COMPREHENSIVE INFRASTRUCTURE PLAN

City of Robins
SFGO Infrastructure Inventory

July 21, 2020
Adopted: March 15, 2021

SNYDER & ASSOCIATES

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Prepared for:

City of Robins
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Robins, Iowa 52328

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INTRODUCTION

1. INTRODUCTION

As a proactive and forward thinking community, the City of Robins, herein referred to as "the City," contracted Snyder & Associates, Inc. to provide professional services for their project known and identified as the, "SFGO Infrastructure Inventory." The projects scope of services aimed to develop a tool that would aid the City as they strategize how to address current infrastructure needs, accommodate growth and new development, and prepare fiscal year budgets. As a result, this report has been prepared to act as that tool for the City, a Comprehensive Infrastructure Plan, preparing the City to overcome evolving and complex infrastructure challenges as they arise, and have a document to reference and update in the future.

Each infrastructure system – Wastewater Collection, Water Distribution, Transportation Network, and Stormwater Management – have been addressed within individual sections of this report. Tailored to each system, the sections provide some combination of system background, estimated future growth and system design, prioritized goals to support fluidity through growth and development, and identification of possible funding options. This proactive planning approach to infrastructure expansion will support the City of Robins in staying ahead of development as the community continues to grow, allowing it to remain resilient and expand efficiently.

1.1 Best Use of the Comprehensive Infrastructure Plan

This Comprehensive Infrastructure Plan is intended to be used as a guide to aid the City as they strategize how to address current infrastructure needs, accommodate growth and new development, and prepare capital improvements project budgets. The ultimate wastewater collection and potable water distribution systems that have been studied in preparation of this report include general information regarding the systems themselves, proposed improvement projects based on projected growth, opinions of probable cost based on year 2020 construction costs, and financing options as they are available today. The transportation and stormwater management infrastructure systems that were developed for this report contain information regarding proposed future improvements, industry standard practices, and existing areas of concern. These portions of infrastructure were not prioritized into periodic completion goals and cost information was not established, but were derived instead to be used as a tool for policy implementation and planning.

This document is not intended to be written in stone, but to provide a basis of understanding for the City of Robins' staff and Officials. It should also be expected that as growth occurs, revisions to this document should be completed to maintain a current vision of the City of Robins and the ever-changing landscape of development, the use and needs of its residents, and infrastructure practices and standards. It is recommended that this Comprehensive Infrastructure Plan is reviewed and updated every four (4) years. This review and revision frequency is a minimum recommendation, and it may be beneficial for revisions to occur more frequently. It is essential to the quality of guidance this plan may provide that the minimum review frequency recommendation is maintained.

1.2 Methodology

To successfully execute a Comprehensive Infrastructure Plan, it is important to understand the driving factors for the data analysis and intent of the recommendations. The City is currently a vibrant place full of opportunity for everyone. Having a plan in place provides clear direction for growth to the community, developers, and City staff alike. Clear direction for growth allows the City to maintain its vibrancy and position to support growth with ease. The prioritization of improvement projects will aid the Robins Economic

Development Initiative (REDI) when encouraging businesses to start in or move operations to the City of Robins and making recommendations to council for economic incentives.

In preparation, data was collected, studied, and analyzed to inventory and identify current and future infrastructure needs. Regional growth areas have been partitioned to develop a preliminary layout of major system components. Infrastructure improvement/expansion goals for service needs have been prioritized in short, intermediate, and long term bases. Magnitudes of estimated system improvement costs and possible funding sources have also been identified.

In accordance with the SFGO Infrastructure Inventory Scope of Services, improvement goals have taken the following into consideration:

The Strategic Future Growth Outline – 2018
Future Land Use Map (FLUM) – 2016
Marketing Demands
Developer Trends
Capital Improvement Plans
Current Agreements with the City of Cedar Rapids
West Side Water System Distribution System Evaluation – 2013
NW Quadrant Sanitary Sewer Collection System Evaluation – 2015
Zieser Property Watershed Management Plan – 2014
GIS Mapping Information & LiDAR
Existing and Future Service Areas
Existing System Evaluations
Downstream System Limitations

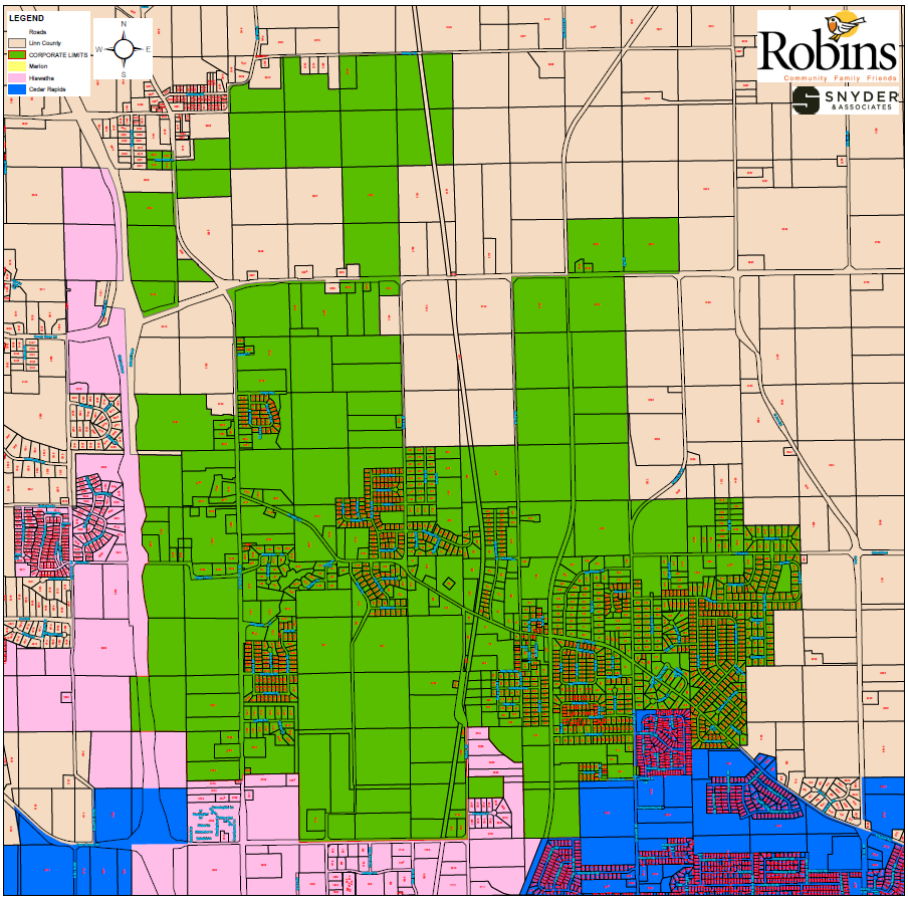

Figure 1: **Robins Map**

In general, the project boundary is situated in Sections 3-10, 15-22, 27-30, TWP 84 North, Range 7 West in Linn County, Iowa.

The information and recommendations presented in this report are based on visual observation, review of available data pertaining to the subject area, and interpretation of available public records. The opinions and recommendations presented herein apply to the subject property conditions at the time of Snyder & Associates, Inc. review.

WATER DISTRIBUTION SYSTEM

2. WATER DISTRIBUTION SYSTEM

2.1 Purpose and Scope

Water quality and supply within a community is critical, not only to the health of its citizens, but to the community's future outlook as well. With the development of this Comprehensive Infrastructure Plan, focus was placed on identifying regional growth areas. For each region, water demand projections were established based on the most applicable land use and standard Iowa DNR user densities. Projections have been identified in terms of user consumption and estimated fire protection needs.

Preliminary layouts for water mains, pressure zones, and other potential water source options were determined as necessary to serve each region. Improvement prioritization has been made utilizing available hydraulic information regarding hydraulic pressure and fire protection, as well as proximity to existing infrastructure, constructability, and development needs. Order of magnitude conceptual 2020 costs for major infrastructure improvements have also been developed for budget planning purposes.

2.2 Existing Conditions

Robins' water system is connected to the City of Cedar Rapids distribution system via three 16" mains located along South Mentzer Road, East Main Street, and East Knoll Drive. Each of these connections are served by the Boyson Road water tower. In 2003, the Main Street Booster Station was constructed to provide adequate system pressures to the highest points in Robins. This area includes the development along Stamy Road, the Irish Hills Subdivision, the Sandridge Subdivision, the Oaks Subdivision, and a large area of undeveloped land.

Currently the demand on the Main Street Booster Station occasionally exceeds the capacity of the pumps, which causes the bypass valve to open resulting in pressure losses on the suction side of the booster station. Because of this, the City of Cedar Rapids will not approve water main extensions for any further development which would be served by the booster station until the situation is resolved.

Usage

Robins and the City of Cedar Rapids have a 28E agreement that was implemented in 1998 and expires in 2024. According to the agreement, Cedar Rapids has limited Robins to a "total daily metered capacity on a 30 day average to be 1,050 gallons per incorporated acre per day and a total peak day metered capacity to be 2,000 gallons per incorporated acre per day". Robins' incorporated area is currently 3,662 acres, of that approximately 1,400 acres are developed.

Table 1: Metered Water Usage

	2015	2016	2017	2018	2019
Average Day (GPD)	187,640	194,143	214,758	206,312	191,684

Table 2: Existing Water Usage vs. Limitations

Existing Water Usage vs. Limitations			
	Area (Acres)	Average Daily Usage (Gallons)	Peak Daily Usage (Gallons)
28E Limits	3,662 (Incorporated)	3,845,100*	7,324,000*

**As limited by the 1998 "Water Service Contract between the City of Robins and the City of Cedar Rapids"*

2.3 Design Criteria

This document is meant to be used for planning purposes only. Changes in the future land use map area (FLUM), actual land use and design will determine the final alignments and sizes of the water mains. Results of our comprehensive analysis were built upon, but not limited to, the following information:

FLUM – 2016
West Side Water Distribution System Evaluation – 2013
Current agreements with the City of Cedar Rapids
Hydraulic calculations provided by the City of Cedar Rapids
Major existing infrastructure elements and service limitations

As the City of Robins water distribution system is connected to the City of Cedar Rapids system, water must be provided, treated, and maintained in accordance with current agreements and SUDAS supplemental specifications, as modified and adopted by the City of Cedar Rapids, are to be followed. As of January 2020, Cedar Rapids allows PVC water main pipe, 12" and smaller, for private developments and requires Ductile Iron Pipe (DIP) for Cedar Rapids Capital Improvement projects on water main sized 16" or larger. Robins shall follow Cedar Rapids guidance with the following exceptions;

- DIP shall be used for the main distribution network within the City, most of which are outlined in this report, regardless of size, or where required by Iowa DNR standards for Leaking Underground Storage Tanks (LUST) sites.
- PVC pipe will be allowed on all other projects, 12" or smaller, on any project within City limits
- PVC pipe will be allowed for trenchless installation on a project-by-project basis, as approved by Cedar Rapids Water Engineering Department

When expanding service area, or adding users to the water distribution system, the Recommended Standards for Water Works published by Great Lakes – Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers and SUDAS shall be followed.

A City of Robins Information Request for Cedar Rapids Water form shall be completed for every project and can be found as Exhibit 30 in Appendix A of this report. The form will be evaluated by the Cedar Rapids Water Engineering Department and will be returned to the applicant with hydraulic information for the proposed system improvements. In cases where the ISO or IFC fire flow requirements cannot be met, the developer, owner or builder of the structures shall be responsible for meeting those requirements on-site. A letter must be drafted for signature by the City of Robins Fire Chief and the developer, owner or builder acknowledging the deficiency. A copy of the signed letter shall be provided to the City of Cedar Rapids Water Engineering Department.

System design information that will be evaluated by the City of Cedar Rapids Water Engineering Department include the following:

System Pressures

- Minimum working pressure in the distribution system should be 45 psi
- Normal working pressure in the distribution system should be approximately 60-80 psi
- Static pressures that exceed 100 psi
    - Pressure reducing devices shall be installed on water mains in the distribution system or within a private building
    - Location of the device will be evaluated on a case by case basis

Fire Flow

- System shall maintain a minimum pressure of 20 psi under all conditions of flow (i.e. fire flow)
- Fire Flow requirements, as established by the Iowa Insurance Services Office (ISO), should be satisfied where fire protection is provided, as feasible.
- Fire Flow requirements, as established by the International Fire Code (IFC), shall be considered and applied where practical and feasible

Water Quality

- Minimum chlorine residual of 2.5 mg/L at the furthest connection

Other design conditions shall be evaluated on a project basis, but shall generally meet the following requirements:

Alignment

- Water mains shall typically be placed in public Right of Way (ROW)
- If an easement is required, it shall be a minimum of 20’ or 2 times the depth of the pipe, whichever is larger

Fire Hydrants

- Hydrants to be spaced no more than 500’ apart, and at critical locations
- A minimum of 5.5’ of cover on 8” and larger water main shall be provided
- Water Age
- Shall be limited to 3-5 days from the point of connection to the furthest user on the main
- Areas with a water age greater than 3-5 days shall provide a flushing plan, flushing device, meter and disposal plan.
- Owner/Developer requesting the extension will be required to cover the cost of flushing until it is deemed no longer necessary by the Cedar Rapids Water Engineering Department, which will be determined by chlorine residual tests.

2.4 Prioritization Factors

Prioritization factors were developed to assist with determining the sequence projects should be completed, and what impacts each improvement has. Each factor is independent from each other, and the more boxes checked does not necessarily equate to a higher priority. Cost was not taken into consideration when prioritizing projects. The committee that was arranged to review the Comprehensive Infrastructure Plan held several meetings to discuss water distribution projects, prioritization, development trends, and specific details of each water segment. The system recommendations identified in this report are the result of Engineering planning and judgement and committee review and concurrence.

Capacity

Capacity in the sense of the water distribution system in Robins relates to the Main Street Booster Station. If a project decreased the demand on the booster station, or increased the capacity of the booster station pump improvements it met the capacity prioritization factor.

Development Driven

Development Driven projects are those that provide service for a new development, typically when a developer requests service, or when the demand to an area of development exceeds what the current system can provide.

Fire Flow

Projects that meet the fire flow criteria are those that increase the amount of water available for fire protection. Each project will not necessarily provide the minimum amount of flow needed to meet building codes, but will be a step toward reaching that goal.

Infill

Infill projects are those that occur in developed areas that are currently served by individual or community well systems.

Limiting Potential Development
Projects that will remove development limitations with regards to capacity and flow meet this criteria. Projects include those that would be required to be completed in order for the City of Cedar Rapids to allow further development in an area.

Looping
Water main looping is a mechanism used to eliminate system dead ends which improves water quality, increases fire flows, and provides more than one location to obtain water.

Operational Efficiency
Projects that reduce the cost of operation and maintenance of the water system fall into this category. Specifically projects that reduce the demand on the booster station meet this criteria.

Proximity to Existing
New water main projects that are directly adjacent to existing facilities and end within a distance that allows growth, from the interior of Robins out, meet this criteria. Constructing the distribution system in this way reduces water quality issues that occur when long stretches of pipe are installed with minimal connections. It also allows for an incremental approach to expanding service and reduces the construction costs to manageable levels.

Redundancy
Redundancy ensures that if a pump goes down or a water main breaks, there is an alternate path to obtain water. This is similar to looping, but could also involve providing additional source connections for existing or proposed water systems, or other forms of system redundancy.

Stage in Planning
Projects that are currently under construction, have been requested by a developer, under design or within the 5 year Capital Improvement Plan (CIP) meet this criteria.

2.5 System Recommendations
Robins worked with the City of Cedar Rapids Water Engineering Department to perform a hydraulic analysis which determined the domestic and fire flow availabilities and pressures at critical points in the system.

Table 3: Water Distribution System Analysis Summary & Recommendations summarizes the improvements that have been identified, the recommended sequence of the improvements, what prioritization factors were met, the size of the proposed water main, and the Engineer's Opinion of Probable Cost (EOPC). Development within the City was assumed to continue in the NW quadrant, as it has most recently and in accordance with updated City Survey 2019. Changes in the location of development, Tower Terrace Road for example, may change the construction sequence of the projects and should be evaluated periodically. The detailed EOPC's can be found in Appendix A as Exhibits 1-29. They represent year 2020 construction estimates and are for budgetary purposes only. Costs should be inflated to the anticipated year of construction for future budgeting purposes. City of Cedar Rapids hydraulic analysis was used to gauge the impacts of each project.

Short Term Goals – 1-2 years
Intermediate Goals – 3-5 years
Long term Goals – 6-15 years
Ultimate Goals – 16+ years

Table 3: Water Distribution System Analysis Summary & Recommendations

WATER DISTRIBUTION SYSTEM - ANALYSIS & RECOMMENDATIONS SUMMARY

Segment ID #	Adjacent Roadway/Development	Prioritization Factors													Size	EOPC*	Original Segment ID** (Corresponds to Hydraulic Data Numbering)
		Capacity	Development Driven***	Fire Flow	Infill	Limiting Potential Development	Looping	Operational Efficiency	Pressure	Proximity to Existing	Redundancy	Stage in Planning					
Short Term Goals																	
1	N. Center Point Rd from Burd Lane to Midway Rd		X								X				12"	$565,000.00	2
2	D&M Addition				X		X			X		X			8"	$548,500.00	5
3	Quass Rd from D&M Addition to Kings Way (future)	X		X		X	X		X		X	X			12"	$457,000.00	6/9
4	Kings Way (future) from Cambridge Heights Addition to Quass Rd	X		X		X	X	X	X		X	X			12"	$680,000.00	4
5	Booster Station Improvements	X	X			X			X	X					-	$60,000.00	N/A
Intermediate Goals																	
6	Landau St				X		X		X	X		X			8"	$184,100.00	N/A
7	County Home Rd from Epic Event Center to C Ave Ext		X				X			X	X	X			16"	$455,500.00	3
8	County Home Rd from N. Center Point Rd to Quass Rd		X	X			X		X		X	X			16"	$764,000.00	7
9	Quass Rd from Kings Way (future) to County Home Rd		X	X			X			X	X				12"	$140,500.00	8
Long Term Goals																	
10	County Home Rd from Quass Rd to N. Troy Rd						X				X	X			16"	$488,500.00	9
11	County Home Rd from N. Troy Rd to Epic Event Center						X				X	X			16"	$483,800.00	10
12	N. Center Point Rd from Wild Rose Rd to W. Main St	X		X	X		X	X	X	X	X	X			16"	$758,800.00	1
13	N. Center Point Rd from Tower Terrace Rd to Chester Rd			X			X				X	X			16"	$509,800.00	11
14	Tower Terrace Rd from N. Center Point Rd to Robins Rd			X			X				X	X			16"	$886,200.00	12
15	E. Knoll Dr from N. Mentzer Rd to Vogt St			X	X		X			X	X				16"	$455,500.00	28
16	N. Mentzer Rd from E. Knoll Dr to County Home Rd										X	X			12"	$1,090,500.00	13
17	Stamy Rd (future) from Tower Terrace Rd to south of Morrison Dr		X				X				X				12"	$836,000.00	14
18	Tower Terrace Rd from Robins Rd to Council St NE			X			X				X	X			16"	$735,500.00	15
19	Robins Rd from Tower Terrace Rd to W. Main St				X						X				16"	$914,500.00	16
20	C Ave Ext from E. Knoll Dr to County Home Rd (upsize)	X		X											16"	$1,326,300.00	17
Ultimate Buildout																	
21	N Center Point Rd from County Home Rd to Segment 1		X	X					X						12"	$310,500.00	N/A
22	N. Troy Rd from E. Main St to County Home Rd		X							X					16"	$1,429,000.00	18
23	N. Troy Rd (future) from County Home Rd to Midway Rd		X												16"	$1,008,700.00	19
24	C Ave Ext (future) from County Home Rd to Midway Rd		X												16"	$955,800.00	20
25	Quass Rd (future) from County Home Rd to Midway Rd		X												12"	$966,200.00	21
26	Flynn's First Addition				X		X			X	X				8"	$568,100.00	25
27	Singer Hill Ln from N. Center Point Rd to I-380				X					X					8"	$305,600.00	26
28	Briarwood Ln from E. Knoll Dr to Maple St				X		X			X	X				8"	$163,800.00	27
29	Vogt St from E. Knoll Dr to north end				X					X					8"	$211,400.00	29

** Costs do not include inflation rates are based on current estimated project costs at the time of the SFGO report preparation in 2020. Costs should be inflated to construction-year amounts at the time of project and CIP budgeting.*

*** Additional information and corresponding map can be found in Appendix A as Exhibit 32 - 2019 Modeling Scenarios*

**** Depending on the development use and design, the City may be responsible for some pipe material upsizing costs*

MIDWAY ROAD
CEDAR VALLEY NATURE TRAIL
CENTER POINT ROAD
C AVENUE
COUNTY HOME ROAD
P 720 GPM
F 1,166 GPM
A 1,166 GPM
DRY CREEK
NORTH MENTZER ROAD
1,166 GPM H
1,166 GPM G
I-380
NORTH TROY ROAD
1,167 GPM I
2,000 GPM R
S 2,000 GPM
2,000 GPM T
U 2,000 GPM
1,362 GPM AD
2,000 GPM V
2,000 GPM W
C AVENUE
1,496 GPM AB
SOUTH TROY ROAD
SOUTH MENTZER ROAD
EAST MAIN STREET
1,497 GPM E
CENTER POINT ROAD
AA 2,000 GPM
TOWER TERRACE ROAD
ROBINS ROAD

LEGEND
EXIST. WATER MAIN
BOOSTED PRESSURE ZONE
BOOSTER STATION
PRESSURE REDUCING VALVE
HYDRAULIC ANALYSIS POINT

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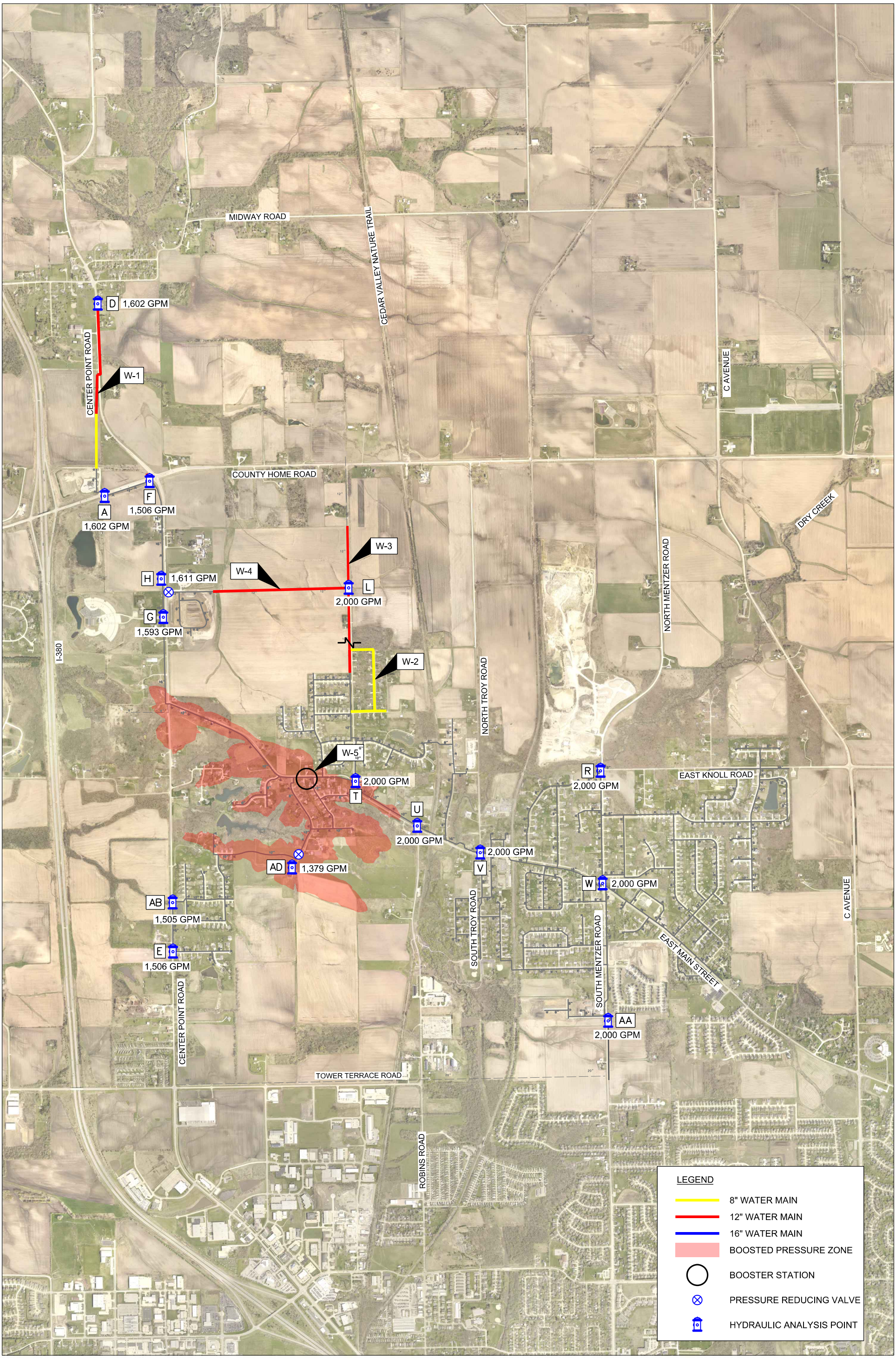
Existing Water System

