



APPENDIX C. ALTERNATIVE GROWTH SCENARIOS

**Carroll County, Georgia
Comprehensive Plan Update**

***Growth Scenarios Analysis
Report***

DRAFT



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I. Overview

1. Purpose

This report analyzes the relative impacts of three alternative growth scenarios for Carroll County, Georgia, as part of the County's comprehensive plan update process. The scenarios reflect distinct, realistic approaches to growth management that would result in distinct land use patterns, fiscal impacts, resource management choices and housing alternatives. This analysis is intended to:

- Identify the alternative land use and growth policies available to the County;
- Describe the relative implications of each of these alternatives within the framework of three scenarios;
- Facilitate rational discussion of these implications through structured, objective comparisons of the scenarios; and
- Help decision-makers define a preferred growth scenario on which to base the County's Comprehensive Plan.

2. Scope of Analysis

This analysis evaluates qualitative and quantitative impacts of three growth scenarios based on the information assembled during the initial phase of this project and summarized in the *Needs, Issues and Opportunities Report*. Quantitative analyses are based on the County's parcel-based geographic information system (GIS), demographic data and projections, available traffic counts and other available information. Qualitative analyses are based on the impacts of identified growth management strategies in similar settings throughout the country. The scope of the analysis for each of the following factors is described below:

- **Community Character:** This qualitative factor addresses the impact of each scenario on the character of different areas of the County. Character is a broad term that describes the mix, intensity and arrangement of land uses, including the relationship of developed areas to natural and developed green-spaces.

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- **Agricultural Operations:** This factor incorporates both quantitative factors (e.g., land consumption) and qualitative factors (e.g., potential land use incompatibilities and potential operational conflicts). It provides a rough comparison of the relative pressures created for the conversion of productive agricultural lands.
- **Land Use Mix:** This factor is a measure of the acreage planned and projected to be absorbed for different purposes.
- **Population Distribution:** This factor compares the distribution of anticipated population growth throughout the County over the next 20 years.
- **Carrying Capacity:** This factor calculates the theoretical build-out population supported by each scenario.
- **Housing Opportunities:** This factor identifies the mix of housing products that could be made available under each scenario. Because the cost of housing demanded in the market will respond to a wide variety of factors that are internal (e.g., service quality, neighborhood quality, compatibility standards, green-space, etc.) and external (e.g., national and regional economy, growth policies of surrounding Counties, etc.) to the County, this analysis will not attempt to quantify housing costs.
- **Employment Opportunities:** This factor will address the relative availability of commercial and industrial sites that will support future employment opportunities.
- **Transportation System:** While no traffic modeling will be conducted as part of this scenario analysis, the relative loading of key arterials and likely demands for additional transportation infrastructure will be identified, as will each scenario's potential to support transit services.

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- **Water and Wastewater Needs:** The scenarios create distinct demands for centralized utility services, relying on different types of services and different providers. This analysis highlights these service implications and the resulting policies required to ensure that services are adequate.
- **School Demands:** While the number of school-aged children will be held constant for each of the scenarios, the distinct distributions of students will be evaluated and the impacts on the school systems highlighted.
- **Emergency Service Impacts:** The distribution of housing will directly affect the ability of fire and emergency medical services to respond to emergency services.

3. Scenarios

Three growth scenarios were developed by the County's planning consultant based on public input and subsequently refined by the Comprehensive Plan Steering Committee. The scenarios, which reflect different land use mixes, different distributions of population, different approaches to growth management, and different levels of coordination between the County and other service providers, are summarized as follows:

- **Rural Residential:** This pattern of scattered low-density residential development throughout the County reflects current zoning and recent development trends. While some more intensive development has been occurring adjacent to existing communities and along the Hwy. 61 corridor, significant development has occurred in agricultural areas and along rural arterial corridors on large lots.
- **Corridors:** This growth pattern, which is a slightly modified version of Carroll Tomorrow's conceptual growth plan, focuses development and public infrastructure investment to support that development within the Highway 61

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corridor between Villa Rica and Carrollton and along U.S. Highway 27 between Bremen and Carrollton. While more intensive residential development than allowed by existing zoning will be authorized north and east of Carrollton, significantly less development would be authorized within rural areas of the County currently zoned for agriculture.

- **Centers:** This growth pattern assumes a much greater level of coordination between the County and cities in the management of growth within each city's planned utility service area (USA). Most new development would occur within these USA areas at intensities sufficient to support the development of centralized sewer systems. Rural/agricultural areas would be limited to much lower densities than are authorized today.

4. Summary of Findings

Each of the three scenarios offers distinct advantages and disadvantages. All of the scenarios provide far more development capacity than is needed for the most rapid growth projected for the next 20 years, each can be made consistent with County greenspace initiatives and each can be adapted to serve economic development goals.

The **Rural Residential** scenario has the advantages of requiring little policy change, maintaining existing land use and development expectations and minimizing public infrastructure costs for centralized wastewater systems. However, this scenario is inconsistent with nearly all of the State and County goals because it maximizes consumption of agricultural land; increases public costs for provision most public services, including the two costliest services (roads and schools); inhibits long-term community growth; will lead to greater traffic congestion and air pollution; and will erode the rural character of the County more rapidly than the other growth scenarios.

The **Corridors** scenario reserves the greatest amount of land for economic development; helps retain agricultural areas and the rural character of the County; is consistent with

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most of the State and County growth goals; and provides development opportunities that will facilitate the establishment of a greenway along the Little Tallapoosa River. However, the minimum 20 acre lot size in agricultural areas will reduce development expectations and property values. Additionally, this scenario presumes that community sewer systems would be established throughout the northeastern quadrant of the County, which will require the establishment of administrative functions that don't currently exist. Developments relying on community systems will facilitate conservation subdivision, but will require expertise to: view the design of systems, guarantee ongoing funding for maintenance, operation and replacement of systems, and monitor on-going system operations.

The **Centers** scenario is most consistent with State and County goals and objectives, and will result in the least fiscal impact to the County and its residents. Additionally, this scenario will provide the greatest support for the growth of communities within the County. However, this scenario will require extensive coordination between the cities, the County and other service providers to address growth issues in planned urban service areas. Both this and the Corridors scenarios also will require a strong commitment to offset decreased values in agricultural areas through a variety of compensatory techniques.

There are enough positive and negative aspects of each scenario that none of the scenarios should be embraced in its entirety. When selecting a preferred scenario, the Steering Committee will need to balance competing objectives and establish clear priorities for each development area or "tier" in the County. **(see cover memo for more discussion)**

II. Scenarios Definitions

1. *Process*

The three scenarios were based on historic land use and development patterns and citizen identification of more desirable growth patterns. During the Steering Committee and citizen participation workshops conducted in the Spring of 2002, participants were asked to indicate where future residential growth should occur. The resulting maps were reviewed by the consultant and three clear patterns emerged. The Rural Residential Scenario (**Map 1**) reflects the build-out of the County under current trends and regulations. The Corridor Scenario (**Map 2**) reflects a focus on growth in and between two highway corridors (U.S. 27 and U.S. 61). The Centers Scenario (**Map 3**) reflects a focus on growth within and near existing communities.

After the schematics were developed, they were applied to current parcel data to evaluate the impact of each scenario on the future use of land. **Map 4** illustrates the existing land use according to the County Assessor's Office records. The schematic boundaries overlaid the County Assessor's parcel data and each parcel was analyzed for land use conversion to the future land use of the specific scenario. Existing vacant parcels were assigned future land uses based on the conceptual land use maps.¹ (**Maps 5-7**) illustrate the resulting parcel-specific land use maps on which much of the analysis is based.

2. *Common Assumptions*

The future land use categories are defined in Exhibit 2. This analysis is based on the future land use maps for each of the scenarios and following common assumptions:

- The population is projected to increase by between 50,503 and 84,382.²
- Housing vacancy rates will average 5 percent.

¹ Conservation and Preferential, which are taxation-derived categories rather than land uses, were treated as agriculture and forestry land.

² Based on the 2000 figure (87,268) from the 2000 U.S. Census and the 2020 projections by Chat/Flint RDC and Brown & Caldwell.

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- Average household size will decrease from 2.66 to 2.57 by 2020.³
- Countywide, the number of households is projected to increase by 19,650 to 32,833.⁴
- 80% of vacant residentially zoned land in each city will be presumed to develop at an average of three dwellings per acre, providing capacity for an additional 9,307 dwellings or 24,073 residents, thereby leaving demand for between 10,343 and 23,526 new residents in currently unincorporated areas.
- Most existing development will remain in place, though limited commercial and residential redevelopment will occur in unincorporated areas.
- Centralized wastewater systems will be required for development at densities greater than one dwelling per acre.
- Centralized water service will be required for development at densities greater than one unit per two acres.
- Each household consumes 300 gallons of water per day and generate 250 gallons of wastewater per day.
- Each new single-family household will create an average of 9.8 daily automobile trips.
- 10-year conservation covenants for preferential tax assessments will not be assumed to be renewed.

3. Variables

The following variables are built into the scenarios.

- Land use distributions and densities vary between the scenarios.
- The density of development in rural areas ranges from 1 dwelling units per 20 acres in agriculture areas to an average 4 dwelling units per acre in the mixed-use and USA land use categories. While some higher density projects will occur in portions these areas, this figure represents an average density after deducting for non-residential land uses and undevelopable land.

³ The 2000 Census reported a 2.66 average household size while Woods & Poole Economics, Inc. project an average household size of 2.57 by 2020.

⁴ Calculated by Planning Works, LLC by dividing the projected population growth by the projected average household size.

4. Land Use Scenarios

A. Rural Residential

As previously noted, the Rural Residential Scenario (**Map 5**) depicts development under existing regulatory conditions, with no modifications to existing growth management policies or land use regulations. Under this scenario, population growth would be accommodated through dispersion with large lot rural residential development. In addition to the existing municipalities and the Fairfield PUD, three residential land use categories depict varied land use patterns: Urban Mix, Suburban Residential, Rural Residential. The average development density, measured in dwelling units (du) per acre, of each land use category is shown in **Exhibit 1**.

Exhibit 1: Rural Residential Land Use Category Development Density

Future Land Use Category	Residential Density
Urban Mix	4 du per acre
Suburban Residential	1 du per 2 acres
Rural Residential	1 du per 4 acres

The urban mix has an average residential density of 4 dwelling units per acre, but these areas include a mix of dwelling types and densities, as well as non-residential uses. Commercial and industrial development primarily would occur within the existing city limits, urban mix area, and commercial strips along Highways 61 and 27, though the areas outside the City utility areas would be limited to scattered low-intensity uses. Suburban residential (reflecting the existing R-2 zoning) would continue expanding around existing population centers and near highways radiating from Carrollton. Scattered residential development of agricultural and conservation lands would be consistent with existing zoning standards that establish a minimum 4-acre lot size.

