STORM WATER ASSET MANAGEMENT PLAN

City of Ionia, MI

Where we're going: System Goals

INTRODUCTION

About this Document

This document is our Storm Water Asset Management Plan (AMP). It defines the goals and guiding principles for operating our storm water system at its lowest life-cycle cost. With input from the community, we will maintain our AMP through a joint effort of our staff, administration, and elected officials. We will update it every five years to ensure its relevancy and effectiveness.

A companion document, our Storm Water Asset Management Program, shows how we will apply the principles of asset management to achieve the goals outlined in this AMP.

Our Commitment

Our storm water system is comprised of pipes, manholes, catch basins, detention basins, and outlets. We operate and maintain them to collect our storm water, manage water quality, and discharge the water back into the environment in chosen locations. Currently, each of us pays to operate, maintain and replace these assets through our taxes. At some point in the future, it may be necessary to fund the system through a utility rate structure. Regardless of how we pay for our system, each of us is an owner of the storm water system. As owners, we commit to manage our assets and make decisions based on long-term life cycle cost.

Asset Management Principals

All infrastructure deteriorates with age and requires proactive management to operate, maintain, repair, and eventually replace each part, or asset. This progresses from routine operation and maintenance through repairs to eventual replacement as the asset ages. Waiting to perform maintenance or make repairs can save money in the short term but may decrease the lifespan of an asset. Replacing assets before they fail does not take full advantage of their value. It is this balance which puts decisions for operations, maintenance, repair, and replacement at the heart of asset management.

Asset management dictates needed actions after considering the condition of an asset, the consequences of its failure, and the action alternatives available. Asset Management drives those solutions with the lowest life cycle cost at the desired Level of Service (LoS).

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Prepared by City of Ionia Staff, with professional, technical expertise provided by:

Prein&Newhof
PN# 2130311

PART 1: DEFINING OUR GOALS–WHAT IS OUR DESIRED LEVEL OF SERVICE?

Our mission is to collect storm water, manage water quality, and discharge it into the environment in chosen locations. We will proactively manage our storm water collection and treatment assets to meet our desired Level of Service (LoS) goals.

As owners, community, must decide its desired LoS. Many factors play into this determination including: compliance with regulations, public health, aesthetics, service reliability, stable costs, etc. We have established these primary goals:

Goal 1: Meet Regulatory Requirements

Our storm water system is designed to meet or exceed regulations established in the Federal Clean Water Act and State of Michigan Statutes/Rules. We strive to achieve continued compliance with environmental regulations and maintain the quality of our environment.

Goal 2: Minimize Flooding and Public Hazards

Our storm water system allows us to collect surface runoff water, convey it to a desired location, and discharge it into the environment. Breaks, blockages, and erosion can affect our storm water assets. Flooding can cause roadway accidents, reduce life of pavements, inhibit use of our transportation assets, and may cause property damage/erosion. We will schedule maintenance, improvements, and replacement to minimize failure vulnerability.

Goal 3: Manage Storm Water Inflow into our Wastewater System

Storm water inflow through sources like roof drains and catch basins can cause sanitary sewer overflows and backups. Groundwater infiltration, if severe enough, can cause backups. Both inflow and infiltration (I/I) take up flow/wastewater treatment capacity and reduces our capacity to collect and treat wastewater. It also increases our treatment costs. We will locate and eliminate sources of I/I whenever it is cost-effective to meet the Federal EPA guidelines for I/I and to minimize the potential for sanitary sewer overflows and back-ups.

Goal 4: Provide Capacity for Community Growth

We will maintain our storm water assets to offer adequate capacity for existing development and will plan for improvements to permit growth. We will control expansion by balancing needs for community redevelopment/infill and desires for new development.

Goal 5: Minimize Life Cycle Costs

The best financial decisions are those which achieve the lowest life cycle costs. This means we consider the full life cycle of each investment each time we look at making improvements. Short term fixes, while they may have low immediate costs, may not be the best long-term financial decision. Likewise, not spending money on maintenance and repairs can give short term cost savings but result in asset failure, increasing life-cycle costs. We will manage our system to pursue the lowest life-cycle cost possible for each asset.

Goal 6: Maintain Water Quality

As storm water travels to and through our system, it can collect sediment, debris (leaves and trash), and vehicle oils. We will design and maintain our system to collect and dispose these things to the best practical extent before our storm water is discharged.

PART 2: INVENTORY - WHAT DO WE OWN?

Our System

Our storm water system includes assets such as collection pipes, culverts, manholes, catch basins, detention basins, and discharge outlets. Vitrified clay pipe (heat-treated clay) and concrete pipe were the main choices for storm sewers in North America for many decades. Material for culverts is typically either concrete or corrugated metal. The metal pipes are subject to rusting and shorter life cycles. Clay brick with mortared joints used to be the primary material for manholes and catch basins. Our system also has structures made with concrete block and precast concrete.

In recent decades, plastic sewer pipe is common in new sewer construction. Although plastics have good corrosion resistance, they are vulnerable to poor installation practices. Given this vulnerability, we typically utilize concrete pipe as our storm sewer material of choice.

A detailed summary of our storm water system assets are in our Storm Water Evaluation Report and in a detailed asset inventory maintained by our Department of Public Works (DPW).

