

CHAPTER 4 HOUSING



HOUSING

4.1 Introduction

Housing is central to a community's quality of life. The traditional American Dream includes ownership of a home that is affordable and large enough to meet the family's needs. Homeownership is valued regardless of one's geographic location and irrespective of one's socioeconomic standing, race, ethnicity, and age. An investment in one's home is also an investment in the community's future. From comments received at public meetings, it is clear that the citizens of Griffin share this belief and are concerned about the quality of housing in their community.

As is evident in the following analysis, Griffin needs to deal with several housing issues. Within the City there is a relatively high percentage of rental housing, deteriorating or dilapidated housing, and cost burdened households. Trying to ensure that future generations will have the opportunity to own safe and affordable housing is one of the serious challenges now facing civic leaders.



To help plan for this and to determine future housing needs, this chapter examines the existing housing stock in the City. This housing inventory includes a review of the types of housing and their age, condition, occupancy, tenure, and cost. Following this is an assessment of current and future needs to help determine the adequacy and suitability of the housing stock to serve the population. This assessment includes housing projections that will assist the City in preparing for an adequate housing supply. The primary source of information for this chapter is the U.S. Bureau of the Census. Maps of the current residential parcels and land areas that are appropriate for future residential development can be found in the Land Use chapter.

4.2 Distribution of Housing Units

The U.S. Census identifies three major categories of housing units: Single-family homes, multi-family homes, and mobile homes. Mobile homes are defined as houses to which there is no permanent foundation. The mobile home classification includes manufactured homes and modular homes. **Figure 4-1** shows the number of units, the number of occupied units, and the different types of housing units in 1990 and 2000.

In 2000, City of Griffin residents occupied 92.1% percent of all housing units in the City. The majority of housing units were single-family detached homes, accounting for 74.1% of all housing units. Mobile homes constituted less than 1% percent of all housing units in the City and multi-family units totaled 24.3% percent of all units.

Figure 4-1
City of Griffin, Types of Housing, 2000

	Number	Percent of Total
Total Housing Units	9,669	100.0%
Occupied Units	8,905	92.1%
Single-family Units	7,162	74.1%
Multi-family Units	2,348	24.3%
Mobile Homes	4	<1%
<i>Source: U.S. Census Bureau, 2000 and Spalding County Tax Assessor's office.</i>		

4.3 Trends in Housing Types

During the 1980s and 1990s, the number of housing units in the City of Griffin continued to increase; however, the trends among the types of housing produced were considerably different. **Figure 4-2** illustrates the trends in housing types and the percent changes for housing since 1980. This table reveals that by 2000 the City of Griffin experienced a reversal in housing stock trends. From 1980 to 1990, the number of single-family units decreased while the number of multi-family units increased. From 1990 to 2000, however, that has reversed and the number of single-family units has increased while the number of multi-family units decreased. Both single family and multi-family units, however, have experienced a net increase since 1980. The City of Griffin's housing stock totaled 9,669 units in 2000, an increase of 1,767 units from 1980. During that same period, however, the city's vacancy rate rose from 5% to 8%.

Figure 4-2
City of Griffin, Trends in Types of Housing, 1980 – 2000

	1980	1990	2000	Percent Change 1980-1990	Percent Change 1990-2000
Total Housing Units	7,902	8,749	9,669	10.7%	10.5%
Occupied Units	7,512	8,076	8,905	7.5%	10.3%
Single-family Units	5,912	5,849	7,162	-1.1%	22.4%
Multi-Family Units	1,968	2,811	2,348	42.8%	-16.5%
Mobile Homes	22	89	4	304.5%	-95.5%
<i>Source: U.S. Census Bureau, Census 2000 and Spalding County Tax Assessor's Office.</i>					

4.4 Age and Condition of Housing

Figure 4-3 reviews the age and condition of Griffin’s housing units over the last twenty years. It should be noted that the definition of substandard housing is based on federal guidelines used in gathering data for the U.S. Census. While these measures have historically provided a base from which to measure basic housing standards, there are several other factors affecting the quality of housing that are not measured by the federal guidelines. These include insect infestation, rodent infestation, the availability and condition of electric power, leaking roofing, foundation problems, sagging floors and ceilings and deteriorated mobile homes.

