

City of Lucas

CAPITAL IMPROVEMENT PLAN



2016 - 2031

Adopted: November 1, 2018

CITY OF LUCAS
CAPITAL IMPROVEMENT PLAN
From 2016 To 2031

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Introduction

The Capital Improvement Plan (CIP) for the City of Lucas is a valuable part of the community planning process. The CIP links local infrastructure investments with comprehensive plan goals, land use ordinances, and economic development efforts. The CIP bridges the gap between planning and spending as well as between the visions of the comprehensive plan and the fiscal realities of improving and expanding community facilities. The purpose of the CIP policy is to create a fair and consistent process outlining procedures for proposing, evaluating, and adopting capital projects creating long-term benefits.

The CIP is a five-year planning document adopted by the City Council to for capital improvements related City roadway and trail drainage system as well as for the water system infrastructure and facilities. The CIP is not to be confused with the Capital Improvement Budget. The Capital Improvement Budget is prepared each year in conjunction with the annual Operating Budget. It generally includes only those projects from the first year of the CIP funded during the current year and will address additional capital needs that are not included in the CIP, such as equipment and vehicles as recommended by the Vehicle Replacement Committee.

A capital project is defined as having a minimum cost of \$5,000 resulting in 1) the creation of a new fixed asset or 2) enhancement of an existing fixed asset.

Typically, the life expectancy of a capital project is 20 years, but it depends on the classification of the asset. Examples of capital projects include construction or expansion of public buildings, the acquisition of land for public use, planning, water system improvements, sewer mains as defined in the wastewater plan, engineering costs, and street and drainage construction. Example of an enhancement to a fixed asset would be reconstruction or reconditioning of streets.

Goals

The following goals help to insure consistence in establishing CIP:

1. Preserving public health, welfare, and safety - providing the basic services that ensure public health, welfare, and safety is the fundamental responsibility of local government.
2. Anticipating the demands of growth - when related to the comprehensive plan, the capital improvement planning process works to anticipate investments in community facilities and infrastructure which are needed to serve or shape the pattern of growth and development.
3. Supporting economic development - having sound fiscal health, high-quality facilities, and services are attractive to business and potential residents. New corporate investment and reinvestment in a community may be influenced by improvements that enhance the quality of life for their labor force. Private decisions that bring jobs to an area and new taxes to a community are based not only on availability of water and sewer but also upon the quality of schools, public safety, recreational opportunities, and many other services. The City of Lucas has identified two areas for commercial development that are located on its peripheral boundaries to complement the high quality of life and not hinder or negatively impact the quality of life.

4. Developing a fair distribution of capital costs - the CIP process allows for public discussion of the preferred means of distributing capital costs over time. Funding strategies to consider include:
 - a. Annually, the City earmarks funds in the unrestricted fund balance to save for future projects.
 - b. Issuance of debt that is paid by both existing and future users of the facility.
 - c. User fees may be deemed more appropriate than property taxes.
 - d. Federal or state funds may also be available to help finance specific projects.

The CIP process can promote discussion of funding strategies.

5. Avoiding undue tax increases - capital improvement planning is a means of avoiding the unpleasant surprise of expensive projects generating large property tax increases. While cost impacts cannot always be precisely determined in advance, the CIP fosters discussion of the distribution of the tax burden of new capital expenditures over time. A corollary benefit of fiscal stability and sound community facility planning can result in an improved bond rating.

Development Process

The CIP outlines the major utility infrastructure, streets and drainage, facilities, parks, and other improvements needed to serve the citizens, meet growth related needs, and comply with state and federal regulations.

Preparation - the Finance Director coordinates the annual update and adoption of the five-year CIP as a part of the annual budget process. The City Manager will lead the review and prioritization of capital projects for City Council consideration. The Finance Director, City Engineer, Development Services Director, and the City Manager shall prioritize and rank projects according to the criteria listed in the project criteria section. The CIP includes all costs associated with the design, rights-of-way acquisition, and construction of a project, as well as the estimated operating and maintenance costs, which impacts future operating budgets. The following guidelines will be utilized in developing the CIP:

1. Solicit citizen participation in formulating the identification and prioritization of the CIP.
2. Identify capital improvements through system models, repair and maintenance records, and growth demands.
3. Prioritize CIP projects based on input from City staff from all areas related to each project, and its effect on operations.

The CIP will be submitted to City Council for review, revision, and approval. It will be reviewed and revised annually to include updated information.

Control - all capital project expenditures must be appropriated in the capital budget. The Finance Director and City Manager must certify the availability of resources before any capital project contract is presented to the City Council for approval.

Financing Programs - recognizing that long-term debt is usually a more expensive financing method, alternative financing sources will be explored before debt is issued. When debt is issued, it will be used to acquire major assets with expected longevity which equal or exceed the average length of the debt issue. Impact fees, assessments, pro-rata charges, or other fees may be used to fund capital projects.

Reporting - periodic financial reports will be prepared to enable the Department Directors to manage their capital budgets and to enable the Finance Department to monitor and control the budget as authorized. Capital project status reports will be presented to City Council.

Capital Improvement Plan (CIP) 2016-2020

Departments will include as part of their project proposal:

1. A Project Summary providing an overview and justification of the project.
2. A Fiscal Overview that includes estimated cost estimates and funding strategies that proposes funding options must be identified including:
 - a. Operating Revenues
 - b. Reserves and/or Debt
 - c. Grants
 - d. Partnerships with Other Organizations
 - e. Impact Fees
 - f. Developer Funded

Expense estimates must be identified in the section for design, site acquisition, construction, estimated annual maintenance and operating cost impact based on the current estimated cost and values. To help manage cash flows, the financial plan must be complete to ascertain the impact on multiple fiscal years.

3. A Project Description section will provide additional project detail such as estimated linear feet, square feet or other applicable measurement, language that explains the overall need for the project as well as the benefit to the community.
4. Proposed Schedule identifying major milestones such as the design, bid, and construction phases.
5. Identification of the Project Manager.

Additional information may be requested by the City Manager and/or the members of the City Council.

Project Criteria

The evaluation of proposed capital projects will be in accordance with the following criteria:

1. Public Health, Safety, and Welfare - projects improving the public health, safety, and welfare of the community will be rated with highest priority. Projects must demonstrate the benefit provided to the community and possible risks from not completing the project. Compliance with state and federal mandates fall under this category.
2. Quality of Life - projects enhancing the quality of life enjoyed by citizens, such as equestrian and hiking trails throughout the city, will receive a high priority.
3. Funding - funding availability considerations are included when ranking projects. Grants and funding partnerships are considered first followed by operating revenues, fund balance, and debt. Debt may be issued to fund capital projects after alternative funding sources are exhausted.
4. Economic Development - projects enhancing and promoting the establishment of commercial business with the best use for a parcel of land that is zoned commercial will be given the highest priority.

CIP Amendment

Amendments to the CIP effecting the current fiscal year must be recommended by the City Manager and approved by the City Council through a budget amendment. Amendments will be considered according to project scoring criteria as previously identified. Higher priority will be given to projects necessary for the public health, safety, and funding availability.

Any plan must be based upon an estimate of certain characteristics. These characteristics may change and vary from time to time and when they do, the CIP should be updated. It may require that certain proposed improvements be implemented immediately or even delayed. Further, this plan is meant to be flexible. It is to be used as a tool to help establish a course of action.

CIP Project Prioritization

Using the criteria identified in the Project Criteria section of this document will assist staff and ultimately the elected officials in rating each project to facilitate prioritization. There are various rating schemes available for establishing capital improvements priorities. The following set of standards are used as the evaluation method for the City:

- **High** - essential capital improvements are projects needed to promote and/or protect the public welfare and safety. Projects classified under this category are projects of the highest priority.
- **Routine** - necessary capital improvements are projects which are needed for the convenience and conservation of endangered resources, or for the completion of partially completed projects. Projects of this type include improvements which are considered necessary for a progressive growing community and for problems that do not negatively impact public welfare.
- **Low** - desirable capital improvements are projects which protect property, replace obsolete

facilities, reduce operating costs and add to the attractiveness of the community. Projects of this type are not considered high priority and may be delayed or removed from the CIP as funding changes. Conversely, these types of projects can be brought forth when budget surpluses or additional funding sources are identified.

- **Deferrable** - these capital improvements are projects of the lowest priority. These projects can be postponed or eliminated from the CIP because of cost, timing, or need.

Roadway and Trail Project CIP At-A-Glance

The following table is a quick reference guide that summarizes the CIP Roadway and Trail Projects. It indicates the fiscal year in which the project is scheduled to begin, a project number for identification purposes, the recommended priority of implementation, the preliminary estimated costs for improvements, and the anticipated funding sources.

