TRANSIT ORIENTED DEVELOPMENT AND ITS EFFECT ON PROPERTY VALUES: AN ATLANTA CASE STUDY

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TRANSIT ORIENTED DEVELOPMENT AND ITS EFFECT ON PROPERTY VALUES: AN ATLANTA CASE STUDY

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SUMMARY

Transit-oriented development (TOD) and its effect on property values research has resulted in mixed findings. Some researchers report positive effects on property values while others are negative or inconclusive. Research on cities such as New York City, Boston, Atlanta and San Francisco have focused on the proximity to rail stations and the negative externalities that accompany it by conducting hedonic pricing models. Other studies have focused more specifically on residential or commercial parcels and their property values at different time points of station development.

This research focuses on five MARTA stations within Fulton County, Georgia: Ashby Station, Lindbergh Station, Sandy Springs Station, Vine City Station and West End Station. Data was obtained from MARTA and Fulton County that includes parcel and tax assessor information. Buffers zones within one-fourth mile, one-half mile and one- mile were created around the stations and an average appraised property value and average land value was determined. A comparative analysis was conducted to determine the effects proximity to rail has at stations with planned and unplanned development.

The research shows that TOD in the Atlanta area has minimal impact on property values. What appears to have more of an impact is the median household income of the neighborhood surrounding the transit station, which of course reflects the value of property afforded.

CHAPTER 1

INTRODUCTION

1.1 Study Overview

Transit Oriented Development (TOD) is defined differently throughout the country. Atlanta's Metropolitan Atlanta Rapid Transit Authority (MARTA) defines TOD as a "broad concept that includes any development that benefits from its proximity to a transit facility and that generates significant transit ridership." (MARTA)The New Jersey Transit Corporation definition is more narrowly stated as "an environment around a transit stop or station that supports pedestrian and transit use, created by providing a mix of land use in a safe, clean, vibrant, and active place." While many agencies define TOD in different ways, most commonly found amongst TODs are; dense mixed-use developments near transit facilities that promote walkable environments. Today, more than 100 TODs exist within the US mainly around heavy, light and commuter rail stations. (Cervero 1994) It is important to note that TOD is not a new concept. More than a century ago, pedestrian-friendly mixed-use communities existed around streetcar and rail lines in many US cities. The presence of massive highway systems and suburban living sparked the disappearance of such communities, resulting in auto-dependent subdivisions sprawled across city boundaries.TOD is a means to restore the dense and walkable streetscapes that once were the fabric of major US cities. TOD is also a strategy for building social capital which includes strengthening relationships between its residents, creating a better quality of life, and providing a place where people can live, work and play.

The absence of a universal definition of TOD makes it difficult to gauge the success of TOD facilities. One author writes:

"Because of the lack of clarity in the definition of TOD, legitimate disagreements about what might constitute good TOD, and diverging priorities and interests, actors may bring different, and sometimes contradictory, goals to the table." (Cervero 2001)

With many U.S. cities experiencing exponential population growth resulting in overcrowded roads, many view transit as a means to alleviate congestion. Despite the potential benefits of transit, resistance from neighborhoods in fear that it will cause their home value to decrease exists. Several studies have been conducted to observe the link between transit station proximity and property values. Findings have been mixed, with some values increasing as the proximity to a rail station increased and some reporting decreasing values. Most studies have focused solely on residential property values, but very few have looked at more than one property class at a time.

MARTA began service in 1979 with 13 stations. Since, MARTA has expanded its rail service to 38 stations with plans to extend current rail lines and add more than 10 stations over the next several years. With little TOD in the Atlanta area and increasingly congested roads, this research will attempt to determine the effect that TOD has on property values in the Atlanta area for development that MARTA was either aware or unaware of.

This research effort will attempt to determine the following objectives: 1) Determine if property values shown trends relative to TOD and 2) Determine the link between median household income, TOD and property values.

1.2 Methodology Overview

To analyze the effects that TOD has on property values, five MARTA stations having both similar and dissimilar neighborhood characteristics were selected. Of the selected stations, or "stations of interest", one station in particular was identified as a TOD, the others with or without TOD characteristics. Distance rings were created around

each of the stations and the average appraised value and average land value were determined. Tools used to isolate parcels and calculate property values included ArcGIS and Microsoft Excel. Property values for five different property classes were compared and TOD adherence for each station was determined.

1.3 Document Organization

The remainder of this document is organized into the following chapters:

- **Chapter 2: Literature Review.** This chapter contains a summary of the literature regarding TOD. It also summarizes several case studies of TODs. Lastly, this chapter contains a summary of literature on the effects of proximity to rail stations on property values.
- **Chapter 3: Data Collection and Methodology.** This chapter includes a detailed description of the data collection effort and the processes that were required to prepare the data for analysis.
- **Chapter 4: Results and Discussion.** This chapter includes a detailed interpretation of the results.
- **Chapter 5: Conclusion.** The final chapter is dedicated to specific recommendations based on the analysis of the data. In addition, a summary of conclusions is presented.

CHAPTER 2

LITERATURE REVIEW

This chapter summarizes the literature relating to Transit Oriented Development and the effects of TODs on property values. Beginning with several different aspects of TOD such as its purpose, implementation practices, a snapshot look at its funding capacities and TOD barriers, this review seeks to understand the ins and outs of development that supports transit. The review then presents several examples of developments that have been identified as successful TODs. Following these examples, the review summarizes the impacts that TOD has had in various cities throughout the United States. Finally, the review examines the impact of TOD on property values?

2.1 TOD Basics

In the United States, 37.4% of TODs surround heavy rail, 31.3% light rail, 21.8% commuter rail, 7.8% bus, and 1.7% surround ferry transit. (Cervero 2001)TOD projects vary from having already been implemented to various stages of planning and development. According to Holtzclaw, residents of TOD-like neighborhoods in the San Francisco Bay Area had almost half the vehicle miles traveled (VMT) per year of new suburban developments and the highest number of notable TODs in the U.S. (Baldassare, Knight et al. 1979) Several cities that are experiencing exponential population growth such as Charlotte, NC; Seattle; Denver and Houston have major TOD projects underway. Both Charlotte and Houston have new (since 2004) light rail systems whose ridership have exceeded their projections and as a result are sparking TODs.

TODs are encouraged by local transit agencies primarily to increase transit ridership, which in turn reduces greenhouse gas emissions, relieves congestion, and

promotes healthier lifestyles. A Portland, Oregon study found that TOD improves the effectiveness of transit investments by increasing the use of transit by 20%-40%. (Parsons Brinckerhoff Quade & Douglas 1996) Agencies also view TOD as a financial investment. Transit facilities have the potential to spur economic development and raise revenues for the agency. Other goals that have been noted in the literature include (Arrington and Cervero 2008):

- Enhance livability,
- Foster wider housing choices,
- Provide private development opportunities, safer neighborhoods,
- Reduce parking requirements,
- Improve air quality
- Promote intermodal integration.

According to TransitOrientedDevelopment.org, the factors driving TOD are “the rapidly growing congested US cities, a growing distaste for suburbia and strip mall development, a growing desire for quality urban lifestyle, a growing desire for more walkable lifestyles away from traffic, changes in family structure: more singles and empty nesters, a growing national support for smart growth, and a new focus on federal policy.”

2.2 TOD Implementation

From the public sector perspective, the most important tool to implementing TOD is having a vision and a strategic plan. (Cervero 1992) However, some research suggests that the vision must begin with real problems and practical solutions. Deciding what type of community is desired for an area and taking the proper steps to ensure the projected outcome are vital. In the case of Arlington County, Virginia, arguably the most

successful TOD outside of a central business district in the United States, the County closely followed a Scandinavian model for its Rosslyn-Ballston corridor in the 1970s. (Cervero 2001) By involving local stakeholders in the strategy that consisted of infrastructure improvements to rail stops along the corridor, “Arlington County managed to transform the Metrorail Orange Line into a showcase of transit-supportive development, with mid-to high-rise towers and multiple uses today.” (Dittmar and Ohland 2004)The Rosslyn-Ballston corridor will be discussed in further detail later in the chapter.

In a national survey of 90 transit agencies, nearly half of the agencies reported having a “regional vision, policy, or plan in place that calls for compact development organized around transit.” (Cervero 2001) Agency initiatives include the “Centers and Corridors” plan in Charlotte, the “Corridors and Wedges” plan in Washington, D.C., and the “Region 2040 Functional Plan” in Portland, Oregon. (Cervero 1994)

Encouraging higher densities is another tool for effective TOD implementation. Different types of TODs such as those in urban neighborhoods have a designated number of dwelling units per acre. In San Diego, the density threshold for residential dwellings is 18 per acre in an urban TOD serving light rail and 12 units per acre in neighborhood TODs where bus service is the major transit mode. In Portland, Oregon, values range from 12 to 30 units for light rail districts based on the distance to the station and 12 to 24 units per acre for bus districts based on distance from the stop. (Parsons Brinckerhoff Quade & Douglas 1996) In contrast, in a 2006 study of TOD potential in the Alpharetta,GA area, just north of Atlanta, the city’s current zoning districts did not reach the minimum density recommended for a functional TOD. (MARTA 2006) Because densities and how they are configured around a station within a TOD zone affect residents’ and employees’ propensity to use transit, most guidelines suggest that densities should decrease from the center so that more people are located closer to the

transit station. According to past research, “density gradients that decay exponentially with distance from a station maximize ridership.” (Nelson 1992)

To make TOD more attractive to developers implementation tools such as, zoning strategies, density bonuses, dedicated bonds, direct loans and grants, relaxed parking standards, and streamlined developer reviews have been used. According to the national survey mentioned previously, the most common and widely used tool to encourage TOD is to create strategic plans for TODs, followed by zoning/density bonuses, relaxed parking standards and capital funding. For example, at Lindbergh Station in Atlanta, the City gave developers an incentive for affordable housing. The incentive included increased floor area ratios(FARs) as long as the developer agreed to keep at least 20% of the units affordable for 15 years. According to the survey, other implementation tools (less often used) included: eminent domain, tax abatement, subsidized housing, underwriting land costs, tax increment financing, and land assembly help.

2.3 TOD Funding

TODs are most commonly funded through private financing. To attract private investment, transit agencies and local governments have funded streetscape improvements such as sidewalks, putting utilities underground and developing civic plazas. Other sources of funding have included Tax Increment Financing (TIFs), Community Improvement Districts (CIDs) and pass through grants awarded by state and federal agencies. To date, no states have provided funding “explicitly” for TOD planning and development although a few “give TODS priority access to state-controlled transportation funding under certain conditions.” (Dittmar and Ohland 2004)Transit agencies and local governments make it clear that in order to implement TODs successfully, they need money. From national experience, transit agencies that have

minimal public financial support suffer tremendously when it comes to TOD. (Academies 2002)This explains the more recent interest in public-private partnerships or joint-development projects.

2.4 TOD Barriers

Many obstacles to TOD implementation have been identified in the literature. Funding and financial support from lending institutions and the associated loan conditions are the barriers most commonly identified. TOD has higher construction costs and is considered “high risk” because of its dense development characteristics. Building around transit stations is often limited in terms of land availability and when coupled with exclusionary/inclusionary housing practices, presents tremendous obstacles for developers. Developers state that the most successful TODs have had strong public sector support and without it successful TODs are nearly impossible. The FTA’s 1997 Policy on Transit Joint Development is seen as a milestone for advocates of TOD. (Dumbaugh 2004) By relaxing federal restrictions on the use of transit-area properties, this policy gives transit agencies a powerful incentive to develop TODs around transit stations. (Dumbaugh 2004) However, have transit agencies such as Atlanta’s MARTA taken advantage of such opportunities?

To gain a more thorough understanding of TOD, the next section will discuss in detail several TOD case studies. U.S. studies are presented as well as an international example.

