The Use of GIS by Economic Development Agencies

in Facilitating the Process of Service and Retail Firm Location.

by

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ABSTRACT

As an ever increasing number of local governments choose to implement Geographic Information Systems (GIS), new opportunities for using this technology in municipal contexts arise. In this research I examine both the site selection process of retail and service firms and how local Economic Development Offices (EDO) can support this process. Furthermore, I evaluate the potential for using GIS in analyzing the current commercial inventory as well as in disseminating strategic information. The Economic Development Office of Brookline, Mass., serves as the client for this project.

Through a series of interviews, I explore all aspects of the site selection process and identify the major parties involved. My survey finds that the level of technological sophistication in the site selection process varies dramatically among the market participants. While both small and national businesses value information, small businesses utilize very little quantitative data in finding their location. National chains, on the other hand, use the latest technology and employ rich data in selecting the site for their next outlet. The research also finds that brokers are highly influential in communicating information about the local market characteristics to both local merchants and national chains.

Based on these findings, I prepare a GIS-based information product, consisting of a series of maps and reports. Adjusted to the institutional settings in Town Hall, this product is aimed at local and national merchants. Its purpose is to provide information to the market participants, augmenting their levels of local knowledge. Second order effects of the product are both an increased visibility of the EDO in the Town of Brookline, and a growing level of communication between all participants in the market. I conclude with specific recommendations about the future of this product in the Town of Brookline and general comments about the use of GIS in economic development.

Thesis Supervisor: Qing Shen

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Introduction

In recent years, Town and City governments across the country have experienced great financial pressure, making it increasingly more difficult for them to provide desired levels of services. In most cases, municipalities have only two sources of local tax revenues, residential and commercial taxes. Though the commercial and industrial contribution to the tax base of most towns lies below that collected from residents, many towns are exploring ways to expand the revenue from this potential source. An increasing number of local governments are realizing that the commercial and industrial sector within their jurisdiction constitutes an integral part of their population's overall level of welfare. The contribution of the economic activities to the local tax base, through the generation of taxable sales and revenues, are in many cases critical to the government's ability to provide its services. On the other hand, commercial and industrial activities themselves consume negligible amounts of services, creating positive net-impacts on local

government budgets (DiPasquale and Wheaton, 1995). This realization has lead many municipalities to actively seek businesses to locate in their jurisdiction. Efforts range from providing zoning that is favorable to industrial and commercial activities, to putting in place industrial parks ready for businesses to move in, all the way to actively seeking investors through advertising and networking.

In addition to the potential positive net-impact brought about by commercial and industrial activities in a municipality, other important developments contribute to a more active role of local governments in supporting its businesses. The recession of the mid-1980s, coupled with the shift in the economy from predominantly employing manufacturing labor to increasingly relying on knowledge labor, has lead to local job losses in many areas. In recent years, the willingness of state and federal government to assist the service provision of municipalities has decreased dramatically, leaving many local governments in difficult situations.

Major technological changes further increase the erosion of tax income of municipalities with traditional manufacturing sectors. The decreasing importance of geography, due both to better transportation connections and more importantly, to the ever-increasing connectivity resulting from the telecommunications revolution has turned many industries foot-loose. In an attempt to make use of cost differentials in local production factors, such as the cost of labor, companies relocate parts, or in some cases their entire operation to profit-maximizing locations. The general trend to note is the displacement of firms from central city locations to suburban locations. More recently, this mobility has expanded to include rural areas as attractive destinations for firm location. As a result of these threatening forces, many local governments can no longer take present industrial and commercial activities for granted. The net-effect of a company's relocation decision on the local jurisdiction is not limited to the forgone tax revenue, though. Whenever a firm ceases to operate or decides to relocate, local jobs are being lost and numerous other, interconnected commercial and industrial activities suffer, multiplying the initial effect of a firm closing.

Although local governments are threatened by leaving firms, they also face great opportunities. Every company that vacates an area in order to relocate in an other area, itself, becomes a potential asset for all the other areas. Just as some other jurisdiction has lured business away from City A, City A has the opportunity to lure another business to their area. Both developments, the threat of companies leaving town as well as the opportunity of new companies locating in the jurisdiction call for a pro-active effort from local government. Municipalities can not afford to sit back and watch the cards for the future be redistributed. They owe it to their constituencies to actively participate in shaping the future of their municipality.

Although municipalities realize the benefits of economic activities on their fiscal budgets, they find themselves with limited possibilities to increase these activities. The lack of available land for development and the fact that no-growth lobbies are gaining strength, inhibits many towns to invite new businesses to locate in their jurisdiction. For these municipalities, a different approach of supporting the local tax base via commercial activities must be employed. In many cases, increasing the number of firms is not an option, requiring the present establishments to be better supported and their effectiveness optimized. This support is achieved through creating an attractive shopping environment by means of customizing the commercial mix and attracting destination establishments to locate in the area. In order for this support to be fruitful, local government must have a clear understanding of the local commercial structure, its customer base, both actual and potential, the forces that shape the market place, and, of course, it must know who its competition is.

Many economic development efforts have been documented involving the location of industrial and manufacturing firms. To my knowledge, only few efforts have been reported in supporting the local retail and service industry. With manufacturing leaving traditional metropolitan settings for areas where land and labor is cheep, retail and services are becoming relatively more important in the overall economic fabric of cities. Unlike industrial firms, retail and service businesses are not becoming foot-loose at the same rate as their industrial counterparts. Retail and service firms require proximity of

their location to that of their customers. Efforts in supporting and creating a healthy retail and service sector are therefore justified and promise to have long-term effects.

In a separate development, an increasing number of local governments are installing town-wide Geographic Information Systems (GIS). Without exception, their advancement is driven by traditional municipal uses in engineering and assessing departments. Since a GIS serves as a data integration tool, it draws its power from the contribution and usage of as many different uses as possible. In this sense, I will explore applications of GIS in supporting economic development efforts. I believe that the suitability of GIS for the proposed research is supported by the rapidly increasing number of large scale retailers who rely on GIS for site selection and market analysis purposes.

The goal of this research, therefore, is to map out the site selection process of retail and service firms, including identification of all relevant players. I perform this analysis against the background of evaluating the use of GIS in supporting and hopefully advancing the mission of economic development agencies. The Town of Brookline, Mass., serves as the study area and the local Economic Development Office (EDO), headed by Amy Schectman, is the client of this research effort. The ultimate goal of this research is to produce concrete products for the use of the EDO. I furthermore hope to augment the economic development agencies' current understanding of the dimensions, dynamics and potentials of its local retail and service sector. At the very heart of this research is Amy Schectman's desire to deliver better information to the parties involved in the site selection process. Increased information will draw attention to the area, allow the involved parties to make better educated selection, in addition to creating a visible, business-friendly atmosphere. Amy Schectman has identified these means to work towards her long-term goal of supporting and increasing the current contribution of commercial activities to Brookline's tax base.

Chapter two introduces the reader to the Town of Brookline and its surroundings. I describe the physical area as well as the peculiarities of the local government. After some general comments on GIS, I follow with an illustration of Brookline's GIS efforts.

Chapter three examines the literature on pro-active economic development as well as at applications of GIS in economic development related areas. In addition to the public sector uses of GIS, I also explore the private sector's GIS efforts in site selection and marketing. In chapter four, I report on the survey of the site selection process as it takes place in Brookline, shedding light on the role of each of the involved players. For the analysis, I distinguish four general groups of actors: (1) Small businesses, (2) large, national chains, (3) brokers and Realtors, and (4) services and consultants. In chapter five, the research describes the information product that arises from the project and chapter six discusses relevant issues and concerns about the product and its future in the institutional setting. Finally, chapter seven summarizes the project, culminating in recommendations and suggestions for future research.

2

Problem Setting

2.1. Brookline

2.1.1. Overview

The Town of Brookline, although an independent political and administrative unit, is tightly interconnected with the larger Boston metropolitan area. Brookline's main commercial center is only 5 miles out of Boston's financial and political center, to which it is connected by main thoroughfares and an extensive public transportation system. Leaving one municipality and entering another, a traveler will not be able to detect any apparent differences between the multiple jurisdictional units which combine the Boston metropolitan area. The north-eastern part of Brookline is wedged deeply into the City of Boston, leaving only the south-western corner to border a different neighboring municipality, the City of Newton. While north-eastern Brookline is very densely populated with predominantly three-story brownstone apartment buildings lining the

streets, the south-west is characterized by single family houses, many of which have estate-like attributes. All of Brookline's commercial activity is concentrated in the dense area where four main centers can be identified, Washington Square, JFK Crossing, Brookline Village, and Coolidge Corner. Additional commercial activity takes place along the main transportation arteries of Boylston Street (Rt. 9), Beacon Street, and Harvard Street, connecting and extending the four identified centers.

In 1990, the roughly 6.5 square miles of the Town of Brookline were home to 54,718 residents, who came from a large number of ethnic and national backgrounds. The local schools pride themselves with unifying children from as many as 65 different countries. Among the many ethnic and national groups, an active Jewish community, as well as a large Russian population color the daily life of this town. The levels of income and education are very high, relative to the state of Massachusetts. The per capita income for 1989 was $29,044 in Brookline, with a median household income of $45,598, compared to $17,224 and $36,952 respectively for the state. Roughly 68% of the population, age 25 and older, hold a college degree, compared to 34% in the entire state, making the residents of Brookline one of the highest educated citizenry in Massachusetts. These numbers should not lead one to believe that the wealth and the high level of education are evenly distributed among the population. In particular, the recent influx of many Russian immigrants to Brookline has added a relatively large number of poor, rather uneducated people to the overall population. While very few people in Brookline live in poverty, there is a significant number that lives at the margin.

The high overall level of wealth, combined with the unusual diversity of its resident's national heritage, creates a unique feel in the town. Many merchants cater to their respective ethnic clientele, making for a lively mix of stores along the major transportation routes. Added to this variety is the mixed land-use, usually associated with European cities, with the first story of the building occupied by a merchant, and the remaining stories reserved for residential or office use. Furthermore, the above-ground tracks of the street car-like subway complete the rare flair which Brookline exudes onto

its residents and visitors. The variety of languages that a visitor can hear being spoken on the side-walks complete the picture of a very unique place.

Much like the uncommon flair of Brookline's streets, the town's political system is very peculiar as well. Incorporated as a town, Brookline is not lead by a mayor but rather by a board of selectmen. The power of decision, however, does not entirely lie in the hand of these selected few, it is rather in the hands of the 240 town meeting members, elected from 16 precincts. These town meeting members participate in the regular town hall meetings, much like members of congress participate in the legislative process of running the nation. Like members of congress, each town meeting member has the right to speak on any issue brought to the meeting by the board of selectmen. This system of government makes for a very slow and sometimes inefficient process. It does, on the other hand, involve a great number of people into governing. This high level of involvement of the public is one of the reasons for the active participation of Brookline's citizens in public debate. The public can observe these discussions as they take place in the many events that are sponsored by various citizen groups, societies, and religious congregations.

A second effect brought about by the unique political system is the steadiness of the climate among the town employees. Unlike under a mayoral system, where the newly elected mayor brings in a host of new administrators, most of the employees in Brookline have been working for the town for many years. This system of a steady political line allows town politics to focus on the long-range, without having the fear of leaving the glory of an unfinished project to the political enemies. The general pattern of long-term thinking has allowed the town to maintain a steady course through times of economic upturns as well as downswings. Government might not be quick in responding to a certain stress, yet, compared to other municipalities, it may have fewer crisis to react to, as its long-term policies have the potential of preventing many such crisis from arising.

2.1.2. General attempt to foster pro-business climate

The recession of the mid-80s, combined with the loss in state aid and the passing of Proposition 2 1/2 has forced Brookline to make dramatic budget cuts. Proposition 2 1/2 restricts the growth of the tax levy, effectively reducing the town's ability to raise taxes. Faced with the threat of loosing the ability to provide desirable levels of municipal services, the town is aggressively seeking new sources of revenues with an emphasis on commercial development. Presently, the commercial tax contribution to Brookline's budget is merely 18%, compared to neighboring Newton with 27%, Dedham with 40%, and Cambridge with 65%.[1]

These threatening forces have lead the administration to actively seek new commercial development, support the present activities and create a general atmosphere of development- and business-friendliness. The town government of Brookline considers the attributes of its local business as promising for future success, and is convinced that with proper support, it can create a sustainable economic climate. In order to provide that support to its commercial areas, the town created an Economic Development Office in early 1995. Supported by the Economic Development Advisory Board (EDAB), a volunteer community group, the EDO is trying to encourage appropriate economic growth, foster the prosperity of businesses in the town's commercial areas, while enhancing the town's built environment by promoting design excellence in new development and preserving and enhancing the character of neighborhoods.[2]

2.1.3. Success of steering, and the desire to know more about present conditions

In a Municipal Incentive Grant application to the State of Massachusetts, the Town of Brookline laid out its plan to create a business-friendly atmosphere. It identified the mix of businesses which make up the different commercial centers as a crucial factor in the area's economic survival. Presently, there is no coordination of who locates where. This has lead, according to the town, to undesirable conditions from the perspective of the

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[1] Municipal Incentive Grant Program application. 1995. Town of Brookline.

[2] EDAB Mission Statement - Draft 11/95. Town of Brookline.

customers. Although it is questionable whether planning should try to create a specific mix, the town would like to analyze the present conditions, and possibly steer development into the direction of the "ideal" mix. Laissez-faire economists would argue that it is the market forces that dictate the mix of retail establishments and that there is no such thing as the "perfect" mix. The present mix, according to this view, must by definition be the perfect mix.

Regardless of what beliefs one holds, the usefulness of analyzing the inventory and possibly comparing it to similar commercial areas, can allow a researcher to gain valuable insights into what the contributing factors to a successful commercial center might be. In addition to the perceived usefulness of analyzing the present conditions, a first success of actively influencing the location decision of a business by the EDO has shown merits of a pro-active behavior. Instead of yet another pharmacy locating in the Coolidge Corner area where three major chains are located within a two block area, the EDO succeeded in convincing the landlord of a large storefront property on Beacon Street to look for an alternative tenant. The EDO put the landlord in touch with a very attractive merchant who was interested in locating in the Coolidge Corner area. With this discount gourmet market (Trader Joe's) locating in the Coolidge Corner, the area will now receive a destination retailer which is expected to attract a substantial amount of traffic.

This example clearly shows that in the case of retail location in Brookline, the criterion of perfect information, which, in an economics sense is necessary for markets to function, might not be fulfilled. This anecdotal piece of evidence suggests that if the EDO would attempt to create a status of perfect information, the market could create a successful mix. This leaves us with two possibilities for pro-active economic development, namely to identify the present mix, define the "ideal" mix, and try to steer future retail location to fit into the grand master plan, or, to improve the quality of the information flow between the economic agents, and by doing so, allow the markets to develop their "perfect" mix. In creating an information product for the Town of Brookline, I follow the second path laid out above.

2.1.4. The town's decision to implement a GIS

A. What is a GIS?

Geographical Information Systems (GIS) are defined as

> *"a database containing a discrete representation of geographic reality in the form of static, two dimensional geometric objects and associated attributes with a functionality largely limited to primitive geometrical operations to create new objects or to compute relationships between objects and to simple query and summary descriptions"* (Goodchild, 1992).

In short, if an information system records and manipulates *"geographical data"* then it is a GIS. A GIS has three major components (Dickinson and Calkins, 1988):

1. The technology (the hardware and the software)
2. The database (spatial and associated non-spatial data)
3. The infrastructure (staff, facilities and other supporting elements)

B. The use of GIS

The use of GIS in public agencies has increased rapidly in the past 15 years and the demand for the technology is accelerated by the current trends in the software and hardware industries. Computers continue to increase in capacity while the machines decrease in size and cost. Improved telecommunications provide for the high speed data transfer that is required in networking computer systems. Software trends also emphasize user-friendly interfaces. These trends combine to create an environment that allows for commercially available GIS that is also relatively inexpensive to install. Although not always suitable for local applications, the increased availability of digital data (often in the public domain) will further contribute to the greater demand for GIS.

The major modes for the use of GIS are:

- Display of geographic data
- query of a geographical database for specific facts

- map analysis with reference to one or multiple problems
- spatial modeling for a broad analysis of geographical data.

A GIS may thus be used to compile a complete geographic database for a specific area, provide a complete geographic referencing system for an area (e.g. automated systems that produce maps), find a solution to a particular problem or need (as in site selection or transportation modeling), provide a general capability to support an ongoing decision process (as in a decision support system), and discover and describe geographical patterns. In a typical local government, this includes land parcel mapping, general plan preparation, zoning review, permit tracking, vacant land inventory, growth monitoring, Census mapping, transportation modeling, environmental impact analysis, facilities and utility mapping (French and Wiggins, 1990).

C. GIS in local government

The literature reports on many studies that evaluate the value of GIS in local government. GIS is believed to provide various benefits by improving information processing capabilities (Campbell, 1992). Calkins and Obermeyer (1991) present a taxonomy for surveying the use and value of GIS which is a useful framework for evaluating the perceived benefits. They define benefits as having two components: the intangible and the price-based. Among the intangible benefits are an overall improved level of preparedness for natural or human inflicted crises, or getting the different departments to better work together as a result of the data transparency within the organization brought about by the GIS. The price based approach was used to measure the time costs of hours saved due to the presence of a GIS. French and Wiggins (1990) present a survey and methodology of the use of hardware and software for automated mapping functions in California planning agencies. Their survey indicated that the agencies that had conducted an evaluation of benefits and costs due to GIS had concluded that their system was a good investment and was producing positive returns.

