STATE OF GEORGIA
COUNTY OF FULTON

RESOLUTION NO. 15-07-344

A RESOLUTION SUPPORTING THE TRANSMITTAL OF A DRAFT CAPITAL IMPROVEMENTS ELEMENT TO THE ATLANTA REGIONAL COMMISSION FOR REGIONAL AND STATE REVIEW AS REQUIRED FOR THE CONSIDERATION OF AN IMPACT FEE PROGRAM

WHEREAS, the City of Milton has prepared a draft Capital Improvements Element to be incorporated into and update the *Milton 2030 Comprehensive Plan* (a copy of which is attached hereto as Exhibit "A"); and

WHEREAS, the draft Capital Improvements Element was prepared in accordance with the "Development Impact Fee Compliance Requirements" and the "Minimum Standards and Procedures for Local Comprehensive Planning" adopted by the Department of Community Affairs pursuant to the Georgia Planning Act of 1989; and,

WHEREAS, a duly advertised public hearing was held on May 4, 2015, at 6:00 P.M. in the Milton City Hall in accordance with Section (3)(a) of Chapter 110-12-2-.04 (Procedural Requirements) of the Development Impact Fee Compliance Requirements chapter of the Georgia Administrative Code; and

WHEREAS, a second duly advertised public hearing was held on July 20, 2015, at 6:00 P.M. in the Milton City Hall in accordance with Section (3)(b) of Chapter 110-12-2-.04 (Procedural Requirements) of the Development Impact Fee Compliance Requirements chapter of the Georgia Administrative Code;

NOW, THEREFORE BE IT RESOLVED, that the Mayor and City Council of the City of Milton do hereby approve transmission of the attached draft Capital Improvements Element to the Atlanta Regional Commission for Regional and State review, in accordance with the requirements of the Development Impact Fee Compliance Requirements chapter of the Georgia Administrative Code.

RESOLVED this 20th day of July, 2015.

Joe Lockwood, Mayor

Attest:

Sudie AM Gordon, City Clerk

Capital Improvements Element






City of Milton Impact Fee Program

Including the following public facility categories:

Parks and Recreation
Fire Protection
Law Enforcement
Road Improvements

DRAFT:
July 20, 2015

ROSS+associates
urban planning & plan implementation

in association with

amec foster wheeler

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Introduction

The purpose of a Capital Improvements Element (CIE) is to establish where and when certain new capital facilities will be provided within a jurisdiction and the extent to which they may be financed through an impact fee program. This Capital Improvements Element addresses parks & recreation, fire protection, law enforcement and road improvements.

As required by the Georgia Development Impact Fee Act ("State Act" of "DIFA"), and defined by the Department of Community Affairs in its *Development Impact Fee Compliance Requirements*, the CIE must include the following for each capital facility category for which an impact fee will be charged:

- a **projection of needs** for the twenty-year planning period to 2035;
- the designation of **service areas**—the geographic area in which a defined set of public facilities provide service to development within the area;
- the designation of **levels of service** (LOS)—the service level that is being and will be provided;
- a **schedule of improvements** listing impact fee related projects and costs for the twenty-year planning period;
- a description of **funding sources** for the twenty-year planning period.

Additionally, in accordance with the State Act and DCA's *Development Impact Fee Compliance Requirements,* a policy statement regarding potential impact fee exemptions is included in this CIE if the City wishes to adopt or apply such exemptions in the future.

Impact Fees Authorized

Impact fees are authorized in Georgia pursuant to O.C.G.A. §36-71-1 et seq., the *Georgia Development Impact Fee Act* (DIFA), and are administered by the Georgia Department of Community Affairs pursuant to Chapter 110-12-2, *Development Impact Fee Compliance Requirements,* of the Georgia Administrative Code. Under DIFA, the City can collect money from new development based on that development's proportionate share—the 'fair share'—of the cost to provide the facilities needed specifically to serve new development. This includes the categories of roads, public safety and parks. Revenue for such facilities can be produced from new development in two ways: through future taxes paid by the homes and businesses that growth creates, and through an impact fee assessed as new development occurs.

Categories for Assessment of Impact Fees

To assist in paying for the high costs of expanding public facilities and services to meet the needs of projected growth and to ensure that new development pays a reasonable share of the costs of public facilities, Milton is considering the establishment of impact fees for parks & recreation, fire protection, law enforcement and road improvements. The chapters in this Capital Improvements Element provide population and employment forecasts and detailed information regarding the inventory of current facilities, the level of service, and detailed calculations of project costs and the impact of new growth and development for the specific public facilities.

The following table shows the facility categories being considered by the City that are eligible for impact fee funding under DIFA and that are considered in this report. The service area for each public facility category—that is, the geographical area served by the facility category—is also given, along with what the standard adopted as the level of service to be delivered for each facility category is based upon.

Overview of Impact Fee Program Facilities

	Parks and Recreation	Fire Protection	Law Enforcement	Road Improvements
Eligible Facilities	Park acres, recreation components (ballfields, etc.) and trails	Fire stations, fire trucks & general vehicles	Administrative facility space	Road projects serving Milton residents and workers
Service Area	Citywide	Citywide	Citywide	Citywide
Level of Service Standard Based on …	Number of acres, components and trail miles per dwelling unit	Square footage and number of vehicles per day/night population	Square footage of facilities per day/night population	LOS "D" for entire road network
Historic Funding Source(s)	General Fund	General Fund	General Fund	General Fund

Terms used in the **Overview Table**:

Eligible Facilities under the State Act are limited to capital items having a life expectancy of at least ten years, such as land, buildings and certain vehicles. 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 most 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 can be collected. Monies collected in a service area for a particular category 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.

Funding Sources for capital improvements have historically been General Fund tax collections, net of any grants received (if any). Impact fees will be used to fund all or a portion of eligible impact fee costs. Tax collections include the City's normal annual property tax levy and any special levies for debt instruments (such as bonds) that are intended to provide funding for impact fee projects in whole or in part.

■ Editorial Conventions

This report observes the following conventions:

The capitalized word 'City' applies to the government of Milton, the City Council or any of its departments or officials, as appropriate to the context. An example is "the City has adopted an impact fee ordinance".

The lower case word 'city' refers to the geographical area of Milton, as in "the population of the city has grown".

The same conventions are applied to the words ‘County’ and ‘county’, ‘State’ and ‘state’.

Single quote marks (‘ and ’) are used to highlight a word or phrase that has a particular meaning 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.

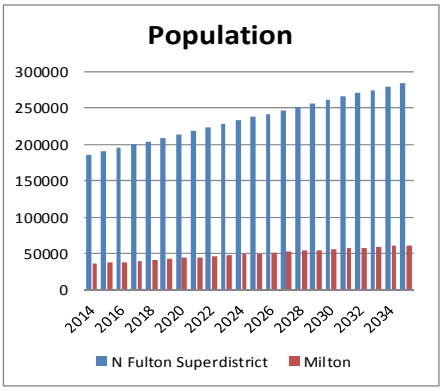
Forecasts

In order to accurately calculate the demand for future services in Milton, new growth and development must be quantified in future projections. These projections include forecasts for population, households, housing units, and employment to the year 2035. These projections provide the baseline conditions from which the current Level of Service calculations are produced. Also, projections are combined to produce what is known as 'day/night population.' This is a method that combines resident population and employees in a service area 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 each public facility category are specified in each public facility chapter.

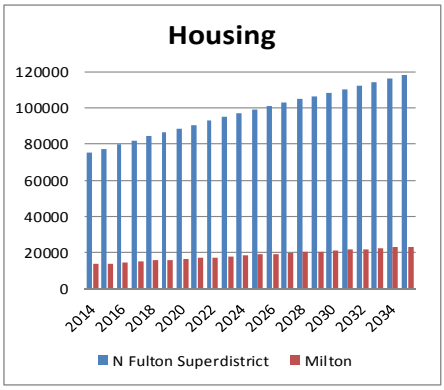
This chapter presents a summary of the forecasts that have been identified as the most appropriate for Milton, based on a wide-ranging analysis of alternate approaches that were considered for their reasonableness and correlation to the City's growth policies contained in its 2030 Comprehensive Plan, adopted in 2011.

Regional Setting

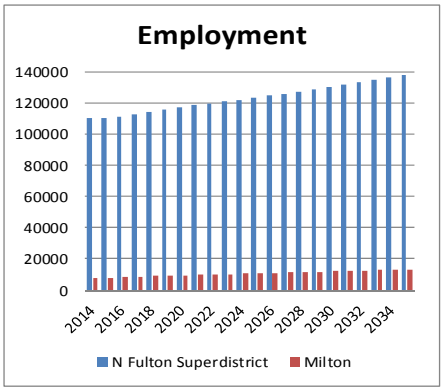
Continuing past trends, Milton is expected to continue to grow at a faster pace than its immediate neighbors with regard to population, housing and jobs. Its neighbors—Alpharetta and John's Creek— contain the preponderance of population and housing units in the 3-city N. Fulton Superdistrict, but are expected to grow collectively at a slower pace than Milton (increasing 49% to Milton's 71% in population and 54% to Milton's 71% in housing between 2014 and 2035). Over the coming twenty years, the city is expected to increase its share of all residents among the three cities from 20% to 22%, and grow from 18% to 20% of all housing units. Numerically, Alpharetta and Johns Creek will continue to dominate employment in the area, adding 21,704 new jobs by 2035 compared to Milton's job increase of 5,500, although this 'modest' growth will increase Milton's share of area employment from 7% to almost 10%.



	N Fulton Superdistrict	Milton
2014	185,319	36,060
2035	284,151	61,580
Increase	53%	71%



	N Fulton Superdistrict	Milton
2014	75,027	13,611
2035	117,860	23,243
Increase	57%	71%



	N Fulton Superdistrict	Milton
2014	110,241	7,771
2035	137,445	13,271
Increase	25%	71%

ARC's N Fulton Superdistrict includes Milton along with Alpharetta and John's Creek. Superdistrict projections interpolated by ROSS+associates.

Population and Housing Unit Forecasts

Table 1 presents the forecasts for population for each year from 2014 to 2035 and provides the forecasts for households and housing units over the same period. The figures shown are, in essence, mid-year estimates reflecting Census Bureau practice. In other words, the increase in population between 2014 and 2035 would actually be from July 1, 2014 to June 30, 2035.

The population forecasts represent a projection of the annual population figures reported by the Census Bureau through 2013. The number of households is calculated based on the most recently reported average household size in the city, and divided into the population forecasts. Since households are synonymous with 'occupied housing units', the total number of housing units is calculated by applying an occupancy rate to account for vacant units. In essence, the city will be 'built-out' as to its capacity to accommodate future residential development under current land use and conservation policies and zoning provisions.

Table 1: Population, Housing and Employment Forecasts

	Milton Population	Households	Housing Units	Jobs
2014	36,060	12,872	13,611	7,771
2015	37,385	13,345	14,111	8,057
2016	38,710	13,818	14,611	8,342
2017	40,039	14,293	15,113	8,629
2018	41,353	14,762	15,609	8,912
2019	42,654	15,226	16,100	9,193
2020	43,941	15,686	16,586	9,470
2021	45,214	16,140	17,066	9,744
2022	46,473	16,589	17,541	10,015
2023	47,718	17,034	18,011	10,284
2024	48,950	17,474	18,477	10,550
2025	50,167	17,908	18,936	10,812
2026	51,371	18,338	19,390	11,071
2027	52,561	18,763	19,840	11,328
2028	53,737	19,183	20,284	11,582
2029	54,899	19,597	20,721	11,831
2030	56,047	20,007	21,155	12,079
2031	57,181	20,412	21,583	12,324
2032	58,302	20,812	22,006	12,565
2033	59,408	21,207	22,424	12,804
2034	60,501	21,597	22,836	13,039
2035	61,580	21,982	23,243	13,271

Source: ROSS+associates: Methodology-Population Forecasts (Appendix A). Methodology-Housing and Employment Forecasts (Appendix B).

Employment Forecasts

Table 1 also shows the forecasts for employment growth in Milton, from 2014 to 2035. The employment figures for Milton reflect an analysis of three approaches:

One, a 'percentage share' approach in which the city's number of employees is based on a constant share of all employment in the immediate area (which includes Alpharetta and John's Creek), that in 2010 was 4.56% of all jobs in the area.

Another, the 'averaged' approach calculates a middle ground between the lower 'percentage share' forecast and the higher, recommended approach.

The recommended approach assumes a correlation between employment and the number of households in the city. Although in 2010, 59% of all people working in Milton commuted in from outside the city, the 'internal' ratio can be a valuable guideline in making estimates. This forecast maintains the expectation that Milton will continue to increase its modest employment base, will benefit from the Transfer of Development Rights program generated by the Conservation Plan, and will actually increase its share of all employment among the three cities in the immediate N. Fulton Superdistrict by several percentage points into the future.

Service Area Projections

In Table 2 the service area forecasts are presented for a single citywide service area measured in two ways: citywide housing units (which quantifies Parks and Recreation service demands), and citywide day/night population (for the public safety services categories, Fire Protection and Law Enforcement).

The 'day/night' population calculation is a combination of the population and future employment projections. The use of day/night population in impact cost and impact fee calculations is based upon the clear rational nexus between persons and services demanded on a 24-hour basis.

The day/night population is used to determine Level of Service standards for facilities that serve both the resident population and business employment. The fire department, for instance, protects one's house 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.

Table 2: Service Area Forecasts

Year	Housing Units (Recreation & Parks)	Day/Night Population (Fire & Police)
2014	13,611	43,831
2015	14,111	45,442
2016	14,611	47,052
2017	15,113	48,668
2018	15,609	50,265
2019	16,100	51,847
2020	16,586	53,411
2021	17,066	54,958
2022	17,541	56,488
2023	18,011	58,002
2024	18,477	59,500
2025	18,936	60,979
2026	19,390	62,442
2027	19,840	63,889
2028	20,284	65,319
2029	20,721	66,730
2030	21,155	68,126
2031	21,583	69,505
2032	22,006	70,867
2033	22,424	72,212
2034	22,836	73,540
2035	23,243	74,851
Increase:	**9,632**	**31,020**

The figures on Table 2 are the figures that will be used in subsequent public facility category chapters for Parks & Recreation, Fire Protection and Law Enforcement.

Impact fees for the Road Improvements category are not population based, but based on vehicle trip generation data. As described in the Technical Appendix of this report, future growth and development in the city will account for about 40% of all city-generated traffic on Milton's roads by 2035.

For a more detailed description of the methodologies considered in preparing the population, household, housing unit and employment forecasts, see the Technical Appendix to this report. For statistical reasons, the forecasts in the Appendix cover the 2010 to 2040 time frame, but the figures used for impact fee purposes cover the 20-year period from the present to 2035.

Parks and Recreation

Introduction

Public recreational opportunities are available in Milton through a number of parks facilities operated by the City of Milton Parks and Recreation Department. Demand for recreational facilities is almost exclusively related to the city'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 city. Thus, the parks and recreation impact fee is limited to future residential growth.

Service Area

The parks and recreation facilities are operated as a citywide system. 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 lacrosse play games at various locations, based on scheduling rather than geography. Other programs are located only at certain centralized facilities, to which any Milton resident can come. Thus, the entire city is considered a single service area for parks and recreation.

Level of Service

Level of Service standards for park lands and for recreational components such as baseball fields, playgrounds, and recreation centers have been adopted by the City in the Parks and Recreation Master Plan (2012). Level of Service standards for preserved open space (conservation easements) and land for trails have been adopted by the City in the Conservation Plan (2013).

Table 3 provides an inventory of the acreage under the control of the Parks and Recreation Department in 2014, or expected to come under its control when Providence Park is transferred.

Table 3: Current Inventory of Park Acres and Planned Trails

Existing Park Acres		Planned Trail System			
Park / Facility Name	Number of Acres	Trail Type	Existing Miles	Proposed Miles	System Total
Bell Memorial Park	32.50	Rural EOP**, Asphalt	-	6.02	6.02
Bethwell Community Center	1.00	Rural EOP, Gravel	0.38	35.78	36.16
Birmingham Park	203.00	Modified Rural EOP, Asphalt	0.72	9.13	9.85
Broadwell Pavillion	0.75	Modified Rural EOP, Gravel	-	3.66	3.66
Freedom Park	1.00	Urban EOP, Concrete	0.45	5.22	5.67
Friendship Community Park	1.81	Urban Bike EOP, Concrete	0.97	17.42	18.39
Hopewell House	2.50	Gravel Roads, Signage	-	9.56	9.56
Providence Park*	42.00	Off Road, Asphalt	-	1.91	1.91
		Off Road, Gravel	-	2.06	2.06
Total Park Acres:	**284.56**	**Total Trail Miles:**	**2.52**	**90.76**	**93.28**

* Currently under the control of Fulton County; expected to transfer to Milton in 2015.
** Edge of pavement.

The total 284.56 acres of park land is equivalent to 1 acre for each 31.5 housing units in the city, as shown in Table 4. The Level of Service standards for land and recreation components are expressed in terms of the number of people each acre, component or mile is intended to serve, which can be re-calculated as the number of housing units served by each acre, component or mile. Multi-use trails follow the same calculation procedure as recreation components, but the LOS is based on the future system serving the 2035 population. Since impact fees are assessed at the time a building permit is issued (and the impact fee will be limited to residential uses), the LOS must be converted to a 'per housing unit' basis.

Table 4 shows how the adopted level of service for each recreation component is converted from a 'per population' basis to a 'per housing unit' basis. First, the currently adopted LOS of 1 per 'X' number of people for each component is converted to one component per 'X' housing units using the city's current average household size. This number is then divided into '1' to produce the 'per housing unit' figure.

