGIS Server and ArcGIS Server for Business. Many companies are seeing a convergence toward geography as a unifying and integrating dimension to many of their business problems. With a server platform such as ArcGIS Server, organizations can collaborate and distribute information using the rich and intuitive media environment of geography. Maps, spatial analysis, interactive dashboards, and 3D visualizations become a medium to share ideas, qualify understanding, and help make better and more informed decisions.

Geography and GIS become the unifying capability that integrates many different activities within a retailer. For example, GIS can bring together pricing analysis, performance, and on-demand reports generated from business intelligence tools and combine these with information on demographics, loyalty purchases, lifestyle, and location. This can be easily mixed and overlaid with supply chain and logistics models developed in a data testing and solution publishing server package.

Combining all these disparate information sources can help a retail company more readily understand the distribution costs associated with locations or assess the potential impact on suppliers, wholesalers, or the supply chain. Once isolated or siloed analysis can be more effectively brought into the decision-making process. GIS gives a clearer understanding of future operating potential, competitive pressure, and customer interaction.

Successful businesses use ESRI GIS software because it gives any organization the ability to go beyond standard data analysis with tools to integrate, view, and analyze data using geography. And the applications can be used across an entire organization, in the field, and on the Internet.

Predictive investigations like market and customer analytics are enhanced by GIS. Many different forms of real-world and modeled data can be used with it to understand the demographic, competitive, and psychographic interaction of consumers, suppliers, and the geographic space in which they are distributed. ESRI GIS is used to increase revenue, optimize use of resources, and enable great business agility by responding to market forces and managing change and competitive pressures or improving forecasting and business planning. Find out what ESRI customers have known for years: that ESRI GIS grows their bottom line.

The beauty and power of GIS is that it allows companies to consider many different possibilities, understand potential, review the impact of different investments, store and produce configurations, or recognize changing trends in retail or the consumer landscape. There is no other software technology that has such a far-reaching and unifying potential.

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# Efficient Fleet Management for Any Size Business: ArcLogistics

ArcLogistics is a complete solution that allows businesses to route and solve scheduling problems. ArcLogistics creates dynamic routes and schedules that cut fuel costs and improve customer service. From a small fleet operation to a large multiuser environment, ArcLogistics provides a quick and significant return on investment. It lends itself to fleet management across all industries and suits retail well.

## Vehicle Routing for Retail

Vehicle routing is a critical factor for retail deliveries. Because customer and delivery schedules change daily, these markets can benefit greatly from ArcLogistics. The demands of customers waiting for deliveries means companies must be able to offer delivery times suitable for both the customer and the fleet. Accurate route optimization of the fleet takes the guesswork out of routing.

Responding quickly to customer requests for a specific delivery time window is easy.

ArcLogistics offers two time windows and a priority function, enabling customer delivery requests to be honored.

ArcLogistics doesn't just sequence a single route; it optimizes the whole fleet, taking into account the unique needs of each business and its customers. Businesses reap the rewards of increased competitive advantage and customer loyalty.

## Complex Routing Simplified

Assigning and allocating multiple vehicles is easy with ArcLogistics. The software uses real street networks and includes street data from provider Tele Atlas for Europe, the United States, and Canada. Companies can also use their own street data in ArcLogistics, as well as add their own barriers and U-turn policies, since the software can consume any network dataset such as those created in ArcGIS Desktop.

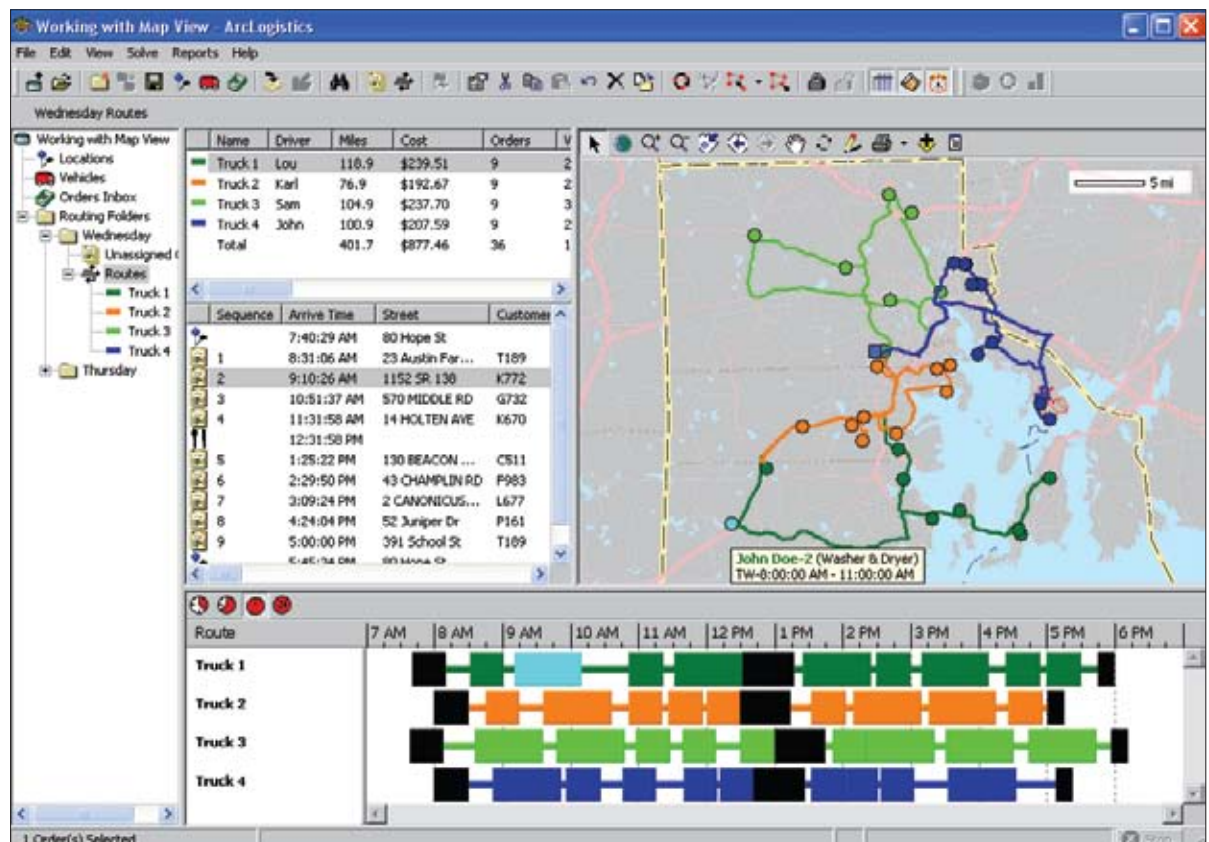
Users can easily create many depots and view multiple time windows. Maps in ArcLogistics

are interactive and can be reproduced to fit on several manifest styles. Orders can be paired with deliveries and pickups happening at the same location. ArcLogistics also allows curb approach, where the route will account for the direction from which the vehicle needs to approach the stop given the potential obstacles near the stop such as lane dividers, one-way streets, and the turn radius of the vehicle.

Hard and soft constraints on travel zones can be created with ArcLogistics by using areas or point locations. Hard zones are fixed areas that vehicles are assigned to and cannot move out of. Soft zones are areas that vehicles are assigned to but can still travel outside of if necessary. This flexibility allows for many types of deliveries and pickups to be honored easily.

ArcLogistics is able to find ordered addresses or stops; assign stops to vehicles; and sequence stops while considering time, whether overtime, unproductive time, resource available time, or customer time windows. Companies have found

ArcLogistics software presents all the information necessary to route multiple vehicles for a fleet of any size including time windows, route maps, and truck or delivery sequences.



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Coop Norge AS

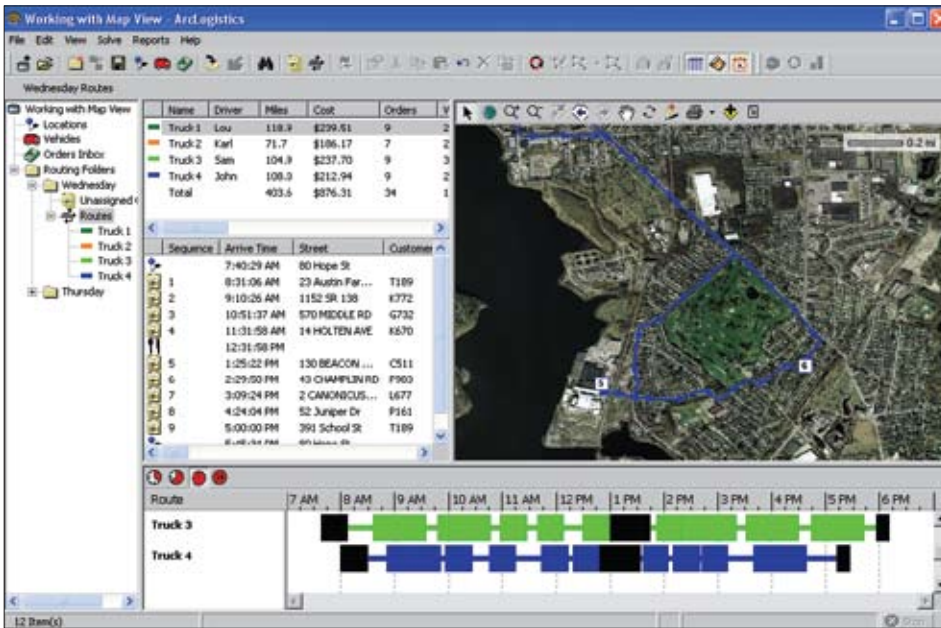
in Norway, to evaluate Coop Norge’s existing stores, product mix, and patronage and appraise its marketing and merchandising strategies quickly and accurately.

“Business Analyst makes it possible for us to analyze data from our own client database, along with external public data, in a whole new way,” says Jon Arne Falk, head of analysis at Coop Norge. “The unique mix of data that we can analyze, model, and visualize gives us very valuable and intuitive insights into our customers and their buying habits.”

By analyzing its data, Coop Norge was able to determine the geographic location and demographic categorization of its customers for any designated shop and target specific marketing campaigns accordingly.

ArcGIS Business Analyst allowed Coop Norge to examine the results of various marketing campaigns in relation to specific stores. Coop Norge was able to better understand the shopping habits of its customers and reduce its marketing costs while increasing sales by adjusting the product mix in target stores identified by the analysis. In addition, the cooperative has improved store use by conducting more specific advertising efforts at the local level.

For more information on ESRI’s solutions for business, visit [www.esri.com/business](http://www.esri.com/business).



ArcLogistics software uses real street networks and includes street data from provider Tele Atlas for Europe, the United States, and Canada.

that the software allows them to consider minimizing costs, what their capacity may be, maximum productivity, and many route alternatives. Businesses that use ArcLogistics understand that great customer service equals happy customers.

Software That Fits Your Workflow

ArcLogistics easily creates a workflow in a company. First, a routing project is created by using a standard template that allows the user to specify where to store the project data, browse to the correct map file, and confirm the address and postal code locator. Next, a location is defined. Locations are where a company’s vehicles start and end their routes. Each vehicle being routed can use many work rules, for example, time, start and end locations, constraints, and costs.

A folder inside the routing project contains unassigned orders and routes, time windows, U-turn policies, street network restriction options, and parameters required for the routes.

Orders are usually imported from other software applications used within a company or can be manually generated. Each order contains information about the stop that needs to be created including the address, routing business rules (e.g., whether it is a curbside delivery), and text.

Using the address, most orders are geocoded during import into ArcLogistics. Orders can also be imported with latitude/longitude coordinates if an address is not known, or users can manually geocode or edit the geocoded position of an order.