D. Context

Following the example of an increasing number of municipalities, including the neighboring City of Newton, Brookline is developing a town-wide GIS. Today, the town possesses one Sun Spark10 workstation running Arc/Info and Arcview2 with one person in the Engineering department having limited knowledge of the system. The town has, however, given a contract to Camp Dresser & McKee Inc. to update its parcel map from analog to digital form, eventually allowing the complete data integration within the entire town administration. It has furthermore approved a permanent GIS manager position within the Information Service Department. The position has been filled as of April 1, 1996.

Once the parcel base map is ready, the town's assessing data can be linked to said map cover. This will allow the display of each attribute contained in the computer aided mass appraisal database (CAMA) to be displayed in cartographic form. Furthermore, a user can display all engineering data, ranging from transportation infrastructure to the municipal sewer system at the same time. The technology does not limit the number of themes that can be displayed and analyzed in conjunction with any one theme. The power of a GIS is based on the ability to observe statistical attribute data on their actual spatial location, and by doing so, add more value to the regular two dimensional data array.

With today's technology advances, including distributed computing and local-, as well as wide-area networks, it is not unreasonable to imagine each data analyst at town hall to have access to the GIS via her own PC terminal at some point in the future. In the example of the City of Newton, this distributed system has become reality as their GIS is available from several departments including the Planning-, School-, Public Works-, Assessing-, and soon the Police and Fire Departments (Terner, 1995).

2.1.5. Conclusion

While Brookline's GIS is still in its conceptual stage and far from being installed, accepted, supported, and running smoothly, interested parties can plan for future

applications. Furthermore, proponents of this technology can augment the chances for a successful implementation by creating crucial political support. Introducing untraditional projects like an economic development application ahead of the actual implementation of the system, creates a climate that allows for many more untraditional projects to unfold. I believe it is imperative that all institutional barriers be overcome for a GIS to develop the greatest potential use for a municipality. As a data integration tool, a GIS is susceptible to institutional barriers and territorialism, yet it draws all its power from the communal use of data resources from all departments. In this spirit, the Economic Development Office wishes to explore the use of GIS in tackling the challenges of its role in supporting the commercial environment.

2.2. Surroundings (Environment)

2.2.1. General

At the onset of my analysis of Brookline's market area, I had to keep in mind the wider context of the issues involved. I not only had to realize the limitation of the project in terms of what is politically feasible, but I also had to recognize the spatial, economical and temporal aspects of the issues. When both analyzing the condition of retail and service establishments in Brookline, and studying the site selection practice in the industry, the researcher must acknowledge that any local market area is interconnected with the surrounding areas. Brookline is a case in example. The geography of Brookline forces its market area to be an integral part of the larger metropolitan market. As a result, I have to take the larger area into account for my analysis of the local conditions. In addition to recognizing the spatial dependency and interconnectedness of Brookline with its neighboring areas, the research must also address the question of the general economic conditions of the market and its temporal dimension. What are the trends in the industry, the economy, and more importantly, in the population, both demographically and behaviorally? I must take all these contexts into account in order to analyze the present

situation of Brookline, and possibly propose a course of action for its Economic Development Office.

2.2.2. Competition from Malls.

What are the reasons for the economic slow-down of the downtown commercial districts? The answer to this rhetorical question sheds substantial light onto the question of how to support the current local downtown. Two related developments have affected the viability of many commercial centers. The first development was the creation and continuing success of shopping malls. The second, is the trend of retail toward operating as national chains.

Over the past 40 years, the creation of shopping malls has changed the retail climate of any local downtown. Mall owners and managers were able to lure the large destination department stores away from the traditional downtown setting into the newly created shopping malls. Many malls are designed with specific department stores in mind, since their presence as anchor stores is necessary for the success of any mall. Being the sole owner of all retail area within a mall, mall management can charge low rents to those stores which attract a lot of traffic, and high rents to those who benefit from the traffic generated by others, yet, by themselves, do not bring in additional clientele. Mall management is therefore maximizing its total rent income stream, while an individual, free-standing store is maximizing profits. The critical issue in the ability to charge discriminatory rents to different tenants, is the fact that the mall can internalize all externalities, positive and negative, of its tenants. Free-standing department stores do not get the benefit of their drawing power, while the same store is able to internalize said benefit in a mall through lower rents. The steep rent differential within a mall is indication of the magnitude of these externalities.

People's changing shopping behavior has accentuated the economic justification for building shopping malls. Today's escalated pace of life, combined with more women entering the work force, more dual-income households, increased out-of-house activities of school children, have made the malls, in their outdoor settings, very successful. With

all its different shops and stores, the malls can offer a one-stop shopping experience, significantly cutting the time spent accomplishing all errands. The controlled climate of malls plays a major role for the success of shopping centers in areas of the country where strolling comfortably from one store to another isn't always an all-season possibility. Extreme summer or winter temperatures have always been prohibitive of such activity without enclosed environments.

Increasingly, malls themselves are becoming destinations. People seek an entertainment value in malls, be it teenagers who meet with their peers, or families who spend an afternoon together. A complex interior design that represents diverse themes is a clear indication of the entertainment value sought by their clients.

Concurrent to the development of the malls, a second set of trends has shaped the retail environment. Due to increased competition on price, retail has become increasingly more large-scale and has organized itself in national chains. Larger establishments and a greater number of outlets allow retailers to make use of economies of scale, reducing the unit cost of their merchandise. Furthermore, the increased importance of advertisement in promoting sales has supported this trend. Advertising has switched its emphasis from newsprint to radio to television, reaching ever larger audiences. As a result, advertising has become more expensive, making it impossible for small stores to successfully compete on a level battle-ground with national chains. All these trends have made it very hard for traditional downtown centers to successfully compete for the limited amount of shopping dollars in the market.

Recent developments indicate that even smaller and older malls find it increasingly more difficult to compete with the larger, more modern malls. A recent article in the Boston Globe describes the difficulty of the Assembly Square Mall in attracting retailer to locate in this relatively old and small center (Kantrovitz, 1996). At the same time, there are indications that the traditional downtown shopping area is experiencing a revival. Several national chains have decided to locate free-standing in traditional downtown areas. So far, retailers have focused on a couple of prestigious areas where income and

education levels are high, and where a certain architectural and cultural flair is present. Among the areas seen as promising are Westport, Conn., Arlington, Va., and Brookline, Mass. (Pacelle, 1996). Contrary to some of the malls who experience economical hardship, most downtown areas have the benefit of a "good" location. If they possess architectural and cultural flair, are well-served by transportation and are located in an area of affluence, selected downtown areas may thrive on their natural assets.

2.2.3. Availability of Data.

Analytical work critically depends on the availability of the "appropriate" data: appropriate in the sense of it being current, suitable for the purpose of the analysis, and with a satisfactory level of quality. These criteria vary across different data types and sources. In this research, I employ two general categories of data, while I comment on a third. The three types are: (1) public data available from governmental sources, (2) public data either created for this research or obtained under special provisions, and finally, (3) proprietary data. I briefly describe each category of data and identify the data types that I use for this project.

A. Public Data

United States Census of Population, data on transportation collected by the Central Transportation Planning Staff (CTPS), as well as land use data from MassGIS, fall under the category of Public data.

The socio-economic data for this study originates from the United States Census of 1990. I pulled relevant variables from the STF3a at the block group level, using basic database management tools. These data are available at any library and are distributed in printed as well as digital form. The digital format for 1990 is available on CD-ROM which marks a significant improvement over the 1980 data which is only available on magnetic tape.[3] A database management tool such as Access or FoxPro allows easy access to CD-ROM data. The difficulty of identifying the spatial unit in which the researcher is

[3]Supermap is the only CD-ROM 1980 Census data tool known to the author. While it allows basic queries, it is very user-unfriendly for downloading data.

interested is today's main complication. I was able to identify the areas of interest, though, by consulting traditional Census track maps and comparing the tract and block group numbers of interest with the written output.[4]

Transportation data and data on employment by location of jobs can be obtained from the Central Transportation Planning Staff (CTPS), which is a joint effort to pool technical resources between several government agencies in Massachusetts. Originating from the US Census, this employment data is categorized into Standard Occupation Codes (SOC). It's spatial aggregation is the Transportation Analysis Zone (TAZ) which serves as the basis for all the transportation and land use modeling at CTPS. The interesting aspect of this data is the fact that the employment data are reported by place of jobs, and not by place of residence, as is the case with the STF3a tabulations.[5] By aggregating the data differently, an additional dimension of the data is introduced, even though the source of the data is the same,

Massachusetts' statewide Geographic Information System (GIS) effort, MassGIS, is the source of the land use data for this research. Based on 1985 aerial photography interpretation, land use data is classified into 21 categories and is stored in individual community coverages.

While all public data are available to the researcher, obtaining them in a useful format can prove to be a time-consuming endeavor. Furthermore, the existence of many sources of public data, such as CTPS' data, is not widely known or advertised by the government sources. As a consequence, many researchers do not know about the data, let alone how to access it. Obtaining data from government sources who are not accustomed to

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[4] The Bureau of the Census has set up a service on the Internet form which a researcher can query the STF3a data. In addition to traditional census tract and block group data, the service also provides the possibility to retrieve data by Postal Zip-Codes. Furthermore, a mapping program allows the user to see the area of interest in cartographic format. (URL: http://www.census.gov)

[5] 1990 data originate from a special tabulation known as the 1990 Census Transportation Planning Package (CTPP). They were provided by the Bureau of the Census to local metropolitan planning organizations (MPOs) and State Departments of Transportation. 1980 special tabulations, called 1980 Urban Transportation Planning Package (UTPP) were distributed to contracting MPOs/States. While the 1980 data are available only through the MPOs/States, the 1990 data will become available to the general public by Spring 1996.

providing data to the public can turn out to be a frustrating experience. Very often, the employees of these places feel that they are being intruded upon by outsiders and that this intrusion hinders them from doing their jobs. Once the researcher obtains the data, she must often satisfy herself with poor data documentation, if such is even included with the data.

B. Special Public Data

With the necessary political support, I was able to obtain public data from the Town of Brookline. Working at Town Hall, I had complete access to the assessing data. In addition to the residential assessing data, data on commercial assets are available. For taxation purposes, the assessing department maintains a record of each business. I used this list, together with a list obtained from the Chamber of Commerce, to create the inventory of the retail and service establishments. I updated and completed this inventory by walking the streets of the commercial centers of Brookline, validating each record. In addition to using the inventory for this research, both the Commercial Assessing Department as well as the Economic Development Department have already found uses for this data. Assessing uses it to update its records and EDO uses it to create labels for a mailing in support of upcoming events.

C. Proprietary Data

A wealth of additional data exists which could augment the value of any research project in the area of economic development. However, I chose not to use this data in my research because of their proprietary nature and issues of completeness of the data. Examples of supplementary data are Dun & Bradstreet's employment data at location of jobs, the numerous providers of secondary Census data, commercial inventories and retail data prepared by real estate services and the Massachusetts Alliance of Economic Development (MAED). While Dun & Bradstreet's inventory of businesses appears to be quite complete and current, its price is prohibitive for the use in this project. MAED's inventory of available space merely includes industrial-type uses, which is irrelevant to this research. Much like the Dun & Bradstreet data, secondary Census data is expensive to obtain. These data sources could be of great use for a larger project, and using them

may turn out to be economically justifiable. Unfortunately, the researcher must carefully evaluate the quality of such data.

2.2.4. Growing Interest in Using Analytic Tools.

The increased use of data in analyzing the suitability of sites can be seen as the direct result of the data's availability, the possession of the technology to handle these data, as well as an institutional setting which allows the same processes to be executed repeatedly. In 1990, Census reports appeared on CD-ROM. At the same time, the government sponsored a program to transfer the Census tract boundaries from analog to digital format. The resulting TIGER files, short for Topologically Integrated Geographic Encoding and Referencing system, represent census tract boundaries in digital form and include the road network of the United States (Marx, 1986; Sobel, 1986; Cowen and Shirley, 1991). This digital Census information gave rise to a large number of GIS applications. The initial TIGER files showed a considerable number of mistakes, causing second generation providers to step into the market place, an sell more accurate coverages.[6]

A growing availability of computing power at an ever-decreasing price has brought the analysis of digital data, including the use of GIS, from the obscure MIS back-room onto the desk-top of many analysts. When the PC was introduced, the cost of computing power, measured in million instructions per second (MIPS), has steadily decreased and is expected to do so in the future (Economist, 1993). The leading GIS software Arc/Info used to be available on UNIX workstations only, but a PC version is to be released shortly by its maker, ESRI, Inc. The ever increasing speed of personal computer's CPUs will allow GIS to become more and more widespread. On the same note, the newest version of Microsoft's spreadsheet Excel is supposed to include some limited mapping capabilities. The results of these two developments will be a heightened interest in this sort of analysis as well as a stronger demand for good and readily available data.

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[6] TIGER 92 files are now available for downloading from the Lawrence Berkeley National Laboratory. (URL: http://cedr.lbl.gov)

GIS and database management tools have now entered the field of site selection, marketing, and market analysis. The existence of the professional journal Business Geographics is the best proof of the technology's infiltration and to some degree, the creation of the industry. Published by GIS World, Inc., Business Geographics tracks innovations and industry developments pertaining to geographic technology.

The acceptance of this novel technology is highest in areas where a repeating process can justify the relative high up-front cost and expensive maintenance and updating efforts of developing and running a GIS. The costs of such a system can be justified by national firms who undergo rapid growth and who require demographic and competitor analysis on a regular basis when opening new outlets. Furthermore, the repetitive nature of the process allows national service firms to produce customized reports for any desired address in the United States. These reports typically consist of a series of demographic profiles for rings with different diameters around the point of inquiry.

2.2.5. Shortcomings of Non-Local Knowledge.

While the above mentioned services do deliver a wealth of information to a client, their effectiveness in accurately describing the local conditions must be questioned. Due to the standardized format of their product, they lack the ability to recognize special conditions. For example, the profiles of the two and three mile radii which Urban Decision Systems, Inc. (UDS) produced for the Coolidge Corner area in Brookline, include large parts of Cambridge, even though Cambridge lies on the other side of the Charles River. This by itself, would not be that grave a mistake, were it not for the fact that transportation routes, both by car and public transit, do not invite travel between the two cities. This is especially true when looking at it in a relative sense. A mile traveled on the east-west axis is much more convenient than one on the north-south axis, in terms of time and effort. Boston's transit system is developed as a set of radial routes, originating in the CBD. This pattern renders circumferential travel more cumbersome than traveling to and from the CBD. Brookline and Cambridge are not connected by readily available routes and travel between the two destinations must be considered circumferential. UDS's or

any similar analysis for that matter, must be taken with a grain of salt. This concern is further emphasized by the fact that UDS's analysis of commercial centers in the area around Coolidge Corner fails to include the Shopping Malls at Chestnut Hill. The two malls, the Mall at Chestnut Hill and the Atrium are considered the two main competitors of Brookline. Failing to include the two is clear evidence that local knowledge is necessary for any sensible analysis.

The lack of local knowledge by service providers leads me to believe that a locally constructed product could produce better and more meaningful information. Furthermore, the increasing proliferation of technology augments expectations from people in the industry. For the demanding clientele, such a product is necessary. For the less demanding clientele, a technologically advanced product might be able to communicate a message of "caring about the small guy". In both cases, the town will be portrayed in a pro-active, business-friendly light, indicating its readiness and commitment to face challenges.

2.3. Proposed Product

In the spirit of the creation of the Economic Development Office, I will produce an information product which has at its core the desire to further the competitiveness of Brookline's commercial areas. The product is created in anticipation of a town-wide GIS, which at the present time is starting to take shape. Against this background, the product shall stand both as a valuable tool, and as a sign of the new direction that future projects can follow and explore further. The prototypical character of the product is necessary because the town's infrastructure is not ready for the implementation of a resident process. The true value of the analysis and the development of the product lies in its role to push the envelope and motivate people to starting thinking about the possibilities and potential power in their hands, once the town-wide GIS is implemented.

3

Literature

3.1. Economic Development

3.1.1. Call for Pro-active Economic Development

In the past, practitioners tried to create jobs and generate tax income by attracting manufacturing businesses to locate in their municipality. The focus of an economic development agency's efforts is slowly shifting away from manufacturing industries to the retail and service industry. Pittman and Culp identify retail as economic development if it draws in expenditures from outside of the area and if it reduces leakages of expenditures by local consumers to the outside (1995). Two lines of pro-active economic development are currently discussed in the literature: (1) changing the physical appearance of the local commercial area, and (2) engaging in a two-way communication with the business community. Pursuing one does not necessarily exclude the pursuit of the other, but fundamental differences do exist in the degree and format of this outreach.

