Table of Contents
Chapter 1: Executive Summary ........................................................................................................... 1-1
  1.1 Master Planning Needs & Goals .................................................................................................... 1-1
  1.2 Data Collection .......................................................................................................................... 1-1
  1.3 Project Areas ............................................................................................................................. 1-2
  1.4 Capital Improvement Recommendations .................................................................................... 1-4
  1.5 Operation & Maintenance Recommendations ............................................................................ 1-4
  1.6 Regulatory Recommendations .................................................................................................... 1-5
  1.7 Summary of Recommended Stormwater Program Costs ............................................................ 1-5
  1.8 Funding ...................................................................................................................................... 1-6
  1.9 Conclusion ................................................................................................................................ 1-7
Chapter 2: Description of Project ........................................................................................................ 2-1
  2.1 Master Planning Needs ................................................................................................................. 2-1
  2.2 Master Planning Goals ............................................................................................................... 2-2
  2.3 Public Involvement ..................................................................................................................... 2-2
  2.4 Basis for Problem Areas ............................................................................................................. 2-2
Chapter 3: Data Collection .................................................................................................................... 3-1
  3.1 Introduction .............................................................................................................................. 3-1
  3.2 Drainage Reports ..................................................................................................................... 3-1
  3.3 City Infrastructure Information ............................................................................................... 3-1
  3.4 City Records ............................................................................................................................ 3-2
  3.5 Citizen Outreach ....................................................................................................................... 3-2
  3.6 City Staff Interviews .................................................................................................................. 3-4
  3.7 Field Observations ..................................................................................................................... 3-4
Chapter 4: Project Areas ....................................................................................................................... 4-1
  4.1 Project Area Identification ......................................................................................................... 4-1
  4.2 Possible Solutions ...................................................................................................................... 4-2
  4.3 Project Summaries ..................................................................................................................... 4-3
Chapter 5: Capital Issue Needs ............................................................................................................. 5-1
  5.1 Project Prioritization ................................................................................................................ 5-1
  5.2 Problem Area Cost Estimates ................................................................................................. 5-4
Chapter 6: Operation & Maintenance Needs

6.1 Need for Operation & Maintenance

6.2 Department Structure/Responsibility

6.3 Sewer Inspections
   - 6.3.1 Current Condition
   - 6.3.2 Recommendations

6.4 Other Infrastructure Inspections
   - 6.4.1 Current Condition
   - 6.4.2 Recommendations

6.5 Cleaning
   - 6.5.1 Current Condition
   - 6.5.2 Recommendations

6.6 Street Sweeping
   - 6.6.1 Current Condition
   - 6.6.2 Recommendations

6.7 Drainage Way Maintenance
   - 6.7.1 Current Condition
   - 6.7.2 Recommendations

6.8 Summary of Operation & Maintenance Needs

Chapter 7: Regulatory Needs

7.1 NPDES MS4 Regulations
   - 7.1.1 Current Conditions
   - 7.1.2 Recommendations

7.2 Total Maximum Daily Load (TMDL) Regulations
   - 7.2.1 Current
   - 7.2.2 Recommendations

7.3 Floodplain Management
   - 7.3.1 Current Conditions
Chapter 1: Executive Summary

1.1 Master Planning Needs & Goals

The City of Danville experiences a wide range of drainage challenges throughout the City which stem from an aging stormwater system, the majority of the community lacking modern stormwater management facilities, a variety of terrains, and increased rainfall intensities.

The Stormwater Master Plan serves as an update and continuation to the Report on Sanitary Sewerage & Storm Drainage done in 1966 by Warren & Van Praag, Inc. The 1966 study served the community well, however, the community and its infrastructure have changed significantly over the last 50 years. The policies and solutions found in the 1966 report need to be updated as well. The Stormwater Master Plan’s ultimate goal is to provide the City with a comprehensive plan to address Danville’s stormwater needs for the next 50 years.

The Master Plan follows the following steps:

1. Data Collection
2. Identification of Project Areas
3. Project Prioritization
4. Identification of Capital Needs
5. Identification of Operation & Maintenance Needs
6. Identification of Regulatory Needs
7. Identification of Funding Sources.

This Chapter summarizes the Master Plan process and its key recommendations.

1.2 Data Collection

Chastain & Associates sought out several sources of information to obtain a complete picture of the stormwater related issues that are found in Danville. These sources included:

1. Drainage Reports
2. City Infrastructure Information
3. Citizen Surveys
4. Citizen Outreach
5. City Staff Interviews
6. Field Observations

Submissions to the Citizen survey and discussions with citizens at public meetings were some of the most informative resources that were used to identify drainage problem areas. Stormwater surveys were collected from August 17, 2015 to October 31, 2015. During that time, 185 surveys were received.
via the City’s website or in paper copies at neighborhood meetings or via the mail. Issues identified included yard flooding, water entering buildings, street flooding, basement seepage, erosion, infrastructure maintenance issues, and sanitary sewer backups.

Citizen requests for service throughout 2015, including a very large rain event in June 2015, were also compiled and added to the stormwater survey locations. A summary of all drainage issue locations is found in Figure 1.1 below.

![Figure 1.1: Citywide Map of Reported Drainage Issues](image)

### 1.3 Project Areas

Using the results of all data gathered, nearby drainage issues were grouped together to form project areas. The Stormwater Master Plan identifies 40 recommended projects that help to eliminate a majority of the City’s stormwater issues. Figure 1.2 below shows the locations of these project areas. Chapter 4 of this plan includes more detailed information on every project area, including the limits of
the area, the size of the area in acres, a description of the problem, possible solutions to rectifying the problem, and additional information that the City should be aware when moving forward with improvements to the area.

The City cannot support the repair of all stormwater issues at one time due to a limited amount of funds available, limited staffing resources, and general public inconvenience and safety considerations. For these reasons, the projects must be prioritized to give the City a strategic approach to capital improvements.

A numerical approach to prioritizing the projects was used, based on 1. Public Health and Safety, 2. Implementation Constraints, 3. Coordination Opportunity, 4. Water Quality, and 5. Inflow and Infiltration (I&I) Problems. Each project was scored based on known data, physical evidence, citizen comments, and City staff knowledge. The projects were then ranked from highest score to lowest score to determine the objective priority for each project. The top ten priority areas are shown in Table 1.1.
Table 1.1: Top Ten Prioritized Projects

<table>
<thead>
<tr>
<th>Priority Rank</th>
<th>Project Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Koehn Creek Corridor</td>
</tr>
<tr>
<td>2</td>
<td>Meadowlawn Area</td>
</tr>
<tr>
<td>3</td>
<td>Bowman Avenue Culvert</td>
</tr>
<tr>
<td>4</td>
<td>Townway Area</td>
</tr>
<tr>
<td>5</td>
<td>Lakeshore Drive/Shorewood Drive</td>
</tr>
<tr>
<td>6</td>
<td>Old Ottawa Road</td>
</tr>
<tr>
<td>7</td>
<td>Porter Street Area</td>
</tr>
<tr>
<td>8</td>
<td>Rivercrest Drive &amp; Myrtle Drive</td>
</tr>
<tr>
<td>9</td>
<td>Dawn Avenue to Montclaire Street</td>
</tr>
<tr>
<td>10</td>
<td>Nevada Avenue &amp; Utah Avenue</td>
</tr>
</tbody>
</table>

Conceptual cost estimates were made for the top ten prioritized projects and the remaining projects were estimated based on a cost of $60,000 per acre. The top ten project estimates are found in Section 6.2 and all projects are estimate in Appendix C.

1.4 Capital Improvement Recommendations

In addition to the previously discussed problem area needs, there are also other capital investments the City should consider to improve the remaining storm sewer systems outside the major projects listed in this report. Chastain recommends:

- An annual storm drainage program to plan for small drainage improvements and infrastructure repairs.
- A storm sewer rehabilitation program for repairing sewers before they must be replaced.
- A Private Property Program that would assist residents in fixing some of the drainage problems that are occurring on private property.

1.5 Operation & Maintenance Recommendations

A comprehensive stormwater program for the City is not only made up of capital improvements, but also in a well-planned operation and maintenance program (O&M) for existing infrastructure. Chastain & Associates reviewed the current O&M activities in Danville and offer the following recommendations:

- Perform inspections to:
  - 10% of the storm sewer system every year.
  - 10% of the drainage structures every year.
  - City of Danville bridges.
  - Drainage Ways
- Perform routine cleaning on:
  - 10% of the storm sewer system every year.
  - 10% of the drainage structures every year.

Additional information on these recommendations is found in Chapter 6.
1.6 Regulatory Recommendations

The City of Danville has regulatory obligations as well that it must meet in order to stay in compliance with State and Federal law. Chastain & Associates reviewed the current regulatory requirements in Danville and offer the following recommendations:

- Remain in compliance with the City's National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System (NPDES MS4) permit by
  - Completing the remaining Best Management Practices as required in the City's last (NPDES MS4) permit.
  - Reviewing the new NPDES MS4 permit for the 2016-2021 cycle and update the City's NPDES efforts to reflect the new permit's significant changes.
- Remain in compliance with the Illinois Environmental Protection Agency's approved Total Maximum Daily Load (TMDL) for the North Fork Vermilion River and Lake Vermilion by
  - Reviewing the City's stormwater management program to determine whether the TMDL includes requirements for the control of storm water discharges.
  - Be aware of TMDL and water quality progress in the watershed in order to foresee upcoming participation requirements.
- Continue the City's compliance with the requirements of National Flood Insurance Program, including administering the requirements of the Flood Hazard Areas Ordinance.
- Consider floodplain buyouts as an alternative solution to those drainage problems within the City where a property is located within a floodplain.
- Review the model stormwater ordinance that was issued by Illinois Department of Natural Resources, Office of Water Resources (IDNR/OWR) to identify additions to its ordinance that will improve the overall operation and management of the City's storm drainage system and not be detrimental to it.

Additional information on these recommendations is found in Chapter 7.

1.7 Summary of Recommended Stormwater Program Costs

The Stormwater Master Plan identified 40 projects that, if complete, could help eliminate most of the City's stormwater issues. The estimated overall capital need for all projects is just under $25 million. All of these projects will not be able to be completed all at once and will likely have to be constructed over several decades as funding is available. In addition to these projects, annual funding is required to fulfill other capital needs, Operation and Maintenance needs, and Regulatory needs.

The top ten projects, based on their prioritization rank, have a total estimated cost of $17,282,500. The construction of these projects is dependent on the amount of funding that can be made available to make the improvements. To complete these top 10 projects in 10 years and fund the other needs of the City, an annual amount just over $3.4 million a year would be necessary. If these projects are constructed over a 15 year or 20 year period, that annual amount would decrease to approximately $2.8 million and $2.5 million, respectively. The following table shows a breakdown of these costs for
the various durations to complete the top ten projects. Annual recommendations for other stormwater program needs are also included in the summary.

### Table 1.2: Summary of Stormwater Program Costs (Annual)

<table>
<thead>
<tr>
<th>Summary of Capital Needs</th>
<th>10 Year Cost (Annual)</th>
<th>15 Year Cost (Annual)</th>
<th>20 Year Cost (Annual)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem Area Projects (Top 10/No. Years)</td>
<td>$1,728,250</td>
<td>$1,152,167</td>
<td>$864,125</td>
</tr>
<tr>
<td>Annual Storm Drainage Project</td>
<td>$250,000</td>
<td>$250,000</td>
<td>$250,000</td>
</tr>
<tr>
<td>Storm Sewer Rehabilitation</td>
<td>$250,000</td>
<td>$250,000</td>
<td>$250,000</td>
</tr>
<tr>
<td>Private Property Program</td>
<td>$100,000</td>
<td>$100,000</td>
<td>$100,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$2,328,250</strong></td>
<td><strong>$1,752,167</strong></td>
<td><strong>$1,464,125</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Summary of O&amp;M Needs</th>
<th>Cost (Annual)</th>
<th>Cost (Annual)</th>
<th>Cost (Annual)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storm Sewer inspections</td>
<td>$70,000</td>
<td>$70,000</td>
<td>$70,000</td>
</tr>
<tr>
<td>Drainage Structure Inspections</td>
<td>$40,000</td>
<td>$40,000</td>
<td>$40,000</td>
</tr>
<tr>
<td>Drainage Way Inspections</td>
<td>$75,000</td>
<td>$75,000</td>
<td>$75,000</td>
</tr>
<tr>
<td>Vactor Truck (for storm sewer and drainage structure cleaning)</td>
<td>$50,000</td>
<td>$50,000</td>
<td>$50,000</td>
</tr>
<tr>
<td>Street Sweeping</td>
<td>$300,000</td>
<td>$300,000</td>
<td>$300,000</td>
</tr>
<tr>
<td>Drainage Way Maintenance</td>
<td>$200,000</td>
<td>$200,000</td>
<td>$200,000</td>
</tr>
<tr>
<td>Miscellaneous Equipment Needs</td>
<td>$100,000</td>
<td>$100,000</td>
<td>$100,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$835,000</strong></td>
<td><strong>$835,000</strong></td>
<td><strong>$835,000</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Summary of Regulatory Needs</th>
<th>Cost (Annual)</th>
<th>Cost (Annual)</th>
<th>Cost (Annual)</th>
</tr>
</thead>
<tbody>
<tr>
<td>General NPDES Program Administration</td>
<td>$50,000</td>
<td>$50,000</td>
<td>$50,000</td>
</tr>
<tr>
<td>Storm System Outfall Mapping</td>
<td>$50,000</td>
<td>$50,000</td>
<td>$50,000</td>
</tr>
<tr>
<td>Erosion Control Ordinance</td>
<td>$75,000</td>
<td>$75,000</td>
<td>$75,000</td>
</tr>
<tr>
<td>Outfall Inspection &amp; Monitoring</td>
<td>$50,000</td>
<td>$50,000</td>
<td>$50,000</td>
</tr>
<tr>
<td>Stormwater Pollution Prevention Plans for City Facilities</td>
<td>$20,000</td>
<td>$20,000</td>
<td>$20,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$245,000</strong></td>
<td><strong>$245,000</strong></td>
<td><strong>$245,000</strong></td>
</tr>
</tbody>
</table>

| **Grand Total**                                | **$3,408,250**        | **$2,832,167**        | **$2,544,125**        |

### 1.8 Funding

Various funding sources were identified and discussed to possibly fund additional investments in stormwater program. These include:

- Reallocation of existing funds
- Increasing revenue from existing revenue sources, such as:
  - Property Tax
  - Sales Tax
  - Food & Beverage Tax
  - Sanitary Sewer Enterprise Fund
- Seeking new revenue sources, such as:
1.9 Conclusion

This Stormwater Master Plan serves as an important first step for the City of Danville towards improving the stormwater drainage system of the City. It is a snapshot of the problems that the City is currently facing and allows the City to see the system with a broad viewpoint. With a comprehensive knowledge of the problems it’s facing, the City evaluated the priority of all these problems and has a plan of action towards improving the problems. It now understands the costs of these needed improvements and has identified ways to fund them.

The City of Danville is now poised and ready to take the next steps of funding, designing, and constructing the much needed improvements to the drainage system of Danville, Illinois.
Chapter 2: Description of Project

2.1 Master Planning Needs

The City of Danville has an aging stormwater system, relatively little modern stormwater management facilities, and a combination of terrains that cause a wide range of drainage challenges throughout the City. The aging system is often in need of repair and is undersized in many locations. Design standards have evolved since the first storm sewers were built, which contributes to under sizing of those initial storm sewers. Much of the City was developed before a stormwater management ordinance was established. Residents, who never had stormwater issues before, are now experiencing standing water in the streets, their yards, and even their homes.