B. Corridors

The Corridors Scenario is built on the premise that future development should occur adjacent to major transportation corridors and existing development. It suggests that future commercial and industrial development should congregate along Highways 61, 27

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and 78 (**Map 6**). Development focused within transportation corridors would require coordinated effort between local governmental jurisdictions to construct and operate infrastructure.

Highway 27 would become the primary employment corridor with varied industrial and heavy commercial uses. Land uses adjacent to Highway 61 would be a mix of residences and businesses. Suburban residential development, preferably designed as conservation subdivisions, would occur in the area east of Highway 27, north of Highway 166 and along both sides of the I-20 and Highway 78 corridors. Rural residential development using on-site wastewater systems (septic tanks) is limited to existing sites and small scattered clusters in agricultural areas. Agricultural and rural lands are retained west of the Highway 27 corridor and south of Highway 166 through density reductions in agricultural zones. The land use categories specified for this scenario include Employment/Industrial, Commercial/Mixed-Use, Suburban Residential, Rural Residential and Agriculture. The density of residential development for each land use category is shown in **Exhibit 2**.

Exhibit 2: Corridors Land Use Category Development Density

Future Land Use Category	Residential Development Potential
Employment/Industrial	None
Commercial/Mixed-Use	4 du per acre
Suburban Residential	1 du per 2 acres
Rural Residential	1 du per 4 acres
Agriculture	1 du per 20 acres

C. Centers

The Centers Scenario views cities as the focal point for future development through a combination of in-fill and annexation. Capital improvements would be concentrated within the existing city limits and Urban Service Areas (USAs), which are planned for centralized municipal water and wastewater services within the next 20 years. Most development would occur within or adjacent to existing city limits with the most intense development occurring along highway corridors. Rural residential development would

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be limited to existing sites and scattered conservations subdivisions in agricultural areas. Agriculture land is retained throughout the County. Industrial and commercial development would be directed to the Urban Service Areas and at existing locations. The land use categories specified for this scenario include Urban Services Areas (urban mix), Suburban Residential, Rural Residential and Agriculture. The residential development density of these land use categories is shown in **Exhibit 3**.

Exhibit 3: Centers Land Use Category Development Density

Future Land Use Category	Residential Development Potential
Urban Service Areas	4 du per acre
Suburban Residential	1 du per 2 acres
Rural Residential	1 du per 4 acres
Agriculture	1 du per 20 acres

III. Scenarios Analysis

1. *Analysis Approach*

This analysis consists of qualitative and quantitative critique of the three scenarios, which will be summarized for comparison on the following factors: Community Character, Agricultural Operations, Land Use Mix, Population Distribution, Carrying Capacity, Housing Opportunities, Employment Opportunities, Transportation System, Water and Wastewater Needs, School Demands and Emergency Service Impacts.

A. **Community Character**

This qualitative factor describes the relationships between land uses and the character of different areas of the County. For this analysis, character includes density, unit types, dispersion and mix of land uses. Prior to plan adoption, the County should address other character issues, including green spaces, street system layout and site design factors.

Scenario 1: Rural Residential - The built environment under this scenario is characterized by:

- **Widely scattered residences in rural areas.** Rural residences occupying lots of 4 acres or larger will be scattered throughout existing farm, pasture and timber lands. Existing expanses of undeveloped, timber or agricultural land would be dotted with homesteads whose residents typically would work in towns and cities.
- **Lack of visual distinction between the communities and surrounding suburban residential development.** Cities will lack clearly defined edges as rural areas transition to suburban residential at the fringes of cities. Suburban residential development on septic systems will surround existing communities. As the cities grow, it will be increasingly difficult to annex land. Any significant planned annexation would impact a large number of rural residential landowners who rely on CCWA water and on-site septic systems. Suburban residents likely will oppose annexation. Land fragmentation will make it difficult to justify extending public utilities to low

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density residential development or even scattered development at higher densities on the city fringe. Land fragmentation also will tend to isolate subdivisions and make road connections between neighborhoods more difficult to achieve. This will tend to reduce residents' access to public facilities and services.

- **Fragmented residential development in urban mix areas.** The lack of cohesion between suburban residential development on septic systems that are reviewed by the County and residential development relying on cities' centralized services will result in poor connectivity between developments and
- **Commercial development within cities and along the existing commercial strips (Highways 61, 27 & 78).** Small scale scattered commercial development will locate along these highway corridors. Larger scale commercial projects generally require centralized sewer systems and will be located within cities.
- **Industrial development focused within cities and at the edges of cities having convenient access to centralized sewer.** While there may be some pressure for lower end industrial uses in outlying areas, any significant employment base will require centralized sewer services available within or at the edges of cities.

Scenario 2: Corridors – The built environment under this scenario is characterized by:

- **Open feel of agricultural areas with very low density development** at one dwelling per 20 acres. This increases the entry cost of a non-farm rural residence, which means that most rural homes will tend to be larger, up-scale housing. The lower densities will reduce the number of subdivisions and favor long-term, farming, ranching, timber and other resource-based land uses.
- **Rural Residential development limited to infill of existing subdivisions and out-parcels in rural/agricultural areas.** The limited supply of existing

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rural lots will limit the amount of rural residential development in the southeastern, southern and western portions of the County.

- **Scattered Suburban Residential development clusters throughout the northeastern quadrant of the County.** These areas will consist of a mix of conventional low density and conservation subdivisions that are served by community sewer systems and linked by a connected greenways. Both conventional and conservation subdivisions provide a mix of residential unit types. New development along the Highway 13 and 166 corridors will be buffered from the roadway to retain the corridors' rural character, despite the suburban densities (2 dwellings per acre) adjacent residential development.
- **Mixture of industrial and heavy commercial uses providing employment opportunities along Highway 27 between Carrollton and Bremen.** Development in the corridor will be linked to the extension of municipal sewer service, and thus is likely to occur in a relatively sequential pattern. To retain the capacity and safety of the highway, development will be accessed by a combination of widely-spaced side roads, frontage roads and parallel collectors, which will foster a business park character in much of the corridor.
- **Mix of residential and commercial uses in the Highway 61 corridor between Villa Rica and Carrollton,** with commercial development focused near major intersections. As with the Highway 27, the larger scale development will be located closer to the cities where municipal sewer services are available. In areas without centralized services, small scale commercial development would be located near intersections.

Scenario 3: Centers - The built environment under this scenario is characterized by:

- **A combination of very low density development and small clusters of houses to retain open feel in agricultural areas.** Existing agriculture and timber lands will remain largely undeveloped, with the exception of a new residential community in the southeast portion of the County. Homes in these areas will be limited to 20 acre parcels unless clustered, with sufficient

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agricultural lands are set aside in conservation easements to retain the base density of 1 dwelling per 20 acres.

- **Rural Residential development limited to infill of existing parcels in agricultural and timber areas.** No new rural residential subdivision is anticipated in this scenario
- **Suburban residential development in a new, predominantly residential community in the southeastern quadrant of the County.** This predominantly residential community would be established in near the County's new reservoir on existing timber lands. Some neighborhood commercial and service uses will be developed on the site.
- **Most new development within existing cities and in designated urban service areas (USAs).** Most of this development will be tied to municipal wastewater systems, which will result in phased development radiating out from the cities of Villa Rica, Temple, Bremen, Bowdon and Carrollton. Residential development will include a mix of dwelling types at varied densities. The coordination of development with wastewater systems is likely to result in well-coordinated, well-connected street systems and better access to city services. Non-residential development will tend to be located along highway corridors and will be buffered from low density development by moderate to high density residential development.

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Exhibit 4: Summary of Community Character

Scenario 1: Rural Residential	Scenario 2: Corridors	Scenario 3: Centers
<ul style="list-style-type: none"> < Widely scattered residences in rural areas. < Lack of visual distinction between the communities and surrounding suburban residential development. < Fragmented residential development in urban mix areas. < Commercial development within cities and along existing commercial strips (Highways 61, 27 and 78). < Industrial development focused within cities and at edges of cities having convenient access to centralized sewer. 	<ul style="list-style-type: none"> < Open feel of agricultural areas with very low density development. < Limiting Rural Residential development to infill of existing subdivisions and out-parcels in rural/agricultural areas. < Scattered Suburban Residential development clusters dominating northeastern quadrant of County. < Locating a mixture of industrial and heavy commercial uses providing employment opportunities along Highway 27 between Carrollton and Bremen. < Including a mix of residential and non-residential uses in the Highway 61 corridor between Villa Rica and Carrollton. 	<ul style="list-style-type: none"> < A combination of very low density development and small clusters of houses in agricultural areas. < Limiting Rural Residential development to infill of existing parcels in agricultural and timber areas. < Suburban residential densities in a new, predominantly residential community to be established in southeastern quadrant of County. < Most new development occurring within existing cities and in designated urban service areas (USAs).

B. Agricultural and Timber Operations

The long-term viability of agriculture and timber operations is influenced by many factors internal and external to the County. The internal factors most directly influenced by the scenarios are the fragmentation of the land base, land use compatibility and the availability of local agriculture support services. Excessive land fragmentation makes it difficult to purchase or lease land areas that are large enough for efficient agriculture operations. Land fragmentation often is accompanied with the proliferation of rural residential uses that are incompatible with commercial agriculture. New rural residents frequently complain about the noises, odors, dust, lights, hours of operations and/or large, slow traffic generated by agricultural operations. In many cases, the residents who move to agricultural areas for the pastoral setting create the greatest obstacles to continued farming and ranching.

Conversion of land from agriculture or timber to other uses erodes the local tax base. While farms and ranches typically generate fairly modest revenue on a per acre basis, their service costs generally are lower than their taxes. In cost of service analyses

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conducted throughout the country, agricultural lands generate revenues that exceed public service costs, while the costs of service for residential development generally exceed revenues.

Additionally, the reduction of agricultural land erodes tax revenues and employment from businesses involved in agricultural support, such as processing, packaging, marketing, equipment sales and financing of agricultural products. As agricultural operations diminish, support businesses must either relocate, close or find new markets.

Scenario 1: Rural Residential – This scenario is likely to have the following impacts on agriculture:

- **Fragmentation of agricultural and timber holdings reduces land supply.**
The existing 4 acre minimum lot size for rural areas will reduce land availability for efficient farm, ranch and timber operations in Carroll County. If population growth is accommodated on 4 acre lots, the agriculture and timber land bases will be whittled away, reducing the supply of land for purchase or rent land and increasing the difficulty of meeting the “economies of scale” necessary for efficient agricultural and timber production.
- **Residences interfere with normal agricultural and timber operations.**
The industrialized nature of modern agriculture generates dust, smoke, odors, noise, light, and large machinery traffic that typically generate complaints by adjacent non-farm residents. Complaints by rural residents often force farmers and ranchers to alter operations to minimize nuisances, which hinders efficient agriculture production. In extreme cases, farmers may be ordered to abate nuisances subsequent to successful legal challenges.
- **Reduced agricultural operations will hurt agricultural support businesses.** As a result of rural residential encroachment on agriculture land, the number of viable farms will decrease along with the amount of land in production. This will reduce incomes for businesses that directly or indirectly support agricultural operations. Feed and seed dealers, implement sales and repair, commodity storage, processing, packaging and lending businesses will

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lose traditional agricultural business. This also will reduce sales tax revenues for local governments.

