GEOTEMPORAL TRADE AREA EVALUATION WITH DYNAMIC GRIDDING TO AVOID THE MODIFIABLE AREA UNIT PROBLEM (MAUP)

By

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A THESIS PRESENTED TO THE GRADUATE SCHOOL OF THE UNIVERSITY OF FLORIDA IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS

UNIVERSITY OF FLORIDA

2010
To my Mother and Father: I am eternally grateful for your loving support and generosity throughout the years.
ACKNOWLEDGMENTS

I would like to acknowledge my advisor and mentor, Grant Ian Thrall, for his enduring patience, support, and direction during my pursuit of a Master of Arts degree. He has been instrumental in guiding me toward this goal and can take full responsibility for this timely accomplishment. He initiated my interest in the Marketing Geography discipline and has supported my intellectual growth with a progressive movement delving into the dynamic realms of the MAUP and Fractal Geometry. I could not ask for a better advisor, as he has given me the academic guidance and moral support necessary to make completion of this thesis a most rewarding and challenging experience.

The business that provided the data used in this study prefers to remain anonymous. Their cooperation allowed the topic of this thesis to be feasible. My commitment to the firm was that their time and effort would be rewarded by the results of the analysis of their data being both interesting to them, and relevant to their managerial decisions. This commitment was important in designing the work and the presentation of the completed analysis.

I would also like to acknowledge the rest of my committee—Timothy Fik and Youliang Qiu—for their continued support and enthusiasm, I am truly grateful. With the combined efforts of everyone involved, especially those of my committee members, I am approaching the completion of this thesis. Their efforts have made it a truly enjoyable and rewarding experience, for that, I am forever indebted.
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Changes within a trade area of a retailer can change the profitable performance of the business. Among the most important changes to a trade area over which the retailer has no control are changes to the demographic composition of households, the entry and exit of competitors, and the relocation of competitors within the trade area. Geospatial technology provides for cost effective evaluation of changes in the phenomena that affect the trade area. This provides an opportunity for the retailer to document changes that have occurred and evaluate how those changes affect their enterprise. Important geotemporal measures are customer count change by location, transaction change by location, and revenue change by location. Sustainable best practices of a business firm requires awareness of the trajectory of change and thereby enable the firm to appropriately adjust to current and anticipated market conditions. A repeatable methodology is presented that measures changes in business activity across space and through time. A case study of a firm providing retail services in Alachua County, Florida, documents the methodology. This study indicates that further research on geotemporal analysis for business decisions is warranted, especially that which has focus on the Modifiable Areal Unit Problem (MAUP). MAUP reveals if the
geographic container for the data is itself a source of a statistical bias radically influencing both qualitative and statistical results.
"Real time" management decisions are critical to the long term success of large and small businesses. Large multi-branch retail chains have for the past two decades been beneficiaries of geospatial analysis and geospatial technology. Cost of implementation and limited general public knowledge of "location based intelligence\(^1\)" has contributed to smaller locally owned businesses from reaping the same benefits as large business. This thesis demonstrates that geospatial analysis provides management of a small business, information that is critical to the business decision in "real time\(^2\)."

This thesis integrates a triad of concepts, thereby adding time critical to mainstream business geography literature:

- retail market/service provider location trade area theory
- geospatial technology
- time

"Real time" geospatial analysis, hereafter referred to as geotemporal analysis, identifies entry and exit of competitors, tracks customer interaction with the store, and evaluates change in the non-customer population of the trade area. Geospatial changes can lead to cannibalization of revenues, a change in market penetration, and prospects to improve the market position.

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\(^1\) Location Based Intelligence (LBI) allows for real time tracking of information to alert the operator and provide an enhanced perspective of situational awareness that can help improve judgment decisions. [http://works.bepress.com/mgmichael/4/](http://works.bepress.com/mgmichael/4/) … [http://www.encyclopedia.com/doc/1G1-199973425.html](http://www.encyclopedia.com/doc/1G1-199973425.html)

\(^2\) Real time is when things respond to events as they occur, and may refer to: **Real Time Locating Systems** (RTLS), are used to track and identify the location of objects in real time using simple, inexpensive nodes (badges/tags) attached to or embedded in objects and devices (readers) that receive the wireless signals from these tags to determine their locations. RTLS typically refers to systems that provide passive (automatic) collection of location information.
Trade area calculations are primarily used in retailing to calculate expected store performance before the stores "open their doors." The benefits of predicting store performance include avoidance of financial losses, zeroing in on profitable opportunities, and not to be underestimated is the ability to negotiate a more advantageous long term lease or purchase price of a site.

After transaction, the choice of site is fixed. In the short run, managerial decisions cannot be made on fixed costs. The store managers' degree of freedom subsequently narrows to marketing and some variation in the value platform offered by the business.

"Real time" evaluation of a trade area has not entered the academic or practitioner literature. This absence is not because of lack of importance; rather, the data has not been available to academics to create a study of the type necessary for a real "real time" demonstration. Businesses that employ the technology to be described here are not sharing the benefits of the analysis, and not letting the world know about the existence of their "Geotemporal War Room." Indeed, real time information is internally recognized as critical to the success of the enterprise. Real estate has been said to be "information arbitrage (Thrall, 2002)." The belief among stakeholders is that those with the information can sustain their enterprise into the future. Those without the information are "throwing dice with their future."

It is fortunate that a successful, locally owned medical service provider gave access to the data used here. The data made available is comprised of two time periods, each period being a full year, and with a four year interval separating the two time periods. The methodology of this thesis can be extended to data sets with shorter time differences: hourly, daily, and monthly. Knowledge gained from the two time period
analysis will contribute to further research on geotemporal business decisions. Alachua County provides an ideal test site. Gainesville is a comparatively compact city. Traffic congestion keeps the city compact. Most employment is at a central location. For these reasons, the land use and urban form of Gainesville is not complex and mirrors the general theory on urban spatial structure (Thrall, 1987). It is also fortunate that the business that provided access to the data was a small locally owned enterprise. Large multi-branch retail chains have benefited from geospatial analysis and technology. The analysis here documents that geospatial analysis can also benefit the small business. Adoption of geospatial analysis by small business is expected to occur, in large measure by the ready and nearly ubiquitous acceptance of Google Earth and Google Maps. Google at this time does not offer the geospatial functionality required for this analysis; however, it is inevitable that the functionality is offered. In the meantime, the necessary functionality is available via specialized software packages.

The technology employed in this thesis is ESRI Business Analyst, R-Statistics, and Caliper Corporation’s Maptitude GIS. The particular strength of Business Analyst is its technology for geocoding and assignment of lifestyle segmentation profiles (this will be explained a later part of this thesis). Maptitude GIS software is capable of carrying out the spatial data operations, and spatial visual operations required in this thesis.

The customer data is from a locally owned, privately developed and owner managed business. The business is a medical service provider. Service consumers make an appointment, travel to and from the "brick and mortar" facility. Familiarity with and trust of the research team was a necessary precondition for this work to be performed. A needs assessment was casually executed, without intruding with business operations. The
needs assessment revealed that the business had been maintaining a computerized database as part of its scheduling and billing operations. However, the data had not previously been considered an asset, and the management had never seen their own data as geospatial. Google's geospatial capabilities wetted their appetites.

The data was received without any monetary transaction. A non disclosure agreement was signed committing that the customer addresses and identities remained anonymous, and that the business remained anonymous as well. The business did however incur a cost due to disruption of normal routines, and allocation of resources for data extraction from their transactions files. This effort was not insignificant, and an indication of the importance in which the business management considered this study. The quid-pro-quo is that the business facilitating this study by allowing access to its data, receive a copy of the results in return.

The data covered the years 2004 and 2008. This time period too was fortunate for the study though not for the economy. As the national economy entered a recession it would have been expected that the decline would transfer into a decline in demand for the goods and services offered by the case study business. In other words, as income, expected income, and consumer confidence declined, it would be reasonable to expect that the revenues would change as well. The more inelastic the consumers demand, the less changes in the national economy would translate into local demand changes.

The data included address of the customer, count of each customer’s transactions (visits), revenue generated by each customer within the time frame. Customer addresses gives rise to lifestyle segmentation profile derivation via ESRI Business Analyst.
CHAPTER 2
TRADE AREA CALCULATION: AN OVERVIEW

Marketing Geography

The foundations of Marketing Geography can be traced to literature from the early 1900s where practitioners first began utilizing the methodologies now being used within this field. Geographers have long known that there are causal determinants to many spatial distribution patterns. With a combination of quantitative and qualitative analysis, the cause of spatial patterns can be detected, hypotheses formulated, and statistically confirmed or refuted. These steps are important to predicting future spatial distributions of phenomena, or spatial distributions of phenomena elsewhere. When the phenomena is important to the success of a business, then the business must include the present and predicted spatial distributions when making time critical operational decisions and creating long term managerial strategy.

“All retailing operations are complex but most executives would agree that location (and its associated attributes) contributes more to the long-term success of the retail unit than does any other factor” (Ritchey, 1984). Additionally, the optimal location of services and the significance of a location strategy is “…to help assure a successful [business] undertaking” (Mercurio, 1984). The earliest attempts to apply geographic research techniques to retail outlets date to the 1920s when the attempt was made to determine, on behalf of large multi-branch retail firms, the relative value of one site, compared to the relative advantages of other sites in the same region. These first attempts and early studies employed methodologies that were mainly subjective and based on factors believed to be significant (Goldstucker et al., 1978). Applebaum suggested that the origins of Marketing Geography may be traced to the beginning of
the twentieth century when chain companies—especially tobacco shops—began to conduct detailed surveys of pedestrian flows along streets in order to identify the most desirable sites (highest foot traffic) within the main centers of towns (Davies, 1977). These early studies were marginally effective at improving the business decision-making process, but they were the first real use of the foundations used in today’s business geography techniques.

William Applebaum is widely recognized as a pioneer in the discipline of Marketing Geography and is described by Davies (1977) as the chief architect of Marketing Geography as a separate field of study in the United States. “Store location research, as both an academic and practical area of inquiry, owes much to the formative work of William Applebaum. From about 1945 until his death in 1978, Applebaum was a colossus amongst those teaching the new subject of Marketing Geography, lecturing at the Harvard Business school” (Davies and Rogers, 1984). Although Applebaum had a degree in geography from the University of Minnesota, his work was not widely accepted or valued within the discipline of geography.³ Turning a bad thing into an opportunity, Applebaum gravitated to an audience that was highly receptive - business practitioners and business academics. Although his contributions, as well as those other geographers from this era, were mainly cartographic representations of market areas, Applebaum was instrumental in opening the avenues of thought that created Marketing Geography as an accepted discipline within the field

³ It might be asked, "why did the Association of American Geographers" wait until 2008 to create its Business Geography Specialty Group (see www.BusinessGeography.info ). Marketing Geography is a subset of the larger emerging literature on Business Geography. The focus of Business Geography is geospatial analysis to improve the business decision, while the focus of Marketing Geography is essentially retail location. This thesis brings information relevant to Marketing Geography and analyzes that information to be relevant to the large array of decisions that must be made in business.
of geography itself. Among the list of contributions made by Applebaum, he is well known for the customer spotting method, the analog method, methods for determining market penetration, methods for determining store rents, and store site evaluation. His understanding of both the business/marketing perspective and the geographic concepts allowed Applebaum to become recognized as the expert in his field during his own time. Applebaum is regarded as one of the ‘fathers’ of Marketing Geography, and one of the most important geographers of the 20th century.

Another pioneer in the advancement of the Marketing Geography discipline is David Huff, whose work with spatial interaction models was a revolutionary concept for the business community. Huff was a business student studying marketing at University of Washington during the late 1950s. There he participated in "brown bag" lunches with geography graduate students. Upon graduation he became a faculty member at University of California at Los Angeles.4 There, and independent of his geography colleagues, he formulated what is today regarded as "the Huff model." Huff's formulation is the kingpin of spatial interaction models used in applications ranging from marketing geography to transportation studies. Initially, Huff's work was not readily accepted in mainstream geographic thought, but instead became one of the most studied formulations in Regional Science which was at the interface between the disciplines of economics and geography.5 Huff also purposely disseminated his work to business practitioners by publishing examples of his work in trade publications. As Applebaum did before him, Huff found an enthusiastic audience that was receptive to the value of

4 Personal communication between David Huff and Grant Thrall, narrated to Ron Dietz.
5 For more on the Huff model and spatial interaction models in general, see Kingsley Haynes and A. Stewart Fotheringham, 1984, Gravity and Spatial Interaction Models, Sage Publications: Beverly Hills CA.
his work. Huff presented purely geographic based concepts and methodologies to this audience which helped to diffuse these Marketing Geography techniques outside of the confines of geographic circles. Today, David Huff is retired from the Department of Marketing at University of Texas at Austin, and is a consultant to Environmental Systems Research Institute (ESRI). 

Early use of site location methodologies were encumbered by the use of ‘checklists;’ decisions made with the use of mere checklists were in the final analysis considered, and likely were, highly subjective (for examples see Nelson 1958; Goldstucker et al., 1978; Applebaum and Cohen, 1960). The perceived absence of a sound theoretical framework limited the academic acceptance of marketing geography within the geographic discipline. The quantitative revolution of the 1960s would change this. Marketing geographers were quick to apply regression analysis, and include the "checklist" fields as independent variables. Revenues per square foot were one of the more common dependent variables in the regression equation. Marketing Geography subsequently gained high respect within the discipline of geography, and became accepted as a distinct scientific subfield of geography. However, as the body of marketing geography knowledge increased, and as more and more businesses adopted marketing geography methodologies, the newly emerging geography academics were drawn to Colleges of Business in which it had originated. 

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6 Among Professor David Huff's consulting activities is overseeing the Business Analyst add-in to ESRI's ArcMap. Business Analyst is a combination of data and software. In particular, Business Analyst includes the Huff model, and the means to calibrate the Huff model with a firm's own data.

7 Avjit Ghosh is a very good example. He received his Ph.D. in Geography (1979), and MA in Geography (1977), both from University of Iowa under the direction of Professor Gerard Rushton. Ghosh has been one of the most important contributors to advancing the literature on spatial interaction models and their use in business. He has been Dean of the College of Business at University of Illinois, and today remains as a Professor of Business Administration at University of Illinois.
geographic analysis, geographic technology, geographic theory, when used to solve actual business decisions, has evolved to form a body of knowledge of ‘best practices’.

**Value and Justification**

Goldstucker et al. (1978) reasoned that retail market/service provider’s trade area size and shape is affected by: (1) the extent of product differentiation and the relative effectiveness of brand promotion; (2) the range of choice in administering pricing made possible by product differentiation, oligopoly, and other influences; (3) the ratio of fixed to total costs; (4) the economies of scales of production at each center; and (5) the availability of adequate markets within a radius of economical outreach. Each of these contains an aspect of geography that is useful to the overall calculation of a trade area, while others also include the intangible aspects of Marketing Geography. “That shape has not been used more extensively in geography may result from the earlier inability to measure it precisely. Many of the terms and measurements that have been used to identify shape have been inadequate. Moreover, geographers have been primarily concerned with an ideographic, rather than a nomothetic, approach to geographical problems” (Boyce and Clark, 1964). Simmons (1984) states that if a store is achieving a low share of trade, it is vital to establish the ‘image’ of the store compared with selected competition to find out why people shop at one store rather than another. The geographer must take these intangible aspects of marketing into account, but the main focus for the geographer is on the locational attributes of a retail outlet that determine and influence store patronage.

Location is crucial to the overall success of the retail outlet and can provide that necessary competitive advantage, but retail demand consisting of the consumer’s demand for goods require a careful consideration of the positive and negative
externalities associated with doing business. This includes factors not normally taken into account regarding the customer such as population distribution, household income, race and ethnic characteristics, personal preferences and desires, purchasing habits, etc. The successful marketing strategy attempts to describe how the individual retail outlet performance rates in relation to the potential cannibalization and symbiotic aspects of competition, the impact of the price of goods and quality of services provided, as well as the influence of suitable location policy.

Retail performance is significantly shaped by the size and demographic composition of an outlet's trade area; therefore, trade area is a spatial expression of the limits to the firm's market potential (Ghosh and McLafferty, 1987). The marketing geographer must use this information in completing an analysis as it is required to gain a fully encompassing view of an inherently uneven spatial distribution of this retail demand within a defined trade area in order to maximize the potential for future sales and growth.

