

## AGENDA

**ROANOKE VALLEY RESOURCE AUTHORITY**  
**1020 HOLLINS ROAD, NE**  
**ROANOKE, VIRGINIA 24012**  
**DECEMBER 3, 2025**  
**11:30 A.M.**

### **I. OPENING CEREMONIES**

- A. Call to Order
- B. Roll Call
- C. Welcome Guests
- D. Requests to Postpone, Add To, or Change the Order of the Agenda

### **II. BUSINESS ITEMS**

#### Action Items:

- A. Resolution adopting revised Authority By-laws
- B. Resolution adopting revised Employee Handbook
- C. Resolution adopting the Authority's regular meeting schedule for CY 2026
- D. Consider new RVRA brand logo and adopt RVRA brand guide

#### Information Items:

- E. Discuss federal Hazard Mitigation Plan 2025 Update

### **III. CONSENT AGENDA**

Consent agenda items are routine and will be approved by a single resolution. If discussion is required, an item may be removed from the consent agenda and considered separately.

- A. Minutes of October 22, 2025 (Note: The Board did not meet in November)

### **IV. REPORTS**

- A. October 2025 Financials
  - 1. Statement of Cash Balances
  - 2. Statement of Operations
  - 3. Reconciliation of Net Income to Cash Provided by Operations for Month of October 2025 (Cash Basis)
  - 4. Summary of Reserve Funds
  - 5. Summary of Cash Reserve Funds Transferred from Roanoke Valley Regional Solid Waste Management Board
  - 6. Cumulative Statement of Operations
  - 7. VRA2021A Bond Issuance
- B. Waste Tonnage Report
- C. Trailer Report
- D. Residential Waste Report
- E. Wood Waste Report
- F. Recycling Report
- G. Household Hazardous Waste Report
- H. Project Status Report

**V. PUBLIC QUESTIONS / COMMENTS RECEIVED**

**VI. CHIEF EXECUTIVE OFFICER REPORT**

**VII. BOARD MEMBER COMMENTS**

**VIII. ADJOURNMENT**

ITEM NO. II.A  
BUSINESS - ACTION ITEM

AT A REGULAR MEETING OF THE ROANOKE VALLEY RESOURCE AUTHORITY:

**MEETING DATE:** December 3, 2025

**AGENDA ITEM:** Resolution adopting revised Authority By-laws

**SUBMITTED BY:** Jonathan A. Lanford, Chief Executive Officer  
Lorie Bess, Administrative Coordinator

**SUMMARY:**

Attached is a revision of the current Authority Bylaws for the Board's review and consideration. Of note is the addition of electronic participation in a meeting. (Article II.5)

**RECOMMENDATION:**

It is recommended that the Board adopt the revised By-laws, as presented.

**ROANOKE VALLEY RESOURCE AUTHORITY BY-LAWS**  
**Approved \_\_\_\_\_**

**WHEREAS**, pursuant to the Virginia Water and Sewer Authorities Act, Chapter 28, Title 15.1, Code of Virginia (1950), as amended, the governing bodies of the County of Roanoke, the City of Roanoke, the City of Salem, and the Town of Vinton have established the Roanoke Valley Resource Authority for the purpose of establishing and operating a garbage and refuse collection and disposal system at and through a transfer facility, landfill and related facilities; and

**WHEREAS**, the Roanoke Valley Resource Authority desires to enact by-laws governing the manner in which the Authority's business may be transacted and in which the power granted to it may be enjoyed.

**NOW, THEREFORE, BE IT RESOLVED** by the Roanoke Valley Resource Authority that the following by-laws are hereby enacted:

**BY-LAWS OF ROANOKE VALLEY RESOURCE AUTHORITY BOARD**

**ARTICLE I - SEAL**

The seal of the Authority shall be circular and shall have inscribed thereon, within and around the circumference, the following: "THE ROANOKE VALLEY RESOURCE AUTHORITY" in the center shall be the word "SEAL".

**ARTICLE II - AUTHORITY MEETINGS**

1. Regular meetings of the Authority shall be held ~~at least once per calendar month at such time or times as may be prescribed as approved~~ by a resolution adopted by the Authority. When any regular meeting of the Authority ~~shall fail falls~~ on a legal holiday of any participating political subdivision, then such meeting shall be held on the next following regular business day. ~~Regular meetings of the Authority shall be held at such place as the Authority may from time to time direct. Unless otherwise noted, meetings shall be held at the~~

Administration Building, 1020 Hollins Road NE, Roanoke, VA 24012. The first regular meeting ~~in January~~ of each year shall be the annual reorganization meeting of the Authority, at which officers shall be elected.

2. Special meetings of the Authority may be held at any time and place upon the call of any individual Authority member ~~upon with~~ at least twelve hours' written notice to each member. ~~served personally or left at his usual place of business or residence.~~ Notice of any special meeting of the Authority may be waived in writing either before or after the meeting and shall be deemed waived by attendance at any such meeting. Special meetings shall be held at such place and time as ~~may be~~ specified in the notice thereof and in accordance with the Code of Virginia.
3. If any disagreement in the conduct of any meeting or the order of business shall arise, the rules of parliamentary procedures as set forth in the most recent edition of Robert's Rules of Order shall prevail, providing that the terms and conditions of the Articles of Incorporation for the Roanoke Valley Resource Authority and the Roanoke Valley Resource Authority Members Use Agreement shall in all cases be controlling.
4. In absence of the Chairman and Vice-chairman, the Authority shall appoint a Chairman pro tempore who shall preside at the meeting.
5. Participation in meetings through electronic communication - Any Board member who is unable to attend a regular or special meeting in person due to (i) an emergency or a personal matter, or (ii) a temporary or permanent disability or other medical condition, may participate in the meeting through electronic communication from a remote location that may not be open to the public, subject to the following:
  - A. A quorum of the Board is physically assembled at the central meeting

location.

- B. The member notifies the chairperson on or before the day of the meeting that he or she is unable to attend (i) due to an emergency or personal matter identified with specificity, or (ii) due to a temporary or permanent disability or other medical condition that prevents the member's physical appearance. A member may participate in a remote meeting due to an emergency or personal matter at no more than two (2) meetings in each calendar year.
- C. The Board records in its minutes the (i) specific nature of the emergency or personal matter or the fact of the disability or medical condition, and (ii) the remote location from which the member is participating.
- D. The Board arranges for the voice of the absent member to be heard by all persons in attendance at the central meeting location. The Board by motion shall vote to approve or disapprove the member's electronic participation. If the absent member's remote participation is disapproved because such participation would violate this Section, such disapproval shall be recorded in the Board's minutes.

### **ARTICLE III - OFFICERS AND THEIR DUTIES**

1. The Authority shall annually elect a Chairman and a Vice-chairman from their membership, and a Secretary and Treasurer. The Secretary and Treasurer need not be members of the Authority. The offices of Secretary and Treasurer may be combined. The Authority may appoint a Chief Executive Officer, who shall not be an Authority member, who shall exercise such powers and duties as may be delegated to him by the Authority.
2. The Authority shall, at its annual meeting each year, or if a quorum is not present at such meeting, then at the next regular meeting or at the next special meeting called for such purpose at which a quorum is present, elect officers to hold office for one year or until their successors are duly elected and qualified unless their term of office shall expire or they are removed prior to such time. If any offices

become vacant during the year for any cause, the Authority shall at the next regular meeting fill the same.

3. The Chairman, or in his absence the Vice-chairman, shall preside at all meetings of the Authority and perform all of the duties commonly incident to such office and shall perform such other duties and have such other powers and authority as may be conferred from time to time by the Authority in accordance with law.
4. The Secretary shall have charge of the seal and perform all of the duties commonly incident to such office and shall perform such other duties and have such other powers and authority as may be conferred from time to time by the Authority in accordance with law. The Secretary shall act as recording secretary of the Authority.
5. The Treasurer shall have custody of all the Authority's funds and shall deposit them in the Authority's name in such bank or banks as the Authority may select and shall at all reasonable times exhibit his books and accounts to any member of the Authority or to any members of the governing bodies of any member participating political subdivision. In addition, the Treasurer shall perform all of the duties commonly incident to such office and shall perform such other duties and have such other powers and authority as may be conferred from time to time by the Authority in accordance with law.
6. The Chief Executive Officer shall perform such duties as may be incidental to his position or assigned to him. With the approval of the Authority, he may employ such person or persons as may be necessary in the operation of landfill facilities within the funds that are allocated for such purposes.
7. The Chief Executive Officer and the Treasurer shall be bonded in an amount deemed reasonable to cover funds at their disposal, the cost of such bond to be paid out of the Authority's funds.

8. The Authority may contract with a participating political subdivision for services to produce warrants or checks for expenditures of the Authority. Such warrants or checks shall be created and issued upon the written request of the Authority's Chief Executive Officer and the Chairman or his written designee.
9. A monthly statement of receipts and disbursements shall be submitted by the Authority's Chief Executive Officer to the Treasurer and the Authority.

#### **ARTICLE IV – AMENDMENTS**

These By-Laws may be amended or repealed and new By-Laws may be made by unanimous vote of all representatives of the Authority at any regular or special meeting of the Authority.

**UNANIMOUSLY ADOPTED** at the organizational meeting of by the Roanoke Valley Resource Authority Board held on this \_\_\_\_\_ day of \_\_\_\_\_, 2025.

