

High Tech Atlanta: Global Links Deep in Dixie

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Introduction

Cities seek to be known as high technology job magnets due to the economic benefits accruing to that perception, though only limited understanding and no agreement exists as to either the basis for the high technology label or the types of jobs encompassed. Attaining this favourable designation is particularly important for urban areas in the southern United States, historically perceived as a lagging region. The following research examines how metropolitan Atlanta developed as a mecca for high technology activity, in what sectors its locational strength lies, and where within the metropolitan region related businesses and employees cluster. The city's prominence in this critical sector rests largely on a strategically timed confluence of embedded attitudes prioritizing economic success and the presence of entrepreneurial individuals in business, politics, and educational institutions.

Atlanta is widely viewed as the economic centre of the southern United States. As enunciated by former Mayor Hartsfield, who directed and presided over the major boom phase of Atlanta's growth, Dixie's leading metropolis is "too busy to hate [non-whites]" because it is too occupied with making money. A demographic focus of this research explores the prevalence of Asians, especially Indians and Chinese, in the high technology/professional specialty occupational category. The face of 21st century Atlanta increasingly assumes a more global and higher technology profile than apparent in its previous public image.

The following section lays out the theoretical framework for explaining the

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success of Atlanta as an urban high technology "magnet" within a developmentally challenged region (Kantor 1995). A detailed case study of the southeast's leading metropolis traces the beginnings of high technology stemming from the presence of the Georgia Institute of Technology and the meeting of several entrepreneurial business and political leaders. The examination culminates by assessing Atlanta's current position within American high tech locations, and its new global labour presence.

Predicting Prominence

The highly agglomerated nature of Atlanta's technology sector fits within several related theoretical frameworks. Their particular applicability to the Atlanta case study is noted as each one is discussed. A complementary set of theories addresses how a national level metropolitan economy emerges from a lagging region. Agglomeration economies enhance groups of closely located companies by drawing on similar embedded strengths. This demonstrably increases both the visibility and reality of those strengths in the locality and their resident related companies. Examples of such attributes include local research universities with strength in an applied specialty with an industrial focus, good technology transfer mechanisms and an appropriately skilled labour pool featuring both high skilled technicians and support personnel. In Atlanta's case, this is attributable to the presence of the Georgia Institute of Technology and a large number of other post-secondary educational institutions in the area (Combes 2002).

The second group of relevant theories highlights comparative advantages of firms and/or regions, and the importance of making a good match between the two (Porter 2000). To a certain extent advantages can be constructed, particularly the political targeting of fiscal and regulatory incentives, but such strategies must necessarily reflect locally embedded attributes. For a lagging region these could lie in the availability of plentiful high quality low cost housing (a key component of an affordable cost of living) and a concentration of accessible quality of life urban-suburban attributes. As a large southern city, Atlanta certainly fits this requirement. Product cycle and firm life cycle (Markusen et al 1986) theories constitute the third theoretical link, matching the development stage of a commodity with locational features most conducive to the needs of each particular stage. Atlanta's possession of an extraordinarily broad economic base (Pollard and Storper 1996) assisted in its successful transition through each stage of the firm life cycle, with a broad skill base of workers to match.

Case study literature further illustrates the importance of getting lucky with local leadership who forge a dynamic core to push policies and create circumstances leading to growth in their industry and city (Walcott 2001). Public-private partnership theories, the fourth theoretical application to Atlanta's situation, forecast the beneficial effects of combining political muscle to build a "pro-business" economic environment using fiscal and regulatory incentives aimed toward an industrial sector. The high technology sector forms a particularly popular target, given its lucrative wage levels and thus high multiplier effects throughout the region (Malecki 1997).

The following section explores Atlanta's fit within 'second tier cities' that forge conscious political strategies for trying harder to support their economic strengths. Numeric data, which is time bound and relativistic, is supplemented and illuminated by interview data from key informants in key firms in key sectors (Markusen et al 1999). A string of anecdotal evidence lends credence to theories relating the growth of particular economic sectors in particular places to the actions of particular humans who happen to congregate, exchange information, and build on this tacit knowledge (Saxenian 1994). The following detailed case study of Atlanta's development as a high tech Southern centre demonstrates the relevance of theories stressing the salutary affects of structural comparative advantage building agglomerations, and the nurturing power of agency.

Network Roots and Branches: A Historical Perspective

At the turn of the previous century in the 1890s, prominent newspaper publisher Henry Grady sought to attract investment to struggling post-Civil War Atlanta by proclaiming his city's propensity to subsume all other issues to economic advancement. In the postwar years of the 1940s and 1950s, the state of Georgia tried to grow its job base by recruiting factories from the northern and eastern U.S. This proved an early harbinger of what would eventually become the migratory flow of companies and workers from the rustbelt to the sunbelt, a technology-rich stream building up a new layer in Atlanta's occupation structure (Markusen et al 1986).

