

5-Year Capital Improvement Program Infrastructure Replacement Facility Plan

City of Chisholm -Collection System



Prepared For:
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I hereby certify that this report was prepared by me or under my direct supervision and that I am a duly licensed engineer under the laws of the state of Minnesota.

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31,650 lineal feet (6.0 miles) of main line sanitary sewer pipe, nearly 17,250 lineal feet (3.25 miles) of sanitary sewer laterals/services and about 140 manholes. In addition, the city annually contracts for the rehabilitation of about 6-8 manholes by private firms while the city's public works crews annually replace 2-4 random failing manholes and perform 6-10 random spot repairs of broken and misaligned pipe. And three (3) years ago, the city updated its sewer televising capabilities by purchasing an Envirosight self-propelled sewer camera system.

Based on their repair and maintenance records as well as the televising of its' sewer mains, the city public works crews have identified 5th Street South, from 6th Avenue SW/East TH#73 Frontage Road to 1st Avenue SE, as its' number one (#1) priority project for replacement. The water and sewer utilities along that stretch of 5th Street South were constructed about 1910 when many of the homes along it were also being built. The age and poor condition of sanitary sewer pipes and structure, including the potential failure of two (2) brick manholes, as well as the age, deterioration and under sizing of the original 1910 watermain and the poor to failing condition of the existing streets and sidewalk supported its' #1 ranking.

Although it would have been desirable from a time, cost and convenience perspective to replace the utilities, street and sidewalks along all seven (7) blocks of 5th Street South in a single project, the local school district had recently passed a referendum to alter its local campus on the north side of 5th Street between 2nd and 4th Avenues SW through the demolition, refurbishment and construction of various building in 2025. Such activities will require coordination between the city and school district regarding sewer and water service sizes and locations as well as street and sidewalk features, width, and locations. Thus, it was proposed to proceed with a multi-phased project with phase 1 being a complete infrastructure replacement project for the easterly three (3) blocks of 5th Street South from 2nd Avenue SW to 1st Avenue SE at an as bid construction cost of \$2,266,700 and a total project cost of \$2,720,040. That project was bid in December 2023 and is currently under construction.

Also included and prioritized in that 2021 ten (10) year Capital Improvement Program's Infrastructure Replacement Projects were the following streets and avenues as shown on the projects area map contained in Appendix E, which now comprise this "5 Year Capital Improvement Program Infrastructure Replacement Facility Plan":

- 5th Street SW from 2nd Avenue to 6th Avenue;
- 6th Street/4th Avenue NE from CAH #67 to 5th Street NE;
- 5th Street NW from 2nd Avenue to 8th Avenue; and
- 2nd Avenue SW from 1st Street to 6th Street.

I. Introduction

Despite continuing and on-going efforts by the City of Chisholm to actively and aggressively reduce flows in its sanitary sewer collection system, which are then pumped to and treated at the Central Iron Range Sanitary Sewer District (CIRSSD) treatment facility, infiltration and inflow (I/I) continue to be an issue throughout the city's collection system and is more significant in certain identified areas of the city. Inflow occurs when rainwater and/or snow melt either directly enter or are misdirected into the sanitary sewer collection system rather than being captured by the storm sewer collection system of structures and pipes. Infiltration occurs when ground water seeps into the sanitary sewer collection system through cracks, leaks and faulty joints in the manhole structures and pipes. The severity of infiltration is directly correlated to such factors as: the height or depth of the water table; the soil type; the presence of rocks; the pipe embedment material; and the extent of tree root invasion into the pipes at joints, connections and manhole structures. The loss/deterioration of mortar in brick manholes & frost action on all manholes also contributes to the problem of infiltration.

Much of the city's sanitary sewer collection system was constructed between 1900 and 1950 and is, therefore, now over 75 years old. About eighty percent (80%) of that system consist of brick manholes and clay pipe, with either oakum or no sealing material/gaskets at joints.