Once the orders are imported and geocoded, ArcLogistics will create a solution, or users can manually create routes. Users can also edit those routes visually and on the fly to reorder stops or change roads traversed.

Return on Assets

Many companies find they reduce costs by 10 to 30 percent through minimizing mileage, overtime, and vehicles while reducing time spent routing and waiting. Thanks to ArcLogistics, productivity increases by 10 to 15 percent through servicing more customers with the same fleet, responding to same-day requests, and reducing cycle time and driver-to-dispatcher ratio. Customer service and satisfaction improves by offering tighter time windows for deliveries and promises kept via on-time performance, which results in establishing and maintaining customer retention and a great company reputation.

For more information, visit [www.esri.com/arclogistics](http://www.esri.com/arclogistics).

# Introducing ArcGIS Business Analyst Server: Incorporate GIS Analysis and Geodemographic Data with Your Business Workflow

As the world's leading provider of GIS software for more than 37 years, ESRI understands how to make the most of information in today's fast-paced businesses. Today, approximately 500,000 organizations worldwide integrate ESRI's ArcGIS family of products into their enterprise workflows and solve complex problems easily.

To assist businesses even more, ESRI has created ArcGIS Business Analyst Server, a cutting-edge GIS combining extensive business, demographic, and consumer data with the most sophisticated tools for market and competition analysis, facilities placement, and advanced customer analytics.

ArcGIS Business Analyst Server enables organizations of any size to publish and share business data, maps, analyses, models, and reports that help businesses make better decisions.

## Produce

ArcGIS Business Analyst Server helps standardize analytic processes and workflows, reduce software deployment costs, and ease implementation, all through a geographic view of a business's data. From desktops, mobile applications in the field, and the Internet, ArcGIS Business Analyst Server manages information so it can be viewed and accessed throughout the organization. Publication-quality maps, reports, and analysis output can be combined into market studies and distributed in a ready-to-use, Web-browser-based application.

## Disseminate

Access and use of information can be managed by a company's information technology department. No GIS experience is necessary to create new, easy-to-use end-user applications. Now, anyone needing access to business information and analysis can use ArcGIS Business Server.

## Advantages of ArcGIS Business Analyst Server

- Browser-based access to geographic analyses for a more comprehensive outlook on information
- Lower cost of ownership through centrally managed, focused business GIS applications
- Cross-platform deployment
- Integration with other enterprise systems
- Ability to create custom applications and services throughout the enterprise using .NET and Java

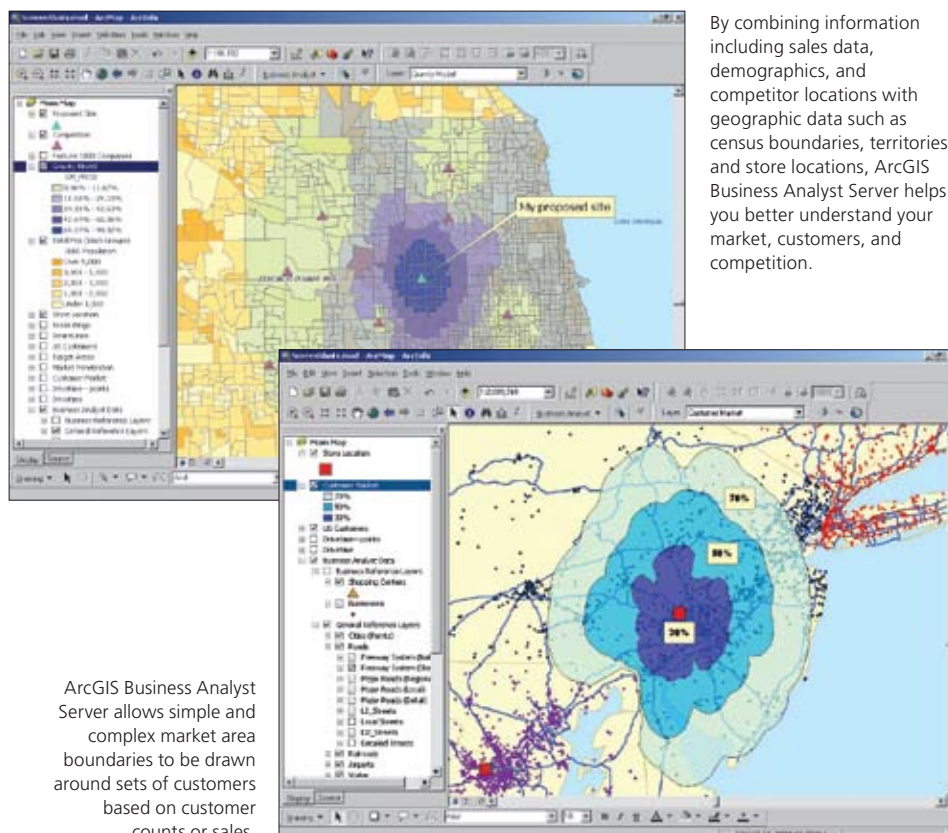
## Employ

Using a Web client makes using ArcGIS Business Analyst Server easy for anyone in the company; it is also efficient to deploy and serves applications fast to those who need it. Focused applications can be created to target specific tasks throughout the organization.

## Hit the Ground Running

ArcGIS Business Analyst Server includes advanced analysis tools that businesses need to accomplish mission-critical tasks right away. Finding the best potential new site locations, defining a store's trade areas, analyzing corresponding markets, measuring store/location performance, conducting market planning and expansion, and performing customer analytics are just a few of the functions that can be performed out of the box. The variety of customer prospecting tools available make it easy to identify and target your best customers, creating reports in a number of popular formats including Adobe Acrobat PDF, Microsoft Word and Excel, and HTML.

For more information, visit [www.esri.com/businessanalyst](http://www.esri.com/businessanalyst).



By combining information including sales data, demographics, and competitor locations with geographic data such as census boundaries, territories, and store locations, ArcGIS Business Analyst Server helps you better understand your market, customers, and competition.

ArcGIS Business Analyst Server allows simple and complex market area boundaries to be drawn around sets of customers based on customer counts or sales.

# Try ESRI's Business Analyst Online Using a Day Pass for Only \$149

ESRI's Business Analyst Online is an easy and efficient way for retailers to use the power of GIS software with the most up-to-date data without the overhead of maintaining a GIS in-house. Combining GIS technology with extensive demographic, consumer, and business data, Business Analyst Online delivers on-demand analysis, boardroom-ready reports, and maps over the Internet.

ESRI offers a day pass for \$149 that allows you to browse all the data, maps, and interactive features Business Analyst Online has to offer. For eight continuous hours, you can use Business Analyst Online to analyze trade areas, evaluate your competitors, identify potential store locations, find new customers, target direct mail, and reveal untapped markets. The day pass gives you access to all the reports available with regular subscriptions including ESRI's current-year demographic updates and five-year projections. At the end of your analysis time, design and print up to a total of five reports and maps.

Business Analyst Online allows for reporting on consumer spending, business data, demographics, and market potential. Consumer spending reports provide information about what consumers spend their money on, their buying habits, and the potential for consumer spending for various products and services by market. These reports help with decisions about expanding product and service offerings, targeting specific markets, and identifying the best areas to market products and services. Data from ESRI's Consumer Expenditure, Market Potential, and Retail MarketPlace databases, as well as traffic data from MPSI/DataMetrix, is included.

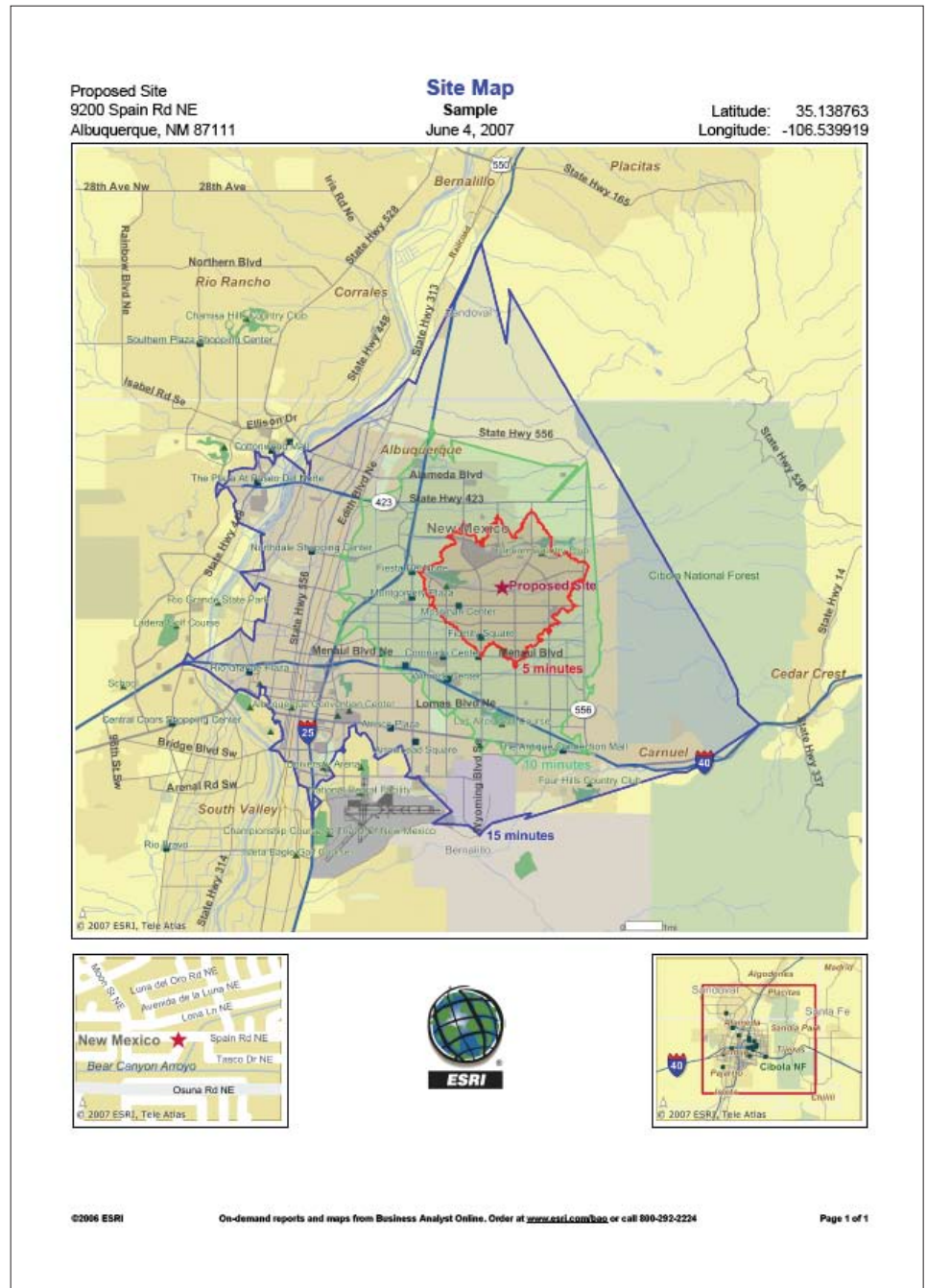
Generating business data reports can help with site evaluation and the site selection process. The numbers of businesses and employees in a specified area, comparable daytime population versus residential population, and information about existing major shopping centers are included. The business data reports available

through Business Analyst Online are based on data from *infoUSA* and the Directory of Major Malls (DMM).

A day pass is an ideal option for retailers who want to experiment with the technology; they need only a few reports or maps and often

like the option to try out different criteria as the reports are run.

