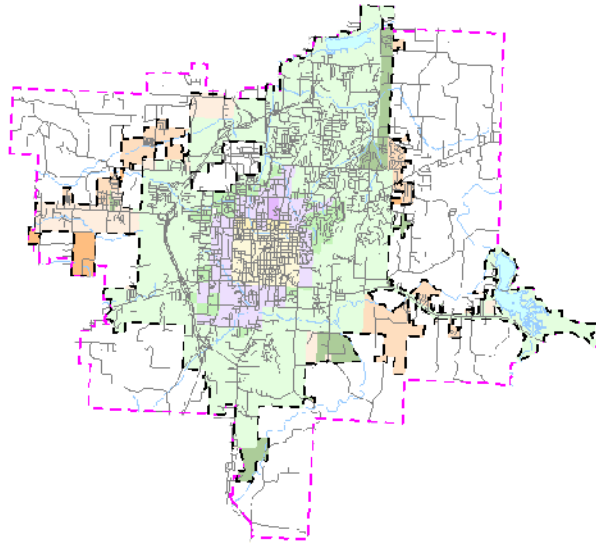


REVISED IMPACT FEE STUDY: WASTEWATER AND WATER

**Including an Update of the Parkland Dedication and
Fee-in-Lieu Requirements**

FAYETTEVILLE, ARKANSAS



prepared by

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EXECUTIVE SUMMARY

This study calculates the maximum impact fees that could be adopted by the City of Fayetteville to help fund growth-related infrastructure improvements for water and wastewater facilities. It also updates the City's existing park land dedication and fee-in-lieu requirements.

An impact fee is a one-time charge on new development, typically collected at time of building permit issuance or connection to the water or wastewater system. Impact fees are designed to ensure that new development contributes a fair share of the cost of the capital improvements needed to serve growth.

The study was prompted by the need to find alternative sources of revenue to fund capital improvements necessitated by the community's rapid growth. The City's population has been growing at a rate of more than 3.2 percent annually, over twice as fast as the state as a whole. The City has traditionally funded capital improvements primarily on a pay-as-you-go basis, largely with sales tax and utility fee revenues.

The purpose of this project is to assist the City of Fayetteville in developing a system of development impact fees to ensure that new development pays a fair share of the cost of infrastructure needed to serve it. The project has been divided into two phases. The first phase, termed a "feasibility study," reviewed the legal framework, local data and potential fees, and determined in conjunction with local officials the type of impact fee system that should be developed in the second phase.¹ It also included a survey of impact fees and development exactions in comparable communities, which was provided as a separate document.²

Phase Two is the impact fee study. The facilities selected at the conclusion of Phase One to be included in the impact fee study include water transmission, distribution and storage facilities; wastewater collection and treatment plant facilities; arterial and collector roads; and parks. The park component is limited to updating the City's park land dedication requirements, as well as updating the fees paid in lieu of dedication.

Phase Two was originally broken into two parts that were addressed in two separate reports. An initial draft of Part One, covering water and wastewater impact fees, was prepared in October 2001 and was finalized in March 2002. An initial draft of Part Two, which covered road impact fees and park land dedication and fees in-lieu, was prepared in February 2002. A subsequent draft combined Parts One and Two.³ This draft deletes the road section, which the City has decided not to pursue, and updates the water and wastewater fees and the park fee-in-lieu calculations based on 2000 U.S. Census data on average household size.

The potential impact fees for the two facility types (water and wastewater), along with the updated park fees in-lieu of dedication, are presented in Table 1 below by generalized land use categories. The two

¹Duncan Associates, *Fayetteville Impact Fee Study: Policy Directions Memorandum*, April 2001.

²Cooper Consulting Company, *Development Fee Survey for Fayetteville, Arkansas*, April 2001.

³Duncan Associates, *Final Impact Fee Study: Water, Wastewater and Roads, Including an Update of the Parkland Dedication and Fee-in-Lieu Requirements*, April 2002.

impact fees could vary by unit size for new single-family construction, based on the lower demands for services associated with smaller units.

Table 1
IMPACT FEE SUMMARY

Land Use (Dwelling Size)	Unit	Water	Waste-water	Parks	Total
Single-Family (up to 1,300 sq. ft.)	Dwelling	\$253	\$685	\$555	\$1,493
Single-Family (1,301 to 1,700 sq. ft.)	Dwelling	\$320	\$868	\$555	\$1,743
Single-Family (1,701 to 2,300 sq. ft.)	Dwelling	\$363	\$985	\$555	\$1,903
Single-Family (more than 2,300 sq. ft.)	Dwelling	\$407	\$1,102	\$555	\$2,064
Single-Family (average)	Dwelling	\$308	\$835	\$555	\$1,698
Multi-Family	Dwelling	\$219	\$593	\$393	\$1,205
Mobile Home	Dwelling	\$308	\$835	\$555	\$1,698
Retail*	1,000 sq. ft.	\$49	\$134	\$0	\$183
Office*	1,000 sq. ft.	\$49	\$134	\$0	\$183
Industrial*	1,000 sq. ft.	\$49	\$134	\$0	\$183

* nonresidential water and wastewater fees assume 3" meter for a 100,000 sq. ft. building

Source: Water fees from Table 33; wastewater fees from Table 42; park fees-in-lieu from Table 48.

The calculated maximum fees per new single-family dwelling are compared with national average impact fees in Table 2. The three proposed fees for Fayetteville combined are less than one-third of the national average fees for the same four facilities. Most of this discrepancy can be explained by the fact that the proposed fees do not cover the full range of cost components for the identified facilities. For example, the water fee does not include treatment costs or any line costs that would typically be provided by developers, the wastewater fee includes only treatments plant costs, and the park fee covers only land costs.

Table 2
IMPACT FEE SUMMARY PER SINGLE-FAMILY UNIT

Facility Type	Fayetteville's Maximum Fees	National Average Fees
Neighborhood Parks and Trails	\$555	\$1,214
Water Transmission, Storage and Distribution Line Oversizing	\$308	\$2,199
Wastewater Treatment	\$835	\$1,929
Total	\$1,698	\$5,342

Source: Maximum fees for Fayetteville for average single-family unit from Table 1; national average fees from non-random survey of 141 communities that have impact fees prepared by Dr. James C. Nicholas, University of Florida at Gainesville, October 2001.

BACKGROUND

An impact fee is a form of "exaction," through which a developer or builder is required to contribute to the costs of public improvements required to serve the development. Generally, impact fees are designed to pay for the new development's proportionate share of the cost of off-site improvements, and credit against the fees is given if the developer is required to contribute to the system of facilities for which the fees are charged through on-site dedication, construction or monetary payment. Typically the fee is levied on some easily measurable unit of activity, such as the construction of one dwelling unit or of a specified number of square feet of commercial or industrial space, and is collected at the time of building permit issuance or water meter purchase.

A major impetus for this project is the need for a major wastewater treatment plant expansion and associated collector system improvements. With an estimated total project cost of \$120 million, the wastewater improvements could well be the most costly and extensive capital project ever undertaken by the City.

The City finances most capital improvements on a pay-as-you-go basis. This is done utilizing revenues from the one-percent City sales tax adopted in 1993 (of which, by City Council resolution, at least 75 percent is used to fund capital projects), the one-percent Hotel, Motel, Restaurant sales tax adopted in 1996 to fund park improvements, and operating revenues from the City's enterprise funds, including water, wastewater and solid waste.

The City's last five-year capital improvements program (CIP), excluding bond funding, included almost \$86 million in capital funding for the five-year period. Over half of the pay-as-you-go funding is from the one-percent sales tax, as shown in Table 3.

Table 3
CAPITAL FUNDING BY SOURCE, 2000-2004

Revenue Source	Amount	Percent
Sales Tax	\$45,758,000	53.3%
Water & Sewer Fund	\$14,472,000	16.8%
Shop Fund	\$8,690,000	10.1%
Off-Street Parking Fund	\$6,564,000	7.6%
Airport Fund	\$3,486,000	4.1%
Parks Development Fund	\$3,457,000	4.0%
Community Dev't Block Grant Fund	\$2,015,000	2.3%
Solid Waste Fund	\$756,000	0.9%
General Fund	\$700,000	0.8%
Total	\$85,898,000	100.0%

Source: City of Fayetteville, Five Year Capital Improvements Program, 2000-2004, November 1999 (excludes bond funding).

Three-quarters of the City's one-cent sales tax is dedicated to capital improvements. The City's sales tax capital funding is spent on a wide variety of improvements. Foremost among these are streets, water and wastewater and parks, as shown in Table 4.

Table 4
SALES TAX CAPITAL FUNDING, 2000-2004

Project Type	Amount	Percent
Streets	\$19,390,000	42.4%
Wastewater	\$7,968,500	17.4%
Parks	\$3,393,000	7.4%
Water	\$3,205,500	7.0%
Bridge & Drainage	\$3,042,000	6.6%
Fire	\$2,121,000	4.6%
Police	\$1,395,000	3.0%
Library	\$852,000	1.9%
Transportation	\$650,000	1.4%
Other	\$3,741,000	8.2%
Total	\$45,758,000	99.9%

Source: City of Fayetteville, Five Year Capital Improvements Program, 2000-2004, November 1999.

The City has about \$31 million in outstanding debt. Two-thirds of that is in water and sewer revenue bonds, as shown in Table 5.

Table 5
OUTSTANDING DEBT

Bond Issue	Original Issue	Original Amount	Outstanding*
Hotel & Restaurant, Series 1995 (Continuing Ed Center)	1979	\$2,675,000	\$1,335,000
Sales Tax, Series 1997 (Walton Arts Center)	1986	\$2,610,000	\$1,700,000
Water & Sewer, Series 1999 (Water Transmission Main)**	1992	\$8,365,000	\$7,815,000
Water & Sewer, Series 1994 (Water Transmission Main)	1994	\$5,500,000	\$3,585,000
Hotel & Restaurant, Series 1998 (Town Center)	1998	\$6,950,000	\$6,765,000
Water & Sewer, Series 2000 (Wastewater Improvements)	2000	\$10,000,000	\$10,000,000
Total		\$36,100,000	\$31,200,000

* as of December 31, 2000

** 12% for wastewater improvements per utility rate study

Source: City of Fayetteville, Annual Budget and Work Program, 2001, December 2000.

Impact fees are most appropriate for communities that are experiencing rapid growth. The Fayetteville-Springdale-Rogers Metropolitan Statistical Area (MSA), comprised of Washington and Benton Counties, was the sixth fastest growing MSA in the country in the 1990s.⁴ Washington County, of which Fayetteville is the county seat, has been growing at a compound annual growth rate of 3.4 percent since 1990, and one-third of the population added since then has been in Fayetteville. The City itself has been growing at 3.2 percent annually, over twice as fast as the state as a whole. It is not surprising that this pace of growth has created problems in terms of the City's ability to finance the capital improvements needed to accommodate new development.

⁴U.S. Census Bureau, *Statistical Abstract of the United States: 2000*, Table No. 34, p. 33.