A revealing exception to that recruitment strategy was the permission extended by relocating companies to their top researchers to remain close to major universities in the northeast. Companies very expensively reversed this labour strategy in the late 1990s by offering major financial inducements for highly skilled employees to come with them when they moved to the South. The business community's previous lack of appreciation for the value added of researchers consequently hampered the development of Georgia's knowledge industry by not increasing the local pool of knowledge workers from native education institutions.

Correspondingly, business leaders who were graduates of the Georgia Institute of Technology placed more emphasis on obtaining jobs for Tech grads than in bringing in outsiders for local positions anyway. The combination of these two strategies paved the way for locally based innovative developments. Ten months after the Lockheed Aircraft Corporation came to the northwest suburb of Marietta to occupy the former Bell Aircraft Corporation building in 1951, a new company called Scientific Atlanta started as a spin-off from federally funded research at Georgia Tech. Seven faculty members affiliated with the Engineering Experiment Station at Tech spearheaded this enterprise. Scientific Atlanta became the city's top and most prolific technology firm. By the year 2000, it employed over 2,800 workers, attained annual sales exceeding \$1 billion, and had generated over thirty spin-off companies (Combes 2002). Long-serving Congressmen such as Sen. Sam Nunn and Rep. Newt Gingrich nurtured partnerships between Atlanta's research universities, military concerns, political ties, and business outlets.

In the 1960s, Atlanta's business and political leadership constituted a famously coterminous growth machine (Stone 1989). A table full of leaders including the mayor, the head of the leading bank, and CEOs of the city's major businesses quickly concluded that segregation had to end so their city could advance -- and went to work to implement this agreement. Their success in the 'Forward Atlanta' campaign of 1961-1967 set Atlanta apart as a pro-business Southern city of relative racial calm, where corporate migrants to an ascending Sunbelt could safely put their investments. Multiple term mayors Ivan Allen (1962-1970) and Maynard Jackson (1973-1977 and 1990-1994) epitomized Atlanta's historic political transition from a leading white business family to the first black mayor of a major southern city (Pomerantz 1996), signaling the dawning acceptance of diversity in this rapidly developing metropolis.

The financial success of Ross Perot's enterprising company 'EDS' attracted the attention of a remarkable group of Georgia Institute of Technology fraternity brothers who subsequently journeyed to Texas in the mid-1970s to learn about the new business of software services. They returned to found 'Management Sciences America' (MSA), purportedly one of the first computer stores east of the Mississippi River, at a prime location in the heart of downtown Atlanta (personal communication, editor of 'TechLINKS' magazine). The "Heathkit" style build-your-own-computer set became one of the store's most popular products, attracting students who loved to tinker such as Georgia Institute of Technology's Dennis Hayes. Hayes went on to create Hayes Microcomputer Products and Hayes Modem - at one time the world's largest modem company. By 1979, the state government-supported business incubator Advanced Technology Development Corporation (ATDC) operated across from the Georgia Tech campus with which it was closely affiliated. ATDC continues to produce successful companies.

While planning its first personal computer in 1980, IBM hired the head of software at MSA's store on Piedmont and Peachtree and gave MSA the development contract. Their new employee then turned to Hayes, who was located in nearby suburban Norcross. Together, they created Peachtree Software for IBM. An employee of Lanier copier went to Norcross as well and developed what became Lotus 123, incorporated into IBM's word processing and spreadsheet package. DCA, an early network system, also came from the MSA family. Microsoft's work graphics were purchased as a software graphics package developed by local Marietta graphics artist Lou Wasner. The difficulty experienced by MSA in trying to sell expensive mainframe software inspired Leland Strange and Bill Goodhues to lower the cost of their product to fewer than eighty dollars and advertise it in magazines as a mail order purchase -- and made millions as a consequence. Dow Jones purchased MSA in the mid-1990s.

Another example of interpersonal local networking with large consequences occurred in the early 1980s. Then-mayor of Atlanta Andrew Young participated in a fascinating discussion at a United Way fundraiser about the possibilities of new satellite technology expounded by Glenn Robinson, a Georgia Tech graduate and founder of dish satellite broadcasting company Scientific Atlanta. Young introduced him to local entrepreneurial upstart Ted Turner - and Cable Network News (aka CNN) was born.