The DPW keeps a list of non-pipe assets which includes purchase date, original cost, inspection reports, repair history, maintenance schedule, and specifications.

Our Plan

We will keep our system inventory current by storing records of our storm water system in our Geographic Information System (GIS). A GIS contains maps of all pies, manholes, catch basins, and outlets along with an inventory of non-pipe assets (equipment, buildings, etc.) and asset data pertinent to Operations, Maintenance, and Replacement.

PART 3: RISK OF FAILURE – WHAT ARE THE CONDITIONS OF OUR ASSETS?

Our System

To understand how long each of our assets may last, we must track their condition and potential failure risk. A functional asset failure is the primary consideration for Risk of Failure (RoF). However, we also must evaluate the risk of a physical asset failure for pipes, manholes, catch basins, culverts, and outlets. We will use physical inspections and maintenance records to rate their condition.

Our Plan

We will keep our condition assessments current using periodic asset inspections at regular intervals frequent enough to document reasonably expected condition changes. The inspection intervals will vary by asset type and its expected life. Next, we will score each asset on its likelihood or risk of failure. RoF ratings are on a scale of 1-5 with 5 being the highest RoF.

PART 4: CONSEQUENCE OF FAILURE – WHAT HAPPENS WITH A FAILURE?

Our System

It is important we understand the severity of consequences which may occur if any asset in our system fails. Functional failure consequences can occur when pipes and catch basins become blocked with sediment or debris. Physical failure consequences can occur when we have pipe breaks, outlet washouts, and structure collapses.

Our Plan

We will evaluate the Consequence of Failure (CoF) of each asset, from both a functional and physical failure perspective. We will maintain redundancy on assets with a high CoF. All CoF ratings will be on a scale of 1-5 with 5 being the highest CoF.

PART 5: CRITICALITY – HOW DO WE PRIORITIZE OUR ACTIONS?

Our System

We must prioritize our actions to meet our Level of Service (LoS) goals while managing our work loads, utility rates, and minimizing life cycle costs. Consequence of Failure and Criticality should not be confused. Criticality is the product of as asset's Risk of Failure (RoF) and Consequence of Failure (CoF). Criticality drives an asset's action priority.

Our Plan

Criticality ratings help us prioritize improvements and with development of our Capital Improvement Plan. Criticality of assets within our system will be determined by multiplying each asset's RoF (1-5) by its CoF (1-5).

PART 6: CAPACITY – DO WE HAVE ENOUGH, NOW AND FOR THE FUTURE?

Our System

Our system must meet service demands both now and into the future based on current and future land use. Over time, flows fluctuate with changes in property use and population. The majority of our system is providing our desired level of flood protection. However, there are a few areas where improvements are required. Analysis of our system capacity is in our Sewer Flow Study report.

Our Plan

We will maintain our storm water assets to provide adequate capacity for existing development and will plan for system improvements which allow our community to grow. We will manage system expansion by balancing needs for community redevelopment/infill and desires for new development.

PART 7: OPERATIONS AND MAINTENANCE – KEEPING UP WITH ROUTINE WORK

Our System

Certain portions of our system need routine maintenance to continue functioning. Catch basins need sediment removed, structures need repairs, and detention systems kept free of overgrowth. Our system Operations and Maintenance (O&M) demands are stable and we will manage the system to maintain our current service levels. We will use Computerized Maintenance Management System (CMMS) tools to maintain asset inventories and schedule regular O&M activities.

Our Plan

We have established the following O&M goals:

1. Maintain staffing and equipment levels so in-house staff can perform routine O&M activities.

2. Use in-house staff to verify proper function of all system assets.

3. Hire outside consultants and contractors when specialized technical or equipment capabilities are needed.

PART 8: CAPITAL IMPROVEMENTS – CONTINUING SYSTEM RENEWAL

Our System

Improvement recommendations for our storm water system are in our Flow Study and Storm Water System Evaluation Reports. These reports identify the scope and priorities of proposed storm water system improvements such as pipe replacements, equipment replacements, and major O&M activities.

Our Plan

We will incorporate the recommendations of the various reports into a comprehensive Capital Improvement Plan (CIP) which will document the major projects we plan to complete within the next 10 years. Criticality ratings set the order and timing of projects. Project timing often is driven by the availability of outside funding such as loans and grants. We will maintain and update our comprehensive CIP every year.

PART 9: FINANCIAL STRATEGY–RATE PLANNING AND STABILITY

Our System

Actions on our storm water system are funded through our General Fund, Street Funds, or through charges to private development when required to support that development.

Our Plan

We will maintain a life cycle forecast of expected costs to minimize and stabilize budgetary impacts.

Recognizing that our storm water system is a utility similar to our drinking water and wastewater systems, we will evaluate the potential establishment of a storm water utility.

SUMMARY

Our Asset Management Program outlines how we will achieve our Asset Management Plan goals. We will adjust it from time to time as new/improved tools, software, and evaluation techniques are developed. Regardless of those changes, we will incorporate Asset Management into our everyday activities, including system improvements and master planning. By proactively managing our storm water system, we can meet our desired Level of Service goals at the lowest possible long term cost.