STARTING IN FISCAL YEAR	PROJECT NO.	PRIORITY	PROJECT	ESTIMATED COST	FUNDING SOURCE
2016-2017	1	High	Winningkoff Road Reverse Curve	\$964,000 (\$xxxxx Actual)	Impact Fees and Certificate of Obligation
	2	High	Stinson Road/W. Lucas Road Intersection Improvements	\$453,000 (\$xxxxx Actual)	Certificates of Obligation, Reginal Toll Revenue, Collin County Bond, City of Lucas General Fund
	3	High	W. Lucas Road Widening	\$1,500,000 (\$xxxxx Actual Including Maintenance)	Regional Toll Revenue, City of Lucas General Fund, and Collin County Bond
2016-2017	4	Routine	Street Maintenance	\$750,000 (\$159,403 Actual)	City of Lucas General Fund
2017-2018	5	High	Country Club Road/Estates Parkway Intersection Improvements	\$350,000	Certificate of Obligation
	6	High	Winningkoff Road Middle Section from the Reverse Curve to Snider Lane	\$1,400,000	Certificate of Obligation
	7	Routine	E. Winningkoff Road Trailhead	\$240,000	\$120,000 City of Lucas General Fund and \$120,000 Collin County Park Board Grant

STARTING IN FISCAL YEAR	PROJECT NO.	PRIORITY	PROJECT	ESTIMATED COST	FUNDING SOURCE
	8	Routine	Street Maintenance	\$750,000 (\$566,784 + 234,051 Actual)	11-8209-301 City of Lucas General Fund
2018-2019	9	High	Stinson Road Southern Section from Parker Road to Bristol Park	\$2,267,000	Certificate of Obligation
	10	High	Blondy Jhune Road Reconstruction from Western Bridge to Winningkoff Road	\$2,700,000	Certificate of Obligation
	11	Low	Northeast Equestrian and Pedestrian Trails	\$xxx	To Be Determined
	12	Routine	Street Maintenance	\$750,000	City of Lucas General Fund
2019-2020	13	High	Stinson Road Northern Section from Bentwater Drive to the Reverse Curve	\$2,000,000	To Be Determined
	14	Routine	Streets Maintenance	\$750,000	City of Lucas General Fund
2020-2021	15	High	Winningkoff Road Southern Section from E. Lucas Road to the Reverse Curve	\$1,900,000	To Be Determined
	16	Routine	Street Maintenance	\$750,000	City of Lucas General Fund
	17	Low	Exercise and Leisure Loop	\$xxxxxx	To Be Determined

STARTING IN FISCAL YEAR	PROJECT NO.	PRIORITY	PROJECT	ESTIMATED COST	FUNDING SOURCE
	18	Low	Southwest Multipurpose Trails	\$xxxx	To Be Determined
2021-2026	19	Routine	Street Maintenance (\$1,000,000 per year)	\$5,000,000	City of Lucas General Fund
2026-2031	20	Routine	Street Maintenance (\$1,000,000 per year)	\$5,000,000	City of Lucas General Fund

WINNINGKOFF ROAD REVERSE CURVE				
PROJECT SUMMARY				
Starting in Fiscal Year	Project No.	Category	Project Status	Priority
2016-2017	1	Roadway	Complete	High
FISCAL OVERVIEW				
Cost		Source of Funding		
\$144,645 Design Contract		Impact Fees and Certificate of Obligation		
\$502,411 Construction Contract				
\$100,480 Contingency				
\$747,536 Total Budget				
\$964,000 March 2017 Estimate				
\$xxxx Actual				
PROJECT DESCRIPTION				
Replace existing asphalt pavement with concrete pavement. The eastern curve will be designed to accommodate a school bus and an auto passing in opposite directions. The western curve will be replaced with a three-way stop sign controlled intersection at Forestview Drive. The project length is approximately 0.5 miles.				
PROJECT SCHEDULE				
Project Begin Year		Project End Year		
2017		2018 - Complete		
PROJECT MANAGER: City Engineer				



STINSON ROAD/W. LUCAS ROAD INTERSECTION IMPROVEMENTS				
PROJECT SUMMARY				
Starting in Fiscal Year	Project No.	Category	Project Status	Priority
2016-2017	2	Roadway	Complete	High
FISCAL OVERVIEW				
Cost		Source of Funding		
\$91,130 Design Contract \$391,572 Construction Contract \$97,000 Contingency \$579,702 Total Budget* \$453,000 March 2017 Estimate \$xxxx Actual		Certificates of Obligation, Reginal Toll Revenue, Collin County Bond, City of Lucas General Fund		
PROJECT DESCRIPTION				
Provide for two northbound Stinson Road lanes on approach to W. Lucas Road: one left turn and one right turn. Improve drainage along the W. Lucas Road. *The addition of a fourth leg to Country Club Road/W. Lucas Road intersection was added to design of this project in early 2018.				
PROJECT SCHEDULE				
Project Begin Year		Project End Year		
2017		2018 - Complete		
PROJECT MANAGER: City Engineer				



W. LUCAS ROAD WIDENING

PROJECT SUMMARY

Starting in Fiscal Year	Project No.	Category	Project Status	Priority
2016-2017	3	Roadway	Complete	High

FISCAL OVERVIEW

Cost of Capacity Improvements	Source of Funding
\$72,250 Design Contract \$1,172,780 Construction Contract \$237,609 Roadway Maintenance* \$254,970 Contingency \$1,737,609 Total Budget \$1,500,000 May 2013 Estimate \$xxxxx Actual	\$1,200,000 in Regional Toll Revenue, \$244,414 in Collin County Bonds, and \$55,586 City of Lucas General Fund

PROJECT DESCRIPTION

Widen W. Lucas Road from Willow Springs School to Angel Parkway by adding a center and left turn lane. The project length is approximately 1.5 miles. *During the construction of the three lanes, numerous areas of the existing roadway required full depth repairs.

PROJECT SCHEDULE

Project Begin Year	Project End Year
2017	2018 - Complete

PROJECT MANAGER: City Engineer



STREET MAINTENANCE				
PROJECT SUMMARY				
Starting in Fiscal Year	Project No.	Category	Project Status	Priority
2016-2017	4	Roadway	Complete	Routine
FISCAL OVERVIEW				
Cost		Source of Funding		
\$750,000 Total Budget \$159,403 Actual*		City of Lucas General Fund		
PROJECT DESCRIPTION				
Each year, roads require proper maintenance to provide reliable mobility at minimal cost. Project List: <ol style="list-style-type: none"> 1. Daytona Avenue/CR 391 2. Horseman Drive 3. Skyview Drive 4. Edgefield Lane Turnaround *Most of the funds budgeted for FY 2016-2017 were shifted to FY 2017-2018 to accommodate the contractor's schedule.				
PROJECT SCHEDULE				
Project Begin Year		Project End Year		
2017		2017 - Complete		
PROJECT MANAGER: City Engineer				



COUNTRY CLUB ROAD/ESTATES PARKWAY INTERSECTION IMPROVEMENTS				
PROJECT SUMMARY				
Starting in Fiscal Year	Project No.	Category	Project Status	Priority
2017-2018	5	Roadway	Design	High
FISCAL OVERVIEW				
Cost		Source of Funding		
\$82,700 Design <u>\$267,300 for Construction</u> \$350,000 Total Budget \$350,000 March 2017 Estimate		Certificate of Obligation		
PROJECT DESCRIPTION				
Add a right turn lane from eastbound Estates Parkway to southbound Country Club Road. Add a left turn lane from northbound Country Club Road to westbound Estates Parkway. TxDOT may add funding to this project to improve drainage near the intersection.				
PROJECT SCHEDULE				
Project Begin Year		Project End Year		
2017		2020		
PROJECT MANAGER: City Engineer				



**WINNINGKOFF ROAD MIDDLE SECTION
FROM THE REVERSE CURVE TO SNIDER LANE**

PROJECT SUMMARY

Starting in Fiscal Year	Project No.	Category	Project Status	Priority
2017-2018	6	Roadway	Design	High

FISCAL OVERVIEW

Cost	Source of Funding
\$215,850 Design Contract <u>\$1,184,150 for Construction</u> \$1,400,000 Total Budget \$1,400,000 March 2017 Estimate	Certificate of Obligation

PROJECT DESCRIPTION

Reconstruct 0.5 miles of Winningkoff Road with concrete pavement and improve drainage.

PROJECT SCHEDULE

Project Begin Year	Project End Year
2017	2022

PROJECT MANAGER: City Engineer



TRAILHEAD ON E. WINNINGKOFF ROAD

PROJECT SUMMARY

Starting in Fiscal Year	Project No.	Category	Project Status	Priority
2017-2018	7	Trail	Complete	Routine

FISCAL OVERVIEW

Cost	Source of Funding
\$240,000 Estimate \$240,000 Actual	\$120,000 City of Lucas General Fund and \$120,000 Collin County Park Board Grant

PROJECT DESCRIPTION

Trailhead on E. Winningkoff Road was constructed during Fiscal Year 2016-2017. The Trailhead provides parking, a corral, restroom facilities, and other amenities. Additional work, such as marking the trail and maintenance was completed in Fiscal Year 2017-2018.

PROJECT SCHEDULE

Project Begin Year	Project End Year
2017	2018 - Complete

PROJECT MANAGER: Development Services Director



STREET MAINTENANCE				
PROJECT SUMMARY				
Starting in Fiscal Year	Project No.	Category	Project Status	Priority
2017-2018	8	Roadway	Complete	Routine
FISCAL OVERVIEW				
Cost		Source of Funding		
\$882,335 Total Budget \$864,431 Actual		City of Lucas General Fund		
PROJECT DESCRIPTION				
Each year, roads require proper maintenance to provide reliable mobility at minimal cost. Project List: <ol style="list-style-type: none"> 1. Blondy Jhune Road 2. Stinson Road 3. Lewis Lane 4. Rock Ridge Road 5. White Rock Trail 				
PROJECT SCHEDULE				
Project Begin Year		Project End Year		
2017		2018 - Complete		
PROJECT MANAGER: City Engineer				



**STINSON ROAD SOUTHERN SECTION
FROM PARKER ROAD TO BRISTOL PARK**

PROJECT SUMMARY

Starting in Fiscal Year	Project No.	Category	Project Status	Priority
2017-2018	9	Roadway	Design	High

FISCAL OVERVIEW

Cost	Source of Funding
\$264,910 Design Contract <u>\$2,002,090 for Construction</u> \$2,267,000 Total Budget \$2,267,000 March 2017 Estimate	Certificates of Obligation