SFGO Infrastructure Inventory | Figure 2 | Robins, Iowa | 03/24/2020



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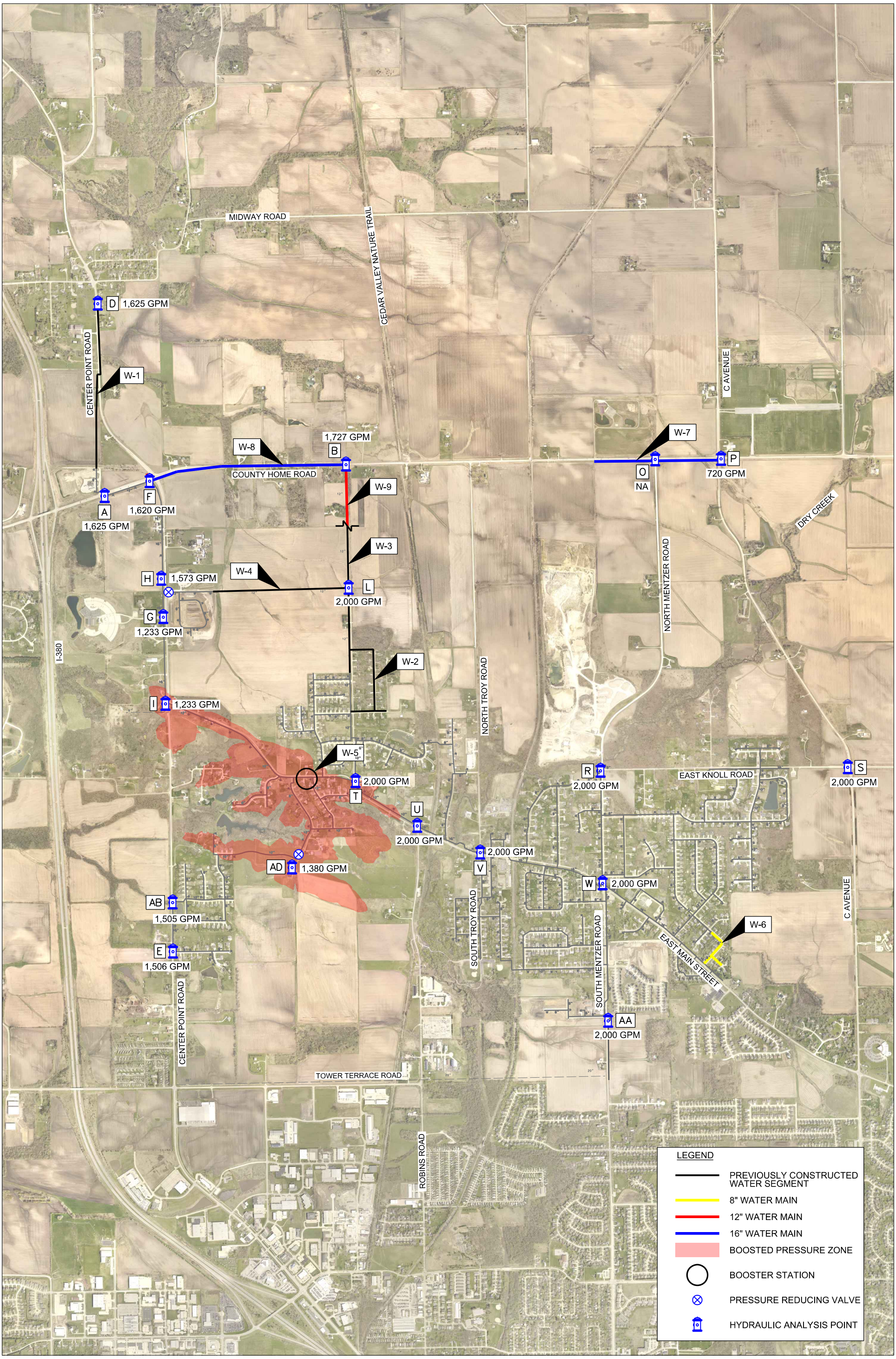
Water System Expansion - Short Term

SFGO Infrastructure Inventory | Figure 3 | Robins, Iowa | 07/21/2020



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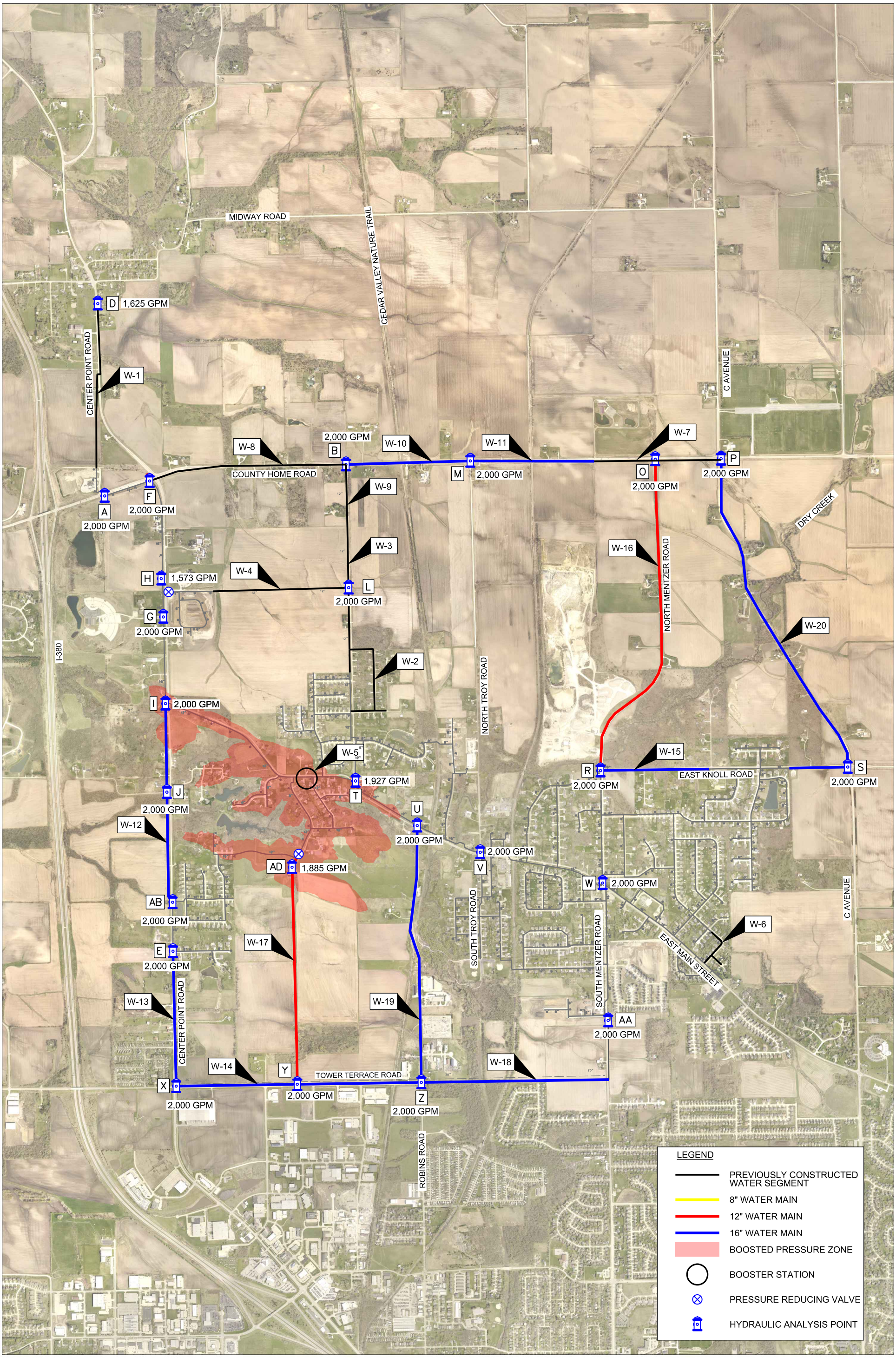
Water System Expansion - Intermediate

SFGO Infrastructure Inventory | Figure 4 | Robins, Iowa | 07/21/2020



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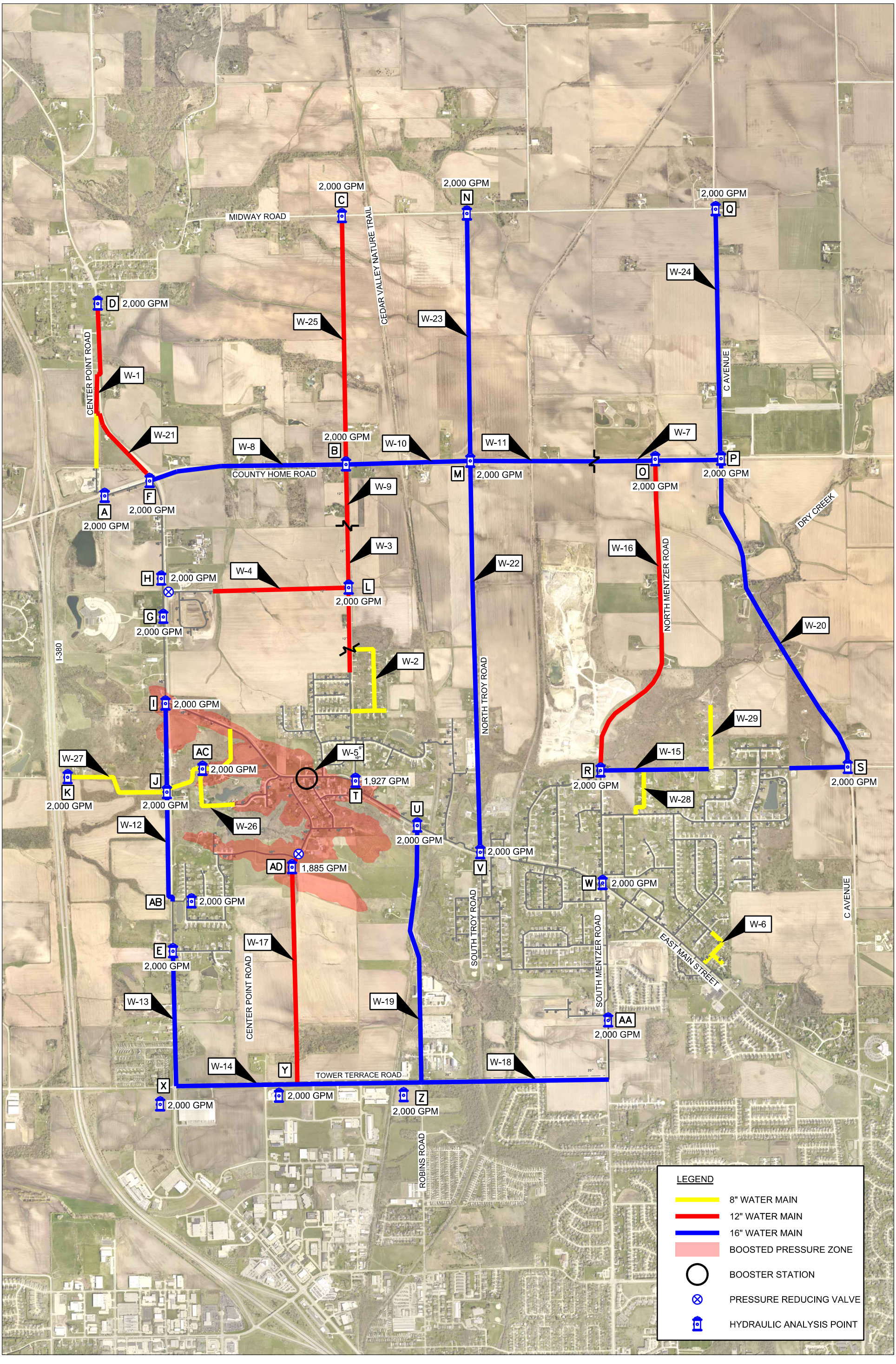
Water System Expansion - Long Term

SFGO Infrastructure Inventory | Figure 5 | Robins, Iowa | 07/21/2020



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Water System Expansion - Ultimate Buildout

SFGO Infrastructure Inventory | Figure 6 | Robins, Iowa | 03/24/2020

2.6 Financial Review

The following is a brief overview of potential funding sources for capital projects like infrastructure improvements. Municipal financing is typically broken into two general types, traditional and non-traditional. The City may want to consider adding a surcharge to the water rates to facilitate the construction of the distribution system improvements in lieu of relying on G.O. Bonds and LOST revenue as has been done in the past. This would allow the City to separate water costs from other improvement projects as well as facilitate budget projections.

Revenue

Fees to local residents and businesses play a critical role in local infrastructure financing. Utility fees can be used as the dedicated revenue source to secure revenue bond financing. Local governments can gain revenue by enforcing fees for things like system changes due to repairs, system expansion for new development, connection for service, and through cyclical billing for system usage.

Water Service Connection Fees

The City of Robins currently charges per connection based on zoning type where a connection is being made in conjunction with a building permit being issued. The fee may be affected by several factors, for example, the type of connection and why it is being made.

Table 4: Water Service Connection Fees

ZONING TYPE	FEE AMOUNT	COMMENTS	CODE SECTION
Agricultural	$750/lot	Offsets Fire Protection & Infrastructure Cost	Chapter 90.06 Ord. No. 1906 7/1/2019
Residential	$1,000/lot		
Non-Residential	$2,000/lot		

Improvement Utilization Fees

The water connection fees based on infrastructure improvements billed to districts benefitting from the improvement can offset improvement expenses. If an improvement did not benefit an individual district currently or at any time in the future, that district would not participate in the payback for that improvement.

Flat Rate Fees

A flat rate calculation based on an entire infrastructure improvement area and dividing that into the total estimated infrastructure costs is another option to offset infrastructure expenses. In this rate structure every entity serviced would pay for a portion of every water main improvement constructed within the service area.

Consumer Usage Fees

Although revenue associated with water usage is limited due to water being supplied to consumers according to the City's Water Service Contract with the City of Cedar Rapids, it is still an option. Pricing structures based on consumer usage can be designed to encourage water conservation. Common pricing structures include increasing block rates related to water usage, time of day pricing, water surcharges for excessive use, and seasonal rates.

Municipal Securities (or Bonds)

Bond financing is a pay-as-you-use debt obligation issued by local and state governments to help finance capital expenditures. Broadly speaking, municipal bonds are sold to investors with periodic interest payment and specified principal repayment obligations. They are often an attractive option to income-oriented investors looking to reduce income tax bills because they are typically exempt from state and federal income taxes. There are multiple types such as:

- General Obligation Bonds
- Revenue Bonds
- Private Activities Bonds
- Leasing-Revenue Bonds

Historically speaking, general obligation bonds were perceived to be a more secure investment choice for investors than revenue bonds while yielded greater returns. This however hasn't been the trend in recent years.

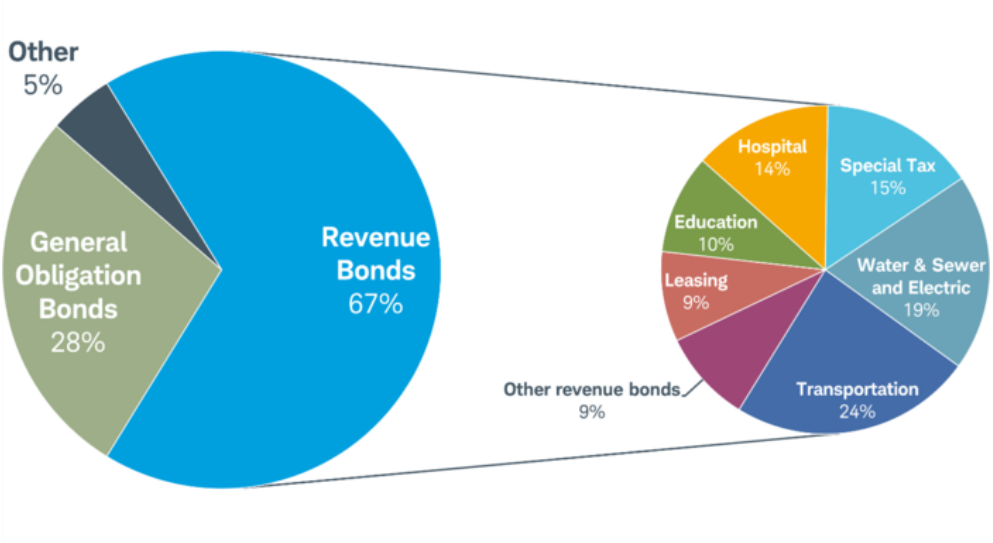


Figure 7: Bloomberg Barclays Municipal Bond Index

Source: Bloomberg Barclays Municipal Bond Index, as of 9/4/2019. "Other" includes the insured and pre-refunded indexes. "Other revenue bonds" include the industry development revenue (IDR)/pollution control revenue (PCR), housing, and resource recovery indexes.

General Obligation Bonds

General obligation (GO) bonds are backed by the general revenue of the issuing municipality and make up approximately one quarter of all municipal bonds. GO bonds issued by state or local government can be backed by different types of pledges with the most common types being:

- GOs backed by unlimited taxing authority and a dedicated tax pledge
- GOs backed by unlimited taxing authority and with no dedicated tax pledge
- GOs backed by limited taxing authority

Revenue Bonds

Revenue bonds are supported by a specific revenue source, such as a toll road, hospital, or higher-education system. There are numerous categories of revenue bonds that are usually issued by net or gross revenue pledges. For purposes of the Water Distribution System section of this Comprehensive Infrastructure Plan we will introduce the following:

- Water and Sewer Utility Bonds
- Special Tax Revenue Bonds
- Lease Revenue Bonds

Revenue Bonds may be issued in anticipation of income generated from water service charges in accordance with rates established by ordinance. Revenue bonds are entirely self-liquidating with debt service payable from system revenues. Revenue bonds incur no general tax liability or obligation. Revenues must be sufficient to pay the cost of operation and maintenance plus debt service. The financial soundness of the utility is the governing factor in determining marketability of revenue bonds.

To make water revenue bonds marketable, the net operating revenue after deduction of operating expenses should be a minimum of 130% of the annual principal and interest payment. In addition, it is generally necessary under current market conditions to capitalize a reserve fund with an amount equal to the largest single year's principal and interest payment. This capitalized reserve fund is security to the bondholders in the event of a potential default. The surplus that accrues from the coverage for revenue bonds can be used for capital improvements. Revenue bonds can be issued without voter approval. Revenue bonds may be issued for any reasonable period. In today's market, revenue bonds are generally most marketable with a period of between 10 and 20 years.

Taxation

Tax revenue is the most commonly used source for local infrastructure financing including sales, property, and sometimes income or wage taxes.

TIF

Tax Incremental Financing (TIF) is a financing method used to promote economic development and redevelopment. It enables local governments to undertake improvement projects or offer subsidies to sponsor economic development by capturing future incremental revenue. TIF is one of the most popular economic development tools used by local governments and can be used for a variety of purposes such as utility infrastructure improvements, streetscape upgrades, and creation of parks and greenways. Property taxes are the most common financing source for TIF. Local governments may also create an ordinance to establish a TIF district using sales or utility taxes as the source.

Federal and State Grants

United States Environmental Protection Agency (EPA)

https://www.epa.gov/waterfinancecenter

Water Finance Clearinghouse

The US EPA's Water Infrastructure Finance and Resiliency Center developed the Water Finance Clearinghouse as an information and assistance center identifying water infrastructure financing approaches that help communities reach their public health and environmental goals. This web-based portal assists municipalities in making informed decisions for drinking water, wastewater, and stormwater infrastructure needs. This database offers financial assistance sources available to fund a variety of watershed protection projects.

https://www.epa.gov/waterdata/water-finance-clearinghouse

Water Infrastructure Financial Leadership Guide

https://www.epa.gov/sites/production/files/2017-09/documents/financial_leadership_practices_document_final_draft_9-25-17_0.pdf

Table 5: Funding and Financing Sources

EXAMPLES OF NATIONAL/STATE FUNDING & FINANCING SOURCES							
Agency	Program	Drinking Water	Wastewater	Stormwater	Grants	Loans	Low Income Community Focus
EDA	EAA	✓	✓	✓	✓	✓	✓
EDA	Public Works	✓	✓	✓	✓	✓	✓
EPA	WIFIA	✓	✓	✓		✓	
FEMA	Disaster Mitigation Funding	✓	✓	✓	✓		
HUD	CDBG	✓	✓	✓	✓	✓	✓
States/EPA	DWSRF	✓	✓	✓		✓	
States/EPA	CWSRF					✓	
USACE	State planning assistance	✓	✓	✓	✓		
USDA	RBDG	✓	✓	✓	✓		✓
USDA (RUS)	WEP	✓	✓	✓	✓	✓	✓

Acronyms:
CDBG: Community Development Block Grant
CWSRF: Clean Water State Revolving Fund
DWSRF: Drinking Water State Revolving Fund
EAA: Economic Adjustment Assistance
EDA: Economic Development Association
EPA: United States Environmental Protection Agency
FEMA: Federal Emergency Management Agency
HUD: United States Department of Housing and Urban Development
RBDG: Rural Business Development Grants
RUS: Rural Utilities Service
USDA: United States Department of Agriculture
WIFIA: Water Infrastructure Finance and Innovation Act

Source: EPA Water Infrastructure Financial Leadership: Successful Financial Tools for Local Decision Makers

SRF

State Revolving Funds (SRF) have been developed and implemented by the Iowa Department of Natural Resources (IDNR) to offer municipality's financial assistance for a wide range of water infrastructure projects. Through a powerful partnership with the state, the program is partially funded by the US Environmental Protection Agency (EPA) Clean Water State Revolving Fund (CWSRF) and Drinking Water State Revolving Fund (DWSRF). This Iowa DNR program is managed by the Iowa Finance Authority.

The Drinking Water SRF funds water treatment plants or improvements to existing facilities, water line extensions to existing unserved properties, water storage facilities, and wells. Public and private community water systems, whether they are for profit or not for profit, non-transient non-community public water supplies if they are either publicly owned or are not for profit, and transient non-community systems if they are owned by government entities are eligible.

Iowa's SRF program offers multiple types of loans:

Construction Loans

- Loans are 1.75% for up to 20 years
- Origination fee is 0.5%
- Servicing fee is 0.25%
- Extended financing up to 30 year is available for some loans

Planning & Design Loans

- Loans are zero percent for up to three years
- No initiation or servicing fees
- No minimum or maximum loan amount
- Loans may be rolled into an SRF Construction Loan or repaid when permanent financing is obtained

Nonpoint Source Loans

- Qualified projects include:
- Construction of treatment plants or improvements to existing facilities
- Water line extensions to existing unserved properties
- Water storage facilities
- Wells
- Low interest loans for public and private borrowers

For additional information regarding SRF financing:
http://www.iowasrf.com/about_srf/srf-resources/

Water & Waste Disposal Loan & Grant Program

US Department of Agriculture's Water & Waste Disposal Loan & Grant program provides long-term, low interest funding that is sometimes combined with grant funds for clean and reliable drinking water systems, sanitary sewage disposal, sanitary solid waste disposal, and storm water drainage to households and businesses in eligible rural areas and towns with populations of 10,000 or less.

For additional information:
https://www.rd.usda.gov/sites/default/files/fact-sheet/508_RD__FS_RUS_WEPDirect.pdf
https://www.rd.usda.gov/programs-services/water-waste-disposal-loan-grant-program

Wastewater and Drinking Water Treatment Financial Assistance Fund

This funding option is a new program that was created by the Iowa Water Quality Bill SF512. Grants will be awarded annually and used for improvements to wastewater and drinking water treatment facilities, including source water protection projects. The maximum grant award is $500,000. Priority is to be given to disadvantaged communities, projects that will significantly improve water quality in their watershed, projects that use alternative wastewater treatment technologies (all projects proposing alternative technologies must be approved by DNR), communities with the highest sewer or water rates, projects that use technology to address nutrient reduction, and projects that will improve source waters for drinking water utilities.

Water Quality Financing Program

This new revolving loan fund will provide financial assistance to projects that improve water quality with a higher prioritization to collaborative efforts.

STORMWATER MANAGEMENT

3. STORMWATER MANAGEMENT

3.1 Purpose and Scope

The City of Robins currently has many smaller detention basins designed to accommodate stormwater driven by individual developments. While these kinds of basins serve their purpose – larger, regional basins perform better overall, require less maintenance, and reduce public concern. Often times they can be double as community recreation areas, improving quality of life and encouraging healthy lifestyles.

This report identifies existing detention basins and ownership, as well as, potential areas for future regional detention or retention basins and development of the conveyance corridors.

3.2 Existing Conditions

The City currently requires Developers to design detention basins in accordance with SUDAS and the Iowa Stormwater Management Manual and require the Developer or a Homeowners Association to manage and maintain each basin. The result is the construction of individual basins for every subdivision, regardless of the size, and which have to be monitored by the City to ensure maintenance is being performed as required. A detention basin withholds water for a short duration and is generally considered a dry bottom basin, whereas a retention basin will always have a minimum, wet bottom water level. Dry bottom basins are the preference of the City, but wet bottom basins have been allowed on individual basis. Retention basins require additional maintenance to avoid becoming stagnant and a nuisance to the community.

Detention/Retention Basin Inventory

Currently the City of Robins has 21 individual basins, 14 private and 7 City owned and maintained. The Stormwater Management Map provides visual detail of the existing basins.

