

INDUSTRY CLUSTER ANALYSIS IN ORDER TO PROMOTE PRODUCTIVE
BUSINESS DEVELOPMENT IN WESTERN ORANGE COUNTY, FLORIDA

By

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To everyone who has supported me, in particular my mom whose relentless support has gotten me this far

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California's Silicon Valley hosts a thriving electronics cluster which has continued to grow at a staggering rate for more than forty years. Elements attributed with its success are Stanford University, specialized labor force, easily accessible resources and networking among businesses. After witnessing the region's international success, jurisdictions became interested in replicating Silicon Valley's conditions to construct prosperous industry clusters for their region. The economic concept of cluster theory, better known as economies of agglomeration, has been in existence for over a hundred years but has gained popularity in the past two decades. The development that will occur around the future extension of State Route 429 in Orange County, Florida has jurisdictions trying to decide which businesses and industries would be the most beneficial to the area and thus should be attracted to the region.

This study seeks to gain a better understanding of clusters in Western Orange County by using common economic development tools. Location quotient is used to see which industry sectors are concentrated in the County and shift-share analysis will determine which industry sectors are specialized in the County. Multipliers are used to

determine which industries within Western Orange County, the primary study area, will benefit their locality the most. Employment maps examine the employment density of different industries in the study area by census block.

Results concluded that hospitals and health services; administration and support services; manufacturing and transportation industries were clustered throughout Orange County and Western Orange County would benefit by encouraging complimenting businesses and industries to establish or relocate to the area.

CHAPTER 1 INTRODUCTION

Silicon Valley is known world-wide for its astounding growth in the electronic industry over the past forty years (Bradshaw, King and Wahlstrom, 1999). Situated in Northern California, Silicon Valley has gained an advantage over electronic industries due to Stanford University's electrical engineering program which provided laboratory and manufacturing space and produced skilled workers specialized in electronics. The region grew to become an epicenter for the electronic industry due to the easily accessible research and manufacturing institutions, specialized work force, and informal networking among entities. This phenomenon sparked an interest among jurisdictions and prompted them to begin researching the possibility of forming their own Silicon Valley in their locality thus popularizing policy based on cluster theory.

Cluster theory is based on the speculation that complementing firms and localities experience economic benefits when industry firms are geographically concentrated by gaining a competitive advantage (Porter, 2000). Cluster analysis was introduced by the Economic Strategy Panel who worked to examine possible industry clusters in various regions of California in 1994 (Bradshaw, King and Wahlstrom, 1999). Since then promoting the formation of industry clusters has become a chief concept in economic development.

State Road 429 Corridor

The Daniel Webster Western Beltway, more commonly called State Road 429, provides a north-south route through Orange County, Florida as an alternative to the heavily traveled Interstate 4 (Expressway Authority, 2012). A twenty-five mile extension of the highway from US Highway 441 has become a top priority in order to complete a

route that treks around metropolitan Orlando. The extension would exist in Orange, Lake and Seminole Counties and is expected to promote new development along its route.

Due to the direct development impact the extension will have on their areas, the cities of Apopka, Ocoee, Winter Garden and Orange County have a vested interest in determining which industries are, or have the potential to be, clustered in the region. This information can then be used to evaluate which industries should be attracted to the region to gain the largest economic benefit for their locality.

Research Questions and Objectives

The aim of this study is to examine which industries would be the most beneficial to establish or relocate in the soon-to-be developed area surrounding the extension of State Road 429. This will be done by determining which industries are clustered, or have the potential to be clustered, in the region by profiling areas significant to the extension and using economic development tools to conduct a cluster analysis. The cluster analysis hopes to establish which industries are concentrated, have a competitive advantage and most positively affect the region in question.

Organization

This work is divided into six Chapters. Chapter 2 details clusters by compiling various cluster definitions, describing the competitive advantage gained by clusters and discussing the critiques of the theory. Chapter 3 gives context to the regions being examined by describing Orange County, Metro Orlando and the specified study area complete with information on the three most impacted cities. Chapter 4 discusses the methodology and details the economic tools used for analysis. The findings of the analyses are detailed in Chapter 5. Lastly Chapter 6 provides concluding observations.

CHAPTER 2 LITERATURE REVIEW

Clusters Defined.

Clusters are easier to identify than to define. Michael Porter's definition of clusters as "geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions in a particular field that compete but also cooperate (2000)" is widely accepted but clusters have been defined differently by many researchers. Masoomah Zeinalnezhad and Shahnorbanun sahran Muriati mukhtar (2010) collect a number of cluster definitions from recent academia including:

- A cluster can be defined as a geographical grouping of firms that belong predominantly to one activity sector
- UNIDO United Nations Industrial Development Organization, defined clusters as a sectoral and geographical concentration of enterprises that produce and sell a range of related or complementary products and thus face common challenges and opportunities.
- An industry cluster is a geographically bounded concentration of similar, related or complementary businesses, with active channels for business transactions, communications and dialogue that share specialized infrastructure, labor markets and services, and that are faced with common opportunities and threats
- A cluster can be defined as a geographical, shared focused and sectoral concentration and combination of firms
- An industrial district of mostly small and specialized firms that perform different, but complementary activities and that are linked horizontally and vertically through a mix of cooperative and competitive relations
- Clusters consist of private enterprises of various sizes, including producers, suppliers, and customers, plus labor, government, professional associations, and academic, research or training institutes.

These definitions are all similar which illustrate the three fundamental aspects of a cluster: (1) inter-related firms with (2) developed relationships which are (3)

geographically concentrated. These characteristics are present in most definitions of clusters but are specifically defined to meet the needs of the research.

Industry clusters are not limited to the concentration businesses producing the similar products or services. Inter-related firms refer to a range of companies; Porter lists a wide range of potential cluster components including linked industries, specialized suppliers, complementing businesses, manufacture of inputs, governmental industries, institutions, and sometimes foreign firms (2000). Universities and tech schools can be considered part of clusters because the educational investment can foster innovative ideas among the cluster's future employees. For example the University of California at Davis, centrally located in California's wine county, has been the forerunner in wine-making research which has assisted the California wine industry with innovative initiatives (Porter, 1990). Clusters not only contain the manufacturers of the cluster's final product but also include institutions which produce the specialized machinery; produce and transport the inputs; and market and distribute the final product.

The range of industries that can be included in clusters are illustrated by the types of relationships within the cluster. Anderson (1994) classified cluster relationships into three categories: Buyer-Seller; Competitor and Collaborator; and Shared-Resource (as cited in Smith, n.d.). The Buyer-Seller relationship focuses on the vertical interactions among the production of the goods or services. Product and process intelligence is commonly shared among competing firms to foster innovation, improve procedures and create a strategic alliance which illustrates Competitor and Collaborator relationships. Shared-Resource relationships are horizontal connections among businesses formed

by their shared workforce, expertise, equipment or intelligence even if their final goods or services are unrelated. These relationships expand further than the traditional relationships formed in the production process of a good to include an expansive flow of goods and services among firms in a region.

Linkages between firms which promote improvement and innovation in a cluster are shaped and strengthened by the firm's geographic concentration. The geographic boundary of a cluster can be formed by a variety of aspects including geographic and political boundaries; transportation and travel costs; and the location of resources or final product market (Smith, n.d.; Porter, 2000; Bernat, 1999.) Rosenfeld states that the "geographic boundaries of clusters are set by the distances those in firms and entrepreneurs are willing to travel for informal face-to-face meetings (2005, p.6)." Porter describes a similar term for the boundaries of a cluster saying "the geographic scope of clusters ranges from a region, a state, or even a single city to span nearby or neighboring counties...[and] relates to the distance over which informational, transactional, incentive, and other efficiencies occur (2000, p.16)." The boundary of an industry cluster is therefore closely associated with the extent of the relationships formed by the firms comprising the cluster.

Bernat asserts that cost-minimization is the primary determinant of cluster size and location (1999). It has been shown that industries will cluster to reduce transportation costs if the production process is experiencing an increasing return to scale. Location theory also explains that firms are likely to form close to their inputs or final market. Input oriented firms station themselves closer to their inputs when the inputs are heavier, bulkier or more perishable than the output (Blakely & Leigh, 2010). Market

oriented firms are situated closer to their final market because the final output is heavier, bulkier or more perishable than its inputs. Clustered firms also “reduce labor costs by increasing the local labor supply or by increasing labor productivity (p.173, Bernat 1999)” because workers are attracted to areas with lots of potential employers thus increasing the labor supply which in turn reduces wages (all other things being equal).

Competitive Advantage

When inter-related, geographically concentrated firms form relationships and develop into an industry cluster, the firms experience a competitive advantage in their field (Porter, 2000). Marshall was one of the first economists to discuss the benefits of the concentration of specialized firms within a locality over a century ago (1892). In his work he explains that once businesses locate near their resources or final market, to save costs, skilled workers will travel to the region looking for jobs, men will generate useful suggestions on how to become more efficient, and costs would be decreased for businesses due to the ability to share expensive machinery (1892). These benefits are relatively the same for what Porter names the primary advantages held by clusters which are increased productivity experienced by firms within the cluster; increased business formation; easy access to technology and innovations within the field; and the increased likelihood of new business formation.

The advantage gained by the concentration of firms associated with optimal price-minimization and is referred to as economies of agglomeration (Porter, 2000). Proximity to resources or the final market drastically decreases transportation costs, directly passing the savings on to the firms. Businesses are also able to utilize specialized inputs of an industry such as business services, machinery, information, and workers. A

region with a specialization attracts employees of that skill to the region looking for work which helps a cluster grow; therefore attracting more skilled workers. Increased access to information within the cluster allows firms to assess the needs of their buyer, become informed about new developments within the field, and the strategies of their competitors. Complementing businesses are also able to take advantage of economies of agglomeration by utilizing specialized inputs and increasing the marketability of the locality. Complementing businesses increase the appeal of a region for firms of similar businesses looking to relocate and thus expanding the cluster. Developed clusters also give public officials a recommendation as to where public funds and resources should be allocated to provide optimal results for the locality (Barkley & Henry, 2001).

Innovation is essential to maintain a competitive advantage and is fostered within a cluster (Porter, 2000). Firms are more easily able to find more efficient techniques for their creating, operating, delivering, and marketing methods of their products and services by observing the strategies utilized by similar businesses within the cluster. Learning is easily facilitated by close interactions between firms and entities in the form of site-visits, business meetings, and direct observation and firms are able to quickly act on these insights. Knowledge spillovers amongst firms within a cluster keep the industry modern. This enables firms to “experiment at lower cost or delay large commitments until there is a greater assurance that a new product, process or service will pan out... by contrast a firm relying on distant outsourcing faces greater challenges of contracting, securing delivery, obtaining associated technical service and support, and coordinating across complementary entities (Porter, 2000, p. 24).”

The formation of new businesses seeking to take advantage of the competitive advantages of a region promotes growth and innovation within the cluster (Porter, 2000). New businesses are attracted to regional clusters because the barriers of entry are low, they hope to take advantage of the productivity of other firms, and there is an easily accessible market. Barriers to entry are greatly lessened because a developed cluster is already equipped with skilled workers, a strong knowledge base, and readily available inputs. New firms can gain knowledge of the dynamics of the cluster and alter their product or service to satisfy segments of the market not being addressed by present firms within the cluster. Small, new businesses can also be assisted by established businesses which may possibly buy-out the small businesses if they become profitable.

Types of Clusters

Cluster components and characteristics differ between industries and can take a variety of forms. Ann Markusen argues that clusters can be grouped into four categories based on common traits (Barkley & Henry, 2001). The four cluster types are Marshallian, hub and spoke, satellite platforms, and state-anchored clusters.

Marshallian clusters consist of small and medium sized, locally owned firms with extensive trade and cooperation between firms. The businesses are typically “craft based, high-technology, or producer services (p.4)” Hub and spoke clusters are characterized by one or several large firms (the hubs) and smaller suppliers and service firms (the spokes) who support the larger firms. The firms cooperate together but usually on the terms of the larger firms. However there is not much “cooperation among competitor firms to spread risks, stabilize markets and share innovations (p.4).” Satellite platforms contain medium and large sized branch plants of multi-plant firms based

outside the cluster. There is not much trade and networking between firms and growth of the cluster depends on the ability to attract branch plants to the area. State-anchored clusters have a large non-profit or public entity with complementing supply and service firms. Interactions within cluster are primarily purchases between the entity and the subsequent supply and service firms. Growth of this cluster depends on political support for the expansion of the entity.

Diamond of Competitive Advantage

Although the general theory of inter-related firms forming a competitive advantage has been around for some time, Michael Porter is accredited with advancing the theory. Porter established a diamond framework presenting the sources of locational competitive advantage which in his book *The Competitive Advantage of Nations* (1990). The conditions required for forming a competitive advantage are broken into four points: factor conditions; demand conditions; related and supporting industries; and firm strategy, structure and rivalry.

Factor conditions are the inputs, or resources, needed to compete in the industry (Porter, 1990). Inputs include human resources, physical resources, knowledge resources, capital resources and infrastructure. Human resources are the skills and knowledge possessed by the laborers and management. Physical resources are the area's natural resources, land, water and climate and how plentiful, available, and useful are the resources. Location to other firms, industries and markets can also have an influence on the success of a cluster. Knowledge resources are compiled from universities, governments, businesses or trade associations in the form of research institutions, business literature, market research reports and other materials which are able to educate about goods and services. Capital resources deal with how capital is

obtained to finance an industry. Infrastructure is “the type, quality and user cost of infrastructure available that affects the competition, including the transportation system, the communications system, mail and parcel delivery, payments or funds transfer, health care, and so on (p. 75).” Which factors are the most vital is determined by each industry but nations with a competitive advantage usually have low-cost or unique factors which are vital to gaining a competitive advantage in a certain industry. However, possessing all the necessary factors is only the first part; nations must efficiently and effectively utilize their resources to gain a competitive advantage.

The second point of the diamond is demand conditions which describe the conditions at home for the product or service of an industry (Porter, 1990). Demand conditions are broken into three categories: “the composition of home demand, the size and pattern of growth of home demand and the mechanisms by which a nation’s domestic preferences are transmitted to foreign markets (p.86)”. Even with the competition of globalization, home demand is highly significant to local industries. Industries strive to gratify home buyer needs and are often shaped by the local demand. On the same note, home buyers can encourage firms to become more innovative to better satisfy the demand for their goods and services. It is debatable whether or not a large home demand is strength or weakness because large markets generate economies of scale but may discourage exporting to other markets which is a vital component of having a competitive advantage. Rapid growth encourages firms “to adopt new technologies faster, with less fear that they will make existing investments redundant, and to build large, efficient facilities with the confidence that they will be utilized (p.94).” Home demand also has the ability to encourage the internalization of

succeeding industries. This may occur for a number of reasons such as foreign markets beginning to demand the same products or services as the home demand, to imitate foreign technologies, to mimic cultural influences or to form political alliances.

Related and supporting industries are the third point and illustrate how economically efficient it is for firms which require similar labor, inputs, machinery, etc. benefit from being located near each other. Firms are able to form close relations and create ongoing coordination when they are close to suppliers, related firms, and supporting firms.

Although foreign firms may offer the same product, “the home market is highly visible to domestic suppliers, and success is there a matter of pride (p.103).” The proximity of similar establishments also encourages innovation within the industry between competitors. Firms gain access to supplier innovations more easily and are able to influence future developments in the industry. These benefits do not usually happen immediately but tend to develop over time.

The final element of competitive advantage is firm strategy, structure and rivalry. Sustained investment and a high level of commitment and effort are called for by firms to create and sustain a competitive advantage. Domestic rivalry plays a big role in continuing the growth of an industry with a competitive advantage. “Local rivals push each other to lower costs, improve quality and service, and create new products and processes (p.118).” As mentioned before, competing firms fight over market share, laborers and technology breakthroughs. These forces can spur the creation of new businesses hoping to compete for market share or serve new segments of the market with similar products or services.

Porter goes on to credit two more forces in play that help create countries gain a competitive advantage: chance and government. Chance events are out of the control of the firms and can have a large impact on nations. These can include new inventions, technology discontinuities, surges of regional or national demand, major cost changes, wars or political decisions, both foreign and domestic. Although government may seem like it should be the fifth point of the diamond, it's "real role in national competitive advantage is in influencing the four determinates (p.127)." Government has the ability to facilitate or hinder nations gaining a competitive advantage by determining subsidies, establishing trade policies or becoming a purchaser of the goods or services of the industry.