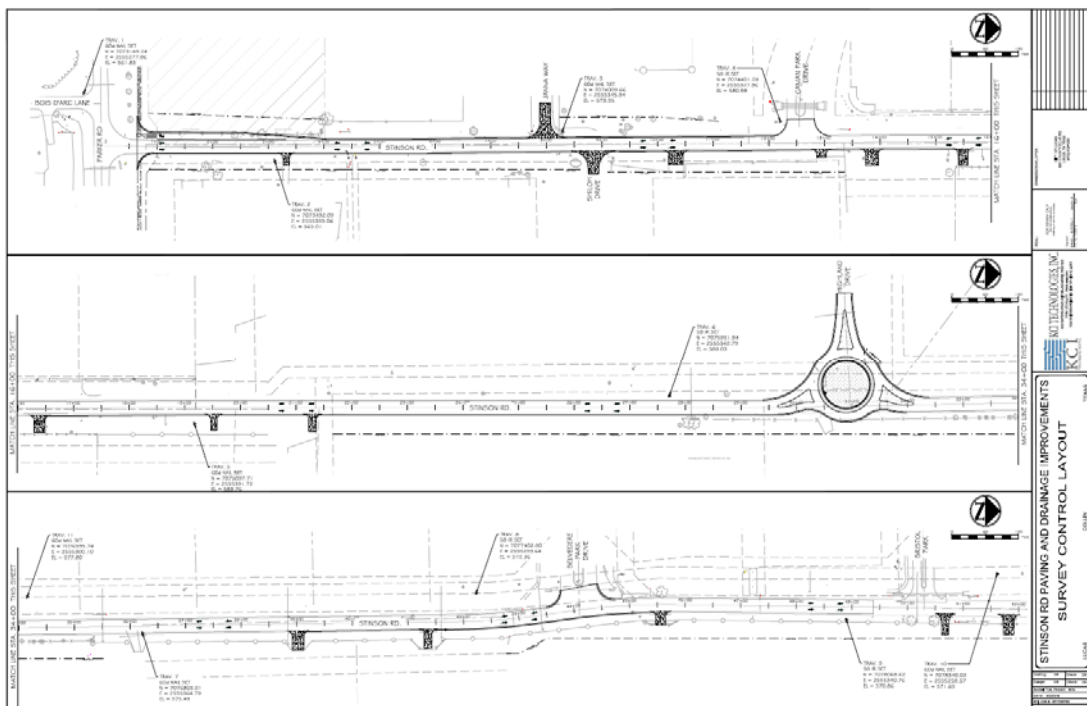
PROJECT DESCRIPTION

This concrete project extends from Parker Road to Bristol Park, and it is about a mile long. It does not include the Muddy Creek Bridge. A straight, flat two-lane roadway is planned to have a roundabout at Highland Drive.

PROJECT SCHEDULE

Project Begin Year	Project End Year
2017	2020

PROJECT MANAGER: City Engineer



**BLONDY JHUNE ROAD MIDDLE AND EASTERN SECTIONS
FROM THE WESTERN BRIDGE TO WINNINGKOFF ROAD**

PROJECT SUMMARY

Starting in Fiscal Year	Project No.	Category	Project Status	Priority
2017-2018	10	Roadway	Design	High

FISCAL OVERVIEW

Cost	Source of Funding
\$192,415 Design Contracts <u>\$2,584,685 for Construction</u> \$2,700,000 Total Budget \$2,700,000 May 2013 Estimate	Certificates of Obligation

PROJECT DESCRIPTION

Replace existing asphalt roadway with a two-lane concrete roadway from the western bridge to Winningkoff Road. The project length is about a mile long and has two different pavement cross sections to accommodate minimizing the impact to the tree canopy.

PROJECT SCHEDULE

Project Begin Year	Project End Year
2017	2020

PROJECT MANAGER: City Engineer



NORTHEAST EQUESTRIAN AND PEDESTRIAN TRAILS				
PROJECT SUMMARY				
Starting in Fiscal Year	Project No.	Category	Project Status	Priority
2018-2019	11	Trail	Planning	Low
FISCAL OVERVIEW				
Cost		Source of Funding		
\$\$\$		To Be Determined		
PROJECT DESCRIPTION				
Obtain easements and construct equestrian and pedestrian trails radiating from the E. Winningkoff Trailhead to the west and south. These trails would generally follow Blondy Jhune Road, E. Winningkoff Road, Welborn Lane, and White Rock Creek (from Winningkoff Road to Snider Lane) The purpose is to link to other trails such as the Trinity Trail, and keep equestrian trails separate from multipurpose trails.				
PROJECT SCHEDULE				
Project Begin Year		Project End Year		
2019		2026		
PROJECT MANAGER: Development Services Director				

STREET MAINTENANCE				
PROJECT SUMMARY				
Starting in Fiscal Year	Project No.	Category	Project Status	Priority
2018-2019	12	Roadway	Planning	Routine
FISCAL OVERVIEW				
Cost		Source of Funding		
\$750,000		City of Lucas General Fund		
PROJECT DESCRIPTION				
Each year, roads require proper maintenance to provide reliable mobility at minimal cost.				
PROJECT SCHEDULE				
Project Begin Year		Project End Year		
2018		2019		
PROJECT MANAGER: City Engineer				

**STINSON ROAD NORTHERN SECTION
FROM BENTWATER DRIVE TO THE REVERSE CURVE**

PROJECT SUMMARY

Starting in Fiscal Year	Project No.	Category	Project Status	Priority
2020-2021	13	Roadway	Planning	High

FISCAL OVERVIEW

Cost	Source of Funding
\$2,000,000 August 2018 Estimate	To Be Determined

PROJECT DESCRIPTION

Replace existing asphalt roadway with a concrete, two-lane roadway from Bentwater Drive to the reverse curve at 405 Stinson Road. It does not include the Muddy Creek Bridge and is about 0.66 miles in length. This is a straight and flat roadway with no four-way intersections.

PROJECT SCHEDULE

Project Begin Year	Project End Year
2020	2023

PROJECT MANAGER: City Engineer

STREET MAINTENANCE				
PROJECT SUMMARY				
Starting in Fiscal Year	Project No.	Category	Project Status	Priority
2019-2020	14	Roadway	Planning	Routine
FISCAL OVERVIEW				
Cost		Source of Funding		
\$750,000		City of Lucas General Fund		
PROJECT DESCRIPTION				
Each year, roads require proper maintenance to provide reliable mobility at minimal cost.				
PROJECT SCHEDULE				
Project Begin Year		Project End Year		
2019		2020		
PROJECT MANAGER: City Engineer				

**WINNINGKOFF ROAD SOUTHERN SECTION
FROM E. LUCAS ROAD TO THE REVERSE CURVE**

PROJECT SUMMARY

Starting in Fiscal Year	Project No.	Category	Project Status	Priority
2020-2021	15	Roadway	Planning	High

FISCAL OVERVIEW

Cost	Source of Funding
\$2,000,000 August 2018 Estimate	To Be Determined

PROJECT DESCRIPTION

Replace existing asphalt roadway with a concrete, two-lane roadway from E. Lucas Road to the Reverse Curve north of Christian Lane. The project is about 0.6 miles in length. A new culvert 800 feet north of E. Lucas Road will be part of this project.

PROJECT SCHEDULE

Project Begin Year	Project End Year
2020	2024

PROJECT MANAGER: City Engineer

STREET MAINTENANCE				
PROJECT SUMMARY				
Starting in Fiscal Year	Project No.	Category	Project Status	Priority
2020-2021	16	Roadway	Planning	Routine
FISCAL OVERVIEW				
Cost		Source of Funding		
\$750,000		City of Lucas General Fund		
PROJECT DESCRIPTION				
Each year, roads require proper maintenance to provide reliable mobility at minimal cost.				
PROJECT SCHEDULE				
Project Begin Year		Project End Year		
2020		2021		
PROJECT MANAGER: City Engineer				

EXERCISE AND LEISURE LOOP				
PROJECT SUMMARY				
Starting in Fiscal Year	Project No.	Category	Project Status	Priority
2020-2021	17	Trail	Planning	Low
FISCAL OVERVIEW				
Cost		Source of Funding		
\$\$\$		To Be Determined		
PROJECT DESCRIPTION				
Construct a five-mile loop starting a City Hall and proceeding south along Country Club Road, west along W. Lucas Road, north along future Allison Lane, east along Estates Parkway, and south along Country Club Road ending at City Hall. The purpose of the loop is to provide a separate facility away from the vehicular traffic. The width of the loop pavement should be between seven and 14 feet depending on location and a desire to create a two-way facility. The loop may be constructed from crushed granite and/or concrete.				
PROJECT SCHEDULE				
Project Begin Year		Project End Year		
2021		2026		
PROJECT MANAGER: Development Services Director				

SOUTHEAST MULTIPURPOSE TRAILS				
PROJECT SUMMARY				
Starting in Fiscal Year	Project No.	Category	Project Status	Priority
2020-2021	18	Trail	Planning	Low
FISCAL OVERVIEW				
Cost		Source of Funding		
\$\$\$		To Be Determined		
PROJECT DESCRIPTION				
Obtain easements and construct multipurpose trails south of W. Lucas Road and west of Southview Drive. These trails would connect with the Exercise and Leisure Loop along W. Lucas Road at Willow Springs School and the TP&L Powerlines in the southern part of the city. A trailhead may be included as part of this project.				
PROJECT SCHEDULE				
Project Begin Year		Project End Year		
2021		2026		
PROJECT MANAGER: Development Services Director				

STREET MAINTENANCE				
PROJECT SUMMARY				
Starting in Fiscal Year	Project No.	Category	Project Status	Priority
2021-2022	19	Roadway	Planning	Routine
FISCAL OVERVIEW				
Cost			Source of Funding	
\$5,000,000			City of Lucas General Fund	
PROJECT DESCRIPTION				
Each year, roads require proper maintenance to provide reliable mobility at minimal cost. FY 2021-2022 \$1,000,000 FY 2022-2023 \$1,000,000 FY 2023-2024 \$1,000,000 FY 2024-2025 \$1,000,000 FY 2025-2026 \$1,000,000				
PROJECT SCHEDULE				
Project Begin Year			Project End Year	
2021			2026	
PROJECT MANAGER: City Engineer				

STREET MAINTENANCE				
PROJECT SUMMARY				
Starting in Fiscal Year	Project No.	Category	Project Status	Priority
2026-2031	20	Roadway	Planning	Routine
FISCAL OVERVIEW				
Cost		Source of Funding		
\$5,000,000		City of Lucas General Fund		
PROJECT DESCRIPTION				
<p>Each year, roads require proper maintenance to provide reliable mobility at minimal cost.</p> <p>FY 2026-2027 \$1,000,000</p> <p>FY 2027-2028 \$1,000,000</p> <p>FY 2028-2029 \$1,000,000</p> <p>FY 2029-2030 \$1,000,000</p> <p>FY 2030-2031 \$1,000,000</p>				
PROJECT SCHEDULE				
Project Begin Year		Project End Year		
2026		2031		
PROJECT MANAGER: City Engineer				

Water System Projects CIP At-A-Glance

The following table is a quick reference guide that summarizes the CIP Water System Projects. It indicates the fiscal year in which the project is scheduled to begin, a project number for identification purposes, the recommended priority of implementation, the preliminary estimated costs for improvements, and the anticipated funding sources.