Identified Areas of Concern

Although most of the basins operate sufficiently, and are of little concern to the City, there have been occasions where residents and City staff have expressed the desire for improvements. Frequently the issues stem from the fact the HOA's do not maintain them properly, or don't understand it is their responsibility as outlined in the Restrictive Covenants provided by the Developer. This can cause additional issues, as the Restrictive Covenants are not regulated by the City, nor can the City enforce them. Recently this concern has been addressed by Developer's Agreement setting terms of maintenance responsibilities and Stormwater Management Agreement to further establish enforcement of detention basin maintenance.

Additionally, the drainage way identified as South Drainageway is an area of concern and should be addressed through a drainage study which can determine the improvements needed to minimize flooding risks to the adjacent property owners. This can be done in conjunction with identified sanitary sewer improvements in the area to minimize the disruption to the residents.

As other areas of concern arise, the City should address them individually.

3.3 Design Criteria

The stormwater management portion of this Comprehensive Infrastructure Plan was designed with the following goals in mind:

- Construct regional retention basins in lieu of requiring individual detention basins by developers, where feasible.
- Build sedimentation forebays upstream of the regional basins and downstream of undeveloped ground for water quality and quantity benefits.
- Reserve the future conditions 100 year floodplain within a drainage easement to convey stormwater to the regional retention basin within public property.
- Once the 100 year floodplain has been reserved, ensure that design standards from the Iowa Stormwater Management Manual (ISMM) for channel flow are used. This will ensure flow capacity of the channel will convey the 100 year peak flow while keeping velocities low enough at all recurrence interval storms to prevent erosive conditions in the channel.
- Require MPEs of one-foot above the 100 year elevation along the basin and conveyance corridors as well as 10 ft. to 20 ft. buffer strips to ensure separation distances from the operational section of the conveyance corridor.

Typical Corridor Section

Natural Conveyance Corridors shall be utilized whenever and wherever possible. Engineered and Hybrid designs will be considered on a case by case basis in areas where the terrain or amount of water flow may prohibit establishment of a Natural Conveyance Corridor. Conveyance corridor designs shall include Minimum Protection Elevations (MPEs) of at least one-foot above the 100 year water surface elevation near any water body or conveyance corridor. Conveyance corridor section shall generally follow the existing terrain. An example conveyance corridor cross section can be seen in Figure 8: Example Corridor Cross Section.

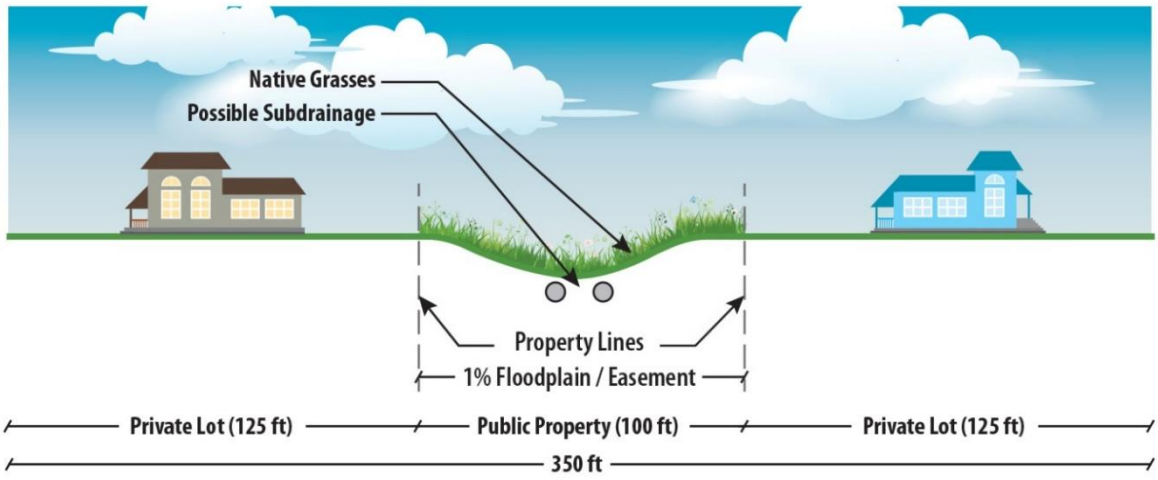


Figure 8: Example Corridor Cross Section

Conveyance Corridors

The City will require all developments to reserve the 100-year floodplain, at full build-out conditions, to convey the 100-year storm flow to the proposed regional retention basins within publicly owned property or easement. Establishing conveyance corridors owned by the City will provide reduced flooding concerns and reduced risk of future property damage. The City will be able to maintain the conveyance corridor as intended in perpetuity which should also reduce resident complaints and ownership disputes. Conversely, traditional grading with large storm sewer infrastructure proves to be very expensive to build and maintain over time and is accompanied by overflow flooding concerns that increase the risk for future property damage.

Designs of conveyance corridors take on many shapes and aspects depending on the desires of the developer, end user, and/or the City.

Natural Conveyance Corridor

An example of a Natural Conveyance Corridor can be found in Figure 9: Natural Conveyance Corridor Stream Design Example. This type of design can serve as an amenity to the neighborhood/community it travels within. Planting native grasses gives greater erosion protection than turf grass, due to the deeper root system, and provide an opportunity for less maintenance in the long term. Native grasses can require more effort and cost for establishment of vegetation. Turf grasses can be planted for a more manicured look by mowing the conveyance corridor on a regular schedule. Turf grass is typically easier and less costly to establish, but with a higher maintenance cost long term.

Figure 9: Natural Conveyance Corridor Stream Design Example

Engineered Conveyance Corridors

Engineered stream design can be useful when visual aesthetics are less important than function and cost. This type of design employs hard armoring with rip-rap to reduce erosion concerns. An example can be seen in Figure 10: Engineered Stream Design Example. These designs also include less vegetation than natural designs and may not be seen as an amenity. Although hard armoring can provide less long term maintenance cost, it can be more expensive to construct.

Figure 10: Engineered Stream Design Example

Hybrid Conveyance Corridors

A hybrid approach to the two methods can also be used. An example of this can be seen in Figure 11: Turf Reinforcement Mat after Installation and Post Vegetation Establishment. This figure of images show Turf Reinforcement Mat (TRM) immediately after installation and after vegetation has had time to establish. TRM is used when a more natural manicured look is wanted, but there is a desire to increase the erosion protection. The TRM itself can be an interconnected textile mat or a robust plastic mat with perforations where vegetation can establish. Sub-drain installation is also common to mitigate extended wet periods in the channel during low flow conditions. These products can serve as a hybrid to both design approach and cost considerations.

Figure 11: **Turf Reinforcement Mat after Installation and Post Vegetation Establishment**

Sediment Forebays

Sedimentation forebay construction is recommended at entry points to regional retention basins. These man-made pools of water constructed as a preliminary catch basin will significantly reduce the sediment entering the main retention basin, particularly during any upstream construction of developments. They prolong the time frame between construction and the need for dredging and ensure ecological quality in and around the retention basin is preserved while construction activities occur and for a period of time after. Forebays should be inspected frequently and cleared of built up sediment to ensure optimal performance, especially during construction. An example of a constructed forebay can be found in Figure 12: Sedimentation Forebay.

Figure 12: Sedimentation Forebay

Interim Sediment Forebays

Land development is expected to grow from the bottom of the hill to the top, as that is usually where sanitary sewer exists. Row crop agriculture is the dominant land use in the undeveloped watersheds in the City of Robins and is anticipated to stay in production until the development concludes. As the agricultural land will be upstream from any storm water facility (basin or conveyance corridor) there is the increased opportunity for substantial sediment loading through the conveyance corridors and eventually to the regional retention basins downstream. Interim sediment forebays shall be constructed to minimize the migration of silt into the conveyance corridors.

Temporary Sediment Forebays

Similar to Interim Sediment Forebays, temporary sediment forebays and/or check dams upstream of developments as they are constructed shall be required to mitigate downstream water quality concerns. This practice will perform similar to the sedimentation forebays at the entry points of the regional detention basins by slowing the channel flow. This will allow for portions of the sediment to remain upstream. Additionally, any sediment that has accumulated behind any check dams should be required to be cleared by the developer to ensure it doesn't travel downstream after the check dam has been removed. The actual practice(s) implemented to trap sediment will be dependent on site conditions. An example of a check dam can be seen in Figure 13: Rock Check Dams/Structures. Temporary sediment forebays may be eliminated or converted to interim sediment forebays as necessary to maintain optimal performance of the conveyance corridors.

Figure 13: **Rock Check Dams/Structures**

3.4 Stormwater Recommendations

Although the current basins function satisfactorily, it is the City's desire to implement regional basins, where possible, and eliminate existing basins if feasible. Although the City's preference is for regional basins, there will still be a need for private detention basins to be constructed for smaller developments. Regional basins will provide the City and its residents with more benefits than continuing to construct individual basins. Such benefits include:

- *Easier Maintenance* – It will allow the City to enjoy increased maintenance efficiency due to the consolidation of many basins into one large basin.
- *More Effective Management* – It would provide more efficient management for water quantity and sedimentation. Larger basins have proven to be more effective in practice for managing flood waters. The forebays allow convenient access with the proper equipment to remove sediment when needed.
- *Recreation* – It would provide the community with considerably more recreational opportunities.

Table 6: Detention Basin Storage Volume Need

DETENTION BASIN	DRAINAGE AREA **(Acre)**	ESTIMATED **100-Year** STORAGE VOLUME **(Acre-Feet)**	ESTIMATED **100-Year** POOL AREA **(Acre)**
North Basin (From 2015 Report)	461	89	16
West Basin	627	137	28
South Basin	154	40	11
East Basin	934*	128**	25**

**Drainage area truncated at C Avenue. Actual drainage area extends to the northeast towards Central City.*
***Drainage Basin landlocked based on current city limits.*

The conceptual detention basins shown in the Stormwater Management Map as found in Appendix B as Exhibit 1 were developed using multiple methods. The estimated storage volume and 100-year pool area for the north basin were obtained from a hydraulic model developed for a 2015 report developed by Snyder & Associates for a Watershed Management Plan. The west and south basins were preliminarily sized using TR-55 methodology and fit onto the existing site contours using GIS. The east basin was fit onto the existing site as best as possible using GIS due to site constraints produced by Mentzer Road and the current Robins corporate limits. Preliminary calculations were not performed for this site as the actual watershed area is extremely extensive and the storage volume needed to attenuate the 100-year storm is too large to practically contain within this site.

South Drainageway Considerations

- Aesthetic elements, beautification, and enhancements
  - Neighborhood theming
  - Quality of Life
  - Additional Cost
  - Potential Flood Concerns
- Areas of erosion concerns
  - Armoring methods
  - Materials
- Assessment of risk
  - Is there an actual flooding problem, or only a perception of risk?
  - Determine actual return period of an event that could cause damages
  - Actual or projected damages to property
  - Compare costs for a drainage study, construction project, on-going maintenance, and new liability
- Possible Solutions
  - Complete a stormwater drainage study of the area of concern
  - Drainageway maintenance and improvements
  - Conveyance structure improvements
  - Overflow improvements
  - Additional upstream detention

The City needs to develop an action plan to address the following items:

- Create an Ordinance or Policy for enforcement, which would define areas for special design criteria
- Determine the responsibility for design
- Determine the responsibility for construction
- Determine the responsibility for cost
- Ownership
- Maintenance
- Conditions for a regional basin vs. individual basins
- Construction sequence
- Master plan for stormwater with property owners
- Buffer requirements
- Conveyance channel materials, native, turf, armored

3.5 Financial Review

There are several methods the City can use to recoup some or all of the design and construction costs from the end users of the regional retention basin. However, regardless of the revenue methods used, there is a need for the City to invest in the design and construction of the regional basins up front for ease of compliance and enforcement when managing the stormwater within the watershed. The City can then set fees based on actual costs rather than a planning level cost opinion.

Below you will find discussion on three revenue options; a development impact fee, a building permit fee, and implementing a stormwater utility. These revenue options would spread out the financial responsibility to multiple participants rather than placing it solely on the Developer.

Development Impact Fee

This option would place some of the financial responsibility on subdivision developers and encourage green development practices. This impact fee would be collected at the time of final platting and be based on total area (acres) included within the proposed development. Different rates could be applied based on percentage of impervious area or specific land uses. The City would collect this fee before a final plat would be approved. For properties not required to plat before developing, these fees would be collected in conjunction with site plan approval.

Building Permit Stormwater Connection Fee

This option would place some of the financial responsibility on the actual builder of the dwelling and/or structure. This fee should be based on lot size (per acre rate). This will ensure the revenue from this funding option remains stable. If the fee were to be on a per lot basis the final revenue may be wholly different than the preliminary projection. The size and overall number of lots can vary from preliminary development plans and what is actually platted and constructed at the end of the process. This fee could also be modified based on impervious area, but would primarily be based on area within a given lot.

There are two mechanisms that could be used to collect this fee. First, the fee could be a standalone permit application that would need to be filed before a building could be constructed within the watershed specified in this report. Alternatively, this fee could be added as an additional stipulation to the current Building Permit application form as a “YES/NO” option. The “YES/NO” option would be whether or not all or part of the proposed lot falls within the specified watershed. If yes, then the applicant would need to remit an additional stormwater connection fee based on the area that falls within the watershed before construction could commence.

Stormwater Utility

A stormwater utility can be used to fund two distinct portions of the proposed management plan. First, it can recoup the cost of design and construction of the regional retention basin. Second, it can also fund the ongoing long-term maintenance of the public conveyance and storm sewer system, the maintenance for the regional retention basin, and maintenance for the proposed sedimentation forebays.

Below is discussion on two alternate ways to approach implementing a stormwater utility. The first allocates monthly fees to all developed lots within the watershed. The second allocates a monthly fee to all developed lots within the City.

Watershed Stormwater Utility

This option would place some of the financial burden on the property owners within the specified watershed. A stormwater utility assessed within the watershed would be a monthly utility fee collected from each developed lot. Most often, different rates are to be remitted based on a particular land use and/or the amount of impervious area that is present within a given lot. For a residential lot in a city comparable with the City of Robins, the rate is typically based on a flat rate per month for each lot. For commercial/industrial/multi-family lots, it can be based on the amount of impervious area within the lot using an Equivalent Residential Unit (ERU) calculation. Alternatively, a higher standard rate can be used for commercial/industrial/multi-family lots. ERUs and using imperviousness to set particular rates is further discussed below.

Citywide Stormwater Utility

This option would place some of the financial burden on all of the property owners within the City. The proposed regional retention basins are not only going to serve their utilitarian purpose, but they will also be an amenity for the entire City and its residents and businesses. The proposed retention basins may include recreational elements with the design and construction. These elements will provide incentive for the basins to be enjoyed by local citizens that reside or do business outside of the specified watershed. In addition, it may also attract individuals that do not currently reside or do business within the City.

If this option is implemented, it would not be implemented in addition to a watershed only utility, but as a standalone utility. The City would then determine if a flat rate per lot would be used or if impervious area would be used as a basis for setting a rate for each individual lot, citywide. If imperviousness was chosen to set rates, an ERU would then need to be calculated.

An ERU is typically set by determining the average amount of imperviousness within a residential lot inside the City. Once an ERU has been calculated, a base rate per ERU is determined. All lot rates would then be set based on this base rate and the amount of impervious area within each lot. The final step would be to determine whether or not the City desires to use a land use factor to increase fees for high imperviousness land uses. Examples of how some rates would be calculated can be found in Tables 6 and 7 below. The example in Table 6 with varied rates assumes an ERU equals 4,000 sq. ft. of impervious area. This was determined by measuring a small cross section of lots within the City. The rate per ERU in Table 7 and the rates per lot were used for these examples after a review of rates for cities of similar size when compared to the City of Robins.

Table 7: Example Stormwater Utility Rates Using ERU Calculation

LAND USE	TOTAL IMPERVIOUS AREA (sq ft)	PARCEL ERU	RATE per ERU	LAND USE FACTOR	TOTAL MONTHLY Stormwater Fee
Residential A	3,500	0.88	$2.00	1.00	$1.75
Residential B	4,000	1.00	$2.00	1.00	$2.00
Residential C	5,500	1.38	$2.00	1.00	$2.75
Big Box Commercial	550,000	137.5	$2.00	1.50	$412.50
Small Commercial	70,000	17.50	$2.00	1.50	$52.50
Multi-Family	40,000	10.00	$2.00	1.50	$30.00

Table 8: Example Stormwater Utility Rates Using Flat Rates

LAND USE	TOTAL IMPERVIOUS AREA (sq ft)		RATE per LOT		TOTAL MONTHLY Stormwater Fee
Residential A	3,500		$2.00		$2.00
Residential B	4,000		$2.00		$2.00
Residential C	5,500		$2.00		$2.00
Big Box Commercial	550,000		$35.00		$35.00
Small Commercial	70,000		$35.00		$35.00
Multi-Family	40,000		$35.00		$35.00

HMGP

FEMA's Hazard Mitigation Grant Program (HMGP) connects individuals and state, local, or tribal government representatives with the resources they need to implement hazard mitigation measures in their communities. FEMA's vision is to serve as a catalyst to increase understanding and proactive action to help people in communities reduce their losses from natural hazards. Studies have shown that every $1 spent equals $4 of future damages mitigated.

United States Environmental Protection Agency (EPA)
https://www.epa.gov/waterfinancecenter

Water Finance Clearinghouse

The US EPA's Water Infrastructure Finance and Resiliency Center developed the Water Finance Clearinghouse as an information and assistance center identifying water infrastructure financing approaches that help communities reach their public health and environmental goals. This web-based portal assists in making informed decisions for drinking water, wastewater, and stormwater infrastructure needs. This database offers financial assistance sources available to fund a variety of watershed protection projects.
https://www.epa.gov/waterdata/water-finance-clearinghouse

SRF

The Iowa SRF provides low-cost loans for projects to address stormwater quality. Loans are provided to both public and private entities. Projects must have a water quality benefit, that is, the project must be designed to keep pollutants out of waterways.

The link below is a PowerPoint presentation, Iowa's SRF: Options for Financing Green Infrastructure, with funding options and project examples.
http://www.iowasrf.com/media/cms/Website_GI_201625_CAB11031FC913.pdf

WASTEWATER COLLECTION SYSTEM

4. WASTEWATER COLLECTION SYSTEM

4.1 Purpose and Scope

Results of our comprehensive analysis include regional growth areas – Sewershed Regions – that identify larger areas currently serviced or to be serviced in the future by the Wastewater Collection System. They are each made up of multiple smaller, sub-regions. These areas have been analyzed according to current zoning districts, projected future zoning districts as reflected in the Future Land Use Map (FLUM), and broken down further by an estimated timeframe for buildout of the land. Calculations for developed or developable area within each region and their respective sub-regions were completed. Projected flow rates according to Iowa DNR standards where then determined per each sewershed region and then detailed per each individual wastewater collection system improvement segment.

Preliminary layouts for major infrastructure elements, gravity mains, force mains, and lift stations were determined as necessary to serve each region. These elements are the skeletal elements necessary for each region and do not include all collection system elements to provide service to individual parcels within the respective region. Zoning deviations from the future land use map could potentially change sizing and system recommendations. Changes in the land use, FLUM area and actual topographic survey and developer design will determine the final alignments, sizes and slopes of the sanitary sewer mains.

Cursory hydraulic calculations to determine sizes of major infrastructure elements and existing service capability limitations were performed in conjunction with the preliminary layouts. Additionally, downstream sanitary sewer infrastructure capacities were checked for overloading. Infrastructure layouts are based on wastewater conveyance to and through the existing Indian & Dry Run Creek Sanitary Sewer systems.

Improvement prioritization has been made utilizing capacity adequacy, proximity to existing infrastructure, constructability, conceptual estimates based on year 2020 construction costs, and projected development needs.

4.2 Existing Conditions

The construction of the 2014 Northwest Quadrant Lift Station was based upon the City's desire to serve the greatest region through the use of a gravity sewer collection system that flows to a common lift station. The 2014 Northwest Quadrant Lift Station was built to eventually allow for the decommissioning of the Kings Way Lift Station. The force main from the Kings Way Lift Station empties into the 2007 Dry Creek Sewer Extension Project. The capacities of each of the above mentioned projects are detailed below. For additional information refer to Exhibit 24 of Appendix C.

2014 Northwest Quadrant Lift Station

The 2014 Northwest Quadrant Lift Station project was constructed with a set of parallel 6-inch force mains and two pumps capable of 278 gallons per minute (gpm) at 116 feet of head (TDH). This design point was chosen to meet the 10-year design flow rate of 400,000 gallons per day (gpd), with the largest pump out of service, utilizing only one of the 6-inch force mains. The 20-year design flow rate of 1,600,000 gpd could then utilize both 6-inch force mains with an estimated TDH of 249 feet and a velocity of 6.3 fps. At the time the facility was designed, only the commercial projected service area was considered as there was no gravity sewer connection to the residential projected service area. It

was also expected that the residential projected service area was to be served by the Kings Way Lift Station for a period of time and that commercial growth would come first.

Table 9: 2014 Northwest Quadrant Force Main Design

Design Period	Total Area (Acres)	Pumping Capacity	Force Main Size	Approx. TDH (feet)	Velocity (ft/sec)
10-Year Design Flow (2024)	80	400,000 gpd	6-inch	117	3.2
20-Year Design Flow (2034)	320	1,600,000 gpd	Dual 6-inch	249	6.3

Kings Way Lift Station

The Kings Way Lift Station project (2010) was constructed with a single 6-inch force main and two pumps capable of 209 gallons per minute (gpm) at 63 feet of head (TDH) which then empties into an 18" PVC gravity main designed with 0.12% slope. This design point was chosen assuming 60% of the area, sewer shed (SS-A) (See Figure IV.A), would develop over the next 20 years and to match the pumps selected for the lift station at the Wildflower development for maintenance purposes. The lift station can currently pump 300,000 gallons per day (gpd), with the largest pump out of service.

Table 10: Kings Way Force Main Design

Design Period	Total Area (Ac res)	Pumping Capacity*	Force Main Size	Approx. TDH (feet)	Velocity (ft/sec)
20-Year Design Flow (2025)	165	300,000 gpd	6-inch	63	2.37
Ultimate Design Flow	350	490,000 gpd	6-inch	83	3.86

**Design Flow*

Existing Gravity Sewer

The 2007 Dry Creek Sewer Extension project was constructed with an 18" gravity main beginning at the intersection of Robinwood Drive and West Knoll Drive and increasing to a 30" gravity main southward to the end of Rickey Allen Drive. The approximately 1,100 acre service area (900 acres developed) defined for the project is bound by North Center Point Road to the west, County Home Road to the north, the railroad to the east and West Main Street to the south. The area included a mix of residential, commercial/office space and a golf course.

Through other projects, construction of the 18" gravity main continued westward through Woodland Estates and northward along Quass Road to terminate just south of the future Kings Way street extension. The 1997 Northwest Sanitary Sewer Trunk, Lift Station and Force Main project connected Woodland Estates to the existing collection system including a lift station at the intersection of West Knoll Drive and Robinwood Drive. During the construction of Woodland Estates 1st Addition, the City paid the developer to upsize the 8" gravity main to 18" within the development. In 2000 the City extended the 18" sanitary sewer from Woodland Drive north to the end of the D & M Subdivision. In 2010 the City installed additional 18" gravity sewer in conjunction with the Kings Way Lift Station

project from the future connection of Quass Road and Kings Way southward to the northern end of the D & M Subdivision.

Table 11: Gravity Sewer Capacities

PROJECT	GRAVITY MAIN SIZE	MINIMUM SLOPE	DESIGN CAPACITY (GPD)	PEAK CAPACITY (GPD)**
1997 NW Trunk	18”	0.50%	4,380,000	5,176,000
Woodland Estates	18”	0.20%	2,770,000	3,274,000
D & M	18”	0.16%	2,480,000	2,928,000
2007 Dry Creek Sewer*	18”	0.34%	3,615,000	4,268,000
Kings Way Lift Station (upstream)	8”	1.15%	838,000	882,000
Kings Way Lift Station (downstream)	18”	0.12%	2,145,000	2,536,000

** At the intersection of West Knoll and Robinwood Drive*
***Calculated by Manning’s Equation*

Cedar Rapids Water Pollution Control Facility

The City of Cedar Rapids provides treatment for the wastewater conveyed from the City of Robins, as well as, other surrounding municipalities. The cities have an agreement in place pertaining to the construction, operation, and maintenance of the Cedar Rapids Water Pollution Control Facilities. This agreement signed in 1980 specifies an acceptable capacity of flow from the City of Robins that is allowed for treatment at their facility. The agreement also states that the City of Cedar Rapids reserves the right to sell additional capacity should additional capacity at the Water Pollution Control Facility be available. In the event additional capacity is not available, the City of Robins is required to reduce its loading or aid in expansion efforts of the City of Cedar Rapids Water Pollution Control Facility.

Table 12: 1980 Agreement Allowable Flows to Cedar Rapids Water Pollution Control Facility

MAXIMUM FLOW	AVERAGE FLOW	BOD	SS	TKN
1,120,000 (GPD)	400,000 (GPD)	600 lbs/day	800 lbs/day	120 lbs/day

Table 13: Robins Wastewater Flow Totals to Cedar Rapids Water Pollution Control Facility

	2012	2013	2014	2015	2016	2017	2018	2019
Max. Day (GPD)	576,000	960,000	1,052,000	820,000	851,000	818,000	1,175,000	850,000
Average Day (GPD)	310,652	351,438	351,674	315,275	431,510	323,384	424,442	357,000

It is important to note that the agreement between the City of Cedar Rapids and the City of Robins expires in 2024 and the Cities are currently working on updating and revising the agreement.