For your convenience, a day pass can be purchased online through ESRI's Web site by visiting [www.esri.com/bao](http://www.esri.com/bao).



The Business Analyst Online day pass gives you access to all the powerful data and reporting capabilities of Business Analyst Online for a business day without the commitment of a subscription.

# Buxton's SCOUT and ESRI's Business Analyst Online— Providing Retailers with Instant Access to Current Demographic Data and Mapping

Buxton is an industry leader in customer analytics and retail site selection technology. The company provides strategic target marketing research services to major retailers, cities, and economic development groups throughout the United States. With more than 450 years of combined executive retail, marketing, and community management experience, Buxton has pioneered the use of demographics, psychographics, drive-time analysis, and lifestyle characteristics for research purposes.

Buxton has integrated its SCOUT online site and customer management system with ESRI's Business Analyst Online. The service combines GIS technology with extensive demographic, consumer, and business data to deliver more than 50 reports and maps over the Internet. Because ESRI hosts Business Analyst Online, organizations are freed from managing lots of

data or doing their own technology updates.

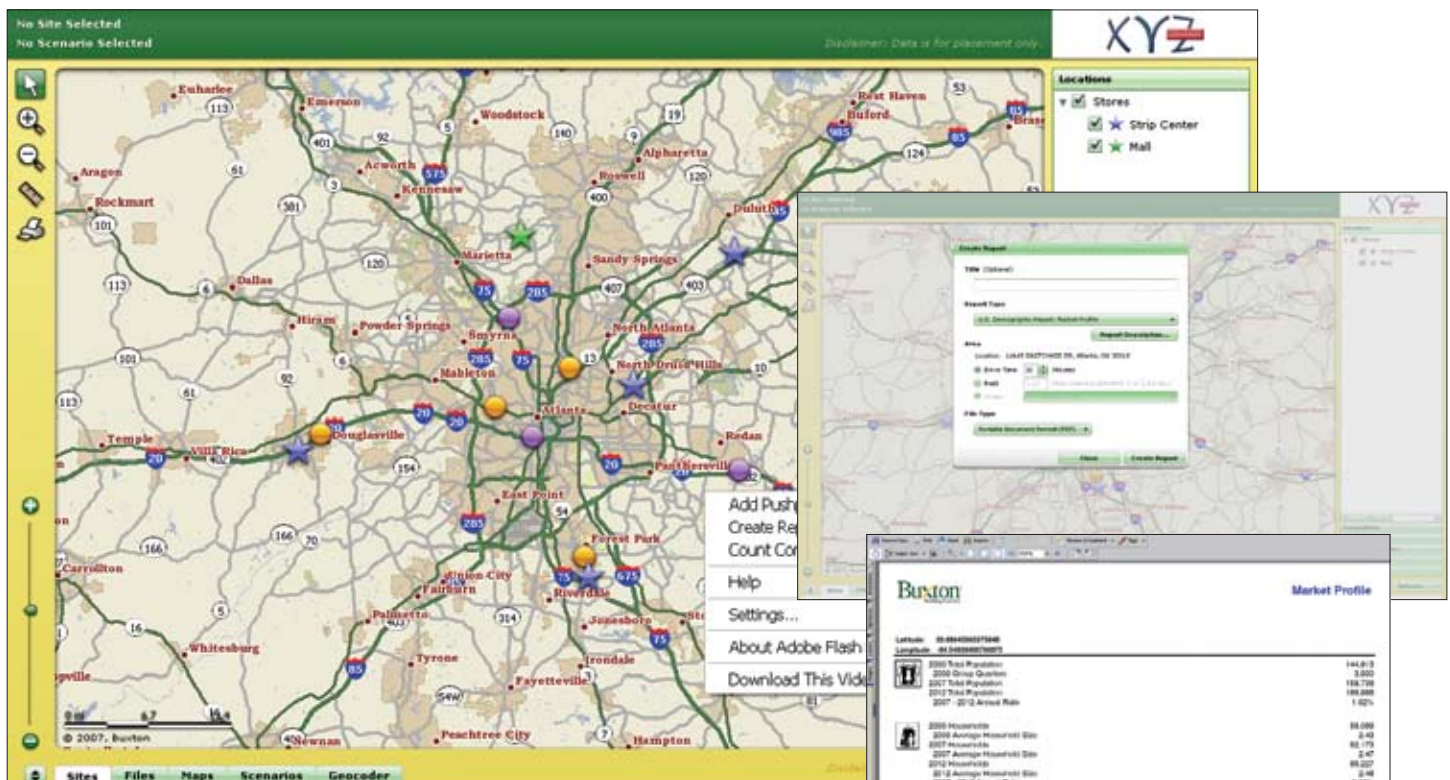
"Business Analyst Online was integrated with our SCOUT online application quickly to provide our retail clients with instant access to the most accurate demographic data and mapping with the simple push of a button," says Todd Walls, executive vice president of business development, Buxton. "The integration of Business Analyst Online enabled us to evolve SCOUT from a static tool to an interactive utility, thereby enhancing the value of SCOUT to our retail clientele."

This implementation of ESRI's on-demand reports and map service into Buxton's SCOUT application enables retailers to identify the best retail applications through interactive modeling of demographic profile reports and site maps. Retailers including FedEx, Kinko's, and Interstate Batteries use SCOUT to view infor-

mation about current sites, current and potential customers, and sales forecasts as well as site photos, signage images, aerial views, lease documents, site plans, and more. SCOUT also provides retailers with the ability to model potential sites under different market scenarios.

"Buxton is the premier company in customer analytics," says Simon Thompson, director, commercial business industry, ESRI. "We are delighted to work with a company that really understands the needs of retailers and is forward thinking in its application of technology. Together, we are improving the answers to the age-old question, Where are the best locations for my stores?"

For more information on ESRI's retail solutions, visit [www.esri.com/retail](http://www.esri.com/retail).



SCOUT, a customized, Web-based location management service, provides users with instant access to site information including demographic reports powered by ESRI's Business Analyst Online.

# Integrated Market Planning and Portfolio Optimization Available for Retailers from BearingPoint, SAS, and ESRI

Historically, business intelligence (BI) and GIS technologies have followed separate development and implementation paths. Today, the retail industry is driving the development of closer integration between these two enterprise technologies. In retail, the majority of business data involves a spatial dimension, and spatial analysis is a valuable tool in predicting customer behavior and understanding store performance.

Market leaders BearingPoint, SAS, and ESRI have recognized the rapidly growing need for integrated retail solutions and are committed to bringing a best-in-class consulting, GIS, BI, and predictive analytics software solution to market. The Market Planning and Portfolio Optimization (MPPO) solution provides a platform for delivering dedicated retail applications to many different activities including operational dashboards, real estate planning, site selection, and market optimization.

BearingPoint's dedicated retail real estate consulting practice brings decades of experience in helping clients develop retail sites quickly and supporting all aspects of the project life cycle. With MPPO, BearingPoint consultants work closely with clients to design and implement innovative, real-world solutions with measurable results. BearingPoint provides specialized operational and market research, enterprise model creation, change management, and broader systems integration services as part of

MPPO. The system allows retailers to model networks of existing stores more effectively and align development opportunities so as to maximize return on invested capital.

As the leader in business intelligence software and services, SAS ensures retailers have the tools and analytic capability to turn data into knowledge. The MPPO solution combines the SAS retail software suite with GIS analysis and spatial modeling to enable business professionals to make better decisions about their customers and their customers' needs and behaviors as well as how to optimize the design, rollout, and location of store networks. MPPO combines the SAS retail software suite, including Enterprise Miner, Enterprise BI Server, and integration technologies, and seamlessly connects to other business warehouses and retail intelligence applications.

The foundation of MPPO's capabilities lies in ESRI's ArcGIS Business Analyst Server, specifically designed as an enterprise GIS server for commercial GIS users and business professionals. ArcGIS Business Analyst Server includes a library of spatial analysis components; activity-driven workflows; and a wide range of data including business lists, demographics, consumer expenditure, background mapping, premium aerial photography, and market potential. These tools provide critical insight into finding the best sites through geographic



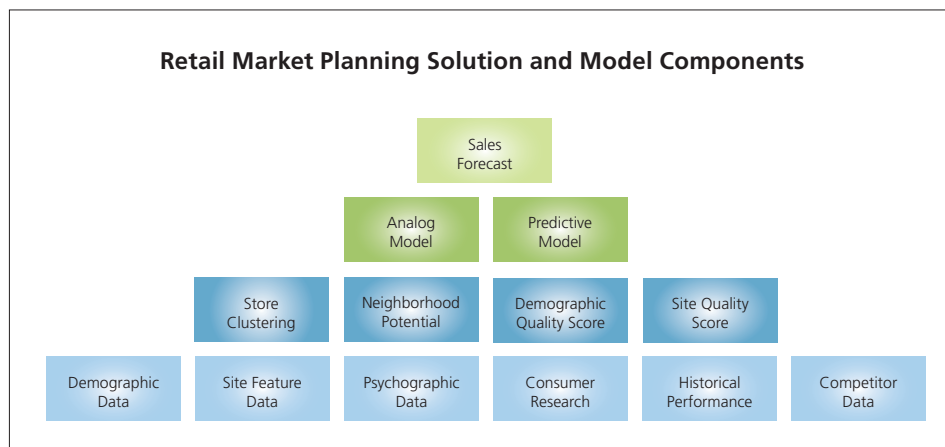
analysis, customer profiling, segmentation, and advanced market suitability models.

One of the biggest challenges retailers face is a lack of centralized customer intelligence that can be shared across departments including real estate, marketing, and merchandising. MPPO overcomes this and turns customer intelligence into an enterprise asset that can then be used by multiple departments in many different applications. It can also be tailored to fit the specific needs and challenges faced by retailers when creating market development plans.

By adopting MPPO, retailers gain new ways to centrally manage their customer data and perform statistical and spatial analysis. Using BI and GIS, retailers can perform data mining and distribute customer intelligence data across the entire enterprise. Benefits include increased market share through optimal store planning, improved understanding of how to increase like-for-like sales through higher store sales, more effective merchandising, and greater return on investments through more targeted marketing campaigns.

MPPO supports Web- and mobile-based delivery of information including specialized real-time and syndicated spatial and demographic data from ESRI ArcWeb Services. This data includes ESRI's Community Tapestry market segmentation data; current-year updates and five-year projections of demographic data and consumer spending; and market potential

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### Integrated Market Planning and Portfolio Optimization Available for Retailers from BearingPoint, SAS, and ESRI

shopping center, business, traffic, and census data. Data from more than 20 different commercial data providers is also included.

