


REGIONAL REVIEW NOTIFICATION

Atlanta Regional Commission • 229 Peachtree Street NE | Suite 100 | Atlanta, Georgia 30303 • ph: 404.463.3100 fax: 404.463.3205 • atlantaregional.org

DATE: October 11, 2021

ARC REVIEW CODE: P2110112

TO: Chairman Harry Johnston, Cherokee County
ATTN TO: Brantley Day, Cherokee County Community Development Agency Director
FROM: Douglas R. Hooker, Executive Director, ARC


Digital signature
Original on file

The Atlanta Regional Commission (ARC) has received the following proposal and is initiating a regional review to seek comments from potentially impacted jurisdictions and agencies. The ARC requests your comments related to the proposal not addressed by the Commission's regional plans and policies.

Name of Proposal: 2021 Cherokee County CIE Amendment

Review Type: Local Comprehensive Plan

Description: A review of the draft 2021 Cherokee County Capital Improvement Element (CIE) Amendment.

Submitting Local Government: Cherokee County

Action Under Consideration: Approval

Date Opened: October 11, 2021

Deadline for Comments: November 1, 2021

Earliest the Regional Review can be Completed: Upon approval by Georgia DCA

THE FOLLOWING LOCAL GOVERNMENTS AND AGENCIES ARE RECEIVING NOTICE OF THIS REVIEW:

ARC COMMUNITY DEVELOPMENT
ARC RESEARCH & ANALYTICS
CHEROKEE COUNTY
GEORGIA DEPARTMENT OF NATURAL RESOURCES
DAWSON COUNTY
PICKENS COUNTY
CITY OF CANTON
CITY OF MOUNTAIN PARK
CITY OF WALESKA
NORTHWEST GEORGIA REGIONAL COMMISSION

ARC TRANSPORTATION ACCESS & MOBILITY
ARC AGING & HEALTH RESOURCES
GEORGIA DEPARTMENT OF COMMUNITY AFFAIRS
BARTOW COUNTY
FORSYTH COUNTY
CITY OF ACWORTH
CITY OF HOLLY SPRINGS
CITY OF NELSON
CITY OF WOODSTOCK

ARC NATURAL RESOURCES
GRTA/SRTA
GEORGIA DEPARTMENT OF TRANSPORTATION
COBB COUNTY
FULTON COUNTY
CITY OF BALL GROUND
CITY OF MILTON
CITY OF ROSWELL
GEORGIA MOUNTAINS REGIONAL COMMISSION

Attached is information concerning this review.

If you have any questions regarding this review, please contact Donald Shockey at dshockey@atlantaregional.org or 470-378-1531. If ARC staff do not receive comments from you on or before **Monday November 1, 2021**, we will assume that your agency has no comments and will close the review. Comments via e-mail are strongly encouraged. The ARC review website is located at <https://atlantaregional.org/community-development/comprehensive-planning/plan-reviews/>.

NOTICE OF LOCAL PLAN SUBMITTAL AND HEARING/COMMENT OPPORTUNITY

Submitting Local Government:	Cherokee County	Date Received:	October 11, 2021			
Local Contact:	Brantley Day, Director, Community Development Agency, Cherokee County					
Phone:	678-493-6078	E-Mail:	bday@cherokeega.com			
Fax:		Website:	cherokeega.com			
Street	1130 Bluffs Parkway	City State, Zip:	Canton, Georgia 30114			
Department of Community Affairs Review Required						
Review Title:	2021 Cherokee County CIE Amendment					
Description:	<p>A review of the draft 2021 Cherokee County Capital Improvement Element (CIE) Amendment.</p> <p>Document can be viewed on the ARC website at: https://atlantaregional.org/community-development/comprehensive-planning/plan-reviews/ Under Plan Review, search for the Cherokee County.</p>					
The submitted documents are available for review at ARC and the local government.						
Reviewing Regional Commission:						
<p>Atlanta Regional Commission 229 Peachtree Street NE, Suite 100 Atlanta, GA 30303</p> <p>Phone 404-463-3100 Fax 404-463-3254</p>						
Contact Person:	Donald Shockey, Plan Review Coordinator					
E-Mail	dshockey@atlantaregional.org					

ARC STAFF NOTICE OF REGIONAL REVIEW AND COMMENT FORM

DATE: October 11, 2021

ARC REVIEW CODE: P2110112

TO: ARC Managers

FROM: Donald Shockey, Plan Review Coordinator, 470-378-1531

Reviewing staff by Jurisdiction:

Community Development: Smith, Andrew

Natural Resources: Santo, Jim

Aging & Health Resources: Perumbeti, Katie

Transportation Access & Mobility: James, Reginald

Research & Analytics: Skinner, Jim

Name of Proposal: 2021 Cherokee County CIE Amendment

Review Type: Local Comprehensive Plan

Description: A review of the draft 2021 Cherokee County Capital Improvement Element (CIE) Amendment.

Submitting Local Government: Cherokee County

Date Opened: October 11, 2021

Deadline for Comments: November 1, 2021

Earliest the Regional Review can be Completed: Upon approval by Georgia DCA

Response:

- 1) ☐ Proposal is CONSISTENT with the following regional development guide listed in the comment section.
- 2) ☐ While neither specifically consistent nor inconsistent, the proposal relates to the following regional development guide listed in the comment section.
- 3) ☐ While neither specifically consistent nor inconsistent, the proposal relates to the following regional development guide listed in the comment section.
- 4) ☐ The proposal is INCONSISTENT with the following regional development guide listed in the comment section.
- 5) ☐ The proposal does NOT relate to any development guide for which this division is responsible.
- 6) ☐ Staff wishes to confer with the applicant for the reasons listed in the comment section.

COMMENTS:

[illegible]

Transmittal Resolution
2021 Capital Improvements Element
Cherokee County, Georgia


WHEREAS, Cherokee County has adopted a Capital Improvements Element as an amendment to the *Cherokee County Comprehensive Plan*; and

WHEREAS, a 2021 Capital Improvements Element has been prepared in accordance with the "Development Impact Fee Compliance Requirements" and the "Minimum Planning Standards and Procedures for Local Comprehensive Planning" adopted by the Board of Community Affairs pursuant to the Georgia Planning Act of 1989, and

WHEREAS, a duly advertised Public Hearing was held on October 5, 2021, at 6:00 P.M. in Cherokee Hall of the Cherokee County Administration Building;

BE IT THEREFORE RESOLVED that the Board of Commissioners of Cherokee County, Georgia, does hereby submit the 2021 Capital Improvements Element to the Atlanta Regional Commission for Regional and State review, as per the requirements of the Development Impact Fee Compliance Requirements.

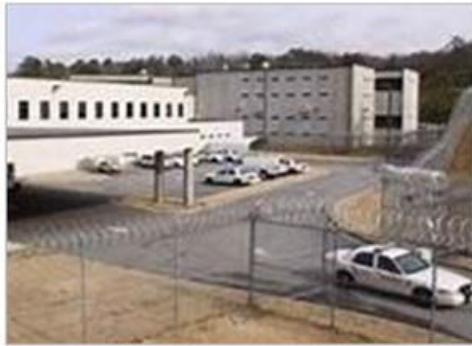
Adopted this 5th day of October, 2021.

BY: 
Harry Johnston, Chairman

ATTEST: 
Christy Black, County Clerk



Impact Fee Program



Capital Improvements Element

Cherokee County, Georgia

Including the following public facility categories:

Library Facilities
Parks and Recreation
Public Safety Facilities
Sheriff's Patrol
Fire Protection & Emergency Medical Services
Road Improvements

ROSS+associates

urban planning & plan implementation

in association with

Hatley Plans LLC

Draft: 10/5/21

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INTRODUCTION

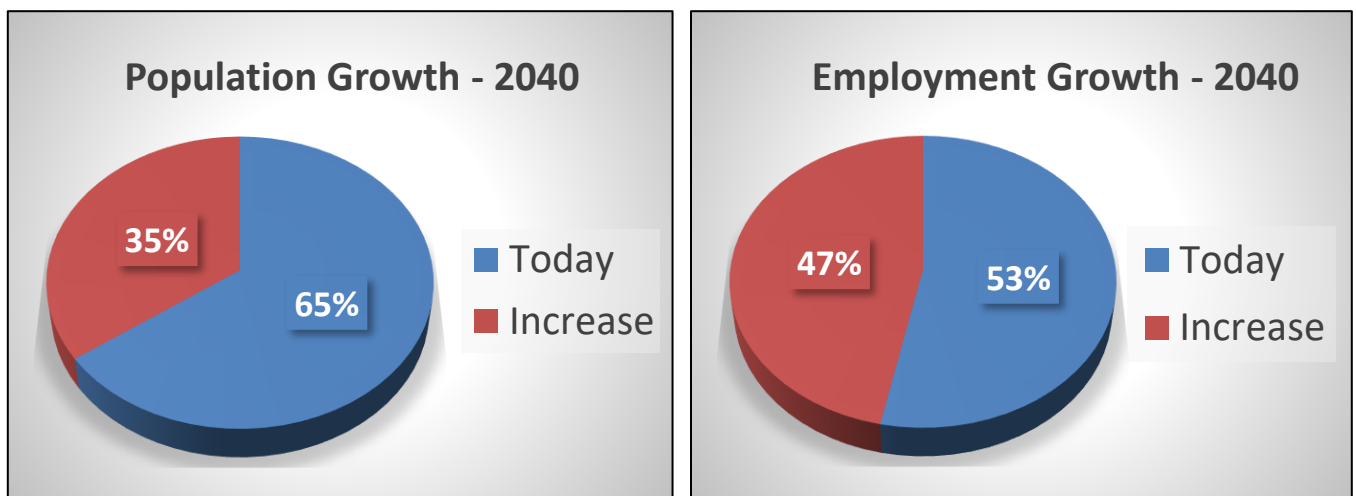
■ Updating the Impact Fee Program

Cherokee County was the first to adopt a countywide impact fee program in Georgia, which occurred in 2000, and included its initial Capital Improvements Element, Impact Fee Ordinance and Fee Schedule. The County most recently amended its CIE in 2013. This Methodology Report updates the County's documentation, including the recognition of current prices and costs for capital equipment and facilities, and extends the horizon of the program from 2030 to 2040.

Adoption of a new CIE and fee schedule would therefore update the County's program to current realities that was first instituted many years ago.

■ Looking Ahead

Forecasts indicate major growth ahead for Cherokee County as people continue to move into the county, propelled by growth in the Atlanta Metro Area, and attracted to favorable housing prices, a great school system, and access to jobs and services. Over the next 20 years to 2040, it is expected that more than one-in-three of the people that will be living in Cherokee County then are not here today. Employment will outpace population growth. By 2040, the total number of jobs in the county will be home to 47% new businesses.



Population Outlook

This future increase in population is not as unprecedented as it may seem. Looking back since 2000 the county's population grew from 143,777 to 265,292—a 46% increase—which included the collapse of the housing market and the onset of the Great Recession in 2008 and that only began to rebound in 2012. Comparing the population increase estimated from 2000 to 2020 to the increase projected from 2020 to 2040, both periods are estimated to grow at an average annual rate of increase of 5%.

Increased Job Opportunities

Even more robust than population growth, the nonresidential growth forecast indicates an increase in the number of private-sector jobs such that, by 2040, almost half of all jobs (47%) will be new to

the county. Compared to today's employment of 89,359, new jobs will have increased by 78,393—an 87.7% increase over the number of today's workers. (These numbers exclude government, construction and agricultural workers, since they are not assessed impact fees.)

According to Woods & Poole Economics, Inc., from 2020 to 2040, the county will see its greatest numerical increases in health care and social assistance (a 63.4% increase) and in educational services employment (up 55.3%), followed by accommodations and food services (up 49.7%) and professional and technical services (44.3%). In total, these four categories will comprise almost half (49%) of all jobs in the county in 2040. Adding in the administrative jobs category brings these five categories to a total of almost two-thirds (64.1%) of all jobs in the county by 2040, reflecting a total of slightly more than two-thirds of all jobs added since 2020 (66.9%).

With all of this projected population and employment growth by 2040, Cherokee County will be called upon to increase the capacity of its facilities and infrastructure. This expansion will be necessary in order to maintain the attractive quality of life and business environment enjoyed today by residents and businesses alike. For more information on anticipated growth, see the Forecasts section beginning on page 6 of this report. Detailed growth forecast methodologies are addressed in Technical Appendix B, *Future Forecasts*.

■ Impact Fees

Impact fees, examined in this report, present one potential revenue source in the on-going search for public facilities funding. We identify the current levels of service provided throughout the county and the desired levels of service for the future in order to quantify the capital facilities needed to achieve Cherokee County's goals for the future. Based on that analysis, calculations have been carried out in order to identify what portion of future capital facilities could be funded through impact fee collections.

In this report, capital costs have been examined for six public facility categories: Library Services, Parks & Recreation, Public Safety Facilities, the Sheriff's Patrol, Fire Protection Services, Emergency Medical Services, and Road Improvements. Based on plans of the County and projections of future capital investment needs, the portion of future capital costs that could be met through impact fees has been calculated. In short, impact fees could be used to fund a large portion of the capital costs in these public facility categories, and at the desired Level of Service standards, over the next 20 years to 2040.

In the end, impact fees represent a potential funding source that must be balanced against other needs of the County. In this report the maximum allowable impact fee for each public facility category has been calculated; this is the most that could be charged. Ultimately, the impact fee amounts charged will help to shift the burden for funding these capital projects from the tax base as a whole to the new growth and development actually creating the need for these capital improvement projects.

This meets the goal that is the essence and basis of impact fees:

Everyone—both here today and coming in the future—pays their fair share of the capital improvements needed to serve them on an equal basis.

Impact Fees Authorized

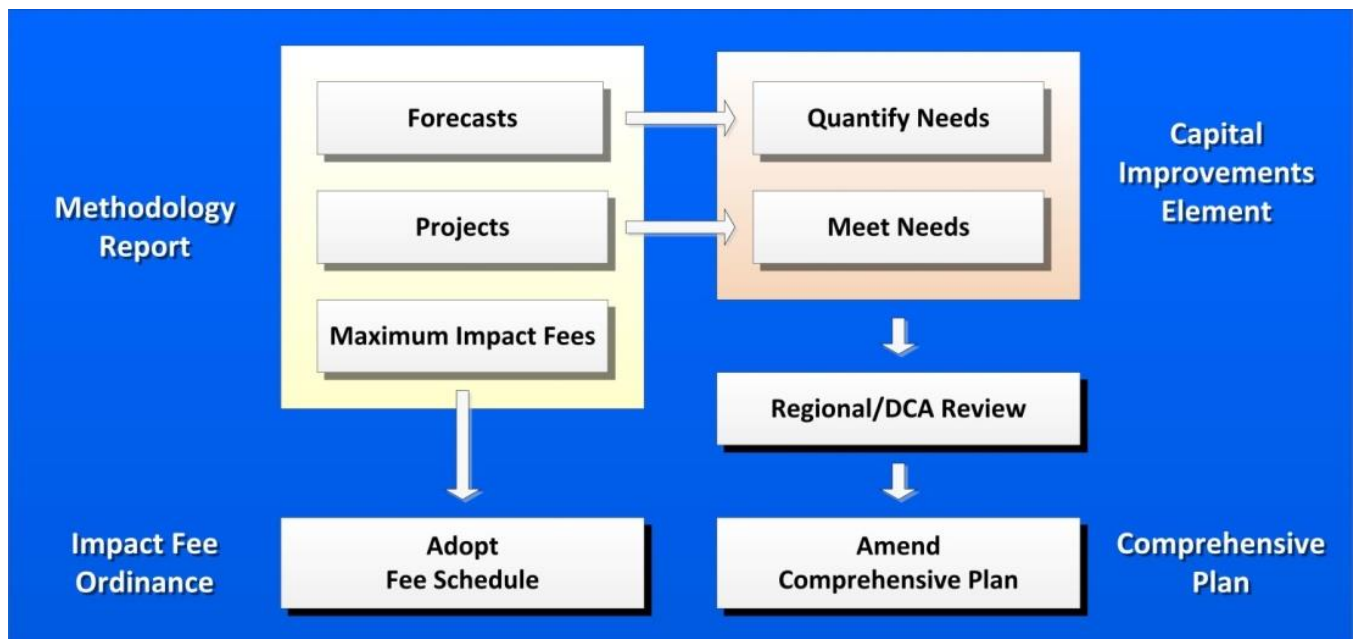
Impact fees are a form of revenue allowed by the State, and strictly defined and regulated through State law. Impact fees are authorized in Georgia under Code Section 37-71, the *Georgia Development Impact Fee Act* (DIFA), and are administered by the Georgia Department of Community Affairs (DCA) under Chapter 110-12-2, *Development Impact Fee Compliance Requirements*.

Under DIFA, the County can collect money from new development based on that development's proportionate share—the 'fair share'—of the cost to provide the facilities it needs. The State law allows impact fees to be collected in the categories of libraries, parks & recreation, public safety (law enforcement, fire protection, and EMS), road improvements, stormwater control, and water and wastewater facilities. Ultimately, and importantly, the services provided in the public facility categories for which impact fees are being charged must be the same for both the existing community and future growth.

The provisions of the DIFA are extensive, in order to assure that new development pays no more than its fair share of the costs and that impact fees are not used to solve existing service deficiencies.

Impact Fee Documentation

The diagram below illustrates the various documents and their interrelationship in the impact fee program.



The Cherokee County Impact Fee System consists of four components:

- A **Methodology Report**, which includes:
 - updated forecasts of population, housing and employment for the county;
 - capital improvement projects to serve new growth, based on Level of Service standards, for each public facility category; and,
 - the impact cost of new growth and development (and thus the maximum impact fees that can be assessed).
- This **Capital Improvements Element** (CIE) to implement the County's proposed improvements, including an updated Five-Year Community Work Program.
- Amendments to the **Impact Fee Ordinance**, including an updated impact fee schedule by land use category.
- The County's **Comprehensive Plan**, which will be amended by the adoption of this CIE.

■ Eligible Facilities

The table on the next page shows the facility categories that are eligible for impact fee funding under Georgia law and that are included in the County's impact fee program. For each facility category, the types of public facilities that could be eligible for impact fee funding (in whole or in part), the service area for each public facility category as well as the basis for the standard adopted as the Level of Service to be delivered for each facility category is listed.

Table 1: Overview of Impact Fee Program – Facilities

	Eligible Facilities	Service Area	Level of Service Standard Based on ...
Library Services	Library facilities including collection materials	Countywide	Square footage and number of collection materials per dwelling unit
Parks and Recreation	Park acres and recreation components	Countywide	Number of acres and recreation components per dwelling unit
Public Safety Facilities	Adult Detention Center, Fire Dept Headquarters, Emergency Management Agency	Countywide	Square footage of facilities per day-night population
Sheriff's Patrol	Precinct stations, Special Operations and CID facility space, and S.W.A.T. robotic system	Unincorporated Area	Square footage of facilities per day-night population
Fire Protection and Emergency Medical Services	Fire stations, fire trucks and auxiliary vehicles; EMS facility space and ambulances	Fire: Countywide except Woodstock EMS: Countywide	Square footage of facilities and number of vehicles per day-night population
Road Improvements	Road projects serving residents and workers	Countywide	LOS "D" for entire road network

NOTE: All facilities, including library volumes, vehicles and equipment must have a useful life of 10 years or more.

The following terms are used in Table 1:

Eligible Facilities under the State Act are limited to capital items having a life expectancy of at least 10 years, such as land, buildings and other facilities, and major rolling stock (such as fire trucks). Impact fees cannot be used for the maintenance, supplies, personnel salaries,

or other operational costs, or for short-term capital items such as computers, furniture or passenger automobiles. None of these costs are included in the impact fee system.

Service Areas are the geographic areas that the facilities serve, and the areas within which the impact fee would apply. Monies collected in a service area for a particular type of facility may only be spent for that purpose, and only for projects that serve that service area.

Level of Service Standards are critical to determining new development's fair share of the costs. The same standards must be applied to existing development as well as new to assure that each is paying only for the facilities that serve it. New development cannot be required to pay for facilities at a higher standard than that available to existing residents and businesses, nor to subsidize existing facility deficiencies.

■ Editorial Conventions

This report observes the following conventions:

- The capitalized word 'County' applies to the government of Cherokee County, the Board of Commissioners or any of its departments or officials, as appropriate to the context. An example is "the County has adopted an impact fee ordinance".
- The lower-case word 'county' refers to the geographical area of Cherokee County, as in "the population of the county has grown".
- The same conventions are applied to the words 'City' and 'city', 'State' and 'state'.
- Single quote marks (' and ') are used to highlight a word or phrase that has a particular meaning as used in this report or refers to a heading in a table.
- Double quote marks (" and ") are used to set off a word or phrase that is a direct quote taken from another source, such as a passage or requirement copied directly from a law or report.
- Numbers shown on tables are often rounded from the actual calculation of the figures for clarity, but the actual calculated number of decimal points is retained within the table for accuracy and further calculations.

FORECASTS

Notable future growth and development is forecast for Cherokee County over the coming 20 years as recovery from the Great Recession takes wing—a process that has already begun.

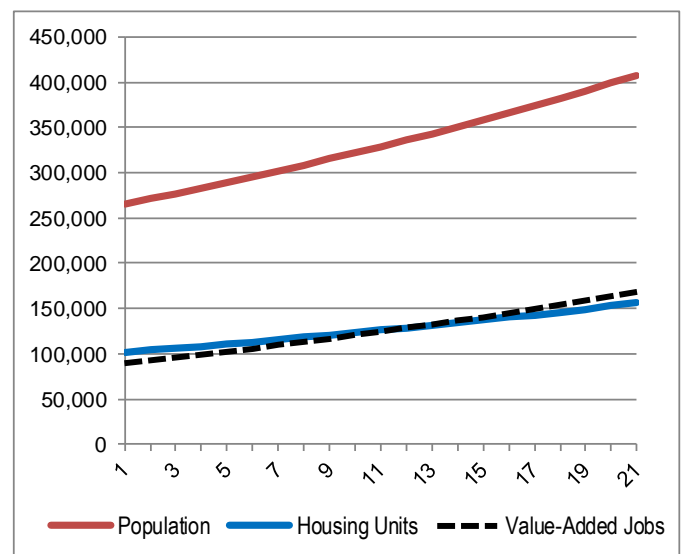
■ County Projections

Population projections reflect this extensive growth that is expected by 2040 in the county, interrelated with both housing and business growth. The ultimate population forecast for 2040 is more than 128,000 people—an additional 35% in the number of people in the county today. Housing for this future population growth will increase at the same rate, yielding a 2040 housing stock of almost 50,000 units of all types of housing, adding about 13,000 units to the existing housing supply.

Employment in the county will also increase dramatically, adding over 16,600 (58.3%) to the number of value-added jobs here today. The numbers shown in the 'value-added jobs' column are private sector, building-occupying employment figures and exclude those that are referred to as 'non-building related' jobs. 'Non-building related' jobs are those that do not normally require issuance of a building permit, and thus would not be assessed an impact fee, such as employment that is considered to be transitory in nature (such as those working on construction sites) or are strictly land-based such as farm workers. In addition, the workers employed by governmental entities are excluded because governments are exempt from impact fees.

Table 2: Forecasts of Future Growth

Year	Population	Housing Units	Value-Added Jobs
2020	265,292	101,537	89,359
2021	271,045	103,738	92,596
2022	276,923	105,988	95,832
2023	282,928	108,286	99,069
2024	289,064	110,634	102,305
2025	295,332	113,034	105,542
2026	301,737	115,485	109,252
2027	308,281	117,989	112,963
2028	314,966	120,548	116,673
2029	321,796	123,162	120,384
2030	328,775	125,833	124,094
2031	335,905	128,562	128,243
2032	343,189	131,350	132,392
2033	350,632	134,199	136,541
2034	358,236	137,109	140,690
2035	366,005	140,083	144,839
2036	373,942	143,121	149,422
2037	382,051	146,224	154,004
2038	390,336	149,395	158,587
2039	398,801	152,635	163,169
2040	407,450	155,945	167,752



	Population	Housing Units	Value-Added Jobs
2020	265,292	101,537	89,359
2040	407,450	155,945	167,752
Increase	142,158	54,408	78,393
Percent	53.6%	53.6%	87.7%

■ Service Area Projections

In Table 3, the service area forecasts are presented for the countywide service area measured in two ways: countywide housing units (which quantifies Library Services and Parks & Recreation demands), and countywide day-night population (for the Public Safety Facilities, EMS and Road Improvements public facility categories).

The 'day-night population' calculation is a combination of the future population and employment projections shown on Table 2. The day-night population is used to determine Level of Service standards for facilities that serve both the resident population and business employment on a 24-hour basis. Public Safety Facilities, for instance, operate on a 24-hour basis serving the entire county. Thus, this 'day-night population' is a measure of the total services demanded of a 24-hour service provider facility and a fair way to allocate the costs of such a facility among all of the beneficiaries.

