Innovative approaches
Practical results
Outstanding service

2024 WATER AND WASTEWATER IMPACT FEE STUDY

Prepared for:

City of Grand Prairie

September 2024

Prepared by:

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FNI Project #: GRP22251

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EXECUTIVE SUMMARY

1.0 Background

Chapter 395 of the Texas Local Government Code (TLGC) requires an impact fee analysis be performed before impact fees can be created and assessed. Chapter 395 defines an impact fee as "a charge or assessment imposed by a political subdivision against new development in order to generate revenue for funding or recouping the costs of capital improvements or facility expansions necessitated by and attributable to the new development." In September 2001, Senate Bill 243 amended Chapter 395, thus creating the current procedure for implementing impact fees. The City of Grand Prairie's (City) impact fees have most recently been updated in 2017.

2.0 Land Use Assumptions

To assist the City in determining the need and timing of capital improvements to serve future development, a reasonable estimation of future growth is required. Growth and development projections were formulated based on assumptions pertaining to the type, location, quantity, and timing of various future land uses within the community. Projections were developed for the combined water and wastewater service area. The existing (2024) served population is estimated to be approximately 208,081. The projected 2034 population is approximately 245,567.

3.0 Capital Improvement Plan

An impact fee capital improvement plan (CIP) was developed for the City to ensure high quality water and wastewater service that promotes residential and non-residential development. The recommended improvements will provide the required capacity and reliability to meet projected water demands and wastewater flows through 2034. The impact fee eligible costs for the water system improvements are $10,669,165 and $110,790,790 for the North Sector and South Sector respectively. The impact fee eligible costs for the wastewater system improvements are $6,315,267 and $39,995,518 for the North Sector and South Sector respectively.

4.0 Impact Fee Analysis

The water and wastewater impact fee analysis involves determining the utilization of existing and proposed projects required, as defined by the CIP, to serve new development over the next 10 years. The

total projected costs include the projected 10-year capital costs, the projected financing costs for the capital improvements, and the consultant costs for preparing and updating the Impact Fee Study. The financing costs are based on the interest paid over a 20-year bond for proposed projects only. The interest rate assumed for the impact fee calculations was 5.0%. The calculated maximum allowable impact fees for the north and south sectors are as follows:

North Sector:

- Maximum allowable water impact fee for a 5/8 x 3/4-inch meter with 50% credit = $1,888
- Maximum allowable wastewater impact fee for a 5/8 x 3/4-inch meter with 50% credit = $1,117
- Total combined maximum allowable impact fee for a 5/8 x 3/4-inch meter with 50% credit = $3,005

South Sector:

- Maximum allowable water impact fee for a 5/8 x 3/4-inch meter with 50% credit = $4,780
- Maximum allowable wastewater impact fee for a 5/8 x 3/4-inch meter with 50% credit = $1,725
- Total combined maximum allowable impact fee for a 5/8 x 3/4-inch meter with 50% credit = $6,505

1.0 BACKGROUND

Chapter 395 of the Texas Local Government Code (TLGC) requires an impact fee analysis be performed before impact fees can be created and assessed. Chapter 395 defines an impact fee as "a charge or assessment imposed by a political subdivision against new development in order to generate revenue for funding or recouping the costs of capital improvements or facility expansions necessitated by and attributable to the new development." In September 2001, Senate Bill 243 amended Chapter 395 thus creating the current procedure for implementing impact fees. Chapter 395 identifies the following items as impact fee eligible costs:

- Construction contract price
- Surveying and engineering fees
- Land acquisition costs
- Fees paid to the consultant preparing or updating the capital improvement plan (CIP)
- Projected interest charges and other financing costs for projects identified in the CIP

Chapter 395 also identifies items that impact fees cannot be used to pay for, such as:

- Construction, acquisition, or expansion of public facilities or assets other than those identified in the impact fee CIP
- Repair, operation, or maintenance of existing or new capital improvements
- Upgrading, updating, expanding, or replacing existing capital improvements to serve existing development in order to meet stricter safety, efficiency, environmental, or regulatory standards
- Upgrading, updating, expanding, or replacing existing capital improvements to provide better service to existing development
- Administrative and operating costs of the political subdivision
- Principal payments and interest or other finance charges on bonds or other indebtedness, except as allowed above

The first step in the impact fee development process is the establishment of land use assumptions (LUA) that address growth and development for a 10-year planning period (TLGC Section 395.001(5)) for the years 2024-2034. The LUAs, which include population projections, will become the basis for the preparation of impact fee CIPs for water and wastewater facilities. This analysis is based on data contained in the *Land Use Assumptions and Capital Improvements Plan Report*, which was presented to the Impact Fee Advisory Committee on June 10, 2024 (included in **Appendix A**).

The purpose of this report is to address the methodology used in the development and calculation of water and wastewater impact fees for the City. The methodology used herein satisfies the requirements of the TLGC Chapter 395 for the establishment of impact fees.

Table 1-1 provides a list of abbreviations used in this report.

Table 1-1: List of Abbreviations

Abbreviation	Full Nomenclature
AWWA	American Water Works Association
CBG	Census Block Group
CIP	Capital Improvement Plan
ETJ	Extra-Territorial Jurisdiction
FNI	Freese and Nichols, Inc.
LUA	Land Use Assumption
MGD	Million Gallons per Day
SFLUE	Single Family Living Unit Equivalent
TLGC	Texas Local Government Code

2.0 LAND USE ASSUMPTIONS

Population and land use assumptions are important elements in the analysis of water and wastewater systems. To assist the City in determining the need and timing of capital improvements to serve future development, a reasonable estimation of future growth is required. Growth and future development projections were formulated based on assumptions pertaining to the type, location, quantity, and timing of various future land uses within the community. These land use assumptions, which include population and non-residential acreage projections, will become the basis for the preparation of impact fee CIPs for water and wastewater facilities.

2.1 SERVICE AREAS

Chapter 395 requires that service areas be defined for impact fees to ensure that facility improvements are located in close proximity to areas generating needs. Legislative requirements stipulate that water and wastewater service areas can extend to the entire city limits and extra-territorial jurisdiction (ETJ). An analysis including the ETJ was conducted in order to consider provision of water and wastewater service areas.

Figure 2-1 illustrates the water and wastewater service areas for the Grand Prairie Impact Fee Study. The water and wastewater service areas are bound by the existing city limits and ETJ.

North Sector

South Sector

0 4,500 9,000

SCALE IN FEET

FIGURE 2-1

CITY OF GRAND PRAIRIE

WATER & WASTEWATER SERVICE AREAS

LEGEND

Water/Wastewater Service Area

- North Sector
- South Sector
- Grand Prairie City Limit
- ETJ Boundary

- Road
- Railroad
- Stream
- Lake
- Other City Limit
- County Boundary

Grand Prairie TEXAS

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2.2 PROJECTED GROWTH

The *Land Use Assumptions and Capital Improvements Plan Report*, included in **Appendix A**, describes the methodology of the projected growth for the impact fee study. **Table 2-1** and **Table 2-2** below summarize the LUAs for the impact fee study. **Figure 2-2** presents the population projections by U.S Census Block Groups (CBG) within the water and wastewater service areas. **Figure 2-3** presents the non-residential acreage projections by CBG within the water and wastewater service area.

Table 2-1: City-Wide Population and Non-Residential Acreage Projections

Demographic	2024	2034	10-Year Growth	Percent Change
Population	208,081	245,567	37,486	18%
Non-Residential Acreage	8,724.62	12,659.81	3,935.19	45%

Table 2-2: Population and Non-Residential Acreage Projections by Service Area

Year	Population	Growth in Population	Population Compound Annual Growth Rate	Non-Residential Acreage	Growth in Non-Residential Acreage
North Sector					
2024	205,729	7,007	0.34%	8,685.96	1,745.53
2034	212,736			10,431.49	
South Sector					
2024	2,352	30,479	30.16%	38.66	2,189.66
2034	32,831			2,228.32	
Total					
2024	208,081	37,486	1.67%	8,724.62	3,935.19
2034	245,567			12,659.81	

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FIGURE 2-3

CITY OF GRAND PRAIRIE

10-YEAR NON-RESIDENTIAL ACREAGE PROJECTIONS BY CENSUS BLOCK GROUP

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3.0 CAPITAL IMPROVEMENT PLAN

An impact fee eligible CIP was developed for the City to ensure high quality water and wastewater service that promotes residential and non-residential development. The *Land Use Assumptions and Capital Improvements Plan Report*, included in **Appendix A**, describes the methodology used to determine the impact fee eligible CIP projects. The recommended improvements will provide the required capacity and reliability to meet 10-year projected water demands and wastewater flows through 2034. **Table 3-1** and **Table 3-2** below summarize the water demand projections and wastewater flows for the impact fee study.

Table 3-1: Projected Water Demands

Planning Year	Total Population	Non-Residential Acreage	Average Day Demand (MGD)	Maximum Day Demand (MGD)	Peak Hour Demand (MGD)
North Sector					
2024	205,729	8,685.96	28.00	47.60	71.41
2034	212,736	10,431.49	29.68	50.46	75.70
South Sector					
2024	2,352	38.66	0.36	0.72	1.08
2034	32,831	2,228.32	6.16	12.32	18.48
Total					
2024	208,081	8,724.62	28.36	48.32	72.49
2034	245,567	12,659.81	35.84	62.78	94.18

Table 3-2: Projected Wastewater Flows

Planning Year	Total Population	Non-Residential Acreage	Average Day Flow (MGD)	Peak Wet Weather Flow (MGD)
North Sector				
2024	205,729	8,685.96	24.92	99.68
2034	212,736	10,431.49	26.49	105.96
South Sector				
2024	2,352	38.66	0.25	1.00
2034	32,831	2,228.32	4.40	17.60
Total				
2024	208,081	8,724.62	25.17	100.68
2034	245,567	12,659.81	30.89	123.56

3.1 WATER AND WASTEWATER SYSTEM IMPROVEMENTS

Proposed water distribution and wastewater collection systems projects were developed utilizing the City's updated water and wastewater hydraulic models and the growth patterns developed for the LUAs. Summaries of the costs for each of the projects required for the 10-year period used in the impact fee analysis for both the North Sector and South Sector water and wastewater systems are shown in **Tables 3-3** through **3-6**.

