

# RESILIENCE PLAN

## TOWN OF ABINGDON, VIRGINIA

JUNE 2025



PREPARED FOR TOWN OF ABINGDON PUBLIC WORKS  
AND COMMUNITY DEVELOPMENT DEPARTMENT  
WITH ASSISTANCE FROM:  
RUMMEL, KLEPPER, & KAHL, LLP

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JUNE 2025

**PREPARED FOR:**

TOWN OF ABINGDON



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## Acronyms List

CCTV	Closed Circuit Television
CFPF	Community Flood Preparedness Fund
ESC	Erosion and Sediment Control
FEMA	Federal Emergency Management Agency
FIS	Flood Insurance Study
GIS	Geographic Information System
H&H	Hydrology & Hydraulics
MGD	Million Gallons per Day
NOAA	National Oceanic and Atmospheric Administration
PER	Preliminary Engineering Report
RCP	Reinforced Concrete Pipe
RDII	Rainfall Derived Infiltration and Inflow
SFHA	Special Flood Hazard Area
SI/SD	Substantial Improvement/Substantial Damage
SSES	Sanitary Sewer Engineering Study
SWM	Stormwater Management
SWMM	Stormwater Management Model
TLG	The Lane Group
TOA	Town of Abingdon
VDEM	Virginia Department of Emergency Management
VESMP	Virginia Erosion and Stormwater Management Program



## Executive Summary

In recent years, it has become apparent that storm intensity and frequency have increased, causing detrimental effects of flooding and property damage throughout the Commonwealth of Virginia. Many localities have developed and adopted strategic plans to identify and mitigate flooding and plan for more resilience against future flooding in their communities. Such efforts will protect the local citizens and their properties from damages, as flooding is expected to increase due to climate change. This Resilience Plan will serve as a guide for the Town of Abingdon, Virginia to examine current flooding, infrastructure, and projects that will help preserve the safety and longevity of the Town.

Formally known as Black Fort, the Town of Abingdon was incorporated in 1778 and is located in Washington County, Virginia, which is located in the valley and ridge region of Southwest Virginia. It is accessible between exits 14, 17, and 19 along the Interstate 81 Corridor. According to the 2020 census, this beautiful and historic town is home to nearly 8,400 people and encompasses approximately 8.3 square miles, with roughly half of the area designated as residential land use. The Town's center is home to many cultural attractions, including the Barter Theatre, Martha Washington Inn & Spa, and the Virginia Creeper Trail, to name a few.

Areas around Wolf Creek, Town Creek, Berry Creek, and Fifteen Mile Creek, within the Town of Abingdon, Virginia have historically flooded. In 2023, the Town of Abingdon tasked RK&K to assist in grant preparation for Resilience Plan funding and in 2024, asked RK&K to develop a Resilience Plan for the Town. Utilizing an established Resilience Plan will enable the Town to develop a strategy that focuses on upgrading, modifying, and installing new stormwater and flood control practices in strategic locations within the Town. RK&K developed the Resilience Plan using social data and Town goals, including public involvement, related specifically to this effort. This Resilience Plan aims to implement nature-based solutions to the maximum extent practicable to mitigate current flooding, as well as increase resilience to future flooding situations.

Development of the following Resilience Plan was made possible from applying for and obtaining a grant from the Virginia Department of Conservation and Recreation's Community Flood Preparedness Fund (Round 4) in 2023. The Community Flood Preparedness Fund was established in the Code of Virginia and passed during the 2020 session of the General Assembly. This program offers funding to localities across the Commonwealth to reduce and mitigate the impacts of flooding, including climate change considerations. It allows localities to develop their own Resilience Plans and apply for funding for future projects and studies in subsequent rounds after having a Plan approved by the Department of Conservation and Recreation.

This Plan outlines the findings obtained from analyzing the Town's available data and publications, reflections on where the Town's efforts currently stand and where improvements can be made, and ideas for potential implementation to meet the Town's flooding and resilience goals for the future, especially as it pertains to climate change. An evaluation of the vulnerability of public assets, utilities, roads, and structures within the Town was conducted to develop townwide flood mitigation strategies. The Resilience Plan will focus on the Town's floodplains, current and planned infrastructure, and stormwater management to provide a path forward to allow the Town to plan for improvements in the future.

## 1.0 Data Review

The primary step in developing a Resilience Plan is to gather all relevant information and documentation relating to the locality. Once all documentation has been made available, either by the Town or from publicly available sources, the data review process ensues.

### 1.1 Town of Abingdon Comprehensive Plan

In 2020, the Town of Abingdon (TOA), Virginia updated their Comprehensive Plan that was originally adopted in 2013. This update aimed to capture a more comprehensive plan for the future of the Town as they looked ahead to year 2040. This effort was led by the Abingdon Planning Commission and encompasses the feedback provided by a diverse group of stakeholders, including elected leaders, local government administrators, citizens, business owners, community organizations, and state agencies. Citizen surveys were also conducted to give participants an opportunity to answer questions about the Town's priorities, shortcomings, and what they believed the Town's growth should look like in the future. Respondents expressed varying attitudes regarding growth, but agreed that small-town charm, history, and beauty are essential characteristics of Abingdon that must be preserved.

The Town aims to preserve its natural and historical beauty while also protecting the residents and properties from flood-related property damage while including considerations for climate change. Priority stormwater projects include the proposed Clark Street/Valley View Drive Stormwater Management (SWM) Improvements, which involves upgraded road crossings and channel improvements in the vicinity of Clark Street, Valley View Drive, and N. Court Street to reduce flooding and erosion within the right-of-way and property damage within the contributing drainage area. The Town's comprehensive plan also cites the now completed East Main Street Culvert Project, which reconstructed a segment of E. Main Street between Tanner and Deadmore Streets, replacing the existing culvert that conveys Town Creek beneath the roadway. This improvement increased the capacity of the culvert, preventing recurrent flooding of the street during storm events (Town of Abingdon, 2020).

### 1.2 Hazard Mitigation Plan

The Mount Rogers Hazard Mitigation Plan was originally adopted and approved by the Federal Emergency Management Agency (FEMA) in December 2005. The Plan was recently updated in 2023 to include new data and analysis to improve the hazards identified and mitigation measures proposed using the newest information available. Within the TOA, Wolf Creek, Town Creek, Berry Creek, and Fifteen Mile Creek have historically flooded. Severe storms, including ice, have also made the Town a high-risk area for flooding.

A summary of the natural disaster ranking for the Town is shown in Table 1 below. The rankings correspond to the likelihood and/or relative severity of the given hazard. A ranking of L represents low likelihood, M is moderate likelihood, H is highest likelihood. A designation of NA means that hazard data is not available.

Table 1. Town of Abingdon Natural Disaster Ranking

Hazard Type	Climate Change	Dam Safety	Drought	Earthquake	Flood	Hailstorm	Hazardous Material Spills	Karst and Sinkholes	Landslide	Pandemic	Severe Winter Storm/ Ice	Tornadoes/Hurricanes	Wildfire	Windstorm	Thunderstorms/ Lightning
Abingdon	L	NA	L	L	H	L	M	NA	NA	L	H	M	M	M	L

The Hazard Mitigation plan included a summary of past repetitive loss properties, defined as those with 2 or more claims of at least \$1,000 over a 10-year rolling period. The Town has one repetitive loss property reported as of 2023. A request was made to FEMA for an updated report; however, FEMA was unable to provide the information at this time. The request has been submitted, and the information will be included when available.

Several studies and preliminary engineering reports have been conducted by the Town in response to areas with high incidences of flooding, but very few recommendations, if any, have been implemented to date. The Town acknowledged the ongoing need for review of all streams and creeks within the corporate limits, especially the land use changes due to continued development within the contributing watersheds. These reports propose that the Town perform hydrology and hydraulics (H&H) analyses on problematic watershed areas and develop solutions to address the flooding problems. High/medium ranking recommendation strategies include the following:

- Make flood improvements at the intersection of E. Main Street and Town Creek; reestablish the stream bank and create a floodplain.
- Make flood improvements to Valley View Drive Area.
- Implement Emergency Power for Critical Infrastructures (Town Hall, Harry L. Coomes Recreation Center (future shelter) Public Safety Communication Towers, Public Works building and fuel station, and wastewater treatment plant.
- Repair and replace aging sewer infrastructure to create access to communication services along the Virginia Creeper Trail Corridor in case emergency response is needed (Mount Rogers Planning District Commission, 2023).

### 1.3 Abingdon Municipal Code

The Town of Abingdon’s Code of Ordinances was reviewed for inclusion of articles addressing flooding hazards and stormwater management. The initial coverage of the Town’s Virginia SWM Program was adopted August 1, 2014, in accordance with State regulations (Town of Abingdon, 2023). The SWM code language is contained in Chapter 44 (Land Use), Article VIII (Community Design Standards), Division 5 (Virginia Erosion and Stormwater Management Program). The purpose of this ordinance is to ensure the

health, safety, and welfare of the citizens of the Town and protect the quality and quantity of State waters from the potential harm of unmanaged stormwater.

The code follows the water quantity and water quality technical criteria outlined in Article 3 (9 Virginia Administrative Code 25-875-570, et seq.) of the Virginia Erosion and Stormwater Management Program (VESMP) Regulations. This requires peak flows to be attenuated to a rate that is 20 percent less than that of pre-development for channel protection if generated from land development greater than one acre. Sites under one acre require a 10 percent reduction to pre-development peak flow. Under no circumstances is it required to provide reductions beyond that of the fully forested condition. Flood protection requires post-development peak flow to be reduced to that of the pre-condition. In order to remain consistent with the state code referenced in the Town's stormwater management municipal code, the Town has amended the verbiage within Chapter 44, Article VIII Div 5, as required. Technical criteria for regulated land disturbing activities to remove reference to part IIB as the VESMP regulations no longer refer to this section as such. All section references will need to be updated as well to match the new regulations effective July 1, 2024.

In addition to these requirements the Town has procedures in place to analyze and account for substantial improvements/substantial damage (SI/SD) of structures in the Special Flood Hazard Area. A SI/SD refers to structures whose improvement or repair meets or exceeds 50% of the market value and must be brought into compliance with the current floodplain ordinance. When an application is submitted there is a box on the permit to denote if the property is in the floodplain to alert the Town that a special analysis must be done. The Town is currently working on updating the permitting software so that it will automatically flag properties in the Floodplain in the future. The Town will then conduct a straight tax assessment on the property to assess the value. If there is a disagreement on the assessment the applicant can submit a current appraisal for review. The building permit application collects project cost and itemized estimates to be evaluated against the building value. After an emergency the Town will use Virginia Department of Emergency Management's (VDEM) preliminary damage assessments in Crisis Track to determine which properties they should visit.

