Clark Dietz
ENGINEERS

Utility Asset Management Study

July 2013

Prepared for

Village of Franklin Park

Prepared by

Clark Dietz, Inc.

Utility Asset Management Study

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EXECUTIVE SUMMARY

The Village of Franklin Park and Clark Dietz, Inc. have worked closely to formulate a systematic plan to prepare an Asset Management Program for the Village. This plan includes four (4) separate steps to establish an Asset Management Program for the Village. These steps are:

- Step 1: Inventory and Problem Definition
- Step 2: Small Capital Improvements and Maintenance Projects
- Step 3: Master Planning Program
- Step 4: Recommendations / Improvements

The "*2013 Utility Asset Management Study*" includes only Step 1 of the Asset Management Plan. The Utility Asset Management Study provides an examination of the Water Utility, Sewer Utility, roadway pavement, and sidewalk ramps throughout the Village. This Study quantifies the status of the existing assets within the Village in an attempt to define "where the Village stands" regarding the condition of their infrastructure. This Study also includes Preliminary Opinions of Probable Costs to maintain and/or replace these assets in order to improve or maintain them in a Fair or better condition.

Asset Management: Definition

The U.S. EPA defines Asset Management as "maintaining a desired level of service for what you want your assets to provide at the lowest life cycle cost. The lowest life cycle cost is the best appropriate cost for rehabilitating, repairing, or replacing an asset. Asset management is implemented through an asset management program and typically includes a written asset management plan".

For the Village of Franklin Park, an asset management plan or program is a dedicated program for maintaining your utilities, roadways and sidewalks to a desired level.

Step 1: Inventory and Problem Definition

The scope of this Study includes only Step 1 towards the development of the Asset Management Plan. This step largely consists of quantifying the condition of the existing assets and the development of a Geographic Information System (GIS) database of this information. This database is a compilation of the Village's information about their utilities and streets, and is intended to be used by the Village's staff and consultants to record and identify detailed information about these systems.

Once the information is gathered and stored in this database, it is imperative to the project's success that this information be continually updated in order to record the condition of the asset as it improves, depreciates, or simply ages. The continued updating of this database is to be the framework by which the Village makes future decisions and prioritizes Village improvements.

Water System Inventory

The Water Utility atlases were recently updated as part of a separate project. As part of this Study, the atlas data was expanded to include a more detailed database of the Village's water system. The database expansion included the age and materials of the water mains, the ID numbers, size, and manufacturer information for the hydrants and valves, and water main break data for the past 10 years. This information is stored in the database, but also included in the appendices to this Study.

The Village's water facilities (pump stations and storage) are in Fair condition, with the exception of the King Street Reservoir. The west reservoir is in need of immediate structural repair to the roof which is currently underway. The Village's 78 miles of water distribution system has an average age of nearly 70 years. The system has a large percentage of mains 6-inch diameter and smaller that will require a dedicated program to upgrade. The Village's water distribution system also experiences a higher than average number of water main breaks on an annual basis. This is largely due to the age of the system and again indicates the need for an increase in the Village's water main replacement program.

A water main program that would replace approximately 0.8 miles (4,100 feet) of water main per year was recommended. The estimated annual cost of this program (in 2013 dollars) is $1.46 million. This is a significant increase in funding over the Village's current annual program. Additional improvements to the reservoirs, booster stations, and a redundant feed to the King Street Pump Station add up to an additional $13.9 million and should be budgeted for separately and completed over the next 10 years.

Sewer System Inventory

The Sewer Utility atlases were also recently updated as part of a separate project. As part of this Study, the atlas data was expanded to include a detailed database of the Village's storm, sanitary, and combined systems. The database expansion included: the age and materials of the sewers, size, and rims and inverts where provided. Sewer breaks, flooding, and plugging data for the past 10 years, as provided by the Village, was also included in the database. Maps of this information are included in the appendices to this Study.

The Village's seven (7) active lift stations are in Fair to Good condition, with the exception of the Anderson Lift Station which is in need of replacement. Minor repairs for individual stations are recommended to improve operation or to meet current safety requirements. These recommended improvements total approximately $420,000.

The Village's 94 miles of collection system has an average age of nearly 76 years. The condition of these sewers is largely unknown due to the lack of routine videotaping or monitoring. Based on the information provided and the overall age of the system, the combined sewers system is thought to be in Fair to Poor condition.

The development of a Capacity, Management, Operation and Maintenance (CMOM) program for the Village's sewers is strongly recommended. This program will help to uncover the condition of all sewers within the Village so that a more detailed plan for the repair or replacement of these assets can be prepared. Without a detailed CMOM program, repairs to this system will continue to be reactionary to failures, plugging, etc.

Based on the length, size, and age of the Village's collection system, it is recommended that the Village establish a program that annually funds the following items:

• System Inventory (Video Inspection and Cleaning):	$ 100,000
• Piping Lining and Spot Replacement:	$1,400,000
• I/I Reduction Program:	$ 221,000
	$1,721,000

The funding of these programs will need to be adjusted once the Village has systematically inventoried the sewers for a few years and as the condition of the sewers is further uncovered.

Pavement and Sidewalk Inventory

The condition report of the Village's roadways was updated in late 2012. This report was published using information from the MicroPaver database previously developed for the Village. Each block of street was given a Pavement Condition Index (PCI) rating from 0 – 100. The condition of the Village's 59.9 miles of streets shows an overall improvement from 40.0 to 47.6 over the past 3 years. The higher rating is attributed to the maintenance and rehabilitation program for the existing pavement.

In order for the Village to continue to improve their streets to an average score of Fair (PCI>55), projections were made for the annual pavement program. The funding estimates for this pavement improvement program ranged from $4.5 mil for a 5-year plan to $4.1 mil. for a 15-year plan. Comparatively the efforts needed to reach a satisfactory condition (PCI of 70) were slightly higher at $4.8 mil per year for a 10-year plan.

In addition to the pavement inventory, the Village requested that Clark Dietz assist in developing a database of the existing ADA accessible structures in the Village. A rating system of 0-5 was developed and used to rate the 1,655 existing structures located at intersections within the Village. It was recommended that the Village look to budget up to $200,000 annually for seven years to bring these structures into PROWAG compliance. This program should be combined with the Village's roadway rehabilitation program as curb and gutter replacement is often required.

General Recommendations

Table 6-1 from Chapter 6 summarizes the capital costs for all the improvements recommended for each Village utility. It is recommended that the Village begin to consider funding for these projects.

Table 6-1. Capital Cost Estimate

Village Asset	Length (miles or each)	Total Cost	Est. Avg. Annual Cost	Cost per Mile or Each	Program Length (yr)
Watermain	78	$112,206,000	$3,741,000	$1,439,000	30
Sewer	94	$122,791,000	$4,094,000	$1,307,000	30
Roadways	60	$52,800,000	$4,800,000	$880,000	*10
Sidewalk Ramps	1655	$1,223,000	$175,000	$1,000	7
	Totals:	$289,020,000	**$12,810,000**		

Notes: * Includes the year of initiation (11-years in length)
1. Sewer and Water programs are listed as 30-year to account for initiation of phases at later dates.

The Village will need to significantly increase funding for the maintenance and replacement of their utilities and roadways to improve the condition of these assets to Fair. The Village will need to consider the funding sources available for these improvements as they look to the future, as a variety of loan and grant programs exist to assist communities with a detailed plan and funding system for improvements. The Village also should consider a comprehensive water and sewer rate study to establish a plan to fund these improvements.

The Village will need to continue to update the GIS database that has been developed for their staff's use. Additional training of the staff may be required, but once staff is comfortable working with this system it will be a valuable tool to be used to build a comprehensive utility and roadway Capital Improvement Projects (CIP) plan for the Village. A comprehensive plan for the Village will assure that resources are used responsibly and transition the Village from a reactionary to visionary approach for their future.

The Village will need to continue with Steps 2 – 4 of this program in order to achieve the goal of establishing a formal Asset Management Program. These next steps include:

Step 2: Small Capital Improvements and Maintenance Projects
This step focuses on fixing immediate problems identified in each system, completing "Quick Fix" projects where needed, continuing to meet the Village's O&M needs, and addressing projects identified as immediate maintenance concerns.

Step 3: Master Planning Program
This step focuses on the development of water and sewer models, developing a detailed prioritized plan for improvement projects, and provides a more comprehensive and detailed plan for meeting the Village's long-term goals.

Step 4: Recommendations / Improvements
This step sets the administrative controls in place to meet the Master Plan goals. This finalizes the CIP program and establishes priorities, and includes the establishment of the financial strategy for funding these improvements.

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CHAPTER 1. PROJECT SUMMARY

1.1 PURPOSE AND SCOPE

The purpose of this study is to prepare an inventory and define problems within the Village of Franklin Park's utilities and roadways. This is the first step toward preparing a comprehensive Asset Management Plan. By completing an Asset Management Plan, the Village can prepare and manage the information necessary to allow those responsible for the Village's infrastructure to make informed decisions and set priorities for maintenance and replacement of the Village's infrastructure. Future steps in the asset management process include:

- Identifying small capital improvements and maintenance projects.
- Implementing a Master Planning program.
- Implementation of Plan recommendations.

This study includes a detailed inventory of the infrastructure associated with the Village's water utility, sewer utility, pavement, and sidewalks. The condition of each utility will be examined and recommendations for improvements will be made. Recommendations will be based on compliance with all federal, state, and local codes and standards. The study will include a preliminary cost estimate for these improvements.

A major part of this first step in the Asset Management Plan process was the development of Geographic Information System (GIS). This database is a comprehensive compilation of the Village's information about their utilities and streets. GIS allows the user to record and identify detailed information about a municipal system. Franklin Park plans to use their GIS to develop a maintenance and replacement plan for their utilities and streets.

1.2 INVENTORY

The Village encompasses 5.1 square miles with a population of 18,351 (2010 census). This report compiled all Village operated roadways, watermains, sewers, and sidewalks from atlas and as-built data provided to Clark Dietz. Table 1-1 lists the total assets examined for this study.

Table 1-1. Village Asset Totals

Asset	Amount (Miles)
Watermain	78
Sewers	94
Roadways	60

CHAPTER 2. WATER SYSTEM

2.1 SYSTEM OVERVIEW

The Village of Franklin Park purchases its water from the City of Chicago. Water from Chicago flows through a 24-inch transmission main and enters the 3 million gallon (MG) and 1 MG underground storage reservoirs located at the Main Pump Station. The Village has three additional ground storage reservoirs and two elevated storage tanks. Four booster pumping stations distribute water throughout the Village. The water distribution system consists of approximately 78 miles of water mains ranging in size from 4-inch to 24-inch in diameter. Figure 2-1 shows a simplified layout of the Village's water supply and distribution system.

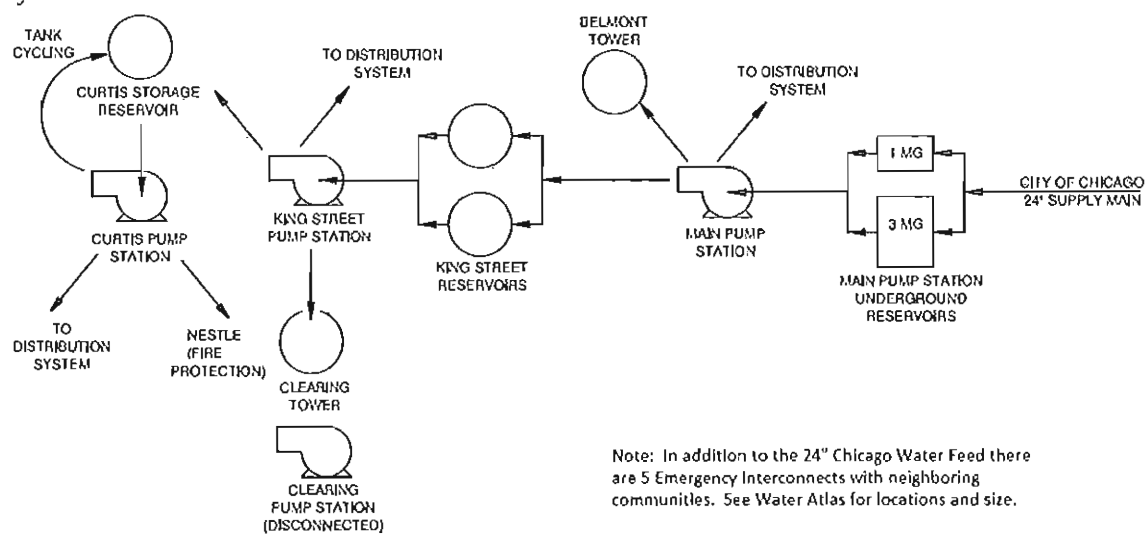


Figure 2-1. Water System Diagram

2.1.1 System Map & GIS Data

Updates to the Village GIS utility atlas were recently completed by Clark Dietz. The utility atlas includes all the water mains in the distribution system, including their size, material, and age, where available, and the use of the pipe (main, service, etc.). Information about the water storage tanks and reservoirs was also entered into the system.

The hydrant and valve identification numbers were derived from the Village's historic card catalog data which included 777 hydrant and 762 valve index cards. The information from these cards was entered into the GIS database with the corresponding hydrant or valve. A table of the numbered hydrants and valves along with their locations is included in Appendix 2.A. Several of the cards had incomplete information or did not match the atlas. These items are flagged and noted for further review or investigation by Village staff.

Data fields were added for the hydrant index, hydrant flow data, hydrant test data, and hydrant service dates. These fields will be populated by the Village in the future.

The Village supplied monthly reports and work tickets for water main breaks experienced since January, 2002. The addresses and dates of these breaks were entered into the GIS database and located on the map.

2.2 FACILITIES PLAN – 2003

A comprehensive Facilities Plan for the Village's water system was completed by Clark Dietz in 2003. This section summarizes the findings of that plan. Items that have been updated since the completion of the Facilities Plan are noted.

2.2.1 Service Area

The Village of Franklin Park's water system service area is shown on the map in Appendix 2.B. The service area includes the entire area within the Village boundary. The land use within the Village breaks down in the following manner: 54% Industrial, 40% Residential, and 6% Commercial/Open Space/Public Facilities.

2.2.2 Pump Station Assessments

Each of the Village's booster pumping stations was inspected to assess the overall condition of the stations. In general the stations are in fair to good condition. A detailed assessment of each pump station is included in Section 2.4.

2.2.3 Flow Requirements

The average daily water pumped within the Village in 2003 at the time of the Facilities Plan was 3.94 million gallons per day (mgd). That flow was estimated based on pump run times and the rated capacity of the pump rather than flow meters; thus the values are not completely reliable. The maximum amount pumped per day is calculated to be 6.74 mgd, which resulted in a peaking factor of 1.7. The average daily water purchased from the City of Chicago is 5.19 mgd, which therefore equates to a maximum day purchase of 8.83 mgd (daily water purchased times peaking factor of 1.7).

The current average day demand is approximately 3.47 mgd based on water purchased from Chicago in 2012. The Facilities Plan estimated that the average day water demand in 2020 will be 5.36 mgd with a maximum day demand of 10.7 mgd. Those estimates do not correspond to the data that indicates that water usage has decreased slightly since 2003. This is likely due to the closing of several industries within the Village as well as the improvement of low flow fixtures in residential and commercial use. Therefore the projected demand of 5.36 mgd will likely be at least 1 to 1.5 times the projected demand if current data is used. This indicates that the water system has more than enough capacity to manage the demand well into 2020.

2.2.4 Hydraulic Model

The hydraulic modeling completed as part of the 2003 Facilities Plan summarized the performance of the Village's water system. The model showed that the system is capable of meeting both the average day and maximum day demands under normal operation. The model also verified that the Village has adequate storage and pumping capacity to meet the future maximum day water demands.

One area of concern was identified by the model. The model showed that system pressures of less than 30 psi are possible in some central and southern areas of the Village under maximum day demands. This situation can occur when the King Street Pump Station (KPS) is running and the Main Pump Station (MPS) is down. The current system relies on the MPS to run under maximum day demands. The primary reason for the low pressure is that the central and southern areas contain many undersized watermains of 6-inch and 4-inch diameters and are also some of the oldest mains in the Village. This problem was identified in the 2003 Facilities Plan and it recommended a replacement program for these old small-diameter mains to improve system pressures. Recent analysis of the system has shown that this condition still exists.

Some improvements have been made to the system since the model was completed in 2004. This report did not include a provision to rerun the water model; however, any improvements made should improve the performance of the system. These changes include:

- Installation of 16-inch water main on Franklin Ave.
- Installation of 10-inch and 12-inch water main in areas of Schierhorn Court, Gage Street, River Road, and Elm Street
- Water main upgrade (6-inch to 8-inch) on Reeves Ct. & Pearl Street between Belmont Avenue and King Street.
- Water main upgrade on (6-inch to 8-inch) on Birch Street & Cherry Ave.

Tables 7-4 and 7-5 in the 2003 Facilities Plan listed several other water distribution system improvements, including replacement of many 6-inch and 4-inch water mains. It is recommended that the Village continue to implement these improvements. The 2003 Facilities Plan can be found in Appendix 2.C.