Porter's advancement of cluster theory is frequently referenced when designing economic development plans and initiatives but his theory is criticized for lacking solid definition of its components and being overly generalized (Motoyama, 2008). Previous works on the economic development suggest that competitiveness is used to describe a region which is economically flourishing but Porter uses competitiveness to describe a strategy for economic development. Porter uses the terms regional competitiveness and specialization interchangeably and explains how each term supports the other without an explanation as to the cause of either phenomena. Studies have shown that "there is little evidence to suggest that regions based on specialization consistently have a higher rate of innovation and economic growth (p.357, Motoyama, 2008)." The generalized theory also gives broad strategies essential to foster clusters but neglects to account for the extreme variety between industries. Vital aspects of some industry clusters, such as a technical school in a manufacturing cluster, are not important or necessary in other

clusters, such as a technical school in a high-technology cluster. Motoyama concludes that “the theory should pay attention to industry-specific conditions and incorporate them into policy (p.359, 2008).”

Critiques of Cluster Theory

Cluster theory as a strategic approach to local economic development is limited in its application to a locality and the possible handicaps that could occur in an established cluster.

The primary difficulties with using cluster theory as a local economic development plan is the task of identifying and forming clusters in a region. A vaguely defined cluster boundary makes it difficult to assess the extent of a possible cluster and to what scale data should be analyzed when searching for a cluster in a locality. Boundaries vary for each cluster and make it difficult to decide whether to examine data searching for industry clusters on a state, region, county, zip code or census block level. Once an area of analysis is determined the task becomes determining how to decide which industries are clustered.

Employment data can be used to examine some aspects of a cluster such as key firms, industry growth and labor statistics but does not quantify how strong an industry cluster is or illustrate the relationship between related and supporting industries and services (Motoyama, 2008). This can include government entities, universities, vocational schools, trade associations and other entities in the region that may or may not be part of a cluster. Analyzing the relationships amongst firms and industries can be done using input-output analysis but this method only discloses the monetary transactions between firms and does not show the rivalry and collaboration between industries which is required for a successful cluster. Motoyama concludes that “most

efforts to quantify clusters end up as a regrouping exercise with industrial codes (p.357, 2008).”

Utilizing cluster theory without a well-defined industry cluster is nearly impossible because of the difficulty in synthetically forming one. In order for public officials to implement strategies to in hopes of forming a cluster, a thorough analysis is needed of the economy and it would be hard to pick which industries to target (Barkley & Henry, 2001). Selecting specific industries can also become “problematic because projections of industry-wide growth prospects are notoriously unreliable, growth prospects change over time in response to market forces (p.7, Barkley & Henry, 2001).”

Focusing on one sector of the economy also carries a large amount of risk because of frequent boom-and-bust cycles within sectors and thus may not be the best economic development strategy (Motoyama, 2008). Instead of specializing in one sector it seems that a region would benefit from investing in several prime sectors of the economy. Support institutions are also hard to establish and may not always assist in the development of a cluster as it is intended (Barkley & Henry, 2001).

Difficulties can also arise within the clusters which may handicap its growth and compromise the benefits of being clustered. A cluster with fully developed relationship between firms has the potential to cause on over reliance on current firms and compromise technology innovations (Bathlet and Taylor, 2002). Long-term relationships between customers and suppliers are found to be beneficial but only to a certain point. However some deeply-rooted supplier-customer relationships increased the likely hood that firms would fail due to a heavy reliance of personal relations. A development of “excessive trust may cause structures of blind confidence and gullibility to spread within

a network (Bathlet and Taylor, 2002, p.102)” in the long-run after years of trusting relations between firms. Bethlot and Taylor thus argue that a certain degree of permeability is necessary for a cluster to create a competitive advantage in the long-run. Permeability is also important for technology and knowledge innovations because firms lose their competitive advantage if they become overly reliant on present technology and exclude innovation. Other companies will begin utilizing new technologies, become more efficient, and generate an improved, more efficient cluster. Even Porter acknowledges that clusters may ignore or resist industry-crucial innovations “which tends to invalidate the existing pools of talent, information, suppliers and infrastructure (2000, p. 24).”

CHAPTER 3 CONTEXT OF ANALYSIS

A thorough economic profile and history of a region is necessary for any form of economic analysis. This aids in gaining a better understanding of the region and the context of the data being analyzed. The planned extension of State Road 429 made Western Orange County, Florida the focus of analysis. To better define this region a study area was created by the Metro Orlando Economic Development Commission by creating a three mile buffer around three vital interchanges on State Road 429. Situated in Western Orange County, the study area contains three key cities: Apopka, Ocoee and Winter Park. The city of Orlando is not within the boundaries of the study area but because of its proximity, its assets and economic activities influence the study area. It is also important to gain a better understanding of the city of Orlando because it will be included in analysis done at the county level and can construe outcomes because of its large economic presence. The following sections aid in illustrating the study area by examining the economic history and economic profile of Orange County, economic profile of the Metro Orlando area, and a profile of the study region including the cities of Apopka, Ocoee and Winter Park.

Economic History of Orange County, Florida

Orange County is situated in Central Florida and encompasses thirteen cities and a vast amount of agriculture land. Florida has historically been a chief producer of fruits and vegetables due to the state's relatively warm winter (Stonge, 2008). Since Florida's inauguration to the United States in 1821, there has been interest in producing oranges throughout the state. After the Civil War ended there were rapid expansions in orange groves statewide. Orange County became the largest orange producer in the state due

to its county's railroad network. Harsh winter freezes decreased Orange County's farm values by more than \$3 million total between 1890 and 1900. Although there was a significant increase in orange bearing trees in the 1920s, by 1960 the county's leading industries was trade or services with a developing tourism industry.

By the end of the nineteenth century, Florida's tourism industry began to develop (Stonge, 2008). America's wealthy began taking vacations for entertainment and health benefits, as doctors commonly recommended a change of climate for health ailments. The state's warm climate appealed to Northerners and the elderly making Florida a retirement and vacation destination. From 1960 to 1980 the percentage of Floridians born in Florida or other Southern states decreased while the percentage of Floridians born in the Northern states rose. Florida's booming railroad network in the beginning of the twentieth century and the decreased automobile prices of the 1930s promoted tourism in the region. Orange County became one of the top six counties with the most rooming accommodations in 1928, illustrating that it was one of the top tourist destinations in Florida. However, Orange County's current tourism industry was not spawned until the county's strongest tourism allurements were opened in 1971.

Disney World has had a significant impact on, not only Orange County, but Florida's entire economy (Roseboom, 2011). Disney world is 75 acres of theme parks, restaurants, clubs, retail shops, hotels, golf courses and provides a variety of entertainment activities for all ages. Today, Walt Disney World generates \$18.2 billion annually in economic activity and makes up 2.5% of the gross domestic product for the state (Roseboom, 2011). Disney currently employs 62,000 cast members but the total jobs created by Disney, both directly and indirectly, amount to 160,000. Taxes created

by the attraction amount to a net benefit for Florida of \$400 million, \$100 million of which goes directly to Orange County. Each year Disney “purchases more than \$2 billion worth of goods and services... [Of which] nearly \$1 billion is paid to vendors with a presence in the state and approximately \$500 million goes to vendors in Central Florida (Rosebloom, 2011).” Having a large, established business purchase locally creates a multiplier effect, which is a net increase in economic activity resulting from an initial economic event. Walt Disney Parks and Resorts President Al Weiss explained that “the ripple effect created by our operations resonates throughout Florida as families across the state use their earnings to purchase goods and services from the diverse businesses both large and small that make Florida such an amazing place to live, work and play (as quoted by Roseboom, 2011).”

Today Florida is still viewed as an ideal retirement and vacation spot but while Orange County recognizes the economic benefits it’s gained from Walt Disney World, the county and Orlando metro area have chosen different industry sectors to specialize in.

Orange County’s Economic Profile

Orange County has a population of 1,145,956 and with a percentage change of population between 2000 and 2010 of 27.8% which is significantly higher than Florida’s state change in population of 17.6% showing that Orange County’s population is growing faster than the state average (U.S. Census Bureau, n.d.). Unlike other parts of Florida, only 9.7% of Orange County’s population is 65 years old or older compared to the state average of 17.3% showing that Orange County does not have a significant graying population. More people are speaking languages other than English at home more frequently in Orange County (30.9%) in comparison to the state average (25.8%).

Orange County is equal with the State's average of foreign born persons amounting to roughly 18% of the total population. The percentage of persons older than 25 who have graduated from high school is 86.7% in Orange County and 84.9% in Florida and the percentage of persons older than 25 who have obtained a graduate degree or higher in Orange County is 29.6% and 25.6% in Florida. This shows that the residents of Orange County are slightly more educated than the state average.

As of January of 2011, Orange County's cost of living index was 87.7 showing that it is cheaper to live here than the U.S. average cost of living (OnBoard Informatics, 2010). In 2009 the medium household income was \$46,897 for the county and \$44,376 for the state; median contract rent was \$833 for the county and \$802 for the state; and the medium house or condo was valued at \$205,200 for Orange County and \$182,400 for the state. These living costs illustrate that the cost of living in Orange County is low compared to the U.S. average but high compared to the state of Florida.

Metro Orlando

Before Walt Disney World invaded Orange County, Orlando was better known for its close proximity to Patrick Air Force Base, Cape Canaveral Air Force Station, and Kennedy Space Center (ExploreOrlandoFlorida, 2006). These companies encouraged high-tech companies to locate in the Orlando area. The opening of Walt Disney World made it one of the top vacation destinations in the world. The city was able to better handle the influx of tourists when the McCoy Air Force Base closed and became the Orlando International Airport in the early 1970s. Today Orlando is visited by families worldwide for its attractions. Orlando is a thriving city, working to specialize in industry sectors outside of its strong tourism industry.

The city has an established group committed to ensuring economic and business growth in Central Florida called The Metro Orlando Economic Development Commission (EDC). The EDC was founded in 1977 and works to encourage businesses location to Orlando and assists local companies within Orange, Lake, Seminole and Osceola Counties and the City of Orlando (OrlandoEDC, 2010). The metro area serves as the headquarters for many businesses such as Darden Restaurants and Tupperware Corp.; divisional headquarters for numerous businesses including Mitsubishi Power Systems Americas, Lockheed Martin, L-3 Communications and Science Applications International Corporation; and houses facilities for over 150 international companies. Metro Orlando also encompasses the Central Florida Research Park which is the 7th largest in the country, home to more than 120 companies and employs 8,500 people. The research park is the leader in the United States military's simulation and training programs.

The University of Central Florida, the second biggest university in the nation, is located in Metro Orlando (OrlandoEDC, 2010). The school has a reputation for its exceling laser and optics department; superior hospitality studies; and established post-bachelor's degrees in simulation and human performance enhancement (OrlandoEDC, 2010). A recently opened medical school will contribute to the area's growing medical field which includes Sanford-Burnham Medical Research Institute and M. D. Anderson Orlando Cancer Research Institute with plans to create Nemours Children's Hospital, a University of Florida research center, Orlando VA Medical Center in 2012. The Metro Orlando region is accessible through the Orlando International Airport and two other

smaller airports; several major highways and interstate roads; and in the future by SunRail, a commuter rail system planned for Central Florida.

The EDC has examined the assets and identified the industry strengths of the region (OrlandoEDC, 2010). The twelve identified industry strengths are advanced manufacturing; agritechology; aviation and aerospace; clean technology and sustainable energy; digital media; film and television production; financial services and financial technology; life science and biotechnology; manufacturing, warehouse and distribution; modeling, simulation and training; optics and photonics; and software and hardware.

Study Area

The primary study area, as established by Little John Engineering Associates, is composed of a three mile buffer around the proposed extension of State Road 429. The cities of Apopka, Ocoee and Winter Garden are the central focuses of the study area and exhibit similar characteristics. All three cities experienced a significantly greater increase in population between 2000 and 2010 (55.9%, 45.9% and 140.9%) than the state average (17.6%) (U.S. Census Bureau, n.d.). More than one third of their populations are under the age of 18 and there is considerable less persons above the age of 65 than the state average. The population is more educated in terms of having completed high school or a bachelor's degree and has a higher median household income than the state. The percentage of people living below poverty in all cities is almost less than the state average. It is likely that many residents commute to Orlando for work because employees travel an average of 25-30 minutes to work each day in all cities.

Apopka

Located twelve miles northeast of Orlando, Apopka is the second largest city in Orange County and boasts a population of 41,542 as of 2010 (U.S. Census Bureau, n.d.) Apopka has many beneficial entities and advantages to attract people and businesses to relocate to the area. Assets include the Business and Aviation center, Northwest Distribution Center, Apopka Westside Research Park and the Institute of Food and Agricultural Sciences (Land Development Innovations, 2011). The city possesses “more than 276,666 square feet of commercial buildings in the development process...[and] 750+/- acres of vacant industrial properties; 1,000+/- acres of vacant mixed use properties; and 480+/- acres of vacant commercial properties available for development (EDC, 2011, p.1).”

Ocoee

Ocoee is located south of Apopka and had a population of 35,579 as of 2010 (U.S. Census Bureau, n.d.). It is located near the largest interchange in Central Florida, allowing easy access to the Florida Turnpike, SR 429, SR 408 and SR 50 (Ocoee Community Redevelopment Agency, 2010). The area also contains the Health Central Hospital which offers medical offices and professional space. Development of the Ocoee Business Park will provide a large amount of industrial space and the redevelopment of the Community Redevelopment Area Improvement District located on West State Road 50 will provide an improved commercial district for Ocoee and Winter Garden.

Winter Garden

Southwest of Ocoee is the city of Winter Garden with a population of 34,568 (U.S. Census Bureau, n.d.). Winter Garden contains five activity centers: Crown Point High

Tech, Fowler Grove Regional, Story Road Industrial, Traditional Downtown, and West State Road 50 Commercial (City of Winter Garden, n.d.) Crown Point High Tech is currently being used for agriculture and is planned to be a commercial activity center. Fowler Grove Regional is currently a mixed-use development with retail, restaurants, offices, and residential units with parcels available for purchase. Story Road Industrial houses businesses in the construction, automotive and manufacturing industries. The mixed-use downtown is occupied by lots of small businesses and serves as an arts and cultural center for western Orange County.