Table 3: Service Area Forecasts - Countywide

	Library, Parks	Public Safety Facility, Emergency Medical Services, Road Improvements		
	Housing Units	Population	Value-Added Employment	Day-Night Population
2020	101,537	265,292	89,359	354,651
2021	103,738	271,045	92,596	363,641
2022	105,988	276,923	95,832	372,755
2023	108,286	282,928	99,069	381,997
2024	110,634	289,064	102,305	391,369
2025	113,034	295,332	105,542	400,874
2026	115,485	301,737	109,252	410,989
2027	117,989	308,281	112,963	421,244
2028	120,548	314,966	116,673	431,639
2029	123,162	321,796	120,384	442,180
2030	125,833	328,775	124,094	452,869
2031	128,562	335,905	128,243	464,148
2032	131,350	343,189	132,392	475,581
2033	134,199	350,632	136,541	487,173
2034	137,109	358,236	140,690	498,926
2035	140,083	366,005	144,839	510,844
2036	143,121	373,942	149,422	523,364
2037	146,224	382,051	154,004	536,055
2038	149,395	390,336	158,587	548,923
2039	152,635	398,801	163,169	561,970
2040	155,945	407,450	167,752	575,202
Increase 2020-40	54,408	142,158	78,393	220,551

Unlike county-wide services, the Cherokee County Fire Department provides its primary services to the entire county except the City of Woodstock. This includes all of the unincorporated area and the cities of Ball Ground, Canton, Holly Springs and Waleska, as well as the portions of Mt. Park and Nelson within the county.

The approach is that the Fire Department protects one's house whether or not anyone is at home, and protects stores and offices whether or not they are open for business. Thus, this 'day-night population' is a measure of the total services demanded of a 24-hour service provider facility and a fair way to allocate the costs of such a facility among all of the beneficiaries.

Table 4: Future Growth Forecasts – County Fire Service Area

	Residential Uses	Nonresidential Uses		
	Housing Units	Population	Value-Added Employment	Day-Night Population
2020	86,341	230,249	70,486	300,735
2021	87,894	234,507	73,039	307,546
2022	89,468	238,826	75,592	314,418
2023	91,061	243,206	78,145	321,351
2024	92,674	247,647	80,698	328,345
2025	94,308	252,148	83,251	335,399
2026	95,960	256,711	86,178	342,889
2027	97,631	261,334	89,105	350,439
2028	99,321	266,016	92,031	358,047
2029	101,030	270,758	94,958	365,716
2030	102,757	275,560	97,885	373,445
2031	104,502	280,420	101,158	381,578
2032	106,262	285,336	104,431	389,767
2033	108,041	290,311	107,703	398,014
2034	109,835	295,342	110,976	406,318
2035	111,646	300,428	114,249	414,677
2036	113,471	305,567	117,864	423,431
2037	115,309	310,759	121,479	432,238
2038	117,161	316,003	125,093	441,096
2039	119,026	321,296	128,708	450,004
2040	120,902	326,639	132,323	458,962
Increase 2020-40	34,561	96,390	61,837	158,227

The Fire District includes all of the cities in the county except Woodstock, and all of the unincorporated area.

Unlike the other public facility categories above, the primary service area of the Sheriff's Patrol focuses on the unincorporated area of the county. Impact fees for the Sheriff's Patrol serving homes in the service area are based on the number of housing units in the service area. For all nonresidential land uses, the day-night population is used, which provides a 'per person' figure that is applied to the employment characteristics of each type of land use. (This is described more completely in the public facility chapters where it is used.)

Table 5: Future Growth Forecasts - Sheriff's Patrol

	Residential Uses	Nonresidential Uses		
	Housing Units	Population	Value-Added Employment	Day-Night Population
2020	67,686	181,666	44,487	226,153
2021	68,696	184,378	46,098	230,476
2022	69,706	187,098	47,710	234,808
2023	70,720	189,826	49,321	239,147
2024	71,735	192,557	50,933	243,490
2025	72,751	195,287	52,544	247,831
2026	73,766	198,020	54,391	252,411
2027	74,780	200,747	56,238	256,985
2028	75,790	203,466	58,085	261,551
2029	76,799	206,179	59,932	266,111
2030	77,802	208,880	61,779	270,659
2031	78,799	211,563	63,845	275,408
2032	79,789	214,227	65,911	280,138
2033	80,772	216,871	67,977	284,848
2034	81,744	219,488	70,043	289,531
2035	82,705	222,072	72,109	294,181
2036	83,652	224,623	74,390	299,013
2037	84,585	227,134	76,671	303,805
2038	85,500	229,599	78,953	308,552
2039	86,399	232,017	81,234	313,251
2040	87,276	234,379	83,515	317,894
Increase 2020-40	19,590	52,712	39,028	91,740

The Sheriff's Patrol serves the unincorporated area.

A much more extensive socioeconomic analysis and description of the growth projections is contained in Appendix B: Future Growth.

LIBRARY SERVICES

■ Introduction

Library services in Cherokee County are provided through the Sequoyah Regional Library System that also provides library services to Pickens and Gilmer Counties. Cherokee County's libraries are operated and maintained primarily by financial contributions from Cherokee County, with local jurisdictions providing financial contributions toward the libraries' operations and the State of Georgia providing limited assistance for operations and new construction. The library system provides services to all residents of Cherokee County through a variety of information and materials, facilities, and programs.



Demand for library services is almost exclusively related to the county's resident population. Businesses may use public libraries for research purposes, but the use is incidental compared to that of the families and individuals who live in the county. Thus, a library services system impact fee is limited to future residential growth.

■ Service Area

Materials, facilities and services of the library system are equally available to the county's population. The entire county is therefore considered a single service district for library services. An improvement in any part of the county increases service to all parts of the county to some extent.

■ Level of Service

The current Level of Service (LOS) is based on an inventory of library facilities and collection materials, which are shown in Table 6. This inventory includes 83,355 square feet in six libraries and 212,689 in collection materials.

Table 6: Inventory of Library Facilities

Facility	Gross Floor Area in Square Feet	Collection Materials
R.T. Jones Memorial Library	31,100	70,280
Ball Ground Library	9,000	24,423
Hickory Flat Library	10,000	31,188
Rose Creek Library	10,000	33,551
Woodstock Library	21,407	51,769
Cherokee County Law Library	1,848	1,478
Total Inventory	83,355	212,689

In Table 7, the Level of Service calculations are determined by dividing the 'Facility' figures by the number of housing units in the county in 2020. These calculations determine that the library system provided almost one square foot of library space and two collection materials and for each dwelling unit in the county in 2020.

Table 7: Level of Service Calculation

Facility	Service Population	Level of Service
Building Area (Square Feet)	Number of Housing Units (2020)	Square Feet of Floor Area per Housing Unit
83,355	101,537	0.8209
Collection Materials	Number of Housing Units (2020)	Collection Materials per Housing Unit
212,689	101,537	2.0947



■ Forecasts for Service Area

Future Demand

In Table 8 the current Level of Service figures from Table 7 are used to calculate New Growth Demand for facilities and collection materials between 2020 and 2040 by multiplying the LOS by the projected increase in housing units over the next 20 years.

Table 8: Future Demand Calculation

Level of Service	Service Area Growth	New Growth Demand
Square Feet of Floor Area per Housing Unit	Number of New Housing Units (2020-40)	Square Feet of New Floor Area Needed
0.8209	54,408	44,665
Collection Materials per Housing Unit	Number of New Housing Units (2020-40)	Collection Materials Needed
2.0947	54,408	113,968

Table 9 presents the expected demand for new library facilities in an annual format. In the case of the Hickory Flat project, the total floor area of the facility after its expansion will be 17,000 square feet. However, the net increase in floor area serving the county is 7,000 square feet. This is the portion needed to meet future growth demand and is therefore the only impact fee eligible square footage. In addition, the total floor area of the Rose Creek replacement project will be 20,000. Of this, only 10,000 square feet is impact eligible, as this is the net increase in floor area between the new facility and the existing building it will replace.

The table also shows two future library projects roughly in pace with the anticipated growth in dwelling units. The proposed construction in the northeast part of the county would result in a new 24,000 square foot library. Another proposed library in the southwest part of the county would result in a 20,000 square foot facility. However, only a portion of this fourth facility (3,665 square feet, or 18%) is impact fee eligible since the total square footage of all of the proposed projects combined (61,000) exceeds the amount (44,665) that is technically required by new growth to 2040. Only 44,665 square feet of the identified projects is 100% impact fee eligible; any overage is not eligible, which equates to 16,335 square feet that is allocated to the Future Southwest Area Branch.

Table 9: Future Library Facility Projects

Year	New Dwelling Units	Running Total: SF Demanded	Project	Square Footage*
2021	2,201	1,807		
2022	2,250	3,654	Hickory Flat Expansion	7,000
2023	2,298	5,540		
2024	2,348	7,468		
2025	2,400	9,438		
2026	2,451	11,450	Rose Creek Replacement	10,000
2027	2,504	13,506		
2028	2,559	15,607		
2029	2,614	17,753		
2030	2,671	19,945		
2031	2,729	22,186		
2032	2,788	24,474	Future Northeast Area Branch	24,000
2033	2,849	26,813		
2034	2,910	29,202		
2035	2,974	31,644		
2036	3,038	34,138		
2037	3,103	36,685		
2038	3,171	39,288		
2039	3,240	41,948		
2040	3,310	44,665	Future Southwest Area Branch	20,000
Total				61,000

* 'Square Footage' excludes existing space that will be added to (Hickory Flat) or replaced (Rose Creek). And, any future square footage exceeding the impact fee eligible cap of 44,665 is not impact fee eligible; this applies to 82% (16,335 square feet) of the Future SW Area Branch.

Table 10 presents the figures for collection material demand. Materials demanded by new growth are calculated in the first columns by multiplying the Level of Service (from Table 7) times the net new dwelling units each year (from Table 2). Thus the 'New Materials Needed (annual)' column represents the number of materials that must be purchased in order to meet new growth's demand in each year. The 'Running Total' column shows the accumulated number of new collection materials that will meet the needs of future residential growth in the county.

However, the Library System discards a few of its collection materials each year as they become worn out, disfigured, broken or out of date. To maintain the collection, these materials need to be replaced with new materials. Since these materials replenish the overall collection, the responsibility for these replacements falls to the current residents and not to new growth.

Over the past several years the discard rate has averaged 4.4% of materials in the Library System's collection. As the collection grows in the future, this discard rate will continue relative to the new materials being acquired. By including the discarded materials for replacement each year, the resulting 'Total Materials Needed (annual)' column reflects the total number of volumes required annually to maintain the LOS once these non-impact fee eligible volumes are discarded. Thus, the new materials that will be needed each year will meet both the demand of new growth and the replenishment of the current collection. A total of 118,983 collection materials will need to be purchased to maintain the Level of Service for new and existing development and to account for discarded volumes.

Table 10: Future Collection Materials Needed

Year	New Growth Demand			Plus Discarded Materials	Total Materials Needed (annual)
	New Dwelling Units	New Materials Needed (annual)	Running Total		
2021	2,201	4,610	4,610	203	4,813
2022	2,250	4,713	9,323	207	4,920
2023	2,298	4,814	14,137	212	5,025
2024	2,348	4,918	19,055	216	5,135
2025	2,400	5,027	24,083	221	5,248
2026	2,451	5,134	29,217	226	5,360
2027	2,504	5,245	34,462	231	5,476
2028	2,559	5,360	39,822	236	5,596
2029	2,614	5,476	45,298	241	5,716
2030	2,671	5,595	50,893	246	5,841
2031	2,729	5,716	56,609	252	5,968
2032	2,788	5,840	62,449	257	6,097
2033	2,849	5,968	68,417	263	6,230
2034	2,910	6,096	74,512	268	6,364
2035	2,974	6,230	80,742	274	6,504
2036	3,038	6,364	87,106	280	6,644
2037	3,103	6,500	93,606	286	6,786
2038	3,171	6,642	100,248	292	6,935
2039	3,240	6,787	107,035	299	7,085
2040	3,310	6,933	113,968	305	7,239
Total	54,408	113,968		5,015	118,983

Note: Discard rate = 4.4%

■ Future Costs

New Library Space

The building floor area needed to serve new growth identified in Table 9 is used to calculate the future cost to meet service demand, as shown in Table 11. The costs are shown in current dollars, and then adjusted to reflect the Net Present Value based on the year in which the expenditure is anticipated. For facility construction, the estimated current cost of construction is adjusted using the BCI (building construction cost index), and then reduced by the Discount Rate to determine the Net Present Value.

Table 11: Facility Costs to Meet Future Demand

Year	Project	Total Floor Area	Total Cost *	% for New Growth	Total Impact Fee Eligible	Net Present Value (NPV)**
2022	Hickory Flat Expansion	7,000	2,600,000	100%	2,600,000	\$ 2,684,360
2026	Rose Creek Replacement	10,000	4,000,000	100%	4,000,000	\$ 4,402,124
2032	Future Northeast Area Branch	24,000	9,500,000	100%	9,500,000	\$ 11,506,101
2040	Future Southwest Area Branch ***	20,000	-		-	\$ -
Total		61,000	16,100,000		16,100,000	\$ 18,592,585

* Based on Georgia Public Library Service formulas for calculating new building construction and building addition costs.

** Net Present Value = Current cost estimate inflated to target year using the Building Cost Index (BCI), reduced using the Discount Rate from the Cost Adjustments and Credits Chapter.

*** Construction of the Future Southwest Area Branch will be deferred until after 2040.

Cost estimates are based on figures prepared by the Sequoyah Regional Library System utilizing formulas provided by the Georgia Public Library Service for the state's Capital Outlay Grant Program. Costs shown on the table include the total estimated costs to increase the Hickory Flat Library by 7,000 square feet, construct 10,000 square feet (i.e., the impact fee eligible portion) of the 20,000 square foot Rose Creek Library replacement project, and to construct one new future library branch. The construction of the Future Southwest Area Branch will be deferred until after 2040.

New Collection Materials

The average cost of a collection material is based on the overall value of all of the materials in the current collection. The inventory of the current collection is shown on Table 18, along with the average cost to acquire each type of material and the total value of all such materials on hand. Overall, the system's collection of 212,689 materials has a current (replacement) value of \$3,502,185.48. Dividing one by the other, the average per volume in the collection is \$16.47.

The new collection materials needed to serve new growth and to offset the discard rate, identified on Table 10, are used to calculate the future cost to meet service demand, as shown in Table 13. The 'Total Cost' each year (in current dollars) is produced by multiplying the number of collection materials needed times the average per-volume cost calculated from Table 18. The percentage of the cost attributable to new growth in each year is based on the percentage of total volumes

demanded that are attributable to new growth's demand (i.e., excluding the volumes needed to replace the discarded volumes).

This results in the 'New Growth Share' amounts, which are then adjusted to reflect the Net Present Value based on the year in which the expenditure is anticipated. The Net Present Value calculation for the acquisition of collection materials is based on the CPI (consumer price index) inflation factor, and then reduced by the Net Discount Rate to determine the Net Present Value.

Table 12: Value of Collection Materials – 2020

Type of Collection Materials	Number of Volumes in Collection	Average \$\$ Per Volume	Total Value
Adult Hardback Books	97,272	\$ 16.67	\$ 1,621,524.24
Juvenile/Easy Books	81,422	\$ 12.96	\$ 1,055,229.12
Reference Books	5,657	\$ 30.75	\$ 173,952.75
Paperback Books	11,920	\$ 12.20	\$ 145,424.00
Audiobooks	7,910	\$ 29.70	\$ 234,927.00
DVDs	6,574	\$ 20.00	\$ 131,480.00
CDs	1,045	\$ 10.00	\$ 10,450.00
Microforms	889	\$ 145.33	\$ 129,198.37
Total Collection	212,689	\$ 16.47	\$ 3,502,185.48



Table 13: Collection Material Costs to Meet Future Demand

Year	Total Materials Needed (annual)	Total Cost (2020 \$)	% for New Growth	New Growth Share (2020 \$)	Net Present Value
2021	4,813	\$ 79,256.59	95.79%	\$ 75,916.27	\$ 77,012.04
2022	4,920	\$ 81,021.04	95.79%	\$ 77,606.36	\$ 79,862.86
2023	5,025	\$ 82,749.49	95.79%	\$ 79,261.97	\$ 82,743.94
2024	5,135	\$ 84,549.96	95.79%	\$ 80,986.55	\$ 85,764.59
2025	5,248	\$ 86,422.45	95.79%	\$ 82,780.12	\$ 88,929.32
2026	5,360	\$ 88,258.92	95.79%	\$ 84,539.20	\$ 92,129.95
2027	5,476	\$ 90,167.42	95.79%	\$ 86,367.26	\$ 95,480.71
2028	5,596	\$ 92,147.93	95.79%	\$ 88,264.30	\$ 98,986.36
2029	5,716	\$ 94,128.45	95.79%	\$ 90,161.35	\$ 102,573.33
2030	5,841	\$ 96,180.98	95.79%	\$ 92,127.38	\$ 106,322.84
2031	5,968	\$ 98,269.52	95.79%	\$ 94,127.90	\$ 110,199.60
2032	6,097	\$ 100,394.08	95.79%	\$ 96,162.91	\$ 114,207.08
2033	6,230	\$ 102,590.65	95.79%	\$ 98,266.90	\$ 118,390.39
2034	6,364	\$ 104,787.22	95.79%	\$ 100,370.90	\$ 122,670.69
2035	6,504	\$ 107,091.81	95.79%	\$ 102,578.37	\$ 127,178.17
2036	6,644	\$ 109,396.41	95.79%	\$ 104,785.84	\$ 131,790.21
2037	6,786	\$ 111,737.02	95.79%	\$ 107,027.80	\$ 136,552.91
2038	6,935	\$ 114,185.66	95.79%	\$ 109,373.23	\$ 141,559.55
2039	7,085	\$ 116,670.30	95.79%	\$ 111,753.16	\$ 146,727.57
2040	7,239	\$ 119,190.96	95.79%	\$ 114,167.58	\$ 152,061.23
Total	118,983	\$ 1,959,196.86		\$ 1,876,625.35	\$ 2,211,143.38

PARKS AND RECREATION FACILITIES

■ Introduction

Public recreational opportunities are available in Cherokee County through a number of parks facilities operated by the Cherokee Recreation and Parks Agency (CRPA). Demand for recreational facilities is almost exclusively related to the county's resident population. Businesses make some incidental use of public parks for office events, company softball leagues, etc., but the use is minimal compared to that of the families and individuals who live in the county. Thus, the parks and recreation impact fee is limited to future residential growth.



■ Service Area

Parks and recreational facilities are made available to the county's population without regard to the political jurisdiction within which the resident lives. In addition, the facilities are provided equally to all residents, and often used on the basis of the programs available, as opposed to proximity of the facility. For instance, children active in the little leagues play games at various locations throughout the county, based on scheduling rather than geography. Other programs are located only at certain centralized facilities, to which any Cherokee County resident can come. As a general rule, parks facilities are located throughout the county, and future facilities will continue to be located around the county so that all residents will have recreational opportunities available on an equal basis. Thus, the entire county is considered a single service area for parks & recreation.



■ Level of Service

The determination of Level of Service (LOS) standards begins with an inventory of existing County facilities.

Table 14 focuses on lands operated as parks by the CRPA, as well as acreage that will be utilized as future active or passive recreation areas. The developed and undeveloped parkland comprises a total of over 4,000 acres.

A variety of recreation components are located in the County's parks and are inventoried in Table 15: Level of Service Calculations.

Table 14: Current Inventory of Park Lands

Park / Facility	Acreage
Developed	
Badger Creek Park	151.00
Barnett Park	25.00
Blankets Creek Bike Trails	364.00
Bryan Walker Field	3.14
Buffington Park	3.00
Cherokee County Aquatic Center	38.00
Cherokee County Senior Center	1.83
Cherokee Mills Park	40.00
Cherokee Veterans Park	149.00
Cline Park	12.00
Dwight Terry Park	30.00
Field's Landing Park	280.00
Garland Mountain Horse and Hiking Trails	544.00
Hickory Trails Park	24.00
Hobgood Park	60.00
J.J. Biello Park	470.00
Kenney Askew Park	55.00
Lewis Park	57.00
Patriots Park	33.00
Recreation Center (South Annex)	14.00
Riverchase Park	10.00
Sequoyah Park	39.00
Union Hill Community Center	3.00
Waleska Park	18.00
Weatherby Park	17.00
<i>Developed Park Acres</i>	<i>2,440.97</i>
Undeveloped	
Dunn Property	36.00
Free Home Property	102.00
Forestar Property	62.00
John Ford Property	186.00
Hudgens Property	405.16
Hwy 372 Property	23.76
Park Village	25.00
Rebecca Ray Park	15.00
Rubes Creek Park	39.00
Thacker Property	141.00
Thompson Property	43.00
Willoughby-Sewell Property	226.59
Yellow Creek Road Property	538.36
<i>Undeveloped Park Acres</i>	<i>1,842.87</i>
Total Park Acres	4,283.84



Table 15 shows the current inventory of recreation components controlled by the County, as well as components the County does not currently have in its recreation system but plans to add in accordance with recommendations in its 2019 *Recreation, Parks, Greenspace & Trails Master Plan*. These currently show as "0" below.

Table 15 also presents the Level of Service in recreation land and facilities per population, converts this to the Level of Service per the number of housing units occupied by that population, and then expresses the Level of Service per housing unit (since impact fees are assessed per housing unit when building permits are issued, not population).

Table 15: Level of Service Calculations

Component Type	Current Inventory	Level of Service per "X" Population*	Level of Service per "X" Housing Units**	Level of Service per Housing Unit***
Park Acres	4,283.84	1 per 99 Population =	1 per 38 Housing Units =	0.026316 for each Housing Unit
Recreation Buildings & Supporting Facilities				
Aquatic Center/Swimming Pools	1	1 per 135,817 Population =	1 per 51,982 Housing Units =	0.000019 for each Housing Unit
Banquet Hall	1	1 per 265,292 Population =	1 per 101,537 Housing Units =	0.000010 for each Housing Unit
Community Room (square feet)	12,548	1 per 21 Population =	1 per 8 Housing Units =	0.125000 for each Housing Unit
Concessions/Restroom Building	14	1 per 18,949 Population =	1 per 7,253 Housing Units =	0.000138 for each Housing Unit
Double Gymnasium	1	1 per 75,000 Population =	1 per 28,705 Housing Units =	0.000035 for each Housing Unit
Maintenance Building	5	1 per 53,058 Population =	1 per 20,307 Housing Units =	0.000049 for each Housing Unit
Maintenance Yard (square feet)	58,325	1 per 5 Population =	1 per 2 Housing Units =	0.500000 for each Housing Unit
Parking Spaces	5,665	1 per 47 Population =	1 per 18 Housing Units =	0.055556 for each Housing Unit
Restroom Building	21	1 per 12,633 Population =	1 per 4,835 Housing Units =	0.000207 for each Housing Unit
Recreation Center	1	1 per 81,490 Population =	1 per 31,189 Housing Units =	0.000032 for each Housing Unit
Senior Center	2	1 per 132,646 Population =	1 per 50,769 Housing Units =	0.000020 for each Housing Unit
Park and Recreation Components				
Amphitheater	0	1 per 203,725 Population =	1 per 77,973 Housing Units =	0.000013 for each Housing Unit
Athletic Field (FB, Soccer, Lax)	28	1 per 7,500 Population =	1 per 2,871 Housing Units =	0.000348 for each Housing Unit
Baseball/Softball Diamond	39	1 per 4,500 Population =	1 per 1,722 Housing Units =	0.000581 for each Housing Unit
Adaptive BB/SF Diamond	1	1 per 150,000 Population =	1 per 57,411 Housing Units =	0.000017 for each Housing Unit
Basketball Court, Outdoor	3	1 per 30,000 Population =	1 per 11,482 Housing Units =	0.000087 for each Housing Unit
Batting Cage	38	1 per 6,981 Population =	1 per 2,672 Housing Units =	0.000374 for each Housing Unit
BMX Bike Track	0	1 per 407,450 Population =	1 per 155,946 Housing Units =	0.000006 for each Housing Unit
Boat/Fishing Dock	3	1 per 88,431 Population =	1 per 33,846 Housing Units =	0.000030 for each Housing Unit
Disc Golf Course	1	1 per 135,817 Population =	1 per 51,982 Housing Units =	0.000019 for each Housing Unit
Dog Park	1	1 per 60,000 Population =	1 per 22,964 Housing Units =	0.000044 for each Housing Unit
Event Lawn	5	1 per 53,058 Population =	1 per 20,307 Housing Units =	0.000049 for each Housing Unit
Fishing/Boat Ramp	2	1 per 132,646 Population =	1 per 50,769 Housing Units =	0.000020 for each Housing Unit
Fitness Equipment, Outdoor	2	1 per 132,646 Population =	1 per 50,769 Housing Units =	0.000020 for each Housing Unit
In-Line Hockey Rink, Outdoor	1	1 per 150,000 Population =	1 per 57,411 Housing Units =	0.000017 for each Housing Unit
Pavilion / Picnic Area	42	1 per 6,316 Population =	1 per 2,418 Housing Units =	0.000414 for each Housing Unit
Outdoor Classroom	1	1 per 265,292 Population =	1 per 101,537 Housing Units =	0.000010 for each Housing Unit
Pickleball Court	10	1 per 20,000 Population =	1 per 7,655 Housing Units =	0.000131 for each Housing Unit
Playground	10	1 per 26,529 Population =	1 per 10,154 Housing Units =	0.000098 for each Housing Unit
Skate Park	1	1 per 101,863 Population =	1 per 38,987 Housing Units =	0.000026 for each Housing Unit
Splash Pad	1	1 per 265,292 Population =	1 per 101,537 Housing Units =	0.000010 for each Housing Unit
Tennis Court	22	1 per 11,984 Population =	1 per 4,587 Housing Units =	0.000218 for each Housing Unit
Trails, Paved (miles)	4.5	1 per 58,954 Population =	1 per 22,564 Housing Units =	0.000044 for each Housing Unit
Trails, Soft Surface (miles)	38.9	1 per 6,820 Population =	1 per 2,610 Housing Units =	0.000383 for each Housing Unit
Volleyball Courts, Outdoor Sand	3	1 per 60,000 Population =	1 per 22,964 Housing Units =	0.000044 for each Housing Unit

* *Italics*: LOS is based on the adopted level of service in the Cherokee County Recreation, Parks, Greenspace & Trails Master Plan (2019).

