



# 2019 SEWER ACTIVITY REPORT



*Prepared by*

**Justin Swinford, P.E. - Civil Engineer II**

**Adam Shaw - Civil Engineering Technician II**



## M E M O R A N D U M

DATE: February 18, 2020

TO: Sanitary Sewer Technical Committee

FROM: Justin Swinford, P.E., Civil Engineer II  
Adam Shaw, Civil Engineering Technician II

RE: Sewer Activity in the City of Urbana from January 1, 2019 to December 31, 2019

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### I. INTRODUCTION

The City of Urbana owns, operates, and maintains 540,829 linear feet (102.4 miles) of sanitary sewer and 756,693 linear feet (143.3 miles) of storm sewer. The sanitary sewer system includes 2,334 manholes while the storm sewer system includes 8,274 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 2019-2020 fiscal year include:

- \$838,554 for sanitary sewer operation and maintenance activities
- \$563,721 for 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
- \$85,675 for the private to public sanitary conversion program
- \$4,200 for the sewer GIS data system and sanitary sewer modeling
- \$587,723 for storm sewer operation and maintenance activities
- \$653,778 for storm sewer rehabilitation projects
- \$50,000 for Boneyard Creek maintenance
- \$18,750 for stream gauge flow monitoring
- \$250,000 for storm water Master Plan study
- \$20,000 for hazardous sump pump discharge abatement
- \$350,000 Green Street MCORE Project Strom Sewer Improvements

## **II. SEWER REHABILITATION ACTIVITIES**

### **A. Point Repairs**

Point repairs to the sanitary sewers were made at 15 separate locations. Approximately 53 linear feet of repairs were performed on the sanitary sewer system, as well as construction or replacement of 13 sanitary sewer manholes. Similarly, point repairs to the storm sewers were made at 36 separate locations. Approximately 35 linear feet of repairs were performed on the storm sewer system, as well as 34 storm sewer structure repairs and 6 new or replacement storm sewer structures.

Locations of sanitary and storm sewer repairs completed in 2019 are presented in Figures 1 and 2. Histories of sewer repairs from 2014 to 2019 are presented in Figures 3 and 4. Sanitary and storm sewer repair locations from 1998 to 2019 are presented in Figures 5 and 6.

### **B. New Sewer Construction**

As part of the 2018-2020 Miscellaneous Sewer Repair contract, 130 linear feet of new storm sewer and 6 new storm sewer manholes or inlets were constructed to address localized drainage issues.

Three new sanitary sewer manholes were constructed as part of the 2018-2020 Miscellaneous Sewer Repair contract.

### **C. Cured-in-Place Sewer Lining**

No sewer lining activities were completed in 2019. The City's Engineering and Operations Divisions are working to implement new sewer inspection software, which will be used to evaluate and determine the next selection of sewers to be lined 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 2019 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 2019. 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 2019. 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 2019 including root removal, sewer cleaning, televising, manhole cleaning, manhole inspections, and chemical treatment for grease.

The Public Works Department implemented a new work order management program, Lucity, in 2018. This program is designed to track and report the work done by the City's Operations staff. As this software was implemented in the middle of the reporting year, the City has incomplete maintenance activity data for 2019.

#### **IV. SANITARY SEWER BACK-UP CALLS AND RESPONSES**

The City of Urbana Operations Division responded to a total of 54 sanitary sewer back-ups in 2019. Of the 54 back-ups, 32 were in private lines while the remaining 22 were in city-owned sewers. These back-ups did not result from surcharging during heavy rainfall events.

A history of sewer back-up complaints in the City from 2014 to 2019 is presented in Figure 9. The locations of sanitary sewer back-ups reported in 2019 are presented on Figure 10. Locations of sanitary sewer back-ups reported from 2010 to 2019 are shown in Figure 11.

#### **V. SANITARY SEWER SURCHARGES AND RESPONSES**

Two sanitary sewer back-ups were reported throughout the year as a result of one 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 2020 in order to identify private sanitary sewers that serve multiple properties. No smoke testing was done in 2019.

## **VII. OVERHEAD SEWER PROGRAM**

There was one overhead sewer installations completed in 2019. 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 2014 to 2019 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 2019.

## **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 10 separate locations participated in this program in 2019. Figure 13 summarizes the pavement replacement reimbursement program participation in 2019. A history of program participation from 2014 to 2019 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.

No hazardous sump pump discharge was identified in 2019. 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. \$20,000 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 purchased new sewer televising equipment in 2018, to be retrofitted on to the existing sewer televising truck. This purchase included an upgrade to the CUES GraniteNet inspection software. The implementation of this new software was completed in 2019. GraniteNet offers better GIS data integration and the ability to attach multiple file types to sewer assets.

The Engineering Division is also 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. InfoSWMM software will be implemented in 2020 to create a model of the sanitary sewer network that serves both cities and the UCSD interceptor sewers that transmit those flows to the treatment facilities.

The Engineering Division continued to develop the GIS database for the sanitary and storm sewer systems in 2019. 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 has also implemented the use of computer tablets in the field by sewer crews and electrical crews. These tablets contain map files that provide much more information than a traditional paper map and allow for more frequent updates to the map.

### **XIII. SEWER WORK PLANNED FOR 2020**

#### **A. Sanitary Sewer Work**

The following sanitary sewer projects are tentatively scheduled for 2020:

- Sanitary Sewer Lining Project ~ \$350,000
- Sanitary Sewer Repair Project ~ \$150,000
- Green St. MCORE Sanitary Sewer Work ~ \$250,000

#### **B. Storm Sewer Work**

The following storm sewer projects are tentatively scheduled for 2020:

- Storm Sewer Repair Project ~ \$250,000
- Storm Sewer Lining Project ~ \$100,000
- Storm Sewer Cleaning & Televising ~ \$250,000
- Green St. MCORE Storm Sewer Improvements ~\$350,000

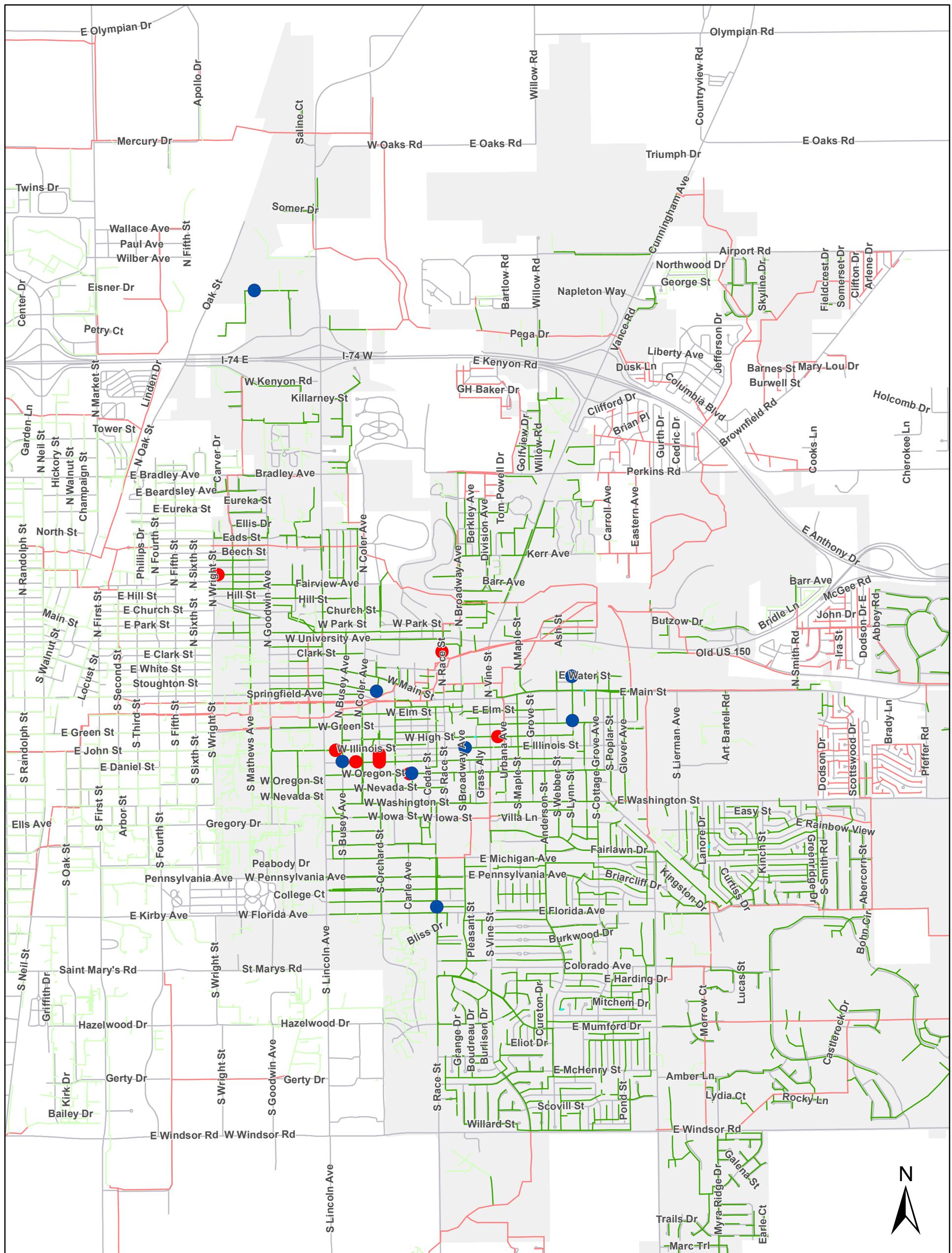
Figure 15 summarizes future sanitary and storm sewer work identified by the City.