Table 6
POPULATION GROWTH, 1990-2000

	1990	1996	2000	Increase	Annual Rate
Fayetteville	42,249	52,976	58,047	15,798	3.23%
Springdale *	29,941	37,700	43,787	13,846	3.87%
Other Municipalities*	10,503	15,156	17,540	7,037	5.26%
Unincorporated	30,716	36,077	38,341	7,625	2.24%
Washington County	113,409	141,909	157,715	44,306	3.35%
State of Arkansas	2,350,624	n/a	2,673,400	322,776	1.30%

* only the Washington County portion of Springdale and Elm Springs

Source: U.S. Census Bureau; Northwest Regional Planning Commission

Over the last twelve years, the City has issued permits for an average of about 750 new dwelling units annually, as shown in Table 7.

Table 7
RESIDENTIAL BUILDING PERMITS, 1990-2001

Year	Single-Family	Townhouse	Duplex	Multi-Family	Total
1990	251	2	16	91	360
1991	259	0	62	297	618
1992	356	2	74	257	689
1993	434	0	256	342	1,032
1994	439	0	246	754	1,439
1995	452	60	186	320	1,018
1996	445	47	80	154	726
1997	265	0	64	281	610
1998	281	0	30	40	351
1999	357	8	54	515	934
2000	279	40	44	188	551
2001	411	17	48	223	699
Total	4,229	176	1,160	3,462	9,027
Annual Avg.	352	15	97	289	752

Source: City of Fayetteville, *General Plan 2020*, 2001 revision, p. 4-4; Planning Department, 3/26/02.

The number of units by housing type can be estimated from the 2000 census distribution and the building permits issued since that time. The census count is taken as of April 1. Based on building permit trends for the last two years, it is estimated that Fayetteville had about 27,000 dwelling units by April 2002, as shown in Table 8.

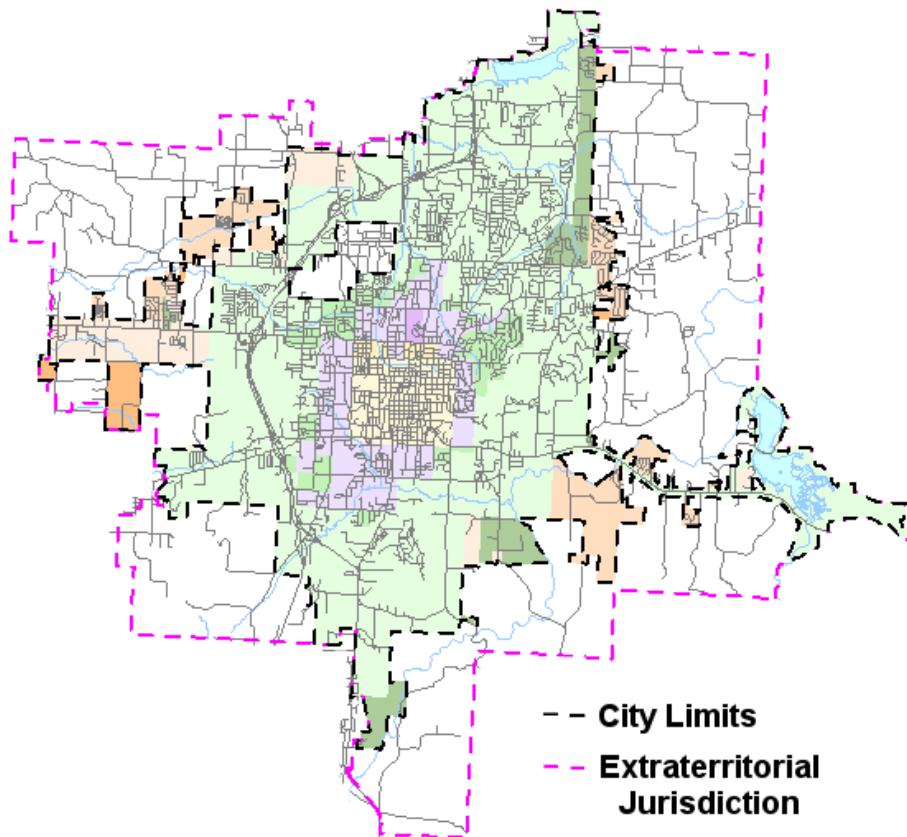
Table 8
HOUSING UNITS BY TYPE, 1990-2002

Housing Type	April 2000	2 Years of Permits	April 2002
Single-Family	12,663	690	13,353
Townhouse	1,010	57	1,067
Duplex	1,721	92	1,813
Multi-Family	9,077	411	9,488
Mobile Home	847	0	847
Other	8	0	8
Total	25,326	1,250	26,576

Source: April 2000 units by type from 2000 U.S. census; units permitted over last 2 years from Table 7.

In addition to development within its incorporated limits, the City is also affected by, and has some control over, development in unincorporated areas within its extraterritorial jurisdiction. Within this area, which extends up to two and one-half miles from the corporate limits, the City exercises joint subdivision authority with Washington County. The combined corporate and extraterritorial jurisdictions are referred to as the City's planning area, which covers approximately 86 square miles.

Figure 1
PLANNING AREA



WATER

The City does not currently charge new water customers an impact fee to help defray the off-site capital costs to the utility system associated with a new customer (the City does charge a connection fee to cover costs associated with connection to the City's water line). Such a one-time, up-front fee, called by many names including capital recovery fee and system development charge, is one of the most common forms of development impact fees. While cities lack explicit statutory authority to impose water or wastewater impact fees in Arkansas, these fees have a long history and have been litigated in Arkansas. Consequently, there appears to be adequate legal authority for the City to impose water impact fees.

Service Area

The City sells water on a wholesale basis to four customers: the Washington Water Authority, the Mount Olive Water Association, the City of Elkins and the City of West Fork. In addition, the City provides retail water service, including water pipes, meters and billing, to development in the cities of Farmington and Greenland, as well as a portion of Johnson. As shown in Table 9, 81 percent of the City's water sales are to customers within Fayetteville's city limits.

Table 9
CURRENT WATER CUSTOMERS

Jurisdiction	June 2001 Consumption (100 gallons)	Percent
Fayetteville	2,903,568	81%
Elkins (wholesale)	46,291	1%
Farmington	95,658	3%
Greenland	28,578	1%
Growth Area	324,186	9%
Mount Olive (wholesale)	44,379	1%
West Fork (wholesale)	80,520	2%
RDA/WWA (wholesale)	0	0%
White River	47,411	1%
Total	3,570,591	100%

Source: Fayetteville Water and Sewer Department, "Consumption of Water Customers, June 2001."

It is recommended that the City's entire water service area should be treated as a single impact fee service area. A service area is an area subject to a uniform fee schedule. A single service area can be justified from several perspectives. First, from the perspective of an individual customer, the lay-out of the utility system and the customer's geographic relationship to components of the system, including location of treatment plants, size and placement of lines, and so forth, are discretionary decisions made by the utility. Moreover, water systems are designed with features to ensure system-wide reliability. This is illustrated by the fact that special mains are often installed to allow treatment facilities to serve several areas. Also, many systems are "looped" to provide redundant transmission facilities. These system reliability aspects make it difficult or impossible to assign certain costs by geographic area. Additionally,

there are facilities that serve various geographic areas and therefore present geographically unallocatable costs. Finally, the utility's entire rate revenue is pledged as security for the repayment of revenue bonds, making it impossible to allocate debt payment costs to subgroups of customers. In summary, because (1) many siting and design decisions are discretionary rather than locational; (2) systems are often designed with redundant facilities for system reliability; (3) some facilities have no geographic-specific service area; and (4) revenue bonds are backed by system-wide revenues, it can be argued that each utility operates as a complete, integrated system. Therefore, any customer who receives service from such a system may reasonably be considered to be receiving sufficient benefit from the payment of an impact fee, thus meeting the benefit nexus of the rational nexus test.

Water Demand

The City's 1996 *Water Master Planning Study* was based on 20-year population growth projections (1995-2015) for Fayetteville and four other communities whose water is provided by the City. The 2000 Census, however, revealed that the projections used in the master plan were significant underestimates. As shown in Table 10, the population served with City water in 2000 was very close to the population projected to be served by the year 2005.

Table 10
WATER MASTER PLAN POPULATION PROJECTIONS

Municipality	1990	1995	2000 Projected	2000 Actual	2005 Projected	2015 Projected
Fayetteville	42,099	49,264	54,046	58,047	60,647	76,364
Farmington	1,322	1,579	1,837	3,605	2,094	2,609
Greenland	757	858	958	907	1,059	1,260
Elkins	692	813	934	1,251	1,055	1,297
West Fork	1,628	1,768	1,908	2,042	2,048	2,329
Total	46,498	54,282	59,683	65,852	66,903	83,859

Source: All except 2000 actual from McGoodwin, Williams and Yates, Inc., *Fayetteville Water Master Planning Study*, October 1996; 2000 actual from 2000 U.S. census.

The water master plan analyzed historic water usage, and noted that water usage had been growing significantly faster than population. The plan used service population projections and the assumption that average day demand per person would continue to increase to project future average day demand. The per capita demand assumptions included nonresidential as well as residential demand. However, actual demand did not increase nearly as much as was projected, despite significantly more rapid population growth than was anticipated. In 2000, water demand averaged only 13.04 million gallons per day (mgd), not the 13.67 mgd that had been forecast. The reason that demand did not increase as expected is that two major water customers, Pinnacle Foods and Washington Water Authority, both made significant reductions in water usage since the master plan was prepared. For example, water purchased by Washington Water Authority went from 17 mg in June 1996 to zero in June 2001. Thus, the lower-than-expected increase in demand does not appear to be due to increased conservation by most customers, but to changes in demand by a couple of major users.

The water master plan noted that the ratio of maximum to average day water demand over the prior twenty years ranged from 1.25 in 1992 to 1.85 in 1990. It noted that "the potential certainly exists for

a maximum day of approximately 2.0 times the average day in any given year,” and used a two-to-one ratio to estimate potential maximum day demand from average day demand, as shown in Table 11.

Table 11
WATER DEMAND PROJECTIONS, 1995-2015

	1990	1995	2000 Projected	2000 Actual	2005 Projected	2015 Projected
Average Day Demand (mgd)	10.21	12.44	13.67	13.04	16.07	22.23
Service Population	46,498	54,282	59,683	65,852	66,903	83,859
Daily Demand per person (gpd)	220	229	229	198	244	265
Average Day Demand (mgd)	10.21	12.44	13.67	13.04	16.07	22.23
Maximum Day Demand (mgd)	15.69	21.56	27.34	n/a	32.15	44.46
Ratio of Max. to Avg. Demand	1.54	1.73	2.00	n/a	2.00	2.00

Source: All except 2000 actual from McGoodwin, Williams and Yates, Inc., *Fayetteville Water Master Planning Study*, October 1996; 2000 actual average day demand from memo from Fayetteville water/sewer maintenance superintendent, July 30, 2001; 2000 actual service population from Table 10.

Service Unit

A water utility must be able to supply water to satisfy demand that fluctuates over a wide range. Yearly, monthly, daily and hourly variations must all be accommodated. Water demand rates most important to the design and operation of a water system are average day, maximum day and maximum hour. The allocation of capital costs in this analysis is based on both average and maximum day water demand.

To calculate water impact fees, the water demand associated with different types of customers must be expressed in a common unit of measurement, called a "service unit." Water system components must be designed to meet peak demand. Consequently, water impact fees should reflect maximum potential demand, which is determined by the capacity of the water meter. This can be accomplished by developing factors that convert each meter size into multiples of a "Single-Family Equivalent" meter, or SFE. An SFE is a common denominator that converts all classes of customers into a common unit of expression. An SFE is the water demand associated with the smallest water meter used in the system (5/8" by 3/4"), which is the meter typically used by a single-family residence.