2.5 TOD Case Studies

2.5.1 Rosslyn-Ballston Redevelopment Corridor

In May, 1996 the County Board of Arlington County, Virginia established the "Rosslyn Coordinated Redevelopment District." The corridor consists of dense, mixed-use development surrounding five Metro stations (Rosslyn, Court House, Clarendon, Virginia Square, and Ballston). As of 2004, the corridor had more than 21 million square feet of office space, retail and commercial and more than 3,000 hotel rooms and 25,000 residences. (Ryan 1999) The corridor covers roughly 2 square miles compared to approximately 14 square miles of a comparable suburban layout. During the planning stages, County officials focused on the following principles:

- Include mixed land uses
- Exhibit Compact Building Design
- Provide ranges of housing types
- Promote “walkable” neighborhoods
- Exhibit a distinct sense of place
- Preserve open space
- Utilize existing development
- Provide transportation choices
- Practice fair decision-making
- Promote stakeholder participation

Between 1991 and 2002, Metro ridership within the corridor doubled with nearly 50 percent of residents commuting by transit. Arlington County planners state that when residents are involved in developing plans they are more supportive of dense

development. Therefore, more than 40 Board-appointed County commissions and nearly 60 neighborhood civic associations make certain that citizens and local businesses are involved in all public and private development decisions. This interaction is made possible through community partnerships such as the Ballston Partnership, Clarendon Alliance, and Rosslyn Renaissance. As with many TODs, incentive zoning is used to attract private sector development. Because of the high demand to reside within the corridor, maintaining affordable housing was difficult for the County. In response, Arlington expanded its density bonus provisions allowing 25 percent more density.

In 2002, the Arlington Corridor was selected by the U.S. Environmental Protection Agency (EPA) as the recipient of the National Award for Overall Excellence in Smart Growth Achievement. EPA noted that many of Arlington's policies and procedures could be implemented in other communities. The EPA also supports planning density around transit as a model for "directing growth to new or existing transit corridors while protecting older neighborhoods and natural areas."

"Arlington County has maintained its political and economic commitment to transit-oriented redevelopment for three decades. Residents support the smart growth program because they participate in developing plans and reviewing projects, pay low taxes thanks to the strong commercial tax base, and enjoy the convenient shops, services and transit."

- Carrie Johnson, Member of Arlington County Planning Commission and long-time resident

2.5.2 San Francisco Bay Area

Several TODs are found within the San Franciso Bay area. This section will focus on three completed developments located at stations served by the local transit agency the Bay Area Rapid Transit (BART) system. Reportedly , there are seven transit villages at or near BART property. BART's system map is pictured in Figure 2.1 below.

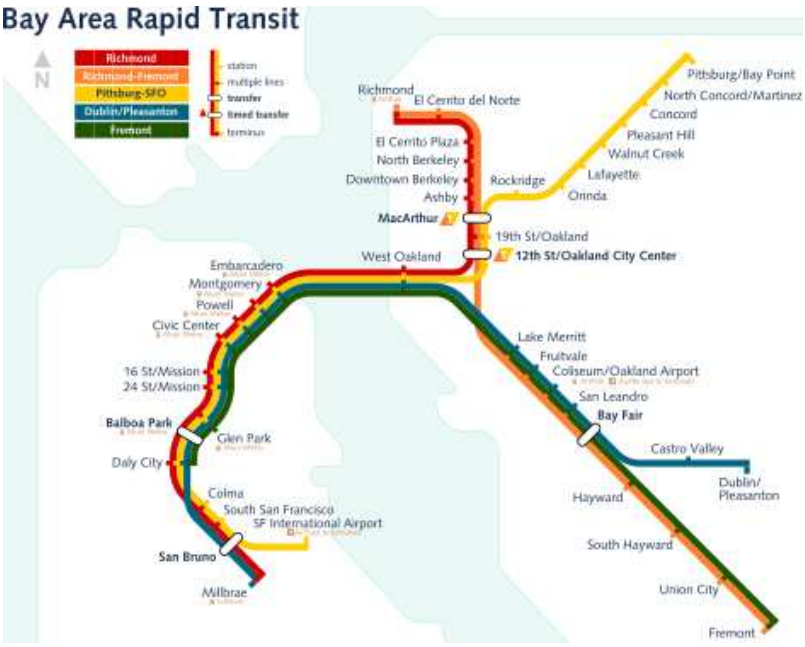

Figure 2.1: BART System Map

2.5.2.1 Emery Station, Emeryville

The site of a former brownfield, the Emery Station is 20-acres of mixed-use development in the East Bay area. Initiated by Amtrak, construction of the rail station began in 1998 as a result of negotiations between the City of Emeryville and Chevron who previously owned the land. Anchored by an Amtrak station that makes 13 daily roundtrips, the TOD currently includes 550,000 square feet of office and 150 residential units and ground-floor retail. Residential units consist of lofts, townhomes and senior housing. With more than $200 million invested in the station, the City also completed a pedestrian bridge over the Amtrak tracks to a nearby mixed-use center. With the nearest BART station two miles away, the City of Emeryville saw fit to provide its residents and businesses with access to BART. The Emery Go-Round, funded by local employers (5% from the city), is a shuttle bus that connects the development to the McArthur BART Station operating from 5:45 a.m. to 9:30 p.m. every 15 minutes. Figure 2.2 and Figure 2.3 are before and after photos of the Emery Station development.

Figure 2.2: Emery Station before development

Figure 2.3: Emery Station after development

2.5.2.2 Fruitvale Transit Village, Oakland

The Fruitvale Village idea was first proposed in 1992 by community members who opposed BART's announcement of plans to build a multi-level parking facility at the Fruitvale station. Spearheaded by the Unity Council, an alternative plan was developed using Community Development Block Grant (CDBG) funds given to the Council from the City of Oakland. After ten years, with collaboration and support from several agencies such as the University of California at Berkeley's National Transit Access Center, the U.S. Department of Transportation and the Federal Transit Administration, construction on Fruitvale Village began in 1999. Its proposed goals were to (Transportation 2008):

- Strengthen existing community institutions and catalyze neighborhood revitalization – physically, economically and socially.
- Reduce poverty, build assets, and contribute to the local economy – by providing a stable source of jobs and income.
- Encourage and leverage public and private investment.
- Enhance choices for neighborhood residents, including services and retail choices.
- Provide high quality, affordable housing.
- Improve the perception and reality of safety.
- Beautify a blighted area.
- Increase BART ridership and reduce traffic and pollution.
- Be sustainable and environmentally sound.

To date, the Village consists of 257,000 square feet of mixed-use development. There are 47 mixed-income residences, 114,000 square feet of community services such as a library, medical clinic, and senior center. Neighborhood retail, including shopping and dining, occupy 40,000 square feet of the Village and to accommodate its visitors and park-n-ride transit users, a 150-car parking garage and BART parking structure were built. The pedestrian plaza, which lies in the center of the Village, is lined with palm trees and fountains that create a colorful and festive fabric for its residents and visitors as seen below in Figure 2.4. (Transportation 2008)

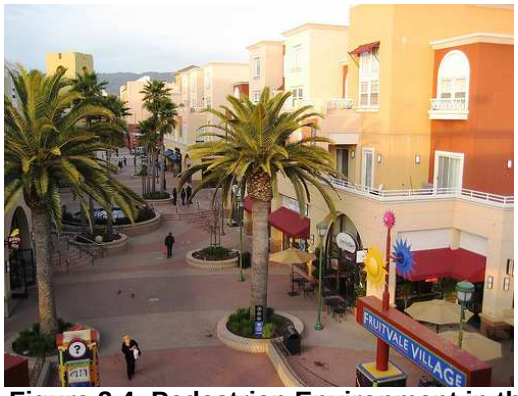

Figure 2.4: Pedestrian Environment in the Fruitvale TOD

2.5.2.3 Pleasant Hill BART Station

According to Urban Ecology, Inc, the Pleasant Hill BART station shows how TOD can work and is often pointed to as one of the best examples of TOD development in the United States. (Transit 2009) Similar to the Fruitvale Transit Village, the Pleasant Hill Station project was proposed to take the place of proposed parking structures. Surrounding the Pleasant Hill BART station, the Contra Costa Centre is located at a major transportation hub. BART, Interstate 680, a regional trail and a future light-rail corridor all converge at this location. The Contra Costa Centre program is designed to locate employment and housing opportunities near transportation centers. The Specific Plan for the Pleasant Hill area was adopted by the county in 1983 and since then has earned many prestigious awards and honors. Growth management elements according to the Plan were to include (Transit 2009):

- A regional approach to addressing development and traffic concerns
- Creation of a jobs/housing center around existing regional transportation hub
- Public/private financing of infrastructure improvements

- The completion of nearly $90 million in major public infrastructure improvement concurrent with or prior to development using property owner supported assessment bonds, and redevelopment tax increments
- The capacity to finance up to $30 million in additional infrastructure improvements through redevelopment tax increments
- Requirements for transportation demand management and child care program
- Public financing of affordable housing projects through redevelopment tax increments and tax exempt bonds
- Creation of jobs/housing balance

Contra Costa Centre currently features approximately 2.2 million square feet of Class A office space, 423 hotel rooms (Embassy Suites and a Marriott Renaissance hotel and almost 2,300 multi-family residential units. At completion, the greater Centre area will have approximately 2.8 million square feet of office and commercial development and 2800 residential units. Because of market downturns, county officials are unable to provide a construction completion date.

Figure 2.5: Contra Costa Centre

2.5.3 Portland, Oregon

Many of the planning practices used in Portland serve as models to many other cities. According to Planetizen, a key strategy of the Portland region has been to rezone land adjacent to light rail stations in order to create new mixed-use development. (TOD 2008) In several Portland cases, a New Urbanist program has been followed and has resulted in well-connected, pedestrian-friendly streets and a diverse mix of housing, retail and civic uses. In 1998, Portland Metro's (Portland's metropolitan planning organization)Transit-Oriented Development Program was the first in the nation to receive authorization to use federal transportation funding to specifically acquire land for redevelopment adjacent to a light rail station. Metro utilized this program to create its 2040 Growth Concept that focused heavily on transit villages, main streets and mixed-use urban centers. The goals of the program were to (TOD 2008):

- Create new market comparables for higher density buildings near transit and urban centers.
- Cultivate developers with expertise in higher density mixed-use buildings in suburban settings.
- Increase acceptance of urban style buildings through high quality design.
- Carry out placemaking and contribute to local identity

As a result of the TOD Program, six projects, ranging from small to large, have been completed. The six projects and short descriptions of each are outlined in Table 2.1.

Table 2.1: Summary Table of Portland TOD

Project Name	Location(city)	Description	Completion Date	Size	Cost
The Merrick	Portland	• 6 stories • 185 apartments • 15,000 sq. ft of retail • 206 structured parking spaces	2005	0.9 acres	$24 million
Nexus	Hillsboro	• 422 market rate apartments • 7,100 sq. ft of retail	2008	10.4 acres	$50 million
Russellville Commons	Portland	• 576 apartments (market and senior units) • 6,600 sq. ft of retail • 13,600 sq. ft of commercial space	2002	10.1 acres	$73 million
Pacific University	Portland	• 5-stories • Classrooms, health and physical therapy clinics • Ground floor retail	2007	0.88 acres	$30 million
North Main Village	Milwaukie	• 64 apartments • 33 condos, flats, and townhomes • 8,000 sq. ft of retail	2006	1.90 acres	$14 million
The Rocket	Portland	• 16,037 sq. ft of commercial space	2007	0.09 acres	$4.1 million

2.5.4 Curitiba, Brazil

Curitiba is the capital of Paraná, one of Brazil's most southern states. City planning began nearly three centuries ago when city leaders first established building regulations such as limiting the number of trees that could be cut and requiring that homes have roofs made of tile, not wood. During the second half of the nineteenth century, Curitiba's population tripled due in part to immigrants from Japan, Lebanon and Syria. Many of Curitiba's sister cities experienced high unemployment rates, impoverished conditions, and congestion. However, in 1964, the city's mayor had a different vision. Mayor Jaime Lerner, an architect and planner turned Curitiba into a metropolitan center with a preference for public transportation over the automobile. His proposal introduced plans to "minimize urban sprawl, reduce downtown traffic, preserve Curitiba's historic district, and provide easily acceptable and affordable public transit." (Parsons Brinckerhoff Quade & Douglas 1996) In 1968, Lerner's proposal was adopted and became known as the Curitiba Master Plan.