STARTING IN FISCAL YEAR	PRIORITY NO. and PROJECT	ESTIMATED COST	FUNDING SOURCE
<i>These numbers were estimated and generated by BW2 Engineers in September 2016. The costs associated with rights-of-way, easements, property acquisition, permitting, mitigation, construction testing, and inspection are not included in the following information estimated and generated by BW2 Engineers.</i>			
2016-2017	1. Parker Road 12-Inch Waterline Phase 1 – Section 1 from Stinson Road to Enchanted Way	\$292,037 (\$309,272 Actual)	Capital Improvements Water Fund
	2. Parker Road Eight-Inch Waterline Phase 2 from Shepherds Creek Drive to Santa Fe Trail	\$326,004 (\$527,234 Actual)	Capital Improvements Water Fund
	3. North Pump Station Improvements: A) Add 500,000 Gallon Water Tower B) Wiltshire Court Eight-Inch Waterline Connection C) Replace Existing Pump Station D) System Pressure Reducing Valves	\$2,421,513	Capital Improvements Water Fund
	4. Automatic Flushing Valves (AFVs) for Non-Looped Waterlines -- The location of these AFVs will be installed where looping of the waterlines is not practical.	\$400,000	Capital Improvements Water Fund
	5. Meter Replacement	\$629,860	Capital Improvements Water Fund
	2016-2017 and 2017-2018 TOTAL	XXX	
2018-2019	6. Waterline Looping	\$1,200,000	To Be Determined
	7. Parker Road Eight-Inch Waterline Phase 3 from Santa Fe Trail to Stinson Road	\$-0-	TxDOT
	8. Rollingwood Circle/Choice Lane/Lakeview Drive Six-Inch Waterline -- This project will improve water quality and fire protection to 97 homes.	\$432,165	To Be Determined
	9. A) Edgefield Lane/W. Lucas Road Six-Inch Waterline B) Cedar Bend Trail/E. Lucas Road Six-Inch Waterline -- These two projects will improve water quality and fire protection to 32 homes.	\$113,530	To Be Determined
	10. Graham Lane and Rock Ridge Court Eight-Inch Waterline Loop from Country Club Road to Rock Ridge Road	\$571,775	To Be Determined
	2018-2019 TOTAL	XXXX	
	11. Snider Lane Eight-Inch Waterline from Shady Lane to Sterling Brown Lane -- This	\$594,549	Impact Fees

STARTING IN FISCAL YEAR	PRIORITY NO. and PROJECT	ESTIMATED COST	FUNDING SOURCE
<i>These numbers were estimated and generated by BW2 Engineers in September 2016. The costs associated with rights-of-way, easements, property acquisition, permitting, mitigation, construction testing, and inspection are not included in the following information estimated and generated by BW2 Engineers.</i>			
	project is a requirement of the Lakeview Downs subdivision. Fire hydrants to be added and will improve water quality on the east side of Lucas.		
	12. Glencove Circle and Crestview Circle Six-Inch Extensions to Brockdale Park Road Eight-Inch Loops -- This project will improve water quality and fire protection to 15 homes and add fire hydrants to the area.	\$224,255	To Be Determined
2019-2020	13. Hickory Hill Street Eight-Inch Waterline from Stinson Road to Brookhaven Drive -- This project will improve water quality and fire protection and add fire hydrants to 12 homes.	\$226,383	To Be Determined
	14. Manor Lane Eight-Inch Waterline -- This will replace an undersized four-inch line, add fire hydrants, and improve the water looping between Estelle Lane and Winningkoff Road.	\$313,951	To Be Determined
	15. A) Rock Ridge Road 12-Inch Waterline from Estates Parkway to Fairbrook Circle and B) Fairbrook Circle Eight-Inch Waterline -- This will replace existing six-inch waterlines and bring Fairbrook Circle into the Lucas Waterworks System.	\$491,953	To be Determined
	16. Repaint McGarity 200,000-Gallon Ground Storage Tank	\$150,150	To Be Determined
	17. Enchanted Way/Brookhaven Drive Eight-Inch Waterline -- This project will improve water quality and fire protection to 23 homes.	\$203,262	To Be Determined
	18. Rock Ridge Road/Lovejoy High School Eight-Inch Waterline Loop -- This project improves the looping on the west side of the city and at the high school.	\$56,773	To Be Determined
	2019-2020 TOTAL	XXXXX	
2020-2026	19. McGarity 950,000 Gallon Ground Storage Tank	\$1,279,093	To Be Determined
	20. A) Shiloh Drive/Toole Drive Six-Inch Waterline Replacement B) Braeburn Way Eight-Inch Waterline Loop	\$190,546	To Be Determined
	21. Fairbrook Circle/Graham Lane Eight-Inch Waterline Loop	\$256,453	To Be Determined
	22. Lewis Lane Eight-Inch Waterline from Shepherds Creek Drive to Green Acres Lane	\$300,113	To Be Determined
	23. Angel Parkway 12-Inch Waterline from McGarity Lane to Estates Parkway	\$425,539	To Be Determined
	24. Ingram Lane Six- and 12-Inch Waterlines from McGarity Lane to W. Lucas Road	\$836,217	To Be Determined

STARTING IN FISCAL YEAR	PRIORITY NO. and PROJECT	ESTIMATED COST	FUNDING SOURCE
<i>These numbers were estimated and generated by BW2 Engineers in September 2016. The costs associated with rights-of-way, easements, property acquisition, permitting, mitigation, construction testing, and inspection are not included in the following information estimated and generated by BW2 Engineers.</i>			
	25. Estates Road Eight-Inch Waterline	\$232,014	To Be Determined
	26. Chisholm Trail/Caman Park Drive and Turnberry Lane/Highland Drive Eight-Inch Waterline Loops	\$322,203	To Be Determined
	27. Stinson Road/Enchanted Way Eight-Inch Waterline	\$142,278	To Be Determined
	28. Stinson Road/E. Lucas Road Eight-Inch Waterline	\$147,827	To Be Determined
	29. Rock Creek Estates Six-Inch Waterline	\$175,610	To Be Determined
	30. Stinson Road 12-Inch Waterline Connector	\$39,189	To Be Determined
	31. Repaint North Pump Station 750,000 Gallon Ground Storage Tank	\$409,303	To Be Determined
	32. Repaint McGarity 350,000 Ground Storage Tank	\$228,690	
	33. A) Parker Road 12-Inch Waterline Phase 1 - Section 2 B) Parker Road/Brookhaven Drive Eight-Inch Waterline	\$835,239	To Be Determined
	2020-2026 TOTAL	XXXXXX	
2026-2031	34. Replace McGarity 500,000 Gallon Water Tower	\$1,372,140	To Be Determined
	35. Rock Ridge Road 12-Inch Waterline from Exchange Parkway to Fairbrook Circle	\$224,712	To Be Determined
	36. Lakeview Downs/Trinity Park Six-Inch Waterlines and Eight-Inch Loop	\$1,135,688	To Be Determined
	37. Forest Grove Road/Horseman Drive/Orr Road Six- and Eight-Inch Waterlines	\$867,422	To Be Determined
	38. Orr Road (North) Eight-Inch Waterline	\$426,327	To Be Determined
	39. PR 5252 Six-Inch Waterline Replacement	\$93,486	
	40. Repaint North Pump Station 500,000 Gallon Ground Storage Tank	\$297,124	

PARKER ROAD 12-INCH WATERLINE PHASE 1 – SECTION 1			
PROJECT SUMMARY			
Starting in Fiscal Year	Engineering Priority No.	Category	Project Status
2016-2017	1	Water	2018 - Complete
FISCAL OVERVIEW			
Cost		Source of Funding	
\$62,900 Design \$244,796 Contract \$36,879 Contingency <u>\$10,000 Adjustment FY 16/17</u> \$354,575 Total Budget \$292,037 September 2016 Estimate \$309,272 Actual		Capital Improvement Water Fund	
PROJECT DESCRIPTION			
This project is needed to improve infrastructure and to accommodate the TxDOT Parker Road widening requiring Lucas to abandon an existing six-inch waterline along Parker Road.			
PROJECT SCHEDULE			
Project Begin Year		Project Completion Year	
2016		2018 - Complete	
PROJECT MANAGER: City Engineer			
PROJECT DETAILS			
Description	Estimated Quantity	Unit Cost	Cost
Mobilization, Bonds, Insurance	1	\$11,500.00	\$11,500
Traffic Control/ Construction Signing	1	\$3,000.00	\$3,000
Erosion Control	1	\$5,000.00	\$5,000
Trench Safety	2,115	\$1.50	\$3,173
Furnish & install 12" PVC, including Class "B" embedment	2,100	\$60.00	\$126,000
Furnish & install 12" PVC, by bore and jacking	25	\$320.00	\$8,000
Furnish & install 8" PVC, including Class "B" embedment	15	\$42.00	\$630
Furnish & install 8" PVC, by bore and jacking	25	\$280.00	\$7,000
Furnish & install 12" Bend	1	\$8,000.00	\$8,000
Furnish & install 8" Bend	1	\$800.00	\$800
Furnish & install 12" Tee	4	\$1,200.00	\$4,800
Furnish & install 12" Valve	5	\$1,500.00	\$7,500
Furnish & install 8" Valve	1	\$500.00	\$500
Furnish & install 12"x8" Reducer	1	\$1,200.00	\$1,200
Furnish & install Fire Hydrant, lead and 6" valve	3	\$4,000.00	\$12,000
Connections to Existing Water Lines	1	\$8,000.00	\$8,000
Cut and Plug Existing Water Lines	1	\$2,000.00	\$2,000
Remove Existing Fire Hydrant and Return to City	2	\$500.00	\$1,000
Furnish & install Water Service Connection	16	\$1,500.00	\$24,000
Block Sod	500	\$7.00	\$3,500
Seeding	3,000	\$1.25	\$3,750
Construction Contingency (10%)	1	\$25,342	\$25,342
Engineering/Surveying Services (10%)	1	\$25,342	\$25,342