In order to calculate the cost of various types of water facilities to serve a service unit, it is necessary to determine the average amount of water consumed by a typical single-family unit. Dividing the average day demand generated by single-family customers in Fayetteville during the most recent 12-month period (July 2000 through June 2001) by the estimated number of single-family dwelling units in Fayetteville in 2001 yields a reasonably good estimate of average day water demand per single-family equivalent service unit. Multiplying that by the two-to-one ratio of maximum to average day demand provides the maximum day demand per service unit. These calculations are summarized in Table 12.

Table 12
WATER DEMAND PER SERVICE UNIT

Average Day Demand from Single-Family Customers, 2001 (gpd)	3,467,731
Estimated Single-Family Units in Fayetteville, 2001	12,922
Average Day Demand per Single-Family Equivalent (gpd)	268
Maximum Day Demand Factor	2.00
Maximum Day Demand per Single-Family Equivalent (gpd)	536

Source: City of Fayetteville, "Consumption of Water Customers," residential (single-family) users in Fayetteville, July 2000 through June 2001; 2001 single-family units in Fayetteville estimated from Table 8 using 2002 units and reducing by average annual growth rate; maximum day demand factor from Table 11.

The total number of existing service units served by the City's water system can be estimated from recent water consumption records. Increasing year 2000 water demand for two years by the annual percent increase in population during the last decade results in the estimate of current demand. Dividing that by the average day demand per single-family equivalent yields the current number of service units.

Table 13
WATER SERVICE UNITS, 2002

Average Day Water Demand, 2000 (mgd)	13.04
Annual Percent increase in Population, 1990-2000	3.23%
Average Day Water Demand, 2002 (mgd)	13.88
Average Day Demand per SFE (gpd)	268
Single-Family Equivalents, 2002	51,791

Source: 2000 average day demand from Table 11; average day demand per SFE from Table 12; annual percent increase in population from Table 6.

The fact that the City's water master plan did not precisely forecast population growth in the water service area or growth in demand during the first five years of the 20-year planning period does not invalidate it as a reasonable basis for the development of water impact fees. The improvements that were identified as needed during the planning period were based on the projected growth in demand, and the cost per increment of demand should be reasonably accurate, regardless of whether the growth, and thus the need for the improvements, occurs over 20 years or a somewhat different time period. As shown in Table 14, the projected growth in demand anticipated in the master plan is the equivalent of 36,530 new single-family units, regardless of whether one looks at growth in average day or maximum day demand.

Table 14
PLANNED NEW WATER SERVICE UNITS, 1995-2015

	Average Day	Maximum Day
Projected Water Demand, 2015 (mgd)	22.23	44.46
Water Demand, 1995 (mgd)	12.44	24.88
New Water Demand, 1995-2015 (mgd)	9.79	19.58
Water Demand per SFE (gpd)	268	536
New Single-Family Equivalents (SFEs), 1995-2015	36,530	36,530

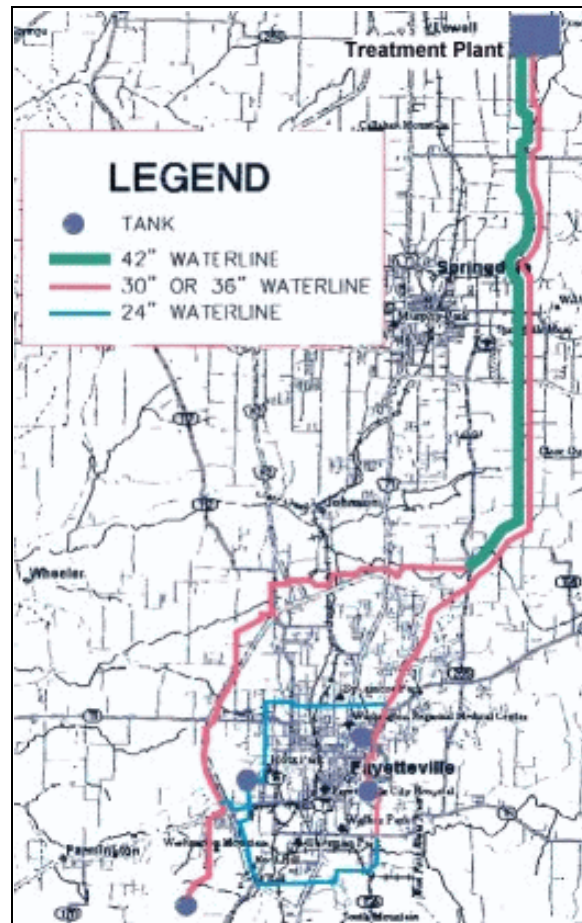
Source: 2015 and 1995 demand from Table 11 (1995 maximum day is 2 times average day); water demand per SFE from Table 12.

Treatment and Supply

The City of Fayetteville and three other cities make up the Beaver Water District, which operates two regional water treatment plants located east of Lowell, Arkansas (see Figure 2). The District pays only for the plants, with the cities responsible for constructing the transmission lines needed to get the water to their distribution systems. The regional water treatment plants were expanded about five years ago. The City's water master plan did not provide costs for centralized facilities, since the City does not own the water treatment plants. It may be difficult to charge impact fees for water treatment capacity because the City does not directly own the facilities. Insufficient information is available to determine the capital cost of the treatment plants paid by Fayetteville, and no such costs will be included in the impact fee calculations for the purpose of this study.

The treated water supplied by the Beaver Water District is pumped through parallel 36-inch and 42-inch diameter transmission lines. The high service pump station at the Beaver Water District is equipped with four vertical turbine pumps, capable of delivering about 30.6 mgd of treated water to the City of Fayetteville each day. The pump station and the new 42-inch line were put into full-time operation in 1993. The lines run south from the plant, over Fitzgerald Mountain and into the Fayetteville system east of Lake Fayetteville. A surge tank 20 feet in diameter by 100 feet tall is located on top of Fitzgerald Mountain. The surge tank has a capacity of 0.25 million gallons (mg) and functions as a buffer for the operation of the high service pumps at the Beaver Water District. A hydraulic model indicates that the maximum capacity of the parallel transmission lines is approximately 46 mgd.

Figure 2
WATER FACILITIES



The 1996 water master plan determined that the capacity of the transmission lines from the Beaver Water District would be adequate to accommodate projected growth in water demand through 2015, but that the capacity of the pumping station would be reached shortly after the year 2000. However, it noted that facilities are in place for adding a new pump or pumps to meet this demand.

Although the water master plan did not provide any cost estimates for expanding the capacity of the pumping stations or transmission lines, Fayetteville's water utility has incurred the cost of constructing the existing facilities in order to provide capacity for its growing customer base. In fact, the majority of the City's existing water revenue bond debt is continuing to pay for these water supply facilities. The current replacement cost of the transmission lines and associated facilities is estimated to be about \$16.3 million. Dividing the current replacement cost by the capacity of the lines results in the cost to new customers of 35 cents per gallon per day of maximum day water demand, as shown in Table 15. Multiplying this by the maximum day demand generated by a single-family unit results in the water supply cost per service unit.

Table 15
WATER SUPPLY COST PER SERVICE UNIT

Original Cost of 36" Line and Associated Facilities	\$7,332,339
Original Cost of 42" Line (in operation 1993)	\$5,744,922
Total Original Cost of Supply Facilities	\$13,077,261
Cost Inflation Factor, 1993-2002	1.248
Current Replacement Cost of Supply Facilities	\$16,320,422
Transmission Line Capacity (gpd)	46,000,000
Supply Facility Cost per Maximum Day Gallon	\$0.35
Maximum Day Demand per SFE (gpd)	536
Supply Facility Cost per SFE	\$188

Source: Original costs from City of Fayetteville; cost inflation factor is *Engineering News-Record* Construction Cost Index, ratio of March 2002 to annual average for 1993; line capacity from McGoodwin, Williams and Yates, Inc., *Fayetteville Water Master Planning Study*, October 1996, p. 3-3; maximum day demand per SFE from Table 12.

Water Storage Tanks

The City's water distribution system is divided into five pressure planes. The primary pressure plane, which receives all of the water delivered from the Beaver Water District, currently has six ground storage tanks and two elevated storage tanks located at five sites with a total capacity of 27.75 mg. Because many areas of the city are above the overflow elevation of the primary pressure plane, water must be repumped to supply four additional areas of high elevation. Two of these have small elevated storage tanks, while adequate pressure in the other two is maintained by the use of variable speed pump stations. The entire system has just over 28 mg of storage capacity (see Table 16).

Table 16
EXISTING WATER STORAGE FACILITIES

Existing Tanks	Capacity(mg)
Baxter Ln at North St	1.000
Baxter Ln at North St	5.000
Rogers Dr	4.000
Rogers Dr	4.000
Kessler Mountain	6.000
Kessler Mountain	6.000
Markham Hill (elevated)	1.000
Gully Road (elevated)	0.750
Subtotal, Primary Pressure Plane	27.750
Sequoyah/Hyland Park Pressure Plane (elevated)	0.250
Township Pressure Plane (elevated)	0.075
Highway 45 E Pressure Plane (pump)	0.000
South Mountain Pressure Plane (pump)	0.000
Total System	28.075

Source: McGoodwin, Williams and Yates, Inc., Fayetteville Water Master Planning Study, October 1996.

According to the water master plan, storage requirements in the water distribution system are determined by the needs of operational storage, fire flow and emergency storage. Operational storage should be about 20 percent of maximum day demand. Fire flow requirements are based on judgement on the required duration of flows based on the level of risk in the community, and were determined in cooperation with the City fire department. Emergency storage needs are generally set at about two days of average usage.

The water system's current needs at the time the water master plan was prepared were determined to be over 32 mg, which is considerably higher than the existing storage capacity, which is just over 28 mg. This deficiency has no doubt increased somewhat in the intervening five years, as demand has grown while no additional storage capacity has been added. As can be seen in Table 17, the capacity needs projected by the master plan show a strong relationship to water demand, with an average of 2.63 gallons of storage capacity needed per gallon of average day demand.

Table 17
WATER STORAGE NEEDS, 1995-2015

Storage Requirements	1995	2000	2005	2015
Operational (mg)	4.30	5.50	6.40	8.90
Fire Flow (mg)	3.00	3.50	4.00	5.00
Emergency (mg)	24.90	27.30	32.10	44.50
Total System (mg)	32.20	36.30	42.50	58.40
Average Day Water Demand (mgd)	12.44	13.67	16.07	22.23
Gallons of Storage per Gallon of Avg. Day Demand	2.59	2.66	2.64	2.63

Source: McGoodwin, Williams and Yates, Inc., Fayetteville Water Master Planning Study, October 1996.

Applying the ratio of storage capacity to demand to current conditions indicates that the existing capacity deficiency is on the order of 8 million gallons, as shown in Table 18.

Table 18
WATER STORAGE DEFICIENCY, 2002

Average Day Water Demand, 2002 (mgd)	13.880
Gallons of Storage per Gallon of Avg. Day Demand	2.63
Current Storage Capacity Needs (mg)	36.500
Current Storage Capacity (mg)	28.075
Existing Storage Capacity Deficiency (mg)	8.425

Source: 2002 average day demand from Table 13; storage capacity per mgd of demand is average from Table 17; current capacity from Table 16.