MPPO also contains sophisticated analysis models for trade area generation conducted using forms-based workflow; multivariate analysis; and proprietary household demographic, segmentation, and competition models as well as high-definition drive-time analysis. Any trade areas can be refined based on further analysis such as results from applying weights and impedances to the network, competitors, or the demographic desirability of individual areas. Sales forecasts are generated based on

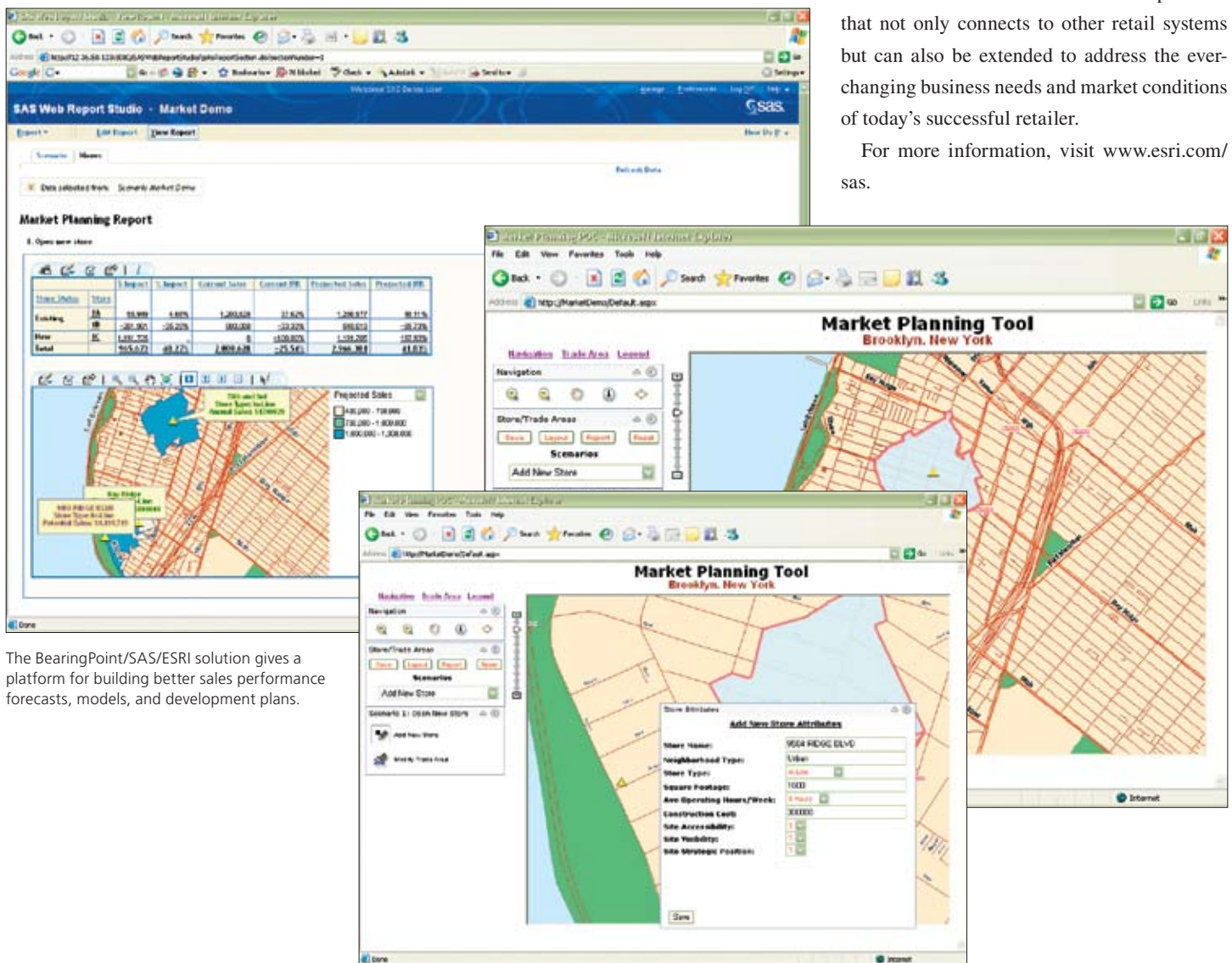
the characteristics of the store and its trade area population and household income. Additional factors such as average operating hours per week and real estate site characteristics serve as input to return-on-investment calculations using comprehensive cash-on-cash calculations. The result of applying different scenarios can be replayed through dashboard views and an extensive reporting interface.

Multiple implementation strategies can be used by retailers depending on the individual needs of each company. For example, small- or medium-sized businesses may prefer to use hosted services due to size or infrastructure limita-

tions. MPPO offers an end-to-end solution, allowing clients to adopt a phased approach based on their individual needs and project dependencies. Available on BearingPoint's Managed Services, either as an ESRI-hosted solution or from SAS using Solutions on Demand, MPPO can be implemented in-house within the retailer's enterprise or through access provided using on-demand ASP/hosted services solutions.

MPPO is a unique solution developed in response to market demand and the lack of coordinated solutions for retail market planning. By providing a single point of sourcing, BearingPoint, SAS, and ESRI provide retailers with a collaborative and holistic platform that not only connects to other retail systems but can also be extended to address the ever-changing business needs and market conditions of today's successful retailer.

For more information, visit [www.esri.com/sas](http://www.esri.com/sas).



The BearingPoint/SAS/ESRI solution gives a platform for building better sales performance forecasts, models, and development plans.

# GeoVue Builds Integrated GIS Solution for Commercial Business Clients

GeoVue, an industry-leading provider of geographic modeling and location intelligence solutions for the retail and restaurant industries, focuses on helping companies optimize stores within an existing territory or new territory. The company's solutions make it easy for any retailer to determine just how many stores a territory can most profitably accommodate. GeoVue supports its site selection software with consulting services for multilocation businesses that are looking to maximize capital planning and localize product marketing and merchandising.

GeoVue takes a different view of site selection from traditional desktop or GIS-only systems. The company realizes that today's retailers are inundated with data and need to turn that data into decisions. Making sense of this data helps companies understand the overall impact that capital investments and the real estate planning process have on the ultimate success of their business, from market strategy to site selection. Retail and restaurant businesses face continuous competitive pressure, and many of the top-named companies have discovered GIS-enhanced business solutions to be invaluable assets in achieving corporate business goals.

For retailers, site selection is often the most critical decision to be made, since even the best store with the most sought-after products may fail if placed in the wrong location. GeoVue has adopted ESRI's ArcGIS Server enterprise GIS suite as its preferred platform for developing solutions to meet these retailer challenges. ArcGIS Server combines enterprise-class business GIS with demographic profiles, a retailer's own customer data, and advanced analytic modeling. This solution is valuable to retailers as well as franchise and restaurant chain operators.

ESRI's ArcGIS provides GeoVue with an integrated collection of GIS software and application development tools that let application developers and end users deploy and access GIS functionality wherever it is needed including the Web. GeoVue Enterprise is a powerful

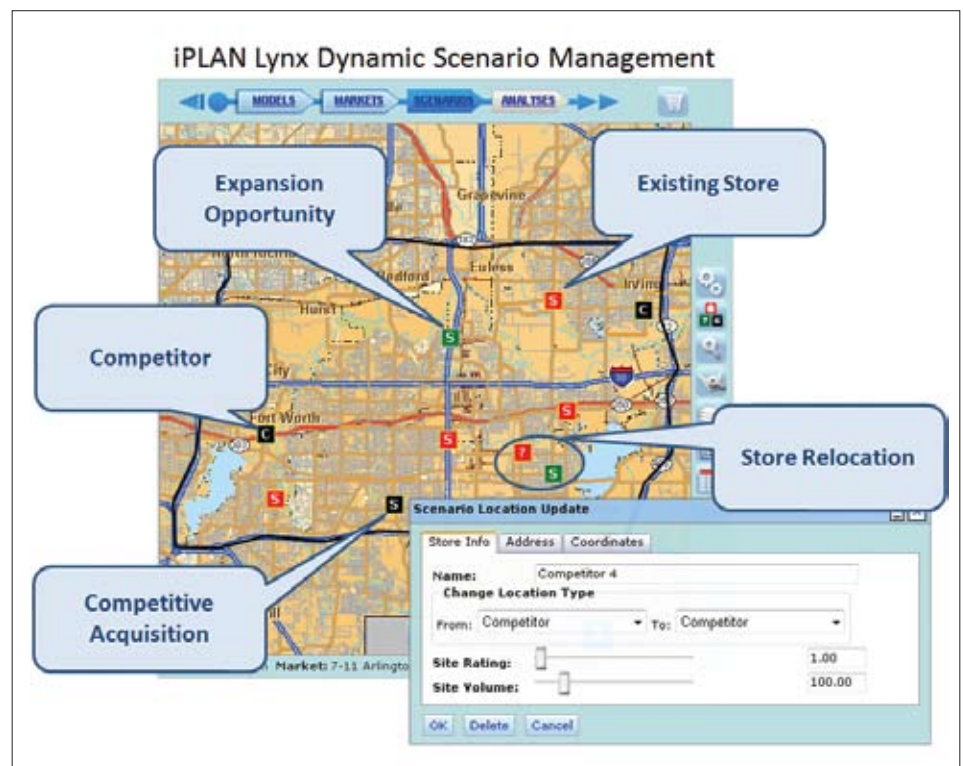
Web services-based platform for retail and franchise site selection, market planning, and sales forecasting. This platform optimizes a variety of retail activities including creating and analyzing trade areas, market forecasting, and producing comprehensive business reports.

GeoVue has adopted server GIS because it allows the retailer to choose from many different architectures and centrally host the solution alongside other enterprise systems or data warehouses. The awareness and adoption of server-based GIS technology is growing among retailers as they realize the importance of geographic analysis and the value of adding location analysis in forecasting, executive dashboards, and business decision making. GIS capabilities are being deployed to larger and larger numbers of users over networks and the Web.

Now, retailers can deploy GeoVue Enterprise across their entire company and give all users easy access to a powerful Web services-based

platform for retail and franchise site selection, market planning, and sales forecasting. The new application combines ESRI's ArcGIS Server platform with other enterprise software using IT-compliant services and interoperable business tasks. GeoVue Enterprise provides advanced, powerful geographic analysis, visualization, and data management capabilities with real-time sales and trade performance information derived from the customers' own systems. Customers can then perform different modeling tasks simultaneously including analyzing data from different locations or performing site development activities. Retailers who implement this solution will find that the integrated approach shortens decision-making time and helps bring a new store or concept to market more quickly and at a lower cost.

For more information, visit [www.geovue.com](http://www.geovue.com).



With iPLAN Lynx from GeoVue, retailers can easily interact with the model assumptions to experiment with different expansion scenarios including closing stores, acquiring competitors, relocating, and opening new stores.

# Mapping Specialists: Choosing the Right Retail Sites and Target Markets



Retailers know that the success of a store depends largely on its location. While GIS plays a large role in site selection and target marketing decisions, the data that's used to fuel the GIS engine is equally important. The right combination of demographic data and a powerful, easy-to-use GIS program can deliver stellar results for retailers.

Retailers have found this combination of GIS and demographic data in MapBridge, a powerful, easy-to-use addition to ESRI's ArcGIS that provides both mapping and reporting on demographic variables from within ArcGIS. MapBridge spans the functionality of two powerful applications—ESRI's ArcGIS and SRC's Allocate—to provide retailers with powerful geodemographic mapping technology in one easy-to-use interface.

## Site Selection and Target Marketing

One way retailers use MapBridge is to compare the demographics around a proposed store to the demographics around existing store locations. The resulting maps and reports help them quickly

discover which potential locations should perform as well as their best existing locations.

Retailers do not only use MapBridge to analyze potential sites. Direct marketing campaigns can be more effective when MapBridge is part of the campaign toolset. Retailers can easily select geographic areas where the demographics fit the customer profile they are trying to reach.

By targeting only select geographies—all the way down to the block group level—retailers can save money on campaigns and achieve better response rates.

SRC president Dean Stocker, whose company provides the Allocate demographic data retrieval engine for MapBridge, said, "MapBridge is an elegant approach to mainstreaming sophisticated GIS and micromarketing into one easy-to-use solution."

## ArcGIS at Your Fingertips

MapBridge takes advantage of the power of ArcGIS to help retailers save time and money and make smart decisions. Users can easily pick the geographic area they want to study

from a list, layer, or grid area. Ring or drive-time areas around locations can be saved as "virtual geographies" and used again, increasing productivity.