Non-italics: LOS is based on the current inventory divided by the current population, with the exception that the level of service calculations for the aquatic center/swimming pools, recreation center, amphitheater, BMX bike track, disc golf course, skate park, and tennis courts, are based on the number of each component that is anticipated to serve local needs through 2040.

** Converted using average population per housing unit in 2020, with the exception that average population per housing unit in 2040 is used for the seven cited in the above footnote.

*** "1" divided by the number of housing units for each component under 'Level of Service per "X" Housing Units' column.

Table 15 incorporates a combination of LOS standards reflecting current conditions and Master Plan standards where applicable, relevant and useful to the impact fee calculations.

First priority is given to the LOS standards adopted in the 2019 Master Plan, where those standards relate to actual facilities and are based on population. Where an existing category has no comparable component in the Master Plan, the LOS for the current facilities is used. This is calculated by dividing the current inventory into the current (2020) population. The same is true where the LOS standard in the Master Plan differs as to its basis (such as 'x' playgrounds per park vs. population).

In some instances (for the aquatic center/swimming pools, recreation center, amphitheater, BMX bike track, disc golf course, skate park, and tennis courts), the LOS is based on the number of each component that is anticipated to serve local needs through 2040. This is due to a determination that applying the adopted Master Plan LOS or the LOS for current facilities will yield a larger number of recreation components than necessary to serve future needs.

The standards used in this Methodology Report provide greater clarity to future parks and recreation component development in terms of the County's current activities and planned improvements.



■ Forecasts for Service Area

Future Demand

Table 16 below applies the LOS calculations from Table 15 to determine the facilities needed to meet the demand created by the existing residents of the county as well as the future demand for recreation components that will be generated by new growth and development.

The current number of housing units (101,537) is multiplied by the LOS standard ('LOS per Housing Unit') to determine the existing demand of today's population. The increase in housing units between 2020 and 2040 (54,408 - see Table 2) is multiplied by the same LOS to produce the future demand created by future growth.



Table 16: Existing and Future Demand

Component Type	LOS Per Housing Unit	Existing Demand (2020)*	New Growth Demand (2020-2040)**
Park Acres	0.026316	2,672.03	1,431.79
Recreation Buildings & Supporting Facilities			
Aquatic Center/Swimming Pools	0.000019	1.95	1.05
Banquet Hall	0.000010	1.00	0.54
Community Room (sq. ft.)	0.125000	12,692.13	6,801.00
Concessions/Restroom Building	0.000138	14.00	7.50
Double Gymnasium	0.000035	3.54	1.90
Maintenance Building	0.000049	5.00	2.68
Maintenance Yard (sq. ft.)	0.500000	50,768.50	27,204.00
Parking Spaces	0.055556	5,640.94	3,022.67
Restroom Building	0.000207	21.00	11.25
Recreation Center	0.000032	3.26	1.74
Senior Center	0.000020	2.00	1.07
Park and Recreation Components			0.00
Amphitheater	0.000013	1.30	0.70
Athletic Field (FB, Soccer, Lax)	0.000348	35.37	18.95
Baseball/Softball Diamond	0.000581	58.96	31.60
Adaptive BB/SF Diamond	0.000017	1.77	0.95
Basketball Court, Outdoor	0.000087	8.84	4.74
Batting Cage	0.000374	38.00	20.36
BMX Bike Track	0.000006	0.65	0.35
Boat/Fishing Dock	0.000030	3.00	1.61
Disc Golf Course	0.000019	1.95	1.05
Dog Park	0.000044	4.42	2.37
Event Lawn	0.000049	5.00	2.68
Fishing/Boat Ramp	0.000020	2.00	1.07
Fitness Equipment, Outdoor	0.000020	2.00	1.07
In-Line Hockey Rink, Outdoor	0.000017	1.77	0.95
Pavilion / Picnic Area	0.000414	41.99	22.50
Outdoor Classroom	0.000010	1.00	0.54
Pickleball Court	0.000131	13.26	7.11
Playground	0.000098	10.00	5.36
Skate Park	0.000026	2.60	1.40
Splash Pad	0.000010	1.00	0.54
Tennis Court	0.000218	22.14	11.86
Trails, Paved (mile)	0.000044	4.50	2.41
Trails, Soft Surface (miless)	0.000383	38.90	20.85
Volleyball Courts, Outdoor Sand	0.000044	4.42	2.37

* 2020 Housing Units = 101,537

** New Units (2020-2040) = 54,408

Impact Fee Eligibility

New recreation components are eligible for impact fee funding only to the extent that the improvements are needed to specifically serve new growth and development, and only at the Level of Service applicable countywide. Table 17 shows the number of new recreation components that are needed to satisfy needs of the county's future residents, and the extent to which fulfillment of those needs will serve future growth demand.

Table 17: Future Park Facility Impact Fee Eligibility

Component Type	Current Inventory	Existing Demand	Excess or (Shortfall)	New Growth Demand	Net Total Needed*	Total Needed**	% Impact Fee Eligible
Park Acres	4,283.84	2,672.03	1,611.81	1,431.79	0.00	0.00	0.00%
Recreation Buildings & Supporting Facilities							
Aquatic Center/Swimming Pools	1	1.95	(0.95)	1.05	2.00	2.00	52.33%
Banquet Hall	1	1.00	0.00	0.54	0.54	1.00	53.58%
Community Room (sq. ft.)	12,548	12,692.13	(144.13)	6,801.00	6,945.13	6,945.00	97.93%
Concessions/Restroom Building	14	14.00	0.00	7.50	7.50	8.00	93.77%
Double Gymnasium	1	3.54	(2.54)	1.90	4.43	4.00	47.39%
Maintenance Building	5	5.00	0.00	2.68	2.68	3.00	89.31%
Maintenance Yard (sq. ft.)	58,325	50,768.50	7,556.50	27,204.00	19,647.50	19,648.00	100.00%
Parking Spaces	5,665	5,640.94	24.06	3,022.67	2,998.61	2,999.00	100.00%
Restroom Building	21	21.00	0.00	11.25	11.25	11.00	100.00%
Recreation Center	1	3.26	(2.26)	1.74	4.00	4.00	43.61%
Senior Center	2	2.00	0.00	1.07	1.07	1.00	100.00%
Park and Recreation Components							
Amphitheater	0	1.30	(1.30)	0.70	2.00	2.00	34.89%
Athletic Field (FB, Soccer, Lax)	28	35.37	(7.37)	18.95	26.32	26.00	72.89%
Baseball/Softball Diamond	39	58.96	(19.96)	31.60	51.56	52.00	60.76%
Adaptive BB/SF Diamond	1	1.77	(0.77)	0.95	1.72	2.00	47.38%
Basketball Court, Outdoor	3	8.84	(5.84)	4.74	10.58	11.00	43.08%
Batting Cage	38	38.00	0.00	20.36	20.36	20.00	100.00%
BMX Bike Track	0	0.65	(0.65)	0.35	1.00	1.00	34.89%
Boat/Fishing Dock	3	3.00	0.00	1.61	1.61	2.00	80.38%
Disc Golf Course	1	1.95	(0.95)	1.05	2.00	2.00	52.33%
Dog Park	1	4.42	(3.42)	2.37	5.79	6.00	39.49%
Event Lawn	5	5.00	0.00	2.68	2.68	3.00	89.31%
Fishing/Boat Ramp	2	2.00	0.00	1.07	1.07	1.00	100.00%
Fitness Equipment, Outdoor	2	2.00	0.00	1.07	1.07	1.00	100.00%
In-Line Hockey Rink, Outdoor	1	1.77	(0.77)	0.95	1.72	2.00	47.38%
Pavilion / Picnic Area	42	41.99	0.01	22.50	22.49	22.00	100.00%
Outdoor Classroom	1	1.00	0.00	0.54	0.54	1.00	53.58%
Pickleball Court	10	13.26	(3.26)	7.11	10.37	10.00	71.08%
Playground	10	10.00	0.00	5.36	5.36	5.00	100.00%
Skate Park	1	2.60	(1.60)	1.40	3.00	3.00	46.52%
Splash Pad	1	1.00	0.00	0.54	0.54	1.00	53.58%
Tennis Court	22	22.14	(0.14)	11.86	12.00	12.00	98.84%
Trails, Paved (mile)	4.50	4.50	0.00	2.41	2.41	2.41	100.00%
Trails, Soft Surface (miles)	38.90	38.90	0.00	20.85	20.85	20.85	100.00%
Volleyball Courts, Outdoor Sand	3	4.42	(1.42)	2.37	3.79	4.00	59.23%

* Additional components needed to meet future growth needs.

** For recreation components that can only be built in whole numbers: 'Total Needed' rounded to nearest whole number. For park acres and walking trails, actual number shown.

The table begins with the current inventory of recreation components, and the 'existing demand' for those components to meet the needs of the current (2020) population based on the applicable Level of Service standards (shown on Table 15).

The 'Excess or (Shortfall)' column compares the existing demand to the current inventory for each recreation component. If an 'excess' were to exist, that would mean that more components (or portions of components) exist than are needed to meet the demands of the current population, and those 'excesses' would create capacity to meet the recreational needs of future growth. This is the case for three components in Cherokee County—park acres, maintenance yard square feet, and parking spaces. And in the instance of park acres, the County already has more acreage than the adopted Level of Service standard requires for both existing and future residents.

Conversely, a 'shortfall' indicates that there are not enough components (or portions of components) to meet the recreational needs of the current population based on the LOS standard (e.g., aquatic center/swimming pools, community room space, double gymnasiums, etc.).

In all other instances, 'existing demand' is the same as the 'current inventory' and there is no excess or shortfall (e.g., banquet halls, concession/restroom buildings, maintenance buildings, etc.). This occurs where 'existing demand' is used in the calculation of LOS standards in Table 15.

The column on Table 17 labeled 'New Growth Demand' shows the total demand for recreation components specifically to meet future growth needs (from Table 16). The 'Net Total Needed' column shows all existing and future needs combined, which equates to the number of new components that are needed to be added to the recreation system. The current 'shortfall' that exists for recreation components is added to new growth's facility needs to bring the current population up to the current Level of Service required to be available to all—both current and future residents. The need for park lands is shown as '0' because, as noted above, the County has sufficient acreage to meet the needs of both existing residents and future growth.

For all components except trail miles the 'Total Needed' column is rounded to the nearest whole numbers. This is simply because the County cannot build a portion of a facility, it must build entire facilities. As a result, the '% Impact Fee Eligible' column may reflect a percentage less than 100%.

For example, new growth mathematically demands only slightly over half (.54) of a banquet hall. The County cannot build a portion of a banquet hall for it to serve its intended purpose; it must build an entire banquet hall for it to be usable. Thus, one banquet hall needs to be added, and the portion of the new facility that is impact fee eligible (.54) results in the percentage that is impact fee eligible (53.58%); the remainder is excess capacity available to serve new growth beyond the current planning horizon. As such, the excess capacity could be recouped through impact fees at that time but cannot be charged to new growth between now and 2040.

Conversely, in some cases the 'net total needed' figure is rounded down to the nearest whole number in the 'Total Needed' column. For example, new growth demand for fishing/boat ramps is only 1.07 ramps. To round that number up to '2' would result in 1 ramp being 100% impact fee eligible and the other only 7% eligible. In these cases, it makes more sense from a public expenditures standpoint to fund only 1 ramp with impact fees (at 100% eligible) now and to delay the construction of a second until a future date when new impact fee calculations (a revised CIE with a horizon extended beyond 2040) would more fully justify the third field.

The '% Impact Fee Eligible' column shows the percentage of each new facility that is eligible for impact fee funding. A majority of recreation facilities are only partially eligible for impact fee funding. Athletic fields, for example, are 72.89% impact fee eligible. This percentage equates to the portion of needed fields (26) that are demanded by new growth alone (18.95), calculated by dividing '18.95' by '26'. The remaining 27.11% is needed to satisfy existing demand due to the 'shortfall' in the County's inventory of athletic fields based on the LOS standard.

■ Future Costs

Table 18 is a listing of the future capital project costs to provide the additional recreation components needed to attain the applicable Level of Service standards.

Table 18: Future Costs to Meet Future Demand for Parks and Recreation

Component Type	Total Proposed	Net Cost Per Unit*	Gross Cost Per Unit**	Total Cost (2020)	% Impact Fee Eligible	New Growth Share (2020)	Net Present Value***
Park Acres	0.00	-	-	-	-	-	-
Recreation Buildings & Supporting Facilities							
Aquatic Center/Swimming Pools	2	\$ 13,200,000	\$ 16,104,000	\$ 32,208,000	52.33%	\$ 16,855,574	\$ 19,773,370
Banquet Hall	1	\$ 1,250,000	\$ 1,525,000	\$ 1,525,000	53.58%	\$ 817,162	\$ 958,618
Community Room (sq. ft.)	6,945	\$ 195	\$ 238	\$ 1,652,216	97.93%	\$ 1,617,958	\$ 1,898,036
Concessions/Restroom Building	8	\$ 812,500	\$ 991,250	\$ 7,930,000	93.77%	\$ 7,435,810	\$ 8,722,991
Double Gymnasium	4	\$ 3,500,000	\$ 4,270,000	\$ 17,080,000	47.39%	\$ 8,093,439	\$ 9,494,459
Maintenance Building	3	\$ 255,000	\$ 311,100	\$ 933,300	89.31%	\$ 833,522	\$ 961,955
Maintenance Yard (sq. ft.)	19,648	\$ 6	\$ 7	\$ 143,823	100.00%	\$ 143,823	\$ 165,984
Parking Spaces	2,999	\$ 500	\$ 610	\$ 1,829,390	100.00%	\$ 1,829,390	\$ 2,146,068
Restroom Building	11	\$ 120,000	\$ 146,400	\$ 1,610,400	100.00%	\$ 1,610,400	\$ 1,889,169
Recreation Center	4	\$ 11,500,000	\$ 14,030,000	\$ 56,120,000	43.61%	\$ 24,474,790	\$ 28,711,517
Senior Center	1	\$ 3,150,000	\$ 3,843,000	\$ 3,843,000	100.00%	\$ 3,843,000	\$ 4,508,245
Park and Recreation Components							
Amphitheater	2	\$ 500,000	\$ 610,000	\$ 1,220,000	34.89%	\$ 425,646	\$ 476,055
Athletic Field (FB, Soccer, Lax)	26	\$ 1,000,000	\$ 1,220,000	\$ 31,720,000	72.89%	\$ 23,120,084	\$ 25,858,201
Baseball/Softball Diamond	52	\$ 500,000	\$ 610,000	\$ 31,720,000	60.76%	\$ 19,273,449	\$ 21,556,009
Adaptive BB/SF Diamond	2	\$ 450,000	\$ 549,000	\$ 1,098,000	47.38%	\$ 520,283	\$ 581,901
Basketball Court, Outdoor	11	\$ 75,000	\$ 91,500	\$ 1,006,500	43.08%	\$ 433,577	\$ 484,926
Batting Cage	20	\$ 25,000	\$ 30,500	\$ 610,000	100.00%	\$ 610,000	\$ 682,242
BMX Bike Track	1	\$ 600,000	\$ 732,000	\$ 732,000	34.89%	\$ 255,387	\$ 285,633
Boat/Fishing Dock	2	\$ 36,000	\$ 43,920	\$ 87,840	80.38%	\$ 70,602	\$ 78,964
Disc Golf Course	2	\$ 175,000	\$ 213,500	\$ 427,000	52.33%	\$ 223,464	\$ 249,929
Dog Park	6	\$ 200,000	\$ 244,000	\$ 1,464,000	39.49%	\$ 578,103	\$ 646,568
Event Lawn	3	\$ 90,000	\$ 109,800	\$ 329,400	89.31%	\$ 294,184	\$ 329,025
Fishing/Boat Ramp	1	\$ 30,000	\$ 36,600	\$ 36,600	100.00%	\$ 36,600	\$ 40,935
Fitness Equipment, Outdoor	1	\$ 35,000	\$ 42,700	\$ 42,700	100.00%	\$ 42,700	\$ 47,757
In-Line Hockey Rink, Outdoor	2	\$ 300,000	\$ 366,000	\$ 732,000	47.38%	\$ 346,856	\$ 387,934
Pavilion / Picnic Area	22	\$ 75,000	\$ 91,500	\$ 2,013,000	100.00%	\$ 2,013,000	\$ 2,251,400
Outdoor Classroom	1	\$ 20,000	\$ 24,400	\$ 24,400	53.58%	\$ 13,075	\$ 14,623
Pickleball Court	10	\$ 65,000	\$ 79,300	\$ 793,000	71.08%	\$ 563,626	\$ 630,376
Playground	5	\$ 100,000	\$ 122,000	\$ 610,000	100.00%	\$ 610,000	\$ 682,242
Skate Park	3	\$ 750,000	\$ 915,000	\$ 2,745,000	46.52%	\$ 1,276,921	\$ 1,428,147
Splash Pad	1	\$ 500,000	\$ 610,000	\$ 610,000	53.58%	\$ 326,865	\$ 365,576
Tennis Court	12	\$ 75,000	\$ 91,500	\$ 1,098,000	98.84%	\$ 1,085,313	\$ 1,213,847
Trails, Paved (mile)	2.41	\$ 500,000	\$ 610,000	\$ 1,470,850	100.00%	\$ 1,470,850	\$ 1,645,044
Trails, Soft Surface (miles)	20.85	\$ 60,000	\$ 73,200	\$ 1,526,150	99.99%	\$ 1,525,926	\$ 1,706,641
Volleyball Courts, Outdoor Sand	4	\$ 35,000	\$ 42,700	\$ 170,800	59.23%	\$ 101,168	\$ 113,149
Totals						\$ 207,162,369	\$ 122,772,547
							\$ 140,987,537

* Cost estimates are based on known or comparable facility costs.

** Includes contingency at 15% and architectural/engineering services at 7%.

*** Construction dates vary. NPV based on CPI, CCI or BCI as appropriate, in an average construction year of 2030.

Facility construction costs in the 'Estimated Cost per Unit' column are based on costs drawn from a variety of sources, including facilities that have been previously constructed by the County and similar facilities that have been built in other counties. Each of these, current estimated cost figures are then increased to the gross cost by 22% to account for architectural and engineering services as well as contingencies.

These 'Total Cost (2020)' figures on the Table are converted to 'New Growth Share (2020)' dollars based on the percentage that each improvement is impact fee eligible (from Table 17).

The Net Present Value of new growth's share of the cost for each component is calculated as follows:

Since the actual pace and timing of construction for the improvements proposed to meet future demand have not been programmed, an 'average' year of 2030 is used for Net Present Value calculations—some improvements will occur earlier for less money, and some later at greater cost. All will average out.

To calculate the Net Present Value (NPV) of the impact fee eligible cost estimate for the construction of the recreation components, the NPVs are calculated by increasing the current (2020) estimated costs using Engineering News Record's (ENR) 10-year average building cost inflation (BCI) rate for buildings (such as gymnasiums), the 10-year average CPI rate for acreage, and the 10-year average construction cost inflation (CCI) for all other projects. All project costs are then reduced to current NPV dollars using the Net Discount Rate.

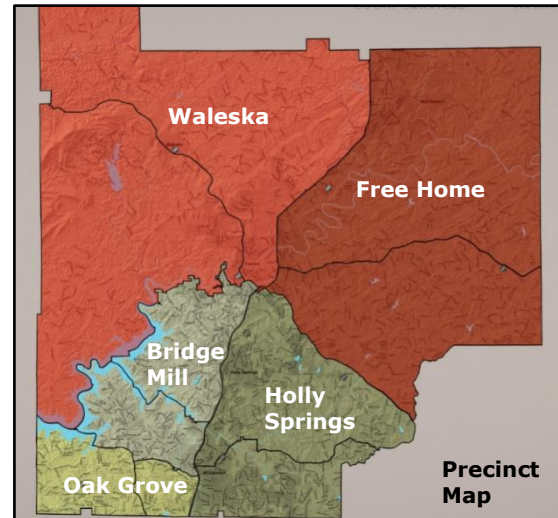
SHERIFF'S PATROL

■ Introduction

The Cherokee County Sheriff's Patrol category focuses on the law enforcement activities of the Department and includes the Uniform Patrol Division, the Criminal Investigations Division (CID), and the Special Operations Division. These Divisions provide primary law enforcement throughout the unincorporated county, as well as back up and supplemental services within all the incorporated areas.

■ Service Area

The unincorporated county is considered a single service area for the provision of primary law enforcement services by the Sheriff's Patrol, because all residents and employees in this area of the county have equal access to the benefits of the program.



■ Level of Service and Forecasts for Service Area

The current Level of Service is determined by an inventory of the square footage and specialized equipment used by the Sheriff's Patrol components, as shown on Table 19. This inventory includes space in the five precincts utilized by the Uniform Patrol Division, as well as the precinct occupied by the Traffic Enforcement Unit (under the Special Operations Division) in the Ball Ground area and building space for additional Special Operations units (specifically, K-9 and CMANS) and the Criminal Investigation Division. Note that rolling stock such as patrol cars are not generally eligible for cost recovery because they do not last at least 10 years and are therefore not included in the inventory below.

Table 19: Current Facilities – Sheriff's Patrol

Description	Location	Quantity
Facilities		<i>Square Feet</i>
Bridge Mill Precinct	9950 Bells Ferry Road	2,396
Free Home Precinct	9253 Freehome Highway	2,396
Hickory Flat Precinct	7675 Vaughn Road	2,396
Oak Grove Precinct	100 Ridge Mill Court	2,983
Waleska Precinct	9081 Fincher Road	2,396
Ball Ground/Traffic Enforcement Unit (TEU) Precinct	1190 Evenflo Drive	2,396
K-9 Unit	1083 Marietta Highway	1,040
South Annex/Criminal Investigation Division (CID)	7475 Main Street	11,524
Cherokee Multi-Agency Narcotics Squad (CMANS)	1225 Univeter Road	5,650
Total Square Feet		33,177

Table 20: Level of Service and New Growth Demand

Facility Space	Current Service Population	Level of Service	Service Area Growth	New Growth Demand
Existing Square Feet	Day-Night Population (2020)	Square Feet of Floor Area per Person	Day-Night Pop Increase to 2040	Square Feet of New Floor Area Needed
33,177	226,153	0.1467	91,740	13,458

Day-night population is used in calculating the current level of service as well as demand for future facilities and equipment in that the Sheriff's Patrol provides law enforcement services to both residences and businesses throughout the unincorporated area on a 24-hour basis.

The level of service for Sheriff's Patrol services in Cherokee County, measured in terms of square footage and per day-night population in 2020, equates to 0.1467 square feet per person. Facilities needed to serve new growth in 2040 include 13,458 square feet in space that is 100% impact fee eligible because it is the full amount needed to meet new growth demand.

■ Future Costs

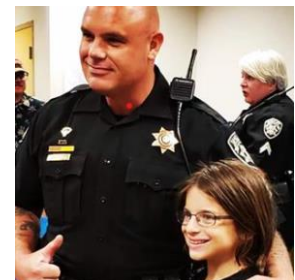
The estimated improvement cost for needed Sheriff's Patrol facility space (in 2020 dollars) is based on an average per square foot cost for several similar facilities drawn from BNi publications of construction costs for similar law enforcement facilities.