The 2024 percent utilization is the portion of a project's capacity required to serve existing development. It is not included in the impact fee eligible analysis and cost calculation. The 2034 percent utilization is the portion of the project's capacity that will be required to serve the projected growth in the City's service area by 2034. The 2024-2034 percent utilization is the portion of the project's capacity required to serve development from 2024 to 2034. The portion of a project's total cost that is used to serve development projected to occur from 2024 through 2034 is calculated as the total actual cost multiplied by the 2024-2034 percent utilization. Only this portion of the cost is used in the impact fee analysis.

The 10-year water system impact fee eligible projects are shown on **Figure 3-1**. The 10-year wastewater system impact fee eligible projects are shown on **Figure 3-2**. City staff provided costs for the existing impact fee eligible projects. For proposed impact fee projects, planning-level costs were developed as part of the *2022 Wastewater Master Plan Update* and *2024 Water Master Plan Update*. FNI (Freese and Nichols, Inc.) has no control over the cost and labor, materials, equipment, or over the contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs are based on the information known at this time and represent only the engineer's judgment as a design professional familiar with the construction industry. FNI cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

The projected costs include construction, engineering, contingency, and financing. The financing costs are based on the compound interest paid over the 20-year bond for future projects only. The interest rate assumed for the impact fee calculations is 5.0%.

Table 3-3: Cost Allocation for Water Impact Fee Eligible CIP – North Sector

Proj. ID	Description of Project	Percent Utilization				Capital Cost	Financing Costs	Total Cost	Existing Customers (Not Eligible)	10-Year 2024-2034 (Eligible)	Beyond 2034 (Not Eligible)
		Existing Customers (2024)	10-Year Customers (2034)	10-Year Growth (2024-2034)	Beyond 2034						
EXISTING											
A	20-inch West Sara Jane Parkway Water Line	74%	85%	11%	15%	$429,437	$0	$429,437	$317,783	$47,238	$64,416
B	2.0 MG Peninsula Elevated Storage Tank	83%	92%	9%	8%	$2,640,804	$0	$2,640,804	$2,191,867	$237,672	$211,264
C	30-inch Highway 360 Water Line	58%	65%	7%	35%	$3,721,621	$0	$3,721,621	$2,158,540	$260,513	$1,302,567
D	42-inch Camp Wisdom Water Line	73%	83%	10%	17%	$1,069,595	$0	$1,069,595	$780,804	$106,959	$181,831
E	36-inch Lakeridge Parkway Water Line	76%	83%	7%	17%	$6,731,053	$0	$6,731,053	$5,115,600	$471,174	$1,144,279
F	30/24-inch Broad Street/England Parkway Water Line	79%	84%	5%	16%	$3,354,467	$0	$3,354,467	$2,650,029	$167,723	$536,715
G	12 MG Terminal Ground Storage Tank	39%	42%	3%	58%	$1,800,097	$0	$1,800,097	$702,038	$54,003	$1,044,056
H	30-inch South Great Southwest Parkway Water Line	74%	85%	11%	15%	$2,132,735	$0	$2,132,735	$1,578,224	$234,601	$319,910
I	Robinson Road EST and Pump Station Replacement and 30/36-inch Water Line	78%	82%	4%	18%	$18,843,450	$0	$18,843,450	$14,697,891	$753,738	$3,391,821
J	Highway 161 Frontage Road 12-inch Water Line	76%	84%	8%	16%	$4,048,000	$0	$4,048,000	$3,076,480	$323,840	$647,680
M	Water Impact Fee Update	0%	100%	100%	0%	$27,099	$0	$27,099	$0	$27,099	$0
Total Existing Water Capital Improvements Cost						**$44,798,357**	**$0**	**$44,798,357**	**$33,269,256**	**$2,684,561**	**$8,844,539**
PROPOSED											
2N	24-inch Great Southwest Parkway/North Carrier Parkway Water Line	71%	89%	18%	11%	$4,878,200	$2,577,788	$7,455,988	$5,293,752	$1,342,078	$820,159
5N	1.0 MGD Wholesale Supply Increase	0%	100%	100%	0%	$328,400	$173,536	$501,936	$0	$501,936	$0
6N	20.0 MGD of Wholesale Supply (11.2 MGD Supply Increase)	0%	26%	26%	74%	$3,677,700	$1,943,408	$5,621,108	$0	$1,461,488	$4,159,620
8N	8/12-inch I-30 Frontage Road Water Lines	74%	86%	12%	14%	$3,494,400	$1,846,547	$5,340,947	$3,952,300	$640,914	$747,733
9N	24-inch Duncan Perry/Egyptian Way Water Line	80%	89%	9%	11%	$8,670,500	$4,581,754	$13,252,254	$10,601,803	$1,192,703	$1,457,748
10N	12-inch Highway 161 Frontage Road Water Line	58%	84%	26%	16%	$7,160,400	$3,783,772	$10,944,172	$6,347,620	$2,845,485	$1,751,067
Total Proposed Water Capital Improvements Cost						**$28,209,600**	**$14,906,805**	**$43,116,405**	**$26,195,475**	**$7,984,604**	**$8,936,327**
Total Water Capital Improvements Cost						**$73,007,957**	**$14,906,805**	**$87,914,762**	**$59,464,732**	**$10,669,165**	**$17,780,866**

Notes: Utilization in 2024 on Proposed Projects indicates a portion of the project that will be used to address deficiencies within the existing system, and therefore is not eligible for impact fee cost recovery for future growth.
Financing cost for proposed projects is based on a 20-year bond at 5% interest rate.

Table 3-4: Cost Allocation for Water Impact Fee Eligible CIP – South Sector

Proj. ID	Description of Project	Percent Utilization				Capital Cost	Financing Costs	Total Cost	Existing Customers (Not Eligible)	10-Year 2024-2034 (Eligible)	Beyond 2034 (Not Eligible)
		Existing Customers (2024)	10-Year Customers (2034)	10-Year Growth (2024-2034)	Beyond 2034						
EXISTING											
K	36-inch Mansfield Water Supply Line Phase 1	3%	28%	25%	72%	$5,832,122	$0	$5,832,122	$174,964	$1,458,030	$4,199,128
L	Heritage Pump Station and 2.0 MG Heritage Ground Storage Tank	10%	70%	60%	30%	$11,016,228	$0	$11,016,228	$1,101,623	$6,609,737	$3,304,868
M	Water Impact Fee Update	0%	100%	100%	0%	$27,099	$0	$27,099	$0	$27,099	$0
Total Existing Water Capital Improvements Cost						**$16,875,449**	**$0**	**$16,875,449**	**$1,276,586**	**$8,094,866**	**$7,503,996**
PROPOSED											
1S	24-inch SH-360 Water Line Extension Phase 3	0%	51%	51%	49%	$5,401,000	$2,854,052	$8,255,052	$0	$4,210,076	$4,044,975
2S	16-inch Miller Road Water Line	0%	100%	100%	0%	$7,238,400	$3,824,989	$11,063,389	$0	$11,063,389	$0
3S	2.0 MG Lakeview Drive Elevated Storage Tank	7%	41%	34%	59%	$19,500,000	$10,304,390	$29,804,390	$2,086,307	$10,133,492	$17,584,590
4S	12-inch Lakeview / Miller Road	0%	19%	19%	81%	$3,182,400	$1,681,676	$4,864,076	$0	$924,175	$3,939,902
5S	24-inch Auger Road Water Line	0%	31%	31%	69%	$13,476,700	$7,121,496	$20,598,196	$0	$6,385,441	$14,212,755
6S	4.0 MGD Pump Station and 2.0 MG Ground Storage Tank	0%	71%	71%	29%	$13,728,000	$7,254,290	$20,982,290	$0	$14,897,426	$6,084,864
7S	24/30-inch Delivery Point A U.S. 287 / Delivery Point C Auger WTP Water Line	0%	15%	15%	85%	$6,525,700	$3,448,377	$9,974,077	$0	$1,496,112	$8,477,966
8S	16-inch Ram Trail Water Line	0%	50%	50%	50%	$11,044,800	$5,836,406	$16,881,206	$0	$8,440,603	$8,440,603
9S	16/20-inch Old Fort Worth Road Water Line	0%	34%	34%	66%	$8,068,400	$4,263,586	$12,331,986	$0	$4,192,875	$8,139,111
10S	24-inch Water Line North of Padera Lake	0%	19%	19%	81%	$5,803,200	$3,066,586	$8,869,786	$0	$1,685,259	$7,184,527
11S	12-inch US 287 Water Line	0%	13%	13%	87%	$3,978,000	$2,102,095	$6,080,095	$0	$790,412	$5,289,683
12S	12-inch Soap Creek Water Line	0%	14%	14%	86%	$1,404,000	$741,916	$2,145,916	$0	$300,428	$1,845,488
13S	16/20-inch Lake View Water Line	0%	29%	29%	71%	$1,060,800	$560,559	$1,621,359	$0	$470,194	$1,151,165
14S	20-inch County Road 506 Water Line	0%	21%	21%	79%	$5,678,400	$3,000,638	$8,679,038	$0	$1,822,598	$6,856,440
15S	16-inch County Road 506 Water Line	0%	30%	30%	70%	$2,636,400	$1,393,153	$4,029,553	$0	$1,208,866	$2,820,687
16S	16-inch Mountain Creek Water Line	0%	21%	21%	79%	$3,151,200	$1,665,189	$4,816,389	$0	$1,011,442	$3,804,948
17S	12/16-inch Prairie Ridge Boulevard Water Line	0%	42%	42%	58%	$4,187,100	$2,212,590	$6,399,690	$0	$2,687,870	$3,711,820
18S	12-inch 775 Pressure Plane Water Line	0%	15%	15%	85%	$1,872,000	$989,221	$2,861,221	$0	$429,183	$2,432,038
19S	18-inch Heritage Parkway Water Line	0%	44%	44%	56%	$4,914,000	$2,596,706	$7,510,706	$0	$3,304,711	$4,205,995
20S	20-inch David to Cypress Road Water Line	0%	28%	28%	72%	$8,143,200	$4,303,113	$12,446,313	$0	$3,484,968	$8,961,345
21S	24-inch State Highway 2 Water Line Phase 1	0%	26%	26%	74%	$13,909,000	$7,349,936	$21,258,936	$0	$5,527,323	$15,731,613
22S	24-inch State Highway 2 Water Line Phase 2	0%	25%	25%	75%	$9,594,000	$5,069,760	$14,663,760	$0	$3,665,940	$10,997,820
23S	24-inch State Highway 2 Water Line Phase 3	0%	26%	26%	74%	$5,896,800	$3,116,047	$9,012,847	$0	$2,343,340	$6,669,507
24S	2.0 MG Proposed Elevated Storage Tank	0%	41%	41%	59%	$19,500,000	$10,304,390	$29,804,390	$0	$12,219,800	$17,584,590
Total Proposed Water Capital Improvements Cost						**$179,893,500**	**$95,061,164**	**$274,954,664**	**$2,086,307**	**$102,695,924**	**$170,172,432**
Total Water Capital Improvements Cost						**$196,768,949**	**$95,061,164**	**$291,830,113**	**$3,362,894**	**$110,790,790**	**$177,676,428**

