Technical Memorandum

Date:    Wednesday, June 01, 2016
Project: Sanitary Sewer Master Plan Update
To:      City of Cedar Rapids
From:    David Haugen/HDR
          David Dechant/HDR
Subject: TM 5.0 Policy and Other Considerations (Revised)

This Technical Memorandum presents a review and summary of current sanitary sewer policies and city planning goals that affect the sanitary sewer collection system. The intent is to capture policy considerations under development and to propose future policy considerations. Concurrent with preparation of this TM, a number of new policies are in various stages of development.

This document organized as follows.

- Objective
- Summary
- Policy Considerations
- Other Considerations
- Attachment A – Policy Regarding Public Ownership of Sanitary Sewer Lift Stations

Objective
The objective of this TM 5.0 Policy and Other Considerations is to review and summarize ongoing policy and other considerations that will affect the sanitary sewer system.

Summary
High wet weather flows experienced at Water Pollution Control and throughout the City’s and surrounding cities collection systems are driving the development of current and future policy within the City of Cedar Rapids. Coordination with the City’s street reconstruction program, a push to assume responsibility for a number of currently private lift stations, and funding needs are also drivers.

Current policy considerations include the following.

- Public Ownership of Sanitary Sewer Lift Stations
- Street Reconstruction Sanitary Sewer Policy
- Foundation Drains and Sump Pumps (Private Source I&I)
- Service Laterals and Service Connections (Private Source I&I)
- Neighboring Cities
- Rate Revenue Allocation Between Treatment and Collection
- Sanitary Sewer Design Storm Event (Figure 1)
This technical memorandum also identifies areas targeted for future growth and portions of the existing system identified as priorities to address collection system infiltration and inflow. The Envision CR Comprehensive Plan identified future growth areas that may require future sanitary sewer service. Many of the identified areas were already serviceable. Further study is required to determine the status of remaining areas. The areas requiring further study centered on the southern end of the corridor. Figure 2 below identifies future growth areas and Figure 3 shows the serviceability of those areas.

Priority areas, by metershed, that were established from recent inflow and infiltration studies are also identified in the other considerations section of this technical memorandum. Figure 4 through Figure 6 identify priority metersheds. Work is underway in the two highest priority areas identified include the Lennox and Park Avenue neighborhoods. Initial investigations in these neighborhoods are complete.

The City’s intent for this sanitary sewer master planning effort is that it is the initial step in an ongoing process to develop and refine a hydraulic model and produce and update a living master plan.

Policy Considerations
Policies that need to be considered and presented to City Council focus on implementation of solutions that adequately address wet weather issues, coordination with the City’s street reconstruction program, incorporate a number of private lift stations, and provide adequate funding. These issues fuel the need to reevaluate policy within collection and treatment systems and determine the most efficient way to coordinate with other City initiatives underway. The outcomes of the policy choices will affect services and charges for them.

Public Ownership of Sanitary Sewer Lift Stations
A policy regarding transfer of ownership from private to public for a number of sanitary sewer lift stations was presented to the City Council’s Infrastructure Committee. The proposed policy will provide consistent requirements to current and future property owners served by a lift station. In addition, the policy will define the guidelines for the City to acquire ownership of existing private lift stations with the City. A copy of the proposed policy can be viewed in Attachment A. Currently there are seven (7) privately owned and operated lift stations that the City could assume responsibility for.

Properly designed, operated, and maintained lift stations will minimize the risk of sanitary sewer overflows, basement backups, and related health and water quality issues. Below are key points of the draft policy presented to the Infrastructure Committee:

- No new privately owned lift stations will be permitted in the City of Cedar Rapids. Lift stations servicing eight or fewer residential equivalent properties will be exempt.
- The City will not take ownership of existing private lift stations until recommended improvements are made to the lift station.
- Current owners of existing private lift stations may choose to fund necessary improvements themselves or request that the City fund and complete the improvements. When the City funds improvements, the current owner of existing
private lift stations will be subject to a supplemental rate structure so the City may recoup some of the costs for improvements and subsequent operations and maintenance of the lift station. Current owners that fund the necessary improvements themselves will be exempt from a supplemental rate structure.

- All proposed lift stations shall comply with the City’s Lift Station Design Guidelines as established by the Public Works and Utility Departments.
- Proposed lift stations to serve development areas shall be sized to serve adjacent areas at the City’s request. In this case, the City will reimburse the developer for the incremental difference for what is required for the specific development.