2.2.5 Future Conditions

As stated previously, the Facilities Plan estimated a 2020 average daily demand of 5.36 mgd and a peak daily flow of 10.7 mgd. These estimates are now considered very conservative when compared to current demand. The Plan recommended a five-year implementation plan for system improvements to meet these future flows and bring the system up-to-date. The recommended implementation plan is shown in the table in Appendix 2.D. Several of these improvements have been completed and are noted in the table. We recommend that no additional capacity improvements are necessary other than the maintenance items noted in the plan. The current system has more than enough capacity to handle future demands.

2.2.6 Recommendations

It is recommended that the Village continue to implement the improvements identified in Tables 8-1 through 8-5 in the Facilities Plan. These tables are included in Appendix 2.D. They have been updated to show the improvements that have been completed since 2003. The costs for the remaining items have not been updated.

2.3 DISTRIBUTION SYSTEM

2.3.1 History and Overview

There are approximately 78 miles of water main in the Franklin Park distribution system. The mains range in size between 4-inches and 24-inches. The original water distribution system dates back to the 1920s. Village staff estimates that the average age of the entire distribution system is approximately 60 to 70 years. The oldest sections of water main are located in the central and eastern areas of the system. 6-inch mains make up much of the distribution system in those areas, along with some 4-inch mains. A listing of all the mains in the system is shown in Table 2-1.

Table 2-1. Village Water Mains

Size (inches)	Length (feet)	Length (miles)	Percentage
≤ 4/unknown	1,940	0.4	0.5%
4	17,516	3.3	4.3%
6	154,200	29.2	37.7%
8	50,987	9.7	12.4%
10	48,612	9.2	11.9%
12	99,149	18.8	24.2%
14	13,992	2.7	3.4%
16	9,133	1.7	2.2%
20	6,935	1.3	1.7%
24	6,909	1.3	1.7%
Total	**409,373**	**77.6**	**100%**

2.3.2 Water Main Breaks

Water main breaks in the Village are recorded and tracked by the Water Department staff. During the period of January 2003 through June 2012, the system experienced an average of 84 breaks per year. This includes breaks on water mains, services, hydrants, and fire lines. The majority of the breaks occurred on water mains, which averaged 57 breaks per year. A summary of the data assembled by the Water Department staff between 2003 and June of 2012 is shown in Table 2-2. Detailed lists of the annual repairs are included in Appendix 2.E as well as in the GIS database. Sizes for the repaired mains were not always collected, however by overlaying the break data on the GIS water atlas it shows that the majority of breaks took place on 6-inch and smaller diameter mains. Figure 2-2 shows a breakdown of the types of pipe breaks reported by staff. The map in Appendix 2.F shows the location of all the breaks throughout the distribution system.

Table 2-2. Average Yearly Water Pipe Breaks, January 2003 – June 2012

Repair Type[1]	Average Count	Average Man-hours	Avg. % of Total Man-hrs	Peak Year	Peak Count	Average Equipment-Hours	Avg. % of Total Equip-hrs
Main	57	1948	75%	2005	87	389	73%
Service	19	426	16%	2007	24	94	18%
Hydrant	6	203	8%	2008	13	45	9%
Total	80	2592	–	–	–	534	–

[1] Between January 2003 and June 2012, Water Department staff also repaired one storm water pipe break, installed a water retention reservoir, removed a drain pipe, and repaired three fire lines.

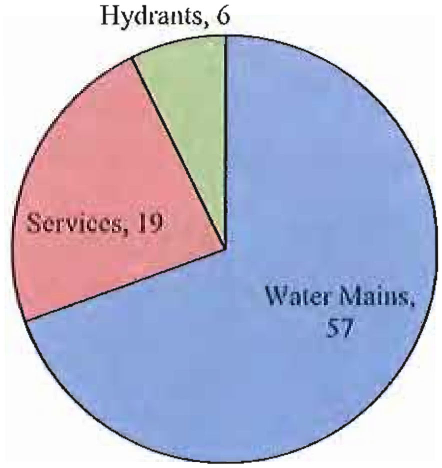
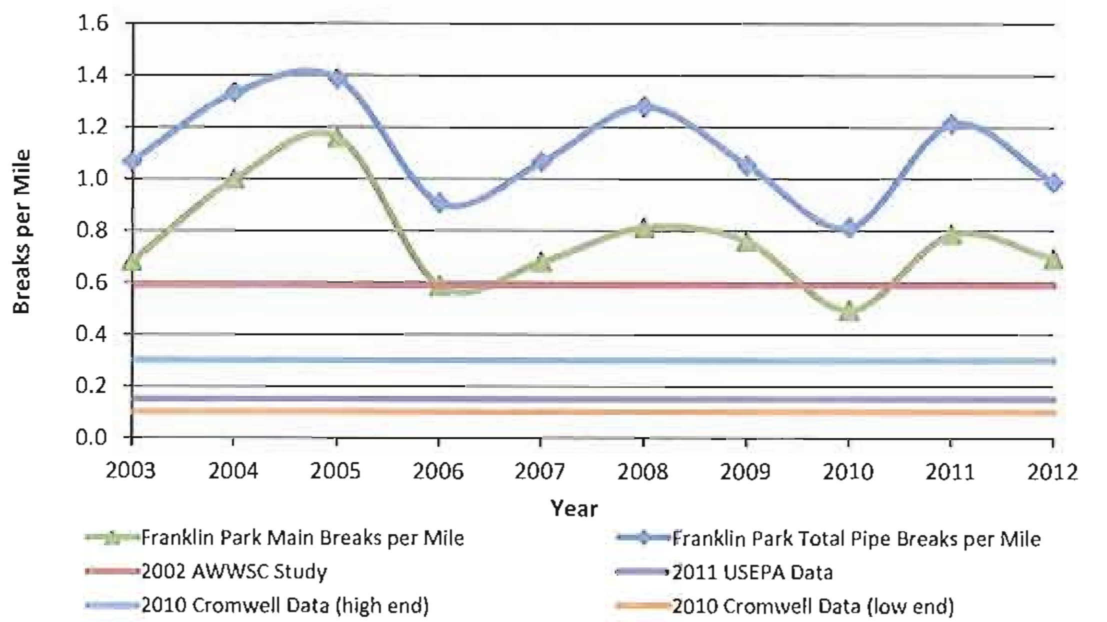


Figure 2-2. Average Yearly Water Pipe Breaks, January 2003 – June 2012

The Village staff has indicated that water main breaks occur more frequently when the Belmont elevated storage tank is taken offline. The elevated tank acts as a surge tank for the distribution system and lessens the effects of high pressure or pressure surges in the water mains. The condition occurred last summer when the Belmont Tower was drained for inspection. An increase in main breaks was noted and the inspection of the tank had to be postponed. Similar conditions were tried on the Clearing tank in the western sector of the town, but there was no increase in main breaks noted. A possible explanation is that the western and eastern sides of town are seperated through check valving and/or pressure reducing valves that allow flow to feed from the east zone to the west zone. The zones are divided along Mannheim Rd. Another possibility is the larger amount of undersized and older watermain in the eastern side of town.

Recent information from the American Water Works Service Co. (2002) found that an average distribution system experiences 36 breaks per 100 kilometers (61 miles) of pipeline per year. This equates to 0.59 breaks per mile. A 2010 study estimated that average systems experience 0.1 to 0.3 breaks per mile per year (Cromwell 2010). That study also mentioned that breaks are more frequent in mains 10-inch diameter and smaller than they are on larger mains. A recent USEPA study estimated that an optimized system has about 15 breaks per year per 100 miles of pipe which calculates to a target ideal break rate of 0.15 breaks per mile.

With approximately 78 miles of water main in the distribution system and an average of 57 water main breaks per year, the Village of Franklin Park experiences 0.73 breaks per mile of water main annually. If all breaks and all pipe lengths are included in the calculation, the breakage rate is 1.03 breaks per mile of pipe annually. The Village experiences water main breaks at a higher rate than the industry average.



Note: 2012 data extends through June. Value used is extrapolated from data.

Figure 2-3. Average Yearly Water Pipe Breaks

Figure 2-3 shows that the Village of Franklin Park experienced water main breaks two times the high-end of the 2010 industry average. Despite an overall decreasing trend in the number of breaks since 2003, they still occur at a rate of almost five times that of an optimized system.

Frequent main breaks place a considerable drain on Village resources. From review of the break reports, on average the Village spends approximately 2,600 man-hours and 535 equipment hours annually on repairing water main breaks. In 2012 the loss rate of purchased water was calculated to be 26.6% which equates to nearly 337 MG of purchased water. For most similarly sized and age municipalities the desirable loss rate is typically no more than 15%, which is attributable to allowable losses through fire flows, metering discrepancies, flushing, etc. Therefore a loss rate of 26.6% is higher than average and it is likely attributable to the high percentage of main breaks and repairs. Factoring in the labor to complete repairs along with the loss of purchased water, it is within the Village's interest to reduce these costs.

2.3.3 Age of Distribution System

The map in Appendix 2.G shows the approximate age of the Village's water system based on the decade that each section of the Village was developed. This information was taken from Cook County historical air photos. The water mains were assumed to have been installed at the same time that houses and businesses were constructed in the various areas. The map shows that the majority of Franklin Park's water distribution system was installed prior to 1960, making it at least 50 years old.

2.3.4 Water Pipe Lifespan

Industry data indicates that the following lifespans can be expected from various pipe materials and the typical time periods for use:

- Ductile Iron – 75 to 100 years (1970's to Present)
- Cast Iron – 100 to 120 years (1920's to 1940's)
- ACP (Asbestos Cement Pipe) – 50 to 70 years (1940's to 1960's)
- PVC (Poly-Vinyl Chloride) – 75 to 100 years (1980's to Present)
- Concrete Pressure Pipe – 75 to 100 years (1980's to Present)

This information was taken from the following sources:

- "Water Main Break Rates in US/Canada", Utah State University (April 2012)
- "Dawn of Replacement", American Water Works Association (2001)
- "Condition Assessment of Ferrous Water and Distribution", EPA (2009)

According to provided as-built data and input from Village staff, the majority of water mains in Franklin Park are cast iron with some ductile iron, transite (asbestos concrete), and concrete pressure pipe (CPP). The Village switched from installing cast iron to ductile iron after the 1960s. The Village does not typically allow PVC, but there may be some in the distribution system due to neighborhood annexations.

The water main age map and the list above show that large sections of the Village's distribution system may be reaching their expected lifespans. The lifespans of water mains constructed prior to World War II are projected to end between 2025 and 2050 depending on their date of installation. The EPA estimates that the water distribution systems in most U.S. communities will reach their expected lifespan by 2040.

71% of the pipes in Franklin Park's water distribution system were installed prior to 1950. The water mains will reach 100 years of age in the following proportions:

- 2030 – 16% of system
- 2040 – 34% of system
- 2050 – 71% of system

After 100 years, most types of pipes have reached their projected lifespan. Increased pipe breaks and failures are to be expected. It therefore is imperative that the Village place a greater emphasis on replacement of older defective mains that will soon outlive their service life.

2.3.5 Pressure Deficiencies

The hydraulic model completed as part of the 2003 Facilities Plan identified possible pressure deficiencies in the central and southern areas of the Village. With only the King Street Pump Station in operation, this area can experience pressures less than 30 psi under maximum day demands. This area contains many 6-inch and 4-inch mains; replacing these undersized mains will improve the available system pressures.

2.3.6 Water Distribution System Summary

The map in Appendix 2.F shows the approximate age of the distribution system, all the water main breaks recorded over the past ten years, and the length of water main with average breaks per mile for each decade of installation. The map shows a correlation between pipe age and the number of breaks. The breaks are especially concentrated in the 1930s and 1940s era pipes; the majority of this pipe is likely cast iron. As noted earlier, repairing these breaks costs the Village an average of 2,600 manhours and 535 equipment hours annually. The breaks are responsible for a large portion of the 26.6% loss in purchased water. Table 2-3 shows a comparison of water intake from Chicago vs. water sold in the Village in 2012.

Table 2-3. Water Intake vs. Billed, 2012

Date	Enter Raw In (Gal)	Raw In (MG)	Enter Sold (Gal)	Sold (MG)	Difference (MG)	Difference %
Jan-12	89,624,100	89.6	71,535,000	71.5	-18.1	-20.2%
Feb-12	108,534,900	108.5	69,312,000	69.3	-39.2	-36.1%
Mar-12	83,415,300	83.4	64,346,250	64.3	-19.1	-22.9%
Apr-12	108,430,100	108.4	73,125,100	73.1	-35.3	-32.6%
May-12	117,309,500	117.3	82,125,500	82.1	-35.2	-30.0%
Jun-12	136,362,400	136.4	98,857,500	98.9	-37.5	-27.5%
Jul-12	110,285,300	110.3	88,560,750	88.6	-21.7	-19.7%
Aug-12	125,231,400	125.2	75,560,750	75.6	-49.7	-39.7%
Sep-12	90,058,000	90.1	81,840,000	81.8	-8.2	-9.1%
Oct-12	96,551,000	96.6	74,564,500	74.6	-22.0	-22.8%
Nov-12	119,830,400	119.8	80,028,750	80.0	-39.8	-33.2%
Dec-12	81,590,100	81.6	70,723,500	70.7	-10.9	-13.3%
Totals:	1,267,222,500	1267.2	930,579,600	930.6	-336.6	-26.6%

Peak Mo.	136,362,400	136.4	98,857,500	98.9	-49.7	-39.7%
Average per Mo.	105,601,875	105.6	77,548,300	77.5	-28.1	-25.6%
Average Per Day	3,471,842	3.5	2,549,533	2.5	-0.9	-0.1%
	Peak Avg. per Day	4.6	mgd	3.3	mgd	

Notes: 1. Yellow indicates a peak value

2.4 PUMP STATIONS

Four booster pumping stations are located within the Village. The booster stations pump water received from the City of Chicago in the two (2) underground concrete reservoirs located at the Main Pump Station to the rest of the system. These booster stations maintain fire flows and system pressures as established by the IEPA.

2.4.1 Main Pump Station (MPS)

The MPS is located at 9535 W. Belmont Avenue in the eastern area of the Village and shares a site with the Public Works building. This booster station was constructed in 1949. The MPS pumps water directly to the distribution system or to the elevated tank onsite.

This pump station has been recently updated, including replacement of the pumps, motors, and Master Control Cabinet (MCC) and installation of Variable Frequency Drive (VFD)s on all the pump motors in 2009. The station includes four booster pumps, a gas chlorine feed system, and an emergency natural gas generator set. The four pumps have a total pumping capacity of 12,000 gpm and a firm capacity (capacity of the station with the largest pump out of service) of 7,800 gpm. The pumps draw directly from the underground reservoirs. Table 2-4 provides details about the MPS pumps.

Table 2-4. MPS Pumps

Pump Number	Discharge Pump Capacity (gpm)	Pump Head (ft)	Motor Horsepower
No. 1	1200	160	75
No. 2	2400	160	125
No. 3	4200	160	200
No. 4	4200	160	200

An assessment of the station's condition was completed on November 1, 2012. In general the station is in good condition, but some improvements are necessary:

- Walls and piping are in need of painting throughout the station.
- Interior lighting needs to be upgraded.

- Tuckpointing is required on the exterior of the masonry building.
- Roof repairs are required.
- Consider improving the building's security measures.
- Additional repair items are listed in the 2003 Facilities Plan. See Tables 8-2 and 8-3 in Appendix 2.D.

The total cost of these improvements is estimated as $240,000. A breakdown of this cost estimate is included in Appendix 2.I.

2.4.2 King Street Pump Station (KPS)

The KPS is located in the western area of the Village at 10920 King St., north of I-294 and east of Wolf Road. This pump station was constructed in 1983. The station pumps to the Milwaukee Road Industrial District & Clearing Industrial District Business Parks in the western portion of the Village. The KPS is dependent on the MPS because MPS pumps water to two onsite ground storage reservoirs. The KPS pumps then draw from these reservoirs and distribute water to the system.

The station includes five booster pumps, a diesel-fueled fire pump, a chlorine feed system, and a diesel emergency generator set. The booster pumps, fire pump, and generator set are exercised regularly. The generator set was installed with the rest of the station and is designed to run two 150 Hp pumps simultaneously. The electric and control panels have some recent upgrades. The most recent update at the KPS included the installation of a VFD on Pump No. 3.

The five booster pumps have a total pumping capacity of 12,100 gpm and a firm capacity of 9,000 gpm. The capacity of the fire pump is 3,500 gpm. Details of the KPS pumps are shown in Table 2-.

Table 2-5. KPS Pumps

Pump Number	Discharge Pump Capacity (gpm)	Pump Head (ft)	Motor Horsepower
No. 1	3100	145	150
No. 2	1400	145	75
No. 3	3100	145	150
No. 4	1400	145	75
No. 5	3100	145	150
Fire Pump	3500	231	–

An assessment of the station's condition was completed on November 1, 2012. In general the station is in good condition but the following improvements are necessary:

- VFDs and high efficiency motors be installed on the remaining four booster pumps.
- Improving the building's security measures.
- Complete the remaining improvements from the 2003 Facilities Plan should also be

completed. See Tables 8-1 through 8-5 in Appendix 2.D.