Notes: Utilization in 2024 on Proposed Projects indicates a portion of the project that will be used to address deficiencies within the existing system, and therefore is not eligible for impact fee cost recovery for future growth.
Financing cost for proposed projects is based on a 20-year bond at a 5% interest rate.

Table 3-5: Cost Allocation for Wastewater Impact Fee Eligible CIP – North Sector

Proj. ID	Description of Project	Percent Utilization				Capital Cost	Financing Cost	Total Cost	Existing Customers (Not Eligible)	10-Year 2024-2034 (Eligible)	Beyond 2034 (Not Eligible)
		Existing Customers (2024)	10-Year Customers (2034)	10-Year Growth (2024-2034)	Beyond 2034						
EXISTING											
A	10/12/15/18-inch Cherokee Trail Gravity Main	87%	88%	1%	12%	$276,640	$0	$276,640	$240,677	$2,766	$33,197
B	Robinson Road 8/12-inch Gravity Main	47%	70%	23%	30%	$218,908	$0	$218,908	$102,887	$50,349	$65,672
C	Fargo Drive 18/24-inch Gravity Main	83%	91%	8%	9%	$203,105	$0	$203,105	$168,577	$16,248	$18,280
D	Wisdom Road 21/24-inch Gravity Main	85%	87%	2%	13%	$1,012,970	$0	$1,012,970	$861,025	$20,259	$131,687
E	East Avenue K 10/12/18-inch Gravity Main	83%	89%	6%	11%	$2,564,917	$0	$2,564,917	$2,128,881	$153,895	$282,141
F	Northeast 5th Street 10/12/15/18-inch Gravity Main	75%	77%	2%	23%	$276,640	$0	$276,640	$207,480	$5,533	$63,627
J	Wastewater Impact Fee Update	0%	100%	100%	0%	$27,099	$0	$27,099	$0	$27,099	$0
Total Existing Wastewater Capital Improvements Cost						**$4,580,280**	**$0**	**$4,580,280**	**$3,709,527**	**$276,149**	**$594,604**
PROPOSED											
1	East Shady Grove Road 10/12/18/21-inch Gravity Main	47%	55%	8%	45%	$2,430,000	$1,284,085	$3,714,085	$1,745,620	$297,127	$1,671,338
2	West Shady Grove Road 15/18/21-inch Gravity Main (Phase 1)	75%	87%	12%	13%	$3,980,000	$2,103,152	$6,083,152	$4,562,364	$729,978	$790,810
3	Grand Lakes Boulevard 12/15/18/21-inch Gravity Mains	75%	87%	12%	13%	$3,570,000	$1,886,496	$5,456,496	$4,092,372	$654,780	$709,344
4	Rock Island 12/18/21-inch Gravity Mains (Phase 1)	36%	67%	31%	33%	$3,740,000	$1,976,329	$5,716,329	$2,057,878	$1,772,062	$1,886,389
5	Highschool Drive 12/15/18/24/27/30-inch Gravity Main	76%	79%	3%	21%	$5,130,000	$2,710,847	$7,840,847	$5,959,044	$235,225	$1,646,578
6	Rock Island 8/12-inch Gravity Mains (Phase 2)	48%	73%	25%	27%	$650,000	$343,480	$993,480	$476,870	$248,370	$268,239
7	West Shady Grove Road 12/15-inch Gravity Main (Phase 2)	75%	87%	12%	13%	$2,700,000	$1,426,762	$4,126,762	$3,095,071	$495,211	$536,479
8	Trinity Boulevard 15-inch Gravity Main	62%	80%	18%	20%	$2,360,000	$1,247,095	$3,607,095	$2,236,399	$649,277	$721,419
9	Performance Lift Station Expansion and 21-inch Gravity Main	60%	79%	19%	21%	$2,001,000	$1,057,389	$3,058,389	$1,835,033	$581,094	$642,262
12	Idlewild Road 15-inch Gravity Main	68%	83%	15%	17%	$1,640,000	$866,626	$2,506,626	$1,704,505	$375,994	$426,126
Total Proposed Wastewater Capital Improvements Cost						**$28,201,000**	**$14,902,261**	**$43,103,261**	**$27,765,158**	**$6,039,118**	**$9,298,985**
Total Wastewater Capital Improvements Cost						**$32,781,280**	**$14,902,261**	**$47,683,541**	**$31,474,685**	**$6,315,267**	**$9,893,589**

Notes: Utilization in 2024 on Proposed Projects indicates a portion of the project that will be used to address deficiencies within the existing system, and therefore is not eligible for impact fee cost recovery for future growth.
Financing cost for proposed projects is based on a 20-year bond at a 5% interest rate.

Table 3-6: Cost Allocation for Wastewater Impact Fee Eligible CIP – South Sector

Proj. ID	Description of Project	Percent Utilization				Capital Cost	Financing Cost	Total Cost	Existing Customers (Not Eligible)	10-Year 2024-2034 (Eligible)	Beyond 2034 (Not Eligible)
		Existing Customers (2024)	10-Year Customers (2034)	10-Year Growth (2024-2034)	Beyond 2034						
EXISTING											
G	Gifco Lift Station and 18-inch Force Main	41%	100%	59%	0%	$3,885,002	$0	$3,885,002	$1,592,851	$2,292,151	$0
H	Soap Creek Phase 1 42/48-inch Gravity Main	14%	49%	35%	51%	$6,682,954	$0	$6,682,954	$935,614	$2,339,034	$3,408,307
I	Soap Creek Phase 2 24/30-inch Gravity Main	4%	54%	50%	46%	$2,650,000	$0	$2,650,000	$106,000	$1,325,000	$1,219,000
J	Wastewater Impact Fee Update	0%	100%	100%	0%	$27,099	$0	$27,099	$0	$27,099	$0
Total Existing Wastewater Capital Improvements Cost						**$13,245,055**	**$0**	**$13,245,055**	**$2,634,464**	**$5,983,284**	**$4,627,307**
PROPOSED											
SS-1	Firefly Center 18-inch Gravity Main	31%	84%	53%	16%	$3,060,000	$1,616,997	$4,676,997	$1,449,869	$2,478,808	$748,320
SS-2	Davis Road 12/18-inch Gravity Main	11%	64%	53%	36%	$8,630,000	$4,560,353	$13,190,353	$1,450,939	$6,990,887	$4,748,527
SS-3	Rolling Meadows Drive 12-inch Gravity Main	37%	64%	27%	36%	$2,890,000	$1,527,163	$4,417,163	$1,634,350	$1,192,634	$1,590,179
SS-4	Miller Road 15-inch Gravity Main	0%	69%	69%	31%	$3,375,000	$1,783,452	$5,158,452	$0	$3,559,332	$1,599,120
SS-5	South Lakesong 24-inch Gravity Main	0%	15%	15%	85%	$1,800,000	$951,174	$2,751,174	$0	$412,676	$2,338,498
SS-6	Lakeview Road 15-inch Gravity Main	0%	54%	54%	46%	$2,106,000	$1,112,874	$3,218,874	$0	$1,738,192	$1,480,682
SS-8	Cypress Road 36-inch Gravity Main	0%	52%	52%	48%	$17,712,000	$9,359,556	$27,071,556	$0	$14,077,209	$12,994,347
SS-9	State Highway 2 15-inch Gravity Main	0%	65%	65%	35%	$3,330,000	$1,759,673	$5,089,673	$0	$3,308,287	$1,781,386
SS-10	North Lakesong 12-inch Gravity Main	0%	14%	14%	86%	$1,188,000	$627,775	$1,815,775	$0	$254,209	$1,561,566
Total Proposed Wastewater Capital Improvements Cost						**$44,091,000**	**$23,299,017**	**$67,390,017**	**$4,535,158**	**$34,012,234**	**$28,842,625**
Total Wastewater Capital Improvements Cost						**$57,336,055**	**$23,299,017**	**$80,635,072**	**$7,169,623**	**$39,995,518**	**$33,469,932**

Notes: Utilization in 2024 on Proposed Projects indicates a portion of the project that will be used to address deficiencies within the existing system, and therefore is not eligible for impact fee cost recovery for future growth.
Financing cost for proposed projects is based on a 20-year bond at a 5% interest rate.