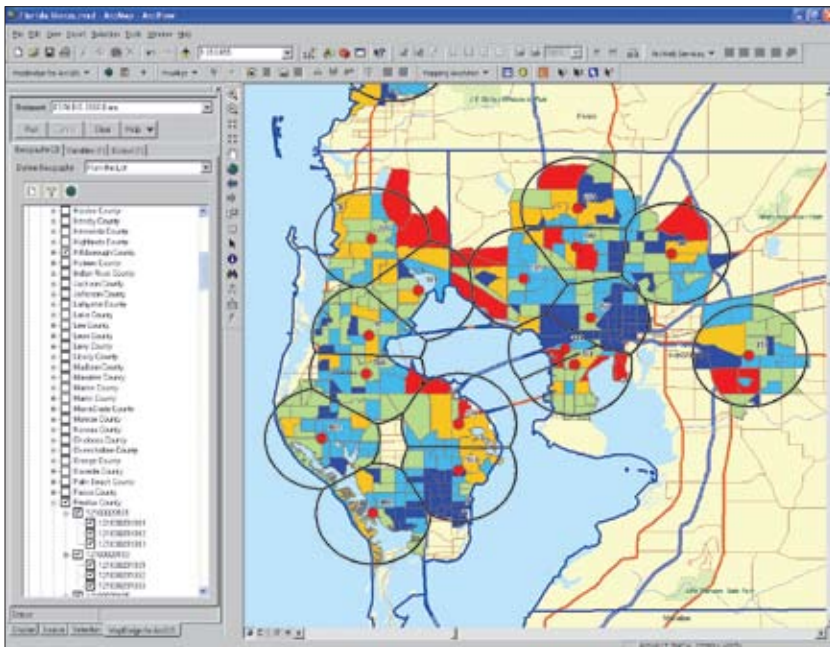
All available demographic data can be viewed and selected from the ArcGIS table of contents. Retailers who know their target audience can use expressions to define their own demographic variables and add them to the standard variable list. For example, multiple income groups can be joined to form a single variable for the income range wanted for study.

For any geographic area studied, the retailer can create three types of reports: summary, comparison, and rank. Reports can be created in Excel, HTML, PDF, or other popular formats, and maps can be published directly to PowerPoint for presentation purposes.

## Convincing Results

The results you get with MapBridge are convincing. Maps provide an insightful view of any market area at a quick glance, and demographic reports and graphs give the deep level of detail and information that retailers need to make smart marketing, sales, and operational decisions.

MapBridge is developed, marketed, and supported by Mapping Analytics, an ESRI business partner. This company of skilled professionals has more than 18 years of experience helping retailers use geographic analysis and mapping to gain greater insight into their markets and customers and to deploy sales and marketing resources more effectively.



Retailers can get a valuable demographic view of any market area using MapBridge for ArcGIS. They can target geography, choose demographics to analyze, and create trade areas from one easy-to-use interface. Applications include market analysis, target marketing, and site selection.

Contact: David Klein  
 dklein@mappinganalytics.com  
 518-439-4453  
 Call 877-893-6490 toll-free or visit  
[www.mapbridge.com](http://www.mapbridge.com) or  
[www.mappinganalytics.com](http://www.mappinganalytics.com).

## Get the Geographic Advantage for Business GIS and Business Intelligence Together Benefit Organizations

GIS and business intelligence (BI) have traditionally addressed differing issues in organizations and have resided in mutually exclusive operational silos. Both technologies have matured into viable enterprise solutions that fit well in today's IT environments. It comes as no surprise that organizations are now looking to integrate these solutions to increase the return on IT investment and improve overall business performance.

The BI community is looking to enhance the analytic capabilities of their applications because they now realize that location can have a profound impact on behaviors and outcomes. Furthermore, the ability to use a map to present data as actionable information fits well with the BI trend to exploit visualization technology for more efficient communication.

The GIS community also benefits from the ability to use BI to create a common point of

access to disparate organizational datasets. BI provides very robust enterprise reporting environments, which broaden and secure the distribution of GIS-enhanced reports. Recently, many BI platforms have incorporated sophisticated analytic applications that can now be leveraged by GIS.

For more information, visit [www.esri.com/bi](http://www.esri.com/bi).

### ESRI and Business Intelligence White Paper—Download Now!

This white paper describes the purpose and benefits of both GIS and BI, the technological advancements that have fostered their integration, and the synergistic advantages of integrated applications that can benefit the entire organization without disrupting existing IT environments. You can download this ESRI white paper at [www.esri.com/wpbi](http://www.esri.com/wpbi).



## ESRI Business GIS Summit Where Your Business Gains the Geographic Advantage

See firsthand how business solutions provide a more competitive edge, drive business innovation, and increase return on investment (ROI).

### Don't miss this event!

- See how others have gained a more competitive edge using geographic data and analysis.
- Attend expert-led sessions and get updated on industry trends and best practices.
- Hear how GIS helps improve operations in all commercial business segments.

### Keynote Presenter

*Mr. Henrik Dahlin,  
Process Development Manager  
DHL Express Europe*

DHL Express Europe is a global leader in international express, overland transport, and air freight. The company uses GIS to help determine the best terminal locations and plan routes for the most optimal delivery service. These activities have helped DHL experience a large return on investment. Listen as Dahlin discusses the value proposition of GIS for business, especially in this tough economic climate.

Register today at  
[www.esri.com/bizsummit2009](http://www.esri.com/bizsummit2009)



## Data for Retail Analysis

Staying in touch with changing consumer tastes while beating the competition to the next “big brand” is an ongoing challenge for retailers. To help make better business decisions, retailers can integrate ESRI’s unique consumer, demographic, and spending data products into their customer records to learn more about their consumers’ shopping and spending patterns. The more that retailers know about their most profitable customers, the better they can serve them, reach them, keep them, and find more like them. ESRI’s data products can help provide some of these answers.

### ESRI’s Demographic Data

Demographic data variables such as age, income, race, education, family type, and employment can reveal important information about populations in market areas. Other demo-

graphic variables, such as the presence of children, housing tenure, and household size, can further categorize these populations. ESRI’s demographic data is available at standard geographies such as national, state, county, census tract, core-based statistical area (CBSA), and block group. Demographic data deliverables include online reports, maps, and stand-alone data and can be integrated in ESRI’s desktop software such as ArcGIS Business Analyst. The data is available in formats such as Excel, comma-separated variable (CSV), and shapefile.

For example, if a retailer’s most profitable customers are young married couples with school-aged children, merchandise mix and advertising campaigns can be adjusted to attract more of these customers. Retailers who plan to enlarge their current stores, add new products, or expand operations into new markets should

incorporate demographic data into their strategic decisions.

### Consumer Expenditure Data

ESRI’s Consumer Expenditure Survey (CEX) data provides information about the amounts that households actually spend for certain categories of products and services. The data also highlights estimates of current consumer spending patterns. The CEX database contains more than 730 data items grouped into 15 categories such as food, alcoholic beverages, housing, apparel and services, transportation, travel, health care, entertainment/recreation, education, personal care products and services, and miscellaneous. Data is reported by the product or service; variables include total expenditures, the average amount spent per household, and a Spending Potential Index (SPI).



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SPI compares the local average expenditure by product to the average amount spent for that product nationally. An index of 100 is average. For example, an SPI of 120 means that average spending by local consumers is 20 percent above the national average; an SPI of 80 means that the average local spending is 20 percent below the national average.

CEX data is updated annually and is available in data file formats including CSV, shapefile, and dBASE. The data is available for standard levels of geography, such as state, county, census tract, block group, ZIP Code, rings of any size, or polygon, and can be integrated into ESRI's ArcGIS software products. Business Analyst Online, ESRI's on-demand reporting and mapping Web service, offers reports and maps for seven expenditure categories: automotive aftermarket, financial, house and home, household budget, medical, recreation, and retail goods and services.

Retailers can use this data to identify trends in consumer spending, measure local demand for products, better understand consumers' purchasing habits and product preferences, and reveal changing consumer trends by geography.

### Market Potential Data

To view markets from another perspective, ESRI's market potential data measures the probable demand for a product or service in an area. A Market Potential Index (MPI) for each product or service measures the probability that adults or households in a specific area will exhibit certain consumer behaviors compared to the United States average. The index is tabulated to represent a value of 100 as the overall demand for the United States. Therefore, a value higher than 100 represents high demand; below 100 shows low demand. For example, an index of 120 implies that demand in the trade area will probably be 20 percent higher than for the United States as a whole. An index of 85 means that demand in the trade area is 15 percent lower than that of the United States.

The database contains more than 2,200

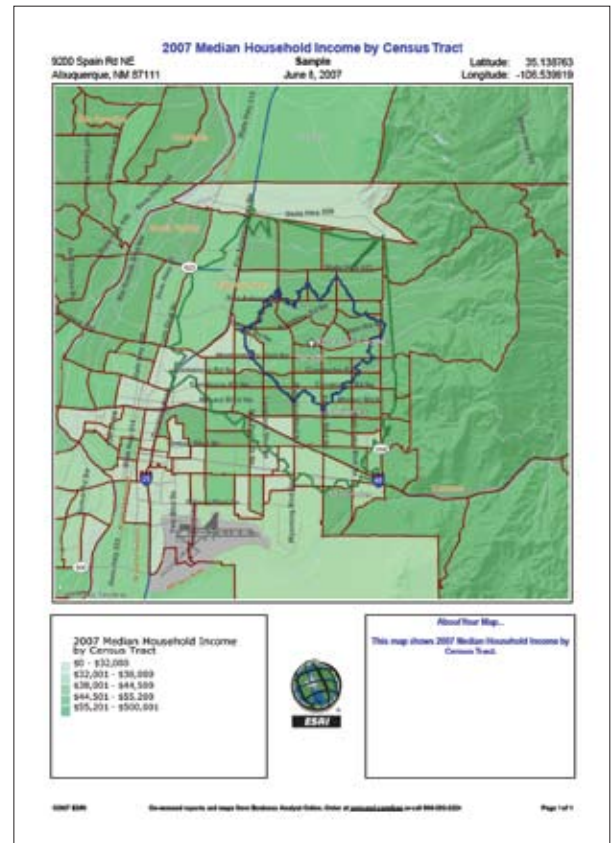
data variables grouped into 35 categories including apparel, convenience stores, electronics, furniture and household goods, grocery, Internet, pets and products, restaurants, sports, telephones and services, tools, toys and games, travel, videotapes, and DVDs.

Available in standard geographies, such as national, state, county, census tract, block group, and ZIP Code, the data is delivered in formats including dBASE, CSV, shapefile, and Excel file formats.

ESRI's market potential data can help retailers better understand, predict, and influence consumer behaviors nationally or for specific U.S. market areas. For example, retailers can learn about areas with the highest growth potential for a particular product or service. Retailers can also use the information to help optimize merchandise mix by store location and determine profitable expansions. Marketers use the data to develop target market plans based on the probability that area consumers will purchase particular products or services. Combining market potential data with consumer expenditure data can provide a more complete view of a market's potential with the actual spending in that market.

### Retail MarketPlace Data

ESRI's Retail MarketPlace data can also be used to analyze a market from another perspective. Retailers commonly include two bits of data in their analyses—a measure of sales potential or demand and a list of competitors. The competition can be identified from business lists that include industry codes and total retail sales. Although business data does not differentiate between sales to other businesses and sales to households, it's a rough measure of



Visualizing ESRI data on a map allows retailers to get the big picture regarding store reach and census tracts, a first step in targeting new customers and increasing revenues.

retail activity. Sales potential can be measured indirectly by the number of households, household income, and the overall demand for select goods (rates of consumption) or measured directly by consumer spending for select goods. Consumer spending is the popular choice. Spending data is reported by the amount that is spent for goods or services, but not where the purchases were made. For example, the amount spent for shoes can be estimated, but there is no way to know where the shoes were purchased—at a shoe store, department store, or sporting goods store; from a catalog; or online.