The first line of thought argues that in order for the local downtown business districts to survive in the face of increasing competition from alternative modes of shopping (i.e. Malls, Power Centers, Home Shopping, etc.), it must turn inward and analyze its situation (Gruen, 1995). One sub-branch of this line of thought suggests that downtown merchants organize themselves and unite in their common cause. It prescribes a market driven plan of action to focus on strengths and work together create a unique experience for the customer (Palma, 1995). A focus on marketing and management is more important than upgrading the infrastructure, according to this theory. The second sub-branch suggests that downtowns should learn from the success of malls. In particular, the behavior of shoppers should be studied and the downtown shopping area should incorporate some of the physical attributes which make malls flourish. Physical beauty is as important as an unobstructed view of the shopping windows, even if this should mean that trees lining the shopping street have to disappear (Lagerfeld, 1995).

Recently, the second line of pro-active economic development has been receiving more attention in the literature. It suggests that an economic development agency actively seek to attract retail into an area (Brammer and Tomasik, 1995; Divine, 1995; Farley and Cucka, 1995; Pyplacz, 1995). Farley and Cucka draw parallels to successful consumer marketing and recommend that the economic development agency segments the market, builds a special product (a brand) in this market, and manages this brand (1995). Devine, on the other hand, proposes to communicate recent demographic information to potential retail firms, in order to attract their attention to the local area (1994). More recently, he suggests that a two-way communication be established between all decision makers in the retail site selection process and the government agencies (Devine, 1995). In the example of the City of Glendale, Ariz., Devine documents the main ingredients of successful communication. FAST FAX, the name of Glendale's outreach program, consists of two parts: one part provides interested parties with information on demand, while the second part is geared towards the general dissemination of information. The first part is based on one-on-one meetings between interested parties and the Economic Development agency, allowing each to get a first-hand sense of the issues involved and a feel for the overall

climate. Furthermore, the city maintains a database of interested parties' fax numbers as the second element of its overall program. Included in this list are "brokers, real estate agents, architects, lawyers, bankers, shopping center owners, property managers, appraisers, grocers, accountants, home builders, mortgage companies, sign companies, title companies, investors, and developers." (Devine, 1995) Through the constant contact, all involved parties know the issues and concerns of their "business partners", creating a nourishing atmosphere, with information being the glue of the fabric.

3.1.2. Use of Technology

Aimed at supporting the second line of pro-active economic development, numerous analytical tools and forms of technology find their application in a field that is traditionally thought of as technology averse. For instance, database management tools are used to maintain inventories of available space for interested firms (Devine, 1995). The Massachusetts Alliance for Economic Development (MAED) maintains such a database and allows potential tenants to query its listings for applicable spaces. This database, however, contains only industrial spaces and offers no service to a town like Brookline, which is primarily interested in supporting its retail sector. Along those same lines, Harrison and Sharma document their efforts in creating a database for all of Canada which includes relevant information for business location decisions (1996). Their product, SitePro, includes information on issues such as geography, work force, infrastructure, culture and recreation, taxation, demographics, and industrial cost factors, to name just a few. Using a software interface, an interested party can query the database such that it fulfills all of the firm's requirements, and it will be presented with a small selection of areas which it should further explore. Again, this product is mainly geared towards industrial site selection.

A separate development documents the use of information technology in understanding an area's potential for economic development and consequently allowing economic development to refine its targeting of the industry (Brammer and Tomasik, 1995; Pyplacz, 1995; Sweet, 1994; Whittaker, 1994). Sweet analyzes two software packages

that allow municipalities to target certain SIC code industries to locate in their area, based on the characteristics of an area (1995). While sophisticated "leakage" modeling finds its application in retail potential analysis (Brammer and Tomasik, 1995), other areas limit themselves to collecting information and communicating it to entrepreneurs (Pyplacz, 1995). The former approach introduces many variables in estimating the level of present demand and potential sales. Such calculations should be regarded with a healthy level of skepticism, since any result critically depends on a large number of factors. There is no guarantee that all the factors are correctly evaluated and that their relationships are accurately modeled. The latter approach leaves the analysis part to the entrepreneur and merely focuses on delivering accurate and timely information. It suggests that through this information, better matched services and goods are being provided in the area's neighborhood.

3.2. Site Selection, Marketing, and GIS in the Private Sector

Based on the work of such influential figures as Applebaum and Huff, a rich literature has developed on the issues of market and trade area analysis for retail and service firms (Applebaum, 1966; Huff and Batsell, 1977; Goodchild, 1983; Gosh and McLafferty, 1987; Jones and Simmons, 1987; Wrigley, 1988). The majority of this literature was established before the emergence of GIS. It has built the foundation upon which the increased availability of today's data and the technical support of GIS can flourish. Gosh and McLafferty, Jones and Simmons, and Wrigley have created inclusive descriptions for firms to follow when selecting new sites. Numerous techniques for the various types of analysis are documented and examples are given. Interestingly, this literature does not incorporate the use of GIS. I suspect that the development of GIS was not sufficiently advanced for mainstream usage when the literature was published. The literature does, however, point out the usefulness of GIS in future analysis on numerous occasions.

Only a few years later, the literature is full of references to the future of GIS in market analysis (Beaumont, 1991; Arbeit, 1993; Longley, 1995). Beaumont demonstrates the

usefulness of GIS in supporting business activities that are a result of the 1970s and 1980s trend towards "niche" marketing (1991). GIS technology allows the creation of sophisticated "Marketing Information Systems, Branch Location Analysis, and the use of Direct Marketing" (Beaumont, 1991). The increased use of the spatial elements of data collected from customers is believed to be the key for a company's future success (Arbeit, 1993; Longley, 1995). Furthermore, spatial data is seen as the key of any GIS application. The importance, availability, and source of such data is widely documented in the literature (Cooke, 1993; Stoecker, 1993; Sherwood, 1996). The directory of Marketing Information Companies for 1995, published by American Demographics Magazine, spans over more than 30 pages of company descriptions (1995).

In addition to the growth of data and the increased power of the software, new ways of analyzing data have come about. As a result of increased computing power, an analyst can now visualize her results. This capability allows for easier, yet more in-depth understanding of the data. (O'Connor and Eichenbaum, 1988; Eichenbaum, 1989; Kalinski, 1992).

The availability of data and the respective technology to make sense of it gave rise to a host of applications in the business world. Generally termed "Geodemographics", this area of research has received a surge of interest (Flowerdew and Goldstein, 1989; Brown, 1991). At the essence of this research is the desire and necessity to better understand the market, or in other words, to get a sense of who lives where and usually does what? Segmenting markets into homogenous areas allows analysts to identify a specific area's psychogram. These psychograms explain and summarize the behavior of the area's residents. (Weiss, 1988; Mitchell, 1995) Among the uses for market segmentation are constructing marketing plans and advertisement copy for target areas.

Retail and real estate are two industries where GIS applications in site selection are gaining more and more acceptance. GIS is lauded for allowing the retailer to better understand the market conditions of its established trade area in terms of customer and competition (Reid, 1993). In general, GIS finds use in businesses that undertake frequent

analysis due to their large number of outlets. Businesses whose outlet location play a critical role in their success find GIS very useful in planning their sites. For those businesses that worry about the physical attribute of the parcel or the building, GIS may be of very little use. Good examples of the first type are fast-food outlets and gas stations. Examples of the latter are power plants and factories for which soil type and slope information might be more important. The real estate industry is slowly but surely joining the party on the band wagon of technology (Hoffman, 1995). Castle surveys the current uses of GIS in real estate and develops a framework for future applications (1993). Along these lines, CB Commercial, a national commercial real estate brokerage house announced their alliance with MapInfo, a large GIS provider (1994). Real estate investment analysis depends increasingly on GIS technology, as more and more analysts wish to back their judgment with hard data from decision support systems (Peterson, 1993).

3.3. GIS in Economic Development

3.3.1. Present Applications

A growing number of local economic development agencies employ information technology in supporting their constituencies. As mentioned above, spread sheets and database management tools, along with new forms of telecommunication like the facsimile have become essential aids for today's economic development agencies. More sophisticated examples are less common and have mostly been developed for industrial location usage.

A limited number of economic development agencies have made use of GIS's ability to find suitable sites for new businesses (Barnett and Okoruwa, 1993; Black et al, 1994; Millar, 1994; Smersh, 1995). The conceptual framework of these systems is a basic Ian McHargian overlay (McHarg, 1971), where several location criteria are combined to find suitable areas for development. The selection is based on the process of exclusion of

unsuitable areas. The state of Georgia took the application of GIS in economic development a step further and explored ways of using it as a visualization tool for advertisement purposes (Drummond, 1993). While the technological commitment of the Georgia application is impressive, its success is challenged by flaky equipment and the user's wish for interactive querying when sitting in front of a computer screen. Counter a user's expectation, though, the system allows for no add hoc query, but merely displays a number of prepared screens, possibly leaving her unsatisfied even when faced with all this great technology. In this sense, a series of glossy color maps would have done the job without leaving the customer puzzled.

GIS has found its way into economic development, though, with less technological hype than in the above example. It proves to be useful as an analysis tool for creating a better understanding of one's own assets, upon which a successful marketing campaign can be launched (Black et al, 1994). Here, the use of GIS is one of supporting an active communication role of the economic development agency.

While several such systems are described in the literature, the use of GIS in economic development is almost entirely restricted to locating new manufacturing businesses (Smersh, 1995). McIntyre, however, introduces the use of GIS by economic development agencies for locating retail development (McIntyre, 1994). The application of GIS in this case has been extended from locating manufacturing firms, which are generally concerned with finding lowest production cost locations, to that of locating retail firms, which are concerned with market proximity. Even though this application takes GIS a step further in its use for economic development, it is basically yet another example of site selection and only briefly addresses issues of market analysis.

3.4. Conclusion

The literature indicates two general trends in economic development. The first development describes the call for more pro-active economic development. This call is in

response to the changing economic climate which leaves many municipalities fighting for resources. The second development suggests that EDOs should employ newly available technology to support their mission. Private industry has taken the lead in utilizing technology, and by doing so, has demonstrated what the possibilities are. At the same time, it has raised the expectations of market participants in regards to technology. If economic development agencies wish to actively participate in shaping market conditions, they must employ similar levels of technical sophistication as private industry.

One of the most promising technologies available to towns is GIS. The literature suggests several different uses. Based on the experiences of other towns, I summarize a number of key points necessary for a successful GIS application in economic development. A successful application must take into account the degree of familiarity with the technology of all involved: the economic development officer and her staff, as well as the customers. These systems are still far from being user-friendly and their use can become technically involved. Relief appears to be on the horizon, though. PC's are becoming more powerful and will allow the use of GIS on these more familiar platforms. The availability of the technology on the PCs, coupled with the introduction of mapping capabilities in familiar spread sheet software such as Excel, enhances the increasing democratization of GIS use in offices. Very soon, basic GIS capabilities will become the foundation of every office analyst's work. Increased standardization of mapping devices, combined with rising levels of expectations by customers, will allow for the use of technology in this field. It even appears safe to argue that this trend will create an atmosphere where customers come to expect a certain degree of technology.

The question of interactivness versus prefabricated output must naturally be addressed. From the Georgia application, we learn that once a sophisticated looking room full of technology is installed, the audience has a higher expectation of the technology. The format of the output has the potential to make or break the content of the information, and must therefore be carefully formulated.

A researcher must address the necessary degree of customization of the system for any product. Because of the high level of effort involved in creating a single item of analysis, a limited number of applications must be identified. As a consequence, the use of technology must be sensible for the end-user and worth the cost of applying it. Furthermore, the researcher must always keep the limitations of technology in mind when producing and communicating output.

In conclusion, I propose that an in-house use of GIS is most suitable for economic development agencies. The products of the analysis should be communicated to all interested parties in order to create a flow of information conducive to a constructive pro-business atmosphere. Economic development agencies should always look to employ conventional and proven telecommunication when communicating with the outside world. I believe that apart from personal contact, mail and telephone communication, only Facsimile communication is becoming universally acceptable.

4

Survey

4.1. Introduction

4.1.1. Purpose

In order to evaluate how technology can assist economic development efforts, I first had to gain both an understanding of the process of site selection in general, and specifically as it related to Brookline. I gained these necessary insights through a series of extensive interviews. Both the process and the key players involved in finding a site are of interest to me. At the onset of this survey, I identified three groups of players which I subsequently interviewed. These three groups are: (1) Business owners of newly opened establishments, (2) brokers and real estate agents, and (3) consultants and service providers.

I constructed the survey with the goal of gaining insights sufficient enough to map out the site selection process as it takes place in its various forms. More importantly, I attempted

to get a sense of all the issues involved in this process, both facilitating inhibiting. It must be added here, that at no time did I attempt to compile information in a manner that would allow a quantitative analysis of the results. The end result of this research was envisioned as a product to assist the economic development agency, and the format of the surveying process was therefore not as critical to the outcome. Moreover, I believe that a somewhat open format allowed me to better understand the dynamics of the process. Leaving the survey quite open allowed me to recognize and change some of my predisposed notions once they became apparent.

4.1.2. Who was surveyed

I interviewed business owners of small establishments as well as representatives of larger chain retailers who located in the Brookline area within the last year. I did not initially expect brokers and agents to be important players in this process. To my surprise, they turned out to be significant sources of information. Brokers and agents appear to be a promising party with which economic development agencies should engage in two-way communication to possibly augment the process of site selection and in general, help create a business-friendly atmosphere.

Finally, I interviewed service providers and consultants. These sources, while playing a limited role in the relatively small Brookline market, allowed me to develop a clearer and more inclusive picture of the process as it takes shape.

4.1.3. Questionnaires

To address the different needs of each group of interviewees, I produced a different questionnaire for each one of them. The set of questions for the newly located businesses was the most structured, as I anticipated my questions to dictate the general direction of the interview. In the other two cases, I prepared a set of questions that would guide the interview, yet allow for sufficient freedom to adjust to the particular situation. I wanted to maintain this degree of freedom since every interviewee engaged in a highly

specialized activity, limiting the grade of predictability of an interview. (See Appendix A for a sample of questions.)

I conducted most interviews with newly located businesses in person, with the exception of two interviews where the conversation took place over the telephone. The remaining interviews with brokers and agents, as well as those with the consultants were conducted over the telephone. (See Appendix B for a list of interviews.)

Since some of the questions were rather hypothetical in nature, I took great care to avoid leading the interviewee with a question. For example, I provided minimal guidance to the interviewee when a question was broad in nature. This was important in order to truly get a feeling of what is needed to improve the current situation. Only after the interviewee tried to answer a hypothetical question, did I ask follow-up questions, forcing the interviewee to respond to specific alternatives of information services.

4.2. New Locators

"The more frequent the site selection decision takes place, the more automated it is." (William Wheaton) Based on this general rule, I grouped newly located businesses into two groups, (1) small businesses and (2) national or regional chains. Chains, by definition, have large numbers of retail outlets and their site selection process tends to be more automated than that for small businesses. In many instances, chains employ high levels of technical sophistication when searching for suitable locations. On the other hand, smaller one-store businesses owners or operators tend to go through a very limited number of site selection experiences in their life time, and a their resulting process tends to be less sophisticated. Since the Brookline commercial area consists of both groups of retailers, with national chains gaining in presence over time, the site selection process of both sets are here examined.

4.2.1. Small businesses

For this research, I defined small businesses as establishments that are independent of a larger unit, meaning that owner, operator, and employees are present in the same locale. It does, however, not exclude businesses with multiple outlets. Often, the owner of a small business is also the person who operates the business. The size of small businesses varies from those run by one person to one that employs 20 workers. In most cases, the store size of small businesses is smaller than the outlets of national chains, though that isn't always the case.

A. Decision maker and analysis

With almost no exception, the owner is the person who establishes the location of her business. In this position, the owner searches for a location, evaluates all the alternatives and finally decides on the actual site. While none of the merchants mentioned the use of services or consultants in making their decision, a limited number made use of quantitative information such as Census data and traffic counts. Of those who consulted quantitative information on the area, only one owner actively sought out the data at a library. The remainder received the data from their Realtor.

All of the merchants collected informal, more qualitative information on the area. This was done by walking around and observing traffic patterns, looking at the competition or the lack thereof. Very often, informal contacts with present owners of stores, friends in the business, or brokers, further increased their knowledge base on the area's characteristics.

B. Decision criteria

Among the favorable decision criteria mentioned most frequently were high levels of income and education in the surrounding area as well as the density at which the two phenomena can be observed in Brookline. Secondly, high levels of traffic, both foot and automobile traffic, and the proximity to public transportation were seen as important criteria in choosing a site. Other criteria included high visibility and the general reputation of the area. This last criterion is indicative of the locational value of being

located in Coolidge Corner. The name, Coolidge Corner, is seen by the merchants as an advantage when giving directions over the telephone or adding directions in print adds. Among all the criteria, rent played a most critical role in making the decision to locate in one site versus another.

Since most owners did not consult hard data in the form of traffic counts or Census data, the evaluation of the criteria was based on perception rather than quantitative analysis. Some owners, however, did perform their own informal quantitative analysis by counting traffic or observing the length of time that cars have to wait in an intersection until the light turns green. These informal types of analysis are performed to compare the virtues and vices of one location to another.

C. Time frame

The amount of time spent from the onset of the search for a location to signing a lease varies greatly from business to business. In some cases, the time frame for finding a locale, making the decision, and negotiating the lease was only a couple of months while in other instances, this process took place over several years. This great degree of variation can be explained by the varying level of urgency that is associated with finding a site. For some owners, establishing a business was their full time job, while for others, it was something they pursued on the side while working another job or running a second business. In almost all cases, the time spent looking for a locale far exceeded the time it took to come to an agreement with the landlord.