FIGURE 3-1
CITY OF GRAND PRAIRIE
WATER SYSTEM
IMPACT FEE ELIGIBLE
CAPITAL IMPROVEMENTS PLAN
LEGEND
Proposed IF Eligible Improvements
Pump Station
Ground Storage Tank
Elevated Storage Tank
Midlothian Delivery Point
Water Line
Existing IF Eligible Improvements
Pump Station
Ground Storage Tank
Elevated Storage Tank
Water Line
Existing Water System
Wholesale Meter
Transfer Valve
Groundwater Well
Pump Station
Ground Storage Tank
Elevated Storage Tank
10" and Smaller Water Line
12" and Larger Water Line
Water Supply Line
Ellis County FWSD 1 Water Line
Midlothian Water Lines
10" and Smaller Water Line
12" and Larger Water Line
Mansfield Water Lines
10" and Smaller Water Line
12" and Larger Water Line
Road
Railroad
Stream
Lake
Parcel
City Limit
ETJ Boundary
County Boundary
South Sector Service Area
PRESSURE PLANES
639 Pressure Plane
660 Pressure Plane
720 Pressure Plane
775 Pressure Plane
M Impact Fee Update
660 PRESSURE PLANE
639 PRESSURE PLANE
720 PRESSURE PLANE
775 PRESSURE PLANE
North Sector
South Sector
FORT WORTH WATER SUPPLY
DALLAS NORTH WATER SUPPLY
1.0 MGD SUPPLY INCREASE
20.0 MGD TOTAL SUPPLY
(11.2 MGD SUPPLY INCREASE)
DALLAS SOUTH WATER SUPPLY
MANSFIELD WATER SUPPLY
MIDLOTHIAN TAYMAN WATER SUPPLY
2.0 MG 109th St. Elevated Storage Tank Overflow Elev. = 660'
Duncan Perry Transfer Valve
Small Hill (1) - 5.0 MG Ground Storage Tank (1) - 8.0 MG Ground Storage Tank
Small Hill Pump Station 639' PP Firm Capacity: 8.0 MGD 660' PP Firm Capacity: 24.9 MGD
0.5 MG Small Hill Elevated Storage Tank Overflow Elev. = 639'
1.5 MG Bowles Elevated Storage Tank Overflow Elev. = 639'
2.0 MG Robinson Rd. Elevated Storage Tank Overflow Elev. = 660'
Robinson Rd. Pump Station Firm Capacity: 14.4 MGD (3) - 5,000 gpm Pumps
Freetown Transfer Valve
2.0 MG Traders Village Elevated Storage Tank Overflow Elev. = 720'
Carrier Transfer Valve
Camp Wisdom Flow Control Valve
Terminal 2 - 12.0 MG Ground Storage Tanks
Terminal 12.0 MG Ground Storage Tanks
2.0 MG Peninsula Elevated Storage Tank Overflow Elev. = 720'
Heritage Pump Station Firm Capacity: 6.0 MGD 2.0 MG Ground Storage Tank
Koscher Pressure Reducing Valve
Proposed 2.0 MG Tank Elevated Storage Tank Overflow Elev. = 775'
Proposed 2.0 MG Lakeview Dr. Elevated Storage Tank Overflow Elev. = 775'
Proposed Midlothian Pump Station Firm Capacity: 4.0 MGD 2.0 MG Ground Storage Tank
2.0 MGD SUPPLY INCREASE
PROPOSED DELIVERY POINT C AUGER WTP (GRP Participation)
DELIVERY POINT A US 287 (For Emergency Supply Only)
PROPOSED MIDLOTHIAN DELIVERY POINT D (For Emergency Supply Only)
Euless
Fort Worth
Irving
Arlington
Dallas
Duncanville
Cedar Hill
Mansfield
Midlothian
Venus
MOUNTAIN CREEK LAKE
JOE POOL LAKE
TARRANT CO.
DALLAS CO.
JOHNSON CO.
ELLIS CO.
SCALE IN FEET
0 3,000 6,000
Grand Prairie TEXAS
FREESE NICHOLS

FIGURE 3-2
CITY OF GRAND PRAIRIE
WASTEWATER COLLECTION SYSTEM IMPACT FEE ELIGIBLE CAPITAL IMPROVEMENTS PLAN

J Impact Fee Update

LEGEND

Existing IF Eligible Improvements
- Lift Station
- Wastewater Line
- Force Main

Existing Wastewater System
- Manhole
- Lift Station
- 10" and Smaller Wastewater Line
- 12" and Larger Wastewater Line
- Force Main

Other Wastewater System
- Lift Station
- Wastewater Treatment Plant
- 10" and Smaller Wastewater Line
- 12" and Larger Wastewater Line
- Force Main
- Road
- Railroad
- Stream
- Lake
- City Limit
- ETJ Boundary
- Other City Limit
- County Boundary

WATERSHEDS
- Bear Creek
- North Mountain Creek
- South Mountain Creek

PROPOSED IMPACT FEE ELIGIBLE IMPROVEMENTS
- Lift Station
- Wastewater Line
- Force Main

0 3,000 6,000
SCALE IN FEET

GRAND PRAIRIE TEXAS

FREESE AND NICHOLS

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Updated: Thursday, August 15, 2024 12:08 PM
User Name: I24249

4.0 IMPACT FEE ANALYSIS

The water and wastewater impact fee analysis involves determining the eligible proportion of total projected costs to serve new development and the projected number of service units attributed to new development over the next 10 years. The total projected costs include the projected 10-year capital costs, the projected financing cost for the capital improvements, and the consultant cost for preparing and updating the Impact Fee Study, as summarized in **Section 3.1**.

4.1 SERVICE UNITS

The maximum allowable impact fee is calculated by dividing the eligible CIP costs (minus a credit) by the total number of service units attributed to new development during the impact fee eligibility period. A water service unit is defined as the single-family living unit equivalent (SFLUE) to a water connection for a single-family residence. The City does not directly meter wastewater flows and bills for wastewater services are based on the customer's water consumption. Therefore, a wastewater service unit is defined as the wastewater service provided to a customer with a water connection for a single-family residence.

The service equivalent associated with multi-family residential, public, commercial, and industrial connections is converted to service units based upon the capacity of the meter used to provide service. The number of service units required to represent each meter size is based on the maximum rated capacity of the meters as shown from American Water Works Association (AWWA) Standards C700 and C702. The service unit equivalent for each meter size is listed in **Table 4-1**.

Table 4-1: Single Family Living Unit Equivalency Table

Meter Size	Meter Type	Maximum Safe Operating Capacity[1] (gpm)	Single Family Living Unit Equivalents
5/8" x 3/4"	Displacement	15	1.0
3/4"	Displacement	25	1.7
1"	Displacement	40	2.7
1.5"	Displacement	50	3.3
2"	Displacement	100	6.7
3"	Compound	320	21.3
4"	Compound	500	33.3
6"	Compound	1,000	66.7
8"	Compound	1,600	106.7
10"	Compound	2,300	153.3

[1]Safe maximum operating capacity is based on AWWA standards C700 and C702.

Table 4-2 and **Table 4-3** detail the water and wastewater service units for 2024 and the projected service units for 2034 for the North and South Sectors, respectively. The base meter size for single-family homes in Grand Prairie is assumed to be a 5/8 x 3/4-inch water meter. Larger meters represent public, commercial, and industrial water use. The City provided current meter data that included the meter size and type of each active water meter. The growth in water meters was projected using the LUAs from **Section 2.2**. The growth in service units was determined by subtracting the existing service units from the projected 2034 service units and resulted in a growth of 2,825 water and wastewater SFLUEs in the North Sector and 11,588 water and wastewater SFLUEs in the South Sector, over the 10-year impact fee eligible period.