Table 3-1. Quickfacts for the Cities of Apopka, Ocoee and Winter Garden, obtained by U.S. Census

People QuickFacts	Ocoee	Apopka	Winter Garden	Florida
Population, 2011 estimate	NA	NA	NA	19,057,542
Population, 2010	35,579	41,542	34,568	18,801,310
Population, percent change, 2000 to 2010	45.9%	55.9%	140.9%	17.6%
Population, 2000	24,391	26,642	14,351	15,982,378
Persons under 5 years, percent, 2010	7.1%	8.1%	7.8%	5.7%
Persons under 18 years, percent, 2010	27.7%	27.4%	28.1%	21.3%
Persons 65 years and over, percent, 2010	8.7%	10.0%	9.6%	17.3%
Female persons, percent, 2010	51.2%	51.5%	51.6%	51.1%
White persons, percent, 2010 (a)	66.8%	64.3%	68.8%	75.0%
Black persons, percent, 2010 (a)	17.5%	20.7%	16.0%	16.0%
American Indian and Alaska Native persons, percent, 2010 (a)	0.4%	0.3%	0.4%	0.4%
Asian persons, percent, 2010 (a)	5.5%	3.2%	5.1%	2.4%
Native Hawaiian and Other Pacific Islander, percent, 2010 (a)	0.1%	0.1%	0.1%	0.1%
Persons reporting two or more races, percent, 2010	3.4%	3.3%	3.6%	2.5%
Persons of Hispanic or Latino origin, percent, 2010 (b)	20.8%	25.4%	22.0%	22.5%
White persons not Hispanic, percent, 2010	53.6%	49.5%	54.3%	57.9%
Living in same house 1 year and over, 2006-2010	84.9%	88.5%	82.9%	83.1%
Foreign born persons, percent, 2006-2010	16.6%	16.6%	16.4%	19.2%
Language other than English spoken at home, pct age 5+, 2006-2010	21.6%	27.0%	23.6%	26.6%
High school graduates, percent of persons age 25+, 2006-2010	84.6%	88.5%	88.6%	85.3%
Bachelor's degree or higher, pct of persons age 25+, 2006-2010	26.2%	28.8%	31.6%	25.9%
Mean travel time to work (minutes), workers age 16+, 2006-2010	28.1	30.1	26.3	25.7
Housing units, 2010	12,802	15,707	13,260	8,989,580
Homeownership rate, 2006-2010	78.4%	81.0%	73.2%	69.7%
Housing units in multi-unit structures, percent, 2006-2010	10.6%	10.2%	15.2%	30.0%
Median value of owner-occupied housing units, 2006-2010	\$230,400	\$222,100	\$247,200	\$205,600

Table 3-1. Continued

People QuickFacts	Ocoee	Apopka	Winter Garden	Florida
Households, 2006-2010	11,586	14,739	10,569	7,152,844
Persons per household, 2006-2010	2.94	2.66	2.91	2.53
Per capita money income in past 12 months (2010 dollars) 2006-2010	\$25,994	\$27,379	\$25,803	\$26,551
Median household income 2006-2010	\$60,135	\$59,688	\$62,152	\$47,661
Persons below poverty level, percent, 2006-2010	8.3%	7.9%	7.7%	13.8%
Business QuickFacts	Ocoee	Apopka	Winter Garden	Florida
Total number of firms, 2007	3,555	3,541	3,542	2,009,589
Black-owned firms, percent, 2007	S	12.8%	S	9.0%
American Indian- and Alaska Native-owned firms, percent, 2007	F	F	F	0.5%
Asian-owned firms, percent, 2007	S	S	S	3.2%
Native Hawaiian and Other Pacific Islander-owned firms, percent, 2007	F	F	F	0.1%
Hispanic-owned firms, percent, 2007	17.4%	S	S	22.4%
Women-owned firms, percent, 2007	26.7%	S	29.9%	28.9%
Manufacturers' shipments, 2007 (\$1000)	NA	173,162	212,411	104,832,907
Merchant wholesaler sales, 2007 (\$1000)	551,563	128,595	303,293	221,641,518
Retail sales, 2007 (\$1000)	573,717	567,689	298,046	262,341,127
Retail sales per capita, 2007	\$18,068	\$15,141	\$10,453	\$14,353
Accommodation and food services sales, 2007 (\$1000)	54,943	51,907	25,671	41,922,059
Geography QuickFacts	Ocoee	Apopka	Winter Garden	Florida
Land area in square miles, 2010	14.71	31.24	15.41	53,624.76
Persons per square mile, 2010	2,418.5	1,329.6	2,243.2	350.6
FIPS Code	51075	1700	78250	12
			Orange County	

S: Suppressed; does not meet publication standards

X: Not applicable

F: Fewer than 100 firms

NA: Not available

FN: Footnote on this item for this area in place of data

Includes persons reporting only one race.

Hispanics may be of any race, so also are included in applicable race categories

CHAPTER 4 METHODOLOGY

This research seeks to recognize the industries which are most likely to be clustered in Western Orange County, Florida. To accomplish this, economic development tools were used to analyze the region including location quotients, shift-shares, and multipliers. This was done by examining data at the county level and data within the study area. Employment data for several industries was gathered and compiled into maps illustrating employment density within the study area. This Chapter details the methods of data collection and analysis and the limitations of study.

Method of Data Collection and Analysis

Location Quotient Analysis

Location quotient analysis was used to gain a better understand of the firms concentrated in Orange County, Florida. This tool compares the number of employees of an industry in a location to the number of employees of that industry in a larger economy to determine if the location has a denser number of employees than the reference economy (Blakely & Leigh, 2010). It is calculated by first finding the percentage of employment in the location and broader economy by dividing the employment in the industry by the total employment. Next the local employment percentage is divided by the percentage of employment for the broader economy. The result is a ratio comparing the employment in the location to the reference economy. A location quotient of one indicates that the location has the same ratio of employment in the industry to the reference economy; less than one indicates that the location has a fewer employers in the industry in the location; and a value greater than one indicates that the location has a higher employment of the industry than the reference location. A

location quotient higher than one represents a specialization of that industry in the location and the higher the number the more the region is specialized.

This research examined the location quotient for Orange County, Florida with employment data provided by the Bureau of Labor and Statistics. Industries were classified in accordance with the North American Industry Classification System (NAICS). NAICS codes classify business establishments into twenty broad industry classifications which are categorized by number. The twenty primary industries are then broken into more detailed sectors, sub-sectors and super sectors resulting in hundreds of six-digit industry classifications.

The location quotient analysis was used at the county level and the United States served as the benchmark for comparison so that the location quotients were not distorted by employment in Florida. For example, an industry with a high location quotient compared to the nation may not have a high location quotient when compared to the state. Industries were analyzed at the three-digit NAICS code classification due to data availability.

Shift-Share Analysis

Shift-Share analysis was used to analysis which industries in the region have a competitive advantage. Shift-Share analysis breaks down the economic growth or decline of an industry sector into three parts (Blakely & Leigh, 2010). Similar to Location quotient, a local economy is compared to a benchmark economy, usually state or nation, which comprises the economy being analyzed but two years of employment data are needed for the calculations. For the best results the two years of data should be between five and ten years apart.

The three parts include economic growth, proportional shift and differential shift (Blakely & Lehigh). The economic growth accounts for the change in employment in the sectors due to the overall economic growth or decline of the nation on the regional economy. Proportional shift identifies which industries are contributing to growth and decline by measuring “the relative advantage or disadvantage that an industry has relative to the overall economic growth (Blakely & Leigh, 2010, p.182).” Differential shift is most important because it shows how much of a change in an industry can be attributed to the region’s competitive advantage. Shift-analysis is expressed as follows (Blanco, 2010):

$$\Delta e_i = e_i \left[\frac{US^*}{US} - 1 \right] + e_i \left[\frac{(US_i^*)}{(US_i)} - \left(\frac{US^*}{US} \right) \right] + e_i \left[\frac{(e_i^*)}{(e_i)} - \left(\frac{US_i^*}{US_i} \right) \right] \quad (4-1)$$

where

$\Delta e_i = Shift - Share Analysis$

$e_i = local\ employment\ in\ industry\ i\ at\ the\ beginning\ of\ the\ period$

$e_i^* = local\ employment\ in\ industry\ i\ at\ the\ end\ of\ the\ period$

$US = total\ U.S.\ employment\ at\ the\ beginning\ of\ the\ period$

$US^* = total\ U.S.\ employment\ at\ the\ end\ of\ the\ period$

$US_i = U.S.\ employment\ in\ industry\ i\ at\ the\ beginning\ of\ the\ period$

$US_i^* = U.S.\ employment\ in\ industry\ i\ at\ the\ end\ of\ the\ period$

This research used shift-share analysis to analyze the competitiveness of firms in Orange County, Florida between 2004 and 2009. During this time period Florida experienced a recession as the housing market crashed but this will not affect the shift share analysis because Florida’s benchmark for comparison, the United States, also experienced the recession at the same time.

Employment data was collected from the Bureau of Labor and Statistics for 2009 to keep consistent with the data being collected for the other tools of analysis. The five-year span of analysis was chosen because it gives industries enough time to develop; a

short time span would not be able to show industries growing with a competitive advantage and an excessively long time span could cloud the results of current firms an advantage as industries grow and decline over time. Orange County served as the local economy and the United States served as the reference economy. Industry employment was split into NAICS codes at the three digit level. The industries determined to have the highest competitive advantage were determined by a high differential shift.

Multipliers

Multipliers are values given to industries reflecting the impact the industry has on its economy via job creation (Stevens & Lahr, 1988).

The main components of total economic effects are called the direct, indirect and induced effects. These are commonly defined, respectively, as:

(1) the exogenous economic change introduced into the economy;

(2) the jobs and production needed to produce the goods and services required, from within the region, the support the production associated with the direct economic change; and

(3) the jobs and production in the region required to fulfill the household demands for goods and services generated by the wages of all the additional employees associated with (1) and (2) above.

(p. 89, Stevens & Lahr, 1988)

They show how much an industry positively affects their local economy and account for the direct, indirect and induced effects resulting from an increase in employment in the industry. If a building were being constructed, the direct effect would be the employment increase in the construction sector; the indirect effect would be the employment increase in sectors needed to support the construction such as materials supply, machine rental, ect.; and the induced effects would be the employment increase due to increased household spending locally.

The larger the multiplier the more positive effect it has on the economy. For example if the construction industry has a Type I multiplier of 1.35 and a redevelopment project creates 100 jobs the net direct, indirect and induced effects will be an addition of 135 jobs in the locality. Knowing which industries have the highest multipliers gives local officials an idea of which industries to attract to the region to gain the most effective results for their locality.

This research examined the multipliers within eight of the zip code blocks within the Western Orange County study area. The zip codes used to create the study region were 32703, 32818, 32798, 32712, 34761, 32830, 34734, and 34787. Data was obtained through IMPLAN software obtained by MIG, Inc. Industries were classified into 442 categories and their Type SAM multiplier was analyzed which includes the direct, indirect and induced affect that the industry has on the economy. Type SAM multiplier is calculated by adding together the direct effect, indirect effect, and induced effect and dividing the result by the direct effect. The industries with the highest multipliers were considered the best industries for the region.

Employment Maps

Maps were created to visually display employment density throughout the study area. This was done to gain a better understanding of which industries have the highest employment within the region and where those industries are clustered. Employment data was broken into census block and obtained by the U.S. Census Bureau. Employment data was used from 2009 and was workplace area characteristic data meaning that jobs were totaled by the jobs located within the census blocks. Industries were broken into twenty two-digit NAICS codes.

Limitations

The limitations of this study are embodied in the nature of cluster theory and the levels of data being analyzed. Location quotient and shift-share analysis were examined at the county level due to data availability thus the results will not directly correlate with the study region and may be skewed due to the large, economic presence of the city of Orlando. Multipliers and employment density maps are examined within the study region making the analyses directly correlate to the region but there are still drawbacks of this approach. Cluster definitions lack a specific geographic boundary making it difficult to determine at what level to examine data when looking for industry clusters. Attempting to identify industry clusters is difficult because clusters rarely, if ever, are confined to political boundaries such as city limits, metropolitan areas or county boundaries.

CHAPTER 5 RESULTS

Location Quotient

The results showed that twenty industries had a location quotient value higher than one, meaning that these industries are employing more people than the U.S. average. Table 5-1 shows the industries whose location quotient is greater than one for Orange County, Florida. The high location quotients for the industries of amusements, gambling and recreation, accommodation, rental and leasing services, transit and ground transportation, and food services and drinking places results display the large presence that tourism has in the county.

The high location quotient for air transportation is most likely due to the Orlando International airport and the several other small airports in the county. The Metro Orlando Economic Development Commission's twelve selected industries for the region align with some of the location quotient results including aviation and aerospace, digital media, film and television production, and software and hardware. Due to data availability not all of the location quotients were able to be calculated; industries unable to be analyzed included several manufacturing industries and transportation industries.

Shift-Share

More than half of the industry sectors examined had a positive differential shift, meaning that part of the growth experienced by these industries between 2004 and 2009 was due to a specialized advantage that region possessed. Table 5-2 shows eighteen industries with the highest differential shift. Similar to the location quotient results, the heavy influence of Orlando's tourism industry is prevalent in the results. However the amusements, gambling, and recreation industry, which tops the list of

location quotient, is not at the top of the list or even in the top ten. In actuality the amusement, gambling, and recreation industry has a negative differential shift meaning that although the industry is concentrated in the region and employing a large number of workers, it is not growing. This is understandable considering that Walt Disney World, a fundamental component of the amusement, gambling, and recreation industry, has been in operation for over forty years. The strong differential shifts of hospitals and ambulatory health care services can be explained by Metro Orlando's heavy investment in hospitals and health care services in the past several years. Three manufacturing industries experienced a high differential shift including computer and electronic manufacturing; transportation equipment manufacturing and machinery manufacturing.

Multipliers

The multiplier results ranged from a high of 2.18 to a low of zero. More than half of the industries analyzed had a multiplier of zero, meaning those industries do not employ anyone or employ enough workers to have a significant effect on the economy. A number of specific manufacturing jobs had high multiplier effects including aircraft engine and engine parts manufacturing; flavoring syrup and concentrate manufacturing; soft drink and ice manufacturing; and guided missile and space vehicle manufacturing. Unique to this analysis is the significance of the industries described as greenhouse, nursery and floriculture production; performing arts companies; and religious organizations. This suggests that these industries are important specifically to the study region and not an important industry for the county.

Employment Maps

The maps assisted in visually displaying where and how densely jobs were located for two-digit NAICS code industries. There was variation among which census blocks

were the densely populated with each industry but in general the blocks with significant density were in or around the cities of Apopka, Ocoee and Winter Garden.

Maps of NAICS sectors 11, 21 and 22 had low employment signifying that there are few jobs in the industries of agriculture, forestry, fishing and hunting; mining, quarrying, and oil and gas extraction; and utilities. Industries classified under management of companies and enterprises; educational services; other services; and public administration were scattered throughout the study region without significant densities in the cities. Employment was clustered around Apopka for sectors of manufacturing; finance and insurance; and professional, scientific, and technical services. Sectors with significant densities in Ocoee included arts, entertainment and recreation; transportation and warehousing; and accommodation and food services.

Synthesis

The location quotient and shift-share analysis of Orange County depicted what would be expected after learning of the county's economic history. Tourism is the county's biggest asset and has benefited complimenting industries such as accommodations, food and beverage services, retail, and ground transportation. Although the industry has been growing over the past 40 years it is not directly connected with Western Orange County because Orlando has been the center of tourism.

Hospitals and healthcare services showed a significant location quotient, differential shift and multiplier. In recent years there has been extensive expansion of new healthcare facilities, particularly in Orlando, suggesting that a medical cluster is or has formed in Orange County. Significant invest in the health field has been done in Orlando but looking into what the health sector needs to complement its existing

businesses or which inputs of the industry could be created locally could be beneficial and taken advantage by Western Orange County. Industries related to the medical field with significant multipliers include medical and botanical manufacturing; nursing and residential care facilities; Medical and diagnostic labs and outpatient and other ambulatory care services; dental laboratories manufacturing; surgical and medical instrument, laboratory and medical instrument manufacturing; and Surgical appliance and supplies manufacturing.

Administrative and support services has a large differential shift and location quotient illustrating that it is a growing industry, possibly because more business and regional headquarters are locating in the Orlando Metro area. This potential cluster could benefit from Western Orange County's high multipliers in custom computer programming services; information services; office administrative services; business support services; management, scientific, and technical consulting services; and securities, commodity contracts, investments, and related activities. Some of these sectors would also compliment the developing high-tech industries. Data processing, hosting and related services has a high location quotient and computer and electronic product manufacturing has a significant shift-share. These industries provide jobs for the higher-than-state-average educated population of Western Orange County.

Manufacturing and transportation industries have the potential to be thriving industries in the region and provide jobs for the majority of the population whom did not attend institutions of higher education. General transportation significant values include the location quotients for air transportation; rail transportation; support activities for transportation; and transit and ground passenger transportation. Significant shift-share

analysis included air transportation, support activities for transportation and transportation equipment manufacturing. Air transportation is the key industry in the transportation sector, more than likely due to the large presence of the Orlando International Airport. This fact is more prevalent when examining multipliers. Local multipliers also illustrate the close connections between the transportation and manufacturing industries. Significant multipliers include aircraft manufacturing; aircraft engine and engine parts manufacturing; and guided missile and space vehicle manufacturing. Manufacturing and transportation industries complement each other because developed transportation networks decrease the manufacturing company's shipping costs.

Recommendation for Further Research

This research could have been greatly advanced with the use of spatial analysis tools available in ESRI's ArcGIS. Spatial autocorrelation, also known as Moran's I, could have been used to determine if and how much industry employment was clustered in Western Orange, County. ESRI (2010) defines this as feature as a tool which "measures spatial autocorrelation based on feature locations and attribute values using the Global Moran's I statistic." It determines if the data is dispersed, random or clustered by calculating a z-score and p-value which determines if the null hypothesis, which is that values are randomly dispersed within the study area, can be accepted or rejected. The test also produces a Moran's I index value which when positive indicates the data is clustered and is dispersed when the index value is negative. Conceptualization is based on inverse distance which states that neighboring features have a greater effect on a target feature than features located further away.

