MEMORANDUM

To: Capital Improvements Advisory Committee (CIAC)

From: Kumar Gali, P.E., Assistant Director of Public Works-Engineering
Kent Collins, P.E., Director of Public Works

Date: February 20th, 2020

Reference: Discussion concerning a recommendation to City Council on the Land Use Assumptions, Capital Improvements Plans, and Maximum Allowable Impact Fees per Service Area from the Water, Wastewater, and Roadway Impact Fee Study, and Recommended Assessed Impact Fees.

The City of Coppell collects roadway, water and wastewater impact fees to cover costs associated with infrastructure needed to serve future development. According to Chapter 395 of the Texas Local Government Code, cities must review their impact fees at least every five years. Last time the City Council adopted impact fees was in April of 2012. In January of 2018, the City entered into a contract with Birkhoff, Hendricks & Carter, LLP to perform an impact fee study for revisions to the city's current capital improvements plan (CIP) and to make recommendations on the impact fees needed to implement the CIP. Per statute, any amendments to the impact fee need to follow a schedule of required actions, meetings and public notices.

The City's Planning and Zoning Commission serves as the Capital Improvement Advisory Committee (CIAC), as established by the City's Impact Fee Ordinance and allowed by statute. This item is to review the final report by Birkhoff, Hendricks & Carter, LLP and make recommendation to City Council.

Currently the City of Coppell assesses impact fees at $900/meter for water and wastewater and $150/development unit for roadway. The maximum that could be charged currently are $995/meter for water, $927/meter for wastewater, and $210/development unit for roadway. During the last update in 2012, the City Council made no changes to the assessed fees.

The results of the impact fee study being presented with this item indicate the maximum allowable fees could be $900/meter for water, $446/meter for wastewater and $178/development unit for roadway. One of the roles of the CIAC is to recommend a fee structure to the City Council. Staff recommends maintaining consistency with the existing fees to the extent allowable by law.

Staff will be present at the meeting to make a presentation and answer any questions. Attached with the memo is the draft final report.

ENGINEERING EVALUATION REPORT OF THE

WATER, WASTEWATER & ROADWAY 2018 - 2028 IMPACT FEE UPDATE

Submitted To

THE · CITY · OF

COPPELL

TEXAS · 1890

Submitted By

BIRKHOFF, HENDRICKS & CARTER, L.L.P.
SPECIALIZING IN CIVIL ENGINEERING FOR MUNICIPALITIES AND GOVERNMENTAL AGENCIES
WATER & WASTEWATER IMPACT FEE
TBPE Firm No. 526

In Association With:

LEE ENGINEERING, L.L.C.
TRAFFIC ENGINEERS
ROADWAY IMPACT FEE
TBPE Firm No. 450

THESE DOCUMENTS ARE FOR INTERIM REVIEW AND ARE NOT INTENDED FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES.

DEREK B. CHANEY
Texas P.E. #107199

October 2019

FINAL DRAFT

CITY OF COPPELL, TEXAS

ENGINEERING EVALUATION REPORT
FOR THE
WATER, WASTEWATER, & ROADWAY
2018 - 2028 IMPACT FEE REVIEW

TABLE OF CONTENTS

ROADWAY

A. GENERAL

The engineering analysis portion of the 2018-2028 Water and Wastewater Impact Fee Update determines utilized-capacity cost of the major water distribution facilities and wastewater collection facilities between the year 2018 and the year 2028. City facilities, eligible for impact fee reimbursement, include pump stations, water storage tanks, water transmission lines, wastewater lift stations, force mains, and wastewater trunk lines. The study period is a ten-year period with 2018 as the base year. The engineering analysis of the water and wastewater systems is based on the projected land uses for buildout (prepared by others) and is based on the existing and proposed infrastructure that is required to provide service for new development.

The City's Water Distribution System Master Plan and Wastewater Collection System Master Plan were updated and reviewed as part of this study. This 2018 Water and Wastewater Impact Fee Update reflects the capital improvements shown by the Master Plans. The Master Plans are based on the future land use plan from the City's 2030 Comprehensive Plan adopted by the City Council in 2011 by ordinance number 91500-A-559.

B. COST OF FACILITIES

Actual project costs for the existing elements of the water distribution and wastewater collection system are from the water, wastewater, and roadway impact fee analysis, completed by Freese and Nichols, Inc., dated February 2012. Project costs for proposed lines and facilities are estimated by referencing costs of recently bid projects similar in nature, and include an allowance for the estimated associated costs of engineering, land rights, and financing.

C. UTILIZED CAPACITY

Utilized capacities for the water distribution and wastewater collection systems infrastructure items are calculated based on flows derived with the population growth projections of the City's 2030 Comprehensive Plan. 2018 and 2028 design flows are compared as ratios to the buildout design flows for each eligible infrastructure item in the water distribution and wastewater collection systems. Utilized capacities of the existing and proposed improvements in the period are applied to the total project costs to calculate the dollar value associated with the growth in the ten-year period.

D. SUMMARY OF IMPACT FEE REPORTS

There were minor changes for the water and wastewater systems based on anticipated development over the 2018 to 2028 planning period. The master planning efforts include organized systematic approaches to expand capacity and service for new development. This Impact Fee Analysis follows Master Plans and utilizes hydraulic modeling for both the water and wastewater systems.

In 2018, the City's existing Water System Master Plan was updated for the City of Coppell. The master plan also determined the capital improvements needed to meet future demand rates. These improvements include water lines that would close loops in the system to help improve water quality. Based on the proposed design, this impact fee update was created to aid the City in implementation of the capital improvement plan.

Likewise, in 2018, the City's existing Wastewater System Master Plan was updated. The City currently operates and maintains two municipal lift stations, both of which are expected to remain in service through 2028 and at buildout.

E. METHOD

For the creation of the Master Plans, digital Hydraulic models were created for both the Water and Wastewater Systems which simulate the hydraulic responses of the systems to the various demands. The hydraulic models include 2018, 2028 and buildout (2030) scenarios. Demands, or flows, were distributed to the water model nodes and to the wastewater model manholes for each scenario. The demands were based on the City population projections and land use distributions as shown in the City's 2030 Comprehensive Plan. The scenarios include the proposed lines, facilities and pumps that were determined to be necessary by the Master Plans. 48-hour (wastewater) and 72-hour (water) extended period simulations were run for each scenario, and the resulting flow rates were used as the basis for the utilized capacity calculations over the 10-year study period.

F. LAND USE ASSUMPTIONS SUMMARY

The City's 2030 Comprehensive Plan, determined populations for buildout land use conditions. Those projections determined a buildout population of 42,636 to be reached in 2030. A population of 41,100 was estimated for 2018 according to the City's website. For this update, a population of 42,380 was linearly extrapolated from the City's 2016 Comprehensive Plan for 2028. **Table 1** shows those population growth assumptions.

Table 1: Population Growth Assumption

	2018	2028	Buildout (2030)
Population	41,100	42,380	42,636
% of Buildout	96%	99%	100%
2018 to 2028 Population Growth:		3%	

The future land use plan classified the parcels of land in the planning area by land use types (i.e.; residential, industrial, commercial). Maps were provided by the City for the future land uses which display the composition and distribution of the City's water and wastewater users.

G. LIVING UNIT EQUIVALENCY CALCULATION

The approach taken to relate growth of the City to the existing and future users was to apply the growth to the number and type of existing connections to the water system. Residential and commercial connections to the water system each require a water meter, and those meters can vary in flow rate capacity, by size. A connection with a high-capacity water meter can cause larger demands on the water system because they draw water from the system at a greater rate, and thus a proportionally larger maximum impact fee can be charged to those higher capacity connections. Additionally, wastewater production rates generally relate to the water usage rates, and therefore the same mechanism was applied for the wastewater collection system maximum impact fee calculation.

Maximum impact fee values were calculated for the various water meter size connections by assigning unitless Living Unit Equivalency (LUE) values to each meter size, based on the flow rate capacities of the meters. The LUE values allow for ratios of capacity to be developed for projection of the calculated maximum impact fee values. The American Water Works Association Standards for Water Meters provides the table of continuous duty maximum flow rates that were used for the LUE assignment, as shown in **Table 2**.

Table 2: Living Unit Equivalencies For Various Types And Sizes Of Water Meters

Meter Type	Meter Size	Maximum Flow Rate (gpm) [(a)]	Ratio to ¾" Meter
Simple	¾"	15	1
Simple	1"	25	1.7
Simple	1½"	50	3.3
Simple	2"	80	5.3
Compound	2"	80	5.3
Turbine	2"	100	6.7
Compound	3"	160	10.7
Turbine	3"	240	16
Compound	4"	250	16.7
Turbine	4"	420	28
Compound	6"	500	33.3
Turbine	6"	920	61.3
Compound	8"	800	53.3
Turbine	8"	1,600	106.7
Compound	10"	2,300	153.3
Turbine	10"	2,500	166.7
Turbine	12"	3,300	220

[(a)] *Source: AWWA Standard C700 (1995) - C703 (1996)*

H. CURRENT METER COUNT & ESTIMATION OF SERVICE UNITS

Existing water meter counts in 2018 were provided by the City, by size. **Table 3** –Living Unit Equivalent table show the conversion of the existing meter counts to Living Units, and the projection of future Living Units at the end of the study period, based on the anticipated growth from the City's 2030 Comprehensive Plan.

Table 3: 2018 - 2028 Living Unit Equivalents (LUE) By Meter Size

Meter Size	2018			2028			New Living Units During Impact Fee Period
	Existing Water Meter Count [a]	Living Units per Meter [b]	Total Living Units	Projected Water Meter Count	Living Units per Meter [c]	Total Living Units	
3/4" - 5/8"	**12,055**	1.0	12,055	**12,430**	1.0	12,430	375
1"	**470**	1.7	799	**485**	1.7	825	26
1½"	**140**	3.3	462	**144**	3.3	475	13
2"	**634**	6.7	4,248	**654**	6.7	4,382	134
3"	**13**	16.0	208	**13**	16.0	208	0
4"	**10**	28.0	280	**10**	28.0	280	0
6"	**5**	61.3	307	**5**	61.3	307	0
8"	**14**	106.7	1,494	**14**	106.7	1,494	0
10"		166.7	0		166.7	0	0
12"		220.0	0		220.0	0	0
Totals:	**13,341**		**19,853**	**13,755**		**20,401**	**548**

[a] Number of meters within City Limits

[b] Derived from AWWA C700 - C703 standards for continuous rated flow performance of meters, scaled to 3/4" meter

I. WATER DISTRIBUTION SYSTEM

The hydraulic water model scenarios, 2018, 2028 and buildout, conform to the City's Water Distribution System Master Plan, and were used for the ten-year review period analysis. The proposed waterlines, as shown by the Master Plan, were determined necessary for service to the projected populations and land uses.

The hydraulic analysis was performed utilizing H2ONET version 14 computer software to aid in developing an overall system of water lines, storage facilities and pump stations required to serve the area within the planning boundary. A 72-hour Extended Period Simulation (EPS) hydraulic models were created for the buildout condition and for the year 2018 (existing) water distribution system condition with maximum daily, maximum hourly, and minimum hourly demands simulated through a 72-hour diurnal curve. Demand rate changes, observed by the hydraulic model over the 10-year study period, were used for the utilized capacity calculations.

1) Population

According to the City's 2030 Comprehensive Plan, the buildout population is expected to be reached around the year 2030, but could change with actual growth, changes in economic conditions or changes in development impacts. Since the estimated water demand in this analysis is based on growth projections, any future change will directly affect estimated demand rates and facility needs. The densities used for calculating the buildout residential population are shown on **Table 4**.

Table 4: Residential Unit and Population Densities

Land Use	Units Per Acre	Population Per Unit
Residential Neighborhood	3.0	3.0
Urban Residential Neighborhood	8.0	3.0
Mixed Use Residential	15.0	2.0

2) Water Supply

When the City of Coppell reaches its ultimate development, it will have an estimated population of 42,636 people. Based on water demands developed for this study, this population will yield a total maximum daily demand for treated water of approximately 23.9 million gallons per day (MGD).

Currently, the City of Coppell receives its treated water supply from Dallas Water Utilities (DWU) at the Village Parkway Pump Station. The water supplied to the City is transmitted through a 60-inch water line that supplies the Village Parkway Pump Station.

Table 5 below shows the current and projected maximum day supply requirements at the Village Parkway Pump Station.

Table 5

DWU Delivery Point	Maximum Day Supply Required (MGD)	
	2018	Buildout
Village Parkway Pump Station	22.7	23.9

3) Water Distribution System Demands

Analysis and design of the proposed water distribution system is based on the anticipated maximum water demand and the proposed future land use, including residential population and non-residential acreage projections, in the City of Coppell. Based on available information, a maximum daily residential demand of 400 gallons per capita per day (gpcd) has been utilized for this analysis.

For the purpose of distributing the non-residential demands within the hydraulic model for this analysis, non-residential areas, as dictated by the City and their Proposed Land Use Map, were measured. Based on other North Texas communities, per acre demands for the non-residential areas were established.

Table 6 summarizes the residential demand rates in gallons per capita per day (g.p.c.d.) and non-residential demand rates in gallons per acre per day (g.p.a.d.) utilized in calculating Coppell's buildout maximum day and hour water demands.

Table 6: Design Water Demand Rates

Land Use	Residential		Non-Residential	
	Max Day Per Capita g.p.c.d.	Max. Hour Per Capita g.p.c.d.	Max. Day Per Acre g.p.a.d.	Max. Hour Per Acre g.p.a.d.
Residential Neighborhood	400	800		
Urban Residential Neighborhood	400	800		
Mixed Use Residential	400	800		
Mixed Use Non-Residential			3,000	6,000
Neighborhood Center Commercial			2,000	4,000
Old Coppell Historic District			2,000	4,000
Freeway Special District			2,500	5,000
Industrial Special District			2,500	5,000
Parks & Open Space			250	500

The calculated water demands, for the two land uses within the City's planning area at buildout, are summarized in **Table 7** and **Table 8** summarizes the Maximum Daily and Maximum Hourly Demands.