Policy recommendations will be finalized and accepted by the full Council. At the time of writing this TM, this policy had been recommended for acceptance by the Infrastructure Committee and was seeking Council approval.

Pavement Reconstruction
Street reconstruction including Paving for Progress will capitalize on $18 million in new annual revenue, set aside solely for the maintenance, repair, construction and reconstruction of public streets. In November 2013, voters approved a 1-percent local option sales tax on road improvements that pays for this starting July 2014. The program creates a significant opportunity to coincidentally address sewer needs in the impacted areas. At question is the funding source for those sewer improvements.

Given limited Sewer Utility funding, consideration should be given to the Sewer Utility funding the public sewer improvement portion and street reconstruction funding the street improvement portion. The Sewer Utility would televise ahead of the project to verify the condition of the public sewer and then fund repairs to the sewer coincidental with the street repairs. Additionally, private sewer service lateral lines and taps would be upgraded at the same time to address failing sewer service lines and failed taps. The associated cost would be born by the adjacent properties.

Foundation Drains and Sump Pumps (Private Source I&I)
Initially in 2010 with the Collection System Infiltration and Inflow Analysis and more recently with the ongoing Collection System Infiltration and Inflow Analysis / Pilot Program and Water Pollution Control Main Lift Station Capacity Assessment, the City has taken a comprehensive look at inflow and infiltration and its affect on the water pollution control facilities ability to treat the generated flows. It has long been understood that wet weather events caused by heavy rains and high river levels have inundated and overwhelmed the collection system and challenge treatment plant capacity. Inflow and infiltrations studies conducted in the Lennox neighborhood, with 1950’s and 1960’s vintage housing, indicate that approximately thirty percent of the homes have stormwater connections to the sanitary sewer collection system. These illicit connections were found to consist of roof drains directly connected basement sump pump connections and footing tile connections.

Currently, approximately one third of the volume treated annually and as much as three fourths of the peak flow at the Water Pollution Control Facility is inflow and infiltration. Current policy includes a foundation drain reimbursement program. Homeowners are eligible for up to five
hundred dollars aid to disconnect foundation drains and sump pumps from the sanitary sewer collection system.

Current policy should be amended or new policy should be developed to more effectively target illicit connections. Private source policy removal programs very greatly from community to community. Technical Memorandum 856, developed as part of the Collection System Infiltration and Inflow Analysis / Pilot Program and Water Pollution Control Main Lift Capacity Assessment, outlines and summarizes excising policy for various municipalities in Iowa.

Technical Memorandum 856 demonstrated that there are a range of strategies utilized covering voluntary, involuntary, and incentivized removal of illicit connections. It is recommended that this Technical Memorandum be used to help develop policy that fits within the City of Cedar Rapids. Current discussions initiated as part of that study propose to start the inspection program as a point of sale inspection with correction required prior to sale. This program is a logical first step in developing policy. It is minimally invasive to the homeowners and could be supplemented with additional triggers when the proper education and outreach has been completed. Additional inspection triggers include the following.

- High infiltration and inflow areas identified through collection system flow metering
- Evidence of improper sewer connection
- Issuance of a building permit

Service Lateral and Service Connections (Private Source I&I)

There are over 500 miles of private service laterals connected to the 660 miles of public sewer in Cedar Rapids. Similar to the deterioration over time of the public sewers that comprise the collection system, private service lateral connections begin to age, crack and leak. Current policy within the City of Cedar Rapids is that homeowners are responsible for their service lateral from its connection to the main to the house. This is a customary approach avoiding the amount of capital it would take for the City to maintain this private infrastructure.

According to a compilation of data from the EPA presented through their outreach program, service lateral connections comprise of 40 percent of inflow and infiltration into the collection system. Consideration should be given to a service lateral inspection program at the point of sale. Not only would this benefit the City of Cedar Rapids by reducing the inflow and infiltration, but would also protect the buyer. Implementation of an expanded citywide service lateral inspection program could be implemented over an extended period by adding triggers that initiate the requirement for the inspection. Additional inspection triggers include the following.