APPROVED:

ATTEST:

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Chairman, RVRA

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Board Secretary, RVRA

c: Members of the Roanoke Valley Resource Authority Board  
Richard Caywood, County Administrator, Roanoke County  
Valmarie Turner, City Manager, City of Roanoke  
Pete Peters, Town Manager, Town of Vinton  
Christopher Dorsey, City Manager, City of Salem  
Jonathan Lanford, Chief Executive Officer, RVRA  
Jim Guynn, Legal Counsel

**ITEM NO. II.B**  
**BUSINESS - ACTION ITEM**

**AT A REGULAR MEETING OF THE ROANOKE VALLEY RESOURCE AUTHORITY:**

**MEETING DATE:** December 3, 2025

**AGENDA ITEM:** Resolution adopting revised Employee Handbook

**SUBMITTED BY:** Jonathan A. Lanford, Chief Executive Officer  
Lorie Bess, Administrative Coordinator

**SUMMARY:**

Mr. Haskell Brown has been working diligently to assist us in updating our 2009 Employee Handbook, to bring it up to date with current practices and laws. Some clarity is provided for certain topics, including short- and long-term disability benefits. The Handbook also includes updated policies for drug/alcohol/controlled substance use. Some key updates include:

- Section 2.2 Language added to describe how criminal history reports should be handled. The wording comes from the Virginia Department of Human Resource Management's policies, which reflects best practice.
- Section 3.15 Tuition Reimbursement Program – Language added to clarify to employees that in return for tuition assistance, they will be asked to sign a memo acknowledging they will continue employment with RVRA for three years from the date of their certificate/degree. In the event they do not remain employed with RVRA within those three years they will be responsible for repaying the costs associated with their program. Any such repayment will be prorated such that they will owe 100% of the cost if they leave within year one, 50% if they leave during the second year, and 33% during the third year.
- Section 3.9 Regarding the 20-year service pay. Rewritten to clarify the process outlined by the Payroll Department.
- Section 4.1.1 Clarification that information on STD and LTD benefits can be found in the benefit enrollment guide, not the Employee Handbook.
- Section 4.1.8 Language is added noting that RVRA follows Roanoke County's short- and long-term disability HR Management Policies.
- Section 4.9(A) Rewritten to reflect the Authority's adherence to the state's holiday calendar.
- Section 4.9(C) Floating holidays - this section is deleted.
- Section 5.9.1(B) The reference to an exit interview has been deleted.
- Section 6.5.17(F) The highlighted text in the middle of the statement has been deleted.

Section 7.1.3      Addresses marijuana and/or cannabis oil, particularly for medicinal uses. This Section addresses that you follow the normal FMSCA-prescribed policy for all FMSCA-covered employees, meaning they are not permitted for medicinal cannabis oil use under the state statute. Non-FMSCA employees must provide a “practitioner’s” certification to be protected under the state statute, and they are still not allowed to be impaired at work or possess these substances at work.

**RECOMMENDATION:**

It is recommended that the Board approve the attached resolution to adopt the revised Employee Handbook, as presented.



## **RESOLUTION OF THE ROANOKE VALLEY RESOURCE AUTHORITY**

**Adopted this <DATE> of <MONTH>, 2025  
NO. <NUMBER>**

A RESOLUTION adopting a new Employee Handbook for the Roanoke Valley Resource Authority setting forth the Authority's policies and procedures concerning employment matters.

**BE IT RESOLVED** by the Roanoke Valley Resource Authority that:

1. The attached document entitled "Roanoke Valley Resource Authority, Employee Handbook," dated <DATE>, 2025, is hereby adopted pursuant to section 15.2-5114 of the Code of Virginia as the Authority's policies and procedures concerning employment matters.
2. All prior resolutions or other actions of the Roanoke Valley Resource Authority addressing the subject of employment, human resources, or personnel policies and procedures are hereby superseded and repealed.

On motion of \_\_\_\_\_ to adopt the resolution, seconded by \_\_\_\_\_ and carried by the following roll call vote:

**AYES:**

**NAYES:**

**ABSENT:**

**ATTEST:** \_\_\_\_\_  
Lorie Bess, Board Secretary

**ROANOKE VALLEY RESOURCE AUTHORITY**  
**EMPLOYEE HANDBOOK**

Approved via Resolution No. <NUMBER>,  
adopted <DATE>, 2025

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## CHAPTER 1 – GENERAL CONDITIONS OF EMPLOYMENT

### 1. General Conditions of Employment.

#### 1.1 Roanoke Valley Resource Authority.

- A. The Roanoke Valley Resource Authority, hereinafter in this handbook referred to as the “Authority,” was originally established in 1989 pursuant to the Virginia Water and Waste Authorities Act, title 15.2, chapter 28 of the Code of Virginia. That act, the Authority’s articles of incorporation, and its by-laws provide its purpose, powers, and governance structure. The Authority establishes policy and procedures, passes resolutions, sets tipping fees, and approves the budget.
- B. The Chief Executive Officer is a full-time official appointed by the Authority. The duties of this position are specified in the Authority’s by-laws, Authority resolutions, and other official Authority actions. These duties include acting as the Chief Executive Officer of the Authority, preparing the Authority’s annual budget, and executing resolutions, policies, and orders of the Authority.

#### 1.2 Equal Employment Opportunity.

The Authority complies with all federal, state, and local laws regarding equal employment opportunities, including Title VII of the Civil Rights Act of 1964, 42 U.S.C. §§ 2000e—2000e17; the employment-related provisions of the Americans with Disabilities Act, 42 U.S.C. §§ 12111—12117, and the Virginia Human Rights Act, Va. Code §§ 2.2-3900—2.2-3909. Accordingly, all applicants for employment and employees are afforded equal opportunity in all aspects of employment without regard to the applicant or employee’s race, color, religion, sex, sexual orientation, gender identity, marital status, pregnancy, childbirth or related medical conditions including lactation, age, military status, disability, or ethnic or national origin. This policy of equal employment opportunity applies to all practices and procedures relating to recruitment and hiring, compensation, benefits, termination, and all other terms and conditions of employment. The Authority also maintains a harassment-free workplace as set forth in this handbook. Applicants and employees may direct their questions about these equal employment opportunity policies or requests for reasonable accommodation to the Administrative Coordinator.

#### 1.3 Interpretations.

The Chief Executive Officer shall have the final authority to interpret the policies and procedures set forth in this handbook and shall have the authority to ensure full compliance with such policies. This handbook shall not be construed to limit the authority of the managers and supervisors of the Authority’s work units to make policies and procedures governing the conduct and performance of employees under their management or supervision provided that such policies and procedures shall not conflict with this handbook, actions of the Authority’s Board, or the directives of the Chief Executive Officer.

## CHAPTER 2 – APPLICATION AND HIRING PROCESS

### 2. Application and Hiring Process.

**2.1 Application Process.** Each applicant for Authority employment must complete an Employment Application form. Employment Application forms are available on the Authority's website or by contacting the Administrative Coordinator. The Authority accepts applications only for posted positions that are currently vacant. A closing date established for receipt of applications for vacant positions will accompany all vacancy announcements. Only qualified applicants meeting the minimum job requirements will be considered for interviewing. Upon completion of the hiring process, the selected applicant and all others will be notified.

**2.2 Qualifications for Employment.** All appointments shall be based on legitimate, non-discriminatory reasons, including merit and suitability for the position. To be considered for a position, an applicant must be able to perform the essential functions of the job with or without a reasonable accommodation where required by the Americans with Disabilities Act. Depending on the identified position and after the conditional job offer, the applicant may be required to pass a medical examination or test completed by an Authority-chosen physician in addition to the pre-employment drug and alcohol screening required for all new employees. The Authority will pay the cost of the alcohol and drug screening and any required medical examination or test. Unsuccessful completion of the medical examination or a positive alcohol or drug test may result in rejection of the applicant for employment with the Authority. The Authority also may require medical examination periodically throughout employment for positions where physical standards must be maintained. At the time that an applicant undergoes the pre-employment drug and alcohol screening required for all new employees, the Authority will conduct a criminal history records check on the applicant. Offers of employment may specify that the offer is contingent on receipt of an acceptable criminal history report and that the offer may be rescinded based on information obtained from that report. The Authority will not retain a criminal history report after the hiring process is complete, will destroy the report after a hiring decision is made, and will retain a brief note regarding the outcome of the criminal history records check in a confidential portion of the recruitment file. For the applicant rejected because of background information, the note should indicate that this applicant was the preferred choice based on qualifications, interview, etc., but did not receive an offer (or had a conditional offer retracted) because of information obtained through a criminal history records check. For the person hired, the note should indicate that as of the date of the criminal history report, a criminal history records check revealed no problem areas related to this employment.

**2.3 Application for Positions Requiring Operation of Authority Motor Vehicles.** Applicants for positions requiring the operation of an Authority-owned motor vehicle must possess a valid Virginia driver's license, including a Commercial Driver's License, if necessary, at the time of employment. The Authority will require such applicants to show proof of possession of the required license and to submit a copy of their Division of Motor Vehicles driving record. Employees whose driving records do not meet the standards

required by the Authority or its insurer may be ineligible for hire. Employees who are required to drive an Authority vehicle may also be required to complete a defensive driving course, as required by their supervisor, within the initial probationary period, or at any other time the Authority deems appropriate.

**2.4 Work Authorization.** The Immigration Reform and Control Act of 1986 makes it illegal for employers to employ anyone who is not legally authorized to work in the United States. Within three business days of the date employment begins, all new employees must provide documentation that is identified on the I-9 form (Employment Eligibility Verification form) to establish their identity and authorization to work in the United States. If an employee is authorized to work in the United States but is unable to present a required document within three business days after the first day of work for pay, the employee must present a receipt for the application of the document within that three-business-day period and the actual document within 90 calendar days after the first day of work for pay. Employees will be suspended during this time and will not be permitted to work. Failure to provide the required documents within the required time periods will result in immediate termination.