Table 4-2: North Sector SFLUE Projections

Meter Size	2024		2034		Growth in Single Family Living Unit Equivalents
	Number of Meters	Service Unit Equivalents	Number of Meters	Service Unit Equivalents	
5/8” x 3/4"	47,412	47,412	49,027	49,027	1,615
3/4"	0	0	0	0	0
1"	1,735	4,685	1,794	4,844	159
1 1/2"	788	2,600	815	2,690	90
2"	2,357	15,792	2,437	16,328	536
3"	119	2,535	123	2,620	85
4"	96	3,197	99	3,297	100
6"	62	4,135	64	4,269	134
8"	25	2,668	26	2,774	106
10”	3	460	3	460	0
Total	**52,597**	**83,484**	**54,388**	**86,309**	**2,825**

Table 4-3: South Sector SFLUE Projections

Meter Size	2024		2034		Growth in Single Family Living Unit Equivalents
	Number of Meters	Service Unit Equivalents	Number of Meters	Service Unit Equivalents	
5/8” x 3/4"	647	647	9,031	9,031	8,384
3/4"	0	0	0	0	0
1"	15	41	209	564	524
1 1/2"	4	13	56	185	172
2"	4	27	56	375	348
3"	2	43	28	596	554
4"	1	33	14	466	433
6"	1	67	14	934	867
8"	0	0	0	0	0
10”	1	153	3	460	307
Total	**675**	**1,024**	**9,411**	**12,611**	**11,587**

4.2 MAXIMUM IMPACT FEE CALCULATION

Chapter 395 of the TLGC states that the maximum allowable impact fee may not exceed the amount determined by dividing the cost of capital improvements required by the total number of service units attributed to new development during the impact fee eligibility period less a credit to account for water and wastewater revenues used to finance capital improvement plans. The credit can either be determined through a detailed financial credit analysis process or by assuming 50% of the impact fee eligible cost. The City chose to assume 50% of the impact fee eligible cost for this study. The maximum allowable impact fee calculations are summarized below:

NORTH SECTOR

Maximum Allowable Water Impact Fee (North Sector):

Existing CIP Eligible Cost:	$2,684,561
Future CIP Eligible Cost:	$7,984,604
Total Eligible Costs:	$10,669,165
Total Water Impact Fee Credit (50%):	$5,334,582

The total eligible cost associated with the existing and proposed water system improvements to meet projected growth over the next 10 years in the North Sector is $10,669,165. The increase in the number of service units due to growth over the next 10 years in the North Sector is projected as 2,825 SFLUEs.

$$\text{Maximum Allowable Water Impact Fee with 50\% Credit} = \frac{\text{Total Eligible Cost} - \text{Credit}}{\text{10-year growth in SFLUEs}}$$

$$= \frac{\$10,669,165 - \$5,334,582}{2,825 \text{ SFLUE}}$$

$$= \textbf{\$1,888 / SFLUE}$$

Maximum Allowable Wastewater Impact Fee (North Sector):

Existing CIP Eligible Cost:	$276,149
Future CIP Eligible Cost:	$6,039,118
Total Eligible Costs:	$6,315,267
Total Wastewater Impact Fee Credit (50%):	$3,157,634

The total eligible cost associated with the existing and proposed wastewater system improvements to meet projected growth over the next 10 years in the North Sector is $6,315,267. The increase in the

number of service units due to growth over the next 10 years in the North Sector is projected as 2,825 SFLUEs.

$$\text{Maximum Allowable Wastewater Impact Fee with 50\% Credit} = \frac{\text{Total Eligible Cost} - \text{Credit}}{\text{10-year growth in SFLUEs}}$$

$$= \frac{\$6{,}315{,}267 - \$3{,}157{,}634}{2{,}825 \text{ SFLUE}}$$

$$= \textbf{\$1,117 / SFLUE}$$

The combined maximum allowable water and wastewater impact fee for the North Sector is $3,005 for a 5/8 x 3/4-inch meter.

SOUTH SECTOR

Maximum Allowable Water Impact Fee (South Sector):

Existing CIP Eligible Cost:	$8,094,866
Future CIP Eligible Cost:	$102,695,924
Total Eligible Costs:	$110,790,790
Total Water Impact Fee Credit (50%):	$55,395,395

The total eligible cost associated with the existing and proposed water system improvements to meet projected growth over the next 10 years in the South Sector is $110,790,790. The increase in the number of service units due to growth over the next 10 years in the South Sector is projected as 11,587 SFLUEs.

$$\text{Maximum Allowable Water Impact Fee with 50\% Credit} = \frac{\text{Total Eligible Cost} - \text{Credit}}{\text{10-year growth in SFLUEs}}$$

$$= \frac{\$110{,}790{,}790 - \$55{,}395{,}395}{11{,}587 \text{ SFLUE}}$$

$$= \textbf{\$4,780 / SFLUE}$$

Maximum Allowable Wastewater Impact Fee (South Sector):

Existing CIP Eligible Cost:	$5,983,284
Future CIP Eligible Cost:	$34,012,234
Total Eligible Costs:	$39,995,518
Total Wastewater Impact Fee Credit (50%):	$19,997,759

The total eligible cost associated with the existing and proposed wastewater system improvements to meet projected growth over the next 10 years in the South Sector is $39,995,518. The increase in the number of service units due to growth over the next 10 years in the South Sector is projected as 11,587 SFLUEs.

$$\text{Maximum Allowable Wastewater Impact Fee with 50\% Credit} = \frac{\text{Total Eligible Cost} - \text{Credit}}{\text{10-year growth in SFLUEs}}$$

$$= \frac{\$39{,}995{,}518 - \$19{,}997{,}759}{11{,}587 \text{ SFLUE}}$$

$$= \textbf{\$1,725 / SFLUE}$$

The combined maximum allowable water and wastewater impact fee for the South Sector is $6,505 for a 5/8 x 3/4-inch meter.

TLGC Chapter 395 authorizes the assessment and collection of impact fees in Texas for water and wastewater related capital improvements. The maximum allowable impact fee per service unit for the water and wastewater systems are summarized below in **Table 4-4**. **Table 4-5** summarizes the maximum allowable impact fee by meter size for the water and wastewater systems. A comparison graph showing impact fees in other benchmark cities throughout the metroplex for a single-family dwelling is included on **Figure 4-1**.

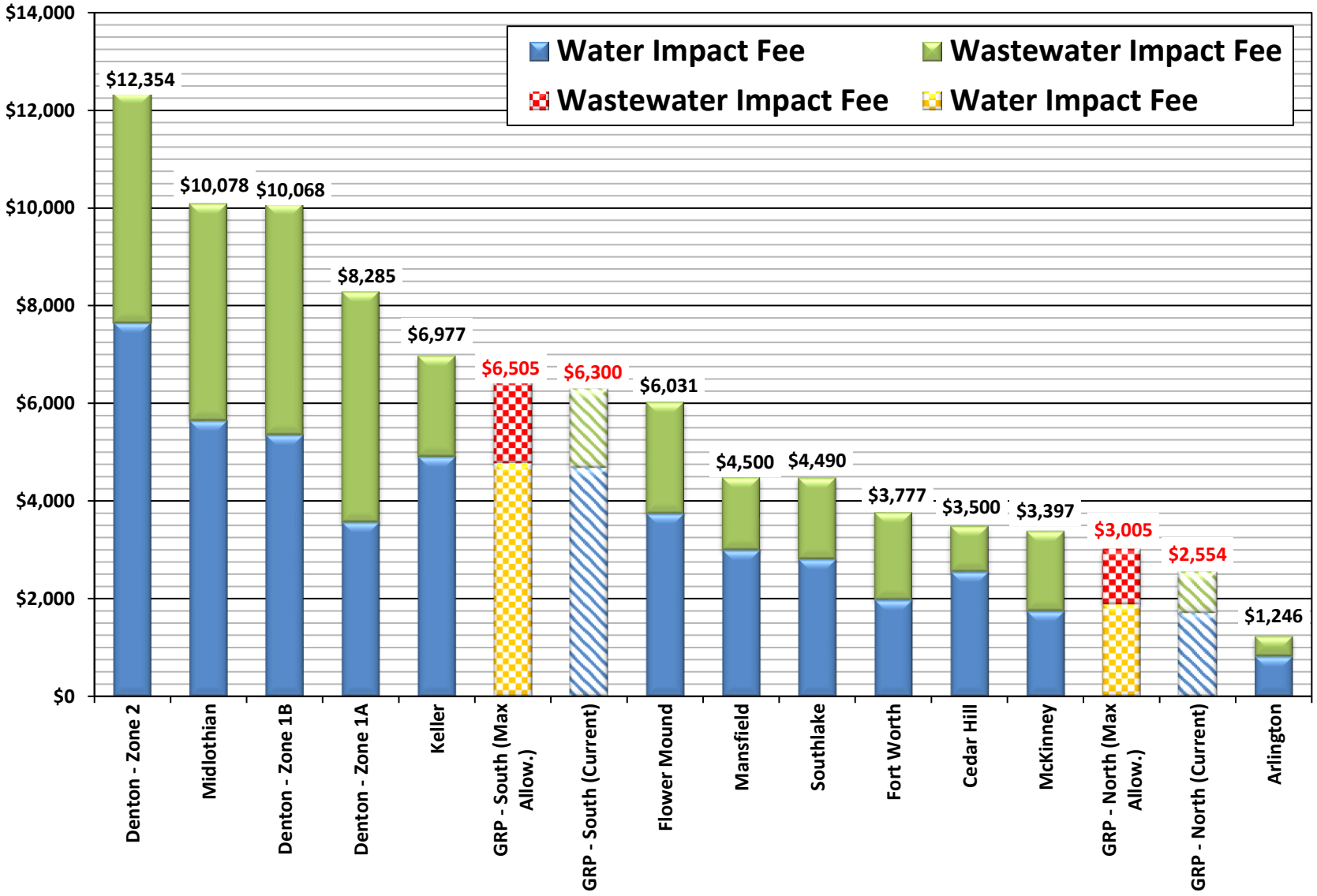
Table 4-4: Maximum Allowable Impact Fee Summary

North Sector		South Sector	
Water	**Wastewater**	**Water**	**Wastewater**
$1,888	$1,117	$4,780	$1,725
$3,005		**$6,505**	

