2020 SEWER ACTIVITY REPORT

Prepared by

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M E M O R A N D U M

DATE: February 16, 2021

TO: Sanitary Sewer Technical Committee

FROM: Tim Cowan, P.E., Public Works Director
Adam Shaw, Civil Engineering Technician II

RE: Sewer Activity in the City of Urbana from January 1, 2020 to December 31, 2020

I. INTRODUCTION

The City of Urbana owns, operates, and maintains 542,208 linear feet (102.7 miles) of sanitary sewer and 758,767 linear feet (143.7 miles) of storm sewer. The sanitary sewer system includes 2,337 manholes while the storm sewer system includes 8,319 storm manholes or inlets. Based on the U.S. Environmental Protection Agency's estimated infrastructure replacement cost of one million dollars per mile of sewer pipe Urbana's sanitary and storm sewer infrastructure would be valued at almost one quarter of a billion dollars.

The sanitary and storm sewer budgets for the 2020-2021 fiscal year include:

- $859,518for sanitary sewer operation and maintenance activities
- $506,238for sanitary sewer rehabilitation projects
- $10,500 for the overhead sanitary sewer program
- $50,000 for the sewer lateral pavement reimbursement program
- $4,000 for the illegal connection reimbursement program
- $25,000 for the private to public sanitary conversion program
- $5,000 for the sewer GIS data system and sanitary sewer modeling
- $602,417 for storm sewer operation and maintenance activities
- $616,090 for storm sewer rehabilitation projects
- $100,000 for Boneyard Creek maintenance
- $18,750 for stream gauge flow monitoring
- $119.959 for storm water Master Plan study
- $10,000 for hazardous sump pump discharge abatement
- $284,529 Green Street MCORE Project Sanitary Sewer Improvements
- $411,863 Green Street MCORE Project Storm Sewer Improvements

II. SEWER REHABILITATION ACTIVITIES

A. Point Repairs

Point repairs to the sanitary sewers were made at 10 separate locations. Approximately 60 linear feet of repairs were performed on the sanitary sewer system, as well as construction or replacement of 5 sanitary sewer manholes. Similarly, point repairs to the storm sewers were made at 25 separate locations. Approximately 14 linear feet of repairs were performed on the storm sewer system, as well as 17 storm sewer structure repairs and 3 new or replacement storm sewer structures.

Locations of sanitary and storm sewer repairs completed in 2020 are presented in Figures 1 and 2. Histories of sewer repairs from 2015 to 2020 are presented in Figures 3 and 4. Sanitary and storm sewer repair locations from 1998 to 2020 are presented in Figures 5 and 6.

B. New Sewer Construction

As part of the 2018-2020 Miscellaneous Sewer Repair contract, 44 linear feet of new storm sewer and one new storm sewer manhole or inlet were constructed to address localized drainage issues.

No new sanitary sewer manholes were constructed in 2020 as part of the 2018-2020 Miscellaneous Sewer Repair contract.

C. Cured-in-Place Sewer Lining

No sewer lining activities were completed in 2020.

The City has completed full length cured-in-place lining on 127,980 linear feet (24.2 miles) of sanitary sewer to date, which represents 23.8% of the sanitary sewer system. The City has completed full length cured-in-place lining on 25,183 linear feet (4.8 miles) of storm sewer to date, which represents 3.3% of the storm sewer system. Sanitary and storm sewer lining locations from 1998 to 2020 are presented in Figures 7 and 8.

III. MAINTENANCE ACTIVITIES

The City's Operations Division performed routine sewer cleaning, grease treatment, and televising activities in 2020. Due to the change in work order recording and reporting procedures, the City does not have complete data to represent the quantity of this work that was completed in 2020. However, it is expected that the quantity of this work was similar to what was completed in the previous year.

Various maintenance activities were undertaken by the City in 2020 including root removal, sewer cleaning, televising, manhole cleaning, manhole inspections, and chemical treatment for grease.

Moving forward the City is hoping to target cleaning and inspecting approximately 10% of its sanitary sewers and 10% of its storm sewers annually to help develop subsequent year's capital improvement projects as well as begin planning more proactive maintenance and hopefully reduce the number of reactive maintenance calls.

IV. SANITARY SEWER BACK-UP CALLS AND RESPONSES

The City of Urbana Operations Division responded to a total of 47 sanitary sewer back-ups in 2020. Of the 47 back-ups, 19 were in private lines while the remaining 28 were in city-owned sewers. Seven (7) of these events indicated heavy rainfall caused the surcharge.

A history of sewer back-up complaints in the City from 2015 to 2020 is presented in Figure 9. The locations of sanitary sewer back-ups reported in 2020 are currently unavailable at this time due to reporting issues with newly implemented asset management software. Locations of sanitary sewer back-ups reported from 2010 to 2019 are shown in Figure 11.

V. SANITARY SEWER SURCHARGES AND RESPONSES

Seven sanitary sewer back-ups were reported throughout the year as a result of two heavy rainfall and sanitary sewer surcharge events. The back-up complaints were not concentrated to any particular area, indicating that the sewer back-ups were more likely the result of overwhelmed sanitary sewers than sewer blockages or broken pipes. In response to these complaints, the City typically sends each property owner an Overhead Sewer Program information packet and a letter urging them to contact the Public Works Department to discuss their complaint.

VI. SEWER SYSTEM INVESTIGATIVE STUDIES

Dye water testing was done as needed to determine which sewer systems buildings or drainage structures were tributary to. More dye water testing is planned for 2021 in order to identify private sanitary sewers that serve multiple properties. No smoke testing was done in 2020.

VII. OVERHEAD SEWER PROGRAM

There were two overhead sewer installations completed in 2020. Information on the Overhead Sewer Program was distributed to many eligible property owners and is also available on the City's website. A history of overhead sewer program participation from 2015 to 2020 is presented in Figure 12.

VIII. ILLEGAL CONNECTIONS AND DISCHARGES

The City adopted an illegal connection reimbursement program in December 2007. Under this program property owners are reimbursed for 50% of the cost to eliminate an illegal sanitary connection to the storm sewer, up to $4,000. No properties participated in the illegal connection reimbursement program in 2020.

IX. PAVEMENT REPLACEMENT REIMBURSEMENT PROGRAM

The City adopted a pavement replacement reimbursement program for sewer service laterals in December 2007. This program was revised in January 2018, with implementation of a unit price program taking immediate effect. Under the revised program, residents are reimbursed an amount proportional to the amount of pavement work completed. Property owners at 6 separate locations participated in this program in 2020. Figure 13 summarizes the pavement replacement reimbursement program participation in 2020. A history of program participation from 2015 to 2020 is presented in Figure 14.

X. HAZARDOUS SUMP PUMP DISCHARGE ELIMINATION PROGRAM

When a hazardous sump pump is reported to the City, the property owner is notified and is asked to take action to abate the hazard. This can be done by moving the sump pump discharge to a different location or by connecting to the City's storm sewer system.

One hazardous sump pump discharge was identified in 2020. In a case, the property owner could chose to participate in the Hazardous Sump Pump Discharge Elimination Program, through which the City provides a public storm sewer within the right-of-way adjacent to the property and the sump pump discharge is connected directly to the new storm sewer. This program involves a cost share by the homeowner of 50% of construction costs, up to a maximum share of $500.00. $10,000 is budgeted for this program each year.

XI. PRIVATE TO PUBLIC SEWER CONVERSION PROGRAM

The City adopted a private to public sanitary sewer conversion program in March 2010 and funded the program with $25,000 from the Sewer Benefit Tax revenues. Under this program the City assumes ownership of private sanitary sewers which have undergone necessary infrastructure upgrades, serve two or more properties, and have been designated as priorities per the Department of Public Works criteria. The City pays for the cost of required infrastructure repairs. The City continues to identify properties that are served by shared private sanitary sewer laterals, with conversions taking place as deemed necessary by the condition of those sewers.