Table 7: Buildout Design Water Demands By Land Use

Land Use	Maximum Daily Demand (MGD)	Maximum Hourly Demand (MGD)
Residential	17.1	34.1
Non-Residential	6.8	13.7
Total:	**23.9**	**47.8**

Table 8: Design Water Demands

Scenario	Maximum Daily Demand (MGD)	Maximum Hourly Demand (MGD)
2018 Demand (MGD)	22.7	45.4
Buildout Demand (MGD)	23.9	47.8

4) Water Distribution System Hydraulic Analysis

Analysis of the buildout water distribution system is based on the ultimate water demand anticipated and the geographical distribution of the water demand. The design of the proposed water distribution system is based on three separate demand conditions. The first condition is used to determine the buildout supply from purchased treated water from Dallas Water Utilities (DWU) which is based on the maximum daily demand. This demand rate is the minimum supply and minimum pumping required by the system. The second condition utilizes the maximum hourly demand rate on the day of maximum demand. Maximum hourly demand rates are used to size distribution lines and to determine the volume of elevated storage. The size of existing and proposed distribution lines is shown on the Master Plan Map presented at the end of this report. The third condition is the minimum hourly demand rate on the day of maximum demand. This rate is used to analyze the refill rates of elevated storage. These three demand conditions were modeled over a three-day period (72 hours) with an Extended Period Simulation (EPS). The 72-hour EPS was developed with the use of a diurnal curve that is used to peak the water demand in the model from a minimum hourly demand condition through a maximum daily demand condition and to a maximum hourly demand condition. **Figure 1** shows the diurnal curve used in this analysis and was developed based on neighboring North Texas communities.

72-HOUR EPS DIURNAL CURVE

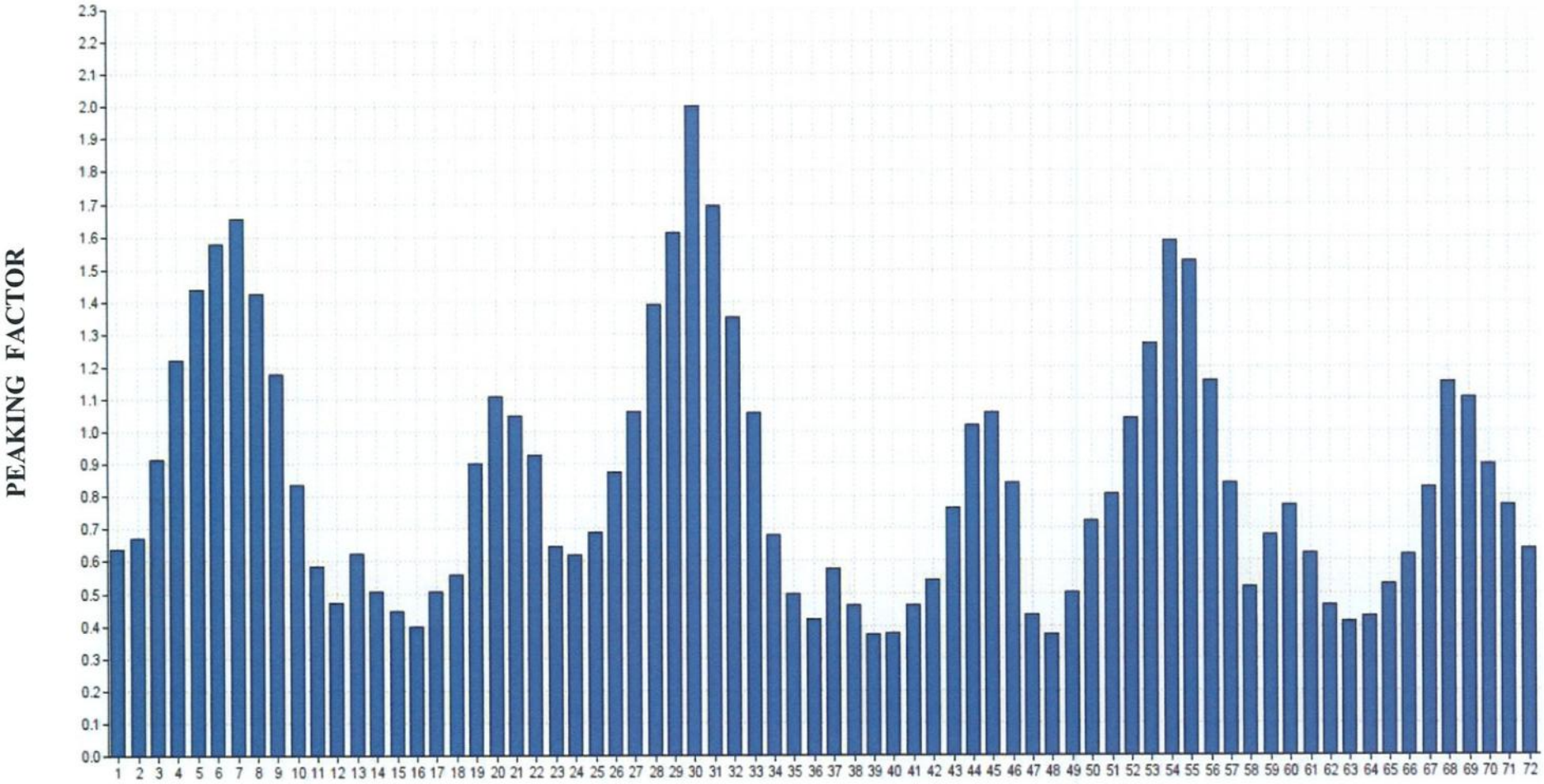


FIGURE NO. 1

a) Village Parkway Pump Station

The City of Coppell is currently operating one pump station, the Village Parkway Pump Station. The current firm capacity of the Village Parkway Pump Station, with the largest pump out of service, is estimated to be 40.3 MGD. The TCEQ requires the firm capacity of the pump station be calculated with the largest pump out of service. The Village Parkway Pump Station is located on the northeast corner of MacArthur Boulevard and Sandy Lake Road. The existing pump facilities include two 5.0 MGD pumps, three 10.1 MGD pumps and one 13.0 MGD pump. Using the actual pump curves provided by the City, and construction record drawings showing the Village Parkway Pump Station layout, the pump station piping, pumps and ground storage tanks were included in the model. The Village Parkway Pump Station cannot be readily expanded. Therefore, the Village Parkway Pump Station it considered to be at its ultimate capacity.

Table 9, below, illustrates an overview of the pump and motor performance data for the existing Village Parkway Pump Station.

Table 9: Village Parkway Pump Station Overview

Pump No.	Rated Capacity Flow @ TDH
1	10.1 MGD @ 215' TDH
2	10.1 MGD @ 215' TDH
3	10.1 MGD @ 215' TDH
4	13.0 MGD @ 210' TDH
5	5.0 MGD @ 200' TDH
6	5.0 MGD @ 200'TDH

b) Ground Storage Reservoirs

Ground storage within the system is necessary to provide a dependable supply during periods of high demand, emergencies or disruption in supply. The volume of ground storage in this report was designed to match the pump stations' pumping capacity in MGD for a draw down period of 6 hours, or a 12-hour average day demand draw down. This volume provides for a reasonable level of protection against interruptions in water supply from DWU during the critical demand period. Using this approach, it is recommended that no less than 10 million gallons of ground storage be available at buildout.

Presently there is 10.0-million gallons of ground storage in the City of Coppell, all located at the Village Parkway Pump Station. A summary of the existing ground storage is shown in **Table 10**.

Table 10: Ground Storage Reservoir Overview

	Tank Name	Location	Size (MG)
EXISTING	Village Parkway No. 1	Village Parkway Pump Station	6.0
	Village Parkway No. 2	Village Parkway Pump Station	4.0
GROUND STORAGE RESERVOIR GRAND TOTAL			***10.0***

c) Elevated Storage

The City's existing elevated storage includes the 1.5-Million Gallon Southwestern Elevated Storage Tank located on the north side of Southwestern Boulevard between Coppell Road and Freeport Parkway, and the 2.0-Million Gallon Wagon Wheel Elevated Tank located off of Northpoint Drive, east of Royal Lane. In addition to serving as a regulator for the systems water pressure and providing emergency pressure during potential power outages at the pump stations, elevated storage in a distribution system serves as a source of supply when the system demand exceeds the ability to provide water by pumping alone. As previously stated, this normally occurs during the maximum hour demand situation.

In the City of Coppell system, the buildout maximum hourly demand has been estimated to be 47.8 MGD. Using an elevated storage drawdown time of 6 hours, an additional 14 MGD can be contributed from the existing 3.5 million gallons of elevated storage. **Table 11**, below, summarizes the existing capacities.

Table 11: Elevated Storage Tank Overview

	Tank Name	Location	Size (MG)
EXISTING	Southwestern Tank	Southwestern Blvd. and Coppell Road	1.5
	Wagon Wheel Tank	Royal Lane and Northpoint Drive	2.0
Existing SUBTOTAL			**3.5**
ELEVATED STORAGE TANK GRAND TOTAL			***3.5***

d) Fire Flow Analysis

A fire hydrant is an element of the water distribution system that provides for public fire-protection service. The usage of a fire hydrant as a source of water for fighting a fire is the primary purpose for which the element is installed. A fire flow analysis was performed on the water distribution system utilizing the computer software. Each service area was analyzed for fire protection during the maximum daily demand at buildout. Every junction node in each of the service areas was analyzed in order to meet the following constraints, which meet or exceed TECQ standards:

- Minimum Fire Flow Required for a Given Junction (1 hydrant) - 1.44 mgd (1,000 gpm)
- Residual Pressure at the Fire Flow Junction - 20 psi
- Minimum Acceptable System Pressure with a Fire in the System - 35 psi

A single fire hydrant has a maximum discharge rate of 1.44 MGD (1,000 gpm). The analysis consisted of placing up to 1.44 MGD (the equivalent of using one fire hydrant with 3 outlet nozzles) at each junction node and requiring the water distribution system to maintain minimum pressures. All the junction nodes in the planning area were analyzed in the buildout model. A fire flow was added to a junction node during the maximum daily demand run to determine if the system could deliver the required fire flow while maintaining a residual pressure at the node of 20-psi. In addition, all other nodes were checked to determine if pressures within the system could be maintained at a minimum design pressure 35-psi. The results indicate that the water distribution system will be able to provide fire flow.

5) Capital Improvement Program

The additions to the water distribution system during the study period are shown in **Figure 2** - 2018-2028 Water Impact Fee C.I.P. Map, on the following page. Proposed transmission main and distribution line projects are listed in **Appendix A**.

6) Water System Impact Fee Summary

Appendix A includes the calculations for the impact fee eligible projects that were determined to have utilized capacity during the study period. Total project costs and utilized capacity costs for the impact fee projects are summarized in **Table 12**.

Table 12: 2018-2028 Water Distribution System Utilized Capacity Summary

Water System	Total 20-year Project Cost ($)	Utilized Capacity During Fee Period ($)
Existing Water Facilities	$4,504,082	$180,163
Existing Transmission / Distribution Lines	$10,600,286	$787,631
Existing Water System Planning	$49,400	$49,400
Existing Water System Subtotal:	**$15,153,768**	**$1,017,194**
Proposed Transmission / Distribution Lines	$464,784	$438,062
Proposed Water System Subtotal:	**$464,784**	**$438,062**
Total:	**$15,618,552**	**$1,455,256**

he total 20-year project costs and utilized capacity costs over the study period include costs of construction, engineering, land rights and financing.

THE · CITY · OF

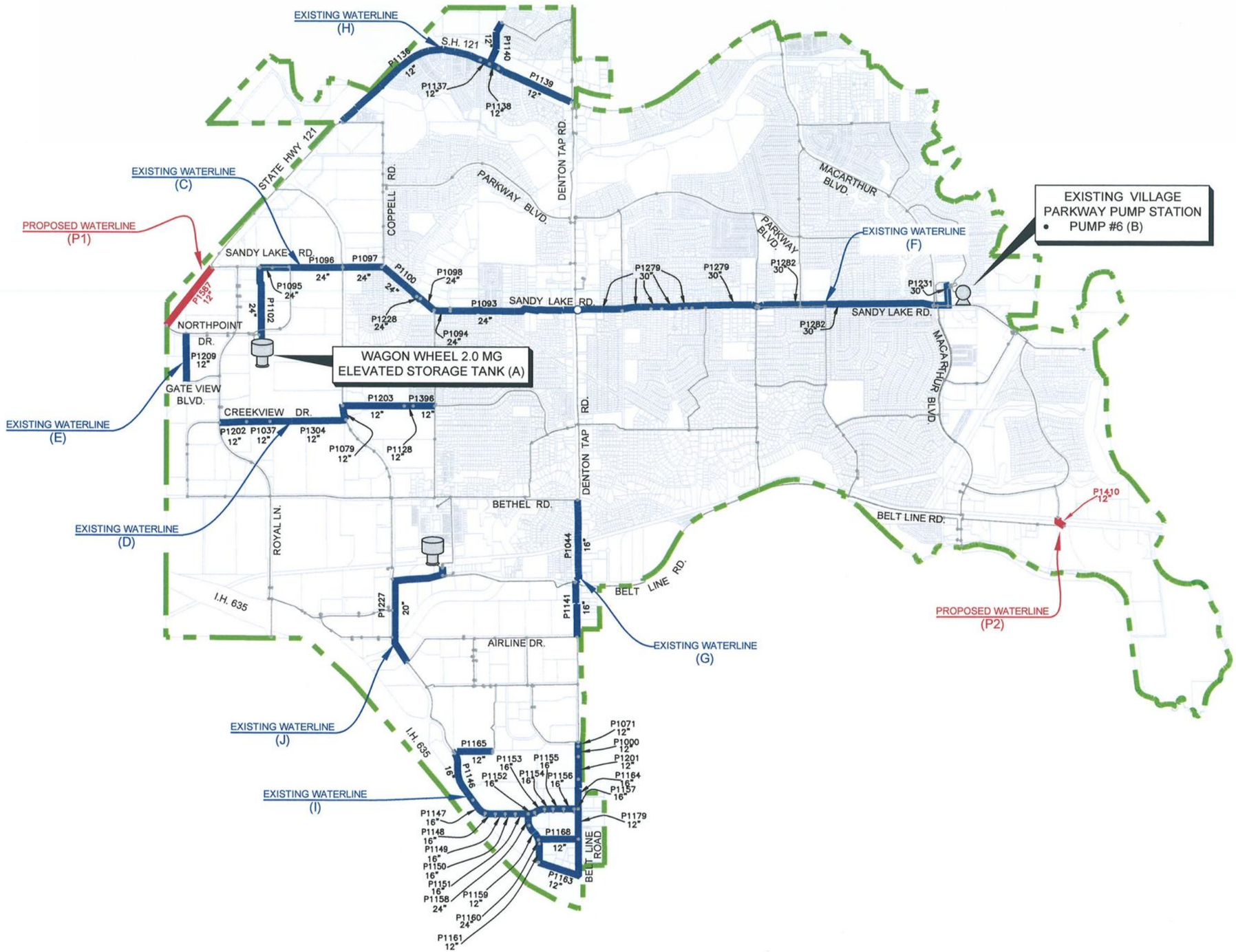
COPPELL

TEXAS · 1890

2018-2028 WATER IMPACT FEE C.I.P. MAP

BIRKHOFF, HENDRICKS & CARTER, L.L.P.
PROFESSIONAL ENGINEERS
TBPE Firm No. 526; TBPLS Firm No. 10031800
Dallas, Texas