Scenario 2: Corridors – This scenario is likely to have the following impacts on agriculture:

- **Most existing agricultural and timber lands in the south and west parts of the County will be retained.** Approximately 209,435 acres of agricultural and timber lands are planned for agricultural or timber operations in this scenario. With minimum lot sizes increased to 20 acres, relatively few new non-farm dwellings would be constructed in these areas of the County other than on existing parcels.
- **Limited development potential will reduce agricultural land values and increase values of existing rural residential parcels.** The reduction in development potential from 1 dwelling per 4 acres to 1 dwelling per 20 acres will constrain the supply of rural residential property. This will increase land costs for available rural residential homes and tracts, thus increasing the overall value of new and existing rural residences. The value of raw agricultural land likely will decrease, which may impair farmers' and ranchers' ability to borrow money needed for operations because land value is their primary collateral.
- **Virtually all agricultural land in the northeastern part of the County will be converted to suburban resident development.** Most new population growth will be concentrated in the northeastern part of the County where growth pressures are greatest. Isolated parcels will continue to be used for a variety of farming, ranching and timber operations but the combination of increasing land values and residential encroachment will reduce their long-term viability for these purposes.
- **Relatively small proportion of County growth to occur in agricultural areas.** Similar to Corridors scenario, the Centers scenario would allow for minimal residential development in the agriculture areas resulting in the

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benefits to agriculture already mentioned. The maximum build out within the agriculture use category is 3,780 dwellings on 75,596 vacant agriculture acres.

Scenario 3: Centers – This scenario is likely to have the following impacts on agriculture:

- **Most agricultural lands in the southern and western parts of the County will be retained.** Approximately 209,159 acres of land is planned for agricultural or timber operations, virtually the same areas as established under the corridors scenario. Unlike the corridors scenario, opportunities for conservation subdivisions in these agricultural areas will allow the creation of rural residential development. In addition to being buffered from existing agricultural operations, conservation subdivisions will be required to reserve permanent agricultural space or contribute to a mitigation fund to retain agricultural lands and green space.
- **A new residential community in the southeastern portion of the County will reduce existing timber lands by 5,811 acres.** This alternative assumes that a new residential community will be developed that is more than twice the size of the Fairfield PUD will include a mix of unit types and neighborhood scale retail and service uses. This new development will be located on existing timber lands east of the Carroll County Water Authority's (CCWA) reservoir and south of Highway 166.
- **Agricultural land near cities will be developed as utilities are extended into Urban Service Areas.** Under this scenario, all development near cities will occur on centralized water and sewer systems, resulting in a more contiguous growth pattern. While farm land will be converted, the phasing of development with utility extensions will minimize leap-frog development and pressures for premature conversion of agricultural lands.
- **Relatively small proportion of County growth to occur in agricultural areas.** Similar to Corridors scenario, the Centers scenario would allow for minimal residential development in the agriculture areas resulting in the

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benefits to agriculture already mentioned. The maximum build out within the agriculture use category is 3,578 dwellings on 71,555 vacant agriculture acres.

Exhibit 5: Summary of Agricultural Operations

Scenario 1: Rural Residential	Scenario 2: Corridors	Scenario 3: Centers
<ul style="list-style-type: none"> < Land fragmentation reduces the viability of agriculture in the County; < Up to 16,315 new homes in rural/ag areas; < Significant conflicts between agriculture and encroaching residential development; < Reduced private investment in agriculture facilities; and < Loss of jobs in agriculture support businesses. 	<ul style="list-style-type: none"> <209,435 acres of agricultural land retained; <Build out of 3,780 new homes in the agricultural area; <Minimal land fragmentation and land use conflicts; <Retention of jobs in agriculture support businesses; <Agriculture land in a large contiguous region in the west, south and southeast parts of the County. 	<ul style="list-style-type: none"> < 209,159 acres of agricultural land retained; < Build out of 3,578 new homes in the agricultural area; < Minimal land fragmentation and land use conflicts; < Retention of jobs in agriculture support businesses; < Large retained AG land to the south, west and southeast; < Conservation subdivisions allow some additional rural residential development < Loss of timber land to new residential community in southeast Carroll County.

C. Land Use Mix and Carrying Capacity

The land use mix directly relates to the future demand for public services, housing opportunities, the supply and location of commercial and industrial sites, and future transportation choices.

Scenario 1: Rural Residential – As shown in **Exhibit 6**, this scenario assumes that most of the County’s growth will occur on rural residential lots and in low density suburban areas outside existing cities. Rural residential would be scattered throughout the 56% of the unincorporated area of Carroll County on four-acre lots in accordance with existing zoning. As shown in **Exhibit 7**, more than 16,000 homes could be accommodated under this zoning. An additional 50,410 homes could be accommodated in the 25,205 acres of suburban residential development at an average density of 2 dwellings per acre. The Urban Mix zone would house an additional 12,364 dwellings on 3,091 vacant acres near existing communities.

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Exhibit 6: Rural Residential Scenario Land Use Mix

Rural Residential Land Use Categories	Total Acreage	Percent of Total Acreage	Vacant Acreage	Percent of Vacant Acreage
Quasi-Public (exempt)	3,592	1.16%	0	0.00%
Industrial	497	0.16%	0	0.00%
Commercial	2,219	0.72%	0	0.00%
Fairfield	2,091	0.68%	853	0.81%
Incorporated	33,108	10.72%	11,210	10.61%
Rural Residential	173,624	56.22%	65,258	61.79%
Suburban/residential	85,046	27.54%	25,205	23.86%
Urban Mix	8,625	2.79%	3,091	2.93%
Totals	308,802		105,617	

Source: Planning Works, LLC

The Rural Residential scenario accommodates 79,088 dwelling units (69,721 in unincorporated areas), 2 to 4 times the projected dwellings needed to accommodate projected population growth over the next 20 years.

Exhibit 7: Rural Residential Scenario Dwelling and Population

Rural Residential Land Use Categories	Vacant Acreage	Dwelling Density	Residential Development Potential	Estimated Additional Population
Fairfield	853	2 per acre	1,706	4,384
Incorporated	3,903	3 per acre	9,367	24,074
Rural Residential	65,258	1 per 4 acres	16,315	41,928
Suburban/residential	25,205	1 per 2 acres	50,410	129,553
Urban Mix	3,091	4 per acre	12,364	31,775
Totals	105,617		79,088	231,715

Source: Planning Works, LLC

Scenario 2: Corridors – The Corridors scenario concentrates residential, commercial and industrial uses in the northeast quadrant of the County, from Villa Rica southwest to Carrollton. As shown in **Exhibit 8** this scenario emphasizes commercial and industrial development, reserving 856 vacant acres for industrial uses in the Highway 27 Corridor and 1,506 vacant acres of land for commercial mixed use, primarily in the Highway 61 and Highway __ corridors. Additional commercial and industrial development would occur on available city sites. New housing construction would occur in Suburban Residential, Agriculture and Commercial/Mixed Use areas. As

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shown in **Exhibit 9**, the Suburban Residential category could accommodate 31,194 new dwellings on 15,597 acres in the northeast quadrant of the County . Up to 3,780 dwellings could be constructed in Agricultural and Timber areas. The commercial/mixed use corridors could accommodate up to 6,023 dwellings.

Exhibit 8: Corridors Scenario Land Use Mix

Corridors Land Use Categories	Total Acreage	Percent of Total Acreage	Vacant Acreage	Percent of Vacant Acreage
Agricultural	209,435	67.82%	75,596	71.58%
Quasi-Public (exempt)	3,592	1.16%	0	0.00%
Fairfield	2,091	0.68%	853	0.81%
Incorporated	33,108	10.72%	11,210	10.61%
Employment/Industrial	3,441	1.11%	856	0.81%
Mixed Use	6,453	2.09%	1,506	1.43%
Suburban/Residential	50,683	16.41%	15,597	14.77%
Totals	308,803		105,618	

Source: Planning Works, LLC

Exhibit 9: Corridors Scenario Dwelling and Population

Corridors Land Use Categories	Vacant Acreage	Dwelling Density	Residential Development Potential	Estimated Additional Population
Fairfield	853	2 per acre	1,706	4,384
Incorporated	3,903	3 per acre	9,367	24,074
Agriculture	75,596	1 per 20 acres	3,780	9,714
Mixed Use	1,506	4 per acre	6,023	15,478
Suburban Residential	15,597	2 per acre	31,194	80,170
Totals	84,362		52,070	133,820

Source: Planning Works, LLC

The Corridors scenario accommodates 52,070 dwelling units (42,703 in unincorporated areas), 1.6 to 2.6 times the projected dwellings needed to accommodate projected population growth over the next 20 years.

Scenario 3: Centers – This scenario focuses most residential, commercial and industrial development in urban service areas (USAs) surrounding communities. As shown in **Exhibit 10**, the USAs encompass 52,326 acres, of which 17,059 acres currently are vacant. These areas will be developed for a mix of uses at intensities that require connection to municipal water and sewer systems, including up to 68,236 dwellings. An additional feature of this scenario is the development of a new

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residential community in the southeastern quadrant of the County on existing timber lands. As shown in **Exhibit 11** his development is expected to include up to 9,880 dwellings of various types, along with neighborhood services and retail opportunities required. The remaining agricultural and timber areas in the County would accommodate up to 3,578 dwellings.

Exhibit 10: Centers Scenario Land Use Mix

Centers Land Use Categories	Total Acreage	Percent of Total Acreage	Vacant Acreage	Percent of Vacant Acreage
Agricultural	209,159	67.73%	71,555	67.75%
Commercial	2,220	0.72%		0.00%
Quasi-Public (exempt)	3,592	1.16%		0.00%
Industrial	497	0.16%		0.00%
Fairfield	2,091	0.68%	853	0.81%
Incorporated	33,108	10.72%	11,210	10.61%
Urban Service Areas	52,326	16.94%	17,059	16.15%
New Residential Community	5,811	1.88%	4,940	4.68%
Totals	308,804		34,062	

Source: Planning Works, LLC

The Centers scenario accommodates 92,768 dwelling units (83,401 in unincorporated areas), 2.8 to 4.7 times the projected dwellings needed to accommodate projected population growth over the next 20 years.