High tech 'Hotlanta' hit its growth spurt in the late 1980s as a fiscal and physical flow of financial and human capital migrated to the Sunbelt's largest metropolitan areas. Interstate highway spokes, bridged north of Atlanta by limited access highways, channeled demographic settlement patterns (largely fueled by suburbanites from the northern U.S.) into a wedge of counties north of the city. An innovative technique of laying fiber optic cables in loops to avoid service disruption by a single line cut, pioneered nationally by Bell South in Atlanta's northwestern Cobb County, provided the region with more miles of cable delivering Internet access than possessed by any other metropolitan area in the country (Walcott and Wheeler 2001). This revolutionary new line routing came in response to the challenge posed by the large number of construction machines tearing up the red dirt in Atlanta's booming suburban sprawl. In the next section, Atlanta's high technology locations are discussed in greater detail.

Spatial Distribution and Sectoral Composition of Atlanta High Tech

For the purpose of this study, high technology firms are defined as those engaged in the design, development, and introduction of new products and innovative manufacturing processes, or both, through the systematic application of scientific and technical knowledge (U.S. Congress, Office of Technology Assessment 1995). Benefits to being seen as a high tech hot spot include the associated high pay and related high impact multipliers from purchases of goods and services in non-high technology sectors such as luxury goods. High technology firms constitute attractive components in the metropolitan sectoral mix due to their propensity to cluster while attracting related production chain companies, and their counter cyclical innovation effect balancing downturns in other areas (Malecki 1997; Walcott 1999).

Urban corporate landscapes fall into several categories and scales. Innovation centres comprised of numerous industry leaders characterize settings such as California's Silicon Valley and Massachusetts' metropolitan Boston (Hall and Markusen 1985). Atlanta's metropolitan population of 4.1 million (U.S. Bureau of the Census 2000), ranks 11th in the U.S., placing it as a 'second tier city' or regional (southeast) leading metropolis. A recent national study placed it fifth in telecommunications services employment, sixth in software publishers employment, seventh in internet services, eighth in computer systems design and related services, tenth in high tech establishments, eleventh in high tech employment, thirteenth in high tech exports (which comprised 16 % of all exports from Georgia) and size of high tech payroll (AEA 2005).

The core of metropolitan Atlanta consists of the ten counties in the Atlanta Regional Commission's jurisdiction, where the great majority of high technology companies and employees reside. Atlanta serves as the major high technology employment site within the state of Georgia. In the year 2003 (the basis for AEA's 2005 high tech industry survey), the largest 114 metropolitan areas in the United

TABLE 1 Percent of Local Economy Represented by High Tech Sector Jobs

1)	Austin, TX	9.0%
2)	San Francisco	8.6%
3)	Raleigh-Durham	8.0%
4)	Boston	7.1%
5)	Denver	5.1%
6)	Atlanta	4.1%
7)	Chicago	4.0%
8)	New York	4.0%

Source: "The Metropolitan New Economy Index", Progressive Policy Institute

TABLE 2 Top High Technology Employment Sectors in Metropolitan Atlanta

Category (combined NAICS)	Employment (2002)
IT Technology (esp. programming & design)	52,953
Telecommunications	46,901
Software Publishing	11,770
Life Sciences ¹	8,394

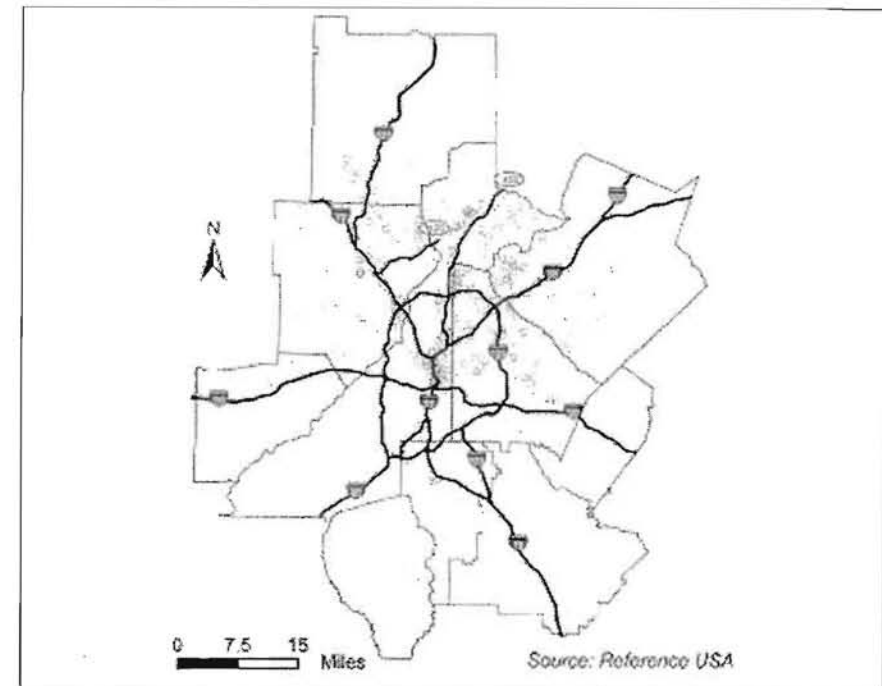
Note: 1. (pharmaceutical, bio, labs, related manufacturing)