The total cost of all improvements is estimated as $1,700,000. This cost estimate is itemized in Appendix 2.I.

2.4.3 Curtis Pump Station (CPS)

The CPS is also located in the western area of the Village at 3401 Mt. Prospect Rd. located on the grounds of the Nestle Corporation. The site is east of South County Line Road and north of I-294. Part of the building is owned by Nestle with the other half belonging to the Village. The SCADA system and pump controls were updated in 2004. The CPS goes online when pressures in this area of the Village fall below 36 psi. It is designated as standby for firefighting purposes, which is of particular benefit to Nestle. CPS pumps turn on when the KPS pumps are not running. There is no chemical addition equipment at this station. The station normally serves as a redundant source of storage and fire protection in case of an emergency.

The station includes two booster pumps that are owned by the Village and a fire pump that is owned by Nestle. The booster pumps have a total pumping capacity of 3,000 gpm and a firm capacity of 1,000 gpm. The smaller pump was updated with a soft starter and is operated regularly to cycle the water in the onsite storage reservoir. No design information was available for Nestle's fire pump. Table 2-6 shows details of the Village's two booster pumps at the CPS. The motors' horsepower was not available, nor was any information for Nestle's fire pump.

Table 2-6. CPS Pumps

Pump Number	Discharge Pump Capacity (gpm)	Pump Head (ft)	Motor Horsepower
No. 1	1000	185	–
No. 2	2000	185	–

An assessment of the station's condition was completed on November 1, 2012. In general the station is in fair condition. Since the station is rarely used, upgrades are not recommended.

The 2003 Facilities Plan recommended shutting down this pump station, but the Village has continued to maintain it and has completed some updates. The two pumps are operable and capable of providing water pressure in case of an emergency. The station greatly benefits the Nestle Corporation by providing an onsite source of fire protection. The Village must decide if the benefits of keeping the station outweigh the expense of maintaining it.

2.4.4 Clearing Pump Station

The Clearing booster pumping station is located at 10801 Franklin Avenue in the west area of the Village. This station was built in 1961 and is over 50 years old. It includes one booster pump with a capacity of 1,000 gpm. The pump has been electrically disconnected from the distribution system and is no longer in use. A chemical addition system is not installed at the station. The Clearing Elevated Tank is also located at this site.

The 2003 Facilities Plan recommended removing the Clearing booster pump from service. The pump should be removed if it is of no real benefit to the water distribution system.

2.5 GROUND STORAGE RESERVOIRS

Five ground storage reservoirs are located within the Village. The Village has an agreement with Utility Service Company, Inc. (USC), to perform regular inspections of the two elevated storage tanks and is considering adding the reservoirs as well. The Village pays an annual fee to cover their maintenance.

2.5.1 MPS Ground Storage Reservoirs

The two MPS underground concrete storage tanks are located on the north side of site of the MPS. The reservoirs receive water directly from the City of Chicago through a 24-inch main. For distribution to the Village's water system, the pumps at the MPS draw water from a pumping chamber that links these two tanks. One tank has a capacity of 1 MG and was constructed in 1949 at the same time as the pump station. The second larger tank is 3 MG and was constructed in 1957. The pumping chamber can be isolated from either of the tanks through a sluice gate on the 3 MG reservoir and valving for the 1 MG reservoir. A small Village park is located on top of the reservoirs.

The two reservoirs were inspected by Smith LaSalle, Inc. on October 11, 2011. The inspection report is included in Appendix 2.J. The report includes partial plans for the larger 3 MG reservoir. This tank was found to be in "Satisfactory" condition. The inspection revealed some minor cracking on the walls, sedimentation on the tank floor, corrosion of the ladder and vent openings, and exposed corroded rebar where penetrations had been made into the structure. It was recommended that the Village repair the exposed rebar as soon as possible. Replacement of the ladder rungs was also suggested. Another inspection should be performed within three years to monitor the other issues.

The smaller 1 MG reservoir was found to be in "Fair" condition. A large vertical crack that showed signs of leaking was found on the west wall. The expansion joints on each wall were bulging into the tank. Exposed corroded rebar was observed on the ceiling where pipe penetrations had been made. Hairline cracks were found on some pilasters and minor rock pockets were observed throughout the tank. It was recommended that the large wall crack and the corroded rebar be repaired within a year. The expansion joints and other minor issues should be monitored in the next inspection.

A site visit to the MPS took place on November 1, 2012. The tanks were not opened at that time as the access hatches into each tank are closed with a chain and lock and machinery would be necessary to lift the heavy hatch covers. The sluice gate that isolates the 3 MG tank to the pumping chamber is no longer functional, so only the 1 MG tank can be isolated for maintenance and repairs. Since the 3 MG tank cannot be isolated from the pumping chamber, the only way to perform maintenance on the defective sluice gate or on the 3 MG tank is to take the MPS and both reservoirs off line (The 1 MG can be fed, but since it discharges to the shared pumping chamber it will not provide any benefit if the pumping chamber is down for service). As noted earlier this condition places considerable strain on the network and the system will need to run solely on the remaining flow in the other active tanks (Belmont Elevated, Clearing Elevated, King St., and Curtis). Prior to performing work, the King Street reservoirs must be filled and the two MPS reservoirs isolated from the system at the incoming water main. The King Street reservoirs hold a three day supply of water, so the work at MPS must be completed in one day, leaving two days for disinfection.

The total cost of repairs to the two reservoirs is estimated at $90,000. See Appendix 2.I for a detailed breakdown of the cost estimate. Village Staff has indicated that repairs on the tanks have begun and are being performed as of the draft of this report. Therefore the report has been adjusted to reflect completion of these repairs. The report includes replacement of the sluice gate on the 3 MG reservoir. Repair of the ladder rungs and the exposed rebar in the 3 MG tank and repairs of the wall cracks and exposed rebar in the smaller tank are included with the Village's contract with Utility Service Company (USC). Since the performance of the MPS and the reservoirs is crucial to the operation for the entire water system, it is recommended that all outstanding repairs be completed as soon as possible.

2.5.2 King Street Ground Storage Reservoirs

The two KPS above-ground steel storage tanks are located in the western area of the Village on the site of the KPS. The two 5 MG tanks were constructed in 1983 and were inspected by USC in May 2011. The tanks are filled indirectly through the distribution system by the pumps at the MPS. Since water should not be drawn away from the distribution system during periods of peak use, the feed to the reservoirs is closed during the day and opened at night. This requires the MPS to fill the tanks only at night, using the stored water for distribution through the day by the KPS pumps.

The tanks were last recoated in 1988 and 1999 and are due for recoating. The exteriors of the tanks were given a cursory examination during a site visit on November 1, 2012. The tanks' exterior condition matches that stated in the USC inspection report. In addition to requiring a new coating, the 2011 USC reports noted that the western tank had some areas of structural concern regarding severe deterioration of the roof supports and evidence of improper mixing due to ice and thermal stratification. The USC report is included in Appendix 2.K.

A recent inspection of the tanks by USC has determined that the conditions in the west tank have deteriorated more rapidly than expected. USC has recommended that the tank be removed from service and structural repairs be performed immediately. Village staff has been working with USC and other tank manufacturers to determine the best course of action for the Village. At present USC has been retained to perform the necessary structural repairs, however these repairs are only short term in nature and replacement is still recommended for long term service. Latest estimates for replacement are between $2,500,000 and $5,000,000.

2.5.3 Curtis Groundwater Storage Reservoir

The Curtis ground storage tank is located in the western area of the Village at the same site as the CPS. The 1 MG steel tank was constructed in 1966 and was inspected by USC in April, 2011. The tanks are filled indirectly through the distribution system by the pumps at the MPS. The Nestle Corporation could drain the tank with their onsite fire pump during an emergency situation. The tank is typically only used for emergency and fire protection.

The exteriors of the tanks were given a cursory examination during a site visit on November 1, 2012. The tanks' exterior condition matches that stated in the USC report. The tank was last recoated in 2007 and its condition is good. Therefore, recoating isn't recommended until 2016. The USC report is included in Appendix 2.L.

2.6 ELEVATED STORAGE TANKS

USC has a contract with the Village to inspect and maintain the two elevated steel storage tanks. The water system is operated so that the elevated tanks provide an emergency water supply and act as surge tanks for the distribution system. Pressure is maintained by the booster stations.

2.6.1 Belmont Avenue Elevated Storage Tank

The Belmont Avenue elevated storage tank is located in the eastern area of the Village. The height to the tank's low water level is 125 feet. The steel ellipsoidal tank was constructed in 1961 and has a capacity of 450,000 gallons. The tank is located within a chain-link fence on the grounds of the Public Works building and the MPS. The elevated tank is filled using the MPS pumps, and has cellular antennae installed on its top. The tower functions as a surge tank to prevent spikes in water pressure from damaging the system's water mains in the eastern half of the Village.

USC recently performed a visual inspection of the Belmont Tower. They determined that both the interior and exterior are in good condition. Approximately five years ago, the tank was blasted and recoated. A washout inspection of the tower will occur in Spring 2013. The cost of this service is included in the Village's contract with USC.

2.6.2 Clearing Elevated Storage Tank

The Clearing elevated storage tank is located at 10801 Franklin Avenue in the west area of the Village. The height to the tank's low water level is 125 feet. The torus-bottom ellipsoidal tank was constructed in 1961 and has a capacity of 250,000 gallons.

USC performed an inspection on the exterior of the Clearing tank on May 28, 2010. They also performed a brief visual inspection on the wet interior of the tank through the access hatch on the roof. In general the tank was in poor condition. Corrosion was evident throughout the tank, and USC recommended recoating the interior and exterior surfaces. As a result of this inspection the tank was recently recoated and repaired. The cost of the recoating is included in the Village's contract with USC.

2.7 STANDARDS AND COMPLIANCE

The 2003 Facilities Plan found that the current water system is in compliance with state statutes and includes all the required facilities. The IEPA recommends that available water storage in municipal systems should be equal to the volume of average day demand plus a fire flow demand of 2,500 gpm for two hours. With a current average day demand of approximately 4 mgd, the needed storage is 4.3 MG. The Village has a total storage capacity of 15.7 MG which provides over 3 days of operation if the Chicago supply is inoperable. The booster pumping stations are also capable of maintaining system pressures greater than the required 20 psi in all areas of the Village. Therefore the Village meets the IEPA requirements.

2.8 PRELIMINARY COSTS

A summary of the preliminary cost estimates for repair or replacement of the water system components is shown below. See the appendices referenced in the previous sections for detailed breakdowns of these cost estimates.

2.8.1 Distribution System

An estimated cost for replacement of the entire system was developed for this report. Since all of the piping and products used in the system have lifespans ranging from as low as 75 to as high as 120 years the estimate needs to consider full replacement of the system over time. The timeframe for replacement needs to factor age/deterioration, breakage rates, and necessary upgrades for capacity/pressure distribution. Costs were derived from recent water main construction projects and not adjusted for inflation and includes minor street repair. Replacement for the entire water distribution system will cost around $138,617,000 in current dollars. See the table in Appendix 2.H for a breakdown of total water main replacement costs.

The older small-diameter mains (6-inch and less) total approximately 173,657 feet (42% of total system) and are the primary source of water main breaks in the Village. They account for nearly 70% of all main break repairs in the Village. These mains should be brought up to current standards and replaced with minimum 8-inch diameter mains. The cost of replacing all of the small-diameter mains in the Village is approximately $53,836,000 which amounts to almost 40% of the total cost to replace the entire system.

By examining the Distribution System Age Map we estimate that approximately 71% of the water system will reach its expected lifespan by 2050. Since nearly 98% of the total watermains that are less than 8-inch diameter were built prior to 1960, a replacement program focused on upgrading will accomplish the twin tasks of improving pressure distribution and replacement of older deteriorating mains. Therefore small diameter upgrading should be the primary focus of any distribution improvements. To accomplish total replacement of all mains less than 8-inch in diameter by 2050 the Village would need to replace approximately 4,700 feet annually at an estimated annual cost of $1,455,000.

Since the remaining 31% of the system will also reach its service life by 2050, the watermain replacement program should focus on replacement of these mains as well. Since there is a correlation with break rates and smaller diameter sizes the focus should be placed on high break rates and age for mains of 12-inch diameter and smaller in the areas developed prior to 1950. To accomplish total replacement of all mains that have reached their service life by 2050 the Village would need to replace an additional 3,400 feet annually at an estimated annual cost of $1,201,000. Included within this budget figure would be any remaining feeder main upgrades such as the Franklin Avenue project from Scott to Mannheim.

Table 2-7 illustrates the estimated costs for Distribution upgrades:

Table 2-7. Water Main Distribution Upgrade Costs

Project	Total Cost (w/ pvmt)	Total Cost (w/o pvmt)	Length	Units
8" Upgrade Cost:	$ 53,836,000	$ 46,890,000	173,900	FT
Watermain Replacement	$ 43,378,000	$ 38,466,000	122,800	FT
12" Upgrade Cost (Franklin Ave)	$ 1,142,000	$ 1,022,000	3,005	FT
Total System Upgrade Costs	**$ 98,356,000**	**$ 86,378,000**	**299,800**	FT
Annual Budget till 2050:	$ 2,659,000	$ 2,335,000	8,200	FT

If a program of this scope is enacted and the replacement rates noted above can be achieved by 2050, the Village could conceivably reduce the replacement program to a slower rate after 2050. Target mains again would be selected based on age and breakage rates. Since the system consists of 77.5 miles of main with a target service life of 100 years, an optimum replacement figure would be to replace 0.8 miles per year which amounts to 4,100 feet at an annual cost of $1,388,000.

It is important to note that the cost figures used for this analysis are for traditional open cut replacement which includes physical replacement of all fittings, valves, vaults, hydrants and services to the curb stop. The price also includes costs for replacing the pavement at the location of the open cut. As newer and more innovative methods and products are introduced in the present and near future it is possible that they will have a positive effect in lowering replacement costs. These newer methodologies feature in-situ replacement with minimal disturbance. Since some of these technologies are relatively new and have been untested we were not able to consider their use for this analysis. However, it is certainly possible to consider that these new technologies will not cost more than a traditional open cut method which is prudent for budgetary purposes. As these projects evolve we fully support examining all possibilities to embrace newer technology or methodology provided that it can reduce cost, timeframe, and/or improve longevity.

2.8.2 System Redundancy

The 2003 Facilities Plan recommended installing a 24-inch water main feed directly from the City of Chicago feed line to the King Street reservoirs and pump station (KPS). The benefit of this extension would be to provide redundancy for the Village in case the MPS is taken off line. The KPS and associated Curtis pumps could act to provide backup service to the Village in the case of an emergency. In the current system if MPS goes down the Village only has a 3 day supply (assuming that all tanks are filled to capacity). A separate feed would ensure unlimited service provided that the feed from Chicago is not disrupted. The cost of the new 24-inch feed pipe, with a length of approximately 11,000 feet, was estimated at $6,700,000 in the 2003 Facilities Plan.

Despite the obvious benefits this redundancy can offer it is worth noting that since inception the Village has not had an event that has used up all storage within the system. As demonstrated earlier the Village does have an above average amount of storage for the system, however, the current maintenance and repair needs of several of the storage systems warrants consideration of this option.

The scheduled maintenance repairs for the storage systems for the upcoming fiscal year will place the Village at some risk though as the MPS and KPS reservoirs will need to be taken offline for crucial repairs and upgrades. Since all facilities are finite in service life it is very possible that these storage systems will need to be taken offline for extended periods of time several times in the future. It is for this reason that this redundancy option merits consideration. We do not place the priority of this item as high as the replacement of distribution mains or as addressing critical maintenance needs to the pumps, tanks and reservoirs, but it should be considered as a goal to achieve sometime in a 20-year timeframe.

2.8.3 Booster Pumping Stations

The booster pumping stations throughout the Village are in fair to good condition. Some minor repairs are necessary; the costs of these improvements are included in Appendix 2.I.

Since the 2003 study, numerous upgrades have been completed at the MPS. The station is in good condition and only minor repairs are needed. The KPS requires more extensive improvements. Only a few of the repair items listed in the 2003 Facilities Plan have been completed. The total cost of all recommended repairs at the KPS is $1,700,000. A plan must be developed to prioritize and schedule these improvements. Total cost for repairs/upgrades to all booster pumps is $1,940,000

The 2003 Facilities Plan recommended abandonment of both the Curtis and Clearing pump stations. Neither of these facilities is absolutely needed in the distribution system except in emergency situations. The Village should consider removing one or both of these facilities and thereby eliminate their maintenance costs.

2.8.4 Storage Facilities

The Village's storage facilities range from very poor to good condition. The greatest expense associated with the tanks is structural repairs or replacement of the western King Street tank at a cost between $2.5M to $5M. Recoating is also necessary at the east KPS reservoir at an estimated cost of $161,000. Some upgrades are also necessary at all of the other tanks. The Clearing tank also has access and safety repairs and upgrades that are necessary with an estimated cost of $70,000. The total cost for repairs to all storage tanks is estimated to be $5,210,000.

2.9 RECOMMENDATIONS

The identified deficiencies in the Village's water system must be addressed soon. The Village needs to develop a Capital Improvement Plan to address these needs. The projects can be funded through increased water rates; loan programs (IEPA SRF), or possibly bond sales.