**Tool and Methodologies**

Marketing Geography has a body of established methodologies and techniques, and some terminology that might be unique to the field. Therefore, in this section of the thesis, a brief summary of terminologies used in Marketing Geography are presented. Then, several methods illustrative of Marketing Geography, and used in this thesis, are summarized.

**Terminology**

This section summarizes the various terms and concepts used by Marketing Geographers and its associated literature.
MARKET SHARE is the ratio of a store’s sales in a geographic region to the total sales potential or otherwise defined as per capita sales divided by per capita sales potential. Market share is also known as market penetration.

TRADE AREA of a retail market/service provider outlet is the spatial expression of its market potential. It is the geographic area from which its customers are normally drawn with an established benchmark of 80% capture of customers by location. It is usually a function of distance, location of competitors, accessibility, and size (square footage) of the retail establishment.

TRADE AREA DELINEATION is the process through which the trade area of a retail market/service provider trade area of a store is spatially demarcated or the area on a map where the majority of customers are drawn.

DIRECTIONAL DISTRIBUTION (STANDARD DEVIATIONAL ELLIPSE) measures whether a distribution of features exhibits a directional trend (whether features are farther from a specified point in one direction than in another direction).

STANDARD DISTANCE measures the degree to which features are concentrated or dispersed around the geometric mean or median center.

SYMMETRICAL DIFFERENCE is a visual depiction of the area not covered when two dissimilar polygons are overlaid on top of one another.

MEAN CENTER identifies the geographic center (or the center of concentration) for a set of features.

CENTROID is the geometric center of mass for the polygon being studied.

Methods

Customer spotting method

With the intention that Marketing Geography become academically accepted, and compete on a equal footing with other subfields of geography as well as economics, Applebaum and Cohen (1960) promoted the use of repeatable analytical methods. Input to their methodological approaches were measurements of trade area, site accessibility, characteristics of the population within a trade area, competitive supply, economic base and stability of that economic base, trade area penetration, store size and store function, building costs, and operating costs. The outcome was a significant rise in the
academic stature of Marketing Geography, a rise in the demand for Marketing Geography graduates in geography, allied academic fields, and practice.

While William Applebaum wrote extensively, his publications were mainly targeted to practitioners. His publications in the trade press served to build his stature among practitioners, served as an outlet for his highly creative mind, and served to increase demand for his consultant work. Applebaum's publications in academic journals which served to establish Marketing Geography as an academic discipline were published 1960s. This was after Applebaum left Harvard, and after Applebaum had worked for several decades in private consulting practice, learning and proving his discipline first hand. Applebaum's publications therefore can be thought of as a compilation of a consultant's "secret" methods, proven by application, and revealed by paying clients to be highly valuable.8

Applebaum's work was a supreme example of the geographer at work in the field. Among methods he innovated and put into practice were: customer spotting, trade area delineation, site evaluation, and market penetration. His primary focus was on the empirical study of store trade areas and on the market share captured from the trade area. Among Applebaum's most important and steady clients were Kroger Company (grocery stores) and Stop & Shop (small quick serve gasoline station oriented grocery stores), among other grocery store chains in the USA Northeast and Midwest.

One of the methods Applebaum introduced in his own work in the 1930s, and subsequently published in trade and academic outlets, was his customer spotting

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8 The late Reg Golledge in a personal communication to Grant Thrall and subsequently communicated to Ron Dietz, stated that one of Saul Cohen's great accomplishments was to convince William Applebaum to publish his methods. Applebaum's response to "snubbing" by mainstream geography academics was to disregard academic geographers. Applebaum's story appears to be itself an analogue in academic geography toward its research publications whose focus is on improving business decisions.
method. Prior to the 1930s, the trade areas of grocery stores had been limited largely by the distance people were willing to walk. However, as automobiles became affordable to middle class families, trade areas became more complex. Trade areas could be larger because of the automobile, and grocery stores needed parking lots. Applebaum "spotted" automobile license plates in a grocery store's parking lot, then used that information to retrieve the registered address of the automobile from the State's Department of Transportation. Applebaum was also a pioneer early in the automobile era on the in-store survey techniques by placing pins on a wall map indicating the location customers' home addresses (namely their origin), as well as a pin for the location of the grocery store (the destination). Hence, origin-destination models in Marketing Geography were introduced. Today, of course, address match geocoding is used in GIS software, instead of pins on a map. Through trial and error, Applebaum concluded that a string encompassing 80% of the pins outlining a compact shape was a useful estimate of a trade area. He reasoned that 20% of the customers "spotted" were spurious. Today we still separate the core from spurious customers, while other criteria are used for enveloping the boundary of a trade area (Patel, Fik, and Thrall, 2008).

Applebaum's customer spotting procedure has subsequently served as the starting point for trade area calculations; indeed, the entire location based intelligence literature owes a debt to Applebaum. Applebaum's work penetrated beyond the dense walls of the academy, and showed the practitioner the importance of geography to their business decisions, and provided a method for answering the question, where should limited resources be allocated to advertising and location development. If a location is
developed, what is the impact on other stores under the same ownership; namely, cannibalization?

Customer spotting is also important to location based service providers in that with the data, the friction of space between the customer and the location can be calculated. This is also known as the distance decay of the customer's demand schedule. Each item in a store, and collection of all items within the store, creates or overcomes a friction-of-distance. The choice of which goods are to be offered in the store therefore affects the trade area. Cannibalization between stores can change because of store offerings. While in the short run, location for most brick-and-mortar cannot easily change, knowing the relationship between friction-of-distance and stocking of goods can be useful in daily real-time business strategic decisions, including advertising, marketing, goods stocked, and level of service.

Geospatial technology including GIS software and online geospatial databases have improved the productivity of those performing Marketing Geography, and thereby lowered its cost and increased its accessibility to smaller business firms. Sources of geospatial databases used by Marketing Geographers may be comprised of bank data (ATM records, check records, etc.), credit card data, or point of sale data collected by the retail market/service provider, but each record has an attribute that can be used to locate the activity on the landscape. Retail firms are in the business of making money and as they operate within the competitive business environment they are very protective of the information collected and techniques used, so they ensure that their data is likewise protected. Although the means for customer spotting/plotting are greater

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9 Customer spotting methods have been used by Ghosh and McLafferty (1987); Moloney (1989); and Rogers and Green (1978), among others.
than they were in the past, some obstacles still exist such as the cost of obtaining proprietary data monetarily or by entering into the contractual obligations and protections afforded by a Non-Disclosure Agreement.

**Trade area delineation**

Using the information collected by customer spotting survey methods or point of sale data, trade market areas can be accurately delineated and refined as primary, secondary, or tertiary trade areas as introduced by Applebaum (1966). He has defined the primary trade area as the geographic spatial core from which a store draws most of its customer business and using his analysis of grocery store chains, Applebaum (1966) found that this primary trade area encompassed about a 60 to 70% capture of store customers. Applebaum found the secondary trade area to be comprised of the next highest ratio of customers to population capture and drawing upon an additional 15, 20, or 25% of overall sales. The tertiary trade area can be defined as that area from which the residual, transitory, or spurious customers are drawn and usually exist on the outer fringe of a trade area, often considered out of town sales.

The effects of agglomeration cannot be understated as retail stores can form symbiotic relationships that serve to expand and increase the size of the market trade area and subsequent market penetration. Applebaum (1965b) notes this effect in a case study comparison of a discount food supermarket and a general discount merchandise store located adjacent to each other with a stand-alone discount food supermarket and no location association. The supermarket located adjacent to the merchandise store formed a symbiotic relationship that strengthened the trade area for both businesses that established more drawing power than the unassociated, stand-alone supermarket.
Summary

There are many ways, methods, and techniques available to the analyst to calculate the value of location to a particular business, but it is up to the individual analyst to apply those techniques that most effectively serve to enhance the business decision. The models presented are only a small selection of the entire site assessment/location selection measures commonly used and are significant because they allow the analyst the means to objectively evaluate an existing site or a prospective new site for a retail outlet. This objectivity facilitates solid analysis, improved judgment, and timely recommendations that compliment the business decision allowing retail firms the ability to methodically and systematically apply the results of these models with confidence. For instance, knowing the customer origins and subsequent trade market areas for a particular location may identify the presence of market overlap or market gaps that indicate improper utilization of marketing practices prompting changes to location configuration, marketing and advertising measures, or operating techniques.
CHAPTER 3  
TRADE AREA CALCULATION: AN INTEGRATED GIS APPROACH 

GIS as a Marketing Geography Research Tool

Historical Overview

GIS (geographic information systems) is a combination of computer hardware, software programs, analysis methods, and the proper application of these components together by competent and knowledgeable analysts.\(^\text{10}\) GIS allows the user to create, display, analyze, and manage spatially referenced data consisting of a wide range of categories from customer location to supply nodes to lines of distribution to competitor locations to population demographic characteristics and more. Researchers realized the potential value that computer mapping software programs could provide to the Marketing Geographer in performing retail market analysis. Wolf (1969) describes the Synagraphic Mapping System (SYMAP), developed in 1964 by Howard T. Fisher at Northwestern University, as one of the first programs that allowed for the creation of a visual representation of spatially distributed data on a digital map. SYMAP was revolutionary in that it allowed the user the ability to analyze areally distributed data and create choropleth maps with a thematic function for shading polygons. With this technology, Marketing Geographers could integrate this early and first known GIS application software with the business decision-making process to calculate areal sales volume potential, sales territory mapping, and determining industrial plant or warehouse locations (Wolf 1969).

Businesses have been using GIS technology since its inception on mainframe computers dating back to the mid-1960s although published literature does not account

\(^{10}\) See Peuquet and Marble, (1990), editors, for seminal discussion of the meaning of GIS.
for this use in applied research in the private sector until the 1980s (King, 1993). This could be due to the fact that GIS was not widely available, the technology was cost prohibitive to operate, the functions provided limited and time-consuming application, and that businesses utilizing the technology were not willing to broadcast the existence and use of technologies that provided a competitive advantage over rivals. “Emerging standards for the transfer of spatial data and for the specification of spatial process models will provide greater inter-operability between components developed at different times, for different purposes, and by different people using different hardware and software” (Heikkila, 1998). Corporations are very protective of closely guarded proprietary data, business decision-making processes, techniques, and methodologies to the point that in comparison with industrial firms, retailers tend to be oversensitive to confidentiality with many facts of operation being needlessly suppressed (Davies, 1977). There are many open source websites where useable data can be found and downloaded, but the fact remains that the Marketing Geographer often has to deal with the costs associated with the acquisition, protection, and use of proprietary business datasets. This is detrimental to the analyst and impedes the improvement of findings and conclusions where transparency could improve the application of techniques and methodologies with the open sharing of ideas and information. While Marketing Geography literature is vast and has been improved with expansion through recent years, “its structure resembles an iceberg – 90% submerged. Geographers engaged in intelligence work are not the only ones with disclosure problems” (Epstein, 1978). It seems that human nature and the competitive advantage within this field are overriding factors contributing to the historically slow emergence of GIS, as the first study explicitly
incorporating the use of this technology, as noted by Ghosh and Craig (1986), did not 
emerge in published literature until the 1980s.

**Customer Spotting Method**

The computing power, size of memory storage files, and advances in GIS programs 
available today have enhanced the applicability of the methods introduced by William 
Applebaum. His work with customer spotting and the means through which customer 
addresses are plotted on a map, the basis for trade area delineation, have been 
Improved with the efficiency of GIS in terms of time saved by the analyst. GIS facilitates 
the use of raw data collected and allows for the display of spatial data visually, 
especially with the use of Geocoding functions. Geocoding is the procedure through 
which GIS applies coordinate data in the form of latitudes and longitudes to individual 
records based on a field in the data consisting most commonly of address, zip code, or 
zip code + 4 location information. When an individual record has coordinate data, GIS is 
able to position the object on the correct location on the planet (Thrall, del Valle, and 
Thrall, 1995). GIS software geocodes data based on the existence of two attribute files 
that are joined together to present the data spatially. The first attribute file contains the 
individual record of transactions for each customer and the second attribute file must 
contain the coordinate data used to present the data spatially on a map.

The U.S. Census has created a set of data, collectively referred to as 
Topologically Integrated Geographic Encoding and Referencing (TIGER) Line files. 
TIGER files can be accessed via the Internet and freely downloaded from the US 
Census www.census.gov web site. While not perfect, the intent is that the TIGER files 
include the streets in the U.S., their names, type of street, and addresses, all within a 
standardized digital format that can be readily integrated with other databases within a
GIS environment. Databases of addresses then can be matched with the TIGER line files in a manner similar to relational database management (RDM). Since the TIGER line latitude-longitude coordinates are known, and the address range for each line segment is known, then RDM can be used with spatial interpolation to estimate the geographic coordinate of the address within the external database. This point is then displayed on the map in a position corresponding to the street address number, on the correct side of the street, and set back 50 feet from the street segment line. This procedure is repeated by the GIS software for each record in the database. Such geocoding allows spatial visualization of external database addresses within the GIS. The external databases can be customer addresses, store locations, event locations such as the occurrence of a crime, and so on.

There is a match accuracy and error associated with geocoding because TIGER Line files do not cover all of the streets in the U.S., especially in the rural areas, and because the quality of this data is only as good as the technician that digitized the line and entered the street address values. Geocoding to a zipcode or zip code + 4 polygon has less error because the match is based on a larger polygon area than the street address which is represented by a single point along a line. Thrall and Thrall (1994) have documented that street level geocoding has a lower ‘hit rate’ than geocoding to the zip code + 4 level. This is due to the arrangement of zip code and zip + 4 areas, which are depicted with polygons used to geocode match records located within the polygon boundaries and are assigned to the centroid of the individual polygon. The analyst must determine the level of precision required by the analysis and whether or not the level of
error introduced by TIGER Line files is an acceptable sacrifice to geocode at the street level and a specific locational point.

The use of GIS facilitates the process of plotting customer location in relation to the retail outlet store and the calculation of trade areas. This is done by determining the distance of each customer location from the retail outlet store and attaching that distance to the customer record data file. The analyst can then query these distances to find the primary, secondary, or tertiary trade areas by finding those records that are closest to the store and comprise 70% of store sales.

**Demographic Application**

Marketing Geographers utilize Geodemographics to gain a better understanding of the customer base being served by the retail market/service provider outlet store.\(^{11}\) ESRI’s Business Analyst add-in to ArcMap includes "Community Coder" geocoding application. Community Coder was formerly known as CACI/Coder Plus. Community Coder appends demographic information to the data record based upon its address. Community Coder has 60 demographic attribute traits utilized by the U.S. Census Bureau specifically focusing on population and household characteristics to create customer cluster profiles encompassing over 200,000 neighborhoods. The assignment of a demographic profile by Community Coder divides and separates the customer dataset into 12 Life Mode groups and 65 Residential Segments each individually known.

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as a Tapestry (Appendix A). These Tapestries have also formerly been known as A Classification of Residential Neighborhoods (ACORNs) or Lifestyle Segmentation Profiles (LSPs). “LSPs provide a composite measurement that summarizes population characteristics by location” (Thrall and Mecoli, 2003). ESRI BIS Coder Business Analyst uses a clustering of customers, based on the consumption history and anticipated spending profile of the area where they live, in a process of assigning a Tapestry that groups these consumers at the zip code, zip code + 4, or street level. “The basic principle that underlies the creation and use of an LSP is Tobler’s first law of geography: all things are related, but near things are more related than distant things” (see Goss, 1995; Thrall and Mecoli, 2003). These profiles, or Tapestries, are assigned to residential neighborhoods to reveal the spending habits of an area in the theory that people with similar interests, similar spending habits, and making similar choices will choose to reside within close proximity of each other spatially.