Table 4: Level of Service Conversion

Component Type	Adopted LOS*			LOS per X Housing Units**			LOS per Each Housing Unit***	
Park Land (acres)	1 acre per	83	population =	1 acre per	31.5	Housing Units =	0.0317919	for each Housing Unit
Conservation Easements (acres)	1 acre per	22	population =	1 acre per	8.5	Housing Units =	0.1181754	for each Housing Unit
Land for Trails (acres)	1 acre per	560	population =	1 acre per	211.6	Housing Units =	0.0047270	for each Housing Unit
Baseball Field	1 per	5,000	population =	1 per	1,887.3	Housing Units =	0.0005299	for each Housing Unit
Football/Soccer/Lacrosse	1 per	7,000	population =	1 per	2,642.2	Housing Units =	0.0003785	for each Housing Unit
Basketball Court	1 per	5,500	population =	1 per	2,076.0	Housing Units =	0.0004817	for each Housing Unit
Playground (Structured)	1 per	1,750	population =	1 per	660.5	Housing Units =	0.0015139	for each Housing Unit
Picnic Shelter / Pavilion	1 per	1,750	population =	1 per	660.5	Housing Units =	0.0015139	for each Housing Unit
Community Center	1 per	15,000	population =	1 per	5,661.8	Housing Units =	0.0001766	for each Housing Unit
Multi-Use Trails	1 mile per	660.16	population =	1 mile per	249.2	Housing Units =	0.0040131	for each Housing Unit

* Level of Service adopted in Parks and Recreation Master Plan: 1.2 Acres per 100 Population (park land) & 1 Component per population shown. Level of Service adopted in Conservation Plan: 2500 acres in 2030 for conservation easements, and 100 acres in 2030 in land for trails to be purchased. Multi-use Trail LOS based on system build-out in 2035 (93.28 miles serving 61, 580 people).
** Converted using average population per housing unit in 2014. (Exception: conservation easement and land for trails acreage converted using population per housing unit in 2030 due to LOS based on Conservation Plan recommendations for that year.)
*** "1" divided by the number of housing units for each component under "LOS per X Housing Units" column.

2,100 housing units yields 1 basketball court.]

By way of example, the current LOS for basketball courts is 1 court per 5,500 people. That number—5,500—is divided by the 2014 average household size to convert 'people' into 'housing units'. The result is the converted standard of 1 field per 2,100 housing units. By dividing the component (1) by the number of housing units it serves results in the portion of a basketball court that serves 1 housing unit (0.0004761).

[Reversing the calculation, 0.0004761 times

Note that the categories of components shown in Table 4 are not necessarily the only component types that are or will be available to City residents in the future.

Forecasts for Service Area

Existing and Future Demand

Table 5 shows the current and future demand in land and recreation components based on the LOS standards adopted by the City and shown on Table 4.

Existing demand is calculated in order to determine if there are currently more than enough facilities to serve the current (2014) population or if there is a shortfall requiring future facilities to be built to serve today's population.

For the number of acres and facilities to meet future population needs, the increase in housing units between now and 2035 is multiplied by each level of service standard to produce the future demand. The 'new units' figure on the Table is the citywide increase taken from Table 2.

Table 5: Existing and Future Demand

Component Type	Adopted LOS per Housing Unit	Existing Demand (2014) *	New Growth Demand (2015-35) **
Park Land	0.0317919	432.72	306.22
Conservation Easements	0.1181754	1,608.485	1,138.265
Land for Trails	0.0047270	64.339	45.531
Baseball Field	0.0005299	7.212	5.104
Football/Soccer/Lacrosse	0.0003785	5.151	3.645
Basketball Court	0.0004817	6.556	4.640
Playground (Structured)	0.0015139	20.606	14.582
Picnic Shelter / Pavilion	0.0015139	20.606	14.582
Community Center	0.0001766	2.404	1.701
Multi-Use Trails (miles)	0.0040131	54.623	38.655

* 2014 Housing Units = 13,611
** New Units (2035) = 9,632

Note that 'demand' figures are expressed in decimals rather than whole numbers. This allows a high level of accuracy when dealing with cost allocations between existing residents and future growth. For instance, a particular new facility may in part meet a current need and in part serve future growth; each would be responsible for their 'fair share' of the cost. As will be seen, however, ultimately recreation component needs are converted to whole numbers.

Impact Fee Eligibility

New parks and 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 citywide. Table 6 shows the number of new park acres and recreation components that are needed to satisfy both current and future needs of the city's residents, and the extent to which fulfillment of those needs will serve future growth demand. The table begins with the current inventory of park lands and components, and the 'existing' demand for those components to meet the needs of the current (2014) population based on the adopted level of service standards (from Table 5). The 'excess or (shortfall)' column compares the existing demand to the current supply of park acres and recreation components.

Table 6: Future Park Facility Impact Fee Eligibility

Facility	Current Inventory	Existing Demand	Excess or (Shortfall)	New Growth Demand	Net Total Needed	Whole Total Needed	Percent Impact Fee Eligible
Park Land	284.560	432.720	(148.160)	306.220	454.380	455.000	67%
Conservation Easements	0	1,608.485	(1,608.485)	1,138.265	2,746.750	2,747.000	41.4%
Land for Trails	0	64.339	(64.339)	45.531	109.870	110.000	41.4%
Baseball Field	5	7.212	(2.212)	5.104	7.316	8.000	63.8%
Football/Soccer/Lacrosse	7	5.151	1.849	3.645	1.797	2.000	89.8%
Basketball Court	0.5	6.556	(6.056)	4.640	10.696	11.000	42.2%
Playground (Structured)	2	20.606	(18.606)	14.582	33.188	34.000	42.9%
Picnic Shelter / Pavilion	2	20.606	(18.606)	14.582	33.188	34.000	42.9%
Community Center	1	2.404	(1.404)	1.701	3.105	4.000	42.5%
Multi-Use Trails (miles)	2.52	54.623	(52.103)	38.655	90.757	91.000	42.5%

Where an 'excess' is identified, that means that more land or components (or portions of components) exist than are needed to meet the recreation needs of the current population, and those 'excesses' create capacity to meet the recreational needs of future growth. Conversely, a 'shortfall' indicates that there are not enough facilities and more components (or portions of components) are needed to meet the recreational needs of the current population based on the adopted LOS.

The next column on Table 6 shows the total demand in land and components specifically to meet future growth needs, and the 'net total needed' to meet all existing and future needs combined. A current 'excess' in facilities reduces the need for new facilities because the 'excess' is already available to serve new growth. A 'shortfall', however, adds to new growth's needs with facilities to bring the current population up to the adopted level of service required to be available to all—both current and future residents.

For example, the City has 7 football/soccer/lacrosse fields but the adopted level of service indicates that only 5 fields and a portion of a 6th (0.151 or 15.1%) are needed to serve the current population, leaving the remainder of the 6th field and all of the 7th field available to serve future growth. Future growth, however, will need a total of 3.645 fields to fully satisfy its needs, based on the adopted LOS. Since 1.849 existing fields are currently available, only 1.797 new field capacity will be needed to meet future demand. This figure is rounded up to 2 new fields (since the Parks and Recreation Department cannot construct only a portion of a new facility), of which the 1.797 portion needed for new growth represents 89.8% of the total to be built.

On the other hand, the City has only 5 baseball fields where 7.212 in field capacity is needed to serve current needs, leaving a 'shortfall' in capacity of 2.212 fields. New growth will need 5.104 fields for itself, to which is added the current population's shortfall for a total of 7.316 to provide for both current and future needs. Rounded to 8 new fields, new growth needs only 63.8% of the total to satisfy its own demand.

Future Costs

Table 7 on the next page presents the estimated cost calculations for both the land acquisition and recreation component projects proposed and the maximum extent to which the project costs are impact fee eligible.

The figures in the 'components proposed' column are drawn from the 'whole total needed' column in Table 6. The 'total cost figures' on the Table are converted to 'new growth share' dollars based on the percentage that each improvement is impact fee eligible. Note that this affects most of the recreation components to the extent that partial components identified in the 'net total needed' column of Table 6 had to be rounded up to whole components, creating an 'overage' portion of each facility type.

Table 7: Future Costs to Meet Future Demand

Facility	Components Proposed	Net Cost per Unit*	Gross Cost per Unit**	Total Cost	% Impact Fee Eligible	New Growth Share	Net Present Value***
Land:							
Park Land	455	$ 110,000	$ 134,200	$ 61,061,000	67.39%	$ 41,150,793	$ 46,275,787
Conservation Easements	2,747	$ 10,000	$ 12,200	$ 33,513,400	41.44%	$ 13,886,835	$ 15,616,327
Land for Trails	110	$ 150,000	$ 183,000	$ 20,130,000	41.39%	$ 8,332,101	$ 9,369,796
	Subtotal Land Acquisition			*$ 114,704,400*		*$ 63,369,730*	*$ 71,261,910*
Facilities:							
Baseball Field	8	$ 185,000	$ 225,700	$ 1,805,600	63.80%	$ 1,151,897	$ 1,541,931
Football/Soccer/Lacrosse	2	$ 85,000	$ 103,700	$ 207,400	89.85%	$ 186,339	$ 249,434
Basketball Court	11	$ 50,000	$ 61,000	$ 671,000	42.18%	$ 283,021	$ 378,853
Playground (Structured)	34	$ 30,000	$ 36,600	$ 1,244,400	42.89%	$ 533,698	$ 714,408
Picnic Shelter / Pavilion	34	$ 90,000	$ 109,800	$ 3,733,200	42.89%	$ 1,601,093	$ 2,143,225
Community Center	4	$ 450,000	$ 549,000	$ 2,196,000	42.53%	$ 933,971	$ 1,108,195
	Subtotal Facility Construction			*$ 9,857,600*		*$ 4,690,018*	*$ 6,136,046*
Multi-Use Trails (miles):							
Rural EOP**, Asphalt	6.02	$ 450,000	$ 549,000	$ 3,304,980	42.48%	$ 1,403,875	$ 1,879,229
Rural EOP, Gravel	35.78	$ 300,000	$ 366,000	$ 13,095,480	42.48%	$ 5,562,641	$ 7,446,159
Modified Rural EOP, Asphalt	9.13	$ 600,000	$ 732,000	$ 6,683,160	42.48%	$ 2,838,844	$ 3,800,080
Modified Rural EOP, Gravel	3.66	$ 450,000	$ 549,000	$ 2,009,340	42.48%	$ 853,519	$ 1,142,521
Urban EOP, Concrete	5.22	$ 700,000	$ 854,000	$ 4,457,880	42.48%	$ 1,893,599	$ 2,534,774
Urban Bike EOP, Concrete	17.42	$ 700,000	$ 854,000	$ 14,876,680	42.48%	$ 6,319,252	$ 8,458,959
Gravel Roads, Signage	9.56	$ 20,000	$ 24,400	$ 233,264	42.48%	$ 99,085	$ 132,635
Off Road, Asphalt	1.91	$ 450,000	$ 549,000	$ 1,048,590	42.48%	$ 445,416	$ 596,234
Off Road, Gravel	2.06	$ 300,000	$ 366,000	$ 753,960	42.48%	$ 320,264	$ 428,706
	Subtotal Trail Construction			*$ 46,463,334*		*$ 19,736,493*	*$ 26,419,298*
			Totals:	$ 171,025,334		$ 87,796,241	$ 103,817,254

* Sources: Milton Parks and Recreation Master Plan (2012) and Conservation Plan (2014) for land and facilities; Milton Transportation Engineer for per mile trail construction costs.

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

*** Construction dates vary. NPV based on CPI, BCI or CCI as appropriate, in an average construction year of 2025.

To calculate the Net Present Value of the impact fee-eligible cost estimate for non-construction improvements (the new park land), the currently estimated 2014 cost is inflated to the target year using the 10-year average CPI and then is reduced using the Net Discount Rate. For the construction of the recreation components, the NPVs are calculated by increasing the current (2014) esti-

mated construction costs using the Engineering News Record's 10-year average building cost inflation (BCI) rate for buildings (community centers) and the average construction cost inflation (CCI) rate for all other projects. All project costs are then reduced to current dollars using the Net Discount Rate.

Fire Protection

Introduction

Fire protection is provided by the City through its Fire Department. The capital value of fire protection is based upon fire stations, land, and apparatus. Emergency medical services are administered by the Fire Department, but are provided under contract to a private vendor that provides and maintains the ambulances. The Department provides space to house one of the ambulances in Fire Station 43.

Service Area

The Fire Department operates as a coordinated system, with each 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. Since the stations would continue to operate as 'backups' to the other stations, everyone in the city would benefit by the construction of a new station since it would reduce the 'backup' times the station nearest to them would be less available. For these reasons the entire city 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 program.

Table 8: Inventory of Fire Protection Facilities

Description	Existing Square Feet	Existing Number
Fire Stations		
Fire Station 41	6,581	
Fire Station 42	3,600	
Fire Station 43	11,566	
Total Square Feet	**21,747**	
*Heavy Vehicles**		
Fire Engines		4
Ladder Trucks		1
Air Trailer		1
Medical Rescue Unit		1
TLAER** Vehicle		1
Total Heavy Vehicles		**8**
*General Vehicles**		
Battalion Incident Command Vehicle		1
Support Vehicle		1
Administration Vehicles		6
Total General Vehicles		**8**
Other		
Emergency Warning Sirens		**10**

* Vehicles having a service life of 10 years or more.
** Technical Large Animal Emergency Rescue

Currently, fire protection is provided by facilities with a combined square footage of 21,747, utilizing a total of 16 vehicles (that is, vehicles having a service life of 10 years or more). Eight of the vehicles are heavy vehicles providing fire and rescue services and 8 are general support vehicles.

In addition, this year the City has installed 10 emergency warning sirens throughout the city. Since the coverage of each siren is related to geographical area (i.e., how far away can the siren be heard), it is estimated that all 10 will serve the entire city to 2035 at an expected life of 20 years.

Table 8 presents the current inventory of Fire Department facilities, vehicles and sirens.

Level of Service

The level of service for fire protection in Milton is measured in terms of the number of heavy and general vehicles, the number of square feet of fire station space and the number of emergency warning sirens, per day/night population in the service area.

Day/night population is used as a measure in that fire protection is a 24-hour service provided continuously to both residences and businesses in the service area.

Table 9 presents the calculation of the current level of service.

Table 9: Current Level of Service Calculation

Facility	Service Population*	Level of Service
Existing Square Feet	**2014 Day/Night Population**	**Square Feet per Day/Night Population**
21,747	43,831	0.4962
Existing Heavy Vehicles	**2014 Day/Night Population**	**Heavy Vehicle per Day/Night Population**
8	43,831	0.000183
Existing General Vehicles	**2014 Day/Night Population**	**General Vehicle per Day/Night Population**
8	43,831	0.000183
Existing Emergency Warning Sirens	**2035 Day/Night Population**	**Emergency Warning Sirens per Day/Night Population**
10	74,851	0.000134

* The current level of service for the emergency warning sirens is based on the total 2035 day/night population, as the existing sirens will serve the City for the next 20 years.

The level of service calculated for the Department's occupied floor area and vehicles are based on the current day/night population. This level of service will be projected forward to 2035 to determine future improvements needed to serve new growth while maintaining the current level of service enjoyed citywide.

The level of service for the sirens, however, is different. Since the current complement of sirens is expected to serve the city for the next 20 years, the level of service is calculated based on the 2035 day/night population. In essence working backwards, new growth's share of the total expense can be determined (as shown in the following Section).

Forecasts for Service Area

Future Demand

The Level of Service standards from Table 9 are multiplied by the forecasted day/night population increase to produce the expected future demand in Table 10. As discussed in the previous Section, the current level of service is used to calculate future demand for space expansion and new vehicles, while new growth's share of the 10 emergency warning sirens is based on the level of service that will exist in 2035, covering both existing and future populations. The result, for the sirens, is that 41.44% of the sirens specifically serve future growth and development

The 'day/night population increase' figures are taken from Table 2: Service Area Forecasts.

Table 10: Future Demand Calculation

Level of Service	Future Population	New Growth Demand
Square Feet per Day/Night Population	**Day/Night Population Increase (2014-35)**	**Net New Square Feet Demanded**
0.4962	31,020	15,391
Heavy Vehicle per Day/Night Population	**Day/Night Population Increase (2014-35)**	**Net New Heavy Vehicles Demanded***
0.000183	31,020	5.662
General Vehicle per Day/Night Population	**Day/Night Population Increase (2014-35)**	**Net New General Vehicles Demanded****
0.000183	31,020	5.662
Emergency Warning Sirens per Day/Night Population	**Day/Night Population Increase (2014-35)**	**Number of Sirens for New Growth*****
0.000134	31,020	4.144

* 6 **heavy vehicles** will have to be added to the inventory, one of which will only be 94.4% eligible for impact fee funding. (7 are proposed)
** 6 **general vehicles** will have to be added to the inventory, one of which will only be 94.4% eligible for impact fee funding. (7 are proposed)
*** New growth's 'share' of the 10 sirens is 4.144 (or 41.44% of the total 10).

Because only 'whole' vehicles can be purchased, 'more' new vehicles need to be added than are technically demanded by new growth. Thus, while 6 heavy vehicles and 6 general vehicles need to be acquired to cover expansion of the fleet to meet the needs of future growth and development, one of each type of vehicle will not be 100% eligible. In addition, one more vehicle in each category is proposed to be acquired over the 20-year period, which would not be impact fee eligible at this time. The additional vehicles and the portions of the 6th vehicles will, however, provide service to growth beyond 2035, if any, and can be funded through a future extension of the City's impact fee program at that time if warranted.

Table 11 and Table 12 provide an annual breakdown of the future demand for stations and equipment following the adopted level of service standards. The facility projects shown in Table 11 are based on the City's desire to increase the inventory of fire protection facilities in a balanced way; the final projects could be reconfigured, with 15,391 square feet ultimately being impact fee eligible. Of the 10 emergency warning sirens recently installed, only the portion that is eligible for impact fee consideration is shown to serve new growth.