The program should prioritize water systems repairs/improvement in the order in which the repair/improvement has the greatest effect on operation of the system as a whole and/or impacts the largest area of service. We recommend the following order of priority for the water system improvement program in order to obtain peak performance by 2050:

1.	Reservoir Repairs & Upgrades	$5,210,000
2.	Booster Pump Repairs & Upgrades	$1,940,000
3.	Distribution Upgrades (≤ 6-inch to 8-inch min.)	$53,836,000
4.	Age Related Distribution Upgrades	$44,520,000
5.	System Redundancy (24-inch feed to KPS)	$6,700,000
	Total System Cost:	$112,206,000

The following Table 2-8 shows the initial 7 years of a 30-year program for upgrades. It is imperative to perform all necessary repairs to the reservoirs and booster pump systems as early as possible as noted above; their disruption can affect the entire system. Thereafter efforts can be concentrated on system upgrades. Seven years was chosen simply because it is difficult to evaluate costs without factoring interest, inflation, etc. In 2020 the Village should reevaluate the condition of the system and compare it with the goals noted in this report. In accordance with what has been discussed earlier the Village should continue to perform main replacement at a minimum rate of 4,700 feet per year for 6-inch and less upgrades and 3,400 feet per year for age-related upgrades until 2050. After that point a minimum replacement program of 4,100 feet per year should be introduced to keep pace with the age-related deterioration of the system.

Table 2-8. Water Capital Improvement Costs

	Program Year								
Capital Improvement	2013	2014	2015	2016	2017	2018	2019	2020	Total
Reservoir Upgrades & Improvements	$ 5,210,000	$ 376,000							$ 5,586,000
Booster Upgrades & Improvements	$ 240,000	$1,700,000							$ 1,940,000
Distribution Upgrades ≤ 6-inch		$2,910,000	$1,455,000	$1,455,000	$1,455,000	$1,455,000	$1,455,000	$1,455,000	$11,640,000
System Redundancy (24-Inch to KPS)						$6,700,000			$ 6,700,000
Age Related Distribution Upgrades			$2,402,000	$2,402,000	$1,201,000		$2,402,000	$1,201,000	$ 9,608,000
Totals:	$ 5,450,000	$4,986,000	$3,857,000	$3,857,000	$2,656,000	$8,155,000	$3,857,000	$2,656,000	$35,474,000

CHAPTER 3. SEWER SYSTEM

3.1 SYSTEM OVERVIEW

The Village's sewer system consists of nearly 94 miles of gravity sewer, which consists of 39 miles of combined sewers, 34 miles of storm sewer, 21 miles of sanitary sewer, nine lift stations, and just over 4,400 feet of force main. See Appendix 3.A for an overall exhibit of the Village's sewer system. The sewer system pipes range in size from 4-inch to 132-inch. Combined and sanitary flow is transported to the east side of the Village through a series of large interceptor sewers to the Metropolitan Water Reclamation District of Greater Chicago (MWRD) Des Plaines System Deep Tunnel which lies under the west bank of the Des Plaines River. The Tunnel travels south to the MWRD Stickney Wastewater Treatment Plant for treatment.

In periods of peak flows the Village also has four (4) combined sewer overflow (CSO) structures that discharge combined sewage into the Des Plaines River. The CSO's are in the same MWRD connection chambers noted above. The discharge pipes range in size from 30-inch to 132-inch. Three of the four structures are monitored by MWRD. See Appendix 3.B for data on the Village CSO's.

3.1.1 System Map and GIS Updates

Updates to the Village's sewer system map and GIS database were recently completed by Clark Dietz. The updates included adding as much sanitary sewer system data (including storm sewers and combined sewers) that was provided by the Village. Information about the lift stations was also entered into the system. The following data fields were added for the sewer system map:

- The number of parcels classified as residential, commercial or industrial in each sewershed.
- Sewer backup records, including the date of the incident. This information was inserted based on the monthly sewer reports written by the Village since January, 2003.
- The location of sanitary sewer overflows (SSO) and surcharges. This information was inserted based on the monthly sewer reports written by the Village since January, 2003.
- Structural problems and/or failures in the manholes, sewers, or lift stations. This information was inserted based on the monthly sewer reports and/or work tickets written by the Village since January, 2003.

For the storm sewer system, data fields were added for manhole numbers, CSO locations, and the addresses for any basement, street, or yard flooding, including dates. All these fields will be populated by the Village in the future.

3.1.2 Combined & Sanitary Sewersheds

The Village's seven sanitary sewersheds were overlaid on the system map and are shown in

Appendix 3.C. The sewersheds consist of combined and/or separated sanitary & storm sewer and were inventoried to identify the number of structures, lengths of pipes, pipe types, and number of parcels in each basin. Currently approximately 4.7 square miles of the Village are served by combined or sanitary sewer. This amounts to approximately 7,600 parcels.

3.1.3 Storm Water Sewersheds

The Village's storm sewers were overlaid on the system map. Sewersheds were based on property that is estimated to flow into storm sewer that discharges either to Silver Creek, Crystal Creek, or the Des Plaines River. There were three (3) sewersheds identified to discharge into the Des Plaines River along the eastern side of the Village, one (1) sewershed that discharges to Crystal Creek, and one last large sewershed that discharges to Silver Creek through multiple locations in the west and south part of the Village. The storm water sewersheds provide stormwater relief to approximately 2.5 square miles of the Village. The remaining 2.2 square miles are served by combined sewer.

The mapping identifies the reported combined sewer overflow (CSO) locations and was revised to show flooding problem areas. The storm water map is included in Appendix 3.D.

3.2 SYSTEM DESCRIPTION

3.2.1 Service Area

The Village of Franklin Park's sewer system service areas are shown on the map in Appendix 3.C. The service areas include most of the entire Village area of approximately 4.7 square miles and just fewer than 7,600 parcels.

3.2.2 Age and Type of Sanitary & Combined Sewer Collection System

The age of the collection system ranges between 30 and 90 years with an average age of 72 years. The type of piping installed ranges from clay to PVC. Similar to the age analysis performed for the water system, the age of the developing area of the Village was determined and shown in Appendix 3.F. Traditionally the sewer systems in developing 20th century areas precede the installation of the water systems within a decade. Following this basis the approximate age of the sewer system was estimated with an assumption that the majority of the system was constructed of the popular materials.

Historical precedence and onsite observations allow us to estimate the following pipe types and lifespans based on their era of use:

- Clay Pipe (VCP) – 50 to 75 years (1920's to 1940's)
- Concrete Pipe (ACP, CPP, & PCP) – 75 to 100 years (1940's to Present)
- Corrugated Metal Pipe (CMP) – 30 to 50 years (1940's to 1960's)
- Poly-Vinyl Chloride (PVC) – 75 to 100 years (1970's to Present)

Considering that the average age of the system is at 72 years it is reasonable to conclude that the majority of the system is near the end of its service life. The most notable exception is the recent installations of the Combined Sewer Relief System (CSRS) Interceptors that consist of several large diameter sewers constructed of Precast Concrete Pipe. This is fortunate, since the primary interceptors of the combined sewer system are the primary conduits of sewage for the Village and disruptions within these pipes due to repairs would have large impacts on the Village.

3.3 COMBINED SEWERS

3.3.1 Overview and History

The Franklin Park sewer system contains approximately 39 miles of combined storm and sanitary sewers. Combined sewers in the service area range in size from 6-inch to 132-inch. Pipe materials consist of clay, concrete, and PVC. The age of the combined sewers ranges between 60 and 90 years. The oldest combined sewer sections are located in the central and north eastern areas of town. The information in the GIS system estimates that the average age of the combined sewers is 76 years old.

3.3.2 Flooding Problem Areas

The locations of any reported flooding complaints due to combined sewers are recorded by the Village Engineering Department. The flooding complaints are recorded by date and whether they fall into the category of home or business basement flooding, street flooding, or yard flooding. The majority of these problems occur along the Silver Creek corridor of the Village. Most flooding typically occurs due to limited capacity in the combined sewer system adjacent to Silver Creek. Sewer separation and storage projects along the Silver Creek corridor have been planned by both the Village and MWRD for this area to help alleviate this. The Village has procedures in place for staff to follow during flooding events.

3.3.3 CSO/Surcharge Locations

The locations of CSOs and surcharges are also recorded in the monthly sewer reports written by the Village and CSO's are also monitored by the MWRD. The system experiences approximately 7 to 20 CSOs per year. The reports indicate that most CSOs typically occur due to limited capacity in the TARP system rather than the Village's collection system. Surcharges also occur on the Village's collection system in some locations upstream of the Combined Sewer Relief System (CSRS) interceptors which indicates that there are some capacity limitations of the collector sewers. The Village has procedures in place for staff to follow in the event of CSOs and surcharges. The CSO's and surcharge Flooding Map is listed as Appendix 3.E.

Since installation of the CSRS interceptor sewers there has been a marked decrease in surcharges and nuisance flooding within Subbasins 2 and 3. The interceptors were designed to carry a 100-year storm capacity based on the USWB Tech. Paper No. 40 rather than the more modern ISWS Bulletin 70. Surcharges and flooding within these subbasins appear to be more sporadic and caused by structural deterioration of the sewers, limited capacity of the collection system, and inadequate inlet capacity.

3.3.4 Sewer Breaks

Sewer breaks in the Village are recorded and tracked by the Sewer Department staff and the majority of them occurred on the combined sewer system. During the period of January

2003 through June 2012, the system experienced an average of nine total breaks per year. This includes breaks on sewer mains, laterals, and manholes. The majority of the breaks occurred on laterals, which averaged five breaks per year. A summary of the data assembled by the Sewer Department staff between 2003 and 2012 is shown in Table 2-2. Detailed lists of the annual repairs have been input into the GIS database. Staff did not calculate the average size of the broken pipes. The majority of repairs were made on 8-inch and smaller diameter sewers. The map in Appendix 3.F shows the location of all the breaks throughout the distribution system.

Table 3-1. Average Yearly Sewer Pipe Breaks, January 2003 – June 2012

Repair Type	Average Count	Average Man-hours	Average % of Total Man-Hrs	Peak Year	Peak Count	Average Equip-hours	Average % of Total Equip-hrs
Main	4	85	48%	2012	13	18	44%
Lateral	5	71	40%	2011	11	17	42%
Manhole	1	20	11%	2011	3	6	15%
TOTAL	9	175	-	-	-	41	-

3.3.5 Structural Problems/Failures

The locations of structural deficiencies in any manholes or lift stations are also recorded in the monthly sewer reports written by the Village. None of the lift stations are known to have structural deficiencies. Only six of the sewer breaks reported between January 2003 and June 2012 were listed as manhole repairs.

Structural damage in manholes is a common source of groundwater infiltration. Onsite observation from both CDI and Village staff indicate that infiltration is very common in the large majority of manholes, catch basins, and inlets throughout all of the sub basins. Infiltration leads to increased deterioration of the structures as well as reduces the capacity for the existing system. Also from a financial aspect all flow that is discharged to MWRD through the TARP system needs to be treated and therefore paid for. Reducing infiltration is therefore very beneficial to the capacity of the system and will eventually pay for itself in reduced treatment costs.

The majority of structural problems occur in Subbasins 2 and 4. There is a correlation between the age of the sewer system and the structural condition. Other reasons for the decay of structures include the buildup of harmful gases and damage from flooding.

3.3.6 Condition Assessment

In general the condition of the combined sewer system is unknown due to a lack of routine videotaping and monitoring. Since the majority of the combined sewer system resides in the older areas of town and has experienced the highest percentage of break repairs, we estimate that the system is in fair to poor condition. The areas most in need of repair and maintenance are in the central and north eastern part of the Village within Subbasins 1, 2, and 4. Since the installation of newer, higher-capacity interceptors through the CSRS projects it is recommended that separation projects are implemented when and wherever possible to relieve the existing aging combined system.

Separation projects are expensive and can place a considerable strain on engineering and construction budgeting. Since adequate capacity is provided in the interceptors it is recommended that at a minimum the existing system needs to be inspected and rated through video inspection and a lining and point repair program should be implemented in the near future.

3.4 SANITARY SEWERS

3.4.1 Overview and History

Sanitary sewer mains in the service area range in size from 4-inch to 36-inch and total approximately 21 miles. Pipe materials consist mainly of clay, CMP, concrete, and some PVC. The age of the system ranges between 30 and 70 years. Most of the newer sections of the sewer system are PVC. The oldest sewer sections are located in the south central and western areas. The information in the GIS system estimates that the average age of the entire gravity sewer system is 63 years.

3.4.2 Sewer Backups

Sewer backups are recorded in the monthly sewer reports written by the Village. The system experiences much fewer backups than the combined sewer system. The majority of the backups occur in the Subbasins 4 and 5 of the Village. There is not a correlation between the age of the sewers and the frequency of backups. The reports indicate that most backups typically are the result of the stormwater inflow during high rain events rather than inadequate capacity.

3.4.3 Structural Problems/Failures

Similar to what is noted above in Section 3.3.5, structural deterioration and damage in manholes is a common source of groundwater infiltration. It is in the Village's best interest to reduce infiltration as much as possible.

The majority of sanitary structural problems occur in Subbasins 1 and 4. There is a correlation between the age of the sewer system and the structural condition. Other reasons for the decay of structures include the buildup of harmful gases and damage from flooding.

3.4.4 Condition Assessment

In general the condition of the combined sewer system is unknown. From a review of the break data, surcharge data, and the younger age of the system, the sanitary system appears to be in better condition than the larger combined system. However, as noted earlier videotaping and monitoring is necessary to provide a more accurate assessment. The areas that appear to be the most in need of repair and maintenance are the western sections of Subbasin 1 and south central sections of Subbasin 4.

3.5 STORM SEWERS

3.5.1 Overview and History

Storm sewers in the service area range in size from 6-inch to 60-inch. Pipe materials mainly consist of corrugated metal pipe (cmp), transite, and concrete. The age of the system ranges between 30 and 60 years. Most of the newer sections of the storm sewer system are less than 15 years old. The oldest storm sewer sections are located in the Silver Creek Subbasin. The Storm Sewer System map is shown in Appendix 3.D.

3.5.2 Flooding Complaints

The locations of any reported flooding complaints are recorded in an Excel spreadsheet maintained by the Village Engineer and have been updated on the GIS database. The flooding complaints are recorded by date and whether they fall into the category of home or business basement flooding, street flooding, or yard flooding. The majority of these problems occur in the Silver Creek Subbasin area of the Village. All reported flooding incidents are recorded on the system map located in Appendix 3.E. Most flooding typically occurs due to surcharge from Silver Creek. The Village has procedures in place for staff to follow during flooding events.

3.5.3 Condition Assessment

From a review of the break data, surcharge data, and the younger age of the system, the system appears to be in better condition than the majority of the combined and sanitary systems. However, as noted earlier videotaping and monitoring is necessary to provide a more accurate assessment. Immediate repairs cannot be recommended at this time. Emphasis should be placed on review and inspection to provide an accurate assessment of the system.

3.5.4 Administrative Control

The Village's current policies and process for storm water management were reviewed. The current policies are doing an adequate job of managing flooding and sewer backup complaints on an on-call basis. We would recommend the Village perform the following:

- Implement programs to fund needed maintenance of sanitary and combined sewers
- Implement program to reduce Infiltration and Inflow into the sanitary and combined sewers
- Implement a program to fund improvements for the storm collection system through increased sewer separation, runoff storage, and runoff conveyance projects

3.5.5 MS4 Compliance

The Village is currently permitted and has met and maintained all NPDES requirements. Since costs to perform the monitoring are inclusive to the engineering staff budget, MS4 compliance is not a major contributing factor for this report.

3.6 LIFT STATIONS

Six wastewater lift stations and three stormwater lift stations are owned and maintained by the Village of Franklin Park. The purpose of these lift stations is to transport sewage or stormwater from a low elevation to a higher elevation to then allow gravity flow through pipes or channels. A condition assessment was completed for each of the stations.

3.6.1 17th Avenue Lift Station

The 17th Avenue wastewater lift station serves a small service area on the south side of the Village that includes several nearby businesses. It is located on a fenced site and includes two submersible pumps in a five-foot diameter wet well with the valves in a separate manhole. Wastewater enters an empty chamber prior to flowing into the wet well that houses the pumps, which allows for extra storage. The Village owns two spare pumps that can be swapped out with the existing pumps. A plug for a portable emergency generator set is located onsite. A chemical to reduce grease buildup is fed upstream, and the station does not have grease problems. The control and SCADA panels are located outside and are in good condition. Pump data is shown in Table 3-2.

Table 3-2. 17th Avenue Lift Station Pumps

Pump Type	Pump Capacity (gpm)	Pump Head (ft)	Motor Horsepower
(2) Flygt Submersible	–	–	5

The station was recently updated by installing new pump rails. The bottom of the wet well was also relined to repair some concrete corrosion.

An assessment of the station's condition was completed on November 1, 2012. In general the station is in good condition. There are areas of rust on some surfaces inside the wet well; it is recommended that these are coated or replaced.