Table 21: Facility Costs to Meet Future Demand

Square Feet of New Floor Area	Cost per Square Foot*	Current Cost Estimate	% Impact Fee Eligible	Total Impact Fee Eligible	Net Present Value**
13,458	\$ 285.85	\$3,846,969.00	100%	\$3,846,969.00	\$4,512,901.38

* Source: Average of several similar Sheriff facilities reported by BNi Engineering News Record.

** Based on 10-year average annual BCI projected to 2030.



The Net Present Value (NPV) of new growth's share (100%) of the cost for the new building construction is calculated as follows: Since the actual pace and timing of construction for the additional square footage proposed to meet future demand have not been programmed, an 'average' year of 2030 is used for Net Present Value calculations—some improvements will occur earlier for less money, and some later at greater cost. All will average out.

To calculate the NPV of the impact fee eligible cost estimate for the construction of the new floor area, the NPV is calculated by increasing the current (2020) estimated cost using Engineering News Record's 10-year average building cost inflation (BCI) rate. The projected costs are then reduced to current NPV dollars using the Net Discount Rate (see Cost Adjustments and Credits Chapter).

PUBLIC SAFETY FACILITIES

■ Introduction

The Cherokee County Sheriff's Patrol operates the County Jail (Adult Detention Center) and detention facilities in the Justice Center and administers all activities of the Sheriff's Patrol from space in the Public Safety Facility building. The Public Safety Facility building is also home to the Cherokee County Emergency Management's Emergency Operations Center (EOC) and the E-9-1-1 emergency communications center, both of which are operated by the County Marshal's Office. The Public Safety Building and the Adult Detention Center comprise the Public Safety Complex.



For the purposes of this public safety facility category, all law enforcement activities that are countywide in nature are included in this section and referred to generically as the Public Safety Facilities category. The Uniform Patrol Division, the Criminal Investigations Division (CID), and the Special Operations Division primarily serve the unincorporated area of the county and are addressed under the Sheriff's Patrol section of this report. In addition, headquarters for the Fire and Emergency Services Department are located in the Public Safety Facility building and are addressed under the Fire Protection Services section of this report.

■ Service Area

The entire county is considered a single service area for the provision of the law enforcement activities provided under the Public Safety Facilities category because all residents and employees in the county have equal access to the benefits of the program.

■ Level of Service and Forecasts for Service Area

Table 22 shows existing Public Safety Facilities and planned projects to meet the future 2040 needs of the county. Unlike other public facility categories in Cherokee County, planned future expansion of building space to serve the needs of both existing development and future growth to 2040 is the basis for the impact fee calculations, including the level of service.

Table 22: Current Facilities – Public Safety Facilities

Description	Location	Floor Area (sq. feet)
Existing Facilities		
Public Safety Facility Building	150 Chattin Drive	26,350
Adult Detention Center	498 Chattin Drive	367,550
Training Center	516/375 Chattin Drive	20,500
Garage	500 Chattin Drive	5,000
Justice Center Detention Space	90 North Street	11,404
<i>Total Existing Floor Area</i>		430,804
Planned System Improvements		
Vehicle Driving Training Center	TBD	8,000
<i>Total Planned Floor Area</i>		8,000



The inventory of existing facilities includes the Adult Detention Center, detention space in the Justice Center, as well as the Public Safety Facility building and related buildings adjacent to the overall Public Safety Complex (which includes the 'training center' comprised of the Roger Garrison LE Training Center and Shaw Woodard Firearms Training Complex, as well as a special purpose garage).

Planned improvements include a Vehicle Driving Training Center. This future facility, combined with the existing facilities, will result in a total of 438,804 square feet in building area that has been identified by the County as sufficient to meet local needs through 2040.

Table 23: Level of Service and New Growth Demand

Facilities	Service Population	Level of Service	New Service Population	New Growth Demand
Planned Square Feet	2040 Day-Night Population	Square Feet of Floor Area per Person	2040 Day-Night Population	Square Feet of New Floor Area Needed
8,000	575,202	0.0139	575,202	8,000

Table 23 shows the level of service calculations for the Public Safety Facilities system planned to meet the needs of the County in 2040. The level of service for Public Safety Facilities services in Cherokee County is measured in terms of square footage per day-night population. Day-night population is used as a measure in that Public Safety Facilities serve both residences and businesses in the county.

Future demand in this category (also shown in Table 23) is based on the current plans of the County to add square footage to the existing system, which all together is intended to serve future growth in the county in the coming years. This is represented by the 'Square Feet of New Floor Area Needed'.

■ Future Costs

The estimated improvement cost for the Vehicle Driving Training Center is based on the unit cost (\$285.85) used for Sherriff's Office facility space in the preceding chapter. This per square foot dollar amount is applied to the 8,000 square feet for the new facility.

Table 24: Facility Costs to Meet Future Demand

Year	Project	Square Feet of New Floor Area	Total Cost	% Impact Fee Eligible	Net Present Value (NPV)*
2025	Vehicle Driving Training Center	8,000	\$ 2,286,800.00	100%	\$ 2,476,833.21

* Current cost estimate inflated to target year of 2025 using the ENR Building Cost Index (BCI), reduced to NPV using the Discount Rate.

The Net Present Value (NPV) of new growth's share (100%) of the cost for the new building construction is calculated as follows:

To calculate the NPV of the impact fee eligible cost estimate for the future construction of new floor area, the NPV is calculated by increasing the current (2020) estimated cost using Engineering News Record's 10-year average building cost inflation (BCI) rate to the target construction year of 2025. The projected costs are then reduced to current NPV dollars using the Net Discount Rate (see Cost Adjustments and Credits Chapter).



FIRE PROTECTION SERVICES & EMS

■ Introduction

Fire protection and emergency medical services are provided by the County through its Fire and Emergency Services Department. The Department has under its command fire stations; administrative and training facilities; fire trucks and other fire-fighting, rescue and hazardous materials vehicles; and ambulances.

■ Service Area

Fire protection is provided by the County to the entire county outside of the City of Woodstock, which is known as the Fire Services District. The City of Woodstock has its own fire department and operates cooperatively but independently from the County system. Emergency medical services, on the other hand, are provided countywide.

For these reasons the entire county outside of Woodstock is considered a single service area for the provision of fire protection because all residents and employees within this area have equal access to the benefits of the County program. The service area for emergency medical services, however, is the entire county including all incorporated and unincorporated areas.

The Fire Department operates as a coordinated system for fire protection, with each fire station backing up the other stations in the system. The backing up of another station is not a rare event; it is the essence of good fire protection planning. All stations do not serve the same types of land uses, nor do they all have the same apparatus. It is the strategic placement of personnel and equipment that is the backbone of good fire protection. Any new station would relieve some of the demand on the other stations in the network. Since the stations would continue to operate as "backups" to the other stations, everyone in the Fire Services District would benefit by the construction of a new station since it would reduce the "backup" times the station nearest to them may be experiencing.

The same is true of the distribution of ambulances in that the addition of new ambulances would both increase service as the population increases and further support service delivery countywide.

■ Level of Service and Forecasts for Service Areas

The current Level of Service is determined by an inventory of the square footage and heavy vehicles used for fire protection and emergency medical services. As shown in Table 25 and Table 44, the Fire and Emergency Services Department currently provides services with a combined building square footage of 198,918 in its 12 fire stations and supporting facilities, utilizing a total of 59 fire-fighting apparatus and 22 ambulances.



Table 25: Existing Fire Stations and Facilities

Existing Fire Stations and Facilities		
Name	Location	Floor Area
Headquarters (in Public Safety Facility)	150 Chattin Drive	13,100
Fire Station #1	100 Old Bascomb Court	11,600
Fire Station #2	420 Valley Street	11,265
Fire Station #3	270 Crown Avenue	9,700
Fire Station #4	9253 Free Home Highway	6,333
Fire Station #5	10378 E. Cherokee Drive	4,500
Fire Station #6	3396 Land Road	10,238
Fire Station #7	1530 Barnes Road	3,092
Fire Station #8	260 Hickory Road	8,168
Fire Station #9	1467 Reinhardt College Pkwy	11,631
Fire Station #11	2731 Marietta Highway	4,950
Fire Station #12	9081 Fincher Road	7,485
Fire Station #13	2833 Knox Bridge Highway	3,529
Fire Station #15	5804 Yellow Creek Road	4,446
Fire Station #16	190 West Main Street, Canton	744
Fire Station #17	125 Chickasaw Drive	1,650
Fire Station #18	5480 Salacoa Road	1,760
Fire Station #19	100 Ridge Mill Court	9,773
Fire Station #20	6724 Bells Ferry Road	9,330
Fire Station #21	1190 Evenflo Drive	7,485
Fire Station #22	9550 Bells Ferry Road	6,333
Fire Station #23	7675 Vaughn Road	6,333
Fire Station #24	1000 River Park Boulevard	7,200
Fire Station #25	2550 Holbrook Camp Road	5,500
Fire Station #26	95 Dogwood Pass, Nelson	2,000
Fire Station #27	1216 Lake Arrowhead Drive	1,580
Fire Station #29	3541 Cumming Highway	3,000
Fire Station #32	3644 Sugar Pike Road	1,640
Fire Training Facility	3985 Holly Springs Parkway	22,996
Logistics "B" / Old #3	3624 Hickory Flat Highway	1,557
Total Existing Square Footage		198,918

Table 26: Existing Vehicles

Type and Number of Existing Vehicles*

Fire Apparatus

Engine	35
Ladder	4
Tender	6
Rescue	7
Utility	6
Air/Light	1
Total Fire Apparatus	59

EMS Vehicles

Ambulances	22
Total Ambulances	22

* Vehicles having a service life of 10 years or more.



Day-night population is used in calculating the current level of service as well as demand for future facilities and equipment in that fire protection and emergency medical services are provided to both residences and businesses on a 24-hour basis. Day-night population figures are based on the applicable service area; for Fire Protection Services (in terms of square footage and fire apparatus), the 'service population' is the entire county with the exception of Woodstock, whereas for Emergency Medical Services (i.e., ambulances) the 'service population' is countywide.

Table 27: Level of Service and New Growth Demand

Facilities	Current Service Population	Level of Service	Future Service Population	New Growth Demand
Existing Square Feet	2020 Day/Night Population*	Square Feet per 2020 Day/Night Population	Day/Night Population Increase (2020-40)*	Net New Square Feet Demanded
198,918	300,735	0.661439	158,227	104,658
Existing Fire Apparatus	2020 Day/Night Population*	Fire Apparatus per 2020 Day/Night Population	Day/Night Population Increase (2020-40)*	Net New Apparatus Demanded ***
59	300,735	0.000196	158,227	31.04
Existing Ambulances	2020 Day/Night Population**	Ambulance per 2020 Day/Night Population	Day/Night Population Increase (2020-40)**	Net New Ambulances Demanded ***
22	354,651	0.000062	220,551	13.68

* For Fire District (all of the unincorporated area and all of the cities in the county except Woodstock).

** Countywide service area.

***Number of fire apparatus will be rounded down to 31 vehicles at 100% impact fee eligibility. Number of ambulances will be rounded down to 13 vehicles at 100% impact fee eligibility.

The level of service for Fire Protection and EMS services in Cherokee County is measured in terms of square footage, fire apparatus, and ambulances per day-night population in 2020. Facilities needed to serve new growth in 2040 include 104,658 square feet in space that is 100% impact fee eligible because it is the full amount needed to meet new growth demand. Additional future needs are 31.04 fire apparatus and 13.68 ambulances. Note that, because only 'whole' vehicles can be purchased (as opposed to the portion of one -- .04 of a fire apparatus and .68 of an ambulance -- that is technically needed to meet future demand), these figures are rounded down to the nearest whole number, resulting in 31 fire apparatus and 13 ambulances that are 100% impact fee eligible.

■ Future Costs

The estimated improvement cost for needed building area (in 2020 dollars) is based on the prevailing cost for fire station construction (\$450 per square foot). This per square foot dollar amount is applied to the 104,658 square feet for 'new building area', which may take the form of construction of new

facilities or additions to existing floor area, depending on the needs of the County in providing fire protection services. Vehicle costs are based on prevailing rates for similar vehicles equipped to local specifications.

Table 28: Facility Costs to Meet Future Demand

Description	Number	2020 Cost Each*	Total 2020 Cost	Estimated Cost 2030 (NPV)**	% Impact Fee Eligible	Total Impact Fee Eligible Cost
New Building Area (sq.ft.)	104,658	\$ 330.00	\$ 34,537,002.57	\$ 40,515,555.65	100%	\$ 40,515,555.65
New Fire Apparatus	31	\$ 484,166.67	\$ 15,009,166.67	\$ 17,321,856.40	100%	\$ 17,321,856.40
Ambulance	13	\$ 225,000.00	\$ 2,925,000.00	\$ 3,375,699.07	100%	\$ 3,375,699.07
Totals		\$ 709,496.67	\$ 52,471,169.23	\$ 61,213,111.12		\$ 61,213,111.12

* Building cost estimates based on information provided by Cherokee County Fire and Emergency Services. Vehicle costs are estimated using current prevailing rates for similar vehicles equipped to local specifications; fire apparatus unit cost is an average based on the vehicle types in the existing fleet.

**2020 cost estimate inflated to target year (2030) using the CPI, reduced to NPV using the Discount Rate.

The Net Present Value (NPV) of new growth's share (100%) of the costs for future improvements is calculated as follows:

Since the actual pace and timing of construction for the additional square footage and the purchase of vehicles proposed to meet future demand have not been programmed, an 'average' year of 2030 is used for Net Present Value calculations—some improvements will occur earlier for less money, and some later at greater cost. All will average out.

To calculate the NPV of the impact fee eligible cost estimate for the construction of the new floor area, the NPV is calculated by increasing the current (2020) estimated cost using Engineering News Record's 10-year average building cost inflation (BCI) rate. The projected costs are then reduced to current NPV dollars using the Net Discount Rate (see Cost Adjustments and Credits Chapter).

The NPV of the cost for all vehicles is calculated by increasing the current (2020) estimated cost using the Consumer Price Index (CPI) rate. The projected costs are then reduced to current NPV dollars using the Net Discount Rate.



ROAD IMPROVEMENTS

■ Introduction

The information in this chapter is derived from road project information reflecting proposed road improvement projects that create new capacity.

■ Service Area

The service area for these road projects is defined as the entire county, in that these road projects are recognized as providing primary access to all properties within the county as part of the countywide network of principal streets and thoroughfares. All new development within the county will be served by this network, such that improvements to any part of this network to relieve congestion or to otherwise improve capacity will positively affect capacity and reduce congestion throughout the county.

■ Level of Service Standards

Two types of Level of Service standards are used for road improvements: one for the design of roadways at a designated operational level, and one for the actual accommodation of traffic to be generated by new growth and development. The latter standard allows the cost of improvements to the road system to be equitably allocated between improvements that accrue to existing traffic today and improvements that will accommodate traffic generated by future growth and development.

Operational Design Standards

Level of Service (LOS) for roadways and intersections is measured on a 'letter grade' system that rates a road within a range of service from A to F. Level of Service A is the best rating, representing roads operating with unencumbered travel; Level of Service F is the worst rating, representing operational conditions of heavy congestion and long delays. This system is a means of relating the connection between speed and travel time, freedom to maneuver, traffic interruption, comfort, convenience and safety to the capacity that exists in a roadway. This refers to both a quantitative measure expressed as a service flow rate and an assigned qualitative measure describing parameters. *The Highway Capacity Manual, Special Report 209*, Transportation Research Board (1985), defines operational design Level of Service A through F as having the following characteristics:

1. LOS A: free flow, excellent level of freedom and comfort;
2. LOS B: stable flow, decline in freedom to maneuver, desired speed is relatively unaffected;
3. LOS C: stable flow, but marks the beginning of users becoming affected by others, selection of speed and maneuvering becomes difficult, comfort declines at this level;
4. LOS D: high density, but stable flow, speed and freedom to maneuver are severely restricted, poor level of comfort, small increases in traffic flow will cause operational problems;
5. LOS E: at or near capacity level, speeds reduced to low but uniform level, maneuvering is extremely difficult, comfort level poor, frustration high, level unstable; and

6. LOS F: forced/breakdown of flow. The amount of traffic approaching a point exceeds the amount that can transverse the point. Queues form, stop & go. Arrival flow exceeds discharge flow.

The traffic volume that produces different Level of Service grades differs according to road type, size, signalization, topography, condition and access. The County has set its Level of Service for road improvements at LOS 'D', a level to which it will strive ultimately. However, interim road improvement projects that do not result in a LOS of 'D' will still provide traffic relief to current and future traffic alike and are thus eligible for impact fee funding.

Accommodating Future Traffic

Regardless of the design of roads in the system, the system must address the future traffic demands that will be created by new growth and development.

All road improvement projects benefit existing and future traffic proportionally to the extent that relief from over-capacity conditions eases traffic problems for everyone. For example, since new growth by 2040 will represent a certain portion of all 2040 traffic, new growth would be responsible for that portions' cost of all road improvements in the system that create new capacity. This approach recognizes that some improvements to the road system do not create new capacity—such as resurfacing, road maintenance, bridge replacements with the same number of lanes, etc.

It is noted that the cost-impact of non-Cherokee County generated traffic on the roads traversing the county (cross commutes) is off-set by state and federal assistance. The net cost of the road projects that accrues to Cherokee County reasonably represents (i.e., is 'roughly proportional' to) the impact on the roads by Cherokee County residents and businesses.

The basis for the road impact fee would therefore be Cherokee County's cost for the improvements that create new capacity divided by all traffic in 2040 (existing today plus new growth)—i.e., the cost per trip—times the traffic generated by new growth alone. For an individual land use, the cost per trip (above) would be applied to the number of trips that will be generated by the new development when a building permit is issued, assuring that new growth would only pay its 'fair share' of the road improvements that serve it. All other (non-capacity) improvements would be the cost responsibility of the current base of residents and businesses, including the creation of new capacity that exceeds the needs of future 2040 traffic.

■ Forecasts for Service Area

The County has identified road projects that provide an increase in road capacity that will serve new growth; these are shown on Table 29. This is not a list of all County road projects. These projects were selected from the 2016 Comprehensive Transportation Plan for inclusion in the County's impact fee program because the specific improvements proposed will increase traffic capacity and reduce congestion to some extent, whether through road widening, improved intersection operations or upgraded signalization.

The cost figures shown in the 'Total County Cost' column of Table 29 are the current project cost figures. These figures are then calculated in Net Present Value (as discussed in the Cost Adjustments and Credits chapter) and shown in the last column, based on the year of project expenditure.

Table 29: Road Projects and Estimated Costs

Project Description	Total County Cost*	Year of Completion	Net Present Value**
Woodstock Road at Victory Drive Roundabout	\$ 1,011,255.00	2022	\$ 1,034,147.45
Holbrook Campground Road at Birmingham Road Roundabout	\$ 1,092,156.00	2022	\$ 1,116,879.86
Union Hill Road at Lower Union Hill Road Roundabout	\$ 1,820,260.00	2022	\$ 1,861,466.43
Batesville Road at Sugar Pike Road Roundabout	\$ 1,516,883.00	2022	\$ 1,551,221.68
SR 140 at East Cherokee Drive intersection improvements	\$ 6,034,196.00	2022	\$ 6,170,796.08
SR 140 at Hickory Road/Batesville Road intersection improvements	\$ 4,706,045.00	2024	\$ 4,921,524.37
Heard Road Extension Phase 4	\$ 2,834,246.00	2024	\$ 2,964,019.84
Heard Road Extension Phase 5	\$ 3,954,009.00	2024	\$ 4,135,054.31
Bells Ferry Road widening	\$ 16,049,000.00	2026	\$ 17,163,795.20
SR 140 at Hickory Road widening and intersection improvements	\$ 4,548,627.00	2030	\$ 5,087,322.11
SR 140 widening between Hickory Road and East Cherokee Drive	\$ 4,125,922.00	2030	\$ 4,614,556.04
SR 140 at East Cherokee Drive widening and intersection improvements	\$ 5,842,023.00	2030	\$ 6,533,895.34
Heard Road Extension Phase 2	\$ 9,654,153.00	2030	\$ 10,797,496.92
Heard Road Extension Phase 3	\$ 8,003,177.00	2030	\$ 8,950,995.39
Total	\$ 71,191,952.00		\$ 76,903,171.03

* Total estimated cost of project in 2020 dollars less non-County assistance.

** Net Present Value = current cost inflated to target year using the ENR Construction Cost Index, (CCI) reduced to NPV using the Discount Rate.

■ Eligible Costs

As discussed thoroughly in the *Trip Generation* section of the Appendix, new residential and nonresidential growth and development will represent 41.72% of the traffic on Cherokee County's road network in 2040. To that extent, new growth's fair share of the road project costs that are attributed to new growth are shown on the following table.

Table 30: Eligible Cost Calculations

Project	Net Present Value	% Impact Fee Eligible*	New Growth Cost (NPV)
Woodstock Road at Victory Drive Roundabout	\$ 1,034,147.45	41.715%	\$ 431,397.39
Holbrook Campground Road at Birmingham Road Roundabout	\$ 1,116,879.86	41.715%	\$ 465,909.43
Union Hill Road at Lower Union Hill Road Roundabout	\$ 1,861,466.43	41.715%	\$ 776,515.72
Batesville Road at Sugar Pike Road Roundabout	\$ 1,551,221.68	41.715%	\$ 647,096.29
SR 140 at East Cherokee Drive intersection improvements	\$ 6,170,796.08	41.715%	\$ 2,574,164.17
SR 140 at Hickory Road/Batesville Road intersection improvements	\$ 4,921,524.37	41.715%	\$ 2,053,027.12
Heard Road Extension Phase 4	\$ 2,964,019.84	41.715%	\$ 1,236,448.85
Heard Road Extension Phase 5	\$ 4,135,054.31	41.715%	\$ 1,724,949.02
Bells Ferry Road widening	\$ 17,163,795.20	41.715%	\$ 7,159,923.31
SR 140 at Hickory Road widening and intersection improvements	\$ 5,087,322.11	41.715%	\$ 2,122,190.09
SR 140 widening between Hickory Road and East Cherokee Drive	\$ 4,614,556.04	41.715%	\$ 1,924,974.46
SR 140 at East Cherokee Drive widening and intersection improvements	\$ 6,533,895.34	41.715%	\$ 2,725,632.01
Heard Road Extension Phase 2	\$ 10,797,496.92	41.715%	\$ 4,504,204.86
Heard Road Extension Phase 3	\$ 8,950,995.39	41.715%	\$ 3,733,931.79
Total	\$ 76,903,171.03		\$ 32,080,364.51

* See the *Trip Generation* section in the Appendix. Actual % of trips: 41.7152688%

COMMUNITY WORK PROGRAM

The following impact fee funded projects are contained in this Capital Improvements Element and amend the Community Work Program contained in the Cherokee County Comprehensive Plan. The listing includes the year 2021 to account for projects anticipated to begin prior to 2022.