Source: Metro Atlanta Chamber of Commerce

States accounted for 67 % of all jobs, and 81 % of all high technology employment. Metropolitan Atlanta placed sixth with 4.1 % of jobs in the local economy coming from the high technology sector -- slightly ahead of Chicago and New York as a percent of total jobs (Table 1). Possibly indicative of Atlanta's role as more of a merchandising than innovating location, the metropolitan area ranked only 32nd in both science and engineering degrees (Progressive Policy Institute 2003).

Several other commissioned studies noted the relative strength of both the state and the metropolitan area in particular sectoral clusters, which again are only indicative of relative strength within that study as it defined the measured clusters. According to Ernst & Young's BIO survey of life science related firms, in the year 2003 Georgia reached the top ten for the first time, placing ninth in life science firms (a position it retained in 2004), the vast majority of which are in the metropolitan Atlanta-Athens (University of Georgia) corridor. Burrill & Company, another major life science industry observer, noted that in the year 2002 Georgia companies raised more capital per biotechnology company than did similar firms in California, Maryland, North Carolina, New Jersey, Pennsylvania and Texas (Kochut 2003).

As part of its 'Forward Atlanta' five-year economic development marketing campaign, Metropolitan Atlanta's Chamber of Commerce (MACC) drew up several industry clusters it featured as 'Industries of the Mind' (Akioka 1999, www.macc.org 20000). The two leading employment sectors, virtually tied as

**FIGURE 1 High Tech Companies in Metropolitan Atlanta**

measured by the number of workers, were telecommunications services (49,748 employees) and what the MACC defined as a cluster of related computer software, programming and services (49,699 employees). These groupings and the number of associated employees reflect Atlanta's historic strengths. Major job creation sectors in the metro area through the 1990s, as defined by Porter's study for the National Governors Association in 2002, were business services (approximately 78,000 jobs added) and IT (approximately 7,000 jobs added) in the high technology sector. By the year 2002, MACC's North American Industry Classification System (NAICS) based data showed leading high technology employment continued to be in IT, telecommunications, software publishing and the life sciences (Table 2).

For the purposes of the maps generated by census district address matching, the major SIC (Standard Industrial Classification) codes (used by the data utilized) of companies represented in Atlanta's high technology sector were SIC 7371-5 (computers), SIC 8731-4 (R&D labs), SIC 2834 & 384 (Biopharmaceutical and medical devices), and SIC 8071 (medical laboratories). Their combined location fell into definite clusters and corridor alignments along major transportation routes (Figure 1). Almost all high tech companies heavily concentrate north of I-20, including a downtown-to-midtown bubble by the major research universities in the vicinity of the merged I-75 and I-85 'Connector'. Another major bubble appears in the prestigious office area of 'Perimeter Center' at the intersection of the route

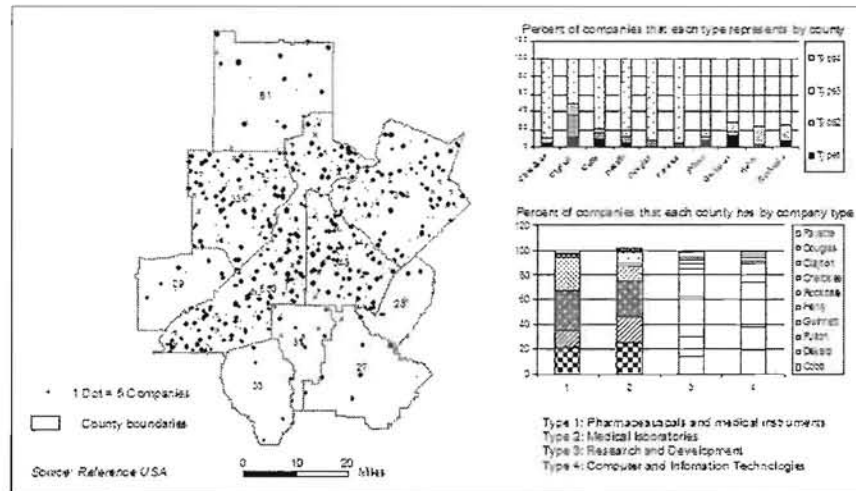


FIGURE 2 High Technology Companies by Sectoral Distribution, Atlanta

285 beltway and the north mid point route 400, continuing up route 400 and in-filling throughout the wedge between I-85 to encompass Technology Park Atlanta. A concentration in east Cobb County between I-575 north of route 120 includes high priced residential and office real estate locations. A breakdown of high technology companies by different SIC codes (Figure 2) illustrates the predominance of computer and IT companies, and their concentration in the four core counties of Fulton (including the city of Atlanta in the centre), Cobb, DeKalb and Gwinnett. Indeed, Fulton contains twice as many as any other county, with the other three counties featuring roughly the same number of similarly classified companies.