**Summary**

Geospatial technology has increased the productivity and precision of analysis created by Marketing Geographers (see Pickles, 1995). “The geospatial technological innovations include remote GIS, spatial data transfer standards, open GIS specifications, digital spatial data libraries, object-oriented GIS, and network-resident programming such as JAVA” (Heikkila, 1998). GIS has proven to be a valuable tool that enhances the business decision-making process through timely and accurate spatial analysis that offers the retail market/service provider a competitive advantage that competitors may or may not be using.
CHAPTER 4
TRADE AREA CALCULATION: METHODOLOGY

This section presents a methodological algorithm that can be followed by a retail market/service provider to calculate a trade area. The methodology integrates concepts from retail location analysis, geospatial statistics, and GIS technology. The algorithm presented here would not have been practical before the creation of contemporary geospatial technology and powerful computers. This methodology has its foundations in the retail location assessment literature summarized in Chapters 2 and 3. The algorithm presented here is demonstrated using actual data collected from a single outlet retail service provider in Alachua County, Florida.

The first objective of this study is to present the algorithm as in step-by-step fashion. The second objective of this section is to provide a descriptive overview to increase the understanding of the procedure so that it can be repeated by other analysts. The benefits of the algorithm arise because the success of a retail service provider depends upon location; the algorithm offers the entrepreneur to better evaluate the changing market landscape, and thereby realize a competitive advantage.

The retail business that provided the data for this study requires anonymity. The retail business will therefore be referred to as the "Client." The "Client" provided customer data for two time periods, 2004 and 2008. Both databases included customer address, transaction date, and amount paid for the transaction. The datasets were received in comma-delimited format (CSV). Data entry errors were corrected or eliminated. The CSV file was exported as an Excel XLS file. ESRI Community Coder can read XLS data files. The XLS file is processed by Community Coder and then imported as a data layer into the GIS environment. A second dataset was created by
joining the 2004 and 2008 datasets that is comprised of the customers with accounts showing up in both the 2004 and 2008 datasets. The second database was also geocoded. Therefore, three GIS data layers (shapefiles) were used:

- customers in 2004
- customers in 2008
- customers in both 2004 and 2008

Geographically spurious customers were eliminated by including only customers with home addresses within Alachua County, Florida. Geocoding had revealed customers with addresses in Iowa and Minnesota, as well as other countries. The results of each dataset selection refinement are as follows:

- 2004 Alachua Clients (1423) / 2004 All Clients (1745) = 81.55%
- 2008 Alachua Clients (1459) / 2008 All Clients (1761) = 82.85%
- 2004+2008 Alachua Clients (645) / 2004+2008 All Clients (664) = 97.14%

The presence of selected customers, as a percentage in relation to all customers, represent a ratio for each year group dataset that are all above 80% and can be considered a statistically significant study group.

Using the ESRI ArcMap spatial statistics function, the Centroid, Directional Distribution (Standard Deviation Ellipse), and Standard Distance for each year group dataset was calculated with the process shown graphically in the flow chart below (Figure 4-1). It should be noted that the Directional Distribution (Standard Deviation Ellipse) and Standard Distance shown below were calculated using the 1st Standard Deviation and Euclidean Distance centered around the Centroid calculated for the individual year group dataset being used. The figures below are organized by dataset year group used and, as much as possible, are color coded representations with 2004 customers depicted in red (Figures 4-2 and 4-3), 2008 customers depicted in blue.
(Figures 4-4 and 4-5), and 2004+2008 customers depicted in green (Figures 4-6 and 4-7). Overlaying the 2004, 2008, and 2004+2008 shapefile functions by year group, the growth and decay areas are further revealed (Figures 4-8 and 4-10). Additionally, the Symmetrical Difference between the Directional Distribution (Standard Deviation Ellipse) and the Standard Distance was calculated using a comparison of the 2004 and 2008 datasets (Figures 4-9 and 4-11). The area shown represents the customer transition area or change in time for the respective functions.

By using the spatial statistics functions provided by ArcMap, and visually shown on the Figures (4-2 through 4-11), the following customer capture statistics are shown in the list below.

Customer Capture Statistics.

Client’s Customer List 2004
Directional Distribution (Standard Deviational Ellipse) 1074/1423 = 75.47% capture of 2004 customers.
Standard Distance 1060/1423 = 74.49% capture of 2004 customers.

Client’s Customer List 2008
Directional Distribution (Standard Deviational Ellipse) 1090/1459 = 74.71% capture of 2008 customers.
Standard Distance 1080/1459 = 74.02% capture of 2008 customers.

Client’s Customer List 2004+2008
Directional Distribution (Standard Deviational Ellipse) 489/645 = 75.81% capture of 2004+2008 customers.
Standard Distance 486/645 = 75.35% capture of 2004+2008 customers.

The measurements shown above indicate a very stable and solid market penetration and customer capture. There appears to be little change or variation within the three different datasets throughout the encompassing five year period being analyzed.
The Core Trade Area Radial Method

In applying the core trade area radial method, the centroid of the spatial distribution of the data was used as the starting point. From the centroid, radial distances of 1.5 and 1.0 miles were used to create a circle polygon and calculate the number of customers captured within these distances. These distances were not chosen arbitrarily, and for the size of the study area were appropriate using conventional marketing geography practices.

Publix supermarket corporate headquarters utilize the competitive edge benefit of a Marketing Geography division that employs analysts to perform the techniques and methodologies associated with retail market/service provider location and trade area calculation. The location, by address, of each Publix store was found using BellSouth’s The Real Yellow Pages Gainesville, Florida phonebook for 2008, obtaining the addresses of Publix locations, geocoding those addresses, and plotting each location on the map using GIS. By reverse engineering the known locations of Publix supermarkets for the Gainesville, Florida area, the established trade area can be roughly estimated. This is done by buffering each Publix supermarket location until the buffered areas become tangent to each other where possible and, in contiguous areas, where market overlap is minimized while maximizing the market penetration for each site (Figure 4-12). The estimated radius of 1.5 miles revealed the target core trade area for existing Publix supermarket locations and will be used as a benchmark representative trade area.

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12 Communication to Ron Dietz by Professor Grant Thrall. Publix headquarters has employed students from University of Florida that have completed the Business Geography Program under the direction of Professor Thrall. Professor Thrall has also presented invited Friday Afternoon Seminars to senior Publix management at their headquarters in Lakeland Florida.
Customer spotting and the benchmark trade area distance of 1.5 mile radius are applied to the "Client's" database. The number and percent of "Client" customers located within a 1.5 mile radius from the centroid are thereby determined. The results are shown in Figures 4-13 to 4-15, and in the list below.

Market Penetration Within The Core Trade Area.

- 2004 Alachua County, FL Customers 511/1423 = 35.91% (Figure 4-13).
- 2008 Alachua County, FL Customers 504/1459 = 34.54% (Figure 4-14).
- 2004+2008 Alachua County, FL Customers 216/645 = 33.49% (Figure 4-15).

(Based upon the number of customers within 1.5 miles from the client's location, divided by the total number of client's customers within Alachua County, Florida.)

This list reveals that the customer capture rate is constant, with the difference in percentage within the core trade area from 2004 to 2008 changing by only 1.37%.

During the five year period covered by this study, there were eight new retail market/service provider outlet stores that appeared on the landscape. This was determined by using BellSouth’s The Real Yellow Pages Gainesville, Florida phonebook from 2004 (32 competitor listings) and 2008 (43 competitor listings), obtaining the addresses of competitor locations, creating a spreadsheet of these locations, geocoding those addresses, and plotting each location on the map using GIS. The appearance of these eight new competitor locations are important because of the uncertainty that they introduce to the existing business equilibrium and the potential impact on current customer strength through cannibalization and market penetration. Figures 4-16 to 4-24 show the number and percent of the Client’s customer dataset captured within a 1.5 mile radius from all eight new competitors (Figure 4-16) and each new competitor location (Figure 4-17 to 4-24). In no particular order, new competitor 1 through 8 potential impact by customer capture revealed in the following list:
New Competitor Location Analysis.

- All eight new competitor locations appearing from 2004 to 2008, Alachua County, FL Customer capture 326/1459 = 22.34% (Figure 4-16).

- New competitor location number 1 appearing from 2004 to 2008, Alachua County, FL No Customer capture 0/1459 = 0% (Figure 4-17).

- New competitor location number 2 appearing from 2004 to 2008, Alachua County, FL Customer capture 13/1459 = 0.89% (Shared buffer trade area with new competitor 3) (Figure 4-18).

- New competitor location number 3 appearing from 2004 to 2008, Alachua County, FL Customer capture 14/1459 = 0.96% (Shared buffer trade area with new competitor 2) (Figure 4-19).

- New competitor location number 4 appearing from 2004 to 2008, Alachua County, FL Customer capture 68/1459 = 4.66% (Shared buffer trade area with new competitor 5) (Figure 4-20).

- New competitor location number 5 appearing from 2004 to 2008, Alachua County, FL Customer capture 150/1459 = 10.28% (Shared buffer trade area with new competitor 4) (Figure 4-21).

- New competitor location number 6 appearing from 2004 to 2008, Alachua County, FL Customer capture 87/1459 = 5.96% (Figure 4-22).

- New competitor location number 7 appearing from 2004 to 2008, Alachua County, FL Customer capture 6/1459 = 0.41% (Figure 4-23).

- New competitor location number 8 appearing from 2004 to 2008, Alachua County, FL Customer capture 39/1459 = 2.67% (Figure 4-24).

Additionally, during the five year period covered by this study, there were four existing retail market/service provider outlet stores that moved, changing their physical location within the landscape. This was determined by using BellSouth’s *The Real Yellow Pages* Gainesville, Florida phonebook from 2004 and 2008, obtaining the addresses of competitor locations, creating a spreadsheet of these locations, geocoding those addresses, and plotting each location on the map using GIS. The movement of these four existing competitor locations is important because of the uncertainty that they
introduce to the existing business equilibrium and the potential impact on current customer strength through cannibalization and market penetration. These moving competitor locations are more important than the new outlets because they have a customer base and could increase the market penetration. The following list depicts the number and percent of the Client’s customer dataset captured within a 1.5 mile radius of each moving competitor location for 2004 and 2008 listed first through fourth:

**Existing Competitor Change in Location Analysis**

- First moving competitor appearing from 2004 to 2008, (2004 Location) Alachua County, FL Customer capture 451/1423=31.69% of 2004 customers, 444/1459=30.43% of 2008 customers (Figure 4-25).
- First moving competitor appearing from 2004 to 2008, (2008 Location) Alachua County, FL Customer captured 69/1459 = 30.43% of 2008 customers (Figure 4-26).
- Second moving competitor appearing from 2004 to 2008, (2004 Location) Alachua County, FL Customer captured 67/1423 = 4.71% of 2004 customers and 65/1459 = 4.46% of 2008 customers (Figure 4-27).
- Second moving competitor appearing from 2004 to 2008, (2008 Location) Alachua County, FL Customer captured 63/1459 = 4.32% of 2008 customers (Figure 4-28).
- Third moving competitor appearing from 2004 to 2008, (2004 Location) Alachua County, FL Customer captured 345/1423=24.24% of 2004 customers, 367/1459=25.15% of 2008 customers (Figure 4-29).
- Third moving competitor appearing from 2004 to 2008, (2008 Location) Alachua County, FL Customer captured 346/1459 = 23.71% of 2008 customers (Figure 4-30).
- Fourth moving competitor appearing from 2004 to 2008, (2004 Location) Alachua County, FL Customer captured 67/1423=4.71% of 2004 customers, 65/1459=4.46% of 2008 customers (Figure 4-31).
- Fourth moving competitor appearing from 2004 to 2008, (2008 Location) Alachua County, FL Customer captured 477/1459 = 32.69% of 2008 customers (Figure 4-32).
The results of an analysis of the competitor’s moving physical outlet store location from 2004 to 2008 revealed that the First competitor moved to a more distant location and lost market penetration influence on the Client’s customer base. The Second and Third competitor’s had very little location change and, therefore, had very little change in market penetration influence on the Client’s customer base, remaining at consistent potential capture levels. The Fourth competitor moved closer to the Client’s location from 2004 to 2008, significantly increasing potential market penetration influence and could be a future threat to potential customer capture levels.

**The Grid Method**

The next method of analysis was to apply a 1 x 1 and then a 1.5 x 1.5 mile grid layer that covered Alachua County. The two different sized grid cells are used to detect existence of MAUP. The respective data layer was then combined with the 2004 and 2008 customer datasets using the overlay function. The cells with customer data were selected and exported as an individual layer to be used in the analysis and creation of the choropleth maps (Figures 4-33 to 4-47). The choropleth maps were created using the Jenks Method consisting of natural breaks and classified into five distinct classes. Each breaking point threshold by class was then rounded to a nearest whole number and applied to other similar category choropleth maps showing different year group data results.
Figure 4-1. Data manipulation and methods flow chart.
Figure 4-2. Alachua county customers 2004 directional distribution (standard deviational ellipse).
Figure 4-3. Alachua county customers 2004 standard distance.
2008 Customers in Alachua County Directional Distribution (Standard Deviational Ellipse)

Figure 4-4. Alachua county customers 2008 directional distribution (standard deviational ellipse).
Figure 4-5. Alachua county customers 2008 standard distance.
2004+2008 Customers in Alachua County Directional Distribution (Standard Deviational Ellipse)

Figure 4-6. Alachua county customers 2004+2008 directional distribution (standard deviational ellipse).
Figure 4-7. Alachua county customers 2004+2008 standard distance.
Figure 4-8. Alachua county customer growth and decay zones overlay of the directional distribution (standard deviational ellipse) polygons by dataset year group.
2004 and 2008 Customers in Alachua County Directional Distribution (Standard Deviational Ellipse) Symmetrical Difference

Figure 4-9. 2004 and 2008 Customers in Alachua County, FL. directional distribution (standard deviation ellipse), symmetrical difference overlay.
Figure 4-10. Alachua county customer growth and decay zones overlay of the standard distance polygons by dataset year group.
Figure 4-11. 2004 and 2008 Customers in Alachua County, FL. Standard distance, symmetrical difference overlay.
Figure 4-12. 2008 Publix supermarket locations (1.5 mile buffer).
Figure 4-13. 2004 Alachua county customers within 1.5 miles of the centroid.

Figure 4-14. 2008 Alachua county customers within 1.5 miles of the centroid.
Figure 4-15. 2004+2008 Alachua county customers within 1.5 miles of the centroid.

Figure 4-16. 2004+2008 All eight new competitor locations appearing from 2004.
Figure 4-17. New competitor location number 1 appearing from 2004 to 2008.

Figure 4-18. New competitor location number 2 appearing from 2004 to 2008.
Figure 4-19. New competitor location number 3 appearing from 2004 to 2008.

Figure 4-20. New competitor location number 4 appearing from 2004 to 2008.
Figure 4-21. New competitor location number 5 appearing from 2004 to 2008.

Figure 4-22. New competitor location number 6 appearing from 2004 to 2008.
Figure 4-23. New competitor location number 7 appearing from 2004 to 2008.

Figure 4-24. New competitor location number 8 appearing from 2004 to 2008.
Figure 4-25. First moving competitor appearing from 2004 to 2008, (2004 location).

Figure 4-26. First moving competitor appearing from 2004 to 2008, (2008 location).
Figure 4-27. Second moving competitor appearing from 2004 to 2008, (2004 location).

Figure 4-28. Second moving competitor appearing from 2004 to 2008, (2008 location).
Figure 4-29. Third moving competitor appearing from 2004 to 2008, (2004 location).

Figure 4-30. Third moving competitor appearing from 2004 to 2008, (2008 location).
Figure 4-31. Fourth moving competitor appearing from 2004 to 2008, (2004 location).

Figure 4-32. Fourth moving competitor appearing from 2004 to 2008, (2008 location).
1x1 Mile Grid Overlay Choropleth Map
2004 Total Revenue in Alachua County, Florida

Figure 4-33. 2004 Total revenue (dollars), 1x1 mile grid cell.
Figure 4-34. 2008 Total revenue (dollars), 1x1 mile grid cell.
Figure 4-35. 2004 Average revenue per transaction (dollars), 1x1 mile grid cell.
1x1 Mile Grid Overlay Choropleth Map
2008 Average Revenue per Transaction
Alachua County, Florida

Figure 4-36. 2008 Average revenue per transaction (dollars), 1x1mile grid cell.
Figure 4-37. 2004 Number of transactions, 1x1 mile grid cell.
Figure 4-38. 2008 Number of transactions, 1x1 mile grid cell.
Figure 4-39. 2004 Number of customers, 1x1 mile grid cell.
1x1 Mile Grid Overlay Choropleth Map
2008 Customers in Alachua County, Florida

Figure 4-40. 2008 Number of customers, 1x1 mile grid cell.
Figure 4-41. Total revenue change from 2004 to 2008, 1x1 mile grid cell.
Figure 4-42. Total revenue change from 2004 to 2008, 1.5x1.5 mile grid cell.
Figure 4-43. 1x1 Mile grid cell coordinate plane.