SEPTEMBER 2019



1" = 3000'

LEGEND

- COPPELL CITY LIMIT
- EXISTING PIPE
- 271 / 12" — EXISTING IMPACT FEE PIPE NUMBER & SIZE
- 444 / 12" — PROPOSED IMPACT FEE PIPE NUMBER & SIZE
- EXISTING JUNCTION NODE
- EXISTING ELEVATED STORAGE TANK
- EXISTING PUMP STATION

FIGURE 2

J:\CLERICAL\Coppell\2018-111 W&WW & Thoroughfare\Reports\Maps\Water Impact Fee Map.dwg

J. WASTEWATER COLLECTION SYSTEM

The wastewater collection system components in the impact fee analysis include existing and proposed trunk sewer lines, wastewater lift stations, and force mains. The City's wastewater is conveyed to, and treated by a regional provider, the Dallas Water Utilities (DWU) Department. The DWU wastewater conveyance or treatment facilities are excluded from this impact fee update.

1) Hydraulic Wastewater System Model

The hydraulic wastewater system model updates were performed in InfoSewer, an ArcGIS-based modeling software utilized for planning, design, and analysis of wastewater collection systems. The hydraulic modeling files from the City's previous impact fee update were obtained from the City and used as the framework to update the hydraulic modeling scenarios for the existing (2018), 10-year (2028) and buildout development conditions.

Development of wastewater flows to be injected into the model were determined using flow monitoring data collected as part of the City's 2015 wastewater flow meter study. The City provided the 2015 Flow Monitoring report, dated August 2016 and prepared by RJN Group. The flow data collected was extracted from the report and used as the basis for determination of dry and wet weather model loadings. Unique diurnal patterns, which represent the variation in quantity of flow throughout a typical 24-hour cycle, were developed for each of the twenty-two flow meter basins previously studied. These diurnal patterns are the mechanism used by the model to convert average dry weather flows into peak dry weather flow.

The previously collected flow meter data was also used to estimate rainfall derived inflow and infiltration (RDI/I). The method used to estimate RDI/I is referred to as the RTK Hydrograph Method. This method required development of parameters simulating the systems fast, moderate and slow response to RDI/I. The variables in the so called RTK Method are further described as follows.

- R: The fraction of Rainfall over the watershed entering the sewer
- T: The Time to peak RDII flow
- K: The ratio of time to recession (recovery) to T

The dry and wet weather flows were populated, and updated hydraulic models were used to determine utilized capacities for the existing and proposed system components over the 10-year study period.

2) Existing Wastewater Collection Lines

The wastewater collection system analysis considers all drainage basins within the planning area but is typically narrowed to analyze those pipe sizes 12-inches in diameter and larger. Eliminating line sizes smaller than 12-inches in diameter from the study leaves only the interceptor and trunk lines to be included. For existing Impact Fee projects, actual costs were utilized where known. Eligible existing wastewater collection lines are shown on **Exhibit 2**. The existing collection system lines were found to have capacity for future growth as projected, and therefore, no proposed collection lines are required.

3) Existing Wastewater System Facilities

Table 13 shows the major existing wastewater lift stations and the firm pumping capacities. Two existing wastewater facilities were included in the impact fee calculations.

Table 13: Existing Wastewater Lift Stations

Existing Wastewater Lift Station Name	Number of Pumps	FIRM* Pumping Capacity
Sandy Lake	3	4.5 MGD
DeForest	3	14.4 MGD

* FIRM pumping capacity neglects capacity of largest installed pump.

4) Capital Improvement Program

No eligible wastewater system improvements are required during the study period.

K. WASTEWATER COLLECTION SYSTEM IMPACT FEE SUMMARY

Appendix B includes the calculations for the impact fee eligible projects that were determined to have utilized capacity during the study period. Total project costs and utilized capacity costs for the impact fee projects are summarized in **Table 14**.

Table 14: 2018-2028 Wastewater System Impact Fee Utilized Capacity Summary

Wastewater System	Total 20-year Project Cost ($)	Utilized Capacity During Fee Period ($)
Existing Wastewater Facilities	$10,684,855	$213,697
Existing Trunk Sewer Lines	$10,304,388	$222,216
Existing Wastewater System Planning	$52,700	$52,700
Total:	**$21,041,943**	**$488,613**

THE · CITY · OF

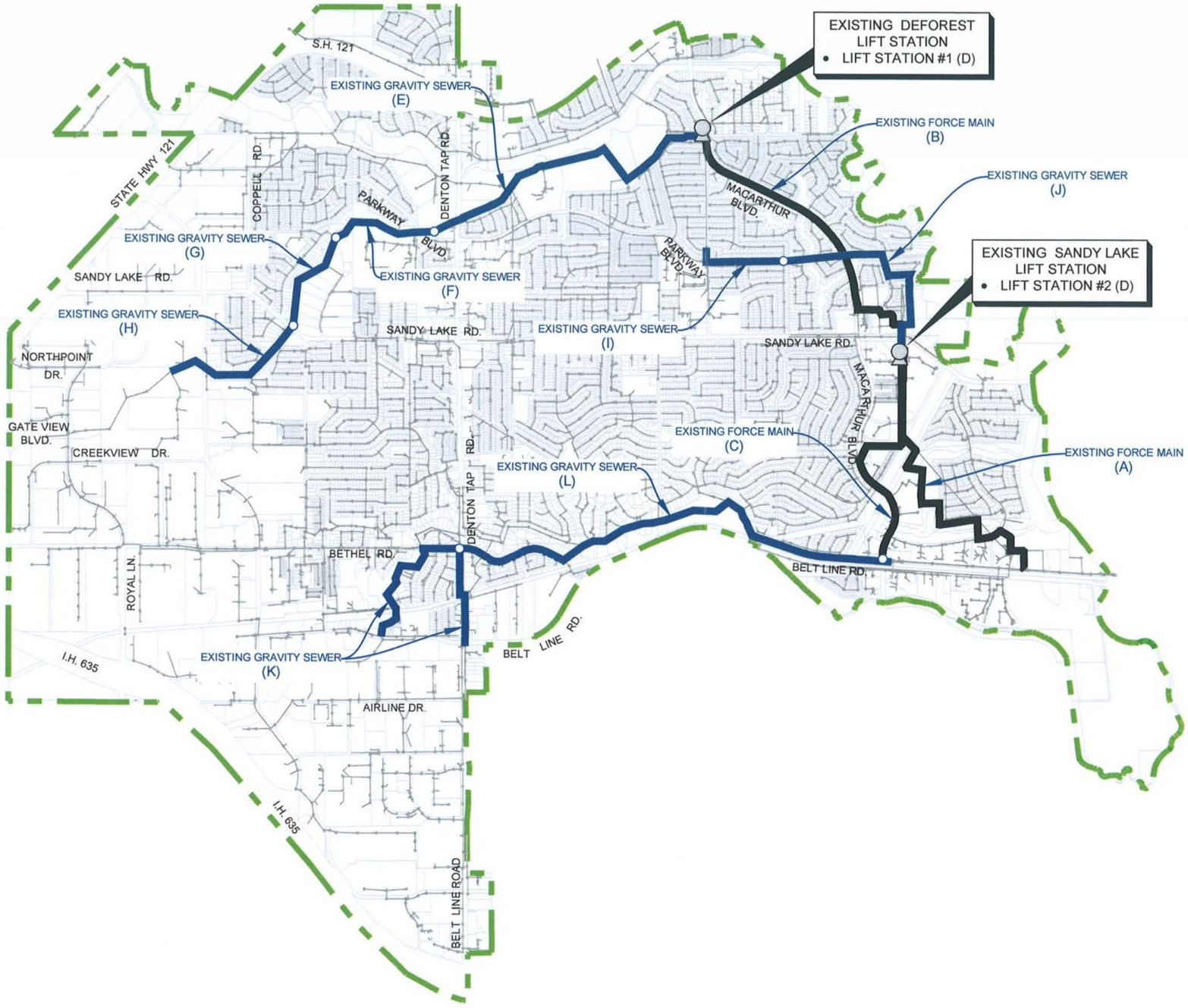
COPPELL

TEXAS · 1890

2018-2028 WASTEWATER IMPACT FEE C.I.P. MAP

BIRKHOFF, HENDRICKS & CARTER, L.L.P.
PROFESSIONAL ENGINEERS
TBPE Firm No. 526; TBPLS Firm No. 10031800
Dallas, Texas

SEPTEMBER 2019



1" = 3000'

LEGEND

- COPPELL CITY LIMIT
- EXISTING PIPE
- 271 / 12" — EXISTING IMPACT FEE GRAVITY MAIN PIPE NUMBER & SIZE
- 271 / 12" — EXISTING IMPACT FEE FORCE MAIN PIPE NUMBER & SIZE
- 444 / 12" — PROPOSED IMPACT FEE PIPE NUMBER & SIZE
- EXISTING MANHOLE
- EXISTING LIFT STATION

FIGURE 3

J:\CLERICAL\Coppell\2018-111 W&WW & Thoroughfare\Reports\Maps\Wastewater Impact Fee Map.dwg

L. CALCULATION OF MAXIMUM IMPACT FEES

Impact fees for the water and wastewater systems are calculated separately by dividing the total existing and proposed utilized capacity cost of the capital improvements or facility expansions necessitated and attributable to new development in the service area within the next ten years by the number of living units anticipated to be added to Coppell within the next ten years. The calculated cost per new LUE is then divided by two, per Chapter 395 of the Local Government Code. The calculated maximum impact fee for each meter size is shown below.

Water Impact Fee = $\frac{\text{Eligible Existing Utilized Cost + Eligible Proposed Utilized Cost}}{\text{Number of New Living Unit Equivalent over the Next 10 Years}}$

$$= \frac{\$1{,}017{,}194 + \$438{,}062}{548} \qquad \frac{\$1{,}455{,}256}{548}$$

Calculated Impact Fee = **$ 2,655.58**

Allowable Maximum Water Impact Fee: (Max Impact Fee x 50%)* = **$ 1,327.79**

** - Maximum allowable impact fee is 50% of the maximum calculated impact fee per Chapter 395 LGC*

Wastewater Impact Fee = $\frac{\text{Eligible Existing Utilized Cost + Eligible Proposed Utilized Cost}}{\text{Number of New Living Unit Equivalent over the Next 10 Years}}$

$$= \frac{\$488{,}613 + \$0}{548} \qquad \frac{\$488{,}613}{548}$$

Calculated Impact Fee = **$ 891.63**

Allowable Maximum Wastewater Impact Fee: (Max Impact Fee x 50%) = **$ 445.81**

** - Maximum allowable impact fee is 50% of the maximum calculated impact fee per Chapter 395 LGC*

The calculations herein assigned a LUE of 1.0 to 3/4" - 5/8" water meters which is the typical size for residential applications, and therefore the calculated maximum impact fees are for those residentially sized meters with a LUE value of 1.0. Connections which use larger meter sizes may be charged higher fees. **Table 15** provides the allowable maximum fee for the various size meters.

The maximum water impact fee collected over the 10-year period would be $727,628.92, based on the projected 548 Living Unit Equivalents. The maximum wastewater impact fee collected over the 10-year period would be $244,303.88, based on the projected 548 Living Unit Equivalents.

Table 15: Allowable Maximum Fee Per Living Unit Equivalent AND Per Meter Size and Type

50% Max . Water Impact fee /LUE $1,327.79

50% Max . Wastewater Impact fee /LUE $445.81

Meter Type	Meter Size	LUE	Maximum Impact Fee		Total
			Water	Wastewater	
Simple	3/4" -5/8"	1	$1,327.79	$445.81	$1,773.60
Simple	1"	1.7	$2,257.24	$757.89	$3,015.13
Simple	1-1/2"	3.3	$4,381.70	$1,471.19	$5,852.89
Simple	2"	5.3	$7,037.28	$2,362.82	$9,400.10
Compound	2"	5.3	$7,037.28	$2,362.82	$9,400.10
Turbine	2"	6.7	$8,896.18	$2,986.96	$11,883.14
Compound	3"	10.7	$14,207.34	$4,770.22	$18,977.55
Turbine	3"	16	$21,244.61	$7,133.04	$28,377.65
Compound	4"	16.7	$22,174.06	$7,445.11	$29,619.17
Turbine	4"	28	$37,178.07	$12,482.81	$49,660.89
Compound	6"	33.3	$44,215.35	$14,845.63	$59,060.98
Turbine	6"	61.3	$81,393.42	$27,328.45	$108,721.87
Compound	8"	53.3	$70,771.12	$23,761.93	$94,533.05
Turbine	8"	106.7	$141,675.01	$47,568.44	$189,243.45
Compound	10"	153.3	$203,549.95	$68,343.41	$271,893.36
Turbine	10"	166.7	$221,342.31	$74,317.32	$295,659.64
Turbine	12"	220	$292,113.43	$98,079.25	$390,192.68

THE · CITY · OF

COPPELL

TEXAS · 1890

ROADWAY
2018-2028 IMPACT FEE REVIEW

LEE ENGINEERING, L.L.C.