A major infrastructure impediment to sustaining a vital flow of information within the high tech sector consists of heavy traffic that bottles up commuters along Atlanta's choked transportation arteries. Companies frequently locate in convenient proximity to the residence of their founders, resulting in a disparate assortment of clusters corresponding to major transportation routes in the north east, north central and north western segments of metro Atlanta. While Silicon Valley has its researcher-attracting coterie of late-night food outlets, New York's 'Iron Triangle' near Soho sports choice coffee shops, and Boston's hangout places are geographically condensed, Atlanta's scattered technology companies and residences in widely spread suburbs lead to a lack of similar food and information flow sites. Socializing opportunities -- and the related trust building, idea-exchanging and network-constructing activities -- are thus restricted (Walcott 1999). Several organizations related to high technology professionals attempt, in a more formal way, to address the obvious geographic challenge to the healthy exchange of ideas and personal relationship building.

Atlanta's heady rise as a technology prominent location came on the backs of large companies with a local presence such as Lucent, IBM, Microsoft and

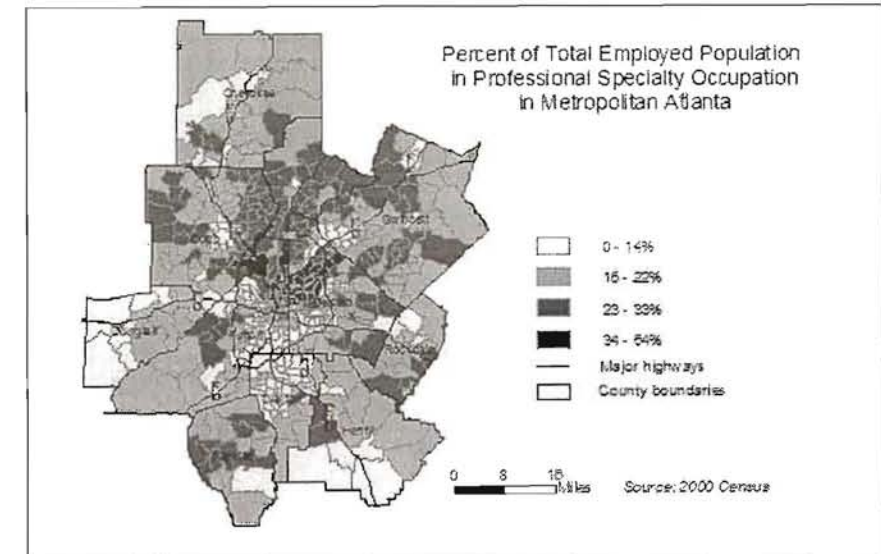


FIGURE 3 Percent of Total Employed Population in Professional Specialty Occupation in Metropolitan Atlanta

Hewlett-Packard. The formerly flourishing telecommunications field featured Atlanta offices for MCI-World Com, Bell South, Electromagnetic Sciences Inc., and Scientific Atlanta. Other technology-heavy large employers include Lockheed Martin (formerly Lockheed Martin Marietta, named for the northwestern Cobb County suburban in which it is located) and Motorola (in northeastern Gwinnett County), UPS, Delta Airlines, Priceline.com Inc. and Healtheon/WebMD Corp (Marcus 1999).

In the year 2000, the Metro Atlanta Chamber of Commerce estimated 165,000 high technology employees comprised more than 8 % of the ten county region's workforce, filling around 9,000 jobs in this region (Sherman 2000). The profusion of high technology jobs and the local unmet labour demand (prior to the IT downturn in 2002 that hit Atlanta particularly hard), along with the relatively inexpensive cost of living and international Olympics profile, drew an entirely new international dimension to Dixie's high technology hot spot, as detailed in the following section. The ability of Atlanta to attract and sustain an international contingent of high technology workers constitutes an important element in its ability to rise to technology prominence.