To visualize the clustering of industry employment, Cluster and Outlier Analysis, or Anselin Local Morans I, could have been used to identify hot spots, cold spots and spatial outliers of industry employment (ESRI, 2010). Similar to the Moran's I, inverse distance is used as the conceptualization. The resulting map classifies each section, ideally census blocks for this analysis, into four categories: HH for statistically significant cluster of high values, LL for statistically significant cluster of low values, HL for features with a high value surrounded by features with low values or LH for features with a low value surrounded by features with a high value. Using Anselin Local Morans I with the data used to create the employment maps would have more accurately visualized clusters in the study area.

Table 5-1. Location Quotient results for Orange County, Florida in 2009

Industry Codes	U.S Employment 2009	Orange County Employment 2009	Location Quotient
NAICS 713 Amusements, gambling, and recreation	1,397,725	51,741	6.81
NAICS 721 Accommodation	1,745,557	39,060	4.12
NAICS 482 Rail transportation	590	9	2.81
NAICS 481 Air transportation	460,679	5,282	2.11
NAICS 491 Postal service	4,194	48	2.11
NAICS 532 Rental and leasing services	545,420	6,107	2.06
NAICS 531 Real estate	1,399,831	14,032	1.84
NAICS 518 Data processing, hosting and related services	245,885	2,261	1.69
NAICS 561 Administrative and support services	6,808,322	61,090	1.65
NAICS 448 Clothing and clothing accessories stores	1,358,656	11,029	1.49
NAICS 515 Broadcasting, except internet	301,493	2,173	1.33
NAICS 492 Couriers and messengers	534,490	3,638	1.25
NAICS 517 Telecommunications	973,912	6,297	1.19
NAICS 551 Management of companies and enterprises	1,855,139	11,794	1.17
NAICS 446 Health and personal care stores	983,012	5,989	1.12
NAICS 541 Professional and technical services	7,479,760	43,630	1.07
NAICS 488 Support activities for transportation	541,637	3,149	1.07
NAICS 485 Transit and ground passenger transportation	416,486	2,376	1.05
NAICS 722 Food services and drinking places	9,333,818	52,240	1.03
NAICS 453 Miscellaneous store retailers	786,174	4,332	1.01

Table 5-2. Differential shift results for Orange County, Florida

Industry Codes	Differential Shift
NAICS 561 Administrative and support services	9217.760061
NAICS 531 Real estate	4110.068474
NAICS 448 Clothing and clothing accessories stores	3185.810485
NAICS 622 Hospitals	2597.390445
NAICS 481 Air transportation	2189.441531
NAICS 446 Health and personal care stores	1980.566045
NAICS 621 Ambulatory health care services	1893.013053
NAICS 812 Personal and laundry services	1153.665089
NAICS 532 Rental and leasing services	1143.082568
NAICS 722 Food services and drinking places	1028.736817
NAICS 488 Support activities for transportation	843.0714286
NAICS 334 Computer and electronic product manufacturing	840.6719916
NAICS 492 Couriers and messengers	744.5168406
NAICS 551 Management of companies and enterprises	734.4853263
NAICS 236 Construction of buildings	728.5403451
NAICS 611 Educational services	709.5401812
NAICS 336 Transportation equipment manufacturing	648.8042449
NAICS 333 Machinery manufacturing	617.8797629

Table 5-3. Type SAM multiplier for Industries within Zip codes 32703, 32818, 32798, 32712, 34761, 32830, 34734, and 34787 in Orange County, Florida

IMPLAN Model for Study Area Description	TypeSAM Multiplier
State and local government passenger transit	2.180214
Other Federal Government enterprises	1.805193
Aircraft engine and engine parts manufacturing	1.699853
Flavoring syrup and concentrate manufacturing	1.692107
Computer systems design services	1.635344
Soft drink and ice manufacturing	1.625294
Radio and television broadcasting	1.608048
Aircraft manufacturing	1.604335
Guided missile and space vehicle manufacturing	1.595039
Performing arts companies	1.571384
Custom computer programming services	1.547736
Religious organizations	1.546390
General and consumer goods rental except video tapes and discs	1.540476
Personal care services	1.538641
Greenhouse, nursery, and floriculture production	1.535166

CHAPTER 6 CONCLUSION

Cluster analysis is a common economic development tool used to gain a better understanding of a locality in hopes of discovering which industries would benefit a region the most by establishing an industry cluster. Establishing industry clusters inorganically is difficult, if not impossible, so it is necessary to look toward developed industries to determine which industries to attract to a region to establish an industry cluster.

After examining location quotients and differential shift for Orange County and multipliers and employment numbers for Western Orange County, a few industries appeared to be clustered in the region. This included industries of hospitals and healthcare; administrative and support services; air transportation; and transportation manufacturing. Significant influence for these industries stems from the city of Orlando but, due to their close proximity, extensions of these industries have a great potential to flourish and greatly benefit the communities of Western Orange County.

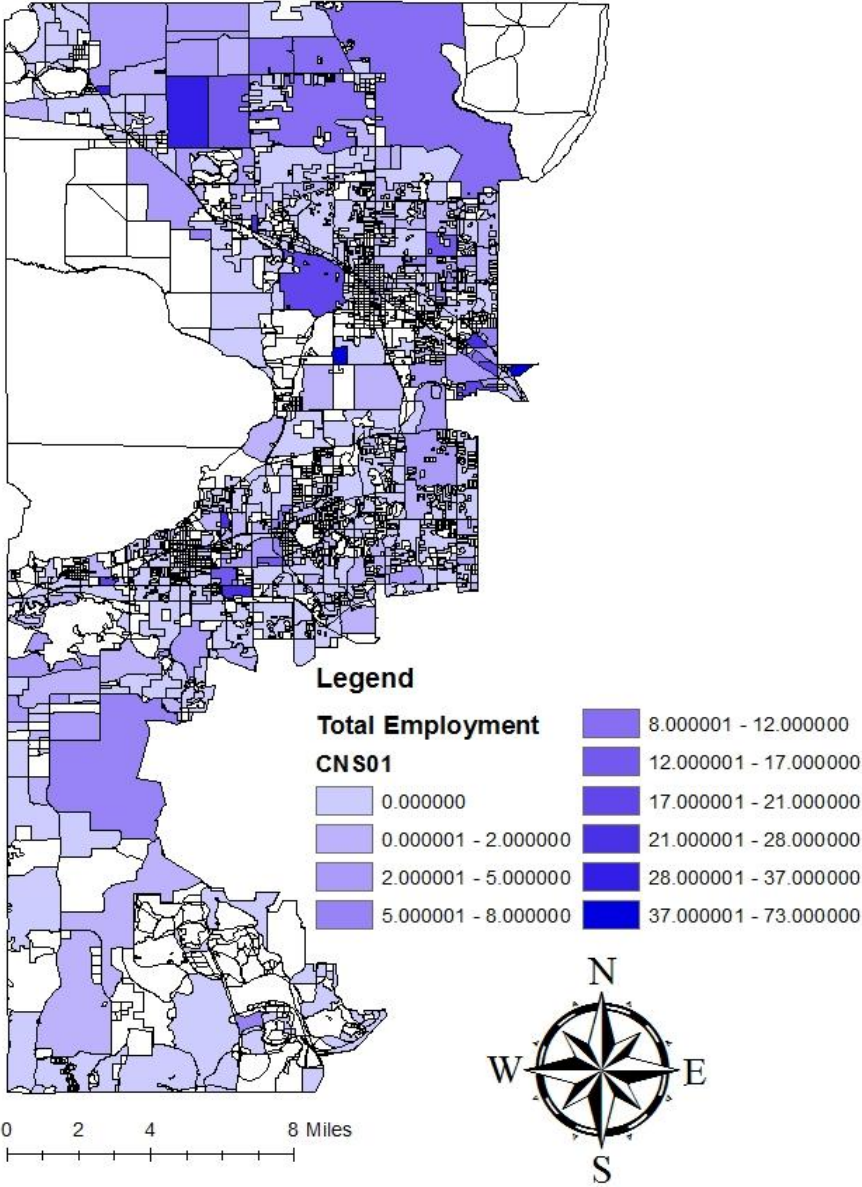
Knowing which industry sectors have a strong presence in the area gives local officials a better understanding as to the types of businesses they should be attracting to the region for successful business development. As the area surrounding SR 429 is being developed, local officials can implement a number of business development tools to attract businesses to the area and encourage business expansion. Tools that support both these objectives include one-stop centers; start-up and venture financing companies; technology and business parks; and enterprise zones (Blakely & Leigh, 2010). One-stop business centers work as a link between business and local government. They save businesses the hassle of going through different governmental

departments by establishing an information center specifically for assisting businesses. It is sometimes hard for small businesses to obtain venture capital from banks and private investors making start-up and venture financing companies essential for small business growth. These companies work to make the best use of funds provided by local residents to assist local businesses. Once they gain funding, small businesses are able to grow and receive assistance from small business development centers which offer research services, management lessons, consulting services and training to small businesses. Technology and business parks contain everything from private to public sector entities whose commercial activities are compatible with each other. Businesses have a specific development objective and support from entities within the park. These parks tend to take ten to twenty years to develop. Enterprise zones have relaxed planning regulations and offer financial incentives, such as tax breaks or subsidies, to potential occupants in order to encourage development of the area.

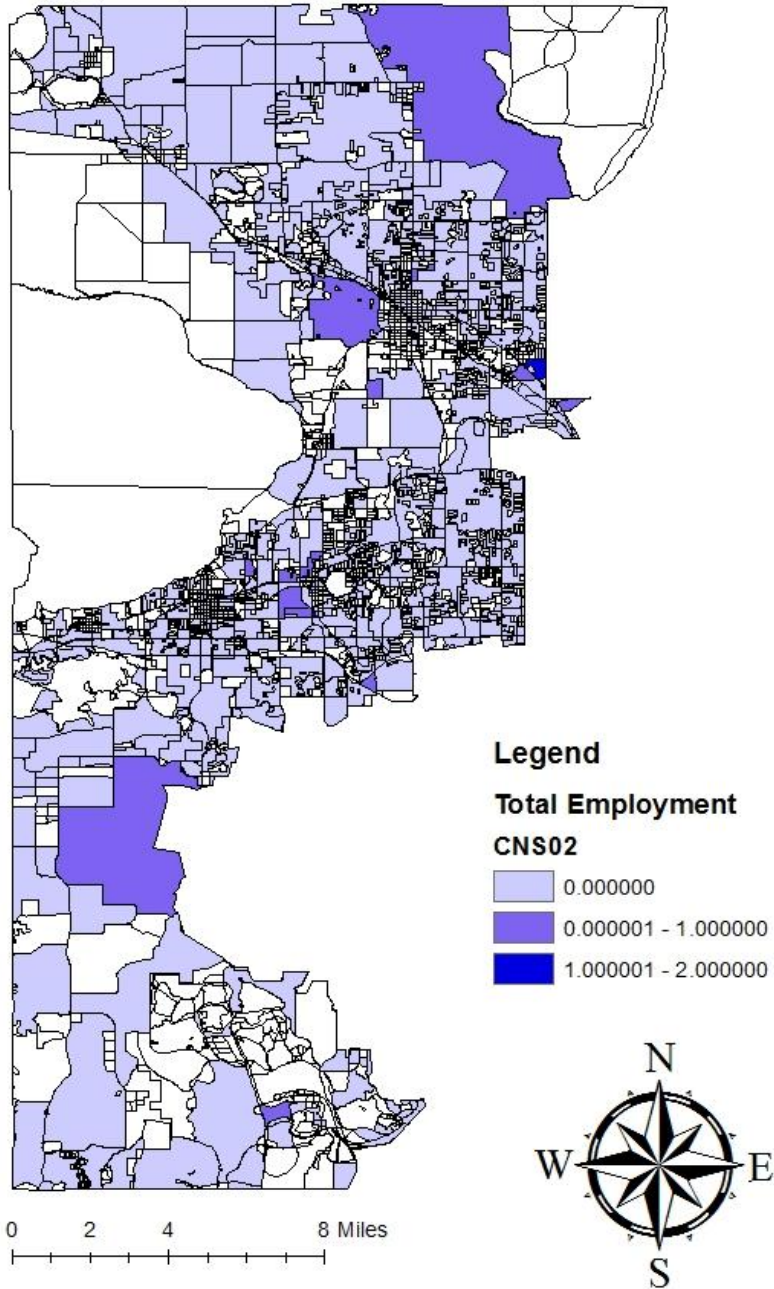
The communities of Western Orange County should utilize some or all of these tools to encourage business development. Some communities are already using these tools, such as Winter Garden's micro loan program and Apopka's Westside research park. The communities of Western Orange County would benefit by coupling the knowledge of their existing assets and business development tools to attract complementing businesses to the region.

APPENDIX
EMPLOYMENT MAPS FOR WESTERN ORANGE COUNTY, FLORIDA

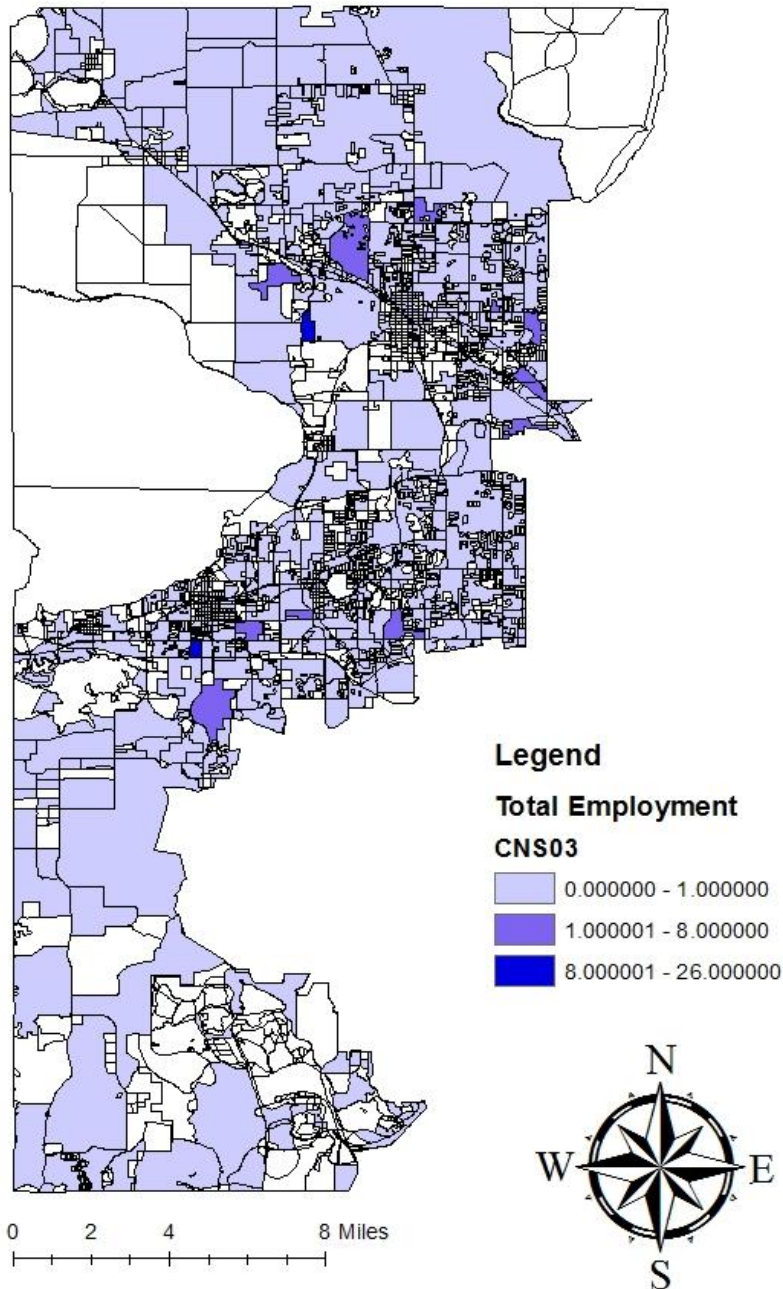
Total Employment of NAICS Sector 11:
Agriculture, Forestry, Fishing and Hunting
By Census Block