## 2019 SEWER ACTIVITY SUMMARY TABLE

	<b>Quantity</b>	<b>Comments</b>
<b>Rehabilitation Activities:</b>		
Sanitary Sewer Pipe Point Repairs	53 l.f.	
Sanitary Sewer Manhole Repairs	9 ea.	
New Sanitary Sewer Manhole Construction	3 ea.	
Storm Sewer Point Repairs	35 l.f.	
Storm Sewer Manhole/Inlet Repairs	34 ea.	
New Storm Sewer Manhole/Inlet Construction	6 ea.	
<b>Maintenance Activities:</b>		
Storm Sewer Cleaning		Data not available, consistent with 2018 activities
Storm Sewer Television Inspection		Data not available, consistent with 2018 activities
<b>Sanitary Sewer Blockages:</b>		
In Private Service Lines	32 ea.	
In City Owned Mains	22 ea.	
<b>Sanitary Sewer Surcharges:</b>		
Reports of Sanitary Sewer Surcharges	2 ea.	
<b>Storm and Sanitary Sewer Programs:</b>		
Overhead Sewer Program	1 ea.	
Illicit Connections & Discharges	0 ea.	
Pavement Reimbursement Program	10 ea.	
Hazardous Sump Pump Discharge Elimination	0 ea.	
Private to Public Sewer Conversion	0 ea.	

Attachments:

- Figure 1 - 2019 Sanitary Sewer Repair Locations
- Figure 2 - 2019 Storm Sewer Repair Locations
- Figure 3 - History of Sewer Pipe Repairs from 2014-2019
- Figure 4 - History of Sewer Manhole/Inlet Repairs from 2014-2019
- Figure 5 - Sanitary Sewer Point Repair Locations 1998-2019
- Figure 6 - Storm Sewer Repair Locations 1998-2019
- Figure 7 - Sanitary Sewer Full Length Lining Locations 1998-2019
- Figure 8 - Storm Sewer Full Length Lining Locations 1998-2019
- Figure 9 - History of Sanitary Sewer Back-Up Complaints from 2014-2019
- Figure 10 - 2019 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 2014-2019
- Figure 13 - 2019 Pavement Replacement Reimbursement Program Participation
- Figure 14 - History of Pavement Replacement Reimbursement Program 2014-2019
- Figure 15 - Proposed Sewer Projects in Capital Improvement Plan



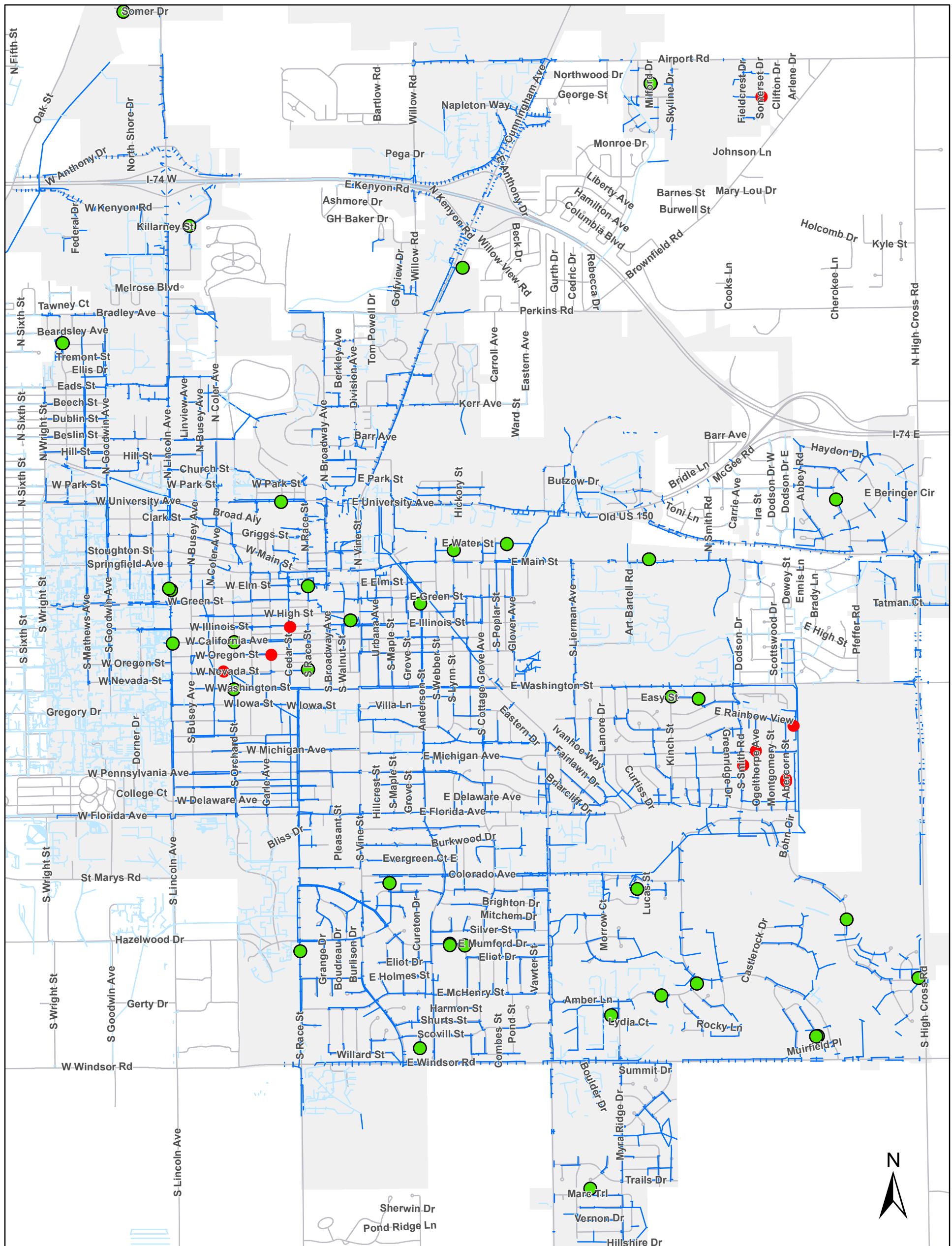
#### Legend

Sanitary Sewers	Sanitary Manhole Repairs
City of Urbana	● 2019
UCSD	
Private	
Corporate Limits	● 2019
City of Urbana	