Globalization Demographics

Since the 1990 census, metropolitan Atlanta's professional specialty occupation population shows signs of a more urban concentration, locating largely within the Route 285 beltway (Figure 3). Although still closely aligned with the major feeder

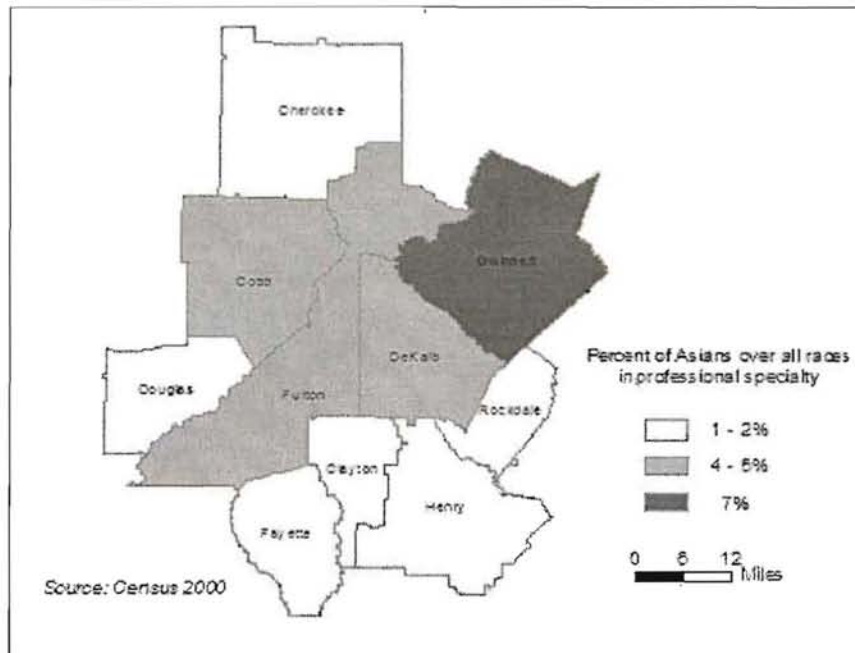


FIGURE 4 Percent of Asian Representation in Professional Specialty Occupation in Metropolitan Atlanta

roadway arteries of I-75 and I-85, this concentration demonstrates a response to the area's infamous traffic congestion. The districts of highest concentration are still to the north of the centre city, an almost reverse image of the less affluent, more southern census districts. This pattern clearly corresponds to the location of high technology companies (Figure 2), illustrating commute-minimizing strategies (Walcott 1999). The concentration in the Fulton-DeKalb boundary reflects several local considerations: Emory University and the medical complex associated with its research hospital, an area of affordable office spaces known as the 'Norcross Cluster', and proximity to major transportation arteries.

An analysis of Atlanta's high technology workforce (based on census 2000 STF 3 and 4 counts) revealed a disproportionate number of ethnic Asians in the professional occupation category (4.7%), particularly those of Indian (37%) and Chinese (25%) ancestry. Koreans form 10% of this high skill workforce category, with Vietnamese at 6%, accounting for 78% of the total Asian component. Within the general 'professional specialty occupation' category, they residentially clustered in the four core counties. The residential concentration of Asian Professional Specialty labor in Gwinnett County (7.3%) reflects the high quality reputation of its school system (Figure 4).

The four top national groups displayed generally similar location patterns, with small variations (Figure 5). Most numerous of all Asian populations in the professional specialty category, Indian Asians (6,586) concentrated in the four core