According to the United States Environmental Protection Agency (EPA), rainfall intensities have been increasing since the 1980’s. This has caused some storm sewers to become under sized, even if nothing else around their neighborhood has changed. Residents who have lived in a neighborhood for years are experiencing problems that did not exist before. The report for the Urban Flooding Awareness Act, June 2015, States that “Urban flooding is most common in older sections of communities where original storm sewers were not designed for present-day standards; urbanization has increased runoff, and climate is trending to more frequent and intense storm events.” It goes on to state, “Urban flooding is expected to increase unless action is taken.”

In 1966, Warren & Van Praag, Inc. compiled the Report on Sanitary Sewerage & Storm Drainage for the City of Danville. This was the last comprehensive report completed for the City. The 1966 report covered both stormwater issues and sanitary issues. These issues included storm sewer sizing problems, storm sewer failures, creek improvements, cross connections to sanitary lines, and other common issues regarding both storm and sanitary sewers. Many areas of the City have been developed since the 1966 report. Others areas that were included in the report have been further developed. The 1966 study served the community well, however, the community and its infrastructure have changed significantly over the last 50 years and the policies and solutions found in the 1966 report need to be updated as well.

Utilities like sanitary sewer systems and water systems have been highly regulated for many years. Storm drainage systems were not regulated until the USEPA began regulating Municipal Small Storm Sewer Systems (MS4s) in 2003. In addition to managing the capacity and condition of its stormwater infrastructure, the City of Danville must now manage the quality of the stormwater in its system.

Storm sewer and drainage systems are often the last thing on the minds of the residents because it is only needed intermittently and is only noticed when a problem affects them. The 2015 rains are a great example of this. The City received 6.5 inches of rain in 24 hours in June and over 14 inches for the month of June. They also received 5 inches of rain in 5 hours at the end of December 2015. These rains brought to light the need for the City to evaluate the state of the storm drainage systems and develop a plan to begin to improve and better manage this vital utility.
2.2 Master Planning Goals

The Stormwater Master Plan’s ultimate goal is to provide the City with a comprehensive plan to address the stormwater needs for the foreseeable future. The plan will identify the following:

1. Stormwater problems currently known
2. “Big Picture” solutions to known stormwater problems
3. A prioritization of the known problem areas through a rating process
4. Recommended improvements to the Operations & Maintenance of the system
5. Regulatory Compliance
6. Estimated level of resources needed to address the runoff issues
7. Possible ways to fund the solutions for the community

These items are discussed in further detail in the remainder of the Master Plan. This Master Plan will serve as the road map for the path towards a better functioning storm drainage system. Implementation of the Master Plan will then follow with the design of viable solutions and construction of individual projects. The system will improve, if resources are put towards designing and constructing these improvements.

2.3 Public Involvement

In August 2015, Chastain & Associates LLC (Chastain) was retained by the City of Danville to begin the Master Planning efforts for the storm drainage system. To understand the needs and nuances of the current system, Chastain reached out to the community to gather input. Those involved included City officials, the staff of the Public Works Department, staff of the Department of Engineering & Urban Services, Chastain staff, and the residents of Danville. Information received on the public outreach efforts can be found in Section 3.4 City Records.

2.4 Basis for Problem Areas

The Stormwater Master Plan problem areas were developed to include any stormwater problem within the limits of the City that pose health, safety, or economic threat to residents or City property. Problem areas located on private property were also included for a comprehensive understanding of stormwater issues between public property and adjacent private property. Generally, problem areas located completely on private property that are not caused by stormwater from City property are excluded.
Chapter 3: Data Collection

3.1 Introduction

To fully understand the deficiencies in the storm drainage system, several sources of information were used. Using all of these sources helped to identify all of the problem areas identified to date. It also reduced the likelihood of overlooking problem areas. The section further discusses the data and how it was used. These sources included:

7. Drainage Reports
8. City Infrastructure Information
9. Citizen Surveys
10. Citizen Outreach
11. City Staff Interviews
12. Field Observations

3.2 Drainage Reports

Past drainage studies help reveal the past conditions of the storm drainage system and how the system has changed since then. Chastain received from the City the Warren & Van Praag, Inc. *Report on Sanitary Sewerage & Storm Drainage* (1966) as well as existing storm and sanitary maps. The 1966 report discussed previous storm sewer improvements, their current problems, and proposed solutions. Not all of these solutions were implemented following the report. In addition, the City has grown, developed, and aged since the 1966 report was made and problems have developed in other locations. Residential and commercial developments have also added to some of the problem areas. The 1966 report listed design assumptions that were used, many of which are now below current standards, including the design year for storm sewer design.

3.3 City Infrastructure Information

The City of Danville maintains records of their storm sewer infrastructure in a number of ways. Storm sewer alignments, sizes, and some elevations are recorded on Sidwell maps, electronic drafting files, and in a Geographic Information System (GIS). The City is currently building a GIS database and map of the storm sewer system. The storm sewer lines and structures are mostly complete. Additional information of each asset has not been populated into the system. The current surface elevations are available thru the City’s LIDAR data. This was used to define drainage areas and estimate the required sizes of storm sewers.
3.4 City Records

Several recent storm events occurred in the City prior to the start of this Master Plan. The City provided a list of all the calls from residents to the City regarding stormwater and sanitary issues from 2015. This list included information such as date, location, information regarding the issue, and what may have been performed to correct the issue. These calls came from all areas of the City. Chastain also received locations of claims from the large June 2015 rain events. These claims were filed with the Mayor’s office in a concerted effort to obtain assistance from the state and federal government for property damage. All locations that were reported were compiled in one map. Figure 3.1 shows, for example, the location from where calls were received from the Townway Area regarding stormwater and sanitary issues in 2015 as well as locations noted in citizen surveys. A city wide map of these locations is found in Appendix A.

3.5 Citizen Outreach

Public input was highly sought in order to capture as many drainage issues within the City of Danville as possible. A stormwater page was created by City Staff on Danville’s website. This webpage provided information on the Master Plan efforts and showed examples of stormwater issues in the City.

A survey was developed to gain information from citizens about the stormwater issues they have witnessed. The survey is shown in Figure 3.2. Chastain and the City distributed surveys at neighborhood meetings for residents to fill out. In addition, the stormwater web page had the survey available to fill out on line.
We need your help! Let us know about the drainage problems you have seen where you live, work, and play in the City of Danville. This information will be used to identify future projects that will reduce flooding in Danville.

When you're done, please leave the survey with a Chastain & Associates or City of Danville Representative. You can also e-mail your answers to stormwater@cityofdanville.org, fold and mail to Chastain & Associates, or complete the survey at www.danville-stormwater.org.

**About You** – Please share so we can follow up with any questions about your observations.

Name  
Address  
Phone  
Email  

May we add you to our e-mail contact list, which will be used for any news and updates to the Stormwater Master Plan?  
Contact will be limited: □ Yes □ No

**Location # ___________ (Please list the corresponding number from your location sticker)**

<table>
<thead>
<tr>
<th>Address or Location Description:</th>
<th>How often does flooding occur?</th>
</tr>
</thead>
<tbody>
<tr>
<td>This location is where I</td>
<td></td>
</tr>
<tr>
<td>Live</td>
<td>4 or more times per year</td>
</tr>
<tr>
<td>Work</td>
<td>Once per year</td>
</tr>
<tr>
<td>Play</td>
<td>Once in the last 5 years</td>
</tr>
<tr>
<td>Other</td>
<td>Once in the last 10 years</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of problem (check all that apply)</th>
<th>I also experience sanitary sewer backups at this location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street flooding</td>
<td>Yes</td>
</tr>
<tr>
<td>Yard flooding</td>
<td>No</td>
</tr>
<tr>
<td>Water entering building</td>
<td></td>
</tr>
<tr>
<td>Water seeping into basement</td>
<td></td>
</tr>
<tr>
<td>Erosion</td>
<td></td>
</tr>
<tr>
<td>Maintenance problems</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>

In order to fund the projects to reduce flooding in Danville, additional funds will be needed. What type of funding would you support? (check all that apply)

| Property tax increase | Sales tax increase |
| A dedicated fee for stormwater improvements | Other tax increase |
| Other | |

**Additional Comments**

________________________________________________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________

**Thank you for your participation!**

Chastain & Associates LLC  5 N. Country Club Rd.  Decatur, IL 62521

**Figure 3.2 Citizen Survey**
The survey asked about the location of the problem to help residents think about areas in addition to where they live. The frequency and type of problem was requested. This is important to help understand what is causing the issues and what may help solve the issue. In addition, the frequency helps prioritize projects. Remediating frequent flooding areas is more impactful than fixing an issue that occurs less frequently. Questions regarding funding were also presented as raising funds will affect every resident and not just those directly impacted by stormwater problems.

Neighborhood meetings were held for areas that the City had identified as having a high number of drainage issues. At those meetings the Master Plan process was discussed in detail and Chastian and/or City staff solicited information regarding drainage problems from the attendees. Maps of the neighborhoods were used by citizens to show where flooding occurred, how flood waters traveled, and where infrastructure seemed to have failed. Survey forms were available for completing at the meeting and for the attendees to share with their neighbors. The meetings that were held included Meadowlawn Area, Vermilion Heights, Village Mall, Center City, Holiday Hills, and Lincoln Park areas. In addition, a City-wide public data gathering meeting was held on Wednesday, October 21, 2015.

Stormwater surveys were collected from August 17, 2015 to October 31, 2015. During that time, 185 surveys were received via the City’s website and in hard copies.

### 3.6 City Staff Interviews

Chastain met with City staff on several occasions to present questions regarding specific problem areas and to discuss any additional problem areas the City may have witnessed. City staff deals with many of the drainage problems on a regular basis and has considerable insight on the possible cause of the problem, what intermediate repairs have been tried, and what a permanent solution may be. In addition, they are aware of stormwater related issues beyond flooding. These include erosion, stormwater quality, and infrastructure deterioration. Chastain met with staff from several areas of the Public Works Department. City staff consulted included:

1. Doug Ahrens: Director of Public Works
2. David Schnelle: Director of Engineering & Urban Services
3. Eric Childers: Stormwater Manager
4. Ray Garcia: Service and Operations Manager
5. Adam Aull: GIS Coordinator
6. Liila Bagby: Planner I

### 3.7 Field Observations

Chastain visited all of the project locations in this report to investigate, analyze, and determine probable solutions. The condition of these areas was noted. Measurements were taken of existing infrastructure and drainage ways. In areas that Chastain had additional questions; the City provided information from previous plans or performed their own site visits. No rain events occurred during the site visits. City staff and citizen photos and videos were used to document the level of flooding in some of these areas.
Chapter 4: Project Areas

4.1 Project Area Identification

Project areas were identified after gathering all the information from City staff, citizens, and field observations. These areas were identified based on the number of complaints or issues, types of issues, and severity of those issues. The number of complaints from the surveys for each type of issue is shown in Table 4.1. The types of issues do vary but the top 3 include yard flooding, street flooding, and water entering a building and/or basement. It is important to note that project areas are different than problem areas. Problem areas are those areas that experience stormwater issues. To improve problem areas, a project will occur within some portion of the problem area. Work may not need to occur within an entire problem area for the entire problem area to benefit. The project area is typically smaller than the problem area.

<table>
<thead>
<tr>
<th>Type of Issue</th>
<th>Number of Reports</th>
<th>Percentage Reported*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yard Flooding</td>
<td>88</td>
<td>48%</td>
</tr>
<tr>
<td>Water Entering Building</td>
<td>47</td>
<td>26%</td>
</tr>
<tr>
<td>Street Flooding</td>
<td>82</td>
<td>45%</td>
</tr>
<tr>
<td>Basement Seepage</td>
<td>72</td>
<td>39%</td>
</tr>
<tr>
<td>Erosion</td>
<td>35</td>
<td>19%</td>
</tr>
<tr>
<td>Maintenance Issues</td>
<td>21</td>
<td>12%</td>
</tr>
<tr>
<td>Sanitary Sewer Backups</td>
<td>19</td>
<td>10%</td>
</tr>
</tbody>
</table>

*Note: More than one issue could be reported per location

See Figure 4.1 for a map showing all of the project areas. It is evident there are drainage problems in all areas of the City. Most of the areas included in the 1966 report appear to have been fixed; however, some do have new issues. Areas downstream of large developments have often been affected. This is possibly due to the lack of the current stormwater management policies until 1993. Flat areas, especially in the southeast side of the City, have stormwater storage issues. The additional storage of the system that should be available within roadside ditches or curb and guttered streets has been lost from siltation or street asphalt overlay work.
4.2 Possible Solutions

Knowing where the City of Danville is experiencing drainage problems is only the first step to improving them. Each identified area was reviewed and a possible solution was identified. In many cases, the capacity of the existing storm sewer system was found and compared to current design requirements. If alternative solutions were possible, these were also identified.
4.3 Project Summaries

The projects identified from the data discussion in Chapter 3 are summarized in the following section. The summary includes information about the project area, the problems experienced, and possible solutions. Additional information that will assist City Staff in determining their course of action to improving the stormwater issue is also included. Project Summaries are listed below and are in order based on prioritization.

Index:
Koehn Creek Corridor - Heatcraft Detention................................................................. 4-6
Koehn Creek Corridor - National Avenue ................................................................. 4-7
Meadowlawn Area ..................................................................................................... 4-8
Meadowlawn Area (Continued) ............................................................................... 4-9
Bowman Avenue Culvert ......................................................................................... 4-10
Townway Area .......................................................................................................... 4-11
Lakeshore Drive/Shorewood Drive ........................................................................ 4-12
Old Ottawa Road ....................................................................................................... 4-13
Porter Street Area ..................................................................................................... 4-14
Rivercrest Drive & Myrtle Drive............................................................................. 4-15
Dawn Avenue to Montcalire Street - Upper............................................................ 4-16
Dawn Avenue to Montcalire Street - Lower.............................................................. 4-17
Nevada Avenue & Utah Avenue ............................................................................. 4-18
Douglas Park ............................................................................................................... 4-19
Coake Street ............................................................................................................... 4-20
Logan Avenue ............................................................................................................ 4-21
Sheral Drive ................................................................................................................ 4-22
High School Block .................................................................................................... 4-23
Winter Avenue/ Bowman Avenue .......................................................................... 4-24
Williams Street ........................................................................................................... 4-25
Edison Street ................................................................................................................ 4-26
Vermilion Street ........................................................................................................ 4-27
Suncrest Drive & Shady Lane ................................................................................. 4-28
Rue Conti Street .......................................................................................................... 4-29
Boone Street ............................................................................................................... 4-30

4-3
Crystal Drive/Griffin Street ................................................................. 4-31
Logan Avenue/Fairchild Street .......................................................... 4-32
Grove Street .................................................................................. 4-33
Forrest Street ............................................................................. 4-34
Texas Avenue ............................................................................. 4-35
Stonegate Community ................................................................ 4-36
Ferndale Avenue ........................................................................ 4-37
Moore Street ............................................................................... 4-38
Elisha Street ............................................................................... 4-39
Harrison Park Golf Course Road .................................................... 4-40
Maywood Drive Circle ................................................................ 4-41
Holiday Square .......................................................................... 4-42
3202 N. Vermilion Street ............................................................... 4-43
Francis Street ........................................................................... 4-44
Hinkley Street ............................................................................ 4-45
Sonny Lane ................................................................................ 4-46
Morin Avenue ........................................................................... 4-47
Shorewood Drive Condos ............................................................... 4-48

**Alphabetical Listing of the Projects:**

3202 N. Vermilion Street ................................................................. 4-43
Boone Street ............................................................................... 4-30
Bowman Avenue Culvert .............................................................. 4-10
Coake Street ............................................................................... 4-20
Crystal Drive/Griffin Street ............................................................. 4-31
Dawn Avenue to Montclaire Street - Upper .................................... 4-16
Dawn Avenue to Montclaire Street - Lower .................................... 4-17
Douglas Park ............................................................................. 4-19
Edison Street ............................................................................. 4-26
Elisha Street ............................................................................... 4-39
Ferndale Avenue ....................................................................... 4-37
Forrest Street ............................................................................ 4-34
Francis Street ................................................................. 4-44
Grove Street ...................................................................... 4-33
Harrison Park Golf Course Road ........................................... 4-40
High School Block ............................................................. 4-23
Hinkley Street ...................................................................... 4-45
Holiday Square ..................................................................... 4-42
Koehn Creek Corridor –Heatcraft Detention ............................. 4-6
Koehn Creek Corridor -National Avenue ................................. 4-7
Lakeshore Drive/Shorewood Drive .......................................... 4-12
Logan Avenue ....................................................................... 4-21
Logan Avenue/Fairchild Street .............................................. 4-32
Maywood Drive Circle ......................................................... 4-41
Meadowlawn Area ............................................................... 4-8
Moore Street ......................................................................... 4-38
Morin Avenue ....................................................................... 4-47
Nevada Avenue & Utah Avenue ............................................. 4-18
Old Ottawa Road .................................................................. 4-13
Porter Street Area .................................................................. 4-14
Rivercrest Drive & Myrtle Drive ........................................... 4-15
Rue Conti Street ..................................................................... 4-29
Sheral Drive .......................................................................... 4-22
Shorewood Drive Condos .................................................... 4-48
Sonny Lane .......................................................................... 4-46
Stonegate Community .......................................................... 4-36
Suncrest Drive & Shady Lane ................................................ 4-28
Texas Avenue ........................................................................ 4-35
Townway Area ...................................................................... 4-11
Vermilion Street ................................................................... 4-27
Williams Street ..................................................................... 4-25
Winter Avenue/ Bowman Avenue ........................................... 4-24
**Koehn Creek Corridor - Heatcraft Detention**

**General Information:**
Location #: 22a  
Project Area: 14.3 Acres  
Prioritization #: 1  
*Estimated Project Cost: $1,200,000  
(*Based on Cost Estimate from V3 Companies)

**General Location:**  
North and East side of Heatcraft Facility and directly south of Voorhees Street along the east side of Koehn Creek

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**  
Water overtops Voorhees Street during most rain year events.