4.3 Design Criteria

This document is meant to be used for planning purposes only. Changes in the land use, Future Land Use Map (FLUM) area, actual land use and design will determine the final alignments and sizes of the sewer mains. Results of our comprehensive analysis were built upon, but not limited to, the following information:

FLUM – 2016
Northwest Quadrant Sanitary Sewer Collection System Evaluation – 2015
Current agreements with the City of Cedar Rapids
Major existing infrastructure elements and service limitations
Topographical mapping and LiDAR
Linn County GIS Land Records Map

There are some specifics to note about the sewershed regions and sub-region areas within them as they are reflected for the purposes of this Comprehensive Infrastructure Plan.

- There are 344 acres of land zoned commercial that are owned by Wendling Quarries, Inc. Although some of this land could potentially be developed into public space, it is considered undevelopable for purposes related to this infrastructure plan and not included in land area totals.
- Information based on the NW Region (Quadrant) previously studied with the Northwest Quadrant Sanitary Sewer Collection Evaluation dated August of 2015 has been included in this report but was not re-evaluated.
- Even though Midway is not part of Robins FLUM and there are not currently any plans to annex or provide service to Midway, the area was included in land area calculations. This is in an effort to provide the best possible estimates for system capacity to account for unknown circumstances that may arise in the future, benefiting both communities.
- While we discuss each zoning area with the generalized zoning classifications of residential, commercial/industrial, and public, there are additional, more specific zoning classifications described in further detail in the FLUM. The generalized zoning descriptions used in this plan adequately reflect the FLUM for purposes of estimating demand to make broad system improvement recommendations.

Design Equivalents

Demand projections for this plan assume that 82% of land area calculations is the developable while the remaining 18% was assumed as dedicated right-of-way (ROW) and parkland dedication. A peaking factor of 3 was used to find the total capacity projected to be demanded of the system in gallons per day.

The peaking factor is a function of population within the service area and is typically in the range of 3 to 4. Further review of proposed use will be needed at the time of development to more accurately calculate the actual peaking factor to be used.

Iowa DNR Minimum Design Equivalents were taken into consideration when determining how to estimate the peak flow volume for a region. While the DNR standard for industrial zoning is 10,000 gallons per acre, but given the anticipated types of development, a lower design equivalent was used for purposes of this evaluation. The design equivalents used to estimate peak flow according to zoning classification within a specific region are identified below.

Residential = 1,000 gallons per acre
Commercial = 5,000 gallons per acre
Industrial = 5,000 gallons per acre
Public = 0 gallons per acre

The minimum design equivalents for commercial and industrial development are expected peak flow rates for new sewers built with modern construction techniques where the specific types of commercial establishments or industrial facilities are unknown. Lower design values may be approved for proposed developments where specific types of establishments or industries are planned and adequate justification is provided for alternative equivalents.

4.4 System Recommendations

Currently, the City provides wastewater services to a combination of residential, commercial, industrial, and public zoning making up 1,698 acres of land. In preparation of this Comprehensive Infrastructure Plan for the City, 6,426 acres of land were studied to speculate future Wastewater Collection System demands.

The 2015 NW Quadrant Sanitary Sewer Collection System Evaluation identified five (5) sewershed sub-regions, SS-A, SS-B, SS-C, SS-D, and SS-E. Table 14: Sewershed (Quadrant) Region Previously Studied shows a breakdown of sub-region in acres.

Table 14: Sewershed (Quadrant) Region Previously Studied

NORTHWEST SEWERSHED	
Sub-Region	Land Area (Acres)
SS-A	204
SS-B	178
SS-C	468
SS-D	315
SS-E	406
1571 Total Acres	

Four additional sewershed regions have been developed as part of this project. These Sewershed Regions are identified as the Southwest, Southeast, Northeast, and Northwest Extension based on geographic location. They are each made up of multiple smaller, sub-regions as identified in Table 15: Wastewater Collection System - Sewershed Regions & Sub-Regions, and shown in Table 14: Sewershed (Quadrant) Region Previously Studied on the following page.

Table 15: Wastewater Collection System - Sewershed Regions & Sub-Regions

SOUTHWEST SEWERSHED		SOUTHEAST SEWERSHED		NORTHEAST SEWERSHED		NORTHWEST SEWERSHED EXTENSION	
Sub-Region	Land Area (Acres)	Sub-Region	Land Area (Acres)	Sub-Region	Land Area (Acres)	Sub-Region	Land Area (Acres)
SS-F	55	SS-K	467	SS-N	160	SS-T	364
SS-G	210	SS-L	571	SS-P	191	SS-U	221
SS-H	402	SS-M	335	SS-Q	154	SS-W	175
SS-I	415	---	---	SS-R	359	SS-X	281
SS-J	22	---	---	SS-S	129	---	---
1104 Total Acres		1373 Total Acres		993 Total Acres		1041 Total Acres	

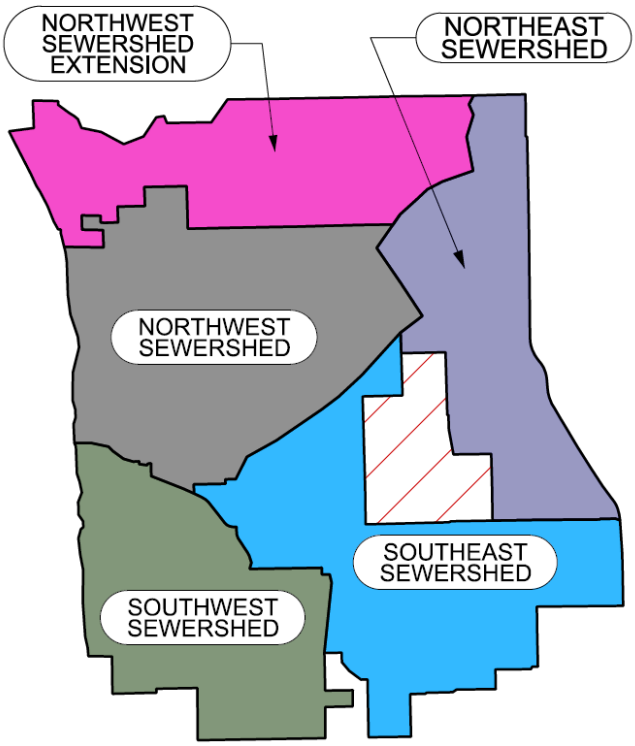


Figure 14: Sewershed Regions

Boundaries for each region and sub-region were located according to topography, the existing sewer system. They were compared to the Future Land Use Map (FLUM). Land area in acres were then totaled based on zoning classification. Using these areas we were able to estimate system demands based on estimated times for buildout according to zoning classification and generalized timeframes for infrastructure system improvement projects.

Of the 1,698 acres of existing or currently serviced sewershed regions there are 1,413 acres zoned residential and 285 acres zoned commercial. Within the next 20 years we are expecting 498 acres of residential and 701 acres of commercial and industrial land to be developed thus requiring wastewater collection services. The ultimate buildout area reflects additional service needs to 2,368 acres of residential and 755 acres of commercial and industrial zoning.

The following information describes each region and respective sub-region in further detail.

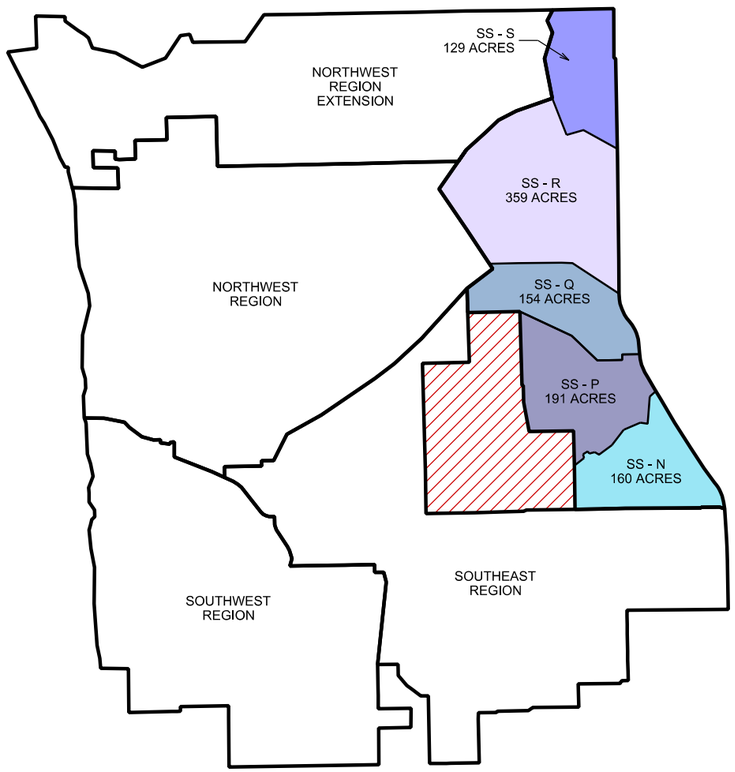
Northeast Region

The northeast region of the Wastewater Collection System is made up of 5 (five) smaller sub-regions – SS-N, SS-P, SS-Q, SS-R, and SS-S as shown in Figure 15: Wastewater Collection System – Northeast Sewershed Maps. A generalized overview of estimated capacity that will be demanded from each sewershed sub-region is shown in Table 16: Northeast Region Sewershed Estimated Demand Projections. Further detail and design recommendations based on these projections can be found in Table 17: Northeast Sewershed Capacity Demand & Design Recommendation in the pages to follow.

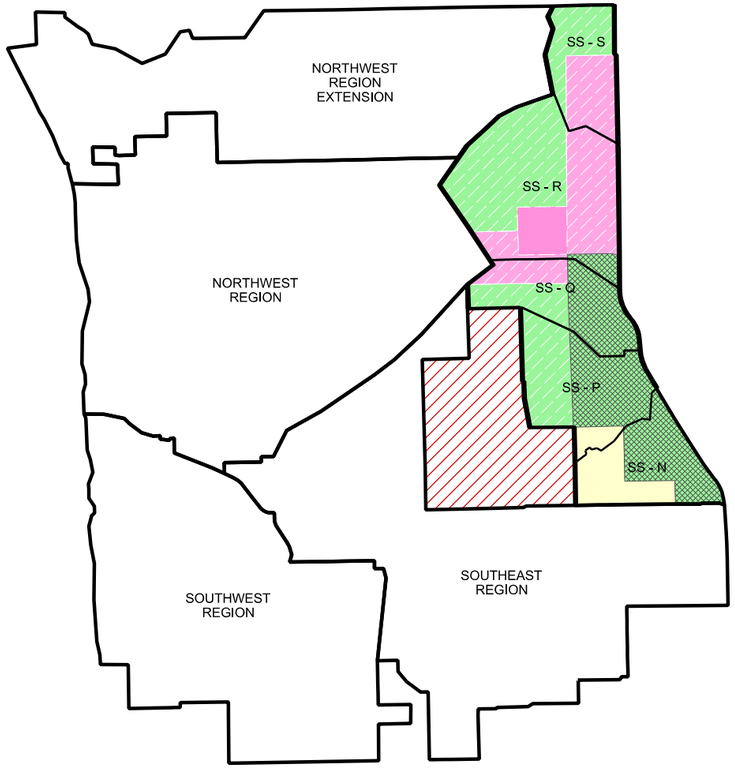
Table 16: **Northeast Region Sewershed Estimated Demand Projections**

	LAND AREA	82% AREA	FLOW @ 1,000 GPM	FLOW @ 5,000 GPM	PEAK FLOW x 3
EXISTING SERVICE					
Residential	83	68	68,000	---	204,000
Commercial/Industrial	---	---	---	---	---
20 YEAR SERVICE					
Residential	272*	223	223,000	---	669,000
Commercial/Industrial	38	31	---	155,000	465,000
ULTIMATE SERVICE BUILD-OUT					
Residential	384	315	315,000	---	945,000
Commercial/Industrial	216	177	---	885,000	2,655,000

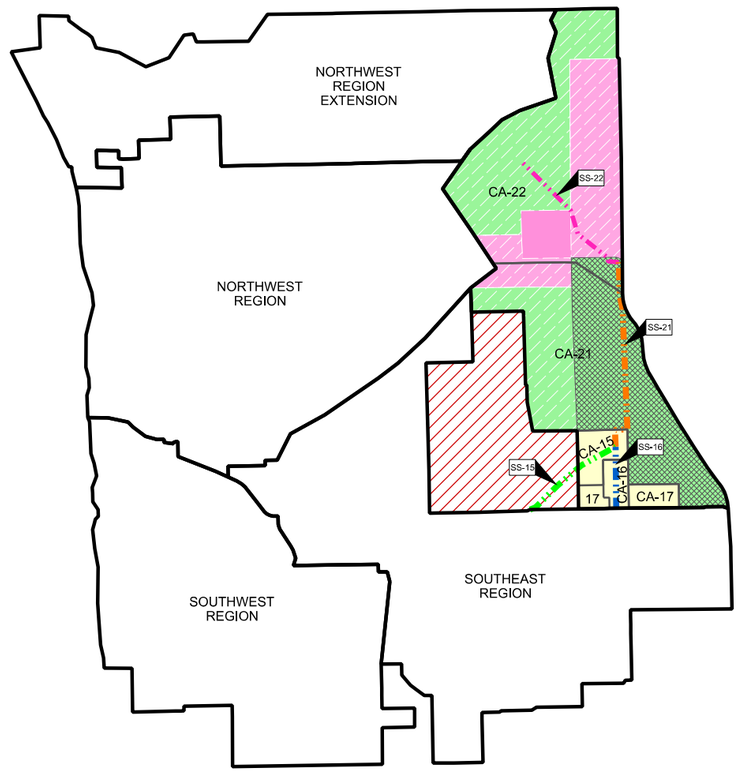
**Accounts for some amount of area within Cedar Rapids city limits.*



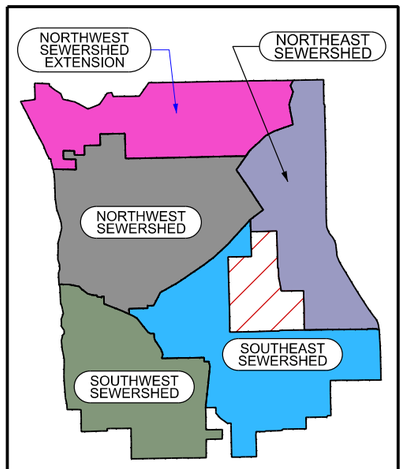
SEWERSHED SUB-REGIONS



SUB-REGION ZONING



COLLECTION AREA ZONING



SANITARY SEWER
SEWERSHED REGIONS

LEGEND

- 27" GRAVITY MAIN
- 24" GRAVITY MAIN
- 21" GRAVITY MAIN
- 18" GRAVITY MAIN
- 15" GRAVITY MAIN
- 12" GRAVITY MAIN
- 8" GRAVITY MAIN
- 18" FORCE MAIN
- 12" FORCE MAIN
- 6" FORCE MAIN
- REGION BOUNDARY
- SUB-REGION BOUNDARY
- COLLECTION AREA
- EXISTING LIFT STATION
- PROPOSED LIFT STATION
- ROBINS QUARRY NO FUTURE DEVELOPMENT

NORTHEAST REGION ZONING PER SUB-REGION LEGEND

ZONING DISTRICT	SS-N (ACRES)	SS-P (ACRES)	SS-Q (ACRES)	SS-R (ACRES)	SS-S (ACRES)	ZONING TOTAL
RESIDENTIAL CURRENT SERVICE	67	16	---	---	---	83
RESIDENTIAL 20 YEAR SERVICE	---	---	---	---	---	---
RESIDENTIAL ULTIMATE SERVICE	---	83	48	186	67	384
COMMERCIAL CURRENT SERVICE	---	---	---	---	---	---
COMMERCIAL 20 YEAR SERVICE	---	---	---	38	---	38
COMMERCIAL ULTIMATE SERVICE	---	---	34	120	62	216
CITY OF CEDAR RAPIDS 20 YEAR RESIDENTIAL	93	92	72	15	---	272
SUB-REGION TOTAL	160	191	154	359	129	993

NORTHEAST REGION ZONING PER COLLECTION AREA LEGEND

ZONING DISTRICT	CA-22 (ACRES)	CA-21 (ACRES)	CA-16 (ACRES)	CA-15 (ACRES)
RESIDENTIAL CURRENT SERVICE	---	---	19	34
RESIDENTIAL 20 YEAR SERVICE	---	---	---	---
RESIDENTIAL ULTIMATE SERVICE	253	132	---	---
COMMERCIAL CURRENT SERVICE	---	---	---	---
COMMERCIAL 20 YEAR SERVICE	38	---	---	---
COMMERCIAL ULTIMATE SERVICE	182	33	---	---
CITY OF CEDAR RAPIDS 20 YEAR RESIDENTIAL	15	257	---	---
COLLECTION AREA TOTAL	488	422	19	34

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Wastewater Collection System - Northeast Sewershed Maps

Robins SFGO Infrastructure Inventory | Figure 15 | Robins, Iowa | 03/24/2020

Table 17: Northeast Sewershed Capacity Demand & Design Recommendations

NORTHEAST SEWERSHED														
SEWERSHED			ZONING CLASSIFICATION BY		RESIDENTIAL DNR PROJECTIONS			COMMERCIAL DNR PROJECTIONS			TOTAL CAPACITY DEMAND	RECOMMENDATION		
SEGMENT ID	SUB-REGION	COLLECTION AREA	RESIDENTIAL	COMMERCIAL & INDUSTRIAL	DEVELOPABLE AREA (82%)	FLOW @ 1,000 GPD	FLOW x3	DEVELOPABLE AREA (82%)	FLOW @ 5,000 GPD	FLOW		PIPE SIZE (INCHES)	SLOPE (%)	TYPE
	SS-S	CA-22	67	62	55	54,940	164,820	51	254,200	0	1,559,640			
	SS-R		202	157	166	165,640	496,920	129	643,700	0				
SS-22	=	CA-22									1,559,640	15	0.50%	GRAVITY
	SS-Q		120	34	98	98,400	295,200	28	139,400	0				
	SS-P	CA-21	175	0	144	143,500	430,500	0	0	0	1,096,340			
	SS-N		94	0	77	77,080	231,240	0	0	0				
SS-21		CA-21 + CA-22									2,655,980	18	0.50%	GRAVITY
	SS-N	CA-17	30	0	25	24,600	73,800	0	0	0	127,920			
	SS-M		22	0	18	18,040	54,120	0	0	0				
SS-17		CA-17									127,920	8		GRAVITY
	SS-N	CA-16	19	0	16	15,580	46,740	0	0	0	46,740			
SS-16		CA-16 + CA-17									174,660	8		GRAVITY
	SS-P	CA-15	16	0	13	13,120	39,360	0	0	0	86,100			
	SS-N		19	0	16	15,580	46,740	0	0	0				
SS-15		CA-15 + CA-16 + CA-17 + CA-21 + CA-22									2,916,740	21	0.50%	GRAVITY

Southeast Region

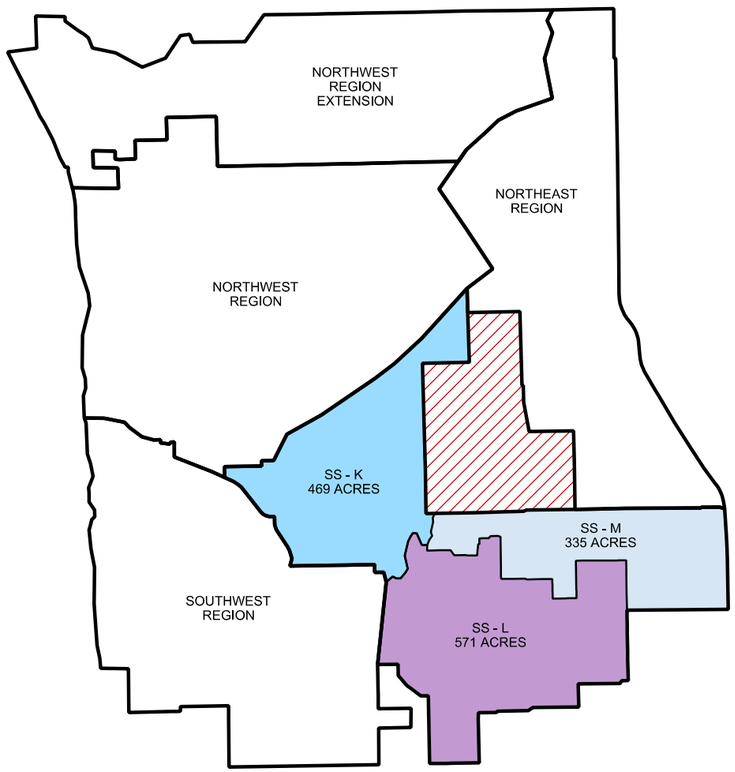
The southeast region of the Wastewater Collection System is made up of 3 (three) smaller sub-regions – SS-K, SS-L, and SS-M as shown in Figure 16: Wastewater Collection System – Southeast Sewershed Maps. Much of this sewershed region is made up of existing development. The collection area's identified account for improvements to the existing system as well as estimated future demand projections serving the northeast region. Table 18: Southeast Region Sewershed Estimated Demand Projections provides estimated capacity that will be demanded from each sewershed sub-region.

Table 18: **Southeast Region Sewershed Estimated Demand Projections**

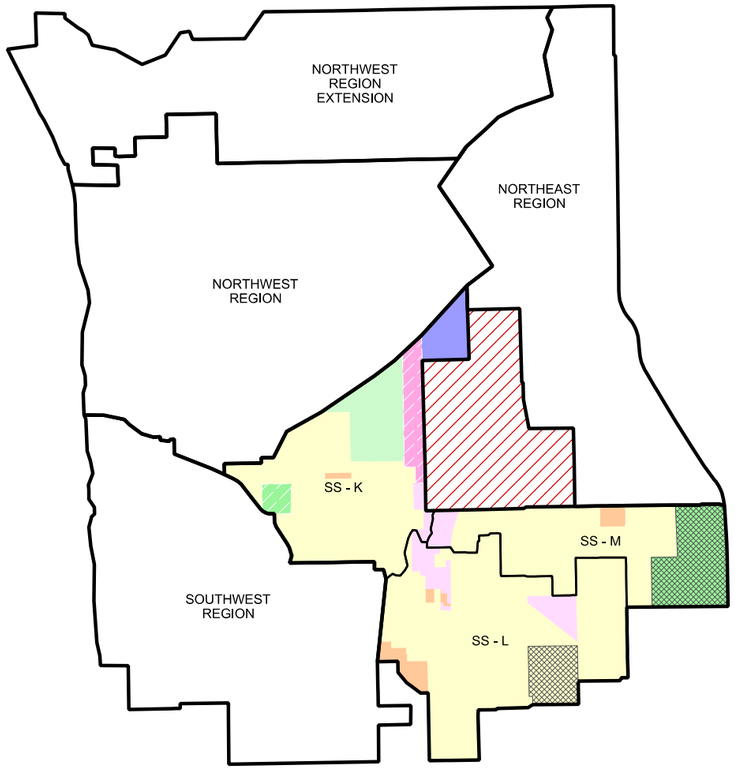
	LAND AREA	82% AREA	FLOW @ 1,000 GPM	FLOW @ 5,000 GPM	PEAK FLOW x 3
EXISTING SERVICE					
Residential	999	819	819,000	---	2,457,000
Commercial/Industrial	105	86	---	430,000	1,290,000
20 YEAR SERVICE					
Residential	181*	148	148,000	---	444,000
Commercial/Industrial	---	---	---	---	---
ULTIMATE SERVICE BUILD-OUT					
Residential	14	12	12,000	---	36,000
Commercial/Industrial	42	34	---	170,000	510,000

**Accounts for some amount of area within Cedar Rapids city limits.*

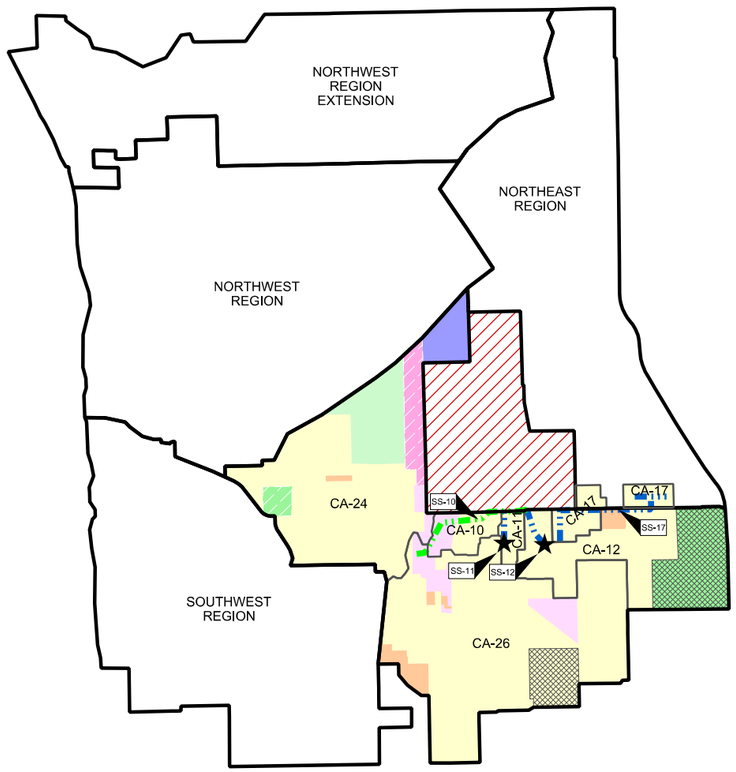
Table 19: Southeast Sewershed Capacity Demand & Design Recommendation found in the following pages provides a detailed breakdown of each proposed infrastructure improvement segment as it relates to individual sewershed sub-regions and their prospective collection area.