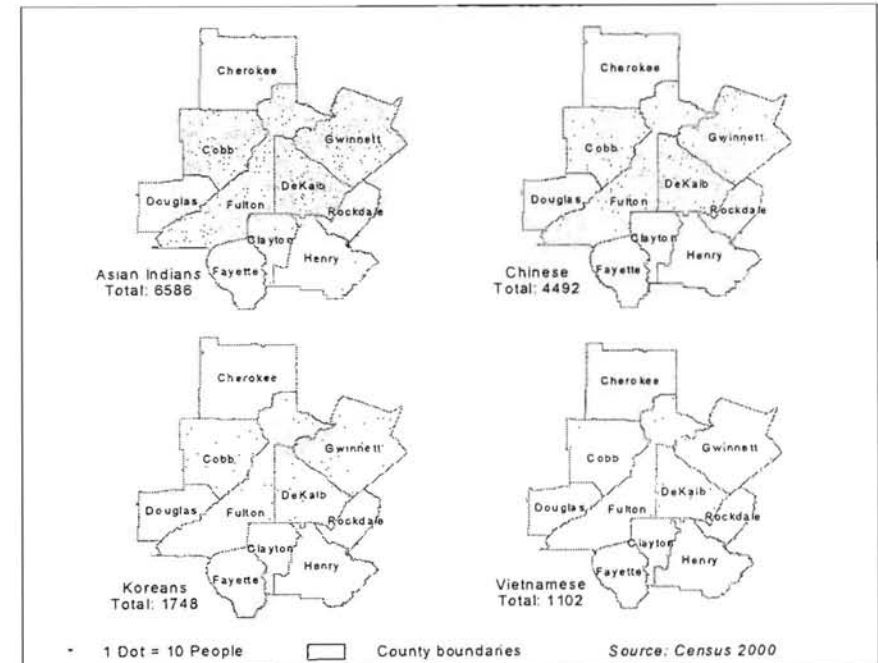


FIGURE 5 Major Asians in Professional Specialty in Metropolitan Atlanta

counties but also were the most diffuse to the north (Cherokee) and south (Clayton). As the second most numerous, the Chinese (4,492) were the most heavily concentrated. Although they are the most populous Asian demographic group in metro Atlanta and the most heavily represented in professional specialty occupations (Figure 6), the Chinese are also significantly bimodal in their occupation distribution, including a large number of small shopkeepers and merchants. The Koreans (1,748) and Vietnamese (1,102) comprise the middle group demographically. The population of Vietnamese in Clayton reflects a large church-related settlement area in that county, whereas many Korean churches thrive in Gwinnett. Dividing diversity by ethnic group, Indians demonstrated the greatest geographical spread, while Koreans were the most concentrated, reflecting the attraction of Korean churches as major social and community centres. Overall, settlement patterns of Asian populations reflect the concentration of well-paying technical specialty jobs and good schools in the northern wedge counties.

According to several interview sources, the Indian community perceives Atlanta as a cosmopolitan city due to its global glow from the Olympics, as the hometown of Martin Luther King, Jr. and the Carter Center. Gujarat constitutes the major sending area for approximately one third of Atlanta's Indian population, including third generation merchants from developing world diasporic cities in Africa and the Caribbean who tend to work in convenience stores, gas stations, dry cleaning businesses and fast food franchises. Hotels comprise another large sector for Asian Indians, who comprise almost half of all hotel owners in the United

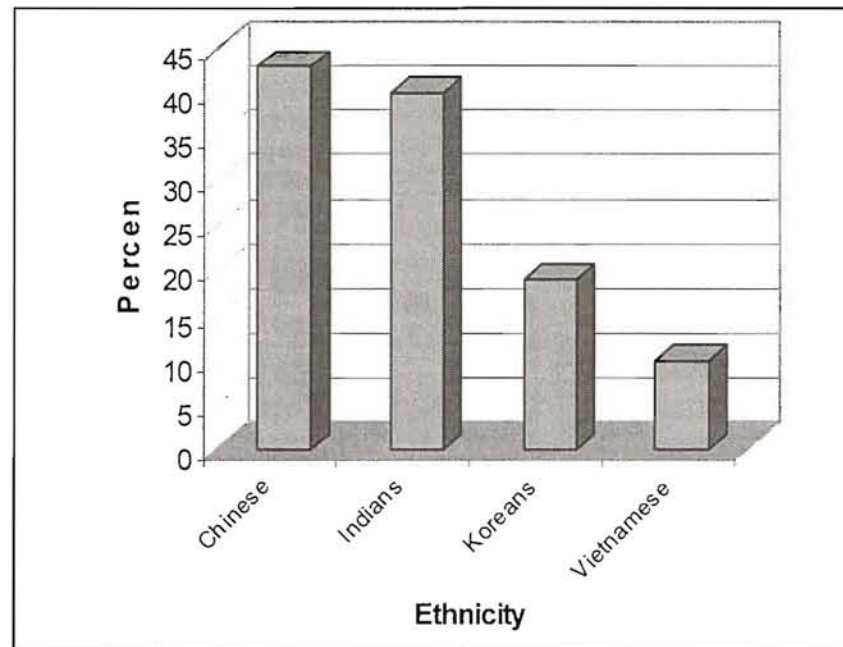


FIGURE 6 Percent of Asian Ethnicities in Professional Specialty Occupations

States. South India, particularly the high technology training centres of Bangalore and Hyderabad, are well represented sending areas for Atlanta Indians, particularly those in the professional specialty occupations.

Indian high technology immigrants increased throughout the 1990s following liberalization of the H1-B visa, a policy (since rescinded) designed to attract high demand high skill labour in short supply domestically. The southern Indian state of Andhra Pradesh, whose capital city of Hyderabad now holds Microsoft's Indian headquarters and a nearby branch of Georgia Tech, supplied many of these workers from its famous IT university. Other south Indians also left their impoverished regions, either for short 'body shopping' sojourns rotated between the two countries by their American employers or for longer-term resettlement from the states of Tamil Nadu, Karnataka, Kerala, and Maharashtra. Over one hundred Indian American associations sustain their communities in Atlanta, including occupational, linguistic, cultural and religious affiliation groups. Indian influence impacts Atlanta's built environment in several retail hubs outlying the central city that feature grocery stores, restaurants, jewelry shops, and Bollywood movie theatres, as well as Indian themed nightclubs in upscale districts and a 'Global Mall' on Buford Highway, the main international retail street through three metropolitan area counties (Walcott 2002).