Appendix B, of the Zoning Ordinance Article V Section 5-1-2 (b), outlines the Town's criteria for establishing and identifying areas that should be subject to special regulations on account of a greater probability of flooding. The purpose in doing so is to:

- protect life and property,
- reduce public costs for flood control,
- improve rescue and relief efforts,
- protect recognizable ecological values,
- prevent the creation of health and safety hazards, disruption of commerce and governmental services, the extraordinary expenditure of public funds for flood protection and relief, the impairment of the tax base, and
- to support and conform to the National Flood Insurance Program.

These efforts would be achieved by regulating the development activities and uses that will cause increases in flooding, requiring those developments to have flood-proofing, and protecting individuals

from purchasing lands deemed unsuitable due to flood hazards. Several recent residential land developments have been required to submit a flood report complete with a hydrologic engineering center's river analysis system for evaluating the effects of the new development on the base flood elevations, such as in the case of residential shed placement within the existing FEMA floodplain (Town of Abingdon, 1995).

## 2.0 Town of Abingdon Existing Projects and Studies

The Town is proactively seeking solutions to key drainage issues within its cooperate limits. These projects range from large-scale, multi-phase culvert replacement and stream restoration projects to developing solutions within the Town right-of-way for residential flooding concerns. A couple of current projects relating to drainage improvements are summarized in the sections below.

### 2.1 Abingdon Drainage Improvements Phase I and II

The Town of Abingdon has studied the regular flooding occurrences at the Town Creek crossing with E. Main Street for nearly 30 years. The existing culverts were deteriorated, undersized, and filled with sediment, rendering them unable to convey the creek under the road during the slightest rainfall event as shown in **Figure 1** (Bakers, 2024). The E. Main Street priority project consisted of two phases, with Phase 1 being referred to as the Abingdon Drainage Improvements Phase 1 – E. Main Street, which was recently completed at the end of 2024. This phase of the project handled upstream concerns, improving the stream from Deadmore Street to Main Street. Also included in Phase 1 were improvements to the stream channel, installation of new box culverts at nearby parking areas of adjacent businesses, and the installation of a new 10-foot by 3-foot box culvert under E. Main Street to tie into the existing channel on the south side of the road as shown in **Figure 2**. Downstream improvements from Tanner Street through Eberhardt Park and under Park Street into the existing stream channel were also included in Phase 1 (Town of Abingdon Virginia Project Updates, 2024).

Abingdon Drainage Improvements Phase 2 – Park Street was opened for invitations for bid in August 2024. This project will remove one of the existing triple, 48-inch reinforced concrete pipes (RCP) at the crossing, downstream of the Phase 1 crossing with a new 10-foot by 4-foot double box culvert to tie into the realigned Town Creek stream alignment. Two of the three existing 48-inch RCPs are to remain in place (AMT, 2024). The Town utilized funding from the American Rescue Plan Act of 2021, with a project estimate of \$1,932,725, for Phase 1 and will use the remaining funds for Phase 2 (Town of Abingdon Virginia Project Updates, 2024).



Figure 1. East Main Street Flooding, April 2021



Figure 2. Box Culvert Replacement under East Main Street, 2024

## 2.2 Preston Street Flooding

The services of The Lane Group (TLG) were secured by the Town to evaluate the existing drainage patterns at the site of two residential properties whose owners have made numerous reports of stormwater inundating their yards. Drainage patterns were developed from this study and indicated with arrows as shown in **Figure 4**, which confirm that the drainage converges on the two residential properties on Hagy Street per the owners' complaints. Currently, there is no ditch or other drainage conveyance systems between Hagy Street and the two residential properties. It was also observed that the roof drainage discharges directly to the foundation of the home. TLG made the following recommendations:

1. Collect and discharge drainage from roof gutters by connecting to a drainage pipe that diverts the stormwater away from the houses.
2. Propose a 4-inch asphalt curb to be constructed along the roadside adjacent to the two properties with returns at the existing business entrances on either side, as shown in **Figure**

5. Some of the curb extends beyond the Town’s right-of-way, so written permission from the business property owners is required prior to construction.

It should be noted that the Town is not legally allowed to perform drainage improvements on privately owned property, and that any solution the Town can offer must be developed by a qualified professional engineer. The residents were notified in writing of the TLG Memorandum analyzing the hydrology in this area and the proposed solutions. Since then, the residents have offered other ideas to remedy the flooding that are not actionable by the Town. A consensus has not been reached from all parties involved on the best way to mitigate the drainage issue (TLG, 2023).

The solutions proposed by TLG would offer short-term relief for the flooding issue but is not a long-term solution. The Town is exploring opportunities for property acquisition in the area to install a stormwater detention pond which would offer a permanent solution to this flooding issue.



*Figure 3. August 2, 2024 Flooding on Preston Street*



Figure 4. Preston Street Existing Drainage Pattern



Figure 5. Hagy Street Proposed Curb Alignment

## 3.0 Gap Analysis

In accordance with the 2023 Grant Manual for the Community Flood Preparedness Fund (CFPF), the Town reviewed and identified components required for inclusion in the Resilience Plan. The data and publications were also made available to the public. Plan development must include the following:

- Projects must focus on flood control and resilience.
- Plan incorporates nature-based infrastructure to the maximum extent possible.
- Plan includes considerations of all parts of a locality regardless of socioeconomics or race and addresses flood resilience needs of underserved populations within the community.
- Plan identifies and includes all communities where flooding has occurred, not just within the Special Flood Hazard Areas (SFHA), and provides the number and location of repetitive loss and severe repetitive loss to properties. Repetitive loss and/or severe repetitive loss often occurs outside of the SFHA and to properties not captured in National Flood Insurance Program reporting. All flooding should be tracked and addressed by the community.
- If property acquisition and/or relocation guidelines are included, the guidelines include equitable relocation strategies for all affected properties including where land is acquired. Property acquisitions must remain undeveloped as permanent open space and under ownership or easement by the locality in perpetuity, but flood control structures may be built on the property.
- Plan includes a strategy for debris management.
- Plan includes administrative procedures for substantial development/substantial improvement of structures within the SFHA.
- Plan includes coordination with other local and inter-jurisdictional projects, plans, and activities and has a clearly articulated timeline or phasing for implementation.
- Plan is based on the best available science and incorporates climate change, sea level rise, and storm surge (where appropriate), and current flood maps.

In order to meet the above criteria, several areas were identified during the Gap Analysis portion of the Plan development for expansion that the Town may consider for future implementation. Firstly, there are tributaries that are not fully mapped by FEMA or do not have established base flood elevations. In reviewing the FEMA Flood Insurance Study, which encompasses the Town limits, it was noted that the FEMA flood maps were originally modeled in 1984 with a Flood Insurance Rate Map, effective March 1988, with revisions to the study in 2010. The report indicates that the 2010 revision had no new H&H modeling performed as a part of the Flood Insurance Study (FIS) update. The report identifies Town Creek and Wolf Creek as primary sources of flooding in the TOA and reports that no structural flood protection measures exist within the limits of Washington County. The report acknowledges the use of non-structural measures for flood protection in the form of land use regulations.

Secondly, the Town's Geographic Information System (GIS) does not contain a complete inventory of attributes for the existing infrastructure or existing easements. It appears that a majority of the existing pipes and structures are graphically located within the Town's database. However, the corresponding attribute data is missing for a majority of the infrastructure. This data is crucial for the Town's records to understand the interaction that stormwater infrastructure has on the surrounding area. The inventory is

also not shown to be encompassed within permanent drainage easements owned by the Town. During the GIS review, it was also noted that the Town’s SWM facilities are also not included in the GIS inventory. The Town does have this data recorded in a standalone document. At the time of this plan, there are no maintenance agreements saved along with this documentation, however the Town’s BMP inventory table attached in **Appendix A** indicates the presence of such agreement.

Over the past several years, the Town has been working with TLG to fully map the Town’s sanitary sewer infrastructure and receive recommendations on how to repair and upgrade the existing infrastructure. This relates to flooding resilience as the system is often overburdened by small storm events resulting in infiltration and inflow throughout the Town. At the time of this report, TLG has completed two of the anticipated five PERs for this effort. Per recommendations in the initial TLG PER for Phases 1 SSES, the Town should pursue the remainder of these studies in order to have a complete understanding of the interaction between the sanitary infrastructure and its impact on rainfall-derived infiltration and inflow (RDII) during flooding events.

Expansion of these three areas will allow the Town to have a more complete picture of their stormwater infrastructure as it pertains to routine flooding and advanced preparation for flood resilience for years to come.

## 4.0 Social and Natural Resources Vulnerability

When analyzing the effects of natural hazards such as flooding, it is crucial to understand the effects that community demographics and natural resources have on the damages endured by the community. Lower income areas are at higher risk of increased damages from flooding due to poor infrastructure, planning, and the ability to protect natural resources and existing infrastructure. The Town’s continued support of the residents and fortification of the Town’s natural resources and infrastructure will help provide security and resilience against flooding damages for the residents of Abingdon.

### 4.1 Census Data for Town of Abingdon

Based off the American Community Survey data reported in 2023, the population for the Town is 8,376 individuals and encompasses more than one census block. Of this population, 91 percent are White, 4 percent are Black, 2 percent are Asian, 1 percent is Hispanic, with the remainder being of two or more racial backgrounds. The median age for the population is about 47 years and 51 percent female. The median household income is \$54,976, which is about three-fifths the median income of the Commonwealth of Virginia. About 13.4 percent of the population is below the poverty line which is about 1.4 times the rate for Virginia (ACS, 2023).

The CFPF Round 4 scorecard (**Appendix B**) for the Town’s grant application identifies the Town of Abingdon as a “low-income geographic area” with the opportunity to provide community scale benefits due to having more than one census block. It was also ranked as having “High Social Vulnerability” according to the ADAPT Virginia’s Social Vulnerability Index Score.

## 4.2 Virginia Creeper Trail

The Virginia Creeper Trail originally functioned as the Virginia-Carolina Railroad in the late 1800s and continued to be in use until the late 1950s. After it was abandoned in 1977, a 34-mile portion of the railroad, extending from the Town of Abingdon to Whitetop Station, underwent a conversion from rail to trail that was completed in 1987 after reconstruction from a series of destructive protests in 1985. Over the years, it has changed ownership, however, the Town of Abingdon now owns a 16-mile portion of the trail, including 15 trestles which were formerly bridge structures that extend beyond the Town’s Corporate limits near Damascus, Virginia. Milepost Zero is located at Abingdon’s Virginia Creeper Trail Welcome Center in the Town’s center off of Green Spring Road. The trail is a beloved attraction for the Town residents and tourists alike and in 2023, was ranked No. 2 on a nationwide list of recreational trails by USA Today (Cardinal News, 2024). Preservation of this unique feature will help to ensure it remains a driver of economic, environmental, and cultural benefit for the Town. The impact of flooding in the Town directly affects the integrity of the trestles and trail, therefore, a plan for resilience for the trail infrastructure is included and discussed in a later section of this report.