- High infiltration and inflow areas identified through collection system flow metering
- Evidence of improper sewer connection
- Repair of sewer lateral
- Root removal
- Issuance of a building permit
- Capital improvement project sewer rehabilitation
Neighboring Cities  
Over 25 percent of the residential loading of the collection system comes from outside of Cedar Rapids. The Cities of Marion, Hiawatha, Robins, and Palo as well as portions of rural Linn County contribute flow to the Cedar Rapids sanitary sewer collection system and Water Pollution Control Facility. Available data indicates that they too may be contributing significant infiltration and inflow. As such, consideration should be given to their contribution to infiltration and inflow and the need for policy to address it. Recommendations for review include:

- Non-Cedar Rapids Sewer Policies – If available, review the sewer policies of neighboring jurisdictions. Incorporate the best practices and provide to the other Cities possible improvements for their programs to reduce the total volume flow of the collection system.
- Review the priority areas from adjacent communities as presented in the Collection System I&I and Main Lift Capacity report and work with neighboring communities for reduction in inflow and infiltration.
- Initiate discussion regarding wet weather flow events with satellite communities and the feasibility of a wet weather surcharge to aide in paying for future upgrades.

Rate Revenue Allocation between Treatment and Collection  
Funding for both the collection system and the treatment plant is primarily through sewer rate revenues. Sewer rate revenue from major industrial customers and the surrounding cities is allocated, along with a portion of the sewer rate revenue from non-industrial customers in Cedar Rapids is allocated to the Utility department for the treatment plant and lift stations. The remainder of the sewer rate revenue from the non-industrial customers in Cedar Rapids is allocated to Public Works for the collection system.

The historic split for non-industrial sewer rate revenue in Cedar Rapids has been 60/40 with 60 percent of the allocated for the collection system. Recently, the split has been reevaluated and adjusted to 61.5/38.5. This split was created in recognition of the amount of work that needed to be completed on the collection system and the impacts that they have on Water Pollution Control Facility. This section takes a look at two similarly sized cities and the rate revenue split that they utilize. Neither of the two cities separately accounts for major industrial or satellite community rate revenues the way that Cedar Rapids does.

The City of Davenport, Iowa collects all of the sewer rate revenue generated and places it into a sewer fund. A portion is then transferred to the Water Pollution Control Plant Fund for operation/equipment and to the Risk Fund for a special no-fault sewer back-up reimbursement program. Responsibilities within the City are divided in the same way as with the City of Cedar Rapids. The collection system is maintained and updated by Public Works and all plant expenditures are the responsibility of Water Pollution Control. The current break down for the City of Davenport is presented in Table 1.

<table>
<thead>
<tr>
<th></th>
<th>Budget</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sewers</td>
<td>$10,796,864</td>
<td>59.4 %</td>
</tr>
<tr>
<td>WPCP</td>
<td>$ 7,169,253</td>
<td>39.5 %</td>
</tr>
<tr>
<td>Risk</td>
<td>$ 200,000</td>
<td>1.1 %</td>
</tr>
<tr>
<td>Total</td>
<td>$ 18,166,117</td>
<td>100 %</td>
</tr>
</tbody>
</table>

Table 1: Davenport Rate Allocation
Likewise, the City of Ames handles collection system and treatment responsibilities similar to that of Cedar Rapids. Water Pollution Control handles treatment and operations, and Public Works manages the collection system. The revenue generated goes into a single sewer fund. Each part of the overall operation is funded out of the same fund balance. Each fiscal year the split can change based upon the specific needs of that year. The current year (2015) split is summarized as follows.

- Treatment Operations $3,662,703
- Treatment Capital $4,835,000
- Collection Operations $872,007
- Collections Capital $3,595,000
- Support Services* $342,268
- Customer Services** $371,721
- Debt Service*** $276,556

*Support Services includes contributions to shared City Administrative function such as purchasing, IT, finance accounting, City Manager/City Clerk, Human Resources.

**Customer Service is the billing function that operates out of the Finance Department and is shared between water, sewer, and electric.

***Debt Service is paid to/thru the Finance Department.

In summary of the above, the revenue that is being withdrawn from the sewer fund balance for this fiscal year has the split shown in Table 2.

It is recommended, similar to Davenport and Ames, and consistent with ongoing discussions that the City reevaluate the revenue split on a yearly basis to determine the best way to address needs at the time.

**Sanitary Sewer Design Storm Event**

Normal, dry weather sanitary flows use very little of the available sanitary sewer capacity. Depending on quality of construction, age, and condition, wet weather flows can range from three to twenty or more times dry weather flow and significantly tax, if not exceed the capacity of the sanitary sewer collection system. The extraneous flows can be the result of precipitation, snowmelt, elevated river levels, or some combination of all. The more extreme the precipitation event or the river level, the greater the extraneous flow.