The Indian high technology community is quite well networked, with several organizations such as the Indian Professional Network (which maintains an active web presence) and TAI, as well as 'Khabar Magazine' which sponsors forums,

events, and serves as a community bulletin board through its website as well as print. Members of this group are "movers and shakers, venture capitalists, and company founders", according to Khabar's editor, who has lived in Atlanta since 1986. They are also politically active, particularly the young technology generation, making their influence felt in the successful underdog campaign of a newly elected Congresswoman. The Georgia AI-PAC conducts a robust email forum, while other community members are active grassroots political organizers, binding that community together.

The Chinese population in Atlanta is similarly bimodal in terms of its occupational affiliation. Chinese represent a slightly higher proportion of high technology workers, due in part to the historically large number of Taiwanese engineering graduates from the world-renowned Georgia Institute of Technology. For young mainland Chinese, obtaining a student visa represents the main route out of their country for advanced training and a higher standard of living. Georgia Tech constitutes a key destination for this technology proficient cohort. Atlanta also attracts second generation Chinese from other parts of the U.S. due to the metro area's fabled job market, attractive climate, stock of affordable new single family homes, infrastructure links such as the U.S.' busiest airport, large number of foreign invested businesses and a core of Chinese community support such as grocery stores and restaurants, according to interviews with half a dozen local Chinese community leaders. The community also contains two Chinese-run banks. While Atlanta received high marks for features such as its forested setting, its initial attraction came from a reputation as an international, Olympics-setting city as well as 'Coke, Carter, UPS, 'Gone With the Wind', CNN', according to an Atlanta-based Asian diplomatic representative. A comfortably sized Asian base population came partially due to a word of mouth communication chain from previous related migrants. These are commonly critical features in any migration chain, but are particularly important in the highly mobile and desirable technical specialty-knowledge worker category.

The high skill base is largely concentrated in engineers and technicians. The 'Association of Chinese Professionals' Atlanta branch attracts approximately 500 members, with double that number on their mailing list. A widening gap exists between more and less economically well-off members -- particularly the less educated who lack English fluency. They also divided along geo-political lines: Mainland Chinese, Taiwanese, and others such as Hong Kong and Southeast Asian immigrants, as well as American born members. This group is also increasingly active politically, seen in voter registration drives and the first Chinese judgeship in the southeastern U.S. Atlanta's economic base, including its high technology component, is more widely diversified than many other American cities, and its demographic base is more widely diverse than many would expect for this Dixie city that is in but not of the Deep South.

Conclusion

Historical positions taken by individuals figure prominently in an assessment of Atlanta's fit with the four theoretical explanations initially projected to account for the metropolitan area's rise as a prominent high technology location within the Deep South. The proclivity to place economic advancement over all other considerations led Atlanta through three critical periods: the post-Civil War rebuilding, transitioning from a wartime economy post-World War II, and largely avoiding the turbulence of the Civil Rights era in the 1960s and 1970s. Partnership between major universities such as Georgia Institute of Technology and government leaders at all levels helped to direct military-industrial funding support aimed at technology development to applied products. The diversity of Atlanta's economic base in general, including its technology sector with various components, shows that government efforts are still going into trying to anticipate new trends while providing general infrastructure support (such as the ATDC incubator facilities) for whatever can flourish in the niche technology sector.

Atlanta's evolution as a high tech town came about due to a confluence of events bringing together pioneering individuals in synergistically related fields, who met because this was and is still a small big city. Although the city's early and continuing success in software and telecommunications reflects localization effects, the broadened and sustaining talent base owes its success to the globalization of the work force reflecting and increasing Atlanta's position on a world stage. Negotiating the political implications of Atlanta as the major city and high technology concentration in a state where poorer rural interests hold major political power requires casting high technology as a statewide benefit and a broader scale activity. The trade journal 'TechLINKS', for example, consciously mentions 'Georgia' three times on the cover of every issue. This research demonstrated several types of clusters evident in high technology related work: the locational agglomeration of companies in the four core counties, the concentrated residences of highly skilled workers drawn by a relatively low cost high quality of life, and the predominant position of Asians (particularly Indians and Chinese) in these occupational sectors. Clearly, high technology attained a critical mass in Atlanta by bringing new faces from new places to the South's traditional business capital, injecting new occupations reflecting the new century's global economics.

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