0 1,150 2,300 4,600  
Feet



**2019 SEWER ACTIVITY REPORT**  
**FIGURE 1**  
**2019 SANITARY SEWER REPAIR LOCATIONS**



#### Legend

##### Storm Sewers

Private

City of Urbana

##### Storm Manhole and Inlet Repairs

2019

##### Storm Sewer Pipe Repairs

2019

##### Corporate Limits

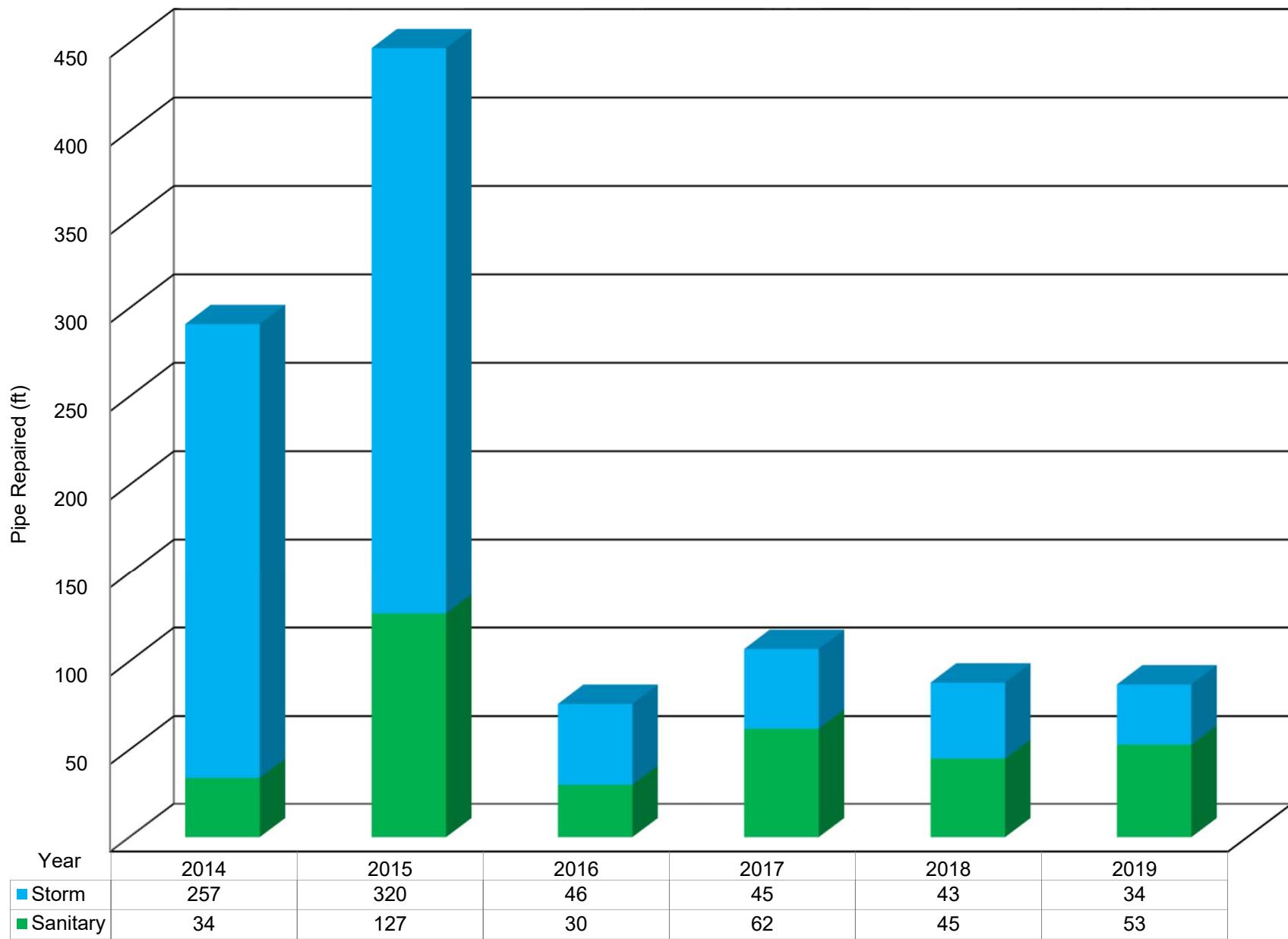
City of Urbana

0 1,000 2,000 4,000  
Feet

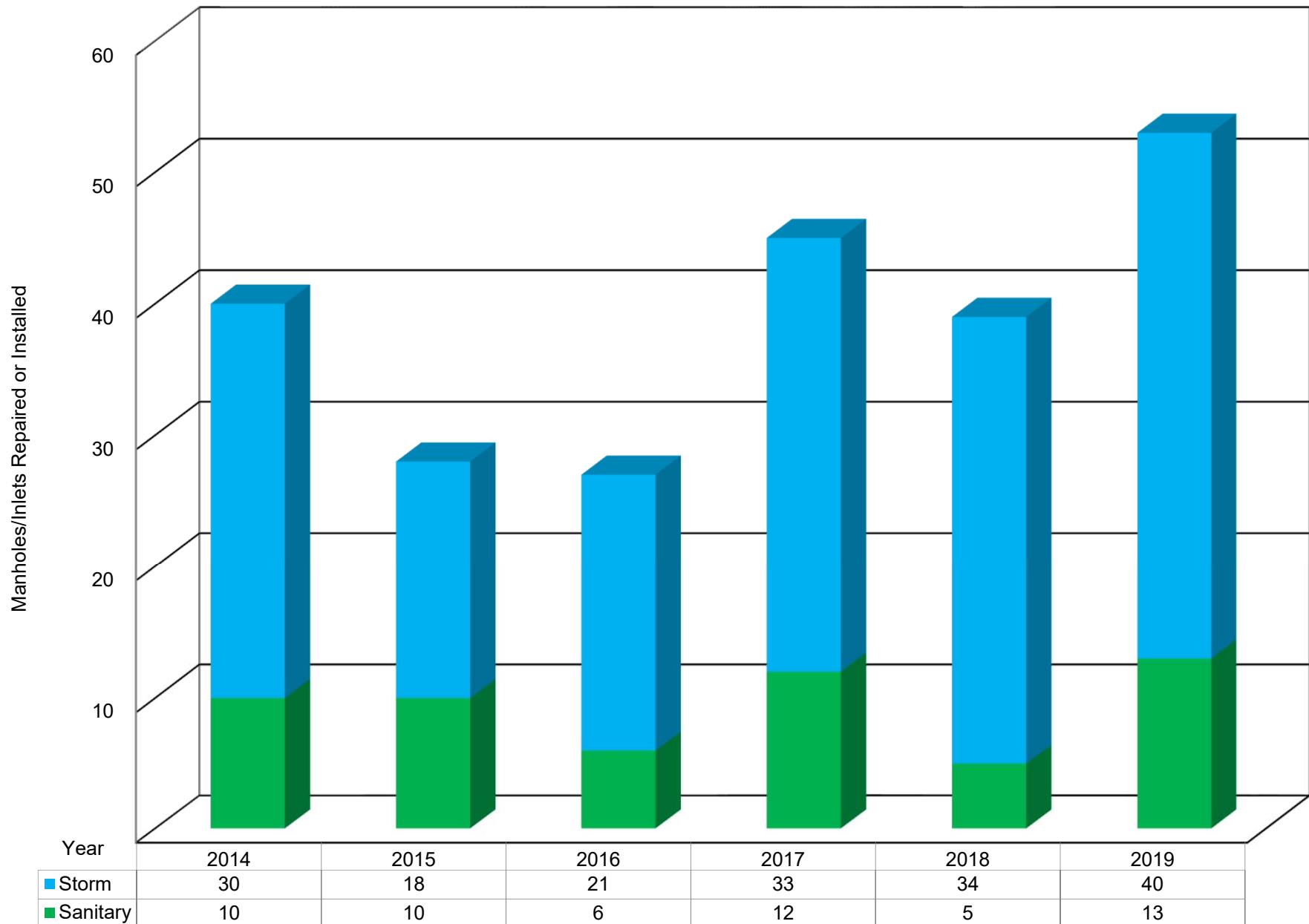


2019 SEWER ACTIVITY REPORT