XII. NEW EQUIPMENT AND TECHNOLOGIES

The Public Works Department continues to use CUES GraniteNet inspection software offering better GIS data integration.

The Engineering Division is still engaged in the process of implementing GIS-based sanitary sewer modeling software in a partnership with the City of Champaign and the Urbana & Champaign Sanitary District. These efforts are anticipated to be completed in 2021.

The Engineering Division continued to develop the GIS database for the sanitary and storm sewer systems in 2020. Storm and sanitary sewer databases were configured to work with the City's new work order management software, Lucity, and to conform to requirements of other programs, such as InfoSWMM.

The City continues to use computer tablets in the field by sewer crews and electrical crews providing much more detailed information than in the past.

XIII. SEWER WORK PLANNED FOR 2021

A. Sanitary Sewer Work

The following sanitary sewer projects are tentatively scheduled for 2021:

- Sanitary Sewer Miscellaneous Repairs ~ $200,000
- Sanitary Sewer Cleaning & Televising ~ $110,000

B. Storm Sewer Work

The following storm sewer projects are tentatively scheduled for 2021:

- Storm Sewer Repair Project ~ $200,000
- Storm Sewer Cleaning & Televising ~ $450,000

Figure 15 is excluded this year since no known locations have been identified yet.

2020 SEWER ACTIVITY SUMMARY TABLE

	Quantity	Comments
Rehabilitation Activities:		
Sanitary Sewer Pipe Point Repairs	60 l.f.	
Sanitary Sewer Manhole Repairs	5 ea.	
New Sanitary Sewer Manhole Construction	0 ea.	
Storm Sewer Point Repairs	14 l.f.	
Storm Sewer Manhole/Inlet Repairs	17 ea.	
New Storm Sewer Manhole/Inlet Construction	1 ea.	
Maintenance Activities:		
Storm Sewer Cleaning	Data not available, consistent with 2019 activities	
Storm Sewer Television Inspection	Data not available, consistent with 2019 activities	
Sanitary Sewer Blockages:		
In Private Service Lines	19 ea.	
In City Owned Mains	28 ea.	
Sanitary Sewer Surcharges:		
Reports of Sanitary Sewer Surcharges	2 ea.	
Storm and Sanitary Sewer Programs:		
Overhead Sewer Program	2 ea.	
Illicit Connections & Discharges	0 ea.	
Pavement Reimbursement Program	6 ea.	
Hazardous Sump Pump Discharge Elimination	0 ea.	
Private to Public Sewer Conversion	0 ea.	

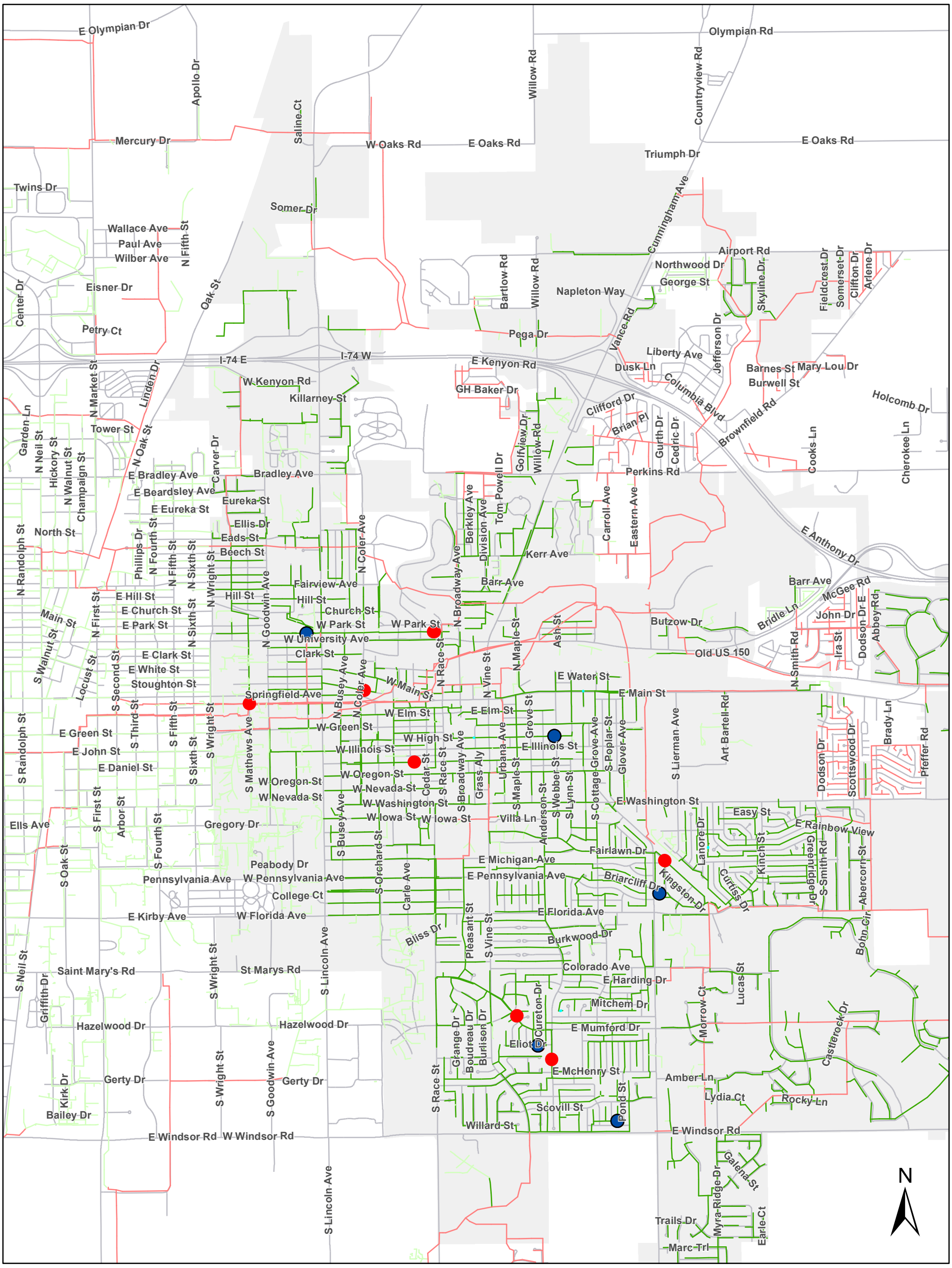
Sanitary Sewer Project	Pipe Length (ft)	Diameter (in)	Manholes
MCORE Project	389	6	3
	990	8	
Sanitary Sewer Totals:	**1379**		**3**

Storm Sewer Project	Pipe Length (ft)	Diameter (in)	Manholes	Inlets
MCORE Project	13	6	19	36
	13	8		
	1973	12		
	400	15		
Storm Sewer Totals:	**2399**		**19**	**36**

Attachments:

Figure 1 - 2020 Sanitary Sewer Repair Locations
Figure 2 - 2020 Storm Sewer Repair Locations
Figure 3 - History of Sewer Pipe Repairs from 2015-2020
Figure 4 - History of Sewer Manhole/Inlet Repairs from 2015-2020
Figure 5 - Sanitary Sewer Point Repair Locations 1998-2020
Figure 6 - Storm Sewer Repair Locations 1998-2020
Figure 7 - Sanitary Sewer Full Length Lining Locations 1998-2020
Figure 8 - Storm Sewer Full Length Lining Locations 1998-2020
Figure 9 - History of Sanitary Sewer Back-Up Complaints from 2015-2020
Figure 10 - 2020 Public Sanitary Sewer System Back-Up Locations *
Figure 11 - History of Sanitary Sewer System Back-Up Locations 2010-2019
Figure 12 - History of Overhead Sewer Program Participation from 2015-2020
Figure 13 - 2020 Pavement Replacement Reimbursement Program Participation
Figure 14 - History of Pavement Replacement Reimbursement Program 2015-2020
Figure 15 - Proposed Sewer Projects in Capital Improvement Plan **