3.6.2 Scott Street Lift Station

The Scott Street lift station was updated in 2004. This lift station serves a residential neighborhood and includes sanitary and combined sewers. The station control panels are located inside a small prefabricated building. The station is located next to Silver Creek and is set on a platform approximately three feet above ground level. This station includes three Flygt submersible pumps and a plug for a portable emergency generator set. The rectangular wet well was constructed using the original station. Pump data is shown in Table 3-3.

Table 3-3. Scott Street Lift Station Pumps

Pump Type	Pump Capacity (gpm)	Pump Head (ft)	Motor Horsepower
(3) Flygt Submersible	–	–	18

An assessment of the station's condition was completed on November 1, 2012. In general the station is in good condition. The valves and piping located in the valve vault require painting. Painting is also required on the building doorframe and fencing. These costs are minor in nature and can be completed by the Utility staff.

3.6.3 J.B. Williams Lift Station

The J.B. Williams Lift Station and Retention Basin was originally constructed in 1989 by the IDOT Division of Water. This station includes two Fairbanks Morse vertical lift pumps with top-mounted 50 Hp motors. The pumps have 53-foot-long shafts and are fitted with two impellers on each. The pumps were recently pulled and rebuilt. There is no backup power at the site.

Silver Creek runs along the north edge of the basin. The pumps are used to pump down the 200 acre-ft storage basin that receives flow via a weir along Silver Creek. The pumps begin emptying the detention basin when there is adequate downstream capacity. The basin is supposed to overflow to the Northeast into the Creek. This basin is used at least 2 to 5 times a year and has overtopped in the past.

Pump data is shown in Table 3-4.

Table 3-4. J.B. Williams Lift Station Pumps

Pump Type	Pump Capacity (gpm)	Pump Head (ft)	Motor Horsepower
(2) Fairbanks Morse Vertical Turbine	3,250	–	50

An assessment of the station's condition was completed on November 1, 2012. In general the station is in good condition. No repairs are necessary at this time.

3.6.4 Sunset Lift Station

This small lift station is no longer necessary to the system and is scheduled to be taken out of service. An inspection was not performed at this station.

3.6.5 Anderson Lift Station

The Anderson Lift Station provides sanitary service to an industrial area and is located within the 100-year floodplain. The prefabricated Smith & Loveless underground station was installed in approximately 1963. It is about 30 feet deep, with a 20-foot deep, 4-foot diameter concrete wet well. The two flooded suction pumps are located underground in the steel lift station enclosure. There is no generator connection at this site, but there are two power phases serving the site to provide redundant power. If both are lost, the station is out of power. The station control panels are located above ground outside of the station. Pump data is shown in Table 3-5.

Table 3-5. Anderson Lift Station Pumps

Pump Type	Pump Capacity (gpm)	Pump Head (ft)	Motor Horsepower
(2) Smith & Loveless Flooded Suction	500	30	15

An assessment of the station's condition was completed on November 1, 2012. In general the station is in poor condition. The wet well is in good condition, but the cover of the underground pump enclosure is rusting badly and requires painting, as does the interior of the enclosure. The station is almost fifty years old and has served its useful life. It is recommended that this station be removed and replaced. The motors should be moved above-ground or submersible pumps could be installed in the existing wet well. The cost of replacing the station with submersible pumps and a separate valve vault is approximately $300,000.

3.6.6 Taft Lift Station

The Taft Lift Station is a small station that provides sanitary service to an industrial area mainly made up of large warehouses. The station is located within the fencing surrounding the industries. Two small submersible pumps on rails are mounted in a four-foot diameter concrete wet well. An old generator set is located at the site, but it is not usable. There are two phases of power feeding the station and there is also a plug for a portable generator. Pump data is shown in Table 3-6.

Table 3-6. Taft Lift Station Pumps

Pump Type	Pump Capacity (gpm)	Pump Head (ft)	Motor Horsepower
(2) Hydromatic Submersible	–	–	2

An assessment of the station's condition was completed on November 1, 2012. In general the station is in fair condition. The pump control panel is old and the conduit from the wet well into the panel is not sealed. This allows gases in the wet well to enter the panel. This conduit should be sealed. The controls should be replaced so the generator can be removed. Only check valves are installed in the valve vault; plug valves should be installed and the piping repainted. The cost of these upgrades is approximately $35,000.

3.6.7 Garra Lift Station

The Garra lift station was constructed approximately five years ago as part of the Belmont Avenue underpass project. The station pumps storm water from an adjacent underground 0.5 acre-ft detention basin that provides stormwater storage for the underpass out to the combined sewer at Grand and Willow. The underground storage basin is constructed of three (3)12-foot by 6-foot by 96-foot long precast concrete boxes and discharges to the wet well of the lift station through a 24-inch pipe. Two submersible pumps are mounted in a six-foot diameter wet well. A screen is mounted across the large inlet pipe in the wet well to prevent large objects from falling into the wet well. The access hatch has a safety grate. A 35 kW natural gas Kohler generator set in a weatherproof enclosure is located within the fenced site. The exterior control panels are mounted on a stainless steel rack. Pump data is shown in Table 3-7.

Table 3-7. Garra Lift Station Pumps

Pump Type	Pump Capacity (gpm)	Pump Head (ft)	Motor Horsepower
(2) Flygt Submersible	–	–	10

An assessment of the station's condition was completed on November 1, 2012. The station is in very good condition and no improvements are required at this time. The underground reservoir was not examined.

3.6.8 Fullerton Avenue Lift Station

The Fullerton Avenue Lift Station is a large station that pumps storm water a short distance to discharge into Silver Creek. It was constructed in the 1980s. The top of this station is set below the level of the adjacent street. Three submersible pumps on rails are mounted in an eight-foot diameter wet well. The station has a plug for a portable generator set. A separate valve vault includes check valves to prevent backflow of the creek into the station. Pump data is shown in Table 3-8.

Table 3-8. Fullerton Avenue Lift Station Pumps

Pump Type	Pump Capacity (gpm)	Pump Head (ft)	Motor Horsepower
Flygt Submersible	–	–	5

An assessment of the station's condition was completed on November 1, 2012. In general the station is in fair condition. The pump control panel is original and should be replaced. The conduit from the wet well into the panel is not sealed, which allows gases in the wet well to enter the panel. This conduit should be sealed. Village staff indicated that a power upgrade is needed and there is an issue with the floats that needs to be checked. The pump rails are rusty and should be replaced. The Village should consider installing a guard rail around the station, as it is located on the corner of a busy street. The cost of completing this work is estimated at $85,000.

3.6.9 Copenhagen Lift Station

The Copenhagen Lift Station is a small Gorman Rupp station located in an industrial area. It is located next to a storm water detention basin that fills during storm events. The station then pumps the storm water out of the detention basin when flows decrease. The station enclosure houses two suction lift pumps and is mounted over the wet well. The station including the pumps and motors has been flooded in the past. The pump motors were recently refurbished and the windings were coated. The control panel, SCADA panel, and remote main disconnect were raised in order to prevent them from being flooded again.

An assessment of the station's condition was completed on November 1, 2012. The station is in good condition.

3.7 CAPACITY, MANAGEMENT, OPERATION, AND MAINTENANCE (CMOM) PROGRAM – CAPACITY ASSURANCE

3.7.1 Program Background

The Village has indicated that they will be beginning a CMOM program. CMOM programs aim to incorporate many of the standard operation and maintenance activities that are already utilized in communities with a new set of information management requirements in order to:

- Better manage, operate, and maintain collection systems
- Investigate capacity-constrained areas of the collection system
- Proactively prevent sanitary sewer overflows (SSOs)
- Respond to SSO events

The CMOM approach helps the owner or operator provide a high level of service to customers and reduce regulatory noncompliance. CMOM can help utilities optimize use of human and material resources by shifting maintenance activities from "reactive" to "proactive" – often leading to savings through avoided costs due to overtime, reduced emergency construction costs, lower insurance premiums, changes in financial performance goals, and fewer lawsuits. CMOM programs can also help improve communication with the public, other municipal works and regional planning organizations, and regulators.

In CMOM planning, the owner or operator selects performance goal targets, and designs CMOM activities to meet the goals. The entire CMOM planning framework covers operation and maintenance (O&M) planning, capacity assessment and assurance, capital improvement planning, and financial management planniug. Information collection and management practices are used to track how the elements of the CMOM program are meeting performance goals, and whether overall system efficiency is improving.

On a periodic basis, utility activities should be reviewed and adjusted to better meet the performance goals. Once the long-term goal of the CMOM program is established, interim goals may be set.

An important component of a successful CMOM program is periodically collecting information on current systems and activities to develop a "snapshot-in-time" analysis. From this analysis, the owner or operator evaluates its performance and plans its CMOM program activities.

Maintaining the value of the investment is also important. Collection systems represent major capital investments for communities and are one of the communities' major capital assets. Equipment and facilities will deteriorate through normal use and age. Maintaining value of the capital asset is a major goal of the CMOM program. The infrastructure is what produces sales and service. Proper reinvestment in capital facilities maintains the ability to provide service and generate sales at the least cost possible and helps ensure compliance with environmental requirements. As a capital asset, this will result in the need for ongoing investment in the collection system to ensure design capacity while maintaining existing facilities and equipment as well as extending the life of the system.

The performance of wastewater collection systems can be linked to the effectiveness of its CMOM program. Performance characteristics of a system with an inadequate CMOM program may include frequent blockages resulting in overflows and backups. Other major performance indicators include pump station reliability, equipment availability, and avoidance of catastrophic system failures such as a collapsed pipe.

A CMOM program is what an owner or operator should use to manage its assets; in this case, the collection system itself. The CMOM program consists of a set of best management practices that have been developed by the industry and are applied over the entire life cycle of the collection system and treatment plant. These practices include:

- Designing and constructing for O&M
- Knowing what comprises the system (inventory and physical attributes)
- Knowing where the system is (maps and location)
- Knowing the condition of the system (assessment)
- Planning and scheduling work based on condition and performance
- Repairing, replacing, and rehabilitating system components based on condition and performance
- Managing timely, relevant information to establish and prioritize appropriate CMOM activities
- Training of personnel[1]

The Village's current focus is the Sewer System Capacity Evaluation (Capacity Assurance) section of the CMOM program. The goal of Capacity Assurance is to evaluate the capacity of the sewer system during both dry and wet weather flows and verify that the system's capacity is maintained.

3.7.2 Program Requirements

The capacity evaluation program builds upon ongoing activities and the everyday preventive maintenance that takes place in a system. The capacity evaluation begins with an inventory and characterization of the system components. The inventory should include the following

[1] "Guide for Evaluating CMOM Programs at Sanitary Sewer Collection Systems", USEPA, January 2005.

basic information about the system:

- Population served
- Total system size (feet or miles of pipe)
- Inventory of pipe length, size, material, age, and condition as available
- Inventory of appurtenances such as bypasses, siphons, diversions, pump stations, tide or flood gates, and manholes, etc., including size or capacity, material and age, and condition as available
- Force main locations, length, size, material, and condition as available
- Pipe slopes and inverts
- Location of house laterals - both upper and lower

For Franklin Park, a large majority of the information noted above has been collected and is incorporated into the GIS system. However, there remains some additional mapping and current video inspection of the system in order to set a sufficient "baseline" for analysis. After establishment of the "baseline" the system then should undergo general annual inspections which serve to continuously update and add to the inventory information.

The next step in the capacity evaluation is to identify the location of wet weather related SSOs, surcharged lines, basement backups, and any other areas of known capacity limitations. These areas warrant further investigation in the form of flow and rainfall monitoring and inspection procedures to identify and quantify the problem. The capacity evaluation should include an estimate of peak flows experienced in the system, an estimate of the capacity of key system components, and the major sources of I/I that contribute to hydraulic overloading events. The capacity evaluation should also make use of a hydraulic model, if any, to identify areas with hydraulic limitations and evaluate alternatives to alleviate capacity limitations. Short and long term alternatives to address hydraulic deficiencies should be identified, prioritized, and scheduled for implementation.[2]

The capacity evaluation program should also include flow monitoring, sewer system testing, and sewer system inspection. Flow monitoring should provide both dry weather flows and wet weather flows affected by I/I. The plan should include the locations of all meters and a record of calibration.

3.8 STANDARDS AND CODES

3.8.1 Required Facilities

The Village of Franklin Park is not required by any governing body to install or provide any sanitary, combined, or stormwater facilities at this time. However, due to frequent flooding along the Silver Creek corridor it is strongly recommended to examine the possibility of improving or adding additional runoff capacity to the system.

3.8.2 Compliance

The Village has been issued a Violation by MWRD for the connection of storm sewer to the combined sewer system on Panoramic Drive at the far North Central border of the Village.

[2] "Guide for Evaluating CMOM Programs at Sanitary Sewer Collection Systems", USEPA, January 2005.

The Village will be correcting the violation by redirecting the storm sewer to discharge to the adjacent IDNR Crystal Creek Phase 2A project.

3.9 MWRD

As of the time of this draft the report has not been presented to MWRD for comment.

The MWRD is currently in the process with the cooperation of participating communities and the IEPA in revising their policy on implementing I/I controls. The desired dry weather goal is 155 gpcd; currently the dry weather flow to the Stickney service area is 243 gpcd. This equates to a desired reduction of 36% of dry weather flow. They have indicated that a model similar in scope and nature to the one implemented by the Milwaukee Metropolitan Sewerage District (MMSD) is the benchmark.

The desired minimum requirements for the proposed Long Term O&M plan are as follows:

- Updated accurate atlas information with GIS capability
- Inventory analysis (inspection & cleaning)
- Establish an annual rehabilitation commitment ($4,000/mile min. is proposed)
- Establish a maintenance plan
- Define a detailed scope for design and construction of proposed work
- Permitting Plan to control I/I from private system connections
- Funding Plan for capital improvements – SRF, local funds, or SSA
- Staffing Plan for managing I/I & Capital improvements
- Provide CMOM program guidelines for communities to meet

These minimum goals are still in their infancy and have not been implemented by MWRD as of the draft of this report. However, it is worth noting that the topic of I/I reduction is of primary importance to the MWRD and implementation of the goals and standards noted above may not be long in coming. Therefore it is in the Village's best interest to frame any future sewer rehabilitation efforts to meet these guidelines. In one respect through the implementation of the GIS upgrades and establishment of this report the Village has taken initial steps to meet some of these new guidelines. The goal now is to continue on this path of implementation which will improve the Village infrastructure, improve capacity of the system, reduce the impact of combined sewer surcharging, and reduce costs wasted on transporting and treating I/I.

3.10 PRELIMINARY COSTS

Preliminary cost estimates were prepared for the sewer system components in need of repair or replacement. The detailed cost estimates can be found in Appendix 3.G.

3.10.1 Lift Station Repair & Replacement

With the exception of the Anderson Lift Station the overall condition of the lift stations for the Village is good. The stations appear to be meeting capacity demands and other than Anderson require minor upgrades and maintenance. Since if/when a station does go down its effect on CSO's and surcharge is dramatically increased, it is important to keep up with needed repairs and maintenance. For this reason lift station repairs should be considered a high priority for the Village and funds should be allocated to fund all necessary repairs. Table 3-9 shows the estimated costs for immediate repairs to the Village's lift stations.

Table 3-9. Lift Station Improvement Costs

Station	Cost Estimate	Comments
17th Ave	$ -	Good Condition, perform routine maint
Scott St.	$ -	Good Condition, perform routine maint
J.B. Williams Basin	$ -	Good Condition, perform routine maint
Sunset	$ -	Not in service, Station to be removed
Anderson	$ 300,000	Poor shape, major overhaul needed
Taft	$ 35,000	Replace control panel & valves
Garra	$ -	Good Condition, perform routine maint
Fullerton Ave.	$ 85,000	Replace control panel, upgrade power, replace rails, & install guardrail
Copenhagen	$ -	Good Condition, perform routine maint
Total:	**$ 420,000**	

3.10.2 System Inventory (Video Inspection & Cleaning Program)

Investigation of the system should be the highest priority in order to verify size and location, assess performance, and indentify immediate repairs. Priority should be placed within the oldest areas which coincidentally contain the largest amount of combined sewers. We recommend the following groups of sewers are examined in order of those with the greatest needs:

- High Priority – Combined Sewers in Subbasins 1, 2, 3, 4, & 6
  - 39.1 miles -
- Medium Priority – Sanitary Sewers in Subbasins 1,2,3,4,5, & 7
  - 21.5 miles
- Low Priority – Storm Sewers in Subbasins 1 thru 7
  - 33.5 miles

The following televising program is recommended to create an up-to-date inventory for the system. A typical cycle for most communities is ten (10) years which is repeated. This calculates to 9.4 miles per year for video inspection. The cleaning and inspection should also use a scoring system to rate the sewers in order to establish repairs. The DVD's should be cataloged and stored in an accessible database and possibly input into the GIS database.

The annual cost is estimated to be $100,000 per year which includes light cleaning of the piping. Heavier cleaning will require additional cost. Average cost is typically around $2 per foot for light cleaning and video inspection.

3.10.3 Pipe Lining/Replacement

It is recommended that at least one year of the televising and cleaning program is established first to begin to identify and catalog conditions of the system. Afterwards it is recommended that a lining and replacement program be initiated to address sewers that are in poor or failed condition.