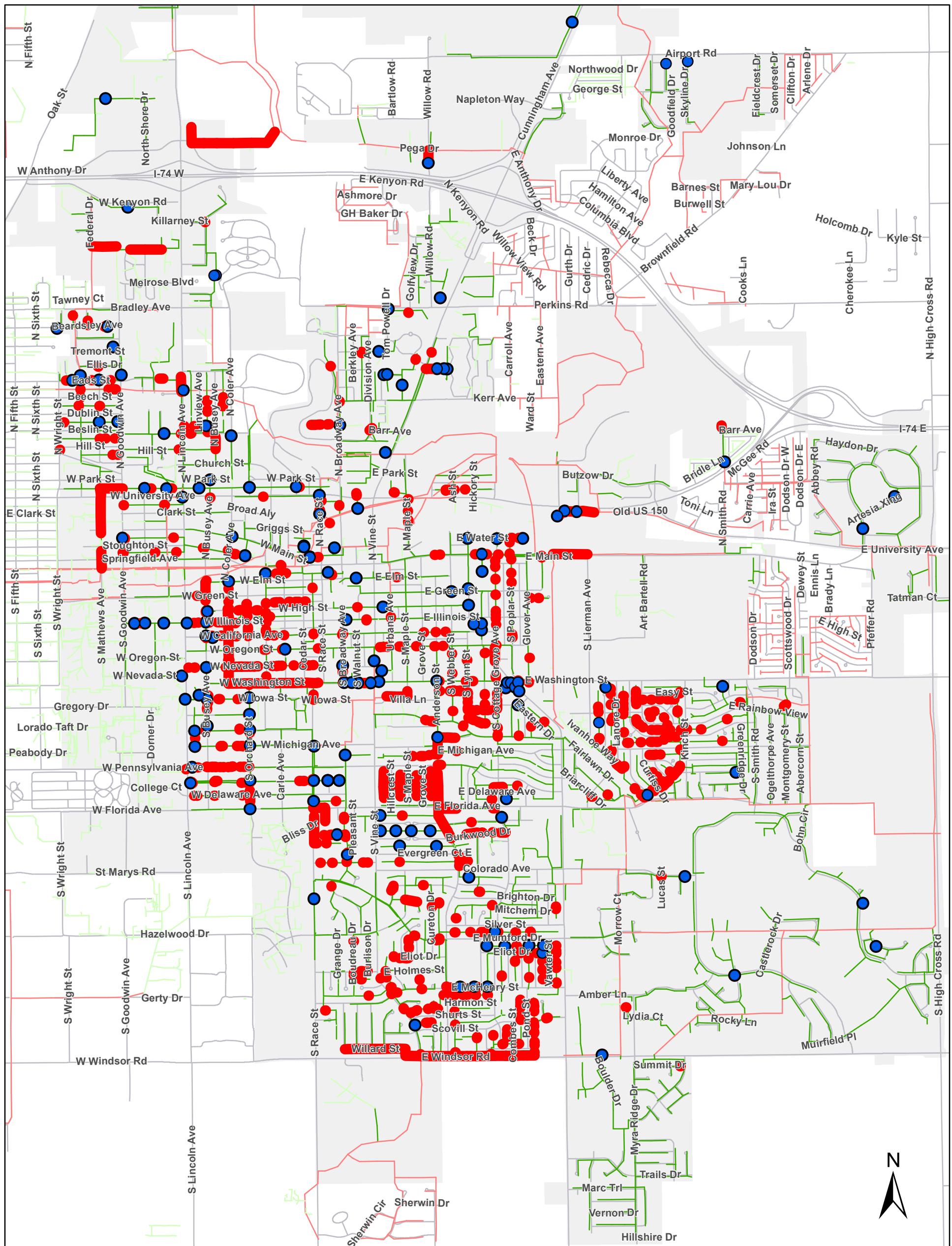
FIGURE 2  
2019 STORM SEWER REPAIR LOCATIONS



**Figure 3**  
Sanitary and Storm Sewer Pipe Repair History



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



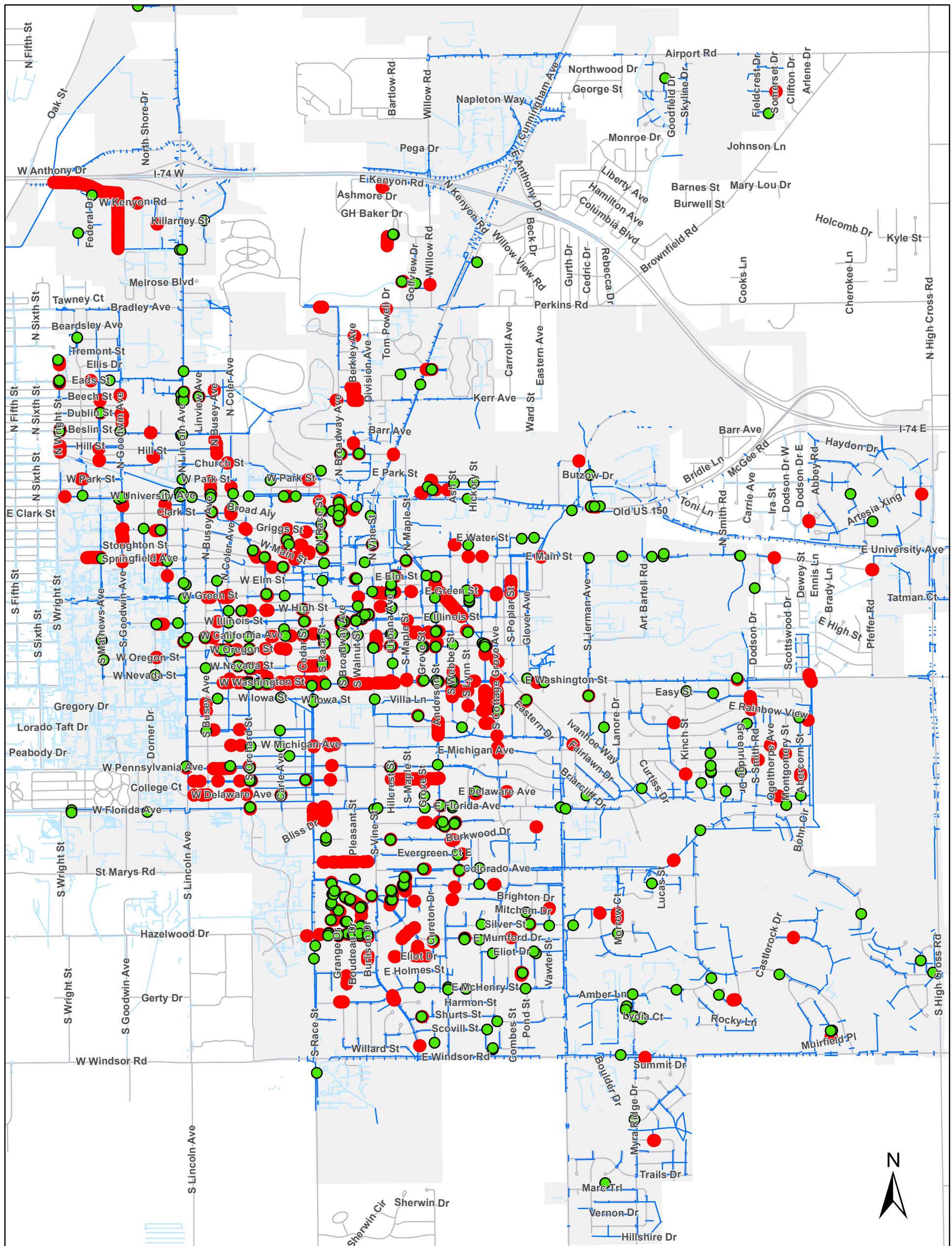
#### Legend

Sanitary Sewers	Sanitary Manhole Repairs
City of Urbana	● 1998-2019
UCSD	
Private	
Sanitary Sewer Pipe Repairs	● 1998-2019
Corporate Limits	
City of Urbana	