The cost of new storage capacity varies significantly depending on whether the tanks are elevated or ground storage. Of the improvements called for in the water master plan, the bulk of the new capacity should be in ground storage. The average cost of new storage capacity is about \$0.44 per gallon, as shown in Table 19.

Table 19
PLANNED WATER STORAGE COSTS, 1995-2015

Planned Storage Improvements	Capacity (mg)	Cost	Cost/Gallon
Hwy 45E Elevated Storage Tank	2.0	\$2,800,000	\$1.400
Mt. Sequoyah Elevated Storage Tank	2.0	\$2,800,000	\$1.400
Primary Pressure Plane Ground Storage (1-5 yrs)	6.0	\$1,900,000	\$0.317
Primary Pressure Plane Ground Storage (5-10 yrs)	12.0	\$3,800,000	\$0.317
Primary Pressure Plane Ground Storage (10-15 yrs)	12.0	\$3,800,000	\$0.317
Total	34.0	\$15,100,000	\$0.444

Source: McGoodwin, Williams and Yates, Inc., *Fayetteville Water Master Planning Study*, October 1996.

Based on the average cost per gallon to expand storage capacity derived from the water master plan, the storage cost per single-family equivalent is shown in Table 20.

Table 20
WATER STORAGE COST PER SERVICE UNIT

Average Storage Cost per Gallon	\$0.444
Gallons of Storage per Gallon of Average Day Demand	2.63
Cost per Gallon of Average Day Demand	\$1.17
Avg Day Demand per SFE (gpd)	268
Storage Cost per Single-Family Equivalent (SFE)	\$314

Source: Storage cost per mg from Table 19; ratio of storage to average day demand from Table 17; average day demand per SFE from Table 12.

A portion of the cost of planned improvements, however, is attributable to existing customers due to the existing storage capacity deficiency. The cost to remedy this deficiency is about \$3.1 million, as

shown below. Dividing this cost by the number of existing service units represents the cost of remedying the deficiency per existing customer, which will be paid by new customers as well.

Table 21
WATER STORAGE DEFICIENCY COST PER SERVICE UNIT

Existing Storage Capacity Deficiency (gallons)	8,425,000
Average Storage Cost per Gallon	\$0.444
Storage Deficiency Cost	\$3,740,700
Estimated 2002 SFEs	51,791
Storage Deficiency Cost per SFE	\$72

Source: Storage capacity deficiency from Table 18; cost per gallon from Table 19; 2002 SFEs from Table 13.

To avoid double-charging new customers by charging them the full cost of the storage capacity they will require, while also charging them, through their rate payments, to remedy existing capacity deficiencies, the deficiency cost per service unit calculated above is deducted from the cost of new growth-related storage capacity to determine the net cost per service unit, as shown in Table 22.

Table 22
WATER STORAGE NET COST PER SERVICE UNIT

Storage Cost per Single-Family Equivalent (SFE)	\$314
Storage Deficiency Cost per SFE	\$72
Storage Net Cost per SFE	\$242

Source: Cost per SFE from Table 20 ; deficiency cost per SFE from Table 21.

Transmission Lines

The costs per service unit for the other components of the water system have been calculated by determining an average cost per unit of capacity. This approach is not feasible for water transmission and distribution lines, since we do not have detailed demand and capacity data for all existing lines. There are two reasonable methodologies for determining line costs: the improvements-driven approach and the buy-in approach.

The improvements-driven approach divides the cost of planned improvements by projected growth in service units over the planning period. The concept here is that while the planned improvements may create some excess capacity beyond what is needed by projected growth, it is likely that the existing system also has some excess capacity that will be used by new customers, and that over the long term these tend to balance out.

The City's 1996 water master plan identifies the major water transmission lines, ranging in size from 12 to 24 inches in diameter, that will be needed to accommodate projected growth in the planning area over the 20-year planning horizon covered by the master plan (1995 to 2015). These line improvements are summarized in Table 23 and illustrated in Figure 3. The costs shown in Table 23 represent the portion of the cost typically paid by the City. When a line needs to be extended to provide service to a new development, developers pay the cost of the line needed to serve the subdivision, which in most

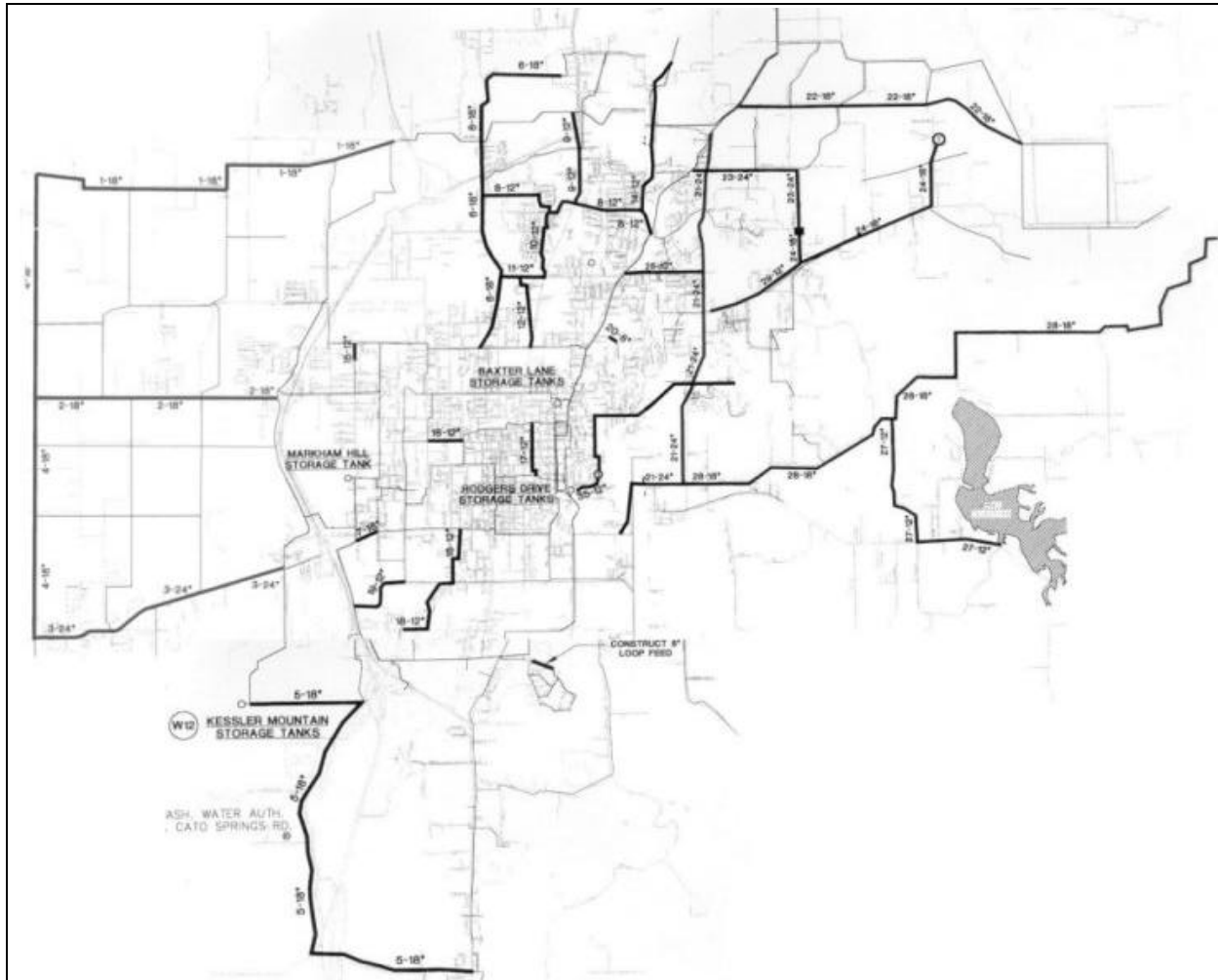
cases is an eight-inch line (six-inch water lines are acceptable under some situations). If the line needs to be oversized to serve other developments, the City pays for the cost of the oversizing. In a few cases, the City has required a developer to front the entire cost of a water line, and used a pro rata agreement to recoup some of line cost from subsequent developers benefitting from the line, which is then remitted to the original developer. Consequently, the line costs shown are the total costs, less the cost of installing the same length of eight-inch line.

Table 23
PLANNED WATER LINE IMPROVEMENTS, 1995-2015

Line Description	Size (in.)	Linear Feet	Cost/Foot	Cost
Mall West on Joyce, S on Gregg to Sycamore	18	20,000	\$54	\$1,080,000
Phillip East on 6th to Lewis	18	1,500	\$54	\$81,000
Appleby & Gregg W to Old Wire Rd	12	12,000	\$14	\$168,000
Millsap S on College to Rolling Hills	12	5,000	\$14	\$70,000
Deane S on Sang to Lawson	12	1,000	\$14	\$14,000
6th and Ellis S to Cato Springs and Vale	12	8,000	\$14	\$112,000
Oakland Zion W on Hwy 45 to Crossover	12	6,000	\$14	\$84,000
Crossover W to Prop Hwy 45E Pump Station	24	10,000	\$66	\$660,000
Prop Hwy 45E Pump Station to Prop Hwy 45E Tank	18	15,000	\$54	\$810,000
Rebecca S on Washington to Spring	12	3,000	\$14	\$42,000
Fiesta Square S to Township	12	4,000	\$14	\$56,000
Gregg E on Township to College	12	3,000	\$14	\$42,000
Township S on Green Acres to Sycamore	12	4,000	\$14	\$56,000
Joyce S on Old Missouri to Rolling Hills	12	6,000	\$14	\$84,000
Garland E on Maple to Whitham	12	2,000	\$14	\$28,000
Bypass W along Hwy 16	18	14,000	\$54	\$756,000
Bypass W along Hwy 62	24	15,000	\$66	\$990,000
Zion S on Old Missouri to Joyce	12	3,500	\$14	\$49,000
Old Wire S on Crossover to 15th St	24	32,000	\$66	\$2,112,000
Old Wire E on Township to Crossover	12	5,000	\$14	\$70,000
Mt. Sequoyah Tank to Hyland Park	16	16,000	\$27	\$432,000
Rodgers Pump Station to Mt Sequoyah Tank	12	2,400	\$14	\$33,600
Bypass W along Salem Rd	18	22,000	\$54	\$1,188,000
Kessler Tanks to Greenland	18	27,000	\$54	\$1,458,000
15th St W to Bypass	12	4,000	\$14	\$56,000
Crossover E to Goshen (N Loop)	18	20,000	\$54	\$1,080,000
Wyman S on Harvey Owl to Elkins	12	15,000	\$14	\$210,000
Crossover E to White River System (S Loop)	18	20,000	\$54	\$1,080,000
Farmington N to Wheeler	18	26,000	\$54	\$1,404,000
Total		322,900		\$14,305,600

Source: McGoodwin, Williams and Yates, Inc., *Fayetteville Water Master Planning Study*, October 1996, Tables 10.1 and 10.2 (excludes line required to connect to White River Rural Water System);.