While neither EPA nor IDNR standards acknowledge a design storm event, Iowa Code Section 567 Environmental Protection, Paragraph 64.2(10) references two and five year storm events to be significant as follows.

<table>
<thead>
<tr>
<th></th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>60.9 %</td>
</tr>
<tr>
<td>Collections</td>
<td>32.0 %</td>
</tr>
<tr>
<td>Support</td>
<td>7.1 %</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 2 Ames Rate Allocation
“b. A sanitary sewer extension construction permit may be denied if bypassing has occurred at the treatment facility, except when any of the following conditions are being met: . . .

(2) The bypassing occurs as a result of a storm with an intensity or duration greater than that of a storm with a return period of five years.”

c. A sanitary sewer extension construction permit may be denied if an existing downstream sewer is or will be overloaded or surcharged, resulting in bypassing, flooded basements, or overflowing manholes, unless:

(1) the bypassing or flooding is the result of a precipitation event with an intensity or duration greater than that of a storm with a return period of two years.”

The referenced Appendix A is presented as Figure 1 herein. It defines the various combinations of storm intensity and duration that constitute the referenced two and five year events. The City has historically included a copy of this figure with the associated storm duration and intensity in reporting collection system overflows to the IDNR.

Metro Area Standards reflect a policy that the minor storm drainage system, consisting of underground piping, natural drainage ways, and other required conveyance, should be designed for a five-year storm event and the major storm drainage system should be designed to prevent major property damage or loss of life from storm runoff expected from a 100 year storm. Similarly, it is suggested that a design storm event(s) be established and included in the Metro Area Standards for sanitary sewer collection system. The aforementioned Iowa Code provides a starting point for selecting the design storm event(s).

Such a design policy for the design of new or replacement of existing sanitary sewer collection system and treatment works should require the incorporation of a reasonable amount of inflow and infiltration that would be expected as part of the outlined design storm event. The use of wet weather benchmarking such as flow metering should be an integral part of the design process. Likewise, it is recommended the City consider developing policies requiring inflow and infiltration studies prior to sizing collection system facilities for basins that surpass a certain peaking factor threshold. These developed policies would work toward mitigating SSO’s and maintaining the capacity of Water Pollution Control.
Potential Growth Areas

Growth areas for the City of Cedar Rapids have been identified through the Envision CR process and incorporated into the comprehensive plan adopted January 27, 2015. Figure 2 below identifies the potential growth areas.
Figure 2 Potential Growth Areas (From Envision CR Comprehensive Plan)

Potential growth areas were then evaluated based upon their serviceability and categorized accordingly. Figure 3 below depicts future growth areas and the current ability to service those areas. Many of the areas have excellent to good serviceability with other areas requiring improvements and further study.
Future growth areas requiring further study for serviceability are generally located in the south and indicated in yellow. It is recommended that the City move forward with preliminary investigation on the infrastructure needs to service these areas.

Areas marked in gray are additional areas that would require further study to assess serviceability, but are areas that the City has not planned to service at this time. Study of those areas should be triggered from interested developers.

**Metershed Priority Areas**
Areas with high infiltration and inflow have been identified based on flow metering data and the associated metersheds identified as priorities on two separate occasions. Technical Memorandum 1 from the Collection System Infiltration and Inflow Analysis presented December of 2010 established the preliminary evaluation of the metersheds with recommendations. This was further evaluated with the addition of new flow data and presented March 2013 in Technical Memorandum 400 as part of the Collection System Infiltration and Inflow Analysis / Pilot Program and Water Pollution Control Main Lift Capacity Assessment.
The priority metersheds are presented below. Tables 3 through 5 contain a compiled list of the metersheds and Figures 4 through 6 contain mapping associated with the metersheds. Work has proceeded within the Lennox and Park Avenue areas. Those areas are highlighted in green within Table 3. In addition, there are a number of areas highlighted in blue that are within neighboring communities.

Based upon the data analysis presented in Technical Memorandum 400 the potentially **highest priority metersheds** based on two or more peak to dry weather ratios greater than 10 include the following:

- The Lennox Avenue and Lennox 9 metersheds in the upper portion of the East Interceptor trunk sewer
- The Morgan 36 and the Wilson metersheds in the upper portion of the West Interceptor trunk sewer system
- The Park Avenue metershed in the West Interceptor trunk sewer system
- The 44\(^{th}\) Street metershed

Several other metersheds may also be priorities based on a peak to dry weather ratio greater than 10. These metersheds are considered **secondary priority metersheds**.