Between 1980 and 2000, the percentage of substandard housing units, defined as lacking complete plumbing, decreased from 1.9 to 1.2 percent. Though this number is small it is relatively high when compared to the percentage of substandard housing units in the Atlanta MSA and in the state of Georgia, 0.4% and 0.5% respectively, see **Figure 4-4**. Also it is disturbing that the number of substandard units actually rose between 1990 and 2000 from 64 to 119.

Part of the reason for this rise in substandard units is the relative age of the housing in Griffin. As **Figure 4-4** illustrates over 10% of the housing units in Griffin are over 60 years old, which is nearly twice the percentage of older homes in the Atlanta region and the state. Another factor contributing to this rise in substandard units is the high poverty rate in the City, households that are cost-burdened have a harder time maintaining safe housing standards.

Figure 4-3
City of Griffin, Condition of Housing Units, 1980 – 2000

	1980	1990	2000	Percent Change 1980-1990	Percent Change 1990-2000
Number Year-Round Units	7,902	8,749	9,669	10.7%	10.5%
Units Built Before 1939	2,012	1,139	1,006	-43.4%	-11.7%
No. of Substandard Units	147	64	119	-56.5%	85.9%
Percent Substandard Units	1.9%	0.7%	1.2%	-63.1%	85.7%
<i>Source: Georgia Department of Community Affairs, Document #DP6-402-D5P-13255, March 1994. US Bureau of the Census, Census 2000.</i>					

Figure 4-4
City of Griffin, Atlanta MSA, and the State of Georgia, Condition of Housing Units,
2000

	Griffin	Atlanta MSA	Georgia
Units Built Before 1939	1,006	66,937	192,972
Percent of Total Built Before 1939	10.4%	4.2%	5.9%
No. of Substandard Units	119	6,751	17,117
Percent Substandard Units	1.2%	0.4%	0.5%
<i>Source: U.S. Census Bureau, Census 2000</i>			

The issue of poor housing conditions was identified as part of the previous Comprehensive Plan. In response, the City decided to investigate the issue further and undertake a Housing Conditions Inventory. A survey was undertaken in August 2001, documenting the external housing conditions in five geographic areas where poor conditions were known to be prevalent. **Figure 4-5** is a map showing the location of these five survey areas. All totaled there were 2,784 single-family housing units inventoried as part of this effort, or approximately 29% of the total housing units in the City. Multi-family units and public housing were not part of this survey.



The survey found that 84% of the single-family units in the survey areas were in adequate condition, with only minor upgrades needed such as painting, repair of cracked windows and removal of litter or junk from the yard. There were 15%, or 410 units, found to be deteriorating. These units are the most critical because if problems such as missing roofing and siding materials or cracking foundations are not repaired then these units will become deteriorated. Finally, only 1%, or 29 total units, were found to be dilapidated. These units have such severe problems that they are likely uninhabitable and should be torn down.

4.5 Tenure, Occupancy and Cost

This section addresses the number of owner and renter-occupied housing units, and vacant units in the City of Griffin. Data is provided in **Figure 4-6**. The majority of occupied housing units in the City were renter-occupied units. These units accounted for 57% while owner units made up 43% of all occupied units.

Figure 4-6
City of Griffin, Trends in Occupancy and Tenure, Cost of Housing,
1980 – 2000

	1980	1990	2000
Total Housing Units	7,902	8,749	9,669
Occupied Units	7,512	8,076	8,876
Number Occupied by Owner	3,581	3,382	3,819
Owner Occupied (%)	47.7%	41.9%	43%
Dollar Median Value (\$)	\$32,700	\$60,600	\$90,700
Number Occupied by Renter	3,931	4,694	5,057
Renter Occupied (%)	52.3%	58.1%	57%
Dollar Median Rent (\$)	\$96	\$233	\$527
Number of Units Vacant	390	673	793
Vacant Units as Percent of Total	4.9%	7.7%	8.2%

Source: U.S. Census Bureau, Census 2000.

As shown in **Figure 4-7**, the City of Griffin in 2000 had a lower owner occupancy rate than Georgia and the Atlanta MSA. Whereas both the region and state have a 2:1 ratio of owner occupied to renter occupied units, Griffin is almost 2:3.