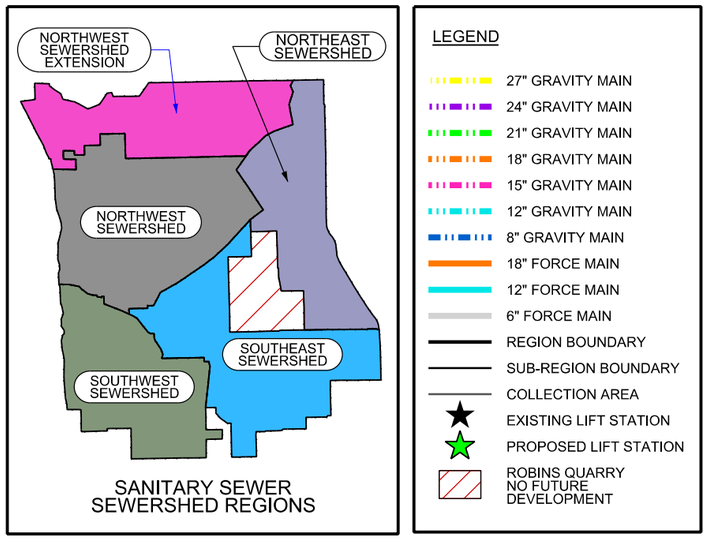
SEWERSHED SUB-REGIONS



SUB-REGION ZONING



COLLECTION AREA ZONING



LEGEND

- 27" GRAVITY MAIN
- 24" GRAVITY MAIN
- 21" GRAVITY MAIN
- 18" GRAVITY MAIN
- 15" GRAVITY MAIN
- 12" GRAVITY MAIN
- 8" GRAVITY MAIN
- 18" FORCE MAIN
- 12" FORCE MAIN
- 6" FORCE MAIN
- REGION BOUNDARY
- SUB-REGION BOUNDARY
- COLLECTION AREA
- EXISTING LIFT STATION
- PROPOSED LIFT STATION
- ROBINS QUARRY NO FUTURE DEVELOPMENT

SOUTHEAST REGION ZONING PER SUB-REGION LEGEND

ZONING DISTRICT	SS-K (ACRES)	SS-L (ACRES)	SS-M (ACRES)	ZONING TOTAL
RESIDENTIAL CURRENT SERVICE	283	459	211	953
RESIDENTIAL 20 YEAR SERVICE	79	---	---	79
RESIDENTIAL ULTIMATE SERVICE	14	---	---	14
COMMERCIAL CURRENT SERVICE	10	44	14	68
COMMERCIAL ULTIMATE SERVICE	42	---	---	42
INDUSTRIAL CURRENT SERVICE	37	---	---	37
PUBLIC	2	22	8	32
CITY OF CEDAR RAPIDS CURRENT RESIDENTIAL	---	46	---	46
CITY OF CEDAR RAPIDS 20 YEAR RESIDENTIAL	---	---	102	102
SUB-REGION TOTAL	467	571	335	1373

SOUTHEAST REGION ZONING PER COLLECTION AREA LEGEND

ZONING DISTRICT	CA-17 (ACRES)	CA-12 (ACRES)	CA-11 (ACRES)	CA-10 (ACRES)	CA-24 (ACRES)	SS-26 (ACRES)
RESIDENTIAL CURRENT SERVICE	52	145	19	25	283	459
RESIDENTIAL 20 YEAR SERVICE	---	---	---	---	79	---
RESIDENTIAL ULTIMATE SERVICE	---	---	---	---	14	---
COMMERCIAL CURRENT SERVICE	---	---	---	15	10	43
COMMERCIAL ULTIMATE SERVICE	---	---	---	---	42	7
INDUSTRIAL CURRENT SERVICE	---	---	---	---	37	---
PUBLIC	---	8	---	---	2	22
CITY OF CEDAR RAPIDS CURRENT RESIDENTIAL	---	---	---	---	---	46
CITY OF CEDAR RAPIDS 20 YEAR RESIDENTIAL	---	102	---	---	---	---
COLLECTION AREA TOTAL	52	255	19	40	467	571

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Wastewater Collection System - Southeast Sewershed Maps

Robins SFGO Infrastructure Inventory | Figure 16 | Robins, Iowa | 03/24/2020

Table 19: Southeast Sewershed Capacity Demand & Design Recommendations

SOUTHEAST SEWERSHED														
SEWERSHED			ZONING CLASSIFICATION BY		RESIDENTIAL DNR PROJECTIONS			COMMERCIAL DNR PROJECTIONS			TOTAL CAPACITY DEMAND	RECOMMENDATION		
SEGMENT ID	SUB-REGION	COLLECTION AREA	RESIDENTIAL	COMMERCIAL & INDUSTRIAL	DEVELOPABLE AREA (82%)	FLOW @ 1,000 GPD	FLOW x3	DEVELOPABLE AREA (82%)	FLOW @ 5,000 GPD	FLOW x3		PIPE SIZE (INCHES)	SLOPE (%)	TYPE
	SS-M	CA-11	19	0	16	15,580	46,740	0	0	0	46,740	DECOMMISSION KERVIN COURT LIFT STATION		
SS-11		CA-11									46,740	8		GRAVITY
	SS-M	CA-12	247	0	203	202,540	607,620	0	0	0	607,620	DECOMMISSION MAPLE STREET LIFT STATION		
SS-12		CA-12									607,620	8		GRAVITY
	SS-M SS-L	CA-10	25 0	15 2	21 0	20,500 0	61,500 0	12 2	61,500 8,200	0 0	131,200			
SS-10		CA-10 + CA-11 + CA-12 + NORTHEAST SEWERSHED									3,702,300	21	0.50%	GRAVITY
	SS-K	CA-24	376	89	308	308,320	924,960	73	364,900	0	1,289,860			
EXISTING		CA-24 + NORTHWEST & NORTHWEST EXTENSION									4,655,140			
	SS-L	CA-26	505	50	414	414,100	1,242,300	41	205,000	0	1,447,300			
EXISTING		CA-26 + CA-24 + NORTHWEST & NORTHWEST EXTENSION									6,102,440			

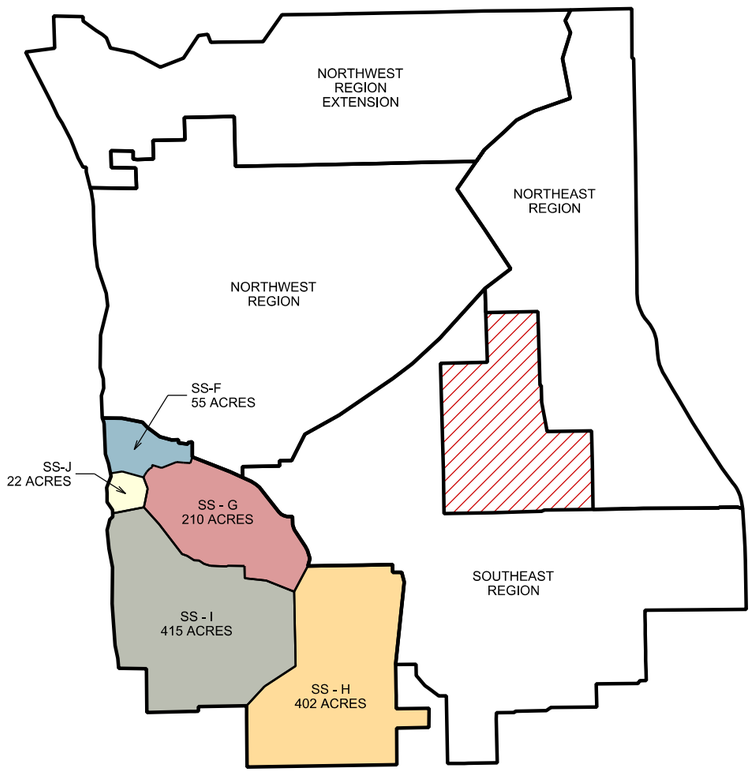
Southwest Region

The southwest region of the Wastewater Collection System is made up of 5 (five) smaller sub-regions – SS-F, SS-G, SS-H, SS-I, and SS-J as shown in Figure 17: Wastewater Collection System – Southwest Sewershed Maps on the following page. The sewershed sub-regions, according to projected buildout per zoning classification, can be found in Table 20: Southwest Region Sewershed Estimated Demand Projections.

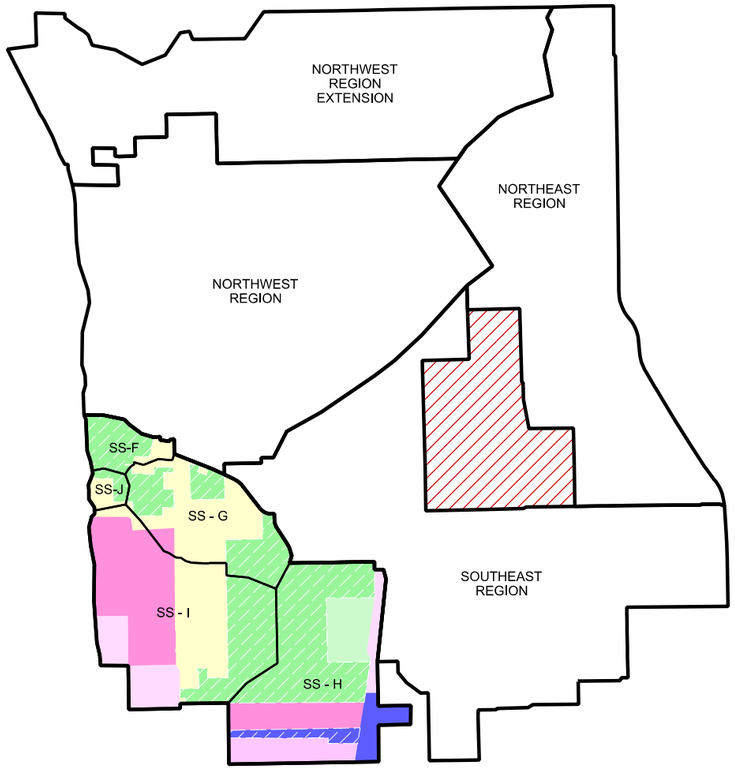
Table 20: **Southwest Region Sewershed Estimated Demand Projections**

	LAND AREA	82% AREA	FLOW @ 1,000 GPM	FLOW @ 5,000 GPM	PEAK FLOW x 3
EXISTING SERVICE					
Residential	241	198	198,000	---	594,000
Commercial/Industrial	180	148	---	740,000	2,220,000
20 YEAR SERVICE					
Residential	45	37	37,000	---	111,000
Commercial/Industrial	422	346	---	1,730,000	5,190,000
ULTIMATE SERVICE BUILD-OUT					
Residential	216	177	177,000	---	531,000
Commercial/Industrial	---	---	---	---	---

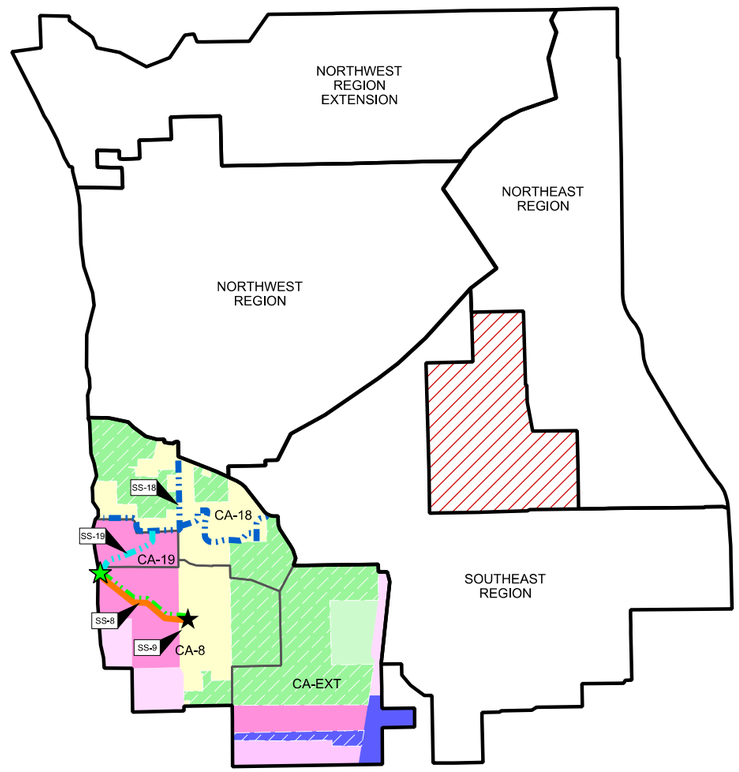
Table 21: Southwest Sewershed Capacity Demand & Design Recommendation found in the pages to follow, provides a detailed breakdown of each proposed infrastructure improvement segment as it relates to individual sewershed sub-regions and their prospective collection area.



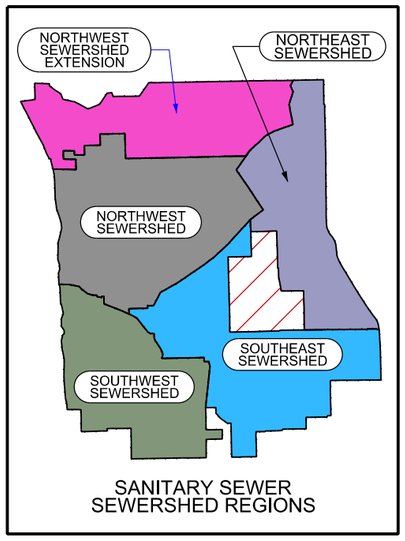
SEWERSHED SUB-REGIONS



SUB-REGION ZONING



COLLECTION AREA ZONING



SANITARY SEWER SEWERSHED REGIONS

LEGEND

- 27" GRAVITY MAIN
- 24" GRAVITY MAIN
- 21" GRAVITY MAIN
- 18" GRAVITY MAIN
- 15" GRAVITY MAIN
- 12" GRAVITY MAIN
- 8" GRAVITY MAIN
- 18" FORCE MAIN
- 12" FORCE MAIN
- 6" FORCE MAIN
- REGION BOUNDARY
- SUB-REGION BOUNDARY
- COLLECTION AREA
- EXISTING LIFT STATION
- PROPOSED LIFT STATION
- ROBINS QUARRY NO FUTURE DEVELOPMENT

SOUTHWEST REGION ZONING PER SUB-REGION LEGEND

ZONING DISTRICT	SS-F (ACRES)	SS-G (ACRES)	SS-H (ACRES)	SS-I (ACRES)	SS-J (ACRES)	ZONING TOTAL
RESIDENTIAL CURRENT SERVICE	10	112	---	107	12	241
RESIDENTIAL 20 YEAR SERVICE	---	---	45	---	---	45
RESIDENTIAL ULTIMATE SERVICE	45	91	180	96	10	422
COMMERCIAL CURRENT SERVICE	---	---	68	60	---	128
COMMERCIAL 20 YEAR SERVICE	---	7	57	152	---	216
COMMERCIAL ULTIMATE SERVICE	---	---	---	---	---	---
INDUSTRIAL CURRENT SERVICE	---	---	52	---	---	52
INDUSTRIAL ULTIMATE SERVICE	---	---	---	---	---	---
SUB-REGION TOTAL	55	210	402	415	22	1104

SOUTHWEST REGION ZONING PER COLLECTION AREA LEGEND

ZONING DISTRICT	CA-18 (ACRES)	CA-19 (ACRES)	CA-8 (ACRES)	CA-EXT (ACRES)
RESIDENTIAL CURRENT SERVICE	141	---	99	---
RESIDENTIAL 20 YEAR SERVICE	---	---	---	45
RESIDENTIAL ULTIMATE SERVICE	146	---	83	193
COMMERCIAL CURRENT SERVICE	---	---	60	69
COMMERCIAL 20 YEAR SERVICE	---	55	104	57
COMMERCIAL ULTIMATE SERVICE	---	---	---	---
INDUSTRIAL CURRENT SERVICE	---	---	---	22
INDUSTRIAL ULTIMATE SERVICE	---	---	---	30
COLLECTION AREA TOTAL	287	55	346	416

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Wastewater Collection System - Southwest Sewershed Maps

Robins SFGO Infrastructure Inventory | Figure 17 | Robins, Iowa | 03/24/2020

Table 21: Southwest Sewershed Capacity Demand & Design Recommendations

SOUTHWEST SEWERSHED														
SEWERSHED			ZONING CLASSIFICATION BY		RESIDENTIAL DNR PROJECTIONS			COMMERCIAL DNR PROJECTIONS			TOTAL CAPACITY DEMAND	RECOMMENDATION		
SEGMENT ID	SUB-REGION	COLLECTION AREA	RESIDENTIAL	COMMERCIAL & INDUSTRIAL	DEVELOPABLE AREA (82%)	FLOW @ 1,000 GPD	FLOW x3	DEVELOPABLE AREA (82%)	FLOW @ 5,000 GPD	FLOW		PIPE SIZE (INCHES)	SLOPE (%)	TYPE
	SS-F	CA-18	55	0	45	45,100	135,300	0	0	0	706,020			
	SS-G		202	0	166	165,640	496,920	0	0	0				
	SS-I		8	0	7	6,560	19,680	0	0	0				
	SS-J		22	0	18	18,040	54,120	0	0	0				
SS-18	=	CA-18									706,020	8	1.00%	GRAVITY
	SS-G	CA-19	0	0	0	0	0	0	0	0	225,500			
	SS-I		0	55	0	0	0	45	225,500	0				
SS-19	=	CA-19 + CA-18									931,520	12	0.50%	GRAVITY
	SS-I	CA-8	182	164	149	149,240	447,720	134	672,400	0	1,120,120	21	0.50%	GRAVITY
1-380 LIFT STATION	=	CA-8 + CA-19 + CA-18									2,051,640	MAINTENANCE AS NEEDED WITH DEVELOPMENT PROGRESSION		
SS-8	=	CA-8 + CA-19 + CA-18									2,051,640	18		FORCE
	SS-I	CA-25	14	0	11	11,480	34,440	0	0	0	1,313,640	DOWNSTREAM FROM WILDFLOWER LIFTSTATION		
	SS-H		225	177	185	184,500	553,500	145	725,700	0				
SS-9	=	CA-25 + CA-18 + CA-19 + CA-8									3,365,280	WILDFLOWER LIFT STATION DECOMMISSION & DOWNSTREAM FORCE MAIN EVALUATION		

Northwest Region Extension

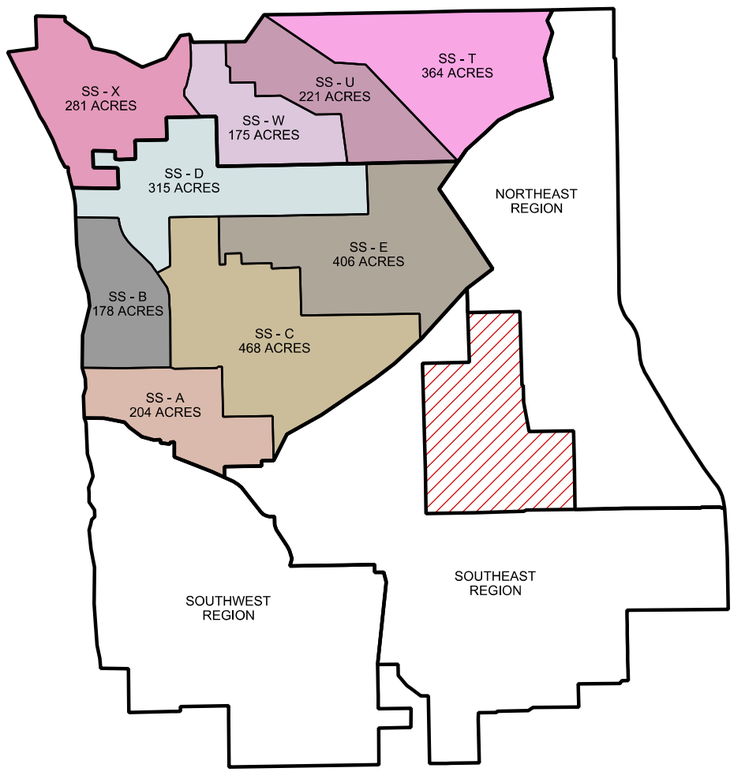
The northwest region extension of the Wastewater Collection System is made up of 4 (four) smaller sub-regions – SS-T, SS-U, SS-W, and SS-X as shown in Figure 18: Wastewater Collection System – Northwest Region + Extension Sewershed Maps on the following page. The sewershed sub-regions, according to projected buildout per zoning classification, can be found in Table 22: Northwest Region Extension Sewershed Estimated Demand Projections.

Sections of Midway have been included in analysis of this sewershed region as a proactive approach in planning so the option is available should they ever choose to or need to connect in the future. It is not assumed Midway will connect to the City of Robin's Wastewater Collection System at any point in time nor are any recommendations dependent on a connection being made by Midway. All of Midway is currently serviced by private septic systems and is not required to connect to Robins' system.

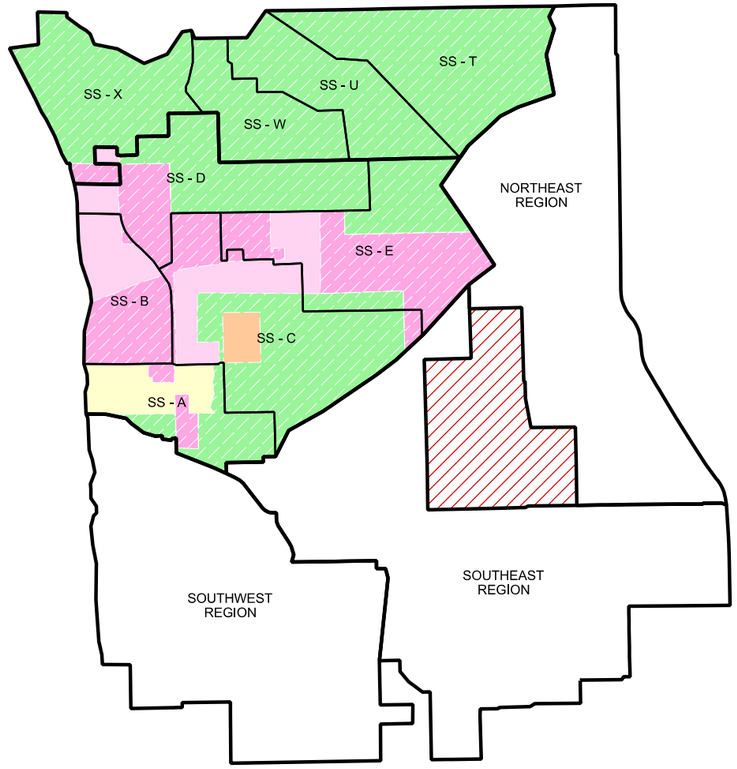
Table 22: **Northwest Region Extension Sewershed Estimated Demand Projections**

	LAND AREA	82% AREA	FLOW @ 1,000 GPM	FLOW @ 5,000 GPM	PEAK FLOW x 3
EXISTING SERVICE					
Residential	90	74	74,000	---	222,000
Commercial/Industrial	---	---	---	---	---
20 YEAR SERVICE					
Residential	---	---	---	---	---
Commercial/Industrial	241	198	---	988,100	2,964,300
ULTIMATE SERVICE BUILD-OUT					
Residential	1754	1438	1,438,280	---	4,314,840
Commercial/Industrial	497	408	---	2,040,000	6,120,000

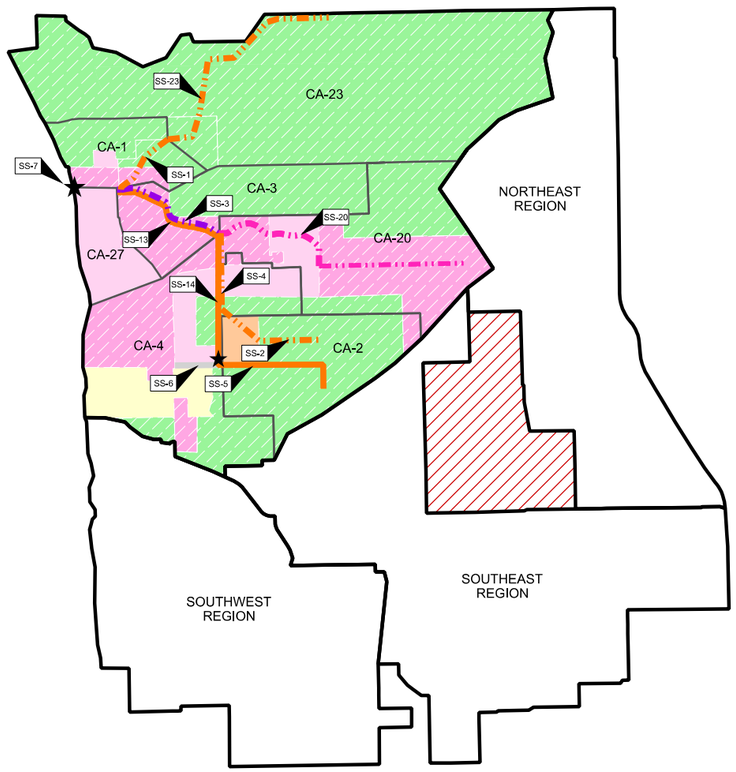
Table 23: Northwest & Northwest Extension Sewershed Capacity Demand & Design Recommendation provides a detailed breakdown of each proposed infrastructure improvement segment as it relates to individual sewershed sub-regions and their prospective collection area. SS-3 has not been calculated to include both SS-1 (CA-1) and SS-23 (CA-23) given that the preliminary alignment for SS-3 ends near North Center Point Road where SS-1 is anticipated to end. This detail makes the assumption then that they will join at North Center Point Road and continue together through the existing 24" gravity line to the NW Lift Station.