From 1950 and 1990, Curitiba experienced high rates of growth going from 300,000 residents to 2.1 million. Once an agricultural center, Curitiba became an "industrial and commercial powerhouse." To accommodate this growth, Curitiba made the decision to plan for the mobility of people rather than cars, giving both pedestrians and mass transit priority over automobiles in highly congested corridors. Between 1974 and 1995, the city's accessibility network developed dramatically. Today, it includes high-capacity buses operating on dedicated transitways, express bus service, orbital routes that connect busways, and over 100 feeder lines that run between low-density neighborhoods and trunkline services. The network passes through 13 municipalities carrying 2.4 million passengers per day with 34 terminals over 385 lines. Many attribute the success of the system to its corridor policies. A Parsons Brinckerhoff' study also

attributes Curitiba's TOD success to officials' willingness to experiment and take risks and their desire to get people moving and get things done quickly and cheaply. (Parsons Brinckerhoff Quade & Douglas 1996) From an urban management perspective, other planning agencies would benefit greatly from Curitiba's corridor policies. These policies are:

- Transit corridors zoned for mixed-use residential and office development to guarantee that buildings both produce and attract trips
- Density bonuses that encourage retail shops and restaurants on the first two floors of all buildings fronting on the transitways
- Areas outside the transit corridors zoned for residential neighborhoods
- Large-scale shopping centers only allowed in transit corridors
- Public housing for low-income families built along the transitways
- In downtown, a restricted parking supply with a pedestrian environment emphasized

One common theme for each of the case studies was an effort to define a set of goals and a TOD vision. Walkability, increased density, more open space, private funding support, job creation, and intense community involvement were all a part of a vision or goal and became an essential part of the planning in each of the case studies. Having a distinct set of goals in mind prior to a projects' development simplifies the process of evaluating the impact a project has after its development.

2.6 TOD Impacts

TOD has the potential to have significant impacts in nearby neighborhoods. It can, as stated above, create more liveable, walkable and bikeable neighborhoods, increase transit ridership and decrease automobile congestion, create mixed-use

communities where residents have different housing choices and can walk to places like the grocery and movie store, generate revenues and provide a community where residents enjoy living.

As stated previously, because a universal definition for TOD does not exist, its successes are difficult to measure. However, two metrics that are often used to gauge TOD success are transit ridership and property values. Research to date shows that TODs can increase ridership from 5 to 6 times that of ridership in similar developments not centered on transit. (Knight and Trygg 1978) Knowing the effects of TOD on transit ridership helps to steer public policy changes. In a 1992 survey of residents living near BART rail stations, 32% responded “yes” when asked if they take transit to work compared to the regional average of only 5%. (Webber 1976) Along the 4-mile Rosslyn-Ballston corridor in northern Virginia, 39% take transit to work, three times the Arlington County average. (Grass 2001)Research supports the concept that residents who live within ½ mile proximity to rail stations are more likely to use transit.TOD and its effect on property values will be discussed in the next section.

2. 7 TOD and Property Values

Dating back to the mid 19th century, researchers worldwide have attempted to find the correlation between transit and its effect on housing property values. In the mid-1800’s, London’s Royal Commission on Metropolis Railway Termini conducted a door-to-door survey to determine the impact that London’s rail lines had on rent premiums in the poor working districts of the city. The survey determined that weekly and monthly rents rose from 10% to 25% within the district based on their proximity to rail stations. (John A. Kilpatrick 2007) Although the London study suggested an increase in monthly rents, more recent studies have found mixed results. This review of relevant research

will focus on studies that have evaluated the impacts of rail (heavy and light) on residential and commercial property values in several U.S. cities.

2.7.1 San Francisco, California

San Francisco's BART (Bay Area Rapid Transit) system is the most studied and documented transit system in the United States. However, many researchers argue that most BART studies were carried out too soon after its inception, too early to produce reliable results. In the 1978 BART Impact Study, just five years after its opening, researchers found that BART played a modest role in shaping city growth and development patterns. (Bernick, Hall et al. 1993) It had improved accessibility and induced policies like incentive zoning and redevelopment financing, but it had not created new growth. Instead, it had redistributed growth that authors determined would have taken place without the presence of rail. BART's impacts in the late 70s were also more local than regional. Downtown San Francisco's office construction was attributed to BART, but not without the help of a redevelopment authority formed in the same year as BART that encouraged development in that downtown market. (Cervero and Landis 1998) In a 1992 study on transit-based housing in the Bay area, Cervero found that residents were most commonly young professionals earning middle-class wages. Focusing on multi-family housing, Cervero suggested that there exists a rent premium for multi-unit projects that form "benefit assessment districts." Therefore, these districts could be used to help finance rail systems. (Cervero 1984)

To revisit BART's impact on transit-based development and economic growth trends, Cervero and Landis conducted a follow-up to the 1978 BART Impact Study. According to the authors, BART was expected to strengthen the Bay Area's urban centers and guide suburban growth that would lead to minicommunities around its

suburban rail stations. (Cervero and Landis 1998)Their report, called BART at 20, found the system to have had modest impacts on land use and urban development in San Francisco. Cervero and Landis made note that BART affected land uses only when supportive conditions such as zoning, community support and market demand were present. The BART at 20 study did compare residential and commercial property values near rail stations, but found that neither was statistically significant. (Cervero and Landis 1998)

2.7.2 Buffalo, New York

In a 2006 study on property values around light rail transit (LRT) in Buffalo, New York, the authors used a hedonic pricing model to assess the impact of proximity to light rail stations on residential property values. Hedonic regressions are regressions of rent or house value against characteristics of the unit that determine that rent or value. (Malpezzi 2002) With a declining population and increasing ridership, research found that for homes located within a half mile of fourteen rail stations, every foot closer to the station increased average property values by $2.31. Using a hedonic model allowed researchers to incorporate other control variables such as: the number of bathrooms, the size of the parcel and location on the East or West side of Buffalo. As a result, it was suggested that these independent variables were more telling of property values than proximity to the station. Similar to past research, the authors determined that proximity effects differ between high and low income areas. The Buffalo study also conducted a straight-line distance and network distance analysis and found that the network model was more statistically significant, but the effects were greater with the straight-line distance model. This suggested that proximity to rail stations is an added locational advantage when compared to physical walking distance to the station. Adversely, the

Buffalo study concluded that proximity effects are positive in high income station areas and negative in low income areas, the exact opposite of Nelson's 1992 study of Atlanta's MARTA (Metropolitan Atlanta Rapid Transit Authority) which will be discussed in its entirety later in the literature review. This might suggest that LRT and heavy rail have different effects on property values and proximity to stations. (Hess and Almeida 2006)

2.7.3 Portland, Oregon

In Portland, Oregon, where no heavy rail system exists (only light rail), the Portland State University Center for Urban Studies took a GIS approach to determine the impacts its light rail system had on single family home values. Using the distance to rail stations as a proxy for accessibility and distance to the line itself as a proxy for nuisance effects, the authors suggested that previous studies using hedonic pricing models may have reached contradictory results because nuisance effects differ with different types of rail or other local characteristics. Considering proximity to rail to have both negative and positive effects (regardless of neighborhood income) was unique to the Portland study. Authors found that the positive effect (accessibility) outweighed the negative effect (nuisance), implying a decreasing price gradient as the distance from the LRT stations increase. (Parsons Brinckerhoff Quade & Douglas 1996) The authors concluded that without controlling for the nuisance effect of the distance to the rail line, estimated coefficients on distance from stations appear to be biased and underestimate the accessibility effect. Researchers who used hedonic price models would argue that they controlled for other variables in their model that focused on housing characteristics and that proximity should be a single variable. (Chen, Rufolo et al. 1997)

2.7.4 Miami, Florida

The city of Miami and its automobile- oriented character are very similar to that of Atlanta. The Miami Metrorail began its operations in the mid-1980s during a time when Miami saw an exponential spike in population growth but a decentralized growth pattern. Metrorail had underperformed its ridership expectations, so unlike cities such as Washington, D.C. and San Francisco, Miami residents were not switching to transit. According to Galtzaff and Smith, “rail transit has had its greatest impact on central business district development decisions…” Because Miami did not have this “booming” metropolitan center, the authors saw fit to examine Metrorail's effects before and after the announcement of the system. Galtzaff and Smith found weak evidence in support of change to residential values after the announcement of the Metrorail system. Eight stations were chosen for the study. (Gatzlaff and Smith 1993) The repeat-sales method used for data manipulation assumed the eight stations selected were a representative sample of the entire county. According to Ryan, “when study areas are more focused around a facility, the results tend to show the expected negative correlation between property values and distance to the transportation facility.” (Ryan 1999)

2.7.5 Washington, D.C.

In Grass’ 2001 study of the relationship between public investment in METRO and property values in Washington, DC, the author took a more desirable approach by selecting time points before and after the start of METRO operations. Five stations impacted by METRO were selected. For each of these, a control station was also selected. The control stations were not located near an active or proposed METRO station. (Grass 2001)The neighborhoods chosen were considered to be economically

stable and experienced few negative effects from METRO. The study failed to express how this economic stability was measured and how the “negative effects” were calculated. Similar to previous studies, Grass used a hedonic price equation to conclude that the average property value increased by 19 percent in the impact areas relative to the control areas. However, the study was limited to residential property values which do not account for all the types of development that occur around transit stations. (Cervero 1994)

2.7.6 Dallas, Texas

No studies have specifically focused on TOD and its potential fiscal impacts in Dallas, until a 2007 publication for the Dallas Area Rapid Transit (DART) agency. Authors reported a 50 percent increase in estimated values of TOD projects between the years 2005 and 2007. They attribute this increase to the tremendous growth of TOD activity in the North Texas Region. Like Cervero and Landis, the authors agree that without local support of such development, TOD development is unlikely. The DART study also found that existing and planned TOD projects near its stations would eventually provide over $46 million each year to area schools, $23 million to member cities, and millions to other local taxing entities. Although these numbers sound promising, the authors were not able to provide time lines on these returns because their calculations were based on annual estimates at buildout. (Kilpatrick, Throupe et al. 2007)

2.7.7 Atlanta, Georgia

To date, not many studies have evaluated the impact that MARTA stations have had on surrounding property values. In a 1992 study of MARTA's East Line, Nelson evaluated the variation in detached single-family residential property prices with respect to transit station proximity. (Nelson 1992) Unfortunately, only three rail stations were within the study corridor and therefore not representative of the entire system. As a follow-up to his 1992 study, Nelson focused on the same East line corridor, but this time split the corridor into north and south subareas. The south corridor was predominantly minority and had a lower median income. (Nelson, Sanchez et al. 1997) The north subarea was predominantly white with less than 10 percent minority population and a higher income. For the south area, Nelson reported the farther the home was from the elevated rail station, the lower its value. Adversely, in the north subarea the farther away the home was from the station, the higher its value. The author's finding of a concave and convex relationship for price gradients in the south and north subareas, respectively, do support the conclusion that in higher income areas, transit stations may reduce the property values of nearby homes. (Nelson, Sanchez et al. 1997)

In a 1999 dissertation, Bowes took Nelson's findings another step by concluding that the effects of station proximity on property values vary greatly with neighborhood income level AND distance to the central business district (CBD). Using a hedonic price model and regression analysis, the author finds that for low income neighborhoods, close proximity to a rail station can greatly increase property values when the station is far from downtown. For higher income neighborhoods, a negative externality effect shifts the station access premium to contours farther from the station. Bowes states that at all levels of median income, the value of proximity to a rail station increases at distances farther from the CBD. Bowes also suggests that there is some evidence supporting

arguments that rail stations increase crime in neighborhoods, but acknowledges this occurs at the CBD where crime is already an issue. (Bowes 1999)

In 2001, Bowes and Ihlanfeldt focused more closely on the factors that account for the relationship between transit stations and residential property values. The authors supported the notion that station proximity may raise property values by reducing commute costs and attracting retail. However, negative externalities (crime) can counter these positive effects.(Bowes and Ihlanfeldt 2001) Like Bowes' 1999 dissertation, the study found that the relative importance of the positive and negative effects from proximity to rail stations varied with distance to the CBD and the median neighborhood income. The authors also suggested that beyond one-quarter mile from a station, negative direct effects are generally restricted to low-income neighborhoods, suggesting that for middle and high income neighborhoods, the commuting cost savings provided by transit exceed any costs caused by negative externalities. Based on a hedonic pricing model, the research reported that rail stations have a positive impact on retail activity farther from the CBD. (Bollinger and Ihlanfeldt 1997)

Rail stations and their effect on commercial property values have not been studied as much as residential property values. In a 1999 article, Nelson took a closer look at the role public policy plays in influencing commercial property markets near rail stations. The study area was Midtown, Atlanta, where three MARTA stations are located. The study period was from the 1980s to 1994, but only 30 commercial buildings were sold during this time. Using ordinary least squares regression to analyze the data, Nelson concluded that commercial property values were influenced positively by access to rail stations and policies that encouraged more intensive development around those stations. Several other employment centers are served by MARTA within the Atlanta metropolitan area such as Lenox Mall and Perimeter Mall. Including these areas in the

study would have provided a more effective analysis of the entire Atlanta area. (Nelson 1999)

Similarly, Bollinger and Ihlanfeldt's 1996 study found that MARTA had altered the composition of employment in favor of the public sector, but only in areas with high levels of commercial activity. Just two years prior, Cervero conducted a land markets impact study on Atlanta. Focusing on the Arts Center and Lindbergh rail stations, Cervero found that in station areas with joint-development activities, vacancy rates tended to be low, and that joint development was positively associated with project size and a healthy local real estate market. (Cervero 1994)

CHAPTER 3

DATA COLLECTION AND METHODOLOGY

The data used in this study came from a limited number of sources. Quantitative data in the form of GIS shapefiles were obtained from MARTA and from the Atlanta Regional Commission (ARC) website. Folders titled “Buildings”, “Maps”, “Parcels”, “Routes” and “Ridership” were provided by MARTA. Each folder contained GIS shapefiles pertaining to its title. Shapefiles obtained from ARC’s website were titled: “Community Facilities”, “Counties”, “Activity Centers” and “Local Highways”. Demographic information on each area within one-fourth, one-half and one mile of the stations was electronically provided by MARTA in tabular form. A series of meetings were held with MARTA officials augmented by phone and email communications. This interaction helped to determine which MARTA stations would be used for analysis. This selection process is further described later in the chapter.