	Total:	\$292,037
<i>These numbers were estimated and generated by BW2 Engineers in September 2016. The costs associated with rights-of-way, easements, property acquisition, permitting, mitigation, construction testing, and inspection are not included in the following information estimated and generated by BW2 Engineers.</i>		

PARKER ROAD EIGHT-INCH WATER LINE PHASE 2			
PROJECT SUMMARY			
Fiscal Year	Engineering Priority No.	Category	Project Status
2016-2017	2	Water	Complete
FISCAL OVERVIEW			
Estimated Cost		Source of Funding	
\$ 41,150 Design \$ 447,218 Construction Contract <u>\$ 60,285 Contingency</u> \$ 548,653 Total Budget \$ 326,004 September 2016 Estimate* \$ 527,234 Actual		Capital Improvement Water Fund and Certificate of Obligation	
PROJECT DESCRIPTION			
<p>This project is needed to improve infrastructure and to accommodate the TxDOT Parker Road widening requiring Lucas to abandon an existing six-inch waterline along Parker Road. The scope of this project was change. *The original alignment was along Lewis Lane between Shepherds Creek Drive and Parker Road and then along Parker Road from Lewis Lane to Santa Fe Trail. The constructed alignment is from Lewis Lane and McCreary Drive via new and existing easements and the TxDOT right-of-way. A six-inch waterline was bored most of the length of the project to avoid removing trees and reducing the impacts to property owners.</p>			
PROJECT SCHEDULE			
Project Begin Year		Project Completion Year	
2016		2018 - Compete	
PROJECT MANAGER: City Engineer			
PROJECT DETAILS			
Description	Estimated Quantity	Unit Cost	Cost
Mobilization, Bonds, Insurance	1	\$12,850.00	\$12,850
Traffic Control/ Construction Signing	1	\$2,000.00	\$2,000
Erosion Control	1	\$4,000.00	\$4,000
Trench Safety	3,500	\$1.50	\$5,250
Furnish & install 8" PVC, including Class "B" embedment	3,500	\$42.00	\$147,000
Furnish & install 8" PVC, by bore and jacking	80	\$280.00	\$22,400
Furnish & install 8" PVC, by wet bore	100	\$90.00	\$9,000
Furnish & install 8" PVC Creek Crossing, by bore and jacking	50	\$330.00	\$16,500
Furnish & install 8" Bend	1	\$4,050.00	\$4,050
Furnish & install 8" Valve	4	\$500.00	\$2,000
Furnish & install Fire Hydrant, including lead and 6" valve	4	\$4,000.00	\$16,000
Connections to Existing Water Lines	1	\$4,000.00	\$4,000
Block Sod	2,500	\$7.00	\$17,500
Furnish and Place Grass Seed, Including all Fertilization and Watering Until Established	5,500	\$1.25	\$6,875
Construction Contingency (10%)	1	\$28,290	\$28,290
Engineering/Surveying Services (10%)	1	\$28,290	\$28,290
		Total:	\$326,004

These numbers were estimated and generated by BW2 Engineers in September 2016. The costs associated with rights-of-way, easements, property acquisition, permitting, mitigation, construction testing, and inspection are not included in the following information estimated and generated by BW2 Engineers.

NORTH PUMP STATION IMPROVEMENTS

PROJECT SUMMARY

Fiscal Year	Engineering Priority No.	Category	Project Status
2016-2017	3	Water	Design

FISCAL OVERVIEW

Estimated Cost	Source of Funding
\$ 185,000 Design \$ 2,777,240 for Construction \$ 2,962,240 Total Budget \$ 2,267,692 September 2016 Estimate	Capital Improvement Water Fund and Certificate of Obligation

PROJECT DESCRIPTION

- A) Provide new elevated storage tank. This will allow for the elimination of the lower pressure plane.
- B) This will allow the ground storage at the North Pump Station to be filled by the upper pressure plane eliminating water service to seven homes.
- C) Replace Existing Pump Station
- D) System Pressure Reducing Valves
- E) Update SCADA hardware and software

PROJECT SCHEDULE

Project Begin Year	Project Completion Year
2016	2019

PROJECT MANAGER: City Engineer

PROJECT DETAILS

	Estimated Quantity	Unit Cost	Cost
A) Add 500,000 Gallon Water Tower			
Mobilization, Bonds, Insurance	1	\$60,000.00	\$60,000
Traffic Control/ Construction Signing	1	\$1,000.00	\$1,000
Erosion Control	1	\$4,000.00	\$4,000
Furnish & install 500,000 Gallon Elevated Storage Tank	1	\$1,100,000.00	\$1,100,000
Furnish & install Yard Piping/Valving	1	\$20,000.00	\$20,000
Furnish & install Electrical	1	\$45,000.00	\$45,000
Furnish & install Tank Piping/Valving	1	\$20,000.00	\$20,000
Site Work	1	\$5,000.00	\$5,000
Furnish and Place Grass Seed, Including all Fertilization and Watering Until Established	4,000	\$1.25	\$5,000
Construction Contingency (10%)	1	\$118,440	\$118,440
Engineering/Surveying/Geotechnical Services (8%)	1	\$118,440	\$118,440
B) Wiltshire Court Connection			
Mobilization, Bonds, Insurance	1	\$3,850.00	\$3,850
Traffic Control/ Construction Signing	1	\$500.00	\$500
Erosion Control	1	\$2,550.00	\$2,550
Trench Safety	975	\$1.50	\$1,463
Furnish & install 8" PVC, including Class "B" embedment	975	\$42.00	\$40,950

Furnish & install 8" PVC, by wet bore	120	\$90.00	\$10,800
Furnish & install 8" Bend	1	\$4,300.00	\$4,300
Furnish & install 8" Valve	2	\$500.00	\$1,000
Furnish & install Fire Hydrant, including lead and 6" valve	1	\$4,000.00	\$4,000
Connections to Existing Water Lines	1	\$5,000.00	\$5,000
Block Sod	700	\$7.00	\$4,900
Furnish and Place Grass Seed, Including all Fertilization and Watering Until Established	1,500	\$1.25	\$1,875
Construction Contingency (10%)	1	\$8,525	\$8,525
Engineering/Surveying Services (10%)	1	\$8,525	\$8,525
C) Replace Existing Pump Station			
Mobilization, Bonds, Insurance	1	\$17,000.00	\$17,000
Erosion Control	1	\$3,000.00	\$3,000
Furnish & install Pumps	3	\$20,000.00	\$60,000
Furnish & construct Pump Building	1	\$120,000.00	\$120,000
Furnish & install Pipes and Valves	1	\$50,000.00	\$50,000
Furnish & install Electrical	1	\$100,000.00	\$100,000
Site Work	1	\$5,000.00	\$5,000
Furnish and Place Grass Seed, Including all Fertilization and Watering Until Established	2,000	\$1.25	\$2,500
Construction Contingency (10%)	1	\$37,537	\$37,537
Engineering/Surveying/Geotechnical Services (10%)	1	\$37,537	\$37,537
D) System Pressure Reducing Valves			
Furnish separate cost of product and cost to Install Residential Pressure Reducing Valve	1,200	\$200.00	\$240,000
E) Update SCADA			
	1	\$100,000.00	\$100,000
		Total:	\$2,367,692

These numbers were estimated and generated by BW2 Engineers in September 2016. The costs associated with rights-of-way, easements, property acquisition, permitting, mitigation, construction testing, and inspection are not included in the following information estimated and generated by BW2 Engineers.

AUTOMATIC FLUSHING VALVES FOR NON-LOOPED WATERLINES			
PROJECT SUMMARY			
Fiscal Year	Engineering Priority No.	Category	Project Status
2016-2017	4	Water	Complete
FISCAL OVERVIEW			
Estimated Cost		Source of Funding	
\$ 400,000 Actual		Capital Improvement Water Fund	
\$ 400,000 September 2016 Estimate			
PROJECT DESCRIPTION			
The location of these AFVs will be installed where looping of the waterlines is not practical. The scope of this project was changed. Temporary AFVs were installed and the looping of waterlines was moved to other projects.			
PROJECT SCHEDULE			
Project Begin Year		Project Completion Year	
2016		2018 - Complete	
PROJECT MANAGER: Public Works Supervisor			
PROJECT DETAILS			
Description	Estimated Quantity	Unit Cost	Cost
Furnish separate cost of product and cost to Install Automatic Flushing Valve	25	\$4,000.00	\$60,000
Install looped water lines at locations to be determined			\$340,000
		Total:	\$400,000
<i>These numbers were estimated and generated by BW2 Engineers in September 2016. The costs associated with rights-of-way, easements, property acquisition, permitting, mitigation, construction testing, and inspection are not included in the following information estimated and generated by BW2 Engineers.</i>			

NEPTUNE METERS REPLACEMENT

PROJECT SUMMARY

Fiscal Year	Engineering Priority No.	Category	Project Status
2017-2018	5	Water	Construction

FISCAL OVERVIEW

Estimated Cost	Source of Funding
\$ 629,860 Contract \$ 748,785 September 2016 Estimate	Capital Improvement Water Fund

PROJECT DESCRIPTION

Replace all existing RG3 meters and registers with Neptune equipment. The scope of this project was changed from an Advanced Metering Infrastructure (AMI) project to an Automatic Meter Reading (AMR) project.