Replacements costs can vary widely based on the size, condition, and extent of the repairs needed. In-place replacements are the most costly as they are invasive and will require physical removal, replacement, and restoration.

Cast in place and spray-on lining have become the industry standard for sewer rehabilitation because they reduce the need for excavation and restoration. However, lining cannot provide full replacement for lines that have failed to the point of collapse. These types of repairs can currently only be repaired through physical removal and replacement.

Since the condition of the sewer system is still largely unknown, an assumption of 5% of what was previously inspected will be estimated to require full removal and replacement (R&R). The remaining 95% was used to calculate the amount to be lined (CIPP). Table 3-10 details the total costs involved to repair or replace the entire system.

Table 3-10. Total System Replacement Cost

Total System Repair/Replacement							
Priority	**Type**	**Total Length (ft)**	**Total Length (mi)**	**R&R Cost**	**CIPP Cost**	**Total Cost**	**Cost per Year**
High	Combined	206,445	39.1	$ 3,089,000	$ 26,970,000	$ 30,266,000	$1,009,000
Medium	Sanitary	113,628	21.5	$ 1,306,000	$ 10,430,000	$ 11,850,000	$ 395,000
Low	Storm	176,751	33.5	$ 2,368,000	$ 20,535,000	$ 23,080,000	$ 770,000
	Totals:	**496,824**	**94.1**	**$ 6,763,000**	**$ 57,935,000**	**$ 65,196,000**	**$2,174,000**

Notes:
1. 2012 construction costs used
2. CIPP lining includes minor repairs to broken laterals. Lateral lining is not factored
3. Assumes complete system replacement
4. A 30-year program was used for Cost per Year
5. All cost figures rounded up to nearest $1,000

Since approximately 72% of the system is near its shelf life and the majority of the system is combined, it is recommended that a focus is placed on repairs and/or replacement on the combined sewers and sanitary sewers that have been identified to be in poor or failing condition. The target cost for this would be approximately a minimum of $1.4M a year. This would repair or replace approximately 2.2 miles a year. Since the storm sewer is relatively new repairs or replacement can be added at a later date. It should be noted that this is a recommended minimum guideline and should be adjusted based upon the conditions reported through the video inspection program.

The costs noted above do not include increasing sewer size or sewer separation. As previously noted, upon receipt of flow data a more thorough analysis can be performed to determine capacity of the existing system and costs for upgrades or separation can be factored. Separation is encouraged to help place relief on the system and is critical in some locations (Scott Street Basin); however, it is worth noting that the construction of the CSRS has provided much-needed capacity to the combined system and has been adequate in handling stormwater runoff. Separation is mainly encouraged to reduce the risk of in-house surcharging. The costs noted above can handle some minor upgrades and separation projects in critical areas, but separation of the entire system is not as critical as the need to replace due to deterioration and age.

Appendix 3.G shows detailed estimates for combined, sanitary, and storm sewer repairs/replacements.

3.10.4 Storm Water Facilities

The 2010 Des Plaines River Detailed Watershed Plan prepared for MWRD identified several improvements along the Silver Creek corridor to provide needed detention and therefore reduce flooding. The project exhibits are included in Appendix 3.H. They recommend the expansion of the Basin 102 north of the Bensenville yard (SLCR-1), construction of two basins in the Cullerton Avenue industrial park (SLCR-2), and expansion of the J.B. Williams Basin No. 106 with associated downstream creek improvements (SLCR-3). In total these improvements would add an additional 680 acre-ft of detention to the floodplain and should reduce flood frequency to the Silver Creek corridor. The report recommended the implementation of SLCR-2 in the Cullerton industrial park. The estimated cost for implementation is $51.5M which would be cost shared among the stakeholders. The report is available from MWRD for review here:
http://www.mwrd.org/pv_obj_cache/pv_obj_id_63C0EEB5F14DE064F3519B0C68C30C9F3BCD8600/filename/Final_LDPRDWP.pdf

Another storm water facility improvement that will be undertaken by the Village is the third and final phase of the Scott Street Basin project. The project involves the separation of combined sewer along Westbrook, Hawthorne, Wrightwood, Richard, Herrick, and Elder between Grand and Fullerton and east of Scott Street. This project will reduce the flow of combined runoff to the Scott Street lift station and redirect stormwater to Silver Creek through connection to the Fullerton Avenue lift station with new storm sewer. This will help to reduce flooding and surcharging of the existing combined sewer system within the project area. Sewer improvements alone are estimated to cost around $570,000.

3.10.5 I/I Reduction (Structure & Lateral Lining)

In addition to repairs and upgrades to the Village's sewer systems the Village should consider a comprehensive approach to reducing I/I to the system. As noted earlier in Section 3.9, the MWRD will be revising their I/I policy in the near future and reduction will become a requirement. The primary sources for I/I have been shown to be through infiltration around penetrations and leaks in structures and manholes and along old and deteriorated sewer laterals from private property. The current industry practice for addressing I/I from structures is to install non-vented sealed frames and grates and install a cement or polymer based liner. Laterals should be chemically grouted or a CIPP liner should be inserted. Table 3-11 shows estimated costs to implement a 30-year manhole and lateral lining program.

Table 3-11. I/I Reduction Program

Description	Quantity	Cost per Each	Total Cost	Cost per Year	# per Year
Manhole	2650	$ 2,500	$ 6,625,000	$ 221,000	88
Private Lateral	7600	$ 6,500	$49,400,000	$ 1,647,000	253
		Totals:	$56,025,000	**$ 1,868,000**	

Notes:
1. Manholes assumed to be 4' diameter and 10' deep
2. Private lateral quantity based on number of parcels, size is assumed at 6"
3. All cost rounded up to nearest $1,000

Note that current Village regulations consider the point of connection of the lateral to the main the responsibility of the property owner. For lateral lining to be performed the current ordinance will need to be reexamined or modified. All costs for legal review are not factored above.

3.11 GOALS NOT ACHIEVED

Unfortunately not all goals outlined in the original scope for the study have been met. This is primarily due to a lack of complete system data as well as current flow data for the sewer system. Updating of this missing data can improve the conclusions drawn from this report and provide a stronger foundation for future planning. The missing data would allow the Village to perform the following analysis items:

- Define all unknown pipes including lengths, sizing, inverts, and type
- Perform an analysis to establish population equivalents (P.E.) for each basin
- Project the anticipated daily average flows (DAF) for each basin
- Calculate peak daily flows (PDF) for the basins
- Provide identification numbers for system manholes
- Provide condition assessment of existing system

3.12 RECOMMENDATIONS

The identified deficiencies in the Village's sewer system must be addressed soon. The Village needs to develop a Capital Improvement Plan to address these needs. The projects can be funded through increased sewer rates, loan programs (IEPA SRF), or possibly bond sales.

The program should prioritize investigation and inventory of the sewer system and lift station repairs/replacement as its first priority. Next should be repair/replacement of combined sewers in all subbasins, followed by sanitary and finally storm. In anticipation of tighter I/I regulations an I/I reduction program should also be developed and implemented as soon as practicable. We recommend the following order of priority for the sewer program in order to obtain peak condition by 2050:

1.	Lift Station Repair & Replacements	$420,000
2.	System Inventory (Video Inspection & Cleaning)	$1,000,000
3.	Pipe Lining & Replacement (Complete System)	$65,196,000
4.	Storm Water Facilities	$570,000
5.	I/I Reduction Program (MH & Lateral Lining)	$56,025,000
	Total System Cost:	$122,791,000

The following Table 3-12 shows the initial seven years of a 30-year program for upgrades. Seven years was chosen simply because it is difficult to evaluate costs without factoring interest, inflation, etc. In 2020 the Village should reevaluate the condition of the system and compare it with the goals noted in this report.

Table 3-12. Sewer Improvement Program

	Program Year								
Capital Improvement	2013	2014	2015	2016	2017	2018	2019	2020	Total
Lift Station Repair & Replacements	$ 420,000								$ 420,000
System Inventory (Video Inspection & Cleaning)	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 800,000
Pipe Lining & Replacement		$1,400,000	$1,400,000	$1,400,000	$1,400,000	$1,400,000	$1,400,000	$1,400,000	$ 9,800,000
Storm Water Facilities	$ 570,000								$ 570,000
I/I Reduction Program	$ 221,000	$ 221,000	$ 221,000	$ 221,000	$ 221,000	$ 221,000	$ 221,000	$1,868,000	$ 3,415,000
Totals:	$ 1,311,000	$1,721,000	$1,721,000	$1,721,000	$1,721,000	$1,721,000	$1,721,000	$3,368,000	$15,005,000

Notes: 1. Hold system improvements till after initial analysis of system is made to detrmine condition
2. Storm water facility is for Scott Street Sewer cost only. SLCR-2 costs not factored.
3. Lateral Lining withheld unitl 2020 for I/I reduction program.
4. All Costs rounded up to nearest $1,000

CHAPTER 4. PAVEMENT INVENTORY

4.1 SYSTEM OVERVIEW

The Village of Franklin Park's streets map is included in Appendix 4.A. The map was updated as part of the 2012 pavement assessment. Only the condition of each street is mapped. As discussed in Section 4.3 below, data for each street section is included in the MicroPaver database.

The Pavement Condition Index (PCI) was developed by the U.S. Army Corps of Engineers. PCI is a numerical index ranging from 0 for a failed pavement to 100 for a pavement in perfect condition. Calculation of the PCI is based on the results of a visual condition survey in which distress type, severity, and quantity are identified. The PCI was developed to provide an index of the pavement's structural integrity and surface operational condition.

PCI is the measure used by MicroPaver to rate streets. The overall PCI of the Village increased from 40 to 47.6 in the three years since the first assessment was performed. The higher rating can be attributed to maintenance and rehabilitation of the existing infrastructure.

Table 4-1. Franklin Park Streets Breakdown by Type

TYPE	STREET LENGTH (MILES)	AVG. WIDTH	% of Total Pavement
ASHPALT	54.4		91%
CONCRETE	5.5	**28.6**	9%
Total	**59.9**		**100**

4.2 2009 PAVEMENT ASSESSMENT

Clark Dietz prepared a pavement assessment report in 2009. This report was used as a basis for the new pavement inventory of all the Village streets. Both plans analyzed the existing condition of the Village streets. Overall, Village streets are now in better condition than they were at the time of the 2009 study. A difference in total square feet of pavement was observed by the 2012 pavement assessment. This difference is explained by the inclusion of cul-de-sacs such as those located off of Silver Creek and Westbrook and additional pavement sections added to Grand Ave. and Belmont Ave.

4.3 PAVEMENT MANAGEMENT SYSTEM

The computer software MicroPaver 6.1.6 updated from the previous version (6.1.2), used in conjunction with the book *Pavement Management for Airports, Roads, and Parking Lots (second edition)* by M.Y. Shahin, was used for the assessment of all streets/pavement in the Village of Franklin Park. Village staff was trained following the guidelines set forth by these two sources to conduct the field survey. Village staff was directed to survey the Village in quadrants set forth in the 2009 survey: North West (NW), North East (NE), South East (SE), and South West (SW). The east-west boundary was defined as Scott Street and was included in the NW and SW sections. The north-south boundary was defined as Belmont Avenue and was included in the SW and NE sections. These four quadrants were then given zone classifications for use in MicroPaver. These are: NW = Zone 1, NE = Zone 2, SE = Zone 3, SW = Zone 4.

In the MicroPaver program, each street in Franklin Park is defined as a branch. The branches (streets) are then further divided into sections. Dividing streets into sections allowed Village staff to systematically inspect the streets and collect valid data. Section determination was based primarily on street width, pavement type, and city blocks. For this assessment, a few additional sections were created on existing branches to provide better data and representation of the condition of the streets. Streets that were not identified as failed in the 2009 report were re-inventoried to update the database; also failed streets that were not repaired were not re-inventoried.

The streets inspection program consisted of field training, pavement inspection, data entry, map creation, and report compilation. Staffing for the project consisted of three Village-employed field technicians to inspect streets, one Clark Dietz staff member to update the GIS map representation of the pavement condition based on MicroPaver, and one Clark Dietz staff member to enter data into MicroPaver and compile the final report.

Detailed section maps created in 2009 were updated and are included with this report for use as a key. MicroPaver creates standard reports for rating branch and section conditions. These reports have been compressed and are included in Appendix 4.B in the form of a condition report.

4.4 CONDITION ASSESSMENT

The rating system for pavements set forth by MicroPaver and M.Y. Shahin can be seen in Figure 4-1. Figure 4-2 shows a breakdown of the streets of Franklin Park as rated by MicroPaver. Table 4-2 converts the ratings to percentages and compares the current data to 2009 data. In 2012, 31 of 115 (27.0%) streets in the Village were in better than poor condition compared to 19 of 115 (16.5%) in 2009. Of the 115 streets, 12 streets are considered failed (10.4%) compared to 13 of 115 (11.3%) in 2009. Streets in very poor and serious condition totaled 50 streets, or 43.5%.

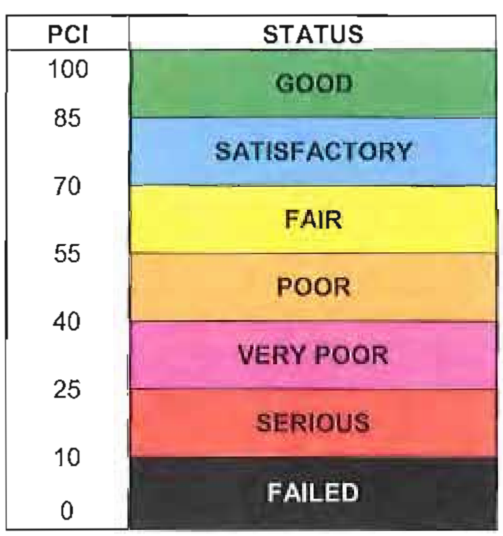


Figure 4-1. Pavement Rating System

GOOD (LENGTH IN MILES 2.9)

GREENFIELD	100.00	0.2
PARK	100.00	0.2
REEVES	100.00	0.3
RIVERSIDE	100.00	0.2
CHERRY	95.00	0.3
GRAND	90.71	1.7

SATISFACTORY (LENGTH IN MILES 6.4)

EDGINGTON	84.20	1.0
OAK	80.77	0.4
JILL	80.00	0.0
PARKLANE	79.00	0.3
MARTENS	76.80	0.8
EMERSON	76.54	0.9
SCOTT	72.95	1.7
HAWTHORNE	70.00	1.2

FAIR (LENGTH IN MILES 12.7)

SILVER CREEK	70.00	0.5
17TH	69.23	0.5
ELDER	69.16	1.4
PEARL	69.12	0.5
SEYMOUR	67.87	0.6
LINCOLN	66.79	1.0
WRIGHTWOOD	66.00	0.1
WESTMANOR	64.00	0.3
BELMONT	63.63	2.2
MAPLE	61.33	0.9
SCHIERHORN	61.00	0.1
LOUIS	60.56	1.0
MONTANA	60.00	0.1
WILLOW	59.00	0.6
RUBY	58.37	1.1
ROSE	56.41	1.5
GUSTAV	56.40	0.6

POOR (LENGTH IN MILES 12.5)

MINNEAPOLIS	54.45	1.0
HERRICK	54.01	0.5
RUTH	52.00	0.1
WILLIAMS	52.00	0.2
BRZEZINSKI	51.90	0.1
FULLERTON	50.65	0.6
LATORIA	50.00	0.1
CALWAGNER	49.73	1.2
BIRCH	49.35	0.4
FRONT	49.00	0.1
SARAH	48.41	1.4
ATLANTIC	47.39	0.6
LEYDEN	47.00	0.1
CHESTNUT	46.87	1.7
SHIRLEY	46.00	0.1
HOUSTON	44.00	0.1
SCHILLER	43.90	1.5
LOMBARD	43.63	0.2
ERNST	43.44	1.1
GAGE	42.76	1.2
CENTER	41.00	0.1
MCNERNEY	41.00	0.2

VERY POOR (LENGTH IN MILES 13.4)

SUNSET	39.45	0.9
RICHARD	39.29	0.6
FRANKLIN	38.56	3.1
BRITTA	38.33	0.3
NONA	38.16	0.2
ANDERSON	38.00	0.1
EXCHANGE	36.00	0.1
ASHLAND	35.00	0.0
BRIGHT	35.00	0.1
GEORGE	34.27	1.0
HACKE	34.00	0.0
DORA	33.13	1.1
COMMERCE	32.22	0.2
WASHINGTON	32.11	0.5
NERBONNE	32.00	0.2
TAFT	32.00	0.1
KINVEY	31.00	0.0
ADDISON	30.40	1.8
CROWN	29.00	0.2
SHEILA	28.78	0.2
WAVELAND	28.40	0.7
DAVIS	28.00	0.1
WALNUT	28.00	0.1
ACORN	27.00	0.2
LESSER	26.03	0.5
NEVADA	25.65	0.7

SERIOUS (LENGTH IN MILES 8.2)

CRESCENT	25.00	0.2
PRAIRIE	24.05	0.1
ROBINSON	24.00	0.3
PARKER	23.00	0.2
KING	22.31	2.4
WOLF	22.01	0.2
DESOTO	22.00	0.0
LEE	22.00	0.1
PACIFIC	21.79	0.9
JAMES	21.00	0.1
WESTBROOK	20.05	0.5
LONNQUIST	20.00	0.2
SONIA	20.00	0.1
COPENHAGEN	19.00	0.1
ELM	18.47	0.6
JOHANNA	18.00	0.2
MELROSE	18.00	0.3
PANORAMIC	18.00	0.2
CHARLES	16.00	0.2
NICHOLS	16.00	0.1
RUNGE	15.87	0.4
CENTRELLA	15.00	0.3
IONA	13.00	0.1
SANDRA	10.70	0.1

FAILED (LENGTH IN MILES 2.0)

LEONA	10.00	0.2
LUCY	9.00	0.1
WELLINGTON	9.00	0.2
LASALLE	8.00	0.0
CARNATION	7.00	0.5
CULLERTON	7.00	0.4
REUTER	7.00	0.1
BELDEN	6.00	0.1
DODGE	6.00	0.1
HART	5.00	0.1
MEDILL	2.00	0.1
POWELL	2.00	0.2

Figure 4-2. Streets of Franklin Park as Classified by MicroPaver (2012)

(Ratings are to the right of each street)

Table 4-2. Franklin Park Streets Performance as Ranked by MicroPaver

	2009		2012		Percent Difference	Rating
	No. of Streets in Rating Class	Percent of Total (%) 2012	No. of Streets in Rating Class	Percent of Total (%) 2009		
	2	1.7%	6	5.2%	3.5%	Good
	7	6.1%	8	7.0%	0.9%	Satisfactory
	10	8.7%	17	14.8%	6.1%	Fair
	19	16.5%	22	19.1%	2.6%	Poor
	32	27.8%	26	22.6%	-5.2%	Very Poor
	32	27.8%	24	20.9%	-7.0%	Serious
	13	11.3%	12	10.4%	-0.9%	Failed
Totals	115	100.00%	115	100.00%	0	

Since the streets of Franklin Park vary in length and width, the streets were next analyzed by area. The results of that assessment as compared to 2009 data can be seen in Table 4-3. At 2.0 million square feet (sf) (22.6%), down from 3.3 million sf (37%) in 2009, the majority of pavement in Franklin Park is rated very poor. Up from 21.3% or 1.92 million sf in 2009, streets in the fair or better category have risen to 41% or 3.71 million sf. The area of failed pavement in 2009 totaled 395,925 sf or 4.4%. In the 2012 assessment, failed pavement totaled 308,482 sf, or 3.4%. Table 4-4 converts this data for viewing in total miles of pavement.