Table 4-5: Maximum Allowable Impact Fee by Meter Size

Meter Size	SFLUE	North Sector			South Sector		
		Water	Wastewater	Total	Water	Wastewater	Total
5/8” x 3/4"	1.0	$1,888	$1,117	$3,005	$4,780	$1,725	$6,505
3/4"	1.7	$3,209	$1,898	$5,107	$8,126	$2,932	$11,058
1"	2.7	$5,097	$3,015	$8,112	$12,906	$4,657	$17,563
1 1/2"	3.3	$6,230	$3,686	$9,916	$15,774	$5,692	$21,466
2"	6.7	$12,649	$7,483	$20,132	$32,026	$11,557	$43,583
3"	21.3	$40,214	$23,792	$64,006	$101,814	$36,742	$138,556
4"	33.3	$62,870	$37,196	$100,066	$159,174	$57,442	$216,616
6"	66.7	$125,929	$74,503	$200,432	$318,826	$115,057	$433,883
8"	106.7	$201,449	$119,183	$320,632	$510,026	$184,057	$694,083
10”	153.3	$289,430	$171,236	$460,666	$732,774	$264,442	$997,216

Figure 4-1: Maximum Allowable Impact Fee Benchmark Cities



APPENDIX A

Land Use Assumptions and Capital Improvements Plan

Innovative approaches
Practical results
Outstanding service

WATER AND WASTEWATER IMPACT FEE STUDY

LAND USE ASSUMPTIONS AND CAPITAL IMPROVEMENT PLAN

Prepared for:

City of Grand Prairie

September 2024

Prepared by:

FREESE AND NICHOLS, INC.
801 Cherry Street, Suite 2800
Fort Worth, Texas 76102
817-735-7300
FNI Project #: GRP22251

FREESE AND NICHOLS

Innovative approaches
Practical results
Outstanding service

WATER AND WASTEWATER IMPACT FEE STUDY

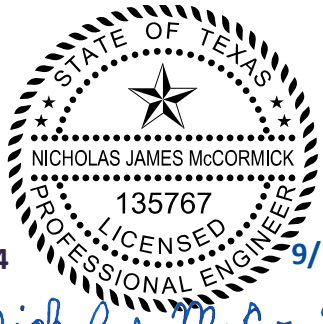
LAND USE ASSUMPTIONS AND CAPITAL IMPROVEMENT PLAN

Prepared for:

City of Grand Prairie

9/18/2024

9/18/2024



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1.0 INTRODUCTION

Chapter 395 of the Texas Local Government Code (TLGC) requires an impact fee analysis before impact fees can be created and assessed. Chapter 395 defines an impact fee as "a charge or assessment imposed by a political subdivision against new development in order to generate revenue for funding or recouping the costs of capital improvements or facility expansions necessitated by and attributable to the new development." In September 2001, Senate Bill 243 amended Chapter 395 thus creating the current procedure for implementing impact fees. Chapter 395 identifies the following items as impact fee eligible costs:

- Construction contract price
- Surveying and engineering fees
- Land acquisition costs
- Fees paid to the consultant preparing or updating the capital improvement plan (CIP)
- Projected interest charges and other financing costs for projects identified in the CIP

Chapter 395 also identifies items that impact fees cannot be used to pay for, such as:

- Construction, acquisition, or expansion of public facilities or assets other than those identified in the impact fee CIP
- Repair, operation, or maintenance of existing or new capital improvements
- Upgrading, updating, expanding, or replacing existing capital improvements to serve existing development in order to meet stricter safety, efficiency, environmental, or regulatory standards
- Upgrading, updating, expanding, or replacing existing capital improvements to provide better service to existing development
- Administrative and operating costs of the political subdivision
- Principal payments and interest or other finance charges on bonds or other indebtedness, except as allowed above

An initial step in the impact fee development process is the establishment of land use assumptions that address growth and development for a ten-year planning period (TLGC Section 395.001(5)) for the years 2024-2034. The land use assumptions (LUA), which include population projections, will become the basis for the preparation of impact fee capital improvement plans for water and wastewater facilities. The purpose of this report is to detail the development of the land use assumptions and the impact fee capital improvements plan.

To assist the City in determining the need and timing of capital improvements to serve future development, a reasonable estimation of future growth is required. One purpose of this report is to summarize the growth and development projections based upon assumptions pertaining to the type, location, quantity and timing of various future land uses within the community, and to establish and document the methodology used for preparing the growth and land use assumptions. These assumptions were initially prepared as part of the City's Water and Wastewater Master Plans and amended to adjust for growth through 2034 in the City.

Additionally, this report describes the water and wastewater improvements where costs will be recovered by new growth in order to serve this future development. Statutory requirements mandate that impact fees be based on a specific list of improvements identified in the program and only the cost attributed (and necessitated) by new growth over a ten-year period may be considered. As projects in the program are completed, planned costs are updated with actual costs to more accurately reflect the capital expenditure of the program. Additionally, new capital improvement projects may be added to the program.

1.1 METHODOLOGY

Based upon the growth assumptions and the capital improvements needed to support growth, it is possible to develop an impact fee structure which fairly allocates improvement costs to growth areas in relationship to their impact upon the entire infrastructure system. The data in this report has been formulated using reasonable and generally accepted planning principles for the preparation of impact fee systems in Texas and meets the requirements of the TLGC Section 395 for the establishment of impact fees.

For the formulation of the land use assumptions and capital improvements plan, a series of work tasks were undertaken and are described below.

1. A kick-off meeting was held to describe the general methodological approach in the study.

2. Water and wastewater service areas were confirmed as to conform with legislative mandate, as well as considerations to allow for future city annexations.

3. Current and projected population data was gathered from the North Central Texas Council of Governments (NCTCOG) forecasts, U.S. Census, and input from City staff on upcoming developments to serve as a basis for future growth.

4. A base year (2024) estimate of population was defined using the NCTCOG and U.S Census data.

5. A ten-year projection (2034) of population was prepared using input from City staff on upcoming developments, future land use plans, and NCTCOG forecasts. Distribution adjustments were then made to consider known or anticipated development activity within the 10-year planning period.

6. Base and 10-year demographics were prepared for the respective service areas for water and wastewater.

7. A capital improvements plan to address projected growth was developed by service area based upon discussions with City Staff.

2.0 LAND USE ASSUMPTIONS

Population and land use assumptions are important elements in the analysis of water and wastewater systems. To assist the City of Grand Prairie in determining the need and timing of capital improvements to serve future development, a reasonable estimation of future growth is required. Growth and future development projections were formulated based on assumptions pertaining to the type, location, quantity, and timing of various future land uses within the community. These land use assumptions, which include population and non-residential acreage projections, will become the basis for the preparation of impact fee capital improvement plans for water and wastewater facilities.

2.1 SERVICE AREAS

Chapter 395 requires that service areas be defined for impact fees to ensure that facility improvements are located in close proximity to areas generating needs. Legislative requirements stipulate that water and wastewater service areas can extend to the entire city limits and extra-territorial jurisdiction (ETJ). An analysis including the ETJ was conducted in order to consider provision of water and wastewater service areas.

Figure 2-1 illustrates the water and wastewater service area for the Grand Prairie Impact Fee study. The water and wastewater service areas are bound by the existing city limits and ETJ.

North Sector

South Sector

0 4,500 9,000

SCALE IN FEET

FIGURE 2-1

CITY OF GRAND PRAIRIE

WATER & WASTEWATER SERVICE AREAS

LEGEND

Water/Wastewater Service Area

- North Sector
- South Sector
- Grand Prairie City Limit
- ETJ Boundary

- Road
- Railroad
- Stream
- Lake
- Other City Limit
- County Boundary

Grand Prairie TEXAS

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2.2 PROJECTED GROWTH

Population estimates were used to provide a historical baseline for population growth within the City of Grand Prairie. Using the City's historical growth trends and data, the 2024 base year population estimate for the City of Grand Prairie and future growth rate were derived. This "benchmark" information provides a starting basis of data for the ten-year growth assumptions.

2.2.1 Historical Population and Growth Rate Summary

A review of population statistics from a variety of sources was conducted to examine Grand Prairie's recent growth rate. Data from the US Census Bureau and NCTCOG population estimates were reviewed to determine potential growth rates. **Table 2-1** presents the historical population data for the City of Grand Prairie.

Table 2-1: Historical Population

Year	NCTCOG Population[1]	NCTCOG Growth Rate	Census Population[2]	Census Growth Rate
2010	175,396	--	175,396	--
2011	176,320	0.53%	178,903	1.66%
2012	176,980	0.37%	182,030	1.75%
2013	179,630	1.50%	183,891	1.02%
2014	181,230	0.89%	185,824	1.05%
2015	182,610	0.76%	188,411	1.39%
2016	184,620	1.10%	192,095	1.96%
2017	187,050	1.32%	193,973	0.98%
2018	189,430	1.27%	193,989	0.01%
2019	191,720	1.21%	194,543	0.29%
2020	196,100	2.28%	196,100	0.80%
2021	198,030	0.98%	197,347	0.64%
2022	199,780	0.88%	201,539	2.08%
2023	204,973	2.53%	202,134	0.29%
10-Year Average Growth Rate		**1.32%**	**--**	**0.95%**
5-Year Average Growth Rate		**1.58%**	**--**	**0.82%**
3-Year Average Growth Rate		**1.46%**	**--**	**1.00%**

[1]Source: North Central Texas Council of Governments

[2]Source: U.S Census Bureau

2.2.2 Population and Non-Residential Projections

In addition to reviewing the historical growth rates and potential development information provided by City staff, FNI prepared a projections database to determine a population and non-residential acreage for each parcel within the City's service area. The City's future land use plan and input from City staff was used to right-size the database to determine reasonable 10-year projections. **Table 2-2** summarizes the population and non-residential acreage projections for the impact fee service areas. The North Sector of the City's service area is more developed and has lower anticipated growth in the 10-year planning period. The South Sector of the City's service area has a lot of developable acreage with significant interest from developers to grow in the 10-year planning period. The overall compound annual growth rate of 1.67% aligns with historical growth rates while also anticipating significant growth in the South Sector (requiring extensive water and wastewater infrastructure expansion).