Table 11: Future Fire Protection Facility Projects

Year	Day/Night Population Increase	Square Feet Demanded (annual)	Running Total: Square Feet Needed	Project	Total Sq Feet Proposed	Eligible Square Footage	Eligible Number
2014	0	0	0	Emergency Warning Sirens*			4.144
2015	1,848	917	917	Storage Facility	1,190	1,190	
2016	1,848	917	1,834				
2017	1,882	934	2,768	Fire Station 42 Replacement**	6,000	2,400	
2018	1,880	933	3,700				
2019	1,879	932	4,633	Training Facility (sf equivalent)	1,801	1,801	
2020	1,877	931	5,564				
2021	1,864	925	6,489				
2022	1,860	923	7,412	Westside Fire Station	6,000	6,000	
2023	1,859	922	8,334				
2024	1,857	921	9,255				
2025	1,854	920	10,175				
2026	1,863	924	11,099				
2027	1,861	923	12,023				
2028	1,860	923	12,946				
2029	1,859	922	13,868				
2030	1,857	921	14,789				
2031	1,859	922	15,712	Hwy 9 Fire Station	6,000	4,000	
2032	1,859	922	16,634				
2033	1,856	921	17,555				
2034	1,858	922	18,477				
2035	1,857	921	19,398				
	39,097	**19,398**			**20,991**	**15,391**	**4.14**

* Only the impact fee eligible sirens are shown, of the total 10 sirens installed.

** 6000 sf fire station replaces an existing 3600 square foot station. Only the increase in floor area (2400 sf) is therefore impact fee eligible.

The total demand figures in Table 12 reflect the 'overage' between the vehicles to be acquired and the 'technical' demand created by new growth.

Table 12: Future Vehicles Proposed

Year	Day/Night Population Increase	Heavy Vehicles			General Vehicles		
		New Vehicles Demanded (annual)	Running Total	New Vehicles	New Vehicles Demanded (annual)	Running Total	New Vehicles
2014	0	0.000	0.000		0.000	0.000	
2015	1,611	0.294	0.294		0.294	0.294	1
2016	1,610	0.294	0.588	1	0.294	0.588	
2017	1,616	0.295	0.883		0.295	0.883	1
2018	1,597	0.291	1.174	1	0.291	1.174	
2019	1,582	0.289	1.463		0.289	1.463	
2020	1,564	0.285	1.749		0.285	1.749	1
2021	1,547	0.282	2.031	1	0.282	2.031	
2022	1,530	0.279	2.310		0.279	2.310	
2023	1,514	0.276	2.586		0.276	2.586	1
2024	1,498	0.273	2.860	1	0.273	2.860	
2025	1,479	0.270	3.130		0.270	3.130	
2026	1,463	0.267	3.397		0.267	3.397	
2027	1,447	0.264	3.661	1	0.264	3.661	1
2028	1,430	0.261	3.922		0.261	3.922	
2029	1,411	0.258	4.180		0.258	4.180	
2030	1,396	0.255	4.434	1	0.255	4.434	
2031	1,379	0.252	4.686		0.252	4.686	1
2032	1,362	0.249	4.935		0.249	4.935	
2033	1,345	0.245	5.180	1	0.245	5.180	
2034	1,328	0.242	5.422		0.242	5.422	1
2035	1,311	0.239	5.662		0.239	5.662	
	31,020	**5.662**		**7**	**5.662**		**7**

Future Costs

The future facility floor area and the number of vehicles needed to meet the demand created by new growth and development in the future are transferred from Table 11 and Table 12 to Table 13, including the years in which the various improvements are anticipated to be needed.

Estimated improvement costs (in 2014 dollars) are based on the following:

For new facility space, prevailing construction costs averaging $210 per square foot are used, reflecting cost estimates provided by the Fire Department. Note that a portion of the fire station project shown in the year 2017 is not impact fee eligible. The project—shown in Table 13 with its full square footage figure (compare to Table 11)—is a mixture of replacement space and new space. Only the net new space serves new growth and is thus impact fee eligible.

For heavy vehicles, costs were averaged among the various vehicle categories to determine the average per vehicle cost for the fleet. The same methodology was used to determine general vehicle costs. These figures, rounded to $443,500 and $38,200 for heavy vehicles and general vehicles, respectively, were used in order to preserve flexibility in the determination of which specific vehicles to acquire in the future.

For the emergency warning sirens, the actual 2014 cost of purchase and installation is shown.

The total cost figures are then converted to 'impact fee cost (2014)' dollars based on the percentage that each improvement is impact fee eligible. Note that this affects the 'overage' portion of the vehicles that resulted from rounding up to whole numbers and the two additional vehicles that are not impact fee eligible, as well as new growth's share of the sirens and the fire station expansion.

Table 13: Project Costs to Meet Future Demand

Year	Improvements Proposed				Total Building Cost in 2014 Dollars	Total Equipment Cost in 2014 Dollars	% Impact Fee Eligible		Total Impact Fee Cost (2014)	Net Present Value
	Facilities (Sq Feet)*	Warning Sirens**	Heavy Vehicles	General Vehicles			Buildings	Equipment		
2014	-	10	-	-	$ -	$ 216,329		41.44%	$ 89,646.74	$ 89,646.74
2015	1,190	-	-	1	$ 249,900	$ 38,200	100.00%	100.00%	$ 288,100.00	$ 305,706.20
2016	-	-	1	-	$ -	$ 443,500		100.00%	$ 443,500.00	$ 453,066.46
2017	6,000	-	-	1	$ 1,260,000	$ 38,200	40.00%	100.00%	$ 542,200.00	$ 595,140.00
2018	-	-	1	-	$ -	$ 443,500		100.00%	$ 443,500.00	$ 462,839.28
2019	1,801	-	-	-	$ 378,210	$ -	100.00%		$ 378,210.00	$ 430,176.66
2020	-	-	-	1	$ -	$ 38,200		100.00%	$ 38,200.00	$ 40,725.67
2021	-	-	1	-	$ -	$ 443,500		100.00%	$ 443,500.00	$ 477,895.17
2022	6,000	-	-	-	$ 1,260,000	$ -	100.00%		$ 1,260,000.00	$ 1,501,562.50
2023	-	-	-	1	$ -	$ 38,200		100.00%	$ 38,200.00	$ 42,050.45
2024	-	-	1	-	$ -	$ 443,500		100.00%	$ 443,500.00	$ 493,440.83
2025	-	-	-	-	$ -	$ -			$ -	$ -
2026	-	-	-	-	$ -	$ -			$ -	$ -
2027	-	-	1	1	$ -	$ 481,700		100.00%	$ 481,700.00	$ 553,376.28
2028	-	-	-	-	$ -	$ -			$ -	$ -
2029	-	-	-	-	$ -	$ -			$ -	$ -
2030	-	-	1	-	$ -	$ 443,500		94.36%	$ 418,497.41	$ 496,408.38
2031	6,000	-	-	1	$ 1,260,000	$ 38,200	66.67%	94.36%	$ 876,046.45	$ 1,194,623.89
2032	-	-	-	-	$ -	$ -			$ -	$ -
2033	-	-	1	-	$ -	$ 443,500		0.00%	$ -	$ -
2034	-	-	-	1	$ -	$ 38,200		0.00%	$ -	$ -
2035	-	-	-	-	$ -	$ -			$ -	$ -
Avg Cost per Unit	$210	$21,633	$443,500	$38,200	**$7,996,339.00**				**$ 6,184,800.60**	**$ 7,136,658.50**

* Total square footage is shown for the fire station replacement project in year 2017; the amount of facility space that replaces the previous facility (3600 sf) is not impact fee eligible (only net new square footage is eligible).
** All 10 existing emergency warning sirens are shown, of which 4.144 (41.44%) are impact fee eligible.

The Net Present Value of the cost estimates for new building construction are calculated by increasing the current (2014) estimated construction costs using the Engineering News Record's 10-year average building cost inflation (BCI) rate, and then discounting this future amount back to 2014 dollars using the Net discount Rate. For non-construction improvements (all vehicles) the currently estimated costs are inflated to their target years using the 10-year average CPI and then reduced using the Net Discount Rate to produce the Net Present Value.

Law Enforcement

Introduction

The Milton Police Department provides primary law enforcement throughout the city. Through a variety of active law enforcement, community outreach and educational programs, the Police Department serves all of the population and employees within the city.

Service Area

The city is considered a single service area for the provision of primary law enforcement services because all residents and employees in the city have equal access to the benefits of the program.

Level of Service

The Police Department currently occupies leased facility space, which includes square footage for administration, operations, evidence storage, and general storage. The Police Department has outgrown this space and is slated to relocate to a larger facility. Construction of the City of Milton Law Enforcement Center is proposed in the near future, and will accommodate all City law enforcement staff and functions.

Statistics for the proposed facility are shown in Table 14.

Table 14: Planned Law Enforcement Space

Description	Proposed Square Feet
Law Enforcement Center	20,000

Table 15: Current Level of Service Calculation

Facility	Service Population	Level of Service
Proposed Square Feet	2035 Day/Night Population	Square Feet per Day/Night Population
20,000	74,851	0.2672

Table 15 presents a calculation of the level of service, based on the planned, new facility space and the future (2035) day/night population. Day/night population is used as a measure in that law enforcement services are provided to both residences and businesses in the service area. The new Law Enforcement Center is expected to serve the current and future population to 2035.

Forecasts for Service Area

Future Demand

Since the Law Enforcement Center is needed now to relieve overcrowded conditions and will serve future needs for years to come, the portion of the expansion that will specifically meet the needs of new growth and development must be determined.

Table 16: Future Demand Calculation

Level of Service	Future Population	New Growth Demand	New Growth Share of Total
Square Feet per Day/Night Population	Day/Night Population Increase (2014-35)	Net New Square Feet for New Growth	Percent Impact Fee Eligible
0.2672	31,020	8,288	41.44%

In Table 16, the facility space LOS standard from Table 15 is multiplied by the forecasted day/night population increase to produce the expected future demand in square feet. This is 41.44% of the total to be constructed.

Table 17: Law Enforcement Center Project Costs

Year	Cost Calculations			
	Total Cost in 2014 Dollars*	Impact Fee Eligible	Impact Fee Cost (2014)	Net Present Value
2014	$ -		$ -	$ -
2015	$ -		$ -	$ -
2016	$ 30,000.00	41.44%	$ 12,432.70	$ 12,825.42
2017	$ -		$ -	$ -
2018	$ -		$ -	$ -
2019	$ 1,600,000.00	41.44%	$ 663,077.31	$ 716,686.51
2020	$ 2,495,000.00	41.44%	$ 1,033,986.19	$ 1,135,096.56
2021	$ -		$ -	$ -
2022	$ -		$ -	$ -
2023	$ -		$ -	$ -
2024	$ -		$ -	$ -
2025	$ -		$ -	$ -
2026	$ -		$ -	$ -
2027	$ -		$ -	$ -
2028	$ -		$ -	$ -
2029	$ -		$ -	$ -
2030	$ -		$ -	$ -
2031	$ -		$ -	$ -
2032	$ -		$ -	$ -
2033	$ -		$ -	$ -
2034	$ -		$ -	$ -
2035	$ -		$ -	$ -
	$ 4,125,000.00		**$ 1,709,496.20**	**$ 1,864,608.49**

* Source: City of Milton FY 2015 Budget, *Capital Improvement Program 2015-2021.*

Future Costs

Future cost to meet the improvements demanded by new growth to 2035 is shown in Table 17, which also indicates the year in which system improvement project phases are proposed.

Estimated improvement costs (in 2014 dollars) are based on construction costs averaging $210 per square foot. The price per square foot reflects cost estimates provided by the City.

The total cost figures are then converted to 'impact fee cost (2014)' dollars based on the percentage that each improvement is impact fee eligible.

Note that a portion of project costs are not impact fee eligible. Of the 20,000 square foot facility, 8,288 square feet is impact fee eligible as calculated on Table 16 (which is 41.44

percent of the total). This percentage is applied to the cost of the new facility on Table 17 to determine the amount that could be collected in an impact fee program. In turn, the amounts that are impact fee eligible (in 2014 dollars) are converted to Net Present Value.

The Net Present Value of the cost estimate for the building expansion is calculated by increasing the current (2014) estimated construction costs using the Engineering News Record's 10-year average building cost inflation (BCI) rate, and then discounting this future amount back to 2014 dollars using the Net Discount Rate. For the communications equipment upgrade, the Consumer Price Index (CPI) is used. (The approaches to calculating NPV are explained in detail in the Cost Adjustments and Credits Section of this report.)

Road Improvements

Introduction

The information in this chapter is derived from road project information contained in the *Milton Capital Improvement Plan 2015—2021* (the "CIP") and project data for future years based on the City's *Comprehensive Transportation Plan*.

Service Area

The service area for these road projects is defined as the entire city, in that these road projects are recognized as providing primary access to all properties within the city as part of the citywide network of principal streets and thoroughfares. All new development within the city will be served by this citywide 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 city.

Level of Service Standards

Level of Service 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 unencumbered travel; Level of Service F is the worst rating, representing 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 Level of Service A through F as having the following characteristics during peak hours at an intersection:

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.

Level of Service

The City has set its Level of Service for road improvements at LOS "D" for peak hour intersection operations, 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.

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 2035 will represent a certain portion of all 2035 traffic, new growth would be responsible for that portions' cost of the road improvements.

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

The basis for the road impact fee would therefore be Milton's cost for the improvements divided by all traffic in 2035 (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.

Forecasts for Service Area

Projects that provide road capacity that will serve new growth are shown on Table 18. This is not a list of all City road projects in the CIP. These projects were selected for inclusion in the City'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 on Table 18 are in current dollars. These figures are calculated in Net Present Value and shown on Table 19. The Net Present Value of the cost estimates for road improvements are calculated by increasing the current (2014) estimated construction costs using the Engineering News Record's 10-year average construction cost inflation (CCI) rate, and then discounting this future amount back to 2014 dollars using the Net discount Rate. (The approaches to calculating NPV are explained in detail in the Cost Adjustments and Credits chapter of this report.)

Table 18: Road Projects and Estimated Costs – Current Dollars

Road Project Name	Estimated Total Cost	City Share*	2014	2015	2016	2017	2018	2019	2020	2021	2022	Future Year
Intersection-Hopewell/Francis/Cogburn	$ 992,103	$ 992,103	$ 992,103	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
Intersection-Deerfield Pkwy @ Morris Rd	$ 334,017	$ 85,206	85,206	-	-	-	-	-	-	-	-	
Intersection-Bethany @ Cogburn	$ 446,923	$ 446,923	446,923	-	-	-	-	-	-	-	-	
Intersection-Arnold Mill @ New Providence	$ 1,571,565	$ 313,300	313,300	-	-	-	-	-	-	-	-	
Intersection-Birmingham @ Providence	$ 4,262,903	$ 852,581	852,581									
Intersection-Hopewell @ Birmingham	$ 1,485,000	$ 1,485,000		675,000	-	-	-	-	-	-	-	
Intersection-Crabapple @ Birmingham	$ 5,853,464	$ 1,333,464	596,474	736,990	-	-	-	-	-	-	-	
Transportation Master Plan Update	$ 225,000	$ 225,000		225,000	-	-	-	-	-	-	-	
McGinnis Ferry Interchange	$ 50,000	$ 50,000		50,000	-	-	-	-	-	-	-	
Crabapple NE Connector Rd	$ 2,300,000	$ 2,300,000		50,000	-	-	1,300,000	950,000	-	-	-	
Bridge Replacement Program	$ 2,211,172	$ 2,211,172	261,172	150,000	300,000	300,000	300,000	300,000	300,000	300,000		-
Intersection-Freemanville @ Providence & B'ham	$ 2,300,000	$ 2,300,000		75,000	975,000	75,000	1,100,000	-	-	-	-	
Intersection-SR9 @ Bethany Bend	$ 225,000	$ 165,000	15,000	-	150,000	-	-	-	-	-	-	
Intersection-Webb Rd Turn Lanes	$ 185,000	$ 185,000		185,000	-	-	-	-	-	-	-	
Intersection-Bethany @ Providence	$ 1,460,000	$ 1,460,000		-	60,000	-	-	-	-	-	1,400,000	
Intersection-Hopewell @ Bethany Bnd/Bethany Way	$ 2,500,000	$ 2,500,000			-	-	-	-	-	-	-	2025
Intersection-Hopewell @ Redd Road	$ 120,000	$ 120,000		120,000								
Intersection-Hopewell @ Hamby	$ 1,175,000	$ 1,175,000		-	-	-	-	-	75,000	1,100,000	-	
Intersection-Hopewell @ Thompson	$ 1,175,000	$ 1,175,000		-	-	-	-	-	-	400,000	775,000	
Crabapple SE Connector	$ 150,000	$ 150,000		-	-	-	-	-	-	150,000	-	
Hopewell/Hamby Road Widening	$ 26,142,900	$ 5,228,580										2030
Morris Road Widening	$ 7,000,000	$ 7,000,000										2024
	$ 62,165,047	$ 31,753,329	$ 3,562,759	$ 2,266,990	$ 1,485,000	$ 375,000	$ 2,700,000	$ 1,250,000	$ 375,000	$ 1,950,000	$ 2,175,000	

* Total cost minus funds from other sources.