Table 4-3. Assessed Pavement Area Performance as Ranked by MicroPaver

	Pavement Performance Analysis by SQFT					
	2009		2012			
	Square Feet of Pavement in Rating Class	Percent of Total (%) 2009	Square Feet of Pavement in Rating Class	Percent of Total (%) 2012	Percent Difference	Rating
	405,868	4.5%	635,596	7.0%	2.5%	Good
	534,041	5.9%	954,755	10.6%	4.6%	Satisfactory
	977,533	10.9%	2,116,865	23.4%	12.5%	Fair
	1,422,320	15.8%	1,831,970	20.2%	4.4%	Poor
	3,334,170	37.0%	2,043,170	22.6%	-14.5%	Very Poor
	1,933,222	21.5%	1,157,273	12.8%	-8.7%	Serious
	395,925	4.4%	308,482	3.4%	-1.0%	Failed
Totals	9,003,079	100%	9,048,111	100%	0	

Table 4-4. Assessed Pavement Performance as Ranked by MicroPaver (based on average pavement width of 28.6ft)

	Pavement Performance Analysis by Mile (utilizing avg. width 28.6')					
	2009		2012			
	Miles of Pavement in Rating Class	Percent of Total (%) 2009	Miles of Pavement in Rating Class	Percent of Total (%) 2012	Percent Difference	Rating
	2.7	4.5%	4.2	7.0%	2.5%	Good
	3.5	5.9%	6.3	10.5%	4.7%	Satisfactory
	6.5	10.9%	14.0	23.4%	12.5%	Fair
	9.4	15.8%	12.1	20.2%	4.4%	Poor
	22.0	37.0%	13.5	22.6%	-14.4%	Very Poor
	12.8	21.5%	7.7	12.8%	-8.7%	Serious
	2.6	4.4%	2.0	3.4%	-1.0%	Failed
Totals	59.5	100%	59.9	100%	0	

4.4.1 Street Maintenance

It is recommended that the Village re-inspects all streets every three years. This will allow the Village to monitor the progress and performance of the street restoration programs through MicroPaver. It is also recommended that the database be updated upon completion of any street-related project during the time period between inspections. This includes projects such as crack sealing, mill & overlay, reconstruction, etc.

4.4.2 Street Rehabilitation Cost Estimates

MicroPaver's Maintenance and Rehabilitation (M&R) plan tool was used to calculate the yearly budget necessary to improve the condition of the Village's pavement from its current rating of Poor (PCI = 47.6) to Fair (PCI ≥ 55) and Satisfactory condition (PCI ≥ 70). The calculations included a 2.5% inflation factor. To raise the pavement rating to Fair using a 5, 10, and 15-year M&R plan, it would cost the Village $4.5 million per year for 5 years, $4.1 per year for 10 years, and $4.1 million per year for 15 years. To raise the pavement rating to Satisfactory from its current condition using a 5, 10, and 15-year M&R plan, it would cost the Village $6.4 million per year for 5 years and $4.8 million per year for 10 years. MicroPaver would not estimate an M&R plan for a 15-year time period in this case because there was no conceivable budget that would allow this. The highest achievable PCI on a fifteen year plan is 61 which is considered a rating of fair and would cost $4.3 million per year. The estimated costs were calculated using prices built into the MicroPaver software. This information is summarized in Table 4-5 below.

Table 4-5. Street Rehabilitation Cost Estimates

Condition	5-Year Plan	10-Year Plan	15-Year Plan
Fair (PCI ≥ 55)	$4,500,000	$4,100,000	$4,100,000
Satisfactory (PCI ≥ 70)	$6,400,000	$4,800,000	N/A

4.5 STANDARDS AND CODES

4.5.1 Required Facilities

The majority of streets maintained by the Village of Franklin Park can be classified as Class III local roads per the Illinois Department of Transportation (IDOT). IDOT's standards for pavement design of a new Class III asphalt local road or street are 12" minimum base course and 6" minimum flexible pavement thickness. Whereas existing roads require a minimum of 3" of flexible pavement on 8" of base course. Overlay and reconstruction candidates should be analyzed for traffic loading and designed to meet anticipated demands.

4.5.2 Compliance

The Village's streets have not been evaluated as to conformance with State, Federal, and Cook County DOT standards. This is mainly due to the lack of records regarding base and pavement thicknesses. Based on recent road work performed in the Village, it is assumed that a typical cross section of streets in Franklin Park includes approximately 10 inches of base and 3 to 5 inches of flexible pavement.

4.6 PRELIMINARY COSTS

4.6.1 Reconstruction Projects

Category (RECONSTRUCTION PROJECTS)	STREET	RATING	LENGTH	AVG. WIDTH	ESTIMATED COST OF CONSTRUCTION
SERIOUS	CRESCENT	25.00	1,083	27.0	$ 406,125.00
SERIOUS	PRAIRIE	24.00	514	27.0	$ 192,750.00
SERIOUS	ROBINSON	24.00	1,800	25.0	$ 675,000.00
SERIOUS	PARKER	23.00	1,173	30.0	$ 439,875.00
SERIOUS	KING	22.31	12,418	29.0	$ 4,656,750.00
SERIOUS	WOLF	22.01	1,110	32.0	$ 416,250.00
SERIOUS	DESOTO	22.00	155	23.6	$ 58,125.00
SERIOUS	LEE	22.00	270	25.0	$ 101,250.00
SERIOUS	PACIFIC	21.79	4,974	26.3	$ 1,865,250.00
SERIOUS	JAMES	21.00	750	27.0	$ 281,250.00
SERIOUS	WESTBROOK	20.05	2,605	26.5	$ 976,875.00
SERIOUS	LONNQUIST	20.00	1,290	23.0	$ 483,750.00
SERIOUS	SONIA	20.00	310	25.0	$ 116,250.00
SERIOUS	COPENHAGEN	19.00	717	36.0	$ 268,875.00
SERIOUS	ELM	18.47	3,176	29.9	$ 1,191,000.00
SERIOUS	JOHANNA	18.00	1,075	25.0	$ 403,125.00
SERIOUS	MELROSE	18.00	1,847	29.0	$ 692,625.00
SERIOUS	PANORAMIC	18.00	1,015	17.0	$ 380,625.00
SERIOUS	CHARLES	16.00	806	25.0	$ 302,250.00
SERIOUS	NICHOLS	16.00	575	23.0	$ 215,625.00
SERIOUS	RUNGE	15.87	2,332	23.7	$ 874,500.00
SERIOUS	CENTRELLA	15.00	1,840	22.0	$ 690,000.00
SERIOUS	IONA	13.00	275	23.0	$ 103,125.00
SERIOUS	SANDRA	10.70	770	22.0	$ 288,750.00
FAILED	LEONA	10.00	810	25.0	$ 303,750.00
FAILED	LUCY	9.00	418	25.0	$ 156,750.00
FAILED	WELLINGTON	9.00	934	30.0	$ 350,250.00
FAILED	LASALLE	8.00	155	23.6	$ 58,125.00
FAILED	CARNATION	7.00	2,380	30.0	$ 892,500.00
FAILED	CULLERTON	7.00	2,120	30.0	$ 795,000.00
FAILED	REUTER	7.00	725	25.0	$ 271,875.00
FAILED	BELDEN	6.00	645	34.0	$ 241,875.00
FAILED	DODGE	6.00	400	24.0	$ 150,000.00
FAILED	HART	5.00	568	30.0	$ 213,000.00
FAILED	MEDILL	2.00	365	34.0	$ 136,875.00
FAILED	POWELL	2.00	1,280	25.0	$ 480,000.00
	Total		**53,680**	**26.6**	**$ 20,130,000.00**

Figure 4-3. Recommended Street Reconstruction Projects

Roads with a PCI between 0 and 25 are considered failed or in very poor condition and require full reconstruction. Rehabilitation and maintenance projects are no longer an option for these streets due to the condition rating of the street. Preliminary cost estimates for the Village streets in need of reconstruction are shown in Figure 4-3 and were based on recent construction project data available to Clark Dietz. At present, approximately 10.2 miles of roadways need to be reconstructed.

4.6.2 Structural Rehabilitation Projects

		STREET	RATING	LENGTH	AVG. WIDTH	ESTIMATED COST OF CONSTRUCTION
STRUCTURAL OVERLAYS	POOR	LATORIA	50.00	357	25.0	$ 53,550.00
		CALWAGNER	49.73	6,300	26.3	$ 945,000.00
		BIRCH	49.35	2,057	25.7	$ 308,550.00
		FRONT	49.00	706	23.0	$ 105,900.00
		SARAH	48.41	7,500	25.0	$ 1,125,000.00
		ATLANTIC	47.39	4,220	27.4	$ 633,000.00
		LEYDEN	47.00	565	23.0	$ 84,750.00
		CHESTNUT	46.87	8,939	25.1	$ 1,340,850.00
		SHIRLEY	46.00	295	20.0	$ 44,250.00
		HOUSTON	44.00	687	27.0	$ 103,050.00
		SCHILLER	43.90	8,036	30.8	$ 1,205,400.00
		LOMBARD	43.88	887	25.3	$ 133,050.00
		ERNST	43.44	5,927	25.0	$ 889,050.00
		GAGE	42.76	6,344	24.8	$ 951,600.00
		CENTER	41.00	353	25.0	$ 52,950.00
		MCNERNEY	41.00	1,190	26.0	$ 178,500.00
	VERY POOR	SUNSET	39.45	4,917	25.0	$ 737,550.00
		RICHARD	39.29	3,215	25.1	$ 482,250.00
		FRANKLIN	38.56	16,120	38.2	$ 2,418,000.00
		BRITTA	38.33	1,650	23.0	$ 247,500.00
		NONA	38.16	925	25.0	$ 138,750.00
		ANDERSON	38.00	630	25.0	$ 94,500.00
		EXCHANGE	36.00	445	26.5	$ 66,750.00
		ASHLAND	35.00	215	27.0	$ 32,250.00
		BRIGHT	35.00	517	27.0	$ 77,550.00
		GEORGE	34.27	5,507	25.0	$ 826,050.00
		HACKE	34.00	150	25.2	$ 22,500.00
		DORA	33.13	6,060	25.0	$ 909,000.00
		COMMERCE	32.22	1,120	27.0	$ 168,000.00
		WASHINGTON	32.11	2,900	26.7	$ 435,000.00
		NERBONNE	32.00	845	22.0	$ 126,750.00
		TAFT	32.00	680	20.0	$ 102,000.00
		KIMMEY	31.00	150	25.2	$ 22,500.00
		ADDISON	30.40	9,597	31.3	$ 1,439,550.00
		CROWN	29.00	1,254	20.0	$ 188,100.00
		SHEILA	28.78	810	25.0	$ 121,500.00
		WAVELAND	28.40	3,937	29.3	$ 590,550.00
		DAVIS	28.00	675	23.0	$ 101,250.00
		WALNUT	28.00	700	27.0	$ 105,000.00
		ACORN	27.00	1,225	24.0	$ 183,750.00
		LESSER	26.03	2,551	25.0	$ 382,650.00
		NEVADA	25.65	3,620	25.0	$ 543,000.00
		Total		**124,778**	**26**	**$ 18,716,700.00**

Figure 4-4. Recommended Structural Rehabilitation Projects

Roads with a PCI of 25 to 50 are considered in very poor or poor condition and require some form of structural rehabilitation. Different forms of rehabilitation include full depth mill and overlay, and pulverize and overlays. Minor rehabilitation projects are no longer an option for these streets due to the condition rating of the street. Typically these streets require complete replacement of the pavement which has failed due to fatigue or age. In most cases the base is in sound condition and minimal replacement is required. Preliminary cost estimates for the Village streets in need of structural rehabilitation are shown in Figure 4-4 were based on recent construction project data available to Clark Dietz. At present, approximately 23.6 miles of roadways need to be structurally rehabilitated.

4.6.3 Surface Rehabilitation Projects

		STREET	RATING	LENGTH	AVG. WIDTH	ESTIMATED COST OF CONSTRUCTION
SURFACE TREATMENT	FAIR	WESTMANOR	64.00	1,410	25.0	$ 70,500.00
		BELMONT	63.88	10,173	46.4	$ 508,650.00
		MAPLE	61.38	4,770	25.4	$ 238,500.00
		SCHIERHORN	61.00	408	25.0	$ 20,400.00
		LOUIS	60.56	5,214	25.0	$ 260,700.00
		MONTANA	60.00	635	25.0	$ 31,750.00
		WILLOW	59.00	3,082	25.4	$ 154,100.00
		RUBY	58.37	5,545	27.7	$ 277,250.00
		ROSE	56.41	7,765	45.9	$ 388,250.00
		GUSTAV	56.40	3,070	28.1	$ 153,500.00
	POOR	MINNEAPOLIS	54.48	5,177	25.0	$ 258,850.00
		HERRICK	54.01	2,413	25.2	$ 120,650.00
		RUTH	52.00	515	27.0	$ 25,750.00
		WILLIAMS	52.00	1,300	44.0	$ 65,000.00
		BRZEZINSKI	51.90	543	111.6	$ 27,150.00
		FULLERTON	50.55	2,865	29.9	$ 143,250.00
		Total		**54,885**	**35**	**$ 2,744,250.00**

Figure 4-5. Recommended Surface Rehabilitation Projects

Roads with a PCI from 50 to 65 are considered in poor or fair condition and require some form of surface rehabilitation. Different forms of surface rehabilitation include 1 ½" – 2" overlays, 1 ½ "– 2" depth mill and overlay, full depth patching, and hot in place recycling. Maintenance projects are no longer an option for these streets due to the condition rating of the street. Preliminary cost estimates for the Village streets in need of surface rehabilitation are shown in Figure 4-5 were based on recent construction project data available to Clark Dietz. At present, approximately 10.4 miles of roadways need surface rehabilitation.