**2.5 Types of Employment.** The Authority has the following three types of employees:

- A. A regular employee serves in an established position specified in the Authority's classification plan, is eligible to receive all employee benefits as described in this handbook, is paid on a salaried basis.
- B. A temporary employee serves in a position only for a specific duration, normally of no more than six months, is ineligible to receive employee benefits as described in this handbook except as otherwise provided by law, and is paid on an hourly basis.
- C. A part-time employee serves in a position for which the work hours are on average less than 30 hours of service per week, is ineligible to receive employee benefits as described in this handbook except as otherwise provided by law, and is paid on an hourly basis.

Each employee, regardless of classification, is employed on an at-will basis, and neither this handbook nor any other policy, procedure, regulation, or rule of the Authority shall be interpreted or construed to create a contract for employment or otherwise make any employee other than an at-will employee.

**2.6 Orientation.** The Administrative Coordinator will meet with each new employee before the employee begins work (i) to provide the new employee with this employee handbook, the Authority's Employee Safety Manual, and information about any applicable employee benefits such as health insurance, group life insurance, flexible spending accounts, retirement benefits, and the Employee Assistance Program; (ii) to collect from the new employee the applicable completed forms such as the I-9 form, the tax withholding forms, the receipt acknowledgments such as those required for this handbook and the Employee Safety Manual, and the required forms for the new employee to participate in any of the applicable employee benefits such as health insurance, group life insurance, flexible

spending accounts, and retirement benefits; and (iii) to answer any questions the new employee may have about the conditions of employment.

## **2.7      Probationary Period.**

- A. The work and conduct of a new employee during the first six months of employment are considered a working test period, or “probationary period.” During this period, an employee is required to demonstrate the employee’s ability to perform the employee’s essential job functions and the employee’s suitability as an employee of the Authority. An employee may be dismissed at any time during the probationary period with no right of appeal through the grievance procedure, except that a dismissed employee who claims that the basis of the employee’s dismissal is unlawful discrimination may appeal such a dismissal through the grievance procedure. Upon successful completion of the probationary period, employment continues on an at-will basis.
- B. A probationary employee’s supervisor may evaluate a probationary employee after three months from the date of employment and after six months from the date of employment, or as determined by the Authority’s needs. Such evaluation is intended to give both the employee and the supervisor the opportunity to discuss their working relationship and make improvements, if necessary. During this evaluation, the supervisor has the option to transfer the probationary employee to regular employment, to extend the probationary period, or to dismiss the probationary employee.
- C. With the approval of the Chief Executive Officer, the supervisor may extend the probationary period for up to six additional months when, among other things, the employee’s ability to meet essential job functions is questionable or the duties of the job require additional training. The supervisor will set forth in writing the reasons for extending the probationary period. In the case of an extended probationary period, the employee will be evaluated, at a minimum, one week prior to the completion of the extended probationary period.
- D. A probationary employee accrues flexible leave at the prescribed rate and may use flexible leave after it has accrued, subject to the employee’s appropriate use of leave and the approval of the employee’s supervisor.

## CHAPTER 3 – COMPENSATION AND BENEFITS

### 3. Compensation and Benefits.

#### 3.1 Classification Plan and Merit Pay.

##### 3.1.1 Classification Plan.

- A. The Authority's Classification Plan establishes the pay of all regular employees. The Chief Executive Officer prepares the Classification Plan, and the Authority's Board approves the Classification Plan. The Classification Plan contains job descriptions, class codes, and pay grades covering all positions. The Authority will administer the Classification Plan fairly and consistently and will compensate all positions according to the duties and responsibilities required in their job performance.
- B. The Classification Plan establishes pay ranges or "grades" for each position. Each grade consists of a minimum rate of pay and a maximum rate of pay for a position in that grade. Initial employment is normally at the minimum rate of pay for the position. If a new employee's qualifications exceed the minimum qualifications of the position, that employee may be appointed at ten percent or more above the minimum rate for the position with the approval of the Chief Executive Officer.
- C. An employee's pay rate may not exceed the maximum rate for the employee's position.
- D. The Classification Plan identifies those grades and positions classified as exempt and non-exempt for Fair Labor Standards Act purposes.

##### 3.1.2 Merit Pay.

- A. The Authority may provide bonuses or merit pay increases in its annual budget to reward employees that have performed their job duties in a meritorious manner as determined by their annual performance evaluation. Bonuses or merit increases may only be given after a satisfactory or better annual performance evaluation during that specific performance period. A bonus is a one-time payment awarded to an employee in addition to the employee's salary or wages. An increase is a permanent change to an employee's salary or wage rate.
- B. Bonuses and merit increases may vary from year to year and employee to employee based on budget constraints and job performance. Bonuses and merit increases are not guaranteed. In addition to an annual merit increase, employees that have shown outstanding performance may receive an additional meritorious increase upon recommendation of the supervisor and approval of the Chief Executive Officer.

- C. A bonus or a merit increase will not be awarded to an employee who does not receive at least a satisfactory annual performance evaluation. However, after a re-evaluation of the employee's performance, the Chief Executive Officer may approve a bonus or merit increase upon recommendation of the employee's supervisor.

**3.2 Recording Work Hours.** Employees covered by this handbook must accurately record all work hours and leave time on an approved time sheet or time card. The standard workweek for payroll purposes begins on Saturday at 12:01 a.m. and ends on Friday at 12:00 midnight. Employees must submit time sheets or cards to their supervisor after the biweekly pay period is complete. The employee's supervisor verifies and approves hours worked and time records are forwarded to the Administrative Coordinator.

**3.3 Payroll Administration.** Roanoke County government administers the Authority's payroll. Accordingly, all payroll disbursements of the Authority will be made in a manner consistent with County procedures and follow the County payroll cycle. Currently, employees are paid biweekly, paydays occur on alternate Fridays throughout the year, and if a payday falls on a holiday, employees are paid on the workday before the holiday. Employees should not discuss their pay with other employees or other persons outside the Authority except as permitted or required by law.

**3.4 Direct Deposit.** The County, on behalf of the Authority, provides electronic funds transfer into employee accounts in lieu of a physical paycheck. All new full-time employees are required to participate in direct deposit. Part-time employees who work on a weekly basis also may participate in direct deposit if they choose.

**3.5 Deductions.** The County, on behalf of the Authority, will deduct all amounts from employee paychecks as required by applicable state and federal laws and will honor any lawful garnishment presented to the Authority or the County. In addition, the County, on behalf of the Authority, will make certain other deductions from employee paychecks that the employee requests. Examples of such voluntary deductions include health insurance premium contributions, retirement contributions, and deferred compensation contributions.

**3.6 Overtime Compensation.**

**3.6.1 FLSA Compliance.** The Authority intends to comply with all requirements of the Fair Labor Standards Act and its associated regulations and to classify and pay the Authority's employees correctly. Improper pay deductions are prohibited. If an employee believes that the employee has been paid incorrectly or that improper deductions have been made from a paycheck, the employee must contact the Administrative Coordinator. If it is determined that pay is incorrect or a deduction was improper, the Authority will correct the pay or deduction and make any reimbursements due to the employee.

**3.6.2 Status Determination.** The Authority will determine the Fair Labor Standards Act status of each position in accordance with applicable federal regulations as either "nonexempt" or "exempt." To be classified as exempt, an employee's salary and duties must meet the

federal requirements for classification as administrative, computer, executive, or professional. Those employees whose job duties do not fall into these categories are classified as nonexempt. The Administrative Coordinator or the employee's supervisor will inform the employee of that employee's Fair Labor Standards Act status upon hiring.

**3.6.3 Non-Exempt Employees.** For nonexempt employees, overtime compensation will begin for all hours actually worked over 40 during the established workweek (i.e., Saturday at 12:01 a.m. through Friday at 12:00 midnight). The Authority provides overtime compensation in the form of time and one-half the nonexempt employee's hourly pay rate. Flexible leave, holiday, or sick leave hours are not considered actual work hours for the purpose of calculating overtime. Management may reschedule employees during the work period so that no more than the regularly scheduled 40 hours are worked.

**3.6.4 Exempt Employees.** Exempt employees are expected to work the hours necessary to complete the job and do not accumulate or record overtime hours worked. Exempt employees, with the approval of their supervisor, are eligible to take time off at their discretion based on hours that have been worked beyond the normal workweek.

**3.7 Standby and On-Call.** The Authority may have a need for essential work to be performed outside regularly scheduled hours. Employees who are required to perform this work are placed on either standby or on-call status and are called back to work if necessary.

**3.7.1 Standby.** Standby is a preplanned status where employees are required to be available for specified periods of time to perform essential work outside regularly scheduled hours and are paid. Employees on standby status are not restricted in the use of personal time, but must be available for call back when contacted by beeper, radio, telephone, or other prearranged means and must be in compliance with the Authority's substance abuse policy set forth in this handbook when reporting for work. Standby time is not considered hours worked. Nonexempt employees are paid in accordance with this handbook and applicable law for all time worked if called back to work. In addition, employees on standby will receive two additional hours pay if not called back while on standby. Employees on standby status who do not respond when called for work may be subject to disciplinary action up to and including dismissal. The Chief Executive Officer must approve standby status for each employee.