D. Chronology of events

The chronology of events in selecting a site were the following: Idea, area, site. Initially a concept or an idea for a store was born. Once the idea was developed, a number of areas were selected in which to pursue a search for available places. Among the areas most frequently considered were Newton, Allston/Brighton, Boston, and Cambridge. Within this subset, certain areas were looked at more frequently than others. For example, Allston, Newton Center, Harvard Square in Cambridge, and Newbury Street in Boston, were the areas mentioned most frequently.

E. Introduction to site

There are two methods by which business owners were introduced to a site. The most common form of getting to know about a location among small business owners was when the merchant drove or walked through an area and saw an empty location with a "for lease" sign. The owner then proceeded to call the Realtor through whom she eventually met with the land lord. The second form involves a Realtor who is actively engaged in finding a site for the owner. In both cases, the owner initiates the action of searching for a locale. This is fundamentally different from larger companies who often are approached by Realtors or land lords.

In general, business owners report to have good experiences with real estate brokers, or at least the ones they eventually used. Some of the owners were even impressed with specific individuals who displayed special knowledge of the area and were able to support their claim with hard data (Census data reports and private sector market analysis). Such a service was perceived as very valuable and lead the owner to limit his dealings to this single broker. Those owners with very small businesses (one person), reported some uncomfortable experiences with Realtors who did not take them and their issues very seriously. Business owners related general feelings of mistrust when dealing with brokers. This feeling about real estate agents resembles that felt for used car salesmen. The persevering sentiment of mistrust is grounded in the inability of merchants to judge the truthfulness of the information given to them by brokers. The validity of information on current market rents, for example, was perceived to be a major concern. For one part, rents make up a large share of the operating expenses of a retail business and secondly, they are very difficult to judge.

F. Ongoing efforts

Most owners engage in ongoing advertisement and marketing efforts. Without an exception, all merchants keep a customer data base. However, the degree with which this information is utilized varies dramatically. While some owners send out frequent mailings, others have not updated their data, resulting in databases that are dilapidated and unfit to be of any use. In addition to mailings, many businesses purchase

advertisement space in the local news print (TAB and Boston Globe) as well as in some special guides (i.e. art guides). Very often, these advertisements are combined with coupons for some store discount. Only few businesses use customized address services such as Metro Mail or Dunhill for mass mailings.

Merchants regard special occasions, like the annual "First Light Night" and the Boston Marathon as great opportunities for drawing attention to the individual stores and the area in general.[7] The Economic Development Offices' initiated and coordinated activities during these special occasions are seen as tremendously valuable. The value is not so much felt during the occasion itself or immediately following thereafter, but is rather viewed as an effort which will pay off in the long-run. Merchants feel that these activities constructively contribute to the overall image of Brookline's commercial area.

Related to building and maintaining an overall attractive image of the area is the often-voiced desire to engage in some form of communal advertising and marketing. Although the call for such activities is heard frequently, merchant's degree of commitment, in terms of money and effort to such causes differs greatly.

G. Additional information and service

Asking for the interviewee's thoughts on additional information and services he or she might have found helpful in making the decision may jeopardize the validity of the survey. If the interviewer is too specific about the kinds of services he is thinking about, he is running the risk of steering the interviewee. On the other hand, leaving the question too broad, might not give sufficient guidance to the interviewee in terms of what she is expected to comment on. The majority of business owners indicated that good demographic data would have helped them in making the decision to locate, as well as

[7]The EDO sponsors and organizes town-wide celebrations like "First Light Night" and the Marathon Shopping Spree. The name "First Light Night" refers to the lighting of the annual holiday season light in the commercial streets of Brookline. In celebration of this event and to draw the attention of the holiday shoppers to the Brookline area, the EDO organized a total of 65 volunteer artists and artist groups to perform, one in each of the participating businesses. Local media coverage for this November 1996 event was extensive. The TAB ran an insert which contained the schedule of all events and many coupons for the participating stores. Several thousand extra copies of this insert were distributed to the stores trying to make the effect last. Channel 4 News ran a feature on the event and the Brookline Community Access Channel covered First Light Night with three camera crews.

helping tailor their present marketing efforts. Apart from Census-type data, traffic data, data on crime and violence, and a list of stores in the area would have proven helpful. Of particular interest to business owners is information on the current level of rents in the area. As mentioned above, rents are a major concern to many merchants when it comes to running a profitable operation. During the lease negotiations, merchants were often told that the quoted rent was very competitive for the general area they were looking in. However, they were unable to test such claims and would welcome a mechanism through which they could verify assertions by landlords and Realtors.

H. Mix

Most merchants view the present mix of stores and store types as well-balanced and promising for the future success of the area. A small number of merchants mentioned a general unease when it comes to national chains, though. Speaking as business owners, the merchants tended to identify themselves with their own kind and display a somewhat critical attitude towards the chain stores. Speaking as consumers, however, the merchants themselves seem to enjoy the benefits of lower prices and extended store hours at large chain retailers.

I. Conclusion

While their site selection process is not characterized by high degrees of technical sophistication, small business owners do understand the usefulness of good information. In addition to understanding its usefulness, they would have welcomed richer information on the characteristics of the area during their site selection than was available to them. At their present stage of trying to make their business successful, they would embrace good data which would allow them to tailor their marketing efforts. While they feel that the treatment they received from Realtors and brokers was professional, they would like to be able to judge the validity of some of the information given to them. They feel that if the information were provided by an unbiased source, such as the town, they could have made a more educated decision. This is not to say, though, that the decision would have been easier or that the chances of deciding for a location in Brookline would have fallen out more favorably for the town. It is important to differentiate the two issues, here, and

clarify that it is not in the interest of the Town of Brookline to have all businesses interested in a site in its municipality. It is in the town's economic interest, though, that those who end up locating in the area, fill an existing demand for their product or service, maintaining a high probability to succeed through the first couple of critical years. In this sense, the EDO wishes to increase the level of information available to merchants in order to augment their level of knowledge, eventually allowing them to come to as educated a decision as is possible.

4.2.2. National chains

The site selection process of large companies who operate a chain of outlets can be characterized by two concepts: It is technically sophisticated and it is performed very secretively. Since these national or regional chains open outlets on a frequently basis and often operate large numbers of stores for which they perform various types of market analysis, investments into technology and knowledge to perform these tasks are economically feasible. As a result, these firms employ the latest technology in order to gain a competitive edge. The high level of competition among retailers, combined with the importance of location, makes this process very secretive. To put it into the words of Stop & Shop's spokeswoman, "Real Estate is the name of the game. Letting our competitors know where we locate would put us at a serious disadvantage." Chain stores' reticent behavior forced me to limit my discussion with them to the general processes that are being employed in selecting a site. The limited information which I gained from interviewing national and regional chains was sufficient enough to create a complete image of the site selection process, even though it may no be very detailed. While the individual criteria employed by specific companies and their sets of decision rules were not made available to me, I was able to gain a general sense of what the important issues in the site selection process were.

A. Decision maker

Based on me interviews, I was able to establish the following generalization about where the decision power lies within a company: The larger the size of a company, the lower in

its hierarchy the location of the decision making power. In smaller, regional firms, the decision making power rests with the president of the company. In larger firms, said power rests with senior management in store operations or real estate and development. Very often, the site selection research unit is located under one of these functions. In some instances, site selection and marketing research efforts are being pooled within the firm.

B. Decision criteria

Depending on the product or service, a firm analyzes different criteria and weights each one of them with differing levels of importance. In general, firms estimate the potential for sales and its location, relative to their proposed site. Gaining a sense of potential demand for their product is as important to the firms as is the presence and location of its competitors. Traffic counts, information on access to a site, the overall economics of an area, and the mix of proposed or existing tenants are being taken into consideration as well. Firms are increasingly constructing psychographic profiles, hoping to explain the aggregate behavior of the potential clientele. Psychographic profiles try to capture the behavior of a population, based on a set of demographic characteristics.

C. Analysis

Based on the wealth of information considered by the firms, the analysis is often supported by a demographic mapping tool. In addition, some firms maintain a full-blown GIS with which they are able to analyze their demographic data, juxtaposing it with already existing outlets and proposed ones as well as those of the competition.[8] Due to the large number of outlets and the analyst's resulting ability to compare success rates among the stores, analog- and regression-based models are created to identify the significance of certain factors in the overall performance of an outlet (Lyles, 1996).

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[8]Several value added resellers (VAR) offer add-on tools to basic GIS software. These add-ons are geared towards performing market analysis, demographic analysis or site selection. Intergraph's AnySite and Equifax' SpartaSite, to mention only two, allow for the customization of a GIS to perform these kinds of analysis in a user-friendly environment. AnySite works on top of MapInfo while SpartaSite uses ESRI's ArcView product. The add-on itself is available for under a thousand dollars, with the GIS inclusive versions ranging from $1,500 to $2,000. Customized blockgroup data which is necessary for any analysis, is available for about $5,000 per state, or $25,000 for the United States (Ethridge Cannon, 1996).

Based on these models, sales and market share forecasts can be performed. In some instances this type of analysis can lead to strategic alliances between different firms. For example, Barnes & Noble Bookstores recognized a positive effect on their business performance when locating in close proximity to a Starbucks location. They have developed their alliances such that Starbucks Cafés are often featured inside Barnes & Nobel Bookstore, each firm benefiting from the other's presence.

Similar to having its own research staff, many retailers employ the service of consultants which in turn perform the decision analysis. Star Market, a New England food retailer, uses Thompson Associates of Ann Arbor, Mich., to develop a comprehensive strategy for future expansion plans. This analysis has a strong spatial component and includes the study of the competition and how it reacts to moves in the industry. Food retailing, in particular, depends critically on the quality of its location, and how it relates to both the customers and the competition. Supermarkets require large-sized lots which are scarce in densely populated areas. It is therefore crucial to a firm's success that it is the first one on an attractive site. Unlike smaller establishments like fast food restaurants, the location of a supermarket can not be easily corrected should the dimensions or location of the market change. The resulting long-term thinking promotes a willingness in these firms to invest in understanding the dynamics of the market and forecast its development. Similar to supermarkets, many large scale retailers engage in extensive research, hoping to protect their investment by making as educated a decision as is possible.

D. Introduction to site

By virtue of their size and success, national and regional chains are often approached by real estate agents and mall developers with a specific location in mind. Unlike the small stores, developers see successful chains as an asset. The commitment of a set of retailers with proven drawing power lends credibility to a developer, facilitating the financing of the project as well as expediting the leasing of the remaining space. Oftentimes, good relationships between stores and developers arise and hold over many years, leading to multiple joint projects.

This practice does, however, not imply that successful chains rely solely on developers and Realtors to contact them for a desirable site. On the contrary, national chains often maintain a large research staff whose job it is to find the perfect site for the next outlet. This is particularly true for chains that operate free-standing outlets, or in what is often referred to as power centers - a number of large retailers locating in highly accessible suburban areas. For example, Thompson Associates, a consultant for retail site selection, is producing a GIS application for Computer City, a national computer retailer. This application will allow Computer City to perform detailed analysis on an unlimited number of sites and markets (Kus, 1996).

Alternatively, large firms may hire exterior experience, engaging commercial Realtors to find and identify suitable sites. Trader Joe's, a west-coast based food retailer, intends to use Milestone Associates of Newton, Mass., a commercial real estate broker, for it's entire east-coast expansion.

E. Ongoing efforts

Ongoing efforts to understand market forces, like the behavior of customers and competition, are widespread and employ the latest technology. Many companies use point-of-sales (POS) information to draw the best possible picture of the clientele. By understanding its customer more thoroughly, the company hopes to better serve his or her needs, successfully differentiating itself from an ever more aggressive competition (Lyles, 1996). Utilizing data on its customer, which is available to the retailer from many sources, is becoming increasingly more critical for the retailer's success.

Just like traditional manufacturing companies, large retailers are relying on information technology to differentiate themselves from their competition. Home Depot and Wal-mart have large ongoing efforts in place which track and analyze the behavior of their customers. These systems allow them to better serve their clientele, and in turn, gain market shares. This trend raises serious questions about the future of small businesses who sell the same merchandise as their larger competitors. Due to their higher overhead per dollar of sales, small businesses have to sell their products at a higher price. In

particular danger are mid-sized retailers who lack the critical size to become technologically involved, yet are too big to deliver the value of intimacy, uniqueness, and personality of smaller stores. Examples of this trend can be found in the case of mid-sized clothing stores in traditional downtown settings and neighborhood hardware stores. These mid-sized establishments have been hit hardest by the stiff wind of competition for the finite amount of consumer spending dollars.

F. Additional information and service

Many companies that operate chain stores on a regional or national scale engage in ongoing market analysis and have established site selection routines which includes publicly available spatial data. Based on the interviews, they perceive a value in including local data into their systems, which could significantly augment the quality of their analysis. Data of interest to large companies include traffic counts, updated population trends, information on employment, as well as information on tax rates and the availability and pricing of utility services.

G. Conclusion

While some of the data national chains desire could be provided to them by the town, their high levels of sophistication and technical involvement in the site selection process does not warrant the town's priority efforts. However, if some of the data products and information packages intended for the smaller businesses and other interested entities could serve national chains as well, there appears no reason why the EDO should discriminate against them and withhold information. The issue of the data and information dissemination to these national chains remains problematic as there are numerous companies, and the EDO budget is limited. In addition, the question on who the EDO supports, the local merchants or the national giants, is attached with heavy loads of political baggage.

4.3. Realtors and Brokers

4.3.1. Overview

Based on my conversations with newly located firms, both small businesses and large companies, the importance of Realtors and brokers in the site selection process became strikingly apparent. In the case of small businesses, the Realtor often takes on a dual role. On the one hand, the Realtor or the broker is necessary to bring landlord and tenant together to finalize a lease. Only if the match is successful and a lease is signed, will the agent receive payment for her services. On the other hand, the Realtor or broker takes on a role of information provider, and as such, she serves as a consultant to the business owner. Based on her knowledge about the area in which she is working, she provides the prospective tenant with general information about the area. In this dual role, the prospective tenant will permanently have to evaluate the sincerity of the Realtor as well as the validity of the information provided to him. The accuracy of the information on the area is critical to the tenant's future success there, and research must thoroughly explore the role of brokers and Realtor. The role of Realtors and brokers as potential agents for disseminating information to tenants should also be investigated.

4.3.2. Different kinds of Realtors and brokers.

The offices of brokers and Realtors come in various sizes and degrees of professional emphasis, ranging from one-person operations specializing in every form of real estate, to national chains focusing purely on one specific form of real estate. Naturally, there are also small, specialized and large, generic firms. Local Realtors and brokers are of greatest interest to me as they routinely engage in the everyday activities of small retail and service firms seeking to locate in the area. However, the larger more regional, or more specialized agents must be regarded as good sources for information on the general business practice as well. In addition, they appear to be important players in shaping the commercial atmosphere in Brookline, and should therefore be included in this analysis.

A. Small, local agents.

There are several local agents active in the Brookline area, working mainly with residential property. There is, however, no commercial Realtor or broker who works exclusively within the Brookline market. Most agents who engage in commercial real estate in the Brookline area are also serving the larger metropolitan region. These agents are generally contacted by the prospective tenant based on a sign in one of the locales that is up for lease. Through these initial meetings, agents are able to show additional properties to their prospective tenants. If the business locator likes the service he or she is receiving from a particular agent, the professional relationship may last up to the point that a site is found. Often, the agent is able to work with the same tenant repeatedly for either relocation or expansion purposes.

Realtors and brokers are keenly aware of the usefulness of information and the more committed ones among them employ various methods to fulfill the information needs of their customers. These products range from brochure-like collections of community facts, like the number of schools and places of religious practice, to demographic data from US Census sources, to customized market analysis reports. Smaller, less specialized Realtors and brokers, who believe in high levels of customer service have made efforts to collect local information to include into a package for their clients. They have had good responses to their efforts from both residential and commercial customers. My interviews with locating business owners confirm this alleged valuation of information. While only a few of these businesses received information on the area, the ones that did saw great value in it. This information enabled them to make a better decision about their site, and created a working relationship with the agent that was built on trust. Through the agent's use of factual information supported by official data, the business owner developed a level of trust resulting in his decision to continue to work with this agent, and with this agent only.

B. Large, sophisticated agents.

The more specialized Realtors and brokers employ sophisticated tools to deliver information to their customers. In their role as Realtor/Consultant to businesses, they

often employ the skills of market and site selection analysts. In this position, their clients expect them to employ the latest technology in delivering a service. This expectation in turn justifies the high initial expense of acquiring costly, sophisticated analysis tools. For example, Milestone Associates of Newton, Mass., a three person company, uses a demographic GIS package called SiteUSA which comes at a cost of several thousand dollars. Since Milestone Associates does not merely search for a site, but also performs the necessary analysis to establish whether a specific site is a "good" site, their customers expect the use of sophisticated tools. Milestone becomes more a consultant to the retailer than a Realtor, with the effect that they maintain long-term relationships with their customers. This strong relationship between the consultant and the retail firm involves decisions that are critical to the retailer's success. This relationship, therefore, takes on the characteristics of an alliance rather than that of a single job, requiring high levels of trust from both sides.