Between 1973 and 2014, the city retained the services of private firms to televise and record the condition of portions/segments of the sanitary sewer collection system thirteen (13) times. And then in April 2021, the city purchased an Envirosight self-propelled sewer camera system, at a cost in excess of \$80,000, to economically identify problems and issues. Based on those televising as well as flow monitoring & smoke testing studies conducted over the past ten (10) years, (as discussed in more detail in the next section of this plan) the city has been preparing and updating its' 10-year Capital Improvement Program (CIP) annually. Implementation of the CIP's has resulted in seventeen (17) infrastructure replacement projects since 2006 in which: over 31,650 lineal feet (6.0 miles) of main line sanitary sewer pipe; nearly 12,250 lineal feet (3.25 miles) of sanitary service/lateral pipe; and 140 manholes have been replaced. And over the past ten (10) years, the city has contracted to have 6-8 manholes rehabilitated annually in addition to the city public works crews replacing 2-4 random failing manholes and performing 6-10 random spot repairs of pipe annually.

Based on their televising and maintenance efforts, the city's public works staff has identified the replacement of the water and sewer utilities along 5th Street South from 6th Avenue Southwest (the east frontage road of TH # 73) to 1st Avenue Southeast (a distance of 7 blocks & 3800') as their number one (#1) priority infrastructure replacement project (see Appendix E).

Due to the reconstruction of the Chisholm Public School facilities, located on the north side of 5th Street SW between 2nd and 4th Avenues SW, which is scheduled to occur in 2024 and 2025 and which will require coordination between the city and school district regarding such items as utility connection location and sidewalk replacement, the first phase of the 5th Street South Infrastructure Replacement Project was limited to the easterly three (3) blocks from 2nd Avenue SW to 1st Avenue SE. That project was bid in December 2023, awarded in January 2024 and is currently under construction.

ordinance in 1994 also, but the original ordinance was not found. However, that ordinance was incorporated into the “Chapter 53-Public & Private Sewers” ordinance which will be discussed next.

Then based on mandates issued by the Minnesota Pollution Control Agency (MPCA) in the late 1990’s or early 2000’s, the city developed and enacted an ordinance entitled “Chapter 53: Public and Private Sewers” which was adopted on July 25, 2006 and is attached, including the accompanying “Certification for Sewer Lateral Inspection and Maintenance” form, in Appendix A. Approximately ten (10) years ago, subsection “K” of section 55.38 was added to that ordinance which directed the actions to be taken in regards to the existing sanitary sewer lateral/service where an existing building was being demolished and depending if the service was going to be reused or abandoned. That subsection is now section 53.36 of newly updated and revised “Chapter 53: Public & Private Sewers” which was adopted on May 11, 2022 and is attached as Appendix B.

The major point of emphasis in the rewrite, reorganization and updating of Chapter 53 in 2022 was to add paragraph “G” to “Section 53.34 -Inspection of Sewer Laterals” which reads as follows:

G. In conjunction with the city’s infrastructure replacement project (s), those properties not possessing a valid certificate of compliance shall be required to obtain a sewer lateral/sump pump inspection within sixty (60) days of notification from the city. If repairs of the sump pump connections and/or the sanitary sewer lateral lines are required, they shall be performed and assessed in conjunction with the project.

Since the adoption of the original Chapter 53 Ordinance in 2006, property owners had the ability to utilize a private contractor of their own choosing or to retain the city’s public works department staff at a cost (currently \$100) to perform the required televising. However, in conjunction with infrastructure replacement projects since 2006, the city public works crews have provided that televising service at no cost to the adjacent property owners if requested (but not required) in order to learn:

- Which service stub connections to the main line pipe were active;
- To learn the location of the active services/laterals for reconnection during reconstruction; and
- To learn the condition of the service/lateral from the building to the mainline sanitary sewer pipe for the benefit of both the city and the property owner.

As part of the infrastructure replacement projects, the sanitary sewer services/laterals were replaced within the street right-of-way or easement. However, it was at the discretion of the property owner to determine whether or not to replace their service/lateral from the right-of-way or easement line to their structure as part of the project even though the line could be failing or in poor condition. The Lakeview Addition area infrastructure replacement project which will be discussed below, was the impetus for adding paragraph “G” above which now “requires” corrective actions (i.e., lining or replacement) outside the right-of-way or easement if needed.

In 2013, the city retained the professional consulting engineering services of H.R. Green, Inc. to conduct the city’s first comprehensive flow monitoring program to identify and quantify the

- The City Public Works Department has ordered and will be installing nearly 1000 plugs on sanitary sewer manhole covers with open pick holes this spring.