0 1,000 2,000 4,000  
Feet



2019 SEWER ACTIVITY REPORT  
FIGURE 5  
SANITARY SEWER REPAIR LOCATIONS  
1998 - 2019



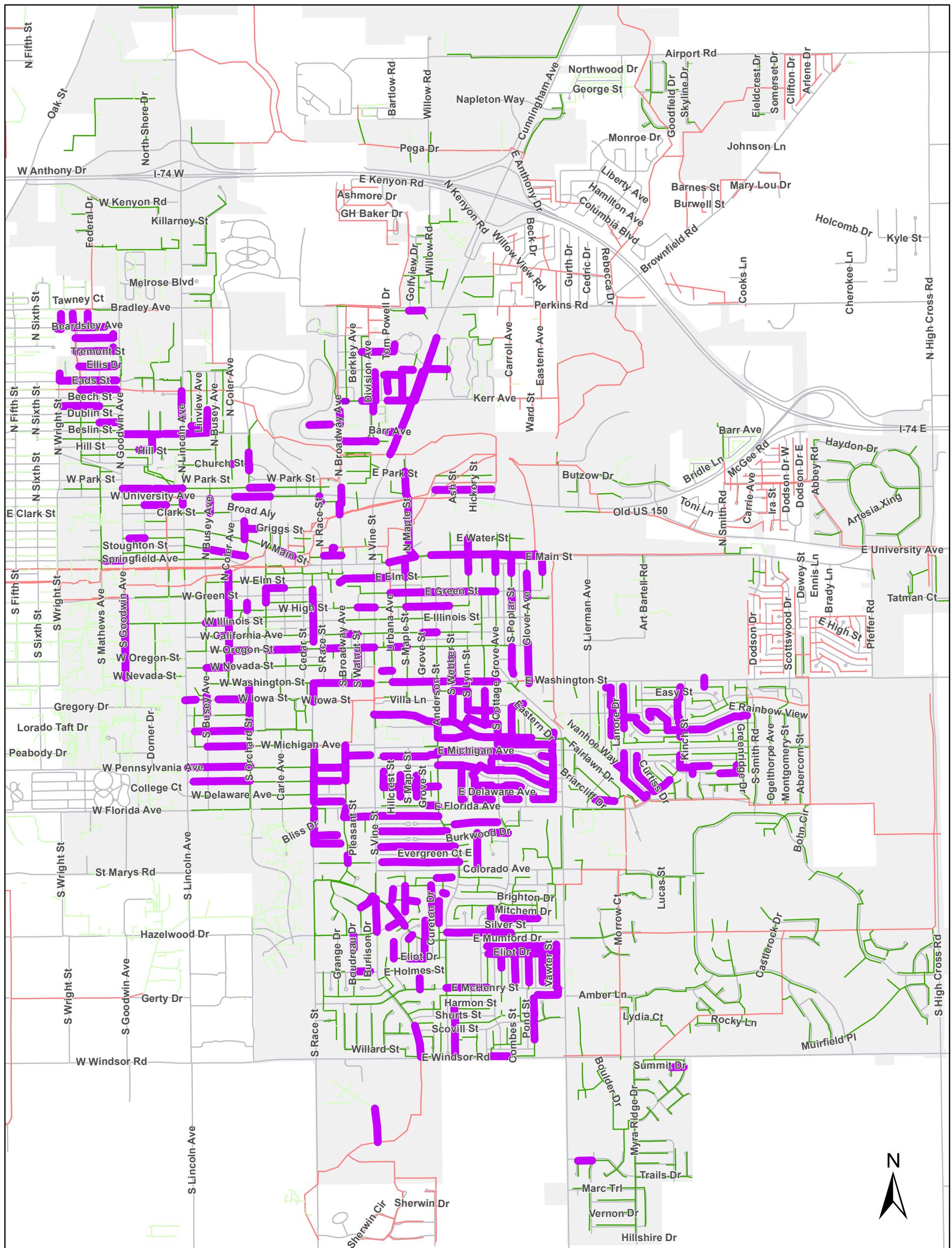
#### Legend

<b>Storm Sewers</b>	<b>Storm Manhole and Inlet Repairs</b>
Private	1998-2019
City of Urbana	<b>Storm Sewer Pipe Repairs</b>
	1998-2019
<b>Corporate Limits</b>	
City of Urbana	

0 1,000 2,000 4,000  
Feet



**2019 SEWER ACTIVITY REPORT**  
**FIGURE 6**  
**STORM SEWER REPAIR LOCATIONS**  
**1998 - 2019**



#### Legend

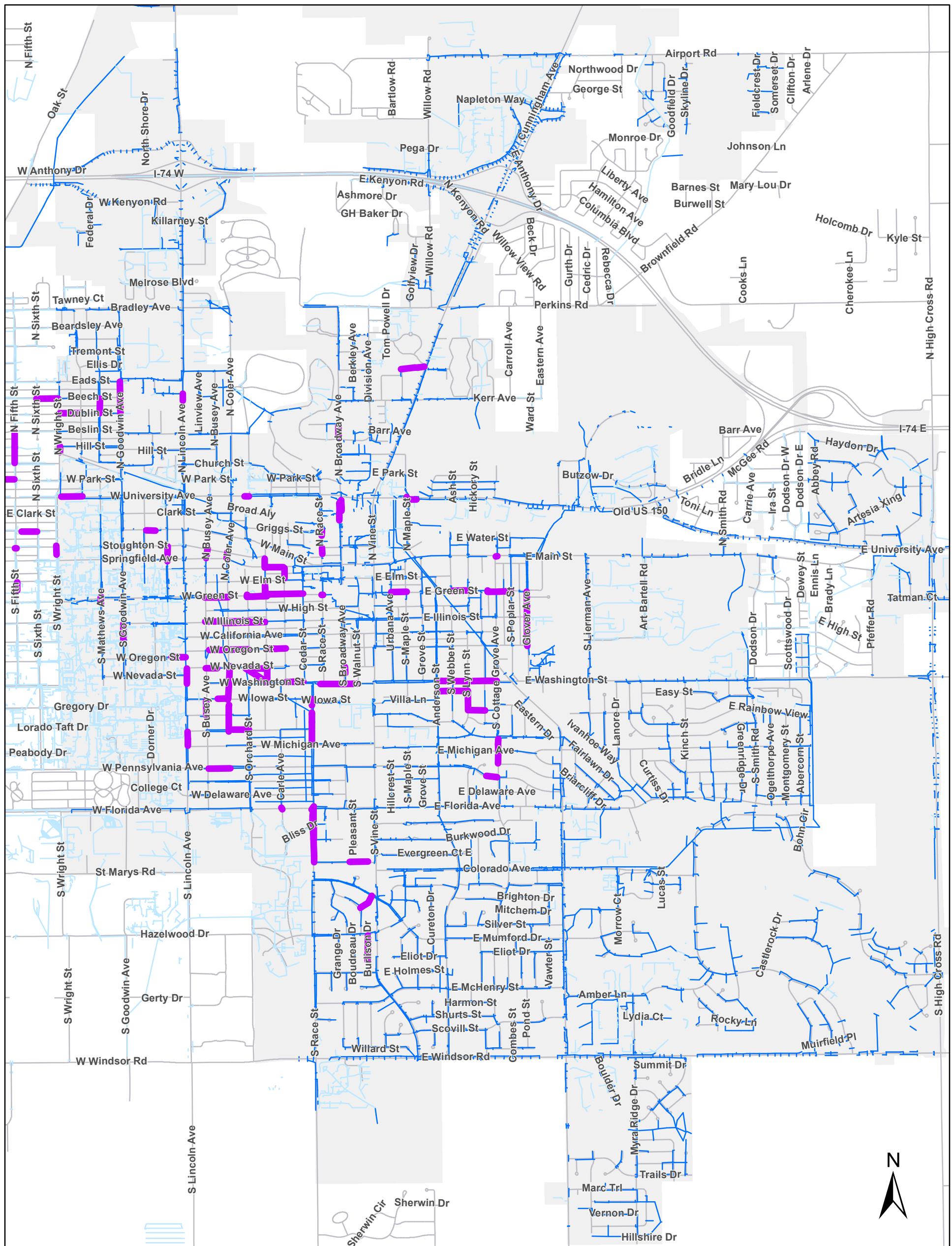
Sanitary Sewers	Corporate Limits
City of Urbana	City of Urbana
UCSD	
Private	
<b>Lined Sewers</b>	