## 4.3 Trestle Engineering Study

The Town collaborated with Mattern & Craig to perform an engineering evaluation of the status of the first 6 trestles along the Town-owned portion of the Virginia Creeper Trail (see Figures 6 and 7 for photographs of one of the trestles). The Town owns the first 15 trestles, however, the remaining 9 were not part of this study. Mattern & Craig provided the Town with their Trestle Engineering Study for 6 of the 15 Town-owned trestles in December 2019. Included with this study were updated field inspections of each structure, summaries of findings, and recommendations for repairs based on any reported deficiencies.

*Table 2. Trestle Structure Information*

Bridge No.	Mile Post	Length (ft)	Max height (ft)	Number of Spans	Curved or Straight	Reference Points
	0					Abingdon
1	0.5	248	21	20	S	
2	3.41	272	37	22	C	
3	3.62	247	44	20	S	
4	4.15	487	44	39	S	
	4.38					Watauga
5	4.85	324	37	26	S	
6	5.23	451	69	36	S	

(Matten & Craig, 2019)

Recommendations were broken down into three categories: Immediate action, short-term action, and long-term action.

## Immediate Action

The study found that items on the Immediate Action list should be rectified within two years of the report issuance and entail partial or entire replacement of the failing or missing members of the trestle. Only 5 percent of the existing members were found to be in this condition. The bridge studies with the highest number of failing members was Bridge 1, which is the beginning of the Virginia Creeper Trail in the Town of Abingdon.

## Short-term Action

The study recommended that short-term actions be completed within two to five years from the date of the findings and required monitoring every 6 to 12 months, should they need replacement sooner than five years. Six percent of the members were found to be in this category.

## Long-term Action

Lastly, the study recommended that long-term measures include routine maintenance at one- to two-year intervals, preventative measures at no more than five-year intervals, replacement of members with greater than a five-year lifespan, and larger rehabilitation efforts that may be required within ten-to-fifteen years. The remaining 89 percent of the bridge members fell into this category. An overall inspection interval of 48 months was recommended for all components (Matten & Craig, 2019).

While this study included only the first 6 trestles, continued evaluation of the remaining 9 should be conducted for trestle specific recommendations. The same inspection interval can still be applied to the unstudied trestles, however, specific engineering recommendations should be developed by an engineering consultant of the Town's choosing.



Figure 6. Creeper Trail Trestle



Figure 7. Creeper Trail Trestle

#### 4.4 Lane Group Sanitary Sewer Evaluation Survey Preliminary Engineering Report for Rainfall Derived Inflow & Infiltration

The Town owns and operates the Wolf Creek Water Reclamation Facility as its wastewater treatment plant. This is a regional facility that also serves area from outside of the Town limits. During storm events, the existing sewer system can become overburdened, which increases the occurrence of RDII. The Wastewater Treatment Plant is permitted to discharge effluent at a rate of 4.95 million gallons per day (MGD). For comparison, a recorded event in 2022 dropped 3.23 inches of rainfall over four days and resulted in an effluent flow of 8.55 MGD. Similarly in 2021, there were peak effluent rates of 12.6, 11.05, and 6.65 MGD following wet-weather events (TLG, 2023)

TLG was tasked by the Town, with funding from Virginia’s Department of Environmental Quality, to perform a comprehensive study of the Town’s Sanitary Sewer Infrastructure. TLG used the original Preliminary Engineering Report (PER) that was completed in 2021 by engineering firm CHA as a starting point and completed five PERs in February 2023. This report evaluated the presence of RDII in the existing sanitary system and recommended that the Town conduct five separate Sanitary Sewer Engineering Studies (SSES) based on the sewersheds shown in **Figure 8**.

Several key findings of the first PER are as follows:

- Visual inspection of over 240 manholes was completed and sections of sewer line showing signs of infiltration and inflow (I/I) were selected for smoke testing and flow monitoring.
- Smoke testing of over 143,450 linear feet of sewer line in the E. Valley / Whites Mill, Black Fort Lane, and Lowry Drive Sub-Basins of the Town's system was completed. Two hundred twenty-eight (228) potential sources of I/I were identified.
- Flow meters were installed in seven (7) areas in the prioritized sub-basins, and wet and dry weather sewer flow information was recorded along with rainfall amounts within these seven areas.
- Over 75,710 linear feet of sewer line was inspected via closed-circuit television (CCTV) inspections, which aided in confirming suspected areas of RDII and assisted in developing the proposed recommendations.
  - CCTV inspections revealed that nearly 50 percent of the Walden Road, Whites Mill, Black Fort, and Lowry Drive sub-basins have severe structural defects and complete failures/collapses within pipes, in addition to significant horizontal and vertical alignment issues. These defects will require complete replacement at cure in place pipe, which is not a remediation option.

TLG recommends several action items for the Town to reduce RDII occurrences within the Phase 1 study area.

1. Firstly, TLG recommends soliciting bids for the Priority 1 (Whites Mill Road) Sewer System Improvement Project, estimated to cost \$3.3 million.
2. Secondly, they recommend securing funding for the sewer line replacement along Waldon Road.
3. Thirdly, TLG recommends continuing with design and construction of the Black Fort Sub Basin Sewer System Improvements Project, totaling \$9.5 Million. At the time of this Plan development, the second PER is underway.
4. TLG's fourth recommendation is to continue these detailed studies for the remaining three SSES study areas over the next three fiscal years: Phase 3 - \$130,000, Phase 4 - \$150,000, and Phase 5 - \$130,000, for a total cost of \$410,000.
5. And lastly, TLG urges continued implementation of routine cleanings and inspections and for the Town to implement a comprehensive assessment management plan.

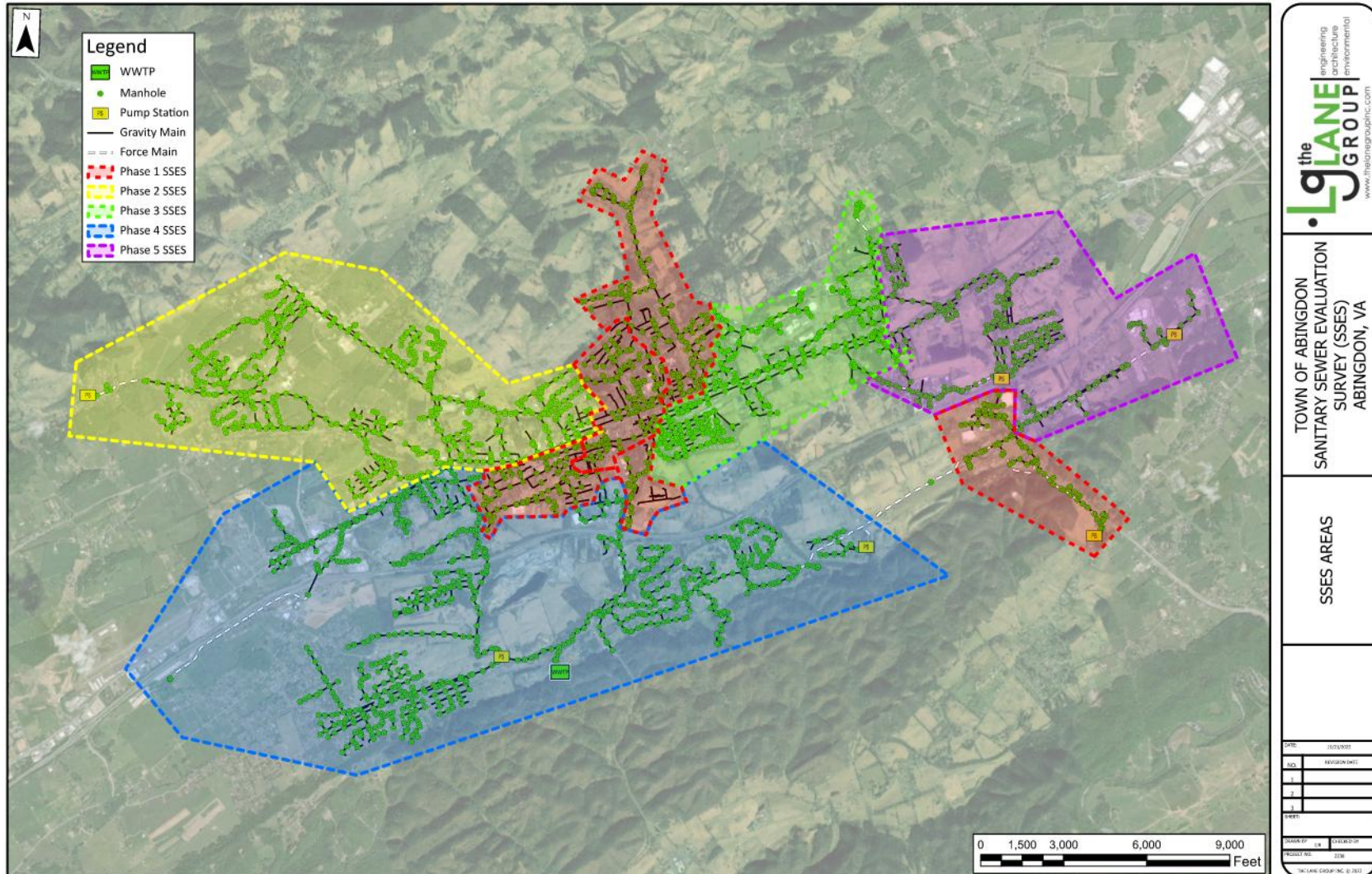


Figure 8. The Lane Group SSES Boundaries

## 5.0 Plan for Flood Resilience – Suggested Flood Mitigation Projects and Management Tools

A list of potential projects was developed for consideration using information that is both publicly available and that was provided directly by the Town that they can explore to meet goals for flooding resilience. More than seventy projects have been identified, however, they all fit within the classification of five distinct categories. **Table 3** summarizes types of projects identified and a brief description of what each entails. **Appendix C** includes the full list of projects identified. The project identification numbers correspond to the numbers in **Figure 9**. These projects fall into the following five categories:

- FEMA Floodplain Mapping and Modeling
- SWM Facilities and Stream Restoration
- Flooding Mitigation
- Emergency Response
- Townwide Initiatives

Townwide initiatives and some project efforts such as townwide watershed modeling using a software program such as PCSWMM, applying precipitation adjustment factor & NOAA update evaluation, and debris management program, are not explicitly labeled in **Figure 9** as they are not easily pinpointed. PCSWMM is a commonly used proprietary modeling software used to determine flooding limits and potential flooding improvement options.