Excluded due to report complications with new asset mgmt. software.
****Excluded this year due to locations being unknown currently.***



Legend

Sanitary Sewers
- City of Urbana
- UCSD
- Private

Sanitary Manhole Repairs
- *2020*

Sanitary Pipe Repairs
- 2020

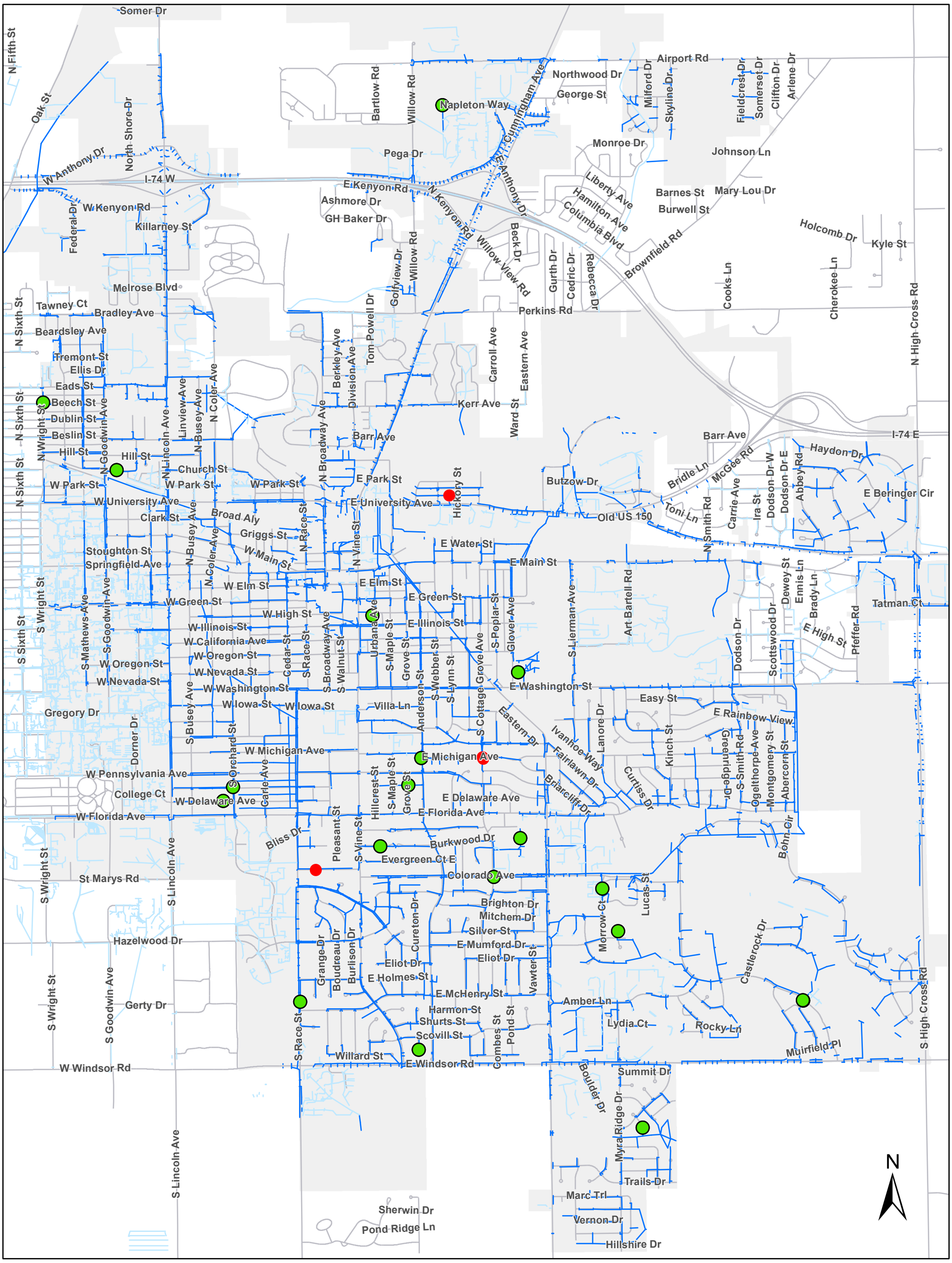
Corporate Limits
- City of Urbana

0 1,150 2,300 4,600
Feet

CITY OF URBANA

2020 SEWER ACTIVITY REPORT

FIGURE 1
2020 SANITARY SEWER REPAIR LOCATIONS



Legend