Exhibit 11: Centers Scenario Dwelling and Population

Centers Land Use Categories	Vacant Acreage	Dwelling Density	Residential Development Potential	Estimated Additional Population
Fairfield	853	2 per acre	1,706	4,384
Incorporated	3,903	3 per acre	9,367	24,074
Agriculture	71,555	1 per 20 acres	3,578	9,195
Urban Service Area	17,059	4 per acre	68,236	175,368
New Residential Community	4,940	2 per acre	9,880	25,392
Totals	98,310		92,767	238,413

Source: Planning Works, LLC

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Exhibit 12: Summary of Land Use Mix

Scenario 1: Rural Residential	Scenario 2: Corridors	Scenario 3: Centers
<ul style="list-style-type: none"> < Most vacant land reserved for rural residential < Commercial/Industrial development limited to cities and urban mix areas < Accommodates far more residential development than needed < Limited infill potential after build-out < No land reserved for agricultural or timber uses 	<ul style="list-style-type: none"> < Most vacant land reserved for agricultural and timber uses < Industrial growth in Highway 27 corridor < Commercial development in Highway 61 corridor < Accommodates less residential development than other scenarios, but more than needed < Retains more agricultural land than other scenarios 	<ul style="list-style-type: none"> < Most vacant land reserved for agricultural and timber uses < Industrial and commercial growth focused in urban service areas < Residential growth focused in USAs and in new residential community in southeast Carroll County < Accommodates more residential growth than other scenarios

D. Housing Opportunities

Shelter is a basic human necessity and the need for housing is as diverse as the population. While housing diversity, quality and affordability can be influenced by local governments through a wide range of regulatory and fiscal methods, the three scenarios are limited to descriptions of distinct land use patterns. This confines the analysis of the growth scenarios to the impact that the three hypothetical land use patterns would have on housing quantity and affordability.

Even without considering the potential for infill at densities greater than historical development patterns, each scenario provides far more residential development potential than needed. This lack of land supply constraints means that market demand will be the key determinant in housing costs in each scenario. Differences between the scenarios will be due to infrastructure costs, densities and minimum lot sizes.

In addition to market demand, infrastructure costs, density and minimum lot sizes affect housing costs and development opportunities. Centralized sewer system construction increases development costs, which may be reflected in higher unit costs for low-density single family units. This cost can be more than offset by gains from the number of units that can be supported per acre on sewer systems. In general, higher density housing is more affordable because land costs are lower per home. Conversely, large minimum lot sizes tend to increase unit costs.

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Scenario 1: Rural Residential – Under this land use scenario, home construction would occur in densities ranging from 1 dwelling per 4 acres (Rural Residential) to 4 dwelling units per acre (Urban Mix). Although the Rural Residential land use would accommodate 7,945 more homes than the Urban Mix category, land consumption under the Rural Residential (83,301 acres) would be 16 times greater per home than the Urban Mix. Rural residential areas are likely to include a mix of site-built and manufactured homes. Though the large minimum lot sizes will favor higher end development, fragmented large lot development patterns will result in a wide range of quality, cost and construction types. Because improvement costs will be minimal, lower cost units will be developed where land prices are lowest. .

Suburban residential development at 1 du per 2 acres contributes an addition 4,967 dwellings on 9,934 acres. These homes will consist of moderate to upper end single-family detached dwellings. Higher per acre land costs and infrastructure costs will tend to increase the costs of these units over time. For developments that provide on-site community wastewater systems, a greater variety of unit types may be developed, but at 2 dwellings per acre, the high cost of sewers will limit development to the upper end of the market.

The Urban Mix district will provide numerous housing choices. The affordability of housing will be limited by land costs and allowable densities. Development within the urban mix would require centralized water and wastewater services and so it is assumed that these areas would be annexed into a city prior to receiving services. While average densities are presumed to be 4 dwellings per acre, much higher densities for individual sites could provide affordable units. .

Scenario 2: Corridors -

Residential development within the Corridors scenario is provided in three areas: the Commercial Mix, Suburban Residential area and the Agricultural area. The number of residential building sites in the agricultural area would be limited due to the

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minimum 20 acre per lot size. Two types of homes will constitute the bulk of new rural residences in the Agricultural area. Expensive homes will be built on large acreage by those who can afford 20 acres, much of which may be leased back to a farmer or rancher for production. Manufactured homes will be placed on some large rural parcels where individuals desire a rural lifestyle, but lack sufficient capital for a site-built home. By constraining the supply of rural land for residential units, this scenario will reduce the affordability of rural residences.

The Suburban Residential category would accommodate most of the new residential development. These homes will consist of moderate to upper end single-family detached homes. Land prices will likely be higher per acre than in the Rural Residential area, although the total cost per ½ acre building lot will be lower in the total price of a 20 acre rural lot. The requirement for community sewer systems will increase the cost per unit. While allowing for a greater range of unit types, suburban residential development is unlikely to provide significant affordable housing. The commercial mix area will provide opportunities for multi-family development in a variety of price ranges. Given the proximity to the Highway 61 corridor, most of the higher-density development in the corridor is likely to be relatively affordable.

Scenario 3: Centers – New residential development in this scenario will be focused within and adjacent to the existing cities. Homes within the Urban Service Area will exhibit diversity in type, size, density, and price. This presumption is dependent on the cities' willingness to extend sewer and water services into USAs.

Agricultural areas will be treated similarly to the corridors scenario, except that conservation subdivision will allow the creation of smaller residential lots. This gives greater value to agricultural land without requiring the sale of productive acreage.

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Exhibit 13: Summary of Housing Opportunities

Scenario 1: Rural Residential	Scenario 2: Corridors	Scenario 3: Centers
<ul style="list-style-type: none"> < Scenario accommodates more than projected demand. < Mix of single family housing on 4-acre rural lots; < Suburban residential units provide moderate to high-end housing. < Homes in the Urban Mix provide mix of unit types and prices. 	<ul style="list-style-type: none"> < Scenario accommodates more than projected demand. < Suburban residential homes would likely serve upper end of the market due to sewer requirements. < Homes built in the agriculture area will mix expensive and manufactured homes. < Commercial mix provides opportunity for affordable housing. 	<ul style="list-style-type: none"> < Scenario accommodates more than projected demand. < Most new dwelling to be developed in the cities or USAs. < Provides opportunity for greatest diversity of housing types. < Conservation subdivision provides greater opportunity for clusters of high end housing in a rural setting.

E. Employment Opportunities

One of the key objectives of the planning process is to improve employment opportunities within the County. To accomplish this, the County will need to attract more higher paying, stable jobs. A wide range of factors will determine the attractiveness of the County for economic growth, including land supply, quality of life, labor force, taxes, utilities, transportation infrastructure, and others. The scenarios address the land supply and, to a lesser extent, the quality of life.

Scenario 1: Rural Residential – This scenario assumes that economic growth primarily will happen within the cities or in the developing areas around the cities. By failing to identify and protect additional land for economic growth, this scenario fails to protect potential economic development sites from encroachment by residential development. This effectively limits the County’s economic growth to areas within existing city limits.

Scenario 2: Corridors – This scenario identifies employment corridors along portions of Highways 27 and 166. By clearly identifying potential economic development areas this scenario will help protect potential economic development sites from residential encroachment. Additionally, by limiting residential development in agricultural areas, the scenario retains more options for economic development sites than the Rural Residential scenario.

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Scenario 3: Centers – This scenario limits retains opportunities for future development of agricultural areas that are similar to the corridors scenario. However, unless more specific land use categories are assigned within USAs, these areas would be subject to the scattered residential development that would limit future industrial development opportunities.

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Exhibit 14: Summary of Employment Opportunities

Scenario 1: Rural Residential	Scenario 2: Corridors	Scenario 3: Centers
<ul style="list-style-type: none"> < Assumes most economic growth will occur within cities < Fails to protect extra-territorial industrial development sites 	<ul style="list-style-type: none"> <Protects two economic development corridors from residential encroachment <Retains agricultural areas for future economic expansion areas 	<ul style="list-style-type: none"> < Assumes that economic growth will occur within cities or USAs, but does not specifically protect sites in those areas < Retains agricultural areas for future economic expansion areas

F. Transportation Needs

Carroll County’s residents currently are almost exclusively reliant on automobiles for mobility within the County and region. As an increasing percentage of County residents live in lower density unincorporated areas (60.8% in the year 1990 compared with 65.2% in the year 2000), auto dependency increases and the feasibility of transit or other modes of transportation decrease. This section analyzes the different transportation system demands, focusing on the amount of driving residents will face and related transportation system costs. The analysis is based on the residential mixes discussed earlier in this report, as well as travel and cost assumptions derived from national studies. Analysis of energy consumption, air pollution and modal choices are qualitative.

Population Distribution. For purposes of the Transportation analysis, projected population distribution is assumed to be proportional to the relative availability of vacant property in each residential category. For example, since 18% of development capacity is located in the rural residential area in the Rural Residential Scenario, then that area will be assumed to absorb 18% of residential growth through the year 2020. **Exhibit 15** shows growth trends for the last five years in Carroll County and the assumed proportion of growth in each Scenario.

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Exhibit 15: Projected Population Distribution

Residential Dwellings Built 1997 through 2002

	# greater than 4 acres	% greater than 4 acres	# between 0.5 and 4 acres	% between 0.5 and 4 acres	% less than 0.5 acres	# less than 0.5 acres	Total	% of Total
Unincorporated	1,272	20.58%	3,666	59.32%	1,242	20.10%	6,180	50.76%
Bowdon	16	8.08%	140	70.71%	42	21.21%	198	1.63%
Bremen	0	0.00%	1	100.00%	0	0.00%	1	0.01%
Carrollton	6	0.47%	477	37.18%	800	62.35%	1,283	10.54%
Mt Zion	11	10.09%	97	88.99%	1	0.92%	109	0.90%
Roopville	10	27.03%	21	56.76%	6	16.22%	37	0.30%
Temple	13	3.17%	138	33.66%	259	63.17%	410	3.37%
Villa Rica	15	3.21%	168	35.97%	284	60.81%	467	3.84%
Whitesburg	5	10.00%	32	64.00%	13	26.00%	50	0.41%
Totals	1,348		4,740		6,088		12,176	

Proportion of Dwellings Under Each Scenario

	Agricultural	Rural	Suburban	Urban
Last 5 Years	8.08%		70.71%	21.21%
Rural Residential	0.00%	18.10%	57.80%	24.10%
Corridors	7.26%	0.00%	63.18%	29.56%
Centers	3.86%	0.00%	12.49%	83.65%

Vehicle Miles Traveled (VMT). Exhibit 16 shows the average density of each residential category, the proportion of growth projected in each residential category, the projected number of new households in each category, and the projected vehicle miles to be traveled under each scenario. The Rural Residential scenario will generate 36 percent more VMT than the Centers scenario and 20 percent more than the Corridors scenario. More VMT translates into greater energy consumption, greater road maintenance costs, more air pollution and longer commute times. Based on the American Automobile Association's 1995 average private cost of vehicle ownership study (\$0.41 per VMT), Carroll County's new residents under the Rural Residential scenario will pay between 37.7 and 63.1 million dollars⁵ per year more than under the Centers scenario between 9.4 and 16.0 million dollars more than under the Corridors scenario for automobile operation.