Table 3. Town of Abingdon Resilience Plan Projects for Consideration

Project ID	Category	Notes
1-31	Floodplain Mapping and Modeling	Establish floodplain limits and base flood elevations
32	Flooding Mitigation	223 Preston Street Flooding Mitigation
33	SWM Facility or Stream Project	Farmers Market Parking Lot Impervious to Pervious Conversion
34-43	SWM Facility or Stream Project	TOA Impervious to Pervious Conversion
44	SWM Facility or Stream Project	TOA Impervious to Pervious Conversion & Emergency Response Center
45-47	SWM Facility or Stream Project	TOA Impervious to Pervious Conversion
48-51	SWM Facility or Stream Project	TOA Impervious to Pervious Conversion or other SWM Facility
52	SWM Facility or Stream Project	TOA Impervious to Pervious Conversion
53-54	SWM Facility or Stream Project	TOA Stream Restoration
55-57	SWM Facility or Stream Project	TOA Stormwater Management Facility
58	Flooding Mitigation	Mill Dam near Stone Mill Road SW
59	Flooding Mitigation	Mill Dam near W Main Street
60-61	Emergency Response	Pedestrian Connectivity
62	Emergency Response	Neighborhoods with Minimal Ingress/Egress
63	Emergency Response	Resilience for Creeper Trail Trestles
64	Floodplain Mapping and Modeling	PCSWMM
65	Floodplain Mapping and Modeling	Precipitation Adjustment Factor & NOAA Update Evaluation
66	Flooding Mitigation	Debris Management Program
67	Townwide	Ordinance for Improving Utility Infrastructure in Critical Areas
68	Townwide	Capacity Building TOA Personnel
69	Townwide	Document and Secure Permanent Drainage Easements
70	SWM Facility or Stream Project	514 Sutton Street SWM/Stream Restoration Project
71	SWM Facility or Stream Project	Railroad Culvert Removal

Town of Abingdon Overall Project Location Map

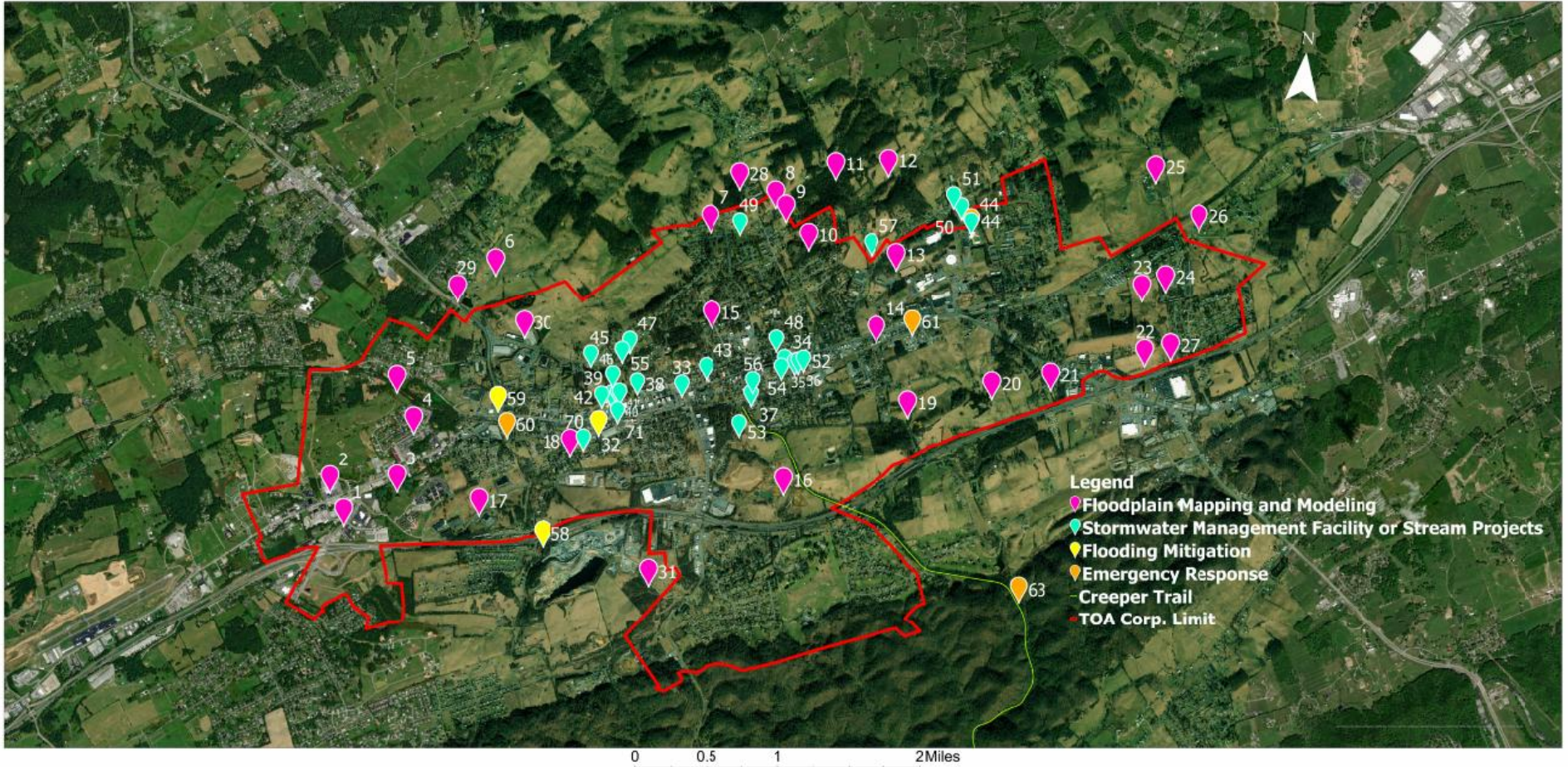


Figure 9. Project Identification Map Overall

## 5.1 FEMA Floodplain Mapping and Other Modeling

The project locations, as shown in **Figure 10**, are proposed where there are tributaries that are not fully mapped by FEMA or do not have established base flood elevations. These projects are being proposed in order to establish those limits and elevations and to also ensure that all upstream contributing areas are being included in the models and mapping. This will have a great impact on the Town's ability to have a more complete picture of flooding throughout its limits and to plan for flooding events.

Other suggested modeling efforts involve fully cataloging the Town's storm drain and SWM inventory in GIS with the corresponding data and attributes. This would be a significant undertaking involving surveying all structures, pipes, and public facilities with missing data, as identified in the gap analysis. This would allow the Town to not only keep a complete record of their inventory but also to enable the infrastructure to be modeled on a townwide and watershed basis. FEMA models can also be incorporated into the model. By utilizing free modeling tools such as the U.S. Environmental Protection Agency's SWM Model (SWMM) or proprietary versions like PCSWMM, this data can be run and rendered to show a complete picture of flooding throughout the Town, which can aid in Capital Improvement Project planning.

Town of Abingdon Project Location Map

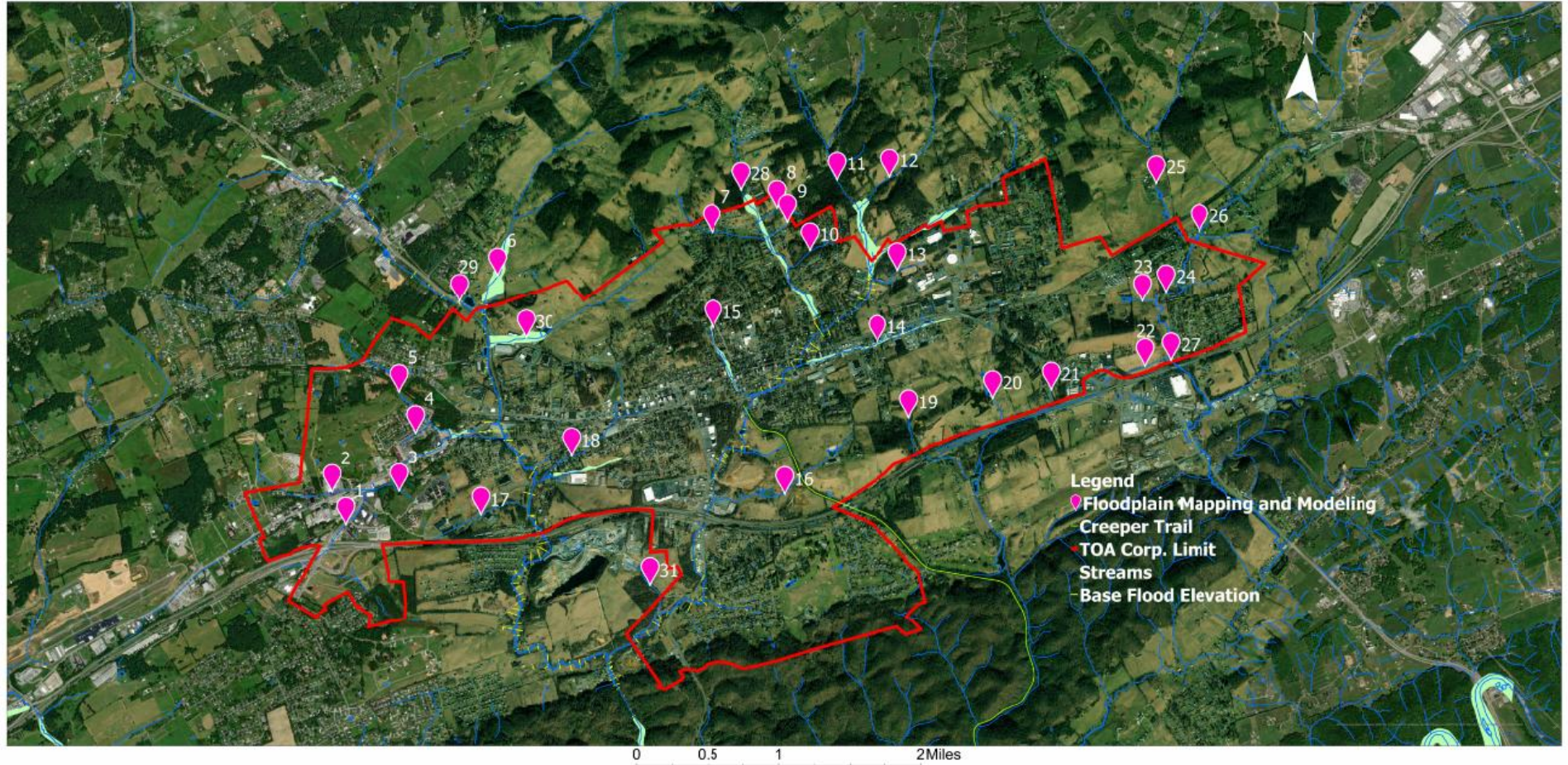


Figure 10. Locations for Additional Flood Mapping

## 5.2 Stormwater Management Facilities & Stream Restoration

SWM projects are mainly concentrated in the town center with only a few in the more rural areas to the north of the Town limits. These projects correspond to project IDs 33-57 on the project key shown in **Figure 9** and vary in size and scope. As shown in the project location map in **Figure 11**, many of the project locations in the town center involve converting impervious area to pervious area, especially on Town-owned property and right-of-way. This can be achieved by utilizing either turf cover or permeable pavement. These projects also entail installing stormwater facilities on Town-owned property and right-of-way to help attenuate stormwater and release it at a more appropriate rate to not cause downstream flooding and erosion. Lastly, this grouping of projects includes potential stream restoration projects to improve stormwater conveyance and reconnect the floodplain where possible. There are several parcels with opportunities for restoring the stream's natural sinuosity that has been removed due to urbanization of the watershed. All projects proposed under this section must utilize nature-based solutions to the maximum extent practicable.