Storm Sewers
- Private
- City of Urbana

Storm Manhole and Inlet Repairs
- 2020

Storm Sewer Pipe Repairs
- 2020

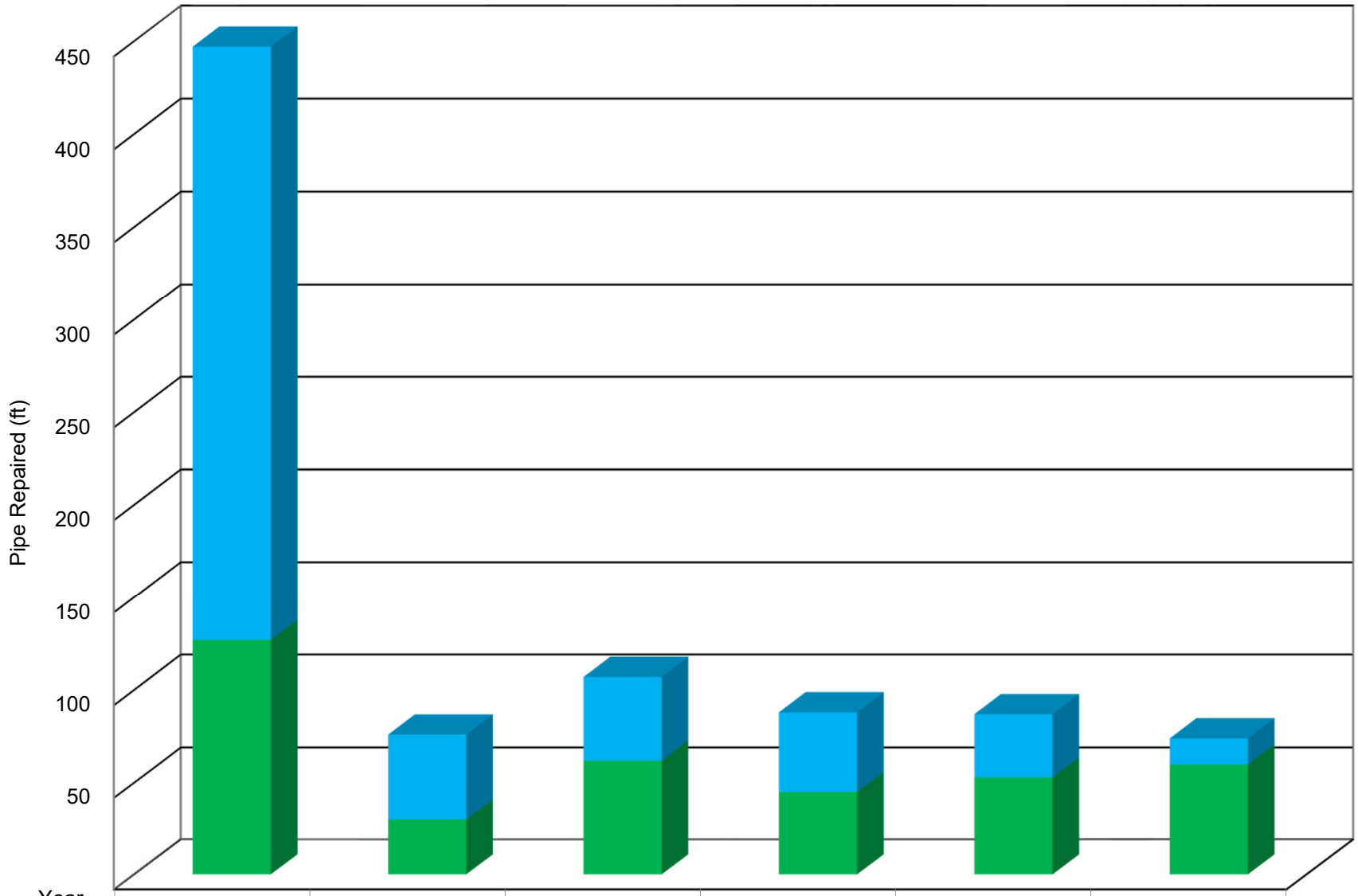
Corporate Limits
- City of Urbana

0 1,000 2,000 4,000
Feet

CITY OF URBANA

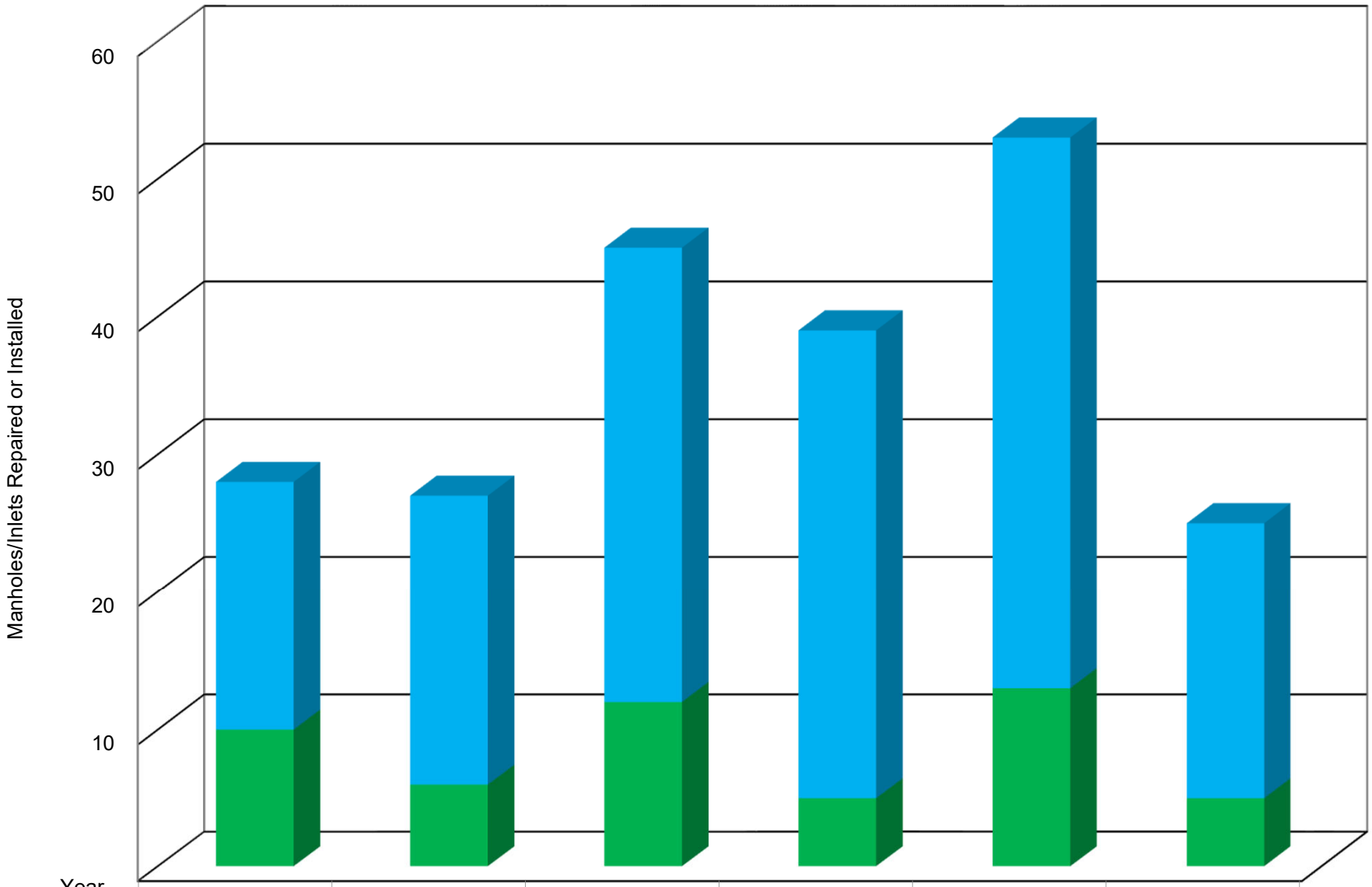
2020 SEWER ACTIVITY REPORT

FIGURE 2
2020 STORM SEWER REPAIR LOCATIONS



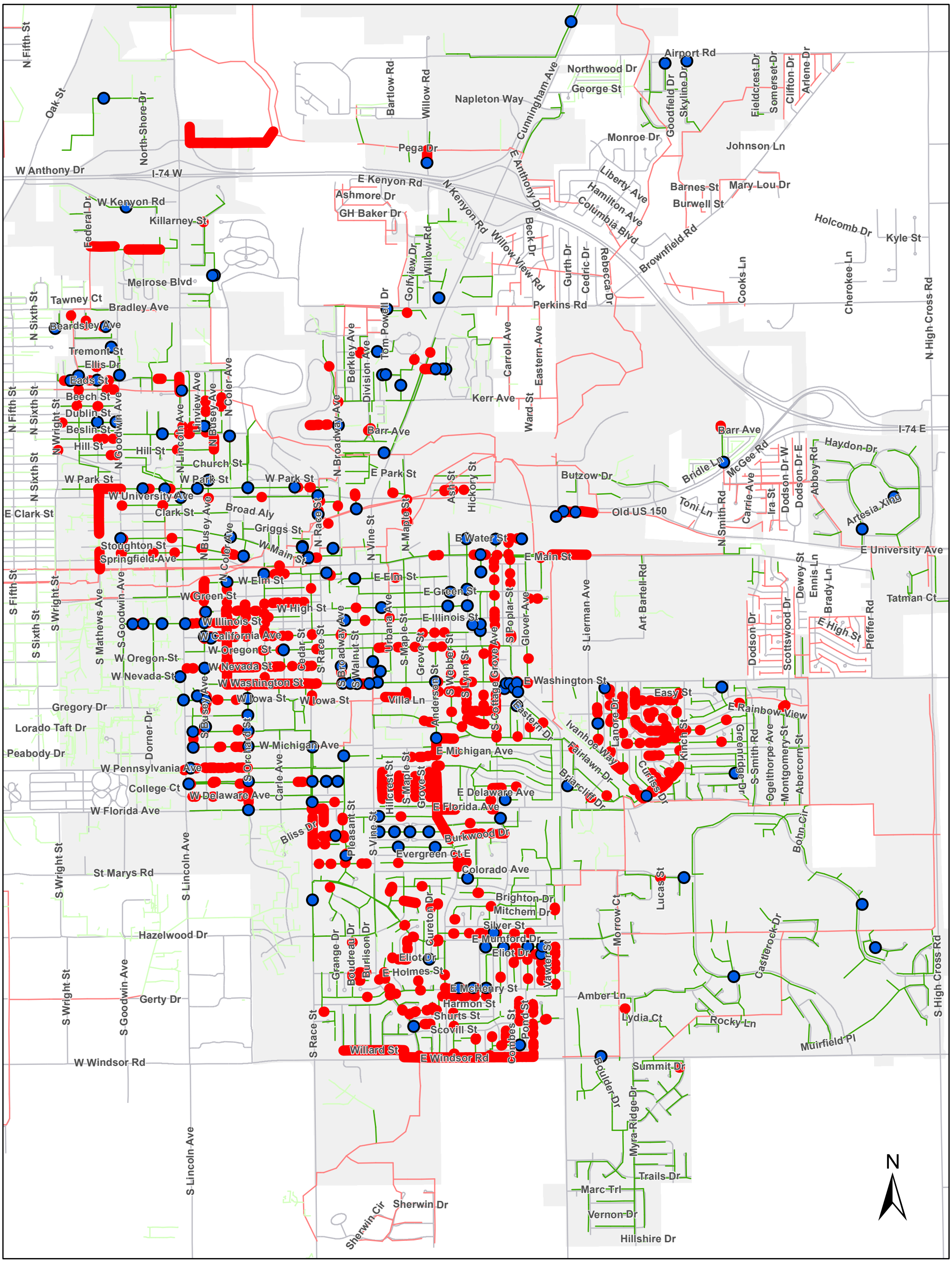
Year	2015	2016	2017	2018	2019	2020
Storm	320	46	45	43	34	14
Sanitary	127	30	62	45	53	60