⁵ These costs are expressed in 1995 dollars and do not presume changes in automobile operations costs.

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Exhibit 16: Vehicle Miles Traveled

	Residential Land Use								Total	
	Ag		RR		SR		UR			
Average Density	0.05		0.25		2		4			
Rural Residential Scenario										
% of Growth	0.00%		18.10%		57.80%		24.10%		100%	
Projection	Low	High	Low	High	Low	High	Low	High	Low	High
# of HH	0	0	3,556	5,941	11,358	18,978	4,736	7,913	19,650	32,833
Avg VMT/HH	0	0	30,000	30,000	22,000	22,000	16,000	16,000		
Total VMT - millions	0	0	107	178	250	418	76	127	432	722
Corridors Scenario										
% of Growth	7.26%		0.00%		63.18%		29.56%		100%	
Projection	Low	High	Low	High	Low	High	Low	High	Low	High
# of HH	1,426	2,383	0	0	12,416	20,745	5,808	9,704	19,650	32,833
Avg VMT/HH	30,000	30,000	30,000	30,000	22,000	22,000	16,000	16,000		
Total VMT - millions	43	72	0	0	273	456	93	155	409	683
Centers Scenario										
% of Growth	3.86%		0.00%		12.49%		83.65%		100%	
Projection	Low	High	Low	High	Low	High	Low	High	Low	High
# of HH	758	1,266	0	0	2,454	4,101	16,438	27,466	19,650	32,833
Avg VMT/HH	30,000	30,000	30,000	30,000	22,000	22,000	16,000	16,000		
Total VMT - millions	23	38	0	0	54	90	263	439	340	568

Road Construction Costs. Exhibit 17 projects the relative costs for construction of local and collector streets under each scenario. The Rural Residential scenario would require 199 to 332 million dollars more for local and collector road construction than the Centers scenario and 161 to 269 million dollars more than the corridors scenario. These costs are based on average frontage at for each residential category except agriculture. At one dwelling per 20 acres, these units are presumed to be located on existing roads or to access those roads from private drives. The costs shown in the table include both public and private construction costs, the latter of which are likely to constitute the majority because developers typically are required to construct all internal subdivision streets. However, the proportion of the public costs is likely to be somewhat higher for the Rural Residential scenario because a greater proportion of the development in rural areas will trigger the need to pave existing roads, both on and off-site.

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Exhibit 17: New Local and Collector Road Construction Costs

Lane-Feet of Frontage per Household

Agriculture	0
Rural Residential	300
Suburban Residential	100
Urban Residential	60

New Lane Miles of Road Required by New Development

	Rural Residential		Suburban Residential		Urban Residential		Total Lane Miles	
	Low	High	Low	High	Low	High	Low	High
	Rural Res.	202	338	215	359	90	150	507
Corridors	0	0	235	393	66	110	301	503
Centers	0	0	46	78	187	312	233	390

Construction Costs per Lane-Mile (in \$ Millions)

Rural Cross Section	\$0.75
Suburban Cross Section	\$1.00
Urban Cross Section	\$1.25

Construction Costs for Each Scenario (in \$ Millions)

	Rural Residential		Suburban Residential		Urban Residential		Total Costs	
	Low	High	Low	High	Low	High	Low	High
	Rural Res.	\$152	\$253	\$215	\$359	\$112	\$187	\$479
Corridors	\$0	\$0	\$235	\$393	\$82	\$138	\$318	\$531
Centers	\$0	\$0	\$46	\$78	\$233	\$390	\$280	\$468

Road Maintenance Costs. Exhibit 18 projects additional road maintenance costs attributed to new growth in each scenario based on the assumptions that paved roads cost an annual average of \$1,500 per lane mile. By the year 2020, the Rural Residential scenario is projected to generate additional road costs of between 0.76 and 1.27 million dollars per year to maintain roadways attributable to new development, in comparison to between 0.45 and 0.75 million dollars for the corridors scenario and between 0.35 and 0.58 million dollars for the centers scenario.

Modal Choices. While the vast majority of trips over the next 20 years are likely to be automobile-based under each of the scenarios, the modal choices available under the scenarios are distinct. Under the Rural Residential or Corridors scenario, the vast majority of new residents will have little choice to bicycle or walk to stores, work or community facilities. The densities, compactness and mix of uses in the Centers scenario provide opportunities to serve bicyclists and pedestrians. Additionally, both the

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Corridors and Centers scenarios provide the greatest opportunities to develop viable transit in the County. None of the scenarios currently proposes high enough densities to support light rail service, but, with proper protection of station sites, either the Corridors or Centers scenarios could be adapted to support either light rail or commuter rail.

Exhibit 18: New Local and Collector Road Maintenance Costs

New Lane Miles of Road Required by New Development

	Rural Residential		Suburban Residential		Urban Residential		Total Lane Miles	
	Low	High	Low	High	Low	High	Low	High
Rural Res.	202	338	215	359	90	150	507	847
Corridors	0	0	235	393	66	110	301	503
Centers	0	0	46	78	187	312	233	390

Average Annual Maintenance Cost per Lane Mile \$1,500

Annual Increase in Maintenance Costs by Year 2020 (in \$Millions)

	Rural Residential		Suburban Residential		Urban Residential		Total Cost	
	Low	High	Low	High	Low	High	Low	High
Rural Res.	\$0.30	\$0.51	\$0.32	\$0.54	\$0.13	\$0.22	\$0.76	\$1.27
Corridors	\$0.00	\$0.00	\$0.35	\$0.59	\$0.10	\$0.17	\$0.45	\$0.75
Centers	\$0.00	\$0.00	\$0.07	\$0.12	\$0.28	\$0.47	\$0.35	\$0.58

Exhibit 19: Summary of Transportation Impacts

Scenario 1: Rural Residential	Scenario 2: Corridors	Scenario 3: Centers
< Costliest in terms of commuting times, road improvements, road maintenance, private travel costs and environmental impacts	< Falls between the Rural Residential and Centers scenario in all measures except viability for transit < Support for transit similar to Centers scenario	< Lowest public and private transportation costs < Least negative environmental impact < Provides best options for pedestrians and bicyclists

G. Water and Wastewater Impacts

The following comparison of water and wastewater costs addresses construction costs for both public (centralized) and private (well and septic system) improvements. Projected improvement costs are based on national averages, actual costs will vary from site to site within the County. No effort has been made to distinguish between system providers (e.g., Carroll County Water Authority and individual municipal systems).

The water and wastewater impacts of the scenarios can be divided into public and private costs, though costs typically are borne by the end user. However, the impacts of those

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costs are passed along to the consumers in different ways. For users of centralized systems, the developer includes the costs of construction those systems in the basis for the lot. Generally, the product cost (lot and home) ranges from four to five times the lot cost. For users of wells and/or septic systems, these costs are not included in the lot costs, so a developer/builder may produce a lower cost unit. In each case the end user spreads capital costs over the life of mortgage.

Capital Costs. Exhibit 20 compares the relative capital costs of systems for new users in the currently unincorporated portions of the County for each land use category under each scenario. The analysis shows relatively minor differences in total costs. However, if costs associated with on-site systems are deducted, there is a significant difference between the Rural Residential and the other two scenarios.

Exhibit 20: Water and Sewer Costs

Residential Water and Sewer Costs for Single Family Homes

			Tap	Lateral	Total
Agriculture	Water		3600	0	3600
	Sewer		6000	0	6000
Rural Residential	Water		2000	1080	3080
	Sewer		6000	0	6000
Suburban	Water		1600	1200	2800
	Sewer		3200	100	3300
Urban City	Water		1310	1320	2630
	Sewer		2810	1100	3910

Source: *American Water Works Association Research Foundation*
adapted by Planning Works for Carroll County

Projected Costs by Scenario (in millions of dollars)

Scenario	Projections	Agricultural		Rural		Suburban		Urban	
		Low	High	Low	High	Low	High	Low	High
Rural Residential									
	Water	0	0	11	18	32	53	12	21
	Sewer	0	0	21	36	37	63	19	31
	Total	0	0	32	54	69	116	31	52
Corridors									
	Water	5	9	0	0	35	58	15	26
	Sewer	9	14	0	0	41	68	23	38
	Total	14	23	0	0	76	127	38	63
Centers									
	Water	3	5	0	0	7	11	43	72
	Sewer	5	8	0	0	8	14	64	107

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Total 7 12 0 0 15 25 108 180

Total Costs for Water and Sewer (in millions of dollars)

Projections	Low	High	Low	High	Low	High
	Total		Public Systems		Private Systems	
Rural Residential						
Water	55.21	92.25	55	92	0.00	0.00
Sewer	77.33	129.22	56	94	21.33	35.65
Total	132.54	221.47	111	186	21.33	35.65
Corridors						
Water	55.17	92.19	50	84	5.14	8.58
Sewer	72.24	120.70	64	106	8.56	14.30
Total	127.41	212.89	114	190	13.69	22.88
Centers						
Water	52.83	88.28	50	84	2.73	4.56
Sewer	76.92	128.52	72	121	4.55	7.60
Total	129.75	216.80	122	205	7.28	12.16

Exhibit 21: Summary of Water and Wastewater Needs

Scenario 1: Rural Residential	Scenario 2: Corridors	Scenario 3: Centers
<ul style="list-style-type: none"> < Private costs are greater than other scenarios due to septic systems in rural residential areas. < Public system costs are lower < CCWA responsibilities for sewer system management are minimal 	<ul style="list-style-type: none"> < Presumes significant sewer service to suburban residential areas < Coordination and management of numerous community systems in suburban areas will create challenges for the CCWA. < Coordination of sewer service with water service in corridors will require new City/CCWA agreements 	<ul style="list-style-type: none"> < Lowest costs for CCWA and private systems < Requires coordination between CCWA and cities as they expand wastewater service into existing CCWA service areas

H. School Demand

The primary distinction between the impacts of the different scenarios on the school system as a whole will be the transportation costs. While costs have not been modeled as part of this analysis, it is clear from other studies and common sense that the more widely distributed the student population, the greater the transportation costs. This suggests that the transportation costs for students under the Rural Residential scenario will be greater than for the other scenarios.