Table 19: Road Projects and Estimated Costs – Net Present Value

Road Project Name	2014	Planned Funding Estimates 2015	2016	2017	2018	2019	2020	2021	Future Expenditures 2022	Future Year	Estimated Total Cost NPV*
Intersection-Hopewell/Francis/Cogburn	$ 992,103	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -		$ 992,103
Intersection-Deerfield Pkwy @ Morris Rd	85,206	-	-	-	-	-	-	-	-		85,206
Intersection-Bethany @ Cogburn	446,923	-	-	-	-	-	-	-	-		446,923
Intersection-Arnold Mill @ New Providence	313,300	-	-	-	-	-	-	-	-		313,300
Intersection-Birmingham @ Providence	852,581	-	-	-	-	-	-	-	-		852,581
Intersection-Hopewell @ Birmingham	-	693,135	-	-	-	-	-	-	-		693,135
Intersection-Crabapple @ Birmingham	596,474	756,790	-	-	-	-	-	-	-		1,353,264
Transportation Master Plan Update	-	231,045	-	-	-	-	-	-	-		231,045
McGinnis Ferry Interchange	-	51,343	-	-	-	-	-	-	-		51,343
Bridge Replacement Program	-	51,343	-	-	1,445,434	1,084,657	-	-	-		2,581,435
Bridge Replacement Program	261,172	154,030	316,336	324,835	333,562	342,523	351,725	361,175	-		2,445,358
Intersection-Freemanville @ Providence & B'ham	-	77,015	1,028,092	81,209	1,223,060	-	-	-	-		2,409,376
Intersection-SR9 @ Bethany Bend	15,000	-	158,168	-	-	-	-	-	-		173,168
Intersection-Webb Rd Turn Lanes	-	189,970	-	-	-	-	-	-	-		189,970
Intersection-Bethany @ Providence	-	-	63,267	-	-	-	-	-	1,730,765		1,794,032
Intersection-Hopewell @ Bethany Bnd/Bethany Way	-	-	-	-	-	-	-	-	-	3,346,504	3,346,504
Intersection-Hopewell @ Redd Road	-	123,224	-	-	-	-	-	-	-		123,224
Intersection-Hopewell @ Hamby	-	-	-	-	-	-	87,931	1,324,308	-		1,412,239
Intersection-Hopewell @ Thompson	-	-	-	-	-	-	-	481,566	958,102		1,439,668
Crabapple SE Connector	-	-	-	-	-	-	-	180,587	-		180,587
Hopewell/Hamby Road Widening	-	-	-	-	-	-	-	-	-	7,991,049	7,991,049
Morris Road Widening	-	-	-	-	-	-	-	-	-	9,125,057	9,125,057
	$ 3,562,759	$ 2,327,895	$ 1,565,864	$ 406,043	$ 3,002,056	$ 1,427,180	$ 439,657	$ 2,347,637	$ 2,688,867	$ 20,462,610	$ 38,230,567

* Net Present Value = 2014 cost estimate inflated to target year using the ENR Construction Cost Index, reduced to 2014 NPV using the Discount Rate.

Eligible Costs

As discussed thoroughly in the Methodology—Trip Generation section of the Technical Appendix, new growth and development will represent 40.1% of the traffic on Milton's road network in 2035. 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 20: Eligible Cost Calculation

Project	Total Cost NPV	% Impact Fee Eligible*	New Growth Cost
Intersection-Hopewell/Francis/Cogburn	$ 992,103	40.1%	$ 397,918.39
Intersection-Deerfield Pkwy @ Morris Rd	85,206	40.1%	$ 34,174.91
Intersection-Bethany @ Cogburn	446,923	40.1%	$ 179,254.45
Intersection-Arnold Mill @ New Providence	313,300	40.1%	$ 125,660.17
Intersection-Birmingham @ Providence	852,581	40.1%	$ 341,958.10
Intersection-Hopewell @ Birmingham	693,135	40.1%	$ 278,006.39
Intersection-Crabapple @ Birmingham	1,353,264	40.1%	$ 542,774.90
Transportation Master Plan Update	231,045	40.1%	$ 92,668.80
McGinnis Ferry Interchange	51,343	40.1%	$ 20,593.07
Bridge Replacement Program	2,581,435	40.1%	$ 1,035,376.64
Bridge Replacement Program	2,445,358	40.1%	$ 980,798.32
Intersection-Freemanville @ Providence & B'ham	2,409,376	40.1%	$ 966,366.34
Intersection-SR9 @ Bethany Bend	173,168	40.1%	$ 69,455.24
Intersection-Webb Rd Turn Lanes	189,970	40.1%	$ 76,194.34
Intersection-Bethany @ Providence	1,794,032	40.1%	$ 719,560.72
Intersection-Hopewell @ Bethany Bnd/Bethany Way	3,346,504	40.1%	$ 1,342,234.96
Intersection-Hopewell @ Redd Road	123,224	40.1%	$ 49,423.36
Intersection-Hopewell @ Hamby	1,412,239	40.1%	$ 566,429.05
Intersection-Hopewell @ Thompson	1,439,668	40.1%	$ 577,430.53
Crabapple SE Connector	180,587	40.1%	$ 72,431.05
Hopewell/Hamby Road Widening	7,991,049	40.1%	$ 3,205,096.16
Morris Road Widening	9,125,057	40.1%	$ 3,659,930.39
	$ 38,230,567		$ 15,333,736

* See the *Methodology - Trip Generation* section in the Technical Appendix.

Exemption Policy

The Georgia Development Impact Fee Act provides that the City's "impact fee ordinance may exempt all or part of particular development projects from development impact fees if:

(1) Such projects are determined to create extraordinary economic development and employment growth or affordable housing;

(2) The public policy which supports the exemption is contained in the [city's] comprehensive plan; and

(3) The exempt development project's proportionate share of the system improvement is funded through a revenue source other than development impact fees."

The following Exemption Policy is included in this CIE and thus becomes part of the City's Comprehensive Plan:

> The City of Milton recognizes that certain office and retail trade development projects provide extraordinary benefit in support of the economic advancement of the city's citizens over and above the access to jobs, goods and services that such uses offer in general. To encourage such development projects, the Mayor and City Council may consider granting a reduction in the impact fee for such a development project upon the determination and relative to the extent that the business or project represents extraordinary economic development and employment growth of public benefit to Milton, in accordance with exemption criteria the City may adopt. It is also recognized that the cost of system improvements otherwise foregone through exemption of any impact fee must be funded through revenue sources other than impact fees.

While this policy provides that exemption criteria may be approved by the City Council as part of its Impact Fee Ordinance, the adoption of such criteria is elective on the part of the City Council and may or may not be activated through inclusion in the Ordinance.

Glossary

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

Capital improvement: an improvement with a useful life of ten 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: means 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 shall 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 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 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 administrative costs, provided that such administrative costs shall not exceed 3 percent of the total amount of the costs. 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 but such 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.'

Technical Appendix

The following pages contain:

- **Methodology – Population Forecasts**
- **Methodology – Housing and Employment Forecasts**
- **Methodology – Trip Generation**

Methodology—Population Forecasts

The purpose of this analysis is to develop population forecasts for use in establishing Level of Service calculations for the City's impact fee program. The population forecasts will subsequently influence the housing unit and employment forecasts that will also be used in the Level of Service calculations.

To accomplish this, a variety of projection approaches were prepared for consideration. Data from both the US Bureau of the Census and the Atlanta Regional Commission were considered, as well as countywide forecasts prepared by Woods & Poole Economics, Inc.

The various approaches presented in the attached Analysis are:

- 2000–2013 Census population data projected to 2040 on a "straight line" basis for each city in North Fulton County—called the Linear Trend approach.
- 2000–2013 Census population data projected to 2040 for each North Fulton city assuming that the ARC Plan 2040 North Fulton projections are incorrect by the same increment as "straight line" determined for 2016 (ARC's first "base" year)—called the Linear Shift approach.
- 2000–2013 Census population data projected to 2040 on a "curved line" basis for each city in North Fulton County as 2nd-order regression—called the Growth Trend.
- 2000–2013 Census population data projected to 2040 assuming that the ARC Plan 2040 North Fulton projections are incorrect by the same increment as determined for 2016 using the growth trend figure—called the Growth Shift.
- The percentage share of countywide population projected for each North Fulton city taken against the ARC Plan 2040 forecasts and those of Woods & Poole Economics, Inc.
- Finally, the capacity of the city to accommodate future development was considered, based on policies in place regarding residential densities and land conservation initiatives.

Note that, in order to maintain data consistency with available data sources, the period 2000-2040 is used in preparing the forecasts. However, for the impact fee program, the 20-year period 2014-2035 will be used.

Historic Trends

Since 2000, the city's population growth has far exceeded its North Fulton neighbors. During these past 13 years, (if the Census Bureau's 2000 estimate is accurate) Milton's population has more than doubled (increasing 124%) at an average annual rate of a little over 9.5%. During this same period, Alpharetta and John's Creek kept pace with North Fulton as a whole with per-

Comparative Growth Rates - North Fulton Cities

			Increase			Share of North Fulton	
	2000	2013	Number	Percent	Avg/Year	Percent	Avg/Year
Alpharetta	47,229	62,298	15,069	31.91%	2.45%	-1.09%	-0.08%
Johns Creek	61,522	82,788	21,266	34.57%	2.66%	0.91%	0.07%
Milton	16,035	35,907	19,872	123.93%	9.53%	67.92%	5.22%
Mountain Park (pt.)	518	576	58	11.20%	0.86%	-16.62%	-1.28%
Roswell	81,361	94,034	12,673	15.58%	1.20%	-13.33%	-1.03%
Total - North Fulton	206,665	275,603	68,938	33.36%	2.57%	100.00%	n/a

Year 2000 population for Milton and Johns Creek estimated by US Bureau of the Census.

centage increases in the low-mid 30s, while Roswell and Mt. Park notably lagged with 16% and 11% increases, respectively (yielding average annual growth rates around 1%).

During this same period, Milton's share of the North Fulton population grew almost 68%, from 7.76% in 2000 to 13.03% in 2013 (increasing its share at an average annual rate of a little over 5.2%). Two of its neighbors—Mt. Park and Roswell—saw their share of North Fulton notably reduced, while Alpharetta and John's Creek barely held their own.

Given the limitations on developable land resources in its neighboring North Fulton cities, continuing market pressures for residential growth, quality public services both existing and planned, and the ambience clearly established in Milton's many fine neighborhoods, growth—at least managed growth—is expected to continue throughout the projection period.

Recommendation

While there is considerable divergence among the various approaches considered in the attached Analysis, we have focused on the Build-out Capacity, the Linear Trend, and the County Share approach using the Woods & Poole countywide figures, for further consideration. The table and graph below show these three scenarios, while the Analysis that follows provides a detailed description of the many and various approaches that were prepared and the methodologies and data used

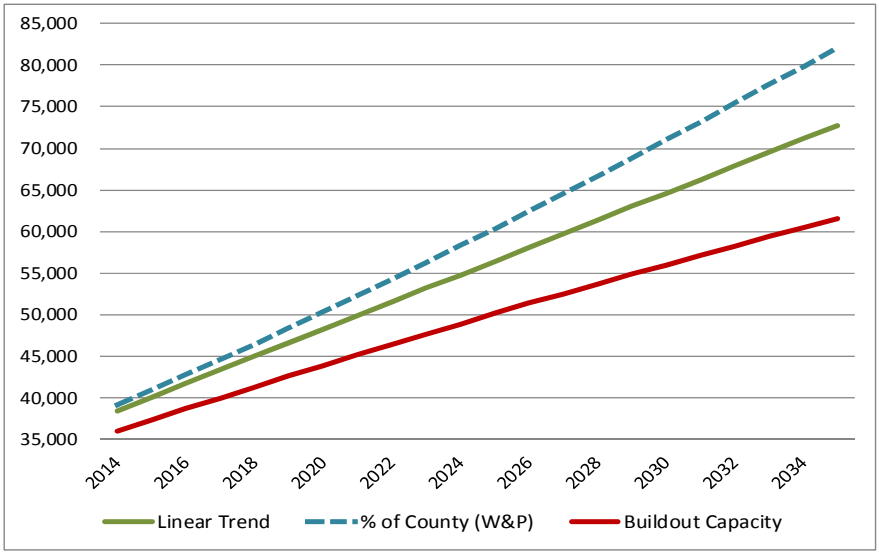
Bottom line: the **Build-out Capacity approach** is recommended as the basis for the City's Impact Fee Program because it fully recognizes the limited amount of available land for development when the City's land conservation policies are taken into consideration, as well as City policies regarding future development densities and the potential for TDRs.

Recommended Alternate Population Forecasts

City of Milton - 2014-2035

Approach	2014	2020	2025	2030	2035	2014 - 2035 Change Increase	Percent	Avg/Year
Buildout Capacity	36,060	43,941	50,167	56,047	61,580	25,520	70.8%	3.54%
Linear Trend	38,508	48,303	56,466	64,629	72,792	34,285	89.0%	4.45%
Percent of County (W&P)	39,180	50,345	60,406	71,034	82,135	42,955	109.6%	5.48%

	Buildout Capacity	Linear Trend	% of County (W&P)
2014	36,060	38,508	39,180
2015	37,385	40,140	40,966
2016	38,710	41,773	42,783
2017	40,039	43,405	44,630
2018	41,353	45,038	46,507
2019	42,654	46,671	48,413
2020	43,941	48,303	50,345
2021	45,214	49,936	52,307
2022	46,473	51,568	54,295
2023	47,718	53,201	56,307
2024	48,950	54,834	58,346
2025	50,167	56,466	60,406
2026	51,371	58,099	62,490
2027	52,561	59,732	64,597
2028	53,737	61,364	66,724
2029	54,899	62,997	68,869
2030	56,047	64,629	71,034
2031	57,181	66,262	73,219
2032	58,302	67,895	75,421
2033	59,408	69,527	77,643
2034	60,501	71,160	79,882
2035	61,580	72,792	82,135



The reasons for our recommendation are:

The Linear Trend and the County Share approaches reflect residential growth potential that could only be achieved if City policies change in the future, and therefore should be viewed more as 'market demand' potential than most likely growth outcomes. Between the two, the Linear Trend forecast is more favored because it directly relies on historic city population data and trends (as estimated by the Census Bureau) and is somewhat more defensible than tying the city's future growth to that of the whole county.

The Linear Trend and the County Share approaches are both unconstrained by land availability and would rely on rezoning approvals not contemplated in the City's Comprehensive Plan. In contrast, the Build-out Capacity approach recognizes the limited amount of available land for development when the City's land conservation policies are taken into consideration, along with the potential for transfers of development rights recommended in the Conservation Plan, as well as the City's policies regarding future development densities within areas that are currently provided with sanitary sewer service and within areas that are not, and will not, be sewered.

In our view, the Build-out Capacity forecasts are the most consistent with current planning policies incorporated into the City's Comprehensive Plan, including development policies regarding future residential densities, which are summarized in the Plan's vision statement:

> ***Milton is a distinctive community embracing small town life and heritage while preserving and enhancing our rural character.***

Further support for the Build-out Capacity approach is that it reflects the City's emerging policies for land conservation embodied in the Conservation Plan, which limits the amount of land available for development, and further being considered in the creation of a conservation subdivision alternative for residential development.

An Analysis of Population Forecasts

City of Milton

Historic Population Growth

The lowest common geographic denominator with ARC's Plan 2040 forecasts is all of Fulton County north of the Chattahoochee River (which consists of two ARC "superdistricts" – neither of which actually coincides with city limit lines). Thus, forecasts have to be made for each of the five cities that comprise North Fulton in order to compare growth in the area, overall, to ARC forecasts. Secondly, since ARC figures are not given for 2035, the forecasts have to extend to 2040 for comparability.

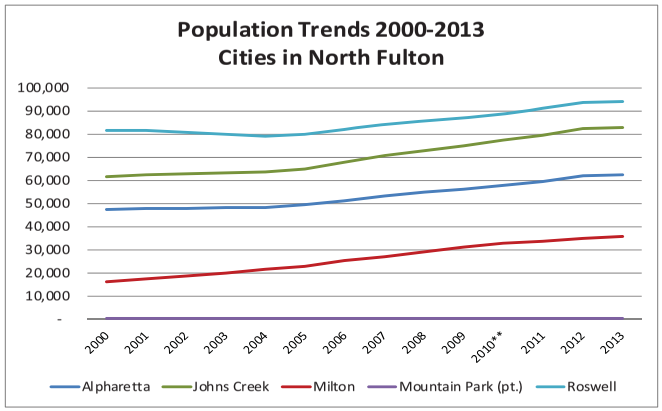
Table 1 shows the latest population estimates for each year between 2000 and 2013, for each city in North Fulton County, prepared by the Census Bureau as part of their Annual Estimates program. These particular figures are from the Intercensal Estimates for 2000-2009 (the Bureau revises its annual estimates for each decade after a Decennial Census to correct individual errors) and from the Census Bureau's Annual Estimates Program for 2010, 2011, 2012 and 2013. (When the 2013 estimates were published, 2010 was slightly revised.)

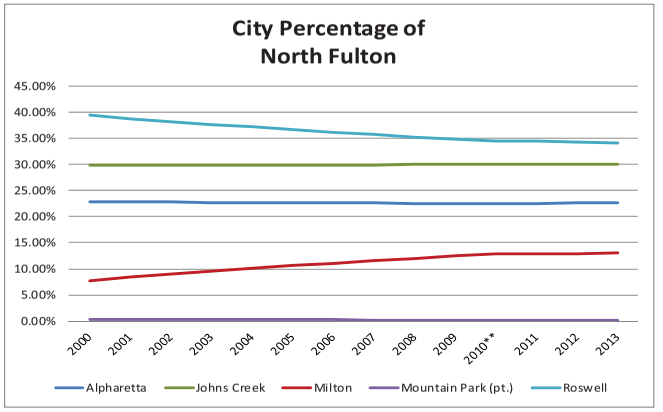
It is important to note that Census Bureau estimates are made as of July 1 of each year, so they differ slightly from the Decennial Census figures for 2000 and 2010, which were taken as of April 1.

Also shown on Table 1 is each North Fulton city's percentage of the total North Fulton population each year. Following that, the total population of Fulton County for each year is shown, followed by each city's percentage of the total Fulton County population each year. These percentages are used later in different forecasting scenarios.