Similar to specialized, small firms, large national Realtors and brokers increasingly make use of the latest technology. Their size enables them to spend the necessary funds for creating and maintaining costly analysis systems. CB Commercial, a leading national commercial real estate broker announced the purchase of MapInfo software to support the daily jobs of its agents, as well as allow them to perform analysis of general trends. They see these two components as crucial parts in helping them build their future strategies (GlobalNews, 1994). The real estate industry in general is slowly but increasingly starting to explore the uses of information technology. This movement comes in response to such factors as initial success stories in the industry, the increased availability and affordability of software, hardware, data and the human capital that can make the technology work. Most importantly, though, firms are starting to see that their customers expect technology to play a role in the services rendered (Hoffman, 1995).

4.3.3. Local information product

Just like the analysts of national chains, Realtors and brokers are interested in local information to complement their existing data. Specifically, they seek information on

available spaces in an area, including square footage and fixture information. They are interested in getting a sense of what exists in an area in terms of commercial activities as well as demographic conditions. It is in their benefit to share information with the EDO in order to establish a symbiotic relationship. In addition to the detailed local information, smaller Realtors and brokers are also interested in basic information on the area if they sense a value of such information to their customers.

4.3.4. Conclusion

Realtors and brokers in general are interested in receiving any kind of information on the area of Brookline. Providing these agents with information and data could be seen as performing the job they themselves are getting paid to do. However, I believe that the EDO should be interested in providing the constituency of potential tenants with accurate and useful information in order for them to better evaluate the match of their product or service with the area's needs. In this spirit, the EDO could make use of the brokerage industry in disseminating the information to the market. If providing Realtors and brokers with information and data products about the local market, helps the commercial area of Brookline become more visible, and the resulting visibility draws more potential tenants to Brookline, then the dissemination of this data must be regarded as valuable in advancing EDO's goals of promoting and supporting the commercial sector.

4.4. Services

The supply of market analysis and site selection related services and products has dramatically increased in recent years. Proof of this surge is the fact that trade magazines such as Business Geographics and American Demographics are filled with advertisements for these products and services. For this research, I divide the entire spectrum of this industry into two groups: the data and software providers and the consultant firms. I recognize that this division is not absolute and that there are many

examples of firms that provide services in both areas. For the present purpose of developing an overview of the industry, this coarse division is sufficient.

4.4.1. Data and software providers

Traditionally, data providers and software providers in this industry were two clearly distinct entities. Only recently did a number of companies emerge that bridge the two areas. Over the last couple of years, value added resellers (VARs) have established their presence on the market by providing integrated solutions that are customized for different industries. In response to the emergence of VARs, the boundary between true data providers and true software providers is starting to blur; many data providers now add software tools to their products and many software providers start to market their own customized add-ons to go with their basic software.

A. Data

The data providers can be divided into three different types: providers of demographic data, providers of geographic data, and finally, providers of data on businesses. Companies that provide demographic data use US Census data and rearrange its spatial qualities to suit the needs of its customers. For example, many applications in marketing and mailings rely on census data by ZIP-code. Some of the providers merge multiple census products into a single data product, delivering all the necessary information to a customer. Projections of demographic and employment data are often added to current data, augmenting the richness in information of the end product.

The quality of the TIGER files produced by the US Census is somewhat spotty, to say the least, and several providers of updated and improved versions of the street coverage have emerged. These products serve the purposes of both mapping demographic data more accurately and allowing for higher success rates in addressmatching. Addressmatching is a process where street addresses are related to their exact geographical location. This process is often used to map the distribution of customers in the geographic space. Understanding the spatial distribution of customers and competitors is key to performing market analysis.

When it comes to providing information on businesses, the provider can not rely on federal data collection efforts like they can with demographic or geographic data. The initial collection and subsequent maintenance of accurate and complete data is very time and cost consuming. The high cost of entry into this industry effectively limits the number of competitors. Dun & Bradstreet Information Services Inc., the leading provider of business information, collects information on more than 10 million businesses and claims to survey each establishment every 18 months. Various products are available from D&B's database, making use of a vast number of attributes collected for each establishment.

B. Software

Database and GIS software applications have come a long way from their respective origins where their use was restricted to technically versed operators. As a result of the technology's widespread applicability and the computerization of our work places, they have become increasingly more user-friendly and ca today be found in many settings. Through the many successes in the field of market analysis and site selection, software providers have started to customize applications specifically for these uses. In doing so, they often extend their area of expertise in the value chain towards the customer. I expect this trend to continue in the future as this market grows in response to the increasing computer literacy among users, and the prevalent user-friendliness of the software tools. The expanding availability of digital data through the growth of the electronic connectivity via the Internet and other commercial networks will further promote the growth in this field.

C. VAR products

As I have previously mentioned, the emergence of value added resellers (VARs) has changed the dynamics of the industry. With an increasing awareness of the possibilities introduced by new information technology among users, the demand for customized products is growing. Numerous small businesses have filled this void and are producing highly specialized applications using the raw products of pure data and software

providers. In this function, they serve as analysts to both large retailers and service providers as consultants to those retailers and service providers who opt to outsource their analysis.

Apart from customized software providers, several firms have specialized by producing semi-customized market analysis products. Urban Decision Systems, for example, produces routine analysis on any address in the US and delivers a report on the present and forecasted demographics as well as on the retail centers for a series of circles around the desired address (1, 2, and 3 mile rings). These products are relatively affordable, yet are limited in accounting for local conditions (See 2.2.5.). They are, however, a very good source for initial information, upon which, further analysis can be undertaken.

D. Interesting Examples

Two examples of information products are worth elaboration. They are both ground breaking in their respective areas and are both established and economically feasible, making them ""real" in a business sense. The first product is developed by Business Development Information Inc. and consists of a database and a customized query mechanism. It is geared toward industrial site selection and provides inclusive information on Canadian communities. A total of 124 variables are available upon which a comparison of sites can be made. The traditional attributes for site selection like demographics, labor market, and economic conditions are available. In addition, the database tries to employ a more holistic view of site selection and includes such variables as the quality of life, the availability of telecommunications, and the levels of both research development and education. A cost calculating module added in enables the analyst to model the industry specific operating costs of her company. Based on its success in Canada, Business Development Information plans to expand its coverage to the neighboring US market. As with any other product, the value of this tool depends critically on the accuracy of its data.

The second information product is of particular interest because it provides the market participants with almost perfect information. Realty Information Group of Bethesda,

MD, publishes commercial real estate data for three major east-coast markets. Their product accounts for almost 100% of the commercial real estate in Washington DC, Baltimore, and New York. Using modern information technology, brokerage firms can query the Realty Information Group database through a graphic interface. For each entry, there are numerous attributes collected, ranging from price per square foot, to maximum available space on one floor, to images of the floor plan. Multimedia technology allows the effective combination of pictorial and quantitative information. Add-on tools provide the user with powerful analysis capabilities for an initial selection from thousands of possibilities. The database which resides on the broker's own computer can be updated via CD-ROM or on-line, depending on the broker's preference.

The two products introduced here, both provide information to interested parties. They furthermore deliver analysis tools to the user with which she can make better use of the available information. The fact that these products are initiated and sustained by for-profit organizations validates the claim that information has great value in the process of site selection.

4.4.2. Consultants

Similar to my difficulties in categorizing Realtors and brokers, I find it difficult to clearly categorize the consultants group. The distinctions between brokers and consultants are fading over time as many brokers become consultants to retail and service firms themselves. On the other hand, consultants have started to enter the market as VARs, creating site selection and market analysis application for their clients. Site selection consultants have themselves undergone a transformation and have become more of a business strategy consultant, actively participating in creating a firm's strategic plan of action.

Talking to pure site selection and market analysis firms, I surmised that their positioning in the industry is rapidly changing. In order to survive, they must become more consumer oriented and offer complete solutions the their customer's problems. This may include analyzing a firm's entire expansion process rather than looking at one site selection at a

time. Furthermore, an increasing number of clients is interested in installing their own analysis tools, robing the pure consultant of his product. In response to this shift, consultants have started to act as VARs, creating complete and highly customized applications for their customers. While these customers will eventually perform the analysis themselves, the consultants see their value created in providing the tool, training the client's staff, and possibly helping to upgrade the application down the line.

4.4.3. Conclusion

With the exception of relatively low-price routine analysis reports of firms like Urban Decision System, the industry of service providers appears to be out of range financially for local businesses. While it is highly unlikely for them to be of direct service to the local merchants, examining this industry allows me to gain an understanding of the practices on the forefront of technology. Exploring the activities in the service sector of the site selection process provides interesting insights into what the pertinent issues are and where the future of site selection is going. This is especially important if one assumes that large national chains will be fortifying their stronghold in the retail and service landscape, and expanding their area of influence, both spatially and in terms of their products and services.

4.5. Lessons

From this survey, it becomes apparent that the site selection process varies considerably among different types of businesses. Small companies have no set routine to follow when looking to locate or relocate. Often without prior expertise, the owners learn on the job and would welcome any information. However, their relative inexperience with demographic data and with data on the competition prevents merchants from actively seeking such information. In the few instances where such information reached the merchant, its value was priceless. In those cases where it did not reach the merchants, the business owners would welcome this information for any future location or relocation. In

some cases, the merchants regretted not seeking such information, as they believe their present economic hardships could have been avoided with access to the proper information.

It should also be mentioned that gathering and providing information is a costly undertaking. The characteristics of the data collection and provision of the data are those of a non-rival good, where one person's enjoyment of the good does not diminish that of another person. In this case, the initial provision of the good involves a large fixed cost but very little variable cost. It is in no individual user's interest to construct this data set, but it is in most persons' interest to use it once it exists. Government can combine the interests of a large number of people and act on their behalf, either by providing the good itself, or by chartering the fee-collecting rights to a private entity that wishes to provide the good to the public. I believe that is precisely the reason the market under-provides the good of information, even though each of the participants would value it. The town, therefore, should take on the role of government and provide the non-rival good of information, which otherwise would not be provided.

Brokers appear to be instrumental in delivering information to tenants since they are almost always involved in the site selection process of small businesses. Unfortunately, their dual role of sales person and unofficial consultant to the merchant has the potential to alienate the merchant if she doubts the sincerity of the broker's information. While it is in no way the intention of the EDO to make brokers behave more accountably in such cases, it is very much in the EDO's interest that the relationship between the merchant and the broker be constructive. This relationship appears to be the prime source of information for the merchant, and it should be EDO's concern to see that this relationship is furnished with the best and most accurate information possible. This goes back to the underlying issue of trying to create an atmosphere where sufficient information is available to merchants to make educated choices about their prospects in a specific locale. The town should be deeply interested in maintaining a stable and profitable commercial district, and the provision of quality information should be seen as the key to attaining this goal.

In the cases of national/regional chains and their service providers, local information plays an important role as well. Most national and regional chains either have sophisticated in-house analysis tools or they delegate the analysis to an outside source. These efforts to understand the current conditions of the market, both in terms of customers and competitors, are quite technically involved and require a great deal of data. The more sophisticated tools integrate company-intern information on customers, such as point of sales data into their overall system. While only a few of these integrated analysis systems exist in the market, their value is seen as critical in serving the customer in the future. Most retailers and service providers have yet to venture into the very forefront of technology, but their advantage over the small business operators is already gigantic.

Just like the small merchants, large retailers and service providers seek information on local conditions. Local information is considered very valuable by large companies or by their respective consultants. The political issue on who the town should support in the ongoing battle between local businesses and national giants remains unsolved, but the issue should be brought back to the fact that the town is interested in promoting stability. By providing good local information to all parties involved, chances that businesses can accurately estimate their potential for success will be increased. In this sense, I believe that the provision of information should be regarded as a means to attain stability in the commercial area, and not as a weapon to fight one or the other side of the spectrum.

Although national chains are often directly approached by developers and land owners, they all maintain close contacts with brokers. This should allow them to receive information on the local conditions if those facts were distributed through Realtors and brokers. The high usage of Realtors and brokers by small businesses strongly suggests that brokers are prime players at whom the EDO should aim its information product. It is also important to note that all commercial brokers are active in the larger metropolitan area of Boston, and not just in Brookline. It is conceivable that by providing an attractive and useful information package, the EDO could induce a number of merchants to look at the Brookline market as a potential area for locations. This increased visibility of Brookline in the market place increases the probability of finding the best possible

matches between stores and locales, further advancing the mission of the local economic development office.

5

The Product

5.1. Purpose

Based on my literature research, the survey conducted with all the players involved in the site selection process, and lastly and probably most importantly, based on my working experience in Town Hall, I define the final product as following six uses:

- Increase the information base of prospective merchants, leading to better educated decisions among all involved.
- Increase EDO's understanding of the market conditions in Coolidge Corner, both in terms of demographics as well as in terms of merchant mix.
- Help current merchants in tailoring their marketing efforts.

- Enter a mode of two-way communication with the involved parties. Compare agendas and find possible areas for collaboration.

- Create a visible atmosphere of business-friendly government. Create a presence of the EDO in the market place, so that interested parties know where to obtain information and advice for doing business in Brookline.

- Set the tone for future use of GIS technology in the "GIS-unfamiliar" environment of Town Hall.

5.2. The Product

The product consists of a series of maps and reports which will be distributed to brokers, tenants, and other interested parties. While no party should be excluded from obtaining the product, I designed the first version with brokers in mind. From my interviews and based on the survey, I learned of the strong influence of brokers on the site selection process. In addition to the perceived sway of brokers, they also have the power to disseminate the information to a vast number of parties, since networking is at the heart of their business.

I want this product to have appeal to a wide group of people and have therefore built it with a "mild" market analysis focus. I use the term "mild" to denote a sense of general analysis for a wide range of users, rather than specialized, in-depth analysis for individual clients.

With the help of the Economic Development Office, I had the opportunity to assemble a meeting with commercial brokers who do business in Brookline (See Appendix C for a list of attendees). In this meeting, I went through a draft of my product with the brokers, eliciting valuable comments. Most notably, the brokers stressed the importance of having concise information which is backed by more detailed data. In their opinion, a merchant will not study a full-length document unless his or her attention is captured by easy and

accessible highlights. In response to this, I have included a cover page of quick facts, hoping to grab the attention of the reader and coax them into the wealth of information contained in the remainder of the package.

Based on the comments of the brokers and the general tone of the discussion at the meeting, I have adjusted the contents of the package and have added several pieces of information, most notably, the attention-grabbing fact sheet. I have also added a map showing the distribution of national chains and local merchants. The brokers felt that this would add an additional layer of useful information about which many of their clients inquire. The final product is included in Appendix D.

The brokers mentioned the usefulness of recent traffic counts of both automobile and foot traffic. They also suggested the use of aerial photography to display parking information. Merchants, and especially national chains, make use of aerials in getting a first impression of the area. The brokers further suggested that EDO produce an advertisement video of the commercial district. According to them, the media of video would enable the town to communicate the special character of its area through the use of testimonials and visual language. While these suggestions piqued the interest of the economic development team, the time frame of this research does not allow me to further pursue them. Amy Schectman and the Economic Advisory Board members that were present at the meeting, took the suggestions seriously and are evaluating them for their future strategy.

5.2.1. Quick Summary

In reaction to the comments from the brokers, I conceived this cover document with the intent to convey quick information about the most important and impressive attributes of the Coolidge Corner area. Expanded from an earlier version that was created by Amy Schectman, I mixed descriptive content on the more qualitative attributes of the area with quantitative highlights drawn from the maps and reports of the package.

5.2.2. Census Information

Based on the 1990 US Census, I produced a series maps and reports, displaying the key characteristics of the area. These characteristics relate directly to the criteria business owners and managers considered when searching for their present location. Furthermore, I tried to include the suggestions of the brokers where this was feasible. The result of this effort is a series of three maps and a report on selective items of the STF3a tabulations. To reach the point where I could produce maps and reports, I had to select the demographic information from the original STF3a tables, then aggregate the data to the Census block group level, and finally, link each block group with the polygons of the GIS coverage. Once I had performed these steps, I was able to display the data in cartographic form. Even though I have produced a limited set of maps and tabulations, any desirable output based on this data can be produced for the Town of Brookline.

A. Maps

I prepared three maps that are based on 1990 US Census data. The three products cover the two main criteria which are explored in the site selection process, namely the level of income and the level of education. Figure 1 and Figure 2 give the reader an indication of the levels of income and their relative spatial location. While the per capita income map reports on the average income of the people living in a specific Census block group, the purchasing power density map in Figure 2 controls for the density of the population. Controlling for density, the viewer gets an indication of the intensity of the potential demand within a certain area. Both maps show that Brookline is a very attractive area for doing business when considering the level of income. Looking at per capita income, the south-western part of Brookline ranks among the areas with the highest level of income per capita, rivaling Newton and Boston's Back Bay and Beacon Hill areas. Controlling for density, Brookline outranks the areas mentioned before and rivals areas that display similar levels of density such as Cambridge and parts of Jamaica Plain and Roxbury. The two maps clearly show that the Coolidge Corner area ranks very high in the two categories of level of income and density of population, making it a prime location for retail and service business.