3.1 Parcel Data

3.1.1 MARTA

Of the GIS data provided by MARTA, the Parcels, Maps and Routes folders were used. The Maps folder contained the shapefiles for the locations of the rail stations. The Routes folder contained the shapefile outlining MARTA’s rail line map. The Parcel folder and its contents are described in further detail below.

Parcel data for entire Fulton County, Georgia for the 2007 tax digest was provided in a GIS shapefile. Thirty-seven attributes were provided within the parcel shapefiles; however, only five were relevant to the analysis of the study which were the property class, the appraised value, the land value and tax digest year.

Property classes provided in the parcel data were defined as follows: “C” is commercial, “E” is properties exempt from property taxes, usually government owned, “H” is a historical property, “I” is industrial, and “R” is residential. Property values were separated by property classes to get a more in-depth picture of transit station proximity effects. The Appraised Value is the value of the home, which Fulton County determines annually as the amount the home is worth. The Land Value is the total land value which includes only the land the home is on and not the value of the home itself. The digest is the year (2007) in which the tax assessment was conducted.

Demographic statistics were generated by MARTA using the Environmental Systems Research Institute (ESRI) 2008 version software of Business Analyst Online. The tabular data included an Executive Summary, Demographic and Income Profile, Income-Employment Profile, Housing Profile, Retail MarketPlace Profile, and a Specialty Housing Profile for the stations of interest within one-fourth, one-half, and one mile distances from the station. ESRI forecasts were based on the U.S. Bureau of Census, 2000 Census of population and housing.

3.1.2 Atlanta Regional Commission

In order to provide local and state data on its website, the ARC works with local government municipalities. ARC obtains written approval from these entities to provide online access to such data. The data contained within ARC’s GIS database is updated annually.

The Community Facilities shapefile contained spatial locations of schools, fire and police stations, airports, hospitals, libraries, and colleges and universities. Utilizing this data in GIS allowed for a visual perspective of where community amenities are located around the stations of interest.

The Counties shapefile contained 29 counties within the Atlanta metropolitan region, which included the ARC's ten-county area and the surrounding counties.

The Activity Centers shapefile designated areas as Regional Centers, Town Centers and Station Communities. The attributes within these shapefiles located the places where major activities occur such as shopping, dining, and recreation.

The Local Highways shapefile consisted of the major highways located throughout the Atlanta metropolitan region. Major expressways and their onramps from the north, south, east and west bound approach were included.

3.1.3 Data Preparation

Shapefiles obtained from both MARTA and the ARC were already projected into the same coordinate system, NAD_1983_StatePlane_Georgia_West_FIPS_1002_Feet. Therefore, no projections were required for GIS analysis.

3.2 Methodology

To determine the effects that proximity to rail has on property values around the stations of interest, a two-part approach was used. First, GIS software was used to identify the parcels located within the chosen proximities from the stations. Identifying these parcels provided the necessary elements used in the second part of the approach. Second, Microsoft Excel manipulation techniques were used to determine the average property value in each property class previously described in the data preparation section. Because data was limited to only one instance of time (2007), the cross-sectional snapshot method used to determine property values is arguable. However, based on the data available, what was determined to be the most proficient methodology is outlined in this section.

3.2.1 Station Selection

As mentioned in the data collection section, the stations of interest were chosen after several meetings (in person, phone and email) with MARTA officials. The first criterion was that each station be located within the same county, namely Fulton County. Choosing stations within the same county made the data collection process manageable. Unfortunately, as previously mentioned, 30 percent of the Sandy Springs parcels were located in Dekalb County. Secondly, stations were chosen based on the amount of development surrounding the station and whether the development was planned or unplanned as described in Chapter One. One station was chosen because it had no recent development; this was used as the control station. The selection process resulted in five stations- four stations with planned and unplanned development and one station with little to no development in its immediate vicinity. Station profiles are

provided in the following section. The number indicated in parenthesis next to the station name is the year the station opened.

3.2.1.1 Ashby Station

The Ashby Station (1979) is located at 65 Joseph E. Lowery Boulevard, just west of the downtown area. Located less than a mile from several major universities, Ashby is convenient to the Atlanta University Center which includes Morehouse College, Clark-Atlanta University, Spelman College, and the Morehouse School of Medicine. In addition to rail, the Ashby station is served by three MARTA bus routes that provide access to the Atlanta University Center, the West End Mall and the Kennedy Center. There are 161 parking spaces available at the station for transit users.

The area just west of the station is the Washington Park Historic District, a historically black neighborhood with many historic residential, commercial and community landmark buildings. The Washington Park District has many roots in the history of racial segregation in Atlanta, as Ashby Street functioned as a “color line” for the city prior to the year 1919. The district is characterized by one and two story buildings built between 1915 and 1958, similar in architecture to English and Georgian cottages. Although some of its buildings are no longer in place, at the center of the district is Washington Park, the first recreational park in Atlanta made available to Blacks. Today, the 25-acre park includes a tennis center, a library, and the Washington Park Natatorium. (Vine City LCI 2009)

Figure 3.1: Ashby Station and Historic Westside Village

In 2008, HJ Russell New Urban Development constructed The Historic Westside Village. The Village consists of 150 one-and-two bedroom luxury condos located adjacent to the Ashby station. One-bedroom units start at $120,000 for purchase and $850 for lease. Publix supermarket, which opened one year prior to the completion of the condos, is also on site. This development was not planned and MARTA had no involvement with its occurrence. The condos are pictured above in Figure 3.1.

3.2.1.2 Vine City Station

The Vine City Station (1979) is located at 502 Rhodes Street, at the intersection of Rhodes Street and Northside Drive (U.S. 41). Located just adjacent to the Georgia Dome, the Georgia World Congress Center, Philips Arena, and the CNN Center, Vine City station serves as a major transit hub for patrons attending events at these venues. The station is also in close proximity to the Atlanta University Center and is just one station east from the Ashby MARTA Station. In addition to rail, the Vine City station is served by three MARTA bus routes that provide access to the Atlanta University Center, the West End Mall and Mosley Park. There are 27 parking spaces available at the station for transit users.

In the early 2000s, the Vine City area was identified as a Livable Centers Initiative (LCI) study area. The LCI is a program offered by the Atlanta Regional Commission to "encourage local jurisdictions to plan and implement strategies that link transportation improvements with land use development strategies to create sustainable, livable communities consistent with regional development policies." (Vine City LCI 2009) The primary goals of the program are to:

1. Encourage a diversity of mixed-income residential neighborhoods, employment, shopping and recreation choices at the activity center, town center, and corridor level
2. Provide access to a range of travel modes including transit, roadways, walking and biking to enable access to all uses within the study area
3. Develop an outreach process that promotes the involvement of all stakeholders (ARC)

The Vine City study area includes 50 blocks and 239 acres surrounding the station, in which, the Ashby Station (including Washington Park) falls within as well. The area is often referred to as the Vine City/Ashby neighborhood. Completed in May 2009, the LCI study takes an in-depth look at the demographic and socioeconomic profile, land use, markets and housing, urban design and historic resources, transportation, environment and open space, and infrastructure and facilities throughout the area. Many recommendations for the area resulted from the LCI study in all of the facets mentioned above. To maintain relevance to this particular research, it is most important to discuss the transportation and transit recommendations.

The area immediately surrounding the Vine City station, unlike the Ashby Station, has seen no recent development. According to the 2004 Vine City Redevelopment Plan, Vine City has seen a loss of population (more than half), property disinvestment and

general economic decline over the past 30 years. The number of vacant lots today are attributed to the redevelopment of the Magnolia Park housing unit. The goal of the 2004 Plan was to identify the current needs of the area and develop plans for improvement and growth. Several projects were named; however, very few have occurred. In response, the LCI study restated the projects to regain the City's attention and propel these projects to the development stage. In restating the projects, the LCI study focused on transit-centered development to be accessible by users of all ages and socioeconomic status. With a goal to preserve the historic fabric of the Vine City area, the LCI recommended TOD that would reflect the 2004 Redevelopment Plan and concentrate the highest density areas along Northside Drive. TOD recommendations directly surrounding the Vine City station are more commercial and retail/office space with pedestrian-friendly streetscapes with new sidewalks and trees throughout to help beautify the area. (URBAN COLLAGE 2004)

With a recommendation for an increase of density and mixed-use development adjacent to both Ashby and Vine City station, the study supports land use and zoning changes to support the vision of the area. Being chosen for a LCI study increases the opportunity for further growth and redevelopment in the Vine City/Ashby neighborhood. The study identifies both immediate and future action plans and charges city officials, NPUs (Neighborhood Planning Unit), local businesses, residents, and other organizations to remain diligent to ensure that the vision for the Vine City/Ashby neighborhood is implemented.

The Vine City/Ashby Station areas also fall within the City of Atlanta's Special Public Interest (SPI) district 11. SPI districts overlay existing zoning and generally allow for and encourage higher density development around existing infrastructure improvements, such as MARTA rail stations. SPI districts also are used to implement tailored zoning regulations to protect the historic fabrics of neighborhoods such as this. SPI-11 was

created with the specific intent of preserving and protecting the existing single-family neighborhoods surrounding both Vine City and Ashby MARTA stations while encouraging residential and commercial development to a promising, yet historically underserved area.

3.2.1.3 West End Station

The West End Station (1982) is located at 680 Lee Street at the intersection of Lee Street and Oglethorpe Avenue. Adjacent to the station is the West End Shopping District that includes the Mall at West End, a U.S. Post Office, and several large retail-chain stores. Less than one-mile south from the Atlanta University Center , the West End serves as a meeting place for many college students to shop, mail packages, and dine. The rail station is served by 7 bus routes that provide access to Wren's Nest (the oldest Atlanta house museum), Atlanta Metropolitan College, Atlanta Technical College, and the Cascade neighborhood. In addition to bike racks, there are 547 parking spaces available at the station for transit users.

Like the Vine City/Ashby neighborhood, the West End is an historical Atlanta area. Its development dates back to the 1830's, where it was formally called White Hall Inn. It was renamed West End after Shakespeare's famous London theatre in 1833. Once one of the most desirable and prosperous suburbs of Atlanta, the West End fell victim to drugs and poverty in the 1970s. In an effort to revive the community, the ARC named the West End neighborhood a LCI study area, with the study released in 2001. The purpose of the study was to formulate strategies to develop the West End to its highest potential. The goal was to "increase the number of people living, working, visiting and playing within the West End; specifically in the medium density mixed use nodes

located within walking distance of the West End MARTA station." This goal is clearly in support of TOD.

The study area includes the West End and Adair Park neighborhoods, approximately 0.6 square miles. Similar to the Vine City area, the West End neighborhood saw a decline in its population after the Harris Homes housing projects were demolished in preparation for the 1996 Olympics. However, more recent trends suggest residents of greater diversity and higher incomes are moving into the neighborhood. From the LCI study, recommendations in the areas of land use, urban design, traffic and transportation, and economic development were included. Recommendations most closely related to TOD included pedestrian bridges, SPI zoning overlays (like the Vine City/Ashby neighborhood), Class A office space at the north end of the transit station, a West End streetcar, improved sidewalks, street beatification and redevelopment of the old Sears building adjacent to the Mall.