Table 1: Population Estimates 2000 - 2013

	Population Estimates*													
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010**	2011	2012	2013
Alpharetta	47,229	47,895	48,011	48,096	48,279	49,339	51,390	53,239	54,830	56,286	57,825	59,407	61,965	62,298
Johns Creek	61,522	62,566	62,891	63,163	63,562	65,116	67,978	70,580	72,844	74,929	77,199	79,501	82,278	82,788
Milton	16,035	17,592	18,913	20,170	21,432	23,064	25,183	27,246	29,210	31,119	32,908	33,902	35,001	35,907
Mountain Park (pt.)	518	514	505	497	489	490	502	510	516	521	550	563	575	576
Roswell	81,361	81,411	80,563	79,739	79,075	79,826	82,172	84,183	85,751	87,089	88,839	91,161	93,649	94,034
Total - North Fulton	206,665	209,978	210,883	211,665	212,837	217,835	227,225	235,758	243,151	249,944	257,321	264,534	273,468	275,603
Percent of North Fulton														
Alpharetta	22.85%	22.81%	22.77%	22.72%	22.68%	22.65%	22.62%	22.58%	22.55%	22.52%	22.47%	22.46%	22.66%	22.60%
Johns Creek	29.77%	29.80%	29.82%	29.84%	29.86%	29.89%	29.92%	29.94%	29.96%	29.98%	30.00%	30.05%	30.09%	30.04%
Milton	7.76%	8.38%	8.97%	9.53%	10.07%	10.59%	11.08%	11.56%	12.01%	12.45%	12.79%	12.82%	12.80%	13.03%
Mountain Park (pt.)	0.25%	0.24%	0.24%	0.23%	0.23%	0.22%	0.22%	0.22%	0.21%	0.21%	0.21%	0.21%	0.21%	0.21%
Roswell	39.37%	38.77%	38.20%	37.67%	37.15%	36.65%	36.16%	35.71%	35.27%	34.84%	34.52%	34.46%	34.24%	34.12%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Fulton County Total	816,190	820,213	815,224	812,568	809,481	818,737	845,181	869,329	888,694	905,511	926,060	949,777	977,129	984,293
Percent of Fulton County														
Alpharetta	5.79%	5.84%	5.89%	5.92%	5.96%	6.03%	6.08%	6.12%	6.17%	6.22%	6.24%	6.25%	6.34%	6.33%
Johns Creek	7.54%	7.63%	7.71%	7.77%	7.85%	7.95%	8.04%	8.12%	8.20%	8.27%	8.34%	8.37%	8.42%	8.41%
Milton	1.96%	2.14%	2.32%	2.48%	2.65%	2.82%	2.98%	3.13%	3.29%	3.44%	3.55%	3.57%	3.58%	3.65%
Mountain Park (pt.)	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%
Roswell	9.97%	9.93%	9.88%	9.81%	9.77%	9.75%	9.72%	9.68%	9.65%	9.62%	9.59%	9.60%	9.58%	9.55%
Total	25.32%	25.60%	25.87%	26.05%	26.29%	26.61%	26.88%	27.12%	27.36%	27.60%	27.79%	27.85%	27.99%	28.00%





* As of July 1 of each year. 2000 and 2010 differ from Census counts, which are as of April 1.
** Revised by Census Bureau in 2013.
Sources: Census Estimates Program, 2011-2013, US Bureau of the Census.
Intercensal Estimates 2000-2010, US Bureau of the Census.

Regional Forecasts

Next, a summary of the forecasts prepared by the Atlanta Regional Commission as part of their Plan 2040 is shown on Table 2, for North Fulton and the county as a whole.

Two ARC Superdistricts comprise North Fulton County – the Roswell Superdistrict and the N Fulton Superdistrict. They are totaled to compare to the five cities collectively that make up North Fulton.

Table 2 shows the figures for ARC's benchmark years starting in 2016 and ending in 2040. (There are no figures for 2035.) Population, household and employment figures are shown. In addition, countywide data from Woods & Poole Economics are shown for comparison. Woods & Poole population forecasts are consistently lower than ARC's for the county as a whole, as are their forecasts of the number of households, as would be expected. We note that ARC used a population for the county in 2010 of 965,593 while the Census Bureau's 2010 Census count was considerably lower at 920,581.

More notably, Woods & Poole countywide employment forecasts are much higher than the ARC figures. Working with the US Bureau of Economic Analysis, Woods & Poole counts jobs and includes sole proprietors and part-time jobs. Employment data from other sources often are counting the number of persons that work, so a person working at two or more jobs would be counted as only "one". This difference will be important when the employment forecasts are prepared for the impact fee program.

Projecting Historic Trends into the Future

In order to get a "handle" on population projections for North Fulton, the population figures from the Census Bureau (Table 1) are projected to the year 2040 using two types of regression analysis (often called "trend analysis"):

- The "linear trend" regression assumes a straight line relationship between the data for each year, and projects that line forward.
- The "growth trend" regression assumes there may be some curve to the data, whether an acceleration or deceleration over time, that will continue into the future.

Both of these are mathematical exercises, but valuable for comparison purposes. The results of the two projections for 2014-2040 for North Fulton are shown on Table 3. (ARC benchmark years are shown in bold.)

Table 2: Regional Forecasts 2016-2040

Population

	2016	2020	2025	2030	2040
N Fulton Superdistrict	145,453	148,312	151,139	153,160	156,837
Roswell Superdistrict	101,857	103,479	104,925	105,943	109,129
Total - North Fulton	247,310	251,791	256,064	259,103	265,966
Fulton Co Total (ARC)	1,103,781	1,148,576	1,198,143	1,244,333	1,338,891
Woods & Poole	1,003,725	1,047,328	1,100,737	1,151,556	1,243,925
ARC minus W&P	100,056	101,248	97,406	92,777	94,966

Households

	2016	2020	2025	2030	2040
N Fulton Superdistrict	53,839	55,050	56,497	57,588	60,295
Roswell Superdistrict	38,686	39,711	40,741	41,517	43,454
Total - North Fulton	92,525	94,761	97,238	99,105	103,749
Fulton Co Total (ARC)	423,617	445,446	472,306	495,818	547,594
Woods & Poole	419,931	443,688	468,614	489,663	526,369
ARC minus W&P	3,686	1,758	3,692	6,155	21,225

Employment

	2016	2020	2025	2030	2040
N Fulton Superdistrict	110,954	117,165	123,005	130,106	144,783
Roswell Superdistrict	45,252	48,458	51,579	55,357	63,610
Total - North Fulton	156,206	165,623	174,584	185,463	208,393
Fulton Co Total (ARC)	767,619	814,009	859,777	914,302	1,032,717
Woods & Poole	1,012,790	1,066,146	1,136,194	1,210,092	1,243,925
ARC minus W&P	(245,171)	(252,137)	(276,417)	(295,790)	(211,208)

Sources: Atlanta Regional Commission, Plan 2040 Forecasts.
2014 Data Pamphlet, Fulton County, Woods & Poole Economics, Inc., Washington DC.

Table 3: Historic Trend Projections

	North Fulton		
	Census Estimates	Linear Trend	Growth Trend
2000	206,665	206,665	206,665
2001	209,978	209,978	209,978
2002	210,883	210,883	210,883
2003	211,665	211,665	211,665
2004	212,837	212,837	212,837
2005	217,835	217,835	217,835
2006	227,225	227,225	227,225
2007	235,758	235,758	235,758
2008	243,151	243,151	243,151
2009	249,944	249,944	249,944
2010	257,321	257,321	257,321
2011	264,534	264,534	264,534
2012	273,468	273,468	273,468
2013	275,603	275,603	275,603
2014		279,453	281,892
2015		285,315	288,933
2016		**291,176**	**296,150**
2017		297,038	303,548
2018		302,899	311,130
2019		308,761	318,902
2020		**314,623**	**326,867**
2021		320,484	335,032
2022		326,346	343,401
2023		332,208	351,978
2024		338,069	360,770
2025		**343,931**	**369,782**
2026		349,793	379,019
2027		355,654	388,486
2028		361,516	398,190
2029		367,378	408,136
2030		**373,239**	**418,331**
2031		379,101	428,780
2032		384,963	439,491
2033		390,824	450,469
2034		396,686	461,721
2035		402,548	473,254
2036		408,409	485,075
2037		414,271	497,192
2038		420,132	509,611
2039		425,994	522,340
2040		**431,856**	**535,388**

Adjusting the Regional Forecasts

ARC's Plan 2040 population forecasts for North Fulton are clearly inaccurate. The ARC population figure for 2016 (247,310) is far less than the projected population figures from Table 3, which range from 291,176 (linear trend) to 296,150 (growth trend), and is even less than the Census figure for 2012. According to the Census Bureau, ARCs 2016 figure for North Fulton was exceeded in 2009.

Two approaches are used to address this problem with regard to population, and are shown on Table 4.

- The first is to use the projections for the benchmark years taken from Table 3. When used on later tables, these projections are referred to as the "trend approach".
- The second is to assume that ARC's figures are incrementally off, and to adjust each benchmark year by the 2016 multiplier; in essence, this shifts ARC's line on a graph without changing its rate of increase (i.e., the "slope" of the graph line remains the same).

The North Fulton Population section of Table 4 shows the two adjustment approaches indicated above. The Linear Trend and Growth Trend results from the regression analysis of the 2000-2013 Census Bureau estimates from Table 3 are inserted under their appropriate years.

Below that on Table 4, the ratio between the linear trend figure and the ARC figure for 2016 is calculated, and applied to the ARC figures in subsequent years as a multiplier. This is referred to as the "linear shift" approach. Similarly, the growth trend-to-ARC ratio is calculated and multiplied times subsequent years to produce the "growth shift" approach.

For adjustments to the number of households, we fall back on average household size calculations. The average household size determined by dividing the ARC population by the ARC number of households for North Fulton is divided into the linear trend and growth trend populations to produce the respective household projections for each year.

Adjustments to employment utilized the ratio between the ARC employment figures and the number of households in the ARC projections. These employment-to-households ratios are then applied to the linear trend and growth trend number of households calculated above to produce new employment figures for each benchmark year for each approach. (Though employment is not directly connected to the number of households because of cross-jurisdictional commuting, the point was to adjust the ARC figures using their own data which had already taken commuting patterns into consideration.)

Table 4: Adjustments to Regional Forecasts 2016-2040

North Fulton Population

	2016	2020	2025	2030	2040
North Fulton - ARC	247,310	251,791	256,064	259,103	265,966
North Fulton - Linear Trend	291,176	314,623	343,931	373,239	431,856
North Fulton - Growth Trend	296,150	326,867	369,782	418,331	535,388
2016 Linear Trend:ARC Ratio	1.1774				
Linear Shift Population	291,176	296,452	301,483	305,061	313,141
2016 Growth Trend:ARC Ratio	1.1975				
Growth Shift Population	296,150	301,516	306,633	310,272	318,491

North Fulton Households

	2016	2020	2025	2030	2040
Number of Households - ARC	92,525	94,761	97,238	99,105	103,749
Avg Household Size - ARC	2.67	2.66	2.63	2.61	2.56
North Fulton - Linear Trend	108,936	118,408	130,605	142,761	168,460
North Fulton - Growth Trend	110,797	123,016	140,421	160,009	208,846

North Fulton Employment

	2016	2020	2025	2030	2040
Employment - ARC	156,206	165,623	174,584	185,463	208,393
Emp:Household Ratio - ARC	1.69	1.75	1.80	1.87	2.01
North Fulton - Linear Trend	183,913	206,952	234,492	267,160	338,373
North Fulton - Growth Trend	187,055	215,007	252,117	299,437	419,494

Alternate Projections

The tables on the next three pages present three alternate projections for the cities that comprise North Fulton. The first two alternates are the linear model approach (including the "trend" method and the "shift" method discussed above), and the growth model approach ("trend" and "shift"). In each case, the city percentages of North Fulton population are projected to 2040 using the linear regression and the growth regression methods, respectively. These percentages are multiplied times the North Fulton total population figures projected using the linear and growth regression methods, and the "shift" method discussed above.

The third set of tables (on page 6) present the Fulton County Share approach. To accomplish this, the city percentages of the Fulton County population totals estimated by the Census Bureau for the 2000-2013 years (from Table 1) are projected to 2040 using a linear regression. These percentages are then multiplied against the ARC Plan 2040 county totals and the Woods & Poole county totals for comparison. This approach, of course, assumes an evolving relationship between the population of the cities in North Fulton and the county as a whole.

Table 5: Population Projections, Linear Model

	Percent of North Fulton				
	Alpharetta	Johns Creek	Milton	Mtn Park (pt.)	Roswell
2000	22.79%	29.77%	8.26%	0.24%	38.94%
2001	22.77%	29.80%	8.68%	0.24%	38.52%
2002	22.74%	29.82%	9.10%	0.24%	38.10%
2003	22.72%	29.84%	9.52%	0.23%	37.69%
2004	22.70%	29.87%	9.94%	0.23%	37.27%
2005	22.67%	29.89%	10.36%	0.23%	36.85%
2006	22.65%	29.91%	10.78%	0.23%	36.43%
2007	22.63%	29.94%	11.20%	0.22%	36.02%
2008	22.60%	29.96%	11.62%	0.22%	35.60%
2009	22.58%	29.98%	12.04%	0.22%	35.18%
2010	22.56%	30.01%	12.46%	0.21%	34.76%
2011	22.53%	30.03%	12.88%	0.21%	34.35%
2012	22.51%	30.05%	13.30%	0.21%	33.93%
2013	22.49%	30.08%	13.72%	0.20%	33.51%
2014	22.46%	30.10%	14.14%	0.20%	33.09%
2015	22.44%	30.13%	14.56%	0.20%	32.68%
2016	**22.42%**	**30.15%**	**14.98%**	**0.19%**	**32.26%**
2017	22.39%	30.17%	15.40%	0.19%	31.84%
2018	22.37%	30.20%	15.82%	0.19%	31.43%
2019	22.35%	30.22%	16.24%	0.18%	31.01%
2020	**22.32%**	**30.24%**	**16.66%**	**0.18%**	**30.59%**
2021	22.30%	30.27%	17.08%	0.18%	30.17%
2022	22.28%	30.29%	17.50%	0.17%	29.76%
2023	22.26%	30.31%	17.92%	0.17%	29.34%
2024	22.23%	30.34%	18.34%	0.17%	28.92%
2025	**22.21%**	**30.36%**	**18.76%**	**0.16%**	**28.50%**
2026	22.19%	30.38%	19.18%	0.16%	28.09%
2027	22.16%	30.41%	19.60%	0.16%	27.67%
2028	22.14%	30.43%	20.02%	0.15%	27.25%
2029	22.12%	30.45%	20.44%	0.15%	26.84%
2030	**22.09%**	**30.48%**	**20.86%**	**0.15%**	**26.42%**
2031	22.07%	30.50%	21.28%	0.14%	26.00%
2032	22.05%	30.52%	21.70%	0.14%	25.58%
2033	22.02%	30.55%	22.13%	0.14%	25.17%
2034	22.00%	30.57%	22.55%	0.14%	24.75%
2035	21.98%	30.59%	22.97%	0.13%	24.33%
2036	21.95%	30.62%	23.39%	0.13%	23.91%
2037	21.93%	30.64%	23.81%	0.13%	23.50%
2038	21.91%	30.67%	24.23%	0.12%	23.08%
2039	21.88%	30.69%	24.65%	0.12%	22.66%
2040	**21.86%**	**30.71%**	**25.07%**	**0.12%**	**22.24%**

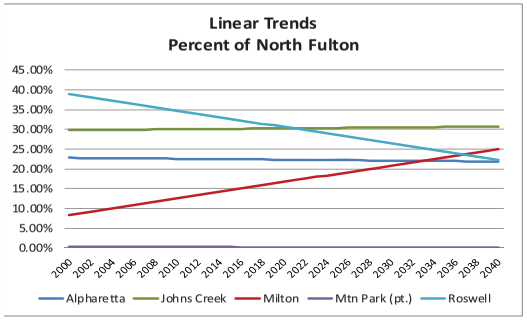


Table 5A: Linear Trend Approach

	Linear Trend North Fulton	Alpharetta	Johns Creek	Milton	Mtn Park (pt.)	Roswell
2000	206,665	45,011	58,728	15,651	487	77,514
2001	209,978	46,285	60,538	17,284	492	78,653
2002	210,883	47,559	62,348	18,916	498	79,792
2003	211,665	48,833	64,158	20,549	504	80,931
2004	212,837	50,107	65,969	22,181	509	82,070
2005	217,835	51,381	67,779	23,814	515	83,209
2006	227,225	52,655	69,589	25,447	520	84,349
2007	235,758	53,929	71,399	27,079	526	85,488
2008	243,151	55,203	73,209	28,712	532	86,627
2009	249,944	56,477	75,020	30,345	537	87,766
2010	257,321	57,751	76,830	31,977	543	88,905
2011	264,534	59,025	78,640	33,610	549	90,044
2012	273,468	60,299	80,450	35,242	554	91,183
2013	275,603	61,573	82,261	36,875	560	92,322
2014	279,453	62,847	84,071	38,508	566	93,462
2015	285,315	64,121	85,881	40,140	571	94,601
2016	**291,176**	**65,396**	**87,691**	**41,773**	**577**	**95,740**
2017	297,038	66,670	89,501	43,405	582	96,879
2018	302,899	67,944	91,312	45,038	588	98,018
2019	308,761	69,218	93,122	46,671	594	99,157
2020	**314,623**	**70,492**	**94,932**	**48,303**	**599**	**100,296**
2021	320,484	71,766	96,742	49,936	605	101,435
2022	326,346	73,040	98,553	51,568	611	102,575
2023	332,208	74,314	100,363	53,201	616	103,714
2024	338,069	75,588	102,173	54,834	622	104,853
2025	**343,931**	**76,862**	**103,983**	**56,466**	**628**	**105,992**
2026	349,793	78,136	105,793	58,099	633	107,131
2027	355,654	79,410	107,604	59,732	639	108,270
2028	361,516	80,684	109,414	61,364	644	109,409
2029	367,378	81,958	111,224	62,997	650	110,549
2030	**373,239**	**83,232**	**113,034**	**64,629**	**656**	**111,688**
2031	379,101	84,506	114,845	66,262	661	112,827
2032	384,963	85,780	116,655	67,895	667	113,966
2033	390,824	87,054	118,465	69,527	673	115,105
2034	396,686	88,328	120,275	71,160	678	116,244
2035	402,548	89,602	122,086	72,792	684	117,383
2036	408,409	90,876	123,896	74,425	690	118,522
2037	414,271	92,150	125,706	76,058	695	119,662
2038	420,132	93,425	127,516	77,690	701	120,801
2039	425,994	94,699	129,326	79,323	706	121,940
2040	**431,856**	**95,973**	**131,137**	**80,955**	**712**	**123,079**