Figure 4-44. 1x1 Mile grid cell overlay offset method.
Figure 4-45. Total revenue change from 2004 to 2008, 1x1 mile grid cell (first foci, origin).
Figure 4-46. Total revenue change from 2004 to 2008, 1x1 mile grid cell (second foci, ¼ mile offset).
Figure 4-47. Total revenue change from 2004 to 2008, 1x1 mile grid cell (third foci, ½ mile offset).
CHAPTER 5
TRADE AREA ALGORITHM

A layer of same-sized grid cells are used as a container for data within each cell’s area, with the added benefit that geography is held constant. The grid provides a static visual display of the dataset year group values applied across the landscape in an area that maintains a consistent level of geospatial parity. Placing dataset year groups in a grid and comparing the results of the mapped areas together reveal the dynamic geotemporal change in phenomena being studied. An example of a dynamic geotemporal application of unemployment rates by county throughout the nation, (http://cohort11.americanobserver.net/latoyaegwuekwe/multimediafinal.html), can be seen in the example created by Latoya Egwuekwe. In Egwuekwe’s geotemporal study, Bureau of Labor Statistics’ monthly unemployment statistics from January 2007 to December 2009 are displayed by country. While Egwuekwe’s geotemporal "movie" is visually appealing, the interpretation of the space-time trend is biased because geography is not held constant - each county has a different size and shape. The larger the county, the greater is the inferred visual weight given to the value of unemployment. Since the unemployment value is calculated as a ratio and reported at the state or county level, it is easy to apply and show these values visually using these arbitrary legal boundaries that are not consistent and often defined by topography. Going a step further, by applying the unemployment values to the centroid of the state or county boundary polygon and then overlaying a grid, the projection and areal weighting inference disparity would be eliminated by using standard area polygons that the grid presents. Application of the grid would also reveal clustering trends and trajectories that would otherwise remain transparent and undetected using dissimilar polygons.
Keeping size and scale constant does not always ensure that statistical analysis of a spatial area will show results that are unbiased. Different areal units can have large impact on the end result of aggregated values. The MAUP is highly sensitive to the direction of investigation (0 to 360 degrees) progression on the landscape, the cell size, the offset distance, and the time frame being studied. Therefore, it is critically important to realize that the depiction of descriptive statistics on a map may not be truly representative of the actual variation of a particular variable displayed across the map as shown.

Application of the grid in conjunction with accepted methodology allows for the spatial variation to become consistent across the landscape. By using a grid size that is appropriate to the study area, the analyst is able to focus on the variable being studied. By keeping geography constant in this way, it allows for the application of other measures to identify significant occurrences of trends and phenomena.

The calculated statistics by grid cell category can be found in Table 5-1 through Table 5-6, and are summarized by approximate calculated arithmetic mean in the following list:

- 1x1 Mile Grid, Total Revenue Change (Table 5-1), $203 per cell.
- 1x1 Mile Grid, Average Revenue Change (Table 5-2), $52 per cell.
- 1x1 Mile Grid, Customer Count Change (Table 5-3), 0.429 per cell.
- 1x1 Mile Grid, Transaction Change (Table 5-4), 0.273 per cell.
- 1.5x1.5 Mile Grid, Total Revenue Change (Table 5-5), 115 per cell.
- 1x1 Mile Grid, Total Revenue Change (Table 5-6), Foci 1 $20 per cell.
- 1x1 Mile Grid, Total Revenue Change (Table 5-6), Foci 2 $75 per cell.
- 1x1 Mile Grid, Total Revenue Change (Table 5-6), Foci 3 $130 per cell.

Figures 4-41 and 4-42 show how the Total Revenue values change on a choropleth map when applied across a 1 x 1 mile grid cell overlay and a 1.5 x 1.5 mile grid cell overlay respectively. The values are clearly dependent upon grid cell size as
their importance becomes more diffused (Figure 4-41) or less diffused (Figure 4-42) with areal change. This can be problematic as the proper areal size adjustment of a grid cell can serve to either highlight or bypass noteworthy clusters as shown in different grid cell overlay sizes.

Figure 4-43 is a depiction of the coordinate plane where the X and Y axes emanate from an origin dividing the grid plane into four quadrants. Figure 4-44 shows how the grid overlay was shifted from the origin into the first quadrant using a direction of 45 degrees and a distance of ¼ and ½ mile. Figure 4-45 is a choropleth map showing total revenue values across a 1 x 1 mile grid overlay, with the First foci lower left grid cell co-located at the origin. Figure 4-46 is a choropleth map showing Total Revenue values across a 1 x 1 mile grid overlay, with the Second foci lower left grid cell located a ¼ mile distance and 45 degrees from the origin. Figure 4-47 is a choropleth map showing total revenue values across a 1 x 1 mile grid overlay, with the Third foci lower left grid cell located a ½ mile distance and 45 degrees from the origin. The choropleth map clearly shows how small changes in distance and direction impact the values represented by the choropleth map. The Second foci (Figure 4-46) has a similar spatial distribution to the First foci (Figure 4-45), but the Third foci (Figure 4-47) has a distinctly different appearance with clustered neighborhoods dominated by the middle range of values.

The Hot Spot Analysis tool calculates the Getis-Ord Gi* statistic for each feature in a weighted set of features. The Gi* statistic tells you whether features with high values or features with low values tend to cluster in a study area with the output being a Z score for each feature which represents the statistical significance of clustering for a
specified distance. This method works by looking at each feature within the context of neighboring features. If a feature's value is high, and the values for all of its neighboring features is also high, it is a part of a hot spot. The higher (or lower) the Z score, the stronger the association. For statistically significant positive Z scores, the larger the Z score, the more intense the clustering of high values. For statistically significant negative Z scores, the smaller the Z score, the more intense the clustering of low values. A Z score near zero indicates no apparent concentration (neighbors have a range of values). The local sum for a feature and its neighbors is compared proportionally to the sum of all features; when the local sum is much different than the expected local sum, and that difference is too large to be the result of random chance, a statistically significant Z score is the result. The use of this statistical method reveals the presence of neighborhoods that are saturated and others that could be mined using more robust marketing applications.

The Hot Spot Analysis (Getis-Ord Gi*) choropleth map values were created using a fixed distance band and a Euclidean distance. The Local G statistics are used to test for spatial clustering in group-level data making it possible to assess the spatial association of a variable within a particular distance of each observation. The spatial clusters show areas with high and low attribute values graphically within the choropleth overlay layer. The 1 x 1 mile grid cell overlay (Figure 5-1) of the Hot Spot Analysis choropleth map clearly shows a more diverse spatial distribution than the 1.5 x 1.5 mile grid cell overlay (Figure 5-2) which appears to become more spatially diffused with small area clusters disappearing and values approaching equivalence.
The Hot Spot Analysis of the 1 x 1 grid cell overlay choropleth maps shows a distinct cluster of cells, with values less than -2.58 standard deviations, appearing in the Second foci (Figure 5-4) spatial distribution that can be described as a submarket. In the application of dynamic gridding shown here, there was still an instance where a submarket was revealed through this process and identifies the existence of tapestry clusters (Appendix A). There are a total of 26 cells in this category submarket with the majority of cells labeled by the College Towns tapestry (7 cells), Prosperous Empty Nesters (5 cells), Enterprising Professionals (2 cells), and In Style (2 cells). The remaining 10 cells from this submarket each garnered enough weight to warrant an individual tapestry label not mentioned above. This submarket cluster did not appear in either the First foci (Figure 5-3) or the Third foci (Figure 5-5) spatial distribution choropleth maps, whose values appeared to be much more closely distributed to each other spatially.
<table>
<thead>
<tr>
<th></th>
<th>Total Revenue 2004</th>
<th>Total Revenue 2008</th>
<th>Total Revenue Change</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>N of Cases</strong></td>
<td>161</td>
<td>161</td>
<td>161</td>
</tr>
<tr>
<td><strong>Minimum</strong></td>
<td>0</td>
<td>0</td>
<td>-3,074.11</td>
</tr>
<tr>
<td><strong>Maximum</strong></td>
<td>3,103.61</td>
<td>6,986.81</td>
<td>3,998.20</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>3,103.61</td>
<td>6,986.81</td>
<td>7,072.31</td>
</tr>
<tr>
<td><strong>Sum</strong></td>
<td>71,921.23</td>
<td>104,639.82</td>
<td>32,718.59</td>
</tr>
<tr>
<td><strong>Median</strong></td>
<td>228.32</td>
<td>388.57</td>
<td>90.04</td>
</tr>
<tr>
<td><strong>Arithmetic Mean</strong></td>
<td>446.716</td>
<td>649.937</td>
<td>203.221</td>
</tr>
<tr>
<td><strong>Standard Error of Arithmetic Mean</strong></td>
<td>47.373</td>
<td>66.429</td>
<td>68.248</td>
</tr>
<tr>
<td><strong>95.0% Lower Confidence Limit</strong></td>
<td>353.158</td>
<td>518.746</td>
<td>68.439</td>
</tr>
<tr>
<td><strong>95.0% Upper Confidence Limit</strong></td>
<td>540.273</td>
<td>781.127</td>
<td>338.003</td>
</tr>
<tr>
<td><strong>Trimmed Mean (10%, Two Sided)</strong></td>
<td>325.096</td>
<td>484.932</td>
<td>148.415</td>
</tr>
<tr>
<td><strong>No. of Observations Trimmed Out</strong></td>
<td>34</td>
<td>34</td>
<td>34</td>
</tr>
<tr>
<td><strong>Standard Deviation</strong></td>
<td>601.101</td>
<td>842.888</td>
<td>865.964</td>
</tr>
<tr>
<td><strong>Variance</strong></td>
<td>361,321.97</td>
<td>710,459.51</td>
<td>749,894.46</td>
</tr>
<tr>
<td><strong>Coefficient of Variation</strong></td>
<td>1.346</td>
<td>1.297</td>
<td>4.261</td>
</tr>
<tr>
<td><strong>Skewness(G1)</strong></td>
<td>2.18</td>
<td>3.61</td>
<td>0.682</td>
</tr>
<tr>
<td><strong>Standard Error of Skewness</strong></td>
<td>0.191</td>
<td>0.191</td>
<td>0.191</td>
</tr>
<tr>
<td><strong>Kurtosis(G2)</strong></td>
<td>5.784</td>
<td>20.546</td>
<td>4.58</td>
</tr>
<tr>
<td><strong>Standard Error of Kurtosis</strong></td>
<td>0.38</td>
<td>0.38</td>
<td>0.38</td>
</tr>
<tr>
<td><strong>Shapiro-Wilk Statistic</strong></td>
<td>0.742</td>
<td>0.67</td>
<td>0.892</td>
</tr>
<tr>
<td><strong>Shapiro-Wilk p-value</strong></td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Anderson-Darling Statistic</strong></td>
<td>11.541</td>
<td>12.81</td>
<td>5.657</td>
</tr>
<tr>
<td><strong>Adjusted Anderson-Darling Statistic</strong></td>
<td>11.595</td>
<td>12.87</td>
<td>5.684</td>
</tr>
<tr>
<td><strong>p-value</strong></td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>
Table 5-2. Average revenue statistics (1x1 mile grid cell overlay).

<table>
<thead>
<tr>
<th>1x1 Mile Grid</th>
<th>Average Revenue 2004</th>
<th>Average Revenue 2008</th>
<th>Average Revenue Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>N of Cases</td>
<td>161</td>
<td>161</td>
<td>161</td>
</tr>
<tr>
<td>Minimum</td>
<td>0</td>
<td>0</td>
<td>-243.14</td>
</tr>
<tr>
<td>Maximum</td>
<td>341.74</td>
<td>696.51</td>
<td>640.41</td>
</tr>
<tr>
<td>Range</td>
<td>341.74</td>
<td>696.51</td>
<td>883.55</td>
</tr>
<tr>
<td>Sum</td>
<td>10,900.25</td>
<td>19,237.22</td>
<td>8,336.98</td>
</tr>
<tr>
<td>Median</td>
<td>60.147</td>
<td>97.897</td>
<td>33.445</td>
</tr>
<tr>
<td>Arithmetic Mean</td>
<td>67.703</td>
<td>119.486</td>
<td>51.782</td>
</tr>
<tr>
<td>Standard Error of Arithmetic Mean</td>
<td>5.47</td>
<td>8.3</td>
<td>9.094</td>
</tr>
<tr>
<td>95.0% Lower Confidence Limit</td>
<td>56.9</td>
<td>103.095</td>
<td>33.823</td>
</tr>
<tr>
<td>95.0% Upper Confidence Limit</td>
<td>78.506</td>
<td>135.877</td>
<td>69.741</td>
</tr>
<tr>
<td>Trimmed Mean (10%, Two Sided)</td>
<td>57.094</td>
<td>102.995</td>
<td>39.413</td>
</tr>
<tr>
<td>No. of Observations Trimmed Out</td>
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<td>34</td>
<td>34</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>69.408</td>
<td>105.312</td>
<td>115.385</td>
</tr>
<tr>
<td>Variance</td>
<td>4,817.44</td>
<td>11,090.71</td>
<td>13,313.67</td>
</tr>
<tr>
<td>Coefficient of Variation</td>
<td>1.025</td>
<td>0.881</td>
<td>2.228</td>
</tr>
<tr>
<td>Skewness(G1)</td>
<td>1.541</td>
<td>2.432</td>
<td>1.787</td>
</tr>
<tr>
<td>Standard Error of Skewness</td>
<td>0.191</td>
<td>0.191</td>
<td>0.191</td>
</tr>
<tr>
<td>Kurtosis(G2)</td>
<td>3.364</td>
<td>8.503</td>
<td>6.24</td>
</tr>
<tr>
<td>Standard Error of Kurtosis</td>
<td>0.38</td>
<td>0.38</td>
<td>0.38</td>
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<tr>
<td>Shapiro-Wilk Statistic</td>
<td>0.845</td>
<td>0.79</td>
<td>0.865</td>
</tr>
<tr>
<td>Shapiro-Wilk p-value</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Anderson-Darling Statistic</td>
<td>5.289</td>
<td>7.295</td>
<td>5.209</td>
</tr>
<tr>
<td>Adjusted Anderson-Darling Statistic</td>
<td>5.315</td>
<td>7.329</td>
<td>5.234</td>
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<tr>
<td>p-value</td>
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<td>&lt;0.01</td>
<td>&lt;0.01</td>
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<tr>
<td>1x1 Mile Grid</td>
<td>Customer Count 2004</td>
<td>Customer Count 2008</td>
<td>Customer Count Change</td>
</tr>
<tr>
<td>-----------------------</td>
<td>---------------------</td>
<td>---------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>N of Cases</td>
<td>161</td>
<td>161</td>
<td>161</td>
</tr>
<tr>
<td>Minimum</td>
<td>0</td>
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<td>-16</td>
</tr>
<tr>
<td>Maximum</td>
<td>109</td>
<td>115</td>
<td>14</td>
</tr>
<tr>
<td>Range</td>
<td>109</td>
<td>114</td>
<td>30</td>
</tr>
<tr>
<td>Sum</td>
<td>1,390.00</td>
<td>1,459.00</td>
<td>69</td>
</tr>
<tr>
<td>Median</td>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Arithmetic Mean</td>
<td>8.634</td>
<td>9.062</td>
<td>0.429</td>
</tr>
<tr>
<td>Standard Error of Arithmetic Mean</td>
<td>1.329</td>
<td>1.347</td>
<td>0.274</td>
</tr>
<tr>
<td>95.0% Lower Confidence Limit</td>
<td>6.008</td>
<td>6.401</td>
<td>-0.112</td>
</tr>
<tr>
<td>95.0% Upper Confidence Limit</td>
<td>11.259</td>
<td>11.723</td>
<td>0.969</td>
</tr>
<tr>
<td>Trimmed Mean (10%, Two Sided)</td>
<td>4.472</td>
<td>4.591</td>
<td>0.331</td>
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<tr>
<td>No. of Observations Trimmed Out</td>
<td>34</td>
<td>34</td>
<td>34</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>16.866</td>
<td>17.097</td>
<td>3.473</td>
</tr>
<tr>
<td>Variance</td>
<td>284.459</td>
<td>292.296</td>
<td>12.059</td>
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<tr>
<td>Coefficient of Variation</td>
<td>1.954</td>
<td>1.887</td>
<td>8.103</td>
</tr>
<tr>
<td>Skewness(G1)</td>
<td>3.7</td>
<td>3.59</td>
<td>0.229</td>
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<tr>
<td>Standard Error of Skewness</td>
<td>0.191</td>
<td>0.191</td>
<td>0.191</td>
</tr>
<tr>
<td>Kurtosis(G2)</td>
<td>16.15</td>
<td>15.436</td>
<td>5.586</td>
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<td>Standard Error of Kurtosis</td>
<td>0.38</td>
<td>0.38</td>
<td>0.38</td>
</tr>
<tr>
<td>Shapiro-Wilk Statistic</td>
<td>0.529</td>
<td>0.521</td>
<td>0.849</td>
</tr>
<tr>
<td>Shapiro-Wilk p-value</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Anderson-Darling Statistic</td>
<td>25.074</td>
<td>27.196</td>
<td>8.831</td>
</tr>
<tr>
<td>Adjusted Anderson-Darling Statistic</td>
<td>25.193</td>
<td>27.325</td>
<td>8.873</td>
</tr>
<tr>
<td>p-value</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>
Table 5-4. Transaction statistics (1x1 mile grid cell overlay).