In order to account for increasing storm intensities, the Town expressed interest in requiring an adjustment factor for increasing storm precipitation depths to account for climate change considerations. For example, by applying a 20 percent increase to NOAA Atlas 14 precipitation depth data for the area, the Town can assess new and retrofitted facilities to attenuate flows more stringently than what state channel and flood protection regulations require. This allows the Town to take climate change considerations into account as projects are developed. Such a requirement can also be incorporated into the Town's municipal code for SWM.

It should be noted that this may be a temporary measure as the NOAA Atlas 14 data are due to be updated to NOAA Atlas 15, with preliminary data in 2025, and a final release date of 2026. At that time, a reevaluation of methodology for incorporating climate change considerations should be conducted.

Town of Abingdon Project Location Map

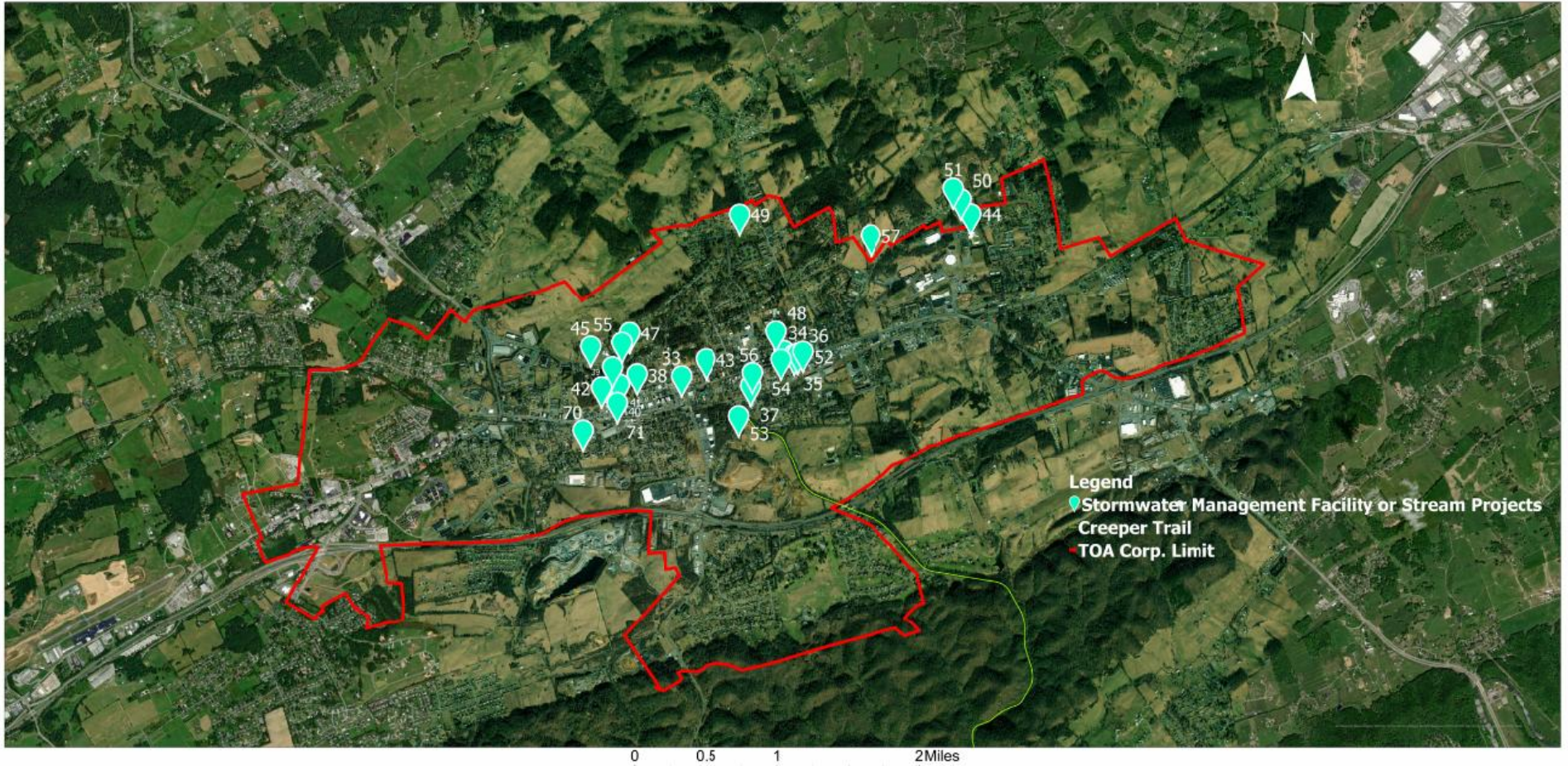


Figure 11. Locations for Potential SWM & Stream Restoration Projects

### 5.3 Flooding Mitigation

The flooding projects included involve localized flooding mitigations and addressing residential drainage issues specifically. These projects are shown on the project key as project IDs 32, 58, and 59 in **Figure 9**. These areas are known flooding areas caused by a blockage of natural flow patterns as shown in **Figure 12**.

There are two large dams along Wolf Creek that are remnants of old mill dams, corresponding to project sites 58 and 59 shown on **Figure 13**. These dams were observed during recent outfall inspections and are located near Stone Mill Road and the other along Highway 19. There is no reference to these dams in the FEMA FIS report for Wolf Creek. Removal of these dams would be the preferable option, however, if these features are considered historic and not eligible for removal, then they will need to be considered in an update to the FEMA floodplain model for Wolf Creek.

Anecdotally, there have been reports of beaver habitations that obstruct flow through the Town's waterways. The Town has expressed interest in addressing this issue through a beaver management effort. This would entail clearing out habitations on a regular basis as beavers build year-round. Focusing on the spring and fall seasons may be beneficial, as that is when beavers are the most active, and their activities coincide with months of heavier intensity rainfall. This will help to ensure clear waterways can be implemented as a part of a larger scale, townwide debris management program for pre- and post-storm debris removal.

The Town currently maintains a townwide leaf removal program with phased vacuum pick-up several times a year, which includes residential areas. Continuation of this program is crucial as leaf removal is a major contributor to blocked storm drain infrastructure and is a burden to clean if not regularly completed. This will ensure the Town's infrastructure is working at its intended capacity during flood events, which will decrease maintenance cost for pipe cleanout in the future.

The Town has personnel that will clear debris prior, during, and post storm events at culverts, bridges, and known flooding locations. Outside of storm events the Town conducts weekly brush pickup, and monthly junk pickup. There is a Town ordinance that restricts unauthorized dumping. The Town will check known locations for dumping, including abandoned properties and outdoor hoarding situations, personnel combat unauthorized dumping by clearing debris with Town personnel. If hazardous waste is discovered, they will notify appropriate authorities and follow the proper procedures for disposal. The County government will conduct annual hazard waste collection. Private property owners are responsible for clearing stream channels behind their homes and businesses, if there is a known issue the Town will contact them and inform them of their responsibility. The Town also educates the public in the dumping of natural material like leaves and grass clippings in streams can increase flood risk. A local group also hosts an annual stream cleanup.