PROJECT SCHEDULE

Project Begin Year	Project Completion Year
2017	2020

PROJECT DETAILS:

Description	Estimated Quantity	Unit Cost	Cost
Meters	?	???	\$629,860
		Total:	\$629,860

These numbers were estimated and generated by BW2 Engineers in September 2016. The costs associated with rights-of-way, easements, property acquisition, permitting, mitigation, construction testing, and inspection are not included in the following information estimated and generated by BW2 Engineers.

WATERLINE LOOPING

PROJECT SUMMARY

Fiscal Year	Engineering Priority No.	Category	Project Status
2016-2017	6	Water	Planning

FISCAL OVERVIEW

Estimated Cost	Source of Funding
\$1,200,000	TBD

PROJECT DESCRIPTION

Loop waterlines to enhance the water system quality and fire protection.

PROJECT SCHEDULE

Project Begin Year	Project Completion Year
2017	2022

PROJECT DETAILS:

Description	Estimated Quantity	Unit Cost	Cost
Install waterline loops at locations to be determined			\$1,200,000
		Total:	\$1,200,000

These numbers were estimated and generated by BW2 Engineers in September 2016. The costs associated with rights-of-way, easements, property acquisition, permitting, mitigation, construction testing, and inspection are not included in the following information estimated and generated by BW2 Engineers.

**PARKER ROAD EIGHT-INCH WATERLINE PHASE 3
(FROM SANTA FE TRAIL TO STINSON ROAD)**

PROJECT SUMMARY

Fiscal Year	Engineering Priority No.	Category	Project Status
2017-2018	7	Water	Construction

FISCAL OVERVIEW

Estimated Cost	Source of Funding
\$-0-	TxDOT Funding of \$238,000

PROJECT DESCRIPTION

This project is needed to accommodate the TxDOT Parker Road widening requiring Lucas to abandon an existing six-inch waterline along Parker Road between McCreary Road and Stinson Road. Staff worked closely with TxDOT to obtain funding from TxDOT for this project.

PROJECT SCHEDULE

Project Begin Year	Project Completion Year
2018	2019

PROJECT MANAGER: City Engineer

PROJECT DETAILS

Description	Estimated Quantity	Unit Cost	Cost
	Total:		\$-0-

These numbers were estimated and generated by BW2 Engineers in September 2016. The costs associated with rights-of-way, easements, property acquisition, permitting, mitigation, construction testing, and inspection are not included in the following information estimated and generated by BW2 Engineers.

ROLLINGWOOD CIRCLE/CHOICE LANE/LAKEVIEW DRIVE SIX-INCH WATERLINE LOOP			
PROJECT SUMMARY			
Fiscal Year	Engineering Priority No.	Category	Project
2018-2019	8	Water	Planning
FISCAL OVERVIEW			
Estimated Cost		Source of Funding	
\$432,165 September 2016 Estimate		To Be Determined	
PROJECT DESCRIPTION			
This project will improve water quality and fire protection for 97 homes.			
PROJECT SCHEDULE			
Project Begin Year		Project Completion Year	
2018		2019	
PROJECT MANGER: City Engineer			
PROJECT DETAILS			
Description	Estimated Quantity	Unit Cost	Cost
Mobilization, Bonds and Insurance	1	\$17,250.00	\$17,250
All Traffic Control, Barricading and Signing Measures	1	\$7,500.00	\$7,500
Temporary erosion control	1	\$8,500.00	\$8,500
Cut and Plug Existing 2" Water Line	3	\$450.00	\$1,350
Cut and Plug Existing 8" Water Line	1	\$500.00	\$500
Furnish and Install Trench Safety system	4550	\$1.75	\$7,963
Cut Out and Remove Existing 8" Water Line as needed	1	\$2,250.00	\$2,250
Cut Out and Remove Existing Reducer and 2" Water Line	3	\$1,500.00	\$4,500
Connect to Existing 6" Water Line	1	\$500.00	\$500
Furnish and Install 6" 11.25 Degree Bend	4	\$675.00	\$2,700
Furnish and Install 6" 90 Degree Bend	7	\$650.00	\$4,550
Furnish and Install 6"x6" Tee	1	\$1,000.00	\$1,000
Furnish and Install 6" Gate Valve	4	\$1,500.00	\$6,000
Furnish and Install Fire Hydrant, Valve and Riser	4	\$3,750.00	\$15,000
Furnish and Install 6" waterline w/Class "B" Embedment	4550	\$ 45.00	\$204,750
Furnish & Install 6" DR-18 w/14" Steel by Boring and Jacking	180	\$ 275.00	\$49,500
Furnish and Install Long Service Water Line	1	\$ 1,250.00	\$1,250
Furnish and Install Short Service Water Line	8	\$ 800.00	\$6,400
Furnish and Install Service Line Over 250 LF	2	\$ 5,000.00	\$10,000
Furnish and Place Block Sodding	1150	\$ 7.00	\$8,050
Furnish and Place Grass Seed	2500	\$ 1.25	\$3,125
Construction Contingency (10%)	1	\$36,263.75	\$36,264
Engineering/Surveying/Geotechnical Services (10%)	1	\$36,263.75	\$36,264
		Total:	\$432,165

These numbers were estimated and generated by BW2 Engineers in September 2016. The costs associated with rights-of-way, easements, property acquisition, permitting, mitigation, construction testing, and inspection are not included in the following information estimated and generated by BW2 Engineers.

**EDGEFIELD LANE/W. LUCAS ROAD SIX-INCH WATERLINE LOOP
CEDAR BEND TRAIL/E. LUCAS ROAD SIX-INCH WATERLINE LOOP**

PROJECT SUMMARY

Fiscal Year	Engineering Priority No.	Category	Project Status
2018-2019	9	Water	Planning

FISCAL OVERVIEW

Estimated Cost	Source of Funding
\$113,530 September 2016 Estimate	To Be Determined

PROJECT DESCRIPTION

This project will improve water quality and fire protection to 32 homes.

PROJECT SCHEDULE

Project Begin Year	Project Completion Year
2018	2019

PROJECT MANAGER: City Engineer

PROJECT DETAILS

Description	Estimated Quantity	Unit Cost	Cost
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A) Edgefield Lane/West Lucas Road Six-Inch Waterline Loop

Mobilization, Bonds and Insurance	1	\$3,150.00	\$3,150
All Traffic Control, Barricading and Signing Measures	1	\$2,000.00	\$2,000
Temporary erosion control including operational control of SW3P	1	\$4,000.00	\$4,000
Cut and Plug Existing 2" Water Line	1	\$450.00	\$450
Furnish and Install Trench Safety system, design and implementation	535	\$1.75	\$936
Cut Out and Remove Existing 12" Water Line as needed, Furnish and Install 12"x6" Tee	2	\$2,750.00	\$5,500
Cut Out and Remove Existing 6" Water Line as needed, Furnish and Install 6"x6" Tee	1	\$1,850.00	\$1,850
Connect to Existing 6" Water Line	1	\$500.00	\$500
Furnish and Install 6" Gate Valve	2	\$1,500.00	\$3,000
Furnish and Install Fire Hydrant, Including 6" Gate Valve and Riser	1	\$3,750.00	\$3,750
Furnish and Install 6" AWWA C900 DR-18 w/Class "B" Embedment	535	\$45.00	\$24,075
Furnish and Install 6" AWWA C900 DR-18 w/14" Steel Casing by Boring and Jacking	50	\$275.00	\$13,750
Furnish and Install Long Service Water Line	2	\$1,250.00	\$2,500
Furnish and Place Block Sodding, including all Fertilization and Watering Until Established	100	\$7.00	\$700
Furnish and Place Grass Seed, including all Fertilization and Watering Until Established	280	\$1.25	\$350

	Edgefield Subtotal:	\$66,511	
B) Cedar Bend Trail/E. Lucas Road Six-inch Waterline Loop			
Mobilization, Bonds and Insurance	1	\$1,350.00	\$1,350
All Traffic Control, Barricading and Signing Measures	1	\$ 5,000.00	\$5,000
Temporary erosion control including operational control of SW3P	1	\$ 1,000.00	\$1,000
Furnish and Install Trench Safety system, design and implementation	105	\$ 1.75	\$184
Cut Out and Remove Existing 12" Water Line as needed, Furnish and Install 12"x6" Tee	1	\$ 2,750.00	\$2,750
Connect to Existing 6" Water Line	1	\$ 500.00	\$500
Furnish and Install 6" Gate Valve	1	\$ 1,500.00	\$1,500
Furnish and Install 6" AWWA C900 DR-18 w/Class "B" Embedment	105	\$ 45.00	\$4,725
Furnish and Install 6" AWWA C900 DR-18 w/14" Steel Casing by Boring and Jacking	40	\$ 275.00	\$11,000
Furnish and Place Grass Seed, Including all Fertilization and Watering Until Established	70	\$1.25	\$88
	Cedar Bend Trail Subtotal:		\$28,096
	Project Subtotal:		\$94,608
Construction Contingency (10%)	1	\$9,461.00	\$9,461
Engineering/Surveying/Geotechnical Services (10%)	1	\$9,461.00	\$9,461
	Total:		\$113,530
<i>These numbers were estimated and generated by BW2 Engineers in September 2016. The costs associated with rights-of-way, easements, property acquisition, permitting, mitigation, construction testing, and inspection are not included in the following information estimated and generated by BW2 Engineers.</i>			