**3.7.2 On-Call.** On-call is a status designated in the employee's job description or by the employee's supervisor that subjects the employee to being called back to work outside regularly scheduled hours. Employees do not receive any type of compensation for on-call status. Call-back for employees on-call is normally not as frequent as for those on standby status. The Authority's substance abuse policy set forth in this handbook applies to on-call employees who are called back to work.

**3.8 Acting Status Compensation.** An employee who is required to assume the duties of another employee in a higher pay grade is entitled to acting status compensation. This compensation is a temporary ten percent increase in the employee's salary, or to the minimum of the pay grade, whichever is more. The employee fulfilling acting status will

receive the appropriate compensation beginning on the first day of the pay period following two consecutive weeks of acting duty status.

**3.9 20-Year Service Pay.** When a full-time employee has reached 20 years of continuous, full-time service with the Authority, the employee is eligible for an additional \$600.00 of pay each year or as otherwise approved by the Authority. This payment is provided as a lump sum at the time of, but separate from, the employee's salary payment on the second pay date in June. These payments will begin on the first such second pay date in June after the employee's 20<sup>th</sup> anniversary of full-time service. If an employee leaves Authority service for any reason during the fiscal year prior to the second pay date in June, the employee will not receive the additional lump sum payment for that fiscal year.

**3.10 Benefit Package.** The Authority offers a benefit package for its regular employees only that includes the following and related benefits:

1. Health, vision, and dental insurance;
2. Flexible spending account;
3. Short- and long-term disability insurance;
4. Life insurance;
5. Long-term care insurance;
6. Virginia Retirement System retirement benefits; and
7. Deferred compensation program.

Roanoke County administers the benefits in this benefits package on the Authority's behalf, and the provisions governing this benefits package are published annually in a benefit enrollment guide. The Administrative Coordinator provides this benefit enrollment guide to all new employees upon hire and to all employees as part of the County's regular benefit enrollment efforts. For more information about these benefits, employees should consult the benefit enrollment guide or consult the Administrative Coordinator.

**3.11 Unemployment Compensation.** Authority employees who are separated from their jobs are eligible to apply for unemployment compensation. They may do so through the Virginia Employment Commission. After application is made, eligibility is determined on an individual basis by the Virginia Employment Commission.

**3.12 Workers' Compensation.**

A. Workers' compensation insurance may pay related medical expenses, at no cost to the employee, for an accident or qualifying illness that occurs as a result of work as set forth in the Virginia Workers' Compensation Act. Workers' compensation

coverage is provided for full-time, part-time, and temporary employees and authorized volunteers. In addition, the employee may be entitled to compensation to help offset the loss of wages while unable to work. Employees do not share in the cost of workers' compensation; the Authority pays the entire cost.

- B. To be considered for full workers' compensation, accidents on the job must be reported to the employee's supervisor immediately. The *Report of Accident or Injury* and the *Panel of Physicians* forms must be completed by the supervisor and employee and forwarded to the Administrative Coordinator within two working days of the accident. These forms are to be completed even if the employee does not receive medical treatment. The Authority's workers' compensation third party administrator reviews all claims that are submitted for eligibility.
- C. During the first seven calendar days that a regular full-time employee is absent from work because of job-related illness or injury, the employee must use accrued sick leave or Flexible Leave hours to receive full pay. Also, during this period, employees participating in the Flexible Leave Plan may use their Frozen Sick Balance, if available, in lieu of Flexible Leave after using two consecutive days of Flexible Leave. After the first seven calendar days and up to the next 90 working days, the employee could receive full pay at the recommendation of the Operations Manager and approval of the Chief Executive Officer. The Chief Executive Officer may grant up to an additional 60 days with pay in special instances. If the employee is absent more than 21 calendar days because of an approved job-related illness or injury, the Authority will reinstate the leave that was used. In order to receive full pay, the employee must sign over any Workers' compensation checks to the Authority.
- D. State law allows the Authority to designate a panel of three physicians that the employee must choose from for an examination verifying the extent of injury or illness. Except as provided by law, if an employee chooses to be treated by a physician other than one on the Authority's panel of physicians, the employee may be responsible for medical expenses related to that treatment.
- E. In cases of job-related injury or illness that extends beyond approved limits or in cases of permanent disability, the employee will receive the compensation allowed under the Virginia Workers' Compensation Act. The employee will not be on pay status with the Authority during this time and, therefore, will not accrue leave hours.
- F. Questions regarding workers' compensation may be directed to the Administrative Coordinator.

**3.13 Social Security.** The Authority contributes to the Social Security contribution for each employee as required by law. The balance of the contribution is deducted from each employee's salary. These payments are then credited to each employee's account. All contributions made to Social Security by the employee and the employee's employers are

totaled and determine the amount of Social Security benefits that the employee will receive upon retirement.

**3.14 Employee Assistance Program.** The Authority offers Employee Assistance Program services as a benefit to employees. Full-time employees and their immediate family members including spouses, children, parents, or other relatives living in the employee's household, may obtain confidential, professional assistance in resolving personal problems through the Employee Assistance Program. The Employee Assistance Program provides professional counseling and referral services. Its purpose is to help employees and their families identify, resolve, and gain control over personal or work-related problems that may be interfering with work and daily life. The employee or the immediate family member may contact the Employee Assistance Program directly. The supervisor may refer an employee to the program as well. This referral is in strict confidence. The employee should contact the employee's supervisor or the Administrative Coordinator for more information on the Employee Assistance Program.

### **3.15 Tuition Assistance Program.**

#### **3.15.1 Purpose.**

- A. The Tuition Assistance Program assists eligible employees with eligible costs associated with certain course work, including tuition, enrollment, or registration fees and the cost of educational or training materials such as textbooks.
- B. The Authority's Tuition Assistance Program helps employees pursue professional growth and development with the Authority by providing assistance for non-mandatory, job-related course work. The Tuition Assistance Program is not intended to replace job skills training, seminars, workshops and other training provided by the employee's work unit or required for the job.

#### **3.15.2 Eligibility.**

- A. The Tuition Assistance Program may be used for completion of (i) higher education such as an associate's, bachelor's, or master's degree, (ii) a high school equivalency examination (formerly known as "GED"), (iii) a certificate or technical course of study, (iv) a Commercial Driver's License or other licensure program, (v) or a single, job-related course. The course work should be related to the current position or prepare the employee for promotion.
- B. Employees who are eligible for educational assistance from other sources, including veterans' benefits, grants, or scholarships, must exhaust those sources before applying for the Authority's Tuition Assistance Program. An employee may still be eligible for the Tuition Assistance Program if the employee receives student loan money for course work.

C. Only regular, full-time, non-probationary employees are eligible to apply for the Tuition Assistance Program. The Tuition Assistance Program is not available to employees who are on extended leave without pay.

**3.15.3 Requirements.**

- A. Employees must apply for the Tuition Assistance Program to the Chief Executive Officer through the Administrative Coordinator. Applications must provide information that describes the course work and explains how the course work would relate to the employee's performance in the employee's current position or prepare the employee for a promotion. The Chief Executive Officer must approve the employee's application prior to the employee's registration for the course work in order for the employee to participate in the Tuition Assistance Program.
- B. For all course work for which assistance is sought pursuant to the Tuition Assistance Program, (i) the employee must achieve at least a grade of "C" or its equivalent for all high school and undergraduate courses, at least a grade of "B" or its equivalent for all graduate courses, and a passing grade for all courses taken on a pass/fail basis, and (ii) the employee must submit a copy of the employee's grade report for all course work to the Administrative Coordinator.
- C. Employees may not use Authority time to take non-mandatory courses unless approved by the Chief Executive Officer.
- D. The Authority will provide financial assistance to employees approved to participate in the Tuition Assistance Program for tuition, enrollment, or registration fees and the cost of education or training materials such as textbooks.

**3.15.4 Contract.** The employee must sign a Tuition Assistance Program Contract in a form prescribed by the Chief Executive Officer, with the assistance of the Authority's General Counsel, as a condition of participating in the Tuition Assistance Program. The Tuition Assistance Program Contract will obligate the employee to repay to the Authority:

- (i) 100 percent of the amount of assistance provided to the employee pursuant to the Tuition Assistance Program if the employee's service is terminated for any reason during the first year following the date on which the employee completes the course work;
- (ii) 50 percent of the amount of assistance provided to the employee pursuant to the Tuition Assistance Program if the employee's service is terminated for any reason during the second year following the date on which the employee completes the course work; or
- (iii) 33 percent of the amount of assistance provided to the employee pursuant to the Tuition Assistance Program if the employee's service is terminated for any reason

during the third year following the date on which the employee completes the course work.

### **3.16 Recognition of Employees.**

**3.16.1 Length of Service.** The Authority may recognize and award employees for their years of service with the Authority. Employees are honored annually by appropriate service awards. Employees are recognized for five-year increments of consecutive Authority service.

**3.16.2 Outstanding Performance.** The Authority may recognize employees who have provided outstanding performance in their duties or for exemplary customer service to either external or internal customers. These employees may receive a certificate and other appropriate means of recognition.