The level of education of the area is displayed in Figure 3. Brookline ranks very high in the percentage of population 25 and over, that possess a college degree. The reader must notice the influence of the graduate student population in certain areas. Specifically the areas around Harvard Square, MIT and Storrow Drive house large numbers of graduate students who are older than 25 and already have a college degree. The remaining population in those areas consists primarily of younger students who are not considered in this indicator, lending the graduate students more weight in influencing the gauge. As expected, south-western Brookline, the City of Newton, the Back Bay and Beacon Hill in Boston also have very high levels of education.

B. Census Tabulation

I produced a customized tabulation of Census data for areas around Coolidge Corner at 1/2, 2, and 3 mile intervals. In order to identify the block groups that fall within these distances, I used the point-in-polygon function of Arcview2. This function selects the block group polygons whose label points fall within a defined circle. I then joined the three sets of polygon identifiers, one set for each circle, with the demographic data table. This join yielded three demographic data tables, each representing the area underneath on of the three circles. Once the three tables were constructed, I used the basic functions of an Excel spread sheet to calculate the data items presented in Table 1 of Appendix D.

In an attempt to evaluate my claim about the drawbacks of commercial data providers due to their lack of local knowledge, I constructed data for two additional areas (See 2.2.5). In comparison to the above mentioned circles, the two new areas did not extend across the River Charles. Their radii are the same as the above rings, though. Upon comparing the two sets, the perfect rings and the cut out circles, I conclude that the general characteristics of the population do not change significantly. On the contrary, the relative shares of all characteristics change at the most by one or two percentage points. When looking at the absolute numbers, though, the two sets differ slightly. This should not be surprising, as the perfect rings extend over a larger area and therefore encompass a larger population. Since this additional level of information does not lend further insights into

the market conditions, it would only help confuse a reader. I therefore decided to omit the right two columns of Table 1 in the final product.

In choosing the attributes for this demographic product, I tried to follow the suggestions of the interviewed business owners and managers. Many people feel that high levels of education and wealth, by themselves, do a poor job in characterizing the uniqueness of the people that live around Coolidge Corner. It is the general sense that people's mixed ethnic backgrounds and linguistic origins are a cornerstone of this area. In this sense, I tried to capture this special flavor of Brookline by including information on the language spoken at home and the year of entry in to the US of foreign-born persons.

Examining the tabulations, the reader quickly sees that the data support the general comments made in discussing the maps. All desirable characteristics are most pronounced in close proximity to Coolidge Corner and decrease steadily with increasing distance. In combination with the maps, this tabulation helps paint the picture of Coolidge Corner as a prime location for retailers and service providers that cater to an educated, wealthy, yet diverse clientele.

5.2.3. Competition

Any commercial center within a larger metropolitan area is influenced by the competition in that larger area. Shopping malls are prime examples of such competitive forces. Due to their large size and attractive composition of stores, a potential store operator must be made aware of their location. Figure 4 displays the location of the shopping malls within approximately three miles of Coolidge Corner. In addition, the map indicates each mall's size in terms of its capturing power. While there are significant shopping possibilities within the area of analysis, there are no large centers within two miles of Coolidge Corner. Boston's main shopping areas around Copley Plaza, the Shops at Prudential, and the Newbury Street shopping area are as far away from Coolidge Corner as the more suburban centers of Watertown and Chestnut Hill in Newton.

5.2.4. Coolidge Corner

The map of the Coolidge Corner merchants is at the heart of the information product. It is based on Boston Edison coverage, which I carefully manipulated such that it can be linked to the merchant inventory. This linkage allows the analyst to map out all the collected information on the merchants. In a later stage, the assessors database can be linked to this coverage as well. Once this link is established, a significant number of additional attributes can be mapped. Using the Boston Edison coverage as the basis for this map insures that the forthcoming base map, delivered to the town by Camp Dresser & McKee, is compatible with this product. CDM is using the same Boston Edison coverage to produce its maps.

A. Break down in categories

Inspired by the desire to better understand the make-up of the merchant mix in Coolidge Corner, I created a map displaying the general categories of merchants and their location (Figure 5). Appendix E lists the three levels of categories into which all the merchants are categorized. Probably of most interest to the brokers is the location and relative size of vacant stores. While it is safe to assume that they know exactly which locales are for lease, seeing the information in map format may add a level of understanding of the spatial relation between the stores which otherwise would be impossible. The effort of mapping the merchants according to their general category of service is also aimed at a possible future undertaking. This kind of information about the mix and its spatial component will allow future research to compare the Coolidge Corner area to other commercial areas. The Economic Development Office has been entertaining the thought of conducting a comparative study between Brookline's main commercial areas and other successful areas.[9] My product can serve as an ideal spring board for such an undertaking. Figure 6 shows the relative share occupied by each of the four uses, including vacant stores. The basis for this breakdown is the number of stores and not their square footage. The retail business category is further broken down into its subgroups in Figure 7.

[9]Such a study was proposed by the Town of Brookline in a Municipal Incentive Grant Program application to the Executive Office of Communities and Development in the summer of 1995. Unfortunately, the grant went to another municipality.

B. Nationals vs. locals

Thanks to a comment from one of the brokers, I decided to add another layer of information to my package. In Figure 8, I show the spatial and numerical distribution of national and local stores. Again, the calculations of shares are based on the number of stores and not on their size.[10] With the approximate store size indicated in the map, the reader can get a qualitative idea of the relative distribution of the two categories.

C. Parking

In Figure 9, I finally try to battle the perception of the parking shortage in Coolidge Corner. In addition to the municipal lots and the number of spaces available, I indicate the location of street parking and the location of merchant's private lots.

5.3. Software and Hardware

To produce the maps and tabulations, I used three basic software types: a spread sheet (Excel), a data base management tool (FoxPro), and a GIS (Arcinfo and Arcview2). With the exception of FoxPro, Brookline has access to all these products, allowing future users to make use of this product and my data collection efforts. While FoxPro may not be available in Town Hall, other available products such as Access and Paradox serve the same purpose. All in all, the town does not need a transfer of technology, and can immediately utilize the results and associated products of the study for future applications. In fact, the new GIS manager has indicated great interest in my project and a meeting with her is planned in order to pass on the results of my efforts.

5.4. Conclusion

The first version of this product merely covers a limited number of the uses which I have identified at the beginning of this chapter. The character of a large part of which implies that the actual use of the product critically depends on how it is communicated to its users. For example, the format in which the product reaches existing businesses must be

[10]Annette Born cited a study she undertook at Harvard Square, in which the shares of nationals and locals were the same whether they were calculated by number of stores or by their actual square footage. (Born, 1996)

carefully thought out. The more immaterial uses, such as communicating the impression of a business-friendly Economic Development Office, depend on a combination of actions which the EDO is undertaking. One single project by itself, can not create the positive perception. In order to communicate such a business-friendly image, the EDO must embed this product in a number of projects and actions with the same mission. Over the eight months that I have worked for the EDO in Brookline, I noticed that each and every contact with the public has been geared to that goal. In this context, the product must be regarded as one of the many step in the right direction.

Concerning the desire to enter a mode of two-way communication with the brokers, I can report that great advances were made. In part due to the existence of this product, the Economic Development Office convened a Brokers' Breakfast, during which initial contact between Town Hall and the broker profession was established. The tenor of the meeting was very constructive and both sides were eager to continue and build on this relationship. I believe that this initial meeting has the potential to establish a fruitful and mutually beneficial relationship amongst all the participants.

The maps and figures pertaining to the character and make-up of the Coolidge Corner commercial business area are a first step in helping EDO understand the current conditions. Additional effort is called for to take this initial analysis a step further. As indicated above, the town intends to further develop this area of the research.

This project comes at a time when the new GIS manager is undertaking a need assessment for all the different Town Hall departments. I believe that the timing for this research could not have been better in order to draw the attention of the GIS manager to unconventional applications of GIS technology. The initial development phase of the town-wide GIS is the best time for EDO to communicate its technology needs and lay the foundation for a promising future.

6

Issues

There is a host of issues which the Economic Development Office must address in order for this product to become a successful contributor to its main mission of supporting and enhancing the economic climate of Brookline. Furthermore, in order for my efforts to bear fruits, several conditions for the future should be met. Because this research is meant as an initial step into a proactive, reciprocal relationship with the business community, a serious effort should be undertaken to maintain the currency of the data. I believe that it is as important for the EDO to maintain the currency of the data, as it is to conserve the knowledge necessary to perform such analysis. I believe that the new GIS manager has the potential to assume some of the necessary roles in maintaining this product. Furthermore, Amy Schectman's willingness to work with students through individual internships as well as through class projects, is yet another promising sign that the product of this research can and will be maintained. Finally, I anticipate that the staff's technical savvy in Town Hall will dramatically increase over time, augmenting the support for projects such as this. Based on these reasons, the future use of this research

looks promising. Although the general conditions for the success of this product are in place or will be in place in the near future, there are still issues that need to be addressed at the present time.

6.1. Confidentiality

With Camp, Dresser & McKee's data arriving at the end of this year, it will be possible to map all the data collected by the assessing department. Some of that data, while very desirable for brokers and other interested parties, must be treated with confidentiality. Several interviewees have indicated that they would value information about current levels of rent. Even though this information might eventually be available, the town must carefully evaluate privacy issues when it comes to releasing such information. Similar to rents, information about actual square footage or machinery and equipment must be protected. There must be a clear set of guidelines within Town Hall to what information can be released to whom and in what form. Once the GIS is in place and many people have access to all sorts of data, this issue becomes even more important.

6.2. Maintenance

The quality of data depends critically on the frequency of its updates and the speed at which its characteristics change. While some data are not susceptible to the influence of time, the merchant inventory in Coolidge Corner is very sensitive to changes. The reason for this can be found in the high merchant turnover rate. In the eight months of my work with the EDO alone, over a dozen stores have changed ownership or have moved to a different location.

Several possibilities for updating the data are available to the EDO. The Commercial Assessing Department is very interested in having up-to-date information on who is doing business in what locale, and a collaboration of EDO and Assessing in updating merchant

information therefore appears logical. However, should this not be possible, students could be engaged to routinely check the accuracy of the data. This work would not require much effort and could even be performed by the Economic Development Officer herself. In her position, she regularly walks the business areas to meet with merchant associations and individual store owners and managers. Though keeping the data current does not present an insurmountable task, it must be organized and possibly institutionalized.

6.3. Usage

Using the database and coverage to create new maps and reports requires a certain level of technical knowledge which is not readily available in Town Hall. Until this knowledge reaches the people who eventually will perform analysis, the GIS manager must perform this service for the interested parties. Experiences in other municipalities show that the process of disseminating user-knowledge takes a long time. The technology itself is becoming more user-friendly and the users are becoming increasingly more computer and technology literate, enabling the acceptance of this technology to be much quicker than has been in the past.

6.3.1. Knowledge - Skill

To this day, GIS is still complicated to use. It is however possible to customize certain routines, making it digestible for unfamiliar users. The GIS manager in Brookline is currently performing a needs assessment, upon which she will base her GIS implementation plan. Two basic options are available to her. The first and most traditional way of organizing a GIS is to centralize the entire operation, including hardware, software and expertise. Under this model, the bulk of the data crunching and the production of maps will belong to her. On the other hand, an increasing number of municipalities have gone over to a distributed data model, where the computing power and expertise are distributed throughout the institution. Under such a scenario, the main

duty of the GIS manager is to maintain the infrastructure, and most importantly, to teach and train the various users.

6.3.2. Reasonability: Time/Output analysis

Once the project leaves the experimental phase and enters the daily operation of Town Hall, the issue of reasonability must be critically explored. It makes sense to explore many possible alleys for the application of a new technology. However, when the technology is applied in regular business tasks, the relationship between costs and benefits must be analyzed. It is relatively easy to calculate the costs of using this technology. Estimating the benefits is almost impossible, though. The only way to insure that the technology is reasonably employed is through establishing clear standards. Every user should ask herself prior to using the technology, whether the task at hand is necessary and secondly, whether GIS technology will add or detract from her ability to fulfill the task. If Town Hall fails to establish such a paradigm, the GIS will become a waste of resources, most notably, staff time.

6.4. Distribution

Together with the EDO, I have decided to use mail and personal delivery to distribute the first round of products. The EDO will get the mailing out as soon as possible to keep the momentum going from the successful brain-storming session at the Brokers' Breakfast.

In a later stage, the product will be distributed to the active merchants, possibly accompanied by a meeting. The product itself allows for easy distribution by facsimile, which opens a whole new array of possible clients. All in all, the EDO feels that this "low-tech" channel of distribution suffices for the beginning. In a later stage, for example when aerial photography becomes available or a short video is produced, other formats for distribution can be explored.

Instead of delivering the information to the people, there is also the possibility of having the merchants come to Town Hall for individual sessions. The Economic Development Officer, the GIS manager, or possibly an intern could customize reports for interested parties. Business owners could bring in their customer data base which could then be mapped out on the GIS to develop a market area analysis. Such sessions would require high involvement by the person running it, and would probably necessitate the town charging a fee to cover the cost for the services rendered. While this form of information distribution is not likely to occur in the very near future, it is useful to envision the possibilities this technology can unfold.

6.5. Conclusion

It would be naive to say that no obstacles hinder the effectiveness of this product. In this chapter, I have identified a series of hurdles which this product and its associated technology will have to overcome. I believe, however, that Amy Schectman, the Economic Development Office of Brookline will be a very able promoter for the product itself. She is able to build the necessary coalitions within and outside Town Hall to "get things done". With the initial success of bringing the broker guild together and creating the beginning of a promising relationship between them and the EDO, Amy Schectman has high hopes for this product.

7

Conclusion

7.1. General

At a time when economic development offices (EDOs) are forced to become more pro-active, newly employed GIS technologies help advancing their mission. The core mission of Brookline's EDO is to support the commercial areas and to promote appropriate development. There is little potential for new development, and the EDO therefore focuses on promoting and enhancing the existing commercial areas. Following these two developments, this research evaluates the use of GIS in assisting local EDOs. In this evaluation, I try to shed some light on two elements of the above research question: How can GIS aid in better understanding the local market dimensions and how can it be employed to assist in the site selection process? At the heart of this research is a tangible product that will aid the local EDO in performing its task.

Using the Town of Brookline, Mass. as the client for this research, I surveyed all actors involved in the site selection process. I found that all participants value information, yet they employ it to various degrees. Small businesses use very little quantitative information while national chains employ sophisticated technology and rich data in finding their perfect location. Similar to merchants, brokers use different levels of technology to serve their clientele. To complete the survey, I explored the activities of consultant services as well as data and software providers.

Based on this research, I defined the purpose of the resulting information product as follows: (1) It must increase the level of information of all involved parties, (2) it must promote communication among the involved parties, (3) it must promote a pro-active, supportive, and visible EDO, and finally, (4) it must raise the acceptance of new technologies in Town Hall. In line with the identified needs of the site selection process that I gained from the survey, I produced an information product that served all four main purposes. In addition, it may also serve future purposes of both increasing the understanding of local market conditions and assisting in tailoring marketing efforts of present merchants.

I believe that my product fulfills all the proposed purposes and has the potential for being the spring board for future research. Throughout this research, I kept in mind that the final product had to be manageable, affordable, sensitive to the level of technology, and most importantly, it needed to be accepted by its intended audience. Using the traditional format of maps and reports for the dissemination of the data insures that all these demands are met.

7.2. Additional Lessons

Apart from the substantial knowledge about the site selection process that I gained, there is a series of lessons that I did not necessarily expect to experience. I learned that, although highly technical approaches to a problem may exist, it is not always the most

sophisticated solutions that best serve a purpose at hand. For instance, I have come across technically involved GIS applications that are being used for site selection analysis. While they may be valuable in the environment that they are employed, they would not have added any value to my proposed product. The requirements for the tool vary across different situations and a researcher must always try to match the level of a tool's technical sophistication with its intended purpose. Furthermore, the requirements and potentials of the intended clients must always be kept in mind.

A second lesson I learned is based on the response that I received from the brokers and the Economic Development Advisory Board members. The brokers' breakfast, convened by Amy Schectman, was a great success due to the participant's willingness to share information, views and opinions. Even if the product that I presented at this meeting were useless in content, it would still receive credit for getting all the parties together at one table. I believe, along with the participants, that this meeting was an important step into the age of "business-friendly" economic development in Brookline. Encouraged by the success of the Brokers' Breakfast, the EDO is now planning a similar meeting with landlords. From this experience, I learned that there may by value in the mere existence of a project, regardless of its material content.

The third lesson pertains to the willingness of Town Hall's staff to collaborate. During the entire project, I repeatedly met people that were willing to work together, across departmental boundaries. Of course, all collaboration must be mutually beneficial to all involved parties. This willingness to collaborate is important for a town-wide GIS to succeed. Since this condition appears to be met in Brookline, I believe that the GIS technology has great potentials for pooling resources in Town Hall.

Finally, I have gotten the impression from numerous sources that a pro-active EDO is greatly appreciated in Brookline. Without exception, people are excited that someone in Town Hall is trying to assist them and that Town Hall's outreach is no longer limited to the tax collector knocking on businesses' doors. The willingness of some of the brokers to share their information with the EDO has also taken me by surprise. For instances,

Roy Roberts of Milestone Assoc., has offered me the use of his demographic software package in order to get access to 1995 data. Although I greatly appreciated the offer, I had to decline based on the deadline for finishing this project. However, it is surprising to me that he was willing to forego what some people would call his competitive advantage over the other brokers. By offering access to his technology, he was willing to effectively level the playing field for all the brokers, eroding his lead in the Brookline market. I think that this is a clear sign that the brokerage industry is committed to establishing a constructive, mutually beneficial relationship with Town Hall.