Before the Retail MarketPlace data was introduced by ESRI in 2002, a direct comparison of buyers and sellers of retail goods was unavailable. ESRI developed the Retail MarketPlace data to enable the direct comparison of retail sales and retail purchases from two disparate universes: businesses and households. In the Retail MarketPlace data, retail sales represent supply only to consumer households, and retail

*continued on page 16*

continued from page 15

### Data for Retail Analysis

purchases represent demand by the type of business. On the supply side, data includes retail sales in dollars and the number of businesses. Demand is measured by retail spending in dollars. Data is presented for 27 industry groups in the Retail Trade sector (NAICS 44–45) and four industry groups in the Food Services & Drinking Places sector (NAICS 722).

This direct comparison between supply and demand also enables retailers to calculate the gap, or the difference, between sales and spending. To facilitate comparisons of different areas, the Retail MarketPlace data displays the gap as a Leakage/Surplus Factor.

Leakage represents a market where demand exceeds supply. Retailers outside a market area are fulfilling the demand for retail products; therefore, demand is “leaking” from the market. This condition highlights an opportunity for new retailers to enter the market or for existing retailers to expand their businesses to accommodate the excess in consumer spending.

Surplus represents a market where supply or sales exceed consumer spending or demand in a particular trade area. Retailers are attracting shoppers that reside outside the trade area. There is certainly more competition, but there is also more retail “traffic.” Brand positioning and product mix are key differentiators in these types of markets.

The Leakage/Surplus Factor ranges in value from -100 to +100. A value of -100 indicates the presence of retailers, but not households. A value of +100 reveals an area with households, but no retailers. In a perfectly balanced retail market, supply equals demand, and the Leakage/Surplus Factor is zero. A zero value also occurs when a trade area contains no businesses or households.

#### Diversity Index

As immigration continues to fuel the U.S. diversification rate by 1 percent per year, retailers are increasingly aware of the marketplace changes generated by this movement. The U.S.

Diversity Index for 2006 is 58.9, up from 54.6 in 2000. For example, the diversity index of 58.9 for the United States means there is a 58.9 percent probability that two people randomly chosen from the U.S. population would belong to different races or ethnic groups. For example, the Hispanic population now stands at 45 million, growing at approximately 4 percent per year since 2000. Asian and multiple-race groups are also growing at significant annual rates of 3.8 percent and 3.5 percent, respectively, while the non-Hispanic white population is growing at a rate of less than 0.5 percent per year.

ESRI’s Diversity Index data summarizes racial and ethnic diversity. The index ranges from 0 (no diversity) to 100 (complete diversity). Data deliverables include comma-separated text files, fixed field text files, dBASE, Microsoft Excel, and shapefiles. Standard geographies such as block group, census tract, county, state, and the United States are available, as are non-standard geographies including CBSA, ZIP Code, Designated Market Area (DMA), place, congressional districts, and county subdivisions (CSD).

Retailers can use ESRI’s Diversity Index data to determine the types of products and services to offer segments of area populations, tailor messaging to gain the most positive responses from each group, define the best areas for expansion, and avoid costly mistakes by being aware of ethnic customs that must be considered.

#### Community Tapestry Segmentation

Segmentation systems operate on the theory that people with similar tastes, lifestyles, and behaviors seek others with the same tastes—“like seeks like.” These behaviors can be measured, predicted, and targeted. ESRI’s segmentation system, Community Tapestry, combines the *who* of lifestyle demography with the *where* of local neighborhood geography to create a model of various lifestyle classifications, or segments of actual neighborhoods with ad-

resses—distinct behavioral market segments. The 65-segment Community Tapestry system classifies U.S. neighborhoods based on their socioeconomic and demographic composition. Retailers can use Community Tapestry to profile their customers by

- Standard geographic areas including census tract, block group, ZIP Code, and ZIP+4
- User-defined areas such as rings or polygons based on distance, drive time, or user specifications
- Customer addresses or site locations

For a broader view of U.S. neighborhoods, Community Tapestry has 65 segments that can be divided into summary groups:

- LifeMode: 12 summary groups based on lifestyle and life stage
- Urbanization: 11 summary groups based on geographic and physical features and income

Community Tapestry data can provide valuable information about the product and media preferences and shopping habits of the U.S. population. For example, residents of the Tapestry *Connoisseurs* segment are affluent, conspicuous consumers, shopping online or at upscale stores for the latest styles and the newest gadgets. Residents of *Green Acres* neighborhoods shop online for clothing and videos. *Prairie Living* households are bargain hunters, searching for deals at Wal-Mart Supercenters, Kmart, and JCPenney.

ESRI’s unique data products can provide retailers with a realistic view of current and prospective markets. Retailers that include these types of data in their analyses and strategies will make more informed and better decisions about merchandise mix, marketing and advertising campaigns, site evaluation and selection, and expansion efforts.

For more information about ESRI’s data products for the retail industry, visit [www.esri.com/data](http://www.esri.com/data).

## College Students Use GIS in Business Intelligence Competition Held at AITP's National Collegiate Conference

### ESRI's Business Analyst Online Provides Tools and Data to Solve a Complex Business Problem

For the second year, ESRI provided GIS software and staff resources to assist in the design, staging, and judging of the Business Intelligence (BI) Competition at the Association of Information Technology Professionals (AITP) annual National Collegiate Conference held March 27–28, 2008, in Memphis, Tennessee.

The BI Competition was hosted by Central Michigan University (CMU) and the Central Michigan University Research Corporation (CMU-RC). The objective of the competition was to introduce the use of GIS and BI software tools to a large audience of future technology leaders. “We chose ESRI's Business Analyst Online software because it is a true BI tool that combines GIS technology with extensive business, consumer, and demographic data to deliver relevant reports and maps,” says Roger Hayden, CMU-RC. “The software was also easy for us to integrate into the competition because it is a Web-based solution and doesn't require that any additional software be installed

on the participants' computers.”

Sixteen undergraduate and four graduate teams were given four hours to solve a business problem that involved prioritizing potential retail store locations from a list of six available sites. A budget of \$85 million and a set of key factors were part of each analysis. Participants used ESRI's Business Analyst Online trade area analysis tools, such as drive-time and buffer analyses, and the reporting functionality to generate demographic, consumer spending, market potential, and retail marketplace profit reports to derive revenue-to-asset ratios based on primary, secondary, and tertiary service areas for each potential site. Contestants used the Excel data retrieval feature in Business Analyst Online to make the query results readily available for their continued economic analysis in a spreadsheet.

The participants' task was to use Business Analyst Online and the included data to determine the retail site location or locations containing the highest revenue-to-asset ratio that could be constructed within the \$85 million budget. Most participants had no experience using GIS software prior to preparing for this competition; however, they found Business Analyst Online to be an intuitive software tool to use.

“Business Analyst Online comes with comprehensive documentation and well-organized tutorials that made it easy for most of the students who had never used the software to get up to speed quickly,” says Tim Pletcher, CMU.

Findings were presented to a panel of judges in a three-page executive summary including maps as appropriate. The top three graduate and undergraduate placements received

awards. Honorable mention awards were also provided.

#### The undergraduate winners

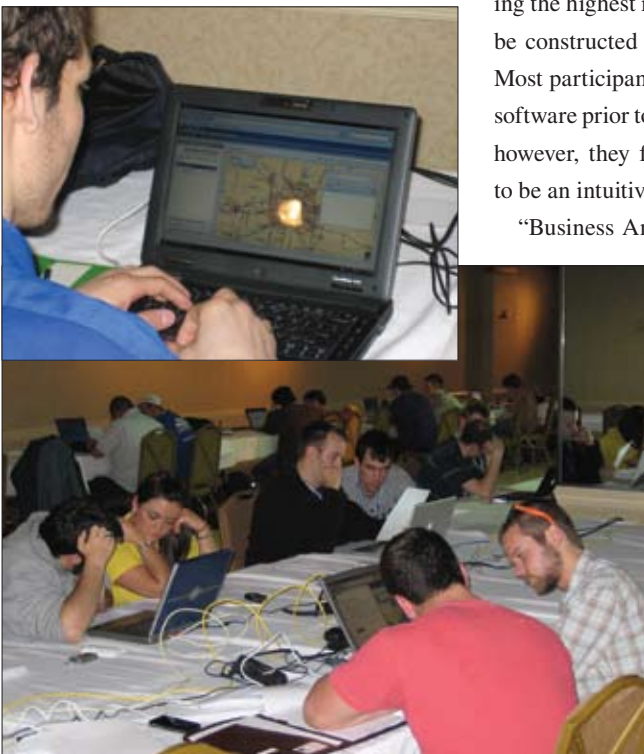
- First place: Zach Waugh, Nick Tuttle—Oklahoma Panhandle State University
- Second place: Nathan Bower—University of Alaska, Anchorage
- Third place: Steven Bauer, Matthew Brickner—Central Michigan University

#### The graduate winners

- First place: Adeyinka Owotuyi, Iris (Yuyin) Qiu—Central Michigan University
- Second place: Robb Winkie—Missouri Western State University
- Third Place: Shirish Modi, Nilesh Hardikar—University of Central Missouri

“ESRI is proud to partner with AITP and the National Collegiate Conference,” says Simon Thompson, commercial business industry manager, ESRI. “We are committed to providing the best education for future business leaders and are pleased to offer hands-on experiences to show how the geographic advantage benefits companies.”

ESRI is continuing to offer more GIS education in the business environment. As part of this ongoing effort, ESRI teamed up with the University of Redlands to develop a special Academic Track to be featured at the 2008 ESRI Business GIS Summit. The Academic Track was specifically designed for universities and academic professionals looking to develop or expand GIS education in traditional business curricula. A special session also explored the potential creation of a national business certificate in GIS program. The Academic Track took place on Wednesday, April 30, 2008, at the Drake Hotel in Chicago, Illinois. To learn more, visit [www.esri.com/businessgis](http://www.esri.com/businessgis).



# Bring the Geographic Advantage to Site Selection with ESRI Software

Site selection is ultimately about maximizing potential while minimizing opportunities available to the competition. Developing a retail concept or market plan requires a balance of understanding based on market facts, customer demand, product lines, and merchandise potential. ESRI GIS software allows retailers to evaluate lifestyle and location preferences, investigate the influence of demographics and consumer segmentation, and model the desirability of different sites based on proximity to other stores or sites.