3030 LBJ Freeway, Suite 1660

Dallas, Texas 75234

CITY OF COPPELL
THOROUGHFARE CAPITAL IMPROVEMENT PLAN

ROADWAY IMPACT FEES

A. LAND USE ASSUMPTIONS BY ROADWAY SERVICE AREA

One of the initial steps in developing roadway impact fees includes the identification of data related to the planned land uses for land within the City of Coppell city limits by roadway service area, as identified in **Figure 4** (page 23). A summary of the land use data by roadway service area is provided in **Table 16** below.

Table 16 - Summary of Land Use Data
City of Coppell 2018 Roadway Impact Fee Study

Service Area		Land Use:	Residential	Office	Retail	Industrial	Public/Institutional	Parks/Open Space
		Unit:	Dwelling Units	Acres	Acres	Acres	Acres	Acres
1	Year	2018	13,887	496	336	1,445	30	1,963
		2028	14,525	709	407	1,445	26	1,560
		Ultimate	14,653	709	407	1,445	26	1,549

B. CAPITAL IMPROVEMENT PLAN

The capital improvement plan (CIP) includes projects intended for construction by the City of Coppell in the next 10 years to serve both existing and future development. In order to be funded by roadway impact fees, a roadway project must be included in the 10-year CIP.

1) Existing Facilities

The City of Coppell major roadway and collector street system is mostly developed at this time. Almost all of the roadways in the City are built to current thoroughfare plan standards. All of the proposed roadway segments on the thoroughfare plan currently exist.

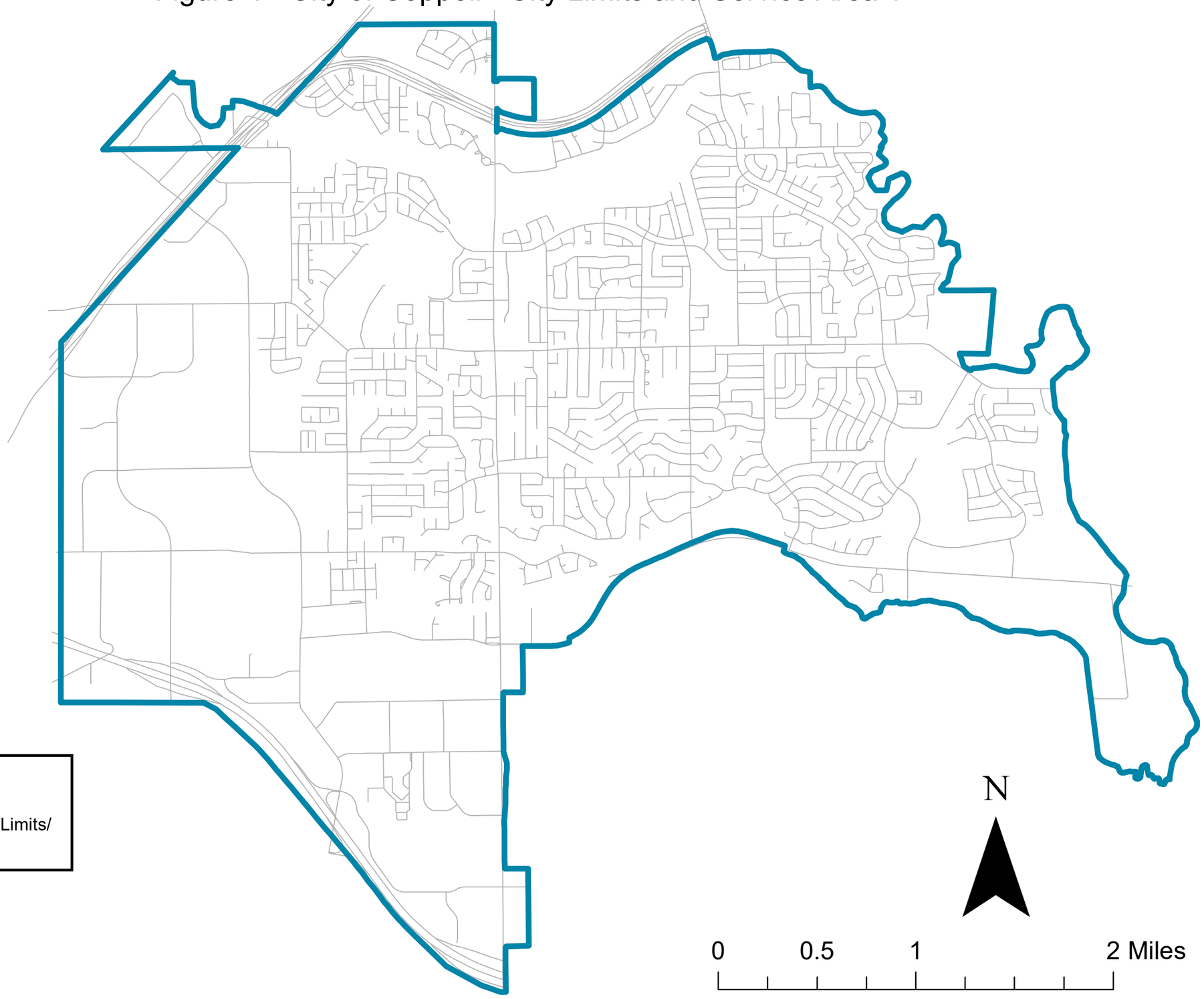
The existing major roadways within the City or near the City Limits under the operation and maintenance jurisdiction of the Texas Department of Transportation (TxDOT) include Interstate 635 (IH 635) and State Highway 121 (SH 121). Existing Boulevards include Belt Line Road, Bethel Road, Denton Tap Road, Freeport Parkway, MacArthur Boulevard, Parkway Boulevard, Royal Lane, and Sandy Lake Road.

2) Proposed Facilities

The City of Coppell Thoroughfare Plan is the basis for development of the future street system. The thoroughfare system is a conventional network conforming to a hierarchical, functional classification system developed to support the forecast traffic demands of future land use.

The highest classification of roadway is the Boulevard type. These roadways are generally multiple lanes (4 or 6) with medians that serve the function of controlling access, separating opposing traffic

Figure 4 - City of Coppell - City Limits and Service Area 1



movements and providing an area for the storage of left turning vehicles. The lower classifications are the Avenue facilities that are developed to serve the adjoining developments. The character of the developments served should determine the sizes and alignments of Avenue roadways.

3) Capital Improvement Plan for Roadway Impact Fees

All roadways included in the Thoroughfare Plan were considered for inclusion in the Capital Improvement Plan (CIP). The thoroughfare facilities determined for inclusion in the Capital Improvement Plan of this study are tabulated in **Table 17A** (page 25) and graphically illustrated in **Figure 5** (page 26). The projects identified were developed based on existing Boulevard sections which are not currently built to the ultimate configuration where the median was wide enough to provide an additional lane in each direction. The turn lane improvements (right turn and dual left turn) were identified based on an engineering review of Boulevard-Boulevard intersections where turn lanes were not provided in all directions. Under existing State Statute, a municipalities' cost associated with TxDOT facilities can be financed with impact fees. Each listed project includes a description of the planned improvements, the approximate project length, and an engineer's opinion of probable cost to the City. The probable construction costs for these projects were prepared without the benefit of a detailed preliminary engineering study for each project and were developed based on previous roadway project construction bids. All roadways included in the 2018 CIP are identified in the City of Coppell Thoroughfare Plan.

Recoupment costs for projects completed as part of the previous CIP are shown in **Table 17B** (page 27). These are projects which have previously been built to serve existing and future roadway needs. The construction costs for these recoupment projects were obtained from information provided in the previous Roadway Impact Fee study.

For both the CIP and recoupment projects, the costs shown include only those costs that will be paid for or has been paid for by the City of Coppell. Financing costs for both of these types of projects were also included in the total estimated cost with an assumed interest rate of 5%.

Table 17A - Proposed Roadway Capital Improvements
City of Coppell 2018 Roadway Impact Fee Study

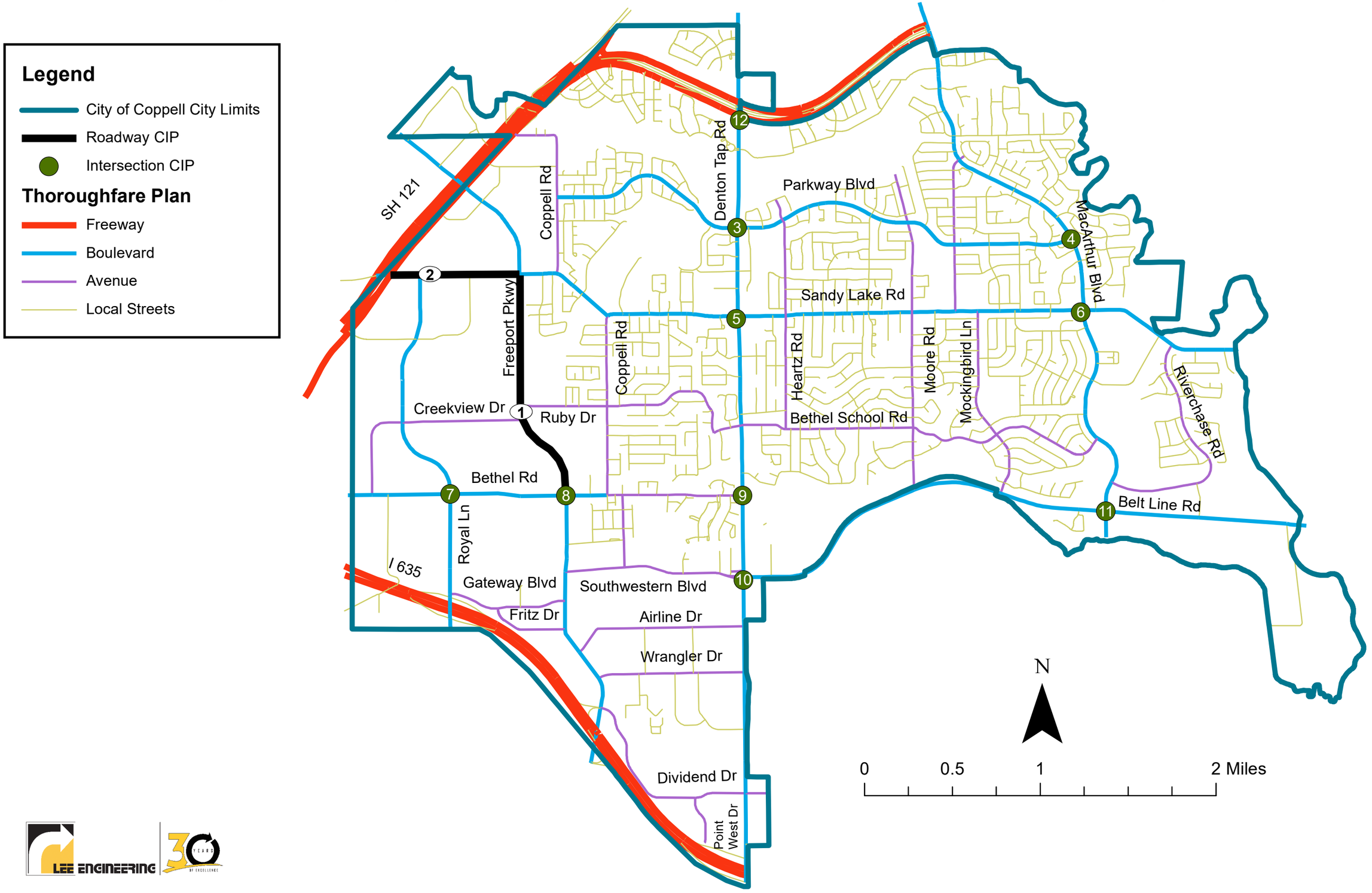
Project #	Road Name	From	To	Segment Length (ft)	Planned Configuration	Existing Condition	Needed Construction	Capital Cost (1)	Debt Service (2)	Total Project Cost
Service Area 1										
1	Freeport Parkway	Bethel Rd	Sandy Lake Rd	7,400	6D	4D	Widen 4-lane divided to 6-lane divided roadway	$ 5,698,000	$ 3,446,445	$ 9,144,445
2	Sandy Lake Road	SH 121	Freeport Pkwy	3,700	6D	4D	Widen 4-lane divided to 6-lane divided roadway	$ 2,849,000	$ 1,723,223	$ 4,572,223
3	Parkway Blvd @ Denton Tap Rd	-	-	-	-	-	Install NB, SB, EB & WB RT Lanes + Additional NB LT L	$ 600,000	$ 362,911	$ 962,911
4	Parkway Blvd @ MacArthur Blvd	-	-	-	-	-	Install SB RT Lane	$ 120,000	$ 72,582	$ 192,582
5	Sandy Lake Rd @ Denton Tap Rd	-	-	-	-	-	Install SB RT Lane	$ 120,000	$ 72,582	$ 192,582
6	Sandy Lake Rd @ MacArthur Blvd	-	-	-	-	-	Install NB & SB RT Lanes	$ 240,000	$ 145,164	$ 385,164
7	Bethel Rd @ Royal Ln	-	-	-	-	-	Install EB, NB & SB RT Lanes	$ 360,000	$ 217,747	$ 577,747
8	Bethel Rd @ Freeport Pkwy	-	-	-	-	-	Install NB & WB RT Lanes	$ 240,000	$ 145,164	$ 385,164
9	Bethel Rd @ Denton Tap Rd	-	-	-	-	-	Install SB RT Lane + Add 2nd EB LT Lane	$ 240,000	$ 145,164	$ 385,164
10	Denton Tap Rd/Belt Line Rd/Southwestern Blvd	-	-	-	-	-	Install NB, EB & SB RT Lanes	$ 240,000	$ 145,164	$ 385,164
11	Belt Line Rd @ MacArthur Blvd	-	-	-	-	-	Install SB RT Lane	$ 120,000	$ 72,582	$ 192,582
12	Denton Tap Rd @ SH 121 EBFR	-	-	-	-	-	Install NB & EB RT Lanes + EB LT Lane	$ 360,000	$ 217,747	$ 577,747
		-	-	-	-	-		$ -	$ -	$ -
TS	Number of Traffic Signals to Construct in Service Area 1:			0				$ -	$ -	$ -
TOTAL								**$ 11,187,000**	**$ 6,766,475**	**$ 17,953,475**