- Hoosier Creek metershed connecting through the C Street sewer system
- 12\(^{th}\) Street, Lennox 4, and Lennox 6 metersheds in the upper portion of the East Interceptor trunk sewer system
- The Jones 10 metershed in the Prairie Creek Interceptor trunk sewer system

Conversely, the potentially **lowest priority metersheds** based on two or more of peak to dry weather flow ratios less than 5 include the following:

- The 5\(^{th}\) Ave, 3\(^{rd}\) Street, Lennox 1, and Lennox 8 metersheds in the upper portion of the East Interceptor trunk sewer
- The Squaw Creek, Indian 36, Tucker Park, Nixon Park, and Robins metersheds in the West Interceptor trunk sewer system
- The Jones 48, J Street 48, Hawkeye, Bowling Street, Bowling 8, J Street SW, J Street 10, and Ingleside
- The Ellis 54, E Ave, Usher’s Ferry, Morgan 12, and Burch Ave metersheds in the West Interceptor trunk sewer system

The Ushers Ferry metershed in the upper portion of the West Interceptor trunk sewer system
<table>
<thead>
<tr>
<th>Location</th>
<th>Description of Approach</th>
<th>Priority</th>
<th>Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>General (G-1)</td>
<td>It is recommended to automate current flow metering data collection and reporting efforts. Automate the targeted 43 meters identified in TM 900 with data acquisition and management capabilities. In addition, automate the rain gauging sites across the City.</td>
<td>High</td>
<td>$385,000</td>
</tr>
<tr>
<td>General (G-2)</td>
<td>Incorporate pre and post rehabilitation flow monitoring into rehabilitation projects to determine the effectiveness with respect to infiltration and inflow reduction.</td>
<td></td>
<td>$6,000</td>
</tr>
<tr>
<td>General (G-3)</td>
<td>Take the results and implementation approach from the Lennox pilot area and implement into the recommended metersheds.</td>
<td>High</td>
<td>$0</td>
</tr>
<tr>
<td>Lennox Avenue (HP-1)</td>
<td>Pilot Area.</td>
<td>High</td>
<td>$1,423,000</td>
</tr>
<tr>
<td>Lennox 9 (HP-2)</td>
<td>Implement and apply the approach and lessons learned from the Lennox area I&amp;I Reduction Pilot Program to this metershed. Initial data collection should center on smoke testing, review of CCTV data then development of an approach to address the problems.</td>
<td>High</td>
<td>$526,000</td>
</tr>
<tr>
<td>Morgan 36 (HP-3)</td>
<td>It is recommended to install additional meters to isolate areas of the sewershed and focus future efforts. Install additional metering in areas with the greatest potential for improvement such as areas with older vintage housing. Implement and apply the approach and lessons learned from the Lennox area I&amp;I Reduction Pilot Program.</td>
<td>High</td>
<td>$16,365,000</td>
</tr>
<tr>
<td>Park Avenue (HP-4)</td>
<td>It is recommended focus initially on inflow in the metershed by smoke testing. Install one additional meter for comparison the areas east and west of 21st Street. Implement and apply the approach and lessons learned from the Lennox area I&amp;I Reduction Pilot Program to this metershed.</td>
<td>High</td>
<td>$783,000</td>
</tr>
<tr>
<td>Wilson (HP-5)</td>
<td>Further investigation should center on the primrose/hickory area and areas with vintage housing. Flow metering data would suggest that these areas are likely to have illicit connections and/or an open and leaky collection system. The first step in investigation should be to gather and view existing data in and around the area of the wet weather event and then transition into a more in depth approach if needed. It is also anticipated that this maybe an area with a high ground water table.</td>
<td>High</td>
<td>$698,000</td>
</tr>
<tr>
<td>44th Street (HP-6)</td>
<td>It is recommended to install additional meters to isolate areas of the sewershed and focus future efforts. Install additional metering in areas with the greatest potential for improvement, such as areas with older vintage housing. Implement and apply the approach and lessons learned from the Lennox area I&amp;I Reduction Pilot Program.</td>
<td>High</td>
<td>$4,774,000</td>
</tr>
</tbody>
</table>