GRAHAM LANE AND ROCK RIDGE COURT EIGHT-INCH WATERLINE LOOP FROM COUNTRY CLUB ROAD TO ROCK RIDGE ROAD			
PROJECT SUMMARY			
Fiscal Year	Engineering Priority No.	Category	Project Status
2018-2019	10	Water	Planning
FISCAL OVERVIEW			
Estimated Cost		Source of Funding	
\$571,775 September 2016 Estimate		To Be Determined	
PROJECT DESCRIPTION			
This project will improve water quality and fire protection to 30 homes.			
PROJECT SCHEDULE			
Project Begin Year		Project Completion Year	
2018		2019	
PROJECT MANAGER: City Engineer			
PROJECT DETAILS			
Description	Estimated Quantity	Unit Cost	Cost
Mobilization, Bonds, Insurance	1	\$22,500.00	\$22,500
Traffic Control/ Construction Signing	1	\$2,000.00	\$2,000
Erosion Control	1	\$13,000.00	\$13,000
Trench Safety	5,230	\$1.50	\$7,845
Furnish & install 6" PVC, including Class "B" embedment	3,115	\$35.00	\$109,025
Furnish & install 6" PVC, by bore and jacking	80	\$260.00	\$20,800
Furnish & install 6" PVC, by wet bore	185	\$75.00	\$13,875
Furnish & install 8" PVC, including Class "B" embedment	2,115	\$42.00	\$88,830
Furnish & install 8" PVC, by bore and jacking	90	\$280.00	\$25,200
Furnish & install 8" PVC, by wet bore	100	\$90.00	\$9,000
Furnish & install 6" Bend	1	\$2,250.00	\$2,250
Furnish & install 8" Bend	1	\$1,085.00	\$1,085
Furnish & install 6" Valve	1	\$400.00	\$400
Furnish & install 8" Valve	4	\$500.00	\$2,000
Furnish & install 8"x6" reducer	1	\$700.00	\$700
Connections to Existing Water Lines	1	\$10,000.00	\$10,000
Furnish & install Fire Hydrant, including lead and 6" valve	9	\$4,000.00	\$36,000
Cut and Plug Existing Water Lines	1	\$4,500.00	\$4,500
Remove Existing Fire Hydrant and Return to City	2	\$500.00	\$1,000
Furnish & install Water Service Connection	28	\$1,500.00	\$42,000
Block Sod	8,000	\$7.00	\$56,000
Furnish and Place Grass Seed, Including all Fertilization and Watering Until Established	3,625	\$1.25	\$4,531
Construction Contingency (10%)	1	\$49,617	\$49,617

Engineering/Surveying Services (10%)	1	\$49,617	\$49,617
		Total:	\$571,775
<i>These numbers were estimated and generated by BW2 Engineers in September 2016. The costs associated with rights-of-way, easements, property acquisition, permitting, mitigation, construction testing, and inspection are not included in the following information estimated and generated by BW2 Engineers.</i>			

SNIDER LANE EIGHT-INCH WATERLINE			
PROJECT SUMMARY			
Fiscal Year	Engineering Priority No.	Category	Project Status
2018-2019	11	Water	Complete
FISCAL OVERVIEW			
Cost		Source of Funding	
\$594,549 September 2016 Estimate \$xxxx Actual		Impact Fees	
PROJECT DESCRIPTION			
This project is a requirement of the Lakeview Downs subdivision, add fire hydrants, and will improve water quality on the east side of Lucas.			
PROJECT SCHEDULE			
Project Begin Year		Project Completion Year	
2017		2018 - Complete	
PROJECT MANAGER: City Engineer			
PROJECT DETAILS			
Description	Estimated Quantity	Unit Cost	Cost
Mobilization, Bonds, Insurance	1	\$23,500.00	\$23,500
Traffic Control/ Construction Signing	1	\$6,500.00	\$6,500
Erosion Control	1	\$15,000.00	\$15,000
Trench Safety	6,075	\$1.50	\$9,113
Furnish & install 8" PVC, including Class "B" embedment	6,075	\$42.00	\$255,150
Furnish & install 8" PVC, by bore and jacking	80	\$280.00	\$22,400
Furnish & install 8" PVC Creek Crossing, by bore and jacking	50	\$330.00	\$16,500
Furnish & install 8" PVC, by wet bore	270	\$90.00	\$24,300
Furnish & install 8" Bend	1	\$3,150.00	\$3,150
Furnish & install 8" Tee	1	\$900.00	\$900
Furnish & install 8" Valve	7	\$500.00	\$3,500
Furnish & install Fire Hydrant, including lead and 6" valve	13	\$4,000.00	\$52,000
Connections to Existing Water Lines	1	\$4,000.00	\$4,000
Cut and Plug Existing Water Lines	1	\$2,225.00	\$2,225
Furnish & install Water Service Connection	20	\$1,500.00	\$30,000
Remove Existing Fire Hydrant and Return to City	1	\$500.00	\$500
Block Sod	1,000	\$7.00	\$7,000
Seeding	12,500	\$1.25	\$15,625
Construction Contingency (10%)	1	\$51,593	\$51,593
Engineering/Surveying Services (10%)	1	\$51,593	\$51,593
		Total:	\$594,549
<i>These numbers were estimated and generated by BW2 Engineers in September 2016. The costs associated with rights-of-way, easements, property acquisition, permitting, mitigation, construction testing, and inspection are not included in the following information estimated and generated by BW2 Engineers.</i>			

GLENCOVE CIRCLE AND CRESTVIEW CIRCLE SIX-INCH EXTENSIONS TO BROCKDALE PARK ROAD EIGHT-INCH WATERLINE LOOPS			
PROJECT SUMMARY			
Fiscal Year	Engineering Priority No.	Category	Project Status
2018-2019	12	Water	Planning
FISCAL OVERVIEW			
Estimated Cost		Source of Funding	
\$224,255 September 2016 Estimate		To Be Determined	
PROJECT DESCRIPTION			
This project will improve water quality and fire protection to 15 homes and add fire hydrants to the area.			
PROJECT SCHEDULE			
Project Begin Year		Project Completion Year	
2018		2019	
PROJECT MANAGER: City Engineer			
PROJECT DETAILS			
Description	Estimated Quantity	Unit Cost	Cost
Mobilization, Bonds, Insurance	1	\$9,000.00	\$9,000
Traffic Control/ Construction Signing	1	\$1,000.00	\$1,000
Erosion Control	1	\$5,100.00	\$5,100
Trench Safety	1,965	\$1.50	\$2,948
Furnish & install 6" PVC, including Class "B" embedment	1,965	\$35.00	\$68,775
Furnish & install 6" PVC, by bore and jacking	40	\$260.00	\$10,400
Furnish & install 6" PVC, by wet bore	180	\$75.00	\$13,500
Furnish & install 6" Bend	1	\$2,500.00	\$2,500
Furnish & install 6" Valve	2	\$400.00	\$800
Furnish & install Fire Hydrant, including lead and 6" valve	4	\$4,000.00	\$16,000
Connections to Existing Water Lines	1	\$7,750.00	\$7,750
Cut and Plug Existing Water Lines	1	\$4,000.00	\$4,000
Furnish & install Water Service Connection	14	\$1,500.00	\$21,000
Block Sod	3,000	\$7.00	\$21,000
Furnish and Place Grass Seed, Including all Fertilization and Watering Until Established	1,375	\$1.25	\$1,719
Construction Contingency (10%)	1	\$19,382	\$19,382
Engineering/Surveying Services (10%)	1	\$19,382	\$19,382
		Total:	\$224,255
<i>These numbers were estimated and generated by BW2 Engineers in September 2016. The costs associated with rights-of-way, easements, property acquisition, permitting, mitigation, construction testing, and inspection are not included in the following information estimated and generated by BW2 Engineers.</i>			

**HICKORY HILL STREET EIGHT-INCH WATERLINE
FROM STINSON ROAD TO BROOKHAVEN DRIVE**

PROJECT SUMMARY

Fiscal Year	Engineering Priority No.	Category	Project Status
2019-2020	13	Water	Planning

FISCAL OVERVIEW

Estimated Cost	Source of Funding
\$226,383 September 2016 Estimate	To Be Determined

PROJECT DESCRIPTION

This project will improve water quality and fire protection to 12 homes.

PROJECT SCHEDULE

Project Begin Year	Project Completion Year
2019	2020

PROJECT MANAGER: City Engineer

PROJECT DETAILS

Description	Estimated Quantity	Unit Cost	Cost
Mobilization, Bonds, Insurance	1	\$9,000.00	\$9,000
Traffic Control/ Construction Signing	1	\$1,000.00	\$1,000
Erosion Control	1	\$5,300.00	\$5,300
Trench Safety	2,120	\$1.50	\$3,180
Furnish & install 8" PVC, including Class "B" embedment	2,120	\$42.00	\$89,040
Furnish & install 8" PVC, by bore and jacking	40	\$280.00	\$11,200
Furnish & install 8" PVC, by wet bore	100	\$90.00	\$9,000
Furnish & install 8" Bend	1	\$1,500.00	\$1,500
Furnish & install 8" Valve	3	\$500.00	\$1,500
Connections to Existing Water Lines	1	\$5,000.00	\$5,000
Furnish & install Fire Hydrant, including lead and 6" valve	2	\$4,000.00	\$8,000
Cut and Plug Existing Water Lines	1	\$1,800.00	\$1,800
Furnish & install Water Service Connection	12	\$1,500.00	\$18,000
Remove Existing Fire Hydrant and Return to City	2	\$500.00	\$1,000
Block Sod	3,015	\$7.00	\$21,105
Furnish and Place Grass Seed, Including all Fertilization and Watering Until Established	1,175	\$1.25	\$1,469
Construction Contingency (10%)	1	\$19,645	\$19,645
Engineering/Surveying Services (10%)	1	\$19,645	\$19,645
		Total:	\$226,383

These numbers were estimated and generated by BW2 Engineers in September 2016. The costs associated with rights-of-way, easements, property acquisition, permitting, mitigation, construction testing, and inspection are not included in the following information estimated and generated by BW2 Engineers.