Figure 4-7
City of Griffin, Atlanta MSA, and the State of Georgia, Tenure and Cost of Housing,
2000

	Griffin	Atlanta MSA	Georgia
Total Housing Units	9,669	1,589,568	3,281,737
Occupied Units	8,876	1,504,871	3,006,369
Number Occupied by Owner	3,819	999,564	2,029,154
Owner Occupied (%)	43%	66%	67%
Dollar Median Value (\$)	\$90,700	\$135,300	\$111,200
Number Occupied by Renter	5,057	505,307	977,215
Renter Occupied (%)	57%	34%	33%
Dollar Median Rent (\$)	\$527	\$746	\$613
Number of Units Vacant	793	84,697	275,368
Vacant Units as Percent of Total	8.2%	5.3%	8.4%
<i>Source: U.S. Census Bureau, Census 2000</i>			

In terms of cost, Griffin’s median housing value and median rent were considerably lower than those of both the Atlanta MSA and the state. This does not mean, however, that the housing in Griffin is more affordable. When compared with the income of City residents, it is clear that a large percentage of the City’s homeowners and renters are cost burdened, see **Figure 4-8**. Cost burdened is defined as paying more than 30% of one’s income on housing costs. Severely cost burdened is defined as paying more than 50% of one’s income on housing costs. In Griffin, 29% of renters and 22.5% of homeowners were cost burdened in 1999. In Georgia by comparison, 35% of renters and 21% of homeowners are cost burdened. So even though housing costs in the City are relatively lower than those in the region and state, they are not necessarily more affordable to the community’s residents.

Figure 4-8
City of Griffin, Cost Burden of Housing, 1999

	Owner		Renter	
	Households	% of Total	Households	% of Total
Total Housing Units	3,634	100%	5,056	100%
Households Paying >30% of Income on Housing: Cost-Burdened	819	22.5%	1,974	39.0%
Households Paying >50% of Income on Housing: Severely Cost-Burdened	358	9.8%	1,000	19.8%
<i>Source: U.S Census Bureau, Census 2000</i>				

4.6 Housing and Community Characteristics

This section of the Housing element addresses the relationship between the existing housing stock and two characteristics of the existing population and workforce: commuting patterns and special needs. These two aspects of the community, when compared with existing housing stock, are good measures of how well the housing stock meets the residents' needs.

4.6.1 Commuting Patterns

As described in the Economic Development chapter, section 3.13, commuting patterns data for just the city is not available from the census, however county level data is, and it indicates that during the 1990s, more and more county residents were leaving the county to go to work. The percentage of employed residents commuting to employment in other counties actually increased from 36.7% to 44.6%. Oddly, the total number of jobs in Spalding County increased from 23,672 in 1990 to 28,931 in 2000. As the county added just fewer than 4,000 new residents, job growth actually exceeded population growth during the 1990s.



Traffic along Taylor Street

While there are many dimensions to this apparent contradiction, new construction is a probable contributing factor. There appears to be a disconnect between the types of jobs the county is attracting and the types of new construction. Namely, the quality, size and amenities of new residential developments are insufficient to entice new employees and their families to live in Griffin and Spalding County.

Therefore, there appears to be a latent demand for increasing diversity of new residential developments in terms of quality, size and neighborhood amenities. In order to increase diversity, however, other barriers must be eliminated, such as the poor performance of the public school system and aging infrastructure.

4.6.2 Special Needs

A variety of populations within the City of Griffin have special housing needs. **Figure 4-9** includes an inventory of some disabilities accounted for by the Census Bureau. Many of these disabilities simply require modifications to existing residences, such as replacing steps with ramps and improving wheelchair accessibility. Others, such as individuals with extreme mental disabilities, require long-term residential care. The City of Griffin has an array of residential services working within the community. There are shelters for victims of domestic violence and their families, rehabilitation centers for individuals recovering from drug addiction or mental illness, additional residential facilities for people with developmental disabilities, and transitional housing for homeless families and individuals. A suite of agencies provide subsidized or affordable housing for older adults and there is a hospice residence for patients with late stage cancer and other terminal diseases.