**Possible Solutions:**  
V3 Companies has proposed rerouting Koehn Creek to flow along the north and east side of the Heatcraft facility instead of the west side and discharge into a proposed detention basin on the east side that would provide detention up to a 50 year storm event. The water would exit the basin to the south and flow through the existing box culvert under Voorhees Street. Another detention basin would be built south of Voorhees Street and immediately east of the creek. This would add further detention capacity in the system.

**Additional Information:**  
Property acquisition and utility relocation will be necessary. The Federal Emergency Management Agency's (FEMA) Flood Map of this area shows that a majority of this property may lie within the 100-year floodplain of Koehn Creek. Improvements to the area, coupled with the other two Koehn Creek projects, may lower the highwater elevation expected at this location. Design should be coordinated with FEMA and the Illinois State Water Survey.
Koehn Creek Corridor - National Avenue

**General Information:**
Location #: 22b  
Project Area: 13.5 Acres  
Prioritization #: 1  
*Estimated Project Cost: $3,100,000  
(*Based on Cost Estimate)

**General Location:**
National Avenue from Cannon Street to Main Street

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
Koehn Creek is conveyed along National Street via a concrete box culvert. The upper portion is failing and in need of replacement.

**Possible Solutions:**
Continue efforts to revert Koehn Creek back to an open channel where it is appropriate. This project would remove National Avenue and use the existing right-of-way and surrounding properties as an open channel creek. Open channel creeks such as this would provide more conveyance than storm sewer.

**Additional Information:**
Property acquisition, house demolition, and utility relocation will be necessary. Permanent street closure will be necessary for all of National Avenue. The Federal Emergency Management Agency's (FEMA) Flood Map of this area shows that a majority of this property may lie within the 100-year floodplain of Koehn Creek. Improvements to the area, coupled with the other two Koehn Creek projects, may lower the highwater elevation expected at this location. Design should be coordinated with FEMA and the Illinois State Water Survey.
Meadowlawn Area

**General Information:**
Location #: 15  
Project Area: 126.8 Acres  
Prioritization #: 2  
Photographs: Appendix B-7 thru B-14

**General Location:**
Problems occurring from Winter Avenue south to Fairchild Street and from Logan Avenue east to Vermilion Street

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
Flooding occurs in the streets and yards along most of the natural drainage channel from Winter Avenue to Fairchild Street. For a 10 year storm, which is the standard design year for storm sewer, the storm sewers are in excess of 300% overcapacity. When this occurs, water at the upstream end of the system, specifically on Meadowlawn Drive, cannot enter the pipes and runs along the surface through yards and can enter houses.

**Possible Solutions:**
The 1966 report recommended a 60” relief sewer for this area. A new storm sewer along Grant Street could be added to collect approximately ¼ of the water that is currently draining to the existing storm sewer. This sewer would begin as a 21” and gradually increase in size to a 72”. It would eventually follow beside the existing 84” storm sewer that is serving this area. Another option would be to add an above ground stormwater drainage area between Roselawn Street and Fairlawn Avenue. This would collect almost all of the water north of this location and release it slowly into the existing storm system. Collecting this water either in an additional storm sewer or drainage area should relieve the capacity constraints of the existing sewer and allow upstream properties to drain. If in final design it is determined that more capacity is necessary, the City should look into opening up the storm sewer back to a natural channel.

**Additional Information:**
Right-of-way will be necessary from Lincoln Park towards the river for the first option. Also, approximately 1750 feet of Grant Street is brick pavement and will have to be replaced. Brick pavement is approximately 4 times as much as an asphalt pavement. Street closures will be necessary as construction moves from block to block. For the second option, property acquisition, house demolitions, and utility relocation will be necessary. Permanent street closure will be necessary for Harmon Avenue between Roselawn Street and Fairlawn Avenue.
Meadowlawn Area (Continued)

**General Information:**
Location #: 15  
Project Area: 126.8 Acres  
Prioritization #: 2  
*Estimated Project Cost: $5,500,000  
(*Based on Cost Estimate)

**New Sewer**

**General Information:**
Location #: 15  
Project Area: 126.8 Acres  
Prioritization #: 2  
*Estimated Project Cost: $3,400,000  
(*Based on Cost Estimate)

**Detention**
Bowman Avenue Culvert

**General Information:**
Location #: 20  
Project Area: 1.2 Acres  
Prioritization #: 3  
*Estimated Project Cost: $145,100  
(*Based on Cost Estimate)

**General Location:**
Bowman Avenue southwest of Holiday Square.

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
Embankment is eroding above and around the box culvert that runs under Bowman Avenue. Water is overtopping the roadway curb near the culvert.

**Possible Solutions:**
Extend culvert and regrade embankment to an acceptable slope. Add inlets north of the culvert to capture more roadway drainage before it overtops the curb.

**Additional Information:**
Right-of-way or easements will be necessary. Partial street closure will be necessary during construction.
Townway Area

**General Information:**
Location #: 9  
Project Area: 20.1 Acres  
Prioritization #: 3  
*Estimated Project Cost: $383,400  
(*Based on Cost Estimate)  
Photographs: Appendix B-4, B-5

**General Location:**
Townway Road east to the CSXT railroad and Liberty Lane south to Northbrook Dr

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
The existing railroad ditch has silted in and has trees grown up in it. Approximately 800’ south of Liberty Lane the ditch is no longer defined and stormwater then flows through the backyards of the houses on the east side of Countryway Street. The block north of the Countryway cul-de-sac also experiences back yard flooding as the water from the properties on the south side of Liberty Lane drain south into their yards. Water from the Village Mall, lying west of Townway Road, is also adding a significant volume of water to the storm sewer between Countryway Street and East Road. For a 10 year storm, which is the standard design year for storm sewer, the pipes are in excess of 200% to 600% overcapacity. General, ditch and storm sewer maintenance is also needed.

**Possible Solutions:**
In order to improve the conveyance of the existing railroad ditch, the CSXT railroad must cooperate in cleaning its ditches. To redirect flows from Liberty Lane, the addition of more inlets and/or underdrains in the back yards will prevent standing water. Add a drainage basin with an outlet toward the railroad ditch in the back of the properties between Liberty Lane and the Countryway cul-de-sac. Increase the storm sewer from 24” to 30” from the mall to the railroad and increase the pipe culvert from 30” to 36” under the railroad. The effect of the downstream property owners should be determined and accounted for during final design. Regular maintenance on ditches and storm sewers is also recommended.

**Additional Information:**
Most of the project is located in the rear yard of properties or on railroad property, therefore coordination and/or easements will be necessary to complete this work.
Lakeshore Drive/Shorewood Drive

**General Information:**
Location #: 4  
Project Area: 5.1 Acres  
Prioritization #: 5  
*Estimated Project Cost: $1,218,000  
(*Based on Cost Estimate)  
Photographs: Appendix B-3

**General Location:**
The ravine in the backyards of properties on Lakeshore Drive and Shorewood Drive

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
Erosion in the ravine is exposing sewer and utility lines, and potentially threatening building structures.

**Possible Solutions:**
Repair of the erosion that has occurred will require fill and regrading. The installation of erosion protection to prevent future erosion is also required. There are various products and techniques that can be used for erosion control, varying from concrete products to natural installations. Choosing the solution is dependent on the slope of the ravine bottom, slopes of ravine sides, preferences of the City and adjacent residents, and budget for improvements.

**Additional Information:**
This entire project is located on the back of private properties. An easement and coordination between property owners will be necessary to complete this work. Environmental and other permits will be necessary.
Old Ottawa Road

**General Information:**
Location #: 11  
Project Area: 1.4 Acres  
Prioritization #: 6  
*Estimated Project Cost: $232,000  
(*Based on Cost Estimate)

**General Location:**
Old Ottawa Road from Denvale Drive to the turn southeast of Denvale Drive

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
The edge of roadway and the roadside ditches are eroding. This can cause structural failures of the roadway. It also can add debris to the roadway that creates hazardous driving conditions.

**Possible Solutions:**
Protect the edge of pavement by adding curb and gutter with storm sewer. Alternatively, add a paved ditch to both sides of the roadway.

**Additional Information:**
Right-of-way will not be necessary. Partial street closure will be necessary during construction. The work will be part of a larger project involving a planned sanitary sewer force main routing along Old Ottawa Road.
Porter Street Area

**General Information:**
Location #: 27  
Project Area: 204 Acres  
Prioritization #: 7  
*Estimated Project Cost: $2,527,000  
(*Based on Cost Estimate)

**General Location:**
The area is bounded by Bowman Avenue, Griggs Street, Fairweight Avenue, and Main Street

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
This area has relatively flat oil and chip roads. This combination creates poorly draining roadways. Approximately half the streets have no curb and gutter and no well-defined roadside ditches that would allow water to drain to the inlets at roadway intersections.

**Possible Solutions:**
Reconstruct roadway as needed and add additional inlets and storm sewer in the areas that there are none.

**Additional Information:**
Right-of-way will not be necessary. Street closure will be necessary during construction.
Rivercrest Drive & Myrtle Drive

**General Information:**
Location #: 16  
Project Area: 10.0 Acres  
Prioritization #: 8  
*Estimated Project Cost: $921,000  
(*Based on Cost Estimate)
Photographs: Appendix B-15

**General Location:**
The ravines along Rivercrest Drive and in the backyards of properties on Myrtle Drive and Woodridge Drive

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
This problem area has multiple issues occurring. Erosion in the ravines is potentially threatening building structures. Runoff from Rivercrest Drive is eroding the edge of pavement. Water along Myrtle Drive and Woodridge Drive has backed up into basements and inlets overflow. Erosion could be contributing to exposed sanitary sewers and services and providing opportunities for stormwater to enter the sanitary sewers.

**Possible Solutions:**
Repair of the erosion that has occurred will require fill and regrading. The installation of erosion protection to prevent future erosion is also required. There are various products and techniques that can be used for erosion control, varying from concrete products to natural installations. Choosing the solution is dependent on the slope of the ravine bottom, slopes of ravine sides, preferences of the city and adjacent residents, and budget for improvements. Add curb and gutter along Rivercrest Drive and add inlets that discharges into the ravine to reduce the likelihood of edge of pavement loss. Locate and repair all outlets for positive drainage. Video storm sewer and replace any damaged pipes along Myrtle Drive and Woodridge Drive. Verify that inlet capacity is adequate for the drainage area.

**Additional Information:**
Most of this project is located on the back of private properties. An easement and coordination between property owners will be necessary to complete this work. Environmental and other permits will be necessary.
Dawn Avenue to Montclaire Street - Upper

**General Information:**
Location #: 10a  
Project Area: 15.3 Acres  
Prioritization #: 9  
*Estimated Project Cost: $924,000  
(*Based on Cost Estimate)

**General Location:**
From intersection of Cedar Avenue and Jackson Street to Chester Avenue following the alignment of the existing storm sewer

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
Flooding occurs in the streets and yards along entire length of storm sewer system.

**Possible Solutions:**
The storm sewer system is undersized to its outlet point. Adding a drainage basin along this system in one or more locations to store the water and slowly release it to the downstream existing pipes would relieve the existing system. This would prevent replacing the storm sewers with larger pipes. Detention could be provided in one location or scattered throughout with individual rain gardens or bioswales.

Other improvements include checking inlet capacities at all of the intersections and increasing the storm sewer size along Jackson Street from a 12” sewer to a 24” sewer to relieve capacity constraints in that area. If this does not relieve the capacity issues in this area consider increasing the size of the downstream 48” and 54” pipes. This cost is not considered in the cost estimate.

**Additional Information:**
Property acquisition, house demolition, and utility relocation may be necessary to build a drainage basin depending on the chosen location. Partial street closure will be necessary during construction along Jackson Street.
Dawn Avenue to Montclaire Street - Lower

**General Information:**
Location #: 10b  
Project Area: 4.3 Acres  
Prioritization #: 9  
*Estimated Project Cost: $437,000  
(*Based on Cost Estimate)

**General Location:**
Meridian Street from Montclaire Street north approximately 400 feet. Montclaire Street from Edison Street to the east.

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
Flooding occurs in the street along both Meridian Street and Montclaire Street. Flooding also occurs in the back yards south of Montclaire Street due to overtopping of the drainage ditch.

**Possible Solutions:**
Increase the storm sewer size from a 12” to a 30” along Montclaire Street to the east. Add storm sewer and inlets along Meridian Street to the south and along Montclaire Street from Edison Street to the east. Grade and shape the ditch in the backyards of the houses on the south side of Montclaire Street. Add an overflow path from the area intersection of Meridian Street and Montclaire Street to Stoney Creek to allow for drainage during times of high creek flow when the creek would back up into the storm sewer. The effect of the downstream property owners should be determined and accounted for during final design.

**Additional Information:**
About half of the project is located on private properties, including the North Ridge Middle School, therefore coordination and/or easements will be necessary to complete this work. The Federal Emergency Management Agency’s (FEMA) Flood Map of this area shows that a majority of these properties may lie within the 100-year floodplain of Stoney Creek. Improvements to the area may provide relief in lower volume rain events, but properties may still experience flooding when the creek is in flood stage.
Nevada Avenue & Utah Avenue

**General Information:**
Location #: 29
Project Area: 30.8 Acres
Prioritization #: 10
*Estimated Project Cost: $660,000
(*Based on Cost/Acre)

**General Location:**
Nevada Avenue from Griffin Street to Delaware Avenue and Utah Avenue from Crawford Street to State Street.

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
Nevada Avenue and Utah Avenue are relatively flat oil and chip roads. This combination creates poorly draining roadways. The streets have no curb and gutter and no well-defined roadside ditches that would allow water to drain to the few inlets at roadway intersections.

**Possible Solutions:**
Reconstruct roadway as needed and add additional inlets and storm sewer from Edwards Street to Virginia Avenue along both Nevada Avenue and Utah Avenue.