Prior to the spring of 2021, the City Public Works crews utilized a push type camera, with an effective televising length of about 100', to conduct mainline and sewer service/lateral inspections. Thus, manhole to manhole televising was not possible. Then, in the spring of 2021, the city purchased an Envirosight self-propelled sewer camera system, at a cost in excess of \$80,000, which now enables the entire sanitary sewer collection system to be televised and recorded quickly, efficiently, and economically to aid in identifying problems and assisting in the prioritization of repairs, rehabilitation, reconstruction & replacement of the system components. Through those maintenance activities of cleaning, repairing, and televising, the city's public works department has now identified the sanitary sewer collection system along 5th Street South, from 6th Avenue SW (the east frontage road of TH#73) to 1st Avenue SE, as it's number one (#1) priority infrastructure replacement project as shown in Appendix E. The easterly three (3) blocks of 5th Street South constituted the first phase of that project which was bid in December 2023, awarded in January 2024 and is now under construction.

III. Description and Evaluation of Existing Wastewater Collection System

The City of Chisholm sanitary sewer collection system consists of approximately 21 miles (110,000 lineal feet) of 8"-15" diameter main line pipe consisting of either vitrified clay (with and without gaskets and/or joint sealing material), concrete (with and without gaskets and/or joint sealing material or polyvinyl chloride (with gasketed or chemically welded joints) pipe. During the past 15-20 years, over 31,650 lineal feet or 6 miles (more than 25% of full system length) has been rehabilitated or replacement. The collection system has an estimated 440 manholes (based on 1 per 250 lineal feet of main line pipe) with more than 1/3 being rehabilitated or replaced since 2006.

The collection system utilizes two (2) lift stations which are:

- The 2nd Street NE lift station which conveys all wastewater flows from sewer sheds B, C & D, as described in the flow monitoring studies found in Appendices C & D, to the CIRSSD pumping station located at the former Chisholm Wastewater Treatment Plant (CWWTP) site. That lift station was rehabilitated and refurbished in 2008 and features three (3) 50 horsepower, 1000 GPM pumps; and
- The 5th Street SE lift station whose replacement is an integral part of the current infrastructure improvement project, was originally constructed about 1910 in conjunction with the main line sanitary sewer and water main construction project. The original lift station was replaced and relocated to a nearby location in the 1960's. The lift station, proposed as part of the current project, will have twin or duplex submersible pumps-each having a minimum 7.5 horsepower rating and capable of delivering a minimum of 100 gallons per minute. This lift station serves a portion of sewer shed B, as identified in the flow monitoring studies found in Appendices C & D which presently includes about 40 single-family residences and 90 acres of industrially zoned property which is about 40%-50% developed currently.

3. Total Infrastructure Replacement.

1) **Option 1-Do Nothing:**

The do-nothing option merely delays or postpones the inevitable replacement of these amenities to a future time & date while prices continue to escalate dramatically. And during that delay, the city will be expending additional time & money in attempting to keep the lines operational through added maintenance & repair.

2) **Option 2-Phased Infrastructure Replacement:**

It would be desirable from a cost and time standpoint, to reconstruct/replace all these projects at one time if funding was available. A recently passed school referendum will be resulting in the demolition of some school buildings and the construction of others on the north side of 5th Street SW between 2nd & 4th Avenue SW during 2024-2026. Coordination will be required between the City and School District as to the size and location of the water & sanitary service/lateral lines to serve the remaining and new school facilities as well as the sequencing/coordinating the utility & street construction timing versus the building construction timing. Under a phased construction approach along 5th Street South, the first phase, which is currently under construction includes the easterly three (3) blocks from 2nd Avenue SW to 1st Avenue SE while the westerly four (4) blocks will probably be reconstructed in one (1) or two (2) phases, as shown in Appendix E, in or after 2025. The other prioritized projects listed above will probably be phased and combined depending on cost and funding availability.

3) **Option 3-Total Infrastructure Replacement:**

As mentioned in Option 2 above, the replacement of the utility lines, streets & sidewalks along 5th Street South, from 6th Avenue SW to 1st Avenue SE, is the number one (#1) priority project in the city's currently adopted 10-year Capital Improvement Plan (CIP). This option would have been preferable if the needed funding had been available and if the school district's plan for demolition of some buildings and the construction of other new facilities on their property, on the north side of 5th Street SW between 2nd & 4th Avenues SW, had been known in early 2023. Likewise, the cost and lack of funding will probably necessitate the 5th Street NW and 2nd Avenue SW projects to be phased when doing the entire project would save time, disruption and money.