7.3. Future Research

I can envision two main projects the Economic Development Office could undertake in the near future. Both would build upon my project and would lend it additional value. First, I believe that it would be very helpful to explore the potentials of my data in terms of a sophisticated promotional product. The expertise of an advertisement or marketing professional could greatly increase the value of the present product and insure that the recipients of the product understand the message that the EDO is trying to deliver. Such a person would also understand the dimensions for using additional media such as aerial photography and video in order to communicate the Town Hall's message.

The second area where I see potential for future research is more closely related to what I have produced. Efforts to further analyze the mix of Brookline's commercial area and how it relates to other successful areas should be possible. Even a comparison with shopping malls could lead to additional insights into the components that make a successful shopping area. Using the merchant inventory and its associated GIS coverage will prove to be a useful platform from which to launch future research. A more technological aspect of future research involves the development of a customized market analysis service by the Town. Such a project would involve getting Brookline's GIS technology customized to quickly perform standard market analysis tasks. A service like

this would catapult this project into a whole new level of sophistication and professional involvement.

No matter what becomes of my research efforts, I believe that they have been very valuable to the EDO in learning to better understand the current conditions of its commercial market areas. Furthermore, with my product, the EDO has an initial document in hand with which it can test the waters of a pro-active economic development agency. Above all, I believe that the most valuable aspect of this project is that it may inspire the people I contacted to individually develop creative approaches to familiar problems. I believe that the present wave of technology has the potential to create and facilitate such inventive approaches.

Appendix

Appendix A:

Questionnaire for newly located businesses:

General:

Ownership/Franchise?
When was this location established?
Number of employees?
Size of establishment?
Target clientele? (Age, gender, income group, area of residence, place of work?)
Marketing / Promotional activities: media, frequency, special events?

Decision maker:

Who is/was in charge of making the location decision?
Own analysis?
Outsourcing? Entire process or parts of process?

- How was contact established: advertisement, word of mouth, ...?
- Who took the initiative?
- What lead to acceptable level of confidence: reputation, example, ...?

Decision criteria:

Which criteria were considered? (Attraction and deterrents)
How were criteria weighted?
How was each evaluated? (Data, tools, ...) (Magazines, Publications, etc.?)

Time frame:

How long did decision making process take?
Is/was there a specific lead time? (When must site be available?)

Chronology of events:

Area
Site
Analysis
Idea/Product

Introduction to site/owner:

Direct
Realtor
Listings
Word of mouth
Which direction did contact go?

Ongoing efforts at analyzing environment:

What? (Market research, Customer data base
Who?
How?
What is the goal?

Additional Help/Info:

What would have helped in terms of information, service, and from whom?
What are some important issues in obtaining/using information?

Various:

Time frame for success?
What is the areas competitive advantage / disadvantage?
What is missing in terms of store mix?

Open:

Sample questions for large companies - national chains:

1. Who is the decision maker?
2. Analysis:
    - Data
    - Source
3. Decision criteria?
    - what was considered?
    - what are the relative weights of the different criteria?
4. Time frame of decision?
5. Introduction to land lord, how?
6. Ongoing efforts (analysis)
7. Is there a service / form of information that could be useful?

Sample questions for brokers and agents:

1. What are you specializing in?
2. How does Brookline differ form other areas?
3. Do you suggest different areas to different people / businesses?
4. What is your sales pitch for the Coolidge Corner, Brookline Village, Washington Square area?
5. Own opinion: Advantages / Disadvantages of these areas?
6. What is missing (store mix), what makes for a good store mix?
7. Do you use any information materials:
    - projections?
    - profiles?
    - inventories?
8. What information/service would help you?
9. How should it be provided?
10. What are your long-term goals?

Appendix B:

List of Interviews:

Businesses:

-small, local
Audio Bookstore
Casual Cup
Brookline Booksmith
Gragin Fife
Zuxus
New England Soup Factory
Earth Wish
Simon Shoes
Relax the Back

-national
Barnes & Nobel
Starbucks
Stop & Shop
Bread & Circus

Brokers:

Roy Roberts, Milestone Associates, Newton
ERA, Pleasant Realty
Ann Colombia
Stephen Karp, New England Development

Consultants, Services:

Susan Houston, Massachusetts Alliance for Economic Development (MAED)
Monty Sharma, Business Development Information
Stan Kus, Thompson Associates
William Wheaton, MIT
Michael Taunton, CBC
Dun & Bradstreet
Urban Decision Systems (UDS)
Metro Mail
Blackburn Marketing Services, Inc

Appendix C:

Brokers' Breakfast, April 23, 1996, 8 a.m.

Amy Schectman	Economic Development Officer
Miceal Chamberlain	Economic Development Advisory Board (EDAB)
Thomas J. Nally	EDAB
Jill Weber	EDAB
Donald R. Zagoren	EDAB
Annette L. Born	The Codman Company, Inc., Boston, Mass.
Ronald H. Golub	The Stonewood Companies, Boston, Mass.
Roy Roberts	Milestone Associates, Newton, Mass.
Sharyn Whitman	Chobee Hoy Associates, Brookline, Mass.
Lynn Cohen	Triad Group
Andreas Siemers	MIT, Cambridge, Mass.

Appendix D:

COOLIDGE CORNER

Brookline, Massachusetts

An Ideal Location for Business

Located directly on one of the busiest stops on the green line, Coolidge Corner draws both locals and tourists to its unique shopping experience. Among its historic treasures are the landmark S.S. Pierce clock tower, the historic 70-year old Arcade mall, and the JFK House, President John F. Kennedy's birthplace. Its dozens of one-of-a-kind shops foster a loyal and steady clientele. The Wall Street Journal considers Coolidge Corner one of the promising downtown areas which will experience a great retail revival.*

Some key facts about the Coolidge Corner:

High Density: 91,944 people live a one mile circle around Coolidge Corner; 239,902 within a two mile circle.

Young Professionals: The median age of the population is 30.6. 88% of the work force living within a 1/2 mile circle of Coolidge Corner are white collar professionals.

Affluence: Per capita income within 1/2 mile of Coolidge Corner is 148% of the state average.

Well Educated: 68% of the population within 1/2 mile of Coolidge Corner have a College Degree, versus 34% for the state. 93% of the same area's population has a high school degree.

* Wall Street Journal. Feb. 16. 1996.

Diversity: Brookline is a melting pot: recent immigration of highly educated people contribute to a variety of life styles, each demanding special products and services.

Great Transportation and Visibility:

Car traffic: Beacon Street: 35,000 cars per day
Harvard Street: 18,000 cars per day

Public: 3,505 passengers board the MBTA surface green line on a daily basis, with a large number of people riding through the area, which greatly adds to the visibility of store fronts.

Parking: Immediately behind the stores, there are 347 city lot parking spaces available. In addition, there is ample street parking right in front of almost all store fronts.

Tenants: Healthy mix of national chains (20%) and local merchants (80%).

Competition: Within a 2 mile radius, there are no shopping centers larger than community malls.

Finally, Coolidge Corner boasts numerous unique features. It hosts one of the few remaining art deco, independent movie houses, showing high quality foreign and art films. The local bookstore hosts frequent readings and book groups, drawing a wide and committed audience. And the Corner has ethnic and mainstream dining choices rivaling downtown Boston for its diversity and quality.

For further information, contact Amy Schectman at the Economic Development Office of the Town of Brookline:

Telephone (617) 730-2468
FAX (617) 730-2442

FIGURE 1 Per Capita Income in 1989 (1989 Dollars)

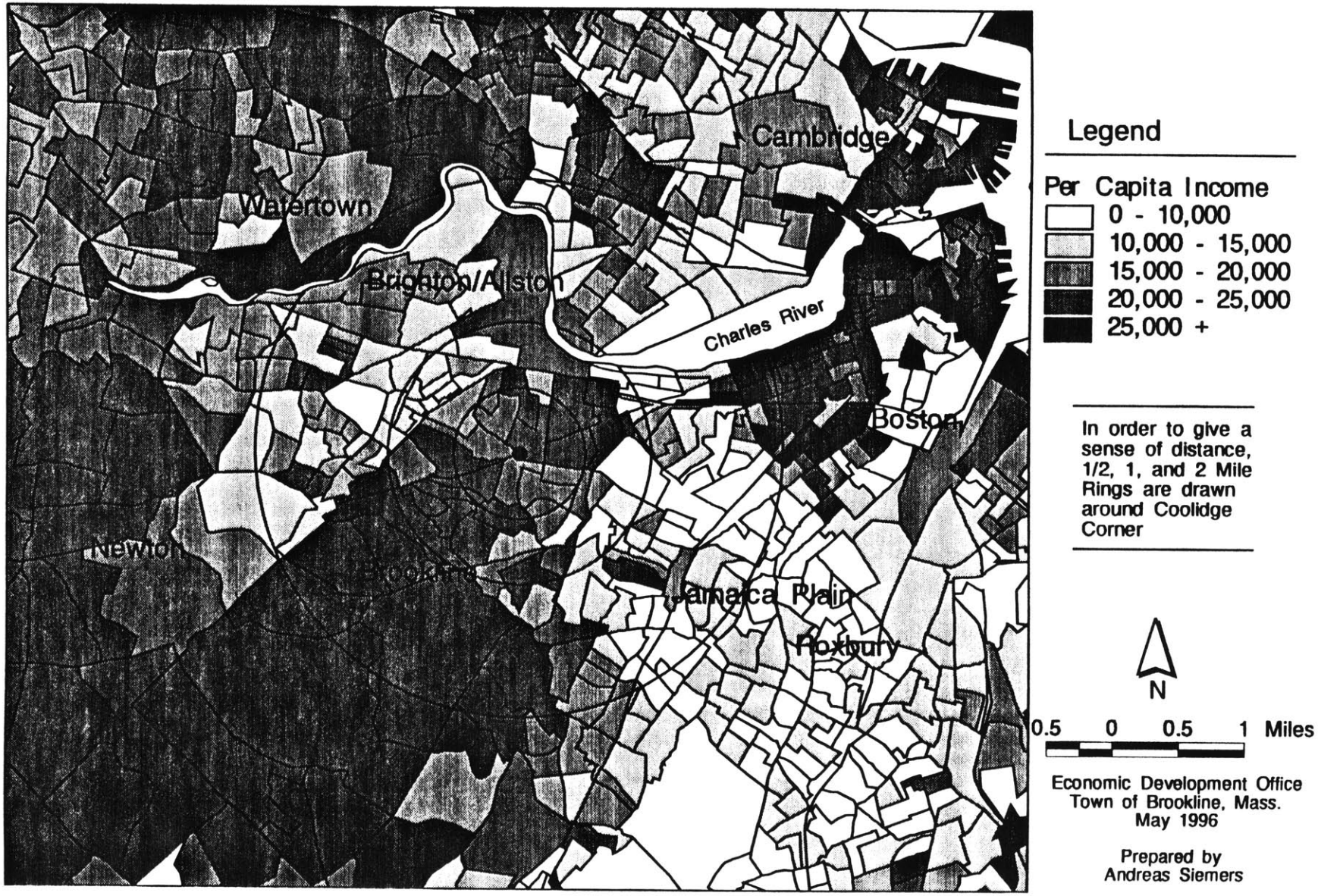


FIGURE 2 Purchasing Power Density in Dollars per Acre (1990)

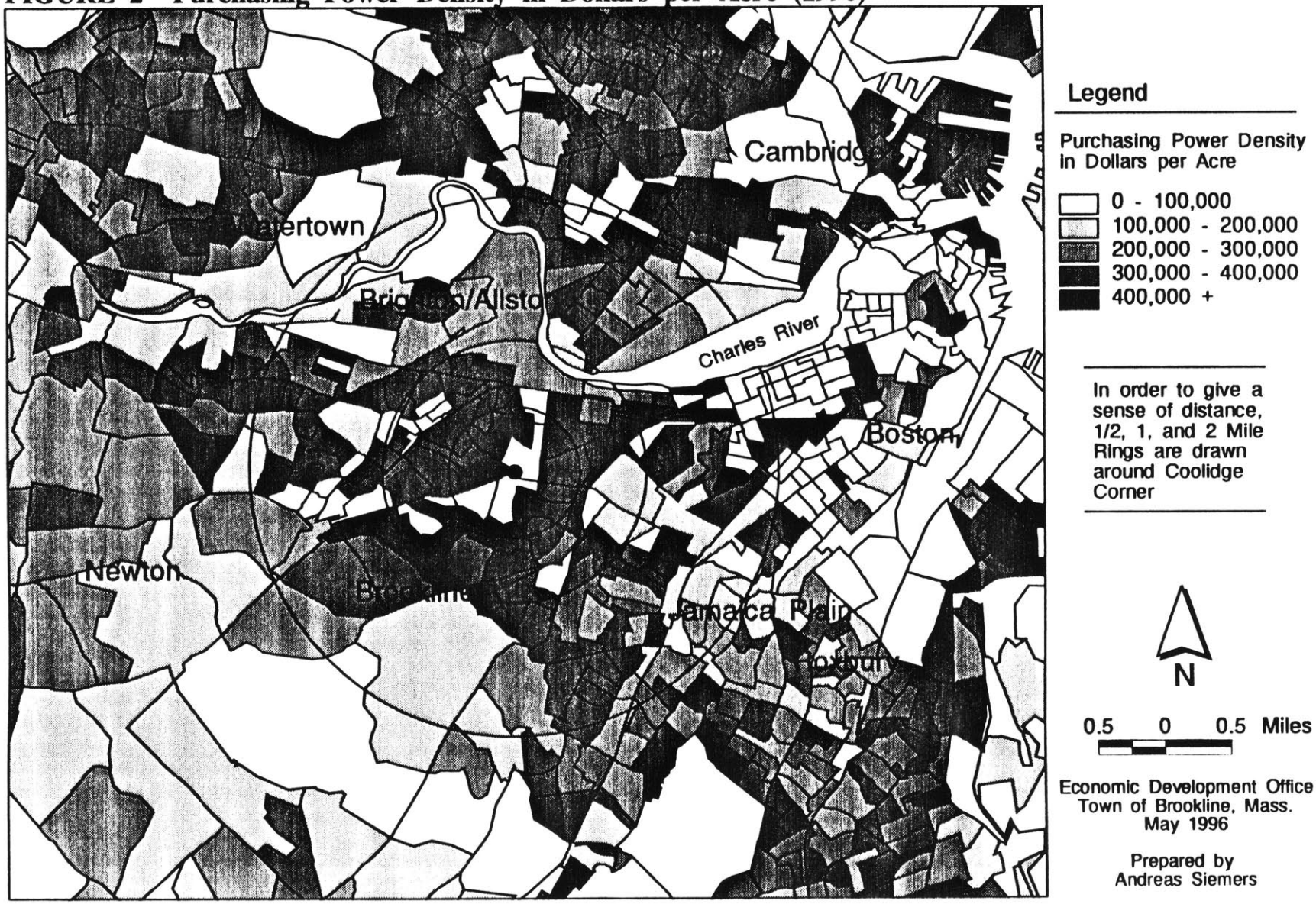


FIGURE 3 Percentage of Population (25 and older) with College Degree (1990)

Table 1 Demographic Profile of Brookline, Mass.

Based on 1990 Census data. 1/2, 1, and 2 Circles around Coolidge Corner.