Figure 3
Sanitary and Storm Sewer Pipe Repair History



Year	2015	2016	2017	2018	2019	2020
Storm	18	21	33	34	40	20
Sanitary	10	6	12	5	13	5

Figure 4
Sanitary and Storm Sewer Manhole/Inlet Repair and Installation History



Legend

Sanitary Sewers
- City of Urbana
- UCSD
- Private

Sanitary Manhole Repairs
- 1998-2020

Sanitary Sewer Pipe Repairs
- 1998-2020

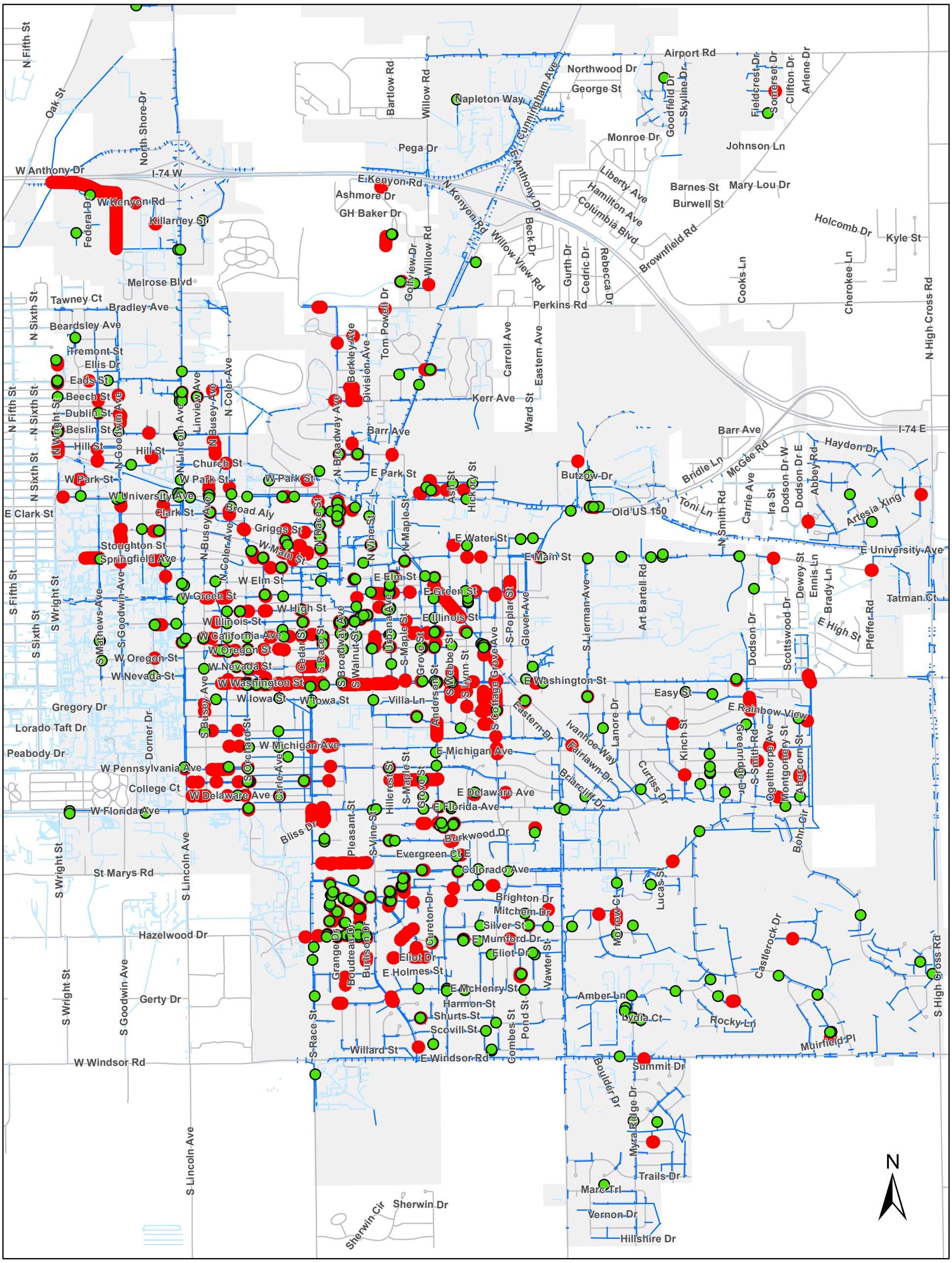
Corporate Limits
- City of Urbana

0 1,000 2,000 4,000
Feet

CITY OF URBANA

2020 SEWER ACTIVITY REPORT

FIGURE 5