Notes:

(1) **For state-maintained roadways and traffic signals, Coppell's participation is shown and assumed to be 20% of the total cost**

(2) **Debt service cost calculated for financing over 20-years at a 5% annual interest rate**

Figure 5 - City of Coppell Proposed Capital Improvement Projects



LEE ENGINEERING 30 YEARS OF EXCELLENCE

Table 17B - Eligible Recoupment Projects Completed with Previous CIP
City of Coppell 2018 Roadway Impact Fee Study

Project #	Road Name	From	To	Cost	Financing	Total Project Cost
Service Area 1						
R-1	Sandy Lake Road	City Limit (West)	N, Coppell Road	$ 4,697,908	$ 1,598,092	$ 6,296,000
R-2	Sandy Lake Road	MacArthur Boulevard	City Limit (East)	$ 5,193,720	$ 1,766,280	$ 6,960,000
R-3	Bethel Road	City Limit (West)	Freeport Parkway	$ 7,280,321	$ 2,475,679	$ 9,756,000
R-4	Southwestern Boulevard	Coppell Road	Grapevine Creek	$ 1,204,349	$ 409,651	$ 1,614,000
R-5	MacArthur Boulevard	Bethel School Road	Belt Line Road	$ 325,394	$ 111,606	$ 437,000
R-6	Sandy Lake Road	N. Coppell Road	Grapevine Creek	$ 6,102,000	$ 2,075,000	$ 8,177,000
R-7	Freeport Parkway	SH 121	Sandy Lake Road	$ 881,800	$ 300,200	$ 1,182,000
R-8	Freeport Parkway	Ruby Road	Sandy Lake Road	$ 987,600	$ 336,400	$ 1,324,000
			TOTAL	**$ 26,673,092**	**$ 9,072,908**	**$ 35,746,000**

C. IMPACT FEE CALCULATION

After the land use assumptions and CIP have been finalized, this information is used to determine the maximum fee per service unit (impact fee) that can be charged by the City for new developments. The fee is calculated by dividing the costs of the capital improvements identified as necessary to serve growth forecast to occur during the 10-year planning period (CIP) by the number of service units of growth forecast to occur (using the land use assumptions). The specific steps, as described in following paragraphs of this section include:

1) Determination of a standard service unit;
2) Identification of service areas for the City;
3) Analysis of the total capacity, level of current usage, and commitment for usage of capacity of existing improvements;
4) Identification of that portion of the total capital improvements necessary to serve the projected growth over the next 10-year period;
5) Determination of the "standard service unit" and equivalency tables establishing the ratio of a service unit to the types of land use forecast for growth;
6) Calculating the resulting eligible costs per service unit (impact fee) for new developments in each service area.

1) Service Unit

To determine the impact fee rate applied to thoroughfare facilities the standard service unit selected was **"PM Peak Hour Vehicle-Miles."** This service unit can be obtained by multiplying the number of trips generated (vehicles) by a specific land use type during the PM peak hour by the average trip length (miles) for that land use. The PM peak hour was chosen because it is usually considered the critical time, with the most vehicles, for roadway analyses. The trip generation data were directly obtained or derived for each defined land use type from the *Trip Generation Manual, 10th Edition* of the Institute of Transportation Engineers, which is the standard data reference to determine vehicle trip generation characteristics of particular land use types and densities. Trip length information for each land use specified was based on data developed for the Dallas-Fort Worth area by the North Central Texas Council of Governments (NCTCOG). The trip length was set at a maximum of three (3) miles for any land use, as this trip length was assumed to be the maximum average distance a trip would travel on roadways within each service area in the City of Coppell. **Table 18** (page 29) shows the typical service units for each land use type used in developing the roadway impact fees.

Table 18 - Service Unit Calculation by Land Use Type
City of Coppell 2018 Roadway Impact Fee Study

	Variable	PM Peak Trips[1] (vehicles)	Trip Length[2] (miles)	PM Peak Hour Vehicle-Miles
Residential	Dwelling Unit	0.99	3.0	2.97
Office	1,000 ft^2	1.15	3.0	3.45
Commercial / Retail	1,000 ft^2	3.81	3.0	11.43
Industrial	1,000 ft^2	0.63	3.0	1.89
Public and Institutional	1,000 ft^2	1.04	3.0	3.12
Parks and Open Space	Acre	6.22	3.0	18.66

[1] Based on ITE *Trip Generation Manual, 10th. Edition*

[2] Based on FHWA *National Household Travel Survey* (2017)

2) Service Areas

The State Statute governing the imposition of development impact fees require that collection and expenditure of fees imposed for street facilities "*...is limited to an area within the corporate boundaries of the political subdivision and shall not exceed six miles.*" To comply with this State Law, one service area (Service Area 1) was established for the City of Coppell to ensure that funds are spent within six miles of where they are collected. The service area is shown in **Figure 4** (page 23). The service areas include all of the developable land within the existing city limits of Coppell.

3) Analysis of 10-Year and Ultimate Growth

The land use assumption data provided by Birkhoff, Hendricks & Carter (BHC) and available in the City of Coppell 2030 Master Plan was converted to the standard service unit (vehicle-miles) by applying the trip generation and trip length data provided in Table 18. These results were used to provide an estimate of the existing service units (vehicle-miles) within each service area, as well as to forecast the growth in service units for both the next 10-year period (2018-2028) and the ultimate development of the City of Coppell. **Table 19** below shows the portion of ultimate build-out service units that will be attributable to growth within the next 10 years.

Table 19 - Summary of Vehicle-Mileage Distribution by Development Period
City of Coppell 2018 Roadway Impact Fee Study

	Existing		2018 - 2028		Year 2028 - Ultimate		
Service Area	Vehicle-Miles 2018	Portion of Ultimate Vehicle-Miles	Vehicle-Miles Added 2018-2028	Portion of Ultimate Vehicle-Miles	Vehicle-Miles Added 2028 - Ultimate	Portion of Ultimate Vehicle-Miles	Ultimate Vehicle-Miles
1	143,942	0.9545	6,865	0.0455	0	0.0000	150,807
Total	**143,942**		**6,865**		**0**		**150,807**

4) Capital Improvements Costs Necessary to Serve 10-Year Growth

The total costs for implementing the roadway CIP were identified previously in Tables 17A and 17B. The street facility improvements identified in the CIP will logically serve all existing and future growth by improved safety and drainage characteristics. Therefore, the 10-year eligible costs have been proportioned as the ratio of the 10-year growth to the total number of service units determined

for build-out, as provided in Table 19 (page 29). **Table 20** below presents a summary of the roadway capital improvement costs for the service area.

Table 20 - Summary of Capital Improvement Cost by Service Area
City of Coppell 2018 Roadway Impact Fee Study

Service Area	Zone Cost of Thoroughfare	Portion of Capacity of Thoroughfare Attributed to Growth (2018 - 2028)	Cost of Thoroughfare Attributed to Growth (2018 - 2028)
1	$53,699,475.00	0.0455	$2,443,326.11
Totals	**$53,699,475.00**		**$2,443,326.11**

In order to maintain the equity of impact fee assessment, the cost for streets included in the 10-year Capital Improvement Plan will include the total cost of the street facilities, not reduced by any expected participation. Rather, construction by a developer of an arterial facility within or off-site should be treated as a credit to the impact fee assessment.

5) Determination of Standard Service Unit Equivalency

Table 21 below presents the derivation of service unit equivalents for each of the six defined land use types. The service unit equivalents are referenced to and based on the residential land use. That is, the vehicle-miles/development unit for each land use are provided as a ratio of that land use to the residential land use.

Table 21 - Thoroughfare Land Use Equivalency
City of Coppell 2018 Roadway Impact Fee Study

Land Use	Development Unit	Veh-Miles / Development Unit (1)	SU Equivalency (2)
Residential	Dwelling Unit	2.97	1.00
Office	1,000 ft^2	3.45	1.16
Commercial / Retail	1,000 ft^2	11.43	3.85
Industrial	1,000 ft^2	1.89	0.64
Public and Insitutional	1,000 ft^2	3.12	1.05
Parks and Open Space	Acre	18.66	6.28

Notes:
(1) Based on data from the ITE *Trip Generation* Manual (10th Edition) and FHWA *National Household Travel Survey* (2017)
(2) Ratio of each land use to service unit of Residential

6) Cost Per Service Unit (Impact Fee) Calculation

Table 22 (page 31) presents a summary of the calculations and resulting capital improvement costs attributable to growth per service unit, which represents the maximum *calculated* impact fee. This fee is calculated by taking the cost of the CIP attributable to growth in the next 10 years (Table 20) and dividing it by the estimated growth, or the number of new service units (Table 19), in the next 10 years.

Table 22 - Impact Fee Calculation for Thoroughfare by Service Area
City of Coppell 2018 Roadway Impact Fee Study

Service Area	Cost of Thoroughfare Attributed to Growth (2018 - 2028)	Number of New Service Units (2018 - 2028)	Cost Per Service Unit	Cost Per Service Unit (Rounded)
1	$2,443,326.11	6,865	$355.91	**$355**
Totals	**$2,443,326.11**	**6,865**		

D. SUMMARY OF IMPACT FEE CALCULATION METHODOLOGY

The methodology for calculating the maximum *allowable* impact fee for roadway facilities can be summarized in the following three steps and is summarized for Service Area 1 below. First, the cost of the roadway facilities (existing roadways eligible for recuperation of construction cost and proposed roadways) that can be attributed to new growth over the 10-year period is determined.

1) Calculation for Service Area 1

Cost of Roadway Facilities (Tables 17A and 17B) = $53,699,475.00
Proportion of Capacity Attributable to New Growth (Table 19) = 0.0455
Cost of Roadway Facilities Attributable to Growth (2018-2028):
$53,699,475.00 x 0.0455 = $2,443,326.11

The second step is to determine the maximum *calculated* impact fee. The maximum *calculated* impact fee is the ratio of the total cost for roadway facilities attributable to growth in the next ten years (2018-2028) divided by the total growth in equivalent service units (ESU). The maximum calculated impact fee for Service Area 1 is:

$$\text{Maximum Roadway Impact Fee} = \frac{\text{Eligible Thoroughfare Cost Attributed to Growth (Table 20)}}{\text{Total Growth in Equivalent Service Units (Table 19)}}$$

$$= \frac{\$2,443,326.11}{6,865 \text{ ESU}}$$

= $355.91 / ESU = $355 / ESU (Rounded Service Area 1)

This amount represents the maximum *calculated* impact fee for roadway facilities. For the final step, the current impact fee legislation requires the City to produce a financial analysis to support a fee greater than 50 percent of the eligible costs or to reduce the maximum calculated impact fee by 50 percent. If the City chooses to use a maximum *allowable* impact fee of 50 percent of the maximum calculated fee the amount would be $355 x 50% = **$177.50** for Service Area 1.

E. IMPACT FEE CALCULATION EXAMPLE

The information provided in **Table 23** represents an expansion of the basic land uses used for calculating the impact fee. This table identifies the total service units generated by specific uses within each land use category and includes land uses which may develop over the next 10-year period. To obtain the impact fee to be charged for a particular land use, the impact fee per service unit adopted by the City and the service units per development unit generated for that particular land use from Table 23 are used. Examples for calculating the impact fee for both a single-family dwelling unit and a 50,000 ft^2 shopping center (commercial / retail facility) assuming maximum *allowable* impact fees of $177.50 per service unit (Service Area 1) are shown following Table 23.

Table 23 - Service Units by Land Use
City of Coppell 2018 Roadway Impact Fee Study

CATEGORY	LAND USE	DEVELOPMENT UNITS[1]	ITE TRIP RATE[2]	TRIP LENGTH[3]	PASS-BY TRAFFIC[4]	SERVICE UNITS[5]	DEVELOPMENT UNIT[6]
							Service Area 1
RESIDENTIAL							
	Single-Family Detached	Dwelling Unit	0.99	3.0	0	2.97	$527.18
	Apartment/Multi-Family	Dwelling Unit	0.56	3.0	0	1.68	$298.20
	Condominium/Townhouse	Dwelling Unit	0.56	3.0	0	1.68	$298.20
	Senior Housing - Attached	Dwelling Unit	0.26	3.0	0	0.78	$138.45
OFFICE							
	Office Building	1,000 ft^2 GFA	1.15	3.0	0	3.45	$612.38
	Medical Office	1,000 ft^2 GFA	3.46	3.0	0	10.38	$1,842.45
COMMERCIAL							
	Automobile Care Center	1,000 ft^2 GFA	3.11	3.0	0.28	6.72	$1,192.80
	Bank	1,000 ft^2 GFA	20.45	2.4	0.35	31.90	$5,662.25
	Super Convenience Market/Gas Station	Fueling Positions	22.96	2.4	0.76	13.22	$2,346.55
	Home Improvement Store	1,000 ft^2 GFA	2.33	3.0	0.42	4.05	$718.88
	Hotel	Rooms	0.60	3.0	0	1.80	$319.50
	Pharmacy/Drugstore	1,000 ft^2 GFA	10.29	2.8	0.49	14.69	$2,607.48
	Fast Food Restaurant with Drive-In/Through	1,000 ft^2 GFA	32.67	2.4	0.50	39.20	$6,958.00
	Fast Food Restaurant without Drive-In/Through	1,000 ft^2 GFA	28.34	2.4	0.50	34.01	$6,036.78
	High-Turnover (Sit-Down) Restaurant	1,000 ft^2 GFA	9.77	3.0	0.43	16.71	$2,966.03
	Shopping Center / General Retail	1,000 ft^2 GFA	3.81	3.0	0.34	7.54	$1,338.35
	Supermarket	1,000 ft^2 GFA	9.24	2.8	0.36	16.56	$2,939.40
INDUSTRIAL							
	Industrial	1,000 ft^2 GFA	0.63	3.0	0	1.89	$335.48
	Mini-Warehouse	1,000 ft^2 GFA	0.17	3.0	0	0.51	$90.53
	Warehouse / Distribution Center	1,000 ft^2 GFA	0.19	3.0	0	0.57	$101.18
INSTITUTIONAL							
	School	Students	0.17	3.0	0	0.51	$90.53
	Day Care Center	Students	0.79	3.0	0	2.37	$420.68
	Nursing Home	1,000 ft^2 GFA	0.59	3.0	0	1.77	$314.18
	House of Worship	1,000 ft^2 GFA	0.49	3.0	0	1.47	$260.93

[1] GFA = Gross Floor Area

[2] (Vehicles); Based on *ITE Trip Generation Manual, 10h Edition*

[3] (Miles); Based on FHWA *National Household Travel Survey* (2017) - maximum of 3 miles

[4] Percentage of traffic already passing by site - land use is an intermediate destination

[5] (Vehicle-Miles)

[6] Based on impact fee of $200.50/service unit for Service Area 1

* This table reflects individual land uses within each category. For land uses not included in the table above, an applicant may provide supporting documentation for the use of a similar land use or an alternative service unit calculation.