**3.17 Uniform Allowance.** The Authority furnishes certain regular employee positions with work-related apparel and provides an annual allowance toward the cost of any additionally required work-related apparel, including pants and safety shoes, not directly supplied by the Authority. Uniform allowance limits and specifications are subject to change by the Authority from year-to-year. Employees will be provided with minimum specifications for all work-related apparel to be purchased and worn by Authority employees. It is the Authority's intent to have its employees outfitted in a uniform manner such as to protect its employees with proper attire and to present a readily identifiable, visible, and professional workforce. Eligible employees will be reimbursed for their expenses, up to the annual allowance limits, upon presentation of appropriate documentation to the employee's direct supervisor exhibiting the purchased apparel meets the Authority's minimum specifications. Apparel directly provided by the Authority and any additionally required and reimbursed apparel constitute the employee's daily work uniform. Employees must wear the designated uniform, as instructed for each position. It is the employee's responsibility to clean and maintain all required apparel and ensure that the employee represents the Authority in a professional manner at all times at the workplace. New employees will be given 60 days after their hire-date to purchase any work-related apparel required by the Authority, except for safety shoes which must be purchased by the employee prior to beginning work. Failure or refusal to comply with the Authority's uniform requirements is grounds for disciplinary action up to and including dismissal.

## CHAPTER 4 – LEAVES OF ABSENCE

### 4. Leaves of Absence.

#### 4.1 Flexible Leave Plan.

**4.1.1 Purpose.** The Flexible Leave Plan is a comprehensive program that recognizes the many diverse needs of employees for time off from work, and includes a disability plan for income protection. Hours accrued in the Flexible Leave Plan may be used for any purpose when scheduled in advance or at times when unforeseen circumstances cause an unscheduled absence. An integral part of the Flexible Leave Plan is short- and long-term disability insurance to cover periods of extended illness or injury. Employees are automatically enrolled in the disability plans as a part of the Flexible Leave Plan. Additional information on short- and long-term disability insurance may be found in the benefit enrollment guide referred to in section 3.10 of this handbook.

**4.1.2 Applicability.** All employees have only the Flexible Leave Plan available for the accrual of leave time. Employees hired before February 25, 2009, may have sick leave in the Frozen Sick Balance governed by section 4.11 of this handbook.

**4.1.3 Accumulation.** Full-time employees will accrue Flexible Leave hours based on their years of continuous service with the Authority. Leave is applied biweekly to the employee's payroll record according to the following table:

| Years of Service | Annual Accumulation | Biweekly Accumulation |
|------------------|---------------------|-----------------------|
| 0 up to 4        | 20 days             | 6.16 hours            |
| 5 up to 9        | 23 days             | 7.08 hours            |
| 10 up to 14      | 26 days             | 8.00 hours            |
| 15+              | 29 days             | 8.93 hours            |

Flexible Leave may be taken in quarter-of-an-hour (i.e., 15-minute) increments and is available for use after leave accruals have been applied. Unless the employee has accrued Flexible Leave available for use, he or she will not be granted Flexible Leave. Absences with pay due to Flexible Leave, civil leave, military leave or other types of paid leave do not affect the Flexible Leave accumulation. However, Flexible Leave will not accrue for any unpaid absence of 40 hours or more per biweekly pay period. This applies to new employees, those leaving the Authority's service, and employees on leave without pay. Flexible Leave will accrue for all employees serving a probationary period. Employees may accumulate Flexible Leave not to exceed 600 hours (i.e., 75 days) by the last pay period of any fiscal year (which ends on June 30) or when the employee leaves the Authority's service.

**4.1.4 Scheduling Flexible Leave.** Although Flexible Leave is a benefit provided for employees to self-manage their time off, it should be scheduled so the ongoing work effort in a work unit is still productive. Flexible Leave may be used for any purpose and should be

scheduled as far in advance as possible. Leave requests must be submitted no less than three working days in advance and approved by the employee's supervisor. The supervisor may waive the three-day requirement in emergency circumstances or when an unforeseen circumstance causes an unscheduled absence. In some work units, Flexible Leave must be requested more than three days in advance. The employee's supervisor will inform the employee when hired if a longer submission time applies. An employee who is utilizing Flexible Leave on the basis of a medical authorization may not work at the employee's secondary employment, if applicable, unless the employee receives the prior permission of the employee's Operations Manager.

#### **4.1.5 Flexible Leave upon Termination.**

- A. Employees who leave the Authority's service are entitled to payment for Flexible Leave up to the maximum accrual rate of 600 hours (i.e., 75 days). This includes retirement, voluntary resignation, or death. Accrued unused Flexible Leave will not be paid upon termination of employment for violation of Authority policies. The Authority will pay the employee once all Authority property is returned and any debt to the Authority is settled.
- B. An employee is expected to give a two-week notice of resignation. Any Flexible Leave taken during this time must be approved by the employee's supervisor and must not interfere with the ongoing work effort of the work unit. Flexible Leave cannot be used to extend a resignation past the two-week notice.

#### **4.1.6 Holidays during Flexible Leave.** Any scheduled holiday that falls during an employee's Flexible Leave time will not be charged to that employee's Flexible Leave balance.

#### **4.1.7 Verification and Notification.** An employee's supervisor has the right to request verification of absences reported as unscheduled Flexible Leave by requiring a physician's statement. When an unforeseen need for Flexible Leave occurs, the employee must notify the employee's supervisor no later than the beginning of the employee's shift, except in cases of emergency. In some work units, a longer notification period may be required. The employee's supervisor will inform the employee if this applies. Failure to notify the supervisor of an absence, except in an emergency situation, is considered grounds for counseling or disciplinary action, or both.

#### **4.1.8 Extended Illness or Disability.** The Authority follows and applies Roanoke County's HR Management Policies concerning short- and long-term disability because Roanoke County administers the benefits in the Authority's benefits package, including those relating to short- and long-term disability, on the Authority's behalf. It is recommended that employees maintain enough Flexible Leave hours to cover unexpected absences, including Family and Medical Leave Act-related absences, workers' compensation-related absences, and the short-term disability waiting period. If an employee will be out of work because of a prolonged illness or injury, the employee should refer to the portions of the benefit enrollment guide referred to in section 3.10 of this handbook describing short- and long-term disability benefits or contact the Administrative Coordinator for more information.

**4.1.9 Cash-In Option.** Employees may receive pay for accrued Flexible Leave rather than taking this time off from work. Banked holiday hours or Frozen Sick Balance hours may not be used for the cash-in option. To be eligible for the cash-in option, employees must maintain a minimum 40-hour balance of Flexible Leave after the cash-in payment is made. Employees may cash-in a maximum 40 hours of accrued Flexible Leave per cash-in period. The cash-in periods are available only during May and November of each fiscal year. A completed “Cash-In Request Form” must be received by the Administrative Coordinator by the first of the month for the respective cash-in period. Payouts will be made during the last regularly scheduled pay period of the cash-in period month. Cash-in hours will be paid at the employee’s regular hourly rate at the time of the request and payment will be made separate from the employee’s regular pay. Pay received from the cash-in option can be rolled over into the employee’s deferred compensation plan if the employee has an established account. The employee may not defer more than the annual maximum contribution and is responsible for ensuring that any cash-in rollover does not exceed the maximum amount. If the employee is already contributing the annual maximum, the cash-in payment may not be rolled into their deferred compensation plan.

**4.2 Maternity/Paternity.**

- A. The period of time an employee is medically disabled resulting from a pregnancy-related condition is treated as any other illness or disability described in this chapter. This period of time may be charged to earned Flexible Leave or, if available, Frozen Sick Balance leave as long as the employee provides a physician’s statement certifying the period of medical disability.
- B. As a benefit, the Authority also allows employees to charge absences resulting from maternity/paternity to earned Flexible Leave or Frozen Sick Balance leave following the adoption of a child. Such an absence may be for a period not to exceed six weeks. In order to request this maternity/paternity leave, the employee must obtain a physician’s statement or a statement from the adoption agency which indicates the amount of time (up to the six-week limit) that is necessary for child care purposes. The employee must submit this statement to the employee’s supervisor a minimum of 30 days in advance of the beginning of the requested absence. Following the supervisor’s review, a recommendation will be forwarded to the Chief Executive Officer for approval.
- C. In cases of maternity/paternity leave, should an employee exhaust accumulated Flexible Leave or Frozen Sick Balance leave, the employee may charge this absence to leave without pay pursuant to the provisions of section 4.4 of this handbook.

**4.3 Family and Medical Leave Act.** The Family and Medical Leave Act, 29 U.S.C. §§ 2601—2654, only applies to employees employed at a worksite at which the employee’s employer employs less than 50 employees if the total number of employees employed by that employer within 75 miles of that worksite is less than 50. The total number Authority

employees at all sites is less than 50. Therefore, Authority employees are not eligible for Family and Medical Leave Act leave. Employees may address any questions about the Family and Medical Leave Act's applicability to the Administrative Coordinator.

**4.4 Leave without Pay.** Leave without pay may be approved for a period or periods not to exceed 180 calendar days for the purpose of extended illness or disability or for personal reasons. However, the Authority has no obligation to grant leave without pay, and the employee must exhaust all other leave sources (e.g., Flexible Leave) prior to seeking leave without pay. If leave without pay is approved, the employee will not accrue retirement credit or Flexible Leave during the time on non-pay status if longer than 40 hours in one pay period. The employee will not receive pay for any holidays which fall during the time on non-pay status. While on leave without pay for longer than 80 hours in one pay period, the employee may continue the employee's health insurance coverage by payment of both the employee share and the Authority share of the premium. An employee on non-pay status also must pay the employee's share of the life insurance premium.

**4.5 Military Leave.** The Authority provides military leave in accordance with applicable law, including the Uniformed Services Employment and Reemployment Rights Act of 1994, 28 U.S.C. §§ 4301—4335, and section 44-93 of the Code of Virginia. The Chief Executive Officer may authorize benefits that are more generous than those afforded by law.