Figure 3.2: West End Sky Lofts

The LCI study had a tremendous impact. In 2003, the old Sears building was torn down and by 2006, construction of the Sky Lofts was complete. The community has 207

units of one and two bedroom condominiums and townhomes. Prices range from $120,000 to $278,000. Several retail shops including a hair salon, nail salon and cleaners are on the ground floor. The building, the largest in the neighborhood, demonstrates the revitalization efforts currently underway. MARTA was involved in the planning stages and played a role in its inception. (West End LCI 2001)

In addition to Sky Lofts, the West End is experiencing redevelopment in conjunction with the Beltline project. The first walking trail, which stretches 2.3 miles and connects to Westview Cemetery, Joseph Brown Middle School and the Kroger Village Shopping Center, was cause for celebration in the West End community when it opened in late 2008. (Connected 2008)

3.2.1.4 Sandy Springs Station

The Sandy Springs Station (2000) is located at 1101 Mount Vernon Highway at the intersection of Abernathy Road/Perimeter Center West and Mt. Vernon Highway. Adjacent to the station is the Perimeter Point Shopping Center, Regal 10 Cinemas, and several large chain hotels. In addition to rail, the station is served by three bus routes with connections to the Perimeter Medical Center, the Dunwoody Village, and the Chamblee area. Perimeter Mall, the largest mall in the Atlanta area, is located one rail stop south of the Sandy Springs Station. Used heavily as a commuter station for nearby residents, the Sandy Springs station has 1,170 daily and long-term parking spots that carry a charge of $4 per day.

In 2001, Sandy Springs was also the focus of an LCI study. The area had already been experiencing growth and improvement as a result of being located inside the Perimeter Community Improvement District (PCID). The PCID is a self-taxing district that uses property taxes to help accelerate transportation and infrastructure improvements

and leverage state and federal funds to relieve congestion and improve pedestrian facilities. Unlike the Vine City/ Ashby and West End neighborhoods, the area surrounding the Sandy Springs Station has seen population growth that has doubled in the past 20 years. The study area for the LCI study included the Sandy Springs Overlay District of the Fulton County Zoning Resolution, characterized by low-density, auto-oriented commercial corridors, and many affluent households. With very little vacant land, the housing stock is considerably young with the oldest homes built in the 60s and 70s. Although the residential market is attractive, the area struggles with its aging retail centers and inability to compete with neighboring activity centers such as the Perimeter Center. The goal of the LCI study was to develop a plan to relieve congestion, improve streetscapes on major corridors, increase transit and mixed-use activity centers, and increase multi-family housing around MARTA stations. In a 2005 update of the 2001 LCI study, in an effort to increase multi-family housing around the station, the Sandy Springs Overlay Zoning District was revised. This included: redrawing of district boundaries, providing density bonus incentives, using open space ratios, and imposing maximum parking requirements. Because the Sandy Springs area has little vacant land and fairly new development, its need for “revitalization” is minimal in comparison to the Vine City/Ashby and West End areas. There has been no planned development near the Sandy Springs Station. (Sandy Springs LCI 2001)

3.2.1.5 Lindbergh Station

The Lindbergh Station (1984) is located at 2424 Piedmont Road nestled at the center point between Midtown and Buckhead. Adjacent to several retail centers and residential units, Lindbergh Center is the home to MARTA headquarters, AT&T and High Tech Institute. In addition to rail, Lindbergh is served by 9 bus routes that provide access

to Emory University, Chastain Park, Buford Highway, and the Briarcliff neighborhood. There are three large parking decks on-site that provide a total of 2,907 daily parking spaces and 544 long-term spaces. The station also has Zipcar and RideStore services available.

The Lindbergh Development is often considered Atlanta's first transit-oriented mixed-use development project. It was also the first development selected to pilot the Federal Transit Administration's 1997 Policy on Transit Joint Development. (Dumbaugh 2004) In 1997, MARTA announced its plan to develop the 47-acre site surrounding the Lindbergh Station into a TOD. The role that MARTA played in this development is very significant in that it was the first time a transit agency in the U.S. took the primary role in developing the properties surrounding a transit station. (Dumbaugh 2004) Prior to development, the area consisted of low-density strip mall centers and an abundance of underused park-and-ride lots. After much land assembly and financial challenges, the final plan for the site was released and included 2.5 million square feet of commercial office space, 300,000 square feet of retail, and approximately 1,300 residential units. Phase I of the project was complete in 2006 and to date includes 900,000 square feet of Class A office space, 364 apartments, 352 condominiums, and over 208,000 square feet of retail. The Uptown Apartments, a premier residential attraction in the Center, was 95% leased immediately after its opening. Other high-end residential opportunities include the EON Condominiums and the Vista Lindbergh Apartments.

Figure 3.3: Lindbergh Station South End Office Complex

Retail attractions located within a one-half mile distance of the station are plentiful. Large chains such as Home Depot, Target, Office Depot, and Best Buy and a host of restaurants like Taco Mac, Five Guys, Tin Drum, and Chili's Grill and Bar are also in close proximity to the station.

Currently, MARTA is exploring opportunities for further development around Lindbergh Station. Expansion ideas include a 20-story apartment tower, a 150,000 square foot office tower, and a 175-plus room hotel.

Figure 3.4 displays the stations along with the LCI study boundaries surrounding each station as discussed above.

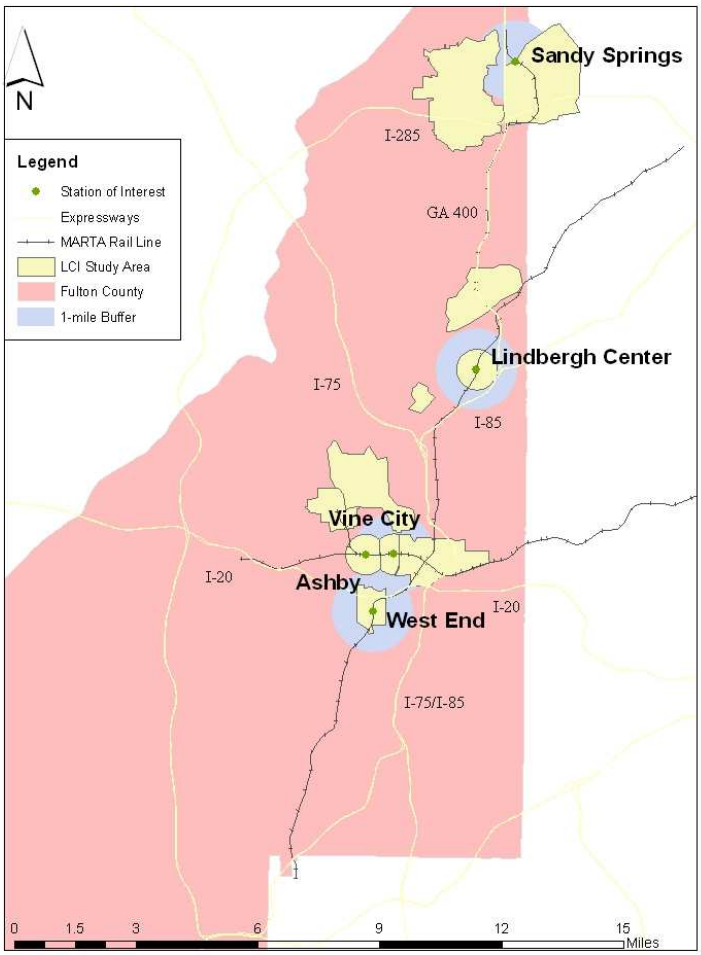

Figure 3.4: Station Activity Centers

3.2.2 Proximity Selection

Distance rings around the stations of interest were chosen based on a combination of previous research on proximity to rail stations and property values and data availability. Rings of zero to one-quarter mile, one-quarter mile to one-half mile, and one-half mile to one mile were selected. Creating spatial buffers in GIS software is easily implemented, therefore this method was applied. One limitation on the data as it relates to proximity was that 30 percent of the Sandy Springs station parcels were located in Dekalb County, rather than Fulton County. Because all parcel data was made available

by MARTA by way of Fulton County, the Dekalb County parcels were not included in the analysis process.

Figure 3.5 below displays the stations of interest, the one-mile distance ring, and the Fulton County boundary. The area surrounding the Sandy Springs station not within Fulton County is clearly displayed.

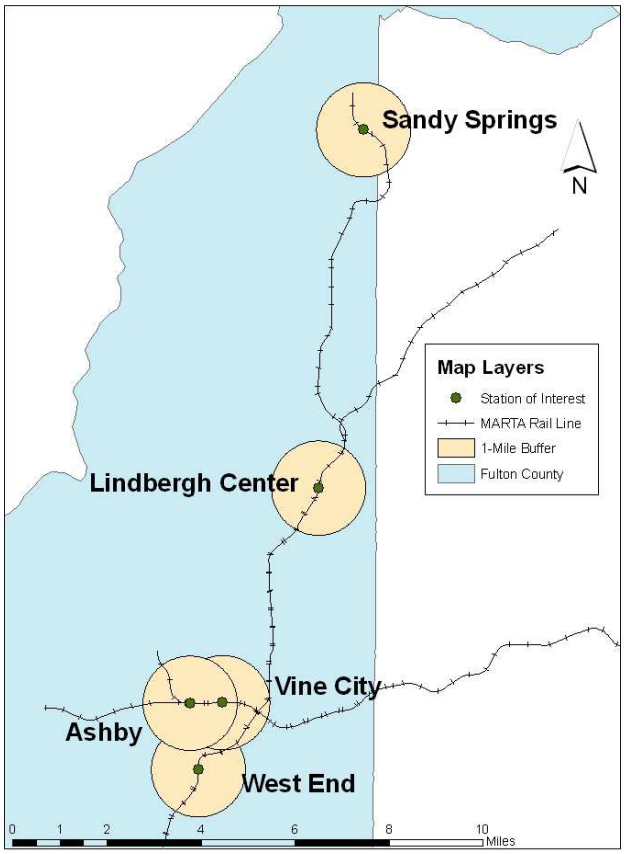

Figure 3.5: Station Buffer Map 1

3.2.3 GIS Analysis

The parcel shapefile and the MARTA station shapefile were added to the dataset from the folder in which the data had been saved. As stated earlier, all shapefiles were projected into Georgia West State Plane-Feet, so no projections were necessary. In order to designate the stations of interest, a tool known as a Query Builder in GIS was

used. The query was defined as follows: “"STATION" = 'Lindbergh Center' OR "STATION" = 'Sandy Springs' OR "STATION" = 'Vine City' OR "STATION" = 'West End' OR "STATION" = 'Ashby'" This code gave GIS the instruction to only display the stations indicated since they were the only ones to be used for analysis purposes.

Next, buffers were created around each of the five stations. Creating buffers in GIS is an ‘Analysis: Proximity: Buffer’ tool within the software. Elements that were needed to create the buffers were the input features, output feature class and distance. The input features are the elements in which the buffers will be drawn around, the output feature class is the directory location each buffer will be saved to, and the distance (which has more than ten options ranging from feet to decimeters) are the units to be used for the buffer. In the case of this research, the input features were the five stations of interest, the buffers were saved to the C:/ drive and a unit of feet was used. Initial buffers for each station at a distance of 1,320 feet (one-fourth mile), 2,460 feet (one-half mile) and 5,280 feet (one-mile) were then created. Next, the buffers had to be manipulated so that the one-half mile buffer did not include the one-fourth mile buffer and so that the one-mile buffer did not include the one-fourth or the one-half mile buffers. Separating the buffers was necessary for more accurate analysis and so that no overlapping occurred within a station area during the parcel analysis process.

To do the separation, ArcGIS has an erase feature which is an ‘Analysis: Overlay: Erase’ tool. Elements that are necessary to perform an erase are: input features, erase features and output feature class. The erase features are those that will be removed from the input features. In this case, the input features were the one-half mile and one-mile buffers created in the previous step. This step was a two-part process, being that the one-mile buffer had to have features erased as well as the one-half mile buffer. Figure 3.6 shows the distinction between each of the final buffers.