	1/2 Mile Circle	1Mile Circle	2 Mile Circle	1 Mile Area (area on Boston side of river only)	2 Mile Area
POPULATION					
Total	27,998	91,944	239,902	87,968	205,232
FAMILIES					
Total	5,655	14,926	39,106	14,668	33,544
HOUSEHOLDS					
Total	13,721	38,194	98,679	37,704	85,460
Avg. Persons per Household	2.041	2.407	2.431	2.333	2.401
HOUSEHOLD SIZE					
1 person	44%	40%	41%	40%	40%
2 persons	32%	33%	31%	32%	31%
3 persons	13%	14%	14%	14%	14%
4 persons	7%	9%	8%	9%	8%
5 persons +	5%	5%	7%	5%	7%
RACE					
White	87%	78%	71%	79%	71%
Black	3%	7%	15%	7%	14%
American Indian	0%	0%	0%	0%	0%
Asian	9%	12%	9%	11%	8%
Other	1%	3%	5%	3%	5%

AGE					
0 - 4	4%	4%	4%	4%	4%
5 - 9	4%	3%	4%	3%	4%
10 - 14	3%	3%	3%	3%	3%
15 - 19	4%	9%	9%	8%	9%
20 - 24	9%	21%	20%	20%	20%
25 - 29	14%	15%	14%	15%	14%
30 - 34	12%	10%	11%	11%	10%
35 - 39	8%	7%	7%	7%	7%
40 - 44	9%	7%	6%	7%	6%
45 - 49	6%	4%	4%	4%	4%
50 - 54	3%	3%	3%	3%	3%
55 - 59	3%	3%	3%	3%	3%
60 - 64	3%	2%	3%	2%	3%
65 - 69	3%	2%	3%	2%	3%
70 - 74	3%	2%	2%	2%	2%
75 - 79	3%	2%	2%	2%	2%
80 - 84	3%	2%	2%	2%	2%
85 +	4%	2%	1%	2%	1%
LANGUAGE SPOKEN AT HOME					
English	76%	72%	73%	72%	72%
Spanish	4%	6%	10%	6%	11%
Russian	4%	3%	2%	3%	2%
German	1%	0%	0%	0%	0%
Yiddish	1%	1%	1%	1%	1%
Others	15%	18%	15%	17%	15%
YEAR OF ENTRY					
1985 - 1990	37%	46%	43%	45%	43%
1980 - 1985	13%	18%	19%	19%	19%
before 1980	50%	36%	38%	37%	38%

MEANS OF TRANSPORTATION TO WORK					
Car, Truck, or Van:					
Drove alone	40%	32%	33%	33%	34%
Carpooled	8%	7%	8%	7%	8%
Public Transit					
Bus or Trolley Bus	7%	10%	12%	11%	13%
Subway/Streetcar	22%	23%	20%	24%	21%
Railroad	0%	0%	0%	0%	0%
Ferryboat	0%	0%	0%	0%	0%
Taxicab	0%	0%	0%	0%	0%
Motorcycle	0%	0%	0%	0%	0%
Bicycle	2%	2%	2%	2%	2%
Walked	14%	19%	19%	17%	17%
Other Means	0%	0%	0%	0%	0%
Worked at Home	4%	3%	3%	3%	3%
EDUCATIONAL ATTAINMENT					
High School Graduate	93%	89%	84%	88%	84%
College Graduate	68%	63%	55%	62%	54%

INDUSTRY						
	Agricult./Forestry/Fishery	0%	0%	1%	0%	1%
	Mining	0%	0%	0%	0%	0%
	Construction	2%	2%	3%	2%	3%
	Manufacturing: Non-Durable Goods	4%	3%	4%	4%	4%
	Manufacturing: Durable Goods	4%	4%	4%	4%	4%
	Transportation	1%	2%	2%	2%	2%
	Communications/Public Utilities	2%	2%	2%	2%	2%
	Wholesale Trade	3%	2%	2%	2%	2%
	Retail Trade	11%	14%	14%	14%	15%
	Finance, Insurance, and Real Estate	12%	10%	9%	10%	10%
	Business/Repair Services	5%	5%	6%	5%	6%
	Personal Services	3%	3%	4%	3%	4%
	Entertainment and Recreation	2%	2%	2%	2%	2%
	Professional and Related Services:					
	Health Services	17%	14%	13%	14%	14%
	Educational Services	15%	19%	17%	17%	15%
	Other Profess. and Rel. Services	16%	14%	14%	14%	13%
	Public Administration	4%	3%	3%	3%	3%
OCCUPATION						
	Managerial/Executive	20%	16%	15%	16%	16%
	Professional	38%	29%	26%	29%	26%
	Technical	6%	7%	7%	6%	6%
	Clerical	12%	16%	17%	16%	17%
	Sales	12%	11%	11%	12%	11%
	Total White Collar:	88%	79%	76%	79%	75%
	Craftsman	2%	3%	4%	3%	4%
	Operatives	1%	2%	2%	2%	2%
	Services	6%	13%	14%	13%	15%
	Laborers	2%	3%	3%	3%	3%
	Farming/Forestry/Fishing	0%	0%	0%	0%	0%
	Total Blue Collar:	12%	21%	24%	21%	25%

HOUSEHOLD INCOME IN 1989					
Less than $5,000	5%	8%	8%	8%	9%
$5,000 to $9,999	8%	10%	12%	11%	12%
$10,000 to $14,999	6%	7%	8%	7%	8%
$15,000 to $19,999	5%	8%	8%	8%	8%
$20,000 to $24,999	6%	7%	8%	7%	8%
$25,000 to $29,999	8%	7%	7%	7%	7%
$30,000 to $34,999	6%	7%	7%	7%	7%
$35,000 to $39,999	6%	6%	6%	6%	6%
$40,000 to $44,999	5%	5%	5%	5%	5%
$45,000 to $49,999	5%	4%	4%	4%	4%
$50,000 to $54,999	5%	4%	4%	4%	4%
$55,000 to $59,999	4%	3%	3%	4%	3%
$60,000 to $74,999	11%	8%	7%	8%	7%
$75,000 to $99,999	10%	6%	6%	6%	6%
$100,000 to $124,999	5%	3%	3%	3%	3%
$125,000 to $149,999	2%	2%	1%	2%	1%
$150,000 or more	3%	3%	3%	3%	3%
MEDIAN HOUSEHOLD INCOME IN 1989					
weighted	$ 39,865	$ 33,440	$31,271	$ 33,060	$ 31,232
PER CAPITA INCOME IN 1989					
weighted	$ 25,567	$ 19,046	$17,977	$ 19,397	$ 18,073
WORKERS IN FAMILY IN 1989					
No workers	10%	12%	13%	12%	14%
1 worker	26%	27%	28%	27%	28%
2 workers	54%	50%	46%	49%	46%
3 or more workers	10%	11%	12%	11%	13%
HOUSING UNITS					
Total	14,154	40,260	106,615	39,839	92,128
Occupied	96%	94%	93%	94%	93%
Vacant	4%	6%	7%	6%	7%

FIGURE 4 Shopping Centers in the Vicinity of Brookline.

FIGURE 5 Coolidge Corner Merchant Categories

Figure 6 General Category Distribution

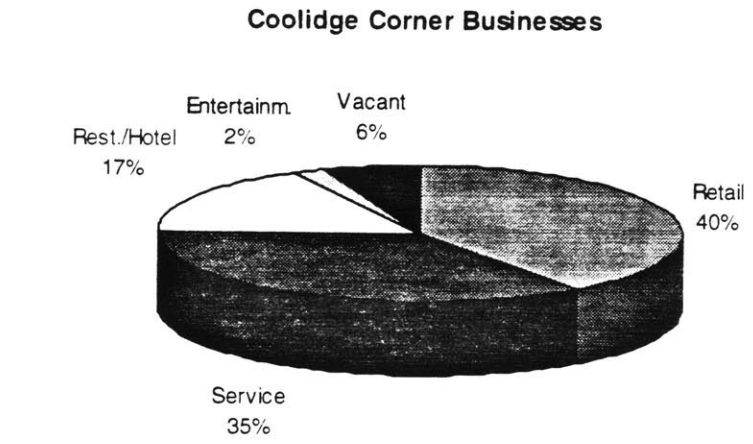


Figure 7 Retail Distribution

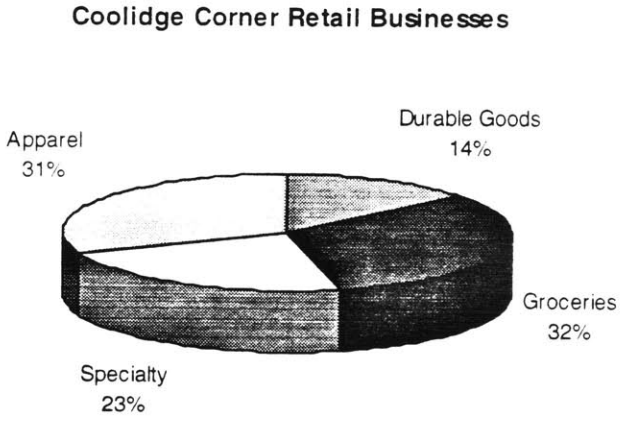


FIGURE 8 Comparison of Retailers and Service Providers: Locals vs. Nationals

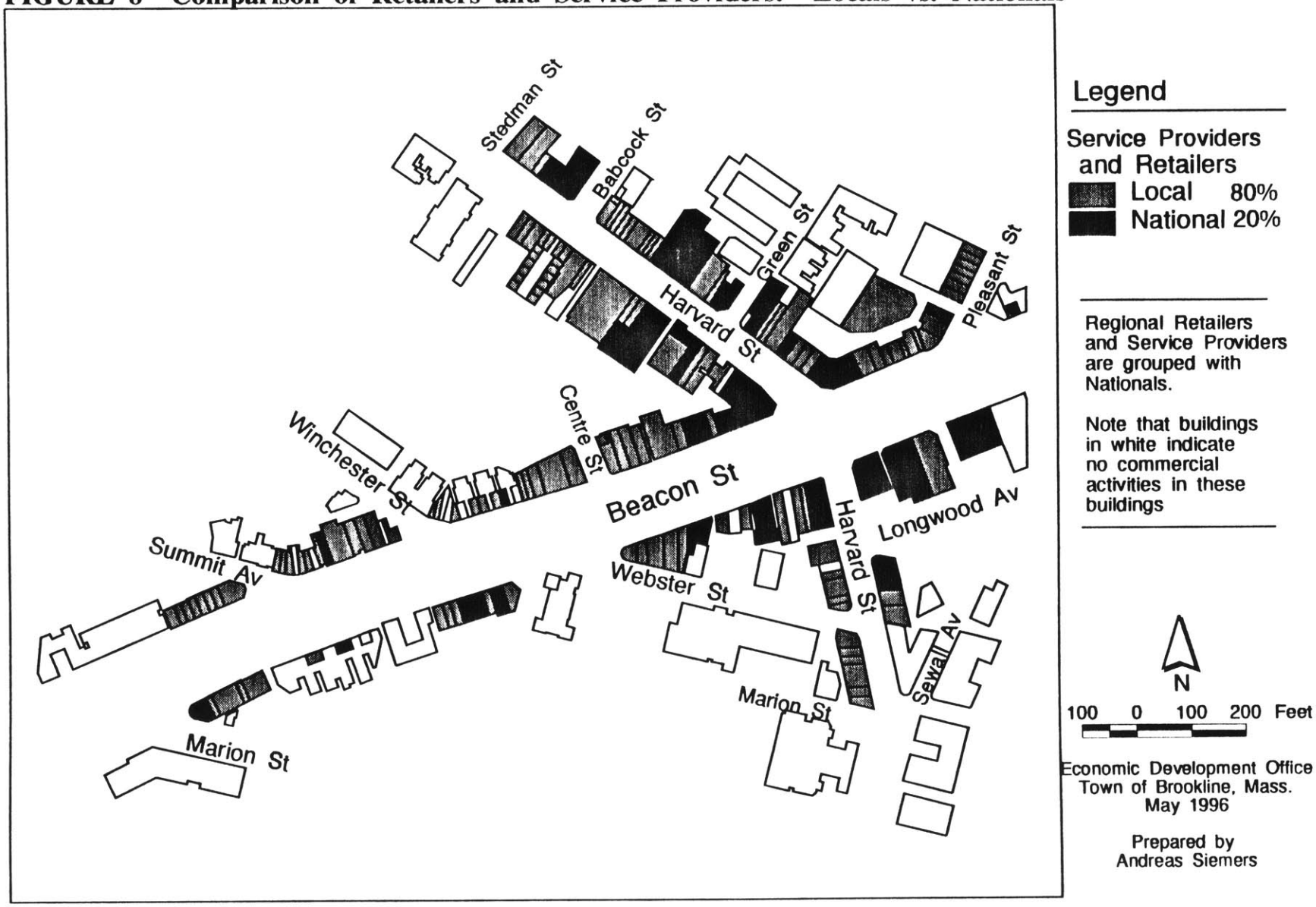
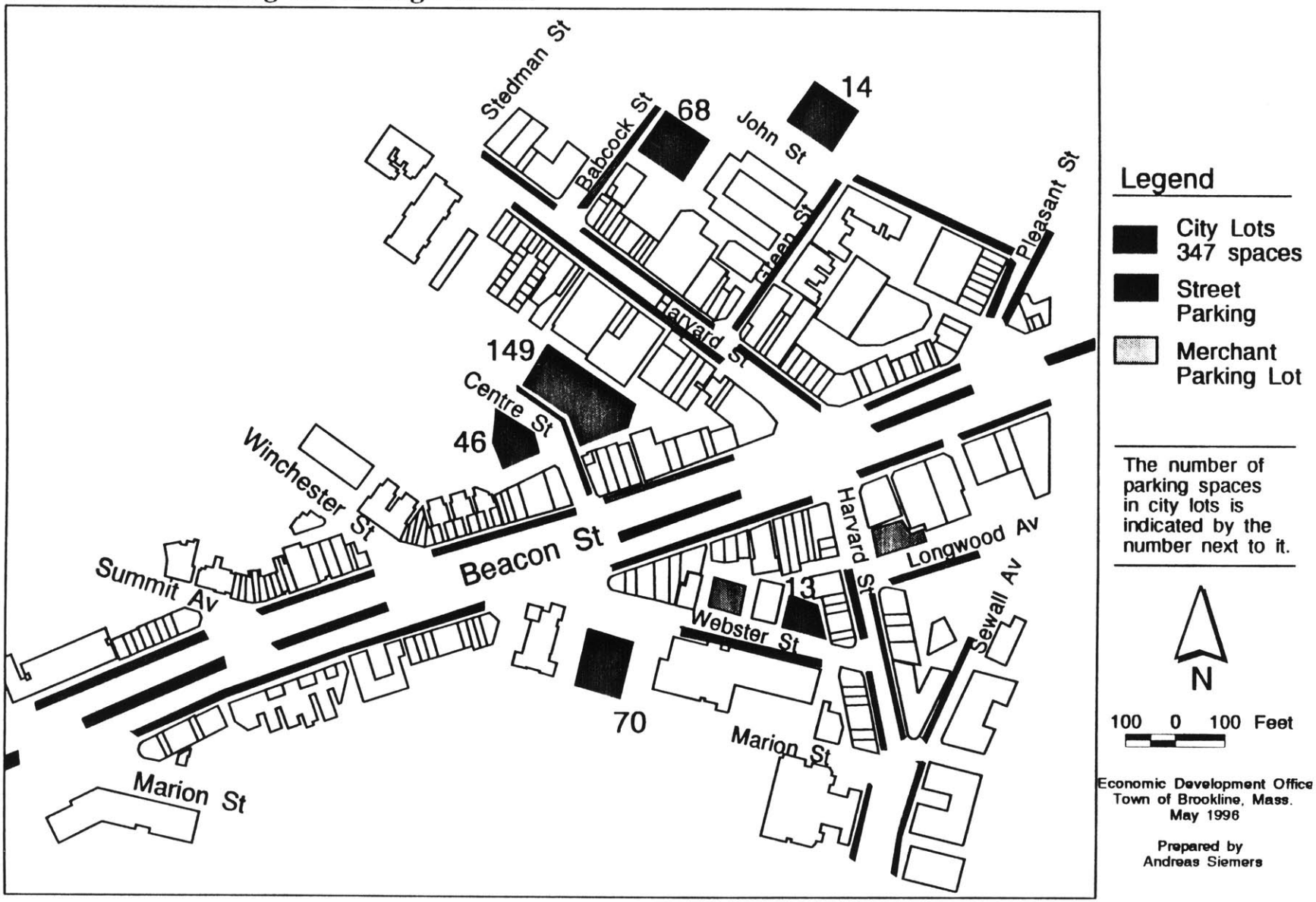


FIGURE 9 Parking in Coolidge Corner



Appendix E:

Categorization of Businesses in Brookline

General Category	Sub-category	Specific Category
1 Service	11 Personal Service	111 Hair
		112 Beauty
		113 Veterinarian
		114 Dry Cleaner / Tailor
		115 Funeral Home
		116 Shoe Repair
		117 Laundry
	12 Health Services	121 Medical Doctor
		122 Dentist
		123 Massage
		124 Optometrist
		125 Hospital / Health Clinic
		126 Other Services
	13 FIRE	131 Bank
		132 Insurance
		133 Realtor
		134 Broker
		135 Travel Agent
		136 Lawyers / Accountants / Management
	14 Educational Service	141 School
		142 Society
		143 Church
	15 Commercial Service	151 Copying / Packaging / Typesetting
		152 Catering
		153 Photography /Photo Developing
		154 Answering Service
		155 Taxi Cab
		156 Cleaning

		157 Paper / Magazine
		158 Moving
		159 Framing
	16 Mechanical Service	161 Car Mechanic / Body Shop
		162 Gas station
		163 Construction / Repair
		164 Autowash
2 Retail	21 Groceries	211 Groceries
		212 Specialties (Butcher, Bakery, Fishery)
		213 Liquors
		214 Pharmacy
		215 Convenience
	22 Apparel	221 Adult
		222 Kids
		223 Jewelry
		224 Second Hand
		225 Shoes
	23 Specialty	231 Antiques
		232 Arts / Crafts
		233 Toys / Children's Books / Party Favors / Cards
		234 Books
		235 Florist
		236 Computer / Software
		237 Beauty Supply / Health Store
		238 Thrift Store
		239 Gallery
	24 Durable Goods	241 Furniture / Kitchen Supplies
		242 Automobile
		243 Sporting Goods / Bicycles
		244 Electronic Equipment / Music / Hi-Fi
		245 Building Supply
		246 Stationary
		247 General Store

3	Restaurant / Hotel	31 Restaurant	311 Restaurant
		32 Diner / Cafe / Deli	321 Diner / Cafe/ Deli 322 Ice Cream Parlor
		33 Bar	331 Bar
		34 Hotel / Hostel	341 Hotel 342 Hostel
4	Entertainment	41 Theater	411 Movie Theater 412 Theater
		42 Video Rental	421 Video Rental
		43 Sports	431 Golf 432 Cricket 433 Health Club
0	Vacant		

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