**Figure 4-9
City of Griffin, Age By Type of Disability, 2000**

Age Group	Total Disabilities Talled	Sensory Disability	Physical Disability	Mental Disability	Self-Care Disability	Go-Outside Home Disability	Employment Disability
5-15 Years	362	44	24	223	71	N/A	N/A
16-64 Years	6,754	387	1,330	823	414	1,489	2,311
65 and Over	3,408	557	1,159	446	399	847	N/A
Total	10,524	988	2,513	1,492	884	2,336	2,311

Source: U.S. Census Bureau, 2000

4.7 Housing Assistance

This section describes the variety of housing assistance organizations that are operating within Griffin. Griffin has a public housing authority and a number of private organizations that offer housing assistance. Much of this information was derived from interviews and the Spalding County Resource Directory, an online directory provided by the Spalding County Collaborative for Families and Children.

4.7.1 Public Housing

The Griffin Housing Authority administers three developments totaling 250 housing units:

- 9 Oaks. Built in the last 20 to 25 years. An elderly housing facility. 50 housing units.
- 120 Meriwether Street. Built in the 1950s. Family housing. 1, 2, 3, and 4 bedroom units.
- 80 Fairmont. Built in the 1960s. Families and a few handicapped units.

Waits for public housing units are roughly three to four months for families, and about a year for 9 Oaks.

According to a recent *Griffin Daily News* newspaper article, there are 471 units of Section 8 rental housing within Griffin. The Section 8 Voucher Program is a federal housing program offered through the U.S.

Department of Housing and Urban Development (HUD) and administered by the Georgia Department of Community Affairs (DCA). It provides tenant-based assistance or rent subsidy on behalf of low-income families to participating landlords who agree to maintain their rental properties to the required Housing Quality Standards.



4.7.2 Private Assistance

There are a wide variety of private organizations that provide housing assistance in Griffin. The Spalding County Collaborative for Families and Children maintains an online directory www.spaldingresources.com that includes a list of available housing assistance. Many of the organizations in the directory provide emergency assistance and are described later in the Community Facilities chapter. Following is just a sample of some of the organizations listed.

Action Ministries - A transitional housing project to enhance the ability of a family to live independently and to move toward self-sufficiency. It provides supportive services and temporary housing for homeless families for a period of six to nine months. Only homeless families are eligible. Transitional and permanent housing is available for persons who are HIV positive. Emergency assistance with rent, mortgage or utilities provided when funding is available. All referrals for HIV housing must come through the Spalding County Health Department.

Affordable Housing Enterprises, Inc., D/B/A Health Care Systems of Georgia - Provides assistance for people who want to buy a home but can't afford an existing home. They offer encouragement and hope to potential homeowners to invest in themselves and their community. Assistance is available for credit repair, location of available property in area, building of affordable homes from the ground up and low interest home mortgages.

Chance House - This is a transitional boarding house for homeless males who are seeking to get back on the right track. Rooms are available based on income. Job training, job placement and counseling are provided.

Christian Women Center, Inc - A non-profit organization whose primary goal is to provide a temporary home to women and their children in crisis. Other services include a one-year training program, shelter, food and clothing, and referral to other agencies as needed. The child care facility is exclusively for the women in the shelter and the training program.

Griffin Area Habitat for Humanity - A local organization that seeks to build lives as well as houses. It is affiliated with Habitat for Humanity International, an ecumenical Christian ministry that builds decent, affordable housing for people currently living in substandard housing. To qualify for a Habitat home, families must invest at least 300 hours building their own or other families' houses. Habitat sells the houses to the family at cost, using a 25-year no-interest loan plan. Habitat has developed five or six homes in Griffin in the last two years.

McIntosh Trail Mental Health, Developmental Disabilities, Addictive Diseases, Personal Growth Center - Provides a wide scope of affordable outpatient, day treatment and residential housing services to people with mental health, Developmental Disabilities and Addictive Diseases disabilities. Fees are based on income level and number of dependents. The immediate situation is treated, but focus is on creating a path that may include employment and independent living assistance enabling all to become valuable contributing members of the community.