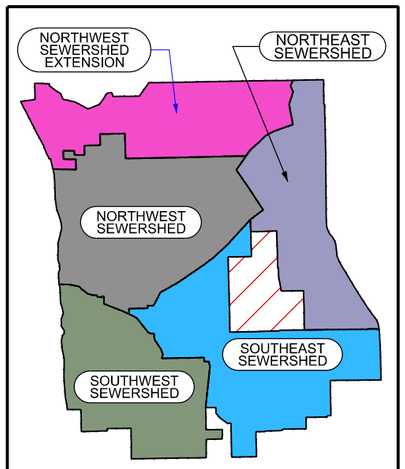
SEWERSHED SUB-REGIONS



SUB-REGION ZONING



COLLECTION AREA ZONING



SANITARY SEWER
SEWERSHED REGIONS

LEGEND

- 27" GRAVITY MAIN
- 24" GRAVITY MAIN
- 21" GRAVITY MAIN
- 18" GRAVITY MAIN
- 15" GRAVITY MAIN
- 12" GRAVITY MAIN
- 8" GRAVITY MAIN
- 18" FORCE MAIN
- 12" FORCE MAIN
- 6" FORCE MAIN
- REGION BOUNDARY
- SUB-REGION BOUNDARY
- COLLECTION AREA
- EXISTING LIFT STATION
- PROPOSED LIFT STATION
- ROBINS QUARRY NO FUTURE DEVELOPMENT

NORTHWEST REGION ZONING PER SUB-REGION LEGEND

ZONING DISTRICT	SS-A (ACRES)	SS-B (ACRES)	SS-C (ACRES)	SS-D (ACRES)	SS-E (ACRES)	SS-T (ACRES)	SS-U (ACRES)	SS-W (ACRES)	SS-X (ACRES)	ZONING TOTAL
RESIDENTIAL CURRENT SERVICE	90	---	---	---	---	---	---	---	---	90
RESIDENTIAL 20 YEAR SERVICE	---	---	---	---	---	---	---	---	---	---
RESIDENTIAL ULTIMATE SERVICE	90	---	281	217	141	364	221	175	265	1754
COMMERCIAL CURRENT SERVICE	---	---	---	---	---	---	---	---	---	---
COMMERCIAL 20 YEAR SERVICE	---	74	93	26	48	---	---	---	---	241
COMMERCIAL ULTIMATE SERVICE	24	104	64	72	217	---	---	---	16	497
PUBLIC USE	---	---	30	---	---	---	---	---	---	30
ROBINS QUARRY NO FUTURE DEVELOPMENT	---	---	---	---	---	---	---	---	---	---
SUB-REGION TOTAL	204	178	468	315	406	364	221	175	281	2612

NORTHWEST REGION ZONING PER COLLECTION AREA LEGEND

ZONING DISTRICT	CA-23 (ACRES)	CA-1 (ACRES)	CA-20 (ACRES)	CA-2 (ACRES)	CA-4 (ACRES)	CA-3 (ACRES)	CA-27 (ACRES)
RESIDENTIAL CURRENT SERVICE	---	---	---	---	90	---	---
RESIDENTIAL 20 YEAR SERVICE	---	---	---	---	---	---	---
RESIDENTIAL ULTIMATE SERVICE	994	97	141	235	136	151	---
COMMERCIAL CURRENT SERVICE	---	---	---	---	---	---	---
COMMERCIAL 20 YEAR SERVICE	---	6	48	---	93	---	92
COMMERCIAL ULTIMATE SERVICE	---	32	217	10	151	87	2
PUBLIC USE	---	---	---	30	---	---	---
ROBINS QUARRY NO FUTURE DEVELOPMENT	---	---	---	---	---	---	---
COLLECTION AREA TOTAL	994	135	406	275	470	238	94

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Wastewater Collection System - Northwest Region + Extention Sewershed Maps

Robins SFGO Infrastructure Inventory | Figure 18 | Robins, Iowa | 03/24/2020

Table 23: Northwest & Northwest Extension Sewershed Capacity & Design Recommendations

NORTHWEST & NORTHWEST EXTENSION SEWERSHED														
SEWERSHED			ZONING CLASSIFICATION BY COLLECTION AREA (ACRES)		RESIDENTIAL DNR PROJECTIONS			COMMERCIAL DNR PROJECTIONS			TOTAL CAPACITY DEMAND	RECOMMENDATION		
SEGMENT ID	SUB-REGION	COLLECTION AREA	RESIDENTIAL	COMMERCIAL & INDUSTRIAL	DEVELOPABLE AREA (82%)	FLOW @ 1,000 GPD	FLOW x3	DEVELOPABLE AREA (82%)	FLOW @ 5,000 GPD	FLOW		PIPE SIZE (INCHES)	SLOPE (%)	TYPE
	SS-D		33	0	27	27,060	81,180	0	0	0				
	SS-T		364	0	298	298,480	895,440	0	0	0				
	SS-U	CA-23	221	0	181	181,220	543,660	0	0	0	2,445,240			
	SS-W		175	0	144	143,500	430,500	0	0	0				
	SS-X		201	0	165	164,820	494,460	0	0	0				
SS-23	=	CA-23									2,445,240	18	0.50%	GRAVITY
	SS-D	CA-1	33	22	27	27,060	81,180	18	90,200	0	394,420			
	SS-X		64	16	52	52,480	157,440	13	65,600	0				
SS-1	=	CA-1 + CA-23									2,839,660	18	0.50%	GRAVITY
	SS-E	CA-20	141	265	116	115,620	346,860	217	1,086,500	0	1,433,360			
SS-20	=	CA-20									1,433,360	15	0.75%	GRAVITY
	SS-C	CA-2	235	10	193	192,700	578,100	8	41,000	0	619,100			
SS-2	=	CA-2									619,100	12	0.50%	GRAVITY
	SS-A		180	24	148	147,600	442,800	20	98,400	0				
	SS-B	CA-4	0	103	0	0	0	84	422,300	0	1,556,360			
	SS-C		46	117	38	37,720	113,160	96	479,700	0				
SS-4	=	CA-2 + CA-4									2,175,460	18	0.50%	GRAVITY
	SS-D	CA-3	151	57	124	123,820	371,460	47	233,700	0	728,160			
	SS-C		0	30	0	0	0	25	123,000	0				
SS-3	=	CA-3 + CA-2 + CA-20 + CA-4									4,336,980	24	0.50%	GRAVITY
	SS-D	CA-27	0	20	0	0	0	16	82,000	0	385,400	12		GRAVITY
	SS-B		0	74	0	0	0	61	303,400	0				
EXISTING	=	CA-27									385,400			
SS-7		CA-1 + CA-3 + CA-27									7,562,040	DESIGN PUMPING CAPACITY INCREASE		
SS-13 SS-14 SS-5	NW LIFT STATION	CA-23 + CA-1 + CA-2 + CA-4 + CA-20 + CA-3 + CA-27									7,562,040	18		FORCE

4.5 Prioritization Factors

Prioritization factors were developed to assist with determining the sequence projects should be completed and what impacts each improvement should have. Each factor is independent from each other and the more boxes checked does not necessarily equate to a higher priority. Cost was not taken into consideration when prioritizing projects. The committee that was arranged to review the Comprehensive Infrastructure Plan held several meetings to discuss wastewater collection projects, prioritization, development trends, and specific details of each sewer project. The system improvement and expansion recommendations identified in this report are the result of Engineering planning and judgement as well as committee review and concurrence.

Capacity

Capacity relates to the amount of flow a pipe can carry or the amount a lift station can pump. Sewer mains shall be designed to flow no more than 75% full during very wet weather and high usage times (i.e. spring thaw + rainfall+ morning hours when people are getting ready for the day). Lift station pumps are similar in that the design is based on that same flow, but there must be redundancy so if the biggest pump were to fail, the remaining pump(s) could continue to meet that flow demand.

Development Driven

Development Driven projects are those that provide service for a new development, typically when a developer requests service, or when the demand to an area of development exceeds what the current system can provide.

Infill

Infill projects are those that occur in developed areas that are currently served by septic systems.

Maintenance

Maintenance takes into consideration the number of lift stations that can be eliminated by rerouting the sanitary sewer through gravity mains resulting in fewer operational and repair costs (i.e. Kervin Ct and Maple St lift stations were constructed as gravity sewer was not readily accessible). This document proposes eventual elimination of these lift stations.

Proximity to Existing

New sanitary sewer projects that are directly adjacent to existing facilities and end within a distance that allows growth from the interior of Robins out meet this criteria.

Stage in Planning

Projects that are currently under construction, have been requested by a developer, are under design or are within the 5 year Capital Improvement Plan (CIP) meet this criteria.

4.6 System Recommendations

There are 23 improvement project segments identified for the Wastewater Collection System based on current development assumption that the NW Region will continue to develop first. They have been separated into three (3) goal categories or phases – Short Term, Intermediate, and Long Term Goals. Due to the varying and complex nature of community growth and its demand for wastewater infrastructure, actual growth should be continually monitored and prioritization should be adjusted as more information becomes available. Rather than forcing every project into a specific goal category an Ultimate Buildout phase has also been used to build in flexibility of project prioritization with time as development and growth progress naturally.

Capacities are based demand per zoning classification with a particular segments collection area and are dependent on downstream sewer main size slopes for the given size. Pipe sizes can be adjusted based on topography and achievable slopes. Table 24: Wastewater Collection System Analysis Summary & Recommendations summarizes the system recommendations and can be found on the following page.

Short Term Goals – 1- 2 years	Long Term Goals – 6-15 years
Intermediate Goals – 3-5 years	Ultimate Build-out – 16+ years

Detailed cost opinions of each individual goal or system improvement project can be found in Appendix C as Exhibits 1-23.

Table 24: Wastewater Collection System Analysis Summary & Recommendations

WASTEWATER COLLECTION SYSTEM - ANALYSIS SUMMARY & RECOMMENDATIONS										
Segment ID	**Adjacent Roadway/Description**	**Prioritization Factors**							**Size**	**EOPC***
		Capacity	Development Driven**	Infill	Maintenance	Proximity to Existing	Stage in Planning			
Short Term Goals										
1	Eagleview Development to NCPR		X				X		18"	$ 744,000.00
2	Quass Road to NW Trunk (South Leg)		X			X	X		12"	$ 937,000.00
Intermediate Goals										
3	NW Trunk (North Leg) From County Home Road Trunk to NCPR	X	X						24"	$ 1,113,000.00
4	NW Trunk (South Leg) From Kings Way to NW Trunk (North Leg)	X	X						18"	$ 791,000.00
5	Kings Force Main and LS Decommission	X	X		X				18"	$ 1,835,000.00
6	Dual 6-inch around Kings Way Church	X	X		X				6"	$ 245,000.00
Long Term Goals										
7	NW Lift Station 20-Year Design Pumping Capacity	X	X		X				-	$ 637,000.00
8	I380 Trunk, Lift Station, and FM to Wildflower	X	X						18" & 21"	$ 2,360,000.00
9	Wildflower Decommission (and evaluate downstream FM)	X	X		X				-	$ 85,000.00
Ultimate Buildout										
10	North Troy to North Mentzer - Adjacent to Quarry					X			21"	$ 1,796,000.00
11	Decommission Kervin Ct (add gravity main)				X				8"	$ 255,000.00
12	Decommission Maple Street Lift Station (add gravity main)				X				8"	$ 353,000.00
13	NW FM (North Leg)	X	X						18"	$ 1,138,000.00
14	NW FM (South Leg)	X	X						18"	$ 1,076,000.00
15	Vogt Street to North Mentzer Road			X					21"	$ 1,201,000.00
16	Vogt Street from East Knoll to Trunk Sewer			X					8"	$ 385,000.00
17	East Knoll (Emerald Court, Briarwood Ln) Sewer Service			X					8"	$ 1,041,000.00
18	Tullymore, Wicklow, Mackenzie, Morgan, and Singer Hill Infills			X					8"	$ 1,770,000.00
19	Trunk to (Tullymore, Wicklow, Mackenzie, Morgan, Singer Hill)			X					12"	$ 497,000.00
20	Along County Home Road (From RR to NW Trunk (N&S Legs)		X						15"	$ 2,259,000.00
21	County Home Road to Vogt Street								18"	$ 1,620,000.00
22	North of Epic Event Center to County Home Road		X						15"	$ 1,153,000.00
23	From Eagle View Development to North Limits FLUM		X						18"	$ 2,083,000.00

** Costs do not include inflation rates are are based on current estimated project costs at the time of the SFGO report preparation in 2020. Costs should be inflated to construction-year amounts at the time of project and CIP budgeting.*

*** Depending on the development use and design, the City may be responsible for some pipe material upsizing costs*

7/19/2020
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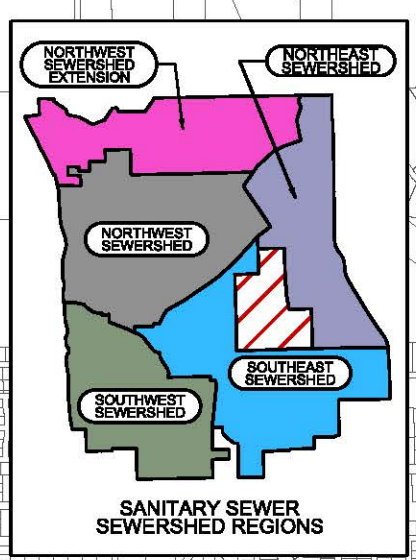
MIDWAY ROAD
SS-1
SS-2
KINGS WAY
COUNTY HOME ROAD
TUMA SOCCER COMPLEX
C AVENUE
DRY CREEK
CEDAR VALLEY NATURE TRAIL
QUASS ROAD
NORTH TROY ROAD
NORTH MENTZER ROAD
WEST MAIN STREET
EAST MAIN STREET
SOUTH MENTZER ROAD
CENTER POINT ROAD
I-380
TOWER TERRACE ROAD
STAMY ROAD
ROBINS ROAD



SANITARY SEWER SEWERSHED REGIONS

LEGEND
- 27" GRAVITY MAIN
- 24" GRAVITY MAIN
- 21" GRAVITY MAIN
- 18" GRAVITY MAIN
- 15" GRAVITY MAIN
- 12" GRAVITY MAIN
- 18" FORCE MAIN
- 12" FORCE MAIN
- 8" FORCE MAIN
- 6" FORCE MAIN
- WATERSHED AREA BOUNDARY
- WATERSHED SUB-AREA BOUNDARY
- RAILROAD TRACK
- EXISTING LIFT STATION
- PROPOSED LIFT STATION

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Wastewater Collection System - Short Term Goals

SFGO Infrastructure Inventory | Figure 19 | Robins, Iowa | 03/24/2020

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MIDWAY ROAD
SS-1
SS-5
SS-3
SS-4
SS-2
KINGS WAY
COUNTY HOME ROAD
QUASS ROAD
CEDAR VALLEY NATURE TRAIL
NORTH TROY ROAD
NORTH MENTZER ROAD
C AVENUE
TUMA SOCCER COMPLEX
DRY CREEK
WEST MAIN STREET
EAST MAIN STREET
SOUTH MENTZER ROAD
CENTER POINT ROAD
I-380
TOWER TERRACE ROAD
STAMY ROAD
ROBINS ROAD

NORTHWEST SEWERSHED EXTENSION
NORTHEAST SEWERSHED
NORTHWEST SEWERSHED
SOUTHEAST SEWERSHED
SOUTHWEST SEWERSHED

SANITARY SEWER SEWERSHED REGIONS

LEGEND

- 27" GRAVITY MAIN
- 24" GRAVITY MAIN
- 21" GRAVITY MAIN
- 18" GRAVITY MAIN
- 15" GRAVITY MAIN
- 12" GRAVITY MAIN
- 18" FORCE MAIN
- 12" FORCE MAIN
- 8" FORCE MAIN
- 6" FORCE MAIN
- WATERSHED AREA BOUNDARY
- WATERSHED SUB-AREA BOUNDARY
- RAILROAD TRACK
- EXISTING LIFT STATION
- PROPOSED LIFT STATION

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Wastewater Collection System - Intermediate Goals

SFGO Infrastructure Inventory | Figure 20 | Robins, Iowa | 03/24/2020

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MIDWAY ROAD
SS-1
SS-5
SS-3
SS-4
SS-7
SS-2
KINGS WAY
SS-6
COUNTY HOME ROAD
QUASS ROAD
CEDAR VALLEY NATURE TRAIL
NORTH TROY ROAD
NORTH MENTZER ROAD
C AVENUE
TUMA SOCCER COMPLEX
DRY CREEK
WEST MAIN STREET
SS-8
SS-9
I-380
CENTER POINT ROAD
SOUTH MENTZER ROAD
EAST MAIN STREET
TOWER TERRACE ROAD
STAMY ROAD
ROBINS ROAD

NORTHWEST SEWERSHED EXTENSION
NORTHEAST SEWERSHED
NORTHWEST SEWERSHED
SOUTHEAST SEWERSHED
SOUTHWEST SEWERSHED

SANITARY SEWER
SEWERSHED REGIONS

LEGEND

- 27" GRAVITY MAIN
- 24" GRAVITY MAIN
- 21" GRAVITY MAIN
- 18" GRAVITY MAIN
- 15" GRAVITY MAIN
- 12" GRAVITY MAIN
- 18" FORCE MAIN
- 12" FORCE MAIN
- 8" FORCE MAIN
- 6" FORCE MAIN
- WATERSHED AREA BOUNDARY
- WATERSHED SUB-AREA BOUNDARY
- RAILROAD TRACK
- EXISTING LIFT STATION
- PROPOSED LIFT STATION

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Wastewater Collection System - Long Term Goals

SFGO Infrastructure Inventory | Figure 21 | Robins, Iowa | 03/24/2020

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NORTHWEST WATERSHED EXTENSION 1041 ACRES
NORTHWEST WATERSHED SS AREAS A-E
NORTHEAST WATERSHED 993 ACRES
SOUTHWEST WATERSHED 1105 ACRES
SOUTHEAST WATERSHED 1375 ACRES

SS - X TOTAL AREA 281 ACRES
SS - W TOTAL AREA 175 ACRES
SS - U TOTAL AREA 221 ACRES
SS - T TOTAL AREA 364 ACRES
SS - S TOTAL AREA 129 ACRES
SS - R TOTAL AREA 359 ACRES
SS - Q TOTAL AREA 154 ACRES
SS - P TOTAL AREA 191 ACRES
SS - N TOTAL AREA 160 ACRES
SS - M TOTAL AREA 335 ACRES
SS - L TOTAL AREA 571 ACRES
SS - K TOTAL AREA 469 ACRES
SS - J TOTAL AREA 22 ACRES
SS - I TOTAL AREA 415 ACRES
SS - H TOTAL AREA 403 ACRES
SS - G TOTAL AREA 210 ACRES
SS-F TOTAL AREA 55 ACRES

SS-1
SS-2
SS-3
SS-4
SS-5
SS-6
SS-7
SS-8
SS-9
SS-10
SS-11
SS-12
SS-13
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SS-17
SS-18
SS-19
SS-20
SS-21
SS-22
SS-23

MIDWAY ROAD
COUNTY HOME ROAD
KINGS WAY
QUASS ROAD
CEDAR VALLEY NATURE TRAIL
NORTH TROY ROAD
NORTH MENTZER ROAD
SOUTH MENTZER ROAD
C AVENUE
DRY CREEK
EAST KNOLL ROAD
WEST MAIN STREET
EAST MAIN STREET
CENTER POINT ROAD
I-380
TOWER TERRACE ROAD
STAMY ROAD
ROBINS ROAD
TUMA SOCCER COMPLEX

NORTHWEST SEWERSHED EXTENSION
NORTHEAST SEWERSHED
NORTHWEST SEWERSHED
SOUTHEAST SEWERSHED
SOUTHWEST SEWERSHED
SANITARY SEWER SEWERSHED AREAS

LEGEND
- 27" GRAVITY MAIN
- 24" GRAVITY MAIN
- 21" GRAVITY MAIN
- 18" GRAVITY MAIN
- 15" GRAVITY MAIN
- 12" GRAVITY MAIN
- 8" GRAVITY MAIN
- 18" FORCE MAIN
- 12" FORCE MAIN
- 6" FORCE MAIN
- SEWERSHED REGION BOUNDARY
- SEWERSHED SUB-REGION BOUNDARY
- RAILROAD TRACK
- EXISTING LIFT STATION
- PROPOSED LIFT STATION
- QUARRY/ NOT SUITED FOR DEVELOPMENT

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Wastewater Collection System - Ultimate Buildout

SFGO Infrastructure Inventory | Figure 22 | Robins, Iowa | 03/24/2020

7/19/2020
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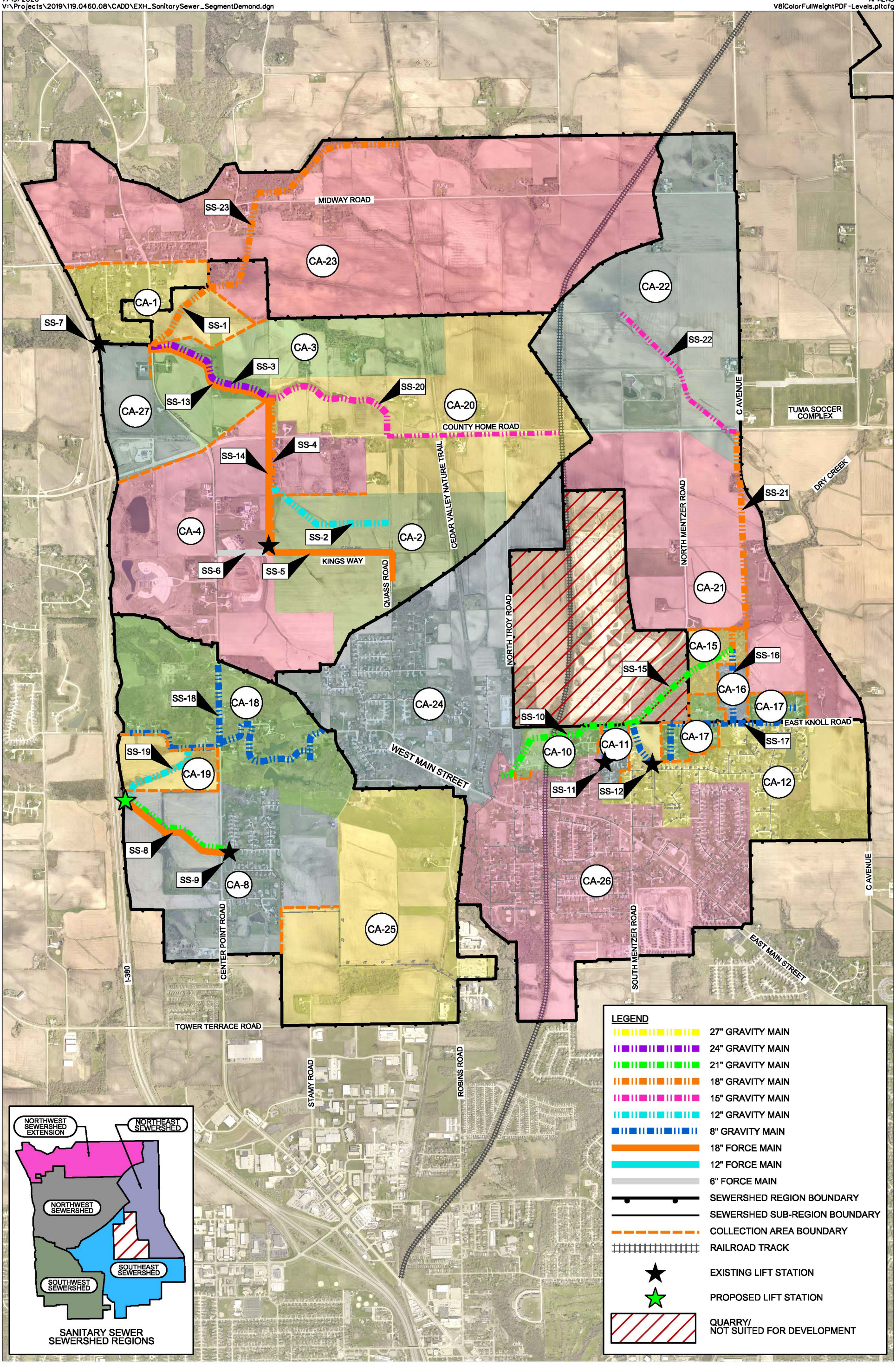

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Wastewater Collection System - Collection Areas

SFGO Infrastructure Inventory | Figure 23 | Robins, Iowa | 03/24/2020

4.7 Financial Review

Keeping up with infrastructure demands is a complex challenge for most communities. Understanding available funding sources is key to the success of new economic development and infrastructure improvement projects. The funding environment is fluid and always changing. The following information is not necessarily limited to but does provide several examples of different kinds of funding sources as they are available today for wastewater improvement projects.