1) Service Area 1 – Example Calculations

SINGLE-FAMILY DWELLING (Service Area 1)

- Vehicle-Miles per Development Unit for Single-Family Dwelling Unit
  (1 Dwelling Unit) x (2.97 Vehicle-Miles / Dwelling Unit) = 2.97 Vehicle-Miles

- Assume 50 percent of the Maximum Calculated Roadway Impact Fee = $177.50 / Service Unit:
  (2.97 Vehicle-Miles) x ($177.50 / Vehicle-Miles) = $527.18

50,000 ft^2 SHOPPING CENTER (Service Area 1)

- Vehicle-Miles per Development Unit for Shopping Center
  (50,000 ft^2) x (7.54 Vehicle-Miles / 1,000 ft^2) = 377.00 Vehicle-Miles

- Assume 50 percent of the Maximum Calculated Roadway Impact Fee = $200.50 / Service Unit:
  (377.00 Vehicle-Miles) x ($177.50 / Vehicle-Miles) = $66,917.50

THE · CITY · OF

COPPELL

TEXAS · 1890

WATER AND WASTEWATER 2018-2028 IMPACT FEE REVIEW

APPENDIX "A"

WATER SYSTEM
IMPACT FEE DATA

PUMP STATIONS
GROUND STORAGE RESERVOIRS
ELEVATED STORAGE TANKS
TRANSMISSION LINES
DISTRIBUTION LINES

CITY OF COPPELL, TEXAS
2018 WATER DISTRIBUTION IMPACT FEE STUDY
EXISTING WATER FACILITIES

Proj. I.D.	Project Discription	Cost ($)				Capacity Utilized (%)			Capacity Utilized ($)		
		Total Capital Cost ($)	Debt Service Interest Rate (%)	20 Year Debt Service Utilizing Simple Interest	Total 20 Yr. Project Cost ($)	2018	2028	In The CRF Period	2018	2028	In The CRF Period
A	Wagon Wheel 2.0 MG EST	$2,786,990	4.0%	$1,314,442	$4,101,432	96%	100%	4%	$3,937,375	$4,101,432	$164,057
B	Village Parkway Pump #6	$273,607	4.0%	$129,043	$402,650	96%	100%	4%	$386,544	$402,650	$16,106
TOTAL EXISTING WATER FACILITIES:		**$3,060,597**		**$1,443,485**	**$4,504,082**				**$4,323,918**	**$4,504,082**	**$180,163**

** Cost Estimates from 2012 Impact Fee Study*

CITY OF COPPELL, TEXAS
2018 WATER DISTRIBUTION IMPACT FEE STUDY
EXISTING WATER DISTRIBUTION LINES

Proj. I.D.	Pipe Number	Length (Ft.)	Diameter (Inches)	Avg. Unit Cost ($/Ft.)	Total Capital Cost ($)	Debt Service Intersest Rate %	20 Year Debt Service Utilizing Simple Interest	Total 20 Yr. Project Cost ($)	(%) Utilized Capacity			($) Utilized Capacity		
									2018	2028	During Fee Period	2018	2028	During Fee Period
C	**24-inch Sandy Lake Road & Coppell Road water line from Denton Tap Road to Wagon Wheel EST**													
	P1093	3,700	24	$83.55	$309,127		$145,795	$454,923	95%	100%	5%	$432,176	$454,923	$22,746
	P1094	460	24	$83.55	$38,432		$18,126	$56,558	95%	100%	5%	$53,730	$56,558	$2,828
	P1095	360	24	$83.55	$30,077		$14,185	$44,263	95%	100%	5%	$42,050	$44,263	$2,213
	P1096	2,000	24	$83.55	$167,096		$78,808	$245,904	95%	100%	5%	$233,609	$245,904	$12,295
	P1097	1,120	24	$83.55	$93,574		$44,133	$137,706	95%	100%	5%	$130,821	$137,706	$6,885
	P1098	520	24	$83.55	$43,445		$20,490	$63,935	95%	100%	5%	$60,738	$63,935	$3,197
	P1100	1,340	24	$83.55	$111,954		$52,802	$164,756	95%	100%	5%	$156,518	$164,756	$8,238
	P1102	2,020	24	$83.55	$168,767		$79,596	$248,363	97%	100%	3%	$240,912	$248,363	$7,451
	P1104	140	24	$83.55	$11,697		$5,517	$17,213	97%	100%	3%	$16,697	$17,213	$516
	P1228	130	24	$83.55	$10,861		$5,123	$15,984	95%	100%	5%	$15,185	$15,984	$799
		11,790			**$985,030**	**4.0%**	**$464,575**	**$1,449,605**				**$1,382,436**	**$1,449,605**	**$67,169**
D	**12-inch water line along Ruby Road from Royal Lane to Coppell Road**													
	P1037	670	12	$48.79	$32,692		$15,419	$48,111	99%	100%	1%	$47,630	$48,111	$481
	P1079	420	12	$48.79	$20,493		$9,665	$30,159	97%	100%	3%	$29,254	$30,159	$905
	P1128	260	12	$48.79	$12,686		$5,983	$18,670	95%	100%	5%	$17,736	$18,670	$933
	P1202	770	12	$48.79	$37,571		$17,720	$55,291	99%	100%	1%	$54,738	$55,291	$553
	P1203	1,750	12	$48.79	$85,389		$40,273	$125,662	95%	100%	5%	$119,379	$125,662	$6,283
	P1304	2,160	12	$48.79	$105,395		$49,708	$155,103	99%	100%	1%	$153,552	$155,103	$1,551
	P1396	620	12	$48.79	$30,252		$14,268	$44,520	95%	100%	5%	$42,294	$44,520	$2,226
		6,650			**$324,480**	**4.0%**	**$153,036**	**$477,516**				**$464,584**	**$477,516**	**$12,932**
E	**12-inch waterline along western edge of City from Northpoint Drive to Gateview Drive**													
	P1209	2,340	12	$224.73	$526,320		$248,231	$774,551	39%	93%	54%	$302,075	$720,332	$418,258
		2,340			**$526,320**	**4.0%**	**$248,231**	**$774,551**				**$302,075**	**$720,332**	**$418,258**
F	**30-inch Sandy Lake Road water line from MacArthur Blvd. to Denton Tap Rd.**													
	P1231	1,060	30	$48.79	$175,510		$82,776	$258,286	95%	96%	1%	$245,372	$247,955	$2,583
	P1279	5,190	30	$48.79	$859,335		$405,292	$1,264,627	95%	96%	1%	$1,201,396	$1,214,042	$12,646
	P1282	5,000	30	$48.79	$827,876		$390,455	$1,218,331	96%	100%	4%	$1,169,597	$1,218,331	$48,733
		11,250			**$1,862,720**	**4.0%**	**$878,524**	**$2,741,244**				**$2,616,365**	**$2,680,327**	**$63,962**
G	**16-inch water line from Bethel Rd. to Airline Dr. along Denton Tap**													
	P1044	2,410	16	$48.79	$483,628		$228,096	$711,723	100%	100%	0%	$711,723	$711,723	$0
	P1141	1,600	16	$48.79	$321,080		$151,433	$472,513	88%	99%	11%	$415,812	$467,788.17	$51,976.46
		4,010			**$804,708**	**4.0%**	**$379,528**	**$1,184,236**				**$1,127,535**	**$1,179,511**	**$51,976**
H	**12-inch SH 121 water line from Coppell Rd. to Denton Tap**													
	P1136	4,800	12	$48.79	$329,891		$155,588	$485,479	96%	100%	4%	$466,060	$485,479	$19,419
	P1137	280	12	$48.79	$19,244		$9,076	$28,320	94%	95%	1%	$26,620	$26,904	$283
	P1138	280	12	$48.79	$19,244		$9,076	$28,320	93%	96%	3%	$26,337	$27,187	$850
	P1139	2,320	12	$48.79	$159,447		$75,201	$234,648	93%	96%	3%	$218,223	$225,262	$7,039
	P1140	1,270	12	$48.79	$87,284		$41,166	$128,450	90%	100%	10%	$115,605	$128,450	$12,845
		8,950			**$615,109**	**4.0%**	**$290,107**	**$905,216**				**$852,845**	**$893,281**	**$40,436**

CITY OF COPPELL, TEXAS
2018 WATER DISTRIBUTION IMPACT FEE STUDY
EXISTING WATER DISTRIBUTION LINES

Proj. I.D.	Pipe Number	Length (Ft.)	Diameter (Inches)	Avg. Unit Cost ($/Ft.)	Total Capital Cost ($)	Debt Service Intersest Rate %	20 Year Debt Service Utilizing Simple Interest	Total 20 Yr. Project Cost ($)	(%) Utilized Capacity			($) Utilized Capacity		
									2018	2028	During Fee Period	2018	2028	During Fee Period
I	**12-inch water line along Belt Line Rd. and west along Dividend Dr. from existing 12-inch water line of Lakeshore Dr. to the existing 12-inch water line at Freeport Parkway**													
	P1000	290	12	$70.63	$20,484		$9,661	$30,145	89%	100%	11%	$26,829	$30,145	$3,316
	P1071	130	12	$70.63	$9,183		$4,331	$13,513	89%	100%	11%	$12,027	$13,513	$1,486
	P1146	1,490	16	$70.63	$105,246		$49,638	$154,884	92%	99%	7%	$142,493	$153,335	$10,842
	P1147	520	16	$70.63	$36,730		$17,323	$54,053	92%	98%	6%	$49,729	$52,972	$3,243
	P1148	290	16	$70.63	$20,484		$9,661	$30,145	92%	98%	6%	$27,734	$29,542	$1,809
	P1149	280	16	$70.63	$19,778		$9,328	$29,106	92%	98%	6%	$26,777	$28,524	$1,746
	P1150	290	16	$70.63	$20,484		$9,661	$30,145	95%	96%	1%	$28,638	$28,939	$301
	P1151	360	16	$70.63	$25,429		$11,993	$37,422	96%	100%	4%	$35,925	$37,422	$1,497
	P1152	190	16	$70.63	$13,421		$6,330	$19,750	96%	100%	4%	$18,960	$19,750	$790
	P1153	310	16	$70.63	$21,897		$10,327	$32,224	96%	100%	4%	$30,935	$32,224	$1,289
	P1154	250	16	$70.63	$17,659		$8,328	$25,987	96%	100%	4%	$24,948	$25,987	$1,039
	P1155	300	16	$70.63	$21,190		$9,994	$31,185	97%	100%	3%	$30,249	$31,185	$936
	P1156	300	16	$70.63	$21,190		$9,994	$31,185	97%	100%	3%	$30,249	$31,185	$936
	P1157	120	16	$70.63	$8,476		$3,998	$12,474	98%	100%	2%	$12,224	$12,474	$249
	P1158	330	24	$70.63	$23,310		$10,994	$34,303	92%	99%	7%	$31,559	$33,960	$2,401
	P1159	500	12	$70.63	$35,317		$16,657	$51,974	96%	100%	4%	$49,895	$51,974	$2,079
	P1160	110	24	$70.63	$7,770		$3,665	$11,434	91%	100%	9%	$10,405	$11,434	$1,029
	P1161	550	12	$70.63	$38,849		$18,323	$57,172	96%	100%	4%	$54,885	$57,172	$2,287
	P1163	2,220	12	$70.63	$156,810		$73,957	$230,766	98%	100%	2%	$226,151	$230,766	$4,615
	P1164	850	16	$70.63	$60,040		$28,317	$88,357	98%	100%	2%	$86,589	$88,357	$1,767
	P1165	1,110	12	$70.63	$78,405		$36,978	$115,383	95%	95%	0%	$109,614	$109,614	$0
	P1168	1,140	12	$70.63	$80,524		$37,978	$118,502	98%	100%	2%	$116,132	$118,502	$2,370
	P1179	870	12	$70.63	$61,452		$28,983	$90,436	98%	98%	0%	$88,627	$88,627	$0
	P1201	650	12	$70.63	$45,913		$21,654	$67,567	95%	100%	5%	$64,188	$67,567	$3,378
		13,450			**$950,040**	**4.0%**	**$448,072**	**$1,398,112**				**$1,335,764**	**$1,385,170**	**$49,407**
J	**Replacement of existing 12-inch with 20-inch water line from the Southwestern Elevated Storage Tank**													
	P1227	4,140	20	$274.07	$1,134,660		$535,145	$1,669,805	95%	100%	5%	$1,586,315	$1,669,805	$83,490
		4,140			**$1,134,660**	**4.0%**	**$535,145**	**$1,669,805**				**$1,586,315**	**$1,669,805**	**$83,490**
	EXISTING WATER DISTRIBUTION LINES TOTAL:													
		62,580			**$7,203,067**		**$3,397,219**	**$10,600,286**				**$9,667,918**	**$10,455,549**	**$787,631**