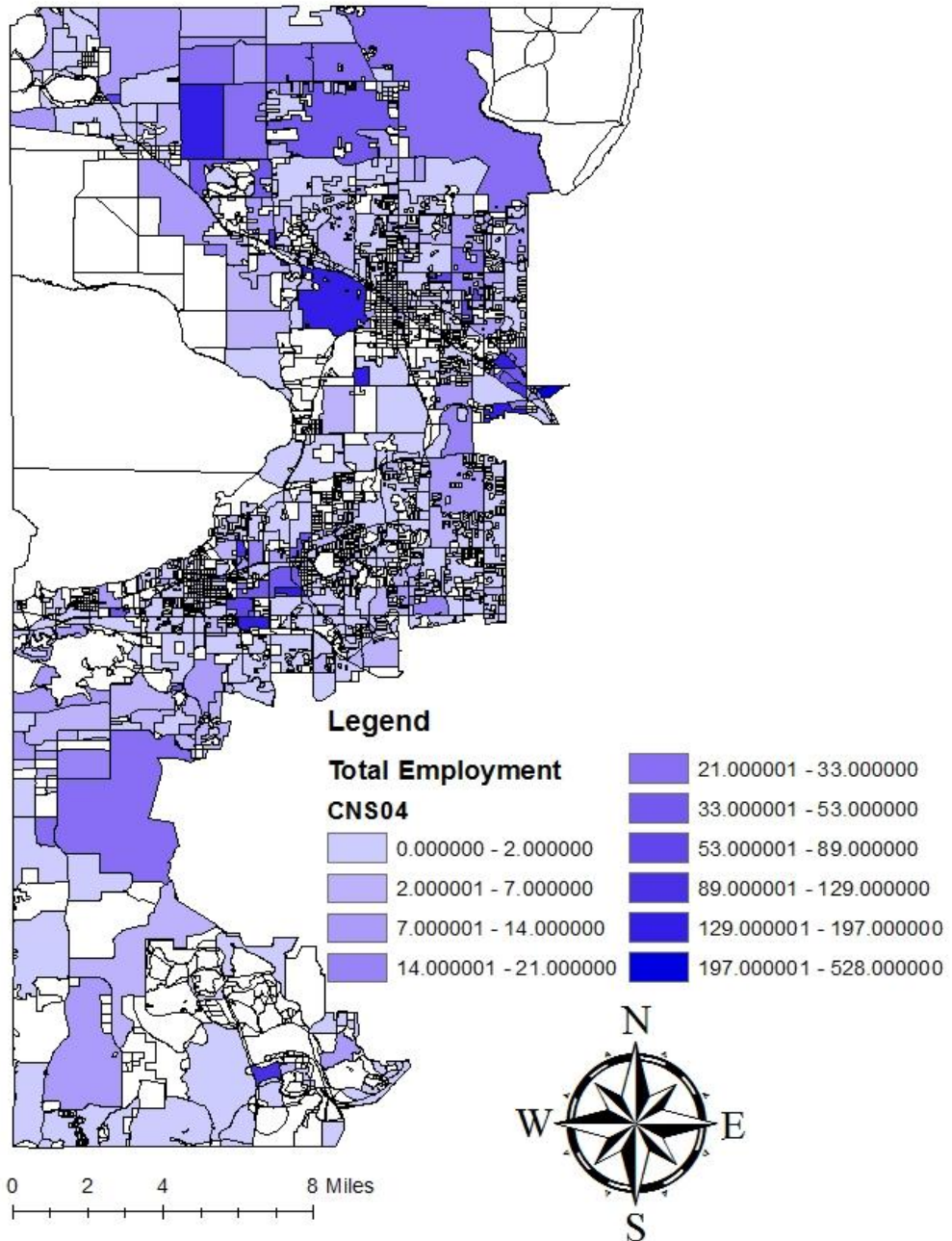
Total Employment of NAICS Sector 21: Mining, Quarrying, and Oil and Gas Extraction By Census Block



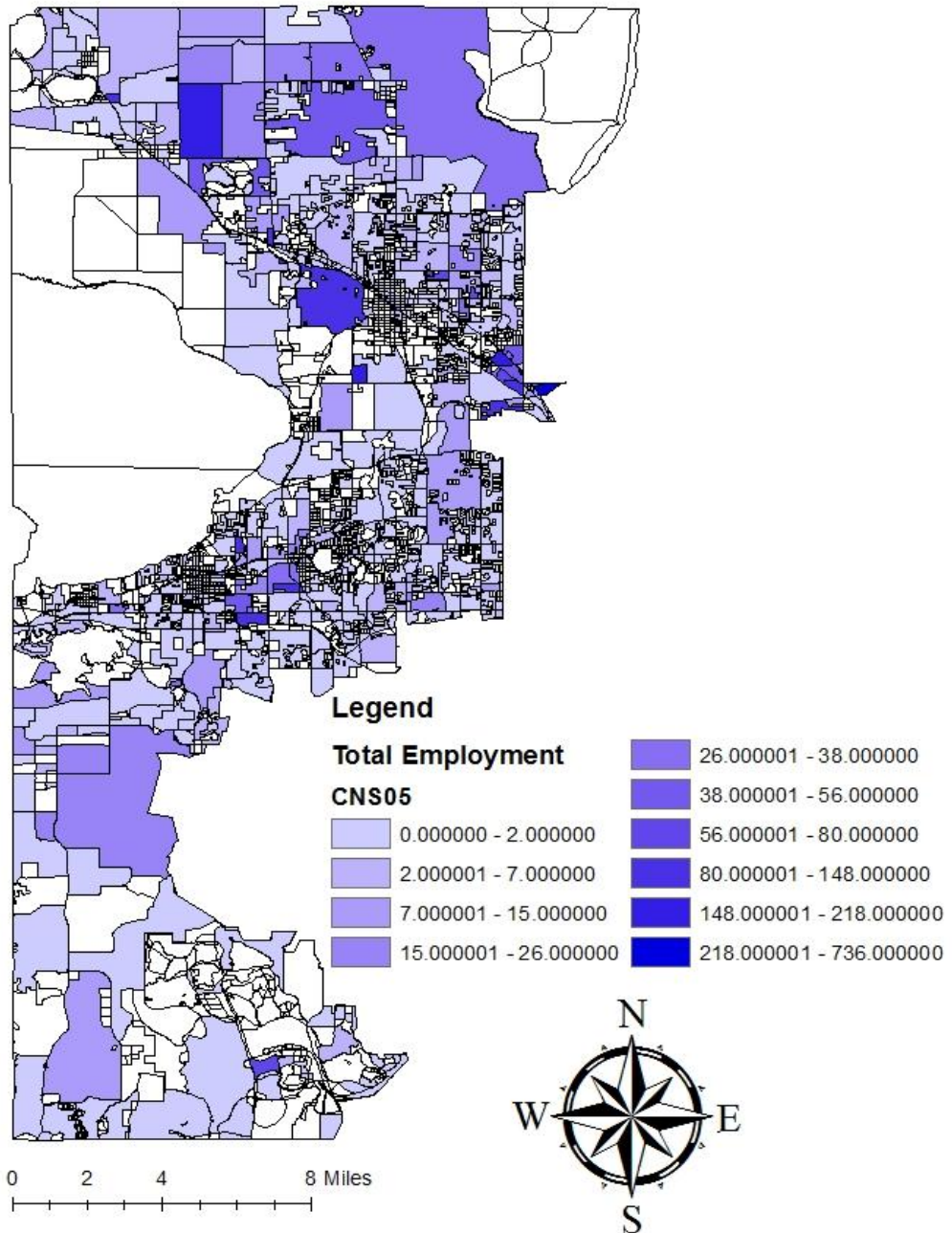
Total Employment of NAICS Sector 22: Utilities By Census Block



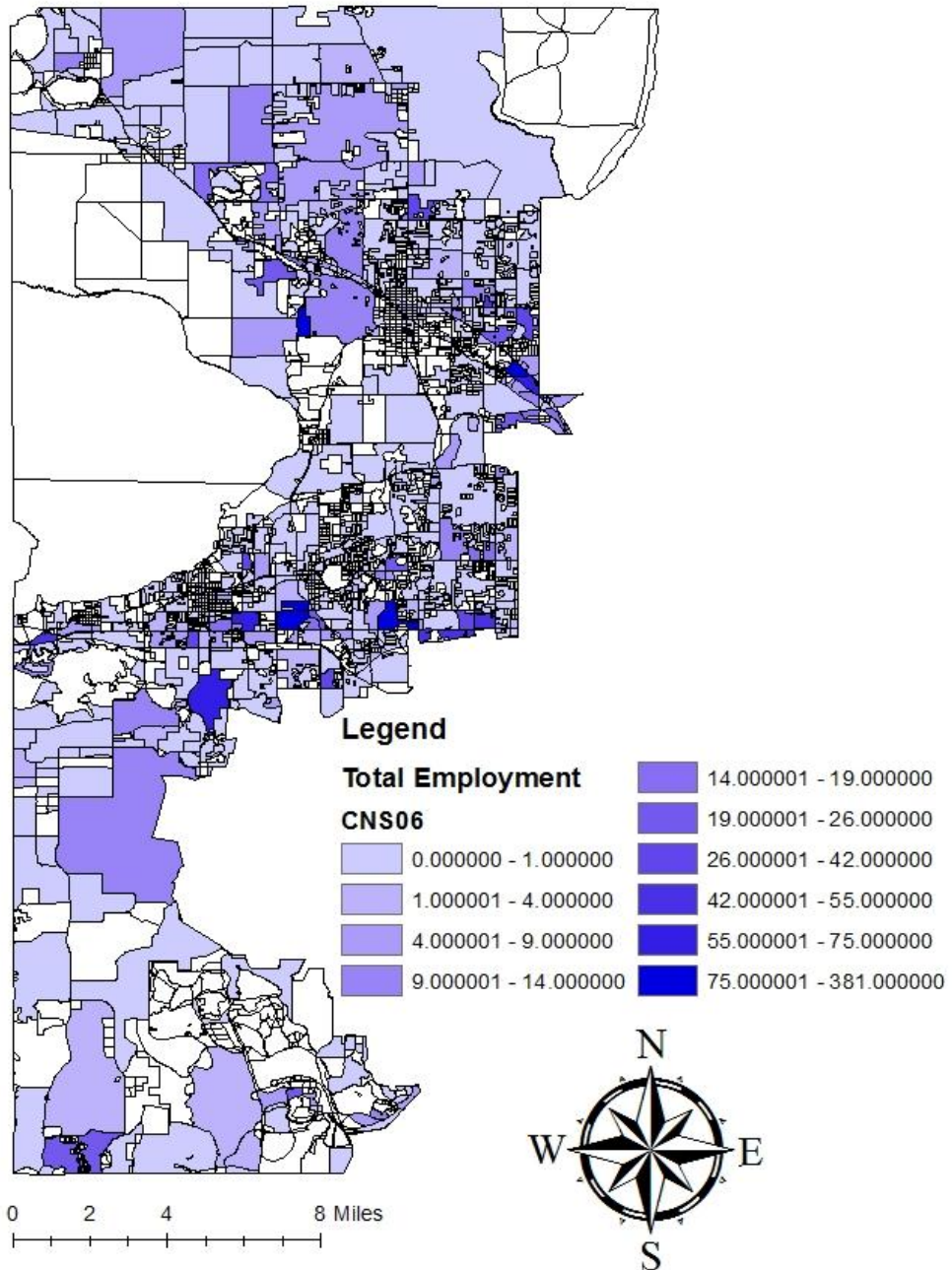
Total Employment of NAICS Sector 23: Construction By Census Block



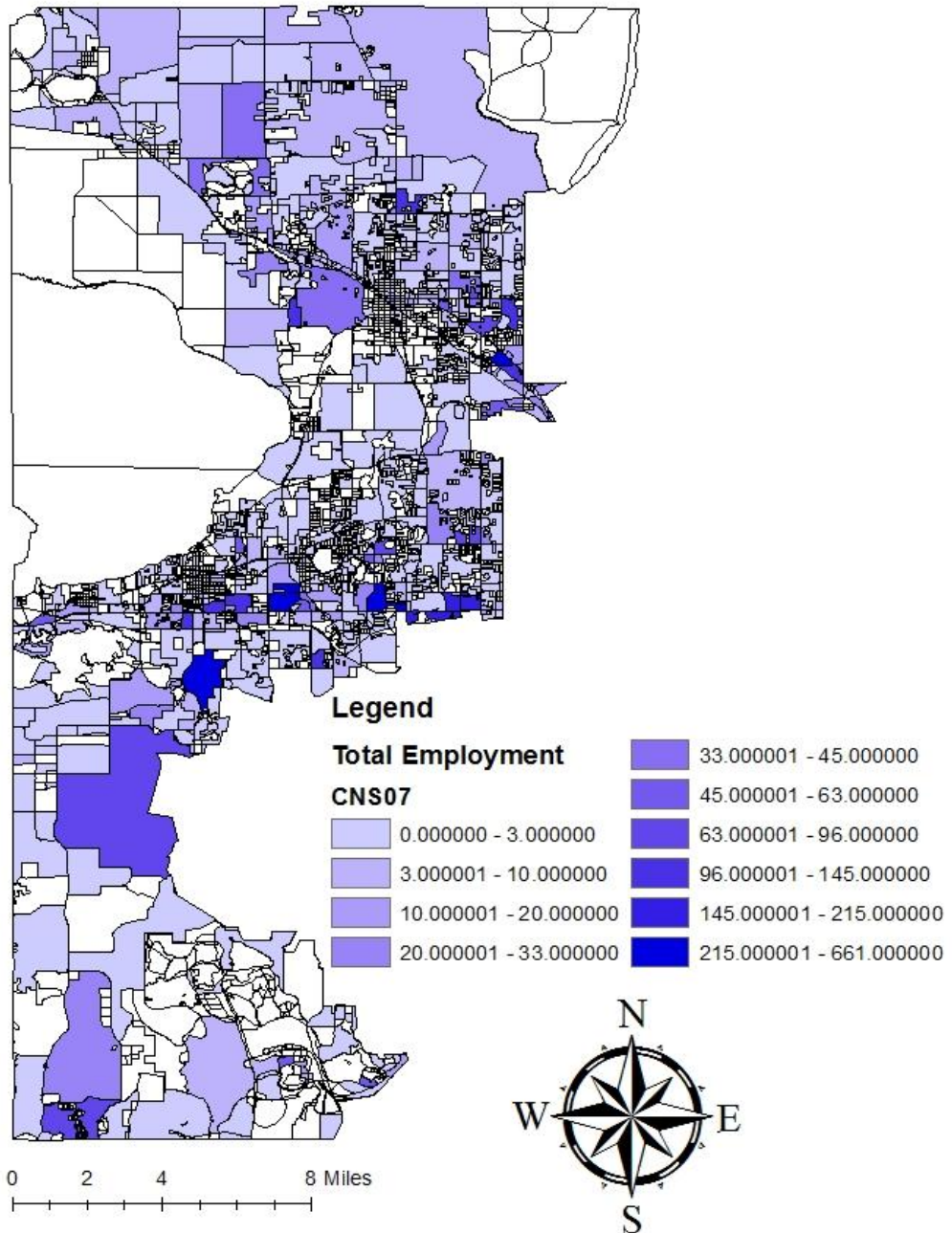
Total Employment of NAICS Sector 31-33: Manufacturing By Census Block