Table 2-2: Population and Non-Residential Acreage Projections by Service Area

Year	Population	Growth in Population	Population Compound Annual Growth Rate	Non-Residential Acreage	Growth in Non-Residential Acreage
North Sector					
2024	205,729	7,007	0.34%	8,685.96	1,745.53
2034	212,736			10,431.49	
South Sector					
2024	2,352	30,479	30.16%	38.66	2,189.66
2034	32,831			2,228.32	
Total					
2024	208,081	37,486	1.67%	8,724.62	3,935.19
2034	245,567			12,659.81	

2.3 SUMMARY

Projected growth has been characterized in two forms: population and non-residential acreage. The following assumptions were made as a basis from which ten-year projections could be initiated. The ten-year projections can be initiated based on the assumption that the City will be able to finance the necessary improvements to accommodate continued growth.

Table 2-3 summarizes the population and non-residential projections within the water and wastewater service area for the impact fee study period.

Table 2-3: Population and Non-Residential Acreage Projections Summary

Demographic	2024	2034	10-Year Growth	Percent Change
Population	208,081	245,567	37,486	18%
Non-Residential Acreage	8,724.62	12,659.81	3,935.19	45%

Figure 2-2 presents the population projections by U.S Census Block Groups (CBG) within the water and wastewater service area. **Figure 2-3** presents the non-residential acreage projections by CBG within the water and wastewater service area.

FIGURE 2-2
CITY OF GRAND PRAIRIE
10-YEAR POPULATION PROJECTIONS
BY CENSUS BLOCK GROUP
LEGEND
Census Block Group
Lake
Road
City Limit
Railroad
ETJ Boundary
Stream
Other City Limit
County Boundary
POPULATION GROWTH
Less than 250 People
250 - 500 People
Greater than 500 People
Census Block Group ID
Existing Population
10-Year Population
POPULATION TOTALS
Existing Population Total: 208,081
10-Year Population Total: 245,567 (+37,486)
SCALE IN FEET
0
4,000
8,000
Grand Prairie TEXAS
FREESE AND NICHOLS
Joe Pool Lake
Fort Worth
Arlington
Irving
Dallas
Cedar Hill
Mansfield
Midlothian
Venus
Euless
TARRANT CO.
DALLAS CO.
JOHNSON CO.
ELLIS CO.


NON-RESIDENTIAL ACREAGE GROWTH
Less than 25 Acres
25 - 100 Acres
Greater than 100 Acres
Census Block Group ID
Existing Non-Residential Acres
10-Year Non-Residential Acres
NON-RESIDENTIAL ACREAGE TOTALS
Existing Non-Residential Acres Total: 8,725
10-Year Non-Residential Acres Total: 12,660 (+3,935)
LEGEND
Census Block Group
Lake
Road
City Limit
Railroad
ETJ Boundary
Stream
Other City Limit
County Boundary
SCALE IN FEET
0
4,000
8,000
Grand Prairie
TEXAS
FREESE AND NICHOLS
Fort Worth
Euless
Irving
Arlington
Dallas
Joe Pool Lake
Cedar Hill
Mansfield
Midlothian
Venus
TARRANT CO.
DALLAS CO.
JOHNSON CO.
ELLIS CO.

FIGURE 2-3
CITY OF GRAND PRAIRIE
10-YEAR NON-RESIDENTIAL ACREAGE PROJECTIONS BY CENSUS BLOCK GROUP

3.0 CAPITAL IMPROVEMENT PLAN

The water and wastewater impact fee analysis involves determining the eligible proportion of total projected costs to serve new development and the projected number of service units attributed to new development over the next 10 years. The total projected costs include the projected 10-year capital costs, the projected financing cost for the capital improvements, and the consultant cost for preparing and updating the Impact Fee Study.

The water and wastewater impact fee CIPs were developed for the City of Grand Prairie to provide high quality water and wastewater service based on the growth patterns detailed in the land use assumptions. The eligible existing and future improvements will provide the required capacity and reliability to meet projected water demands and wastewater flows through 2034 and are sized to 2049 conditions. The water and wastewater projects required to meet growth in the 10-year period were used in the impact fee analysis and calculation.

3.1 WATER DEMAND AND WASTEWATER FLOW PROJECTIONS

The water demand planning criteria shown in **Table 3-1** was developed as part of the City's Water Master Plan. The projected water demands by service area are summarized in **Table 3-2**.

Table 3-1: Water Design Criteria

Criteria	Factor
North Sector	
Residential Average Day Per Capita Usage (gpcd)	115
Non-Residential Average Day Per Acre Usage (gpad)	500
Max Day to Average Day Peaking Factor	1.7
Peak Hour to Max Day Peaking Factor	1.5
South Sector	
Residential Average Day Per Capita Usage (gpcd)	140
Non-Residential Average Day Per Acre Usage (gpad)	700
Max Day to Average Day Peaking Factor	2.0
Peak Hour to Max Day Peaking Factor	1.5

Table 3-2: Projected Water Demands

Planning Year	Total Population	Non-Residential Acreage	Average Day Demand (MGD)	Maximum Day Demand (MGD)	Peak Hour Demand (MGD)
North Sector					
2024	205,729	8,685.96	28.00	47.60	71.41
2034	212,736	10,431.49	29.68	50.46	75.70
South Sector					
2024	2,352	38.66	0.36	0.72	1.08
2034	32,831	2,228.32	6.16	12.32	18.48
Total					
2024	208,081	8,724.62	28.36	48.32	72.49
2034	245,567	12,659.81	35.84	62.78	94.18

The wastewater flow planning criteria shown in **Table 3-3** was developed as part of the City's Wastewater Master Plan. The projected wastewater flows by service area are summarized in **Table 3-4**.

Table 3-3: Wastewater Design Criteria

Criteria	Factor
North Sector	
Residential Average Day Per Capita Production (gpcd)	100
Non-Residential Average Day Per Acre Production (gpad)	500
Peak Wet Weather to Average Day Peaking Factor	4.0
South Sector	
Residential Average Day Per Capita Production (gpcd)	100
Non-Residential Average Day Per Acre Production (gpad)	500
Peak Wet Weather to Average Day Peaking Factor	4.0

Table 3-4: Projected Wastewater Flows

Planning Year	Total Population	Non-Residential Acreage	Average Day Flow (MGD)	Peak Wet Weather Flow (MGD)
North Sector				
2024	205,729	8,685.96	24.92	99.68
2034	212,736	10,431.49	26.49	105.96
South Sector				
2024	2,352	38.66	0.25	1.00
2034	32,831	2,228.32	4.40	17.60
Total				
2024	208,081	8,724.62	25.17	100.68
2034	245,567	12,659.81	30.89	123.56

3.2 WATER AND WASTEWATER SYSTEM IMPROVEMENTS

Proposed water distribution and wastewater collection systems projects were developed as part of the City's Water and Wastewater Master Plans. A summary of the projects eligible for impact fees for both the north and south sectors of the water distribution system are shown in **Tables 3-5** and **3-6** respectively. A summary of the projects eligible for impact fees for both the north and south sectors of the wastewater collection system are shown in **Tables 3-7** and **3-8** respectively.

The 10-year water system impact fee eligible projects are shown on **Figure 3-1**. The 10-year wastewater system impact fee eligible projects are shown on **Figure 3-2**.

Table 3-5: North Sector Water Impact Fee Eligible CIP

Project Number[1]	Project Name
Existing Impact Fee Eligible Projects	
A	20-inch West Sara Jane Parkway Water Line
B	2.0 MG Peninsula Elevated Storage Tank
C	30-inch Highway 360 Water Line
D	42-inch Camp Wisdom Water Line
E	36-inch Lakeridge Parkway Water Line
F	30/24-inch Broad Street/England Parkway Water Line
G	12 MG Terminal Ground Storage Tank
H	30-inch South Great Southwest Parkway Water Line
I	Robinson Road EST and Pump Station Replacement and 30/36-inch Water Line
J	Highway 161 Frontage Road 12-inch Water Line
M	Water Impact Fee Update
Proposed Impact Fee Eligible Projects	
2N	24-inch Great Southwest Parkway/North Carrier Parkway Water Line
5N	1.0 MGD Wholesale Supply Increase
6N	20.0 MGD of Wholesale Supply (11.2 MGD Supply Increase)
8N	8/12-inch I-30 Frontage Road Water Lines
9N	24-inch Duncan Perry/Egyptian Way Water Line
10N	12-inch Highway 161 Frontage Road Water Line

[1]Project numbers correspond to the City's Water Master Plan. Projects 1N, 2N, 4N, 5N, and 8N are not included as they are not Impact Fee eligible.