**Figure 3
PLANNED WATER IMPROVEMENTS**



Dividing the line improvement cost over the 20-year planning horizon from the water master plan by the growth in service units implicit in the plan's projections of water demand results in the water line cost per single-family equivalent, shown in Table 24. This amount is warranted if the improvement-driven approach is used to calculate water line costs.

**Table 24
WATER LINE COST PER SERVICE UNIT, IMPROVEMENT APPROACH**

Planned Line Improvements, 1995-2015	\$14,305,600
New Single-Family Equivalents (SFEs), 1995-2015	36,530
Water Line Cost per SFE	\$392

Source: Planned line improvement costs from Table 23; new SFEs from Table 14.

The alternative to the improvements-driven approach for calculating line costs is the buy-in approach. In this approach, the total replacement value of the City share of costs for existing lines is calculated and divided by existing service units. The concept here is that the existing ratio of line costs to customers is a reasonable guide to future costs to accommodate new customers. In other words, the system of transmission and distribution lines will need to be expanded proportionately to accommodate future growth. At current replacement costs, the City share of existing line costs is about \$8.5 million. Dividing this by current single-family equivalents yields a line cost of \$170 per SFE, using the buy-in approach. This is less than one-half of the cost per service unit derived using the improvements-driven approach, and is the method recommended in this study. Besides being more conservative, it has the advantage that it is not tied to a specific list of improvements.

Table 25
WATER LINE COST PER SERVICE UNIT, BUY-IN APPROACH

Size (inches)	Length (Feet)	City Cost per Foot	Replacement City Cost
10	16,421	\$7	\$115,000
12	152,698	\$14	\$2,138,000
14	9,451	\$20	\$189,000
16	11,722	\$26	\$305,000
18	5,280	\$53	\$280,000
20	11,722	\$60	\$703,000
24	62,568	\$66	\$4,129,000
30	9,029	\$72	\$650,000
Total City Replacement Cost			\$8,509,000
Estimated 2002 SFEs			51,791
Line Cost per SFE			\$164

Source: Water line lengths by size from City of Fayetteville, October 8, 2001 memorandum; costs per foot excluding cost for an 8" line from Table 23 or interpolated; 2002 SFEs from Table 13.

Revenue Credits

New water customers connecting to Fayetteville's water system will pay an impact fee to cover the cost of providing the capacity needed to serve them. They will also pay through their rate payments to retire the outstanding debt from past improvements. In some cases, a credit against the impact fees for debt retirement may be warranted. Finally, new development pays sales tax on construction materials, a portion of which is earmarked for capital improvements and spent on water system improvements, and a credit should be provided for this contribution.

When a credit should be given for debt service payments can be illuminated with an example. Imagine that impact fees are being imposed just prior to the issuance of bonds to pay for a treatment plant expansion to serve growth. The impact fees could be used to repay all of the debt, in which case new customers would not be paying any of the debt service through their rates, and are obviously not deserving of a credit. To the extent that the impact fees are not sufficient to retire the debt, because, for example, they are insufficient to cover the interest, here again no credit is due, since the impact fees were not designed to pay for the interest. Similarly, if the impact fees are used to pay for other growth-

related costs and cannot also cover the debt service on the treatment plant expansion, some of new customers' rate payments are being used to retire the debt, but again this only points to the fact that the impact fees were not high enough to cover the full costs of growth.

When credit is due is when new customers are helping to retire debt for capacity that is being used by existing customers. Most of the water utility's outstanding debt was incurred to pay for the parallel transmission lines and associated facilities used to convey water from the Beaver Water District. The capacity of these lines has been determined to be 46 mgd. Current maximum day demand from existing customers can be estimated to be about 28 mgd. However, existing customers have already retired about 18% of the debt. Of the remaining unpaid-for capacity in the lines, existing development is using about one-half (see Table 26). This percentage of the debt should not be paid for by new customers.

Table 26
ELIGIBLE SHARE OF WATER SYSTEM DEBT

Total Transmission Line Capacity (mgd)	46.00
Percent of Original Debt Outstanding	82.2%
Capacity Not Paid For (mgd)	37.81
Current Maximum Day Water Demand, 2001 (mgd)	27.76
Used Capacity Paid For (mgd)	8.19
Used Capacity Not Paid For (mgd)	19.57
Used Capacity Share of Total Capacity Not Paid For	0.518

Source: Transmission line capacity from McGoodwin, Williams and Yates, Inc., *Fayetteville Water Master Planning Study*, October 1996; percent of original debt outstanding from City of Fayetteville, *Annual Budget and Work Program, 2001*, December 2000; current maximum day demand is two times average day demand from Table 13; used capacity paid for is difference between total capacity and capacity not paid for.

Applying the percentage calculated above to the outstanding debt yields the portion of the debt that is attributable to capacity already consumed by existing customers. All customers, existing and new, will retire this portion of the debt. Dividing the eligible debt portion by the number of current single-family equivalent customers results in the debt credit per service unit, as summarized in Table 27.

Table 27
WATER DEBT CREDIT PER SERVICE UNIT

Outstanding Water System Debt	\$10,462,200
Portion of Debt Eligible for Credit	51.8%
Eligible Outstanding Water System Debt	\$5,419,420
Water Single-Family Equivalents (SFEs), 2002	51,791
Water Debt Credit per SFE	\$105

Source: Outstanding debt from City of Fayetteville, *Annual Budget and Work Program, 2001*, December 2000; portion of debt eligible for credit from Table 26; 2002 SFEs from Table 13.

In addition to paying off outstanding debt for facilities used by existing customers, new customers will pay a one-time sales tax on construction materials that will be used to fund some water capital improvements. They will also pay sales tax annually on taxable purchases in Fayetteville, a portion of which will be used to pay for capital improvements to the water system. In the City's current Capital Improvements Program, almost one-quarter of planned water improvements are to be funded from sales tax revenues. Since six percent of sales tax revenue comes from the sale of construction materials, the water impact fee should be reduced by about one and one-half percent to account for new customers' contribution through sales tax paid on construction materials. In addition, new water customers, along with existing development, will be paying sales tax on other purchases over the next 25 years, a time period often used as the useful life of capital improvements. The portion of this future stream of tax payments that would be used for water system improvements has an equivalent present value of \$172 per service unit, as shown in Table 28.

Table 28
WATER SALES TAX CREDIT

Sales Tax Funding for Planned Water Projects, 2000- 2004	\$3,205,500
Total Water Projects, 2000-2004 CIP	\$13,043,000
Percent of Water/Sewer Improvements Funded by Sales Tax	24.6%
Percent of Sales Tax from Construction Materials	6.0%
Percent Credit for Construction Sales Tax	1.5%
Sales Tax Funding, Excluding Construction Tax, 2000-2004	\$3,157,418
Annual Non-Construction Sales Tax Funding	\$631,484
Water Single-Family Equivalents (SFEs), 2002	51,791
Annual Non-Construction Sales Tax Funding per SFE	\$12.19
Net Present Value Factor (25 Years at 5% Discount Rate)	14.09
Non-Construction Sales Tax Credit per SFE	\$172

Source: Total water/sewer project costs and sales tax funding for water sewer projects from City of Fayetteville, *Five Year Capital Improvements Program, 2000 - 2004*; percent of sales tax from construction materials for 1996-2000 from City Budget Office, October 8, 2001 memorandum; 2002 water SFEs from Table 13.

Maximum Impact Fees

The net cost per service unit is the capital cost to serve new customers, less any credits to account for existing capacity deficiencies or other revenues that will be generated by new development to pay for facilities benefitting existing customers. A credit was provided in the calculation of the cost of water storage facilities to account for existing capacity deficiencies in that component of the water system. Adding the costs per service unit of transmission lines, storage tanks and major distribution lines results in the total cost per service unit. Deducting the credit for debt payments attributable to facilities serving existing development and sales tax that will be generated by new development and used for water system capital improvements results in the net cost per service unit. This represents the maximum impact fee that can be charged to new customers of Fayetteville's water system.

Table 29
WATER NET COST PER SERVICE UNIT

Water Supply Cost per SFE	\$188
Net Storage Cost per SFE (After Deficiency Credit)	\$242
Line Cost per SFE (Buy-In Approach)	\$164
Total Cost per SFE	\$594
Debt Credit per SFE	\$105
Construction Sales Tax Credit per SFE (1.5%)	\$9
Non-Construction Sales Tax Credit per SFE	\$172
Net Cost per SFE	\$308

Source: Water supply cost from Table 15; storage cost from Table 22; distribution line cost from Table 25; debt credit from Table 27; construction sales tax credit is total cost times percent credit from Table 28; non-construction sales tax credit from Table 28.

While the impact fees for nonresidential development will be based on water meter size, the fees for residential uses will be assessed on a per dwelling unit basis. In general, water usage is proportional to the number of people, witness the widespread employment of per capita consumption ratios to project future water demand.⁵ Single-family units tend to have more residents than multi-family or mobile home units, and larger single-family units tend to have larger households than smaller homes. These relationships can be used to develop water (and wastewater) impact fees per dwelling unit that distinguish between types of housing and that also vary the fee for single-family units based on dwelling unit size.

The best available source of data on household size by unit size for single-family units in Fayetteville is still the 1990 U.S. Census. Comparable data from the 2000 census will not be available for another year. The 2000 census data that is available indicates that the average household size for all types of units in Fayetteville has declined only slightly since 1990, from 2.26 to 2.21 persons per unit, indicating that household sizes have been relatively stable.

The census has two variables that are related to dwelling unit size: rooms and bedrooms. Of the two, rooms was chosen as likely to be the more objective measure. The Census Bureau defines rooms as

⁵ U.S. Geological Survey, *Estimated Use of Water in the United States in 1995*, U.S. Government Printing Office, 1998

excluding hallways, bathrooms, porches and unfinished attics and basements. Average household sizes for single-family units by number of rooms was derived from the 1990 U.S. Census five-percent sample data. This data is available only for geographic areas of at least 100,000 population, and consequently it is only available for Washington County. However, the data for Washington County should be reasonably representative of Fayetteville, since Fayetteville's population was 37 percent of Washington County's population in 1990.

To convert single-family units with a certain number of rooms into square footage ranges, the consultant took a 50 percent sample of all single-family homes listed for sale in Fayetteville from the National Association of Realtors website (www.realtor.com). The on-line listings give square footage ranges and the number of rooms. A comparison of the distribution of units from the census with the distribution from the realtor website indicates that the realtors tend to report a higher number of rooms (6.4 rooms per unit on average, compared to 5.6 room from the census data). To adjust for this difference, the number of rooms reported by the realtors were reduced by one, and the resulting distributions were much more comparable. The results are displayed in Table 30.

Table 30
SINGLE-FAMILY UNIT SIZE

No. of Rooms*	Sample Size	Average (sq. ft.)	Range (sq. ft.)
4 or fewer	178	1,170	1,300 or less
5	187	1,506	1,301 to 1,700
6	131	1,881	1,701 to 2,300
7 or more	133	2,807	more than 2,300
Total	629		

*reduced by one to be comparable with census data

Source: 50% sample (every other 5 listings in order of asking price) of single-family units listed for sale in Fayetteville from www.realtor.com on March 5, 2002; ranges broken at approximate midpoints between averages.

The 1990 U.S. Census five-percent sample data include records for 1,613 single-family households in Washington County. These occupied dwelling units are distributed relatively evenly into four size categories based on the number of rooms in the unit. The average number of residents in each size category is shown in Table 31.