** Cost Estimates from 2012 Impact Fee Study*

CITY OF COPPELL, TEXAS
2018 WATER DISTRIBUTION IMPACT FEE STUDY
PROPOSED CIP - WATER LINES

Proj. I.D.	Pipe Number	Length (Ft.)	Diameter (Inches)	Avg. Unit Cost ($/Ft.)	Construction Cost ($)	Engineering Cost (15%)	Land Acquisition (5%)	Total Capital Cost ($)	Debt Service Interest Rate %	20 Year Debt Service Utilizing Simple Interest	Total 20 Year Project Cost ($)	(%) Utilized Capacity			($) Utilized Capacity		
												2018	2028	During Fee Period	2019	2029	During Fee Period
P1	**12-inch SH 121 Frontage Rd. from Northpoint Dr. to Sandy Lake Rd.**																
	This project will begin at the Chapman Pump Station and extend to Millers Ferry Road																
	(2) P1587	2,120	12	$93.00	$197,160	$29,574	$9,858	$236,592		$111,585	$348,177	0%	94%	94%	$0	$327,286	$327,286
	Subtotal:	**2,120**			**$197,160**			**$236,592**	**4.0%**	**$111,585**	**$348,177**				**$0**	**$327,286**	**$327,286**
P2	**12-inch Belt Line Rd. Crossing**																
	This project begin on the Southbound IH-45 Service Road and extend along Leslie to Miller Ferry Road. Then extends along Miller Ferry Road to Starlight Drive																
	(2) P1410 B	350	12	$188.66	$66,030	$9,905	$3,302	$79,236		$37,370	$116,606	0%	95%	95%	$0	$110,776	$110,776
	Subtotal:	**350**			**$66,030**			**$79,236**	**4.0%**	**$37,370**	**$116,606**				**$0**	**$110,776**	**$110,776**
	PROPOSED CIP - WATER LINES TOTAL:																
		2,470			**$ 263,190**			**$ 315,828**		**$ 148,956**	**$ 464,784**				**$ -**	**$ 438,062**	**$ 438,062**

** Average Unit costs are based in 2018 dollars unless otherwise indicated*

(1) - City Participate in Cost Oversize
(2) - City Initiated and Funded
B - Bore Across Roadways

THE · CITY · OF

COPPELL

TEXAS · 1890

WATER AND WASTEWATER 2018-2028 IMPACT FEE REVIEW

APPENDIX "B"

WASTEWATER SYSTEM IMPACT FEE DATA

LIFT STATIONS
FORCE MAINS
COLLECTION LINES

CITY OF COPPELL, TEXAS
2018 WASTEWATER IMPACT FEE STUDY
EXISTING WASTEWATER FACILITIES

Proj. I.D.	Project Discription	Cost ($)				Capacity Utilized (%)			Capacity Utilized ($)		
		Total Capital Cost ($)	Debt Service Interest Rate (%)	20 Year Debt Service Utilizing Simple Interest	Total 20 Yr. Project Cost ($)	2018	2028	In The CRF Period	2018	2028	In The CRF Period
Existing Wastewater Facilities											
A	Existing 30-inch forcemain in Basin C	$1,164,000	4.0%	$548,983	$1,712,983	98%	100%	2%	$1,678,723	$1,712,983	$34,260
B	Saint Joseph 30-inch forcemain (discharge from Deforest PS)	$2,312,041	4.0%	$1,090,439	$3,402,480	98%	100%	2%	$3,334,431	$3,402,480	$68,050
C	Existing 20-inch forcemain from Sandy Lake Lift Station	$1,172,750	4.0%	$553,110	$1,725,860	98%	100%	2%	$1,691,343	$1,725,860	$34,517
D	Upsize Deforest and Sandy Lake Lift Stations	$2,611,742	4.0%	$1,231,789	$3,843,531	98%	100%	2%	$3,766,660	$3,843,531	$76,871
TOTAL EXISTING WASTEWATER FACILITIES:		**$7,260,533**		**$3,424,322**	**$10,684,855**				**$10,471,157**	**$10,684,855**	**$213,697**

** Cost Estimates from 2012 Impact Fee Study*

CITY OF COPPELL, TEXAS
2018 WASTEWATER IMPACT FEE STUDY
EXISTING WASTEWATER COLLECTION LINES

Proj. I.D.	Pipe Number	Length (Ft.)	Diameter (Inches)	Avg. Unit Cost ($/Ft.)	Total Capital Cost ($)	Debt Service Intersest Rate %	20 Year Debt Service Utilizing Simple Interest	Total 20 Yr. Project Cost ($)	(%) Utilized Capacity			($) Utilized Capacity		
									2018	2028	During Fee Period	2018	2028	During Fee Period
E	**Existing 24-inch gravity line in Basin A**													
	FN26	60	24	$194.47	$11,668		$5,503	$17,171	96%	99%	3%	$16,484	$16,999	$515
	FN25	440	24	$194.47	$85,565		$40,356	$125,921	96%	99%	3%	$120,884	$124,662	$3,778
	FN78	70	24	$194.47	$13,613		$6,420	$20,033	96%	99%	3%	$19,232	$19,833	$601
	FN260	260	24	$194.47	$50,561		$23,846	$74,408	96%	99%	3%	$71,431	$73,664	$2,232
	FN261	30	30	$194.47	$5,834		$2,752	$8,586	96%	99%	3%	$8,242	$8,500	$258
	FN262	340	30	$194.47	$66,119		$31,184	$97,302	96%	99%	3%	$93,410	$96,329	$2,919
	FN263	490	30	$194.47	$95,289		$44,941	$140,230	96%	99%	3%	$134,621	$138,828	$4,207
	FN264	10	30	$194.47	$1,945		$917	$2,862	96%	99%	3%	$2,747	$2,833	$86
	FN265	260	24	$194.47	$50,561		$23,846	$74,408	96%	99%	3%	$71,431	$73,664	$2,232
	FN543	350	24	$194.47	$68,063		$32,101	$100,164	96%	99%	3%	$96,158	$99,163	$3,005
	FN546	20	24	$194.47	$3,889		$1,834	$5,724	97%	100%	3%	$5,552	$5,724	$172
	FN547	380	24	$194.47	$73,897		$34,853	$108,750	97%	100%	3%	$105,487	$108,750	$3,262
	FN548	660	24	$194.47	$128,348		$60,533	$188,881	97%	100%	3%	$183,215	$188,881	$5,666
	FN549	1,450	24	$194.47	$281,976		$132,990	$414,966	97%	100%	3%	$402,517	$414,966	$12,449
	FN225	230	24	$194.47	$44,727		$21,095	$65,822	97%	100%	3%	$63,848	$65,822	$1,975
	FN226	1,000	24	$194.47	$194,466		$91,717	$286,184	97%	100%	3%	$277,598	$286,184	$8,586
	FN534	330	24	$194.47	$64,174		$30,267	$94,441	97%	100%	3%	$91,607	$94,441	$2,833
	FN535	140	24	$194.47	$27,225		$12,840	$40,066	97%	100%	3%	$38,864	$40,066	$1,202
	FN533	480	24	$194.47	$93,344		$44,024	$137,368	97%	100%	3%	$133,247	$137,368	$4,121
	FN337	590	24	$194.47	$114,735		$54,113	$168,848	97%	100%	3%	$163,783	$168,848	$5,065
		7,590			**$1,476,000**	**4.0%**	**$696,133**	**$2,172,133**				**$2,100,358**	**$2,165,522**	**$65,164**
F	**Existing 21-inch gravity line in Basin A**													
	FN187	540	21	$126.81	$68,477		$32,296	$100,773	96%	99%	3%	$96,742	$99,765	$3,023
	FN186	400	21	$126.81	$50,723		$23,923	$74,646	97%	100%	3%	$72,407	$74,646	$2,239
	FN233	340	21	$126.81	$43,115		$20,334	$63,449	97%	100%	3%	$61,546	$63,449	$1,903
	FN234	290	21	$126.81	$36,774		$17,344	$54,119	97%	100%	3%	$52,495	$54,119	$1,624
	FN188	620	21	$126.81	$78,621		$37,081	$115,702	97%	100%	3%	$112,231	$115,702	$3,471
	FN236	270	21	$126.81	$34,238		$16,148	$50,386	97%	100%	3%	$48,875	$50,386	$1,512
	FN235	360	21	$126.81	$45,651		$21,531	$67,182	97%	100%	3%	$65,166	$67,182	$2,015
		2,820			**$357,600**	**4.0%**	**$168,657**	**$526,257**				**$509,461**	**$525,249**	**$15,788**

CITY OF COPPELL, TEXAS
2018 WASTEWATER IMPACT FEE STUDY
EXISTING WASTEWATER COLLECTION LINES

Proj. I.D.	Pipe Number	Length (Ft.)	Diameter (Inches)	Avg. Unit Cost ($/Ft.)	Total Capital Cost ($)	Debt Service Intersest Rate %	20 Year Debt Service Utilizing Simple Interest	Total 20 Yr. Project Cost ($)	(%) Utilized Capacity			($) Utilized Capacity		
									2018	2028	During Fee Period	2018	2028	During Fee Period
G	**Existing 18-inch gravity line in Basin A**													
	FN237	1,190	18	$116.10	$138,160		$65,161	$203,322	98%	100%	2%	$199,255	$203,322	$4,066
	FN238	810	18	$116.10	$94,042		$44,353	$138,395	97%	100%	3%	$134,243	$138,395	$4,152
	FN27	770	18	$116.10	$89,398		$42,163	$131,561	97%	100%	3%	$127,614	$131,561	$3,947
		2,770			**$321,600**	**4.0%**	**$151,678**	**$473,278**				**$461,113**	**$473,278**	**$12,165**
H	**Existing 15-inch gravity line in Basin A**													
	FN614	410	15	$108.46	$44,467		$20,972	$65,439	99%	100%	1%	$64,785	$65,439	$654
	FN523	320	15	$108.46	$34,706		$16,368	$51,074	99%	100%	1%	$50,564	$51,074	$511
	FN241	620	15	$108.46	$67,243		$31,714	$98,956	99%	100%	1%	$97,967	$98,956	$990
	FN242	440	15	$108.46	$47,721		$22,507	$70,227	99%	100%	1%	$69,525	$70,227	$702
	FN240	450	15	$108.46	$48,805		$23,018	$71,823	99%	100%	1%	$71,105	$71,823	$718
	FN107	370	15	$108.46	$40,129		$18,926	$59,055	98%	100%	2%	$57,874	$59,055	$1,181
	FN239	690	15	$108.46	$74,834		$35,295	$110,129	98%	100%	2%	$107,926	$110,129	$2,203
	FN215	410	15	$108.46	$44,467		$20,972	$65,439	98%	100%	2%	$64,130	$65,439	$1,309
	FN214	240	15	$108.46	$26,029		$12,276	$38,306	98%	100%	2%	$37,540	$38,306	$766
		3,950			**$428,400**	**4.0%**	**$202,048**	**$630,448**				**$621,415**	**$630,448**	**$9,034**
I	**Existing 21-inch gravity line in Basin B**													
	FN682	380	21	$149.62	$56,857		$26,816	$83,673	96%	99%	3%	$80,326	$82,836	$2,510
	FN565	40	21	$149.62	$5,985		$2,823	$8,808	96%	99%	3%	$8,455	$8,720	$264
	FN564	830	21	$149.62	$124,187		$58,571	$182,759	96%	99%	3%	$175,448	$180,931	$5,483
	FN560	1,140	21	$149.62	$170,571		$80,447	$251,018	96%	99%	3%	$240,977	$248,508	$7,531
		2,390			**$357,600**	**4.0%**	**$168,657**	**$526,257**				**$505,206**	**$520,994**	**$15,788**