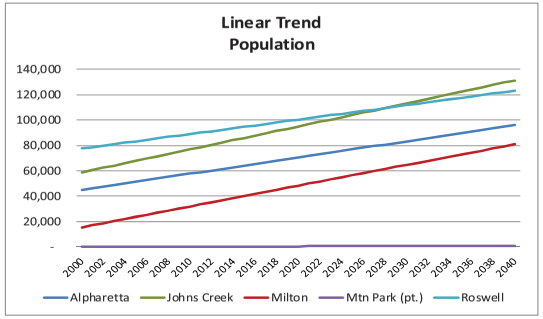


Table 5B: Linear Shift Approach

	Linear Shift North Fulton	Alpharetta	Johns Creek	Milton	Mtn Park (pt.)	Roswell
2000	206,665	45,011	58,728	15,651	487	77,514
2001	209,978	46,285	60,538	17,284	492	78,653
2002	210,883	47,559	62,348	18,916	498	79,792
2003	211,665	48,833	64,158	20,549	504	80,931
2004	212,837	50,107	65,969	22,181	509	82,070
2005	217,835	51,381	67,779	23,814	515	83,209
2006	227,225	52,655	69,589	25,447	520	84,349
2007	235,758	53,929	71,399	27,079	526	85,488
2008	243,151	55,203	73,209	28,712	532	86,627
2009	249,944	56,477	75,020	30,345	537	87,766
2010	257,321	57,751	76,830	31,977	543	88,905
2011	264,534	59,025	78,640	33,610	549	90,044
2012	273,468	60,299	80,450	35,242	554	91,183
2013	275,603	61,573	82,261	36,875	560	92,322
2014	280,794	63,079	84,524	39,704	560	92,928
2015	285,985	64,178	86,153	41,640	561	93,452
2016	**291,176**	**65,276**	**87,786**	**43,619**	**562**	**93,934**
2017	292,495	65,503	88,252	45,046	555	93,138
2018	293,814	65,730	88,719	46,484	548	92,332
2019	295,133	65,957	89,186	47,933	541	91,515
2020	**296,452**	**66,183**	**89,655**	**49,393**	**534**	**90,687**
2021	297,458	66,338	90,029	50,811	526	89,754
2022	298,464	66,493	90,403	52,237	519	88,812
2023	299,471	66,648	90,779	53,672	511	87,861
2024	300,477	66,802	91,154	55,115	503	86,903
2025	**301,483**	**66,955**	**91,530**	**56,567**	**495**	**85,936**
2026	302,199	67,044	91,819	57,971	486	84,879
2027	302,914	67,132	92,107	59,382	478	83,815
2028	303,630	67,220	92,396	60,798	469	82,746
2029	304,345	67,308	92,685	62,221	461	81,671
2030	**305,061**	**67,395**	**92,975**	**63,649**	**452**	**80,590**
2031	305,869	67,502	93,293	65,103	443	79,527
2032	306,677	67,609	93,611	66,564	435	78,457
2033	307,485	67,716	93,930	68,032	426	77,381
2034	308,293	67,822	94,250	69,506	417	76,298
2035	309,101	67,928	94,569	70,987	408	75,208
2036	309,909	68,033	94,889	72,476	400	74,111
2037	310,717	68,139	95,210	73,970	391	73,008
2038	311,525	68,243	95,530	75,472	382	71,898
2039	312,333	68,348	95,852	76,980	373	70,781
2040	**313,141**	**68,452**	**96,173**	**78,496**	**364**	**69,657**

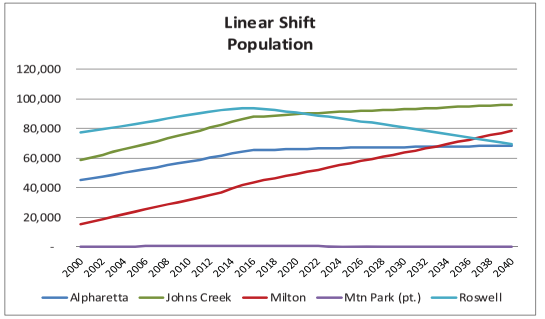


Table 6: Population Projections, Growth Model

	Percent of North Fulton				
	Alpharetta	Johns Creek	Milton	Mtn Park (pt.)	Roswell
2000	22.79%	29.77%	8.37%	0.24%	38.98%
2001	22.77%	29.80%	8.71%	0.24%	38.54%
2002	22.74%	29.82%	9.06%	0.24%	38.10%
2003	22.72%	29.84%	9.43%	0.23%	37.67%
2004	22.70%	29.87%	9.81%	0.23%	37.24%
2005	22.67%	29.89%	10.21%	0.23%	36.81%
2006	22.65%	29.91%	10.63%	0.22%	36.39%
2007	22.63%	29.94%	11.06%	0.22%	35.98%
2008	22.60%	29.96%	11.51%	0.22%	35.57%
2009	22.58%	29.98%	11.98%	0.22%	35.16%
2010	22.56%	30.01%	12.47%	0.21%	34.76%
2011	22.53%	30.03%	12.97%	0.21%	34.37%
2012	22.51%	30.05%	13.50%	0.21%	33.97%
2013	22.49%	30.08%	14.05%	0.20%	33.59%
2014	22.47%	30.10%	14.62%	0.20%	33.21%
2015	22.44%	30.13%	15.22%	0.20%	32.83%
2016	**22.42%**	**30.15%**	**15.84%**	**0.19%**	**32.45%**
2017	22.40%	30.17%	16.48%	0.19%	32.08%
2018	22.37%	30.20%	17.15%	0.19%	31.72%
2019	22.35%	30.22%	17.85%	0.19%	31.36%
2020	**22.33%**	**30.24%**	**18.58%**	**0.18%**	**31.00%**
2021	22.30%	30.27%	19.34%	0.18%	30.65%
2022	22.28%	30.29%	20.12%	0.18%	30.30%
2023	22.26%	30.32%	20.94%	0.18%	29.95%
2024	22.24%	30.34%	21.79%	0.17%	29.61%
2025	**22.21%**	**30.36%**	**22.68%**	**0.17%**	**29.27%**
2026	22.19%	30.39%	23.60%	0.17%	28.94%
2027	22.17%	30.41%	24.56%	0.17%	28.61%
2028	22.14%	30.43%	25.56%	0.16%	28.28%
2029	22.12%	30.46%	26.60%	0.16%	27.96%
2030	**22.10%**	**30.48%**	**27.69%**	**0.16%**	**27.64%**
2031	22.08%	30.51%	28.81%	0.16%	27.33%
2032	22.05%	30.53%	29.99%	0.16%	27.02%
2033	22.03%	30.55%	31.21%	0.15%	26.71%
2034	22.01%	30.58%	32.48%	0.15%	26.41%
2035	21.99%	30.60%	33.80%	0.15%	26.10%
2036	21.96%	30.63%	35.18%	0.15%	25.81%
2037	21.94%	30.65%	36.61%	0.14%	25.51%
2038	21.92%	30.67%	38.10%	0.14%	25.22%
2039	21.90%	30.70%	39.65%	0.14%	24.94%
2040	**21.87%**	**30.72%**	**41.26%**	**0.14%**	**24.65%**

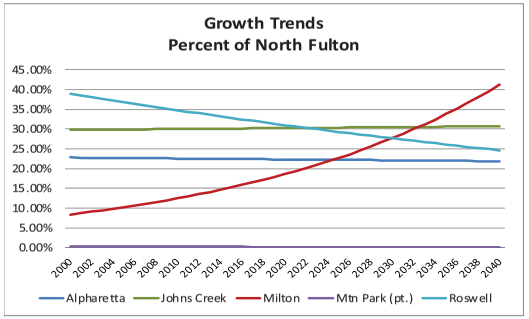


Table 6A: Growth Trend Approach

	Growth Trend					
	North Fulton	Alpharetta	Johns Creek	Milton	Mtn Park (pt.)	Roswell
2000	206,665	47,099	61,530	17,288	505	80,563
2001	209,978	47,805	62,566	18,280	506	80,922
2002	210,883	47,962	62,885	19,106	501	80,345
2003	211,665	48,091	63,168	19,958	496	79,724
2004	212,837	48,307	63,567	20,885	492	79,252
2005	217,835	49,391	65,111	22,246	496	80,189
2006	227,225	51,467	67,971	24,149	510	82,693
2007	235,758	53,345	70,579	26,076	522	84,821
2008	243,151	54,961	72,849	27,988	531	86,484
2009	249,944	56,439	74,943	29,941	538	87,888
2010	257,321	58,045	77,216	32,079	546	89,451
2011	264,534	59,611	79,443	34,321	554	90,911
2012	273,468	61,561	82,190	36,924	564	92,911
2013	275,603	61,978	82,897	38,727	561	92,569
2014	281,892	63,327	84,855	41,223	565	93,603
2015	288,933	64,842	87,043	43,973	571	94,848
2016	**296,150**	**66,394**	**89,287**	**46,906**	**577**	**96,110**
2017	303,548	67,982	91,589	50,034	584	97,388
2018	311,130	69,609	93,951	53,371	590	98,684
2019	318,902	71,275	96,373	56,931	596	99,997
2020	**326,867**	**72,980**	**98,858**	**60,728**	**602**	**101,327**
2021	335,032	74,726	101,407	64,779	609	102,675
2022	343,401	76,514	104,022	69,100	615	104,041
2023	351,978	78,345	106,704	73,709	622	105,425
2024	360,770	80,220	109,455	78,625	628	106,827
2025	**369,782**	**82,139**	**112,277**	**83,869**	**635**	**108,248**
2026	379,019	84,104	115,172	89,463	642	109,688
2027	388,486	86,117	118,142	95,430	648	111,147
2028	398,190	88,177	121,188	101,795	655	112,626
2029	408,136	90,287	124,312	108,585	662	114,124
2030	**418,331**	**92,447**	**127,518**	**115,827**	**669**	**115,642**
2031	428,780	94,659	130,805	123,553	676	117,180
2032	439,491	96,924	134,178	131,793	683	118,739
2033	450,469	99,243	137,638	140,584	691	120,319
2034	461,721	101,618	141,186	149,961	698	121,919
2035	473,254	104,050	144,827	159,963	705	123,541
2036	485,075	106,539	148,561	170,632	713	125,184
2037	497,192	109,088	152,391	182,013	720	126,850
2038	509,611	111,699	156,321	194,153	728	128,537
2039	522,340	114,371	160,351	207,103	736	130,247
2040	**535,388**	**117,108**	**164,486**	**220,916**	**743**	**131,980**

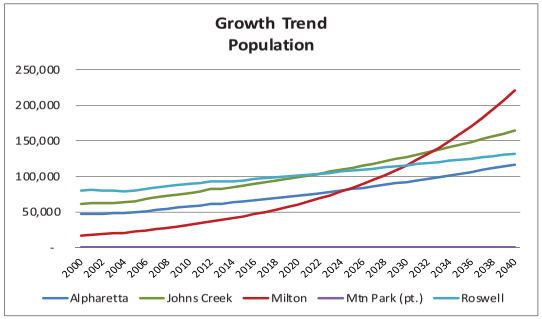


Table 6B: Growth Shift Approach

	Growth Shift					
	North Fulton	Alpharetta	Johns Creek	Milton	Mtn Park (pt.)	Roswell
2000	206,665	47,099	61,530	17,288	505	80,563
2001	209,978	47,805	62,566	18,280	506	80,922
2002	210,883	47,962	62,885	19,106	501	80,345
2003	211,665	48,091	63,168	19,958	496	79,724
2004	212,837	48,307	63,567	20,885	492	79,252
2005	217,835	49,391	65,111	22,246	496	80,189
2006	227,225	51,467	67,971	24,149	510	82,693
2007	235,758	53,345	70,579	26,076	522	84,821
2008	243,151	54,961	72,849	27,988	531	86,484
2009	249,944	56,439	74,943	29,941	538	87,888
2010	257,321	58,045	77,216	32,079	546	89,451
2011	264,534	59,611	79,443	34,321	554	90,911
2012	273,468	61,561	82,190	36,924	564	92,911
2013	275,603	61,978	82,897	38,727	561	92,569
2014	281,892	63,327	84,855	41,223	565	93,603
2015	288,933	64,842	87,043	43,973	571	94,848
2016	**296,150**	**66,394**	**89,287**	**46,906**	**577**	**96,110**
2017	297,492	66,626	89,762	49,036	572	95,445
2018	298,833	66,858	90,238	51,262	566	94,783
2019	300,175	67,089	90,714	53,588	561	94,125
2020	**301,516**	**67,320**	**91,191**	**56,018**	**556**	**93,468**
2021	302,539	67,479	91,572	58,496	550	92,717
2022	303,563	67,638	91,954	61,083	544	91,971
2023	304,586	67,796	92,337	63,784	538	91,230
2024	305,610	67,954	92,720	66,603	532	90,494
2025	**306,633**	**68,112**	**93,103**	**69,546**	**526**	**89,762**
2026	307,361	68,203	93,397	72,549	520	88,950
2027	308,089	68,295	93,692	75,681	514	88,145
2028	308,816	68,386	93,987	78,947	508	87,347
2029	309,544	68,477	94,283	82,354	502	86,555
2030	**310,272**	**68,567**	**94,579**	**85,908**	**496**	**85,771**
2031	311,094	68,678	94,904	89,641	491	85,018
2032	311,916	68,789	95,229	93,537	485	84,272
2033	312,738	68,900	95,555	97,600	479	83,531
2034	313,560	69,010	95,881	101,840	474	82,797
2035	314,382	69,120	96,208	106,263	469	82,068
2036	315,203	69,229	96,535	110,877	463	81,345
2037	316,025	69,339	96,863	115,691	458	80,628
2038	316,847	69,448	97,191	120,713	453	79,917
2039	317,669	69,556	97,520	125,953	447	79,212
2040	**318,491**	**69,665**	**97,849**	**131,418**	**442**	**78,512**

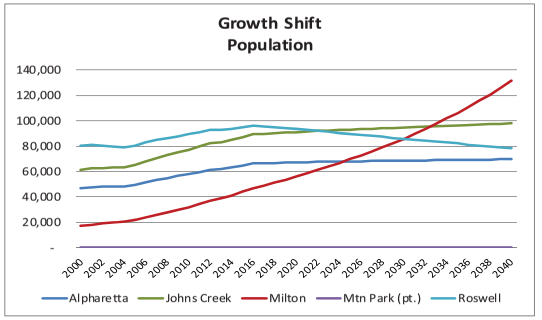


Table 7: Fulton County Share Approach

	Percentages Projected Using Linear Trend Regression				
	Alpharetta	Johns Creek	Milton	Mtn Park (pt.)	Roswell
2000	5.80%	7.58%	2.08%	0.06%	9.93%
2001	5.84%	7.65%	2.22%	0.06%	9.90%
2002	5.89%	7.72%	2.36%	0.06%	9.86%
2003	5.93%	7.79%	2.49%	0.06%	9.83%
2004	5.98%	7.86%	2.63%	0.06%	9.80%
2005	6.02%	7.94%	2.76%	0.06%	9.77%
2006	6.06%	8.01%	2.90%	0.06%	9.74%
2007	6.11%	8.08%	3.04%	0.06%	9.71%
2008	6.15%	8.15%	3.17%	0.06%	9.67%
2009	6.19%	8.23%	3.31%	0.06%	9.64%
2010	6.24%	8.30%	3.45%	0.06%	9.61%
2011	6.28%	8.37%	3.58%	0.06%	9.58%
2012	6.32%	8.44%	3.72%	0.06%	9.55%
2013	6.37%	8.51%	3.85%	0.06%	9.52%
2014	6.41%	8.59%	3.99%	0.06%	9.49%
2015	6.46%	8.66%	4.13%	0.06%	9.45%
2016	**6.50%**	**8.73%**	**4.26%**	**0.06%**	**9.42%**
2017	6.54%	8.80%	4.40%	0.06%	9.39%
2018	6.59%	8.87%	4.53%	0.06%	9.36%
2019	6.63%	8.95%	4.67%	0.06%	9.33%
2020	**6.67%**	**9.02%**	**4.81%**	**0.06%**	**9.30%**
2021	6.72%	9.09%	4.94%	0.05%	9.27%
2022	6.76%	9.16%	5.08%	0.05%	9.23%
2023	6.81%	9.24%	5.22%	0.05%	9.20%
2024	6.85%	9.31%	5.35%	0.05%	9.17%
2025	**6.89%**	**9.38%**	**5.49%**	**0.05%**	**9.14%**
2026	6.94%	9.45%	5.62%	0.05%	9.11%
2027	6.98%	9.52%	5.76%	0.05%	9.08%
2028	7.02%	9.60%	5.90%	0.05%	9.04%
2029	7.07%	9.67%	6.03%	0.05%	9.01%
2030	**7.11%**	**9.74%**	**6.17%**	**0.05%**	**8.98%**
2031	7.15%	9.81%	6.30%	0.05%	8.95%
2032	7.20%	9.89%	6.44%	0.05%	8.92%
2033	7.24%	9.96%	6.58%	0.05%	8.89%
2034	7.29%	10.03%	6.71%	0.05%	8.86%
2035	7.33%	10.10%	6.85%	0.05%	8.82%
2036	7.37%	10.17%	6.99%	0.05%	8.79%
2037	7.42%	10.25%	7.12%	0.05%	8.76%
2038	7.46%	10.32%	7.26%	0.05%	8.73%
2039	7.50%	10.39%	7.39%	0.05%	8.70%
2040	**7.55%**	**10.46%**	**7.53%**	**0.05%**	**8.67%**