Revenue

Collecting and using revenue associated with the sanitary sewer system offers multiple options to cover the cost of improvements. There are different ways to justify a fee and calculate how fees will produce revenue. Fees can be based on usage of existing users, new users, and future users.

System Usage Fees

Implementing flat rate user fees based on usage is possible but limited as the City of Cedar Rapids provides the actual treatment of wastewater for the City of Robins.

System Connection Fees

Enforcing a flat rate connection fee to new users wanting to connect to the existing sanitary sewer system providing them with sewer service is another way to offset the costs of improvements. This type of fee is currently being enforced by the city and Table 25: City of Robins 2020 Sanitary Sewer Connection Fees below outlines the current fee structure. These values are independent of a specific improvement and are billed equally according to a given new user based on the zoning classification they fall under.

Table 25: **City of Robins 2020 Sanitary Sewer Connection Fees**

ZONING CLASSIFICATION	FEE AMOUNT	COMMENTS	CODE SECTION
Single-Family Residential	$910/lot	Offsets Fire Protection & Infrastructure Cost	Chapter 100 Ord. 100.6
Multi-Family Residential	$870/unit		
Commercial	$3,000/acre		
Industrial	$9,500/acre		

Improvement Utilization Fees

Sanitary sewer connection fees based on infrastructure improvements can be billed to individual users or sewer districts benefitting from the specific improvement as another way to offset improvement expenses. This type of fee structure can be used with both existing and new users. It is solely based on improvements so if an improvement does not immediately benefit an individual user or sewer district and won't at some point in the future, that user or district would not need to participate in that particular improvement payback.

Fees not based on actual usage can be calculated using DNR accepted design equivalents per user to estimate fees per sewer district, development, or individual parcel. This would be similar to how system improvement design recommendations were completed in preparation of this Comprehensive Infrastructure Plan.

Taxation

Tax revenue is the most commonly used source for local infrastructure financing including sales, property, and sometimes income or wage taxes.

TIF

Tax Incremental Financing (TIF) is a financing method used to promote economic development and redevelopment. It enables local governments to undertake improvement projects or offer subsidies to sponsor economic development by capturing future incremental revenue. TIF is one of the most popular economic development tools used by local governments and can be used for a variety of purposes such as utility infrastructure improvements, streetscape upgrades, and creation of parks and greenways. Property taxes are the most common financing source for TIF. Local governments may also create an ordinance to establish a TIF district using sales or utility taxes as the source.

Water & Waste Disposal Loan & Grant Program

US Department of Agriculture's Water & Waste Disposal Loan & Grant program provides long-term, low interest funding that is sometimes combined with grant funds for clean and reliable drinking water systems, sanitary sewage disposal, sanitary solid waste disposal, and storm water drainage to households and businesses in eligible rural areas and towns with populations of 10,000 or less.

For additional information:
https://www.rd.usda.gov/programs-services/water-waste-disposal-loan-grant-program

SRF

State Revolving Funds (SRF) have been developed and implemented by the Iowa Department of Natural Resources (IDNR) to offer municipality's financial assistance for a wide range of water infrastructure projects. Through a powerful partnership with the state, the program is partially funded by the US Environmental Protection Agency (EPA) Clean Water State Revolving Fund (CWSRF).

The Clean Water SRF funds wastewater treatment, sewer rehabilitation, and storm water quality improvements, as well as nonpoint source projects. Publicly owned wastewater treatment works, including those owned by cities, counties, sanitary districts, and utility management organizations, are eligible. For nonpoint source projects, both public and private entities are eligible, including farmers, landowners, watershed organizations, landfills and rural homeowners.

Iowa's SRF program offers multiple types of loans:

Construction Loans

- Loans are 1.75% for up to 20 years
- Origination fee is 0.5%
- Servicing fee is 0.25%
- Extended financing up to 30 year is available for some loans

Planning & Design Loans

- Loans are zero percent for up to three years
- No initiation or servicing fees
- No minimum or maximum loan amount
- Loans may be rolled into an SRF Construction Loan or repaid when permanent financing is obtained

Nonpoint Source Loans

- Qualified projects include:
- Construction of treatment plants or improvements to existing facilities
- Water line extensions to existing unserved properties
- Water storage facilities
- Wells
- Low interest loans for public and private borrowers

Wastewater and Drinking Water Treatment Financial Assistance Fund

As a result of new programs created by the Iowa Water Quality Bill (SF512), grants will be awarded annually and used for improvements to wastewater and drinking water treatment facilities, including source water protection projects. The maximum grant award is $500,000. Priority is to be given to disadvantaged communities, projects that will significantly improve water quality in their watershed, projects that use alternative wastewater treatment technologies (all projects proposing alternative technologies must be approved by DNR), communities with the highest sewer or water rates, projects that use technology to address nutrient reduction, and projects that will improve source waters for drinking water utilities.

For additional information regarding SRF financing:
http://www.iowasrf.com/about_srf/srf-resources/

TRANSPORTATION NETWORK

5. TRANSPORTATION NETWORK

5.1 Purpose and Scope

Transportation networks are a vital component of community infrastructure. Having a Comprehensive Infrastructure Plan that accounts for the technical and social impacts of community corridors is essential to a community's vibrancy and attractive nature. This section of the report identifies future collector and arterial streets. It also includes a summarization of design requirements such as typical sections, right-of-way widths, and sidewalk/sidepath/trail widths and locations. As roadwork network expansion and improvements are typically driven by development and reactive to increases in travel demand, specific project prioritization and a cost analysis was not included as part of this project and therefore is not included in this infrastructure system section of the plan.

5.2 Design Criteria - Roadway & Streets

The classifying of streets and highways is necessary for communication among engineers, administrators, and the general public. Streets can be classified based upon major geometric features (e.g. freeways, streets, and highways), route numbering (e.g. U.S., State, and County), or Administrative classification (e.g. National Highway System or Non-National Highway System).

However, functional classification, the grouping of streets and highways by the character of service they provide, was developed specifically for transportation planning purposes and is the predominant method of classifying streets for design purposes. For urban areas, the functional classification hierarchy consists of major arterials, minor arterials, collectors, and local streets.

The streets information contained in this section is based on American Association of State and Highway and Transportation Officials (AASHTO) criteria. The Project Engineer should use the various AASHTO publications and particularly the current edition of AASHTO's "Green Book" to verify the application of values provided herein when complex design conditions or unusual situations occur.

Arterial Streets

Major (Principal) Arterial

The major arterial (referred to as a principal arterial by AASHTO) serves the major center of activities of urbanized areas, the highest traffic volume corridors, the longest trip, and carries a high proportion of a total urban travel on a minimum of mileage. The system should be integrated both internally and between major rural connections.

The major arterial system carries most of the trips entering and leaving the area as well as most of the through movements bypassing the central city. In addition, significant intra-area travel such as between central business districts and outlining residential areas, between major inner-city communities, and between major suburban centers, is served by major arterials. Frequently, the major arterial carries important intra-urban as well as inter-city bus routes. Finally, in urbanized areas, this system provides continuity for all rural arterials that intercept the urban boundary.

Access to private property from the major arterial is specifically limited in order to provide maximum capacity and through movement mobility. Although, no firm spacing rule applies in all or even in most circumstances, the spacing between major arterials may vary from less than 1 mile in highly developed central areas to 5 miles or more in developed urban fringes.

Minor Arterial

The minor arterial inter-connects with and augments the major arterial system. It accommodates trips of moderate length at a somewhat lower level of travel mobility than major arterials. This system places more emphasis on land access but still has specific limits on access points. A minor arterial may carry local bus routes and provide intra-community continuity but ideally does not penetrate identifiable neighborhoods. This system includes urban connections to rural collector roads where such connections have not been classified as urban major arterials.

The spacing of minor arterials may vary from 1/8 to 1/2 mile in highly developed areas to 2 to 3 miles in suburban fringes but is not normally more than 1 mile in fully developed areas.

Collector Streets

The collector street system provides both land access and traffic circulation within residential neighborhoods and commercial and industrial areas. It differs from the arterial system in that facilities on the collector system may penetrate residential neighborhoods, distributing trips from the arterials through the area to their ultimate destinations. Conversely, the collector street also collects traffic from local streets in residential neighborhoods and channels it into the arterial system. In the central business district, and in other areas of similar development and traffic density, the collector system may include the entire street grid.

Major Collector

This type of street provides for movement of traffic between arterial routes and minor collectors and may collect traffic, at moderately lower speeds, from local streets and residential and commercial areas. A major collector has control of access to abutting properties with a majority of access at local street connections. Normally, a slightly higher emphasis is placed on through movements than direct land access.

Minor Collector

This type of street provides movement of traffic between major collector routes and residential and commercial local streets as well as providing access to abutting property at moderate low speeds. Consideration for through movements and direct land access is normally equal.

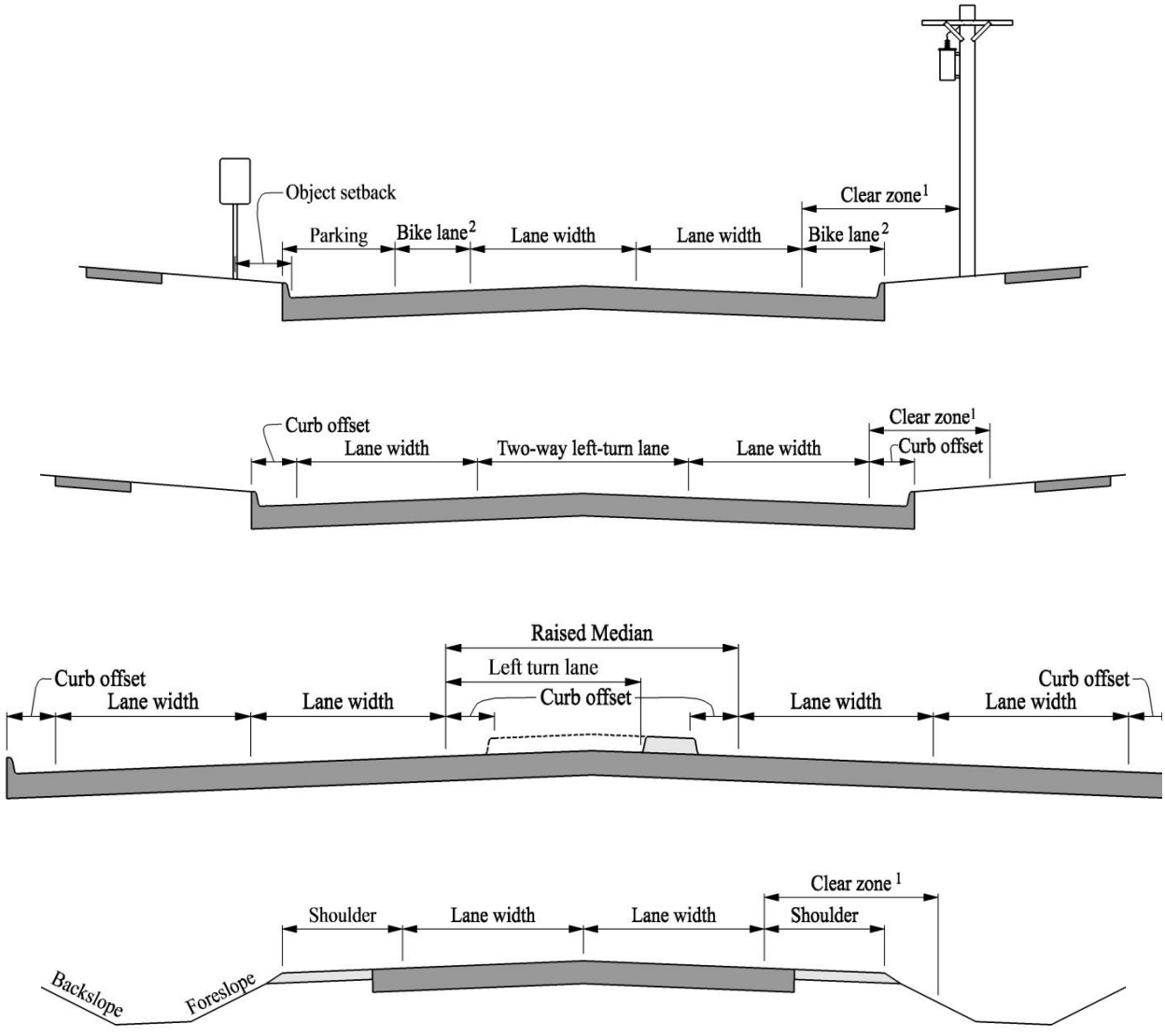
Local Streets

Local streets allow direct access to abutting land and connections to the higher order street systems. They offer the lowest level of mobility and deliberately discourage major through traffic movements.

Private Streets

Certain Jurisdictions allow private streets in specific situations. Private streets are similar to the local streets but generally are located on dead-end roads less than 250 feet in length, short loop streets less than 600 feet in length, or frontage roads parallel to public streets. Design criteria for local private streets are not included in this manual. The Jurisdiction should be contacted to determine if they are allowed.

The following figures illustrate the location of various design elements of the roadway cross-section as specified in Figure 24: SUDAS Chapter 5 – Roadway Design Figure 5C-1.01.



[1] Clear zone is measured from the edge of the traveled way.
[2] See Chapter 12 for bike lane requirements.

Figure 24: SUDAS Chapter 5 – Roadway Design Figure 5C-1.01
Roadway Design Elements

Table 26: SUDAS Chapter 5 – Roadway Design Table 5C-1.01

DESIGN ELEMENT	LOCAL		COLLECTOR		ARTERIAL	
	Res.	*C/I*	*Res.*	*C/I*	*Res.*	*C/I*
General						
Design level of service[1]	D	D	C/D	C/D	C/D	C/D
Lane width (single lane) (ft)[2]	10.5	12	12	12	12	12
Two-way left-turn lanes (TWLTL) (ft)	N/A	N/A	14	14	14	14
Width of new bridges (ft)[3]	See Footnote 3					
Width of bridges to remain in place (ft)[4]	----------	----------	----------	----------	----------	----------
Vertical clearance (ft)[5]	14.5	14.5	14.5	14.5	16.5	16.5
Object setback (ft)[6]	3	3	3	3	3	3
Clear zone (ft)	Refer to Table 5C-1.03, Table 5C-1.04, and 5C-1, C, 1					
Urban						
Curb offset (ft)[7]	2	2	2	3	3	3
Parking lane width (ft)	8	8	8	10	N/A	N/A
Roadway width with parking on one side[8]	26/31[9]	34	34	37	N/A	N/A
Roadway width without parking[10]	26	31	31	31	31	31
Raised median with left-turn lane (ft)[11]	N/A	N/A	19.5	20.5	20.5	20.5
Cul-de-sac radius (ft)	45	45	N/A	N/A	N/A	N/A
Rural Sections in Urban Areas						
Shoulder width (ft)						
ADT: under 400	4	4	6	6	10	10
ADT: 400 to 1,500	6	6	6	6	10	10
ADT: 1,500 to 2000	8	8	8	8	10	10
ADT: above 2,000	8	8	8	8	10	10
Foreslope (H:V)	4:1	4:1	4:1	4:1	6:1	6:1
Backslope (H:V)	4:1	4:1	4:1	4:1	4:1	4:1

Res. = Residential, C/I = Commercial/Industrial

Table 27: Preferred Roadway Elements Related to Design Speed

DESIGN ELEMENT	DESIGN SPEED, mph[12]							
	25	*30*	*35*	*40*	*45*	*50*	*55*	*60*
Stopping sight distance (ft)	155	200	250	305	360	425	495	570
Passing sight distance (ft)	900	1090	1,280	1,470	1,625	1,835	1,985	2,135
Min. horizontal curve radius (ft)[13]	198	333	510	762	1,039	926	1,190	1,500
Min. vertical curve length (ft)	50	75	105	120	135	150	165	180
Min. rate of vertical curvature, Crest (K)[14]	18	30	47	71	98	136	185	245
Min. rate of vertical curvature, Sag (K)	26	37	49	64	79	96	115	136
Minimum gradient (percent)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Maximum gradient (percent)	5	5	5	5	5	5	5	5

Note: For federal-aid projects, documentation must be provided to explain why the preferred values are not being met. For non-federal aid projects, the designer must contact the Jurisdiction to determine what level of documentation, if any, is required prior to utilizing design values between the "Preferred" and "Acceptable" tables.

[1] Number of traffic lanes, turn lanes, intersection configuration, etc. should be designed to provide the overall specified LOS at the design year ADT. Two LOS values are shown for collectors and arterials. The first indicates the minimum overall LOS for the roadway as a whole; the second is the minimum LOS for individual movements at intersections.

[2] Width shown is for through lanes and turn lanes.

[3] Bridge width is measured as the clear width between curbs or railings. Minimum bridge width is based upon the width of the traveled way (lane widths) plus 4 feet clearance on each side; but no less than the curb-face to curb- face width of the approaching roadway. Minimum bridge widths do not include medians, turn lanes, parking, or sidewalks. At least one sidewalk should be extended across the bridge.

[4] See Table 5C-1.02, for acceptable values for width of bridges to remain in place.

[5] Vertical clearance includes a 0.5 foot allowance for future resurfacing.

[6] Object setback does not apply to mailboxes constructed and installed according to US Postal Service regulations, including breakaway supports.

[7] Values shown are measured from the edge of the traveled way to the back of curb. Curb offset is not required for turn lanes. On roadways with an anticipated posted speed of 45 mph or greater, mountable curbs are required. For pavements with gutterline jointing, the curb offset should be equal to or greater than the distance between the back of curb and longitudinal gutterline joint.

[8] Parking is allowed along one side of local or collector streets unless restricted by the Jurisdiction. Some jurisdictions allow parking on both sides of the street. When this occurs, each jurisdiction will set their own standards to allow for proper clearances, including passage of large emergency vehicles. Parking is normally not allowed along arterial roadways.

[9] For local, low volume residential streets, two free flowing lanes are not required and a 26 foot or 31 foot (back to back) roadway may be used where parking is allowed on one side or both sides respectively. For higher volume residential streets, which require two continuously free flowing traffic lanes, a 31 foot or 37 foot roadway should be used for one sided or two sided parking respectively.

[10] Some minimum roadway widths have been increased to match standard roadway widths. Unless approved by the Jurisdiction, all two lane roadways must comply with standard widths of 26, 31, 34, or 37 feet.

[11] Median width is measured between the edges of the traveled way of the inside lanes and includes the curb offset on each side of the median. Values include a left turn lane with a 6 foot raised median as required to accommodate a pedestrian access route (refer to Chapter 12) through the median (crosswalk cut through). At locations where a crosswalk does not cut through the median, the widths shown can be reduced by 2 feet to provide a 4 foot raised median.

[12] It is preferred to select a design speed that is at least 5 mph greater than the anticipated posted speed limit of the roadway. Selecting a design speed equal to the posted speed limit may also be acceptable and should be evaluated on a project by project basis, subject to approval of the Engineer.

[13] Values for low design speed (<50 mph) assume no removal of crown (i.e. negative 2% superelevation on outside of curve). Radii for design speeds of 50 mph or greater are based upon a superelevation rate of 4%. For radii corresponding to other superelevation rates, refer to the AASHTO's "Green Book."

[14] Assumes stopping sight distance with 6 inch object.

5.3 Design Criteria - Trails

A thoughtfully planned bicycle, trail, and sidepath network increases safety, provides users with a more enjoyable experience, and achieves more direct connectivity throughout the community.

Definitions

The following definitions are from the "AASHTO Guide for the Development of Bicycle Facilities" (or AASHTO Bike Guide).

Bicycle Boulevard
A street segment, or series of contiguous street segments, that has been modified to accommodate through bicycle traffic and minimize through motor traffic.

Bicycles Facilities
A general term denoting improvements and provisions to accommodate or encourage bicycling, including parking and storage facilities, and shared roadways not specifically defined for bicycle use.

Bicycle Lane or Bike Lane
A portion of roadway that has been designated for preferential or exclusive use by bicyclists by pavement markings and, if used, signs. It is intended for one-way travel, usually in the same direction as the adjacent traffic lane, unless designed as a contra-flow lane.

Bicycle Route
A roadway or bikeway designated by the jurisdiction having authority, either with a unique route designation or with BIKE ROUTE signs, along which bicycle guide signs may provide directional and distance information. Signs that provide directional, distance, and destination information for bicyclists do not necessarily establish a bicycle route.

Bicycle Network
A system of bikeways designated by the jurisdiction having authority. This system may include bike lanes, bicycle routes, shared use paths, and other identifiable bicycle facilities.

Shared Lane
A lane of a traveled way that is open to both bicycle and motor vehicle travel.

Shared Lane Marking
A pavement marking or symbol that indicates an appropriate bicycle positioning in a shared lane

Shared Use Path
A bikeway physically separated from motor vehicle traffic by an open space or barrier and either within the highway right-of-way or within an independent right-of-way. Shared use paths may also be used by pedestrians, skaters, wheelchair users, joggers, and other non-motorized users. Most shared use paths are designed for two-way travel.

Sidepath
A shared use path located immediately adjacent and parallel to a roadway

Facility Type

Choosing an appropriate facility type refer to Table 28: National Association of City Transportation Officials – Urban Bikeway Design Guide. Additional information outside this report may be found in the AASHTO Bike Guide.

Table 28: National Association of City Transportation Officials – Urban Bikeway Design Guide

<table>
<tr><th colspan="4">ROADWAY CONTEXT</th><th rowspan="2">ALL AGES & ABILITIES BICYCLE FACILITY</th></tr>
<tr><th>Target Motor Vehicle Speed*</th><th>Target Motor Vehicle Volume (ADT)</th><th>Motor Vehicle Lanes</th><th>Key Operational Considerations</th></tr>
<tr><td colspan="2">Any</td><td>Any</td><td>Any of the following: high curbside activity, frequent buses, motor vehicle congestion, or turning conflicts</td><td>Protected Bicycle Lane</td></tr>
<tr><td>< 10 mph</td><td>Less relevant</td><td rowspan="2">No centerline, or single lane one-way</td><td>Pedestrians share the roadway</td><td>Shared Street</td></tr>
<tr><td>≤ 20 mph</td><td>≤ 1,000 – 2,000</td><td rowspan="2">< 50 motor vehicles per hour in the peak direction at peak hour</td><td rowspan="2">Bicycle Boulevard</td></tr>
<tr><td rowspan="5">≤ 25 mph</td><td>≤ 500 – 1,000</td></tr>
<tr><td>≤ 1,500 – 3,000</td><td rowspan="3">Single lane each direction, or single lane one-way</td><td rowspan="4">Low curbside activity, or low congestion pressure</td><td>Conventional or Buffered Bicycle Lane, or Protected Bicycle Lane</td></tr>
<tr><td>≤ 3,000 – 6,000</td><td>Buffered Bicycle Lane, or Protected Bicycle Lane</td></tr>
<tr><td>Greater than 6,000</td><td rowspan="2">Protected Bicycle Lane</td></tr>
<tr><td>Any</td><td>Multiple lanes per direction</td></tr>
<tr><td rowspan="3">Greater than 26 mph</td><td rowspan="2">≤ 6,000</td><td>Single lane each direction</td><td rowspan="2">Low curbside activity, or low congestion pressure</td><td>Protected Bicycle Lane, or Reduce Speed</td></tr>
<tr><td>Multiple lanes per direction</td><td>Protected Bicycle Lane, or Reduce to Single Lane & Reduce Speed</td></tr>
<tr><td>Greater than 6,000</td><td>Any</td><td>Any</td><td>Protected Bicycle Lane</td></tr>
<tr><td colspan="2" rowspan="2">High-speed limited access roadways, natural corridors, or geographic edge conditions with limited conflicts</td><td rowspan="2">Any</td><td>High pedestrian volume</td><td>Bike Path with Separate Walkway or Protected Bicycle Lane</td></tr>
<tr><td>Low pedestrian volume</td><td>Shared-Use Path or Protected Bicycle Lane</td></tr>
</table>

* *While posted or 85th percentile motor vehicle speed are commonly used design speed targets, 95th percentile speed captures high-end speeding, which causes greater stress to bicyclists and more frequent passing events. Setting target speed based on this threshold results in a higher level of bicycling comfort for the full range of riders.*

Guide to Concrete Trails

In August of 2019, the National Concrete Pavement Technology Center and Iowa State University with Snyder & Associates published a Guide to Concrete Trails which can be found at the link below: https://intrans.iastate.edu/app/uploads/2019/08/concrete_trails_guide.pdf

5.3 Roadway Recommendations

Roadway improvements are typically generated as a result of increased traffic volumes which cause a reduction in the roadway's level of service, or improvements are necessitated as roadway surfacing deteriorates over time. This section of the document should be utilized as a planning tool when segments of the City's core roadway system level of service come into question and improvements are being considered. This portion of the document may also be used when roadway surface deterioration requires maintenance work or full reconstruction to determine if any expansion elements would be feasible.

When there becomes an observable concern of the level of service on a segment of the City's core streets network, or if one can be forecasted, the City of Robins may consider completion of a traffic study of the region in question, or of a broader network to determine appropriate measures of proposed improvements.

As development occurs along the corridors identified as being part of the City of Robins' core roadway network, the City should coordinate amongst its Engineering Division, Planning and Zoning, and City staff and officials to ensure that any desired future right-of-way width is dedicated as part of the subdivision and development process. These proposed future right-of-way widths may also be used when considering site improvements plans and when issuing building permits.