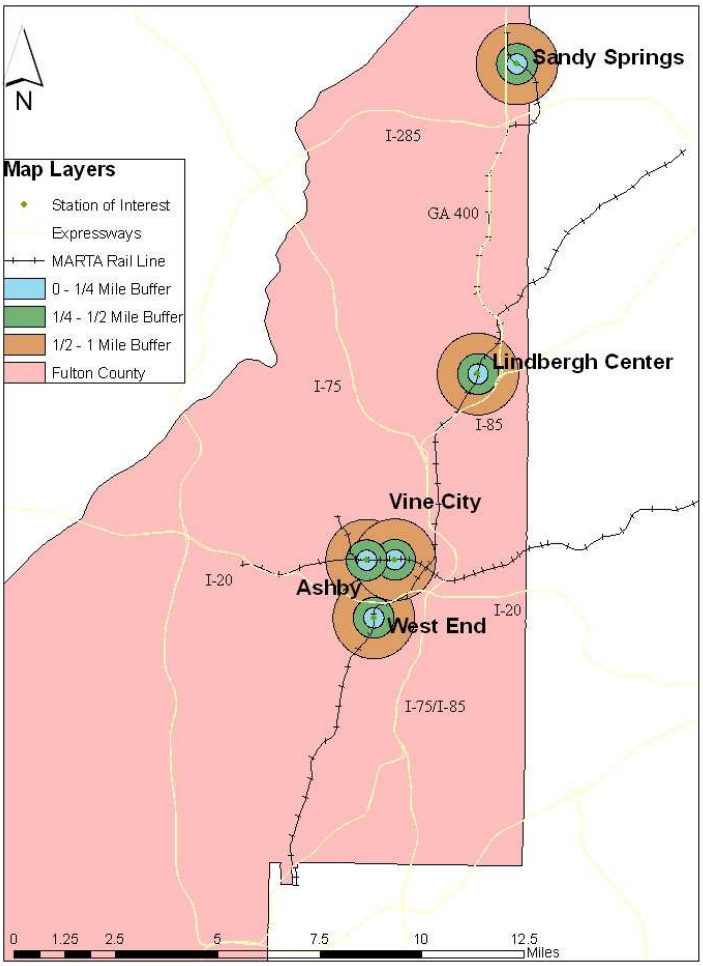

Figure 3.6: Station Buffer Map 2

The next task was to intersect the buffers with the parcel shapefiles. The intersection of these shapefiles would determine the number of parcels in each buffer around the stations of interest. ArcGIS has an 'Analysis: Overlay: Intersect' tool. Elements that are necessary to perform the intersect are input features and the output feature class. The final buffers and the parcel layer were the input features. Table 3.1 below shows the number of parcels within each buffer surrounding the stations found as a result of using the intersect feature. Table 3.2 shows the property breakdown by class as the percent total.

Table 3.1: Station Parcels

	Number of Parcels		
Station	1/4-mile	1/2-mile	1-mile
Ashby	537	1,647	5,193
Lindbergh	476	1,573	10,086
Sandy Springs	302	1,595	2,828
Vine City	469	1,723	7,185
West End	232	1,084	4,669

Table 3.2: Station Parcels: % Total

	C	E	H	I	R
Ashby	11%	13%	0%	1%	76%
Lindbergh	10%	2%	0%	1%	87%
Sandy Springs	11%	3%	0%	0%	86%
Vine City	15%	11%	1%	3%	70%
West End	12%	8%	0%	3%	76%

Property Classes: C – commercial E- exempt H- Historic I – industrial R – residential

The final step in ArcGIS was to export each intersect layer into Microsoft Excel. There were a total of three layers to export, the one-fourth, one-half mile and one-mile buffer/parcel intersects. Each layer contained the parcel data for all five stations. To export to Excel, the attribute table within the layer's option menu was opened. The export tab was selected and the layer was exported as a text file rather than a database file to have compatibility with Microsoft Office. Once the export was complete, the data could now be imported to Microsoft Excel. Excel was the most desirable method for manipulating tabulated data.

3.2.4 Microsoft Excel

To open the text file in the correct format for Excel manipulation, The Text Import Wizard had to determine the type of text to be opened. 'Delimited' was the chosen text type and 'comma' was the delimiter used to separate the text fields. The result was data

consisting of thirty-eight columns and varying row lengths for each buffer distance. Next, the data was sorted based on the station name and separate tabs were made for each station where its respective data was copied and pasted. From here, the data was sorted based on property class so that all residential, commercial, industrial, historical and exempt properties were distinguishable.

Not all thirty-eight columns were needed for analysis, so several were hidden to minimize confusion and maintain order during the analysis process. The columns of concentration were the total appraised values (TOT_APPR) and the land appraised values (LAND_APPR). To determine the average values for these columns, the Excel 'AVERAGEIF' function was used. This tool allows the user to input the range and criteria on the values to be used to calculate the average. The criteria for both columns was ">0" because values of zero would skew the average calculation. The AVERAGEIF was calculated for each station's one-fourth mile, one-half mile and one-mile buffer for each property class.

CHAPTER 4

DISCUSSION AND RESULTS

The analysis conducted to determine the average property value around the five MARTA stations of interest provided mixed findings. Some stations showed consistently increasing or decreasing trends in the property values, while other trends were inconsistent. It was determined that the most appropriate way to present the results was station-by-station, first displaying the average appraised value, followed by the average land appraised value. Although some trends were found, the limitations of the data remain and these trends again are only a snapshot of the possible findings relevant to the data available. The results are first displayed and highlighted and will be discussed in further detail later in the chapter.

4.1 Property Appraisal Values

4.1.1 Ashby Station

Table 4.1: Ashby Station Average Appraised Values

	Average Appraised Value		
	1/4 mile	1/2 mile	1 mile
C	$713,760	$321,902	$598,305
E	$687,595	$961,323	$2,206,185
I	N/A	N/A	$214,111
R	$120,090	$111,231	$106,158

Property Classes: C – commercial E- exempt I – industrial R - residential

The Ashby Station had clear-cut results that showed either a continuous increase or decrease in its property values. As displayed in Table 4.1, the average commercial property values decreased between one-fourth and one-half mile distances from the station, but increased between the one-half and one-mile buffer distance. The exempt properties showed an increase in value as the distance from the station increased.

There were no industrial properties within one-fourth or one-half mile distances from the Ashby Station. Lastly, the residential properties showed a decrease in value as the distance from the station increased.

4.1.2 Lindbergh Station

Table 4.2: Lindbergh Station Average Appraised Values

	Average Appraised Value		
	1/4 mile	1/2 mile	1 mile
C	$2,335,668	$7,502,618	$1,357,624
E	$1,852,798	$1,597,818	$969,583
I	$457,681	$629,940	$715,370
R	$133,113	$243,422	$267,959

Property Classes: C – commercial E- exempt I – industrial R - residential

Lindbergh Station, the most notable TOD of the five stations, showed more consistent trends within the average property values. The commercial properties increased tremendously between the one-fourth mile and one-half mile buffers and then decreased by a surmountable amount between the one-half mile and one-mile distances. From here, the consistency is seen. The exempt properties show a decrease in value as the distance to the station increases. The industrial property values increased steadily as the proximity to the station increased, and the residential property values increased as the distance from the station increased.

4.1.3 Sandy Springs Station

Table 4.3: Sandy Springs Station Average Appraised Values

	Average Appraised Value		
	1/4 mile	1/2 mile	1 mile
C	$11,311,502	$13,507,283	$8,434,222
E	$8,439,152	$1,444,430	$1,708,602
I	$700	N/A	N/A
R	$96,120	$239,930	$275,604

Property Classes: C – commercial E- exempt I – industrial R – residential'

The Sandy Springs Station had less consistency in its property value trends. For the commercial properties, there was an initial increase in value as the distance to the station increased however, the average value for commercial properties decreased significantly between the one-half mile and one-mile distances to the station. The exempt property values saw the opposite spiking trend and decreased dramatically between the one-fourth and one-half mile buffer distances and slightly increased from one-half mile to one-mile distance to the station. There was only one industrial property within the study area, so no trend was attainable. Interestingly, the residential property values within the study area around the Sandy Springs Station increased, with a majority of the increase occurring between the one-fourth and one-half mile buffers.

4.1.4 Vine City Station

Table 4.4: Vine City Station Average Appraised Values

	Average Appraised Value		
	1/4 mile	1/2 mile	1 mile
C	$24,876,128	$620,215	$3,022,993
E	$6,396,326	$5,149,809	$3,966,209
H	N/A	N/A	$708,370
I	N/A	$201,468	$475,004
R	$192,327	$160,700	$163,283

Property Classes: C – commercial E- exempt H- Historic I – industrial R - residential

The Vine City Station area, which is heavily commercial and was used as the control station because of its lack of surrounding development, did exhibit some trends in average property values. For its commercial properties, there was a tremendous decrease between the one-fourth and one-half mile buffer zones, and a substantial increase from the one-half to one-mile buffer. The exempt properties were found to decrease in value as the distance from the station increased. There were no historical records within one-half mile of the station, so no trends were detected. The industrial

properties more than doubled between the one-half and one-mile proximities. As for residential properties, the average value decreased from the one-fourth to one-half buffers and slightly increased from the one-half to the one-mile buffer distance zone.

4.1.5 West End Station

Table 4.5: West End Station Average Appraised Values

	Average Appraised Value		
	1/4 mile	1/2 mile	1 mile
C	N/A	$632,705	$441,690
E	N/A	$814,084	$1,048,445
H	N/A	N/A	$326,667
I	N/A	$414,663	$305,070
R	$261,874	$151,888	$132,192

Property Classes: C – commercial E- exempt H- Historic I – industrial R - residential

Unfortunately, the West End Station had several unreported values. The data provided suggests that there are no commercial, exempt, historic or industrial properties within one-fourth miles from the station. This is quite questionable and therefore, the findings reported are limited in their validity. Nevertheless, the suggested trends shown in Table 4.5 are noteworthy. The commercial property values decreased as distance from the station increased. This was true for the industrial and residential property values as well. In contrast, the average value for the exempt properties increased as the distance from the station increased.

4.2 Land Values

Table 4.6 through Table 4.10 display the results of the average land values from one-fourth to one-half one-mile distances from the stations of interest.

4.2.1 Ashby Station

Table 4.6: Ashby Station Average Land Values

	Average Land Value		
	1/4 mile	1/2 mile	1 mile
C	$259,036	$212,688	$248,798
E	$221,105	$405,884	$518,893
I	N/A	N/A	$407,337
R	$35,417	$34,199	$30,355

Property Classes: C – commercial E- exempt I – industrial R - residential

At Ashby, the commercial property values decreased from the one-fourth to one-mile buffer and increased between the one-half mile and one-mile buffer distances. As the distance from the station increased, the average land value for the exempt properties increased. Industrial properties were only found in the outer buffer zone so no trends were detectable. Lastly, the residential properties' average land value decreased as the distance from the station increased.

4.2.2 Lindbergh Station

Table 4.7: Lindbergh Station Average Land Values

	Average Land Value		
	1/4 mile	1/2 mile	1 mile
C	$2,331,180	$10,399,326	$2,503,992
E	$871,004	$1,159,100	$599,947
I	$261,956	$2,411,416	$1,242,121
R	$48,214	$92,316	$90,641

Property Classes: C – commercial E- exempt I – industrial R - residential

For each property class surrounding the Lindbergh Station, there was an increase in the average land value between the one-fourth and one-half mile buffers, and a decrease in value from the one-half to one-mile buffer.

4.2.3 Sandy Springs Station

Table 4.8: Sandy Springs Station Average Land Values

	Average Land Value		
	1/4 mile	1/2 mile	1 mile
C	$6,158,827	$7,192,910	$6,484,475
E	$1,208,783	$1,244,430	$1,048,622
I	$4,000	N/A	N/A
R	$30,535	$61,190	$87,206

Property Classes: C – commercial E- exempt I – industrial R - residential

At the Sandy Springs Station, the average commercial property land value increased from the one-fourth to the one-half mile buffer and decreased between the one-half and one-mile buffers. The exempt properties increases slightly from one-fourth to one-half mile buffers and decreased from the one-half to one-mile buffer. Industrial properties were only located within the one-fourth mile buffer, so no trend was attainable. The residential property average land values increased as the distance from the station increased.

4.2.4 Vine City Station

Table 4.9: Vine City Station Average Land Values

	Average Land Value		
	1/4 mile	1/2 mile	1 mile
C	$11,151,575	$411,222	$1,131,410
E	$585,451	$1,287,028	$1,063,438
H	N/A	N/A	$237,432
I	N/A	$429,531	$1,408,131
R	$53,018	$39,110	$45,028

Property Classes: C – commercial E- exempt H- Historic I – industrial R – residential

The Vine City Station's commercial property average land values decreased tremendously between the one-fourth and one-half mile buffer distances and nearly tripled between the one-half and one-mile proximities. There were no historical

properties within the one-half mile buffer. The industrial properties' value increased significantly between the one-half and one-mile buffers. As for residential properties, the average value decreased from the one-fourth to one-half buffers and increased from the one-half to the one-mile buffer distance zone.