5-Year Work Program: Impact Fee Eligible Projects

Category	Action/Item	2021	2022	2023	2024	2025	2026	Responsible Party	Cost Estimate	Funding Source	Notes
Library Services	Collection Materials Purchase	✓	✓	✓	✓	✓	✓	Sequoyah Regional Library System	\$481,090	Up to 97.79% Impact Fees; SPLOST &/or General Fund	On-going annual purchases
Library Services	Hickory Flat Expansion		✓	✓				Sequoyah Regional Library System	\$3,800,000	Up to 100% Impact Fees; SPLOST &/or State Funds	The portion of new building area that exceeds the existing building size is impact fee eligible
Library Services	Rose Creek Replacement						✓	Sequoyah Regional Library System	\$4,000,000	Up to 100% Impact Fees; SPLOST &/or State Funds	The portion of new building area that exceeds the existing building size is impact fee eligible
Parks and Recreation	Recreation Center at Veterans Park	✓	✓					Cherokee Recreation and Parks Agency	\$14,030,000	Up to 43.61% Impact Fees; SPLOST &/or General Funds	
Parks and Recreation	Recreation Center in SW Cherokee				✓	✓		Cherokee Recreation and Parks Agency	\$14,030,000	Up to 43.61% Impact Fees; SPLOST &/or General Funds	Timing based on 2024 SPLOST referendum passage
Parks and Recreation	Expand trail system in multiple parks	✓	✓	✓	✓	✓	✓	Cherokee Recreation and Parks Agency	TBD	Up to 100% Impact Fees; SPLOST &/or General Funds	Cost depends on surface material and total number of miles
Parks and Recreation	Expand amenities at Veterans Park		✓	✓	✓			Cherokee Recreation and Parks Agency	TBD	Impact Fees, SPLOST, &/or General Fund	Refer to CIE for impact fee eligible park components and percent eligibility
Parks and Recreation	Athletic Fields (artificial turf, multiple)	✓	✓	✓	✓	✓	✓	Cherokee Recreation and Parks Agency	\$1,220,000	Up to 72.89% Impact Fees; SPLOST &/or General Fund	Number TBD; unit cost is shown

Category	Action/Item	2021	2022	2023	2024	2025	2026	Responsible Party	Cost Estimate	Funding Source	Notes
Parks and Recreation	Boat/Fishing Dock along Etowah River			✓	✓			Cherokee Recreation and Parks Agency	\$43,920	Up to 80.38% Impact Fees; SPLOST &/or General Fund	
Parks and Recreation	Develop a passive park at Yellow Creek Road Property	✓	✓	✓	✓	✓	✓	Cherokee Recreation and Parks Agency	TBD	Impact Fees, SPLOST, &/or General Fund	Refer to CIE for impact fee eligible park components and percent eligibility
Parks and Recreation	Pickleball Courts (multiple)	✓	✓	✓				Cherokee Recreation and Parks Agency	\$79,300	Up to 71.08/% Impact Fees; SPLOST &/or General Fund	Number TBD (up to 10 are impact fee eligible); unit cost is shown
Public Safety	Vehicle Driving Training Center (new)					✓	✓	Cherokee County Sheriff's Patrol	\$2,286,800	Up to 100% Impact Fees; SPLOST &/or General Fund	
Fire Protection & EMS	Fire Station 9 - Replacement	✓						Cherokee County Fire and Emergency Services	\$4,500,000	Up to 100% Impact Fees; SPLOST and/or Fire District	The portion of new building area that exceeds the existing building size is impact fee eligible
Fire Protection & EMS	Fire Station 13 - Replacement		✓	✓				Cherokee County Fire and Emergency Services	\$2,095,000	Up to 100% Impact Fees; SPLOST and/or General Fund	The portion of new building area that exceeds the existing building size is impact fee eligible
Fire Protection & EMS	Fire Station 15 – Relocation and Replacement		✓	✓				Cherokee County Fire and Emergency Services	\$1,500,000	Up to 100% Impact Fees; SPLOST and/or General Fund	The portion of new building area that exceeds the existing building size is impact fee eligible
Fire Protection & EMS	Future Fire Station (new)			✓	✓			Cherokee County Fire and Emergency Services	\$2,000,000	Up to 100% Impact Fees; SPLOST and/or General Fund	
Fire Protection & EMS	Airport Crash Truck			✓				Cherokee County Fire and Emergency Services	\$800,000	Up to 100% Impact Fees; Fire District	
Fire Protection & EMS	Ladder Truck		✓					Cherokee County Fire and Emergency Services	\$1,000,000	Up to 100% Impact Fees; SPLOST and/or General Fund	
Fire Protection & EMS	Fire Apparatus (multiple)	✓	✓	✓	✓	✓	✓	Cherokee County Fire and Emergency Services	TBD	Up to 100% Impact Fees; SPLOST and/or General Fund	

Category	Action/Item	2021	2022	2023	2024	2025	2026	Responsible Party	Cost Estimate	Funding Source	Notes
Fire Protection & EMS	Ambulances (multiple)	✓	✓	✓	✓	✓	✓	Cherokee County Fire and Emergency Services	TBD	Up to 100% Impact Fees; SPLOST and/or General Fund	
Road Improvements	Woodstock Rd. @ Victory Dr. Roundabout		✓					Roadway/SPLOST Program	\$1,011,255	Up to 41.175% Impact Fees; SPLOST	
Road Improvements	Holbrook Campground Rd. @ Birmingham Rd. Roundabout		✓					Roadway/SPLOST Program	\$1,092,156	Up to 41.175% Impact Fees; SPLOST	
Road Improvements	Union Hill Rd. @ Lower Union Hill Rd. Roundabout		✓					Roadway/SPLOST Program	\$1,820,260	Up to 41.175% Impact Fees; SPLOST	
Road Improvements	Batesville Rd. @ Sugar Pike Rd. Roundabout		✓					Roadway/SPLOST Program	\$1,516,883	Up to 41.175% Impact Fees; SPLOST	
Road Improvements	SR 140 @ E. Cherokee Dr. intersection improvements		✓					Roadway/SPLOST Program	\$6,034,196	Up to 41.175% Impact Fees; SPLOST	
Road Improvements	SR 140 @ Hickory/Batesville Roads intersection improvements				✓			Roadway/SPLOST Program	\$4,706,045	Up to 41.175% Impact Fees; SPLOST	
Road Improvements	Heard Road Extension Phase 4				✓			Roadway/SPLOST Program	\$2,834,246	Up to 41.175% Impact Fees; SPLOST	
Road Improvements	Heard Road Extension Phase 5				✓			Roadway/SPLOST Program	\$3,954,009	Up to 41.175% Impact Fees; SPLOST	
Road Improvements	Bells Ferry Road Widening					✓		Roadway/SPLOST Program	\$16,049,000	Up to 41.175% Impact Fees; SPLOST	

APPENDIX A: GLOSSARY

The following terms are used in this Report. Where possible, the definitions are taken directly from the Georgia Development Impact Fee Act.

Capital improvement: An improvement with a useful life of 10 years or more, by new construction or other action, which increases the service capacity of a public facility.

Capital Improvements Element: A component of a comprehensive plan adopted pursuant to Chapter 70 of the Development Impact Fee Act which sets out projected needs for system improvements during a planning horizon established in the comprehensive plan, a schedule of capital improvements that will meet the anticipated need for system improvements, and a description of anticipated funding sources for each required improvement.

Development: Any construction or expansion of a building, structure, or use, any change in use of a building or structure, or any change in the use of land, any of which creates additional demand and need for public facilities.

Development impact fee: A payment of money imposed upon development as a condition of development approval to pay for a proportionate share of the cost of system improvements needed to serve new growth and development.

Eligible facilities: Capital improvements in one of the following categories:

- (A) Water supply production, treatment, and distribution facilities;
- (B) Waste-water collection, treatment, and disposal facilities;
- (C) Roads, streets, and bridges, including rights of way, traffic signals, landscaping, and any local components of state or federal highways;
- (D) Storm-water collection, retention, detention, treatment, and disposal facilities, flood control facilities, and bank and shore protection and enhancement improvements;
- (E) Parks, open space, and recreation areas and related facilities;
- (F) Public safety facilities, including police, fire, emergency medical, and rescue facilities; and
- (G) Libraries and related facilities.

Impact cost: The proportionate share of capital improvements costs to provide service to new growth, less any applicable credits.

Impact fee: The impact cost plus surcharges for program administration and recoupment of the cost to prepare the Capital Improvements Element.

Level of service: A measure of the relationship between service capacity and service demand for public facilities in terms of demand to capacity ratios or the comfort and convenience of use or service of public facilities or both.

Project improvements: Site improvements and facilities that are planned and designed to provide service for a particular development project and that are necessary for the use and convenience of the occupants or users of the project and are not system improvements. The character of the improvement shall control a determination of whether an improvement is a project improvement or system improvement and the physical location of the improvement on site or off site shall not be considered determinative of whether an improvement is a project improvement or a system improvement. If an improvement or facility provides or will provide more than incidental service or facilities capacity to persons other than users or occupants of a particular project, the improvement or facility is a system improvement and shall not be considered a project improvement. No improvement or facility included in a plan for public facilities approved by the governing body of the municipality or county shall be considered a project improvement.

Proportionate share: That portion of the cost of system improvements which is reasonably related to the service demands and needs of the project.

Rational nexus: The clear and fair relationship between fees charged and services provided.

Service area: A geographic area defined by a municipality, county, or intergovernmental agreement in which a defined set of public facilities provide service to development within the area. Service areas in Cherokee may be designated on the basis of sound planning or engineering principles or both.

System improvement costs: Costs incurred to provide additional public facilities capacity needed to serve new growth and development for ...

1. Planning, design and engineering related thereto, including the cost of constructing or reconstructing system improvements or facility expansions, including but not limited to the construction contract price, surveying and engineering fees, related land acquisition costs (including land purchases, court awards and costs, attorneys' fees, and expert witness fees); and,
2. Expenses incurred for qualified staff or any qualified engineer, planner, architect, landscape architect, or financial consultant for preparing or updating the capital improvement element; and,
3. Administrative costs, provided that such administrative costs shall not exceed 3 percent of the total amount of the costs; and,
4. Projected interest charges and other finance costs may be included if the impact fees are to be used for the payment of principal and interest on bonds, notes, or other financial obligations issued by or on behalf of the municipality or county to finance the capital improvements element.

System improvement costs do not include routine and periodic maintenance expenditures, personnel training, and other operating costs.

System improvements: Capital improvements that are public facilities and are designed to provide service to the community at large, in contrast to "project improvements."

APPENDIX B: FUTURE GROWTH

In order to accurately calculate the demand for future services for Cherokee County, new growth and development must be quantified in future projections. These projections include forecasts for population, households, housing units, employment and traffic demand to the year 2040. These projections provide the base-line conditions from which the current (2020) or future (2040) Level of Service calculations are produced.

■ Types of Projections

Accurate projections of population, households, housing units, and employment are important in that:

- Population data and forecasts are used to establish current and future demand for services where the Level of Service (LOS) standards are per capita based. Population data are also used to calculate the future number of households that are expected in the county.
- Household data and forecasts are used to forecast future growth in the number of housing units.
- Housing unit data and forecasts relate to certain service demands that are household based, such as parks and library facilities. The number of households—defined as *occupied* housing units—is always smaller than the total supply of available housing units, which include vacant units. Over time, however, each housing unit is expected to become occupied by a household, even though the unit may become vacant during future re-sales or turnovers.
- Employment forecasts are refined to reflect 'value added' employment figures. This reflects an exclusion of jobs considered to be transitory or non-site specific in nature, and thus not requiring building permits to operate (i.e., are not assessed impact fees), as well as governmental uses that are not subject to impact fees.

'Value added' employment data is combined with population data to produce what is known as the 'day-night population.' These figures represent the total number of persons receiving services, both in their homes and in their businesses, to produce an accurate picture of the total number of persons that rely on certain 24-hour services, such as fire protection.

The projections used for certain public facility categories are the countywide forecasts for those public facility categories—such as the sheriff and library services—that are delivered throughout the county. Projections are also prepared for each of the cities in the county because the cities do not participate in the County's impact fee program, creating a credit situation for new growth outside of the cities that will have to make up the shortfall in impact fee revenue through their other taxes.

■ Population Forecasts

Population forecasts reflect the growth that is expected over the next 20 years. The county encompasses some 326 square miles, and includes seven cities (two of which have portions in both Cherokee County and neighboring counties—Nelson and Mt. Park). The County collects impact fees only in the unincorporated area outside of each city's limits, although countywide services are provided within each of the cities also.

Historic Population Growth

Every year, the US Census Bureau estimates the population in each county and city between decennial censuses (e.g., 2000 and 2010). After a decennial census, the Bureau revises the annual estimates based on the actual Census count. Unlike the decennial censuses, which are 'as of' April 1, the annual estimates are 'as of' July 1 of each year. The following table shows the Census Bureau's estimates through the most recent year reported (2018).

Table A-1: Annual Census Estimated Total Population by Jurisdiction

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Cherokee County Total	143,777	151,189	158,682	165,585	173,105	182,128	193,241	202,544	208,271	212,232
Ball Ground	897	952	1,009	1,061	1,117	1,185	1,266	1,335	1,380	1,413
Canton	8,458	9,978	11,475	12,953	14,468	16,095	17,949	19,659	21,023	22,192
Holly Springs	3,613	4,186	4,767	5,324	5,905	6,547	7,267	7,930	8,455	8,897
Mountain Park (pt.)	10	11	12	14	15	16	17	19	20	20
Nelson (pt.)	319	348	377	405	434	468	507	541	567	586
Waleska	624	670	658	695	711	671	685	688	670	670
Woodstock	10,929	12,284	13,631	14,938	16,296	17,793	19,520	21,082	22,273	23,261
Unincorporated County	118,927	122,760	126,753	130,195	134,159	139,353	146,030	151,290	153,883	155,193

	2010	2011	2012	2013	2014	2015	2016	2017	2018	Increase 2000-18
Cherokee County Total	215,191	217,711	220,638	224,336	230,208	235,387	241,912	247,894	254,149	110,372
Ball Ground	1,443	1,457	1,475	1,488	1,665	1,730	1,916	2,043	2,119	1,222
Canton	23,624	23,989	24,301	24,644	25,287	26,014	26,739	28,361	29,306	20,848
Holly Springs	9,336	9,512	9,722	9,851	10,303	10,771	11,355	11,982	12,920	9,307
Mountain Park (pt.)	13	13	13	13	13	14	14	14	14	4
Nelson (pt.)	602	605	611	613	617	621	624	626	627	308
Waleska	650	655	677	698	873	880	879	891	963	339
Woodstock	23,892	24,408	24,899	26,581	27,541	29,509	30,866	31,598	32,234	21,305
Unincorporated County	155,631	157,072	158,940	160,448	163,909	165,848	169,519	172,379	175,966	57,039

Notes: All data as of July 1 of each year. 2000 and 2010 differ from Decennial Census counts, which were as of April 1. Population estimates include persons living in group quarters.

Sources: For 2010 to 2018: Census Annual Estimates Program, US Bureau of the Census. For 2000 to 2009: Intercensal Estimates 2000-2010, US Bureau of the Census.

While the county as a whole had increased by 110,372 people over the 2000 population, the unincorporated area accounted for 51.68% of that growth, while a total of 48.32% of countywide growth was distributed among all of the cities collectively.

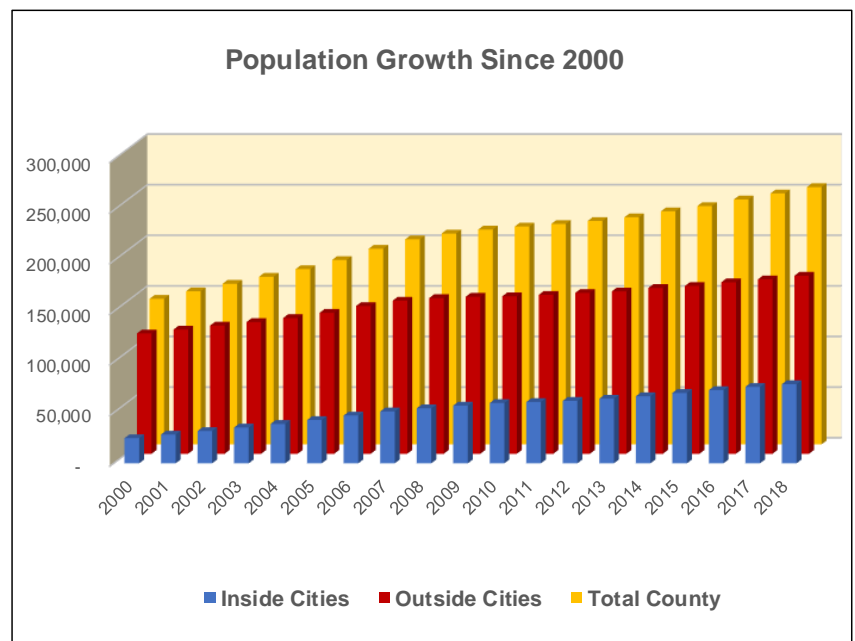
Over these past 18 years, growth in Cherokee County's cities has outpaced the rate of growth in the unincorporated area. Between 2000 and 2018, the county as a whole saw a 76.8% increase in population, while the number of residents living outside the cities increased by 48%, while the population living in the cities collectively more than tripled from 24,850 to 78,183.

Over those same 18 years, population growth varied considerably in the individual cities. The largest increase in the number of residents in any of the cities occurred in Woodstock—21,305 new people—followed closely by Canton—20,848, although Canton's 2018 population was 3½ times its 2000 population while the population in Woodstock basically tripled. Holly Springs was not far behind the leaders with a 2018 population 2.6 times 2000, although its 2018 population was well less than half of the other two. The small city of Ball Ground posted a high 2018 population increase 2.4 times 2000 by adding a little over 1,200 people.

The following table and graph show the annual Census estimates between the 2000 Census and the latest reported year—2018—for Cherokee County inside the cities, outside the cities (the unincorporated area) and the county as a whole. Robust growth during the 2000's at an average annual rate of increase of 6.4%) clearly leveled off during the Great Recession years (starting with the housing collapse in 2008-2009) when the average annual rate of increase dropped to 1.3%, rebounding in 2013 at a recovering annual rate of increase just shy of 2.7% per year.

Table A-2: Annual Census Population Inside and Outside Cities - 2000-2018

	Inside Cities	Outside Cities	Total County
2000	24,850	118,927	143,777
2001	28,429	122,760	151,189
2002	31,929	126,753	158,682
2003	35,390	130,195	165,585
2004	38,946	134,159	173,105
2005	42,775	139,353	182,128
2006	47,211	146,030	193,241
2007	51,254	151,290	202,544
2008	54,388	153,883	208,271
2009	57,039	155,193	212,232
2010	59,560	155,631	215,191
2011	60,639	157,072	217,711
2012	61,698	158,940	220,638
2013	63,888	160,448	224,336
2014	66,299	163,909	230,208
2015	69,539	165,848	235,387
2016	72,393	169,519	241,912
2017	75,515	172,379	247,894
2018	78,183	175,966	254,149



Future Population

Two data sources were used to examine population forecast for the county as a whole to 2040.

The first involved a projection of the annual Census estimates from 2010 to 2018 using a 'growth trend' forecast algorithm, determined to be the 'most likely' projection compared to several other approaches. The result is shown under the 'County Forecast' column on Table A-3.

The next column on the table shows the countywide population forecast prepared by Wood & Poole, Economics, in their latest (2019) Georgia Data Book publication for Cherokee County.

Comparing the two forecasts, the Woods & Poole 2040 population was about 2.6% lower than the 'growth trend' projection. This was expected since the W&P forecast was based on 2010-2018 Census estimates that were slightly lower than the Census Bureau's latest estimates for several of the years.

As explained by Woods & Poole in the Appendix, its database contains more than 900 economic and demographic variables for every county in the United States for every year from 1970 to 2050. This comprehensive database includes detailed population data by age, sex, and race; employment and earnings by major industry; personal income by source of income; retail sales by kind of business; and data on the number of households, their size, and their income. All of these variables are projected for each year through 2050. In total, there are over 180 million statistics in the regional database. The fact that the proprietary Woods & Poole economic and demographic projections rely on a very detailed database, makes them one of the most comprehensive county-level projections available.

A complete description of the Woods & Poole model and methodology is found in Appendix B: Woods & Poole Methodology, which follows this Appendix A. For the employment forecasts presented later, Woods & Poole's data will be extensively relied upon.

The table and graph on the following page present the historical population estimates by the Census Bureau, and the forecast population for each year from 2020 to 2040 for the county as a whole, for each city, and for the unincorporated area.

The forecast for the unincorporated area is calculated by subtracting the forecast for the cities from the countywide total.

Compared to the population growth experienced in the 2010-2018 years, the unincorporated area is projected to capture 37.1% of the countywide growth to 2040, while 62.9% of the growth will occur in the cities collectively.

Table A-3: Population Forecast Comparison

	County Forecast*	Woods & Poole**	Variance Co/W&P
2010	215,191	215,189	0.0009%
2011	217,711	217,820	-0.0500%
2012	220,638	220,773	-0.0611%
2013	224,336	224,487	-0.0673%
2014	230,208	230,396	-0.0816%
2015	235,387	235,424	-0.0157%
2016	241,912	241,600	0.1291%
2017	247,894	247,573	0.1297%
2018	254,149	253,220	0.3669%
2019	259,661	258,884	0.3001%
2020	265,292	264,647	0.2437%
2021	271,045	270,506	0.1993%
2022	276,923	276,466	0.1653%
2023	282,928	282,524	0.1430%
2024	289,064	288,678	0.1337%
2025	295,332	294,921	0.1394%
2026	301,737	301,243	0.1640%
2027	308,281	307,645	0.2067%
2028	314,966	314,121	0.2690%
2029	321,796	320,669	0.3515%
2030	328,775	327,292	0.4531%
2031	335,905	333,984	0.5752%
2032	343,189	340,742	0.7181%
2033	350,632	347,565	0.8824%
2034	358,236	354,449	1.0684%
2035	366,005	361,392	1.2765%
2036	373,942	368,387	1.5079%
2037	382,051	375,435	1.7622%
2038	390,336	382,541	2.0377%
2039	398,801	389,714	2.3317%
2040	407,450	396,958	2.6431%

Sources:

* County Forecast:

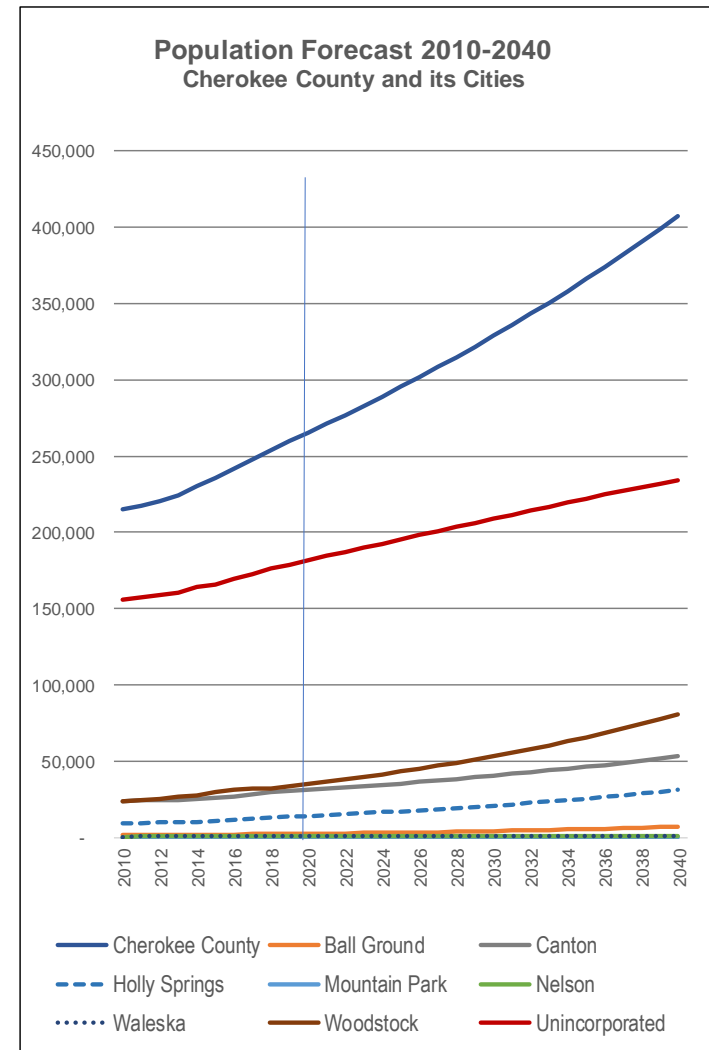
2010-2018 -- US Bureau of the Census Annual Estimates Program.

2019-2040 -- Growth Trend Forecast Program, Microsoft Corporation.

** 2010-2040 -- Woods & Poole Economics Inc., 2019 Georgia Data Book - Walton County.

Table A-4: Cherokee County Total Population Forecast by Jurisdiction

	County Total	Ball Ground	Canton	Holly Springs	Mountain Park	Nelson	Waleska	Woodstock	Unincorporated
2010	215,191	1,443	23,624	9,336	13	602	650	23,892	155,631
2011	217,711	1,457	23,989	9,512	13	605	651	24,408	157,076
2012	220,638	1,475	24,301	9,722	13	611	653	24,899	158,964
2013	224,336	1,488	24,644	9,851	13	613	654	26,581	160,492
2014	230,208	1,665	25,287	10,303	13	617	655	27,541	164,127
2015	235,387	1,730	26,014	10,771	14	621	656	29,509	166,072
2016	241,912	1,916	26,739	11,355	14	624	658	30,866	169,740
2017	247,894	2,043	28,361	11,982	14	626	659	31,598	172,611
2018	254,149	2,119	29,306	12,920	14	627	660	32,234	176,269
2019	259,661	2,236	30,103	13,445	14	630	661	33,609	178,963
2020	265,292	2,359	30,921	13,992	14	634	663	35,043	181,666
2021	271,045	2,490	31,762	14,561	15	637	664	36,538	184,378
2022	276,923	2,627	32,626	15,154	15	641	665	38,097	187,098
2023	282,928	2,772	33,513	15,770	15	644	666	39,722	189,826
2024	289,064	2,925	34,424	16,411	15	647	668	41,417	192,557
2025	295,332	3,087	35,360	17,079	15	651	669	43,184	195,287
2026	301,737	3,257	36,322	17,773	15	654	670	45,026	198,020
2027	308,281	3,437	37,309	18,496	16	658	671	46,947	200,747
2028	314,966	3,627	38,324	19,249	16	661	673	48,950	203,466
2029	321,796	3,827	39,366	20,031	16	665	674	51,038	206,179
2030	328,775	4,039	40,436	20,846	16	668	675	53,215	208,880
2031	335,905	4,262	41,536	21,694	16	672	677	55,485	211,563
2032	343,189	4,497	42,665	22,576	17	676	678	57,853	214,227
2033	350,632	4,745	43,825	23,495	17	679	679	60,321	216,871
2034	358,236	5,007	45,017	24,450	17	683	680	62,894	219,488
2035	366,005	5,284	46,241	25,445	17	687	682	65,577	222,072
2036	373,942	5,576	47,499	26,479	17	690	683	68,375	224,623
2037	382,051	5,883	48,790	27,556	18	694	684	71,292	227,134
2038	390,336	6,208	50,117	28,677	18	698	686	74,333	229,599
2039	398,801	6,551	51,479	29,843	18	701	687	77,505	232,017
2040	407,450	6,913	52,879	31,057	18	705	688	80,811	234,379
Increase 2020-40	142,158	4,554	21,958	17,065	4	71	26	45,768	52,712



Sources: 2010-2018: US Bureau of the Census Annual Estimates Program.
 2019-2040: Growth Trend Forecast Program, Microsoft Corporation, rectified to 2018 Census Estimate.
 Note: Population figures are total number of people, including those residing in group quarters.