<table>
<thead>
<tr>
<th>1x1 Mile Grid</th>
<th>Transactions 2004</th>
<th>Transaction 2008</th>
<th>Transaction Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>N of Cases</td>
<td>161</td>
<td>161</td>
<td>161</td>
</tr>
<tr>
<td>Minimum</td>
<td>0</td>
<td>0</td>
<td>-33</td>
</tr>
<tr>
<td>Maximum</td>
<td>44</td>
<td>29</td>
<td>24</td>
</tr>
<tr>
<td>Range</td>
<td>44</td>
<td>29</td>
<td>57</td>
</tr>
<tr>
<td>Sum</td>
<td>847</td>
<td>891</td>
<td>44</td>
</tr>
<tr>
<td>Median</td>
<td>3</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Arithmetic Mean</td>
<td>5.261</td>
<td>5.534</td>
<td>0.273</td>
</tr>
<tr>
<td>Standard Error of Arithmetic Mean</td>
<td>0.55</td>
<td>0.442</td>
<td>0.57</td>
</tr>
<tr>
<td>95.0% Lower Confidence Limit</td>
<td>4.175</td>
<td>4.662</td>
<td>-0.853</td>
</tr>
<tr>
<td>95.0% Upper Confidence Limit</td>
<td>6.347</td>
<td>6.406</td>
<td>1.4</td>
</tr>
<tr>
<td>Trimmed Mean (10%, Two Sided)</td>
<td>3.756</td>
<td>4.48</td>
<td>0.583</td>
</tr>
<tr>
<td>No. of Observations Trimmed Out</td>
<td>34</td>
<td>34</td>
<td>34</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>6.977</td>
<td>5.602</td>
<td>7.239</td>
</tr>
<tr>
<td>Variance</td>
<td>48.682</td>
<td>31.388</td>
<td>52.4</td>
</tr>
<tr>
<td>Coefficient of Variation</td>
<td>1.326</td>
<td>1.012</td>
<td>26.487</td>
</tr>
<tr>
<td>Skewness(G1)</td>
<td>2.182</td>
<td>1.997</td>
<td>-0.753</td>
</tr>
<tr>
<td>Standard Error of Skewness</td>
<td>0.191</td>
<td>0.191</td>
<td>0.191</td>
</tr>
<tr>
<td>Kurtosis(G2)</td>
<td>6.37</td>
<td>4.475</td>
<td>4.019</td>
</tr>
<tr>
<td>Standard Error of Kurtosis</td>
<td>0.38</td>
<td>0.38</td>
<td>0.38</td>
</tr>
<tr>
<td>Shapiro-Wilk Statistic</td>
<td>0.748</td>
<td>0.784</td>
<td>0.927</td>
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<tr>
<td>Shapiro-Wilk p-value</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Anderson-Darling Statistic</td>
<td>12.003</td>
<td>9.769</td>
<td>3.403</td>
</tr>
<tr>
<td>Adjusted Anderson-Darling Statistic</td>
<td>12.06</td>
<td>9.816</td>
<td>3.419</td>
</tr>
<tr>
<td>p-value</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>
### Table 5-5. Total revenue statistics (1.5x1.5 mile grid cell overlay).

<table>
<thead>
<tr>
<th></th>
<th>Total Revenue 2004</th>
<th>Total Revenue 2008</th>
<th>Total Revenue Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>N of Cases</td>
<td>128</td>
<td>128</td>
<td>128</td>
</tr>
<tr>
<td>Minimum</td>
<td>0</td>
<td>0</td>
<td>-3,074.11</td>
</tr>
<tr>
<td>Maximum</td>
<td>3,103.61</td>
<td>5,130.88</td>
<td>4,094.81</td>
</tr>
<tr>
<td>Range</td>
<td>3,103.61</td>
<td>5,130.88</td>
<td>7,168.92</td>
</tr>
<tr>
<td>Sum</td>
<td>53,694.99</td>
<td>68,438.11</td>
<td>14,743.12</td>
</tr>
<tr>
<td>Median</td>
<td>151.28</td>
<td>293.805</td>
<td>46.955</td>
</tr>
<tr>
<td>Arithmetic Mean</td>
<td>419.492</td>
<td>534.673</td>
<td>115.181</td>
</tr>
<tr>
<td>Standard Error of Arithmetic Mean</td>
<td>54.764</td>
<td>66.592</td>
<td>81.115</td>
</tr>
<tr>
<td>95.0% Lower Confidence Limit</td>
<td>311.124</td>
<td>402.899</td>
<td>-45.332</td>
</tr>
<tr>
<td>95.0% Upper Confidence Limit</td>
<td>527.86</td>
<td>666.447</td>
<td>275.693</td>
</tr>
<tr>
<td>Trimmed Mean (10%, Two Sided)</td>
<td>278.404</td>
<td>373.291</td>
<td>100.17</td>
</tr>
<tr>
<td>No. of Observations Trimmed Out</td>
<td>26</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>619.584</td>
<td>753.406</td>
<td>917.714</td>
</tr>
<tr>
<td>Variance</td>
<td>383,884.47</td>
<td>567,620.99</td>
<td>842,199.22</td>
</tr>
<tr>
<td>Coefficient of Variation</td>
<td>1.477</td>
<td>1.409</td>
<td>7.968</td>
</tr>
<tr>
<td>Skewness(G1)</td>
<td>2.304</td>
<td>2.764</td>
<td>0.42</td>
</tr>
<tr>
<td>Standard Error of Skewness</td>
<td>0.214</td>
<td>0.214</td>
<td>0.214</td>
</tr>
<tr>
<td>Kurtosis(G2)</td>
<td>5.756</td>
<td>11.093</td>
<td>4.148</td>
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<tr>
<td>Standard Error of Kurtosis</td>
<td>0.425</td>
<td>0.425</td>
<td>0.425</td>
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<tr>
<td>Shapiro-Wilk Statistic</td>
<td>0.699</td>
<td>0.703</td>
<td>0.915</td>
</tr>
<tr>
<td>Shapiro-Wilk p-value</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Anderson-Darling Statistic</td>
<td>12.224</td>
<td>10.618</td>
<td>3.659</td>
</tr>
<tr>
<td>Adjusted Anderson-Darling Statistic</td>
<td>12.297</td>
<td>10.681</td>
<td>3.68</td>
</tr>
<tr>
<td>p-value</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>
Table 5-6. Total rev. change stats (1x1 mile grid cell overlay offset foci 1, 2, and 3).

<table>
<thead>
<tr>
<th>1x1 Mile Grid</th>
<th>Total Revenue Change Foci 1</th>
<th>Total Revenue Change Foci 2</th>
<th>Total Revenue Change Foci 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>N of Cases</td>
<td>193</td>
<td>194</td>
<td>183</td>
</tr>
<tr>
<td>Minimum</td>
<td>-2,279.51</td>
<td>-7,333.06</td>
<td>-2,643.91</td>
</tr>
<tr>
<td>Maximum</td>
<td>3,029.86</td>
<td>4,159.85</td>
<td>4,584.89</td>
</tr>
<tr>
<td>Range</td>
<td>5,309.37</td>
<td>11,492.91</td>
<td>7,228.80</td>
</tr>
<tr>
<td>Sum</td>
<td>3,895.04</td>
<td>14,678.11</td>
<td>23,714.39</td>
</tr>
<tr>
<td>Median</td>
<td>10</td>
<td>28.42</td>
<td>0</td>
</tr>
<tr>
<td>Arithmetic Mean</td>
<td>20.182</td>
<td>75.66</td>
<td>129.587</td>
</tr>
<tr>
<td>Standard Error of Arithmetic Mean</td>
<td>55.214</td>
<td>82.327</td>
<td>69.213</td>
</tr>
<tr>
<td>95.0% Lower Confidence Limit</td>
<td>-88.721</td>
<td>-86.716</td>
<td>-6.975</td>
</tr>
<tr>
<td>95.0% Upper Confidence Limit</td>
<td>129.085</td>
<td>238.037</td>
<td>266.149</td>
</tr>
<tr>
<td>Trimmed Mean (10%, Two Sided)</td>
<td>27.362</td>
<td>84.49</td>
<td>65.981</td>
</tr>
<tr>
<td>No. of Observations Trimmed Out</td>
<td>40</td>
<td>40</td>
<td>38</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>767.051</td>
<td>1,146.68</td>
<td>936.291</td>
</tr>
<tr>
<td>Variance</td>
<td>588,366.81</td>
<td>1,314,884.45</td>
<td>876,640.35</td>
</tr>
<tr>
<td>Coefficient of Variation</td>
<td>38.008</td>
<td>15.156</td>
<td>7.225</td>
</tr>
<tr>
<td>Skewness(G1)</td>
<td>0.197</td>
<td>-1.298</td>
<td>1.294</td>
</tr>
<tr>
<td>Standard Error of Skewness</td>
<td>0.175</td>
<td>0.175</td>
<td>0.18</td>
</tr>
<tr>
<td>Kurtosis(G2)</td>
<td>3.116</td>
<td>11.417</td>
<td>6.025</td>
</tr>
<tr>
<td>Standard Error of Kurtosis</td>
<td>0.348</td>
<td>0.347</td>
<td>0.357</td>
</tr>
<tr>
<td>Shapiro-Wilk Statistic</td>
<td>0.911</td>
<td>0.82</td>
<td>0.846</td>
</tr>
<tr>
<td>Shapiro-Wilk p-value</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Adjusted Anderson-Darling Statistic p-value</td>
<td>6.388</td>
<td>9.834</td>
<td>9.155</td>
</tr>
<tr>
<td>p-value</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>
Figure 5-1. Total revenue change from 2004 to 2008, hot spot analysis (getis-ord Gi*)
1x1 mile grid cell.
Figure 5-2. Total revenue change from 2004 to 2008, hot spot analysis (getis-ord gi*)
1.5x1.5 mile grid cell
Figure 5-3. Total revenue change from 2004 to 2008, hot spot analysis (getis-ord gi*)
1x1 mile grid cell (first foci, origin).
Figure 5-4. Total revenue change from 2004 to 2008, hot spot analysis (getis-ord Gi*)
1x1 mile grid cell (second foci, 1/4 mile offset).
Figure 5-5. Total revenue change from 2004 to 2008, hot spot analysis (getis-ord Gi*).
1x1 mile grid cell (third foci, 1/2 mile offset).
CHAPTER 6
TRADE AREA CALCULATION: GEODEMOGRAPHICS

The importance of knowing what comprises a customer base and the particular spending habits of those customers cannot be understated. Marketing Geographers utilize selective profiling methods to group customers into classifications based on their consumption history and Tobler’s Law. The commonly accepted terminology of this method of grouping customers by geodemographics is as a Tapestry profile.

When the Geodemographics are studied, the customer base for this particular retail market/service provider reveal the following results by Tapestry:

Top 5 Tapestry groups by customer count comprised 65% and the Top 10 Tapestry groups by customer count comprised 87% of the total customer base in 2004.

- 19.4% were 13-In Style
- 17.8% were 14-Prosperous Empty Nesters
- 11.9% were 7-Exurbanites
- 9.3% were 16-Enterprising Professionals
- 6.5% were 33-Midlife Junction
- 5.9% were 28-Aspiring Young Families
- 5.0% were 63-Dorms to Diplomas
- 4.9% were 26-Midland Crowd
- 4.4% were 55-College Towns
- 2.0% were 46-Rooted Rural

Top 5 Tapestry groups by customer count comprised 66% and the Top 10 Tapestry groups by customer count comprised 88.4% of the total customer base in 2008.

- 20.9% were 13-In Style
- 17.8% were 14-Prosperous Empty Nesters
- 12.5% were 7-Exurbanites
- 8.1% were 16-Enterprising Professionals
- 6.7% were 28-Aspiring Young Families
- 6.0% were 33-Midlife Junction
- 5.6% were 63-Dorms to Diplomas
- 4.6% were 26-Midland Crowd
- 4.2% were College Towns
- 2.0% were Rooted Rural
Top 5 Tapestry groups by customer count comprised 55% of the Alachua County, FL customer base in 2004.

- 18.4% were 13-In Style
- 19.7% were 14-Prosperous Empty Nesters
- 0.0% were 7-Exurbanites
- 10.8% were 16-Enterprising Professionals
- 6.4% were 33-Midlife Junction

Top 5 Tapestry groups by customer count comprised 54% of the Alachua County, FL customer base in 2004.

- 17.7% were 13-In Style
- 19.3% were 14-Prosperous Empty Nesters
- 0.0% were 7-Exurbanites
- 9.6% were 16-Enterprising Professionals
- 7.8% were 28-Aspiring Young Families

The geodemographics show a very consistent overall Tapestry group capture as well as an individual Tapestry group capture as a percent of the total customer base. There is a slight variation among some of the groups, but this is negligible and for the most part, the percent of overall customer Tapestry capture remained constant throughout the five year study period. When we examine the Alachua County, FL customer Tapestry capture, it is interesting to note that the Exurbanites Tapestry group drops to a value of zero for both time periods. This is indicative of a mobile customer Tapestry group coming into Alachua County, FL specifically for this good/service or, if already here, consuming this good/service, but reporting a home address outside of the county. This is typically the case for a University town, such as Gainesville, FL, where students often report their home of record as being collocated with the parent’s address, are the parents themselves visiting their children in college, are alumni visiting for a University event, are snowbirds passing through, or frequent this retail/service provider due to other intangible positive externalities provided only at this location. This is important
because these Exurbanite Tapestry consumers do not live locally, but visit this retail outlet and spend enough to make it into the Top 5 list by customer count.

The individual Tapestry groups were selected from the entire 2008 year group dataset and were used to create the mean center from that group. Recall, from earlier discussion, that the mean center is the gravitational center of a spatially distributed dataset. Figure 6-1 is a choropleth map showing the total revenue change and the Alachua County, FL Tapestry profile group mean center displayed as an overlay. The map indicates that the correlation indicates that the Top 5 Tapestry groups are spending within the mid range of values calculated for total revenue change. For a detailed description of each Tapestry group, refer to Appendix A.
Figure 6-1. Highest percentage tapestry profile group mean center (2008) and total revenue change from 2004 to 2008, 1x1 mile grid cell overlay.
CHAPTER 7
TRADE AREA CALCULATION: FUTURE CONJECTURE

This analysis has demonstrated the importance to Marketing Geography of the geographic object as a container of attribute data. MAUP has been demonstrated to exist with customer data. This thesis is the first to demonstrate MAUP using customer data. The implication is that trade area analyses need to both hold geography constant, and test for the existence of bias attributable to the manner in which geography is held constant.\(^\text{13}\) This should be integral with best business practices, but has not been previously recognized by those practicing marketing geography.