CITY OF COPPELL, TEXAS
2018 WASTEWATER IMPACT FEE STUDY
EXISTING WASTEWATER COLLECTION LINES

Proj. I.D.	Pipe Number	Length (Ft.)	Diameter (Inches)	Avg. Unit Cost ($/Ft.)	Total Capital Cost ($)	Debt Service Intersest Rate %	20 Year Debt Service Utilizing Simple Interest	Total 20 Yr. Project Cost ($)	(%) Utilized Capacity			($) Utilized Capacity		
									2018	2028	During Fee Period	2018	2028	During Fee Period
J	**Existing 27-inch gravity line in Basin B**													
	FN561	130	27	$124.88	$16,235		$7,657	$23,892	96%	99%	3%	$22,936	$23,653	$717
	FN563	370	27	$124.88	$46,207		$21,793	$68,000	96%	99%	3%	$65,280	$67,320	$2,040
	FN562	410	27	$124.88	$51,202		$24,149	$75,351	96%	99%	3%	$72,337	$74,598	$2,261
	FN318	370	27	$124.88	$46,207		$21,793	$68,000	96%	99%	3%	$65,280	$67,320	$2,040
	FN323	360	27	$124.88	$44,958		$21,204	$66,162	96%	99%	3%	$63,515	$65,500	$1,985
	FN321	220	27	$124.88	$27,474		$12,958	$40,432	97%	100%	3%	$39,219	$40,432	$1,213
	FN314	720	27	$124.88	$89,916		$42,408	$132,324	97%	100%	3%	$128,354	$132,324	$3,970
	FN315	210	27	$124.88	$26,226		$12,369	$38,594	97%	100%	3%	$37,437	$38,594	$1,158
	FN316	50	27	$124.88	$6,244		$2,945	$9,189	97%	100%	3%	$8,913	$9,189	$276
	FN317	30	27	$124.88	$3,747		$1,767	$5,513	97%	100%	3%	$5,348	$5,513	$165
	FN359	300	27	$124.88	$37,465		$17,670	$55,135	97%	100%	3%	$53,481	$55,135	$1,654
	FN362	140	30	$124.88	$17,484		$8,246	$25,730	96%	99%	3%	$24,700	$25,472	$772
	FN363	420	30	$124.88	$52,451		$24,738	$77,189	96%	99%	3%	$74,101	$76,417	$2,316
	FN360	290	30	$124.88	$36,216		$17,081	$53,297	96%	99%	3%	$51,165	$52,764	$1,599
	FN361	80	30	$124.88	$9,991		$4,712	$14,703	96%	99%	3%	$14,115	$14,556	$441
	FN31	500	30	$124.88	$62,442		$29,450	$91,892	96%	99%	3%	$88,216	$90,973	$2,757
	FN32	440	30	$124.88	$54,949		$25,916	$80,865	96%	99%	3%	$77,630	$80,056	$2,426
	FN30	210	30	$124.88	$26,226		$12,369	$38,594	96%	99%	3%	$37,051	$38,209	$1,158
	FN29	40	30	$124.88	$4,995		$2,356	$7,351	96%	99%	3%	$7,057	$7,278	$221
	FN372	250	27	$124.88	$31,221		$14,725	$45,946	96%	99%	3%	$44,108	$45,486	$1,378
	FN374	50	27	$124.88	$6,244		$2,945	$9,189	96%	99%	3%	$8,822	$9,097	$276
	FN373	250	27	$124.88	$31,221		$14,725	$45,946	96%	99%	3%	$44,108	$45,486	$1,378
	FN46	80	30	$124.88	$9,991		$4,712	$14,703	96%	99%	3%	$14,115	$14,556	$441
	FN10154	100	30	$124.88	$12,488		$5,890	$18,378	97%	100%	3%	$17,827	$18,378	$551
		6,020			**$751,800**	**4.0%**	**$354,575**	**$1,106,375**				**$1,065,116**	**$1,098,307**	**$33,191**

CITY OF COPPELL, TEXAS
2018 WASTEWATER IMPACT FEE STUDY
EXISTING WASTEWATER COLLECTION LINES

Proj. I.D.	Pipe Number	Length (Ft.)	Diameter (Inches)	Avg. Unit Cost ($/Ft.)	Total Capital Cost ($)	Debt Service Intersest Rate %	20 Year Debt Service Utilizing Simple Interest	Total 20 Yr. Project Cost ($)	(%) Utilized Capacity			($) Utilized Capacity		
									2018	2028	During Fee Period	2018	2028	During Fee Period
K	**Existing 15/24-inch gravity line in Basin E**													
	FN630	280	24	$152.67	$42,748		$20,161	$62,909	99%	100%	1%	$62,280	$62,909	$629
	FN618	220	24	$152.67	$33,588		$15,841	$49,429	99%	100%	1%	$48,935	$49,429	$494
	FN621	190	24	$152.67	$29,008		$13,681	$42,689	99%	100%	1%	$42,262	$42,689	$427
	FN620	110	24	$152.67	$16,794		$7,921	$24,714	99%	100%	1%	$24,467	$24,714	$247
	FN184	160	24	$152.67	$24,427		$11,521	$35,948	99%	100%	1%	$35,589	$35,948	$359
	FN53	20	24	$152.67	$3,053		$1,440	$4,494	99%	100%	1%	$4,449	$4,494	$45
	FN52	140	24	$152.67	$21,374		$10,081	$31,455	99%	100%	1%	$31,140	$31,455	$315
	FN175	250	24	$152.67	$38,168		$18,001	$56,169	99%	100%	1%	$55,608	$56,169	$562
	FN174	260	24	$152.67	$39,695		$18,721	$58,416	99%	100%	1%	$57,832	$58,416	$584
	FN170	150	24	$152.67	$22,901		$10,801	$33,702	99%	100%	1%	$33,365	$33,702	$337
	FN172	110	24	$152.67	$16,794		$7,921	$24,714	99%	100%	1%	$24,467	$24,714	$247
	FN171	360	24	$152.67	$54,962		$25,922	$80,884	99%	100%	1%	$80,075	$80,884	$809
	FN51	440	24	$152.67	$67,175		$31,682	$98,858	99%	100%	1%	$97,869	$98,858	$989
	FN109	380	24	$152.67	$58,015		$27,362	$85,377	99%	100%	1%	$84,523	$85,377	$854
	FN570	120	24	$152.67	$18,321		$8,641	$26,961	99%	100%	1%	$26,692	$26,961	$270
	FN571	50	24	$152.67	$7,634		$3,600	$11,234	99%	100%	1%	$11,122	$11,234	$112
	FN572	360	24	$152.67	$54,962		$25,922	$80,884	99%	100%	1%	$80,075	$80,884	$809
	FN326	190	24	$152.67	$29,008		$13,681	$42,689	99%	100%	1%	$42,262	$42,689	$427
	FN325	380	24	$152.67	$58,015		$27,362	$85,377	99%	100%	1%	$84,523	$85,377	$854
	FN309	70	24	$152.67	$10,687		$5,040	$15,727	99%	100%	1%	$15,570	$15,727	$157
	FN334	140	24	$152.67	$21,374		$10,081	$31,455	99%	100%	1%	$31,140	$31,455	$315
	FN335	80	24	$152.67	$12,214		$5,760	$17,974	99%	100%	1%	$17,794	$17,974	$180
	FN308	370	15	$152.67	$56,488		$26,642	$83,130	99%	100%	1%	$82,299	$83,130	$831
	FN307	330	15	$152.67	$50,382		$23,762	$74,143	99%	100%	1%	$73,402	$74,143	$741
	FN306	230	15	$152.67	$35,114		$16,561	$51,676	99%	100%	1%	$51,159	$51,676	$517
	FN310	130	15	$152.67	$19,847		$9,361	$29,208	99%	100%	1%	$28,916	$29,208	$292
	FN311	80	15	$152.67	$12,214		$5,760	$17,974	99%	100%	1%	$17,794	$17,974	$180
	FN463	160	15	$152.67	$24,427		$11,521	$35,948	99%	100%	1%	$35,589	$35,948	$359
	FN462	190	15	$152.67	$29,008		$13,681	$42,689	99%	100%	1%	$42,262	$42,689	$427
	FN460	290	15	$152.67	$44,275		$20,882	$65,156	99%	100%	1%	$64,505	$65,156	$652
	FN461	180	15	$152.67	$27,481		$12,961	$40,442	99%	100%	1%	$40,037	$40,442	$404
	FN459	430	15	$152.67	$65,649		$30,962	$96,611	99%	100%	1%	$95,645	$96,611	$966
		6,850			**$1,045,800**	**4.0%**	**$493,236**	**$1,539,036**				**$1,523,646**	**$1,539,036**	**$15,390**

CITY OF COPPELL, TEXAS
2018 WASTEWATER IMPACT FEE STUDY
EXISTING WASTEWATER COLLECTION LINES

Proj. I.D.	Pipe Number	Length (Ft.)	Diameter (Inches)	Avg. Unit Cost ($/Ft.)	Total Capital Cost ($)	Debt Service Intersest Rate %	20 Year Debt Service Utilizing Simple Interest	Total 20 Yr. Project Cost ($)	(%) Utilized Capacity			($) Utilized Capacity		
									2018	2028	During Fee Period	2018	2028	During Fee Period
L	**Existing 30-inch gravity line in Basin C & E**													
	FN466	230	30	$180.48	$41,510		$19,578	$61,088	99%	100%	1%	$60,477	$61,088	$611
	FN465	250	30	$180.48	$45,120		$21,280	$66,400	99%	100%	1%	$65,736	$66,400	$664
	FN464	180	30	$180.48	$32,486		$15,322	$47,808	99%	100%	1%	$47,330	$47,808	$478
	FN128	360	30	$180.48	$64,972		$30,643	$95,615	99%	100%	1%	$94,659	$95,615	$956
	FN129	220	30	$180.48	$39,705		$18,726	$58,432	99%	100%	1%	$57,847	$58,432	$584
	FN127	690	30	$180.48	$124,530		$58,733	$183,263	99%	100%	1%	$181,430	$183,263	$1,833
	FN126	380	30	$180.48	$68,582		$32,346	$100,927	99%	100%	1%	$99,918	$100,927	$1,009
	FN3	320	30	$180.48	$57,753		$27,238	$84,991	99%	100%	1%	$84,142	$84,991	$850
	FN2	360	30	$180.48	$64,972		$30,643	$95,615	99%	100%	1%	$94,659	$95,615	$956
	FN48	650	30	$180.48	$117,311		$55,328	$172,639	99%	100%	1%	$170,913	$172,639	$1,726
	FN449	280	30	$180.48	$50,534		$23,834	$74,368	99%	100%	1%	$73,624	$74,368	$744
	FN448	310	30	$180.48	$55,948		$26,387	$82,336	98%	100%	2%	$80,689	$82,336	$1,647
	FN12	560	30	$180.48	$101,068		$47,667	$148,735	98%	100%	2%	$145,760	$148,735	$2,975
	FN13	520	30	$180.48	$93,849		$44,262	$138,111	98%	100%	2%	$135,349	$138,111	$2,762
	FN60	250	30	$180.48	$45,120		$21,280	$66,400	98%	100%	2%	$65,072	$66,400	$1,328
	FN555	140	30	$180.48	$25,267		$11,917	$37,184	98%	100%	2%	$36,440	$37,184	$744
	FN553	180	30	$180.48	$32,486		$15,322	$47,808	98%	100%	2%	$46,852	$47,808	$956
	FN59	410	30	$180.48	$73,996		$34,899	$108,895	98%	100%	2%	$106,717	$108,895	$2,178
	FN84	390	30	$180.48	$70,387		$33,197	$103,583	98%	100%	2%	$101,512	$103,583	$2,072
	FN23	310	30	$180.48	$55,948		$26,387	$82,336	98%	100%	2%	$80,689	$82,336	$1,647
	FN138	270	30	$180.48	$48,729		$22,982	$71,712	98%	100%	2%	$70,277	$71,712	$1,434
	FN136	410	30	$180.48	$73,996		$34,899	$108,895	98%	100%	2%	$106,717	$108,895	$2,178
	FN22	400	30	$180.48	$72,191		$34,048	$106,239	98%	100%	2%	$104,115	$106,239	$2,125
	FN137	170	30	$180.48	$30,681		$14,470	$45,152	98%	100%	2%	$44,249	$45,152	$903
	FN248	170	30	$180.48	$30,681		$14,470	$45,152	98%	100%	2%	$44,249	$45,152	$903
	FN250	370	30	$180.48	$66,777		$31,494	$98,271	98%	100%	2%	$96,306	$98,271	$1,965
	FN249	30	30	$180.48	$5,414		$2,554	$7,968	98%	100%	2%	$7,809	$7,968	$159
	FN304	320	30	$180.48	$57,753		$27,238	$84,991	98%	100%	2%	$83,292	$84,991	$1,700
	FN305	400	30	$180.48	$72,191		$34,048	$106,239	98%	100%	2%	$104,115	$106,239	$2,125
	FN273	400	30	$180.48	$72,191		$34,048	$106,239	98%	100%	2%	$104,115	$106,239	$2,125
	FN272	400	30	$180.48	$72,191		$34,048	$106,239	98%	100%	2%	$104,115	$106,239	$2,125
	FN271	400	30	$180.48	$72,191		$34,048	$106,239	98%	100%	2%	$104,115	$106,239	$2,125
	FN270	400	30	$180.48	$72,191		$34,048	$106,239	98%	100%	2%	$104,115	$106,239	$2,125

CITY OF COPPELL, TEXAS
2018 WASTEWATER IMPACT FEE STUDY
EXISTING WASTEWATER COLLECTION LINES

Proj. I.D.	Pipe Number	Length (Ft.)	Diameter (Inches)	Avg. Unit Cost ($/Ft.)	Total Capital Cost ($)	Debt Service Intersest Rate %	20 Year Debt Service Utilizing Simple Interest	Total 20 Yr. Project Cost ($)	(%) Utilized Capacity			($) Utilized Capacity		
									2018	2028	During Fee Period	2018	2028	During Fee Period
	FN269	410	30	$180.48	$73,996		$34,899	$108,895	98%	100%	2%	$106,717	$108,895	$2,178
	FN145	30	30	$180.48	$5,414		$2,554	$7,968	98%	100%	2%	$7,809	$7,968	$159
	FN410	320	30	$180.48	$57,753		$27,238	$84,991	98%	100%	2%	$83,292	$84,991	$1,700
	FN411	50	30	$180.48	$9,024		$4,256	$13,280	98%	100%	2%	$13,014	$13,280	$266
	FN413	260	30	$180.48	$46,924		$22,131	$69,056	98%	100%	2%	$67,674	$69,056	$1,381
	FN419	150	30	$180.48	$27,072		$12,768	$39,840	98%	100%	2%	$39,043	$39,840	$797
	FN420	150	30	$180.48	$27,072		$12,768	$39,840	99%	100%	1%	$39,441	$39,840	$398
	FN422	40	30	$180.48	$7,219		$3,405	$10,624	99%	100%	1%	$10,518	$10,624	$106
		12,540			**$2,263,200**	**4.0%**	**$1,067,404**	**$3,330,604**				**$3,274,908**	**$3,330,604**	**$55,696**
EXISTING WASTEWATER COLLECTION LINES TOTAL:														
		44,930			**$7,002,000**		**$3,302,388**	**$10,304,388**				**$10,061,223**	**$10,283,439**	**$222,216**

** Cost Estimates from 2012 Impact Fee Study*

THE · CITY · OF

COPPELL

TEXAS · 1890

ENGINEERING EVALUATION REPORT OF THE WATER AND WASTEWATER 2018 - 2028 IMPACT FEE UPDATE

BIRKHOFF, HENDRICKS & CARTER, L.L.P.
PROFESSIONAL ENGINEERS
DALLAS, TEXAS
(214) 361-7900

October 2019