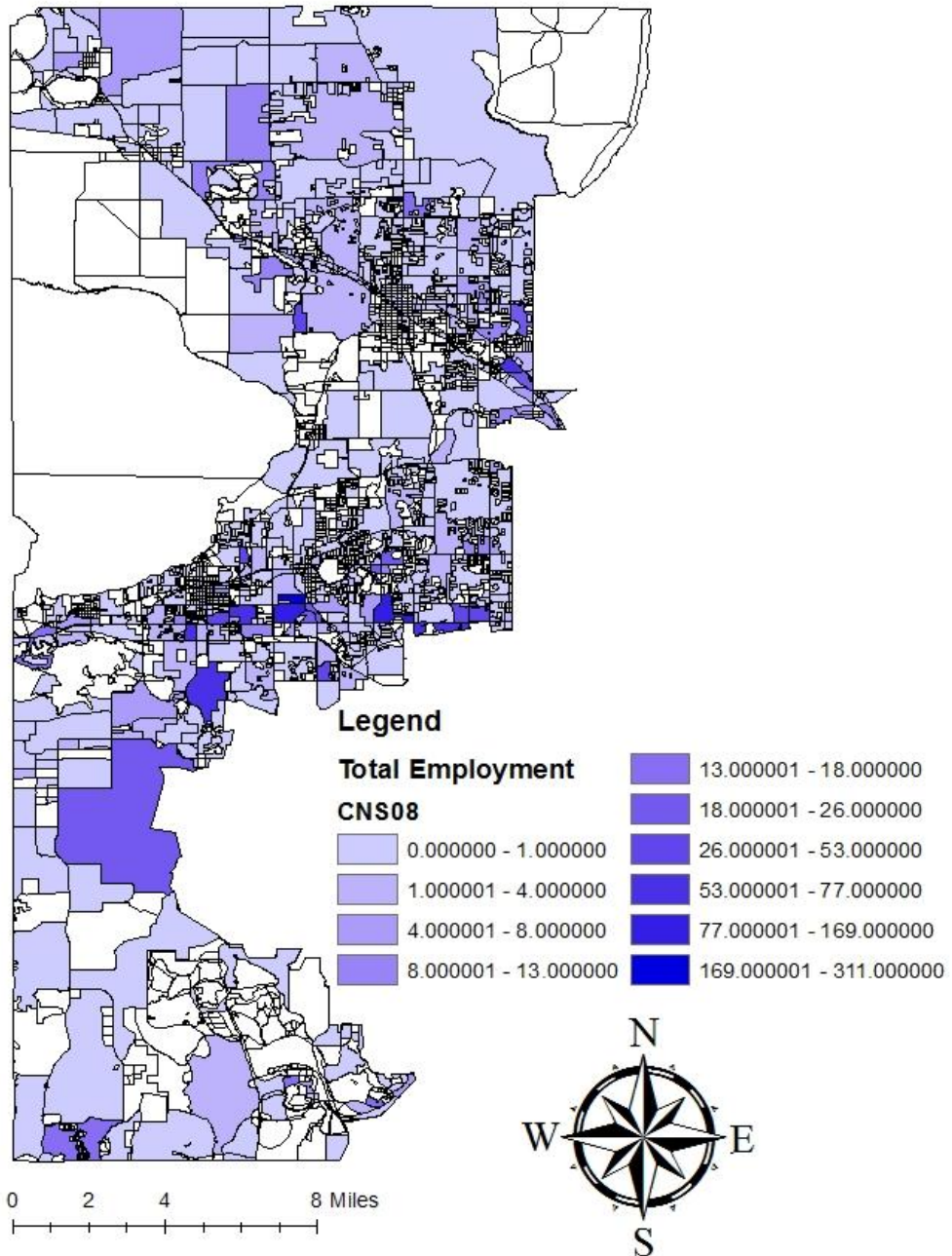
Total Employment of NAICS Sector 42: Wholesale Trade By Census Block



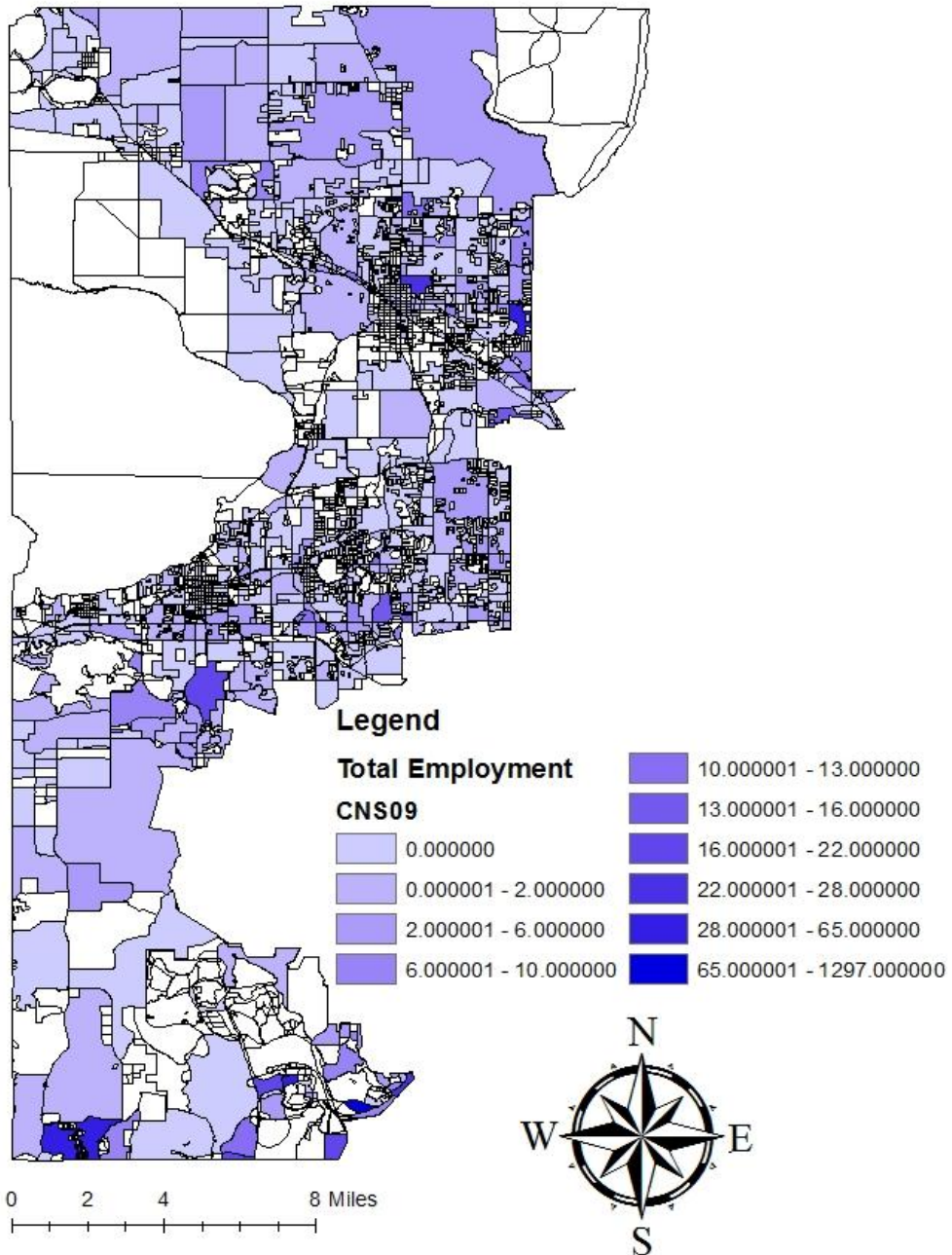
Total Employment of NAICS Sector 44-45: Retail Trade By Census Block



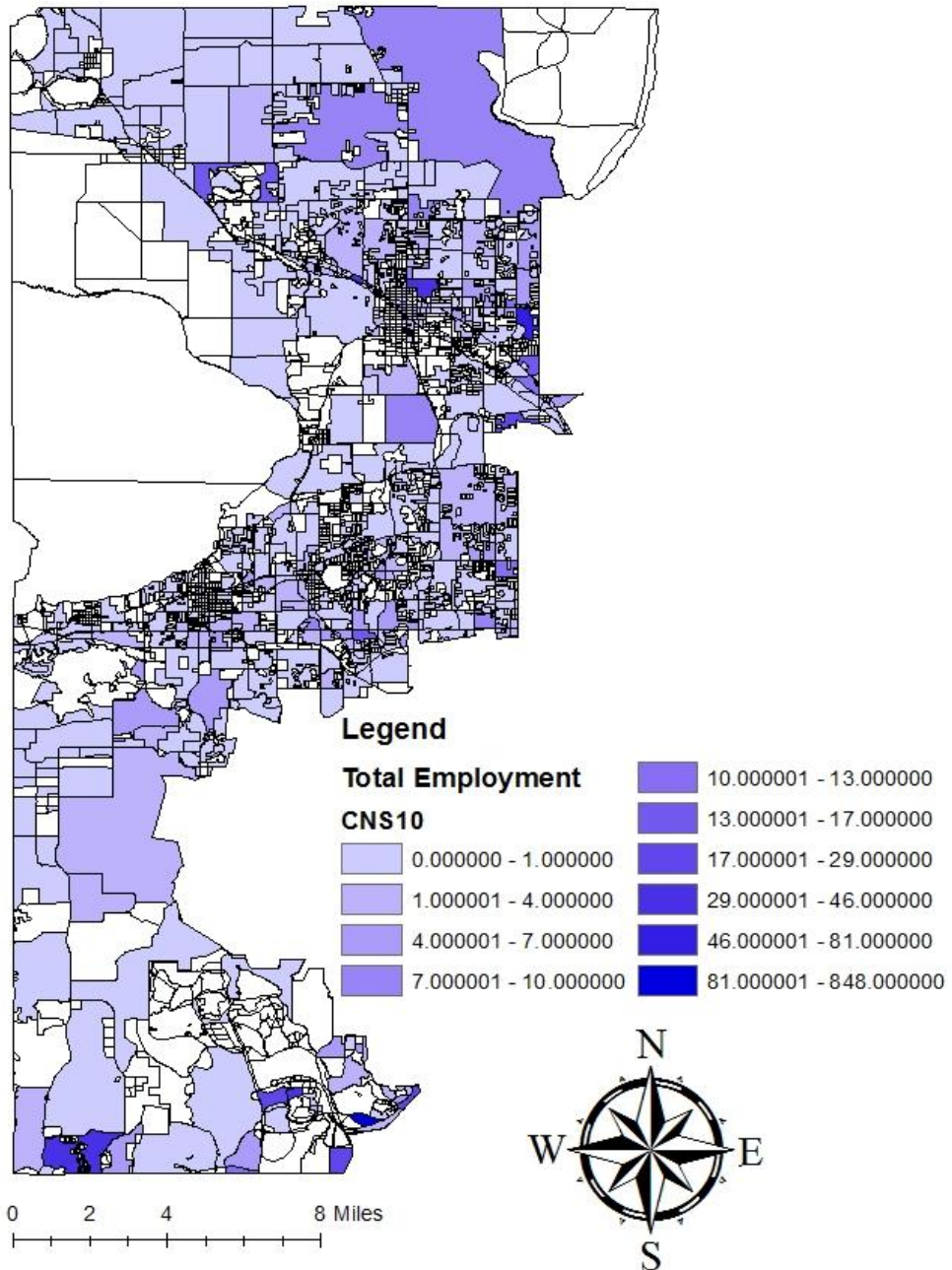
Total Employment of NAICS Sector 48-49: Transportation and Warehousing By Census Block



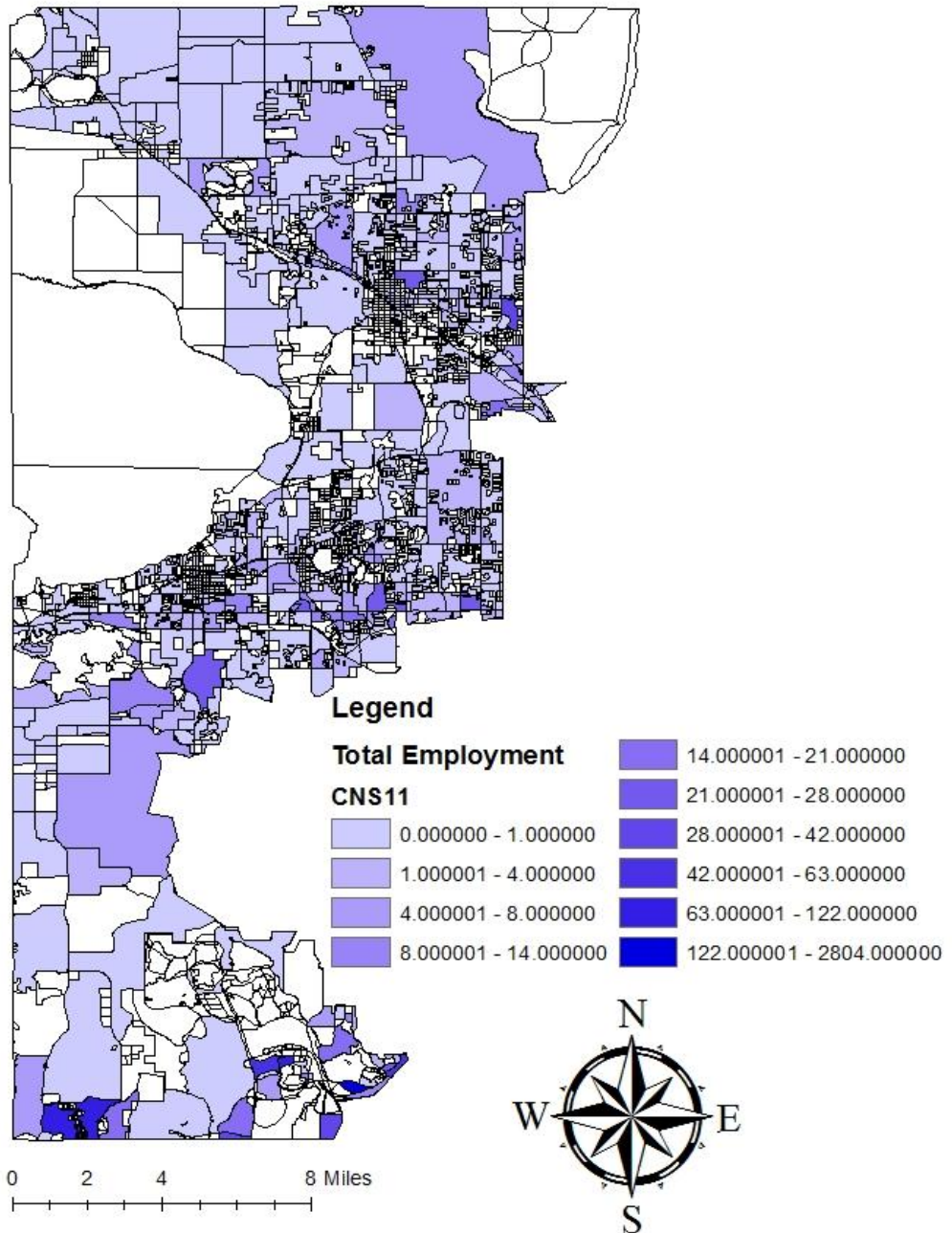
Total Employment of NAICS Sector 51: Information By Census Block



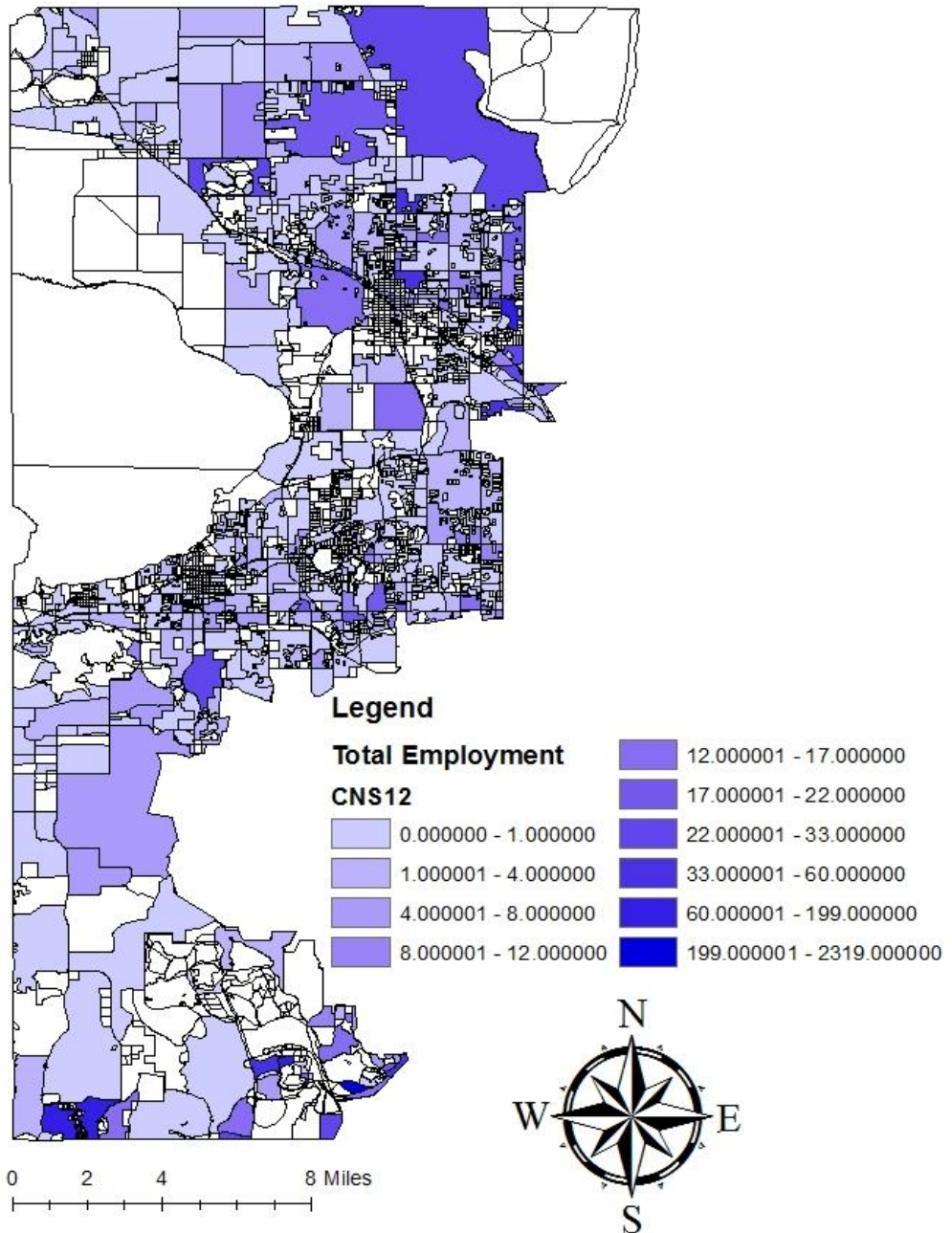
Total Employment of NAICS Sector 52: Finance and Insurance By Census Block