SANITARY SEWER
REPAIR LOCATIONS
1998 - 2020



Legend

Storm Sewers
- Private
- City of Urbana

Storm Manhole and Inlet Repairs
- 1998-2020

Storm Sewer Pipe Repairs
- 1998-2020

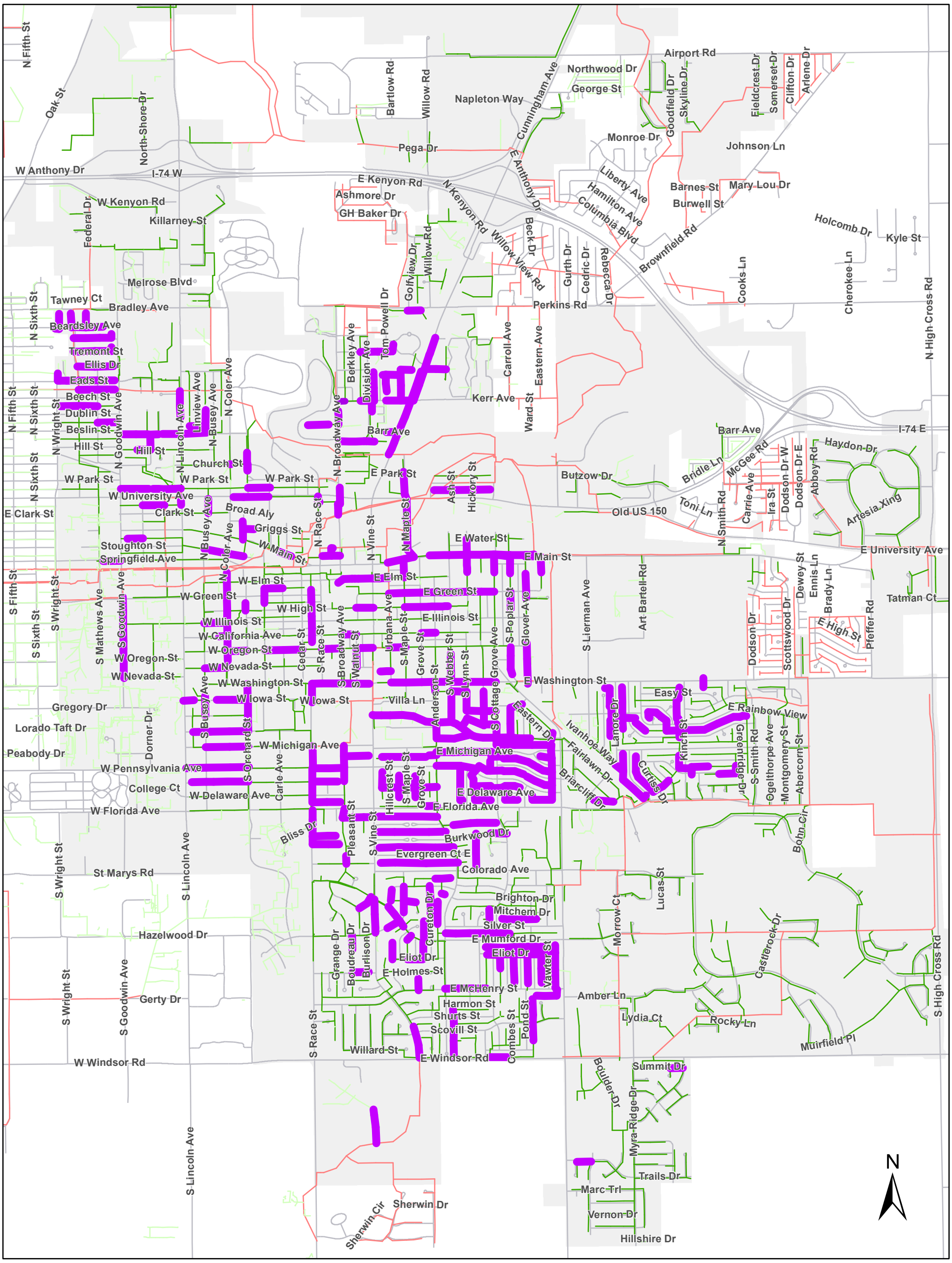
Corporate Limits
- City of Urbana

0 1,000 2,000 4,000
Feet

CITY OF URBANA

2020 SEWER ACTIVITY REPORT

FIGURE 6
STORM SEWER
REPAIR LOCATIONS
1998 - 2020



Legend

Sanitary Sewers

- City of Urbana
- UCSD
- Private
- Lined Sewers

Corporate Limits

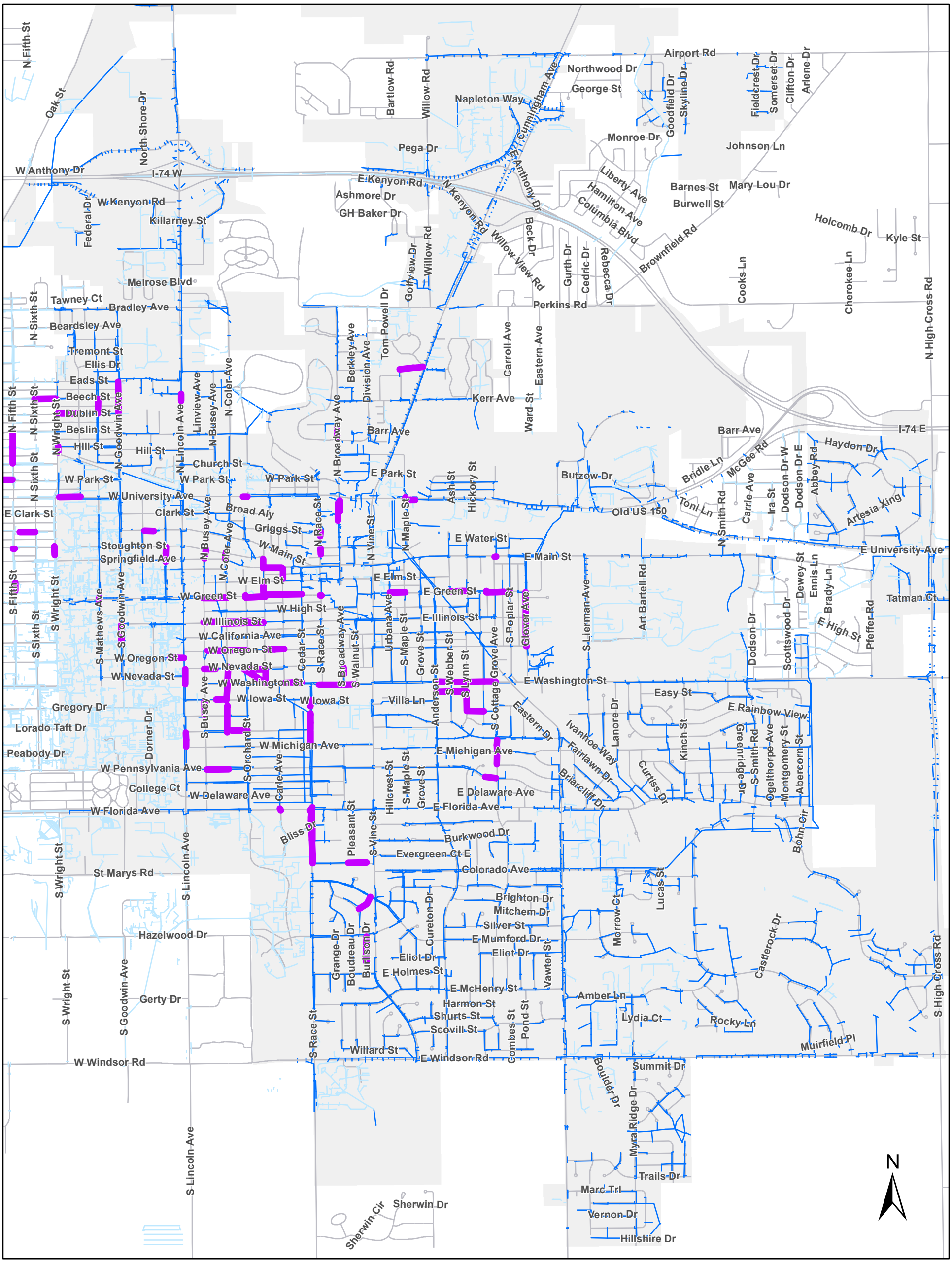
- City of Urbana