■ Housing Unit Forecasts

Projecting new growth and development in terms of housing units is important because residential impact fees are assessed when building permits are issued for new units. Thus, the housing unit is used as the basis for assessing impact fees rather than the number of residents that may occupy the housing unit. Since the number of people residing in a particular housing unit will most likely vary in the years ahead as lifestyles change, families grow, children grow up, occupants age, or the unit becomes occupied by a different household as the previous occupants move out, using population as the basis will vary widely as the years go by. This would result in a constant reassessment of the impact fees due because the demand for services would vary as the number of residents in the unit varies. Instead, using an average fee per housing unit based on average household sizes results in 'averaging' the demand for services which would otherwise vary as the population in the unit changes over time.

Household Population Forecast

The future increase in the number of housing units in the county is based on the population forecasts presented in the previous section. Those population forecasts, however, include people living in group quarters. Since people living in group quarters do not occupy individual housing units, they must be subtracted from the total population forecasts shown in the previous section to determine the number of people actually living in housing units.

The number of people living in group quarters in the county and each city was last reported in the 2010 Census; no more recent credible data is available. Table 5 shows the number of people living in group quarters for each jurisdiction in 2010, the percent of the total population that the group quarters population represented, and the resulting population in each jurisdiction living in households.

Table A-5: Household Population in 2010

	Total Population	People in Group Qtrs	Percent of Total	Household Population
Cherokee County Total	215,191	1,406	0.6534%	213,785
Ball Ground	1,443	-	0.0000%	1,443
Canton	23,624	211	0.8932%	23,413
Holly Springs	9,336	17	0.1821%	9,319
Mountain Park (pt.)	13	-	0.0000%	13
Nelson (pt.)	602	-	0.0000%	602
Waleska	650	396	60.9231%	254
Woodstock	23,892	168	0.7032%	23,724
Unincorporated County	155,631	614	0.3945%	155,017

Note: People in Group Quarters include people residing in dormitories, convalescent and nursing homes, and institutions such as jails.

Source: Summary of Population and Housing Characteristics, 2010 Census, US Bureau of the Census.

Table A-6 shows an example of how the population living in households is calculated (in this case, the county as a whole) for each year out to 2040.

Given the total population projected for the county as a whole, taken from Table A-4, the percent of the population living in group quarters in the county in 2010 is multiplied times the total population projected in each year, which results in the estimated number living in group quarters for that year. By subtracting the number of people in group quarters from the total population, the 'household population' is calculated for each year.

This is a 'best estimate' based on the only authoritative data available. Although the actual number may vary each year, it is expected that the variations will average out to a reasonable estimate of the total increase in 2040 over 2020.

Table A-6: Cherokee County Household Forecasts

	County Population	People in Group Qtrs	Household Population
2010	215,191	1,406	213,785
2011	217,711	1,422	216,289
2012	220,638	1,442	219,196
2013	224,336	1,466	222,870
2014	230,208	1,504	228,704
2015	235,387	1,538	233,849
2016	241,912	1,581	240,331
2017	247,894	1,620	246,274
2018	254,149	1,661	252,488
2019	259,661	1,697	257,964
2020	265,292	1,733	263,559
2021	271,045	1,771	269,274
2022	276,923	1,809	275,114
2023	282,928	1,849	281,079
2024	289,064	1,889	287,175
2025	295,332	1,930	293,402
2026	301,737	1,971	299,766
2027	308,281	2,014	306,267
2028	314,966	2,058	312,908
2029	321,796	2,103	319,693
2030	328,775	2,148	326,627
2031	335,905	2,195	333,710
2032	343,189	2,242	340,947
2033	350,632	2,291	348,341
2034	358,236	2,341	355,895
2035	366,005	2,391	363,614
2036	373,942	2,443	371,499
2037	382,051	2,496	379,555
2038	390,336	2,550	387,786
2039	398,801	2,606	396,195
2040	407,450	2,662	404,788

Table A-7 shows the results for each city and the unincorporated area that results from the methodology described above. The 'percent in households' figures are the inverse of the percent of people living in group quarters (shown on Table A-5).

Table A-7: Cherokee County Household Population Forecast by Jurisdiction

	County Total	Ball Ground	Canton	Holly Springs	Mountain Park	Nelson	Waleska	Wood- stock	Unincor- porated
2010	213,785	1,430	23,413	9,319	13	602	254	23,724	155,030
2011	216,289	1,457	23,775	9,495	13	605	255	24,236	156,453
2012	219,196	1,475	24,084	9,704	13	611	255	24,724	158,330
2013	222,870	1,488	24,424	9,833	13	613	255	26,394	159,850
2014	228,704	1,665	25,061	10,284	13	617	256	27,347	163,461
2015	233,849	1,730	25,782	10,751	14	621	256	29,302	165,393
2016	240,331	1,916	26,500	11,334	14	624	257	30,649	169,037
2017	246,274	2,043	28,108	11,960	14	626	257	31,376	171,890
2018	252,488	2,119	29,044	12,896	14	627	258	32,007	175,523
2019	257,964	2,236	29,834	13,421	14	630	258	33,373	178,198
2020	263,559	2,359	30,645	13,967	14	634	259	34,797	180,884
2021	269,274	2,490	31,478	14,534	15	637	259	36,281	183,580
2022	275,114	2,627	32,335	15,126	15	641	260	37,829	186,281
2023	281,079	2,772	33,214	15,741	15	644	260	39,443	188,990
2024	287,175	2,925	34,117	16,381	15	647	261	41,126	191,703
2025	293,402	3,087	35,044	17,048	15	651	261	42,880	194,416
2026	299,766	3,257	35,998	17,741	15	654	262	44,709	197,130
2027	306,267	3,437	36,976	18,462	16	658	262	46,617	199,839
2028	312,908	3,627	37,982	19,214	16	661	263	48,606	202,539
2029	319,693	3,827	39,014	19,995	16	665	263	50,679	205,234
2030	326,627	4,039	40,075	20,808	16	668	264	52,841	207,916
2031	333,710	4,262	41,165	21,654	16	672	264	55,095	210,582
2032	340,947	4,497	42,284	22,535	17	676	265	57,446	213,227
2033	348,341	4,745	43,434	23,452	17	679	265	59,897	215,852
2034	355,895	5,007	44,615	24,405	17	683	266	62,452	218,450
2035	363,614	5,284	45,828	25,399	17	687	266	65,116	221,017
2036	371,499	5,576	47,075	26,431	17	690	267	67,894	223,549
2037	379,555	5,883	48,354	27,506	18	694	267	70,791	226,042
2038	387,786	6,208	49,669	28,625	18	698	268	73,810	228,490
2039	396,195	6,551	51,019	29,789	18	701	268	76,960	230,889
2040	404,788	6,913	52,407	31,000	18	705	269	80,243	233,233
Increase 2020-40	141,229	4,554	21,762	17,033	4	71	10	45,446	52,349
% in Households	99.347%	100.000%	99.107%	99.818%	100.000%	100.000%	39.077%	99.297%	99.605%

Note: Population figures are total number of people living in households, which does not include those residing in group quarters such as dormitories, convalescent and nursing homes, and institutions such as jails.

Household Projections

First, future household population numbers from Table A-7 are converted into the number of households expected in future years (for each jurisdiction). The results are shown on Table A-8.

Table A-8: Cherokee County Households by Jurisdiction

	County Total	Ball Ground	Canton	Holly Springs	Mountain Park	Nelson	Waleska	Wood- stock	Unincor- porated
2010	75,936	532	8,204	3,330	9	216	96	9,640	53,909
2011	76,825	542	8,331	3,393	9	217	96	9,848	54,404
2012	77,858	549	8,439	3,468	9	219	96	10,046	55,057
2013	79,163	554	8,558	3,514	9	220	96	10,725	55,585
2014	81,235	619	8,781	3,675	9	221	97	11,112	56,841
2015	83,063	644	9,034	3,842	10	223	97	11,907	57,513
2016	85,365	713	9,286	4,050	10	224	97	12,454	58,780
2017	87,476	760	9,849	4,274	10	225	97	12,749	59,772
2018	89,683	788	10,177	4,608	10	225	98	13,006	61,035
2019	91,628	832	10,454	4,796	10	226	98	13,561	61,965
2020	93,616	878	10,738	4,991	10	227	98	14,139	62,899
2021	95,646	926	11,030	5,193	10	229	98	14,742	63,837
2022	97,720	977	11,330	5,405	10	230	98	15,371	64,776
2023	99,839	1,031	11,638	5,625	10	231	98	16,027	65,718
2024	102,004	1,088	11,955	5,853	10	232	99	16,711	66,661
2025	104,216	1,148	12,280	6,092	10	234	99	17,424	67,605
2026	106,476	1,212	12,614	6,339	10	235	99	18,167	68,549
2027	108,785	1,279	12,957	6,597	11	236	99	18,942	69,491
2028	111,144	1,349	13,309	6,866	11	237	99	19,751	70,429
2029	113,554	1,424	13,671	7,145	11	239	99	20,593	71,367
2030	116,017	1,503	14,042	7,435	11	240	100	21,471	72,299
2031	118,533	1,586	14,424	7,738	11	241	100	22,387	73,226
2032	121,104	1,673	14,816	8,053	12	243	100	23,343	74,146
2033	123,730	1,765	15,219	8,380	12	244	100	24,339	75,059
2034	126,413	1,863	15,633	8,721	12	245	101	25,377	75,962
2035	129,155	1,966	16,058	9,076	12	246	101	26,459	76,855
2036	131,956	2,074	16,495	9,445	12	248	101	27,588	77,735
2037	134,817	2,189	16,943	9,829	12	249	101	28,765	78,602
2038	137,741	2,310	17,404	10,229	12	250	101	29,992	79,453
2039	140,728	2,437	17,877	10,645	12	252	101	31,272	80,288
2040	143,780	2,572	18,364	11,077	12	253	102	32,606	81,103
Increase 2020-40	50,164	1,694	7,626	6,086	2	26	4	18,467	18,204
Average HH Size	2.8153	2.6880	2.8539	2.7985	1.4444	2.7870	2.6458	2.4610	2.8758

Note: Average household size for the County and its Cities computed individually based on 2010 Census Data.

This conversion is based on the average household size data taken from the 2010 Census for the county as a whole and for each city. These figures differ for each jurisdiction, and it is assumed that these ratios will persist into the future. The number of households in the unincorporated area of the county results from subtracting all of the city household numbers from the county total.

New Housing Units

A 'household' represents an occupied housing unit. Additional 'vacant' housing units therefore need to be added to the number of households in order to estimate the total number of housing units in each jurisdiction.

This is accomplished by increasing the number of households in the county and each city with the occupancy rate derived for each jurisdiction from the 2010 Census. Again, these ratios differ from jurisdiction to jurisdiction, and are assumed to continue, on average, at the same ratio each year into the future.

Table A-9: Cherokee County Housing Units 2020-2040

	County Total	Ball Ground	Canton	Holly Springs	Mountain Park	Nelson	Waleska	Wood- stock	Unincor- porated
2020	101,537	992	12,226	5,538	10	243	113	15,196	67,686
2021	103,738	1,046	12,559	5,762	10	245	113	15,844	68,696
2022	105,988	1,104	12,900	5,997	10	246	113	16,520	69,706
2023	108,286	1,165	13,251	6,242	10	247	113	17,225	70,720
2024	110,634	1,229	13,612	6,495	10	248	114	17,960	71,735
2025	113,034	1,297	13,982	6,760	10	250	114	18,726	72,751
2026	115,485	1,369	14,362	7,034	10	251	114	19,525	73,766
2027	117,989	1,445	14,753	7,320	11	252	114	20,358	74,780
2028	120,548	1,524	15,154	7,619	11	253	114	21,227	75,790
2029	123,162	1,609	15,566	7,928	11	256	114	22,132	76,799
2030	125,833	1,698	15,988	8,250	11	257	116	23,076	77,802
2031	128,562	1,792	16,423	8,586	11	258	116	24,060	78,799
2032	131,350	1,890	16,869	8,936	12	260	116	25,088	79,789
2033	134,199	1,994	17,328	9,299	12	261	116	26,158	80,772
2034	137,109	2,105	17,800	9,677	12	262	117	27,274	81,744
2035	140,083	2,221	18,283	10,071	12	263	117	28,437	82,705
2036	143,121	2,343	18,781	10,480	12	265	117	29,650	83,652
2037	146,224	2,473	19,291	10,906	12	266	117	30,915	84,585
2038	149,395	2,610	19,816	11,350	12	267	117	32,234	85,500
2039	152,635	2,753	20,355	11,812	12	270	117	33,609	86,399
2040	155,945	2,906	20,909	12,291	12	271	118	35,043	87,276
Increase 2020-40	54,408	1,914	8,683	6,753	2	28	5	19,847	19,590

Occupancy Rate	92.1991%	88.5191%	87.8279%	90.1218%	100.0000%	93.5065%	86.4865%	93.0453%	92.9270%
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Note: Occupancy rates for the County and its cities are computed individually from 2010 Census data.

■ Employment Forecasts

The following Table A-10 shows the forecasts for employment growth countywide in Cherokee County, from 2010 to 2040. The employment figures for Cherokee County are based on forecasts published by Woods & Poole Economics in their latest (2019) *Georgia State Profile*, which includes a data book for every county in the state.

Table A-10: County-wide Employment Forecast (Jobs)

	2010	2020	2025	2030	2035	2040	2020-2040 Increase	
							Number	Percent
Total Employment	78,785	111,329	129,601	150,240	173,000	197,955	86,626	43.8%
Farm Employment	446	502	491	472	452	432	(70)	-16.2%
Forestry, Fishing	198	243	261	277	292	306	63	20.6%
Mining	192	267	289	311	333	353	86	24.4%
Construction	7,126	11088	12,079	13086	14027	14970	3,882	25.9%
Total Non-Building	7,962	12,100	13,120	14,146	15,104	16,061	3,961	24.7%
Federal Civilian	293	351	371	393	415	439	88	20.0%
Federal Military	692	677	678	680	681	682	5	0.7%
State & Local Government	7692	8842	9890	10927	11961	13021	4,179	32.1%
Total Government	8,677	9,870	10,939	12,000	13,057	14,142	4,272	30.2%
Utilities	73	109	118	129	140	151	42	27.8%
Manufacturing	4,072	5960	6,322	6700	7089	7485	1,525	20.4%
Wholesale Trade	2,396	3579	3,977	4399	4824	5234	1,655	31.6%
Retail Trade	10,013	14857	17,064	19434	21966	24611	9,754	39.6%
Transportation & Warehousing	1,204	2683	3,218	3894	4715	5690	3,007	52.8%
Information	991	1414	1,712	2072	2508	3036	1,622	53.4%
Finance & Insurance	4,154	5973	7,430	9011	10706	12522	6,549	52.3%
Real Estate	4,876	6189	7,124	8156	9321	10638	4,449	41.8%
Professional & Technical Services	6,326	8282	9,587	11098	12847	14871	6,589	44.3%
Management of Companies	115	180	181	182	183	184	4	2.2%
Administrative & Waste Services	6,320	7696	8,832	10079	11397	12738	5,042	39.6%
Educational Services	1,480	2460	3,063	3770	4587	5508	3,048	55.3%
Health Care & Social Assistance	6,005	9568	12,648	16545	21085	26140	16,572	63.4%
Arts, Entertainment & Recreation	2,300	3485	4,233	5130	6179	7376	3,891	52.8%
Accommodation & Food Services	5,818	8660	10,342	12221	14267	16618	7,958	47.9%
Other Private Services	6,003	8264	9,691	11274	13025	14950	6,686	44.7%
Total Value-Added	62,146	89,359	105,542	124,094	144,839	167,752	78,393	46.7%

Source: Woods & Poole Economics, Inc., 2019 Georgia Data Book, Cherokee County.

Woods & Poole (W&P) counts jobs, not just employed people, which captures people holding two or more jobs, self-employed sole proprietors, part-time workers, and vacant but available positions. This gives a more complete picture than other forecasts based on the Census data, which counts only the number of **people** that are employed, not the total number of **jobs** available.

On Table A-10, above, the W&P forecasts for the 'types of employment' are shown in three groups. The 'non-building' types of jobs are those that primarily occur out-of-doors. Such jobs include any employment that is considered to be locationally transitory in nature, such as those working on construction sites, or are strictly land-based such as farming and other agricultural workers. Since impact fees are based on building permits, these types of employment generally do not involve construction of primary buildings for the use itself and thus place little more than minor demands for public services.

The second category—'government'—sets those city, county, state, and federal jobs apart since impact fees are not charged for such buildings that are actually owned by those governments, which are otherwise exempt from local taxation. This category includes public (but not private) schools.

The last category—'value-added' employment—is comprised of those types of jobs that represent growth in businesses and other nonresidential uses (such as nonprofits and institutions) that would increase demand for County services and would be subject to impact fees. Even though some of the types of uses may occupy buildings that are exempt from property taxes (such as churches and other places of religious worship), they are not exempt from governmental fees (such as water and sewer service and/or building permit fees).

Table A-11 summarizes the detailed forecasts from Table A-10 by each of the three 'types of employment' for several of the forecast years to 2040. As indicated above, only the 'value-added jobs' would be located in buildings that would be subject to impact fee assessments.

Table A-11: Summary - Countywide Jobs

	Total Jobs	Non-Building Related	Government	Value-Added Jobs
2010	78,785	7,962	8,677	62,146
2020	111,329	12,100	9,870	89,359
2025	129,601	13,120	10,939	105,542
2030	150,240	14,146	12,000	124,094
2035	173,000	15,104	13,057	144,839
2040	197,955	16,061	14,142	167,752
Increase 2020-40	86,626	3,961	4,272	78,393

Source: Woods & Poole Economics, Inc., 2019 Georgia Data Book.

Calculating the number of jobs available within the cities is somewhat similar to the methodology used to project the number of future housing units in each city.

Table A-12 shows the employment figures for the county as a whole (the Woods & Poole 'value added' figures), and the total number of employed persons working in each of the incorporated jurisdictions in the county as reported in the 2010 Census commuting data. Even though census figures show employed persons and not total jobs, and presumably include people working in some buildings that are not subject to impact fees, they are used in forecasting employment in each of the cities for lack of better information.

Table A-12: Cherokee County Value Added Jobs by City and Unincorporated Area - 2020-2040

	County Total	Ball Ground	Canton	Holly Springs	Mountain Park	Nelson	Waleska	Wood- stock	Unincor- porated
Employment - 2010*	58,319	403	13,542	2,476	-	42	505	12,317	29,034
Percent of Countywide Total	100%	0.691%	23.221%	4.246%	0.000%	0.072%	0.866%	21.120%	49.785%
Value-Added Jobs:									
2020	89,359	617	20,750	3,794	-	64	774	18,873	44,487
2025	105,542	729	24,507	4,481	-	76	914	22,291	52,544
2030	124,094	858	28,815	5,269	-	89	1,075	26,209	61,779
2035	144,839	1,001	33,632	6,149	-	104	1,254	30,590	72,109
2040	167,752	1,159	38,953	7,122	-	121	1,453	35,429	83,515
Increase 2020-40	78,393	542	18,203	3,328	-	57	679	16,556	39,028
% of County Total - 2040	100%	0.691%	23.220%	4.245%	0.000%	0.073%	0.866%	21.119%	49.785%

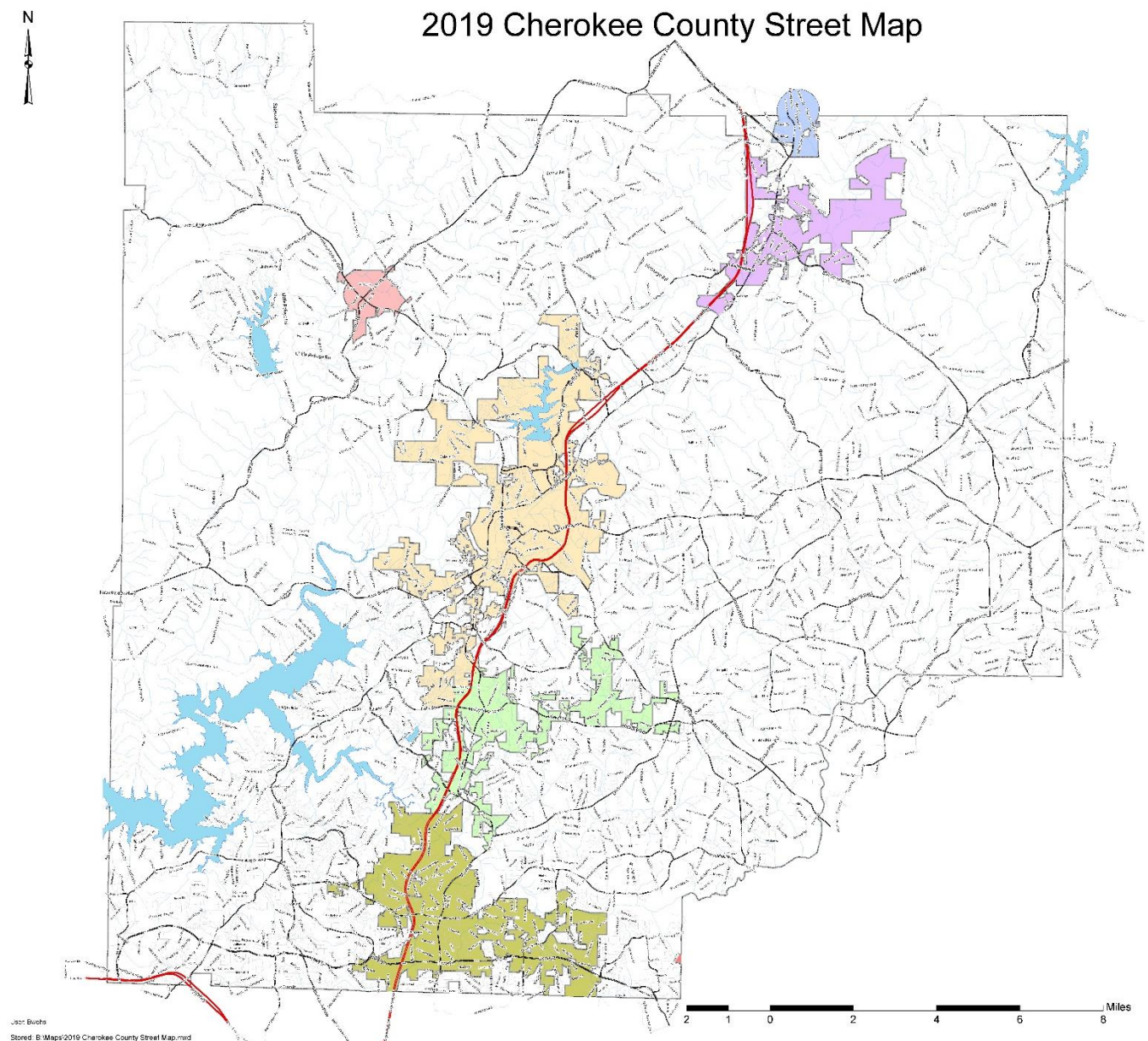
* The 2010 Census reported employed persons, not jobs, based on commuting patterns. Future growth in the cities is assumed to maintain the same ratios, and are applied to the countywide value-added forecasts.

City employment is therefore derived by multiplying the 2010 city census percentages times the number of current and future countywide jobs shown on Table A-11. Employment in the unincorporated area is, of course, the remainder once all of the city numbers are subtracted from the countywide totals.

■ Service Area Projections

The entire county is considered a single service area for those Cherokee County services being considered for impact fee funding that serve all residents and business in the county, whether in the unincorporated area or within the cities. Fire and EMS services and the Sheriff's Patrol have special service areas, which are discussed below in this section.