Trade area analysis is affected by MAUP. Because of recent advances in geospatial technology, GIS automation can be used to detect and correct for MAUP. See Figure 7-1. It is technically feasible and pragmatically important to report time sensitive data within the GIS environment. For instance, with an automated process using GIS and an hourly input of consumption data, it is realistic to expect that the computer aided execution of the methods described above will provide high value added to the business decision. However, to minimize visual and statistical bias, the conceptualization of MAUP and the associated algorithmic framework introduced here should be applied; and that application should be executed at various scales with multiple variables. These applications add value to business, and have relevance to other disciplines studying spatially distributed phenomena, such as tracking of infectious disease, package delivery shipments, terrorist threat/incident reporting, watch/no-fly lists, and home sales data. By adding GIS geospatial processes to available data and

\(^{13}\) By the phrase "holding geography constant" I mean the necessity of using same sized and same shaped containers for the geographic data. The containers should be packable leaving no area excluded. The literature on Central Place Theory has discussed similar requirements. For further discussion, see King, L. 1984. *Central Place Theory*, Sage Publications: Beverly Hills, CA.
computer generation efficiency, there is value added to the business decision-making process and the formation of a Common Operating Picture (COP)\textsuperscript{14} that is applicable in “real time”.

\textsuperscript{14}A common operating picture (COP) is a single identical display of relevant (operational) information that facilitates collaborative planning and assists all echelons to achieve situational awareness. Traditionally, headquarters prepares maps electronically with various symbols to show the locations of significant phenomena and other relevant information.
Figure 7-1. Modeling maup flow chart.
CHAPTER 8
TRADE AREA CALCULATION: CONCLUSION

The next step for the work presented in this thesis is to create geospatial mapping software that detects the MAUP variables (time, area, scale, size, shape, direction, distance, offset foci, etc.) and calculates the threshold values that tip the results into MAUP. Ideally, this software would scan the study area applying the created template every 45 degrees (8 directions), through 4 foci offsets, and 3 different grid cell sizes resulting in 96 snapshots of the trade area. Of course, this is purely subjective and would be dependent upon the variables being studied as well as the expertise and judgment of the analyst. The proposed software would incorporate the functionality of GIS, tapestry profiles, and fractal geometry to calculate a potential strength of trade area value that has a marketable identity. “While the issue of scale has been widely examined in various aspects of physical geography, the MAUP has been largely ignored despite its presence in various types of large scale spatial data analysis” (Dark and Bram, 2007). Conceptually, the proposed software would be an integration of existing open-source GIS software and open-source "R" statistical software. As a side note to this conjecture, it would be advantageous to have the tapestry data updated on an annual basis for more real time applications while also having access to historical tapestry data. This thesis points to a direction for further development of the body of business geographic knowledge and procedures; it merely scratches the surface when considering the potential importance of MAUP to the business decision.

This thesis brings to light that traditional business education including education for various professional degrees such as pharmacy and medicine, does not prepare the entrepreneur practitioner to succeed in business. It is essential for entrepreneurs to
realize that cannibalization and market penetration may be difficult to attain in geographic regions in which competitors are already established. New entering competitors might only be able to compete on the basis of price competition or intense advertising which raises costs and lowers profit margins. The bias then is for new entrants to the market to locate in newly developed areas or by providing a good or service previously not offered in the market.

The value of this thesis extends beyond academic contributions. The results of the thesis are also of value to the "Client" who provided the data. Benefits to the "Client" include the provision of a geospatial overview of the Client's trade area, and sensitivity (or non sensitivity) to the dynamics within the trade area. Those dynamics include changing competition and customer change.
APPENDIX
COMMUNITY TAPESTRY SEGMENTATION SUMMARY DESCRIPTIONS

1. Top Rung

*Top Rung* is the wealthiest consumer market, representing less than 1% of all U.S. households. The median household income of $179,000 is three and a half times that of the national median, and the median net worth of $556,400 is more than five times that of the national level. The median home value is approximately $1,014,600. These highly educated residents are in their peak earning years, 45-64, in married-couple households, with or without children. The median age is 42.3 years. With the purchasing power to indulge any choice, *Top Rung* residents travel in style, both domestically and overseas. This is the top market for owning or leasing a luxury car; residents favor new imported vehicles, especially convertibles. Exercise and community activities are part of their busy lifestyle. Avid readers, these residents find time to read two or more daily newspapers and countless books.

2. Suburban Splendor

These successful suburbanites are the epitome of upward mobility, just a couple of rungs below the top, situated in growing neighborhoods of affluent homes, with a median value of $408,100. Most households are comprised of two-income, married-couple families with or without children. The population is well-educated and well employed, with a median age of 40.5 years. Home improvement and remodeling are a main focus of *Suburban Splendor* residents. Their homes feature the latest amenities and reflect the latest in home design. Residents travel extensively in the U.S. and overseas for business and pleasure. Leisure activities include physical fitness, reading,
and visiting museums, or attending the theater. This market is proactive for tracking investments, financial planning, and holding life insurance policies.

3. Connoisseurs

Second in wealth to Top Rung, but first for conspicuous consumption, Connoisseurs residents are well-educated and somewhat older, with a median age of 45.4 years. Although residents appear closer to retirement than child rearing, many of these married couples have children who still live at home. Their neighborhoods tend to be older bastions of affluence where the median home value is $664,500. Growth in these neighborhoods is slow. Residents spend money for nice homes, cars, clothes, and vacations. Exercise is a priority; they work out weekly at a club or other facility, ski, play golf, snorkel, play tennis, practice yoga, and jog. Active in the community, they work for political candidates or parties, write or visit elected officials, and participate in local civic issues.

4. Boomburbs

The newest additions to the suburbs, Boomburbs communities are home to younger families who live a busy, upscale lifestyle. The median age is 33.8 years. This market has the highest population growth, at 4.6% annually, more than four times that of the national figure. The median home value is $308,700, and most households have two workers and two vehicles. This is the top market for households to own projection TVs, MP3 players, scanners, and laser printers, as well as owning or leasing full size SUVs. It’s the second ranked market for owning flat-screen or plasma screen TVs, video game systems, and digital camcorders, as well as owning or leasing minivans. Family vacations are a top priority. Popular vacation destinations are Disney World and
Universal Studios in Florida. For exercise, residents play tennis and golf, ski, and go jogging.

5. Wealthy Seaboard Suburbs

*Wealthy Seaboard Suburbs* neighborhoods are established quarters of affluence, located in coastal metropolitan areas, primarily along the California, New York, New Jersey, and New England coasts. Neighborhoods are older and slow to change, with a median home value that exceeds $444,600. Households consist of married-couple families. Approximately half of employed persons are in management and professional occupations. The median age is 41.7 years. Residents enjoy traveling and shopping. They prefer to shop at Lord & Taylor, Macy’s, and Nordstrom, as well as Costco Wholesale, their favorite club store. They also purchase many items online or by phone. Residents take nice vacations, traveling in the U.S. and abroad. Europe, Hawaii, Atlantic City, Las Vegas, and Disneyland are popular destinations. Leisure activities include going to the beach, skiing, ice skating, and attending theater performances.

6. Sophisticated Squires

*Sophisticated Squires* residents enjoy cultured country living in newer home developments with low density and a median home value of $244,500. These urban escapees are primarily married-couple families, educated, and well-employed. They prefer to commute to maintain their semi-rural lifestyle. The median age is 37.4 years. They do their own lawn and landscaping work, as well as home improvement and remodeling projects, such as installing carpet or hardwood floors, and interior painting. They like to barbeque on their gas grills and make bread with their bread-making machines. This is the top market for owning 3 or more vehicles. Vehicles of choice are
minivans and full size SUVs. Family activities include playing volleyball, bicycling, playing board games and cards, going to the zoo, and attending soccer and baseball games.

7. Exurbanites

Open areas with affluence define these neighborhoods. Empty nesters comprise 40% of these households; married couples with children occupy 32%. Half of the householders are between the ages of 45 and 64 years. The median age is 43.6 years. Approximately half of those who work hold professional or managerial positions. The median home value is approximately $255,900; the median household income is $83,200. Financial health is a priority for the Exurbanites market; they consult with financial planners and track their investments online. They own a diverse investment portfolio, and hold long-term care and substantial life insurance policies. Residents work on their homes, lawns, and gardens. Leisure activities include boating, hiking, kayaking, playing Frisbee, photography, and birdwatching. Many are members of fraternal orders and participate in civic activities.

8. Laptops and Lattes

The most eligible and unencumbered market, Laptops and Lattes residents are affluent, single, and still renting. They are highly educated, professional, and partial to city life, preferring major metropolitan areas such as New York, Los Angeles, San Francisco, Boston, and Chicago. The median household income is $91,000; the median age is 38.1 years. Technologically savvy, this is the top market for owning a laptop or notebook PC; they use the Internet on a daily basis, especially to shop. Their favorite department store, by far, is Banana Republic. Leisure activities include going to the
movies, rock concerts, shows, museums, and nightclubs. These residents exercise regularly and take vitamins. They enjoy yoga, jogging, skiing, reading, watching foreign films on video tape/DVD, dining out, and foreign travel. They embrace liberal philosophies and work for environmental causes.

9. Urban Chic

_Urban Chic_ residents are well-educated professionals living an urban, exclusive lifestyle. Most own expensive single-family homes with a median value of $633,000. Married-couple families and singles comprise most of these households. The median age is 41.4 years. _Urban Chic_ residents travel extensively, visit museums, attend dance performances, play golf, and go hiking. They use the Internet frequently to trade or track investments or to shop, buying concert and sports tickets, clothes, flowers, and books. They appreciate a good cup of coffee while reading a book or newspaper, and prefer to listen to classical music, all-talk, or public radio programs. Civic-minded, they would probably work as volunteers.

10. Pleasant-Ville

Prosperous domesticity distinguishes the settled homes of _Pleasant-Ville_ neighborhoods. Most residents live in single-family homes with a median value of $326,500; approximately half were built in the 1950s and 1960s. Located in the Northeast and California primarily, these households are headed by middle-aged residents, some nearing early retirement. The median age is 39.4 years. Approximately 40% of households include children. Home remodeling is a priority for residents who live in older homes. Shopping choices are eclectic, ranging from upscale department stores,
to warehouse, or club stores. Sports fanatics, they attend ball games, listen to sports programs and games on the radio, and watch a variety of sports on TV.

11. Pacific Heights

*Pacific Heights* neighborhoods are found in the high-rent districts of California and Hawaii. The median home value is approximately $573,600; residents prefer single-family homes or townhomes. This market is small but affluent; one in two households earns approximately $76,000 annually. The median age is 38.4 years. Distance does not deter *Pacific Heights* residents from keeping in touch with family living overseas, as they make frequent phone calls and travel overseas to visit. Many households own 3 or more cell phones. Residents generally visit Disneyland or Las Vegas during the year, and enjoy playing chess, reading history books, and renting classics on DVD to watch on their giant screen or projection TVs. This is the top market for owning an Apple iMac brand PC.

12. Up and Coming Families

*Up and Coming Families* represents the second highest household growth market and with a median age of 31.9 years, the youngest of the affluent family markets. The profile for these neighborhoods is young, affluent families with young children. Approximately half of the households are concentrated in the South, with another half in the West and Midwest. Neighborhoods are located in suburban outskirts of midsized metropolitan areas. The homes are newer, with a median value of $185,500. Because family and home priorities dictate their consumer purchases, they frequently shop for baby and children’s products and household furniture. Leisure activities include playing softball, going to the zoo, and visiting theme parks (generally Sea World or Disney World).
Residents enjoy watching science fiction, comedy, and family-type video tapes or DVDs.

13. In Style

*In Style* residents live in affluent neighborhoods of metropolitan areas. More suburban than urban, they nevertheless embrace an urban lifestyle. Townhome ownership is more than double that of the national level; however, more than half of the households live in traditional single-family homes. Labor force participation is high and professional couples predominate. The median household income is $67,800. Nearly one-third of these households include children. The median age is 39.3 years. *In Style* residents are computer savvy; they use the Internet daily to research information, track investments, or shop. They own a diverse investment portfolio, contribute to retirement savings plans, and hold long-term care and life insurance policies. They enjoy going to the beach, snorkeling, playing golf, casino gambling, and domestic travel.

14. Prosperous Empty Nesters

*Prosperous Empty Nesters* are well-established neighborhoods located throughout the U.S.; approximately one-third are on the eastern seaboard. The median age is 47.2 years. More than half of the householders are aged 55 or older. Approximately 40% of household types are married couples with no children living at home. Educated and experienced, residents are enjoying the lifestage transition from child-rearing to retirement. The median household income is $66,200. Residents place a high value on their physical and financial well-being, and take an active interest in their homes and communities. They travel extensively, both at home and abroad. Leisure activities include refinishing furniture, playing golf, attending sports events, and reading
mysteries. Civic participation includes joining civic clubs, engaging in fundraising, and working as volunteers.

15. Silver and Gold

Silver and Gold residents are the second oldest of the Tapestry segments and the wealthiest seniors, with a median age of 58.5 years; most are retired from professional occupations. Their affluence has allowed them to move to sunnier climates. More than 60% of the households are in the South (mainly in Florida); 25% reside in the West, primarily in California and Arizona. Neighborhoods are exclusive, with a median home value of $326,600 and a high proportion of seasonal housing. Residents enjoy traveling, woodworking, playing cards, birdwatching, target shooting, salt water fishing, and power boating. Golf is more a way of life than a mere leisure pursuit; they play golf, attend tournaments, watch golf on TV, and listen to golf programs on the radio. They are avid readers, but allow time to watch their favorite TV shows and a multitude of news programs.

16. Enterprising Professionals

This fast-growing market is home to young, educated, working professionals, with a median age of 32.4 years. Single or married, they prefer newer neighborhoods with townhomes or apartments. The median household income is $66,000. This segment is ranked second of all the Tapestry markets for labor force participation, at 75%. Their lifestyle reflects their youth, mobility, and growing consumer clout. Residents rely on cell phones and PCs to stay in touch. They use the Internet to find the next job or home, track their investments, and shop. They own the latest electronic gadgets. Leisure activities include yoga, playing Frisbee and football, jogging, going to the movies, and
attending horse races and basketball games. These residents also travel frequently, domestically and overseas.

17. Green Acres

A “little bit country”, Green Acres residents live in pastoral settings of developing suburban fringe areas, mainly in the Midwest and South. The median age is 39.9 years. Married couples with and without children comprise most of the households, live in single-family dwellings. This upscale market has a median household income of $62,300 and a median home value of $179,700. These do-it-yourselfers maintain and remodel their homes, painting, installing carpet, or adding a deck, and own all the necessary tools to accomplish these tasks. They also take care of their lawn and gardens, again with the right tools. Vehicles of choice are motorcycles and full-size pickup trucks. For exercise, residents ride their bikes and go water skiing, canoeing, and kayaking. Other activities include birdwatching, power boating, target shooting, hunting, and attending auto races.

18. Cozy and Comfortable

Cozy and Comfortable residents are settled, married, and still working. Many couples are still living in the pre-1970s, single-family homes in which they raised their children. Households are located primarily in suburban areas of the Midwest, Northeast, and South. The median age is 41.0 years and the median home value is $164,000. Home improvement and remodeling are important to Cozy and Comfortable residents. Although some work is contracted, homeowners take an active part in many projects, especially painting and lawn care. They play softball and golf, attend ice hockey games, watch science fiction films on video tapes/DVDs, and gamble at casinos. Television is
significant; many households have four or more sets. Preferred cable stations include QVC, Home & Garden Television, and The History Channel.

19. Milk and Cookies

*Milk and Cookies* households are comprised mainly of young, affluent married-couple families. Approximately half of the households include children. The median age for this market is 33.5 years. Residents preferred single-family homes in suburban areas, chiefly in the South, particularly in Texas. Smaller concentrations of households are located in the West and Midwest. The median home value is $131,900. Families with two or more workers, more than one child, and two or more vehicles is the norm for this market. Residents are well-insured for the future. The presence of children drives their large purchases of baby and children’s products, and timesavers such as fast food. For fun, residents play video games, chess, backgammon, basketball, and football, or fly kites. Favorite cable channels include Toon Disney, The Discovery Health Channel, ESPNews, and Lifetime Movie Network.