MANOR LANE EIGHT-INCH WATERLINE

PROJECT SUMMARY

Fiscal Year	Engineering Priority No.	Category	Project Status
2019-2020	14	Water	Planning

FISCAL OVERVIEW

Estimated Cost	Source of Funding
\$313,951 September 2016 Estimate	To Be Determined

PROJECT DESCRIPTION

This will eliminate an undersized four-inch line, add fire hydrants, and improve the water looping between Estelle Lane and Winningkoff Road.

PROJECT SCHEDULE

Project Begin Year	Project Completion Year
2019	2020

PROJECT MANAGER: City Engineer

PROJECT DETAILS

Description	Estimated Quantity	Unit Cost	Cost
Mobilization, Bonds, Insurance	1	\$12,500.00	\$12,500
Traffic Control/ Construction Signing	1	\$3,150.00	\$3,150
Erosion Control	1	\$7,500.00	\$7,500
Trench Safety	3,010	\$1.50	\$4,515
Furnish & install 8" PVC, including Class "B" embedment	3,010	\$42.00	\$126,420
Furnish & install 8" PVC, by bore and jacking	40	\$280.00	\$11,200
Furnish & install 8" PVC, by wet bore	115	\$90.00	\$10,350
Furnish & install 8" Bend	1	\$1,500.00	\$1,500
Furnish & install 8" Valve	3	\$500.00	\$1,500
Connections to Existing Water Lines	1	\$6,250.00	\$6,250
Furnish & install Fire Hydrant, including lead and 6" valve	6	\$4,000.00	\$24,000
Cut and Plug Existing Water Lines	1	\$2,000.00	\$2,000
Furnish & install Water Service Connection	6	\$1,500.00	\$9,000
Remove Existing Fire Hydrant and Return to City	5	\$500.00	\$2,500
Block Sod	5,025	\$7.00	\$35,175
Furnish and Place Grass Seed, Including all Fertilization and Watering Until Established	1,675	\$1.25	\$2,094
Construction Contingency (10%)	1	\$27,148	\$27,148
Engineering/Surveying Services (10%)	1	\$27,148	\$27,148
		Total:	\$313,951

These numbers were estimated and generated by BW2 Engineers in September 2016. The costs associated with rights-of-way, easements, property acquisition, permitting, mitigation, construction testing, and inspection are not included in the following information estimated and generated by BW2 Engineers.

ROCK RIDGE ROAD 12-INCH WATERLINE FROM ESTATES PARKWAY TO FAIRBROOK CIRCLE AND FAIRBROOK CIRCLE EIGHT-INCH WATERLINE

PROJECT SUMMARY

Fiscal Year	Engineering Priority No.	Category	Project Status
2019-2020	15	Water	Planning

FISCAL OVERVIEW

Estimated Cost	Source of Funding
\$491,953 September 2016 Estimate	To Be Determined

PROJECT DESCRIPTION

This project will improve water quality and fire protection to 23 homes.

PROJECT SCHEDULE

Project Begin Year	Project Completion Year
2019	2020

PROJECT MANAGER: City Engineer

PROJECT DETAILS

Description	Estimated Quantity	Unit Cost	Cost
Mobilization, Bonds, Insurance	1	\$19,500.00	\$19,500
Traffic Control/ Construction Signing	1	\$5,000.00	\$5,000
Erosion Control	1	\$10,400.00	\$10,400
Trench Safety	4,165	\$1.50	\$6,248
Furnish & install 8" PVC, including Class "B" embedment	925	\$42.00	\$38,850
Furnish & install 8" PVC, by wet bore	100	\$90.00	\$9,000
Furnish & install 12" PVC, including Class "B" embedment	3,240	\$60.00	\$194,400
Furnish & install 12" PVC, by bore and jacking	40	\$320.00	\$12,800
Furnish & install 12" PVC, by wet bore	120	\$130.00	\$15,600
Furnish & install 12" Bend	1	\$3,000.00	\$3,000
Furnish & install 12" Tee	1	\$1,250.00	\$1,250
Furnish & install 8" Valve	5	\$500.00	\$2,500
Furnish & install 12" Valve	1	\$1,500.00	\$1,500
Furnish & install Fire Hydrant, including lead and 6" valve	9	\$4,000.00	\$36,000
Connections to Existing Water Lines	1	\$5,000.00	\$5,000
Cut and Plug Existing Water Lines	1	\$2,250.00	\$2,250
Furnish & install Water Service Connection	14	\$1,500.00	\$21,000
Remove Existing Fire Hydrant and Return to City	6	\$500.00	\$3,000
Block Sod	1,325	\$7.00	\$9,275
Seeding	8,000	\$1.25	\$10,000
Construction Contingency (10%)	1	\$42,690	\$42,690
Engineering/Surveying Services (10%)	1	\$42,690	\$42,690
		Total:	\$491,953

These numbers were estimated and generated by BW2 Engineers in September 2016. The costs associated with rights-of-way, easements, property acquisition, permitting, mitigation, construction testing, and inspection are not included in the following information estimated and generated by BW2 Engineers.

REPAINT MCGARITY 200,000-GALLON GROUND STORAGE TANK			
PROJECT SUMMARY			
Fiscal Year	Engineering Priority No.	Category	Project Status
2019-2020	16	Water	Planning
FISCAL OVERVIEW			
Estimated Cost		Source of Funding	
\$150,150 September 2016 Estimate		To Be Determined	
PROJECT DESCRIPTION			
Repaint 200,000-gallon ground storage tank at McGarity Pump Station			
PROJECT SCHEDULE			
Project Begin Year		Project Completion Year	
2019		2020	
PROJECT MANAGER: City Engineer			
PROJECT DETAILS			
Description	Estimated Quantity	Unit Cost	Cost
Mobilization, Bonds, Insurance	1	\$8,000.00	\$8,000
Repaint existing 200,000-gallon ground storage tank	1	\$120,000.00	\$120,000
Disinfect Tank	1	\$2,000.00	\$2,000
Construction Contingency (10%)	1	\$13,430.00	\$13,430
Engineering/Surveying Services (5%)	1	\$6,730	\$6,730
		Total:	\$150,150
<i>These numbers were estimated and generated by BW2 Engineers in September 2016. The costs associated with rights-of-way, easements, property acquisition, permitting, mitigation, construction testing, and inspection are not included in the following information estimated and generated by BW2 Engineers.</i>			

ENCHANTED WAY/BROOKHAVEN DRIVE EIGHT-INCH WATERLINE			
PROJECT SUMMARY			
Fiscal Year	Engineering Priority No.	Category	Project Status
2019-2020	17	Water	Planning
FISCAL OVERVIEW			
Estimated Cost		Source of Funding	
\$203,262 September 2016 Estimate		To Be Determined	
PROJECT DESCRIPTION			
This project will improve water quality and fire protection to 23 homes.			
PROJECT SCHEDULE			
Project Begin Year		Project Completion Year	
2019		2020	
PROJECT MANAGER: City Engineer			
PROJECT DETAILS			
Description	Estimated Quantity	Unit Cost	Cost
Mobilization, Bonds, Insurance	1	\$8,000.00	\$8,000
Traffic Control/ Construction Signing	1	\$500.00	\$500
Erosion Control	1	\$1,400.00	\$1,400
Trench Safety	3,235	\$1.50	\$4,853
Furnish & install 8" PVC, including Class "B" embedment	3,235	\$42.00	\$135,870
Furnish & install Fire Hydrant, including lead and 6" valve	1	\$4,000.00	\$4,000
Connections to Existing Water Lines	1	\$3,500.00	\$3,500
Block Sod	150	\$7.00	\$1,050
Furnish and Place Grass Seed, Including all Fertilization and Watering Until Established	7,050	\$1.25	\$8,813
Construction Contingency (10%)	1	\$17,638	\$17,638
Engineering/Surveying Services (10%)	1	\$17,638	\$17,638
		Total:	\$203,262
<i>These numbers were estimated and generated by BW2 Engineers in September 2016. The costs associated with rights-of-way, easements, property acquisition, permitting, mitigation, construction testing, and inspection are not included in the following information estimated and generated by BW2 Engineers.</i>			

ROCK RIDGE ROAD/LOVEJOY HIGH SCHOOL EIGHT-INCH WATER LINE

PROJECT SUMMARY

Fiscal Year	Engineering Priority No.	Category	Project Status
2019-2020	18	Water	Planning

FISCAL OVERVIEW

Estimated Cost	Source of Funding
\$56,773 September 2016 Estimate	To Be Determined

PROJECT DESCRIPTION

This project improves the looping on the west side of the city and improves water quality and fire protection at the high school.

PROJECT SCHEDULE

Project Begin Year	Project Completion Year
2019	2020

PROJECT MANAGER: City Engineer

PROJECT DETAILS

Description	Estimated Quantity	Unit Cost	Cost
Mobilization, Bonds, Insurance	1	\$2,250.00	\$2,250
Traffic Control/ Construction Signing	1	\$1,000.00	\$1,000
Erosion Control	1	\$1,800.00	\$1,800
Trench Safety	770	\$1.50	\$1,155
Furnish & install 8" PVC, including Class "B" embedment	770	\$42.00	\$32,340
Furnish & install 8" Bend	1	\$750.00	\$750
Connections to Existing Water Lines	1	\$5,500.00	\$5,500
Furnish and Place Grass Seed, Including all Fertilization and Watering Until Established	1,700	\$1.25	\$2,125
Construction Contingency (10%)	1	\$4,927	\$4,927
Engineering/Surveying Services (10%)	1	\$4,927	\$4,927
		Total:	\$56,773

These numbers were estimated and generated by BW2 Engineers in September 2016. The costs associated with rights-of-way, easements, property acquisition, permitting, mitigation, construction testing, and inspection are not included in the following information estimated and generated by BW2 Engineers.