0 1,000 2,000 4,000  
Feet

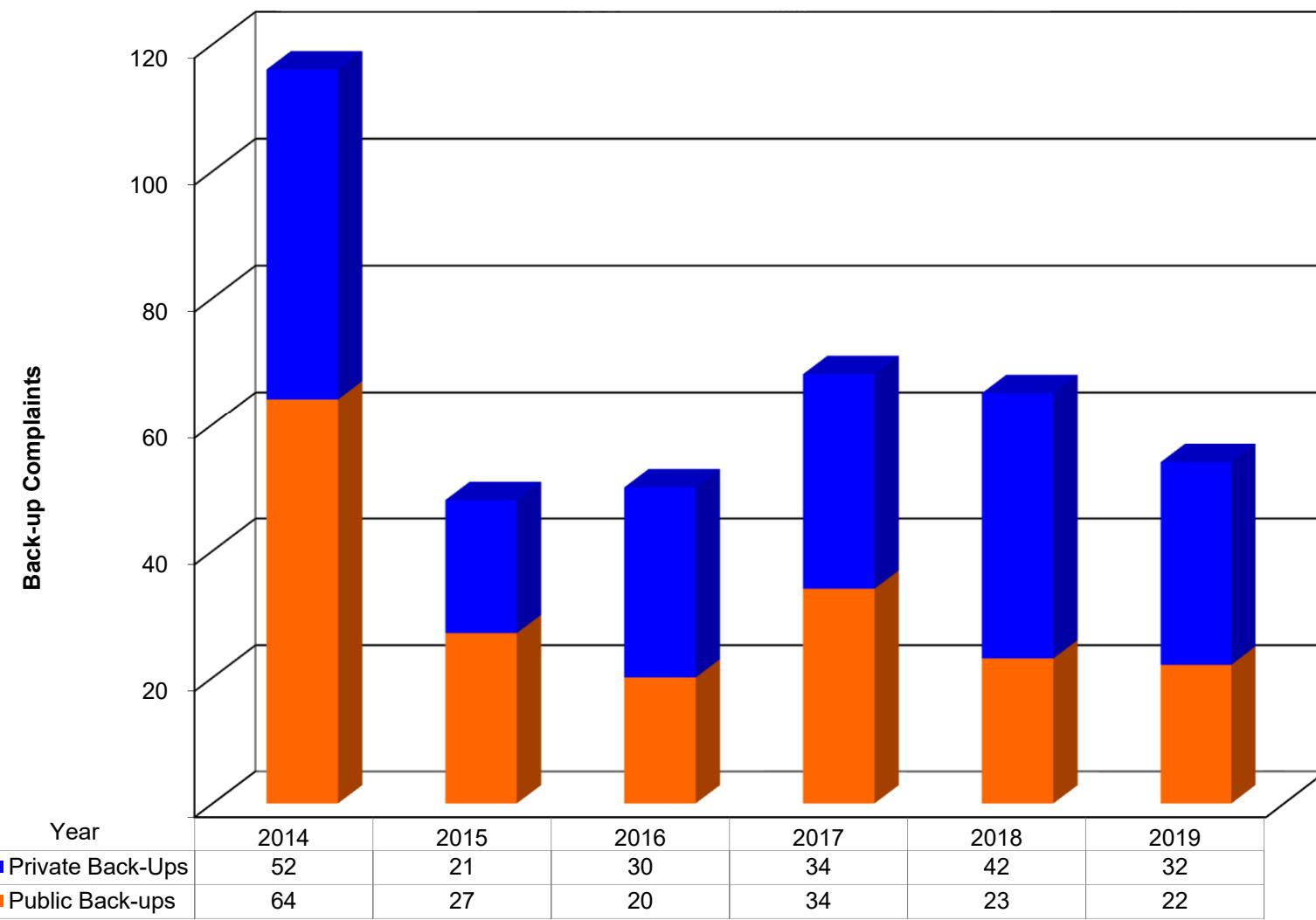


2019 SEWER ACTIVITY REPORT

FIGURE 7  
SANITARY SEWER LINING  
1998-2019



2019 SEWER ACTIVITY REPORT  
FIGURE 8  
STORM SEWER LINING  
1998 - 2019



**Figure 9**  
**Dry Weather Sanitary Sewer Back-Up Complaint History**



#### Legend

2019 Sanitary Sewer Back-Ups



Corporate Limits

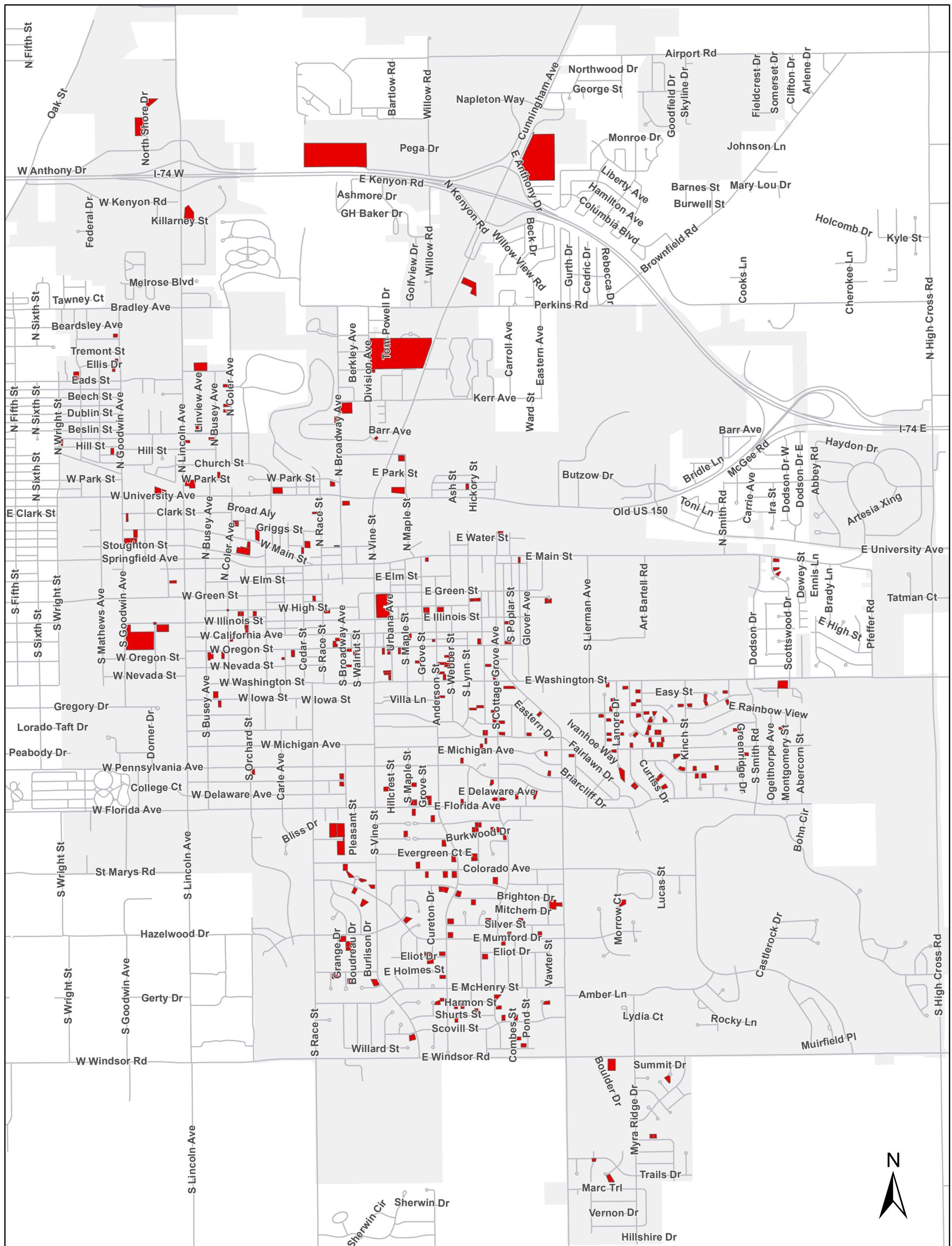
City of Urbana

0 1,000 2,000 4,000  
Feet



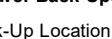
#### 2019 SEWER ACTIVITY REPORT

FIGURE 10  
PUBLIC SANITARY SEWERS  
DRY WEATHER BACK-UPS  
2019



#### Legend

Sanitary Sewer Back-Ups



Back-Up Location

Corporate Limits

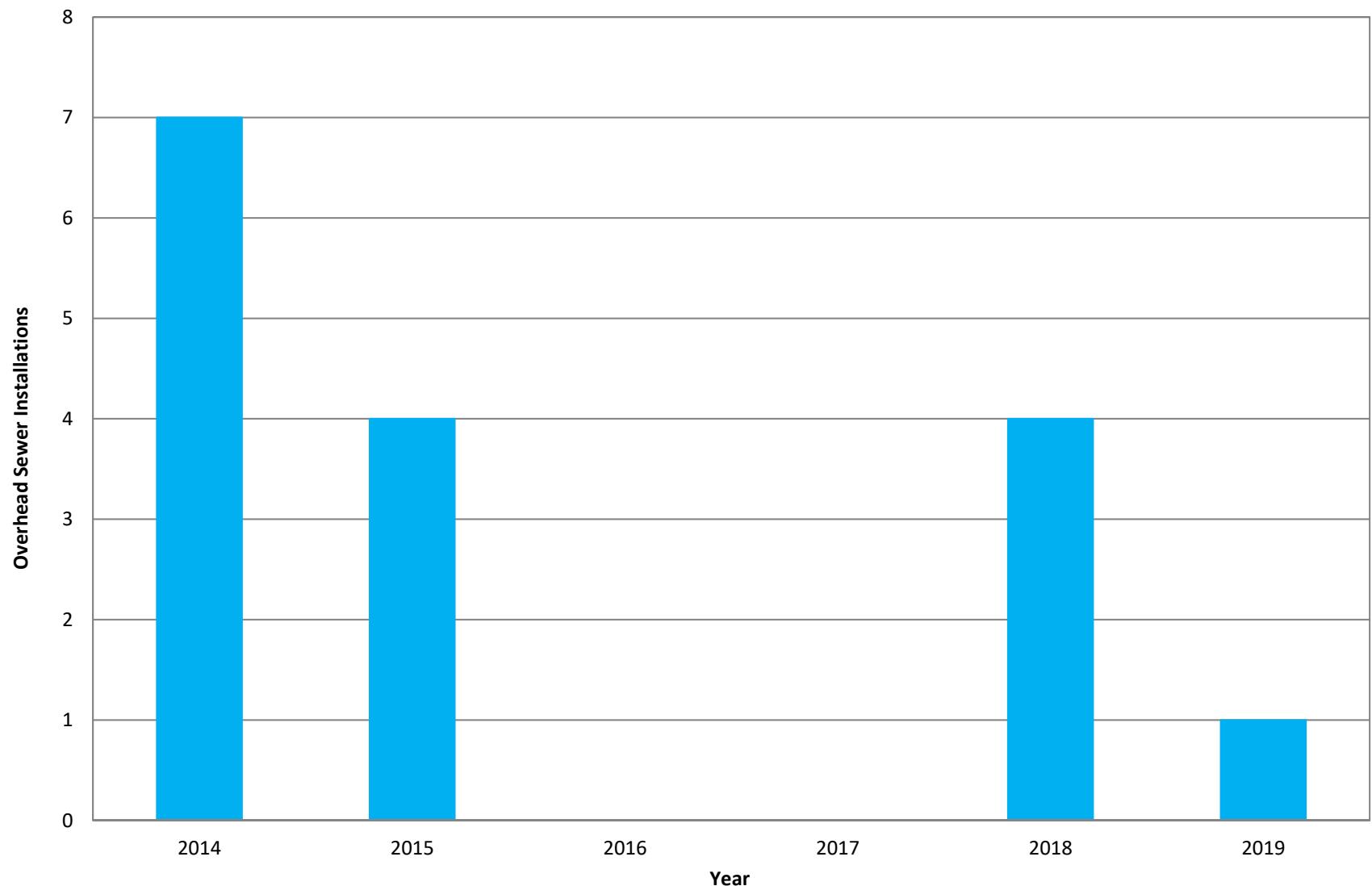
City of Urbana

0 1,000 2,000 4,000  
Feet