0 1,000 2,000 4,000
Feet

CITY OF URBANA

2020 SEWER ACTIVITY REPORT

FIGURE 7
SANITARY SEWER LINING
1998-2020



Legend

Storm Sewers

- Private
- City of Urbana
- Lined Sewer

Corporate Limits

- City of Urbana

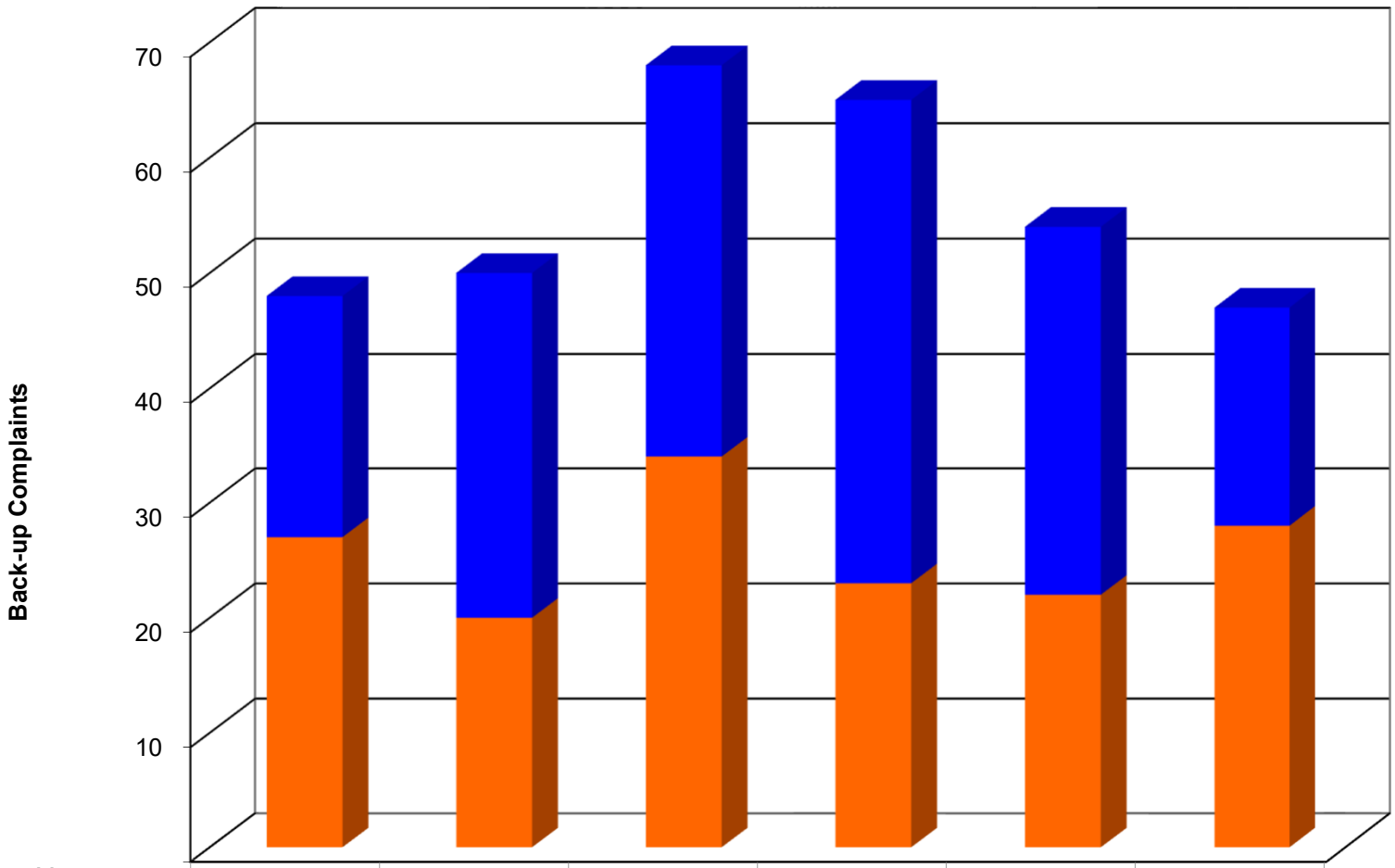
0 1,000 2,000 4,000

Feet

CITY OF URBANA

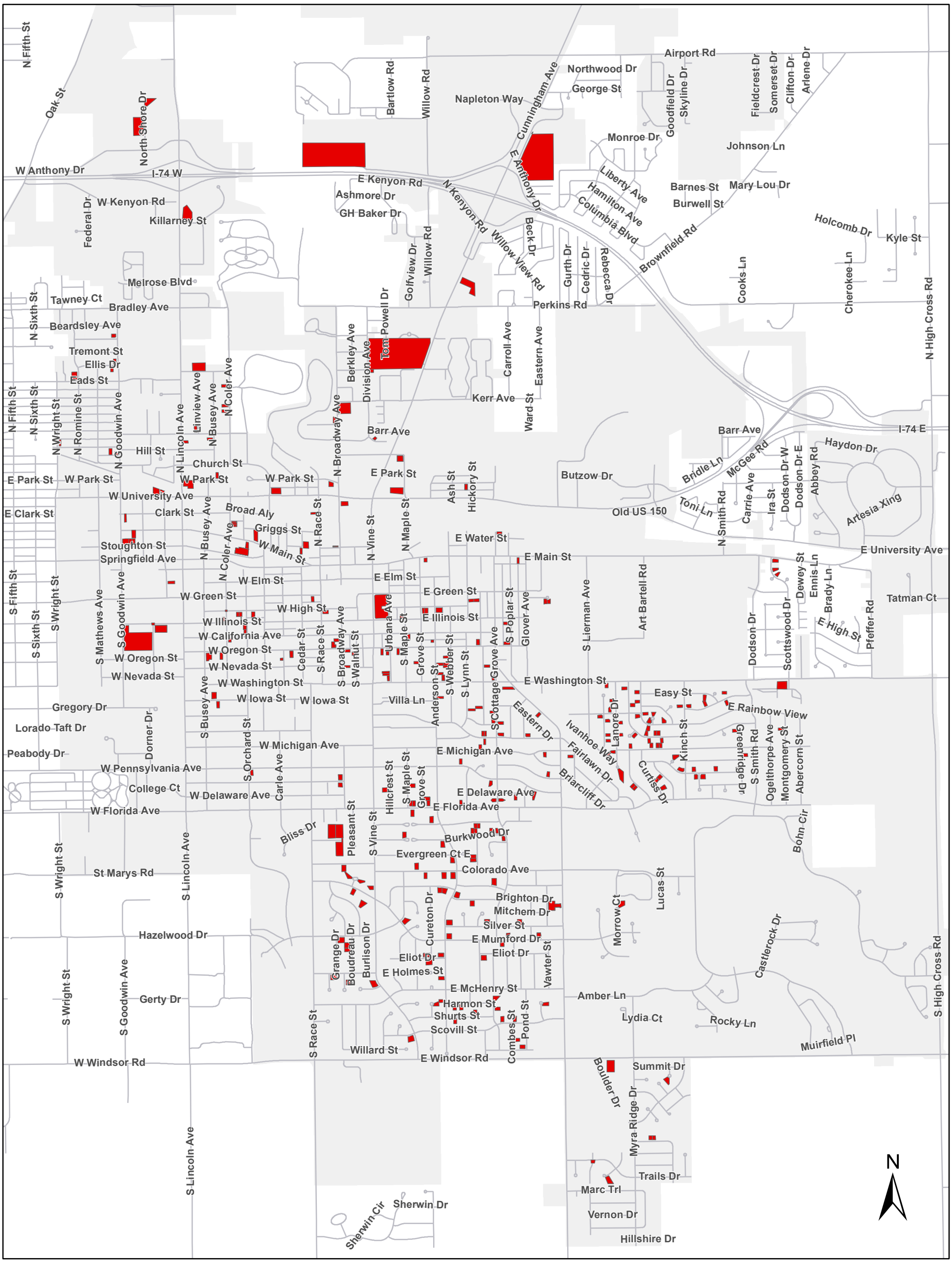
2020 SEWER ACTIVITY REPORT

FIGURE 8
STORM SEWER LINING
1998 - 2020



Year	2015	2016	2017	2018	2019	2020
Private Back-Ups	21	30	34	42	32	19
Public Back-ups	27	20	34	23	22	28