**4.6 Job-Related Training.** An employee may be required or approved by the employee's supervisor to attend job-related training. Such training is considered working time, and the employee will be compensated according to chapter 3 of this handbook. In addition, the Authority will pay for reasonable training-related expenses.

**4.7 Educational Leave.** An employee may be required by the employee's supervisor to attend training which will promote the employee's general job knowledge. When an employee is required to attend such training, the employee will be given a paid leave of absence, and the Authority will pay for expenses in connection with attendance. Employees who choose to pursue a job-related course not required by the Authority may be reimbursed for their tuition under the Tuition Assistance Program described in section 3.15 of this handbook. Optional coursework is not considered working time, and employees will not be paid for their time to attend such courses.

**4.8 Civil Leave.**

**4.8.1 Definition.** Civil leave is leave without loss of pay that may be granted for the following:

1. Service on a jury;
2. Attending court or another judicial or quasi-judicial body when subpoenaed or summoned except when the employee is a party to the suit or other proceeding; or
3. For the purpose of:

- a. Serving as a member of a local electoral board, a deputy general registrar, or an officer of election, provided the employee gives reasonable notice to the employee's supervisor pursuant to section 24.1-119.1 of the Code of Virginia; or
- b. Voting, provided the employee's work schedule precludes the employee from voting before or after the employee's duty hours.

**4.8.2 Duty to Give Notice to Supervisor.** The employee is required to give the employee's supervisor notice of a request to take civil leave (i) for jury service or a court appearance as soon as the subpoena or summons is received and (ii) for service as a member of a local electoral board, a deputy general registrar, or an officer of election or for voting at a time reasonable under the circumstances.

**4.8.3 Presentation of Subpoena or Summons to Supervisor.** If the employee requests civil leave for jury service or a court appearance, the employee shall present the actual subpoena or summons to the supervisor at the time the employee provides the supervisor notice pursuant to section 4.8.2 of this handbook.

**4.8.4 Conditions and Amount of Pay.**

- A. No leave of any kind will be charged for an absence from the work site because the employee must appear at court or another judicial or quasi-judicial body when the appearance is required due to the employee's employment with the Authority. Such an absence is considered work time.
- B. The employee will not be charged Flexible Leave for an absence for the purposes identified in section 4.8.1 of this handbook.
- C. Employees are eligible to receive either Authority pay for civil leave or the daily fee paid for jury service but may not accept both. The employee must provide the Administrative Coordinator with a copy of any check the employee receives as payment for jury service. The employee will keep payment received for jury service, and the Authority will deduct from the employee's gross wages an amount equal to the jury service payment, excluding reimbursement for travel expense.
- D. Where the employee is subpoenaed or summoned as a witness, the employee will receive full pay for the time spent away from work if (i) the employee is scheduled to work at the time of the appearance and (ii) the employee actually appears as a witness.
- E. Civil leave may not exceed the actual time required. Any additional time off on the same day must be charged to Flexible Leave, if eligible, or leave without pay as allowed by law.

**4.8.5 Duty to Remain at Work Site until Ordered to Report for Jury Service.** If an employee is merely on the list of potential persons subject to selection for jury service, the employee shall not leave the work site unless in fact ordered by the court to be reviewed for selection or ordered to actual duty on the jury.

**4.8.6 Disciplinary Action for Noncompliance.** Failure to comply with these procedures may result in disciplinary action.

**4.9 Holidays.**

- A. The Authority observes the same holidays observed by the state government of the Commonwealth of Virginia for state government employees. These holidays include the holidays and additional time off set forth on the Commonwealth's Pay and Holiday Calendar published on the website of the Virginia Department of Human Resource Management. The Administrative Coordinator will inform Authority employees and new hires of the current holiday schedule at appropriate times and by appropriate means. Employees or candidates for employment with questions about the Authority's holiday schedule should direct their questions to the Administrative Coordinator.
- B. Authority offices are closed on designated holidays. Regular employees who do not work on a holiday are eligible to take the holiday off from work and receive payment at the regular daily rate for time off. Holidays are considered an eight-hour period of work which falls on the specified holiday.
- C. Those nonexempt employees designated by their supervisor as having to work on an Authority holiday receive compensation for the amount of actual time worked at the overtime hourly rate and payment for the holiday.
- D. Those exempt employees designated by their supervisor as having to work on a holiday may take discretionary time in accordance with section 3.6.4 of this handbook, if eligible, for the amount of time worked on a holiday.
- E. When an employee is absent from work on approved Sick Leave and a holiday occurs, the employee will be paid for the holiday and such absence will not be charged against the employee's Sick Leave.
- F. When an employee is absent from work on approved Flexible Leave and a holiday occurs, the employee will be paid for the holiday, and the employee's Flexible Leave will not be charged.
- G. The Authority reserves the right to amend the holiday schedule at any time and increase or decrease the number of holidays observed.

**4.10 Funeral Leave.** Funeral leave may be used to cover absences from work caused by the death of immediate family members, to make arrangements, and to attend funerals.

Employees may charge up to three consecutive days, one of which must include the day of last rites, for the death of any one of the following members of the employee's family:

1. Immediate Family - Spouse, child, sibling or parent.
2. Family Relatives - Grandson, granddaughter, grandfather, or grandmother.
3. Step Relatives - Stepfather, stepmother, stepdaughter or stepson.
4. Foster Relatives - Foster father, mother, sister, brother, son or daughter.
5. Other Relatives - Half-sister, half-brother.
6. In-Laws - Mother-in-law, father-in-law, brother-in-law, sister-in-law, son-in-law, daughter-in-law.

Employees may charge up to one day to attend funerals of an aunt, uncle, or other blood relatives residing in the same household as the employee. Employees may request in writing to their supervisor to charge up to two consecutive hours to attend the funeral of any other relative or friend provided written authorization is approved by the employee's supervisor. In unusual circumstances, the Chief Executive Officer may extend the duration of funeral leave limits. Abuse of funeral leave is considered grounds for discipline.

**4.11 Administrative Leave.** The Chief Executive Officer, after consultation with the appropriate supervisor, may place an employee on paid or unpaid administrative leave. Factors that may warrant such leave include a pending human resources investigation, severe weather conditions, or other conditions for which the Chief Executive Officer may need to exercise discretion.

**4.12 Frozen Sick Balance.**

- A. The Frozen Sick Balance may only be accessed after first using two consecutive days of Flexible Leave hours, per occurrence. Employees with a zero balance of Flexible Leave will be unpaid for two work days (or any portion thereof) before entering the Frozen Sick Balance.
- B. If an employee is out due to a work-related injury and has been approved for workers' compensation, that employee must still use two consecutive days of Flexible Leave before they can access the remaining five days of Frozen Sick Balance.
- C. An employee that has used Frozen Sick Balance hours (for either themselves or eligible family members), and has a relapse within two weeks of their illness, may be paid hours from the Frozen Sick Balance again without being required to use another two days of Flexible Leave hours.

D. The rules governing the use of sick leave, as outlined in this section, will continue to apply whenever the employee wishes to use hours from the Frozen Sick Balance. When Frozen Sick Balance hours are exhausted, these guidelines will no longer apply.

E. Frozen Sick Balance hours may be used as follows:

1. For the employee's own illness;
2. Ten days per fiscal year for the employee's family member as defined in section 4.10 of this handbook; or
3. 20 days per fiscal year for maternity/paternity absences pursuant to section 4.2 of this handbook.

F. Payment for unused hours in the Frozen Sick Balance will be paid out to employees who terminate Authority employment at \$10.00 per day for every eight hours remaining in their Frozen Sick Balance up to a maximum of \$2,400.00.

G. Payment for unused hours in the Frozen Sick Balance will be paid out to employees who retire from Authority employment, at minimum age of 50 and at least five years of service, for every eight hours remaining in their Frozen Sick Balance, with no maximum payout, at the following rates:

| <u>Service Period</u> | <u>First 90 Days</u> | <u>After 1<sup>st</sup> 90 Days</u> |
|-----------------------|----------------------|-------------------------------------|
| 5<10 years            | \$35/Day             | \$35/Day                            |
| 11<15 years           | \$35/Day             | \$35/Day + 10% of regular pay       |
| 16<20 years           | \$35/Day             | \$35/Day + 15% of regular pay       |
| 21<25 years           | \$35/Day             | \$35/Day + 20% of regular pay       |
| 26<30 years           | \$35/Day             | \$35/Day + 25% of regular pay       |
| 31+ years             | \$35/Day             | \$35/Day + 30% of regular pay       |

## CHAPTER 5 – EMPLOYMENT ADMINISTRATION

### 5. Employment Administration.

#### 5.1 Personnel Files.

**5.1.1 Maintenance.** The Authority maintains a personnel file for each Authority employee. Personnel records are maintained in accordance with the Library of Virginia's Records Retention and Disposition Schedules for local government records. The employee's personnel file is the official record of all employment with the Authority. Personnel files contain personal information, benefit records, performance evaluations, disciplinary actions, training records, and other pertinent information.

**5.1.2 Inspection.** Personnel records are available for inspection only by the employee and the employee's supervisor and other authorized persons. An employee may review that employee's personnel records by contacting the Administrative Coordinator for an appointment. The Administrative Coordinator must be present during a review of any personnel records.

#### 5.1.3 Confidentiality.

A. All personnel records are the property of the Authority. Records of the name, position, job classification, official salary, or rate of pay of, and records of the allowances or reimbursements for expenses paid to, any officer, official, or employee of the Authority are generally available to the public under the Virginia Freedom of Information Act, Va. Code §§ 2.2-3700—2.2-3715. However, personnel records are otherwise confidential and will not be disclosed outside of the Authority unless the employee authorizes the release of the employee's personnel records in writing or unless otherwise required by law. Only employees who have a need to know, in the performance of their regular duties, will be authorized to view personnel records.