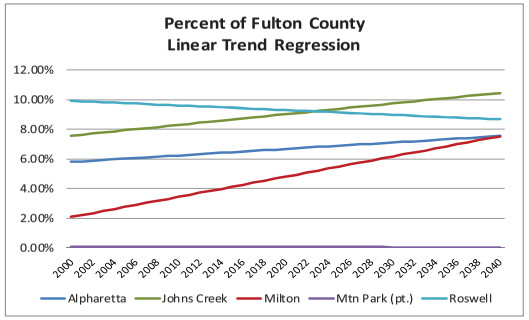


Table 7A: Percentage Share of ARC Plan 2040 Forecasts

	ARC 2040 Plan	Alpharetta	Johns Creek	Milton	Mtn Park (pt.)	Roswell
2000		47,229	61,522	16,035	518	81,361
2001		47,895	62,566	17,592	514	81,411
2002		48,011	62,891	18,913	505	80,563
2003		48,096	63,163	20,170	497	79,739
2004		48,279	63,562	21,432	489	79,075
2005		49,339	65,116	23,064	490	79,826
2006		51,390	67,978	25,183	502	82,172
2007		53,239	70,580	27,246	510	84,183
2008		54,830	72,844	29,210	516	85,751
2009		56,286	74,929	31,119	521	87,089
2010	**965,593**	57,825	77,199	32,908	550	88,839
2011	988,624	59,407	79,501	33,902	563	91,161
2012	1,011,656	61,965	82,278	35,001	575	93,649
2013	1,034,687	62,298	82,788	35,907	576	94,034
2014	1,057,718	67,824	90,818	42,204	606	100,332
2015	1,080,750	69,773	93,575	44,595	615	102,176
2016	**1,103,781**	**71,742**	**96,366**	**47,048**	**624**	**104,005**
2017	1,114,980	72,957	98,148	49,043	626	104,709
2018	1,126,179	74,182	99,947	51,069	629	105,406
2019	1,137,377	75,416	101,761	53,125	631	106,095
2020	**1,148,576**	**76,661**	**103,592**	**55,212**	**633**	**106,778**
2021	1,158,489	77,828	105,322	57,266	634	107,334
2022	1,168,403	79,005	107,066	59,347	635	107,884
2023	1,178,316	80,190	108,825	61,455	637	108,428
2024	1,188,230	81,384	110,598	63,589	638	108,966
2025	**1,198,143**	**82,586**	**112,385**	**65,751**	**639**	**109,497**
2026	1,207,381	83,750	114,123	67,902	639	109,961
2027	1,216,619	84,923	115,874	70,078	640	110,419
2028	1,225,857	86,103	117,638	72,279	640	110,871
2029	1,235,095	87,292	119,416	74,505	641	111,317
2030	**1,244,333**	**88,488**	**121,207**	**76,757**	**641**	**111,757**
2031	1,253,789	89,708	123,033	79,047	641	112,211
2032	1,263,245	90,937	124,872	81,363	642	112,659
2033	1,272,700	92,173	126,725	83,705	642	113,101
2034	1,282,156	93,418	128,592	86,072	642	113,537
2035	1,291,612	94,672	130,472	88,465	642	113,968
2036	1,301,068	95,933	132,366	90,884	642	114,392
2037	1,310,524	97,203	134,274	93,329	642	114,810
2038	1,319,979	98,481	136,195	95,800	642	115,222
2039	1,329,435	99,767	138,130	98,296	642	115,629
2040	**1,338,891**	**101,062**	**140,079**	**100,818**	**642**	**116,029**

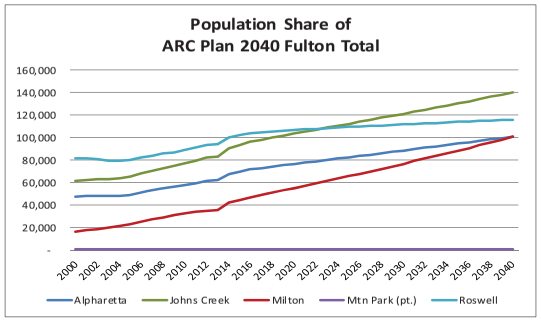


Table 7B: Percentage Share of Woods & Poole Forecasts

	Woods & Poole	Alpharetta	Johns Creek	Milton	Mtn Park (pt.)	Roswell
2000		47,229	61,522	16,035	518	81,361
2001		47,895	62,566	17,592	514	81,411
2002		48,011	62,891	18,913	505	80,563
2003		48,096	63,163	20,170	497	79,739
2004		48,279	63,562	21,432	489	79,075
2005		49,339	65,116	23,064	490	79,826
2006		51,390	67,978	25,183	502	82,172
2007		53,239	70,580	27,246	510	84,183
2008		54,830	72,844	29,210	516	85,751
2009		56,286	74,929	31,119	521	87,089
2010	925,920	57,825	77,199	32,908	550	88,839
2011	949,599	59,407	79,501	33,902	563	91,161
2012	960,237	61,965	82,278	35,001	575	93,649
2013	971,019	62,298	82,788	35,907	576	94,034
2014	981,910	62,963	84,309	39,180	562	93,141
2015	992,816	64,096	85,962	40,966	565	93,862
2016	**1,003,725**	**65,239**	**87,630**	**42,783**	**567**	**94,577**
2017	1,014,641	66,391	89,316	44,630	570	95,286
2018	1,025,565	67,554	91,017	46,507	572	95,989
2019	1,036,476	68,726	92,734	48,413	575	96,683
2020	**1,047,328**	**69,903**	**94,460**	**50,345**	**577**	**97,365**
2021	1,058,168	71,089	96,201	52,307	579	98,039
2022	1,068,934	72,279	97,951	54,295	581	98,700
2023	1,079,612	73,473	99,709	56,307	583	99,346
2024	1,090,242	74,672	101,477	58,346	585	99,980
2025	**1,100,737**	**75,872**	**103,249**	**60,406**	**587**	**100,595**
2026	1,111,158	77,076	105,028	62,490	588	101,198
2027	1,121,459	78,280	106,811	64,597	590	101,782
2028	1,131,640	79,485	108,597	66,724	591	102,349
2029	1,141,665	80,688	110,383	68,869	592	102,896
2030	**1,151,556**	**81,891**	**112,170**	**71,034**	**593**	**103,425**
2031	1,161,350	83,094	113,962	73,219	594	103,938
2032	1,170,998	84,296	115,754	75,421	595	104,432
2033	1,180,531	85,498	117,548	77,643	595	104,910
2034	1,189,938	86,699	119,343	79,882	596	105,371
2035	1,199,189	87,897	121,136	82,135	596	105,812
2036	1,208,329	89,095	122,931	84,406	596	106,238
2037	1,217,399	90,296	124,733	86,697	597	106,652
2038	1,226,370	91,497	126,537	89,006	597	107,051
2039	1,235,222	92,697	128,341	91,330	596	107,434
2040	**1,243,925**	**93,894**	**130,143**	**93,667**	**596**	**107,799**

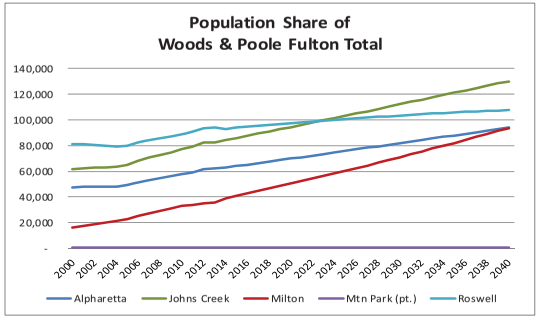
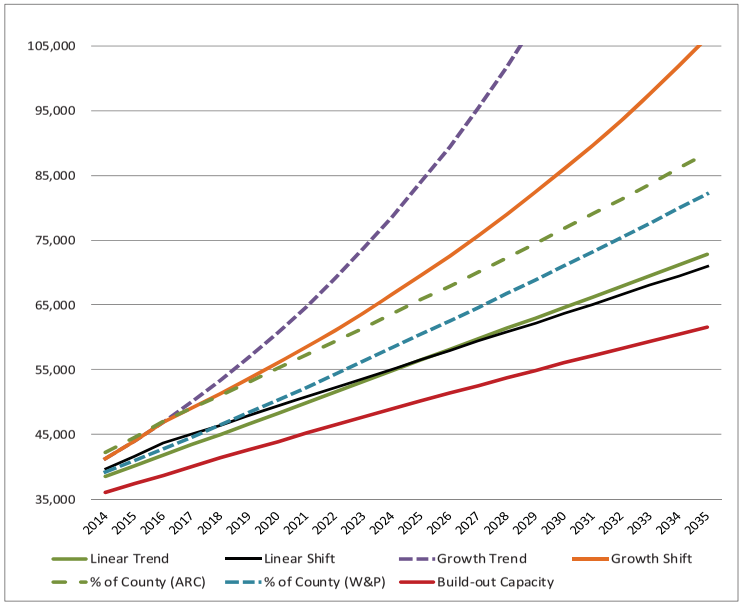


Table 8: Summary of Milton Population Projections - 2014-2035

	Linear Trend	Build-out Capacity	Linear Shift	Growth Trend	Growth Shift	% of County (ARC)	% of County (W&P)
2014	38,508	36,060	39,704	41,223	41,223	42,204	39,180
2015	40,140	37,385	41,640	43,973	43,973	44,595	40,966
2016	41,773	38,710	43,619	46,906	46,906	47,048	42,783
2017	43,405	40,039	45,046	50,034	49,036	49,043	44,630
2018	45,038	41,353	46,484	53,371	51,262	51,069	46,507
2019	46,671	42,654	47,933	56,931	53,588	53,125	48,413
2020	48,303	43,941	49,393	60,728	56,018	55,212	50,345
2021	49,936	45,214	50,811	64,779	58,496	57,266	52,307
2022	51,568	46,473	52,237	69,100	61,083	59,347	54,295
2023	53,201	47,718	53,672	73,709	63,784	61,455	56,307
2024	54,834	48,950	55,115	78,625	66,603	63,589	58,346
2025	56,466	50,167	56,567	83,869	69,546	65,751	60,406
2026	58,099	51,371	57,971	89,463	72,549	67,902	62,490
2027	59,732	52,561	59,382	95,430	75,681	70,078	64,597
2028	61,364	53,737	60,798	101,795	78,947	72,279	66,724
2029	62,997	54,899	62,221	108,585	82,354	74,505	68,869
2030	64,629	56,047	63,649	115,827	85,908	76,757	71,034
2031	66,262	57,181	65,103	123,553	89,641	79,047	73,219
2032	67,895	58,302	66,564	131,793	93,537	81,363	75,421
2033	69,527	59,408	68,032	140,584	97,600	83,705	77,643
2034	71,160	60,501	69,506	149,961	101,840	86,072	79,882
2035	72,792	61,580	70,987	159,963	106,263	88,465	82,135



Comparison of Projections

All of the various projections above for Milton are brought together on Table 8, along with a projection constrained by the amount of developable land available and the City's policies on density.

The two "growth" projections, the Growth Trend and the Growth Shift, are literally "off the charts". The graph under Table 8 is capped at 105,000 to allow the lines for the other forecasts to be clearly seen. The 105,000 cap is close to the 106,000+ projected by the Growth Shift scenario (from Table 6B), but far less than the almost 160,000 generated by the Growth Trend scenario (from Table 6A). For comparison, the Growth Trend scenario would result in a 2035 population a bit larger than today's population of Roswell and Alpharetta combined. Both of these "growth" projections reflect a past trend of ever increasing growth rates in the city, which is consistent with past trends but inconsistent with current planning policies incorporated into the City's Comprehensive Plan and summarized in its vision statement.

The "linear" projections, the Linear Trend and the Linear Shift from Tables 5A and 5B, respectively, are very close to one another, with about 1,800 people separating them in 2035 (a 2.5% difference). Although the "growth" regressions detected a slight curve in the past population data, which those regression projected forward, the "linear" regressions substitute a straight line that averages the annual increases. Examining the Population Trends graph accompanying Table 1, a straight line appears more reasonable, particularly given the City's policies that would rein in rampant development. The Linear Shift scenario has, in our view, two issues: 1) the projection line initially takes a bump up (faster growth rate) in the early years, with a slowing in the later years, and 2) it is based on the ARC regional projections that, although adjusted on Table 4, are inherently suspect. Examining, again, the Population Trends graph accompanying Table 1, the data appear to take a slight drop in the 2010-2013 period instead of a bump up.

The two "county share" approaches are interesting, particularly since the rationale suggesting that Milton will maintain its ever-increasing share of Fulton's countywide population growth based on past experience is not immediately intuitive. But, if the past is prologue to the future, it makes some sense that a correlation exists. What doesn't make sense is tying the relationship to ARC's forecast, which we suspect is as inaccurate countywide (too high) as is the North Fulton forecast (too low). Tying the city's population growth to the Woods & Poole forecast may be more realistic, given the company's reputation, highly regarded data sources and the fact that their countywide forecasts are officially recognized and accepted by the Ga Dept. of Community Affairs.

Lastly, a Build-out Capacity scenario has been added to Table 8. This approach recognizes several key factors:

- The number of developable acres in the city is limited due to its inability to grow through annexation;
- The net acreage that will be available for development is further limited by the number of acres the City Council has set as a goal for land conservation through both direct purchase of conservation easements (2,500 acres) and transfers of development rights (500 acres);
- The majority of future housing units will be located in low density, single-family residential areas. Growth areas, where sanitary sewer is already available, will support higher densities and will benefit from development rights transferred through land conservation in lower density areas. Geographically, these growth areas will not be expanded.

The Build-out scenario is therefore constrained by current development and land conservation policies and the amount of land available for future development.

Discussion of Alternate Forecasts

While there is considerable divergence among the various approaches considered in this Analysis, we have focused on the Build-out Capacity, the Linear Trend, and the County Share approach using the Woods & Poole countywide figures, for further discussion.

Compared to the 124% population increase experienced over the past 13 years, the Linear Trend approach results in a 2035 population increase of 89%, which averages out to a 4.45% increase per year (the 2000-2013 average annual increase was 9.53%). At the "high" end, the County Share approach results in a bit more than a doubling of today's population, but still at an average annual growth rate of 5.45%, which is still much lower than experienced over the past 13 years.[1] The Build-out Capacity approach results in a more modest (but more realistic) 2035 population increase of almost 71%, which averages out to a 3.54% increase per year

The Linear Trend and the County Share approaches reflect residential growth potential that could only be achieved if City policies change in the future, and therefore should be viewed more as 'market demand' potential than most likely growth outcomes. Between the two, the Linear Trend forecast is more favored because it directly relies on historic city population data and trends (as estimated by the Census Bureau) and is somewhat more defensible than tying the city's future growth to that of the whole county.

The Linear Trend and the County Share approaches are both unconstrained by land availability and would rely on rezoning approvals not contemplated in the City's Comprehensive Plan. In contrast, the Build-out Capacity approach recognizes the limited amount of available land for development when the City's land conservation policies are taken into consideration, along with the potential for transfers of development rights recommended in the Conservation Plan, as well as the City's policies regarding future development densities within areas that are currently provided with sanitary sewer service and within areas that are not, and will not, be sewered.

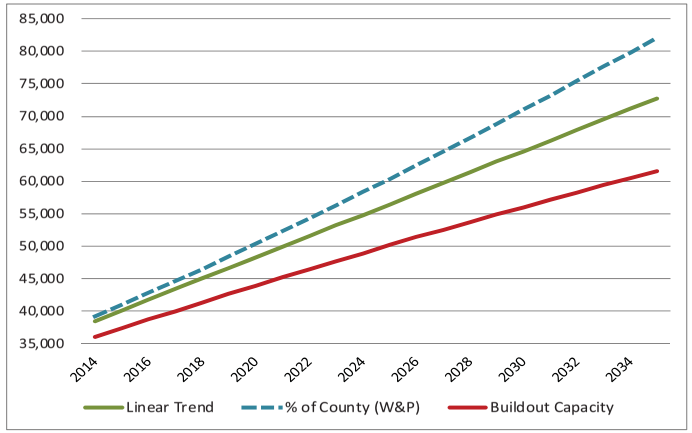
The table and graph to the right show the three scenarios given further consideration (and is also discussed at the beginning of this Appendix).

Recommended Alternate Population Forecasts

City of Milton - 2014-2035

	Buildout Capacity	Linear Trend	% of County (W&P)
2014	36,060	38,508	39,180
2015	37,385	40,140	40,966
2016	38,710	41,773	42,783
2017	40,039	43,405	44,630
2018	41,353	45,038	46,507
2019	42,654	46,671	48,413
2020	43,941	48,303	50,345
2021	45,214	49,936	52,307
2022	46,473	51,568	54,295
2023	47,718	53,201	56,307
2024	48,950	54,834	58,346
2025	50,167	56,466	60,406
2026	51,371	58,099	62,490
2027	52,561	59,732	64,597
2028	53,737	61,364	66,724
2029	54,899	62,997	68,869
2030	56,047	64,629	71,034
2031	57,181	66,262	73,219
2032	58,302	67,895	75,421
2033	59,408	69,527	77,643
2034	60,501	71,160	79,882
2035	61,580	72,792	82,135

Approach	2014	2020	2025	2030	2035	2014 - 2035 Change Increase	Percent	Avg/Year
Buildout Capacity	36,060	43,941	50,167	56,047	61,580	25,520	70.8%	3.54%
Linear Trend	38,508	48,303	56,466	64,629	72,792	34,285	89.0%	4.45%
Percent of County (W&P)	39,180	50,345	60,406	71,034	82,135	42,955	109.6%	5.48%



[1] Calculations of growth since 2000 begin with an estimate by the Census Bureau of the population that occupied the area that subsequently became incorporated as the City of Milton. That figure, shown on Table 1 as 16,035, has been question by Planning officials as being inaccurate and probably too low.

Methodology—Housing and Employment Forecasts

Based on the "Build-out Capacity" population forecasts presented in the Population Methodology, this paper estimates the future number of households, housing units and employment in the city. Note that parks & recreation LOS standards will be based on the number of housing units, while fire and police will combine population and employment into a "day-night" population to reflect their 24-hour service demand.

Housing Units

The table on the next page shows how the housing projections were figured. The approach is to calculate the number of households (which equates to the number of occupied housing units) and then to expand that to the total number of housing units by adding in vacant units.

Our assumption is that the average household size in Milton will "track" the average household size that was reported in the 2010 Census. This approach reflects Milton's much higher proportion of single-family households and families with children compared to future, limited, multi-family development. The Milton 2010 Census average household size is divided into the projected Milton population each year to arrive at the household forecasts for the project period—2014-2035.