20. City Lights

*City Lights* are diverse neighborhoods, situated primarily in the Northeast. This dense urban market is a mixture of housing, household types, and cultures, sharing the same city walks. Housing types include single-family homes, townhomes, and apartments. Approximately 35% of households are apartments in buildings with two to four units, almost four times the national level. Approximately two-thirds of the housing units were built before 1960. Households include both families and singles. The median age of 37.8 years is slightly older than the U.S. median. *City Lights* residents are more likely to spend for household furnishings than home maintenance. They shop at a variety of

21. Urban Villages

*Urban Villages* neighborhoods are multicultural enclaves of young families, unique to U.S. gateway cities, located primarily in California. The median age is 30.7 years. All family types dominate this market. The average family size of 4.12 is the second highest of all the Tapestry segments. Many households have two wage earners, chiefly employed in the manufacturing, health care, retail trade, construction, and educational services industries. The median household income is $56,200. Most residents own older, single-family homes with a median value of $355,600, and multiple vehicles. Family and home dictate purchases. To maintain their older homes, time and money are spent on home remodeling and repairs. Leisure activities include playing soccer and tennis, renting foreign films, listening to Hispanic and variety radio, and visiting Disneyland, Sea World, or Six Flags.

22. Metropolitans

*Metropolitans* residents favor city living in older neighborhoods. Approximately half of the households are comprised of singles who live alone or with others. However, married-couple families are 40% of the households. The median age is 37.1 years. Half of employed persons hold professional or management positions. These neighborhoods are an eclectic mix of single-family homes and multiunit structures, with a median home value of $194,100. The median household income is $57,600. Residents lead busy, active lifestyles. They travel frequently and participate in numerous civic activities. They
enjoy going to museums and zoos, and listening to classical music and jazz on the radio. Refinishing furniture and playing a musical instrument are favorite hobbies. Exercise includes yoga, roller blading, and hiking/backpacking.

23. Trendsetters

These neighborhoods are located primarily on the West Coast. On the cutting edge of urban style, Trendsetters residents are young, diverse, mobile, educated professionals with substantive jobs. The median age is 35.0 years. More than half of the households are single-person or shared. Most still rent, preferring upscale, multiunit dwellings in older city districts. The median household income is $56,700. Residents are spenders; they shop in stores, online, and via the phone. They own the latest laptop computers, cell phones, and MP3 players, and use the Internet daily. Exercise includes playing tennis, volleyball, baseball, and golf, as well as ice skating, snorkeling, and yoga. Leisure activities include traveling, attending rock concerts, and reading biographies. Residents also enjoy syndicated TV shows such as Access Hollywood and Seinfeld.

24. Main Street, USA

Main Street, USA neighborhoods are a mix of single-family homes and multiunit dwellings, found in the suburbs of smaller metropolitan cities, mainly in the Northeast, West, and Midwest. This market is similar to the U.S. when comparing household type, age, race, educational attainment, housing type, occupation, industry, and household income type distributions. The median age of 36.3 years matches that of the U.S. median. The median household income is a comfortable $51,200. Home homeownership is at 66% and the median home value is $190,200. Active members of the community, residents participate in local civic issues and work as volunteers. They
take care of their lawns and gardens, and work on small home projects. They enjoy
going to the beach and visiting theme parks, as well as playing chess, going bowling or
ice skating, and participating in aerobic exercise.

25. Salt of the Earth
A rural or small town lifestyle best describes the Salt of the Earth market. The median
age is 40.4 years. Labor force participation is higher than the U.S. level and
unemployment is lower. Above-average numbers of employed residents work in the
manufacturing, construction, mining, and agricultural industries. The median household
income is $48,800. Households are dominated by married-couple families who live in
single-family dwellings, with homeownership at 86%. Approximately 28% of the
households own three or more vehicles. Most homes own a truck; many own a
motorcycle. Residents are settled, hardworking, and self-reliant, taking on small home
projects, as well as vehicle maintenance. Families often own two or more pets, usually
dogs or cats. Residents enjoy fishing, hunting, target shooting, attending country music
concerts and auto races, and flying kites.

26. Midland Crowd
Approximately 10.8 million people represent Midland Crowd, Tapestry’s largest market.
The median age of 36.3 years parallels the U.S. median. Most households are
comprised of married-couple families, half with children and half without. The median
household income is $48,200. Housing developments are generally in rural areas
throughout the U.S. (more village or town than farm), mainly in the South. Home
ownership is at 84%. Two-thirds of households are single-family structures; 28% are
mobile homes. This is a somewhat conservative market politically. These do-it-
yourselves take pride in their homes, lawns, and vehicles. Hunting, fishing, and woodworking are favorite pursuits. Pet ownership, especially birds or dogs, is common. Many households have a satellite dish, and TV viewing includes various news programs, as well as shows on CMT and Outdoor Life Network.

27. Metro Renters

*Metro Renters* residents are young (approximately 30% are in their twenties), well-educated singles, beginning their professional careers in some of the largest U.S. cities such as New York City, Chicago, and Los Angeles. The median age is 33.6 years; the median household income is $52,300. As the name *Metro Renters* implies, most residents are renting apartments in high-rise buildings, living alone or with a roommate. Their interests include traveling, reading two or more daily newspapers, listening to classical music and public radio programs, and surfing the Internet. For exercise, they work out regularly at clubs, play tennis and volleyball, practice yoga, ski, and jog. They enjoy dancing, attending rock concerts, going to museums or the movies, and throwing a Frisbee. Painting and drawing are favorite hobbies. Politically, this market is liberal.

28. Aspiring Young Families

*Aspiring Young Families* neighborhoods are located in large, growing metropolitan areas in the South and West, with the highest concentrations in California, Florida, and Texas. Mainly comprised of young, married-couple families or single parents with children, the median age for this segment is 30.4 years. Half of the households are owner-occupied single-family dwellings or townhomes, and half are occupied by renters, many living in newer multiunit buildings. Residents spend much of their discretionary income on baby and children's products and toys, as well as home furnishings. Recent
electronic purchases include cameras and video game systems. Leisure activities include dining out, dancing, going to the movies, attending professional football games, fishing, weight lifting, and playing basketball. Vacations would probably include visits to theme parks. Internet usage mainly involves chat room visits.

29. Rustbelt Retirees

Most Rustbelt Retirees neighborhoods can be found in older, industrial cities, in the Northeast and Midwest, especially in Pennsylvania and other states surrounding the Great Lakes. Households are mainly occupied by married couples with no children and singles who live alone. The median age is 43.8 years. Although many residents are still working, labor force participation is below average. More than 40% of the households receive Social Security benefits. Most residents live in owned, single-family homes, with a median value of $118,500. Unlike many retirees, these residents are not inclined to move. They are proud of their homes and gardens, and participate in community activities. Some are members of veterans’ clubs. Leisure activities include playing bingo, gambling in Atlantic City, going to the horse races, working crossword puzzles, and playing golf.

30. Retirement Communities

Retirement Communities neighborhoods are found mostly in cities scattered across the U.S. The majority of households are multiunit dwellings. Congregate housing, which commonly includes meals and other services in the rent, is a trait of this segment, dominated by singles who live alone. This educated, older market has a median age of 50.7 years. A third of residents are aged 65 years or older. Although the median household income is a modest $45,100, the median net worth is $172,000. Good health
is a priority; residents visit their doctors regularly, diet and exercise, purchase low-sodium food, and take vitamins. They spend their leisure time working crossword puzzles, playing bingo, gardening indoors, canoeing, gambling, and traveling overseas. They like to spend time with their grandchildren and spoil them with toys. Home remodeling projects are usually in the works.

31. Rural Resort Dwellers

Favoring milder climates and pastoral settings, Rural Resort Dwellers live in rural nonfarm areas. These small, growing communities mainly consist of single-family and mobile homes, with a significant inventory of seasonal housing. This somewhat older market has a median age of 46.0 years. Most households consist of married-couples with no children living at home or singles who live alone. A higher than average proportion of residents are self-employed and work from home. The median household income is $45,600. Modest living and simple consumer tastes describe this market. The rural setting calls for more riding lawn mowers and satellite dishes. Lawn maintenance and gardening is a priority, and households own a plethora of tools and equipment. Many households own or lease a truck. Residents enjoy boating, hunting, fishing, snorkeling, canoeing, and listening to country music.

32. Rustbelt Traditions

Rustbelt Traditions neighborhoods are the backbone of older, industrial cities in states bordering the Great Lakes. Most employed residents work in the service, manufacturing, and retail trade industries. Most residents own and live in modest single-family homes that have a median value of $97,000. Households are primarily a mix of married-couple families, single-parent families, and singles who live alone. The median
age is 35.9 years; the median household income is $45,300. Residents prefer to use a 
credit union and invest in certificates of deposit. They use coupons regularly, especially 
at Sam’s Club, work on home remodeling or improvement projects, and buy domestic 
vehicles. Favorite leisure activities include hunting, bowling, fishing, and attending auto 
races, country music shows, and ice hockey games (in addition to listening to games on 
the radio).

33. Midlife Junction

Midlife Junction communities are found in suburbs across the country. Residents are 
phasing out of their child-rearing years. Approximately half of the households are 
comprised of married-couple families; 31% are singles who live alone. The median age 
is 40.5 years; the median household income is $43,600. A third of the households 
receive Social Security benefits. Nearly two-thirds of the households are single-family 
structures; most of the remaining dwellings are apartments in multiunit buildings. These 
residents live quiet, settled lives. They spend their money prudently and do not 
succumb to fads. They prefer to shop by mail or phone from catalogs such as J.C. 
Penney, L.L. Bean, and Lands’ End. They enjoy yoga, attending country music concerts 
and auto races, refinishing furniture, and reading romance novels.

34. Family Foundations

Family is the cornerstone of life in Family Foundations communities. A family mix of 
made couples, single parents, grandparents, and young and adult children populate 
these small, urban neighborhoods, located in large metropolitan areas, primarily in the 
South and Midwest. This market represents stability. Hardly any household growth has 
ocurred since 2000; these neighborhoods experience little turnover. The median age is
38.1 years; the median household income is $42,100. Most households are single-family structures, built before 1970, occupied by owners. Many residents are members of church boards or religious clubs, and participate in fundraising. Basketball is a favorite sport; residents play it, attend professional games, watch games on TV, and listen to games on the radio. They watch court TV shows, sports, and news programs on TV, and listen to gospel, urban, and jazz radio formats.

35. International Marketplace

Located primarily in cities in coastal gateway states, International Marketplace neighborhoods are developing urban markets with a rich blend of cultures and household types. Approximately 70% of households are occupied by families. Married-couples with children and single parents with children represent 44% of households. A typical family rents an apartment in an older, multiunit structure. Most of the households are located in California and Northeastern states. The median age is 30.4 years and the median household income is $42,600. Top purchases include groceries and children’s clothing. Residents shop at stores such as Marshalls and Costco Wholesale, but for convenience, they stop at AM/PM or 7-Eleven. They are loyal listeners of Hispanic radio programs, and prefer to watch movies and sports on TV.

36. Old and Newcomers

Old and Newcomers neighborhoods are in transition, populated by those who are starting their careers, or are retiring. The proportion of householders in their twenties or aged 75 years or older is higher than the national level. The median age is 36.6 years. Spread throughout metropolitan areas of the U.S., these neighborhoods have more single-person and shared households than families. Many residents have moved in the
last five years. Approximately 60% of households are occupied by renters; approximately half live in mid-rise or high-rise buildings. Residents have substantial life insurance policies and investments in certificates of deposit, bonds, and annuities. Leisure activities include roller skating, roller blading, playing golf, gambling at casinos, playing bingo, and attending college ball games. They listen to classic hits on the radio. Many residents are members of fraternal orders or school boards.

37. Prairie Living

Agriculture plays an important part of the Prairie Living economy; small, family-owned farms dominate this stable market, located mainly in the Midwest. Two-thirds of the households are married-couple families; the median age is 40.5 years. Homeownership is at 81%; the median home value is $96,300. Although single-family dwellings are characteristic of these communities, 11% of the households live in mobile homes. Approximately 36% of the housing units were built before 1940. These residents are big country music fans, and enjoy hunting, fishing, target shooting, and horseback riding. They work on their vegetable gardens, vehicles, and home projects. Many are members of church boards or civic clubs, and get involved in civic issues. Because cable TV can be unavailable in these rural areas, many households have a satellite dish. Families with pet cats or dogs are common.

38. Industrious Urban Fringe

Industrious Urban Fringe neighborhoods are found on the fringe of metropolitan cities. Approximately half of these households are located in the West; 40% are in the South. Most employed residents work in the manufacturing, construction, retail trade, and service industries. Family is central, and children are present in more than half of the
households. Many live in multigenerational households. The median age is 28.5 years; the median household income is $40,200. Two-thirds of the households own their single-family dwellings, with a median value of $131,400. Necessities for babies and children are among their primary purchases along with toys and video games. Big movie fans, residents visit the cinema several times a month and watch movies at home frequently. They prefer to watch syndicated TV and listen to Hispanic radio.

39. Young and Restless

Change is the constant in this diverse market. With a median age of 28.9 years, the population is young and on the go. About 85% of householders moved in the last five years. Young and Restless householders are primarily renters, living in apartments in multiunit buildings. Almost 60% of households are single-person or shared. This educated market has the highest labor force participation among all the Tapestry segments, at 75%, and the highest female labor force participation, at 73%. The median household income is $40,900. Residents use the Internet daily, to visit chat rooms, play games, obtain the latest news, and search for employment. They read computer and music magazines, and listen to public radio. They watch movies in the theater and on video/DVD, attend rock concerts, play pool, go dancing, and exercise weekly at a facility.

40. Military Proximity

Military Proximity communities depend upon the military for their livelihood. More than 75% of the labor force is in the Armed Forces, while others work in civilian jobs on military bases. The median household income is $40,100 and the median age is 22.5 years. Two-thirds of the households are composed of married couples with children.
Housing types are mainly townhomes and apartments in small multiunit buildings; 93% are occupied by renters. Residents participate in civic activities and are members of business clubs. Many homes have a pet, most likely a dog. Residents use the Internet to trade stocks and make purchases. For exercise, they snorkel, play tennis, practice yoga, and jog. Families visit theme parks and the zoo, throw Frisbees, and go bowling. Recent purchases include MP3 players, digital cameras, video game systems, cell phones, apparel, and jewelry.

41. Crossroads
Young families living in mobile homes typify Crossroads neighborhoods, found in small towns throughout the South, Midwest, and West. These growing communities are home to married-couple and single-parent families. The median age is 31.9 years. Homeownership is at 77% and the median home value is $60,300. More than half of the householders live in mobile homes; 36% live in single-family dwellings. Employment is chiefly in the manufacturing, construction, retail trade, and service industries. Many homes have dogs. Residents generally shop at discount stores, but also frequent convenience stores. They prefer domestic cars and trucks, often buying and servicing used vehicles. Residents go fishing, attend auto races, participate in auto racing, and play the lottery. An annual family outing to Sea World is common. Outer Limits is a favorite weekly TV show.

42. Southern Satellites
Southern Satellites neighborhoods are rural settlements found primarily in the South, with employment chiefly in the manufacturing and service industries. Married-couple families dominate this market. The median age is 37.1 years and the median household
income is $37,700. Most housing is newer single-family dwellings or mobile homes with a median value of $81,400, occupied by owners. Residents enjoy country living. They listen to gospel and country music on the radio, and attend country music concerts. They participate in fishing, hunting, and auto racing. Favorite TV stations are CMT and Outdoor Life Network. Satellite dishes are popular in these rural locations. Households own older, domestic vehicles, particularly trucks and 2-door sedans. Residents invest time in vegetable gardening, and households are likely to own riding mowers, garden tractors, and tillers.

43. The Elders

The Elders’ median age of 73.4 years represents Tapestry’s oldest market. The highest concentration of retiree residents prefer communities designed for senior living, primarily in warm climates. Half of these households are located in Florida, and 30% are situated in Arizona or California. Approximately 80% of households collect Social Security benefits; 48% receive retirement income. These residents are members of veterans’ clubs and fraternal orders. Health-conscious, they take vitamins, visit doctors regularly, and watch their diets. Leisure activities include traveling, working crossword puzzles, fishing, attending horse races, gambling at casinos, going to the theater, and dining out. They play golf, listen to golf on the radio, and watch tournaments on The Golf Channel. Their daily routine includes watching TV and reading newspapers.