B. The Authority also expects its employees to respect their fellow employees. Personal and personnel information about an employee may not be discussed with other fellow employees or outsiders unless the performance of regular duties requires such discussion. Any disclosure of such information to outside parties must have the prior approval of the Chief Executive Officer.

**5.1.4 Accuracy of Information.** Employees should report any change of address, name, telephone number, number of dependents, or other personal information to the Administrative Coordinator so that personnel records and insurance benefits may be kept up-to-date. The Authority will not be responsible for delays or rejections of employee claims or benefits due to the failure of the employee to provide current and accurate contact information to the Administrative Coordinator. Additionally, failure to provide current and accurate contact information to the Administrative Coordinator after being requested to do so may be grounds for disciplinary action up to and including dismissal.

## **5.2    Performance Evaluations.**

- A.    Written performance evaluations are conducted, as a minimum, on an annual basis for regular employees. Performance evaluations for regular employees may also be conducted at other intervals identified by the supervisor. These evaluations are not intended to replace the day-to-day performance discussions between the employee and the employee's supervisor. They should instead help the employee set goals, determine dimensions related to those goals, and establish job specific examples that meet those goals. They are intended to help the employee identify performance level, growth level, and development needs.
- B.    Probationary employees are evaluated, at a minimum, during the third month of employment and prior to the completion of the six-month probationary period. All other employees are evaluated at a minimum annually on or about their annual performance review date. Upon achieving a satisfactory performance evaluation, at a minimum, the regular employee may be eligible for a merit increase, if funding has been authorized and provided such increase does not place the employee's rate of pay above the maximum.
- C.    The Authority expects all employees to render dependable and satisfactory work performance in order that quality services may be efficiently provided. The failure to perform satisfactorily at any time, as determined by the Authority, may lead to discipline, up to and including dismissal. Any non-probationary employee who receives a performance evaluation below the satisfactory level will not be granted a merit increase. The employee shall be reevaluated by the employee's supervisor at the end of three months from the date of such unsatisfactory evaluation. Any employee who receives two or more performance evaluations, not necessarily consecutive, below the satisfactory level, within a three-year period, may be subject to dismissal.

**5.3    Promotions.** A promotion is defined as the selection of an employee from a job class in one pay grade for a position in a higher pay grade. To be selected for a promotion, an employee must meet the requirements and qualifications specified in the job description and must be performing satisfactorily in the current job. It is the policy of the Authority to post job vacancies in accordance with the Authority's application and hiring process if possible. The Authority reserves the right, however, to not post positions internally as it deems necessary. When an employee is promoted into a new position, that employee will serve up to a six-month transitional review period or a period of time determined by the needs of the employee's work unit. During this time, the promoted employee must demonstrate suitability for the position and the ability to perform the essential job functions. The employee's supervisor will make every effort through training and development to ensure successful transition to the new job.

## **5.4    Demotions.**

- A. Demotion is a movement from one position to another position and job classification for which a lower maximum salary is prescribed. It is the policy of the Authority to treat all employees consistently upon demotion and to provide for a reduction in compensation when it is appropriate.
- B. The compensation of a demoted employee will be within the salary range established for the employee's new position. If the demoted employee's current salary is above the maximum rate established for that position, the salary will be reduced. The demoted employee's salary may be set at any point within the established range for his or her new grade. The new salary will be based upon recommendation by the supervisor and approved by the Chief Executive Officer. A demotion may be based on performance. In this situation, the employee has displayed an inability to meet job requirements or to perform the assigned tasks of the position. If a position is available, the employee may be assigned to a position in a lower salary grade provided the employee can perform the tasks of the new position. A voluntary demotion may occur if any employee requests and is granted reassignment in a lower salary grade. All demotions must be approved by the employee's supervisor and the Chief Executive Officer.

## **5.5 Position Reclassification.**

- A. The Authority reserves the right to make changes in the classification system and to adjust compensation of an employee if the duties have increased or decreased to the extent that a different classification is required. The Authority reserves the right to make changes in the job description or title without affecting the position classification.
- B. Supervisors may request a position reclassification at any time. However, such a request should be submitted and considered during budget preparation. The request must be approved by the Chief Executive Officer.
- C. A position reclassification may occur in an existing position because of changes in essential job functions and responsibilities. Often a reclassified position changes by no more than two classification grades or only within the same occupational group. Where a position reclassification results from gradual changes in essential job functions and responsibilities, the incumbent fills the reclassified position and the Authority's application process does not apply. A position will not be reclassified if there are minor changes in the description or title.
- D. The employee whose position is reclassified upward may receive a five-percent increase above the present salary or the minimum salary of the new grade, whichever is greater. The salary for an employee whose position is reclassified downward will remain the same. However, if the employee's present salary is above the maximum salary of the new, lower grade, the employee will not be eligible to receive merit or performance-based salary increases. The employee will be eligible to receive any salary increases given to all Authority employees, provided such

increases are not based on merit or performance. If changes in the pay range occur that place the employee's salary below the maximum, the employee would be eligible for merit or performance-based increases until the salary reaches the new maximum for the lower grade.

**5.6 Position Establishment and Abolishment.** The Authority reserves the right to establish or abolish positions in the Classification Plan according to the needs of the organization. If a position is established, the newly established position is posted and applications for employment are accepted according to the Authority's application and hiring process. If a position is abolished, any incumbent in that position is treated according to the Authority's layoff procedure.

**5.7 Other Classification Adjustments.**

- A. The Authority reserves the right to make changes at any time in the classification system to adjust compensation of employees due to periodic marketplace conditions or wage and salary surveys. Adjustments may occur within identified groups or classes of positions or systemwide.
- B. The reassignment of a position or positions at any time in the Classification Plan as a result of periodic marketplace or salary surveys is wholly separate from the reclassification process. The Chief Executive Officer defines the method by which positions are reassigned and employee salaries are adjusted.

**5.8 Layoff and Recall.**

**5.8.1 Generally.** During certain times the Authority may find it necessary to reduce the number of employees or positions, or both. If layoffs become necessary, the Chief Executive Officer shall identify the positions and employees to be affected. Generally, all part-time and temporary employees in the positions to be reduced will be laid off before any reduction in regular employees in similar positions. All employees will be considered for layoff based only on legitimate business reasons, such as performance and seniority. All employees laid off will be placed on leave without pay.

**5.8.2 Recall.** Employees in laid-off status may be given recall opportunities as determined by the Authority. If a position is reinstated or becomes available, those regular employees in layoff status may receive priority in selection for the position if the employee meets the job requirements of the position. Any employee offered a position in the same grade and job classification that elects not to accept the position will no longer be considered in layoff status. Any employee accepting a job in a position of a lower pay grade and job classification will continue at the same salary if that salary is within the salary range of the position accepted. However, the employee will not lose recall opportunities whether or not the employee accepts the lower position. The recall period will not exceed 18 months.

**5.8.3 Benefits.** Employees laid off under this section 5.8 will be placed on a "leave without pay layoff." This leave may continue for up to 24 months unless the employee declines recall

or resigns earlier. Certain employee benefits will continue during this time. Employees will have the option to be paid for accumulated Flexible Leave or to keep the balance as a credit during the time of leave without pay layoff. If an employee resigns or is terminated during this period, the employee will be paid the appropriate amount for the unused balance of Flexible Leave. The employee on leave without pay layoff will not accumulate Flexible Leave while on non-pay status. During the time of leave without pay layoff, the employee must pay the employee's as well as the Authority's contribution to the employee's health or other insurance to continue coverage. If an employee is laid off for longer than a month, the employee must also pay the employee's share of the Virginia Supplemental Retirement System life insurance.

## **5.9 Termination of Service; Resignations.**

### **5.9.1 Termination of Service.**

- A. An employee's service with the Authority may be terminated due to death, dismissal, disability retirement, job abolishment, layoff, resignation, or retirement. Employees leaving Authority service must return any Authority property in their possession, including, but not limited to, manuals, identification cards, books, badges, keys, uniforms, and tools. The Authority may withhold any Leave balance payout or other payments due to an employee until the employee has returned all Authority property.
- B. The Administrative Coordinator will make provisions for the mailing of W-2 forms, make arrangements for benefit changes, and assist with the completion of other necessary paperwork.

### **5.9.2 Resignations.**

- A. A resignation is voluntary termination of employment at the request of the employee. An employee desiring to resign should give a minimum of two weeks written notice to the employee's supervisor with a copy to the Administrative Coordinator. This notice enables the supervisor to make arrangements for a replacement and provides for work continuity. The supervisor and the resigning employee, by mutual consent, may waive or modify the two weeks' written notice. No written acceptance of a resignation shall be required as a condition precedent to effectiveness.
- B. In order for an employee to resign in good standing, the employee should tender notice of the employee's resignation at least two weeks prior to the effective date of resignation unless waived by the employee's appointing authority. A resignation may be withdrawn only with the written consent of the Chief Executive Officer. A resignation terminates the right to pursue any matter through the grievance procedure.

**5.9.3 Post-Termination Conduct.** Each employee of the Authority has certain legal and fiduciary responsibilities even after the termination of that employee's employment, whether voluntary or involuntary. These include, without limitation, (i) the duty to return all Authority property, (ii) the duty to not disparage the Authority, and (iii) the duty to not disclose the Authority's confidential information. An employee should contact the Chief Executive Officer for further guidance as to what these legal and fiduciary duties are.