**Table 3** High Priority Metersheds
## Collection System Infiltration and Inflow Analysis Recommendations Summary (Medium Priority Metersheds)

<table>
<thead>
<tr>
<th>Location</th>
<th>Description of Approach</th>
<th>Priority</th>
<th>Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hoosier Creek (MP-1)</td>
<td>This is a very small metershed with a limited pipe network. This line should be televised giving special attention to the dead end lines especially the one at Hoosier Creek. Likely one of these dead ends is leaking.</td>
<td>Medium</td>
<td>$95,000</td>
</tr>
<tr>
<td>12th Street (MP-2)</td>
<td>Encourage the City of Hiawatha to address the problem.</td>
<td>Medium</td>
<td>$0</td>
</tr>
<tr>
<td>Lennox 4 (MP-3)</td>
<td>Implement and apply similar approach as the Lennox Avenue Pilot Area.</td>
<td>Medium</td>
<td>$590,000</td>
</tr>
<tr>
<td>Lennox 6 (MP-4)</td>
<td>Implement and apply similar approach as the Lennox Avenue Pilot Area. Area not inclusive of Lennox 9.</td>
<td>Medium</td>
<td>$219,000</td>
</tr>
<tr>
<td>Jones 10 (MP-5)</td>
<td>This small metershed with limited pipe network. Recommend additional investigation with addition focus on areas that contain vintage housing.</td>
<td>Medium</td>
<td>$7,000</td>
</tr>
</tbody>
</table>

*Table 4: Medium Priority Metersheds*
Collection System Infiltration and Inflow Analysis Recommendations Summary (Lower Priority Metersheds)

<table>
<thead>
<tr>
<th>Location</th>
<th>Description of Approach</th>
<th>Priority</th>
<th>Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>5th Avenue (LP-1)</td>
<td>Further investigation is warranted for this metershed. This area needs to be televised or the current televising needs to be viewed with particular attention paid initiating a maintenance program within the area. It is recommended to smoke test this area and search for areas of inflow.</td>
<td>Lower</td>
<td>$119,000</td>
</tr>
<tr>
<td>3rd Street (LP-2)</td>
<td>Continue to monitor flows and work with the City of Hiawatha to address the problem.</td>
<td>Lower</td>
<td>$0</td>
</tr>
<tr>
<td>Lennox 1 (LP-3)</td>
<td>Pilot Area</td>
<td>Lower</td>
<td>$0</td>
</tr>
<tr>
<td>Lennox 8 (LP-4)</td>
<td>Implement and apply the approach and lessons learned from the Lennox area I&amp;I Reduction Pilot Program to this metershed. Initial data collection should center on smoke testing, review of CCTV data then development of an approach to address the problems.</td>
<td>Lower</td>
<td>$352,000</td>
</tr>
<tr>
<td>Squaw Creek (LP-5)</td>
<td>Continue to monitor flows and reassess later.</td>
<td>Lower</td>
<td>$0</td>
</tr>
<tr>
<td>Indian Creek 36 (LP-6)</td>
<td>Continue to monitor flows in Indian Creek and monitor with respect to changes to the basin.</td>
<td>Lower</td>
<td>$0</td>
</tr>
<tr>
<td>Tucker Park (LP-7)</td>
<td>Share results with Hiawatha and encourage them to look for sources of high peak wet weather flows.</td>
<td>Lower</td>
<td>$0</td>
</tr>
<tr>
<td>Robins (LP-8)</td>
<td>Share results with Hiawatha and encourage them to look for sources of high peak wet weather flows.</td>
<td>Lower</td>
<td>$0</td>
</tr>
<tr>
<td>Nixon Park (LP-9)</td>
<td>Share results with Hiawatha and encourage them to look for sources of high peak wet weather flows.</td>
<td>Lower</td>
<td>$0</td>
</tr>
<tr>
<td>Jones 48 (LP-10)</td>
<td>Part of the Prairie Creek Sewer Reconstruction Project. It is recommended to continue monitoring and assess changes later.</td>
<td>Lower</td>
<td>$0</td>
</tr>
<tr>
<td>J Street 48 (LP-11)</td>
<td>Part of the Prairie Creek Sewer Reconstruction Project. It is recommended to continue monitoring and assess changes later.</td>
<td>Lower</td>
<td>$0</td>
</tr>
<tr>
<td>Hawkeye (LP-12)</td>
<td>Continue to monitor flows and move metering to isolate and locate the areas with the greatest defects. Then proceed with a targeted approach.</td>
<td>Lower</td>
<td>$0</td>
</tr>
<tr>
<td>Bowling Street 8 (LP-13)</td>
<td>Continue to monitor flows and reassess later.</td>
<td>Lower</td>
<td>$0</td>
</tr>
<tr>
<td>J Street SW (LP-14)</td>
<td>Continue to monitor flows and reassess later.</td>
<td>Lower</td>
<td>$0</td>
</tr>
<tr>
<td>J Street 10 (LP-15)</td>
<td>Continue to monitor flows and reassess at a later date</td>
<td>Lower</td>
<td>$0</td>
</tr>
<tr>
<td>Ingleside (LP-16)</td>
<td>Continue to monitor flows and reassess at a later date</td>
<td>Lower</td>
<td>$0</td>
</tr>
<tr>
<td>Ellis 54 (LP-17)</td>
<td>Continue to monitor flows and reassess at a later date</td>
<td>Lower</td>
<td>$0</td>
</tr>
<tr>
<td>E Ave (LP-18)</td>
<td>Continue to monitor flows and reassess at a later date</td>
<td>Lower</td>
<td>$0</td>
</tr>
<tr>
<td>Morgan 12 (LP-19)</td>
<td>Continue to monitor flows and reassess at a later date</td>
<td>Lower</td>
<td>$0</td>
</tr>
<tr>
<td>Burch Avenue (LP-20)</td>
<td>Continue to monitor flows and reassess at a later date</td>
<td>Lower</td>
<td>$0</td>
</tr>
<tr>
<td>Usher’s Ferry (LP-21)</td>
<td>Continue to monitor flows and reassess at a later date</td>
<td>Lower</td>
<td>$0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>$26,341,000</strong></td>
</tr>
</tbody>
</table>
Figure 4 High Priority Areas for I/I Reduction
Figure 5 Medium Priority Areas for I/I Reduction
Figure 6 Low Priority Areas for I/I Reduction
Ongoing Master Planning