Town of Abingdon Project Location Map

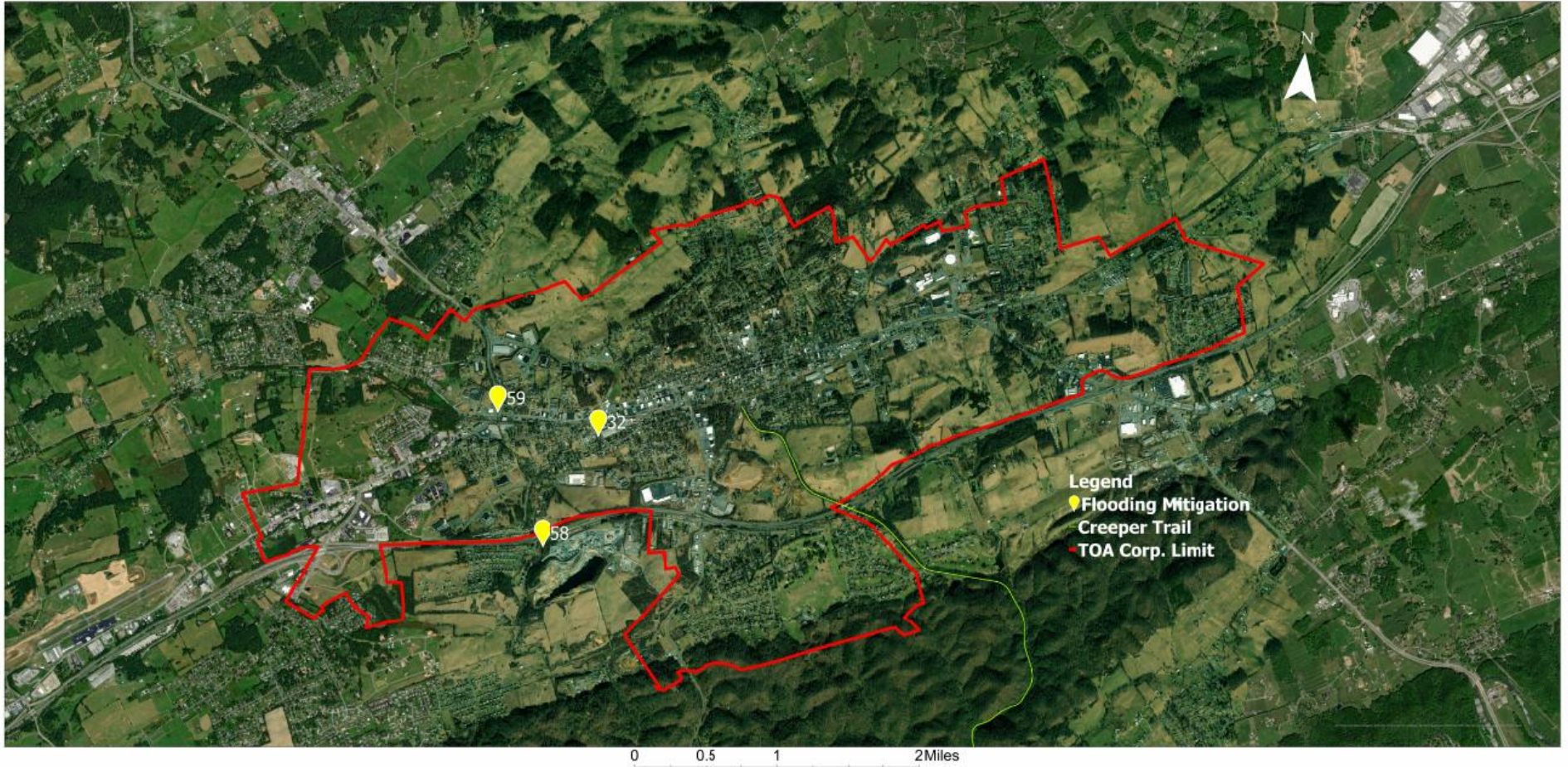


Figure 12. Locations for Flooding Mitigation Projects



*Figure 13. Mill Dam along Wolf Creek*

## 5.4 Emergency Response

The emergency response category is shown on the project key for projects 44, 60, 61, and 63. This group of projects focuses on the preparedness side of resilience planning. Some of the areas that are simple to pinpoint are shown on the map provided in **Figure 9**, such as improving pedestrian connectivity on the eastern and western ends of the Town and establishing a public emergency center at the Harry L. Coomes Recreation Center. This will allow for improved connectivity for all residents within the Town during storm events to seek shelter and have access to available amenities if outages occur after storm events.

The Town wishes to be proactive about maintaining resilience for the Creeper Trail trestles by continuing to implement the recommendations outlined in the Mattern & Craig Trestle Engineering Study. In keeping with the study, routine inspections should continue with intervals not to exceed 48 months between visits. This can be on a rotating schedule to not overburden current Town personnel with one large-scale inspection. Additionally, the Town could potentially consider this position as an opportunity for capacity building.

The Town has also identified neighborhoods with only one point of access, which are referred to as neighborhoods with minimal ingress/egress. These areas are shown in light pink **Figure 14**. In the event of flooding, these areas are at risk for evacuation if connectivity is not improved. Though roadway improvements are outside the scope of this Plan, accessibility to these areas must be taken into consideration in the event of flooding to not put these neighborhoods at increased risk.

Town of Abingdon Project Location Map

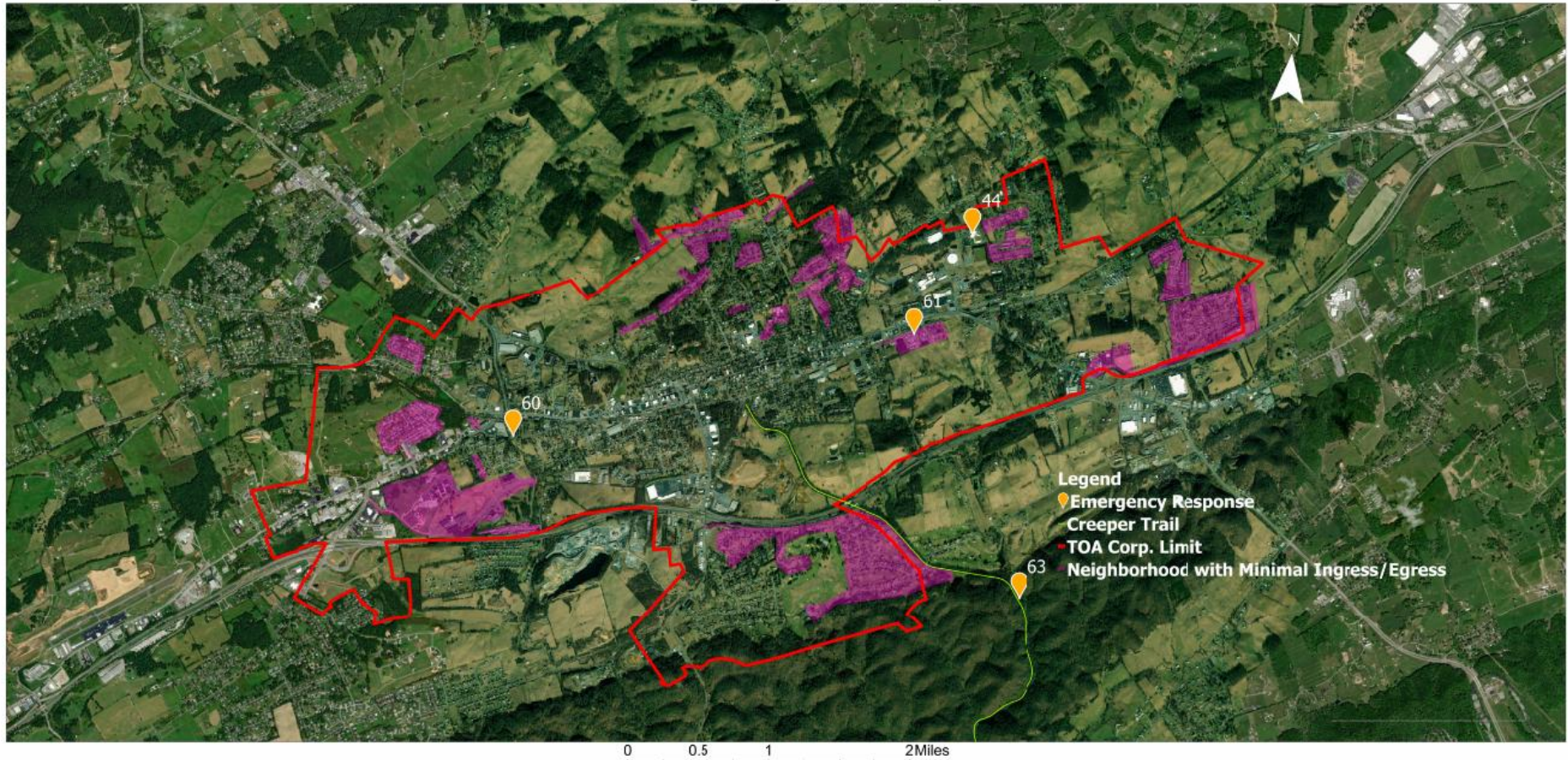


Figure 14. Locations for Emergency Response Projects and Neighborhoods with Minimal Ingress/Egress

## 5.5 Overall Townwide Initiatives

Through regular discussions with the Town during the development of this Plan, several other townwide initiatives were brought up for inclusion in the Plan from a preparedness standpoint including implementing ordinances to improve utility infrastructure in critical areas. For example, the Town can improve the operation of community centers, shelters, and medical facilities by burying powerlines so they remain available to the community before, during, and after storm events. Additionally, the Town can benefit from developing a voluntary townwide communication system to alert residents to find shelter during storm events. This will facilitate public outreach, education, and alerts for storm events and other natural hazards.

Two meetings were held to inform the public and obtain input. The goals of the Plan were first presented by the Assistant Town Manager at a regularly scheduled Infrastructure Advisory Committee Meeting on November 7, 2024 (Town Hall, 133 W. Main Street, 5:30 PM). A resilience planning public outreach meeting was held on January 9, 2025, at the Town Hall (5:30 PM) to present the context of the draft plan in a public setting and provide an opportunity for comments and input.

As defined in the Round 4 CFPF Manual, Capacity Building entails improving the ability of a local government through training of existing staff, hiring qualified personnel, and contracting with expert consultants or advisors. Further, other related actions will allow a local government to assess flood risk and resilience capabilities and identify and mitigate flood risk and flood impacts. By applying for grant assistance for this important role, the Town can employ personnel to undertake these specific tasks.

As indicated in the Gap Analysis portion of the Plan, The Town's GIS does not show the current stormwater infrastructure within permanent drainage easements. Through discussions with the Town during the Plan's development, the Town expressed interest in securing these easements. The Town's GIS personnel would research and update their records to show all existing easements. The Town Senior Project Manager or designee would secure permanent drainage easements on private property that has storm drain infrastructure within its boundaries. This will enable the Town to perform the necessary maintenance activities on a regular basis and install replacements when necessary.

