

# Appendix B: System Capacity Assessment

## Introduction

A stormwater system capacity assessment for this SWIP was performed to address Objective 2.3 (see main SWIP document):

The following strategies were employed for the task:

- Designate previously identified drainage issues in a geodatabase
- Incorporate new drainage issues within the geodatabase
- Consider regulatory floodplains throughout the City and drainage issues within the geodatabase to help prioritize stormwater improvement projects

## Background

The stormwater program that the City of Harrisonburg manages today can be traced back to its roots in the 1999 Stormwater Action Plan. The Action Plan was developed at a time before water quality regulations, when stormwater problems were identified as areas of flooding and erosion. The Action Plan included more than 30 different problem areas and was estimated to cost \$4.5 to \$5.0 million to implement. Identified projects were ranked and prioritized based on relative severity and cost.

The Action Plan cautioned that some of the identified problems could be the responsibility of private property owners and that the City Council should work with staff to define the level of service it was responsible for and able to provide to citizens. The plan also cautioned that there likely were additional drainage issues throughout the City, such as stream maintenance concerns, that would require additional public input and that future development patterns were likely to exacerbate and increase the number of problems.

Many of those same recommendations could still be made today, and some of those same identified drainage issues persist as we develop the recommendations contained in this SWIP.

## Drainage Issues

The City has tracked drainage issues since 2016 and has tracked issues more informally prior to that time. These issues were compared with the 1999 Action Plan to determine the overall status of the City's drainage concerns. Both lists were developed through an Excel spreadsheet and showed a significant amount of overlap with the 1999 plan. See Phase I public input meeting posters in Appendix J for a compiled map of drainage concerns in the City of Harrisonburg.

Based on a review of this city information and information gathered from the public at the SWIP public meetings, a geodatabase of the drainage issues was developed. The geodatabase linked information that was provided through Excel spreadsheets to a physical location for each site and mapped the general limits for each identified issue. In addition, notes about each drainage issue were included in the geodatabase. It should be noted that drainage concerns will not be addressed as part of this improvement plan directly, nor are all drainage concerns of public concern. The purpose of this geodatabase is to ensure that drainage issues are tracked so the City can determine if they are indirectly improved or changed through the construction of the stormwater improvement projects outlined in this plan.

The drainage geodatabase was categorized based on the most common types of issues, as noted below:

- Debris Issues – These problem areas are associated with debris or clogging issues, resulting in standing water.
- Erosion Issues – These problem areas are where stormwater runoff has created noticeable erosion or soil loss.
- Other Drainage Issues – These are areas with basement and backyard wetness, standing water, and/or slow draining water of other types.
- Public Works Maintenance – These are areas that Public Works staff address on an as-needed basis. These issues are considered city concerns or public issues, because the drainage issues may affect a public street or city property. The specific issue could be any of the above categories.

Figure B-1 shows the identified locations of 167 citywide drainage issues identified throughout the City within this SWIP. The Excel spreadsheet linked to this GIS map is part of the study documentation and will be reviewed and updated as drainage concerns are resolved or new drainage concerns are identified.

### Regulatory Floodplains in the City

In addition to the identified drainage concerns noted above, citywide floodplain modeling and mapping is available for use in planning future projects. Figure B-1 also depicts the citywide floodplain designations for consideration in this study.

### Consideration of Storm Sewer Capacity Issues

SWIP goals and objectives focus on the needs associated with achieving regulatory compliance within the outlined MS4 permit cycles. Although directly solving drainage issues does not help achieve water quality goals, mapping of drainage concerns assisted (and will continue to assist) in determining the best locations for water quality projects.

By considering areas with drainage concerns for planning water quality improvement projects, the hope is to achieve a more effective project that improves water quality while simultaneously improving stormwater system capacity issues. Some examples of how drainage concerns can help influence the water quality or BMP projects in this plan are as follows:

- Providing/placing BMPs within a drainage area with known drainage issues may help provide quantity control of runoff while also providing water quality benefits.
- BMPs can help keep downstream storm sewers clean of debris, garbage, and sediment.
- Stream stabilization, restoration, and outfall protection projects can help reduce flow velocities, flooding, erosion and sedimentation, as well as reduce debris and clogging issues.

BMP projects can include improving storm sewer systems, channels, and culverts by providing additional inlets and upgrading the capacity of pipes and channels.

Figure B-1. Citywide Storm Sewer Capacity Issues