VI. Alternative Selected

Based on the age, size, and condition of both the sanitary sewer & water lines along all these streets, it makes economic sense to reconstruct everything in a single project if funding could be secured through grants, loans, bonding, the general tax levy and assessments. However, with the uncertainty of what will be needed at the school site, as well as where and when, it made sense to stop short of that site (at 2nd Avenue SW) with the current project. Coordination with the school district now requires this segment of 5th Street SW between 2nd and 4th Avenues to be advanced for reconstruction in 2025 rather than in 2026 or after, in addition to the 6th street/4th Avenue NE project which had been scheduled for 2025.

cost of that facility treating clean water. Components of the system could also fail in the interim requiring emergency repairs, more cost and inconvenience and greater liability exposure. Additionally, the city public works crews will continue to spend excessive time and money keeping these segments of the collection system operational when it could be better spent elsewhere.

IX. Potential Impacts

A. Land Use

The existing land use along all of these referenced streets is predominately single-family residential homes with the exception of the school district classroom buildings on the north side of 5th Street between 2nd and 4th Avenues SW and the Heritage Manor Health Center on the south side of 6th Street NE. The existing watermains and sanitary sewers lie within the existing 66' wide right-of-way and provide service to all adjacent properties. No land is required to be purchased and no permanent street and/or utility easement are expected to be needed. However, temporary construction easements will probably be needed to facilitate the rehabilitation and/or replacement of failing or non-compliant water and /or sanitary services across private property between the ROW/property line and the homes or buildings. No land is proposed to be rezoned or to be converted from one use to another. The estimated land disturbance is limited to the existing 66' street right-of-way, not including temporary construction easements to rehab or reconstruct failing non-conforming services on private property, and is estimated at approximately 2.5 acres.

Environmental consequences to the current land use will typically be minor, short-term inconveniences to the public and adjacent property owners that include: temporary shutdowns of utility services during disconnection and reconnection; closed streets during construction working hours as well as access to driveways. The proposed construction activity is temporary in nature and once the project is complete, normal activities can resume in the area.

Mitigation measures during the construction activities will include: contractor scheduling of reasonable work days and work hours; coordination with emergency services and the school district transportation vehicles serving the area; facilitating mail delivery and garbage pick-up and monthly status update letters to the adjacent property owners. Temporary water service will be provided during the replacement of the watermains and temporary road and driveway access can be provided overnight and on weekends.

B. Flood Plains

The City of Chisholm has been identified by the Federal Emergency Management Agency (FEMA) as being a Zone X area which are outside or above the 500-year flood plain elevation.

C. Wetlands

Wetland within the city were identified based on the National Wetland Inventory Mapping and because the project construction/reconstruction is within existing streets, no wetlands will be impacted.

D. Historic Properties

- Council conducts public hearing (the City of Chisholm also holds an informal informational hearing one (1) week in advance of formal public hearing);
- Council orders the improvement and authorizes the preparation of plans and specs;
- Council approves plans and specs and authorizes the advertisement for bids.
- Council receives bids and awards contract;
- Council declares cost to be assessed, orders preparation for assessment roll and sets date for assessment hearing.
- Council conducts assessment hearing; and
- Council adopts the assessment roll.

These projects will be following the same procedure. This summer, the city will be authorizing the preparation of the feasibility report as well as the plans and specifications with the intent of holding the informational and public hearings this fall. We intend to bid the project late this year or early next year for construction in 2025. During construction, the city engineer intends to continue the practice of providing a status update newsletter to the abutting property owners on a monthly basis.

XII. Project Schedule

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| A) Submit Project Priority List (PPL) Request | April 2024 |
| B) Submit Intended Use Plan (IUP) Request | May 2024 |
| C) Submit Plans & Specifications to MPCA and MN Department of Health | By October 31, 2024 |
| D) Bid Project | December 2024 |
| E) Begin Construction | April/May 2025 |
| F) Achieve Substantial Completion (Complete except bituminous wearing course application) | August 2025 |
| G) Final Completion | By June 30, 2026 |

CITY OF CHISHOLM 5-YEAR CAPITAL IMPROVEMENT PROGRAM INFRASTRUCTURE REPLACEMENT PROJECTS



- CURRENT 2024 PROJECT
- PROPOSED 2025 PROJECTS
- PROPOSED 2026 PROJECTS
- PROPOSED 2027 PROJECTS
- PROPOSED 2028 PROJECTS
- PROPOSED 2029 PROJECTS