44. Urban Melting Pot

The ethnically rich Urban Melting Pot neighborhoods are made up of recently settled immigrants; more than half of whom were born abroad. Half of the foreign-born residents immigrated to the U.S. in the last 10 years. Most rent apartments in high-
density urban canyons of large cities, primarily in New York and California.

Approximately half of the housing units were built before 1950. The median age is 35.7 years and the median household income is $37,400. Fashion- and cost-conscious, these residents love to shop, from upscale retailers to warehouse/club stores. Leisure activities include going to the beach, visiting theme parks and museums, playing football, ice skating, and roller blading. Distance does not deter these residents from contacting family living outside the U.S. They keep in touch with phone calls and foreign travel.

45. City Strivers

*City Strivers* are urban denizens of densely settled neighborhoods in major metropolitan areas, such as New York City and Chicago. Most households are composed of a mix of family types. The median age is 32.1 years and the median household income is $36,800. Employment is concentrated in the city, with half of employed residents working in the service industry, particularly in health care. Approximately 22% are government workers. Unemployment is twice that of the U.S. level. Housing is mostly older, rented apartments in smaller multiunit buildings. Primary spending is for groceries, baby products, and children’s essentials. Residents enjoy going to dance performances, football and basketball games, and Six Flags theme parks. They listen to urban, all-news, and jazz radio formats, and watch lots of TV, especially movies, sitcoms, news programs, courtroom TV and talk shows, tennis, and wrestling.

46. Rooted Rural

*Rooted Rural* neighborhoods are located in rural areas throughout the country; however, more than three-fifths of the households are located in the South. Households
are dominated by married-couple families; approximately one-third of whom already receive Social Security benefits. The median age is 41.0 years. Housing is predominantly single-family dwellings, with a strong presence of mobile homes and some seasonal housing. The median home value is $89,900. Stable and settled, residents tend to move infrequently. They are do-it-yourselfers, constantly working on their homes, gardens, and vehicles. Many families have pets. Residents enjoy hunting, fishing, target shooting, boating, attending country music concerts, and listening to country music on the radio. Many households have a satellite dish; favorite stations include Outdoor Life Network and CMT.

47. Las Casas
Las Casas residents are the latest wave of western pioneers. Settled primarily in California, approximately half were born outside the United States. Young, Hispanic families dominate these households; 63% include children. This market has the highest average household size (4.27) among all the Tapestry segments. The median age is 25.4 years and the median household income is $35,400. Most households are occupied by renters, although homeownership is at 42%. The median home value is $278,400. Housing is a mix of older apartment buildings, single-family homes, and townhomes. This is a strong market for purchase of baby and children’s products. Residents enjoy listening to Hispanic radio, reading adventure stories, and playing soccer. Many treat their children to a family outing at a theme park, especially Disneyland. When taking a trip, Mexico is a popular destination.

48. Great Expectations
Great Expectations neighborhoods are located throughout the country, with higher proportions found in the Midwest and South. Young singles and married-couple families dominate. The median age is 33.0 years. Labor force participation is high. Manufacturing, retail, and service industries are the primary employers. Approximately half of the households are owners living in single-family dwellings, with a median value of $100,600; the other half are renters, mainly living in apartments in low-rise or mid-rise buildings. Most of the housing units in these older suburban neighborhoods were built before 1960. Residents enjoy a young and active lifestyle. They go out to dinner, to the movies, to bars, and to nightclubs. They enjoy roller skating, roller blading, playing Frisbee, chess and pool, and attending auto races. They read music magazines and listen to rock music on the radio.

49. Senior Sun Seekers
The Senior Sun Seekers market is one of the faster growing markets, located mainly in the South and West, especially in Florida. Escaping from cold winter climates, many residents have permanently relocated to warmer areas; others are “snowbirds” who move south for the winter. Most residents are retired or are anticipating retirement. The median age is 51.4 years; 62% of the householders are aged 55 years or older. Most households are single-family dwellings or mobile homes, with a median value of $107,500. There is a high proportion of seasonal housing. Many residents are members of veterans’ clubs or fraternal orders. They own lots of insurance and consult with a financial advisor. Leisure activities include dining out, reading (especially boating magazines), watching TV, fishing, playing backgammon and bingo, working crossword puzzles, and gambling at casinos.
50. Heartland Communities

*Heartland Communities* neighborhoods are preferred by approximately 6 million people. These neighborhoods can be found primarily in small towns, primarily in the Midwest and South. More than 75% of the households are single-family dwellings, with a median home value of $74,400. Most homes are older, built before 1960. The median age is 41.3 years; nearly one-third of the householders are aged 65 years or older. The distinctly country lifestyle of these residents is reflected in their interest in hunting, fishing, woodworking, playing bingo, and listening to country music. In addition to working on home improvement projects, they are avid gardeners and read gardening magazines. They participate in civic activities and take an interest in local politics. Residents order items from catalogs, QVC, and from Avon sales representatives.

51. Metro City Edge

*Metro City Edge* residents live in older suburban neighborhoods of large metropolitan cities, primarily in the Midwest and South. This market is home to married-couple, single-parent, and multi-generational families. The median age is 29.1 years and the median household income is $30,200. Nearly half of employed residents work in the service industry. Most households live in single-family dwellings; 14% live in buildings with 2 to 4 units, many duplexes. Homeownership is at 56% and the median home value is $74,100. Prudent shoppers, residents buy household and children's items at superstores and wholesalers. They enjoy watching TV (especially sitcoms and courtroom TV shows), going to the movies, visiting theme parks, roller skating, and playing basketball. They read music, gardening, and baby magazines, and listen to urban and gospel radio.
52. Inner City Tenants

*Inner City Tenants* neighborhoods are a microcosm of urban diversity, located primarily in the South and West. This multicultural market is young, with a median age of 27.8 years. Households are a mix of singles and families. Most residents rent economical apartments in mid- or high-rise buildings. Recent household purchases by this market include video game systems, baby food, baby products, and furniture. Internet access at home is not typical; those who have no access at home surf the Internet at school or at the library. Playing games and visiting chat rooms are typical online activities. Residents frequently eat at fast-food restaurants. They enjoy going to the movies, attending football and basketball games, water skiing, and playing football, basketball, and soccer. Some enjoy the nightlife, visiting bars and nightclubs to go dancing.

53. Home Town

These low-density, settled neighborhoods, located chiefly in the Midwest and South, rarely change. *Home Town* residents stay close to their home base. Although they may move from one house to another, they rarely cross the county line. Household types are a mix of singles and families. The median age is 33.7 years. Single-family homes predominate in this market. Homeownership is at 61% and the median home value is $61,800. The manufacturing, retail trade, and service industries are the primary sources of employment. Residents enjoy fishing and playing baseball, as well as playing bingo, backgammon, and video games. Favorite cable TV stations include CMT, Nick at Nite, Game Show Network, and TV Land. When shopping, Belk and Wal-Mart are favorite stops, but residents also purchase items from Avon sales representatives.

54. Urban Rows
With about 1.2 million people, *Urban Rows* is the smallest Tapestry segment. Row houses are characteristic of these neighborhoods found primarily in large Northeastern cities, with much smaller concentrations in the South. Two-thirds of the households are in Pennsylvania; one-fifth are in Maryland. Homeownership is 62% and the median home value is $81,300. Most housing was built before 1950. Households are a mix of family types. Nearly half of the households do not own a vehicle. The median age is 32.9 years. These residents rarely eat out. They prefer BJ's Wholesale Club for general shopping; preferred grocery stores are Acme, Pathmark, and Giant. Residents enjoy roller skating; playing baseball; attending basketball games; listening to urban, variety, and jazz radio programs; and watching sitcoms and sports on TV. Many households do not subscribe to cable.

**55. College Towns**

Education is the key focus for *College Towns* residents. College and graduate school enrollment is approximately 41%. The median age for this market is 24.5 years, with a high concentration of 18-24-year-olds. One out of eight residents lives in a dorm on campus. Students in off-campus housing live in low-income apartment rentals. Approximately 31% of the households are typically town residents who live in owner-occupied, single-family dwellings. The median home value is $132,900. Convenience is the primary consideration for food purchases; residents frequently eat out, order in, or eat easy-to-prepare food. Many own a laptop computer. In their leisure time, they jog, go horseback riding, practice yoga, play tennis, rent videos, play chess or pool, attend concerts, attend college football or basketball games, and go to bars. They listen to classical music and public radio programs.
56. Rural Bypasses

Open space, undeveloped land, and farmland are found in Rural Bypasses neighborhoods, located almost entirely in the South. This market is home to families who live in small towns along country back roads. The median age is 37.1 years. Higher-than-average proportions of employed residents work in the agricultural, mining, manufacturing, and construction industries. Labor force participation is low and unemployment is high. Although most households are single-family dwellings, 32% are mobile homes. Homeownership is at 78% and the median home value is $58,500. Residents save money by maintaining their homes, gardens, and vehicles themselves. They enjoy hunting, reading fishing and hunting magazines, and listening to gospel radio. They prefer to watch courtroom TV and talk shows, as well as cartoons. Recent purchases include baby products, clothes, and toys.

57. Simple Living

Simple Living neighborhoods are found throughout the U.S., in urban outskirts or suburban areas. Half of the households are singles who live alone or share housing, and 32% consist of married-couple families. The median age is 40.1 years. Approximately one-third of householders are aged 65 years or older; 19% are aged 75 years or older. Housing is a mix of single-family dwellings and multiunit buildings of varying stories. Some seniors live in congregate housing (assisted living). Approximately 55% of households are occupied by renters. Approximately 40% of households receive Social Security benefits. Younger residents enjoy going out dancing, while seniors prefer going to bingo night. To stay fit, residents play softball and
volleyball. Many households do not own a PC, cell phone, or DVD player. Residents watch a lot of TV, especially sitcoms and science fiction shows.

58. NeWest Residents

Most NeWest Residents rent apartments in mid- or high-rise buildings in primarily in major western and southern cities. California has the largest concentration of these households, followed by Texas. Families dominate this market. Children reside in 54% of the households, either in married-couple or single-parent families. Approximately half of the population is foreign-born. This young market has a median age of 25.3 years. Most of the employed residents work in service and skilled labor occupations. These residents lead a strong family-oriented lifestyle. Budget constraints restrict their purchases to essentials such as baby food, equipment, and products, as well as children’s clothing. For fun, families go to the movies, visit theme parks, and play soccer. They like to watch sports on TV, especially wrestling and soccer, and listen to Hispanic radio.

59. Southwestern Families

These families are the bedrock of the Hispanic culture in the Southwest, more with children than without. Two-thirds of the households live in owner-occupied, single-family dwellings with a median home value is $52,100. Most employed residents work in blue-collar or service occupations. Southwestern Families is an ethnically diverse market, with a median age of 28.2 years and a median household income of $26,600. Recent purchases include baby and children’s products. Households generally own or lease a 2-door sedan. The grocery store of choice is H.E. Butt. When eating fast food, Whataburger is a favorite stop. Residents enjoy fishing, water skiing, playing soccer,
and going to the movies. They read gardening and parenthood magazines, and listen to Hispanic and urban radio formats. Typical TV viewing includes comedies, as well as wrestling and boxing.

60. City Dimensions

Diversity in household type and ethnicity characterize City Dimensions neighborhoods that are located in large urban cities. Population density remains high, with approximately 2,900 people per square mile. This market is young, with a median age of 29.0 years. Nearly 63% of households rent; more than half are apartments in multiunit structures. Most of the real estate is older. Approximately 70% of the housing units were built before 1960, 42% of which were built before 1940. Many households lease their vehicles, preferring Mercury or Ford models. Residents shop at BJ’s Wholesale Club, Kmart, Marshalls, and T.J. Maxx. They enjoy roller skating, playing soccer and chess, attending auto races and shows, going to the movies, and renting movies on DVD (especially classics, horror, and science fiction). Video game systems are quite popular also.

61. High Rise Renters

This segment has the highest percentage of renters among all of the Tapestry segments; more than nine in ten households are renters in these densely populated neighborhoods. Approximately 41% rent in buildings with 50 or more units. High Rise Renters communities are located almost entirely in the Northeast; 86% of the households are in New York. Residents represent a diverse mix of cultures; many speak a language other than English. The median age is 29.6 years. Household types are mainly single-parent and single-person. Part-time work is just as common as full-
time. Residents do aerobics and play soccer. They enjoy dancing, attending basketball and football games, watching movies on video tapes/DVDs, and listening to all-news, urban, and Hispanic radio. They watch a variety of news programs and are avid viewers of daytime TV.

62. Modest Income Homes

*Modest Income Homes* neighborhoods are found primarily in the older suburbs of metropolitan areas. Single-family dwellings represent more than two thirds of the housing; 15% are duplexes. The median home value is $52,800. Household types are mainly single-person and single-parent. However, approximately 64% of households are family types. The median age is 35.0 years. Slightly more employed residents work part-time than full-time, mainly in service and blue-collar occupations. At 20%, unemployment is high. These frugal residents shop at discount stores, do not pay for Internet access, and rarely eat out. They are content to wait for movies to be shown on TV instead of going to the theater. They watch daytime and primetime TV, especially courtroom TV shows and sitcoms, and listen to urban and gospel radio. A favorite cable channel is BET.

63. Dorms to Diplomas

*Dorms to Diplomas* is Tapestry’s youngest market, with a median age of 21.8 years. College and graduate school enrollment is approximately 81%. Nearly three-fourths of employed residents work part-time in low-paying service industry jobs. Approximately 43% of residents live in on-campus dormitories; the remainder rent apartments in off-campus multiunit buildings. Approximately 90% of households are renters. PCs are a necessity, and the Internet is easily accessible to research assignments, search for
jobs, obtain the latest news, and keep in touch with family. For exercise, residents participate in a variety of sports. They enjoy going to college football and basketball games, rock concerts, the movies, and bars, as well as dancing, playing pool, and renting video tapes/DVDs. They listen to classic hits, public, and rock radio programs.

64. City Commons

City Commons neighborhoods are found in cities of large metropolitan areas, mainly in the South and Midwest. This younger market has a median age of 24.2 years. Single-parent families and singles dominate these households, and children abound. Approximately 77% of the households are renters; approximately 63% of the rentals are apartments in multiunit buildings, primarily with fewer than 20 units. More residents work part-time instead of full-time. This market has the highest unemployment rate among all of the Tapestry segments. Baby and children’s products are the major purchases. Residents enjoy playing basketball, softball, and backgammon. A yearly family outing to a theme park is common. They prefer courtroom TV shows when watching television; listen to gospel, urban, and jazz programs on the radio; and read music, baby, parenthood, and fashion magazines.

65. Social Security Set

Four in ten residents in the Social Security Set segment are aged 65 years or older; the median age is 44.6 years. Most of these residents live alone. Located in large cities scattered across the U.S., these communities are dispersed among business districts and around city parks. The service industry provides more than half of the jobs held by residents who will work. Households subsist on very low fixed incomes. Most residents rent apartments in low-rent, high-rise buildings. Many rely on public transportation,
because more than half of these households do not own a vehicle. Limited resources somewhat restrict the purchases and activities of these residents, although many have invested their savings in stock. They enjoy going to the movies and soccer games, and reading science fiction. Many households subscribe to cable TV; residents particularly enjoy watching game shows, sports, and entertainment news shows.

66. Unclassified

Unclassified neighborhoods include unpopulated areas such as parks, golf courses, open spaces, or other types of undeveloped land. Institutional group quarters, such as prisons, juvenile detention homes, mental hospitals, or any area with insufficient data for classification are also included in this category.
LIST OF REFERENCES


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BIOGRAPHICAL SKETCH

James Ronald Dietz is the son of Glenn and Myrian Dietz. Born in Coral Gables, Florida where he lived with his family until graduation from High School in 1989. He subsequently joined the U. S. Navy for Active Duty service and, upon completion of that obligation, moved to Jacksonville, Florida where his studies in geography began at Jacksonville University under the mentorship of Raymond Oldakowski. James Ronald Dietz received his Bachelor of Arts degree with Honors in geography from Jacksonville University in 1994, and began his graduate studies at the University of Florida, Department of Geography, in 1994 while also serving as a Commissioned Officer in the U. S. Navy. He is currently working towards his Master of Arts degree in geography with special emphasis on retail market trade area calculation.