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Resilience Plan June 2025

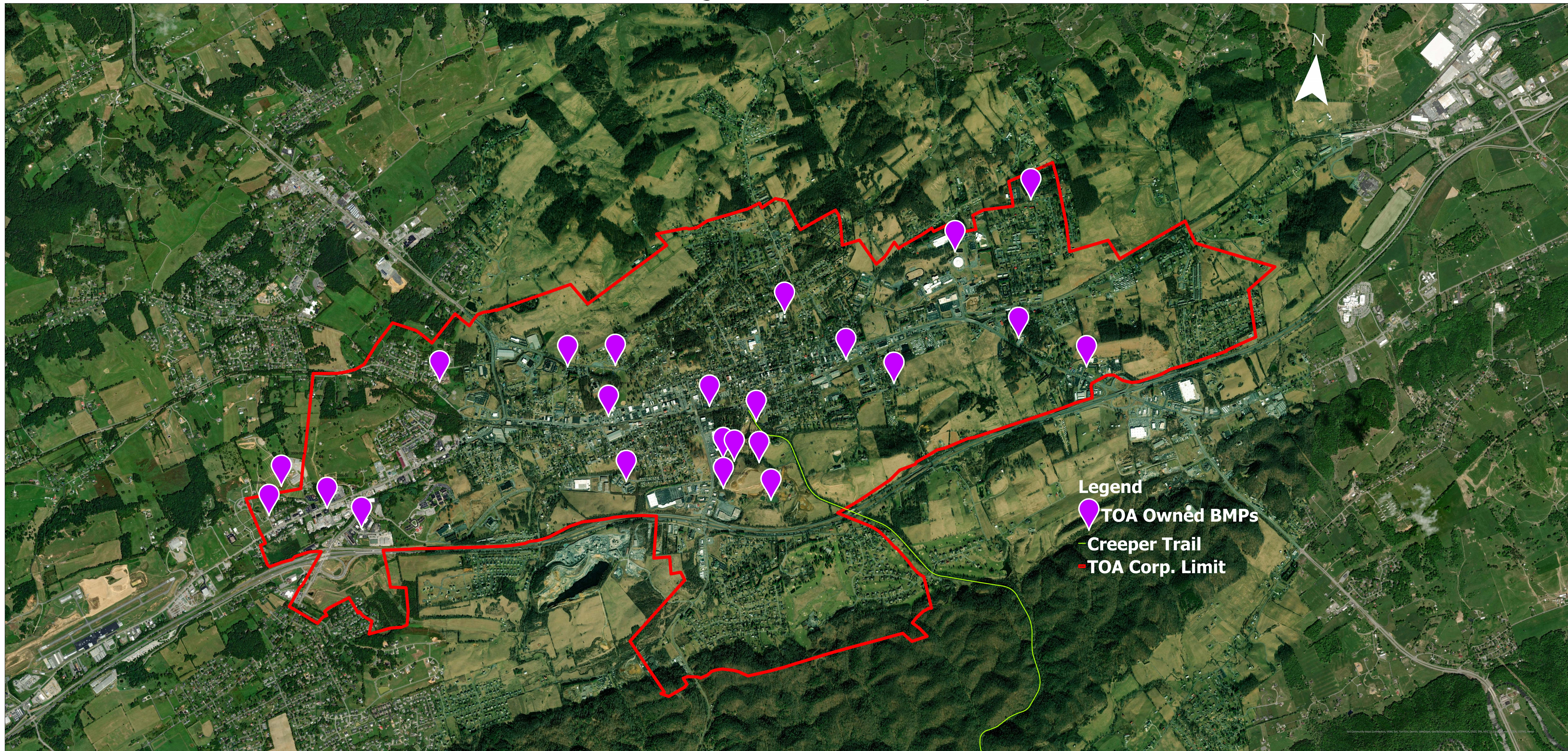
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Appendix A - Town of Abingdon Existing BMP Inventory

BMP_ID	Date Installed	BMP Name	Measurement Name	Measurement Unit	BMP Extent	Impervious Acres Treated	Latitude	Longitude	Existing Land Use	Ownership Type	Maintenance Agreement
2006-06	3/1/2007	Dry Detention Ponds	Area Treated	ACRE	0.6	0.49	36.6974	-82.0125	Urban (land use not specified inside MS4 service area)	Private	No
2006-07	6/20/2007	Dry Detention Ponds	Area Treated	ACRE	0.52	0.52	36.7171	-81.9688	Urban (land use not specified inside MS4 service area)	Private	No
2007-02	10/1/2008	Rain Garden	Contributing Area	ACRE	0.1	0.05	36.7082	-81.9704	Urban (land use not specified inside MS4 service area)	Public	
2007-12	3/1/2008	Dry Detention Ponds	Area Treated	ACRE	2.83	1.89	36.7139	-81.9621	Urban (land use not specified inside MS4 service area)	Private	Yes
2008-04	6/2/2008	Dry Detention Ponds	Area Treated	ACRE	1.46	0.75	36.7090	-81.9753	Urban (land use not specified inside MS4 service area)	Private	No
2008-07	7/13/2010	Dry Detention Ponds	Area Treated	ACRE	1.65	1.1	36.7124	-81.9570	Urban (land use not specified inside MS4 service area)	Private	No
2008-09A	10/1/2012	Dry Extended Detention Ponds	Area Treated	ACRE	4.4	0.5	36.6988	-82.0173	Urban (land use not specified outside MS4 service area)	Private	Yes
2008-09B	10/1/2012	Dry Extended Detention Ponds	Area Treated	ACRE	0.31	0.15	36.6964	-82.0183	Urban (land use not specified inside MS4 service area)	Private	Yes
2009-07	1/4/2011	Dry Extended Detention Ponds	Area Treated	ACRE	1.09	0.91	36.7114	-81.9852	Urban (land use not specified inside MS4 service area)	Private	No
2010-02	7/12/2011	Dry Detention Ponds	Area Treated	ACRE	6.1	1.83	36.6962	-82.0089	Urban (land use not specified inside MS4 service area)	Private	Yes
2010-03	8/12/2013	Dry Extended Detention Ponds	Area Treated	ACRE	1.73	0.69	36.7235	-81.9524	Urban (land use not specified inside MS4 service area)	Private	Yes
2010-05	10/1/2013	Dry Detention Ponds	Area Treated	ACRE	0.63	0.46	36.7109	-81.9899	Urban (land use not specified inside MS4 service area)	Private	Yes
2011-06	4/9/2012	Dry Extended Detention Ponds	Area Treated	ACRE	0.69	0.69	36.7171	-81.9450	Urban (land use not specified inside MS4 service area)	Private	Yes
2011-09	9/15/2017	Dry Extended Detention Ponds	Area Treated	ACRE	1.94	0.55	36.7022	-81.9828	Urban (land use not specified inside MS4 service area)	Private	Yes
2012-01	4/11/2013	Dry Extended Detention Ponds	Area Treated	ACRE	1.53	1.22	36.7049	-81.9734	Urban (land use not specified inside MS4 service area)	Private	No
2014-03	11/15/2014	Dry Detention Ponds	Area Treated	ACRE	2.97	1.266	36.7073	-81.9853	Urban (land use not specified inside MS4 service area)	Public	
2015-02	5/5/2017	Bioretention	Area Treated	ACRE	2.6	1.31	36.7154	-81.9379	Urban (land use not specified inside MS4 service area)	Private	Yes
2016-01	1/10/2018	Dry Detention Ponds & Hydrodynamic Structures	Area Treated	ACRE	0.536	0.126	36.7284	-81.9453	Urban (land use not specified outside MS4 service area)	Private	Yes
2016-05A	4/28/2020	Dry Detention Basin w/ Proprietary Filtering Devices	Area Treated	ACRE	5.56	2.67	36.7048	-81.9722	Urban (land use not specified inside MS4 service area)	Public	
2016-05B	4/28/2020	Dry Detention Basin w/ Proprietary Filtering Devices	Area Treated	ACRE	7.44	6.68	36.7025	-81.9730	Urban (land use not specified inside MS4 service area)	Public	
2016-06A	6/29/2020	Dry Detention Basin	Area Treated	ACRE	1.27	0.5	36.7049	-81.9697	Urban (land use not specified inside MS4 service area)	Private	Yes
2019-01A	4/16/2021	Extended Detention 1 (Underground)	Area Treated	ACRE	0.47	0.26	36.7086	-82.0026	Urban (land use not specified inside MS4 service area)	Private	Yes
2019-01B	4/16/2021	Extended Detention 1 (Underground)	Area Treated	ACRE	0.14	0.1	36.7086	-82.0026	Urban (land use not specified inside MS4 service area)	Private	Yes
2022-01	11/31/2022	Retention Basin w/ Proprietary Filtering Devices	Area Treated	ACRE	29.42	5.73	36.7019	-81.9681	Urban (land use not specified inside MS4 service area)	Public	Yes

# Town of Abingdon Owned BMPs Map



# Appendix B - Round 4 CFPF Score Card

## 1860 - CID510169\_TownofAbingdon\_CFPF

### Review Details

<b>Funding Opportunity:</b>	1446-Virginia Community Flood Preparedness Fund - Capacity Building/Planning Grants - CY23 Round 4
<b>Program Area:</b>	Virginia Community Flood Preparedness Fund
<b>Application Status:</b>	Under Review
<b>Stage:</b>	
<b>Organization:</b>	Town of Abingdon, VA
<b>Applicant:</b>	Laura Dowell
<b>Internal Status:</b>	
<b>Round:</b>	1
<b>Reviewer:</b>	Karyn Reid
<b>Type:</b>	Internal
<b>Role:</b>	Primary
<b>Review Status:</b>	Submitted
<b>Submitted Date:</b>	Nov 30, 2023 11:03 AM
<b>Score:</b>	<b>0.00</b>

## Capacity Building & Planning Scoring Sheet - Round 4

### Eligibility and Scoring

#### Eligibility

Is the applicant a local government (including counties, cities, towns, municipal corporations, authorities, districts, commissions, or political subdivisions created by the General Assembly or pursuant to the Constitution or laws of the Commonwealth, or any combination of these)?

Yes = Eligible for consideration

No = Not eligible for consideration

**Local Government\*:** Yes

Does the local government have an approved resilience plan and has provided a copy or link to the plan with this application?

Yes = Eligible for consideration under all categories

No = Eligible for consideration for studies, capacity building, and planning only

**Resilience Plan\*:** No

If the applicant is not a town, city, or county, are letters of support from all affected local governments included in this application?

Yes = Eligible for consideration

No = Not eligible for consideration

**Letters of Support\*:** N/A

Has this or any portion of this project been included in any application or program previously funded by the Department?

Yes = Not eligible for consideration

No = Eligible for consideration

**Previously Funded\*:** No

Has the applicant provided evidence of an ability to provide the required matching funds?

Yes = Eligible for consideration

No = Not eligible for consideration

**Evidence of Matching Funds\*:** Yes

**Is the project eligible for consideration?**

Yes = Eligible for consideration

No = Not eligible for consideration

**Project Eligible for Consideration\*:** Yes

**Eligibility Comments:**

No match waiver is being requested.

**Eligible Capacity Building and Planning Activities (Select all that apply) ? Maximum 100 points.**

Development of a new resilience plan - 95 points

Revisions to existing resilience plans and modifications to existing comprehensive and hazard mitigation plans - 60 points

Resource assessments, planning, strategies and development - 40 points

Policy management and/or development - 35 points

Stakeholder engagement and strategies - 35 points

Goal planning, implementation and evaluation - 25 points

Long term maintenance strategy - 25 points

Other proposals that will significantly improve protection from flooding on a statewide or regional basis approved by the Department - 15 points

**Capacity Building and Planning\*:** 100.00

**Is the project area socially vulnerable?** (based on [ADAPT Virginia's Social Vulnerability Index Score](#))

**Social Vulnerability Scoring:**

Very High Social Vulnerability (More than 1.5) - 10 Points

High Social Vulnerability (1.0 to 1.5) - 8 Points

Moderate Social Vulnerability (0.0 to 1.0) - 5 Points

Low Social Vulnerability (-1.0 to 0.0) - 0 Points

Very Low Social Vulnerability (Less than -1.0) - 0 Points

**Socially Vulnerable\*:** High Social Vulnerability (1.0 to 1.5)

**Is the proposed project part of an effort to join or remedy the community's probation or suspension from the NFIP?**

(If Yes - 5 Points | If No - 0 Points)

**NFIP\*:** No

**Is the proposed project in a low-income geographic area as defined below?**

"Low-income geographic area" means any locality, or community within a locality, that has a median household income that is not greater than 80 percent of the local median household income, or any area in the Commonwealth designated as a qualified opportunity zone by the U.S. Secretary of the Treasury via his delegation of authority to the Internal Revenue Service. A project of any size within a low-income geographic area will be considered.