Site potential can be calculated using GIS with a range of different models such as travel and drive time, absolute distance, what-if sce-

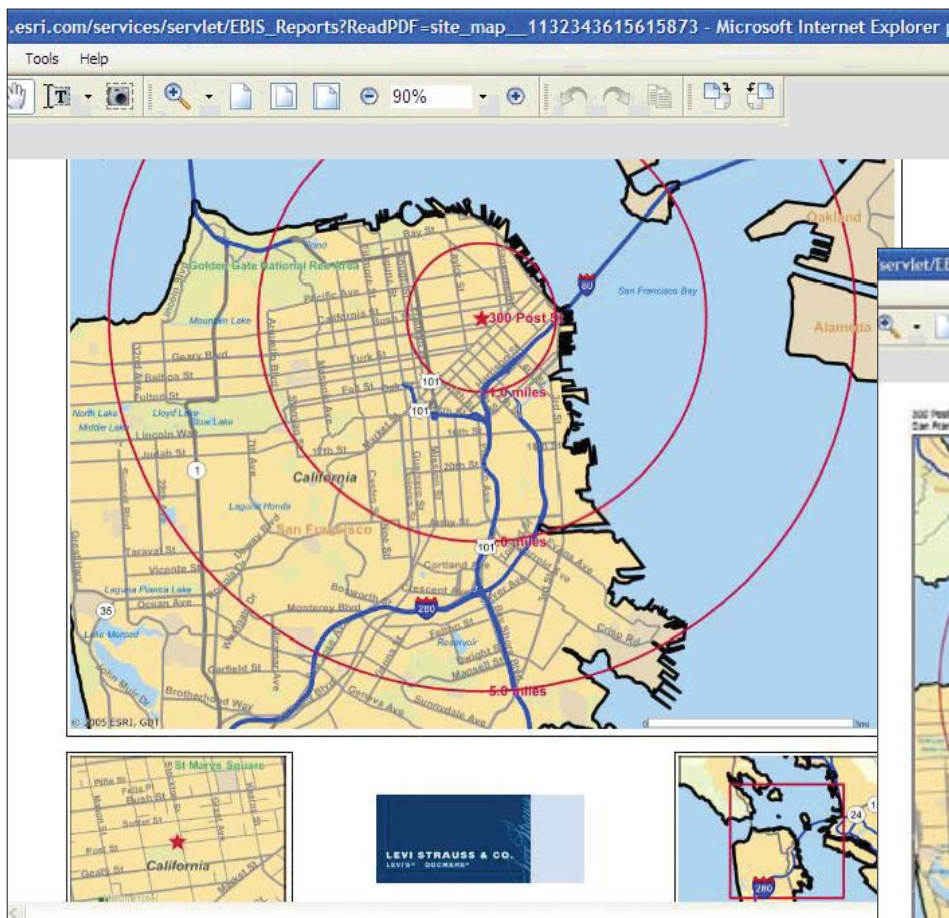
narios, or gravity and interaction models. Each model or analysis can be interactively refined so that predictions can be validated against market surveys or real store and market-based performance data.

This comprehensive analysis obviously needs the best mix of data, software functionality, and market understanding. ESRI is strategically aligned with the industry's leading analysts and vendors to ensure that we can provide the full range of capabilities expected by our clients—not just technology. Retailers can start small using our Business Analyst Online Web services and grow into desktop, server, and enterprise applications as their need or under-

standing grows. Because the data, analysis, and models are portable across our entire software suite, companies can take their knowledge with them as their requirements change.

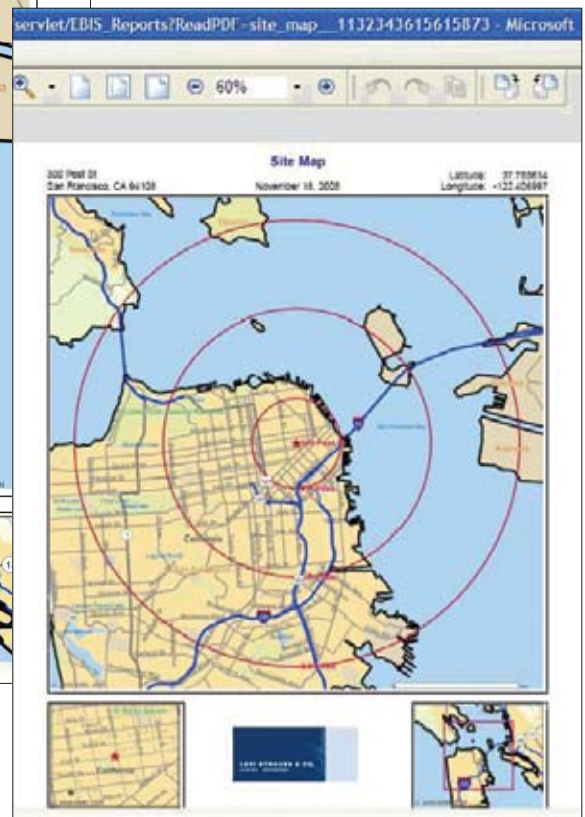
It's vital that retailers get the right information to make better business decisions regardless of their size or operational business model. How a site is best used will depend on many factors, and a company should evaluate each site against multiple conditions. There are interrelationships and influences that need to be investigated and measured. Optimizing retail potential in one location may cause a ripple effect across the rest of the outlets or stores. Retailers have to measure, research, and model site performance and understand the big picture while focusing on the full impact of each decision they make. Consequently, retailers need to be able to evaluate sites as part of a much greater picture—the network of stores or locations—rather than each site in isolation. In the end, maximizing market potential requires a holistic and interconnected approach to get the right results.

Companies need feedback on when and



LS&CO uses ESRI Business Analyst Online to view prospective retailers. The impact of a new retailer is analyzed by creating ring study areas.

By viewing potential retailers and their impact on the market in 1-, 3-, and 5-mile radii, it is easier for LS&CO to decide whether or not to accept a new applicant.



where to eliminate, reorganize, or strengthen their presence in a market or territory. Simply identifying the potential of a new site is not really enough. ESRI encourages its users to investigate, model, and explore their networks and markets as much as possible. Each change has an effect within the ecosystem of competitors and own-brand stores. Being able to visualize, qualify, and predict the impact of various scenarios is vitally important in today's retail climate. Most significantly, any GIS implementation needs to reflect the true dynamics of the marketplace in which the retailer operates. It has to be realistic, believable, and supportive.

**Levi Strauss & Co.: Using GIS to Find the Best Retailers**

Levi Strauss, North America, a division of Levi Strauss & Co. (LS&CO), is the company's largest region and employs approximately 3,100 people throughout the United States, Canada, and Mexico.

The North American region markets products under the Levi's, Dockers, and Levi Strauss Signature brands and includes three businesses: Levi Strauss U.S., Levi Strauss Canada, and Levi Strauss Mexico. Based in the company's San Francisco headquarters, the region accounted for \$2.4 billion of the company's \$4.1 billion in total sales in 2004.

LS&CO wanted to increase distribution to more specialty stores such as general merchandise/work wear and western apparel outfitters. These stores often serve a demographic that is traditionally underserved by other retail channels.

Because these stores and their customers are based primarily on geographic location, LS&CO wanted a tool that would map existing authorized retailers and potential accounts. This application would ensure that new stores would not adversely impact the sales opportunities of existing stores.

Numerous new account applications arrive

weekly, and LS&CO needed a tool that would help it view this incoming data accurately and quickly. LS&CO now uses Business Analyst Online to view the information accurately and consistently to make informed decisions before opening a new retail account.

These analyses were originally performed by an outside vendor, but LS&CO wanted to streamline this process and gain more autonomy. "Fortunately, ESRI helped create the application we needed," says Maurice Kelly, new accounts manager, LS&CO. "This application is absolutely essential to my job. We previously didn't have a readily accessible archive of retail store locations. Business Analyst Online allows us to manage them and see prospective retailers. We can avoid problems such as opening a store directly across the street from an existing account."

To read the full case study, visit [www.esri.com/casestudies](http://www.esri.com/casestudies).

## How to Enhance Customer Data Using GIS

We have introduced a new section to *BusinessGeoInfo* based on feedback from you, our readers. Starting this issue, the GIS methods and practices section describes how to apply tools from the ArcGIS and Business Analyst product family to answer specific business questions.

In this edition, we address the needs of a retailer who wants to more effectively exploit transactional information in points-of-sale and loyal scheme databases to support a promotional product tour.

### Scenario

A large consumer electronics company is planning a 22-day promotional tour to major cities across the United States. The company has already identified its top 17 cities (figure 1), but is struggling to identify the best five cities for the rest of the tour. The company wants to maximize the number of attendees and new product sales that result from the tour. The company maintains a strong customer relationship management (CRM) system and would like to link customer buying history with more predictive information on retail potential. It recognizes that the problem is best solved by integrating the CRM databases with GIS analysis.



Figure 1: Map Displaying the Top 17 Cities a Large Consumer Electronics Company Plans to Visit in a Promotional Tour

### Solution Design

The solution provided to the client uses ArcGIS Spatial Analyst and data from Business Analyst desktop. Corporate CRM records are combined with the Community Tapestry demographic segmentation system to create a model that identifies the best locations for the promotional tour as described in table 1.

Data	Source
Actual sales history	From the corporate CRM
Predicted spending habits	Based on the Community Tapestry dataset supplied with Business Analyst
Customer concentrations	Calculated using combined GIS and CRM analysis
Proximity to target cities	Based on standard reference datasets supplied with Business Analyst

Table 1: Datasets, Sources, and Analyses Used to Solve the City Selection Problem

### Implementation

The first step is to create a map of customer distribution using the customer records in the CRM as the source for the ArcGIS geocoding tool. This tool locates customers at street level by matching the address records with a highly optimized street address database for the whole of the United States. The process generates a hot-spot map of customer locations as shown in figure 2.

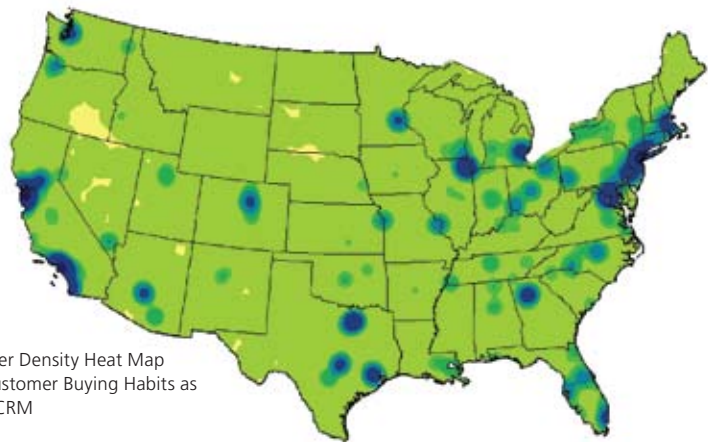


Figure 2: Customer Density Heat Map Created Using Customer Buying Habits as Identified in the CRM

Using GIS, we are immediately able to visualize the distribution of customers and identify areas that differ from the clients' understanding of their customers and spending patterns. Our electronics company has customers all over the United States, but there are some interesting concentrations of clients that do not exactly match population distributions. In addition, a number of distinct pockets of customers can be found, for example, in Texas and the Southeast, which are not in major metropolitan centers. These may represent good places to add to the promotional tour but need further investigation.

The solution design incorporates many different data sources and types of data that are not derived from the same source or at the same geographic scale. To standardize the

analysis and produce a more meaningful and appropriate model, the analysis uses grid-based processing. All data is interpolated onto a 5 x 5-mile grid covering the whole United States. This allows the client to compare any dataset against another, even though they may use different collection sources. In addition, we can reorganize and standardize data as needed; counts can be converted into meaningful densities, as each cell has the exact same area.

The heat map shown in figure 2 is a profile of customer concentration. By sorting the customer densities (from high to low), we identify patterns that predict where we might expect to find new customers. Our electronics client knows its ideal customer's lifestyle and expectations, which do not significantly change across the United States. The next step in our analysis is to use this behavioral information to identify untapped markets and our target customers by finding areas with characteristics similar to those where the best electronics buyers are already known to live. To do this, we will identify the most common Community Tapestry lifestyle segments with the highest concentrations of customers.

The top three segments the company's customers belong to are *High Society*, *Family Portrait*,

### Value of GIS

Without GIS, we might overlook some smaller cities where we have high market potential but lower population densities than in the large metro areas. Our results suggest we may need to mix our tour strategy to not only focus on the traditional big cities but also look at regional cities with high potential and a good match with our ideal consumer segments.

and *Upscale Avenues*. All three segments have similar characteristics: well-educated, married couples who may or may not have kids and who earn a much higher income than the national average (figure 3). Based on these characteristics, the company can target areas with similar groupings of customers because these three segments form the ideal customer profile.