**Additional Information:**
Right-of-way will not be necessary. Street closure will be necessary during construction.
Douglas Park

**General Information:**
Location #: 36  
Project Area: 4.3 Acres  
Prioritization #: 11  
*Estimated Project Cost: $75,000  
(*Provided by City Staff)

**General Location:**
Douglas Park and adjacent streets

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
This is a flat area with few inlets and storm sewer. Most roads do not have a drainage system. Flooding occurs in the streets and yards.

**Possible Solutions:**
Add inlets and storm sewer or other stormwater management features, such as stormwater detention.

**Additional Information:**
Right-of-way may be necessary. Street closure may be necessary during construction.
Coake Street

**General Information:**
Location #: 35  
Project Area: 0.6 Acres  
Prioritization #: 12  
*Estimated Project Cost: $36,000  
(*Based on Cost/Acre)

**General Location:**
Coake Street approximately 700’ north of Willow Street

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
Existing structure impedes flow and causes flooding, and has deteriorated to the point it should be replaced.

**Possible Solutions:**
The cost to replace the structure to increase flow capacity is likely to have a very high cost compared to traffic volumes on Coake Street. Remove the structure and roadway pavement and create an open ditch.

**Additional Information:**
Right-of-way will not be necessary. This will permanently close the low volume street but vehicles can use alternate routes.
Logan Avenue

General Information:
Location #: 17
Project Area: 1.0 Acres
Prioritization #: 12
*Estimated Project Cost: $60,000
(*Based on Cost/Acre)

General Location:
Logan Avenue south from Swisher Avenue for approximately 600 feet.

Description of Problem as Reported by Property Owner(s) and/or City Staff:
Flooding occurs in the street and yards.

Possible Solutions:
Additional inlets would allow more stormwater to enter the existing storm sewer. Increase the existing 15” storm sewer size up to a 24” storm sewer. The storm sewer would outlet to the west in a ravine that leads to Lake Vermilion. The existing storm sewer has the capacity to handle a 2 year storm but for a 10 year storm, which is the standard design year for storm sewer, the pipes are in excess of 200% overcapacity.

Additional Information:
Right-of-way will not be necessary. Street closure will be necessary during construction.
Sheral Drive

**General Information:**
Location #: 6  
Project Area: 1.3 Acres  
Prioritization #: 12  
*Estimated Project Cost: $78,000  
(*Based on Cost/Acre)

**General Location:**
Sheral Drive from Suncrest Drive to Sheral Court (0.12 miles)

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
Flooding occurs in the street and yards with incidences of water entering buildings.

**Possible Solutions:**
Investigate the outfall to the existing storm sewers on Sheral Drive. If it is currently buried, opening the outfall to allow for a free outlet should improve drainage. If the current system continues to be piped to another system, add another storm sewer system along Sheral Drive and connect to the existing storm sewer along Suncrest Drive.

**Additional Information:**
Right-of-way will not be necessary. Partial street closure will be necessary during construction.
High School Block

**General Information:**
Location #: 26
Project Area: 1.5 Acres
Prioritization #: 12
*Estimated Project Cost: $200,000
(*Provided by City Staff)

**General Location:**
Jackson Street from Fairchild Street and Clay Street

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
Flooding occurs in the street. This block is flat with only a few inlets.

**Possible Solutions:**
This would need to be a joint venture with the School District that would involve parking lot redevelopment, detention, and storm sewers. Total costs to be determined as a part of the overall project design.

**Additional Information:**
Right-of-way will not be necessary. Street closure will be necessary during construction.
Winter Avenue/ Bowman Avenue

**General Information:**
Location #: 31  
Project Area: 9.4 Acres  
Prioritization #: 12  
*Estimated Project Cost: $564,000  
(*Based on Cost/Acre)

**General Location:**
Northeast corner of the intersection of Winter Avenue and Bowman Avenue

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
Flooding occurs downstream from this area. No stormwater management, such as detention, was built as part of the Life Church construction.

**Possible Solutions:**
Add stormwater detention northeast of the intersection or south of Winter Avenue.

**Additional Information:**
The problem is created on private property. The purchase of property will be required to build a public stormwater detention facility. It may be difficult to force a private property owner to reduce impervious area on the site. The church is outside the city limits but affects property within the city limits.
**Williams Street**

**General Information:**
Location #: 28  
Project Area: 11.6 Acres  
Prioritization #: 12  
*Estimated Project Cost: $696,000  
(*Based on Cost/Acre)

**General Location:**
Williams Street from National Avenue to Kansas Avenue

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
This area has relatively flat oil and chip roads. This combination creates poorly draining roadways. Approximately half the streets have no curb and gutter and no well-defined roadside ditches that would allow water to drain to the inlets at roadway intersections.

**Possible Solutions:**
Reconstruct roadway to a more urban cross section with an improved base, well laid asphalt, and curb and gutter. Reduce pavement area by converting part of Williams Street to a shared use path. Add additional inlets and storm sewer in the areas that there are none.

**Additional Information:**
Right-of-way will not be necessary. Street closure will be necessary during construction.
**Edison Street**

**General Information:**
Location #: 13  
Project Area: 0.3 Acres  
Prioritization #: 18  
*Estimated Project Cost: $18,000  
(*Based on Cost/Acre)

**General Location:**
Property located just west of Edison Street and Monterey Street intersection

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
Water drains from the west along a natural channel through back yards to this property and floods the back yard. Stormwater has entered the house.

**Possible Solutions:**
Add an inlet and storm sewer in the back yard and connect them to the existing storm sewer along Edison Street.

**Additional Information:**
About half of the project is located on private properties, therefore coordination and/or easements will be necessary to complete this work. Private property cost participation will be necessary.
**Vermilion Street**

**General Information:**
Location #: 19  
Project Area: 8.3 Acres  
Prioritization #: 18  
*Estimated Project Cost: $943,000  
(*Based on Cost Estimate)

**General Location:**
Vermilion Street from Voorhees Street south to Sidell Street

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
Flooding occurs in the street, occasionally flooding the east two lanes of traffic along Vermilion Street.

**Possible Solutions:**
Existing storm sewer along Vermilion Street starts as a 12” pipe and increases up to a 24” pipe. For a 10 year storm, which is the standard design year for storm sewer, the pipes are in excess of 300% overcapacity. Increase the pipe size starting at an 18” pipe and increasing up to a 36” pipe. The effect of the downstream property owners should be determined and accounted for during final design.

**Additional Information:**
Right-of-way will not be necessary. Partial street closure will be necessary during construction. Coordination and permitting with IDOT will be required.
Suncrest Drive & Shady Lane

**General Information:**
Location #: 7  
Project Area: 7.3 Acres  
Prioritization #: 18  
*Estimated Project Cost: $980,000  
(*Based on Cost Estimate)

**General Location:**
The ravine at the ends of the Suncrest Drive and Shady Lane and the ravine along Shady Lane

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
Erosion in the ravine is potentially threatening building structures.

**Possible Solutions:**
Repair of the erosion that has occurred will require fill and regrading. The installation of erosion protection to prevent future erosion is also required. There are various products and techniques that can be used for erosion control, varying from concrete products to natural installations. Choosing the solution is dependent on the slope of the ravine bottom, slopes of ravine sides, preferences of the city and adjacent residents, and budget for improvements.

**Additional Information:**
This entire project is located on the back of private properties. An easement and coordination between property owners will be necessary to complete this work. Environmental and other permits will be necessary.
Rue Conti Street

**General Information:**
Location #: 12  
Project Area: 0.5 Acres  
Prioritization #: 21  
*Estimated Project Cost: $30,000  
(*Based on Cost/Acre)  
Photographs: Page B-6

**General Location:**
Rue Conti Street

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
Water ponds at a low point near the corner along Rue Conti Street and enters the yards.

**Possible Solutions:**
Add a storm sewer from the low point on Rue Conti to the south where it can tie into an existing sewer that discharges into the lake.

**Additional Information:**
Right-of-way will not be necessary. Partial street closure will be necessary during construction.
Boone Street

**General Information:**
Location #: 33  
Project Area: 3.5 Acres  
Prioritization #: 21  
*Estimated Project Cost: $210,000  
(*Based on Cost/Acre)

**General Location:**
Short Street to Anderson Street just north of Seminary Street

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
According to a resident survey there is a collapsed 8”-12” pipe that was not large enough anyway. This causes overflow at inlets and water to flow through the streets.

**Possible Solutions:**
Purchase property and remove infrastructure to allow for open drainage.

**Additional Information:**
Property acquisition, house demolition, and utility relocation will be necessary.
Crystal Drive/Griffin Street

**General Information:**
Location #: 23  
Project Area: 1.3 Acres  
Prioritization #: 23  
*Estimated Project Cost: $78,000  
(*Based on Cost/Acre)

**General Location:**
Behind the houses at the northwest corner of Crystal Drive and Griffin Street

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
Water from the church property along Voorhees Street flows south toward this corner and is causing erosion along a property fence line.

**Possible Solutions:**
Add an above ground stormwater drainage area at the southeast corner of the church property to control flow and connect to the existing storm sewer along Griffin Street. The effect of the downstream property owners should be determined and accounted for during final design.

**Additional Information:**
Easements will be necessary to construct the storm sewer. Street closure will be necessary during construction.
Logan Avenue/Fairchild Street

General Information:
Location #: 25
Project Area: 0.4 Acres
Prioritization #: 24
*Estimated Project Cost: $24,000
(*Based on Cost/Acre)

General Location:
Intersection of Logan Avenue and Fairchild Street

Description of Problem as Reported by Property Owner(s) and/or City Staff:
Flooding occurs in the intersection.

Possible Solutions:
Inlets most likely cannot handle large amounts of runoff coming from the north, east, and south. Determine if inlet capacity could be increased or create an overflow path to allow excess stormwater to continue west along Fairchild Street.

Additional Information:
Right-of-way will not be necessary. Street closure will be necessary during construction.
Grove Street

**General Information:**
Location #: 34  
Project Area: 0.5 Acres  
Prioritization #: 24  
*Estimated Project Cost: $30,000  
(*Based on Cost/Acre)

**General Location:**
Grove Street from Beard Street to Columbus Street

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
This curb and gutter cross section road has very few inlets. In addition, downstream drainage issues are occurring along Beard Street.

**Possible Solutions:**
Perform an inlet and storm sewer capacity study to determine if more inlets should be added, if storm sewers require upsizing, or a combination of both. Alternatively, possible property purchase and conversion to drainage ways could be considered. The effect of the downstream property owners should be determined and accounted for during final design.

**Additional Information:**
Right-of-way or easements may be necessary. Street closure may be necessary during construction.
Forrest Street

**General Information:**
Location #: 38  
Project Area: 0.6 Acres  
Prioritization #: 24  
*Estimated Project Cost: $36,000  
(*Based on Cost/Acre)

**General Location:**
Forrest Street from 4th Street to 5th Street

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
Drainage structures need improvements. There is a lack of structures in this area to collect the stormwater.

**Possible Solutions:**
Improve or replace deteriorate drainage structures. Add inlets and storm sewer in this area.

**Additional Information:**
Right-of-way will not be necessary. Street closure may be necessary during construction.
Texas Avenue

**General Information:**
Location #: 37  
Project Area: 1.3 Acres  
Prioritization #: 24  
*Estimated Project Cost: $78,000  
(*Based on Cost/Acre)

**General Location:**
Texas Avenue from Bliesath Street to Griffin Street

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
The grade is steep and the edges of roadway are eroding.

**Possible Solutions:**
Add erosion control measures along the roadside ditches, such as curb and gutter. Due to the low volume of traffic, another option may be to close the roadway.

**Additional Information:**
Right-of-way will not be necessary. Permanent street closure could occur with no other costs incurred.
Stonegate Community

**General Information:**
Location #: 8  
Project Area: 2.2 Acres  
Prioritization #: 24  
*Estimated Project Cost: $132,000  
(*Based on Cost/Acre)

**General Location:**
Stonegate Community (Stonegate Drive)

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
Water from the agricultural field to the east drains through Stonegate Community. Heavy flow from the field flows over a sidewalk leaving silt which can become a slipping hazard if not removed. Sump pumps run constantly for days after rains. Ditches run full after rains and water is full of silt.

**Possible Solutions:**
Runoff from the agricultural field should be intercepted and rerouted around the subdivision. A detention pond to the east of the subdivision could be added to slow the release of flow into the ditches along Liberty Lane. A pond was not built with this subdivision as there should have been. Further investigations into the reasons for eliminating the pond is suggested as they are not obvious at this time.

**Additional Information:**
Any work upstream of the subdivision will require property to be acquired from the farm land where the pond would be built.
Ferndale Avenue

**General Information:**
Location #: 2  
Project Area: 4.4 Acres  
Prioritization #: 24  
*Estimated Project Cost: $264,000  
(*Based on Cost/Acre)

**General Location:**
Ferndale Avenue from Poland Road to Liberty Lane (0.5 miles)

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
The roadside ditches have filled in from silt and do not provide enough capacity for stormwater conveyance. Stormwater floods the yards along this street. There is a high point approximately 1000’ north of Liberty Lane. There are 2 inlets at the south end of the street at Liberty Lane and no inlets at the north end. The ditches drain approximately 6 acres.

**Possible Solutions:**
One solution would be to recut the ditches deep enough to adequately drain the area. Culverts should be added to all driveways that do not currently have one. Another solution would be to add storm sewer and inlets. The water flowing north would be diverted towards the box culvert under Poland Road that is located approximately 1000’ west of Ferndale Avenue. The water flowing south would connect to the existing storm sewer along Liberty Lane and then discharge in the ditch along the railroad.

**Additional Information:**
Right-of-way may be needed for new ditches. Ditching would be a lower cost solution but regular maintenance would be required to prevent the ditches from filling in again. Partial street closure will be necessary during construction. The ditch and existing storm sewer along the railroad south of Liberty Lane may need to be improved before or as part of this project.
**Moore Street**

**General Information:**
Location #: 24  
Project Area: 4.7 Acres  
Prioritization #: 24  
*Estimated Project Cost: $282,000  
(*Based on Cost/Acre)

**General Location:**
Moore Street from Voorhees Street to Fairchild Street

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
This is a flat area that does not have many inlets and floods the street and yards.

**Possible Solutions:**
Add more inlets and extend storm sewer along this street. Another option is to remove Moore Street and adjoining houses to decrease impervious area. The cost to improve this area will vary depending on the chosen alternative.

**Additional Information:**
Right-of-way will not be necessary. Street closure will be necessary during construction.
Elisha Street

**General Information:**
Location #: 14
Project Area: 4.7 Acres
Prioritization #: 24
*Estimated Project Cost: $282,000
(*Based on Cost/Acre)

**General Location:**
East Elisha Street south to Orchard Street and along North/South Elisha Street

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
Water drains through residents’ yards, flooding and leaving silt.

**Possible Solutions:**
Add inlets and storm sewer that discharges to Stoney Creek to the east.

**Additional Information:**
About half of the project is located on private properties, therefore coordination and/or easements will be necessary to complete this work.
Harrison Park Golf Course Road

**General Information:**
Location #: 39  
Project Area: 0.8 Acres  
Prioritization #: 24  
*Estimated Project Cost: $300,000  
(*Based on Cost Estimate)

**General Location:**
Voorhees Street (Golf Course Road)

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
Erosion is threatening the old golf course club house, roadway, and the adjacent embankment.

**Possible Solutions:**
Add riprap or other erosion protection. Some fill and grading may be necessary before the installation of riprap or erosion protection.

**Additional Information:**
Project located completely on the City of Danville. Street closure may be necessary during construction.
Maywood Drive Circle

**General Information:**
Location #: 18  
Project Area: 6.4 Acres  
Prioritization #: 24  
*Estimated Project Cost: $384,000  
(*Based on Cost/Acre)

**General Location:**
East side of Maywood Drive Circle

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
Flooding occurs in the street and yards. The roadway has been overlayed many times and has reduced the storage capacity of the roadways within the existing curb and gutter. Therefore, stormwater encroaches into yards more frequently.