As summarized in TM 2.0 Historic and Planned Improvements, prior master planning related effort included a 1984 Sewer System Evaluation Survey and a 1998 Sanitary Sewer Master Plan. Contrary to prior master planning, the intent of the current master planning effort is to develop an initial macro scale model of the sanitary sewer system and initiate a living master plan that can be expanded/further developed in subsequent years. The initial plan includes information on the existing sanitary sewer system, inventoried the extent and general condition of the City’s sanitary sewer assets, identifies future growth areas, prepares a macro-scale hydraulic model to determine overall system deficiencies, develops and analyzes macro scale alternatives, prioritizes policy issues and project needs, and assesses overall financial needs.

The intent in subsequent years is to sequentially calibrate and refine the macro scale model to individual metershed areas and, in doing so, incorporate results, further develop and refine system deficiencies, alternatives, policy and project priorities, and financial needs. As a developing, living document, the Sanitary Sewer Master Plan will evolve as conditions change with time. Biannual and/or annual modeling updates are recommended in order to maintain a record of capacities and areas needing attention.
ATTACHMENT A - Policy Regarding Public Ownership Of Sanitary Sewer Lift Stations
I. Policy Goal
This policy is to establish criteria and conditions for City of Cedar Rapids (City) ownership of sanitary sewer pumping stations (lift stations) and associated discharge pressure pipes (force mains).

II. Policy Statement
Lift stations and force mains that are properly designed, maintained and operated minimize the risk of sanitary sewer overflows, sanitary sewer backups and related health and water quality hazards. At a minimum, all lift stations within the City shall be designed in accordance with the Iowa Wastewater Facilities Design Standards. Lift stations and force mains owned by the City shall also meet the City’s Lift Station Design Guidelines.

III. Definitions
A. Capital Improvement Program (CIP): The City’s program to construct new City infrastructure and to repair, reconstruct or replace the City’s infrastructure with City funds.

B. Force Main: A pipe that carries wastewater under pressure from the discharge side of a pump to a point of gravity flow.

C. Lift Station: A wastewater pumping station that lifts the wastewater to a higher elevation. A lift station is typically required either when 1) continuing the sewer at reasonable slopes would involve excessive depths of trench or 2) the lift station serves areas too low to drain into available sewers. Sometimes called a "pump station".

D. Public Sewer: A sewer owned by and subject to the jurisdiction of the City.

E. Residential equivalent properties: A unit of measurement used to denote the typical commodity consumption by a single-family residential customer.