4.2.5 West End Station

Table 4.10: West End Station Average Land Values

	Average Land Value		
	1/4 mile	1/2 mile	1 mile
C	N/A	$508,520	$185,930
E	N/A	$203,338	$338,356
H	N/A	N/A	$97,600
I	N/A	$282,759	$316,435
R	$69,398	$45,744	$42,463

Property Classes: C – commercial E- exempt H- Historic I – industrial R – residential

As previously stated, the West End Station had several unreported values. As for commercial properties, there was a decrease in the average land value between the one-half and one-mile buffer zones. Both the exempt properties and the industrial properties average land value increased from the one-half to one-mile buffer distances. In contrast, the residential properties average land value decreased as the distance from the station increased.

4.3 Discussion

One goal of this research was to evaluate the TOD characteristics of the stations of interest. For the remainder of this discussion, the stations will be discussed based on their adherence to TOD principles. The method for determining the order was both subjective and research-based. In the Methodology section, the station profiles provided information on LCI studies that were completed on each station. The section also highlighted some of the goals of those studies and to what extent those goals had been accomplished. Based on those findings, personal interaction at the stations and in their surrounding neighborhoods, and past research, the following ranking was determined with the greatest adherence to TOD principals:

1. Lindbergh Station
2. West End Station
3. Ashby Station
4. Sandy Springs Station
5. Vine City Station

Table 4.11: Percent Change: Ranked According to TOD Adherence

% Change: Appraised Value			% Change: Land Value		
	1/4 to 1/2 mile	1/2 to 1 mile		1/4 to 1/2 mile	1/2 to 1 mile
1. Lindbergh			1. Lindbergh		
C	221%	-82%	C	346%	-76%
R	83%	10%	R	91%	-2%
2. West End			2. West End		
C	N/A	-30%	C	N/A	-63%
R	-42%	-13%	R	-34%	-7%
3. Ashby			3. Ashby		
C	-55%	86%	C	-18%	17%
R	-7%	-5%	R	-3%	-11%
4. Sandy Springs			4. Sandy Springs		
C	19%	-38%	C	17%	-10%
R	150%	15%	R	100%	43%
5. Vine City			5. Vine City		
C	-98%	387%	C	-96%	175%
R	-16%	2%	R	-26%	15%

Table 4.11 above displays the percent changes as the distance from the station increases for the commercial and residential property classes. Because commercial values and residential values are most affected by market changes and typically respond to the state of the economy, it was most appropriate to only include them in this discussion. Table 4.12 below displays the percentages of the total parcels for the buffer zones for the commercial and residential property classes.

Table 4.12: Percent Total - Commercial and Residential Only

	% of Total Parcels					
	C			R		
	1/4	1/2	1	1/4	1/2	1
Lindbergh	1%	1%	8%	3%	12%	76%
West End	N/A	3%	11%	4%	15%	66%
Ashby	1%	2%	9%	6%	22%	60%
Sandy Springs	1%	2%	8%	3%	32%	53%
Vine City	0%	2%	15%	5%	15%	62%

The Lindbergh Station TOD is labeled Atlanta's first TOD appears first on the list, so how does its percent change in average appraised values and average land values fair as distance from the station increases? For commercial values, there was a 221% increase from the one-fourth to one-mile distance. This is best explained by the number of large retail chains such as Home Depot and Target that are not directly next to the station compared to the smaller chains such as Taco Mac and Five Guys that are on the station grounds. The 82% decrease is best explained by the fact that there are less large chains past the one-half mile marker and an increased number of small retail stores. The average land value percent changes for the commercial properties were consistent with the appraised values. As for the residential properties, the 83% increase is evidence that the townhomes and condominiums located on-site are valued considerably lower than the adjacent residential neighborhood home values. This trend continues within the one-half to one-mile proximities; however, these values are much closer in value because they are contained within the same neighborhood. Again, land values followed a similar trend as the appraised values for the residential properties surrounding Lindbergh.

The West End station was ranked in second on the TOD principles list. The presence of the Sky Lofts, the strong retail presence surrounding the development, and the community's desire to preserve its historical fabric all contributed to the West End's ranking. Observing the West End's pedestrian traffic and its walkability along with the beautification projects that have occurred, it is evident that its potential as a TOD is increasing. Although its commercial values were inconclusive, its residential property values for both the appraised values and the land value, decreased by considerable amounts as the distance to the station increased. This further supports past research by Nelson et al (Nelson 1992) that in lower income neighborhoods, property values decrease as the distance from the station increased. Although this occurred from the one-fourth to one-half buffer distances, this decrease was not as substantial from the

one-half to one-mile buffers surrounding the West End. The data used to conduct this study was from the year 2007 and construction on the Sky Lofts was complete in 2006. Did this new construction drive up the value of homes located further away from the station by making the West End area a more attractive place to live? With several new projects in the pipe line, it is likely that the disparity in value between properties in close proximity to the station and those further away will decrease and the West End will evolve into a more TOD-typical area.

The Ashby and Vine City stations were combined for the LCI study on the Vine City/Ashby neighborhood; however, Ashby Station was given a higher TOD adherence ranking because of its more recent transit-adjacent development. With the Historic Westside Village condominiums and the Publix supermarket, the Ashby Station is transitioning into a front-runner for TOD in the Atlanta area. There are few commercial properties outside those adjacent to the station, which explains the 55% decrease. The 86% increase between the one-half and one-mile buffer zones is a result of venues like the Georgia Dome and the Georgia World Congress Center which are located within one mile of the Ashby Station. It is interesting that the land values did not experience this same degree of change. This may be explained by the idea that what is “within” the building is weighed more heavily than the land the building is on. As for the residential properties, the value decreases as distance from the station increases, but at a marginal rate. Unfortunately, the Village was not complete until 2008, so its values were not included in the study data. It is suspected that the percent change would be more negative in both buffer zones for the residential property class had they been included.

Current development surrounding the Sandy Springs Station is low-density and auto-oriented. For those reasons alone, it received the second-to-lowest ranking in its adherence to TOD principles. However, the presence of many retailers near the station increases its attractiveness as a TOD. There are several large retail chains adjacent to

the station and its immediate vicinity, which account for the 19% increase in commercial values between the one-fourth and one-half buffer mile zones. The 38% decrease can be attributed to the presence of more commercial properties outside the one-half mile buffers. A similar rational is used to explain the 150% increase for the residential properties between the one-fourth and one-half mile buffers. There are less residential properties adjacent to the station (as shown in Table 4.12) and more as the distance from the station increases, so the percentage change in value increases. Because there is little vacant land near the Sandy Springs Station, future development is limited. Rather than focus on TOD principles such as increased density and more housing choices, development near the station should focus on improved walkability for transit users and transition into a less auto-dependent community.

The Vine City Station was ranked the lowest in regards to its adherence to TOD principles. The Station itself seems to be “disconnected” from its surroundings. It sees very minimal pedestrian traffic, except when there are events at nearby venues. As part of the Vine City/Ashby neighborhood, Ashby was given the priority in terms of development and spurring growth. With the Vine City Station having several vacant parcels surrounding the station, it appears to be a prime location for TOD, but its depressed appearance and impoverished economy make TOD difficult. According to Table 4.11, Vine City had the largest decrease in commercial property value, which based on Table 4.12 is because there were no commercial properties located within a one-fourth mile distance from the station. However, there is a tremendous hike in value between the one-half and one-mile buffers because of the large venues located near the station. Interestingly, the Vine City Station had the highest percentage of commercial properties within one-mile of the station location compared to the other stations of interest. The land values followed a similar pattern as the appraised values for Vine City.

Lindbergh, the only notable TOD in Atlanta, has the fifth highest ridership in the MARTA system, while the West End has the third largest. The average appraised property values for all the stations continue to follow previous trends found in Nelson et al (Nelson and McCleskey 1990) research that states that for higher income neighborhoods, property values increase as the distance from the station increases. Inversely, for lower income neighborhoods, property values decrease as the distance from rail increases. However, it appears that new development surrounding stations in lower income areas may be decreasing these disparities.

An important aspect of this research was evaluating developments that were planned and unplanned. Table 4.13 shows the stations of interest based on their TOD adherence rating aligned with their median household income, whether the development was planned or unplanned, and if the average appraised value for the one-mile buffer zone was higher than the one-fourth mile buffer distance.

Lindbergh is Atlanta's only widely recognized successful TOD, yet the median household income within one-half mile of the station is $116,314. For the purpose of comparison, the median household income in Atlanta is $51,482, less than half of Lindbergh's. It appears that the average Atlanta resident cannot afford to live in or near the Lindbergh Center. Development around the West End station, namely the Sky Lofts, was planned and despite new development, the median household income remains relatively low. As for Ashby, where the development was not planned, yet it has TOD characteristics, very low income households remaining with decreasing property values as distance from the station increases. In contrast, Sandy Springs, which like Ashby, had no planned development, but more than four times its median household income, residential property values increase as distance from the station increases. Vine City, which has not had any recent development and shows relatively no adherence to TOD principles, had a low median household income.

Table 4.13: Comparison Summary

Stations: Ranked by TOD Adherence	Median Household Income	Development Planned?	1-mile appraised value greater than 1/4-mile?
Lindbergh	$116,314	Yes	Yes
West End	$25,850	Yes	No
Ashby	$21,599	No	No
Sandy Springs	$85,634	No	Yes
Vine City	$25,151	No	No

1-mile appraised value and ¼-mile appraised value refers to residential average appraised values found in Table 4.x to Table 4.x

Figure 4.1 is a graphical representation of Table 4.13. West End Station, Ashby Station and Vine City Station are indicated by dashed lines. Lindbergh Station and Sandy Springs Station are indicated by solid lines. The order of the stations to the right of the graph is the order in which the lines appear. For example, the first dashed line is the West End Station; the second dashed line is Ashby Station and so forth.

The first data point is the median household income, which is considerably higher for the Lindbergh and Sandy Springs area. The second data point is the average appraised residential property value at one-fourth mile distance from the station and the last data point is the average appraised residential property value at one-mile distance from the station. Comparing the residential property values at one-fourth mile distance from the station to the one-mile distance from the station, clearly illustrates the trend. A greater disparity between the average property values as the distance from the station increases is indicated by the slope of the line between the second and third data points. For instance, a greater slope indicates a greater disparity.

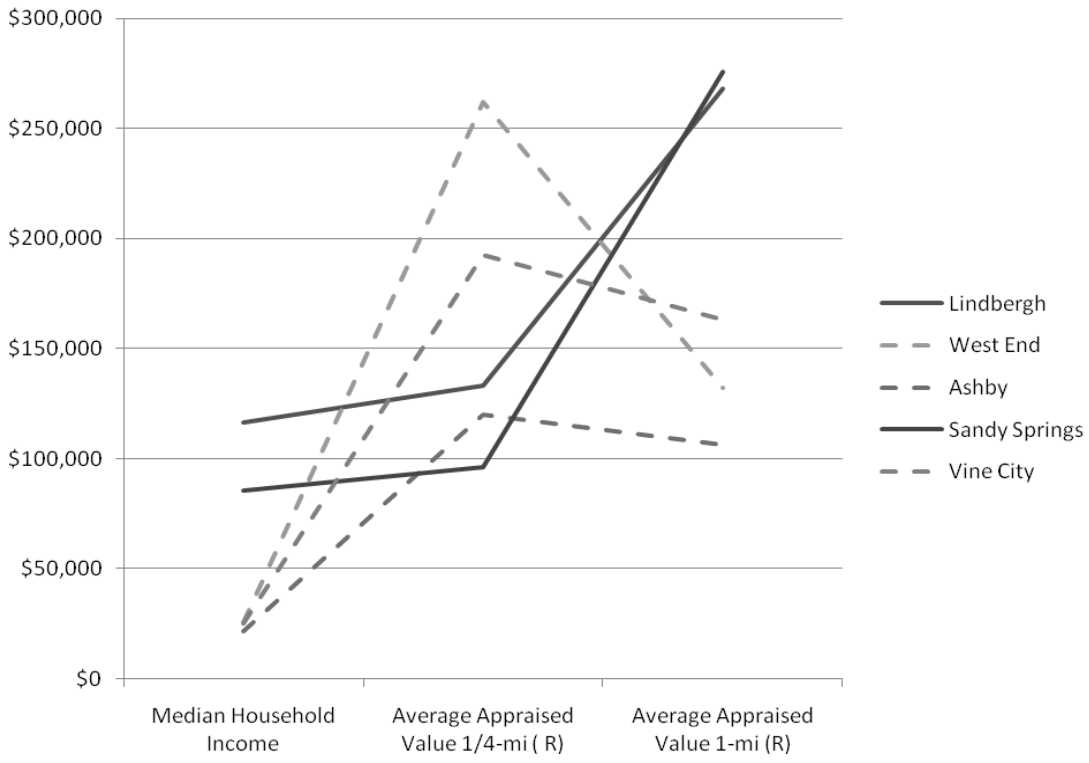

Figure 4.1: Graphical Comparison Summary

CHAPTER 5

RECOMMENDATIONS AND CONCLUSION

5.1 Summary

The research conducted in this thesis leads to the conclusion that TOD in the Atlanta area has minimal impact on property values. What appears to have more of an impact is the median household income of the neighborhood surrounding the transit station, which of course reflects the value of property afforded. Ina traditional node of TOD, property values would be higher closest to the station, but in the case of Lindbergh Station, Atlanta's only recognized TOD, property values increased as the distance from the station increased. This suggests that there is a stronger correlation between the median household income and property values by distance than between TOD and property values.