**Possible Solutions:**
Determine if the storm sewer is undersized or the inlet capacity should be increased. Based on the results, add more inlets and/or increase storm sewer size.

**Additional Information:**
Right-of-way may be necessary if storm sewer is replaced. Partial street closure will be necessary during construction.
Holiday Square

**General Information:**
Location #: 21  
Project Area: 12.0 Acres  
Prioritization #: 23  
*Estimated Project Cost: $720,000  
(*Based on Cost/Acre)

**General Location:**
Holiday Square Shopping Center on Bowman Avenue

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
This site was developed without a stormwater management system. The large amount of impervious area causes flooding downstream of the mall.

**Possible Solutions:**
Add a stormwater management system, such as a stormwater detention facility, decrease the amount of impervious area, or a combination of both.

**Additional Information:**
The problem is created on private property. The purchase of property will be required to build a public stormwater detention facility. It may be difficult to force a private property owner to reduce impervious area on the site.
3202 N. Vermilion Street

**General Information:**
Location #: 5  
Project Area: 0.4 Acres  
Prioritization #: 35  
*Estimated Project Cost: $24,000  
(*Based on Cost/Acre)

**General Location:**
Northwest corner of Liberty Lane and Vermilion Street

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
Water has been flowing onto this property and into the building.

**Possible Solutions:**
An asphalt curb was constructed when Liberty Lane was overlaid to keep roadway runoff from entering this property. The building sits below the surrounding grades and therefore needs its own drainage system to collect the water.

**Additional Information:**
Right-of-way will not be necessary. Private property cost participation will be necessary.
Francis Street

**General Information:**
Location #: 30  
Project Area: 0.9 Acres  
Prioritization #: 35  
*Estimated Project Cost: $54,000  
(*Based on Cost/Acre)

**General Location:**
Avenue A to Avenue B

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
Water enters building on the south of Francis Street. There are no defined ditches along the street.

**Possible Solutions:**
Cut a ditch along the north side of Francis Street and outlet to the east. Alternatively, private property improvements could channel drainage away from the building.

**Additional Information:**
Right-of-way may be necessary and will be determined during design.
Hinkley Street

**General Information:**
Location #: 40  
Project Area: 1.0 Acres  
Prioritization #: 35  
*Estimated Project Cost: $60,000  
(*Based on Cost/Acre)

**General Location:**  
Hinkley Street just south of the property at 902.

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**  
There is existing street ponding and flooding on both sides of the street just south of 902 Hinkley. The existing open area inlets on each side of the street have no outlets.

**Possible Solutions:**  
Investigate an outlet solution to the existing inlets and connect or re-connect to a storm sewer tile. Purchase property at 902 Hinkley Street, demolish, and grade a drainage way to the west/northwest for positive drainage.

**Additional Information:**  
Property acquisition, house demolition, and utility relocation will be necessary. Easements may be necessary to construct outside of 902 Hinkley Street. Partial street closure may be necessary during construction.
Sonny Lane

**General Information:**
Location #: 1  
Project Area: 1.2 Acres  
Prioritization #: 35  
*Estimated Project Cost: $72,000  
(*Based on Cost/Acre)

**General Location:**
Sonny Lane from Vermilion Street to the ditch running north-south along the east side of the subdivision. 3816 Sonny Lane.

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
Street flooding occurs at the southeast corner of Sonny Lane. There are 2 inlets near the corner but there are no inlets along the north-south section of the roadway. The north-south section has sections of curb and gutter that need replaced. The existing storm sewer drains approximately 24 acres. The back side of the property at 3816 Sonny Lane has standing water during large storm events that encroach onto the lower level units.

**Possible Solutions:**
Add more inlets near the southeast corner of Sonny Lane and/or along the north-south section. Increase the pipe size from the southeast corner of Sonny Lane to the drainage ditch located to the east behind the subdivision, if inlet capacity warrants it. Add inlets and storm sewer from the back side of 3816 Sonny Lane to the existing storm sewer. Cost does not include private cost participation.

**Additional Information:**
Right-of-way may be needed from 1 property owner. Partial street closure will be necessary during construction. Private property cost participation will be necessary at 3816 Sonny Lane.
Morin Avenue

General Information:
Location #: 32
Project Area: 6.6 Acres
Prioritization #: 35
*Estimated Project Cost: $396,000
(*Based on Cost/Acre)

General Location:
Along Morin Avenue

Description of Problem as Reported by Property Owner(s) and/or City Staff:
This is a flat area that does not have a defined drainage system and falls within the 100 Year Floodplain.

Possible Solutions:
Due to the location of this roadway within the floodplain, the City should consider a Floodplain buyout in which the houses and roadway would be removed.

Additional Information:
Property acquisition, house demolition, roadway removal and utility relocation will be necessary. The Federal Emergency Management Agency’s (FEMA) Flood Map of this area shows that a majority of this property may lie within the 100-year floodplain of the Vermilion River. This project may be eligible for Floodplain Buyout program assistance and grants.
Shorewood Drive Condos

**General Information:**
Location #: 3  
Project Area: 0.9 Acres  
Prioritization #: 40  
*Estimated Project Cost: $54,000  
(*Based on Cost/Acre)

**General Location:**
Behind Shorewood Drive Condos on Shorewood Drive south of Lakeshore Drive

**Description of Problem as Reported by Property Owner(s) and/or City Staff:**
Water from the condos and the businesses along Vermilion Street does not adequately drain from behind the condos and standing water is often present. The businesses on Vermilion Street were built without detention and the site sheet drains through multiple locations along their rear (west) property line.

**Possible Solutions:**
There is 1 inlet behind the condos and the water is not properly directed to it. Possibly grade a shallow ditch to this inlet to direct the water or add other inlets along the back side of the condos. Drainage from the Vermilion Street business could also be captured and piped into an existing storm sewer system.

**Additional Information:**
This entire project is located on private properties and in the back of properties. An easement and coordination between property owners will be necessary to complete this work. Private property cost participation will be necessary.
Chapter 5: Capital Issue Needs

When stormwater affects a property, the damage, inconvenience, and concern that it causes can be overwhelming to the property owner. Eliminating any future issues are of utmost importance to that property owner. Unfortunately, the City cannot support the repair of all stormwater issues at one time. It has neither the funds nor the staffing resources to manage an undertaking of such magnitude. The inconvenience and safety concerns that arise when much of the community is under construction is also a factor to planning what projects should be constructed. For these reasons the projects must be prioritized to give the City a strategic approach to capital improvements.

5.1 Project Prioritization

A matrix was set up to objectively determine which projects should take priority over others. The matrix evaluates each project based on a number of key criteria. The categories for the criteria included:

1. Public Health and Safety
2. Implementation Constraints
3. Coordination Opportunity
4. Water Quality
5. Inflow and Infiltration (I&I) Problems

The criteria were chosen based on the level of information that was known about them for each project and if there were regulations that guided the City to address them. Each of these categories was given a criteria score between 1 and 5. The category was then weighted. Weighting the categories emphasizes the categories of most concern to the City. Problems relating to health and safety carried the greatest weight. Implementation constraints and coordination opportunities make up the next level of emphasis. Both of these impact how efficient the City can be with funds available for improvements.

The Prioritization Criteria are more defined in Table 5.1. Each project area was evaluated using the prioritization criteria and criteria scores were given for each category. The criteria scores and their resultant weighted scores were compiled in a spreadsheet matrix. The sums of the criteria scores, as well as the weighted score, were calculated. The scores were then sorted from highest to lowest to prioritize the projects. The complete Prioritization Matrix for all project areas is found in Appendix C.

A Draft Stormwater Master Plan was posted on the City’s website for comments from April 1, 2016 through April 22, 2016. This allowed residents to review all portions of the Master Plan, including the project areas and their prioritization. Residents could submit comments via an online form or send comments directly to the Urban Services Department. Each comment was addressed and the resident was informed of any changes to the Master Plan that occurred. Comments received from residents during the public comment period and the responses to these comments are included in Appendix D.
### Table 5.1: Prioritization Criteria

<table>
<thead>
<tr>
<th>Category</th>
<th>General Description</th>
<th>Weighted Score</th>
<th>Criteria Score</th>
<th>Evaluation Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Health and Safety</td>
<td>Evaluates potential impact of flooding and erosion on public health and safety.</td>
<td></td>
<td>10</td>
<td>• Flood water depth and velocity completely surrounds or threatens the structural integrity of buildings and/or vehicles.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Arterial streets impassable and flood waters up into yards</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Erosion threatens arterial street.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Erosion threatens multiple properties or utilities.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td></td>
<td>• Collector streets impassable and flood waters up into yards</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Streets have the potential to ice over in the winter</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Combined sewer flooding observed</td>
</tr>
<tr>
<td>Implementation Constraints</td>
<td>Considers potential implementation constraints or obstacles that may delay or make the project difficult to construct. Examples include extensive permitting issues, difficult right-of-way or easement acquisition, the need to coordinate with other projects that are not ready to construct.</td>
<td>6</td>
<td></td>
<td>• No known permits or only local permits required</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Improvements completely within existing right-of-way</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Project can proceed independently from other projects</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td></td>
<td>• Local and State permits required</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Limited additional right-of-way acquisition required</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Improvements will need to coordinate with one or more other projects but delays not anticipated</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td>• One or more federal permit required</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Extensive right-of-way acquisition required</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Improvements will need to coordinate with one or more other projects which will likely cause some delay</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Areas located outside of City limits</td>
</tr>
<tr>
<td>Coordination Opportunity</td>
<td>Considers opportunities to coordinate drainage improvements with other infrastructure improvements.</td>
<td>6</td>
<td></td>
<td>• Major roadway or sanitary projects within project limits</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Neighborhood improvement project adjacent to project</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td></td>
<td>• Minor roadway or water line projects within project limits</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td>• Other projects or no projects</td>
</tr>
<tr>
<td>Water Quality</td>
<td>Considers potential effects problem area improvements may have on water quality. A score of 5 may also include the score of 3 criteria.</td>
<td>3</td>
<td></td>
<td>• Erosion problems</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Storage or wetland options (besides standard BMPs)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td></td>
<td>• Manufactured BMPs units could be added to storm sewers</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Green solution retrofits are an option</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td>• Improvements will have minimal impact on water quality</td>
</tr>
<tr>
<td>I&amp;I Problems</td>
<td>Considers known sanitary I&amp;I problems. Sanitary sewer problems may be improved by stormwater improvements in the area.</td>
<td>3</td>
<td></td>
<td>• I&amp;I is known to be a problem in this area</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Problem is in combined sewer area</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td></td>
<td>• I&amp;I is known to be a problem in this area</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Problem area is in separate sewer area</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td>• I&amp;I is not known to be a problem in this area, but may exist</td>
</tr>
</tbody>
</table>
Table 5.2 shows a list of the top prioritized projects and Figure 5.1 shows their location within the City. Generally, those projects scored the highest due to high levels of concerns for Public Health and Safety.

**Table 5.2: Top Prioritized Projects**

<table>
<thead>
<tr>
<th>Priority Rank</th>
<th>Project Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Koehn Creek Corridor</td>
</tr>
<tr>
<td>2</td>
<td>Meadowlawn Area</td>
</tr>
<tr>
<td>3</td>
<td>Bowman Avenue Culvert</td>
</tr>
<tr>
<td>4</td>
<td>Townway Area</td>
</tr>
<tr>
<td>5</td>
<td>Lakeshore Drive/Shorewood Drive</td>
</tr>
<tr>
<td>6</td>
<td>Old Ottawa Road</td>
</tr>
<tr>
<td>7</td>
<td>Porter Street Area</td>
</tr>
<tr>
<td>8</td>
<td>Rivercrest Drive &amp; Myrtle Drive</td>
</tr>
<tr>
<td>9</td>
<td>Dawn Avenue to Montclaire Street</td>
</tr>
<tr>
<td>10</td>
<td>Nevada Avenue &amp; Utah Avenue</td>
</tr>
</tbody>
</table>

![Figure 5.1: Top Ten Stormwater Projects](image)
5.2 Problem Area Cost Estimates

Order of magnitude costs are needed to begin to identify the capital needs of the City’s storm drainage system. Detailed preliminary cost estimates were prepared for the top 10 prioritized projects. Having a cost estimate based on a conceptual design will aid the City in budgeting for the projects that are expected to be completed in the more immediate future. The timeline for the completion of these projects will be dependent on the funds available for this work. A list of these top 10 projects and their cost are listed in Table 5.3:

<table>
<thead>
<tr>
<th>Priority Rank</th>
<th>Project Area</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Koehn Creek Corridor</td>
<td>$4,296,500</td>
</tr>
<tr>
<td>2</td>
<td>Meadowlawn Area</td>
<td>$5,538,400</td>
</tr>
<tr>
<td>3</td>
<td>Bowman Avenue Culvert</td>
<td>$145,100</td>
</tr>
<tr>
<td>4</td>
<td>Townway Area</td>
<td>$383,400</td>
</tr>
<tr>
<td>5</td>
<td>Lakeshore Drive/Shorewood Drive</td>
<td>$1,218,000</td>
</tr>
<tr>
<td>6</td>
<td>Old Ottawa Road</td>
<td>$232,000</td>
</tr>
<tr>
<td>7</td>
<td>Porter Street</td>
<td>$2,526,800</td>
</tr>
<tr>
<td>8</td>
<td>Rivercrest Drive &amp; Myrtle Drive</td>
<td>$921,100</td>
</tr>
<tr>
<td>9</td>
<td>Dawn Avenue to Montclaire Street</td>
<td>$1,361,200</td>
</tr>
<tr>
<td>10</td>
<td>Nevada Avenue &amp; Utah Avenue</td>
<td>$660,000</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>$17,282,500</strong></td>
</tr>
</tbody>
</table>

The cost estimates for these projects will be submitted to the City. Because the remaining projects will not be completed for several years, a detailed estimate for all of the projects at this time was not prepared. Instead, the cost estimates from the top 10 projects were used to determine an average cost/acre. These cost estimates included not only construction cost, but estimated engineering costs, ROW acquisition, construction services, and contingency. This rate was applied to the remaining projects to get an order of magnitude cost.

<table>
<thead>
<tr>
<th>Priority Rank</th>
<th>Project Area</th>
<th>Cost/Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Koehn Creek Corridor</td>
<td>$154,600</td>
</tr>
<tr>
<td>2</td>
<td>Meadowlawn Area</td>
<td>$43,700</td>
</tr>
<tr>
<td>3</td>
<td>Townway Area</td>
<td>$19,100</td>
</tr>
<tr>
<td>4</td>
<td>Bowman Avenue Culvert</td>
<td>$120,900</td>
</tr>
<tr>
<td>5</td>
<td>Lakeshore Drive/Shorewood Drive</td>
<td>$238,800</td>
</tr>
<tr>
<td>6</td>
<td>Old Ottawa Road</td>
<td>$165,700</td>
</tr>
<tr>
<td>7</td>
<td>Porter Street</td>
<td>$12,400</td>
</tr>
<tr>
<td>8</td>
<td>Rivercrest Drive &amp; Myrtle Drive</td>
<td>$92,100</td>
</tr>
<tr>
<td>9</td>
<td>Dawn Avenue to Montclaire Street</td>
<td>$69,400</td>
</tr>
<tr>
<td>10</td>
<td>Nevada Avenue &amp; Utah Avenue</td>
<td>$21,400</td>
</tr>
</tbody>
</table>
Cost estimates for these top 10 projects ranged from $12,400/acre to $238,800/acre. The highest project cost/acre was significantly out of the range of the remaining 9 project cost estimates. It was decided to exclude it from the list to determine an average cost/acre factor to be used as the order of magnitude cost. Based on this calculated cost factor and discussions with the City of Danville Public Works staff, the order of magnitude cost to be used for the remaining projects was determined to be $60,000/acre. The Prioritization Matrix in Appendix C includes the cost estimate. It should be noted that in cases where two or more projects were ranked in the Prioritization Matrix with equal weighted scores, these projects were ranked according to its estimated cost. Lower cost projects were ranked highest.