Middle Georgia Community Action Agency, Inc - Offers community service programs designed to improve the overall quality of life and encourage self-sufficiency. Housing services

provided by MGCAA include:

- Energy Assistance - One time heating or cooling energy payment to eligible low-income families.
- Family Resettlement Program – Assists individuals who are homeless or threatened with homelessness with rent, utilities, deposits, first month’s rent and set up fees. Applicant must be a TANF family in the last quarter or end of their lifetime benefits, or whose case has permanently closed for less than 12 months.
- Weatherization- Provides for energy conservation measures on the homes of low-income homeowners and renters (with landlord permission). Services include attic insulation, window repair/replacement and measures to reduce air infiltration.
- Housing Preservation- Provides housing renovations to help low income and very low income homeowners to improve level of energy efficiency, safety and sanitation.

The Nehemiah Program - This is a private non-profit program. Its purpose is to help with down payment assistance for low and middle-income families to achieve home ownership.

Salvation Army Home of Hope - Provides time limited housing for homeless families - men, women and children.

4.8 Assessment of Current and Future Needs

4.8.1 Current Needs

Based on the inventory and public comments received during the creation of this plan, the current housing needs of the community are primarily threefold: lack of home ownership, poor housing conditions, and affordability. In all three areas, Griffin lags behind the regional average and, in many cases, behind the state average. Based on vacancy rates and the supply of undeveloped lots in the City (see Existing Land Use Plan) there seems to be an adequate supply of housing for the immediate and future needs of Griffin residents. The local problems concerning housing do not revolve around the volume of supply, but rather about housing quality and affordability.

Affordability of housing plays a key role in home ownership. There are many barriers to home ownership that affect low-income people. These include meeting loan underwriting criteria such as debt to income ratios, down payment requirements, closing costs, credit histories and interest rates and the low or declining values of properties in declining or transitioning neighborhoods where many low income units are located.

According to the 2000 U.S. Census, as shown in **Figure 4-11**, the majority of Griffin’s households fall within the lower income category. For example, 42% of Griffin’s households had annual incomes ranging from \$0 to \$24,999 in 2000. Using a generally accepted lending standard that a household can purchase a housing unit costing approximately 35% of its annual income, a household in Griffin would have to earn roughly \$31,745 to afford the median owner-occupied housing unit which was valued at \$90,700 in 2000.¹ Applying this same standard in

¹ Dowell Myers, *Analysis with Local Census Data Portraits of Change*, Academic Press, Inc., 1992.

terms of rental cost, a household in Griffin would have to earn approximately \$18,068 annually to afford the median monthly rent of \$527 in the city in 2000.

Figure 4-11: Households by Income Category, 2000

Income Category	Number of Households	Percent of Total Households
\$0-\$9,999	1,525	17.2%
\$10,000-\$14,999	829	9.4%
\$15,000-\$24,999	1,387	15.7%
\$25,000-\$34,999	1,374	15.5%
\$35,000-\$49,999	1,384	15.6%
\$50,000-\$74,999	1,244	14.0%
\$75,000-\$99,999	566	6.4%
\$100,000-\$149,999	290	3.3%
\$150,000-\$199,999	144	1.6%
\$200,000 or more	116	1.3%

Source: U.S. Census Bureau, Census 2000.

There is a need to rehabilitate the substandard and dilapidated housing in Griffin. This type of housing is found throughout the north Griffin neighborhoods, along with some areas to the south and southwest of downtown. Abandoned and dilapidated homes, as well as occupied homes with serious structural problems, are found throughout each neighborhood and not confined to one certain area.

4.8.2 Future Needs

The population of the City of Griffin is expected to increase from 23,451 in 2000 to anywhere from 25,506 to 29,566 in 2025. The following analysis provides an assessment of the City's housing stock by comparing the City's overall housing supply with the demand for housing. The City's supply characteristics have already been discussed in the previous sections. The City's demand characteristics will include the examination of the number of households, household size and household income for the City of Griffin. **Figure 4-12** includes a projection of the number of total housing units needed in 2025. As can be seen, 1,189 additional units are estimated to be needed by 2025. Housing demand projections are based on population projections and are not intended to reflect actual residential construction.