(If Yes - 5 points | If no - 0 points)

**Low-Income Geographic Area\*:** Yes

**Does this project provide ?community scale? benefits?**

More than one census block - 30 points

50-100% of census block - 25 points

25-49% of census block - 20 points

Less than 25% of census block - 0 points

**Community Scale Benefits\*:** More than one census block

**Scoring Comments:**

The Town of Abingdon meets the definition of "low-income geographic area" with a median household income of \$54,384, which is 68% of the state median household income (\$80,615).

This application claims to only provide "community scale" benefits to less than 25% of a census block. This application is for the whole town of Abingdon, which is divided into multiple census blocks, according to

[https://www2.census.gov/geo/maps/DC2020/DC20BLK/st51\\_va/place/p5100148\\_abingdon/DC20BLK\\_P5100148.pdf](https://www2.census.gov/geo/maps/DC2020/DC20BLK/st51_va/place/p5100148_abingdon/DC20BLK_P5100148.pdf)

This application receives a total of 143 points with 100 points for Capacity Building and Planning, 8 points for a high social vulnerability, 5 points for being a low-income geographic area and 30 points for community scale benefits.

**Project Total Score\*:** 143

**Special Conditions:**

Appendix C - Town of Abingdon Resilience Plan Project Summary Table

Project ID	Category	Notes	Priority	Impact on Flooding	Nature Based Approach	Property Acquisiton Required
1	Floodplain Mapping and Modeling	Establish floodplain limits and base flood elevations	High	Significant	Yes	No
2	Floodplain Mapping and Modeling	Establish floodplain limits and base flood elevations	High	Significant	Yes	No
3	Floodplain Mapping and Modeling	Establish floodplain limits and base flood elevations	High	Significant	Yes	No
4	Floodplain Mapping and Modeling	Establish floodplain limits and base flood elevations	High	Significant	Yes	No
5	Floodplain Mapping and Modeling	Establish floodplain limits and base flood elevations	High	Significant	Yes	No
6	Floodplain Mapping and Modeling	Establish floodplain limits and base flood elevations	High	Significant	Yes	No
7	Floodplain Mapping and Modeling	Establish floodplain limits and base flood elevations	High	Significant	Yes	No
8	Floodplain Mapping and Modeling	Establish floodplain limits and base flood elevations	High	Significant	Yes	No
9	Floodplain Mapping and Modeling	Establish floodplain limits and base flood elevations	High	Significant	Yes	No
10	Floodplain Mapping and Modeling	Establish floodplain limits and base flood elevations	High	Significant	Yes	No
11	Floodplain Mapping and Modeling	Establish floodplain limits and base flood elevations	High	Significant	Yes	No
12	Floodplain Mapping and Modeling	Establish floodplain limits and base flood elevations	High	Significant	Yes	No
13	Floodplain Mapping and Modeling	Establish floodplain limits and base flood elevations	High	Significant	Yes	No
14	Floodplain Mapping and Modeling	Establish floodplain limits and base flood elevations	High	Significant	Yes	No
15	Floodplain Mapping and Modeling	Establish floodplain limits and base flood elevations	High	Significant	Yes	No
16	Floodplain Mapping and Modeling	Establish floodplain limits and base flood elevations	High	Significant	Yes	No
17	Floodplain Mapping and Modeling	Establish floodplain limits and base flood elevations	High	Significant	Yes	No
18	Floodplain Mapping and Modeling	Establish floodplain limits and base flood elevations	High	Significant	Yes	No
19	Floodplain Mapping and Modeling	Establish floodplain limits and base flood elevations	High	Significant	Yes	No
20	Floodplain Mapping and Modeling	Establish floodplain limits and base flood elevations	High	Significant	Yes	No
21	Floodplain Mapping and Modeling	Establish floodplain limits and base flood elevations	High	Significant	Yes	No
22	Floodplain Mapping and Modeling	Establish floodplain limits and base flood elevations	High	Significant	Yes	No
23	Floodplain Mapping and Modeling	Establish floodplain limits and base flood elevations	High	Significant	Yes	No
24	Floodplain Mapping and Modeling	Establish floodplain limits and base flood elevations	High	Significant	Yes	No
25	Floodplain Mapping and Modeling	Establish floodplain limits and base flood elevations	High	Significant	Yes	No
26	Floodplain Mapping and Modeling	Establish floodplain limits and base flood elevations	High	Significant	Yes	No
27	Floodplain Mapping and Modeling	Establish floodplain limits and base flood elevations	High	Significant	Yes	No
28	Floodplain Mapping and Modeling	Establish floodplain limits and base flood elevations	High	Significant	Yes	No
29	Floodplain Mapping and Modeling	Establish floodplain limits and base flood elevations	High	Significant	Yes	No
30	Floodplain Mapping and Modeling	Establish floodplain limits and base flood elevations	High	Significant	Yes	No
31	Floodplain Mapping and Modeling	Establish floodplain limits and base flood elevations	High	Significant	Yes	No
32	Flooding Mitigation	223 Preston Street Flooding Mitigation	High	Significant	Yes	Yes
33	Stormwater Management Facility or Stream Project	Farmers Market Parking Lot Impervious to Pervious Conversion	Moderate	Potentially significant	Yes	No
34	Stormwater Management Facility or Stream Project	TOA Impervious to Pervious Conversion	Moderate	Potentially significant	Yes	No
35	Stormwater Management Facility or Stream Project	TOA Impervious to Pervious Conversion	Moderate	Potentially significant	Yes	No
36	Stormwater Management Facility or Stream Project	TOA Impervious to Pervious Conversion	Moderate	Potentially significant	Yes	No
37	Stormwater Management Facility or Stream Project	TOA Impervious to Pervious Conversion	Moderate	Potentially significant	Yes	No
38	Stormwater Management Facility or Stream Project	TOA Impervious to Pervious Conversion	Moderate	Potentially significant	Yes	No
39	Stormwater Management Facility or Stream Project	TOA Impervious to Pervious Conversion	Moderate	Potentially significant	Yes	No
40	Stormwater Management Facility or Stream Project	TOA Impervious to Pervious Conversion	Moderate	Potentially significant	Yes	No
41	Stormwater Management Facility or Stream Project	TOA Impervious to Pervious Conversion	Moderate	Potentially significant	Yes	No
42	Stormwater Management Facility or Stream Project	TOA Impervious to Pervious Conversion	Moderate	Potentially significant	Yes	No

Project ID	Category	Notes	Priority	Impact on Flooding	Nature Based Approach	Property Acquisition Required
43	Stormwater Management Facility or Stream Project	TOA Impervious to Pervious Conversion	Moderate	Potentially significant	Yes	No
44	Stormwater Management Facility or Stream Project	TOA Impervious to Pervious Conversion & Emergency Response Center	Moderate	Potentially significant	Yes	No
45	Stormwater Management Facility or Stream Project	TOA Impervious to Pervious Conversion	Moderate	Potentially significant	Yes	No
46	Stormwater Management Facility or Stream Project	TOA Impervious to Pervious Conversion	Moderate	Potentially significant	Yes	No
47	Stormwater Management Facility or Stream Project	TOA Impervious to Pervious Conversion	Moderate	Potentially significant	Yes	No
48	Stormwater Management Facility or Stream Project	TOA Impervious to Pervious Conversion or other Stormwater Management Facility	Moderate	Potentially significant	Yes	No
49	Stormwater Management Facility or Stream Project	Valley View Drive and Clarke Street	Moderate	Potentially significant	Yes	Potentially
50	Stormwater Management Facility or Stream Project	TOA Impervious to Pervious Conversion or other Stormwater Management Facility	Moderate	Potentially significant	Yes	No
51	Stormwater Management Facility or Stream Project	TOA Impervious to Pervious Conversion or other Stormwater Management Facility	Moderate	Potentially significant	Yes	No
52	Stormwater Management Facility or Stream Project	TOA Impervious to Pervious Conversion	Moderate	Potentially significant	Yes	No
53	Stormwater Management Facility or Stream Project	TOA Stream Restoration	Moderate	Potentially significant - requires further evaluation	Yes	Potentially
54	Stormwater Management Facility or Stream Project	TOA Stream Restoration	Moderate	Potentially significant - requires further evaluation	Yes	Potentially
55	Stormwater Management Facility or Stream Project	TOA Stormwater Management Facility	Moderate	Potentially significant	Yes	No
56	Stormwater Management Facility or Stream Project	TOA Stormwater Management Facility	Moderate	Potentially significant	Yes	No
57	Stormwater Management Facility or Stream Project	TOA Stormwater Management Facility	Moderate	Potentially significant	Yes	No
58	Flooding Mitigation	Mill Dam near Stone Mill Road SW	Low	Somewhat significant	Yes	Potentially
59	Flooding Mitigation	Mill Dam near W Main Street	Low	Somewhat significant	Yes	Potentially
60	Emergency Response	Pedestrian Connectivity	Low	Minimally significant	Potentially	Potentially
61	Emergency Response	Pedestrian Connectivity	Low	Minimally significant	Potentially	Potentially
62	Emergency Response	Neighborhoods with Minimal Ingress/Egress	Low	Minimally significant	No	Potentially
63	Emergency Response	Resilience for Creeper Trail Trestles	Moderate	Potentially significant - requires further evaluation	No	No
64	Floodplain Mapping and Modeling	PCSWMM	Moderate	Significant	Yes	No
65	Floodplain Mapping and Modeling	Precipitation Adjustment Factor & NOAA Update Evaluation	Moderate	Significant	No	No
66	Flooding Mitigation	Debris Management Program	Moderate	Potentially significant	Yes	No
67	Townwide	Ordinance for Improving Utility Infrastructure in Critical Areas	Low	Potentially significant	No	No
68	Townwide	Capacity Building TOA Personnel	Moderate	Significant	No	No
69	Townwide	Document and Secure Permanent Drainage Easements	Moderate	Significant	No	Yes
70	Stormwater Management Facility or Stream Project	514 Sutton Street SWM/Stream Restoration Project	High	Significant	Yes	Yes
71	Stormwater Management Facility or Stream Project	Railroad Culvert Removal	Moderate	Potentially significant	Yes	Potentially