F. Sanitary Sewer: A public sewer that conveys wastewater, and into which storm, surface, ground, and unpolluted waters are not intentionally admitted.
G. Sewer: A pipe or conduit for conveying wastewater or any other waste liquids, including storm, surface and groundwater drainage.

H. Wastewater: The spent water of a community. It may be liquid or a combination of liquid and water-carried wastes from residences, commercial buildings, industrial plants, and institutions. This includes groundwater or surface water that mixes with spent water of a community.

IV. Applicability

A. All sanitary sewer lift stations within the City of Cedar Rapids corporate limits.

B. Sanitary sewer lift stations located in areas surrounding the City of Cedar Rapids for which the property owner has signed a voluntary annexation agreement with the City.

V. Implementation

A. Existing privately owned lift stations:

1. Owners of existing lift stations shall submit a request for public ownership which details the current ownership structure, reasons for the request and maintenance history of the existing lift station.

2. The City will conduct an evaluation of the lift station and force main to evaluate the feasibility of installing a gravity sewer to service the area and to determine improvements necessary to meet current DNR standards and City design guidelines.

3. The City shall take ownership of the lift station once the improvements recommended in the evaluation are completed.

4. Owners will have the following options for completing improvements:

   a. Owners may complete required improvements independently or pay the full cost of a City CIP to complete improvements. Under this option the Owner may dictate the schedule for City ownership and be exempt from a supplemental rate structure.

   b. Owners may submit a request to have the City fund and complete improvements. Under this option, the City will dictate the schedule for improvements as well as the subsequent transition in ownership. After the
improvements are complete, a supplemental rate structure will be established for a period of ten years for all property owners’ served by the lift station. The supplemental rate structure shall not exceed a forty (40) percent increase in a rate payer’s sewer utility bill.

B. Proposed lift stations to serve developing areas:

1. Developers shall demonstrate that construction of a lift station and force main is the lowest cost option over the expected lifecycle when compared to construction of a gravity sanitary sewer extension.

2. City Staff will review the location of the proposed lift station to determine if adjacent areas are in need of sanitary sewer service.

3. If no additional areas are to be served beyond the current development area, the proposed lift station shall be designed in accordance with the City’s Lift Station Design Guidelines and constructed by the developer. Developer will be responsible for the costs of the lift station and force main required to serve the development property.

4. Should adjacent areas need service, the proposed lift station shall be sized to accommodate these areas and be designed in accordance with the City’s Lift Station Design Guidelines and constructed by the developer.

5. The Developer shall submit an evaluation showing the total cost of a lift station designed to serve the development area and the total cost of a lift station designed to serve the expanded area.

6. The City may participate, through the City’s capital improvement program, in the cost of the oversized lift station in an amount not to exceed the incremental increase between what is required to serve the current development area and the expanded area.

7. A Sewer Extension Area will be established for areas outside of the proposed development area. An area-based fee will be set based on the total cost of the City’s participation divided by the total expanded area served.
VI. Financial Plan

A. Existing privately owned lift stations:

1. Improvements made by the City shall be funded through the City’s sanitary sewer CIP fund. The schedule for improvements will be dictated by the amount of funding made available by the City and the prioritization of submitted requests as determined by the City.

2. Operation and maintenance of a lift station will be funded through the City’s wastewater treatment operations fund after the City assumes ownership.

3. Revenues from supplemental rates shall be split, 50% – 50%, between the City’s sanitary sewer CIP fund and the City’s wastewater treatment plant operations fund. The City’s sanitary sewer CIP fund shall use the additional revenue towards improvements for existing privately owned lift stations. The City’s wastewater treatment plant operations fund shall use this revenue towards operating and maintaining the City’s public lift stations.

4. Where gravity sewer improvements are completed, the supplemental rates shall go to the City’s sanitary sewer CIP fund. This revenue shall be used towards improvements for existing privately owned lift stations.

B. Proposed lift stations to serve developing areas:

1. The City’s reimbursement will be funded through the City’s sanitary sewer CIP fund.

2. Reimbursement may be included as a funding request in the next available annual budget cycle.

3. Reimbursement payments may be made at the beginning of the fiscal year as approved.

4. Revenue from area-based fees shall go to the City’s sanitary sewer CIP fund to recoup reimbursement payments.

VII. Exceptions

A. Lift stations serving 7 or fewer residential equivalent properties.