#### 2019 SEWER ACTIVITY REPORT

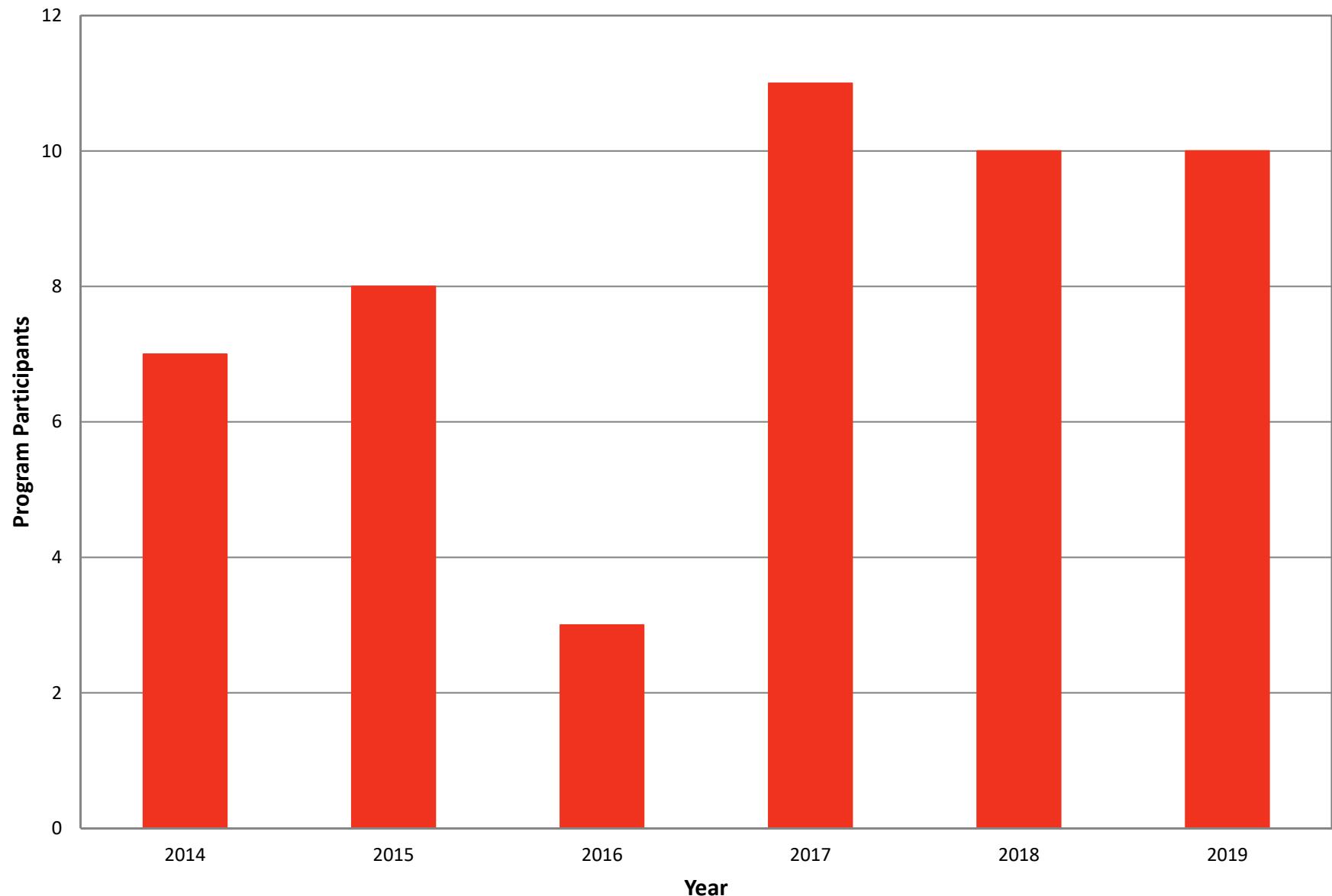
FIGURE 11  
PUBLIC SANITARY SEWERS  
DRY WEATHER BACK-UPS  
2010 - 2019



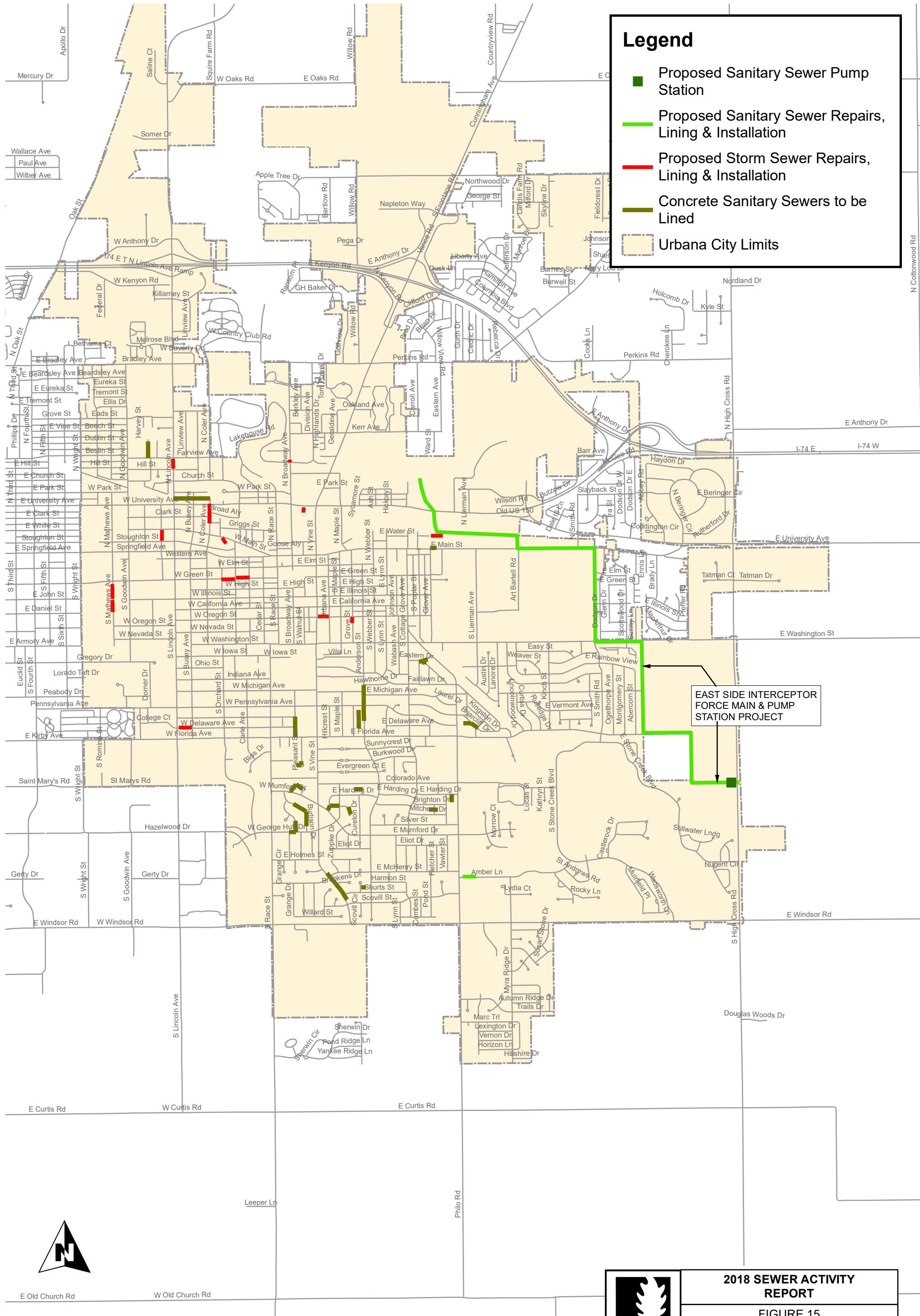
**Figure 12**  
**Overhead Sanitary Sewer Installation History**  
**Overhead Sewer Installations 2013-2018**

#	Address	Date	Reimbursement	Description
1	601 W. High Street	1/24/2019	\$1,430.00	Offset Joint in Sewer Lateral Pipe
2	605 S. Webber	2/27/2019	\$6,175.00	Collapsed Sewer Lateral Pipe
3	908 S. Cottage Grove	3/20/2019	\$4,675.00	Collapsed Sewer Lateral Pipe
4	406 S. Lynn St.	4/5/2019	\$8,437.50	Collapsed Sewer Lateral Pipe
5	212 W. Illinois	4/9/2019	\$12,025.00	Collapsed Sewer Lateral Pipe
6	612 W. Delaware	5/2/2019	\$4,500.00	Collapsed Sewer Lateral Pipe
7	1908 Jane Ann Court	6/3/2019	\$6,000.00	Collapsed Sewer Lateral Pipe
8	507 W. High Street	6/27/2019	\$3,690.00	Collapsed Sewer Lateral Pipe
9	206 E. Holmes St.	7/29/2019	\$3,750.00	Collapsed Sewer Lateral Pipe
10	301 E. Colorado Ave.	10/7/2019	\$2,550.00	Severe Root Intrusion and Collapsed Sewer Lateral Pipe
Total			\$53,232.50	

**FIGURE 13**  
**2019 SEWER LATERAL PAVEMENT REIMBURSEMENT PROGRAM PARTICIPATION**



**Figure 14**  
**Sewer Lateral Pavement Reimbursement Program**



## Legend

- Proposed Sanitary Sewer Pump Station
  - Proposed Sanitary Sewer Repairs, Lining & Installation
  - Proposed Storm Sewer Repairs, Lining & Installation
  - Concrete Sanitary Sewers to be Lined
  - Urbana City Limits

# **2018 SEWER ACTIVITY REPORT**

**FIGURE 15  
PROPOSED SEWER PROJECTS  
IN CAPITAL IMPROVEMENT PLAN**