Table 31
SINGLE-FAMILY HOUSEHOLD SIZE BY ROOMS

No. of Rooms	Sample Size	Avg. Household Size
4 or fewer	281	1.97
5	578	2.49
6	382	2.81
7 or more	372	3.15
Total	1,613	

Source: 1990 U.S. Census 5% sample Public Use Micro Sample (PUMS) data for Washington County, AR.

The number of service units (single-family equivalents) associated with residential units by type and size (for single-family units only) are based on the ratio of average household size to the average household size of a typical single-family unit, which represents one service unit. Single-family units below 1,700 square feet tend to have smaller-than-average households and therefore represent less than one SFE, while larger units represent more than one service unit, as shown in Table 32.

Table 32
RESIDENTIAL WATER SERVICE UNITS

Housing Type	Average Household Size	SFEs/ Unit
Single-Family, up to 1,300 sq. ft.	1.97	0.82
Single-Family, 1,301 to 1,700 sq. ft.	2.49	1.04
Single-Family, 1,701 to 2,300 sq. ft.	2.81	1.18
Single-Family, more than 2,300 sq. ft.	3.15	1.32
Single-Family (average)	2.39	1.00
Multi-Family (average)	1.70	0.71
Mobile Home (average)	2.38	1.00

Source: Average household sizes for average single-family, multi-family and mobile home units from 2000 U.S. Census data for Fayetteville;; average household sizes for single-family units by size categories from Table 31; SFEs/unit is ratio of average household size of unit to average household size of average single-family unit.

As described earlier, a water service unit represents the water demand of a typical single-family connection, which is a 5/8" x 3/4" meter. The number of nonresidential service units associated with larger meters are based on the relative hydraulic capacity of the meter compared to the smallest meter size. The meter capacity ratios are based on safe maximum continuous duty flow standards promulgated by the American Water Works Association. These ratios, which represent the number of service units, or SFEs, associated with a meter of a given size, are shown in Table 33.

The maximum water impact fees are calculated by multiplying the service units per dwelling unit or per nonresidential meter by the net cost per service unit. The maximum fees calculated in this report are presented in Table 33.

Table 33
WATER MAXIMUM FEE SCHEDULE

Land Use (Dwelling Size or Meter Size)	Meter Capacity (gpm)	SFEs/ Unit or Meter	Net Cost/ SFE	Net Cost/ Unit or Meter
Single-Family (up to 1,300 sq. ft.)	n/a	0.82	\$308	\$253
Single-Family (1,301 to 1,700 sq. ft.)	n/a	1.04	\$308	\$320
Single-Family (1,701 to 2,300 sq. ft.)	n/a	1.18	\$308	\$363
Single-Family (more than 2,300 sq. ft.)	n/a	1.32	\$308	\$407
Single-Family Detached (average)	n/a	1.00	\$308	\$308
Multi-Family	n/a	0.71	\$308	\$219
Mobile Home	n/a	1.00	\$308	\$308
Nonresidential (5/8" x 3/4" Meter)	10	1.00	\$308	\$308
Nonresidential (1" Meter)	25	2.50	\$308	\$770
Nonresidential (1-1/2" Meter)	50	5.00	\$308	\$1,540
Nonresidential (2" Meter)	80	8.00	\$308	\$2,464
Nonresidential (3" Meter)	160	16.00	\$308	\$4,928
Nonresidential (4" Meter)	250	25.00	\$308	\$7,700
Nonresidential (6" Meter)	500	50.00	\$308	\$15,400
Nonresidential (8" Meter)	800	80.00	\$308	\$24,640
Nonresidential (10" Meter)	1,150	115.00	\$308	\$35,420

Source: SFEs per residential unit from Table 32; meter capacities are maximum safe continuous duty flows in gallons per minute from the American Water Works Association; SFEs per meter are ratios of meter capacities to capacity of smallest meter; net cost per SFE from Table 29.

The annual revenue that could be generated if the water impact fees are adopted at the maximum amount is estimated to be about \$340,000, as shown in Table 34.

Table 34
POTENTIAL ANNUAL WATER IMPACT FEE REVENUES

Net Cost per Single-Family Equivalent	\$308
Average Annual New Single-Family Units in Fayetteville, 1990-2001	352
Potential Annual Revenue from Fayetteville's Single-Family Growth	\$110,000
Fayetteville Single-Family Customers as Share of Total System Usage	32.2%
Potential Annual Water Impact Fee Revenue	\$340,000

Source: Net cost per SFE from Table 29; average new single-family units from Table 7; Fayetteville single-family customers' share of total water usage from Fayetteville Water and Sewer Department, "Consumption of Water Customers (Usage in 100 Gallons)," July 2000 through June 2001.

WASTEWATER

The City does not currently charge new wastewater customers an impact fee to help defray the off-site capital costs to the utility system associated with a new customer (the City does have a connection fee to cover costs associated with connecting to the system). Such a one-time, up-front fee, called by many names including capital recovery fee and system development charge, is one of the most common forms of development impact fees. While cities lack explicit statutory authority to impose water or wastewater impact fees in Arkansas, these fees have a long history and have been litigated in Arkansas. Consequently, there appears to be adequate legal authority for the City to impose wastewater impact fees.

Service Area

The City's wastewater treatment plant processes wastewater for the cities of Fayetteville, Elkins, Farmington, Greenland and parts of Johnson. The City also maintains the sewer collection systems for the cities of Farmington and Greenland, although the cities own the pipes. However, 95 percent of the wastewater treated by the City is generated within the city limits, as shown in Table 35.

Table 35
CURRENT WASTEWATER CUSTOMERS

Jurisdiction	June 2001 Usage (100 gal)	Percent
Fayetteville	2,552,797	95%
Elkins (wholesale)	15,591	1%
Farmington	84,961	3%
Greenland	22,656	1%
Johnson	7,513	0%
Total	2,683,518	100%

Source: Fayetteville Water and Sewer Department, "Consumption of Sewer Customers, June 2001."

As with the water system, it is recommended that the City's entire wastewater service area should be treated as a single impact fee service area. The arguments in favor of a single service area, laid out in detail in the water section, can be summarized as follows: (1) many siting and design decisions are discretionary rather than locational; (2) systems are often designed with redundant facilities for system reliability; (3) some facilities have no geographic-specific service area; and (4) revenue bonds are backed by system-wide revenues. The decision to implement a wastewater system improvement project with a split watershed concept, discussed in detail below, is an excellent illustration of the first point cited above. The City could expand the existing treatment plant and continue to use lift stations to transport sewage from the Illinois River basin, but instead has decided to construct a second plant on the west side of town. While this decision will result in two largely separate wastewater collection and treatment systems, the new plant to the west will create capacity for additional growth in the east by diverting flows from the existing plant. In these ways, it can be seen that the wastewater utility operates as a complete, integrated system. Therefore, a new customer who receives service from this system may reasonably be considered to be receiving sufficient benefit from the payment of an impact fee, thus meeting the benefit nexus of the rational nexus test.

Wastewater Demand

Two of the most significant measures of wastewater demand are average daily flow and average daily flow during the peak month (usually calculated as a 30-day moving average). Peak daily and hourly flows are also important for some components of the collection system. The 1997 *Fayetteville Wastewater Facility Plan* conducted an analysis of historic water usage from 1992 through 1995. From this analysis, the plan determined that peak month flows would be estimated based on a factor of 1.56 times average daily flows. Current annual average flow to the plant is estimated to be 11.8 mgd.⁶

The *Wastewater Facility Plan* projections of average daily flows for 2020 were based on a number of factors. Residential flows from Fayetteville were projected based on 1995-2020 population growth projections from the Northwest Arkansas Regional Planning Commission and a residential generation rate of 68 gallons per capita per day (gpcd). Flows from outlying areas were estimated based on projected population growth and historic flows. Most of the existing industrial flows are generated by the four largest industries—Pinnacle Foods, Tyson Foods, Mexican Original and Hiland Dairy (1.5 of 2.2 mgd). An additional two mgd was added to current industrial usage to allow for anticipated industrial growth. Future dry weather infiltration was projected using the existing ratio of 30 gpcd. The components of projected average daily wastewater flows are summarized in Table 36.

Table 36
WASTEWATER AVERAGE DAILY FLOW, 2020

City Population	85,090
Residential Flow per Capita (gpd)	68
City Residential Flow (mgd)	5.8
City Commercial Flow (mgd)	2.2
City Industrial Flow (mgd)	4.2
Elkins/Farmington/Greenland (mgd)	0.7
Dry Weather Infiltration (mgd)	2.6
Subtotal, Dry Weather Flow (mgd)	15.5
Wet Weather Inflow (mgd)	6.0
Total Average Daily Flow (mgd)	21.5

Source: CH2M-Hill, *Fayetteville Wastewater Facility Plan*, February 1997.

⁶City of Fayetteville, *Wastewater System Improvement Project, Overview of Project Facility Plan and Environmental Information Document*, RLF Project No. 05-CS-050760-03, September 20, 2001.

Service Unit

To calculate wastewater impact fees, the wastewater demand associated with different types of customers must be expressed in a common unit of measurement, called a "service unit." As with the water impact fee, the service unit for the wastewater impact fee is the "Single-Family Equivalent" customer, or SFE. An SFE is a common denominator that converts all classes of customers into a common unit of expression. As with the water impact fee, the wastewater impact fee for nonresidential uses will be based on the size of the water meter (or on an individual analysis of wastewater demand if no water meter is used). A wastewater SFE is the wastewater demand associated with the smallest water meter used in the system (5/8" by 3/4"), which is the meter typically used by a single-family residence.

In order to calculate the cost of various types of wastewater facilities to serve a service unit, it is necessary to determine the average amount of wastewater generated by a typical single-family unit. Dividing the average daily flows generated by single-family customers in Fayetteville during the most recent 12-month period (July 2000 through June 2001) by the estimated number of single-family dwelling units in Fayetteville in 2001 yields a reasonably good estimate of average daily wastewater demand per single-family equivalent service unit. Multiplying that by the 1.56 ratio of peak month to average daily demand provides the peak month demand per service unit. These calculations are summarized in Table 37.

Table 37
WASTEWATER DEMAND PER SERVICE UNIT

Average Daily Flows from Single-Family Customers, 2001 (gpd)	3,335,717
Estimated Single-Family Units in Fayetteville, 2001	12,922
Average Daily Flow per Single-Family Equivalent (gpd)	258
Peak Month Factor	1.56
Peak Month Flow per Single-Family Equivalent (gpd)	402

Source: City of Fayetteville, "Consumption of Sewer Customers," residential (single-family) users in Fayetteville, July 2000 through June 2001; 2001 single-family units in Fayetteville from Table 12; peak month factor from CH2M-Hill, *Fayetteville Wastewater Facility Plan*, February 1997.

The total number of existing service units served by the City's wastewater system can be estimated from current daily flow. Dividing that by the average daily flow per single-family equivalent yields the number of existing service units.