As explained in the text of this report, impact fees for the library services and the parks & recreation facilities are paid exclusively by residential uses. Thus, the housing unit count and projections presented in this Appendix form the basis for those impact fee calculations.



Impact fees in the Fire Protection and EMS, Public Safety Facilities, Sheriff's Patrol and Road Improvement categories are assessed on a per-housing unit basis for residential development and, for nonresidential uses, on the basis of floor area (in square feet), hotel rooms, acreage, or other appropriate factor reflecting the employment characteristics of the particular use. For these categories the 24-hour service population—called the 'day-night' population—is used for overall Level of Service calculations. The day-night population is used to determine Level of Service standards for facilities that serve both the resident population and businesses. The fire department, for instance, protects people's residences from fire whether or not they are at home, and protects stores and offices whether or not they are open for business. Thus, this 'day-night' population is a measure of the total services demanded of a 24-hour service provider facility and a fair way to allocate the costs of such a facility among all of the beneficiaries.

Countywide Service Area Forecasts

Table A-13 shows the forecasts for the county as a whole for housing units (for the library and parks & recreation categories), and the day-night population for the law enforcement categories.

Future growth between 2020 and 2040 is used to calculate future increases in the demand for services and to determine the Level of Service (LOS) standards in each public service category, to be applied to existing and future development as appropriate. These calculations are explained in each public facility category chapter, since they vary from one category to the next based on existing facility inventories and future planned facility improvements.

A-13: Future Growth Forecasts - Countywide

	Library, Parks & Recreation	Public Safety Facility, Road Improvements		
	Housing Units	Population	Value-Added Employment	Day-Night Population
2020	101,537	265,292	89,359	354,651
2021	103,738	271,045	92,596	363,641
2022	105,988	276,923	95,832	372,755
2023	108,286	282,928	99,069	381,997
2024	110,634	289,064	102,305	391,369
2025	113,034	295,332	105,542	400,874
2026	115,485	301,737	109,252	410,989
2027	117,989	308,281	112,963	421,244
2028	120,548	314,966	116,673	431,639
2029	123,162	321,796	120,384	442,180
2030	125,833	328,775	124,094	452,869
2031	128,562	335,905	128,243	464,148
2032	131,350	343,189	132,392	475,581
2033	134,199	350,632	136,541	487,173
2034	137,109	358,236	140,690	498,926
2035	140,083	366,005	144,839	510,844
2036	143,121	373,942	149,422	523,364
2037	146,224	382,051	154,004	536,055
2038	149,395	390,336	158,587	548,923
2039	152,635	398,801	163,169	561,970
2040	155,945	407,450	167,752	575,202
Increase 2020-40	54,408	142,158	78,393	220,551

Special Service Area Forecasts

Table A-14 is included below for the two public facility categories that are not countywide in their service delivery.

A-14: Future Growth Forecasts - Special Service Areas

	Unincorporated Area				Fire Service Area		
	Sheriff's Patrol				Fire Protection and EMS		
	Population	Value-Added Employment	Day-Night Population		Population	Value-Added Employment	Day-Night Population
2020	181,666	44,487	226,153		230,249	70,486	300,735
2021	184,378	46,098	230,476		234,507	73,039	307,546
2022	187,098	47,710	234,808		238,826	75,592	314,418
2023	189,826	49,321	239,147		243,206	78,145	321,351
2024	192,557	50,933	243,490		247,647	80,698	328,345
2025	195,287	52,544	247,831		252,148	83,251	335,399
2026	198,020	54,391	252,411		256,711	86,178	342,889
2027	200,747	56,238	256,985		261,334	89,105	350,439
2028	203,466	58,085	261,551		266,016	92,031	358,047
2029	206,179	59,932	266,111		270,758	94,958	365,716
2030	208,880	61,779	270,659		275,560	97,885	373,445
2031	211,563	63,845	275,408		280,420	101,158	381,578
2032	214,227	65,911	280,138		285,336	104,431	389,767
2033	216,871	67,977	284,848		290,311	107,703	398,014
2034	219,488	70,043	289,531		295,342	110,976	406,318
2035	222,072	72,109	294,181		300,428	114,249	414,677
2036	224,623	74,390	299,013		305,567	117,864	423,431
2037	227,134	76,671	303,805		310,759	121,479	432,238
2038	229,599	78,953	308,552		316,003	125,093	441,096
2039	232,017	81,234	313,251		321,296	128,708	450,004
2040	234,379	83,515	317,894		326,639	132,323	458,962
Increase 2020-40	52,712	39,028	91,740		96,390	61,837	158,227

Note: Figures include all cities except Woodstock.

The County Fire and EMS Department serves the entire county except Woodstock. Table A-14 reflects this for calculations related to the future demand for facilities and vehicles. However, the County has special relationships with Canton, Holly Springs and Waleska in that fire protection and EMS services are provided within the cities, but they provide direct payments to the County for their services. Thus, the County's Fire Protection impact fee will exclude these three in its calculation.

This is reflected in the following table.

A-15: Fire Service Area for Fee Calculations

	Fire Protection and EMS		
	Population	Value-Added Employment	Day-Night Population
2020	184,673	45,168	229,841
2021	187,520	46,804	234,324
2022	190,381	48,440	238,821
2023	193,257	50,077	243,334
2024	196,144	51,713	247,857
2025	199,040	53,349	252,389
2026	201,946	55,224	257,170
2027	204,858	57,100	261,958
2028	207,770	58,975	266,745
2029	210,687	60,851	271,538
2030	213,603	62,726	276,329
2031	216,513	64,824	281,337
2032	219,417	66,921	286,338
2033	222,312	69,019	291,331
2034	225,195	71,116	296,311
2035	228,060	73,214	301,274
2036	230,906	75,530	306,436
2037	233,729	77,846	311,575
2038	236,523	80,163	316,686
2039	239,287	82,479	321,766
2040	242,015	84,795	326,810
Increase 2020-40	57,342	39,627	96,969

Note: For impact fee calculations, the Fire Service Area excludes Canton, Holly Springs and Waleska with which the County has a special relationships regarding Fire Services funding.

APPENDIX C: WOODS & POOLE METHODOLOGY

Selected data from Woods & Poole for the years 2010 to 2040 have been used as critical factors in the creation of population, household and employment estimates for Cherokee County. The following has been excerpted from the 2019 State Profile for Georgia, prepared by Woods & Poole Economics, Inc., Washington, D.C., in explanation of the methodology W&P uses in creating their estimates and projections, definitions of employment categories, and the interconnected nature of their econometric model approach.

■ Introduction

The Woods & Poole Economics, Inc. database contains more than 900 economic and demographic variables for every county in the United States for every year from 1970 to 2050. This comprehensive database includes detailed population data by age, sex, and race; employment and earnings by major industry; personal income by source of income; retail sales by kind of business; and data on the number of households, their size, and their income. All of these variables are projected for each year through 2050. In total, there are over 200 million statistics in the regional database. The regional model that produces the projection component of this database was developed by Woods & Poole. The regional projection methods are revised somewhat year to year to reflect new computational techniques and new sources of regional economic and demographic information. Each year, a new projection is produced based on an updated historical database and revised assumptions.

The fact that the proprietary Woods & Poole economic and demographic projections rely on a very detailed database, makes them one of the most comprehensive county-level projections available. A description of some characteristics of the database and projection methods is contained below.

■ Overview of the Projection Methods

The strength of Woods & Poole's economic and demographic projections stems from the comprehensive historical county database and the integrated nature of the projection model. The projection for each county in the United States is done simultaneously so that changes in one county will affect growth or decline in other counties. For example, growth in employment and population in Houston will affect growth in other metropolitan areas, such as Cleveland. This reflects the flow of economic activity around the country as new industries emerge or relocate in growing areas and as people migrate, in part because of job opportunities. The county projections are developed within the framework of the United States projection made by Woods & Poole. The U.S. projection is the control total for the 2019 regional projections and is described in the 'Overview of the 2019 Projections' chapter included in Woods & Poole publications.

The regional projection technique used by Woods & Poole—linking the counties together to capture regional flows and constraining the results to a previously determined United States total—avoids a common pitfall in regional projections. Regional projections are sometimes made for a city or county without regard for potential growth in surrounding areas or other areas in the country. Such projections may be simple extrapolations of recent historical trends and, as a result, may be too optimistic or pessimistic. If these county projections were added together, the total might differ considerably from any conceivable national forecast scenario; this is the result of each regional projection being generated independently without interactive procedures and without being integrated into a consistent national projection.

The methods used by Woods & Poole to generate the county projections proceed in four stages. First, forecasts to 2050 of total United States personal income, earnings by industry, employment by

industry, population, inflation, and other variables are made. Second, the country is divided into 179 Economic Areas (EAs) as defined by the U.S. Department of Commerce, Bureau of Economic Analysis (BEA). The EAs are aggregates of contiguous counties that attempt to measure cohesive economic regions in the United States...; in the 2019 Woods & Poole model, EA definitions released by the BEA in May 2007 are used. For each EA, a projection is made for employment, using an 'export-base' approach; in some cases, the employment projections are adjusted to reflect the results of individual EA models or exogenous information about the EA economy. The employment projection for each EA is then used to estimate earnings in each EA. The employment and earnings projections then become the principal explanatory variables used to estimate population and number of households in each EA.

The third stage is to project population by age, sex, and race for each EA on the basis of net migration rates projected from employment opportunities. For stages two and three, the U.S. projection is the control total for the EA projections. The fourth stage replicates stages two and three except that it is performed at the county level, using the EAs as the control total for the county projections.

■ The 'Export-Base' Approach

The specific economic projection technique used by Woods & Poole to generate the employment, earnings, and income estimates for each county in the United States generally follow a standard economic 'export-base' approach. This relatively simple approach to regional employment projections is one that has been used by a number of researchers.

Certain industrial sectors at the regional level are considered 'basic.' This means that these sectors produce output that is not consumed locally but is 'exported' out of the region for national or international consumption. This assumption allows these sectors to be linked closely to the national economy, and hence follow national trends in productivity and output growth. Normally, the 'basic' sectors are mining, agriculture, manufacturing, and the Federal government. In contrast, 'non-basic' sectors are those such as retail trade, transportation, communication, and construction, the output of which is usually consumed locally. The growth of the 'non-basic' sectors depends largely on the growth of the 'basic' sectors that form the basis of the region's economy.

Intuitively, this approach has great appeal and there are numerous examples that seem to support the 'export-base' theory. Automobile production in Detroit, for instance, is obviously much more sensitive to national and international price and demand for transportation equipment than to local demand. In Texas, oil and natural gas exploration and production are tied closely to the worldwide demand and supply of petroleum resources and not tied primarily to energy consumption in Texas.

Although the theory is appealing, some shortcomings do exist in the 'export-base' approach. For example, some 'basic' commodities produced locally are consumed locally. Producers of durable equipment used in other manufacturing processes are often affected not by the national demand for their product but by the regional demand. Machine tool makers that supply the local automobile industry in Detroit will prosper to the extent Detroit's automobile producers prosper. In Houston, the strength of the local oil industry will affect the demand and production of equipment for oil and natural gas production and exploration. In both of these instances, some durable manufacturing industries exist to serve local, not national, markets.

However, despite the shortcomings, the availability of relatively clean data for sub-national geographic areas makes the 'export-base' approach very useful. The analytical framework for projections using the 'export-base' approach entails estimating either demand equations or calculating historical growth rate differentials for output by sector. The principal explanatory variable, or the comparative data series for growth rate differentials, is the national demand for the output of that sector. Employment-by-sector data are often used as a surrogate variable since county output-by-sector data are not available; employment-by-sector data is used by Woods & Poole. Earnings

projections are then obtained by using earnings-per-employee data either estimated as part of the model or imposed exogenously on the system. The complementary relationship could also be estimated, i.e., using earnings forecast to derive employment based on earnings-per-employee data; this procedure has been used previously in some Woods & Poole regional models.

A modification of the 'export-base' approach is used by Woods & Poole to account for regional variants to normal 'basic'/'non-basic' industry definitions. Some 'non-basic' sectors can be more appropriately modeled as 'basic' sectors in certain regional economies. The finance and insurance sector or wholesale trade sector in New York City, for example, and the accommodation and food services sector in Las Vegas, are cases in which traditionally 'non-basic' sectors are really 'basic.' New York is a worldwide financial and trade center and thus 'exports' these services outside of the region; Las Vegas, as a vacation and entertainment center, similarly 'exports' the output of its accommodation and food services sector to other parts of the country. Activity in these sectors, in these specific geographic areas, is therefore linked more closely to the performance of these same sectors in the surrounding regions and the nation as a whole than to the other 'basic' industries in the region.

■ The Demographic Model

The demographic portion of the regional model follows a traditional cohort-component analysis based on calculated fertility and mortality in each county or EA. The 'demand' for total population is estimated from the economic model: if the demand for labor is forecast to rise for a particular county or EA, then either the labor force participation rate will rise or population in-migration will be positive. The inverse is true for counties and EAs with projected declines in employment. Therefore, future EA and county migration patterns for population by age, sex, and race are based on employment opportunities. Individuals and families are assumed to migrate, at least in part, in response to employment opportunities with two exceptions: for population aged 65 and over and for college or military-aged population, migration patterns over the forecast period are based on historical net migration and not economic conditions. The integration of economic and demographic regional analysis is a significant strength of the Woods & Poole approach.

The age, sex, and race distribution of the population is projected by aging the population by single year of age by sex and by race for each year through 2060 based on county or EA specific mortality, fertility, and migration rates estimated from historical data. In the Woods & Poole model, projected net mortality and migration are estimated based on the historical net change in population by age, race, and sex for a particular county or EA. Similarly, projected net births and migration of age zero population by race are estimated based on the historical change in age zero population by race per female population age 15 to 44 by race for a particular county or EA.

The United States population by age, sex, and race projections, 2018-2050, are based on Bureau of the Census population estimates for 1990 through 2017. Woods & Poole forecasts these U.S. estimates with a cohort-component model based on the year to year change in U.S. population by single year of age, race, and sex. Forecast fertility, mortality, and international migration are estimated from the Census population estimates and are applied exogenously to the Woods & Poole U.S. projections. Woods & Poole produces only a 'middle' U.S. population forecast - this forecast is similar to the Census 'middle' forecast scenario for the U.S. population. The U.S. population by age, sex, and race forecast is the control total for the EA projections. Each EA projection serves as the control totals for the county projections.

The 2019 Woods & Poole U.S. population projections, 2018 to 2050, are lower than the 2018 Woods & Poole population projections because historical fertility and net migration 2010 through 2017, based on U.S. Census post-censal estimates, are lower than previously projected resulting in lower fertility and migration assumptions over the forecast period.

■ Population

Population is defined as July 1 residential population and includes: civilian population; military population except personnel stationed overseas; college residents; institutional populations, such as prison inmates and residents of mental institutions, nursing homes, and hospitals; and estimates of undocumented aliens. Excluded are persons residing in Puerto Rico, U.S. territories and possessions, and U.S. citizens living abroad.

For the years 1990 to 2040 the population data are broken down by five race/ethnic groups: White not including Hispanic or Latino (i.e. Non-Hispanic), Black Non-Hispanic, Native American or American Indian Non-Hispanic, Asian American and Pacific Islanders Non-Hispanic, and Hispanic or Latino. Population by race as defined by the Census Bureau reflects self-identification by respondents and does not denote any clear-cut scientific definition of biological stock. **White population** includes people who identify themselves as White and people who do not identify themselves by any race but identify themselves by nationality, such as Canadian, German, Italian, Arab, Lebanese, Near Eastern, or Polish. **Black population** includes people who identify themselves as Black and people who do not identify themselves by any race but identify themselves by nationality, such as African American, Afro-American, Black Puerto Rican, Jamaican, Nigerian, West Indian, or Haitian. **Native American population** includes people who identify themselves as Alaska Native or American Indian by Indian tribe or classify themselves as Canadian Indian, French American Indian, Spanish-American Indian, Eskimos, Aleuts, and Alaska Indians. **Asian American and Pacific Islander** population are people who identify themselves as having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, Vietnam, Hawaii, Guam, Samoa, or other Pacific Islands.

Hispanic or Latino population are people whose origins are from Spain, the Spanish-speaking countries of Central or South America, the Dominican Republic, and who identify themselves generally as Spanish, Spanish-American, Hispanic, Hispano, Latino, and so on. Hispanic population is not a race group but rather a description of ethnic origin. Although Hispanics are part of the other four race groups, they split out separately in the Woods & Poole database so that the four race groups plus Hispanic equals total population.

■ Households

Households are defined as occupied housing units. A housing unit is a house, an apartment, a group of rooms, or a single room occupied as separate living quarters. The occupants of a housing unit may be a single family, one person living alone, two or more families living together, or any group of related or unrelated persons who share living quarters. All people are part of a household except those who reside in group quarters. Group quarters include living arrangements such as prisons, homes for the aged, rooming houses, college dormitories, and military barracks. The average size of households is defined as total population less group quarters population divided by the number of households. Mean household income is defined as total personal income less estimated income of group quarters population divided by the number of households.

■ Employment

The employment data in the Woods & Poole database are a complete measure of the number of full- and part-time jobs by place of work. Historical data, 1969-2017, are from the U.S. Department of Commerce, Bureau of Economic Analysis. Because part-time workers are included, a person holding two part-time jobs would be counted twice.

Data on proprietors include farm and non-farm proprietors by sector. Proprietors include not only those people who devote the majority of their time to their proprietorship, but people who devote any time at all to a proprietorship. Thus, a person who has a full-time wage and salary job and on nights and weekends runs a small business legally defined as a proprietorship would be counted twice. The employment data therefore include full- and part-time proprietors.

Private household employment data include persons employed by a household on the premises, such as full-time baby-sitters, housekeepers, gardeners, and butlers. Miscellaneous employment data include judges and all elected officials, persons working only on commission in sectors such as real estate and insurance, students employed by the colleges or universities in which they are enrolled, and unincorporated subcontractors in sectors such as construction.

The employment data used by Woods & Poole comprise the most complete definition of the number of jobs by county. Woods & Poole data may be higher than that from other sources because they measure more kinds of employment.

■ Employment by Sector

The employment data is by two-digit North American Industry Classification System (NAICS) industry. The two-digit industries are defined in the 2002 North American Industry Classification System Manual. The employment data in the Woods & Poole 2019 database are no longer based on the Standard Industrial Classification (SIC) system definitions. For the years 1969-2000 BEA provided employment industry data by SIC rather than by NAICS; Woods & Poole has estimated the NAICS industry data for 1969-2000 from the BEA SIC 1969-2000 employment industry data and the NAICS employment industry data for the years 2001-2017.

As a rule, employment is classified in a given industry depending on the primary activity of the establishment. For example, employees of a large oil company are classified in many different sectors depending on the specific establishment in which they worked, even though the company as a whole would be considered a mining company: employees at a refinery are in manufacturing; employees at the company headquarters are in services; pipeline operators are in transportation; and oil field workers are in mining. If a given establishment is engaged in activities in different sectors, all employees are classified according to the primary activity of the establishment regardless of their actual occupations; thus, a secretary for a trucking company is a transportation worker and an accountant at a small plumbing company is a construction worker. The main exception to this rule is the classification of government workers in the Woods & Poole database: all government employees are classified in Federal civilian, Federal military, or state and local government employment, regardless of the usual classification of the establishment in which they work. Definitions for each sector, based on NAICS industries, in the Woods & Poole database are as follows:

Farming includes establishments such as farms, orchards, greenhouses, and nurseries primarily engaged in the production of crops, plants, vines, trees (excluding forestry operations), and specialties such as Christmas trees, sod, bulbs, and flower seed. It also includes establishments such as ranches, dairies, feedlots, egg production facilities, and poultry hatcheries primarily engaged in the keeping, grazing, or feeding of cattle, hogs, sheep, goats, poultry of all kinds, and special animals such as horses, bees, pets, fish farming, and animals raised for fur.

Forestry, fishing, related activities, and other includes establishments primarily engaged in harvesting timber, and harvesting fish and other animals from their natural habitats. The sector also includes agricultural support establishments that perform one or more activities associated with farm operation, such as soil preparation, planting, harvesting, and management, on a contract or fee basis. Excluded are establishments primarily engaged in agricultural research and establishments primarily engaged in administering programs for regulating and conserving land, mineral, wildlife,

and forest use. Other consists of jobs held by U.S. residents who are employed by international organizations and by foreign embassies and consulates in the United States.

Mining includes establishments that extract naturally occurring mineral solids (e.g. coal and ores), liquid minerals (e.g. crude petroleum), and gases (e.g. natural gas.) Mining includes quarrying, well operations, beneficiating (e.g., crushing, screening, washing, and flotation), and other preparation customarily performed at the mine site, or as a part of mining activity.

Utilities includes establishments engaged in the provision of electric power, natural gas, steam supply, water supply, and sewage removal. Utilities include electric power generation, electric power transmission, electric power distribution, natural gas distribution, steam supply provision, steam supply distribution, water treatment, water distribution, sewage collection, sewage treatment, and disposal of waste through sewer systems and sewage treatment facilities. Excluded from this sector are establishments primarily engaged in waste management services that collect, treat, and dispose of waste materials but do not use sewer systems or sewage treatment facilities. Also excluded from this sector are federal or state or local government operated establishments.

Construction includes establishments primarily engaged in building new structures and roads, alterations, additions, reconstruction, installations, and repairs. It includes general contractors engaged in building residential and nonresidential structures; contractors engaged in heavy construction, such as abridges, roads, tunnels, and pipelines; and special trade contracting, such as plumbing, electrical work, masonry, and carpentry. Construction includes establishments primarily engaged in the preparation of sites for new construction, including demolition, and establishments primarily engaged in subdividing land for sale as building sites. Construction work done may include new work, additions, alterations, or maintenance and repairs.

Manufacturing includes establishments engaged in the mechanical, physical, or chemical transformation of materials, substances, or components into new products. The assembling of component parts of manufactured products is considered manufacturing, except in cases where the component parts are associated with structures. Manufacturing establishments can be plants, factories, or mills as well as bakeries, candy stores, and custom tailors. Manufacturing establishments may either process materials or may contract with other establishments to process their materials for them. Broadly defined, manufacturing industries include the following: food processing, such as canning, baking, meat processing, and beverages; tobacco products; textile mill products, such as fabric, carpets and rugs; apparel; wood products, including logging, sawmills, prefabricated homes, and mobile homes; furniture; paper; printing; chemicals, such as plastics, paints, and drugs; petroleum refining; rubber and plastics; leather products; stone, clay, and glass; primary metals, such as steel, copper, aluminum, and including finished products such as wire, beams, and pipe; fabricated metals, such as cans, sheet metal, cutlery, and ordnance; industrial machinery, including computers, office equipment, and engines; electronics and electrical equipment; transportation equipment, such as cars, trucks, ships, and airplanes; instruments; and miscellaneous industries, such as jewelry, musical instruments, and toys. Excluded from manufacturing is publishing of printed materials.

Wholesale trade includes establishments engaged in wholesaling merchandise, generally without transformation, and rendering services incidental to the sale of merchandise. The merchandise described in this sector includes the outputs of agriculture, mining, manufacturing, and certain information industries, such as publishing. Wholesale establishments are primarily engaged in selling merchandise to retailers; or to industrial, commercial, institutional, farm, construction contractors; or to professional business users; or to other wholesalers or brokers. The merchandise sold by wholesalers includes all goods used by institutions, such as schools and hospitals, as well as virtually all goods sold at the retail level. Wholesalers can be merchant wholesalers who purchase goods from manufacturers or other wholesalers and sell them; sales branches of manufacturing, mining, or farm companies engaged in marketing the products of the company to retail establishments; or agents, merchandise or commodity brokers, and commission merchants.

Retail trade includes establishments engaged in retailing merchandise, generally without transformation, and rendering services incidental to the sale of merchandise. Retail trade includes store retailers such as motor vehicle and parts dealers including automobile, motorcycle and boat dealers as well as tire and automobile parts stores; furniture and home furnishing stores; electronics and appliance stores; food and beverage stores, including supermarkets, convenience stores, butchers, and bakeries; health and personal care stores such as pharmacies and optical goods stores; gasoline stations; clothing and clothing accessory stores; sporting goods, hobby, book and music stores; department stores; and miscellaneous establishments, including office supply stores, mobile home dealers, thrift shops, florists, tobacco stores, and pet shops. Retail trade also includes nonstore retailers such as internet and catalog sellers, as well as home delivery establishments such as heating oil dealers. Retail trade excludes eating and drinking places, including restaurants, bars, and take-out stands.

Transportation and warehousing includes industries providing transportation of passengers and cargo and warehousing and storage for goods. Establishments in these industries use transportation equipment or transportation related facilities as a productive asset. Transportation includes railroads, highway passenger transportation, trucking, shipping, air transportation, pipelines, and transportation services. Transportation also includes private postal services, and courier services but excludes the U.S. Postal Service. Warehousing includes refrigerated storage and grain elevators.