While in many cities like San Francisco and Portland, TOD has generated more liveable, walkable and bikeable neighborhoods, increased transit ridership and decreased automobile congestion, TOD has not had such sizeable impacts in Atlanta. The MARTA stations selected for this research were chosen based on the presence of planned and unplanned development near the station. The planned stations (Lindbergh and West End) were ranked highest according to their TOD adherence. This suggests that when development takes place in conjunction with MARTA and developers, its adherence to TOD principles is more likely.

The Lindbergh TOD has created a more walkable neighborhood and it provides several options in housing choice. The West End Station has the ridership to support TOD, but the West End Sky Lofts are for purchase only, thus limiting affordability. The Historic Westside Village adjacent to the Ashby Station does offer for-purchase and for-lease housing options; however, its desirability as a place to live is less than the

Lindbergh area due to its declining population and issues with drugs and poverty. Future TOD near the Sandy Springs Station should focus more on decreasing automobile use by increasing transit availability. The Vine City Station has potential for TOD and based on its median household income and the trends found in this research, it is likely that property values will decrease as the distance from the station increases.

5.2 Recommendations

One of the most important outcomes of this research is a better understanding of TOD in Atlanta as it relates to property values. It is apparent that median household income has more of an impact on property values as it relates to proximity to transit. TOD in Atlanta is minimal; however, there are opportunities for growth.

Some specific recommendations as a result of this research are:

Revise the definition of TOD. Although no universal definition for TOD exists, MARTA's definition of TOD is too broad and needs a more narrow focus.

Create a vision for TOD in Atlanta that includes detailed goals and objectives prior to project implementation. TODs in the U.S. and outside the U.S. that are considered models for successful TOD all had specific goals and objectives prior to project implementation.

Identify TOD supporters in the public and private sector. TOD encounters several barriers so identifying agencies and companies that support TOD could combat these barriers.

Consider median household income when selecting potential sites for TOD. Based on this research, median household income is strongly correlated to property values and proximity to transit. Considering the median household income could help to project the impacts of TOD.

5.3 Suggestions for Further Research

One major limitation of this research is that it only provided a “snapshot” of the trends in property values surrounding MARTA stations. This research used data from one point in time and assumed no other externalities that may affect property values such as distance to the central business district and crime.

Further research that examines the effects of TOD on property values in Atlanta longitudinally over time would be valuable. Would the presence of TOD raise or lower the average appraised value before and after development? Would commercial properties and residential properties show similar trends for pre and post TOD? These are questions that would be answered using data over time.

APPENDIX A

DATA TABLE

Table A.1 Sample Data Set

STATION	Stn_Code	BUFF_DIST	DIGEST	SITUS	PARID	OWNER1	PROP_CLASS	TOT_APPR	TOT_ASSESS	IMPR_APPR	LAND_APPR
Lindbergh Center	N6	2640.00	2007	695 MIAMI CIR NE	17 0047 LL0331	SELIG S STEPHEN III ET AL	C3	1915900.00	766360.00	967600.00	3423900.00
Lindbergh Center	N6	2640.00	2007	650 MIAMI CIR NE	17 0047 LL0620	J SPEARS FAMILY L P	C3	1150000.00	460000.00	943900.00	1894800.00
Lindbergh Center	N6	2640.00	2007	660 MIAMI CIR NE	17 0047 LL0638	VERNON ANTHONY G	C3	717000.00	286800.00	492400.00	1210000.00
Lindbergh Center	N6	2640.00	2007	MOROSGO DR NE	17 0048 LL0421	HOME DEPOT U S A INC	C3	716500.00	286600.00	0.00	3141000.00
Lindbergh Center	N6	2640.00	2007	761 SIDNEY MARCUS BLVD	17 0048 LL0645	NORO BROADVIEW HOLDING CO NV	C3	1300000.00	520000.00	706800.00	2079000.00
Lindbergh Center	N6	2640.00	2007	2608 PIEDMONT RD NE	17 004800010437	PIZZA HUT OF AMERICA INC	C3	245800.00	98320.00	12400.00	828600.00
Lindbergh Center	N6	2640.00	2007	2628 PIEDMONT RD NE	17 004800010569	AYAZ PERSIAN & ORIENTAL	C3	843300.00	337320.00	554900.00	904800.00
Lindbergh Center	N6	2640.00	2007	2612 PIEDMONT RD NE	17 004800010635	PIZZA HUT OF AMERICA INC	C3	454200.00	181680.00	341200.00	855300.00
Lindbergh Center	N6	2640.00	2007	2580 PIEDMONT RD NE	17 004800010684	GRANCAL LLC	C3	1579900.00	631960.00	429000.00	3633600.00
Lindbergh Center	N6	2640.00	2007	PIEDMONT RD NE	17 004800010734	MIAMI CIRCLE MERCHANTS	C3	3700.00	1480.00	0.00	127800.00
Lindbergh Center	N6	2640.00	2007	711 MOROSGO DR NE	17 004800020535	SKYLINE III LLC	C3	1833600.00	733440.00	2252000.00	1680000.00
Lindbergh Center	N6	2640.00	2007	745 MOROSGO DR NE	17 004800020543	SKYLINE III LLC	C3	220600.00	88240.00	269600.00	320000.00
Lindbergh Center	N6	2640.00	2007	723 MOROSGO DR NE	17 004800020568	SKYLINE III LLC	C3	909900.00	363960.00	1017800.00	960000.00

REFERENCES

Academies, T.R.B.o.t.N., Transit-Oriented Development and Joint Development in the United States: A Literature Review. Research Results Digest, 2002(52): p. 6-15.

Arrington, G.B. and R. Cervero, Effects of TOD on Housing, Parking, and Travel, in Transit Cooperative Research Program Report 128. 2008, Transportation Research Board. p. 1-58.

Atlanta, C.o., West End Historic District Liveable Center Initiative. 2001: p. 1-73.

Atlanta, C.o., Vine City/Washington Park Liveable Centers Initiative Study. 2009: p. 1-146.

Baldassare, M., R. Knight, and S. Swan, Urban Service and Environmental Stressor: The Impact of the Bay Area Rapid Transit System on Residential Mobility. Environment and Behavior, 1979. 11(4): p. 435-450.

Bernick, M., P. Hall, and R. Schaevitz, Planning Strategies for High-Density Housing Near Rail Transit Stations in Northern California. CPS Brief, 1993. 5(2): p. 1-5.

Bollinger, C.R. and K.R. Ihlanfeldt, The Impact of Rapid Rail Transit on Economic Development: The Case of Atlanta's MARTA. Journal of Urban Economics, 1997. 42: p. 179-204.

Bowes, D.R., Identifying the Impacts of Rail Transit Stations on Residential Property Values in Atlanta, in Andrew Young School of Policy Studies. 1999, Georgia State University: Atlanta. p.112.

Bowes, D.R., Identifying the Impacts of Rail Transit Stations on Residential Property Values in Atlanta. 1999.

Bowes, D.R. and K.R. Ihlanfeldt, Identifying the Impacts of Rail Transit Stations on Residential Property Values. Journal of Urban Economics, 2001. 50: p. 1-25.

Cervero, R., Light Rail Transit and Urban Development. Journal of the American Planning Association, 1984. 50(3): p. 133-47.

Cervero, R., Rail Transit and Joint Development: Land Market Impacts in Washington, D.C. Journal of the American Planning Association, 1994. 60(1): p. 83-94.

Cervero, R., Rail Transit and Joint Development: Land Market Impacts in Washington, D.C. and Atlanta. Journal of the American Planning Association, 1994. 60(1): p. 83-94.

Cervero, R., Transit-Oriented Development in the United States: Experiences, Challenges, and Prospects, in Transit Cooperative Research Program Report 102. 2001, Transportation Research Board.

Cervero, R. and J. Landis, Twenty Years of the Bay Area Rapid Transit System: Land Use and Development Impacts. Science Direct - Transportation Research Part A: Policy and Practice, 1998. 31(4): p. 309-333.

Chen, H., A. Rufolo, and K.J. Dueker, Measuring the Impact of Light Rail Systems on Single Family Home Values: A Hedonic Approach with GIS Application. 1997, Portland State University Center for Urban Studies: Portland. p. 1-12.

Connected, B.A., Westend Trail Summary Sheet, B. Atlanta, Editor. 2008: Atlanta.

Dittmar, H. and G. Ohland, The New Transit Town: Best Practices in Transit-Oriented Development. 2004: Island Press.

Dumbaugh, E., Overcoming Financial and Institutional Barriers to TOD: Lindbergh Station Case Study. Journal of Public Transportation, 2004. 7(3): p. 43-68.

Gatzlaff, D.H. and M.T. Smith, The Impact of the Miami Metrorail on the Value of Residences Near Station Locations. Land Economics, 1993. 69(1): p. 54-66.

Goulding, J.J.a., Livable Sandy Springs Summary Report. 2001: Sandy Springs. p. 1-40.

Grass, R.G., The Estimation of Residential Property Values Around Transit Station Sites in Washington, D.C. . Journal of Economics and Finance, 2001: p. 139-146.

Hess, D.B. and T.M. Almeida, Impact of Proximity to Light Rail Rapid Transit on Station-area Property Values in Buffalo, New York. Urban Studies, 2006. 44(5/6): p. 1041-1068.

John A. Kilpatrick, R.L.T., John I. Carruthers, Andrew Krause, The Impact of Transit Corridors on Residential Property Values. Journal of Real Estate Research, 2007. 29(3): p. 17.

Kilpatrick, J.A., et al., The Impact of Transit Corridors on Residential Property Values. Journal of Real Estate Research, 2007. 29(3): p. 304-320.

Knight, R. and J. Trygg, Urban Mass Transit and Land Use Impacts. Transportation 1978. 5(1): p. 12-24.

MARTA, North Line TOD Study Report. 2006.

Nelson, A.C., Effects of Elevated Heavy-Rail Transit Stations on House Prices with Respect to Neighborhood Income. Transportation Research Record, 1992. 1359: p. 127-132.

Nelson, A.C., Transit Stations and Commercial Property Values: A Case Study with Policy and Land-Use Implications. Journal of Public Transportation, 1999. 2(3): p. 77-95.

Nelson, A.C. and S.J. McCleskey, Improving the Effects of Elevated Transit Stations on Neighborhoods. Transportation Research Record, 1990. 1266: p. 8.

Nelson, A.C. and S.J. McCleskey, Improving the Effects of Elevated Transit Stations on Neighborhoods. Transportation Research Record, 1990(1266): p. 173-180.

Nelson, A.C., et al., Rail Transit in the Suburbs: Case Study of Transit Use in Atlanta's Affluent Northern Tier. Transportation Research Record, 1997. 1571: p. 8.

Parsons Brinckerhoff Quade & Douglas, I., Public Policy and Transit-Oriented Development: Six International Case Studies, in Transit Cooperative Research Program Report 16. 1996, Transportation Research Board. p. 1-173.

Ryan, S., Property Values and Transportation Facilities: Finding the Transportation-Land Use Connection. Journal of Planning Literature, 1999. 13(412): p. 1-17.

Transit, S.F.B.A.R. BART Breaks Ground for Transit Village at Pleasant Hill Station. 2009.

Transit-Oriented Development Program: Transit-Oriented Projects. 2008, Oregon Metro.

Transportation, C.D.o., TOD Summaries. 2008.

URBAN COLLAGE, I., Vine City Redevelopment Plan. 2004. 1: p. 1-30.

Webber, M., The BART Experience- What Have We Learned? The Public Interest, 1976. 12(3): p. 79-108.