The complexities of coordinating capital facility planning for three separate school districts (Carroll County, Carrollton and Bremen) will be particularly troublesome under

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the Centers scenario. As Carrollton and Bremen expand their boundaries, the service area and tax base for Carroll County schools decrease, though not necessarily proportionally to decreases in student base. If the cities annex developed residential property, they will divert students from existing County schools. Probably most confusing, is the potential for the cities to annex existing County school sites, which will transfer area students to city schools. Conceivably, students will be bussed to new city schools despite living adjacent to an existing County school that then falls within the City. The annexed County school would need to bus children into the city from remote locations to maintain sufficient enrollment to keep the school open.

I. Emergency Services Impacts

As shown in **Appendix 4**, the County's fire stations are well located to provide response time to most of the County with an average of under 8 minutes. Currently, the greatest challenge is to staff and equip stations adequately to meet demands that vary significantly between fire stations.

The Rural Residential and Corridors scenarios will have little impact on the need for additional station locations unless significant annexation occurs along the corridors. The Centers Scenario will have more significant impact on service demands, as Villa Rica and Carrollton grow into urban areas, which require a 4 minute response time. The relatively poor connectivity between different parts of these communities will increase the challenges of efficiently locating sufficient stations to provide adequate response times.

2. Relationship to Goals, Objectives and Policies

The scenarios' potential to help achieve the Community's vision is the most important evaluation factor. The following vision statement is a version of Carroll Tomorrow's vision that has been broadened by the County Comprehensive Plan Steering Committee to achieve the Steering Committee's draft goals (see **Appendix 1**):

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“Carroll County is a dynamic community working toward a stronger economic future and better quality of life for all residents. Through effective public-private leadership, Carroll County provides 21st century infrastructure and an educated workforce to capture the jobs of the future. Our communities offer a welcoming small-town atmosphere, vibrant economies, desirable neighborhoods and excellent recreational opportunities. Throughout the County, residents and visitors will find a healthy environment with abundant green spaces, a thriving agricultural community and lifelong learning opportunities.”

This local vision statement locally is consistent with the State of Georgia’s goals (see **Appendix 2**) for comprehensive land use, economic development, environmental and infrastructure planning, which follow:

- **Economic Development:** To achieve a growing and balanced economy, consistent with the prudent management of the state's resources, that equitably benefits all segments of the population.
- **Natural and Historic Resources:** To conserve and protect the environmental, natural and historic resources of Georgia's communities, regions and the state.
- **Community Facilities and Services:** To ensure that public facilities throughout the state have the capacity, and are in place when needed, to support and attract growth and development and/or maintain and enhance the quality of life of Georgia's residents.
- **Housing:** To ensure that residents of the state have access to adequate and affordable housing.
- **Land Use:** To ensure that land resources are allocated for uses that will accommodate and enhance the state's economic development, natural and historic

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resources, community facilities, and housing and to protect and improve the quality of life of Georgia's residents.

Exhibit 17 compares the relative support for the County's vision, the State's goals and the draft objectives reviewed by Carroll County's Comprehensive Plan Steering Committee. These goals were prepared to address the growth issues summarized in **Appendix 3**.

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Exhibit 17: Consistency of Scenarios with Goals and Objectives

	Rural Residential Scenario	Corridors Scenario	Centers Scenario	Comments
Carroll County Vision				Rural residential scenario will scatter development in a manner that results in the loss of agri-business and increased fiscal impacts that will detract from economic development efforts.
State Goals				
Economic Development: To achieve a growing and balanced economy, consistent with the prudent management of the state's resources, that equitably benefits all segments of the population				Rural residential will result in loss of agribusiness and fiscal impacts that will reduce the County's ability to fund economic development efforts.
Natural and Historic Resources: To conserve and protect the environmental, natural and historic resources of Georgia's communities, regions and the state.	--	--	--	Environmental and historic preservation policies could be applied to nearly equal effect in each scenario, though the Rural Residential scenario will result in greater land consumption and air quality degradation
Community Facilities and Services: To ensure that public facilities throughout the state have the capacity, and are in place when needed, to support and attract growth and development and/or maintain and enhance the quality of life of Georgia's residents.				Corridors and Centers scenarios provide greater focus for capital investments and facilitate timing and phasing of development with targeted phasing of infrastructure investments
Housing: To ensure that residents of the state have access to adequate and affordable housing	--	--	--	Other public housing policies and market factors have a greater impact on housing affordability than land use plans. Despite this, the Corridors and Centers scenario will provide greater opportunity for a mix of housing types and prices

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	Rural Residential Scenario	Corridors Scenario	Centers Scenario	Comments
Land Use: To ensure that land resources are allocated for uses that will accommodate and enhance the state's economic development, natural and historic resources, community facilities, and housing and to protect and improve the quality of life of Georgia's residents.				As stated above, the Corridors and Centers scenarios provide greater flexibility for housing development and better targeted public investment to promote economic development. Historic and natural resource protection can be pursued under each of the scenarios.
County Goals & Objectives				

Natural Resources Goal - To preserve and protect resources essential to sustain a healthy environment, including the County's river and stream corridors, woodland habitats and air quality.

Secure green-space system	--	--	--	A common assumption for the scenarios is the development of a greenways system, including the retention of greenspace.
Protect water quality		--	--	Water quality protection efforts will be more effective with centralized wastewater systems developed under the Centers Scenario, though the lower densities throughout rural areas in the Corridors Scenario could yield some water quality benefits.

Land Use Goal - To maintain a balanced, sustainable land use pattern that accommodates projected growth while fostering community vitality, improving the quality of the built environment and protecting the integrity of the natural environment.

Protect economic development lands			--	The Corridors Scenario specifically reserves lands for employment development. The Rural Residential scenario makes no reservations. The Centers Scenario provides greater opportunity for cities to expand infrastructure to serve economic growth.
---	---	--	----	--

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	Rural Residential Scenario	Corridors Scenario	Centers Scenario	Comments
Promote land use compatibility				The Rural Residential scenario will result in the greatest conflicts between agriculture and residential development. The Corridors and Centers Scenarios address this issue, though the Centers addresses it more effectively.
Direct growth to USAs				Urban Service Areas are only included in the Centers Scenario.
Target corridors for economic vitality				The Corridors Scenario is the only one to designate corridors specifically reserved for economic development, though they are not inherently incompatible with the Centers Scenario
Plan suburban areas for X% of residential growth				Each scenario provides ample opportunity for projected suburban demand, though it could be argued that the Centers Scenario constrains lower density suburban development in favor of higher density development on municipal sewer systems.
Allow X% of growth in rural residential areas				The Rural Residential Scenario is ill-suited for limiting the amount of development in rural areas. The Corridors Scenario provides the greatest opportunity for suburban development.
Agricultural land retention				Widespread large lot development under the Rural Residential Scenario will expedite conversion of agricultural lands. The Centers Scenario provides the greatest flexibility in crafting agricultural preservation programs, due to the conservation subdivision option.

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	Rural Residential Scenario	Corridors Scenario	Centers Scenario	Comments
<p>Housing Goal - Create a more diverse housing stock that provides adequate and attainable housing for the diverse shelter needs of Carroll County's residents in a manner that creates stable, viable neighborhoods and enables the County to adequately fund public facilities and services.</p>				
Improve manufactured home parks	--	--	--	Manufactured home park policy is independent of the scenarios.
Require adequate facilities and amenities in new developments	--	--	--	Adequate public facility requirements can be applied to any of the scenarios, though the Rural Residential Scenario will reduce the availability of public funding for capital facilities.
Maintain/enhance housing conditions	--	--	--	Housing maintenance policy is independent of the land use scenarios
Increase median home value	--	--	--	Other public policies and the market will have greater impact on home values County-wide, though the Corridors and Centers Scenarios are likely to result in higher prices for rural residential development.
<p>Economic Development Goal - Develop a more diversified local economy that provides a more stable economic base, more employment opportunities for all segments of the local population and the fiscal resources to provide high quality services to all residents while retaining relatively low tax rates.</p>				
Increase county-wide economic development coordination				Both the Corridors and Centers Scenarios provide distinct, yet positive opportunities for economic development coordination.
Support on-going agricultural and timber operations				The Rural Residential Scenario will result in the most rapid consumption of agricultural and timber lands. The Corridors Scenario retains most agricultural and timber lands outside the northeast quadrant of the County. The Centers Scenario protects agricultural land, but allows for considerable conversion of timber lands.

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	Rural Residential Scenario	Corridors Scenario	Centers Scenario	Comments
Increase the jobs/housing ratio	--		--	The retention of an employment corridor under the Corridors Scenario gives it an edge on the other scenarios, though sufficient land could be reserved under the Rural Residential or Centers Scenarios to increase the jobs housing ratio.
Increase educational attainment	--	--	--	Nothing in the Scenarios inherently supports increased educational attainment, though arguably, the higher school transportation costs under the Rural Residential scenario could impair progress in this important issue.
Increase median income	--	--	--	Nothing in the Scenarios inherently supports increases in median income.
Maintain industrial land inventory			--	The Corridors Scenario specifically reserves land for industrial development. Rural Residential does not reserve any land. The USAs of the Centers Scenario facilitates retention of industrial land by cities.
Transportation Goal - Provide a convenient and cost effective transportation system that emphasizes connectivity, safety, choices of modes and harmony between transportation modes and land uses.				
Limit traffic congestion		--		The Rural Residential Scenario promotes dispersed, auto-oriented development that increases traffic congestion. The Corridors Scenario provides some opportunities for mixed use development, but likely will segregate employment from residential areas. The Centers Scenario provides the greatest opportunities for land use patterns that are not auto-dependent.

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	Rural Residential Scenario	Corridors Scenario	Centers Scenario	Comments
Minimize road maintenance costs		--		The Rural Residential Scenario will result in the most vehicle miles traveled and the most dispersed traffic patterns, which will maximize road maintenance costs. The Centers Scenario will keep the majority of traffic on City or State Roads and thus reduce County road maintenance costs.
Maintain County-wide Thoroughfare Plan	--	--	--	A County-wide Thoroughfare Plan could be maintained under any of the scenarios. Given the scattered development pattern of the Rural Residential Scenario, a Thoroughfare Plan with prioritized Capital Investments would be needed.
Maintain scenic roadway corridors	--	--	--	While this could be accomplished under any scenario, it would be more difficult under the Rural Residential Scenario and easiest under the Centers Scenario
Protect the airport from encroachment				
Community Facilities and Services - Provide for adequate public facilities and services for existing and future residents and businesses in an equitable and cost-effective manner.				
Target development to areas with adequate public facilities		--		The Centers Scenario provides the best opportunity to coordinate development with the extension of municipal facilities. The dispersed pattern of the Rural Residential Scenario locates the greatest amount of development in areas currently lacking adequate facilities.
Coordinate capital planning		--		The Centers Scenario focuses development in USAs that, by definition, require coordination of capital planning initiatives

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	Rural Residential Scenario	Corridors Scenario	Centers Scenario	Comments
Historic Resources Goal - Retain Carroll County's historic, archaeological and cultural assets for future generations of residents and visitors.				
Establish a GIS-based inventory of historic resources	■■	■■	■■	This objective can be accomplished equally well under each scenario.
Protect historic/archaeological resources	■■	■■	■■	This objective can be accomplished equally well under each scenario.