**Figure 4-12
City of Griffin, Future Housing Demand, 2000-2025**

Year	Population	Household Size	Total Households	Total Housing Units**	Additional Units Needed
2000*	23,451	2.62	8,876	9,636	0
2005	23,884	2.62	9,116	9,754	118
2010	24,565	2.62	9,485	10,149	513
2015	25,245	2.59	9,710	10,389	753
2020	25,926	2.61	9,933	10,628	992
2025	26,607	2.63	10,117	10,825	1,189
* Observation					
** Assumes 7% vacancy rate					
<i>Source: Jordan, Jones & Goulding</i>					

Based on the population projections included in this plan, approximately 1,189 additional housing units will be needed by 2025. What this figure does not indicate, however, is the price range and type of housing that is needed to meet current and economic needs of the City. As the economic development statistics pointed out, even though the county’s employment numbers increased, the number of residents commuting outside the county and into the county to work has increased. This contradiction indicates that there appears to be a disconnect between the types of jobs the county is attracting and the types of new construction. Namely, the quality, size and amenities of new residential developments are insufficient to entice new employees and their families to live in Griffin and Spalding County.

4.9 Articulation of Community Goals and Associated Implementation Program

At the Visioning Workshop held on January 10, 2004, participants reviewed the existing housing goals and recommendations of the Comprehensive Plan and offered suggestions to improve them. The goals outlined below are derived from the inventory and these comments. Several of the comments received are actual action items and are included in the following implementation program. This implementation program outlines specific actions to address each of the goals, identifies who is responsible, and sets out a possible timeframe for implementation.

4.9.1 Housing Goals

Based on the analysis of current and future housing needs, the City of Griffin should strive to:

- Encourage home ownership.
- Reduce the cost burden for housing.
- Promote stronger neighborhood identity with diversity and improved walkability
- Encourage the development of housing options for all income ranges and consistent with the economic goals of the City.
- Encourage property maintenance and reduce the percentage of substandard housing.

As was evident in the housing inventory conducted two years ago, Griffin’s housing problems are concentrated in several geographic areas. This plan calls for the targeted approach rather than general broad brush one. **Figure B-3 in Appendix B** presents a target area map for the community that identifies areas where the community should focus its efforts and seek to fulfill these goals first.

The targeted areas include:

- North Hill Street Residential Area
- Commuter Rail Station Area
- Alternative Commuter Rail Station Area/Thomaston Mill Area
- Central Business District
- Medical Center
- Ellis Crossing and Oxford Village commercial redevelopment areas
- Meriwether Street Redevelopment
- Airport
- Several corridors leading into downtown:
 - West Poplar and West Solomon Streets
 - West Taylor Street
 - Experiment Street
 - US 19/41

Detailed descriptions of each of these areas and recommended implementation strategies can be found in the Land Use chapter, section 7.8.

4.9.2 Implementation Program

Goal #1: Encourage home ownership.

Action Item	Responsible Party	Time Frame
Institute home ownership program for first time homeowners in Target Areas	Griffin Housing Authority, DCA, local financial institutions	On-going
Pursue resource opportunities (state and federal grants) for home ownership and renewal (non-profit and private organization)	Griffin Housing Authority, DCA, local financial institutions	On-going

Goal #2: Reduce the cost burden for housing.

Action Item	Responsible Party	Time Frame
Pursue resource opportunities (state and federal grants) for home ownership and renewal (non-profit and private organization)	Griffin Housing Authority	On-going
Revise Zoning Ordinance to encourage the development of workforce housing, or a variety of housing types in target areas	Griffin Planning & Development Dept.	2005-2006

Goal #3: Promote stronger neighborhood identity with diversity and improved walkability.

Action Item	Responsible Party	Time Frame
Allow and encourage compatible infill development in established neighborhoods	Griffin Planning & Development Dept	On-going
Strengthen Historic Preservation efforts in residential neighborhoods.	Griffin Historic Preservation Commission	On-going
Promote transit oriented development near the proposed commuter rail station (contingent on rail station development)	Griffin Planning & Development Dept, and DDA	2006-2008