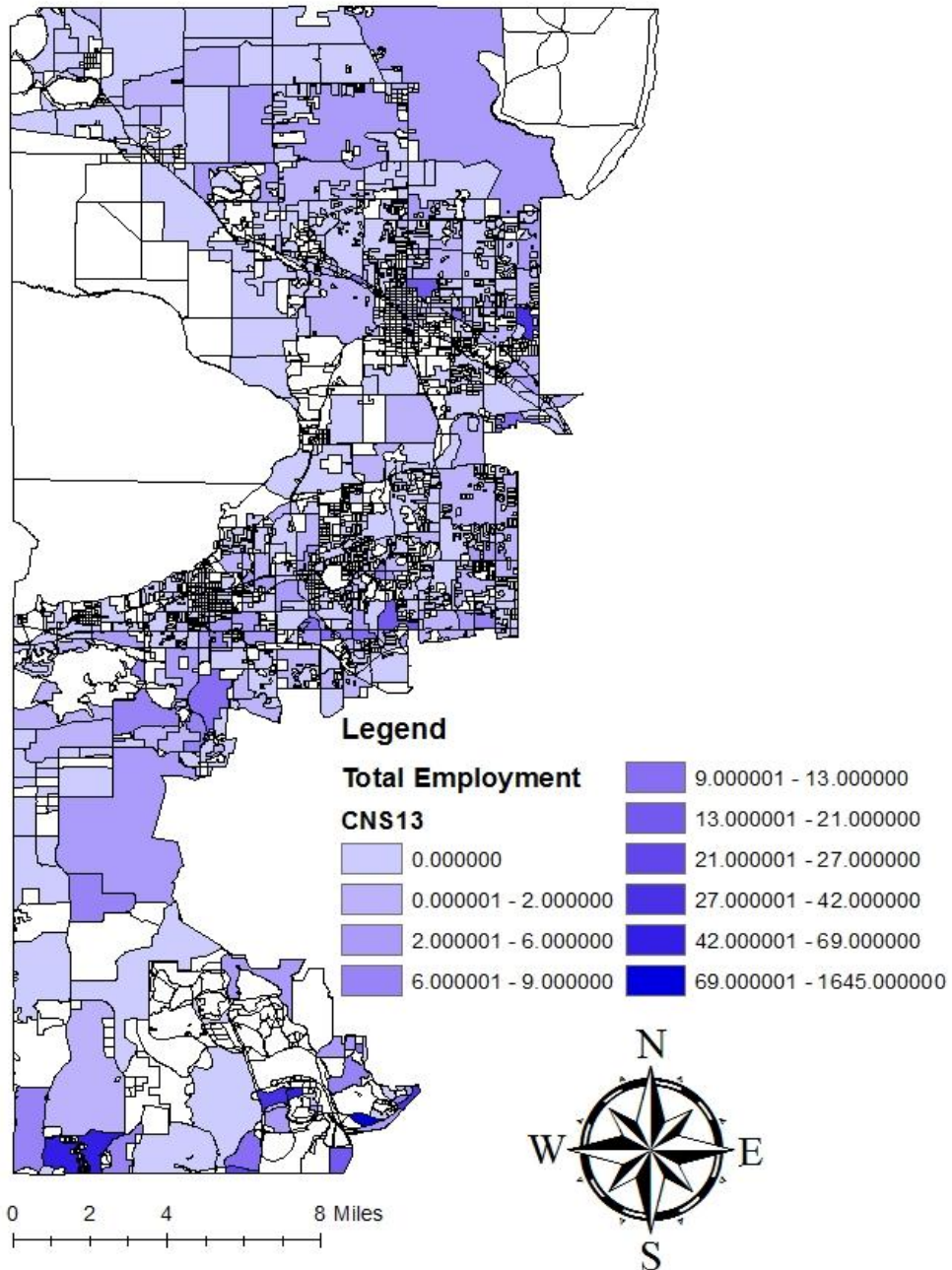
Total Employment of NAICS Sector 53: Real Estate and Rental and Leasing By Census Block



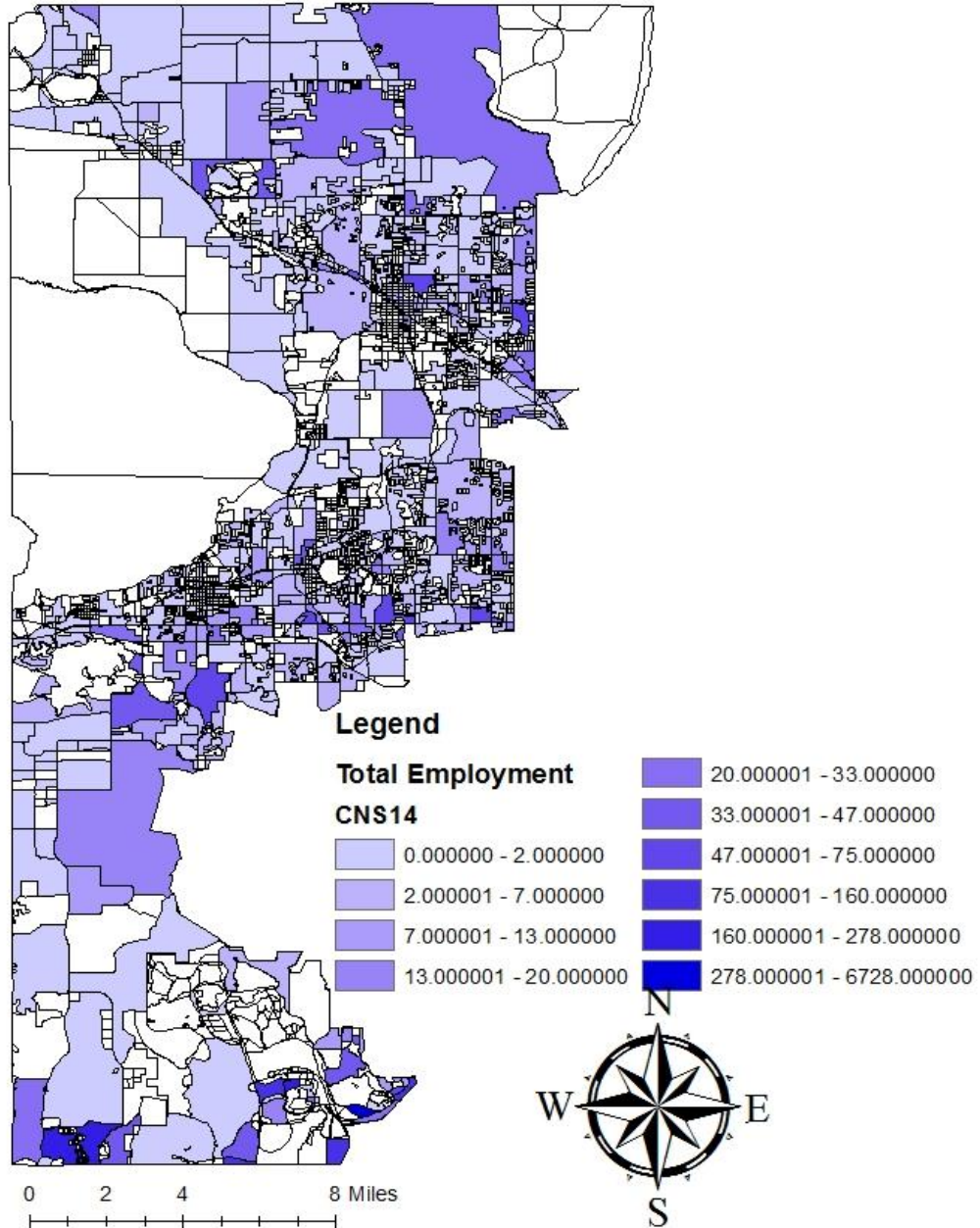
Total Employment of NAICS Sector 54: Professional, Scientific, and Technical Services By Census Block



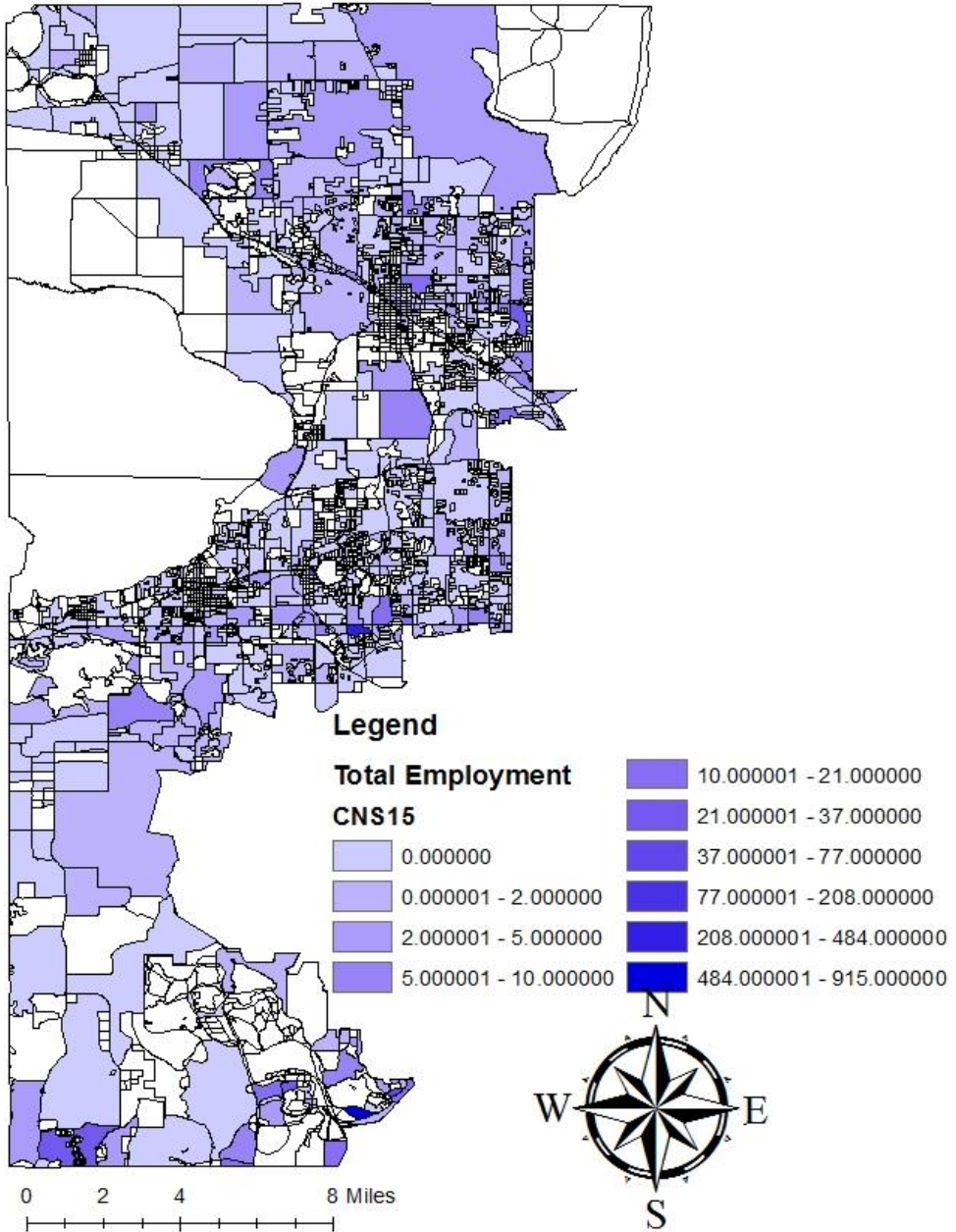
Total Employment of NAICS Sector 55: Management of Companies and Enterprises By Census Block



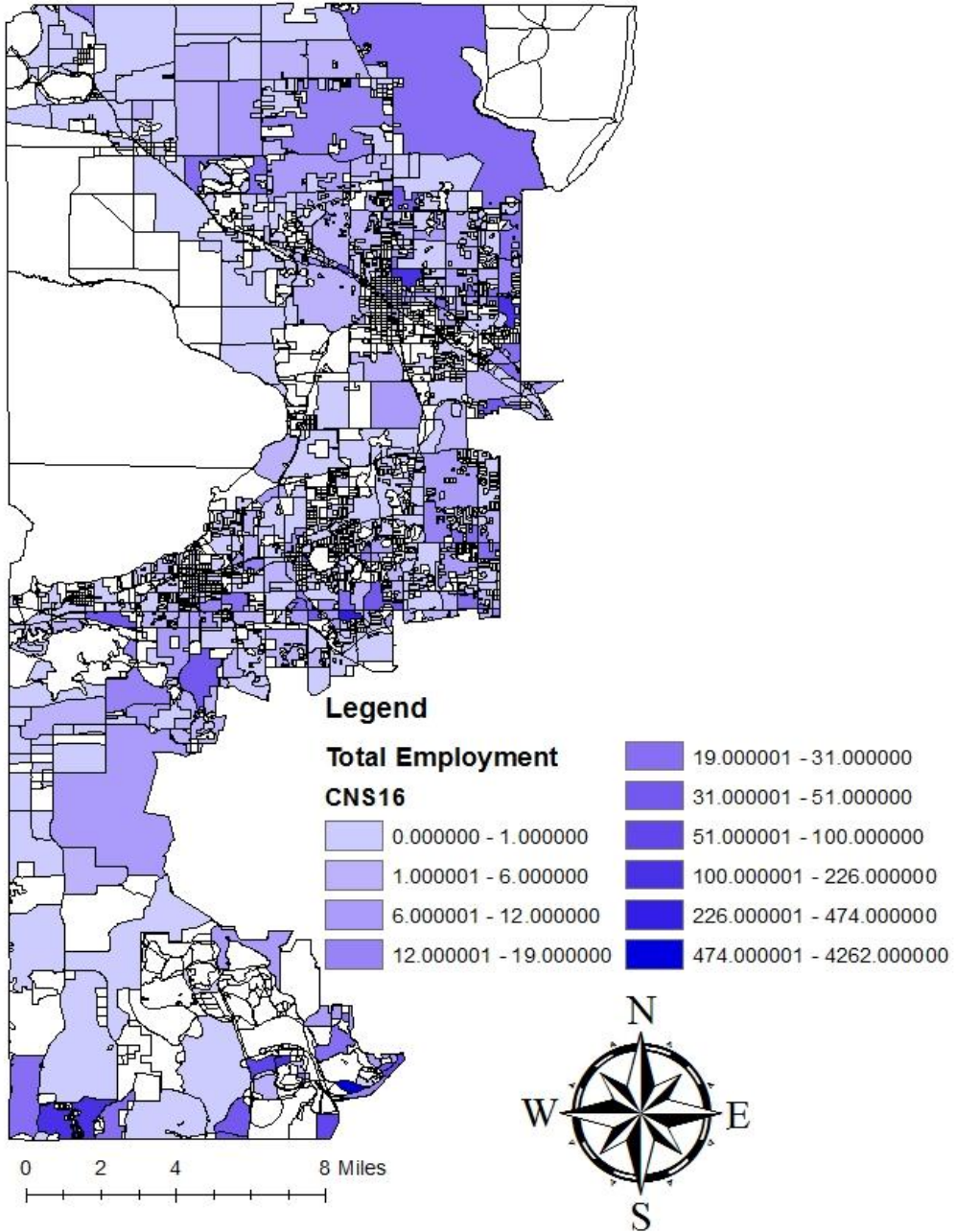
Total Employment of NAICS Sector 56: Administrative and Support and Waste Management and Remediation Services By Census Block