Appendix 1: Draft Goals and Objectives

The following draft goals and objectives were developed from input received from the Steering Committee, staff, Planning Commission, stakeholder groups and the community at large. The goals describe desired ends that will achieve the County's vision. Objectives are measurable steps towards achieving the goals. These steps may be quantified benchmarks (e.g., jobs, acres, households, etc.), specific events (e.g., plans or agreements) or more general objectives (e.g., to minimize, reduce, increase, etc.). Each of the goals and objectives should be directly related to the following vision.

Carroll County Vision

Carroll County is a dynamic community working toward a stronger economic future and enhanced quality of life. Through effective public-private leadership, we will provide a 21st century infrastructure and an educated workforce to capture the jobs of the future. Our community will offer welcoming small town and rural atmospheres, excellent recreation, a healthy environment with abundant green spaces, a thriving agricultural community and lifelong learning opportunities to contribute to the quality of life.

The goals and objectives will be used to define the County's preferred growth scenario and to guide the interpretation and refinement of policies and plan implementation measures. They must be consistent with the State-wide goals attached as Appendix A. Additionally, the goals and objectives should address the County's key growth issues (see Appendix B).

Goals and Objectives

Natural Resources Goal: To preserve and protect resources essential to sustain a healthy environment, including the County's river and stream corridors, woodland habitats and air quality.

Objectives:

- **Green-space.** Secure an inter-connected system of green-spaces through a combination of easements, fee simple ownership and covenants, secure meaningful open spaces, equivalent to 20% of the land area to be developed during the life of the plan.
- **Water Quality.** Minimize the effects of human activity on the quality of surface and groundwater through effective stormwater management and subdivision design.

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Land Use Goal: To maintain a balanced, sustainable⁶ land use pattern that accommodates projected growth while fostering community vitality, improving the quality of the built environment and protecting the integrity of the natural environment.

Objectives:

- **Agriculture** –
 - Protect **X** acres of prime agriculture and forest land through voluntary conservation measures.
 - Minimize conflicts between rural residential development and agricultural operations.
 - Increase the viability of continued agriculture operations through more flexible land use opportunities and other techniques.
- **Rural Residential** – Allow **X** percent of the County’s anticipated growth to occur as low density rural residential development provided that it occurs in locations that can be efficiently served and compatibly designed with agricultural operations and environmental resources.
- **Suburban Residential** – Allow **X** percent of the County’s anticipated growth to occur in suburban residential areas where adequate sewer services are available through municipal or community systems.
- **Corridor Commercial and Employment** – Target highway corridors for commercial and employment opportunities that support community vitality and enhance the attractiveness of the corridors;
- **Urban Service Areas** – Achieve **X** percent of anticipated population growth within defined Urban Service Areas (USA). Such development will be consistent with applicable City standards for land use and infrastructure.
- **Land Use Compatibility** – Mitigate land use transitions to ensure that agricultural, residential, industrial, commercial and environmental lands can serve their intended functions with minimal interference from adjacent land uses.
- **Economic Base Protection** – Designate planned agricultural, timber, industrial commercial lands and protect them from encroachment from residential development that could interfere with the long-term viability of these important economic bases.

Housing Goal: Create a more diverse housing stock that provides adequate and attainable housing for the diverse shelter needs of Carroll County’s residents in a manner that creates stable, viable neighborhoods and enables the County to adequately fund public facilities and services.

Objectives:

- **Manufactured Home Parks.** Improve services and facilities within existing

⁶ Sustainable development patterns maintain environmental quality, social equity, economic and fiscal health, and efficient land use practices.

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manufactured home parks to provide for the safety and recreational needs of residents.

- **Provision and Maintenance of Facilities and Amenities.** Ensure that new housing developments provide and support maintenance of adequate facilities and amenities to foster long-term neighborhood stability.
- **Housing Conditions.** Maintain or enhance the condition of the existing housing stock.
- **Housing Value.** Increase the median value of new housing while continuing to address the needs of existing moderate, low and very low income households.

Economic Development Goal: Develop a more diversified local economy that provides a more stable economic base, more employment opportunities for all segments of the local population and the fiscal resources to provide high quality services to all residents while retaining relatively low tax rates.

Objectives:

- **County-wide Coordination.** Develop a county-wide economic development program involving cities, the County, service providers and other economic development interests.
- **Agricultural and Timber Operations.** Increase economic opportunities for agricultural and forestry operators that complimentary to on-going operations.
- **Jobs/Housing Ratio.** Increase the jobs/housing ratio by **X** by the year 2005, **X** percent by the year 2010 and **X** percent by 2020.
- **Education.** Increase the proportion of high school graduates by **X** by the year 2005, **X** percent by the year 2010 and **X** percent by 2020.
- **Income.** Increase the median household income by **X** by the year 2005, **X** percent by the year 2010 and **X** percent by 2020.
- **Industrial Land Supply.** Coordinate capital improvement programs between the County, its cities and other service providers to create and maintain an inventory of industrial land.

Transportation Goal: Provide a convenient and cost effective transportation system that emphasizes connectivity, safety, choices of modes and harmony between transportation modes and land uses.

Objectives:

- **Traffic Congestion.** Maintain a level of service (LOS) “C” or better along major arterial transportation corridors, with all movements at intersections operating at a LOS “D” or better.
- **Road Maintenance Costs.** Minimize road maintenance costs in agricultural areas by limiting new traffic generation.
- **Coordinated Transportation Planning.** Maintain a county-wide thoroughfare plan that is coordinated with the plans of individual communities, the State and adjacent counties.

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- Scenic Roadways. **Designate and maintain scenic road corridors and adopt appropriate rural design guidelines.**
- Airport. **Protect the function of the airport and opportunities for its expansion by limiting residential encroachment into runway approach zones.**
- **Pedestrian Facilities - ??**
- **Rail - ??**
- **Public Transportation – ??**

Community Facilities Goal: Provide for adequate public facilities and services for existing and future residents and businesses in an equitable and cost-effective manner.

Objectives:

- **Adequate Public Facilities.** Target development in those areas where public facilities (including water, wastewater, roads, and schools) can be provided efficiently without compromising service or increasing costs to existing citizens and businesses.
- **Coordinated Capital Planning.** Develop a coordinated, county-wide capital improvements program involving all service providers that is linked to anticipated growth.
- **Other** – parks, solid waste, public safety, fire, EMS ...

Historic Resources Goal: Retain Carroll County’s historic, archaeological and cultural assets for future generations of residents and visitors.

Objectives:

- Maintain a GIS-based inventory of historic, archaeological and cultural resources.
- Ensure that identified historic, archaeological and cultural resources are not inadvertently taken.

Appendix 2: State-Wide Planning Goals

(a) Economic Development: To achieve a growing and balanced economy, consistent with the prudent management of the state's resources, that equitably benefits all segments of the population.

(b) Natural and Historic Resources: To conserve and protect the environmental, natural and historic resources of Georgia's communities, regions and the state.

(c) Community Facilities and Services: To ensure that public facilities throughout the state have the capacity, and are in place when needed, to support and attract growth and development and/or maintain and enhance the quality of life of Georgia's residents.

(d) Housing: To ensure that residents of the state have access to adequate and affordable housing.

(e) Land Use: To ensure that land resources are allocated for uses that will accommodate and enhance the state's economic development, natural and historic resources, community facilities, and housing and to protect and improve the quality of life of Georgia's residents.

Appendix 3: Key County Growth Issues

Coordinating growth decisions with other jurisdictions – Carroll County is one of many service providers involved in making decisions affecting the timing and location of growth. Coordination is essential to ensure that decisions of each service provider support county-wide growth goals, resulting in more efficient use of taxes and fees.

- **Implementing a coordinated county-wide economic development program.** Carroll Tomorrow has been working towards a coordinated economic development program that will improve employment opportunities for all County residents and improve the fiscal capabilities of the cities and the County to provide public facilities and services. To achieve this end, Carroll Tomorrow is working to support existing employers and attract more high quality employers. To attract better jobs, there are needs to ensure that there are competitive locations for employers and there is a high quality workforce available to fill the jobs. Improving the quality of Carroll County's work force is a high priority.
- **Reinforcing community growth goals/policies.** The County's comprehensive plan must be coordinated with the plans of its communities to ensure that it supports long-term community growth needs and fosters community vitality. The comprehensive plan should address land use patterns and infrastructure at the edges of communities and provide a template for coordinated decision-making in these areas.
- **Coordinating school development with county-wide growth.** Over the next 20 years, the Carroll County School District is likely to be the most significant developer in the County. School location decisions will affect demands for infrastructure (particularly road, water and wastewater system improvements) and development pressures. The locations of new schools should be coordinated with the locations of projected growth to ensure that adequate infrastructure can be provided and to minimize school busing costs.
- **Coordinating with other service providers.** To provide cost-effective services, the Carroll County Water Authority and other public service providers need to know the location, intensity, timing and amount of new development. The plan should provide guidance on all of these aspects of development.

Ensuring a balanced land-use mix – Carroll County encompasses urban, suburban and rural areas that are under pressure for residential development to serve the housing demands from the Atlanta Metropolitan Area. Much of this demand is for starter homes that generate greater fiscal burdens than benefits for the County. The County's fiscal and economic health depend on balancing the mix of residential and non-residential land uses as well increasing the proportion of up-scale housing.

- **Enhancing the jobs/housing balance.** Efforts of the County, its communities, Carroll Tomorrow and other groups have focused on the need to increase the number and quality of jobs available in the County. One measurable objective for the Comprehensive Plan to establish is to increase the ratio of jobs to housing units. The combination of this jobs housing balance and average wage rates would provide a useful benchmark to measure economic development progress.

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- **Developing more diversified housing mix.** Carroll County has experienced strong demand for manufactured homes and starter homes. While the Mirror Lake development represents a more upscale market, the majority of new residential development is geared to more modest market segments. The County needs to foster a more diverse housing market and seek to increase average home prices to levels that better reflect those of the Atlanta Metropolitan area as a whole.
- **Supporting agricultural industry.** Agriculture is an important sector of the County's economy, contributing over \$40 million annually. While the County desires to increase local employment and housing opportunities, the timing, location and design of development will affect the long-term viability of agricultural operations. In addition to the loss of agricultural land when new development occurs, residential encroachment into agricultural areas can interfere with agricultural operations if residences are located downwind of poultry or cattle operations or are adjacent to farms. The Comprehensive Plan should identify prime agricultural lands and identify equitable strategies to support the long-term retention of viable agricultural operations.