Housing Units are calculated using the city's 2010 housing occupancy rate of 94.6%. That assumes that the city's occupancy rates in the future will be fairly consistent with the rate in 2010, and will remain relatively stable. For comparison, although no Census data is available for housing occupancy in Milton prior to its incorporation, neighboring Alpharetta's occupancy rate in 2010 approximated Milton's at 94.4%, and in 2000 it was 94.8%, reflecting a reliably stable level of housing occupancy over the decade that is indicative of Milton as well.

To arrive at the housing unit estimates each year, the number of households is divided by the occupancy rate.

Housing Unit Forecasts: 2014-2035

	Population	Avg HH Size - Milton	Households	Occupancy Rate	Total Housing Units
2010	32,661	2.80	11,659	94.6%	12,328
2014	36,060	2.80	12,872	94.6%	13,611
2015	37,385	2.80	13,345	94.6%	14,111
2016	38,710	2.80	13,818	94.6%	14,611
2017	40,039	2.80	14,293	94.6%	15,113
2018	41,353	2.80	14,762	94.6%	15,609
2019	42,654	2.80	15,226	94.6%	16,100
2020	43,941	2.80	15,686	94.6%	16,586
2021	45,214	2.80	16,140	94.6%	17,066
2022	46,473	2.80	16,589	94.6%	17,541
2023	47,718	2.80	17,034	94.6%	18,011
2024	48,950	2.80	17,474	94.6%	18,477
2025	50,167	2.80	17,908	94.6%	18,936
2026	51,371	2.80	18,338	94.6%	19,390
2027	52,561	2.80	18,763	94.6%	19,840
2028	53,737	2.80	19,183	94.6%	20,284
2029	54,899	2.80	19,597	94.6%	20,721
2030	56,047	2.80	20,007	94.6%	21,155
2031	57,181	2.80	20,412	94.6%	21,583
2032	58,302	2.80	20,812	94.6%	22,006
2033	59,408	2.80	21,207	94.6%	22,424
2034	60,501	2.80	21,597	94.6%	22,836
2035	61,580	2.80	21,982	94.6%	23,243

Source: 2010 City data - 2010 Decennial Census, US Bureau of the Census.
2014-2035 City Population - Build-out Capacity forecast, ROSS+associates.

Employment

Employment projections begin with ARC's Plan 2040 forecasts which are, of course, only taken down to the Superdistrict level. The following table shows the data from the 2010 Census and for the ARC benchmark years.

Note that 2010 is the first and only year that the Census Bureau has published actual employment figures at the city level. Since these are derived from the "employed persons" data and commuting patterns, second jobs are not counted nor are some sole proprietors, so the real figure would be a bit higher.

Note also that the following table goes out to 2040 because comparisons to the ARC projections are required, and ARC didn't do a 2035 estimate. Forecasts in the final Methodology Report will only go out to 2035.

Employment Forecasts: Benchmark Years

	2010*	2016	2020	2025	2030	2040	2010-2040 % Increase
Alpharetta	73,828						
John's Creek	27,947						
Milton	7,039						
N. Fulton Superdistrict**	108,814	110,954	117,165	123,005	130,106	144,783	33.1%
Roswell Superdistrict**	45,405	45,252	48,458	51,579	55,357	63,610	40.1%
North Fulton County	154,219	156,206	165,623	174,584	185,463	208,393	35.1%
Constant % of North Fulton	4.56%						
Milton Employment	7,039	7,130	7,560	7,969	8,465	9,512	35.1%
Milton Households	11,659	13,818	15,686	17,908	20,007	21,982	
Emp:Household Ratio	0.60						
Milton Employment	7,039	8,342	9,470	10,812	12,079	13,271	88.5%

* Source: 2010 Decennial Census, US Bureau of the Census.
** Source: 2016-2040, Atlanta Regional Commission, Plan 2040 Forecasts.

Two ratios are derived from the 2010 Census data: the percentage of Milton employment in North Fulton County, and the employment-to-households ratio.

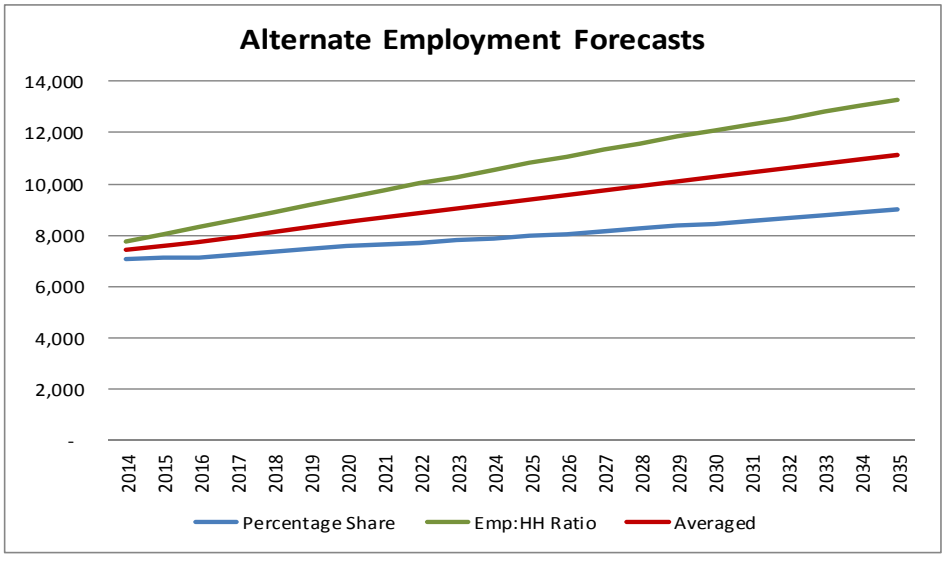
- Milton's employment ratio to North Fulton County is held constant and applied to the ARC forecasts for North Fulton in each of ARC's benchmark years.
- Alternately, Milton's 2010 employment-to-household ratio is applied to the projected number of households in Milton (taken from the preceding table).

The Alternate Employment Forecasts table, below, takes the projections for the benchmark years and expands then to cover all years from 2014 to 2035. For the "percentage share" approach, the intervening years between the benchmarks are interpolated using a straight line methodology.

For the Employment-to-Households Ratio approach, the annual household figures are taken from the first table in this report, above. For the last column on the table, the two approaches are averaged to arrive at a "medium" forecast.

Alternate Employment Forecasts: 2014-2035

	Percentage Share		Emp:HH Ratio		
	North Fulton County	Milton Employment	Milton Households	Milton Employment	Averaged
		At: 4.56%		At: 0.60	
2010	**154,219**	7,039	11,659	7,039	
2014	155,544	7,099	12,872	7,771	7,435
2015	155,875	7,115	13,345	8,057	7,586
2016	**156,206**	7,130	13,818	8,342	7,736
2017	158,560	7,237	14,293	8,629	7,933
2018	160,915	7,345	14,762	8,912	8,129
2019	163,269	7,452	15,226	9,193	8,323
2020	**165,623**	7,560	15,686	9,470	8,515
2021	167,415	7,641	16,140	9,744	8,693
2022	169,207	7,723	16,589	10,015	8,869
2023	171,000	7,805	17,034	10,284	9,045
2024	172,792	7,887	17,474	10,550	9,219
2025	**174,584**	7,969	17,908	10,812	9,391
2026	176,760	8,068	18,338	11,071	9,570
2027	178,936	8,167	18,763	11,328	9,748
2028	181,111	8,266	19,183	11,582	9,924
2029	183,287	8,366	19,597	11,831	10,099
2030	**185,463**	8,465	20,007	12,079	10,272
2031	187,756	8,570	20,412	12,324	10,447
2032	190,049	8,674	20,812	12,565	10,620
2033	192,342	8,779	21,207	12,804	10,792
2034	194,635	8,884	21,597	13,039	10,962
2035	196,928	8,988	21,982	13,271	11,130



Comparing projected employment growth to population growth, the 2014-2035 period anticipates a 70.8% increase in the number of residents (using the Build-out Capacity forecasts). The three alternate employment forecasts laid out on the table above result in the following increases over the 2014-2035 20-year projection period:

Alternate Forecast Results

	Employment Increase		
Approach	Number of New Employees	Percent Increase over 2014	Avg Annual Growth Rate
Percentage Share	1,889	26.6%	1.3%
Emp:HH Ratio	5,500	70.8%	3.5%
Averaged	3,695	49.7%	2.5%

The percentage share approach understates the city's potential for two reasons: ARC anticipates a 40% employment increase by 2040 over 2010 in the Roswell Superdistrict, but only a 33% increase in the N Fulton Superdistrict (which also includes John's Creek and Alpharetta). Given Milton's relatively superior availability of developable land in the Superdistrict and direct access from Ga 400, a higher percentage would be appropriate. Secondly, as noted in the Population Methodology Appendix, ARC's forecasts are suspected of being inaccurate both countywide (too high) and for the North Fulton County area (too low) when compared to actual figures reported by the Census Bureau.

While the Averaged approach would seem intuitively to be the best choice (threading between the high and the low estimates), the Employment-to-Households Ratio approach appears to be the more realistic for two reasons: it assumes the current ratio will remain in balance with the pace of residential development (i.e., managed growth), and the City's proposed Transfer of Development Rights (TDR) program will allow the use of residential unit transfers to be redeemed as nonresidential floor area instead. This latter factor is important considering the relative constraints on developable land and allowed densities, and on the emphasis being placed by the City on land conservation activities (including the donation of conservation easements that would generate TDRs).

Further, a shift toward more local employment would also support the higher results of the Employment-to-Households Ratio approach. In 2010, 80% of all Milton residents that held jobs commuted out of the city to work, while almost 60% of all employees working in the city commuted in from elsewhere. Thus, in 2010, for each 100 workers in the city, 60 were not city residents. Future job growth would be expected to shift this ratio more toward local employment.

Under continued concerns regarding nonresidential development in the city and to maintain a balanced development pattern, **the Employment-to-Households projection is recommended** for the impact fee calculations.

Methodology—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 Milton's roads will be generated by new growth, over and above the traffic generated by the city's residents and businesses today. This Methodology 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 a table summarizing the technical portions of this Methodology is included.

Level of Service

The City 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.

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 2035 will represent a certain portion of all 2035 traffic, new growth would be responsible for that portions' cost of the road improvements.

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

The basis for the road impact fee would therefore be Milton's cost for the improvements divided by all traffic in 2035 (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.

Approach

This Methodology proceeds along the following lines:

- Total traffic currently generated by Milton residents and businesses on the road system within the city is calculated from trip generation and commuting data for 2010, and extended to 2014.
- Future Milton-generated traffic from new growth in the city is calculated from housing unit and employment forecasts to 2035.
- The portion of total 2035 traffic that is generated by new housing units and employment in the city establishes the maximum percentage of Milton's cost of the future road improvements that can be included in an impact fee.

- Lastly, 'primary' trip ends are calculated as the appropriate connection to actual impact on the city's road network by its existing and future land uses.

Summary Tables

The first table below shows how the portion of total 2035 traffic generated by new growth (i.e., total trip ends) is calculated.

Average Daily Trip Ends Generated by New Growth

	2014	2035	Increase	Percent New Growth Trip Ends
Residential Trip Ends	122,642	200,405	77,763	
Commercial Trip Ends	188,762	322,349	133,587	
Industrial+Utility Trip Ends	3,195	5,461	2,266	
Less: Internal Commutes*	(6,417)	(10,958)	(4,541)	
	308,182	517,257	209,075	40.4%

* Residents who work in Milton. These trips to and from work are included in the residential trips, above.

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
		2014	2035	Increase	
Residential Trip Ends	81%	98,913	161,631	62,717	
Commercial Trip Ends	51%	96,047	164,019	67,972	
Industrial+Utility Trip Ends	92%	2,939	5,024	2,085	
Less: Internal Commutes	100%	(6,417)	(10,958)	(4,541)	
		191,482	319,716	128,233	40.1%

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

Overall, new residents and businesses located within Milton in 2035 will generate 40.1% of all Milton traffic on its roads by 2035. Thus, new growth's 'fair share' of the cost to the City to provide road improvements to serve current and future traffic cannot exceed 40.1%.

Pass-by and Diverted Trips

The impact of new growth and development on Milton's road network is the increased number of vehicles 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 ones home to ones 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, which 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 trip 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 streets 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 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. 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.

The percentage of 2035 traffic that will be generated by new growth and the increase in primary trip ends from the second table will play an important role in calculating the impact fee eligible amount of road project costs and 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: 2014 and 2035

	2010	Additional Units*	2014	Increase 2014-2035**	Total in 2035
Single-Family Units	9,912	1,283	11,195	5,933	17,128
Multi-Family Units	2,416	-	2,416	3,200	5,616
Total	12,328	1,283	13,611	9,133	22,744

* Based on building permits issued 2010-2013, adjusted to 2014 total.
** From Build-out Capacity analysis of land availability and City policies on development density and land conservation initiatives.

The 2010 breakdown of housing units by type on the table above are taken from the 2010 Census. These numbers are extended to the number of housing units projected in 2014 (in a previous paper), combining the number of housing units authorized by building permits between 2010 and 2013 with adjustments to reach the 2014 projected total. The 9,133 new housing units forecast for the 2014-2035 period is taken from the Build-out Capacity population scenario.

The next table, below, calculates the amount of traffic that is generated by the city's housing stock today, and the amount that will be generated in 2035.

Residential Trip Generation: 2014-2035 New Growth Increase

	ADT* Trip Ends	2014 Units	2014 ADT Trip Ends	2035 Units	2035 ADT Trip Ends	Increase 2014-2035	Percent New Growth Trip Ends
Single-Family Units	9.52	11,195	106,576	17,128	163,059	56,483	
Multi-Family Units	6.65	2,416	16,066	5,616	37,346	21,280	
Total		13,611	122,642	22,744	200,405	77,763	38.8%

* 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 2014 to 2035, the future increase in trips can be calculated, which will represent 38.8% of all residential trip ends generated in the city.

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

Nonresidential Trip Generation

Calculating traffic generated by businesses located in Milton is more problematical than residential trips because there is no breakdown of types of businesses in the city 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 employee (to/from work, lunch, etc.) but also customers and others that are attracted to the use or serve it in some way.

The following table shows the 'trips per employee' for those uses for which impact fees are commonly collected and for which the data is available.

ITE Trips-per-Employee Data

	ITE CODE	LAND USE	ADT Trip Ends per Employee	Average by Category	Average All Commercial
Port and Terminal (000-099)	30	Intermodal Truck Terminal	6.99		
Industrial/Agricultural (100-199)	110	General Light Industrial	3.02		
	120	General Heavy Industrial	0.82		
	140	Manufacturing	2.13	10.21	
	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		
	443	Movie Theater	53.12		
	460	Arena	10.00		
	480	Amusement Park	8.33	34.79	
	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		
	530	Private High School	19.74		
	560	Church/Place of Worship	26.24	29.58	
	565	Day Care Center	28.13		
	566	Cemetery	58.09		
Medical (600-699)	610	Hospital	4.50		
	620	Nursing Home	3.26	5.26	
	630	Clinic	8.01		
Office (700-799)	710	General Office Building	3.32		25.31
	714	Corporate Headquarters Building	2.33		
	715	Single-Tenant Office Building	3.70	4.18	
	720	Medical-Dental Office Building	8.91		
	760	Research and Development Center	2.77		
	770	Business Park	4.04		
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	32.86	
	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		
		OVERALL AVERAGE	23.01		

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

Overall, the average trip generation rate of all uses listed is 23.01 trips per employee. The table also shows average rates by category (truck terminals are included with 'industrial' and drive-in banks are included with 'retail' uses). 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.

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

Nonresidential Trip Generation: 2010 Census

	Tax Base		Percent of Total	2010 Employees	Avgerage ADT	Total Nonres Trip Ends
Commercial	$ 824,023,125	$ 824,023,125	96.0%	6,755	25.31	170,969
Industrial	$ 2,778,300					
Utility	$ 31,821,750	$ 34,600,050	4.0%	284	10.21	2,899
Total Nonresidential	$ 858,623,175	$ 858,623,175		7,039		173,868
		Less: Internal Commutes*		2,906	times 2 =	5,812
					Net Nonres Trips	**168,056**
		Alternate Using Overall Average				
				7,039	23.01	161,980
		Internal Commutes*		2,906	times 2 =	5,812
					Alternate Net Nonres Trips	**156,168**

* Residents who work in Milton. Trips are included in residential trip generation rate.

Tax base valuations give us some clue as to the breakdown. When the City's 'industrial' and 'utility' tax valuations are combined, the figures suggest that 96% of all uses are 'commercial' in nature, while the remaining 4% is industrial. These percentages, applied to total employment in Milton, give us the number of employees in 2010 in each category.

The upper portion of the table calculates the total number of trips using the average rates for commercial and industrial from the previous table. From the total of all nonresidential trips is deducted the number of trips to/from work generated by city residents, since these trips have already been calculated as part of the residential trip generation rates.

For comparison, the lower part of the table calculates all trips using the overall average for all uses, regardless of type.

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

Nonresidential Trip Generation: 2014-2035 New Growth Increase

	2014 Employees	2014 Trip Ends	2035 Employees	2035 Trip Ends	2014-2035 Increase	Percent New Growth Trip Ends
Commercial	7,458	188,762	12,736	322,349	133,587	
Industrial+Utility	313	3,195	535	5,461	2,266	
Total	7,771	191,957	13,271	327,810	135,853	
Internal Commutes at	3.34%	6,417		10,958	4,541	
Net Nonres Trip Ends		185,540		316,852	131,312	41.4%

The table shows the number of trip ends currently generated by Milton businesses based on 2014 employment. The trip ends by use are distributed using the same percentages calculated on the previous table. The same calculations are made for the year 2035 based on projected employment in the city, and the difference between 2014 and 2035 represents trip ends generated by future growth and development. This totals 41.4% of all nonresidential 2035 trip ends.

The results of the residential and nonresidential trip generation analyses are combined on the Summary table at the beginning of this Methodology for an overall calculation of new growth's share of future traffic generated by Milton residents and businesses. From these figures, pass-by and diverted trip ends will be 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".