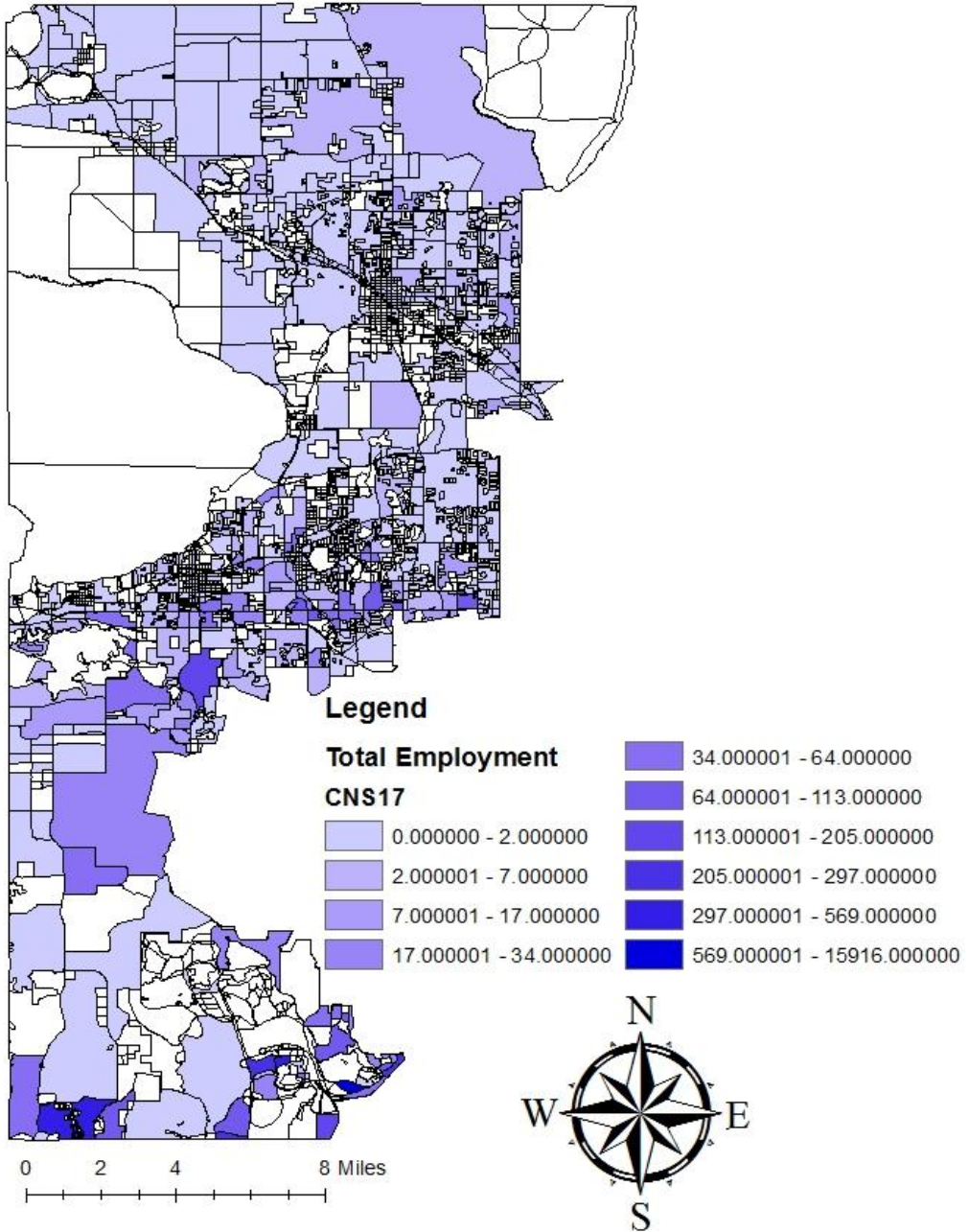
Total Employment of NAICS Sector 61: Educational Services By Census Block



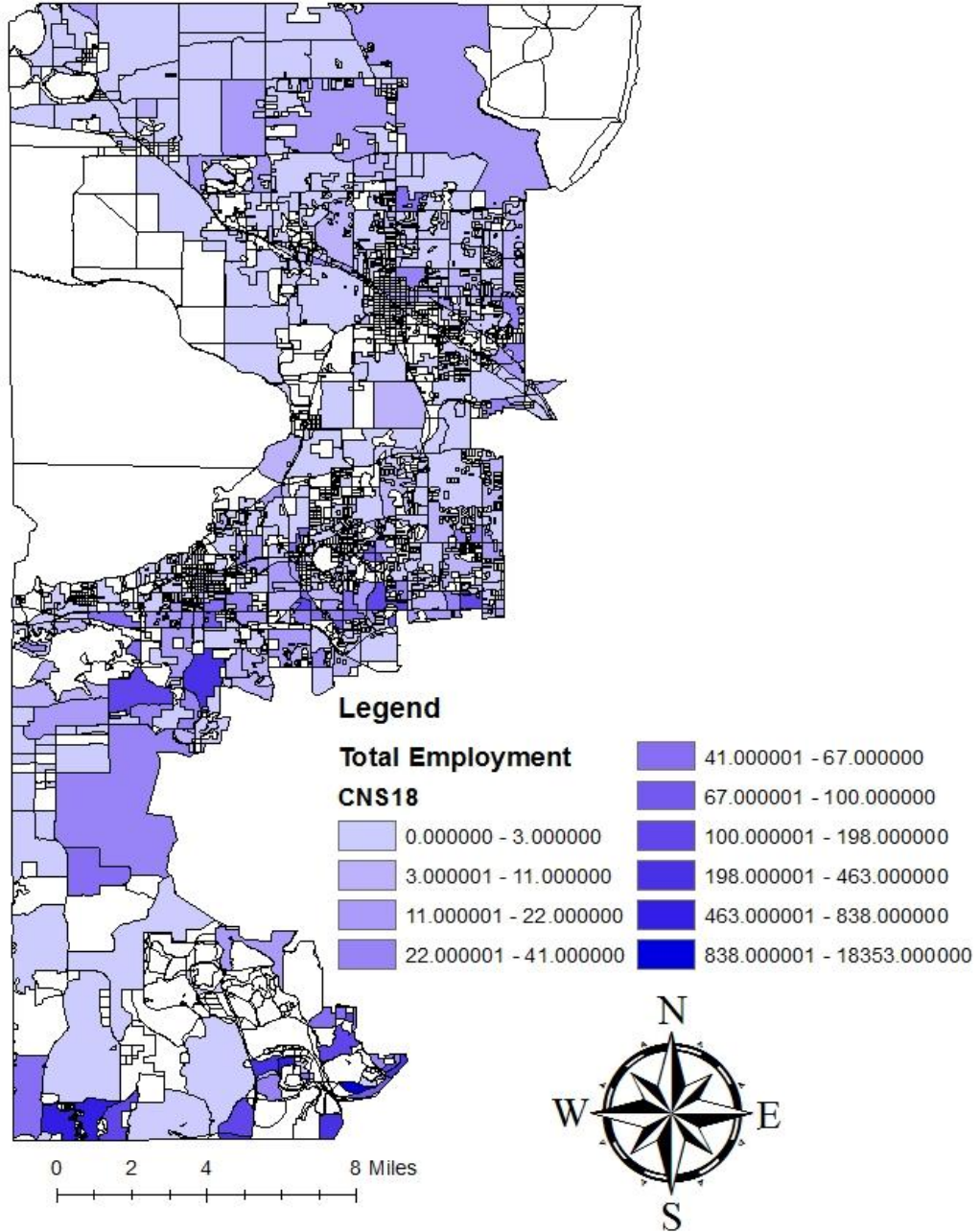
Total Employment of NAICS Sector 62: Health Care and Social Assistance By Census Block



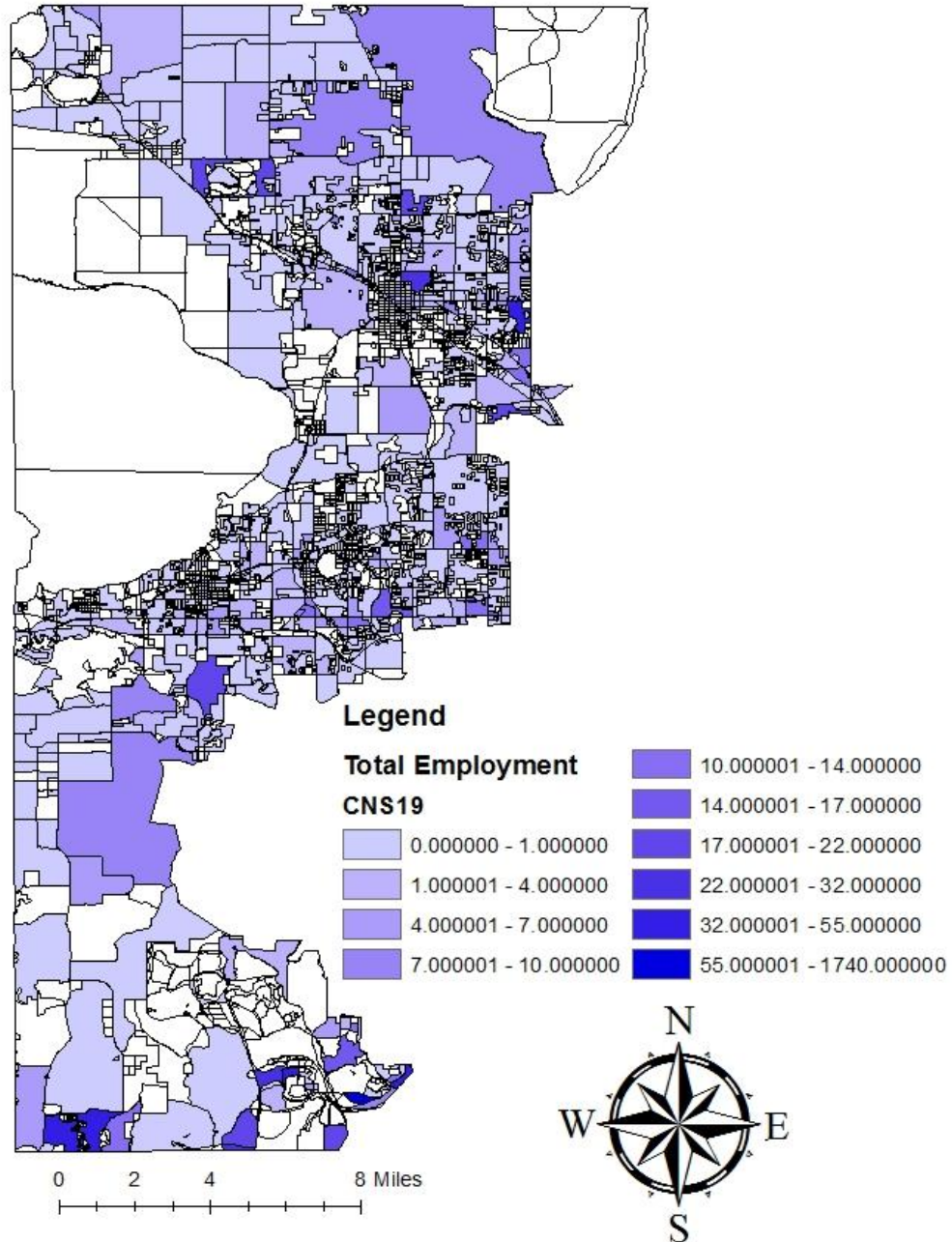
Total Employment of NAICS Sector 71: Arts, Entertainment, and Recreation By Census Block



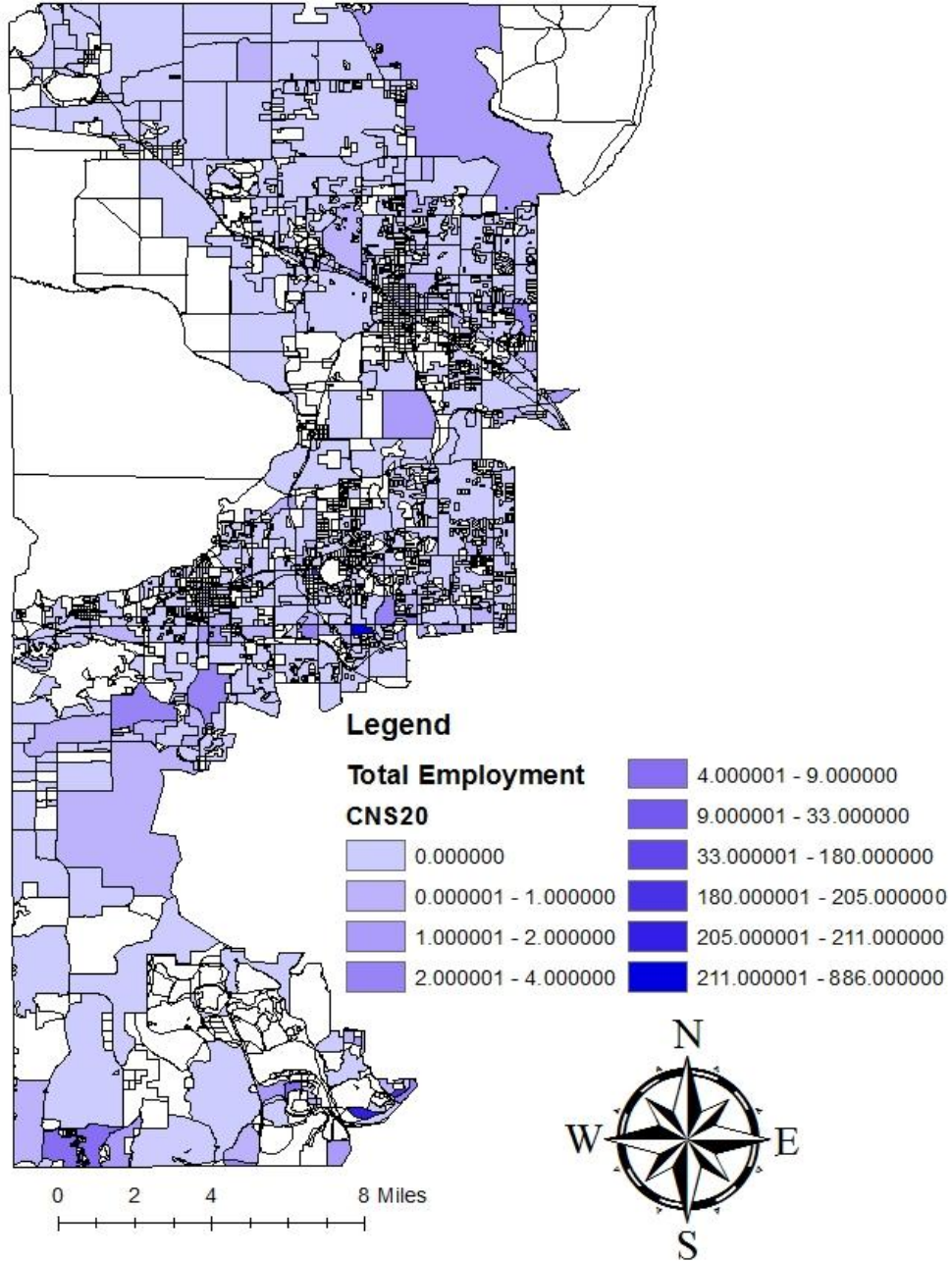
Total Employment of NAICS Sector 72: Accommodation and Food Services By Census Block



Total Employment of NAICS Sector 81: Other Services [Except Public Administration] By Census Block



Total Employment of NAICS Sector 92: Public Administration By Census Block



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BIOGRAPHICAL SKETCH

Michele Janiszewski is from Reading, Pennsylvania. While attending Bloomsburg University she earned her bachelor's degree in business economics with minors in Spanish and Latin American studies. She graduates from the University of Florida in August 2012 with a Master of Arts in Urban and Regional Planning where she focused on her interest of economic development. In May of 2011 she had the opportunity to participate in an urban planning study abroad program and traveled to Brazil to study the country's urban planning initiatives, sustainable designs and development policies.