The estimated overall capital need for all projects is just under $25 million.

5.3 Other Capital Needs

In addition to the previously discussed problem area needs, there are also other capital investments the City should consider to improve the remaining storm sewer systems outside the major projects listed in this report.

5.3.1 Annual Storm Drainage Projects

It would be short sighted to believe the only drainage problems the City of Danville will experience are those listed within the areas shown in this report. City staff is very knowledgeable about the systems within the City, but they are continually learning of new infrastructure that has never been mapped. Typically, this infrastructure is found when it fails and causes damage to other city infrastructure.

As infrastructure continues to age it will need to be maintained or replaced. The City currently responds to stormwater infrastructure failures when they are discovered. The reactive and urgent nature of these repairs typically comes with a higher cost to the City. In addition, as the characteristics of the city change, the City will become aware of new problem areas.

It is recommended that an annual storm drainage project be budgeted for every year in order to plan for small drainage improvements and infrastructure repairs. Repairs to infrastructure can then be planned for before they become an emergency project. This should result in a lower cost project to the City.

5.3.2 Storm Sewer Rehabilitation

The Annual Storm Drainage project as discussed in the prior section would typically be used to repair small sections of storm sewers or drainage issues needing only a localized solution. Storm sewers can experience deterioration throughout the length of the sewer, such as longitudinal cracking or exposed reinforcement in concrete pipe. These deficiencies do not need immediate attention but, if left unattended, will cause future pipe failures. For storm sewers that require attention for the entirety of the pipe, the City can rehabilitate the pipe before failures occur.
Rehabilitation methods vary depending on the size and material of the pipe but some methods include cementitious lining and trenchless long-lining. The location and method of storm sewer rehabilitation work should be based on the results of storm sewer inspections. These inspections are further discussed in Section 6.3 Sewer Inspections of this Plan.

5.3.3 Private Property Program

In reviewing the surveys and citizen feedback received as a part of this Master Plan, there were a number of reported drainage problems that did not reach the level of significance, regarding number of affected residents or size of problem area, as those that became a part of a project area. There are also some project areas that have been defined as a project area but are not on public property nor are directly caused by drainage from a public right-of-way. These instances, while posing a very real threat of nuisance or damage to a property, do not affect the overall drainage system.

The most common reasons that drainage problems on private property are not remedied is the owner lacks the technical knowledge in determining the right course of action, the cost to improve the problem is too great, or the solution must be a collaborative effort between multiple property owners. City of Danville staff meets with residents regularly who are facing such issues to offer technical advice and solutions. The City does not spend City funds to repair a private property issue.

It is recommended that the City consider beginning a Private Property Program that would assist residents in fixing some of these drainage problems that are occurring on private property. This could be a cost-share program in which the property owner pays for a portion of the work, such as 50%, and the City pays for the remainder of the work. It is recommended that a cap be placed on the maximum amount the City will pay per project.

5.3.4 Summary of Capital Needs

The following table shows the capital needs for the City of Danville based on programing 10 projects during the first 10, 15, or 20 years. The project areas prioritized from #1 to #10 are the only projects included in this list.

<table>
<thead>
<tr>
<th>Project or Program</th>
<th>10 Year Cost (Annually)</th>
<th>15 Year Cost (Annually)</th>
<th>20 Year Cost (Annually)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem Area Projects (Top 10/No. Years)</td>
<td>$1,728,250</td>
<td>$1,152,167</td>
<td>$864,125</td>
</tr>
<tr>
<td>Annual Storm Drainage Project</td>
<td>$250,000</td>
<td>$250,000</td>
<td>$250,000</td>
</tr>
<tr>
<td>Storm Sewer Rehabilitation</td>
<td>$250,000</td>
<td>$250,000</td>
<td>$250,000</td>
</tr>
<tr>
<td>Private Property Program</td>
<td>$100,000</td>
<td>$100,000</td>
<td>$100,000</td>
</tr>
<tr>
<td>Total</td>
<td>$2,328,250</td>
<td>$1,752,167</td>
<td>$1,464,125</td>
</tr>
</tbody>
</table>
Chapter 6: Operation & Maintenance Needs

6.1 Need for Operation & Maintenance

A comprehensive stormwater program for the City is not only made up of capital improvements, but also in a well-planned operation and maintenance program for existing infrastructure. Operation and Maintenance (O&M) refers to what tasks should be done to the current system (maintenance) and how it should be done (operation). A stormwater program with well-planned O&M will begin to see fewer occurrences of emergency work orders and will transition from reactive tasks to proactive ones.

Maintaining the current storm drainage system throughout the City is an important part of an effective drainage program. All infrastructures in a built environment have a finite lifespan. This lifespan can either be cut short or extended by the quality of maintenance that is performed on it. Maintenance within the drainage system also effects how the overall system performs.

Many of the identified problem areas have a need for additional capacity in inlets, storm sewers, or drainage ways. Before any improvements are made to increase the capacity of the system, the current state of maintenance on the system should be evaluated.

6.2 Department Structure/Responsibility

The Operations Group of the Department of Public Works handles the day-to-day maintenance and functionality of public infrastructure throughout the City. The Operations Group is comprised of the Divisions of Streets, Sewers, Solid Waste and Vehicle Maintenance. On the average, only 8 personnel are available to be assigned to daily sewer maintenance and repair activities. It was estimated by Public Works leadership that approximately 80% - 85% of those sewer activities are directed towards Sanitary Sewers and Lift Stations. At present, there is not sufficient personnel capacity for an ongoing cleaning and maintenance program for storm sewers. When significant rain events occur or failures/blockages are reported, the response crews are made up of personnel diverted from their primary assignments. There is no proactive televising or inspection program for storm sewers, outfall structures or related components of stormwater relief and discharge.

6.3 Sewer Inspections

6.3.1 Current Condition

The City of Danville currently has one vehicle equipped with closed circuit television (CCTV) inspection equipment. This equipment uses a camera and transporter that travel through underground sewers and televise the inside of the pipes. Sewer televising aids in determining the condition of a sewer. It can find if a sewer is showing signs of deterioration of if preventative maintenance should be performed. If a sewer is beginning to crack or break, it can be rehabilitated. It can also be used to find whether a
The City of Danville primarily uses the televising equipment to inspect sanitary sewers. The use of the equipment on storm sewer is mostly reactionary in nature. If a sinkhole forms in the vicinity of a storm sewer or if it appears that a storm sewer is not performing as it should be, the storm sewer will be inspected.

Inspections of the storm sewer systems are recommended. The system includes both the storm sewers and the drainage structures. Inspecting the entire system all at once would be difficult to accomplish. If City staff were to do the work, their efforts would be pulled away from other tasks. The cost may be very large if it was contracted out all at once. In addition, it is recommended that the City begin a storm sewer inspection program that inspects 10% of the storm sewer system every year. This would create a 10-year inspection cycle and would be roughly 42,240 linear feet of sewer inspection annually.

All storm sewer inspections should score defects consistently using standardized scoring procedures such as the National Association of Sewer Service Companies’ (NASSCO) Pipeline Assessment Certification Program (PACP). After the first round of inspections, a re-inspection schedule should be established based on the defect scores that create shorter inspection intervals for the storm sewers that show deterioration and a higher likelihood for failure. Storm sewers that are in excellent and good condition could be inspected less frequently.

The City should consider using a televising contractor to increase the amount of inspections that can be performed on the storm sewer system annually.
A portion of the drainage structures should also be inspected annually. A similar 10-year inspection cycle with the drainage structures should be followed.

6.4 Other Infrastructure Inspections

6.4.1 Current Condition
The bridges within the City of Danville are not only a part of the City's transportation system, but also a part of the drainage system. Bridges over water ways and water bodies allow for the free flow of water under the City roadways. Bridges are inspected on a regular basis to meet IDOT regulations. Inspections are performed by City of Danville staff.

The City of Danville currently does not inspect drainage ways, such as Stoney Creek, Koehn Creek, Lick Creek, drainage ditches, or roadside ditches.

6.4.2 Recommendations
Bridge inspections should continue within the City to ensure safe roadways and unconstrained drainage. When city staff is structurally inspecting the bridge, they should also look for issues that may contribute to future stormwater issues.

The City should begin to inspect the drainage ways throughout the City. Inspections would find areas that are experiencing erosion problems and find any utilities that have been exposed due to erosion. Inspections would also find any blockages within the drainage way that would reduce the capacity of the system, such as log jams, beaver dams, and man-made obstruction. It is recommended that the City set aside a set amount of funds for inspection annually. The amount to budget should be adjusted after a few inspection years are complete and the level of effort and resources it takes to perform the inspections are well known.

6.5 Cleaning

6.5.1 Current Condition
Storm sewers and drainage structures accept runoff from surface drainage and are, therefore, prone to also collecting elements from the surface that are carried by the stormwater runoff. Silt, sand, plant waste, and garbage are a few examples of items that tend to build up in storm sewers and structures. Over time, and depending on the water velocity that occurs in the sewers, that debris can build up and reduce the effective area of the storm sewer. This reduces its carrying capacity. Large debris such as limbs and garbage can become lodged inside culverts and large diameter pipes which, in turn, can lead to more debris build up around it. If not found, these blockages can choke off the drainage system and cause flooding upstream of the blockage and possible property damage. Furthermore, if a major blockage occurs, it can be very difficult to remove as it is usually found in times of heavy rainfall and there is a large amount of water being held by the blockage.
Currently, the Public Works department only performs a limited amount of storm sewer cleaning. It tends to be more reactionary than preventative. In 2015, 5,500 feet of storm sewers were cleaned. This is an increase from the roughly 5,000 feet that were cleaned in 2014.

![Image](image.jpg)

*Figure 6.2: Drainage Structure Cleaning*

### 6.5.2 Recommendations

Routine cleaning of storm sewers is recommended. It is recommended that the City begin a storm sewer cleaning program that cleans 10% of the storm sewer system every year. The most efficient schedule of cleaning would be to couple it with inspection efforts also being done on the storm sewer system. There will be a greater chance of finding debris in storm sewers during the first cycle of inspections. If complete inspection from one drainage structure to another cannot be obtained, cleaning the pipe would occur at that time. Likewise, if an inspection shows that the sewer had no debris, cleaning could be avoided.

The level of debris that exists during inspection could be noted during the cleaning/inspection process and recorded in order to identify pipes that are more prone to higher levels of debris. After the first round of cleaning, a re-cleaning schedule could be established based on the previously found levels of debris.

Similarly to the storm sewers, drainage structures should also be cleaned as a part of a routine annual cleaning program. Drainage structures that have castings with large openings are very prone to collecting larger pieces of trash. This trash, such as plastic bottles and storage containers can cause blockages in the storm sewers if they are not removed. In addition, some drainage structures were built as catch basins with sumps in them. This means that the structure is deeper than the pipe that
carries water out of the structure. A catch basin retains water and allows suspended sediment to settle out of the water before the water continues downstream through the storm sewer system. Sumps are helpful in improving the water quality of the stormwater in the system. Over time, however, the sump in the structure will fill with sediment and debris and it will no longer be as effective in settling out the debris. Regular maintenance is imperative to allow the catch basins to work as they were designed.

It is anticipated City will require an additional vactor truck to increase the level of storm sewer cleaning in its system and not decrease the cleaning in its sanitary system.

6.6 Street Sweeping

6.6.1 Current Condition
Street sweeping is closely related to the maintenance required on storm sewers. Sweeping and vacuuming the sediment and debris found along the edges of roadways is a way to prevent the debris from building up in storm sewers as previously discussed. In addition, the quality of the water that runs off the roadways and into the storm drainage system is cleaner with street sweeping than without. This is further discussed as it pertains to regulatory requirements in Section 7.1.

The most obvious impact that street sweeping has on the storm drainage system is evident in the autumn season. Danville has many older, established neighborhoods, with older, established trees. During the autumn leaf drop period, the roadway gutters and roadside ditches can be filled by these leaves. If a rain event comes before the leaves are removed, the leaves can quickly form a dam across the entry points to the storm sewer system (i.e. inlet grates or the openings of culverts) and flooding can quickly occur.

The majority of the work that Public Works crews perform on the City’s drainage system involves street sweeping. Approximately $600,000 is spent annually from the Solid Waste Enterprise Fund on personnel and vehicle time for this task and 3234 tons of leaves and debris were removed in 2015. This is lower than the 3,731 tons that were removed in 2014.

6.6.2 Recommendations
The City of Danville manages road debris and leaf drop well through street sweeping. It meets its regulatory requirements consistently. The City should continue its street sweeping program and continue to look for ways to improve its effectiveness during times of the year when leaves could cause
flooding. A public outreach program that educates and encourages citizens to assist with leaf removal could also be considered.

6.7 Drainage Way Maintenance

6.7.1 Current Condition
Similarly to other maintenance operations, the City of Danville performs maintenance activities within drainage ways on an as-needed basis. If reports are made of channel blockages, city crews will remove them. Likewise, if erosion occurs that can undermine utilities or infrastructure, the City will work to repair the areas that have eroded and protect the existing utilities. No other preventative maintenance is performed.

6.7.2 Recommendations
Drainage way maintenance should become a next step after recommended drainage way inspections are performed. Performing regular maintenance on drainage ways will either prevent or repair problems when they are easy to handle instead of when they can no longer be ignored. The types of maintenance that should be performed depends on the type of drainage way. A maintenance manual should be created that outlines what maintenance should be performed and when those activities should be performed.

For grass lined channels, suggested maintenance includes:
- Mowing two times per year.
- Removing weeds or invasive plants two times a year.
- Removing leaves that could block the flow of water after autumn.
- Removing any sediment deposits that have occurred, as needed.
- Revegetating any bare soils, as needed.
- Repair of any erosion that has occurred, as needed.

For concrete lined channels, suggested maintenance includes:
- Removing weeds or invasive plants from concrete joints two times a year.
- Removing any sediment deposits that have occurred, as needed.
- Sealing concrete joints to prevent vegetation growth, as needed
- Repair of any concrete that has failed, as needed.
• Repair of any erosion that has occurred along the edges of the concrete channel, as needed.

For natural channels and creeks, suggested maintenance includes:
• Removing any sediment deposits that have occurred, as needed.
• Removing or trimming flow-constricting vegetation, as needed.
• Repairing and stabilizing a stream bank when it is weakened, unstable, or failing.

Maintenance activities could be done through outside contractors if the City does not have the personnel resources to staff this work.

6.8 Summary of Operation & Maintenance Needs

The following table shows the annual additional O&M needs for the City of Danville based on the recommendations discussed. Included, also, is a line item for miscellaneous equipment needs and replacement. With increased maintenance work, it is expected that additional equipment will be needed.

<table>
<thead>
<tr>
<th>Task/Item</th>
<th>Cost (Annually)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storm Sewer inspections</td>
<td>$70,000</td>
</tr>
<tr>
<td>Drainage Structure Inspections</td>
<td>$40,000</td>
</tr>
<tr>
<td>Drainage Way Inspections</td>
<td>$75,000</td>
</tr>
<tr>
<td>Vactor Truck (for storm sewer and drainage structure cleaning) 500,000 over 10 years</td>
<td>$50,000</td>
</tr>
<tr>
<td>Street Sweeping</td>
<td>$300,000</td>
</tr>
<tr>
<td>Drainage Way Maintenance</td>
<td>$200,000</td>
</tr>
<tr>
<td>Miscellaneous equipment needs/replacement</td>
<td>$100,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$835,000</strong></td>
</tr>
</tbody>
</table>
Chapter 7: Regulatory Needs

In addition to capital investments, operation, and maintenance on its storm drainage system, the City of Danville has regulatory obligations that it must meet in order to stay in compliance with State and Federal law. In addition, the City regulates activities within its storm drainage system in order to protect its citizens.