4.6.4 Preventative Maintenance Projects

		STREET	RATING	LENGTH	AVG. WIDTH	ESTIMATED COST OF CONSTRUCTION
MAINTENANCE	GOOD	GREENFIELD	100.00	1,175	25.0	$ 9,400.00
		PARK	100.00	1,308	25.0	$ 10,464.00
		REEVES	100.00	1,425	27.3	$ 11,400.00
		RIVERSIDE	100.00	1,043	25.0	$ 8,344.00
		CHERRY	95.00	1,610	25.0	$ 12,880.00
		GRAND	90.71	6,321	74.1	$ 50,568.00
	SATISFACTORY	EDGINGTON	84.20	5,320	30.6	$ 42,560.00
		OAK	80.77	2,275	25.0	$ 18,200.00
		JILL	80.00	196	17.0	$ 1,568.00
		PARKLANE	79.00	1,645	33.0	$ 13,160.00
		MARTENS	76.80	4,206	31.3	$ 33,648.00
		EMERSON	76.54	4,750	24.8	$ 38,000.00
		SCOTT	72.95	9,078	30.2	$ 72,624.00
		HAWTHORNE	70.66	6,140	25.0	$ 49,120.00
	FAIR	SILVER CREEK	70.00	2,070	29.9	$ 16,560.00
		17TH	69.23	2,660	31.7	$ 21,280.00
		ELDER	69.16	7,245	25.6	$ 57,960.00
		PEARL	69.12	2,830	27.3	$ 22,640.00
		SEYMOUR	67.87	2,910	36.9	$ 23,280.00
		LINCOLN	66.79	5,201	25.8	$ 41,608.00
		WRIGHTWOOD	66.00	285	25.0	$ 2,280.00
		Total		**69,693**	**30**	**$ 557,544.00**

Figure 4-6. Recommended Maintenance Projects

Some of the deficiencies in the streets system can be remedied with maintenance-type projects. Maintenance projects should occur on pavements with a PCI value of 65 and higher. Typically maintenance projects involve routing and crack sealing, spot patching, diamond grinding, and seal coating. Figure 4-6 lists the streets in need of maintenance work with estimated costs which were based on recent construction project data available to Clark Dietz. At present, approximately 13.2 miles of roadways need preventative maintenance.

Preventive maintenance applies lower-cost treatments to slow the deterioration of a roadway, maintain or improve the pavement condition, and extend the pavement's service life. With varions short-term treatments, preventive maintenance can extend pavement life an average of 5 to 10 years. Applied to the right road at the right time when the pavements are mostly in good condition, preventive maintenance can improve the network condition significantly at a lower unit cost.

4.7 RECOMMENDATIONS

It is recommended that the Village of Franklin Park continue inspecting the streets on the current schedule of every three years. Every inspection creates a data point that allows MicroPaver to better analyze the existing condition of the Village's streets. Once enough data points have been collected (inspections performed), MicroPaver can create models for the system that provide a look into the future as well as look to the past to help track which methods of construction/rehabilitation provide the best result based on cost and performance.

For streets in the categories of Failed and Serious (PCI < 25), it is recommended that the Village of Franklin Park perform a full reconstruction. Full reconstruction of these streets will cost approximately $20.1 million. At the time of reconstruction, it is recommended that the streets be brought up to current IDOT standards as mentioned in Section 4.5.1.

For streets with a PCI within the range of 25 < PCI < 50, it is recommended that the Village of Franklin Park create a program that will perform structural rehabilitation of these streets. The preferred method is full depth mill and overlay. Rehabilitation of these streets will cost approximately $18.7 million. At the time of rehabilitation, it is recommended the streets be brought up to current IDOT standards for pavement thickness as mentioned in Section 4.5.1 if possible.

For streets with a PCI within the range of 50 < PCI < 65, it is recommended that the Village of Franklin Park create a program that will perform surface rehabilitation of these streets. The preferred methods are 1 ½" – 2" depth mill and overlay, and/or hot in place recycling. Rehabilitation of these streets will cost approximately $2.75 million.

For streets in the categories of Fair to Good (65 < PCI < 100), it is recommended that the Village of Franklin Park perform some form of maintenance on these streets as necessary. For example, Greenfield has a PCI of 100 as it was just rehabilitated. Immediate maintenance is not necessary for this street, but in the upcoming years, when cracks begin to form, crack sealing would be recommended to help prevent premature failure and further deterioration of the pavement and maintain the highest PCI possible. Maintenance of these streets will cost approximately $560,000.

Table 4-6. 11 Year Street Rehabilitation Plan Budgetary Estimate

Year	Preventative Maintenance	Surface Rehabilitation	Structural Rehabilitation	Reconstruction	Total
2013	$17,000	$1,370,000	$743,000	$2,677,000	$4,807,000
2014	$13,000	$1,485,000	$1,086,000	$2,205,000	$4,789,000
2015	$19,000	$1,748,000	$998,000	$2,026,000	$4,791,000
2016	$27,000	$1,975,000	$920,000	$1,867,000	$4,789,000
2017	$38,000	$2,074,000	$888,000	$1,802,000	$4,802,000
2018	$59,000	$2,211,000	$835,000	$1,695,000	$4,800,000
2019	$61,000	$1,909,000	$936,000	$1,899,000	$4,805,000
2020	$94,000	$1,733,000	$983,000	$1,995,000	$4,805,000
2021	$138,000	$1,504,000	$1,043,000	$2,116,000	$4,801,000
2022	$207,000	$1,169,000	$1,132,000	$2,299,000	$4,807,000
2023	$295,000	$1,050,000	$1,142,000	$2,317,000	$4,804,000

Creating and managing a maintenance program will help prolong the life of the Village's roads as well as minimize the future need for full street reconstructions. The data shown in Table 4-5 illustrates it would cost the Village approximately $4.1 million to achieve a PCI level of 55. Comparatively, by analyzing the 11 year program, for an additional $700,000, the Village would be able to achieve a PCI of 70. Table 4-6, above was created using MicroPavers's M&R plan tool. The table estimates expenditures necessary to bring the Village of Franklin Park's streets to a PCI level of 70 over a period of 11 years.

CHAPTER 5. SIDEWALK INVENTORY

5.1 SYSTEM MAP

The Village of Franklin Park's sidewalks were not included in the updated GIS maps. The sidewalk database is currently stored in an Excel file that is not linked to the GIS database at this time. Village staff has indicated that they intend to complete the linking of the database at a later date.

5.2 ACCESS RAMP CONDITION ASSESSMENT

Village staff completed a survey of sidewalk ramps/access points throughout Franklin Park in order to assess their condition. In all, 1,655 ramps were surveyed. The ramps were awarded one point for each of these accessibility criteria:

- Detectable warning field
- Conforming detectable warning field
- Conforming slope
- Conforming curb
- Adequate condition of concrete

The current Illinois Department of Transportation (IDOT) Access Ramps standard details are the current design standards used for the Village and State on all construction projects. These details meet the most recent Public Right-Of-Way Accessibility Guidelines (PROWAG) introduced by the Accessibility Board. These requirements are the basis for the scoring system used in the assessment. Since the latest version of PROWAG has not yet been fully adopted, an access ramp may be compliant with previous regulations, AND/OR non-compliant with the soon to be adopted PROWAG regulations.

If the ramps did not meet the criteria, a point was not awarded. The ramps were ranked according to the rating scale shown in Table 5-1. A ramp may be compliant with current standards even if it did not receive a perfect score.

Table 5-1. Public Right-of-Way Accessibility Survey Rating Scale

5	Good Condition & Compliant with New PROWAG Regulations
4	Good Condition & Compliant (Non-PROWAG)
3	Varying Condition & Non-Compliant to PROWAG **or** Poor Condition Compliant (Non-PROWAG)
2	Poor Condition & Non-Compliant (both current & PROWAG)
1	Very Poor Condition & Non-Compliant (both current & PROWAG)
0	Failed Condition & Non-Compliant (both current & PROWAG)

The complete results of the survey are included in Appendix 5.A. The survey showed that the average score of all the ramps evaluated was 3.4, which means that a majority of the ramps in the Village are in better-than-average condition. Table 5-2 shows the condition of all ramps surveyed in the Village.

Table 5-2. Sidewalk Ramp Condition

Condition Rating	Number of Ramps	% of Total
0	11	0.7
1	50	3.0
2	245	14.8
3	577	34.9
4	555	33.5
5	217	13.1
Total	**1,655**	**100 %**

A map showing the sidewalk ramps with a rating of 0 – 3 is included in Appendix 5.B. Many of the worst ramps are located on the major streets of Franklin Avenue, Belmont Avenue, and Schiller Boulevard.

5.3 RECOMMENDATIONS

It is recommended that ramps with a score of "0" should be replaced immediately. The rest of the ramps should be repaired or replaced on an as-needed basis as part of local road projects.

It is recommended that the Village continue their effort to develop a written plan for access ramp replacement. The Village will then need to adopt the plan and follow it on all future street projects. The Village should also carry through with their plan to appoint an ADA Compliance Officer to coordinate the access ramp improvements and address any accessibility issues that arise.

5.4 PRELIMINARY COSTS

Based on recent 2012 construction costs, the budgetary estimate for replacement of one access ramp is approximately $850. Table 5-3 shows the costs associated with replacing all the non-compliant ramps in the Village (Conditions 0 through 4).

Table 5-3. Sidewalk Ramp Replacement Costs

Condition Rating	Number of Ramps	Unit Cost	Total Cost
0	11	$850	$9,350
1	50	$850	$42,500
2	245	$850	$208,250
3	577	$850	$490,450
4	555	$850	$471,750
Total	**1,438**	--	**$1,222,300**

The cost of replacing each ramp can be built into the budgets for the local road projects. In accordance with PROWAG, planning for street improvement projects must include an evaluation of the access ramps on the associated streets and improve access to current standards during construction. This will help to address the needed access repairs within the system but will likely not be adequate to address as much access issues as desired. It is recommended that the yearly 50/50 sidewalk replacement program include a significant portion to address ramp improvements.

Table 5-4 shows a possible scenario for replacement of all the non-PROWAG compliant sidewalk ramps in the Village. This schedule includes allotting $200,000 annually for seven (7) years to replace all non-complaint ramps. The period of seven years was selected in order to meet the Village's annual expenditure on sidewalk related projects of $200,000.

Table 5-4. Sidewalk Ramp Replacement Schedule

Year	Annual Budget	Remaining Balance	Number of Ramps	Remaining Ramps	Notes
1	$ 200,000	$1,022,300	235	1,203	Includes all Ramps with Ratings "0" and "1" & 174 with a rating of "2".
2	$ 200,000	$ 822,300	235	968	Includes all remaining ramps with a rating of "2" & 71 ramps with a rating of "3".
3	$ 200,000	$ 622,300	235	733	All ramps have a rating of "3".
4	$ 200,000	$ 422,300	235	498	All ramps have a rating of "3".
5	$ 200,000	$ 222,300	235	263	Includes all remaining ramps with a rating of "3" and 199 ramps with a rating of "4"
6	$ 200,000	$ 22,300	235	28	All ramps have a rating of "4".
7	$ 22,300	$ -	28	0	All ramps have a rating of "4".

In addition to upgrading the accessibility ramps to current PROWAG guidelines, it is recommended that the sidewalks and access ramps are reviewed at the most every four (4) years in order to ensure that the proposed program upgrades are improving access across the Village. The implementation of a ramp replacement program will require a large upfront cost in capital improvements; however, it is very likely that ongoing upgrade costs will decrease greatly after all improvements are performed due to the resilience of concrete sidewalk as well as the construction materials and methods in place today.

CHAPTER 6. RECOMMENDATIONS

6.1 SUMMARY

This report is a summary of the condition of the Village of Franklin Park's utilities and pavement assets. The report describes the deficiencies in each system and explains methods for correcting these problem areas.

6.2 WATER SYSTEM

The Village's water system is in fair to poor condition and requires a significant amount of improvements. The required minimum improvements are estimated to cost $112,206,000 within the next 30 years to ensure the majority of the system is replaced before the service life is reached. The system is in compliance with all Federal, State, and local codes. The recommended improvements are listed in Table 2-8. These improvements will guarantee a safe, reliable supply of water for the Village.

6.3 SEWER SYSTEM

The Village's sewer system is estimated to be in fair to poor condition. The required minimum improvements are estimated to cost $121,174,000 within the next 30 years to ensure the majority of the system is replaced before the service life is reached. The system reliably transports sewage to the Des Plains River TARP system for treatment. It is recommended that the improvements outlined in Table 3-12 are performed to improve the system. A primary driver for the sewer rehab costs is factoring lateral replacements as shown in Table 3-11. The recommended program does not show this phase beginning until 2020 which allows time for the Village to develop funding and scope for this phase of rehab.

6.4 VILLAGE PAVEMENT

The pavement rating for the Village's streets has been updated to a PCI of 47 from a PCI of 40 in 2009. Overall the streets are in poor condition and require nearly $52,800,000 of repairs over the following 11 years to reach a desired PCI rating of 70. Program breakdowns are in Table 4-6.

6.5 VILLAGE SIDEWALK RAMPS

The Village's overall sidewalk ramp rating is currently 3, which translates to poor condition but is compliant with Non-PROWAG guidelines. Approximately $1,223,000 is needed to update the ramps to modern PROWAG requirements. Improvements are recommended in Table 5-4.

6.6 CAPITAL COST ESTIMATE

Table 6-1 below lists the capital costs for all the improvements recommended for each Village utility. The total cost of all the improvements is rounded to approximately $289,020,000. It is recommended that the Village begin to consider funding for these projects. Village staff should also attempt to rank the projects by their order of importance, and construct the most important improvements first.

Table 6-1. Capital Cost Estimate

Village Asset	Length (miles or each)	Total Cost	Est. Avg. Annual Cost	Cost per Mile or Each	Program Length (yr)
Watermain	78	$112,206,000	$3,741,000	$1,439,000	30
Sewer	94	$122,791,000	$4,094,000	$1,307,000	30
Roadways	60	$52,800,000	$4,800,000	$880,000	11
Sidewalk Ramps	1655	$1,223,000	$175,000	$1,000	7
	Totals:	$289,020,000	**$12,810,000**		

Notes: 1. Sewer and Water programs are listed as 30 year to account for intiation of phases at later dates.

It is estimated that the Village should budget $12.8M per year in order to reach the goals outlined within this report. Since the asset classes run on programs with differing timeframes the Estimated Average Annual cost does not divide cleanly from the total cost of improvements. Actual program amounts differ slightly for each asset year; however, this figure is a good basis for future planning. This figure does not account for inflation within the construction industry. Capital costs should relax somewhat after 7 to 10 years as improvements are made and the quality and reliability of the various assets are improved. Reduction of water wasted through leakage, reduction of time spent on breaks, reduction of fees spent on runoff treatment, and reduction of roadway reconstruct costs due to improved pavement classes all will help provide savings that can be utilized for improvement costs.

Assets for the Village are also finite. The costs noted above do not constitute a final end point for all assets. The recommended plan is an accelerated plan to address the fact that large majorities of all of the assets are reaching the ends of their service lives and replacement or upgrades are necessary to catch up with the level of deterioration. All improvements installed in the present and recent past have a service life as well and these assets will also require repairs and upgrades as they age. For this reason the Asset Management plan will need to be reviewed and updated regularly to address asset conditions.

The Village should consider the needs of all assets when undertaking any specific project. For example, road projects indentified in need of structural rehabilitation or reconstruction should be combined with watermain and sewer repair/replacement projects. Manhole and CIPP lining can easily be added to any street rehabilitation project (even surface rehab projects) and can be an effective way to reduce costs from multiple contracts and perform needed system upgrades with a minimum of disruption. Also note that by law sidewalk and ramp upgrades must be performed in any pavement alteration project and therefore should be included in any pavement rehabilitation cost.

6.7 FUNDING OPPORTUNITIES

6.7.1 Water Projects

As noted previously the water system demands the highest percentage of cost and amount of improvements that are necessary. Funding for water improvements range widely from traditional fees and rates for connections and service to bonding and loan programs like IEPA SRF. This report has not reviewed the current fee and rate system of the Village to determine if the revenue generated from fees and rates at a minimum pays for operation and capital improvements. It is recommended that the Village perform a rate study for the water system.

The IEPA and other federal resources have in recent years expanded loan and some grant programs that can be used for infrastructure improvements. These programs, however, have specific requirements that often require more oversight and management to perform, which can have an effect on cost.

6.7.2 Sewer Projects

Sewer projects follow the same reasoning as is noted above for the water funding. Fees and rates should be examined to verify that at a minimum the revenue generated pays for operations and capital improvements. A rate study is warranted to verify this. As noted previously, bonding and loan sources are available through IEPA and other sources.

Another funding mechanism that can be examined by the Village is the creation of a separate stormwater utility. This utility would manage all aspects of runoff reduction and stormwater collection, storage, conveyance, and treatment. Several communities throughout the country have adopted stormwater utilities to help manage the new requirements created from NPDES and other runoff management regulations. By separating the stormwater costs from the sewer budget it may be more cost effective for the sewer department to focus resources on sanitary and combined sewer rehab. The stormwater utility programs could possibly focus on I/I reduction, combined sewer separation, stormwater storage and management, and green stormwater initiatives (pervious pavement, rain gardens, bio-swale introduction, green roofs, etc.)

6.7.3 Pavement Projects

Pavement rehabilitation is largely dependent upon the Motor Fuel Tax (MFT) Program. The funds allocated by MFT do not meet the maintenance and rehabilitation needs of the Village and alternate funding is needed. Traditional bonding and loan sources are available as are a number of grants and loans through the Federal government. However, these grant and loan programs contain very strict guidelines that govern improvement types and require a larger amount of oversight and management, which can affect costs. Several communities have also supplemented their roadway funds with wheel taxes, registration fees, and stricter parking enforcement.

6.8 SCHEDULE

It is recommended that the Village begin prioritizing improvement projects and planning for their highest-priority projects immediately.

Asset Management should be a continuous process, as the needs of the Village and the status of its infrastructure are continuously changing. This report should be updated annually to best reflect the current state of the Village's utilities and pavement.