Table 38
WASTEWATER SERVICE UNITS

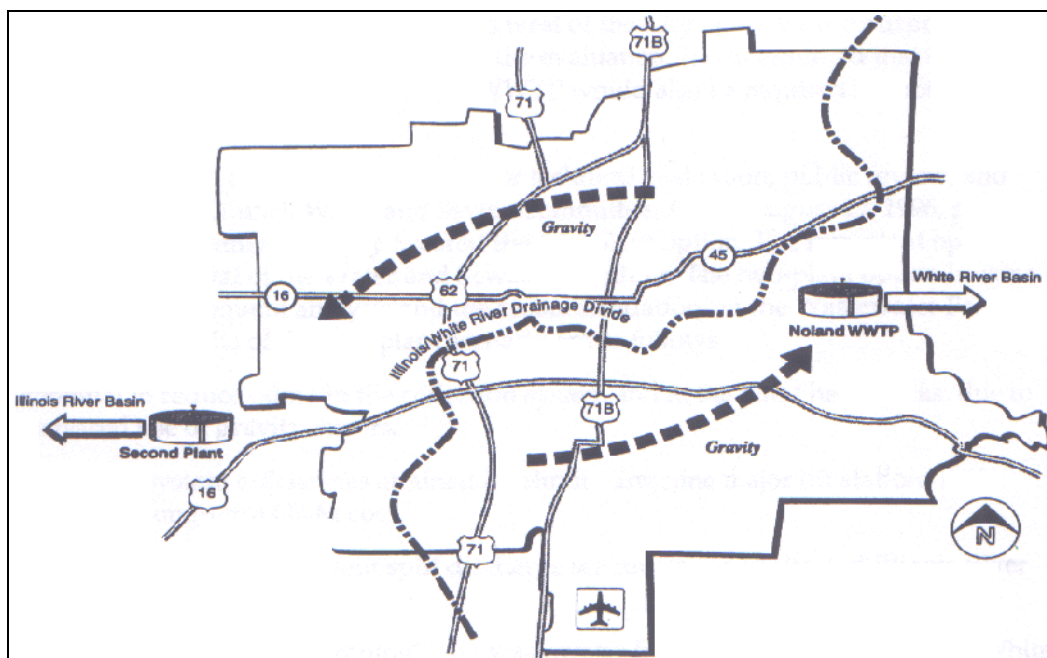
Average Daily Wastewater Flow (mgd)	11.80
Average Daily Flow per SFE (gpd)	258
Single-Family Equivalents	45,736

Source: Average daily flow City of Fayetteville, *Wastewater System Improvement Project, Overview of Project Facility Plan and Environmental Information Document*, RLF Project No. 05-CS-050760-03, September 20, 2001; average daily flow per SFE from Table 37.

Treatment Plant

The current Paul Noland Wastewater Treatment Plant was built in 1988, with a biological treatment capacity of 12.6 mgd. The City's *Wastewater Facility Plan*, originally completed in 1997 and updated this year, evaluated the alternatives of expanding the existing treatment plant versus building a second plant in the Illinois River basin. About half of the city is in the Illinois River basin, and currently wastewater from that basin is transferred by lift stations and force mains to the White River basin, where the Noland treatment plant is located. Locating a second treatment plant in the Illinois River basin would eliminate the need for several costly, high maintenance lift stations and allow most of the collection system to convert to gravity mains. While expanding the existing plant would be more cost-effective in terms of treatment costs, the second plant alternative would have offsetting savings in terms of lower collection system costs. In the recommended two-plant option, construction of the new treatment plant would establish a clear distinction between the flows from the two watersheds. Nine lift stations would be abandoned.

Figure 4
WATERSHEDS AND DIRECTIONS OF FLOWS



The new plant will add 10 mgd to the City's current treatment capacity, which will provide about the amount of new capacity required by the year 2020. The new treatment plant and its outfall line are currently estimated to cost \$42.5 million. Dividing the capital cost by the new average day capacity yields the cost per gallon per day. Finally, dividing that by the average daily flow per service unit results in the treatment plant cost per single-family equivalent (see Table 39).

Table 39
WASTEWATER TREATMENT COST PER SERVICE UNIT

New Treatment Plant and Outfall Line	\$42,500,000
New Average Day Capacity (gpd)	10,000,000
Cost per Gallon per Day	\$4.25
Average Daily Flow per SFE (gpd)	258
Treatment Plant Cost per SFE	\$1,097

Source: Treatment plant cost and new capacity from CH2M-Hill, *Fayetteville Wastewater Facility Plan*, February 1997 and 2001 update; flow per SFE from Table 37.

Collection System

Fayetteville's existing wastewater collection system consists of more than 400 miles of gravity sewers, 25 lift stations and 40 miles of force mains. The *Wastewater Collection System Master Plan*, which was prepared by RJN Group in April 1997, identifies new sewer lines and lift stations needed to serve the City's wastewater customers at the ultimate build-out of the City-defined service area. However, for the purposes of the wastewater facility plan, RJN Group provided additional analysis to define the year 2020 collection system improvement needs. The year 2020 improvements were further refined to reflect converting the Fayetteville system to a two-treatment plant configuration.

The reanalysis performed by RJN Group for the Wastewater Facility Plan reduced the total collection system cost from \$77.9 million for the ultimate build-out of the service area to \$39.2 million for 2020 conditions. However, some of the improvements to existing gravity mains are needed to address existing deficiencies in line capacity to reduce the incidence of sewer overflows.

The City's current policies on line extensions and developer cost participation can be briefly described as follows. When a line needs to be extended to provide service to a new development, developers pay only the cost of the line needed to serve the subdivision, which in most cases is an eight-inch line. If the line needs to be oversized to serve other developments, the City pays for the cost of the oversizing. In a few cases, the City has required subdivisions in an area to pay at the time of final plat to upgrade an overloaded lift station or to build parallel force main. If the projects are not built, the City will refund the money. For example, the City collected \$200 per lot from new subdivisions platted within one-half mile on either side of the Salem Road line to pay for the eight-inch parallel force main. If the City adopts wastewater impact fees that include the collection system costs, developers who participate in the cost of improvements identified in the City's collection system master plan should receive credit for such contributions against their impact fees.

Given the rather extensive deficiencies in the existing collection system that will be remedied by the planned improvements, it is recommended that the wastewater impact fees be limited to treatment plant costs. No credits would be due against this fee for developer improvements to the collection system.

Revenue Credits

The net cost per service unit is the capital cost to serve new customers, less any credits to account for existing capacity deficiencies or other revenues that will be generated by new development to pay for facilities benefitting existing customers. The analysis presented in this study excluded line costs and based the proposed fees solely on treatment plant costs. No significant capacity deficiencies or outstanding debt were identified for the existing treatment plant. Consequently, no revenue credits are due to account for retiring debt on the existing plant or remedying deficiencies.

The estimated cost of the new treatment plant and needed collection system improvements totals \$120 million. The primary funding source will be the 3/4 cent sales tax approved by referendum in November 2001 and slated to go into effect after the one-cent sales tax for the library ends in April 2002. The 3/4 cent sales tax will be used to repay a state revolving loan fund over a ten-year period.

The sales tax-supported state revolving loan will be enough to finance the City's entire \$120 million capital program. The wastewater impact fees would be earmarked exclusively to be used to help defray growth-related improvements to expand the City's wastewater treatment capacity. One alternative would be to use the impact fee revenues to retire the state revolving loan, which would allow the sales tax to expire earlier than would be the case without the impact fee.

As noted earlier in the water section, approximately six percent of all sales tax receipts are derived from the sale of construction materials, much of it for new construction. Consequently, the cost will be reduced by that percentage to account for the fact that new development will be paying a portion of the cost of expanded treatment capacity through payment of sales tax on construction materials.

In addition to paying sales tax on construction materials, new development will also generate a portion of the non-construction sales tax. Extrapolating Fayetteville's population growth during the 1990s, new development over the next 14 years that the sales tax to fund the wastewater improvements is in place would generate approximately 19 percent of the non-construction sales tax revenue. New development will generate, through non-construction sales tax, about 18 percent of the overall sales tax revenue that will be used to fund the wastewater improvements, as shown in Table 40.

Table 40
WASTEWATER SALES TAX CREDIT

Percent of New Development over 14 Years	38.10%
Average New Development Share	19.05%
Non-Construction Share of Sales Tax	94.00%
New Development's Non-Construction Sales Tax Share of Costs	17.91%

Source: Percent of new development over 14 years based on straight-line projection of 1990-2000 population growth from Table 6; average growth share is one-half of new development percentage.

Reducing the treatment plant cost per service unit by 6 percent to account for the construction sales tax and by another 18 percent to account for non-construction sales tax revenues that will be generated by new development during the period when the 3/4 cent sales tax will be in effect yields the net cost per service unit, as shown in Table 41.

Table 41
WASTEWATER NET COST PER SERVICE UNIT

Treatment Plant Cost per SFE	\$1,097
Credit for Construction Materials Sales Tax (6%)	\$66
Credit for Non-Construction Sales Tax (17.91%)	\$196
Total Net Cost per SFE	\$835

Source: Treatment plant cost from Table 39; credit based on percent of sales tax revenues received by Fayetteville from 1996-2000 from building construction, City Budget Office, October 8, 2001 memorandum.

Maximum Impact Fees

As described in the water section, wastewater impact fees for residential development will be charged on a per unit basis, and the single-family fee could be varied depending on the size of the dwelling unit. Nonresidential development will be charged on the basis of the number of service units associated with the water meter. A wastewater service unit, called a single-family equivalent or SFE, represents the wastewater demand of a typical single-family connection, which is a 5/8" x 3/4" meter. The service units associated with larger meters are based on the relative hydraulic capacity of the meter compared to the smallest meter size. The number of SFEs per meter is multiplied by the net capital cost per SFE to determine the maximum impact fee per meter, are shown in Table 42.

Table 42
WASTEWATER MAXIMUM FEE SCHEDULE

Land Use (Dwelling Size or Meter Size)	SFEs/ Unit or Meter	Net Cost/ SFE	Net Cost/ Unit or Meter
Single-Family (up to 1,300 sq. ft.)	0.82	\$835	\$685
Single-Family (1,301 to 1,700 sq. ft.)	1.04	\$835	\$868
Single-Family (1,701 to 2,300 sq. ft.)	1.18	\$835	\$985
Single-Family (more than 2,300 sq. ft.)	1.32	\$835	\$1,102
Single-Family Detached (average)	1.00	\$835	\$835
Multi-Family	0.71	\$835	\$593
Mobile Home	1.00	\$835	\$835
Nonresidential (5/8" x 3/4" Meter)	1.00	\$835	\$835
Nonresidential (1" Meter)	2.50	\$835	\$2,088
Nonresidential (1-1/2" Meter)	5.00	\$835	\$4,175
Nonresidential (2" Meter)	8.00	\$835	\$6,680
Nonresidential (3" Meter)	16.00	\$835	\$13,360
Nonresidential (4" Meter)	25.00	\$835	\$20,875
Nonresidential (6" Meter)	50.00	\$835	\$41,750
Nonresidential (8" Meter)	80.00	\$835	\$66,800
Nonresidential (10" Meter)	115.00	\$835	\$96,025

Source: SFEs per residential unit or meter size from Table 32; net cost per SFE from Table 41.

The annual revenue that could be generated if the wastewater impact fees are adopted at the maximum amount is estimated to be about \$730,000, as shown in Table 43.