Table 3-6: South Sector Water Impact Fee Eligible CIP

Project Number[1]	Project Name
Existing Impact Fee Eligible Projects	
K	36-inch Mansfield Water Supply Line Phase 1
L	Heritage Pump Station and 2.0 MG Heritage Ground Storage Tank
M	Water Impact Fee Update
Proposed Impact Fee Eligible Projects	
1S	24-inch SH-360 Water Line Extension Phase 3
2S	16-inch Miller Road Water Line
3S	2.0 MG Lakeview Drive Elevated Storage Tank
4S	12-inch Lakeview / Miller Road
5S	24-inch Auger Road Water Line
6S	4.0 MGD Pump Station and 2.0 MG Ground Storage Tank
7S	24/30-inch Delivery Point A U.S. 287 / Delivery Point C Auger WTP Water Line
8S	16-inch Ram Trail Water Line
9S	16/20-inch Old Fort Worth Road Water Line
10S	24-inch Water Line North of Padera Lake
11S	12-inch US 287 Water Line
12S	12-inch Soap Creek Water Line
13S	16/20-inch Lake View Water Line
14S	20-inch County Road 506 Water Line
15S	16-inch County Road 506 Water Line
16S	16-inch Mountain Creek Water Line
17S	12/16-inch Prairie Ridge Boulevard Water Line
18S	12-inch 775 Pressure Plane Water Line
19S	18-inch Heritage Parkway Water Line
20S	20-inch David to Cypress Road Water Line
21S	24-inch State Highway 2 Water Line Phase 1
22S	24-inch State Highway 2 Water Line Phase 2
23S	24-inch State Highway 2 Water Line Phase 3
24S	2.0 MG Proposed Elevated Storage Tank

[1]Project numbers correspond to the City's Water Master Plan.

Table 3-7: North Sector Wastewater Impact Fee Eligible CIP

Project Number[1]	Project Name
Existing Impact Fee Eligible Projects	
A	10/12/15/18-inch Cherokee Trail Gravity Main
B	Robinson Road 8/12-inch Gravity Main
C	Fargo Drive 18/24-inch Gravity Main
D	Wisdom Road 21/24-inch Gravity Main
E	East Avenue K 10/12/18-inch Gravity Main
F	Northeast 5th Street 10/12/15/18-inch Gravity Main
J	Wastewater Impact Fee Update
Proposed Impact Fee Eligible Projects	
1	East Shady Grove Road 10/12/18/21-inch Gravity Main
2	West Shady Grove Road 15/18/21-inch Gravity Main (Phase 1)
3	Grand Lakes Boulevard 12/15/18/21-inch Gravity Mains
4	Rock Island 12/18/21-inch Gravity Mains (Phase 1)
5	Highschool Drive 12/15/18/24/27/30-inch Gravity Main
6	Rock Island 8/12-inch Gravity Mains (Phase 2)
7	West Shady Grove Road 12/15-inch Gravity Main (Phase 2)
8	Trinity Boulevard 15-inch Gravity Main
9	Performance Lift Station Expansion and 21-inch Gravity Main
12	Idlewild Road 15-inch Gravity Main

[1]Project numbers correspond to the City's Wastewater Master Plan. Projects 10 and 11 are not included as they are not Impact Fee eligible.

Table 3-8: South Sector Wastewater Impact Fee Eligible CIP

Project Number[1]	Project Name
Existing Impact Fee Eligible Projects	
G	Gifco Lift Station and 18-inch Force Main
H	Soap Creek Phase 1 42/48-inch Gravity Main
I	Soap Creek Phase 2 24/30-inch Gravity Main
J	Wastewater Impact Fee Update
Proposed Impact Fee Eligible Projects	
SS-1	Firefly Center 18-inch Gravity Main
SS-2	Davis Road 12/18-inch Gravity Main
SS-3	Rolling Meadows Drive 12-inch Gravity Main
SS-4	Miller Road 15-inch Gravity Main
SS-5	South Lakesong 24-inch Gravity Main
SS-6	Lakeview Road 15-inch Gravity Main
SS-8	Cypress Road 36-inch Gravity Main
SS-9	State Highway 2 15-inch Gravity Main
SS-10	North Lakesong 12-inch Gravity Main

[1]Project numbers correspond to the City's Wastewater Master Plan. Project SS-7 is not included as it is not Impact Fee eligible.

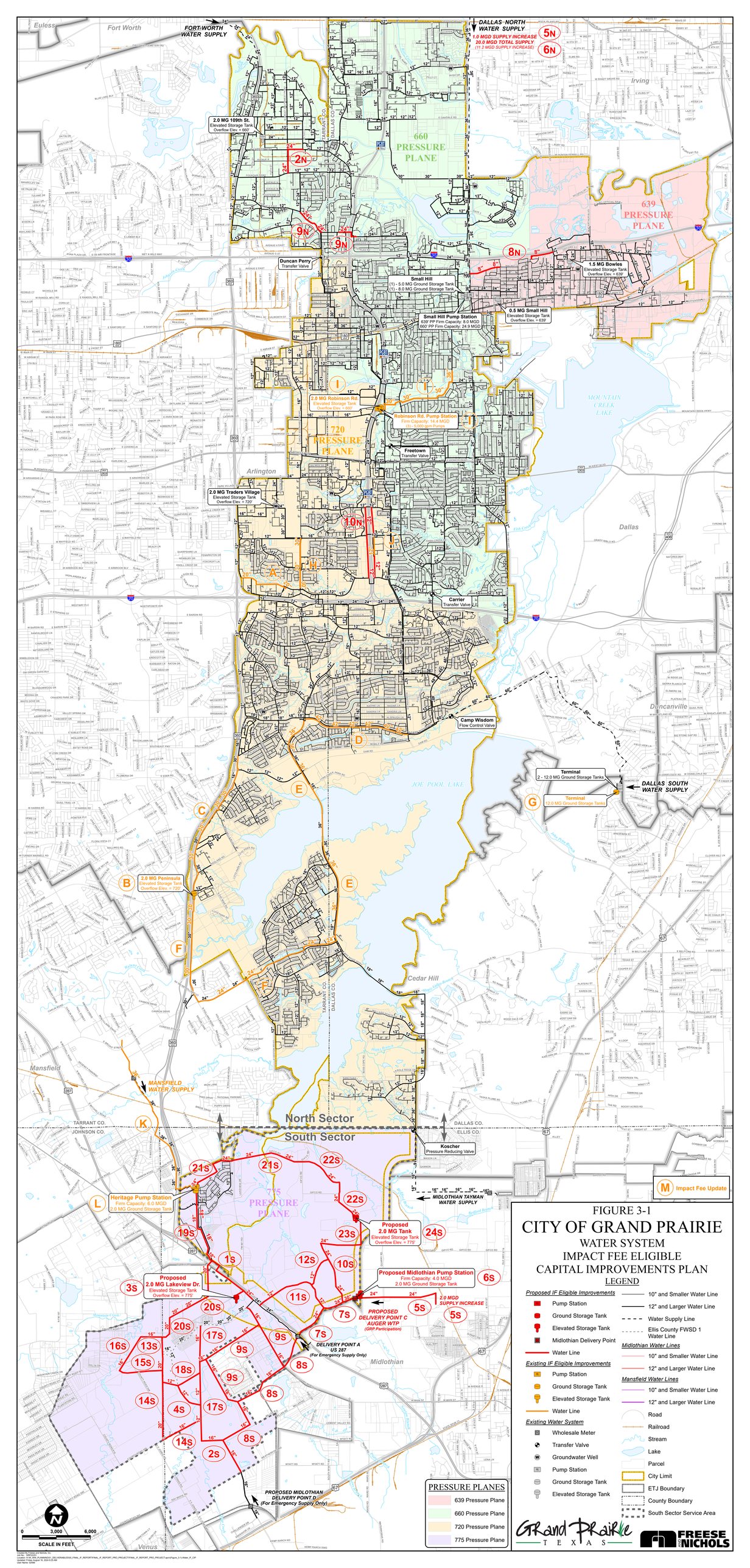

FIGURE 3-1

CITY OF GRAND PRAIRIE

WATER SYSTEM IMPACT FEE ELIGIBLE CAPITAL IMPROVEMENTS PLAN

LEGEND

Proposed IF Eligible Improvements
- Pump Station
- Ground Storage Tank
- Elevated Storage Tank
- Midlothian Delivery Point
- Water Line

Existing IF Eligible Improvements
- Pump Station
- Ground Storage Tank
- Elevated Storage Tank
- Water Line

Existing Water System
- Wholesale Meter
- Transfer Valve
- Groundwater Well
- Pump Station
- Ground Storage Tank
- Elevated Storage Tank
- 10" and Smaller Water Line
- 12" and Larger Water Line
- Water Supply Line
- Ellis County FWSD 1 Water Line

Midlothian Water Lines
- 10" and Smaller Water Line
- 12" and Larger Water Line

Mansfield Water Lines
- 10" and Smaller Water Line
- 12" and Larger Water Line
- Road
- Railroad
- Stream
- Lake
- Parcel
- City Limit
- ETJ Boundary
- County Boundary
- South Sector Service Area

Grand Prairie TEXAS

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FIGURE 3-2
CITY OF GRAND PRAIRIE
WASTEWATER COLLECTION SYSTEM IMPACT FEE ELIGIBLE CAPITAL IMPROVEMENTS PLAN

J Impact Fee Update

LEGEND

Existing IF Eligible Improvements
- Lift Station
- Wastewater Line
- Force Main

Existing Wastewater System
- Manhole
- Lift Station
- 10" and Smaller Wastewater Line
- 12" and Larger Wastewater Line
- Force Main

Other Wastewater System
- Lift Station
- Wastewater Treatment Plant
- 10" and Smaller Wastewater Line
- 12" and Larger Wastewater Line
- Force Main
- Road
- Railroad
- Stream
- Lake
- City Limit
- ETJ Boundary
- Other City Limit
- County Boundary

WATERSHEDS
- Bear Creek
- North Mountain Creek
- South Mountain Creek

PROPOSED IMPACT FEE ELIGIBLE IMPROVEMENTS
- Lift Station
- Wastewater Line
- Force Main

0 3,000 6,000
SCALE IN FEET

GRAND PRAIRIE TEXAS

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