Having established the most common lifestyle groups among the electronics customers, we can extrapolate a relationship between purchasing behavior and lifestyle. In simple terms, we believe we will find the most customers willing to buy new electronic products in the areas with the highest concentrations of the predominant Tapestry LifeMode groups. Knowing this, we can now identify the areas with high customer numbers that match our stated preferences for lifestyle segments.

Figure 4 highlights those ZIP Codes that most closely match our lifestyle selection methods and the concentration of electronics buyers by lifestyle classification. The map clearly shows that there are potential customers in San Francisco, Salt Lake City, and across the whole of the Southeast, which are not close to one of the proposed promotion sites.

The electronics company wants to maximize the total number of customers that it can reach as

### Standardizing Geographic Units

Because each customer has been located down to the individual street on which they live, we can use GIS to aggregate the data to any standard geographic unit, such as ZIP Code, county, or census tract, or they can be assigned to a regular grid such as the 5 x 5-mile cell map used in the analysis. Counts can be generated for the number of customers in each of these grid cells or geographies to produce a heat map that shows variation in the customer density across the United States. This overcomes many of the analytic problems in combining data with different resolutions, scales, and collection units.



Figure 3: Community Tapestry LifeMode Groups

part of the promotional tour and believes that it has chosen cities that closely match its client demographic and customer distribution. Figure 5 shows the 17 current cities ringed by buffer zones of 25, 50, 75, 100, 125, and 125+ miles. With the current distribution, more than 60 percent of the customers are within 125 miles of one of the existing 17 cities, yet the buffer zone covers only 22 percent of the United States.



Figure 4: Customer Concentrations (above) and Concentrations of Top Three Tapestry LifeModes (below)



Having identified the total number of customers who are closest to its tour cities, the company can now decide the best place to locate the five additional cities that will be part of the wider promotion. This evaluation will be based on an understanding of how expensive it is to travel to a tour city, the concentration of customers in urban centers, and how closely these customers match an ideal buyer profile.



Figure 5: Buffer Rings around the 17 Original Tour Cities

The costs that each customer will pay to travel to the nearest cities can be calculated in dollars, travel time, or lost opportunity. The cost is assigned using a weight-per-unit distance as each customer travels away from home. This scoring system does not bias the costs to the nearest promotional site, but rather shows how the customers are distributed across the United States. In the cost model shown in figure 6, yellow areas have high concentrations of customers who travel small distances before meeting another customer. Purple and blue define areas with sparse customers who are less likely to live close to another electronics client with similar buying habits or lifestyle.

*continued on page 22*

continued from page 21

### How to Enhance Customer Data Using GIS

Our analysis has generated four deterministic datasets that will be used in the evaluation of the best cities to add to our promotional tour. These four datasets address the following questions:

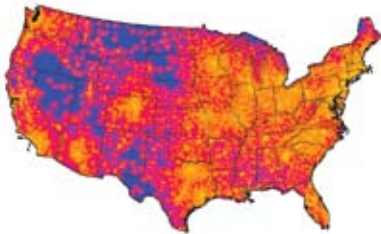


Figure 6: Customer Travel Costs (Yellow represents low costs, while customers in the blue areas are far away from each other and the tour cities.)

1. Where are the greatest concentrations of customers already buying our products?
2. Where are there potential households and customers who meet our ideal customer profile based on the top three Tapestry segments?
3. How far away is the customer's home from one of our tour cities?
4. What is the likelihood that the customer will travel based on real and perceived costs?

The answers to these questions help us identify parts of the United States that score highly based on a weighted model that combines all these factors into a suitability or likelihood model. This model ranks and combines the datasets based on the following conditions and customer criteria:

1. No customer will travel more than 125 miles to visit a promotional event.
2. We reject all areas with a low match threshold to our top Tapestry clusters.
3. We emphasize areas with high densities of existing customers.
4. We want to be located in sites with low costs to attend the tour.

Based on our model criteria, we identify a small subset of sites that are shown in green in figure 7. All the other parts of the United States fail to meet our selection criteria. Once the target areas are identified, it is easy to perform proxim-

ity analysis to identify the closest city. Based on our criteria, the chosen cities are San Francisco, California; Salt Lake City, Utah; Albuquerque, New Mexico; New Orleans, Louisiana; and Birmingham, Alabama. (See the text box for discussion on why the cities are identified.)

GIS analyses have proven invaluable in identifying where best to locate the additional promotional events. Without GIS, it would be almost impossible to create scores of customer density, calculate travel costs between locations, and match localized lifestyle patterns to known customer spending habits.



Figure 7: Areas with the Highest Rank Score (above) According to the Selection Model and the Nearest Major City to Those Locations (below)



By converting all the data sources to a 10 x 10-mile grid, we are able to reduce the impact of variation in data distribution, geographic context, and analysis type. Each dataset becomes a ranked scorecard that represents one dimension of the problem we are trying to solve or input to a mathematical model. This allows us to translate the question posed by the electronics company into evaluation criteria

Our selection model provides some interesting insights into our customers, their lifestyles, and where we should go to maximize our outreach to them.

San Francisco and Salt Lake City are cities that clearly stand out because of high concentrations of customer and Tapestry segmentation matches.

Albuquerque, New Orleans, and Birmingham are all regional cities that do not have as high a concentration as the major U.S. cities but score well across all aspects of our model. They have more customers matching our ideal customer profile buying electronics than would be predicted by their size and are located in places easy to travel to.

within our model. The final result is a simple equation that adds or subtracts the score for each of our layers, analyzing the whole of the United States and all of our customers in seconds. Once these sites have been identified, it is quite easy to repeat our customer density/city proximity model and calculate the total number of customers within 125 miles of the 22 cities. Adding these five new cities based on a GIS-derived model adds an extra 26,000 customers so that 77 percent of our customers are within 125 miles, which still covers only 28 percent of the United States land area (figure 8).



Figure 8: The Final 22 Cities with Total Number of Customers within 125 miles

The analysis performed here can be taken further to optimize the distribution of cities so that overlaps are avoided and the distribution of the tours covers the greatest number of customers. By comparing the number of customers each city will attract, then balancing the cities in the tour, we can reach an optimal solution set. We can resolve how to meet the maximum customers in the minimum number of days with the minimum number of sites. For our set of cities, we would not have an event in Washington, D.C., or investigate those sites with only around 1,000 customers, shown by red circles in figure 8. Based on optimizing these new cities, we can reach 80 percent of our target customers (table 2).

	Main Sites (17)	Percentage U.S. Land Base	Original Tour (+5 new cities)	Percentage U.S. Land Base	Original tour (tweaked +5)	Percentage U.S. Land Base	Optimized (evaluate all sites)	Percentage U.S. Land Base
<b>Number of customers</b>	91,950	60%	118,030	77%	122,928	80%	129,457	85%
<b>Change in number of customers</b>			26,080		30,978		6,529	
<b>Total number of customers</b>	152,995							

Table 2: Customer Distributions within 125 Miles of the Target Cities

One final application of the model allows us to identify cities that are within our target zones and optimize them based on customer distribution and the weighted scores from our spatial analysis. Based on this model, each city is evaluated in turn, and the model forecasts the success of each location compared to its neighbors and all other cities to generate a single optimal set of 22 cities from all the possibilities we have identified. Based on this analysis, we can now reach 85 percent of the electronics buyers/customers, and they are concentrated into small areas that cover only 29 percent of the U.S. land mass (tables 2 and 3).

At this point, we have optimized our sites and analysis. We have come to a point of diminishing returns in which adding cities to our tour will not yield greater success. Figure 4 shows how spread out the customers are in the Midwest and West, such that adding a new city will only bring marginal increases in new customers, compared to increased costs. Figure 9 shows the optimal distribution of cities and numbers of clients who can be predicted to attend the tour events.



Figure 9: Optimal Distribution of Cities Based on Attractiveness to Customer Characteristics and Spatial Distribution

### Conclusion

By combining CRM-based data about customers and their buying habits with spatial analysis, our electronics retailer has gained new insight into the customers' geographic distribution and lifestyles. This can be used to construct more ef-

Ring Miles	Main Sites (17) 5 x 5 Cells Covered	Percentage U.S. Land Base	Original Tour (+5 new cities) 5 x 5 Cells Covered	Percentage U.S. Land Base	Optimized (evaluate all cities) 5 x 5 Cells Covered	Percentage U.S. Land Base
25	572	1%	716	1%	757	1%
50	1,536	3%	1,925	4%	1,985	4%
75	2,359	4%	2,984	6%	3,125	6%
100	3,409	6%	4,332	8%	4,575	9%
125	3,820	7%	4,805	9%	4,823	9%
150	41,647	78%	38,581	72%	38,078	71%
	53,343		53,343		53,343	
Calculations created from raster histogram			85 percent of customers live within 29 percent of the area of the United States.			

Table 3: U.S. Land Area Covered by Each of the 25-Mile Rings

Original List of 17 Cities	Original Cities Plus 5 Best New Cities	Best 22 Cities, Avoiding Overlap	Optimized City List
Baltimore, MD	Baltimore, MD	Boston, MA	Boston, MA
Boston, MA	Boston, MA	Charlotte, NC	Charlotte, NC
Charlotte, NC	Charlotte, NC	Chicago, IL	Chicago, IL
Chicago, IL	Chicago, IL	Dallas, TX	Dallas, TX
Dallas, TX	Dallas, TX	Denver, CO	Denver, CO
Denver, CO	Denver, CO	Houston, TX	Houston, TX
Houston, TX	Houston, TX	Los Angeles, CA	Los Angeles, CA
Kansas City, KS	Kansas City, KS	Miami, FL	Miami, FL
Los Angeles, CA	Los Angeles, CA	Minneapolis, MN	Minneapolis, MN
Miami, FL	Miami, FL	New York, NY	New York, NY
Minneapolis, MN	Minneapolis, MN	Phoenix, AZ	Phoenix, AZ
New York, NY	New York, NY	Seattle, WA	Seattle, WA
Philadelphia, PA	Philadelphia, PA	St. Louis, MO	St. Louis, MO
Phoenix, AZ	Phoenix, AZ	Washington, DC	Washington, DC
Seattle, WA	Seattle, WA		
St. Louis, MO	St. Louis, MO	Atlanta, GA	Atlanta, GA
Washington, DC	Washington, DC	Buffalo, NY	Buffalo, NY
		Columbus, OH	Columbus, OH
	Albuquerque, NM	Detroit, MI	Detroit, MI
	Birmingham, AL	Pittsburgh, PA	Orlando, FL
	New Orleans, LA	Salt Lake City, UT	Pittsburgh, PA
	Salt Lake City, UT	San Antonio, TX	San Antonio, TX
	San Francisco, CA	San Francisco, CA	San Francisco, CA

Table 4: Cities Represented in Each Stage of the Analysis

fective customer retention, sales forecasting, and modeling solutions that have been used to optimize our event planning. The same type of GIS analysis can also be applied to other retail applications such as the creation of more effective marketing strategies, improvement of store locations, innovation of merchandising planning, and improvement of demand forecasting. GIS is demonstrating its value in extending the understanding of customers and their needs, which in

turn allows retailers to implement strategies that directly improve profitability and cost savings.

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Contact Us: If you have specific problems you would like to see explained or you would like to implement the examples shown here in your business, please send your questions, comments, and ideas to [geoinfonews@esri.com](mailto:geoinfonews@esri.com).



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