Figure 9
Dry Weather Sanitary Sewer Back-Up Complaint History



Legend

Sanitary Sewer Back-Ups

Back-Up Location

Corporate Limits

City of Urbana

0 1,000 2,000 4,000

Feet

CITY OF URBANA

2020 SEWER ACTIVITY REPORT

FIGURE 11
PUBLIC SANITARY SEWERS
DRY WEATHER BACK-UPS
2010 - 2019

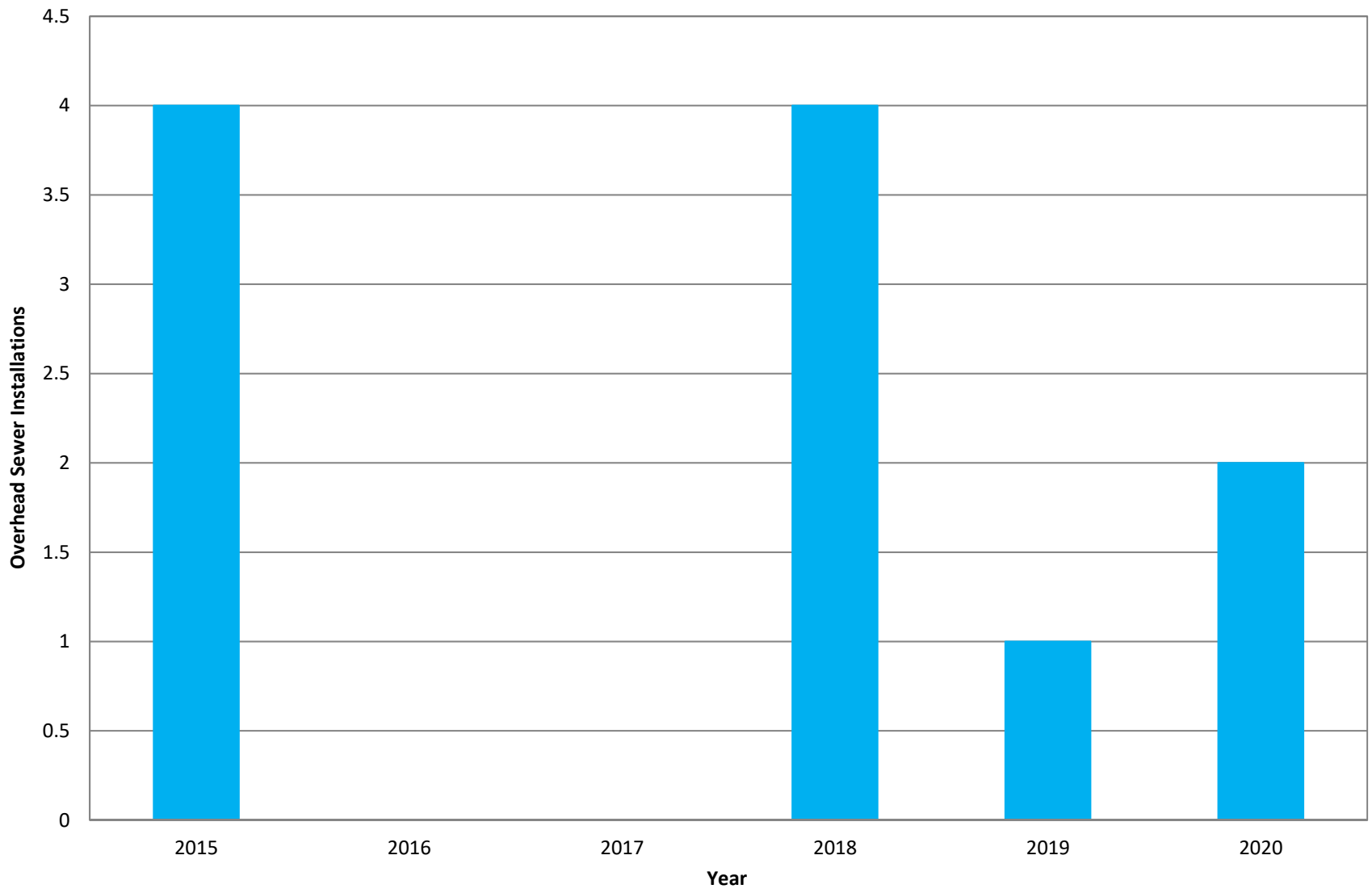


Figure 12
Overhead Sanitary Sewer Installation History
Overhead Sewer Installations 2015-2020

#	Address	Date	Reimbursement	Description
1	712 S. Anderson St.	12/11/2019	$4,500.00	Collapsed Sewer Lateral Pipe
2	807 S. Birch St.	3/17/2020	$7,845.83	Collapsed Sewer Lateral Pipe
3	1905 S. Harding Dr.	4/16/2020	$5,625.00	Collapsed Sewer Lateral Pipe
4	210 Glover Ave	4/20/2020	$8,005.56	Collapsed Sewer Lateral Pipe
5	202 S. Cottage Grove Ave.	6/10/2020	$3,608.33	Collapsed Sewer Lateral Pipe
6	203 E. McHenry St.	10/30/2020	$3,150.00	Severe Root Intrusion and Collapsed Sewer Lateral Pipe
Total			$32,734.72	

FIGURE 13
2020 SEWER LATERAL PAVEMENT REIMBURSEMENT PROGRAM PARTICIPATION

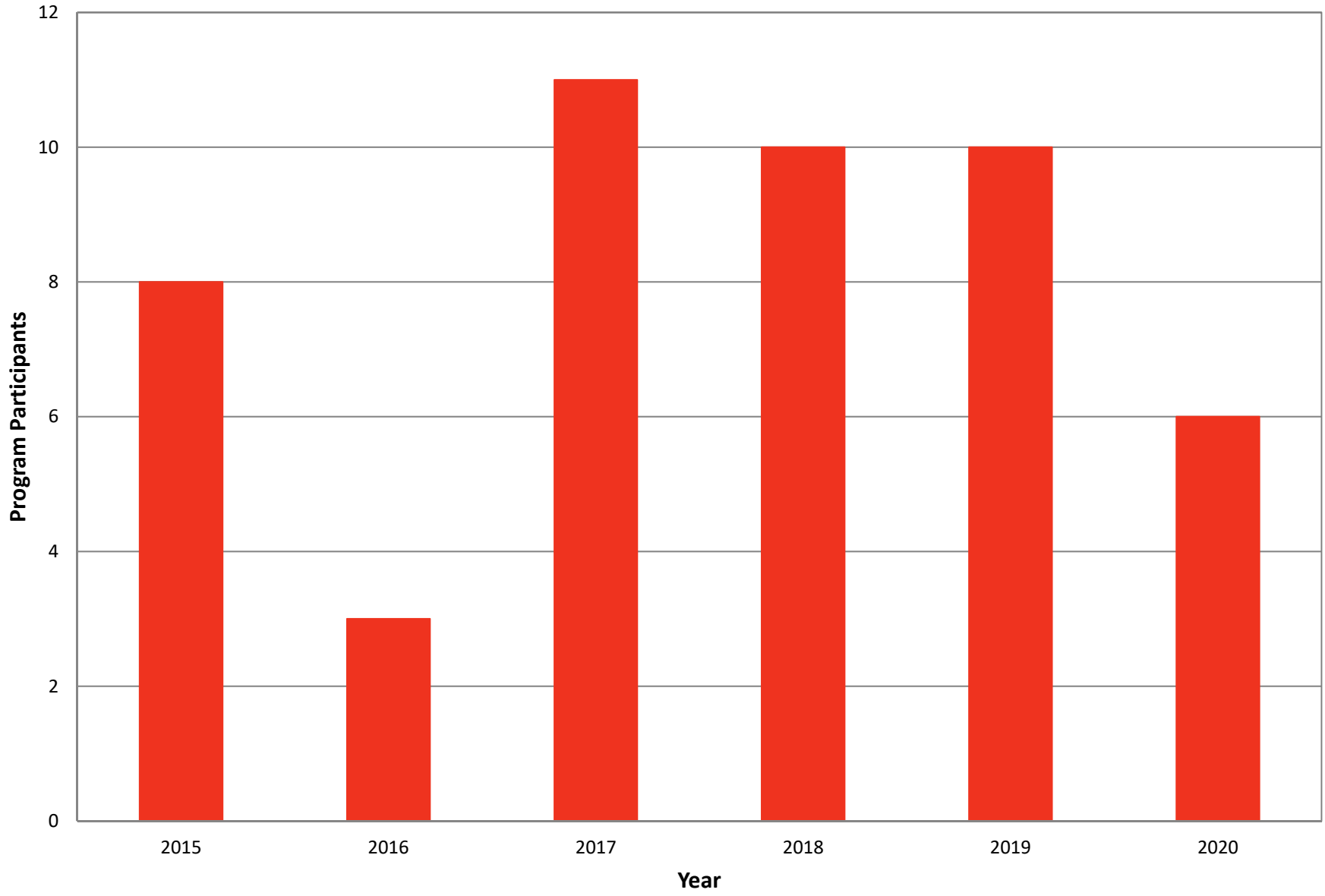


Figure 14
Sewer Lateral Pavement Reimbursement Program