Information includes establishments engaged in producing and distributing information and cultural products; providing the means to transmit or distribute these products as well as data or communications; and processing data. The main components of this sector are the publishing industries, including software publishing, and both traditional publishing and publishing exclusively on the Internet; the motion picture and sound recording industries; movie theaters; the broadcasting industries, including traditional broadcasting and those broadcasting exclusively over the Internet; the telecommunications industries; the industries known as internet service providers and web search portals; data processing industries; and the information services industries.

Finance and insurance includes establishments primarily either engaged in or facilitating financial transactions (e.g. transactions involving the creation, liquidation, or change in ownership of financial assets.) Establishments include depository institutions, such as commercial banks, credit unions savings and loans, and foreign banks; credit institutions; credit card processing; investment companies; brokers and dealers in securities and commodity contracts; security and commodity exchanges; carriers of all types of insurance; insurance agents and insurance brokers. Also included are central banks and monetary authorities charged with monetary control.

Real estate and rental and leasing includes establishments primarily engaged in renting, leasing, or otherwise allowing the use of tangible or intangible assets, and establishments providing related services. Real estate includes real estate leasing establishments, real estate agencies and brokerages, property management establishments, appraisals establishments, and escrow agencies. Rental and leasing includes car and truck rental, consumer goods rentals such as video stores and formal wear rental stores, and commercial equipment renting and leasing construction, transportation, office and farm equipment. Also included are establishments that lease nonfinancial and noncopyrighted intangible assets such as patents and trademarks.

Professional and technical services includes establishments that specialize in performing professional, scientific, and technical activities for others. These activities include legal advice and representation; accounting, bookkeeping, and payroll services; architectural, engineering, and specialized design services; computer services; consulting services; research services; advertising services; photographic services; translation and interpretation services; veterinary services; and other professional, scientific, and technical services. Excluded are establishments primarily engaged in providing office administrative services, such as financial planning, billing and recordkeeping, personnel, and physical distribution and logistics.

Management of companies and enterprises includes bank holding establishments, other holding establishments, corporate management establishments as well as regional and subsidiary management establishments. Company or enterprise headquarters are included.

Administrative and waste management includes establishments engaged in office administration, hiring and placing of personnel, document preparation and similar clerical services, solicitation, collection, security and surveillance services, cleaning, and waste disposal services. Among many other establishments administrative includes call centers, tele-marketers, janitorial services, armored cars, temporary employment agencies, locksmiths, landscaping, and travel agencies. Waste management includes, among other establishments, solid waste collections and disposal, landfill operations and septic tank maintenance. Excluded from administrative and waste management are establishments involved in administering, overseeing, and managing other establishments of the company or enterprise. Also excluded are government establishments engaged in administering, overseeing, and managing governmental programs.

Educational services include private elementary schools, junior colleges, colleges, universities, and professional schools. Also included are trade and vocational schools, business and secretarial schools, computer training services, language schools, fine arts training, sports training establishments, driving schools, flight schools and establishments that provide test preparation and tutoring. Educational services may be provided in part in educational institutions, the workplace, or the home through correspondence, television, or other means. Public schools, including colleges and universities, are excluded from educational services.

Health care and social assistance includes establishments providing health care and social assistance for individuals. Health care establishments include ambulatory care services (e.g. physician offices, dentists, specialists, HMOs, dialysis centers, blood banks, ambulance services), hospitals, and nursing and residential care facilities. Social assistance establishments include individual and family services (e.g. adoption agencies and youth centers) and community services such as food banks and homeless shelters. Excluded from this sector are aerobic classes and nonmedical diet and weight reducing centers. Also excluded are public hospitals and clinics.

Arts, entertainment, and recreation includes establishments that are involved in producing, promoting, or participating in live performances, events, or exhibits intended for public viewing; establishments that preserve and exhibit objects and sites of historical, cultural, or educational interest; and establishments that operate facilities or provide services that enable patrons to participate in recreational activities or pursue amusement, hobby, and leisure time interests. The sector includes establishments engaged in the performing arts, sporting events, museums, zoos, amusement and theme parks, golf courses, marinas, casinos, and gambling establishments. Excluded are movie theaters.

Accommodation and food services includes hotels, motels, casino hotels, bed and breakfasts, campgrounds and recreational vehicle parks and other lodging places as well as eating and drinking places, including restaurants, bars, and take-out stands. Also included are caterers and food service contractors.

Other services, except public administration includes churches and establishments engaged in equipment and machinery repairing, promoting or administering religious activities, grantmaking, advocacy, and establishments providing dry-cleaning and laundry services, personal care services, death care services, pet care services, photofinishing services, temporary parking services, and dating services. Private households that engage in employing workers on or about the premises in activities primarily concerned with the operation of the household are included in this sector.

Federal civilian includes all Federal government workers regardless of their establishment classification. Federal civilian employment includes executive offices and legislative bodies; courts; public order and safety; correctional institutions; taxation; administration and delivery of human resource programs, such as health, education, and public assistance services; housing and urban

development programs; environmental programs; regulators, including air traffic controllers and public service commissions; the U.S. Postal Service; and other Federal government agencies.

Federal military includes Air Force, Army, Coast Guard, Marine Corps, Merchant Marine, National Guard, and Navy. Personnel deployed abroad are counted in their home base or port. Reserves who receive regular training are included. Civilians working on a military base are classified in the sector appropriate to their occupation.

State and local government is defined the same as Federal civilian except that the activities are run by state and local governments. At the local level, this includes all public schools as well as police and fire departments; at the state level, it includes all public junior colleges, colleges, and universities.

■ Personal Income

The historical data (1969-2017) for total personal income are from the U.S. Department of Commerce, Bureau of Economic Analysis. Total personal income is the income received by persons from all sources, that is, from participation in production, from both government and business transfer payments, and from government interest, which is treated like a transfer payment. Persons consist of individuals, nonprofit institutions serving individuals, private uninsured welfare funds, and private trust funds. Personal income is the sum of wages and salaries, other labor income, proprietors' income, rental income of persons, dividend income, personal interest income, and transfer payments less personal contributions for social insurance.

Personal income data in the Woods & Poole database are presented in 2012 dollars. These are called 'constant' dollars and are used to measure the 'real' change in earnings and income when inflation is taken into account. For example, it would be incorrect to assume that Americans were more than twice as wealthy in 1980 as in 1970 even though income per capita increased from \$4,080 to \$10,091; during those ten years the general price level increased more than 97%, and \$10,091 in 1980 could not buy as much as \$10,091 could in 1970. When adjusted for the rate of inflation by making income per capita 'constant' in 2012 dollars, the increase from 1970 to 1980 was only 23% (\$20,019 to \$24,672).

■ The Accuracy of the Projections

Unlike other sciences, economics and demographics cannot rely on experimentation to test theories and verify hypotheses. Rather, historical data are analyzed and theories are developed that explain the historical data. The resulting models are then used to make a projection. Woods & Poole projections, like all economic and demographic projections, utilize this approach: analyzing historical data to make estimates of future data. There are, of course, inherent limitations to projections, and the Woods & Poole projections should never be interpreted as an infallible prediction of the future; future data may differ significantly from Woods & Poole projections and Woods & Poole does not guarantee the accuracy of the projections. In all Woods & Poole publications, the word 'forecast' is used as a synonym for 'projection' and refers to Woods & Poole estimated data for any [future] year [up] to 2050; in Woods & Poole publications 'projections,' or 'forecasts,' both mean estimates of future data to 2050.

One key limitation to all projections, and Woods & Poole projections in particular, is that the future is never known with any certainty. The model on which the projections are based may not accurately reflect future events. In addition, there is always the possibility of an unanticipated shock to the economy, or of some other event that was not foreseen based on an analysis of historical data. For instance, a local government may enact a new industrial policy that has an unexpected, beneficial effect on employment growth. Or an abrupt economic change, although anticipated, may occur with

much greater intensity or in a shorter time period than expected. For example, the projection may assume an increase in the price of a commodity, such as oil, over a five-year period, but an embargo may raise the price to that level in only one year. In addition, the projections may not be accurate because historical data is revised; or because the projection model does not accurately reflect demographic or economic phenomena; or because the projections contain errors; or because the smooth growth path of the long-term projections inaccurately reflects important variance in economic or demographic growth for particular regions; or because assumptions about national or regional growth, upon which the projections are based, turn out to be incorrect. There are many other types of economic and demographic events that could create outcomes far different from Woods & Poole's projections.

Another limitation results from doing forecasts for small geographic areas for small data series. Statistically, models are more reliable the larger the area and/or the series being studied. Small area forecasts, such as county population for White men age 84, are subject to more error because of the small sample size. This error can be reduced, although never eliminated, by constraining the small area forecasts to the forecast totals for a larger area or series; this is the method used by Woods & Poole.

APPENDIX D: TRIP GENERATION

In order to calculate new growth and development's fair share of the cost of road improvements, it is necessary to establish how much of the future traffic on Cherokee County's roads will be generated by new growth, over and above the traffic generated by the county's residents and businesses today. This Appendix Section describes the process through which this determination is made.

■ Summary

A Level of Service must be established for road improvements in order to assure that, ultimately, existing development and new growth are served equally. This Section also presents the process through which new growth and development's 'fair share' of road improvement costs is calculated, and tables summarizing the technical portions of this methodology are included.

Level of Service

The County has set its Level of Service for road improvements at LOS "D", a level below which some roads in the county operate. Using this LOS maximizes roadway capacity before traffic conditions actually break down (LOS "F").

All road improvement projects benefit existing and future traffic proportionally to the extent that relief from over-capacity conditions eases traffic problems for everyone. For example, since new growth by 2040 will represent a certain portion of all 2040 traffic, new growth would be responsible for that portions' cost of the road improvements.

It is noted that the cost-impact of non-Cherokee County generated traffic on the roads traversing the county (cross commutes) is off-set by state and federal assistance. The net cost of the road projects that accrues to Cherokee County reasonably represents (i.e., is 'roughly proportional' to) the impact on the roads by Cherokee County residents driving to and from their homes, and commuters that come in to work in the county.

The basis for the road impact fee would therefore be Cherokee County's cost for the improvements divided by all traffic generated within the county in 2040 (existing today plus new growth)—i.e., the cost per trip—times the traffic generated by new growth alone. For an individual land use, when a building permit is issued, the cost per trip would be applied to the number of trips that will be generated by the new development, assuring that new growth would only pay its 'fair share' of the road improvements that serve it.

Approach

This methodology proceeds along the following lines:


- Total traffic currently generated by Cherokee County residents and businesses in 2020 on the road system within the county is calculated from trip generation and commuting data. Various data sources are relied upon to determine current conditions, as explained in each appropriate section, below.
- Future Cherokee County-generated traffic from new growth in the county is calculated from housing unit and employment forecasts to 2040.

- The portion of total 2040 traffic that is generated by new housing units and employment in the county establishes the percentage of Cherokee County's cost of the future road improvements that can be included in an impact fee.

Summary Table

The table below shows how the portion of 2040 traffic generated by new growth is calculated. The figures represent all trips generated by land use, including pass-by and diverted trips.


Average Daily Trip Ends Generated by New Growth

	2020	2040	Increase	Percent New Growth Trip Ends
Residential Trips	937,554	1,439,937	502,383	
Nonresidential Trips	2,170,021	4,130,485	1,960,464	
Less: Internal Commutes*	(143,705)	(273,532)	(129,827)	
Net Trip Ends	2,963,870	5,296,890	2,333,020	44.0%

* Residents who work in Cherokee County. These trips to and from work are included in the residential trips.

The next table, below, calculates the Primary Trip Ends generated by existing and future traffic by deleting pass-by and diverted trips, as discussed below.

Primary Daily Trip Ends Generated by New Growth

	Percent Primary Trip Ends*	Primary Trip Ends			Percent New Growth Primary Trip Ends
		2020	2040	Increase	
Residential Trips	100%	937,554	1,439,937	502,383	
Commercial	51%	1,072,637	2,062,028	989,392	
Industrial+Utility	92%	56,993	71,708	14,715	
Less: Internal Commutes	100%	(143,705)	(273,532)	(129,827)	
Net New Primary Trip Ends		1,923,479	3,300,142	1,376,663	41.7%

* Derived from 'Trip Generation Handbook' chapter, *Trip Generation*, 9th Edition, Institute of Transportation Engineers.

Overall, new residents and businesses located within Cherokee County will generate 41.7% (more accurately, 41.7152688%) of all Cherokee County vehicles on its roads. Thus, new growth's 'fair share' of the cost to the County to provide road improvements to serve current and future traffic cannot exceed this figure.

■ Pass-by and Diverted Trips

The impact of new growth and development on Cherokee County's road network is the increased traffic added to the system, expressed by transportation engineers as 'trips'. Every 'trip' has two ends—a beginning at its origin and an end at its destination (known as 'trip ends'). There are three types of trips, defined as:

A **Primary Trip** (and its trip ends)—a vehicle travelling from its original beginning to its intended final destination. Driving from one's home to one's place of work is an example of a primary trip.

A **Pass-by Trip**—a vehicle travelling along its usual route from its origin to its final destination that stops off at an intermediate location for any reason. A trip from home to work that stops along the way for gas, dropping off a child at daycare, picking up coffee or dinner, or for any other reason, represents a 'pass-by' trip at the intermediate location.

A **Diverted Trip** (previously called a diverted 'link' trip)—a vehicle that diverts from its normal primary route between its origin to its final destination, and takes a different route to stop off at an intermediate location for any reason. While a pass-by trip remains on its normal route, a diverted trip changes its route to other roads to arrive at the intermediate stop.

New primary trips add vehicles to the road network. Pass-by and diverted trips involve the same vehicles stopping off between their original beginnings and their final destinations, and therefore do not add new vehicles to the road network—the vehicles were already there on their way to their final destinations.

These different types of trips result in different types of 'trip ends'. On a home-to-daycare-to-work trip, for instance, there are two primary trip ends (home and work) and two pass-by or diverted trip ends: arriving at the daycare center and leaving from there to drive to work, for instance. The net impact on the road network, however, is created by the one vehicle and its two primary trip ends.

Impact fee calculations take note of these pass-by and diverted trip ends as not adding to the overall traffic on the road network, and deletes them from the total trip ends reported in ITE's *Trip Generation* manual. While the table above uses overall average percentages of primary trip ends derived from ITE for broad land use categories, the actual percentage for each land use listed on the impact fee schedule for roads is applied to the total trip ends to determine the primary trip ends attributed to that land use.

Although both summary tables above reflect about the same percentage of 2040 traffic that will be generated by new growth, the increase in primary trip ends from the second table will play an important role in calculating the per-trip road impact fee.

■ Residential Trip Generation

Average trip generation rates published by the Institute of Transportation Engineers (ITE) differentiate between 'single-family detached housing' and 'apartments'. The closest correlations with the US Census definitions are 'single-family units' and 'multi-family units', which are shown on the following table.

Residential Units by Type: 2018 and 2040

	2018*	Percent**	Total in 2020***	Increase 2020-2040	Total in 2040
Single-Family Units	80,958	90.02%	91,405	48,979	140,384
Multi-Family Units	8,974	9.98%	10,132	5,429	15,561
Total	89,932	100.0%	101,537	54,408	155,945

* Based on most recent 5-Year American Community Survey PUMS data report (Census Bureau).


** Percent of 2018 total housing units.

*** See Appendix B: Future Growth for housing unit projections.

The 2018 breakdown of housing units by type on the table above are taken from the most recent American Community Survey for Cherokee County (published by the Census Bureau). The 2018 percentage by housing type (single-family and multi-family) is calculated, and applied to the total number of housing units projected in 2020 (taken from the Future Growth Appendix of this report). It is assumed that these percentages will persist into the future, producing a breakdown of the projected 54,408 new housing units forecast for the 2020-2040 period.

The next table, below, calculates the amount of traffic that is generated by the county's housing stock today, and the amount that will be generated in 2040.

Residential Trip Generation: 2020-2040 New Growth Increase

	ADT* Trip Ends	2020 Units	2020 ADT Trip Ends	2040 Units	2040 ADT Trip Ends	Increase 2020-2040	Percent New Growth Trip Ends
Single-Family Units	9.52	91,405	870,176	140,384	1,336,456	466,280	
Multi-Family Units	6.65	10,132	67,378	15,561	103,481	36,103	
Total		101,537	937,554	155,945	1,439,937	502,383	34.9%

* Average Daily Traffic (trip ends) on a weekday; Institute of Transportation Engineers *Trip Generation*, 9th Edition. Total includes trips to/from work.

The calculations are made on the basis of 'average daily traffic' on a normal weekday, using average trip generation rates derived through multiple traffic studies (350 for single-family and 86 for

apartments) and published by ITE. The rates are expressed for 'trip ends'—that is, traffic both leaving and coming to a housing unit.

Comparing traffic in 2020 to 2040, the future increase in trip ends can be calculated, which will represent 34.9% of all residential trip ends generated in the county.

It should be noted that the traffic generated includes trips to and from work and, more particularly, residents who work at a business within the county.

■ Nonresidential Trip Generation

Calculating traffic generated by businesses located in Cherokee County is more problematical than residential trips because there is no breakdown of types of businesses in the county that is readily available. In addition, while employment forecasts have been made in terms of the number of jobs, there is no data available for floor areas, much less by detailed type of use.

The alternate is to view nonresidential traffic generation on a broad 'average' basis. For this, there is data available from ITE for a number of individual uses relating to the total number of trips generated per employee. These trips, of course, include not only trips taken by the employees (to/from work, lunch, etc.) but also customers and others that are attracted to the use, serve it or are served by it in some way.

The Average Daily Traffic (ADT) numbers on the following table, therefore, are calculated by dividing all trips to a use—employees, customers, deliveries to or from, etc.—by the number of employees alone. Since there is more data available for the average number of employees per 1,000 square feet of floor area, it enables a determination of the average total trips generated by the use by the same floor area (and thus the number per '1' square foot of floor area for impact fee calculations).

The table on the following page shows the 'trips per employee' per 1,000 square feet of floor area for those uses for which impact fees are commonly collected and for which the data is available.

Overall, the average trip generation rate of all uses shown on the following table is 10.21 trips per employee for 'industrial' uses and 25.31 for all 'commercial' uses. The 'industrial' category includes such uses as manufacturing and assembly, storage and transportation of goods; the 'commercial' category includes all sales and service uses such as stores, offices, motels, banks, amusements and private institutions). The last column shows the average rate for all 'commercial' uses listed, as opposed to the 'industrial' uses shown in the column on its left.

Although the 'overall' averages are useful for projecting total traffic generation, impact fees for particular uses will reflect the actual average trip generation rate for the specific use.

Technical Appendices Trip Generation

ITE Trips-per-Employee Data

			ADT		Average	Average						
	ITE CODE	LAND USE	Trip Ends per Employee		by Category	All Commercial						
Port and Terminal (000-099)	30	Intermodal Truck Terminal	6.99	}	10.21	}						
Industrial (100-199)	110	General Light Industrial	3.02									
	120	General Heavy Industrial	0.82									
	140	Manufacturing	2.13									
	150	Warehousing	3.89									
	151	Mini-Warehouse	32.47									
	152	High-Cube Warehouse	22.13									
Lodging (300-399)	310	Hotel or Conference Motel	14.34	}	13.58		}					
	320	Motel	12.81									
Recreational (400-499)	430	Golf Course	20.52	}	34.79			}				
	443	Movie Theater	53.12									
	460	Arena	10.00									
	480	Amusement Park	8.33									
	490	Tennis Courts	66.67									
	491	Racquet/Tennis Club	45.71									
	492	Health/Fitness Center	46.71									
	495	Recreational Community Center	27.25									
Institutional (500-599)	520	Private Elementary School	15.71	}	29.58				}			
	530	Private High School	19.74									
	560	Church/Place of Worship	26.24									
	565	Day Care Center	28.13									
	566	Cemetery	58.09	}	5.26					}		
Medical (600-699)	610	Hospital	4.50									
	620	Nursing Home	3.26									
	630	Clinic	8.01	}	4.18						}	
Office (700-799)	710	General Office Building	3.32									
	714	Corporate Headquarters Building	2.33									
	715	Single-Tenant Office Building	3.70									
	720	Medical-Dental Office Building	8.91									
	760	Research and Development Center	2.77									
	770	Business Park	4.04	}	32.86							}
Retail (800-899)	812	Building Materials and Lumber Store	32.12									
	814	Variety Store	66.70									
	815	Free-Standing Discount Store	28.84									
	816	Hardware/Paint Store	53.21									
	817	Nursery (Garden Center)	21.83									
	818	Nursery (Wholesale)	23.40									
	826	Specialty Retail Center	22.36									
	841	Automobile Sales	21.14									
	850	Supermarket	87.82									
	854	Discount Supermarket	40.36									
	860	Wholesale Market	8.21									
	861	Discount Club	32.21									
	875	Department Store	11.56									
	890	Furniture Store	12.19									
Services (900-999)	912	Drive-in Bank	30.94									

Source: *Trip Generation*, 9th Edition, Institute of Transportation Engineers, where survey results given for key land uses.

We know from the 2010 Census how many people worked in Cherokee County based on commuting patterns. The next table provides a breakdown between commercial and industrial employment in the county and calculates trip ends generated by each.

Tax base valuations give us some clue as to the breakdown. When the County's 'industrial' and 'utility' tax valuations are combined, the figures suggest that 75.7% of all uses are 'commercial' in nature, while 24.3% are industrial. These percentages, applied to total employment in the county, give us the estimated number of employees in 2010 in each category.

Nonresidential Trip Generation: 2010 Census


	2010 Tax Base		Percent of Total	2010 Employees	Avgerage ADT	Total Nonres Trip Ends	
Commercial	\$ 1,148,108,530	}	\$ 1,148,108,530	75.7%	44,144	25.31	1,117,296
Industrial	\$ 222,552,172		\$ 368,653,650	24.3%	14,175	10.21	144,686
Utility	\$ 146,101,478						
Total Nonresidential	\$ 1,516,762,180		\$ 1,516,762,180		58,319		1,261,982
			Internal Commutes*		41,786	times 2 =	(83,572)
				Net Nonres Trips		1,178,410	

* Residents who work in Cherokee County. These trips are included in residential trip generation rate.

The table calculates the total number of trips using the average rates for commercial and industrial from the ITE Trips-per-Employee Data table on the previous page. From the total of all nonresidential trips is deducted the number of trips to/from work generated by county residents, since these trips have already been calculated as part of the residential trip generation rates (i.e., county residents driving to/from work at county establishments).

Lastly, the following table calculates the total number of trip ends that will be generated by new nonresidential growth in future traffic on Cherokee County's roads.

Nonresidential Trip Generation: 2020-2040 New Growth Increase

	2020 Employees	2020 Trip Ends	2040 Employees	2040 Trip Ends	2020-2040 Increase	Percent New Growth Trip Ends
Commercial	83,290	2,108,072	160,116	4,052,541	1,944,469	
Industrial+Utility	6,069	61,949	7,636	77,944	15,995	
Total	89,359	2,170,021	167,752	4,130,485	1,960,464	
Less: Internal Commutes at	6.62%	(143,705)		(273,532)	(129,827)	
Net Nonres Trip Ends		2,026,316		3,856,953	1,830,637	47.5%

The table above shows the number of trip ends currently generated by Cherokee County businesses based on 2020 employment. The trip ends by use are distributed using the same percentages calculated on the previous table for 2010. The same calculations are made for the year 2040 based on projected employment in the county, and the difference between 2020 and 2040 represents trip ends generated by future growth and development. This totals 47.5% of all nonresidential 2040 trip ends.

The results of the residential and nonresidential trip generation analyses are combined on the Summary table at the beginning of this Appendix Section for an overall calculation of new growth's share of future traffic generated by Cherokee County residents and businesses. From these figures, pass-by and diverted trip ends are then deleted to determine primary trip ends, which more closely relates to vehicles on the road and thus contribute to traffic congestion.

■ Terminology

This Methodology uses the term 'average daily traffic' (ADT) for a weekday, which is defined by ITE as the 'average weekday vehicle trip ends', which are "the average 24-hour total of all vehicle trips counted from a study site from Monday through Friday."

Additionally, ITE defines a 'trip or trip end' as "a single or one-direction vehicle movement with either the origin or the destination (exiting or entering) inside a study site. For trip generation purposes, the total trip ends for a land use over a given period of time are the total of all trips entering plus all trips exiting a site during a designated time period".

Lastly, ITE defines 'average trip rate' as "the weighted average of the number of vehicle trips or trip ends per unit of independent variable (for example, trip ends per occupied dwelling unit or employee) using a site's driveway(s). The weighted average rate is calculated by dividing the sum of all independent variable units where paired data is available. The weighted average rate is used rather than the average of the individual rates because of the variance within each data set or generating unit. Data sets with a large variance will over-influence the average rate if they are not weighted.

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