Table 43
POTENTIAL ANNUAL WASTEWATER IMPACT FEE REVENUES

Net Cost per Single-Family Equivalent	\$835
Average Annual New Single-Family Units in Fayetteville, 1990-2001	352
Potential Annual Revenue from Fayetteville's Single-Family Growth	\$290,000
Fayetteville Single-Family Customers as Share of Total System Usage	39.8%
Potential Annual Wastewater Impact Fee Revenue	\$730,000

Source: Net cost per SFE from Table 41; average new single-family units from Table 7; Fayetteville single-family customers' share of total wastewater usage from Fayetteville Water and Sewer Department, "Consumption of Sewer Customers (Usage in 100 Gallons)," July 2000 through June 2001.

PARKS

Fayetteville provides a wide diversity of recreational areas and open space for its residents, from neighborhood and community parks to regional parks and trails. On November 14, 1995, the citizens passed a one-cent hotel, motel, restaurant (HMR) tax to implement the unfunded plans for existing and future park facilities.

The City's current park land dedication and fee in-lieu requirement has been litigated up to the state Supreme Court. Rather than attempt to develop park impact fees, our recommendation is that the City retain this system, and update it to reflect the current level of service as well as differences in household size by housing type.

Current Dedication Requirements

The City's subdivision regulations require developers of all new residential subdivisions to dedicate park land or pay a fee in-lieu of dedication. Major developments comprising more than 40 acres or more than 100 housing units are required to dedicate parkland unless no suitable park site is available. The dedication requirement per dwelling unit varies by housing type. The fee in-lieu of dedication is updated every two years based on the average cost of park land. In 1994, the fees were based on \$12,000 an acre. This was increased to \$15,000 per acre in November 1997 and subsequently to the current level of \$18,750 per acre in December 1999. The dedication requirements and current fees-in-lieu of dedication are shown in Table 44. The city is divided into four quadrants, which serve as benefit districts for expenditure of the fees-in-lieu (see Figure 7). The fee revenue is spent within three years in the benefit district in which it is collected. The fees may be spent on park land acquisition and development.

Figure 7
PARK FEE-IN-LIEU DISTRICTS

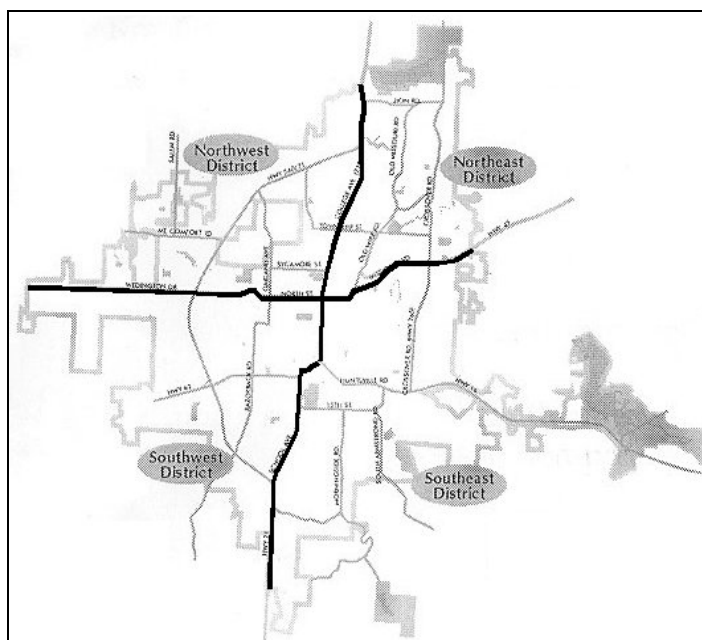


Table 44
CURRENT PARK DEDICATION REQUIREMENT/FEE-IN-LIEU

Housing Type	Acres/Unit	Cost/Acre	Fee/Unit
Single-Family	0.025	\$18,750	\$470
Multi-Family	0.020	\$18,750	\$375
Mobile Home	0.015	\$18,750	\$280

Source: Fayetteville Subdivision Regulations, Section 159.30(K), updated by Resolution 4199 passed November 11, 1999, effective December 10, 1999.

Household Size

The current dedication requirements for single-family and multi-family units accurately reflect the differences in average household sizes between owner-occupied and renter-occupied units. However, the correlation between housing type and tenure is not precise, and actual data on household size by housing type is available from the census and should be used. The source of the dedication requirement for mobile homes is less clear, and again this should be updated using available census data.

Current requirements are based on a national standard of 10 acres per thousand persons and average household sizes for owner and renter occupied units. There are a couple of problems here. One is the use of a national standard, rather than what the City actually provides, as the level of service, and this will be addressed in the next section. The main problem of concern here is that the ratios used are not comparable. This is true on three levels. First, the level of service is based on the ratio of acres of land to total permanent population, including group quarter residents. Second, the persons per unit ratios are based on the ratio of household population, excluding group quarters residents, to occupied units. Finally, the land requirement or fee-in-lieu per occupied unit is multiplied by the total number of new units. While some of these problems are counter-balancing to some extent (use of average household size excludes group quarters residents, but also implicitly assumes all new units will be occupied), the lack of comparability is troubling.

To address these problems, there is a need to develop a level of service standard that is equivalent to the persons per unit ratios used in the park land dedication and fee-in-lieu requirements. Our recommendation is to base the level of service (i.e., acres per person) on household population, excluding group quarters residents, while calculating the persons per unit ratios in terms of household population divided by total units, which includes vacant as well as occupied units.

Data from the 2000 census is the best available data on household population by housing type. The persons per unit ratios by housing type from the 2000 census are shown in Table 45.

Table 45
PERSONS PER HOUSING UNIT

Housing Type	Household Population	Total Units	Persons/ Unit
Single-Family	30,324	12,663	2.39
Multi-Family	20,118	11,808	1.70
Mobile Home	2,036	855	2.38
Total	52,478	25,326	2.07

Source: 2000 U.S. Census data for Fayetteville.

Existing Level of Service

The City has an excellent inventory of park land and facilities for the current effort to update the park master plan. This inventory should be used to ensure that the dedication requirement does not exceed the current level of service provided by the City.

Most park land dedication requirements are based on the needs for neighborhood and community parks. Regional parks are typically not addressed in land dedication requirements, since no development, no matter how large, is likely to contain a suitable dedication site large enough to be a regional park. In addition, the fee-in-lieu of dedication is based on an average cost per acre, which is likely to differ significantly between regional parks, which are normally in very large tracts, often with limited development potential, and neighborhood and community parks, which are often similar to developable residential tracts.

For this reason, the level of service will exclude regional parks. It will also exclude park sites that are on land owned by the school district. Undeveloped park sites owned by the City are included. Excluding regional parks and school-related facilities, the inventory of existing City neighborhood and community park sites, shown in Table 46, totals 564 acres.

Table 46
EXISTING PARK INVENTORY

Park Name	Park Type	Total Acres
Bayyari	Neighborhood (undev)	7.05
Braden	Neighborhood (undev)	2.25
Bundrick	Neighborhood	4.25
Butterfield Trail Expansion	Greenway	2.64
Clarence Craft	Neighborhood	4.75
Combs	Special use	87.00
Crossover	Undeveloped	20.00
Davis	Neighborhood	9.20
Eagle	Neighborhood (undev)	1.95
Finger	Neighborhood	19.00
Friendship	Mini (undeveloped)	0.38
Frisco	Mini (undeveloped)	0.57
Gary Hampton	Special Use	18.00
Gordon Long	Neighborhood	6.62
Greathouse	Neighborhood	6.00
Gregory	Neighborhood	19.38
Gulley Trail	Greenway	13.70
Gulley	Community	26.66
Hotz	Mini	0.60
Veterans Memorial	Community	40.00
Lake Fayetteville Softball	Community	21.26
Lewis Soccer	Special use	27.00
Mt. Sequoyah Gardens	Neighborhood (undev)	2.42
Mudcreek Trail	Greenway	19.92
Ozark View	Neighborhood (undev)	8.16
Ralph "Buddy" Hayes	Mini	0.40
Red Oak Park	Neighborhood	8.74

Park Name	Park Type	Total Acres
Ridgeway View	Greenway (undev)	6.00
Rocky Branch	Neighborhood (undev)	5.70
Routh	Neighborhood	1.64
Salem Village	Neighborhood (undev)	11.59
Square Gardens	Mini	0.33
Shiloh West	Greenway	0.46
Sweetbriar	Neighborhood	4.00
Trammel	Mini	0.70
Walker	Community	64.34
White River	Special use	49.24
Wildwood	Neighborhood (undev)	13.95
Wilson	Community	22.75
Youth Center	Neighborhood/Special Use	5.00
Total		563.60

Source: Lose and Associates, *Fayetteville Comprehensive Parks and Recreation Master Plan*, July 2001 draft (excludes school-owned facilities and regional parks); March 15, 2002 memo from Fayetteville Parks and Recreation Department.

The existing park level of service, based on the inventory of existing park land and an estimate of current household population, is 10.1 acres per thousand residents, as shown in Table 47.

Table 47
EXISTING PARK LEVEL OF SERVICE

Household Population, 1990	38,189
Household Population, 2000	52,697
Estimated Household Population, 2002	55,599
Acres of Neighborhood and Community Park Land	563.60
Acres per 1,000 Household Population	10.1

Source: 1990 and 2000 household population in Fayetteville from U.S. Census Bureau; estimated 2002 household population extrapolated, acres from Table 46.

Proposed Dedication Requirements

The land dedication requirements can be determined by multiplying the persons per unit associated with each housing unit by the existing level of service in terms of acres per person to determine the number of acres to be dedicated per housing unit. The fee in-lieu of dedication is determined by multiplying the dedication requirement by the average cost per acre. This has recently been determined to be \$23,125 per acre. The updated park dedication and fee-in-lieu requirements are shown in Table 48.

Table 48
PROPOSED PARK DEDICATION REQUIREMENT/FEE-IN-LIEU

Housing Type	Persons Unit	Acres/ 1,000 Pop.	Acres/ Unit	Cost/ Acre	Fee-in- Lieu/ Unit
Single-Family	2.39	10.1	0.024	\$23,125	\$555
Multi-Family	1.70	10.1	0.017	\$23,125	\$393
Mobile Home	2.38	10.1	0.024	\$23,125	\$555

Source: Persons per unit from Table 45; acres per 1,000 population from Table 47; cost per acre is average cost of residential land in the city from a survey of local realtors conducted by City of Fayetteville Parks and Recreation Department, September 12, 2001.

The revised dedication requirements are compared with the current requirements in Table 49. The acres required to be dedicated per dwelling unit would be unchanged for single-family development, would be reduced for multi-family units, and would be increased for mobile homes.

Table 49
PARK DEDICATION REQUIREMENT COMPARISON

Housing Type	Current Acres/Unit	Revised Acres/Unit	Percent Change
Single-Family	0.025	0.024	-4.0%
Multi-Family	0.020	0.017	-15.0%
Mobile Home	0.015	0.024	60.0%

Source: Current requirements from Table 44; revised requirements from Table 48.

The revised fees in-lieu of dedication are compared with the existing fees in Table 50. The fees would increase for single-family units and mobile homes, but decrease slightly for multi-family units.

Table 50
PARK FEE-IN-LIEU COMPARISON

Housing Type	Current Fee-in-Lieu	Revised Fee-in-Lieu	Percent Change
Single-Family	\$470	\$555	18.1%
Multi-Family	\$375	\$393	4.8%
Mobile Home	\$280	\$555	98.2%

Source: Current fees from Table 44; revised fees from Table 48.