7.1 NDPES MS4 Regulations

7.1.1 Current Conditions
The Clean Water Act of 1972 introduced the National Pollutant Discharge Elimination System (NPDES) which was a permit system for regulating point sources of water pollution, such as industrial discharge points and discharges from municipalities. Not until the Water Quality Act of 1987, did the United States Congress begin requiring that industrial stormwater dischargers and municipalities separate storm sewer systems (MS4s) obtain NPDES permits.

Phase I of the NPDES Storm Water program began in 1990 and required medium and large municipal separate storm sewer systems (MS4s) to obtain NPDES coverage. The expanded Phase II program began in March 2003 and required small MS4s in urbanized areas to obtain NPDES permits and implement six (6) minimum control measures. An urbanized area as delineated by the Bureau of Census is defined as a central place or places and the adjacent densely settled surrounding area that together have a residential population of at least 50,000 people and an overall population density of at least 500 people per square miles. The City of Danville is considered a small MS4 community and has been obtaining NPDES MS4 permits since 2003.

The MS4 NPDES permit requires the City to develop a program of best management practices (BMPs) around six minimum control measures that include:

- Public education and outreach on storm water impacts
- Public involvement and participation
- Illicit discharge detection and elimination
- Construction site storm water runoff control
- Post construction storm water management in new development and redevelopment
- Pollution prevention/good housekeeping for municipal operations

Some BMPs that the City of Danville has included in their permit go hand-in-hand with other stormwater program needs. For example, the City has committed to developing a storm sewer map in order to be able to track where illicit (illegal) discharges may have originated in the City’s storm sewer system. The inspection and maintenance of the City’s storm sewer system is also a BMP that is included in Danville’s NPDES permit. Perhaps one of the largest BMPs in terms of City resources is the best management program that commits the City to sweep all streets, with storm sewer inlets and curbing, in the City at least three times before September and twice between September and November.
The City of Danville has been diligent in completing the required annual BMPs. Of the 28 best management practices that are included in Danville's NPDES permit, only 6 BMPs had not been completed through 2015. Table 7.1 explains these 6 BMPs further.

<table>
<thead>
<tr>
<th>BMP ID</th>
<th>BMP Category</th>
<th>BMP Subcategory</th>
<th>BMP Description</th>
<th>Work Remaining</th>
</tr>
</thead>
<tbody>
<tr>
<td>C.1</td>
<td>Illicit Discharge Detection &amp; Elimination</td>
<td>Storm Sewer Map Preparation</td>
<td>Continue mapping program and televising of storm and sanitary sewers. Incorporate a data inventory for detection of illicit discharges</td>
<td>GIS map is not fully completed. Not all sewers have been televised.</td>
</tr>
<tr>
<td>C.7</td>
<td>Illicit Discharge Detection &amp; Elimination</td>
<td>Visual Dry Weather Screening</td>
<td>Develop a method of recording data from dry weather outfall screening.</td>
<td>A plan is still being developed for routine inspections and documentation into the GIS system inventory.</td>
</tr>
<tr>
<td>D.1</td>
<td>Construction Site Runoff Control</td>
<td>Regulatory Control Program</td>
<td>Develop a new erosion control and sediment control ordinance to address construction site runoff control of all construction projects.</td>
<td>A draft of the Erosion Control ordinance is being developed and has not been approved by Council.</td>
</tr>
<tr>
<td>D.2</td>
<td>Construction Site Runoff Control</td>
<td>Erosion and Sediment Control BMPs</td>
<td>As part of development an ordinance for erosion and sediment control, ensure best management practices are followed by distributing a manual for erosion/sediment control</td>
<td>A manual is still being developed. Currently IDOT Stormwater Pollution Prevention Plan checklists are being used to inspect sites after rainfall</td>
</tr>
<tr>
<td>F.2.1</td>
<td>Pollution Prevention/Good Housekeeping</td>
<td>Inspection and maintenance Program</td>
<td>Prepare Storm Water Pollution Prevention Plans (SWPPP) for all applicable municipal facilities.</td>
<td>A review of City facilities is ongoing as to whether a SWPPP is required. Not all SWPPPs are completed.</td>
</tr>
<tr>
<td>F.4.1</td>
<td>Pollution Prevention/Good Housekeeping</td>
<td>Municipal Operations Waste Disposal</td>
<td>Wash public works vehicles and equipment as needed in an enclosed bay.</td>
<td>The City has not completed an enclosed wash bay.</td>
</tr>
</tbody>
</table>

A copy of the City of Danville's 2015 Annual Report is found in Appendix E

The MS4 NPDES permit program is regulated by the Illinois Environmental Protection Agency (IEPA) and is reissued every 5 years. It was recently reissued on February 10, 2016 with an effective date of March 1, 2016. A copy of the most current permit is found in Appendix F.
7.1.2 Recommendations

This master planning effort comes at a time when the next cycle of the City of Danville's MS4 NPDES permit is just beginning. The goals of the Master Plan should be considered when developing the program of BMPs to meet the requirements of the new permit. If there are opportunities to perform BMPs that also benefit other goals of the master plan, those actions should take precedence.

First, it is recommended that the BMPs the City has not yet completed from previous permits be continued until completion. These include:

1. BMP B.1 – Continue stenciling structures to inform the public that the storm inlets drain to waterways. This work should be done in concert with the GIS mapping effort to determine how many structures have been stenciled and how many are left to do. A plan to complete the stencils in a given period of time should be developed.
2. BMP C.1 – Continue the City's GIS mapping efforts. A comprehensive GIS storm sewer map benefits the City in multiple ways, including compliance with their NPDES permit.
3. BMP C.7 - Outfall inspections should continue during the mapping process.
4. BMP D.1 – Moving forward with the establishment of an erosion control ordinance is important with respect to the NPDES permit, as well as, the protection of public and private property within the City. Several problem areas within this Master Plan included erosion issues. An erosion control ordinance should not just address construction site activities, but also activities that could prevent further erosion in the problem areas.
5. BMP F.2.1 – Finish SWPPPs for City facilities. The IEPA is familiar with facility SWPPPs since all industrial facilities are also required to have an NPDES permit. This BMP is a “low hanging fruit” for IEPA auditors.

As stated previously, there is a new NPDES MS4 permit for the 2016-2021 cycle. Significant changes have been made from the previous permit. Some of those changes are highlighted as follows with a brief recommendation for incorporating it into the City’s NPDES efforts.

1. The reissued permit requires consideration by permittees of incorporation of green infrastructure concepts into their storm water program.
   - Green infrastructure may provide cost effective solutions to meeting NPDES permit requirements, as well as, address some problem areas.

2. The Public Education and Outreach BMP were modified to include information on the potential effects on stormwater due to climate change. Educational materials concerning non-stormwater discharges must be added to this BMP.
   - Seek out educational materials that have already been created. Partner with other central Illinois MS4 communities for purchasing or preparing these materials.

3. The Public Involvement/Participation BMP now requires a minimum of one public meeting annually to allow the public to provide input as to the adequacy of the permittee's MS4 program.
4. The Public Involvement/Participation BMP now requires the permittee to identify environmental justice areas within its jurisdiction and include appropriate public involvement/participation.

- An Environmental Justice area is a community with a low-income and/or minority population greater than twice the statewide average. There are also some alternative processes to identifying as an environmental justice area. The City of Danville should determine whether it meets these triggers or if portions of the community do prior to the development of any new BMP.

5. The illicit Discharge Detection and Elimination BMP now requires permittees to update their storm sewer map to include any modifications to the sewer system.

- Updating the sewer map should go hand-in-hand with the current and recommended GIS mapping efforts.

6. The Post Construction Stormwater BMP was modified to include consideration of potential impacts and effects of climate change when developing and implementing BMP stormwater controls.

- The City of Danville should seek case studies or examples of other communities that have already developed a method of considering climate change.

7. The Post Construction Stormwater BMP was modified to require an assessment of the water quality impacts of all existing and new flood control projects associated with the permittee or that discharge to the MS4 area. This includes a requirement to consider impacts and effects of climate change on flood management project.

- This BMP will affect the City of Danville's design and review of any new flood management projects that will be done as a part of the implementation of the Stormwater Master Plan.

8. The Pollution Prevention/Good Housekeeping for Municipal Operations BMP must now specifically address discharge from wash waters, building materials, construction waste, trash, landscape materials, pesticides, herbicides, deicing materials, other chemicals, temporary stockpiles, sanitary waste, spills, leaks, etc.

- Completing the facilities SWPPPs and enclosing the wash bay that the City has already committed to doing will aid in the completion of this BMP.

9. The NDPES permit has been modified to require the development and implementation of a monitoring and assessment program. Permittees have 180 days to develop a program. The monitoring section has also been modified to require that monitoring results be used to evaluate the effectiveness of the permittee's program.

- The program development has a fast timeline and could result in a significant impact to the City of Danville's NDPES program. The City should consider the use of an environmental...
testing company to perform these inspections and, perhaps, be a large part of the planning and assessment of the program.

10. If a Total Maximum Daily Load (TMDL) allocation or watershed management plan is approved for any waterbody into which a MS4 discharges, the MS4 must review their stormwater management program to determine whether they meet specific waste load allocations. The new permit states that monitoring shall continue until waste load allocations are met, demonstrated through two continuous NPDES permit cycles.

- The City of Danville is within the North Fork Vermilion River watershed, which has a TMDL. This is further discussed in Section 7.2. Monitoring, as discussed in Item 9 above, should be planned, funded, and assessed with the assistance of an environmental consulting service.

11. Language was added to require participation in a watershed group(s) if the permittee performs any deicing activities that can cause or contribute to a violation of applicable State chloride water quality standards. The watershed group must be organized to implement control measures which will reduce the chloride concentration in any receiving stream in the watershed.

- Further investigation is necessary for this item.

These changes to the NPDES MS4 permit could significantly increase the level of effort the City of Danville puts into its compliance with the NPDES program. If the City does not comply with the permit requirements, they may face significant fines from the IEPA and US EPA.

### 7.2 Total Maximum Daily Load (TMDL) Regulations

#### 7.2.1 Current

A TMDL includes a calculation of the maximum amount of a pollutant that can be present in a waterbody and still meet water quality standards.

The goal of the United States Clean Water Act (CWA) is “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters” (33 U.S.C §1251(a)). Under section 303(d) of the CWA, states are required to identify waters that are impaired or in danger of becoming impaired (threatened). For these waters, states calculate and allocate pollutant reduction levels necessary to meet approved water quality standards. A Total Maximum Daily Load (TMDL) is then calculated to find the maximum amount of a pollutant that can be present in a waterbody to still meet water quality standards. The Illinois EPA is responsible for carrying out the requirements of Section 303(d) of the CWA for the State of Illinois.

The Illinois 2004 303(d) list of impaired waterways included the North Fork Vermilion River and Lake Vermilion. The North Fork Vermilion River is impaired for nitrate/nitrogen and fecal coliform. Lake Vermilion is impaired for total phosphorus and nitrate. A summary sheet of the Vermilion River Watershed, its impaired waterways, and the TMDL status for each is found in Appendix G.

The TMDL process for the North Fork Vermilion River and Vermilion Lake included four different reports, all done by Tetra Tech, Inc. A stage 1 report, “Watershed Characterization, Data Analysis, and
Methodology Selection” was prepared for IEPA in February 2006. It documented the analysis and findings of the watershed characteristics and water quality data in the watershed and then recommended the method by which the pollutant load should be calculated.

Figure 7.1 below shows a delineation of the North Fork Vermilion River and highlights in red the waterways that are impaired.

Subsequent reports included “Stage 2 – Water Quality Sampling report” by Tetra Tech, Inc. and “Stage 3 – Final Report”. The North Fork Vermilion River watershed TMDL Implementation Plan was written by Tetra Tech in Jun 2008 and offers much insight into the causes of the water impairments. It also recommends best management practices (BMPs) for reducing the pollutant within the watershed and, thereby, improving the water quality of the impaired waterways. The Implementation Plan also provides a timeline for various phases of implementation.

In general, the major sources of nitrate and phosphorus loads in the North Fork Vermilion River watershed were estimated to be agriculture and onsite wastewater treatment systems. It was reported, however, that approximately 60 percent of the houses that were located around the shoreline of Lake Vermilion use septic tanks to treat their wastewater. The release of septic tank effluent into Lake Vermilion could have an effect on the water quality of the lake.

Erosion on the banks and beds of tributary streams of the North Fork Vermilion River and Lake Vermilion was identified as a potential source of pollutants. Stream channel erosion causes sedimentation in Lake Vermilion and contributes to the phosphorus and nitrate loading to the watershed.
Lake Vermilion has approximately 14 miles of shoreline, which equates to 73,920 linear feet. In 2005, a report title “Phase I: Diagnostic Study of Lake Vermilion, Vermilion County, Illinois” was prepared for the Consumers Illinois Water Company and IEPA by S.D. Lin and W. Bogner. It found that 25,429 linear feet of shoreline was considered to have severe erosion. Funding through an IEPA Section 319 Grant, as well as, an Illinois Clean Lakes Program Grant was utilized to stabilize all of the severely eroding shoreline. Riprap, geotextile fabric, and vegetation were the primary means of stabilizing these banks. There are still areas of shoreline with slight and moderate erosion that are contributing to the sediment load in Lake Vermilion.

Figure 7.2 shows the findings of the shoreline survey. Red indicates severe erosion, blue indicates moderate erosion locations, and green shows areas of slight erosion. The yellow areas identified existing stabilized shoreline.

The TMDL Implementation plan also listed the Danville Country Club Course as a golf course located within the watershed and close to the impaired waterway. The application of fertilizers on the course could add to the nutrient load.

The TMDL Implementation Plan recommended a phased approach to implementation to achieve the water quality standard for the watershed. Phase I focused on continuing to educate landowners of the water quality issues and the available BMPs. Phase II focused on increasing the voluntary adoption of the BMPs and water quality monitoring. Phase III, if required, would involve additional adoption of the most effective BMPs and the re-assessment of management strategies if goals are not being met.
The Plan concluded that as agricultural BMPs are implemented and failing septic systems are corrected, water quality in the North Fork Vermilion River and Lake Vermilion should improve accordingly and should ultimately result in achieving the required water quality standards.

The City of Danville currently has not been required to be involved with the implementation of the TMDL plan.

7.2.2 Recommendations

The City of Danville has a vested interest in the requirements of the TMDL for the North Fork Vermilion River and Lake Vermilion because of a variety of reasons. First, the City must review its stormwater management program to determine whether the TMDL includes requirements for control of storm water discharges. Reducing pollutant loading due to shoreline erosion and from private septic systems are two items that the City may be required to do. If the City does not meet the TMDL allocations, it must modify its stormwater management program (NPDES permit) including the following tasks:

1. Determine whether the approved TMDL is for a pollutant likely to be found in storm water discharges from the MS4.
2. Determine whether the TMDL includes a pollutant waste load allocations (WLAs) or other performance requirements specifically for storm water discharge from the MS4.
3. Determine whether the TMDL addresses a flow regime likely to occur during periods of storm water discharge.
4. After the determinations above have been made and if it is found the MS4 must implement specific WLA provisions of the TMDL, assess whether the WLAs are being met through implementation of existing storm water control measures or if additional control measures are necessary.
5. Document all control measures currently being implemented or planned to be implemented to comply with TMDL waste load allocations. Include a schedule of implementation and document the calculations that shows the WLA will be met.
6. Describe and implement a monitoring program to determine whether the storm water controls are adequate to meet the WLA.
7. If the evaluations shows that additional or modified controls are necessary, describe the type and schedule for the control additions or revisions.
8. Continue requirements until monitoring from two continuous NPDES permit cycles (10 years) demonstrates that the WLAs are being met.

The magnitude of effort to meet the TMDL and NPDES requirements could be great. Danville should be aware of TMDL and water quality progress in the watershed in order to foresee upcoming participation requirements.

In addition to the regulatory compliance concerns, overall water quality in Lake Vermilion should be cause for the City to focus on the effects the storm drainage system has on this vital asset.