The proposed future roadway sections should be utilized when preparing long range planning documents and funding applications through the Corridor MPO and other potential project funding sources.

Refer to Exhibit 54 in Appendix A for a complete compilation of cross-section like the example in Figure 25: East Knoll Drive Widening.

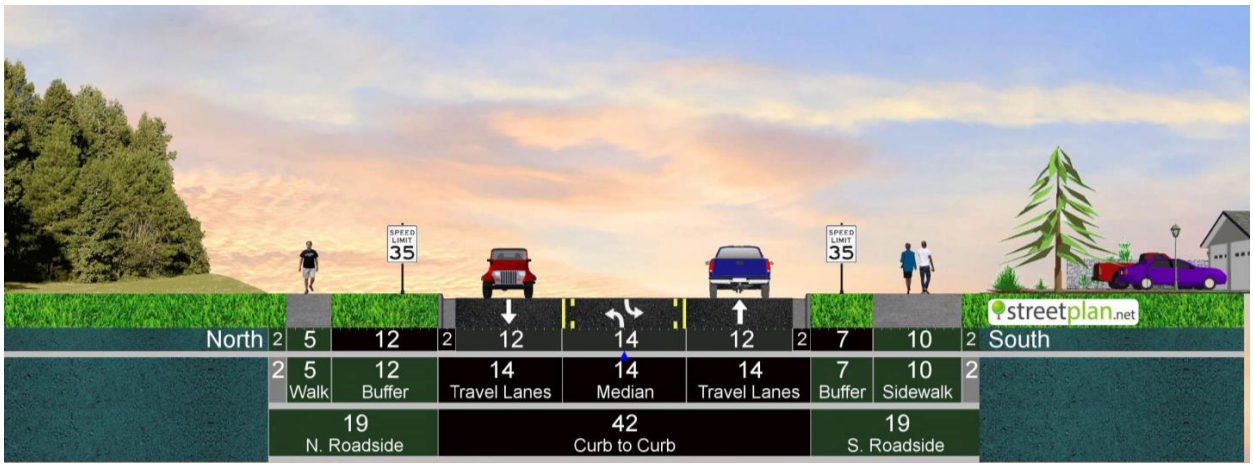


Figure 25: East Knoll Drive Widening

North Mentzer Road to C Avenue NE

80' ROW | 35 MPH | CLASSIFICATION: Collector | LAND USE : Residential & Public

Table 29: Transportation Network Analysis Summary & Recommendations

TRANSPORTATION NETWORK - ANALYSIS SUMMARY & RECOMMENDATIONS															
Street Name	Limits		Land Use	Classification	Existing R/W Width	Proposed Typ. R/W Width	Pavement Width (B-B)	Thru Lane Widths	TWTL Width	On-Street Bike Facilities		Parkway Width		Pedestrian Facilities**	
	From	To								Bike Lanes	Shared Lanes	Left	Right	Left	Right
North Center Point Road	Tower Terrace Road	Midway Road	C-2/R-1/R-2	Major Arterial	80-110	100	44	12	14	-	-	21	16	5	10
Tower Terrace Road	N Center Point Road	Robins Road	C-2/I-2	Major Arterial	120	120	82*	11	-	-	-	14	14	10	10
Tower Terrace Road	Robins Road	Council Street NE	R-3/R-4	Major Arterial	-	120	82*	11	-	-	-	14	14	10	10
Kings Way	N Center Point Road	Quass Road	R-2/P-1/C-2	Minor Arterial	70	70	34	12	-	-	5	6	11	10	5
Midway Road	Midway Road	Quass Road Ext.	R-2	Minor Arterial	66	76	34	12	-	-	5	14	14	5	5
North Mentzer Road	E Main Street	County Home Road	R-2	Minor Arterial	66	80	34	12	-	-	-	16	11	5	10
Quass Road	W Main Street	County Home Road	R-2	Minor Arterial	66	80	34	12	-	-	-	16	11	5	10
Quass Road Ext.	County Home Road	Midway Road	R-2	Minor Arterial	-	80	34	12	-	-	-	16	11	5	10
Robins Road	Tower Terrace Road	W Main Street	R-2/I-2	Minor Arterial	60-142	80	34	12	-	-	-	16	16	5	5
South Mentzer Road	Freeseway Drive	E Main Street	R-2	Minor Arterial	62-84	84	44	12	14	-	-	6	9	5	10
West Main Street	N Center Point Road	East of Cedar Valley Nature Trail	R-1/R-2	Minor Arterial	62-70	70	34	12	-	-	5	11	6	5	10
East Knoll Drive	N Mentzer Road	C Ave NE	R-1/P-1	Collector	68	80	42	12	14	-	-	12	7	5	10
North Troy Road	W Main Street	County Home Road	I-2	Collector	66	84	42	12	14	-	-	14	14	5	5
North Troy Road Ext.	County Home Road	Midway Road	R-2	Collector	-	84	42	12	14	-	-	14	14	5	5
South Troy Road	South Troy Park	E Main Street	R-2	Collector	40	60	26	11	-	-	-	5	15	10	-
Stamy Road	Tower Terrace Road	Approx. 2,000 ft. north of Tower Terrace Road	C-2/I-2	Collector	40-66	80	42	12	14	-	-	12	12	5	5
Stamy Road	Approx. 2,000 ft north of Tower Terrace Road	W Main Street	R-2	Collector	-	66	28	12	-	-	-	12	12	5	5
Wild Rose Road	Wildflower Road	Robins Road	R-2	Collector	60	60	28	12	-	-	-	9	9	5	5

** 16 ft of raised median included*

*** Pedestrian Facilities side designations are subject to change at individual project planning and design phase*

7/19/2020
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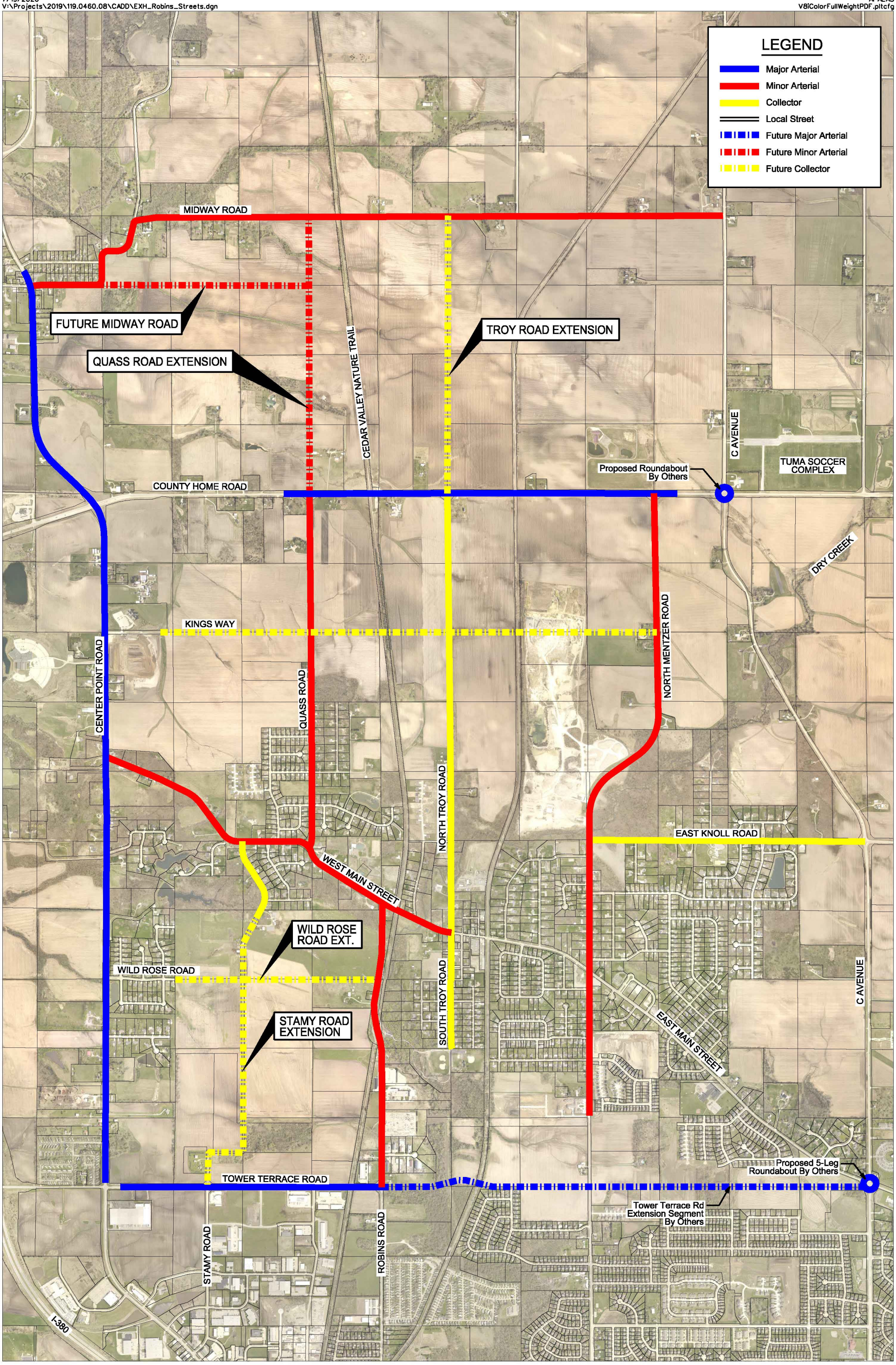


SNYDER & ASSOCIATES

N
NTS

Street Projects

SFGO Infrastructure Inventory | Figure 26 | Robins, Iowa | 03/24/2020

LEGEND

EXISTING TRAIL
FUTURE TRAIL
EXISTING SIDE PATH
FUTURE SIDE PATH
EXISTING ON-STREET
FUTURE ON-STREET
FUTURE ROAD
RAILROAD TRACK

MIDWAY ROAD
FUTURE MIDWAY ROAD
QUASS ROAD EXTENSION
CEDAR VALLEY NATURE TRAIL
TROY ROAD EXTENSION
C AVENUE
TUMA SOCCER COMPLEX
COUNTY HOME ROAD
DRY CREEK
KINGS WAY
CENTER POINT ROAD
QUASS ROAD
NORTH MENTZER ROAD
NORTH TROY ROAD
EAST KNOLL ROAD
WEST MAIN STREET
WILD ROSE ROAD EXT.
WILD ROSE ROAD
STAMY ROAD EXTENSION
SOUTH TROY ROAD
SOUTH MENTZER ROAD
EAST MAIN STREET
C AVENUE
TOWER TERRACE ROAD
STAMY ROAD
ROBINS ROAD
I-380

SNYDER & ASSOCIATES

N
NTS

Trail System

SFGO Infrastructure Inventory | Figure 27 | Robins, Iowa | 03/24/2020

5.4 Financial Review

Having an Infrastructure Improvement Plan is the first step towards successful community growth. Implementing that plan requires funding which isn't always readily available. Navigating and understanding financial resources to fund critical infrastructure projects is essential. The financial field is very dynamic - while some options may expire at some point, new ones will become available. As of the development of this plan, the following financing and funding options summarized below are available for many of the transportation network projects in this plan.

BUILD

The Better Utilizing Investments to Leverage Development (BUILD) is a federally funded, US Department of Transportation Discretionary Grants program. A Notice of Funding Opportunity was first announced in April of 2018. Funds are awarded on a competitive basis to projects for roads, bridges, transit, rail, ports, or intermodal transportation and that provide significant local or regional impact. Merit criteria evaluations include safety, economic competitiveness, quality of life, environmental sustainability, state of good repair, innovation, and partnership. The maximum grant award is $25 million, and no more than $100 million can be awarded to a single State.

In an effort to enhance America's infrastructure, the Federal government has allocated $1 billion in FY 2020. Projects impacting rural areas are more likely to be selected than those impacting urban areas with at least 50% of funds required to be awarded to rural area projects. The current deadline to submit an application is May 18, 2020.

For additional information regarding this grant:
www.transportation.gov/BUILDgrants

Office of Infrastructure Finance and Innovation
Office of the Secretary of Transportation
1200 New Jersey Ave, SE
Washington, DC 20590
United States
Email: BUILDgrants@dot.gov
Phone: 202-366-0301
TTY / Assistive Device Number: 800-877-8339
Business Hours: 8:00am-5:00pm ET, M-F

STBG

Previously known as the Surface Transportation Program (STP), the Surface Transportation Block Grant (STBG) program provides flexible funding that may be used by States and localities for projects to preserve and improve the conditions and performance on any Federal-aid highway, bridge and tunnel projects on any public road, pedestrian and bicycle infrastructure, and transit capital projects, including intercity bus terminals. FY 2020 funding has been estimated to be $12.136 billion.

INFRA

The Infrastructure for Rebuilding America (INFRA) is a US Department of Transportation discretionary grant program for project funding. This program was established in the FAST Act of 2015 to help rebuild America's aging infrastructure. According to a statement released by the US Department of Transportation and updated on January 13th, 2020 – the "INFRA advances a grant program established in the FAST Act of 2015 to help rebuild America's aging infrastructure. INFRA utilizes selection criteria that promote projects with national and regional economic vitality goals while leveraging non-federal funding to increase the total investment by state, local, and private partners. The program also incentivizes project sponsors to pursue innovative strategies, including public-private partnerships. INFRA promotes the incorporation of innovative technology, such as broadband deployment and intelligent transportation systems that will improve our transportation system. INFRA will also hold recipients accountable for their performance in project delivery and operations."

Eligible INFRA project costs may include reconstruction, rehabilitation, acquisition of property (including land related to the project and improvements of the land), environmental mitigation, construction contingencies, equipment acquisition, and operational improvements directly related to system performance. For rural communities in need of funding for highway and multimodal freight projects with national or regional economic significance, INFRA is an opportunity to apply directly for financial assistance from the federal government.

More than $900 million was made available by the US DOT to be awarded to large ($25 million minimum) and small ($5 million minimum) projects with 10% of FY funds dedicated to small projects. With rural areas being awarded 25% of INFRA grant funding. The last round of applications closed February 25, 2020.

For additional information regarding this grant:
www.transportation.gov/INFRA

https://www.transportation.gov/buildamerica/financing/infra-grants/infrastructure-rebuilding-america

Office of the Assistant Secretary for Transportation Policy
1200 New Jersey Ave, SE
Washington, DC 20590
United States
Phone: 202-366-4544
TTY / Assistive Device Number: 800-877-8339
Business Hours: 8:30am-5:00pm ET, M-F

RISE

The Revitalize Iowa's Sound Economy (RISE) funding program was created in 1985 to promote economic development in Iowa through construction or improvement of roads and streets. The program is funded annually with dedicated state motor fuel and special fuel tax revenues. All counties and incorporated cities in Iowa are eligible to apply and receive funds. RISE funds can be used to supplement federal BUILD funding.

There are two types of projects that may be funded, Immediate Opportunity and Local Development projects. Immediate Opportunity projects relate to an immediate, non-speculative opportunity for permanent job creation or retention and have a local match minimum of 20 percent. Local Development projects support local economic development but do not require an immediate commitment of funds and are evaluated on development potential, economic impact, local commitment and initiative, transportation need, and area economic need. The local match is normally 50%. Iowa Certified Sites may be eligible for additional RISE funding depending on the size of the site. There is no minimum or maximum award, typical award amounts have ranged from $50,000 to over $1 million. Application deadlines are February 1 and September 1.

For additional information regarding this grant:
www.iowadot.gov/systems_planning/Grant-Programs/Revitalize-Iowas-Sound-Economy-RISE-Program

Iowa Department of Transportation
Jennifer Kolacia, RISE Program Manager
Systems Planning Bureau
800 Lincoln Way
Ames, Iowa
Phone: 515-239-1738
Email: Jennifer.Kolacia@iowadot.us

A credentialed Iowa Certified Site has relevant site-related data and documentation accumulated and is designated as "development-ready." Certified Sites can be found at the Iowa Economic Development Authority (IEDA) link below.
https://www.iowaeconomicdevelopment.com/aspx/tools/certifiedsites.aspx

Iowa Economic Development Authority
Amy Kuhlers
Phone: 515-348-6250
Email: certsites@iowaeda.com

ICAAP

The Iowa Clean Air Attainment Program (ICAAP)

On January 14, 2020, the Iowa DOT recommended $4 million in funding be awarded to applicants. Award amounts per project ranged from $29,108 to $1,277,370.

For additional information regarding this grant:
https://iowadot.gov/systems_planning/Grant-Programs/Iowa-Clean-Air-Attainment-Program-ICAAP

Iowa Department of Transportation
Iowa Clean Air Attainment Program - Systems Planning Bureau
800 Lincoln Way
Ames, IA 50010
Phone: 515-239-1713
Email: jared.smith@iowadot.us

TIFIA

The Transportation Infrastructure Finance and Innovation Act (TIFIA) program is administered by the US Department of Transportation's Build America Bureau. With a primary goal to enable the construction of large-scale transportation projects by providing financing to complement state, local, railroad, and private investment through long-term, low-interest loans and other types of credit assistance.

Projects eligible include highway and bridges, public transportation, transit-oriented development, intercity passenger bus and rail, intermodal connectors, intermodal freight facilities, and the capitalization of a rural projects fund. $300 million was authorized for FY 2020.

- Loans are available for up to 35 years from the date of substantial completion of a project
- Loan payments may be deferred for up to five years from the date of substantial completion of a project
- Loans can be provided up to a maximum of 49% of project costs although 33% is the maximum amount loaned
- Lines of credit can be for up to a maximum of 33%
- Entity must have a loan repayment program in place

For additional information regarding TIFIA financing assistance:
https://www.transportation.gov/buildamerica/programs-services/tifia

RPI

The TIFIA Rural Project Initiative (RPI) loans provide financing support to smaller communities. Rural communities (located outside an urbanized area with population greater than 150,000) with surface transportation projects between $10 million and $75 million in cost are eligible.

- Fixed interest rate loans available for up to 35 years or longer
- Interest rate can be below market interest rate, which is equal to ½ of the Treasury rate
- Financing can be used in conjunction with other Federal funding and financing up to 80% of project costs

For additional information regarding RPI financing assistance:
https://www.transportation.gov/buildamerica/programs-services/tifia

RTP

Recreational Trails Program

Federal and State Recreational Trails Program
Iowa Department of Transportation
Systems Planning Bureau
800 Lincoln Way
Ames, IA 50010
Phone: 515-239-1252
Email: Scott.Flagg@iowadot.us
Link: https://iowadot.gov/systems_planning/Grant-Programs/-Federal-and-State-Recreational-Trails

MATCH

The Matching Assets To Community Health (MATCH) grant program by The Wellmark Foundation is a challenge grant designed to bring other funders together to support community health projects needing potentially higher levels of funding and collaboration. There are two focus areas to apply for funding – one is access to and the consumption of healthy foods and the other is for safe environments in which to be physically active. The latter is in promotion of built environment approaches for infrastructure and man-made systems, such as community design, parks, trails and other amenities that make it easy to engage in active living, which is likely to increase physical activity for all age groups.

This funding opportunity is available with a Large MATCH Grant for requests up to $100,000 and a Small MATCH Grant for requests up to $25,000. Large grant projects must be completed within two years and matched dollar-for-dollar with cash or in-kind contributions. Small grant projects must be completed within one year and be matched 50 percent with cash or in-kind contributions. Both large and small grant projects must have cash for at least one-half of the matching support.

Large MATCH Grant proposals were due February 21, 2020 with funds being distributed in September of 2020. Small MATCH Grant proposals are due June 5, 2020 with distribution of funds in the following November.

For additional information regarding MATCH funding opportunities:
https://www.wellmark.com/foundation/rfps.html

The Wellmark Foundations
Gina Rooney, Manager
Email: WellmarkFoundation@wellmark.com
Phone: 515-376-6420

INFRASTRUCTURE IMPROVEMENT PROCESS & FLOW CHART

6. DEVELOPMENT INFRASTRUCTURE IMPROVEMENT PROCESS

6.1 Flowchart for Decision Making

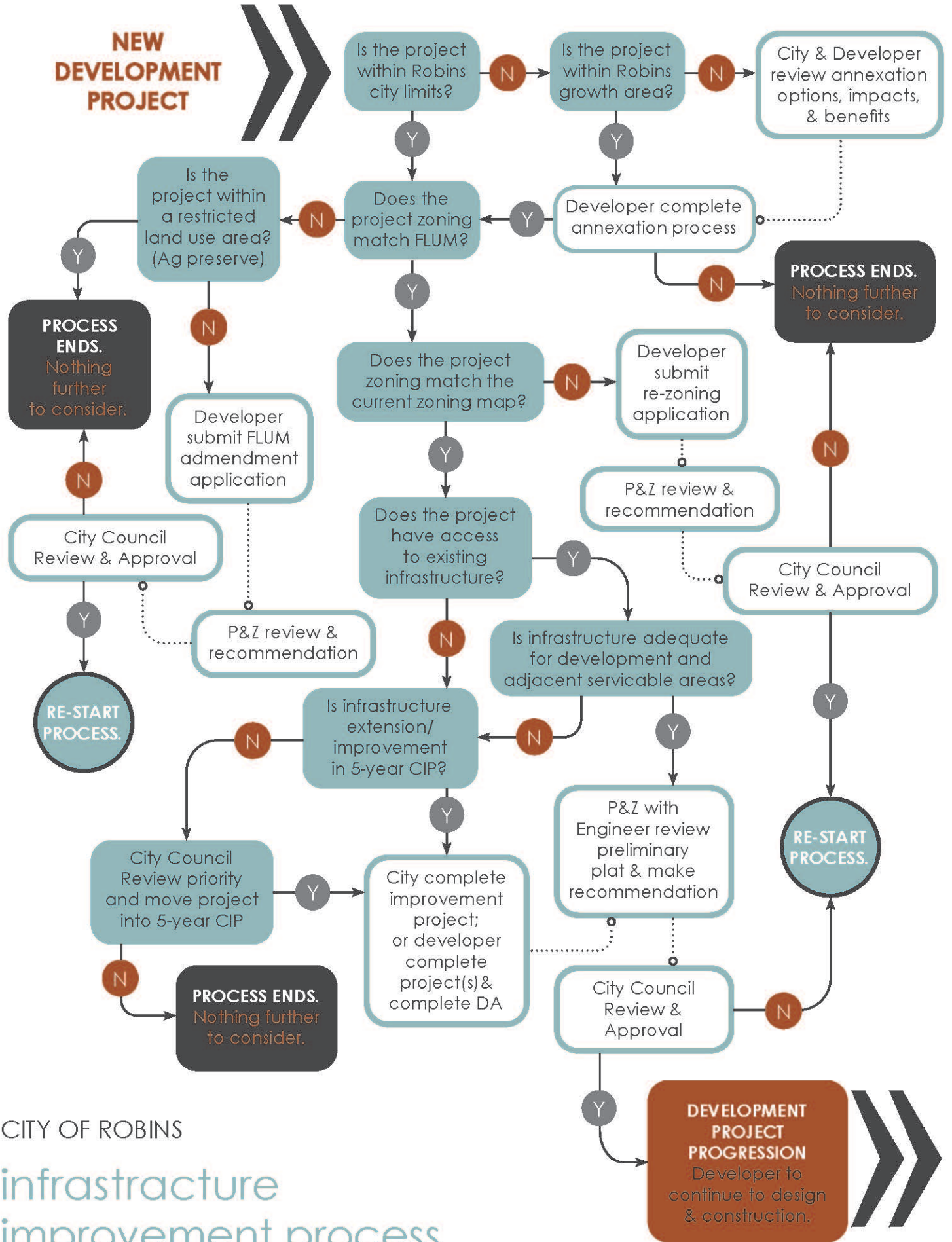
The Development Infrastructure Improvement Process Flow Chart is to be used as an aid to make decisions regarding new development opportunities and proposals based on infrastructure improvements. Improvements include but are not limited to infrastructure improvements including street and transportation networks, sanitary sewer, stormwater collection and management, and water services.

The Development Infrastructure Improvement Process Flow Chart was developed with tiered categorization to help determine how and when to move on to the next set of criteria. Generally speaking Tier I indicates the City is ready and should move on to the next step in the process. Tier II is a more of a hesitation or maybe the City should move forward. Tier III is generally no, or significant discussion will be needed.

General definitions of tiers:

- Tier I
  - Service Available Now or Currently Served
  - Properties that have direct access to the service
- Tier II – Service Nearby
  - Reasonable extension of service
  - Capacity is not a concern unless there are already major issues.
- Tier III – Major Difficulties
  - Beyond 1/4th of a mile
  - Water age is a concern
  - Other major barriers to development

The Flow Chart can be found on the following page.



CITY OF ROBINS

infrastracture improvement process

6.2 Financial Review

Once the City has made it through the flow chart, they can continue considering an infrastructure improvement project by evaluating the financial viability. This may include looking at some or all of the following criteria:

- Current value of the property to be developed.
- Estimated value of the property after development is completed
- Estimated annual tax revenue for the City after development is completed.
- Estimated cost of the infrastructure extension being requested
- City fees to be collected
- SS Dev Fee
- SS Connection Fee
- Water hook-up
- Parkland
- Tier I: 0-5 years
- Tier II: 6-15 years
- Tier III: 16+ years
- How to estimate – (Cost of Infrastructure – Fees to be collected)/ Increase in Annual tax revenue for property