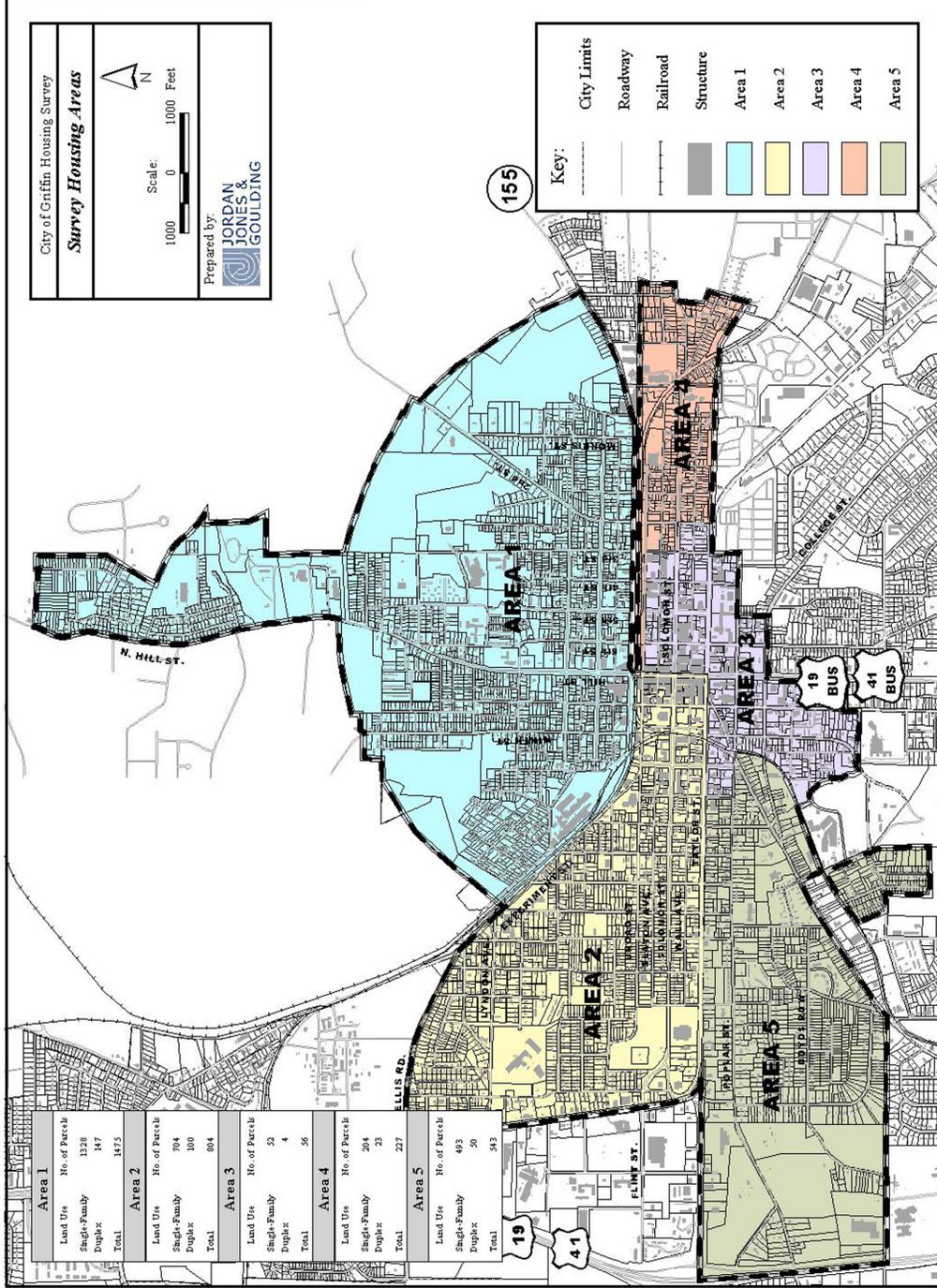
Goal #4: Encourage the development of housing options for all income ranges and consistent with the economic goals of the City.

Action Item	Responsible Party	Time Frame
Encourage an increase in downtown housing residential opportunities (lofts)	Downtown Development Authority	On-going
Draft amendments to the Zoning Ordinance to promote the development of quality housing and a greater variety of housing types, and present to the City Commission for adoption	Griffin Planning and Development Dept.	2005-2006

Goal #5: Encourage property maintenance and reduce the percentage of substandard housing.

Action Item	Responsible Party	Time Frame
Update the Housing Conditions Inventory	Griffin Planning and Development Department	2009-2010
Continued evaluation of housing and property maintenance codes and stringent enforcement	Griffin Planning and Development Department	On going

Figure 4-5: Housing Conditions Inventory, Survey Area



Source: City of Griffin Housing Conditions Inventory, JJG, Figure 1, 2001.