Because the majority of the watershed is being used agriculturally, the greatest impact to the water quality in the North Fork Vermilion River and Lake Vermilion will be the reduction in pollutant loads
from those agricultural acres. The City should, however, encourage proper fertilizer use through public education. If water quality does not improve with the implementation of BMPs in the agricultural community, the City could also consider enacting an ordinance that bans phosphorus in fertilizers used locally.

As suggested in the TMDL Implementation Plan, stream channel and lake shoreline should be stabilized. Suggested BMPs in the TMDL Implementation Plan included Stone Toe Protection and Stream Barbs and Bendway Weirs. Using riparian buggers, grassed waterways, and filter strips could reduce peak flows from runoff areas and channel velocities in the drainage ways throughout the City. These also encourage infiltration, which reduce the volume of water entering the system.

It is currently unclear as to the level of responsibility the City of Danville has in the implementation of the TMDL. No resource needs are identified at this time but could occur if participation is required. The TMDL implementation plan lists several incentive programs and cost-sharing programs that are available in the North Form Vermilion River watershed to aid in the implementation of the TMDL. In addition, the Lake Vermilion Water Quality Coalition (LVWQC) is a group made up of individuals and organizations that are instrumental in the implementation of the TMDL plan’s goals and objectives. They may be a good resource to tap into for increasing the City’s efforts as it relates to the TMDL of the North Fork Vermilion River.

### 7.3 Floodplain Management

#### 7.3.1 Current Conditions

Chapter 157 of the City of Danville Code of Ordinances regulates Flood Hazard Areas within the city limits and its extra-jurisdictional area. The ordinance was modeled after the Illinois Department of Natural Resources’ (IDNR) “Model Ordinance for Flood Hazard Areas”. The use of this ordinance assists in preventing and protecting new developments from flood damage. Having the ordinance in place also allows the City to remain a part of the National Flood Insurance Program (NFIP). The NFIP provides flood insurance protection to property owners in return for local government commitment to sound floodplain management and related flood disaster mitigation efforts. The City of Danville is responsible for upholding the requirements of NFIP.

A Hazard Mitigation Plan was created for Vermilion County in 2014 by the Vermilion County Emergency Management Agency, Southern Illinois University-Carbondale (SIUC) and the Polis Center of Indiana University-Purdue University Indianapolis (IUPUI). This Mitigation Plan included 9 hazards to plan for, including flooding.
7.3.2 Recommendations

It is recommended the City of Danville continue its compliance with the requirements of NFIP, including administering the requirements of the Flood Hazard Areas Ordinance. Being a part of the NFIP allows the City to give residents the power to protect their properties with flood insurance. Not all improvement projects can be completed immediately and, even then, there are storm events that will occur that would be too costly to design and build for.

Having a Hazard Mitigation Plan in place for Vermilion County is a great benefit for the City of Danville. The Illinois Emergency Management Agency (IEMA) assists in floodplain buyouts with its Flood Mitigation Assistance Program. One stipulation of this program is that the community must have a hazard mitigation plan in place. Typically the Flood Mitigation Assistance Program funds the acquisition and demolition of repetitively flooded structures that are insured by the NFIP. It is recommended that the City of Danville consider floodplain buyouts as an alternative solution to those drainage problems within the City where a property is located within a floodplain. The cost for the acquisition and demolition of the impacted properties may be less than the cost to provide relief to those properties.

7.4 City of Danville Stormwater Related Regulations

The City of Danville's Stormwater Management Ordinance can be found in Chapter 162 of the City of Danville, Il Code of Ordinances. The purpose of the ordinance is “to control the transportation of stormwater and reduce the damage to property and injury to persons and promote the orderly development of land and water resources.” Stormwater is also regulated within the City's Zoning Code (Chapter 150) and Subdivision Ordinance (Chapter 161). The Department of Engineering and Urban Services reviews all development plans for compliance with these ordinances as it relates to public infrastructure, including stormwater.

As stated previously in the NPDES section of this chapter, an Erosion Control Ordinance is not yet completed and adopted by the City of Danville.

7.4.1 Recommendations

In June 2015, the Illinois Department of Natural Resources, Office of Water Resources (IDNR/OWR) issued a report for the Urban Flooding Awareness Act. The report recognized that combating the damages of urban flooding requires a coordinated approach from state and local governments.

The first action taken from the results of the Urban Flood Awareness Act Report was the issuance of comprehensive stormwater management ordinances that incorporate best practices. The model
ordinance, created by the IDNR and the Illinois State Water Survey (ISWS) is a template with minimum requirements for an effective ordinance and suggestions for more advance stormwater protection. The model ordinance is intended to be further tailored with local requirements.

A cursory review of the model stormwater ordinance shows that the City of Danville addresses quite a few of the elements recommended in the model ordinance. Some key differences between Danville's current ordinance and the model ordinance are shown in Table 7.2 below. This is not a comprehensive comparison list.

| Table 7.2: Limited Comparison of Danville Ordinance to Model Ordinance |
|-------------------------------------------------|-------------------------------------------------|
| **Rainfall Data**                                | **Model Ordinance**                             |
| Uses Bulletin 70                                 | Recommends updating ordinance as new rainfall data becomes available |
| **Storage Design**                               | **Model Ordinance**                             |
| 50-year return period storm with a 24-hour duration | 100-year critical duration storm               |
| **Frequent Storm Release Rates**                 | **Model Ordinance**                             |
| Cannot exceed rate of discharge from “existing” agricultural condition | 2-year storm maximum allowable release rate given |
| **Free Board**                                   | **Model Ordinance**                             |
| Does not specify                                 | 1-foot to 2-feet                                |
| **Storm Sewers**                                 | **Model Ordinance**                             |
| Design to a 5-year design storm                   | Design to a 10-year design storm                |
| **Overland Flow Paths**                          | **Model Ordinance**                             |
| Does not specify                                 | Requirement to provide overland flow paths to prevent flooding when the design capacity of the minor conveyance system is exceeded |
| **Buffer Requirements**                          | **Model Ordinance**                             |
| Does not specify                                 | Requires buffer areas for all Waters of the United States. |
| **Soil Erosion and Sedimentation Control**       | **Model Ordinance**                             |
| Does not specify                                 | Included within Ordinance                       |
| **Green Infrastructure**                         | **Model Ordinance**                             |
| Does not specify                                 | Includes design requirements for green infrastructure/BMPs |

It is recommended that the City of Danville review the model stormwater ordinance that was issued by IDNR and ISWS to identify additions to its ordinance that will improve the overall operation and management of the City’s storm drainage system and not be detrimental to it.

For example, the 1966 study recommended a two-year design storm for all residential areas and 5-year for commercial and business areas. For the most part, development will occur within the commercial and business areas, thus the 5-year release rate is applicable. In times of redevelopment, however, non-residential development may come into an area that was previously residential. The storm sewers in these areas may only have a 2-year design capacity, therefore a 5-year release rate would not be appropriate. The IDNR model ordinance recommends maximum allowable release rates for storage facility of 0.04 cfs per acres for the 2-year critical duration storm and 0.15 cfs per acre for the 100-year, critical duration storm. These release rates could be higher than the downstream system could accept, therefore this design requirement should be based on local restrictions.

Overall, the model ordinance could serve as a great tool for the City of Danville to update its current ordinance into a comprehensive and relevant Stormwater Management ordinance.
7.5 Summary of Regulatory Needs

The following table shows the annual additional needs for the City of Danville based on its regulatory requirements previously discussed.

<table>
<thead>
<tr>
<th>Task/Item</th>
<th>Cost (Annually)</th>
</tr>
</thead>
<tbody>
<tr>
<td>General NPDES Program Administration</td>
<td>$50,000</td>
</tr>
<tr>
<td>Storm System Outfall Mapping</td>
<td>$50,000</td>
</tr>
<tr>
<td>Erosion Control Ordinance</td>
<td>$75,000</td>
</tr>
<tr>
<td>Outfall Inspection &amp; Monitoring</td>
<td>$50,000</td>
</tr>
<tr>
<td>Stormwater Pollution Prevention Plans for City Facilities</td>
<td>$20,000</td>
</tr>
<tr>
<td><strong>Total¹</strong></td>
<td><strong>$245,000</strong></td>
</tr>
<tr>
<td>Street Sweeping²</td>
<td>$300,000</td>
</tr>
</tbody>
</table>

1. Assumes all other regulatory needs will be managed by City of Danville Staff
2. For information only. Street sweeping cost included in O&M but serves a regulatory function as well.
Chapter 8: Summary of Stormwater Program Costs

The total program costs addressed in the Stormwater Master Plan include the cost of the Capital projects, cost to maintain and operate the system, and the cost required to adhere to regulatory requirements. Table 8.1 is a summary of those annual costs based on programming 10 projects during the first 10, 15, or 20 years.

<table>
<thead>
<tr>
<th>Summary of Capital Needs</th>
<th>10 Year Cost (Annual)</th>
<th>15 Year Cost (Annual)</th>
<th>20 Year Cost (Annual)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem Area Projects (Top 10/No. Years)</td>
<td>$1,728,250</td>
<td>$1,152,167</td>
<td>$864,125</td>
</tr>
<tr>
<td>Annual Storm Drainage Project</td>
<td>$250,000</td>
<td>$250,000</td>
<td>$250,000</td>
</tr>
<tr>
<td>Storm Sewer Rehabilitation</td>
<td>$250,000</td>
<td>$250,000</td>
<td>$250,000</td>
</tr>
<tr>
<td>Private Property Program</td>
<td>$100,000</td>
<td>$100,000</td>
<td>$100,000</td>
</tr>
<tr>
<td>Total</td>
<td>$2,328,250</td>
<td>$1,752,167</td>
<td>$1,464,125</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Summary of O&amp;M Needs</th>
<th>Cost (Annual)</th>
<th>Cost (Annual)</th>
<th>Cost (Annual)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storm Sewer inspections</td>
<td>$70,000</td>
<td>$70,000</td>
<td>$70,000</td>
</tr>
<tr>
<td>Drainage Structure Inspections</td>
<td>$40,000</td>
<td>$40,000</td>
<td>$40,000</td>
</tr>
<tr>
<td>Drainage Way Inspections</td>
<td>$75,000</td>
<td>$75,000</td>
<td>$75,000</td>
</tr>
<tr>
<td>Vactor Truck (for storm sewer and drainage</td>
<td>$50,000</td>
<td>$50,000</td>
<td>$50,000</td>
</tr>
<tr>
<td>structure cleaning)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Street Sweeping</td>
<td>$300,000</td>
<td>$300,000</td>
<td>$300,000</td>
</tr>
<tr>
<td>Drainage Way Maintenance</td>
<td>$200,000</td>
<td>$200,000</td>
<td>$200,000</td>
</tr>
<tr>
<td>Miscellaneous Equipment Needs</td>
<td>$100,000</td>
<td>$100,000</td>
<td>$100,000</td>
</tr>
<tr>
<td>Total</td>
<td>$835,000</td>
<td>$835,000</td>
<td>$835,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Summary of Regulatory Needs</th>
<th>Cost (Annual)</th>
<th>Cost (Annual)</th>
<th>Cost (Annual)</th>
</tr>
</thead>
<tbody>
<tr>
<td>General NPDES Program Administration</td>
<td>$50,000</td>
<td>$50,000</td>
<td>$50,000</td>
</tr>
<tr>
<td>Storm System Outfall Mapping</td>
<td>$50,000</td>
<td>$50,000</td>
<td>$50,000</td>
</tr>
<tr>
<td>Erosion Control Ordinance</td>
<td>$75,000</td>
<td>$75,000</td>
<td>$75,000</td>
</tr>
<tr>
<td>Outfall Inspection &amp; Monitoring</td>
<td>$50,000</td>
<td>$50,000</td>
<td>$50,000</td>
</tr>
<tr>
<td>Stormwater Pollution Prevention Plans for City</td>
<td>$20,000</td>
<td>$20,000</td>
<td>$20,000</td>
</tr>
<tr>
<td>Facilities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$245,000</td>
<td>$245,000</td>
<td>$245,000</td>
</tr>
</tbody>
</table>

| Grand Total                                      | $3,408,250            | $2,832,167            | $2,544,125            |
Chapter 9: Funding

Chapters 2 through 8 of this Stormwater Master Plan identify improvements to Danville’s stormwater program through capital projects, improved operation & maintenance, or improved adherence to permit requirements. Most suggested improvements require additional effort or resources by City staff, technical consultants, contractors, or a combination thereof. On the whole, additional efforts come with an additional cost. The City currently spends roughly $1 million per year on street sweeping, materials, contractual services, and personnel related to stormwater which is a substantially lower amount than the demonstrated demand. The following sections discuss various funding sources used by other communities that may be available to meet the needs of the City’s stormwater program.

9.1 Reallocation of Existing Funds

Reallocating existing funds for stormwater improvements would use revenue that the City has within its current budget and is being used for other functions. This would not require an additional fee or tax increase; however, due to the funding needed to solve Danville’s stormwater problems, this would greatly underfund other necessary expenditures or operations that the City of Danville already requires.

9.2 Existing Revenue Sources

The City could increase the following existing revenue streams to generate the needed funding for stormwater improvements:

- Property Tax: currently dedicated for pension funds, debt service, and the public library.
- Sales Tax
- Food & Beverage Tax
- Sanitary Sewer Enterprise Fund: the existing sanitary sewer fund could be expanded to a Sewer Enterprise Fund including both sanitary and stormwater infrastructure. A new fee structure would need to be created.

9.3 Additional Revenue Sources

Other revenue sources used by other communities for infrastructure improvements such as stormwater include:

9.3.1 General Revenue Bonds

Bonds can be procured to finance the implementation of short term projects. Bond funds have to be spent within 3 years and must be directed to capital projects or equipment. Repayment of bonds can be through various revenue sources, but must be guaranteed to be paid through the City property tax levy.
9.3.2 State Revolving Loan Fund

The Illinois Environmental Protection Agency currently administers the State Revolving Loan Fund (SRLF) which provides low interest loans for sanitary and water projects. Recently, IEPA began allowing stormwater projects to be funded through the sanitary program, called the Water Pollution Control Loan Program. Like General Revenue Bonds, SRLF loans can be procured to finance the implementation of the stormwater projects, but a funding source to repay these loans is still required.

9.3.3 Utility Tax

The City of Danville currently does not have a utility tax. A utility tax is normally added to gas and electric bills and can be implemented up to 5%. Bloomington, Champaign, Decatur, Normal, Peoria, and Urbana all have a utility tax. Springfield does not, but it owns its electrical and water provider.

9.3.4 Special Assessments

Special Assessments are placed for areas that benefit directly from a given project. Properties within the Special Assessment area would pay for the given project and the maintenance of that project area. This type of funding isolates the cost to the area that is causing the problems. Special Assessments have to get approval from the City Council to place properties into a Special Assessment area and require a majority consent from the property owners within the assessment area. Danville currently has one Special Assessment District for stormwater management in the southeast portion of the community. Each parcel pays a rate of $30.00 per acre as an annual maintenance tax.

Special assessments can be established so that the fee paid is directly related to each property's impact on and benefit from the City's stormwater system. Establishing and managing these assessments can be challenging and cost prohibitive for certain affected areas.

9.3.5 Stormwater Utility

Like electricity, water, and sanitary sewers, stormwater runoff can be managed as a utility. The utility is supported by fees that every property owner within the City pays. In turn, the funds raised by the utility are a dedicated funding source for all stormwater related projects and work tasks within the City. The fee is based on each property's impact to the stormwater system. Typically, stormwater utilities fees are based on the amount of impervious surfaces on a property.

According to the Western Kentucky University Stormwater Utility Survey of 2014, there are currently 1,491 stormwater utilities established within the United States. 22 of those exist in Illinois. The City of Danville currently does not have an established stormwater utility. In order to do so, the City Council would have to approve an ordinance establishing said utility.