Coordinating growth with provision of adequate public facilities. One of the greatest growth management challenges is coordinating the efficient development of infrastructure with the development of land uses that create demands for that infrastructure. The Comprehensive Plan should provide a framework for coordinating the public investments by indicating the location, use, intensity and timing of development.

- **Water.** The key water issues are securing adequate supplies of water and distributing enough water to provide for everyday needs and fire suppression.
- **Wastewater.** Wastewater service availability is one of the key limitations to urban and suburban intensity growth. Without centralized service, residential densities and non-residential development potential are limited. Centralized sanitary sewer systems currently are provided in Villa Rica, Temple, Carrollton, Bremen, Bowden and the Fairfield PUD. The County has recently approved the use of community systems to serve suburban development in unincorporated areas. The key wastewater issues that the Plan needs to address are ensuring that new development is adequately served; providing for safe and efficient service; and coordinating municipal and community systems so they can be integrated in the future.
- **Schools.** With a 10-year \$165 million improvement plan providing for construction of new schools and improvements to existing schools, the Carroll County School District is likely to be one of the most significant development forces in the County during the planning period. Schools will create demand for infrastructure and can stimulate residential growth. The primary challenges that should be addressed by the Plan include:
 - Ensuring that development decisions are coordinated with classroom capacity; and
 - Coordinating school siting with growth and capital improvement decisions.
- **Transportation.** The transportation system affects most citizens' quality of life on a daily basis. To ensure that the transportation system continues to effectively serve the needs of residents and businesses, the Plan should guide public investments and development decisions in ways that:

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- Maintain adequate road capacity and minimize delays due to traffic congestion;
 - Maintain road safety, so that roads are safe for drivers, pedestrians, and bicyclists, as well as the residents and businesses located along the roads;
 - Protect primary road corridors from inappropriate development patterns. While Highways 27 and 61 have been identified and zoned as future commercial corridors, emerging development patterns illustrate the inadequacy of existing development regulations to protect the function and appearance of these key entry corridors. Better access control is needed to ensure to minimize future losses in roadway safety and capacity. Better appearance codes (e.g., landscaping and building design standards) are needed to protect the long-term viability of the corridor and to prevent future blight; and
 - Protect scenic road corridors from clearing and encroachment of development. Carroll County has numerous State Highways (e.g., State Highways 5, 113 ...) that exemplify the rural character that makes the County such a desirable place to live and visit. Scattered development along these roadways illustrates the vulnerability of this rural character. Protecting the scenic beauty of these corridors through buffers, setbacks and strict driveway spacing standards will help retain an asset that will pay dividends to future residents by protecting roadway capacity, providing an attractive environment for residents and economic development prospects.
- **Stormwater.** The hilly terrain and erosion-prone soils of Carroll County increase the importance of local stormwater management. In addition to providing valuable recreational and amenities, effective management of increased runoff from development is essential to:
- Protect lives and property from flooding;
 - Protect the quality of surface and ground waters; and
 - Retain wildlife habitat and corridors.

Land use compatibility – land use compatibility is essential to protect the integrity of neighborhoods, the viability of agricultural operations and the desirability/function of industrial areas. To these ends, the Comprehensive Plan should identify effective strategies to:

- **Protect neighborhoods from encroachment of incompatible uses.** This does not mean that all neighborhoods will be homogenous; it means that a combination of buffers, design features and limited segregation through zoning will ensure that transitions between different land uses will mitigate potential off-site impacts (noise, traffic, glare) that would infringe on neighbors.
- **Protect gateways and entry corridors.** As mentioned above, the State highways that provide access to and through the County shape visitors' and residents' opinions of the County. Ensuring that land uses are compatible with the desired character of the corridor, as well as with other uses in the corridor will make the County a more attractive place to live, work and conduct business.
- **Protecting industrial and agricultural areas from encroachment.** Carroll County's emphases on economic development and retention of agri-business mandate the

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protection of industrial and agricultural areas from encroachment by uses that would interfere with industrial and agricultural operations. These uses frequently generate noise, glare, truck traffic and odors that are undesirable to adjacent residents. By designating areas intended for these operations and protecting those areas from residential encroachment, the County can increase the long term viability of these vital economic engines.

Planning for growth and development -- Carroll County has experienced extraordinary growth over the last 30 years. This has emphasized the importance of planning for and effectively managing growth through a growth management process that:

- Results in predictable and equitable development decisions;
- Involves stakeholders in decisions early in the planning and development process – at times when they can have the most significant impact on development patterns; and
- Facilitates effective enforcement of zoning, development and building codes.

Protecting valuable resources -- While Carroll County is largely rural today, growth pressures within the Atlanta metropolitan area promise additional development of large areas of the County. To retain the quality of life that attracts residents and business owners to Carroll County, the Comprehensive Plan should describe the resources to be protected and potential strategies to protect those resources, including:

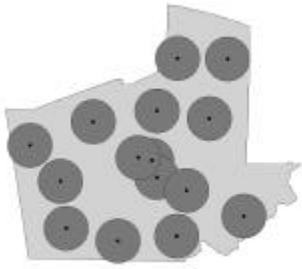
- Protection of woodland areas and heritage trees;
- Protection of wetlands, rivers, streams and lakes;
- Conservation of prime agricultural land;
- Preservation of historical resources; and
- Retention of meaningful green spaces.

Maintaining fiscal integrity – the quality of life in Carroll County is contingent on the County's continued ability to provide high quality services at a reasonable cost to taxpayers. To achieve these ends, the Comprehensive Plan should describe the County's strategies to:

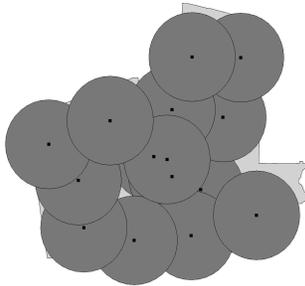
- Enhance the local property and sales tax bases more rapidly than the fiscal obligations for capital facilities, operations and maintenance;
- Ensure that new development funds the costs of capital facilities required to serve that new development;
- Ensure that facilities and services are planned in a way that allows ongoing operations without significant increases in the costs to residents and businesses; and
- Target capital investments to areas that will best achieve the types of growth desired by the County.

Appendix 4: Fire Station Location Analysis

Existing Land Use Class	Acres Vacant Outside Service Radius (2.2m)	Acres Total Outside Service Radius (2.2m)	Acres Vacant Outside Service Radius (4.4m)	Acres Total Outside Service Radius (4.4m)
Unknown\Other	143	1,439		6
Agriculture	34,427	68,254	3,852	5,603
Commercial	1,322	3,290	14	51
Exempt	1,086	3,549	217	241
Industrial	0	468		229
Preferential	233	1,642		54
Residential	13,510	44,053	857	2,721
Utilities	966	1,166	10	196
Conservation	10,603	50,397	664	3,278
Totals	62,290	174,259	5,614	12,377



4 min (2.2 miles)

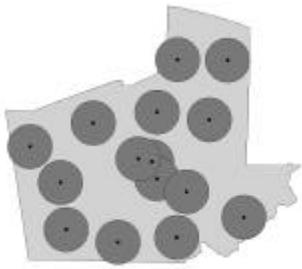


8 min (4.4 miles)

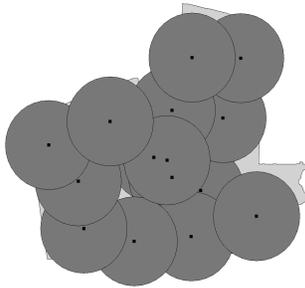
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Rural Residential Scenario

Rural Residential Scenario	Acres Vacant Outside Service Radius (2.2m)	Acres Total Outside Service Radius (2.2m)	Dwelling Units Potential	Acres Vacant Outside Service Radius (4.4m)	Acres Total Outside Service Radius (4.4m)
Commercial		1,300			15
Fairfield	724	1,772			
Industrial		374			229
Incorporated	1,742	5,379		7	36
Quasi Public		1,476			209
Rural Residential	43,313	109,789	10,828	4,739	9,110
Suburban Residential	15,132	49,936	30,264	793	2,641
Urban Mix	1,379	4,234	5,516	75	139
Totals	62,290	174,259	46,608	5,614	12,377



4 min (2.2 miles)

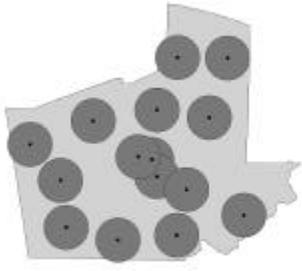


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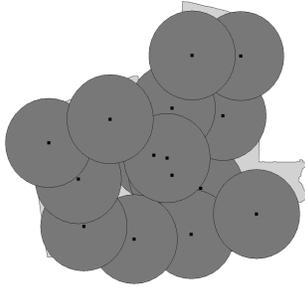
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Corridors Scenario

Corridors Scenario	Acres Vacant Outside Service Radius (2.2m)	Acres Total Outside Service Radius (2.2m)		Acres Vacant Outside Service Radius (4.4m)	Acres Total Outside Service Radius (4.4m)
Agricultural	49,717	132,893	2,486	5,532	11,750
Commercial		1,300			15
Employment	530	2,338		0	0
Fairfield	724	1,772			
Industrial		374			229
Incorporated	1,742	5,379		7	36
Mixed Use	596	1,414	2,382		
Quasi Public		1,476			209
Suburban	8,980	27,313	17,960	74	138
Totals	62,290	174,259	22,828	5,614	12,377



4 min (2.2 miles)

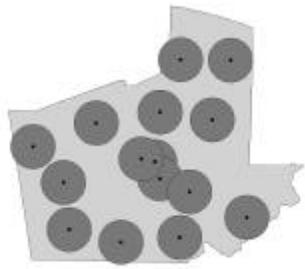


8 min (4.4 miles)

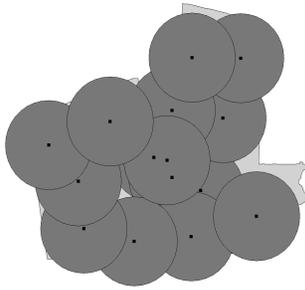
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Centers Scenario

Centers Scenario	Acres Vacant Outside Service Radius (2.2m)	Acres Total Outside Service Radius (2.2m)		Acres Vacant Outside Service Radius (4.4m)	Acres Total Outside Service Radius (4.4m)
Agricultural	45,506	128,946	2,275	4,880	10,714
Commercial		1,300			15
Fairfield	724	1,772			
Industrial		374			229
Incorporated	1,742	5,379		7	36
PUD	4,940	5,811	9,880		977
Quasi Public		1,476		650	209
Urban Service Areas	9,378	29,203	37,510	77	198
Totals	62,290	174,259	49,666	5,614	12,377



4 min (2.2 miles)



8 min (4.4 miles)