**5.10 Continuous Service.** If an employee's employment terminates in good standing and the employee returns to Authority employment within 90 days after the date of termination, the employee will retain seniority and be given credit for previous service for the purposes of accruing Flexible Leave. Individuals wishing to return to their previous positions with the Authority must complete the application and hiring process.

**5.11 Anniversary Dates.** A regular employee's anniversary date is the date hired for regular employment and will be used for determining length of service. A regular employee is eligible for performance evaluation and consideration for a merit increase on or about the employee's annual performance review date. The annual performance review date is the date the employee was placed in the current position.

**5.12 Travel Reimbursement.**

- A. The Authority will reimburse reasonable work-related travel expenses when an employee is required to travel on Authority business. The employee's supervisor and the Chief Executive Officer must approve all such travel in advance. The employee must submit all receipts for eligible travel expenditures to the employee's supervisor as a prerequisite for reimbursement. Ineligible expenses include, but are not limited to, the purchase of alcoholic beverages, personal recreation-related expenses, and in-room hotel "pay-for-view" movies.
- B. Employees who use their personal vehicle for Authority business are also eligible to receive mileage reimbursement. Reimbursement is paid at the current per-mile amount from IRS Publ. 463 or any successor publication by the Internal Revenue Service.

**5.13 Immediate Family Members within a Work Unit.** It is the policy of the Authority not to place immediate family members in a supervisor-subordinate relationship within the same work unit. Additionally, family members may not be hired (even if they would be in separate work units) where the employment of the family members may result in a potential for conflict of interest. This includes regular, part-time, and temporary employees, whether or not probationary. The immediate family includes the employee's spouse and the children, brothers, sisters, parents, and grandparents of the employee and the employee's spouse.

**5.14 Employee Assistance Program.**

**5.14.1 Policy.** For any organization to function properly its employees should be free from major personal problems which can adversely affect job performance, cooperation and attendance. In fulfilling the Authority's mission to support and develop its employees, the Authority has a commitment to providing an Employee Assistance Program from which its employees may obtain competent professional assistance in resolving their personal problems. Through contract, this program is provided for Authority employees by the Carilion Employee Assistance Program.

**5.14.2 Goals and Objectives.** The goal of the Authority's Employee Assistance Program is to retain employees by confidentially assisting employees struggling with personal problems. The objectives of Carilion Employee Assistance Program administering this program are as follows:

1. To facilitate the early identification of personal problems which may affect job performance;
2. To motivate troubled employees to seek and accept professional assistance;
3. To assess the nature and scope of employee problems;
4. To develop and recommend intervention plans for resolving assessed problems;
5. To provide confidential and professional services for the resolution of personal problems and refer to selected community resources for the delivery of needed specialized or long-term services; and
6. To follow-up on employee progress in delivered services and to attempt to assure satisfactory problem resolution.

**5.14.3 Eligible Participants.** The Authority's program as provided by Carilion Employee Assistance Program will provide confidential problem assessment, short-term counseling, and referral case management and follow-up services for all full-time employees, their spouses, and legal dependents.

**5.14.4 Scope of Service.** Assistance services shall be provided in confidence on a short-term basis for such problems as marital and family discord, chemical dependency or abuse, financial difficulties, legal entanglements, psychological, emotional, or behavioral concerns.

**5.14.5 Confidentiality.** All records and information pertaining to an employee's or dependent's involvement with Carilion Employee Assistance Program will be held in strict confidence and will not become part of the employee's regular personnel file. Such information will only be disseminated as otherwise allowed or required by law. All client involvement with Carilion Employee Assistance Program shall be on a voluntary basis except for mandatory referrals described below.

**5.14.6 Referral Procedures.** Referral procedures to facilitate the early identification and resolution of personal problems include the following:

- A. Self-Referral: Any employee, employee's spouse, or employee's dependent, desiring assistance for a personal problem may call Carilion Employee Assistance Program and schedule an appointment to speak with an Employee Assistance Program counselor.
- B. Formal Referral:
  1. Any employee presenting a documented decline in work performance or a particular on-the-job incident which indicates the possible presence of a personal problem, may be referred to Carilion EAP by the employee's immediate supervisor or Operations Manager.
  2. When the employee agrees to accept a Formal Referral, the supervisor or Operations Manager shall call Carilion Employee Assistance Program, shall consult with a counselor about the case, and may choose to schedule an appointment for the employee. The employee shall then be given, in writing, the appointment day, date, time, and place. An Employee Assistance Program Formal Referral Form, obtained from the Administrative Coordinator, will be completed by the Operations Manager, reviewed and signed by the employee, and forwarded to Carilion Employee Assistance Program prior to the time of the scheduled initial interview.
  3. At the discretion of the supervisor, the initial appointment with the Employee Assistance Program counselor may be scheduled during the employee's assigned work hours. Subsequent appointments may be scheduled for times other than the employee's assigned work hours.
  4. When a Formal Referral is made to the Employee Assistance Program in accordance with this prescribed procedure, the supervisor or Operations Manager shall be notified:
    - a. That the employee did or did not keep the initial appointment as arranged;
    - b. That the employee has accepted or rejected the program's offer of assistance; or
    - c. That the employee will or will not require time away from work for treatment of a personal problem.

In the event that an employee requires time away from work; Carilion Employee Assistance Program shall notify the supervisor or Operations Manager, as applicable, of the requested date the leave of absence should

begin and the anticipated return to work date. In all cases, the Employee Assistance Program counselor will collaborate with the employee's supervisor or Operations Manager in order to determine the appropriate procedure for scheduling time away from work. Requests for time away from work must comply with established policies and procedures.

C. Mandatory Referrals.

1. Carilion Employee Assistance Program will provide all substance abuse assessments resulting from positive drug or alcohol tests required by United States Department of Transportation regulations. All Employee Assistance Program policies and procedures referenced in this handbook apply when performing a substance abuse assessment required by United States Department of Transportation regulations.
2. The Substance Abuse Professional, through Carilion Employee Assistance Program, will provide assessments in accordance with United States Department of Transportation regulations. United States Department of Transportation regulations require that the Substance Abuse Professional:
  - a. Evaluate the employee and establish whether or not the employee requires assistance in resolving alcohol or drug problems;
  - b. Advise the Authority as to whether the employee has properly complied with any recommended rehabilitation; and
  - c. Recommend a course of unannounced follow-up tests to be conducted after the employee returns to duty.

It remains the Authority's responsibility to make final determination on whether to return employees to duty and to implement the course of recommended follow-up testing.

3. Procedures:
  - a. An employee who engages in conduct prohibited by the Authority's Substance Abuse Policy, may receive a mandated referral to the Employee Action Program. The employee's supervisor will give the employee a letter detailing the employee's infraction, expectations of submitting to a substance abuse evaluation and following all recommendations made by the Substance Abuse Professional. The employee will sign a written consent to release information to the employee's supervisor.
  - b. The employee, if allowed to return to work, must begin implementing and complying with all treatment recommendations.

The Substance Abuse Professional will contact the employee's supervisor indicating the expected return to work date (following a negative alcohol/drug screen) as well as the communication regarding assessment, compliance, and follow-up testing required by United States Department of Transportation regulations.

- c. The Substance Abuse Professional will provide the recommended testing schedule to Safety and Compliance Services, Inc., following the employee's return to work and will follow up in person or by telephone on an as-needed basis to encourage continued recovery or compliance.

**5.14.7 Continued Obligation to Comply with Policies and Procedures.** Involvement in Carilion Employee Assistance Program shall not result in any employee receiving special privileges or exemptions from standard policies and procedures. The Authority recognizes that resolving employee personal problems is vital to establishing and maintaining sound work relationships and believes that it is of importance that all employees perform their work responsibilities at acceptable levels and follow established policies and procedures at all times. The employee's involvement in this program shall in no way interfere with the employee's supervisor or Operations Manager's right and obligation to take the appropriate corrective action consistent with established policies and procedures.

**5.14.8 Administrative Direction.** The Authority's Employee Assistance Program is coordinated with Carilion Employee Assistance Program by the Authority's Administrative Coordinator.

## CHAPTER 6 – EMPLOYEE RESPONSIBILITIES

### 6. Employee Responsibilities.

#### 6.1 Safety.

**6.1.1 Policy.** Safety on the job is crucial. It is the responsibility of all Authority employees to observe the safety rules established for their positions. Operations Managers and supervisors shall provide training of employees in the proper use of any required machinery, equipment, tools, and personal protective equipment and shall document such training. Employees shall participate in and complete training as to the proper use of any required machinery, equipment, or tools. Employees shall be trained and use the proper personal protective equipment required for their jobs. Employees who use an Authority vehicle shall follow all safety procedures and traffic laws and comply with section 6.2 of this handbook.

**6.1.2 Questions.** Each employee shall promptly address any questions about these safety procedures or laws to the employee's supervisor. Employees who fail to follow established safety rules or improperly use protective equipment will be subject to disciplinary action up to and including dismissal.

**6.1.3 Reporting Accidents and Defects.** An employee who finds any apparent defect in Authority equipment must report it to the appropriate supervisor as soon as possible, preferably before beginning the shift. Any accident involving Authority equipment must be reported immediately to the appropriate supervisor regardless of the cause. Authority equipment should only be used for its intended purpose. No employee may modify or repair equipment without the prior permission of the employee's supervisor.

#### 6.2 Vehicle Policy.

**6.2.1 Vehicle Safety.** It is the policy of the Authority to maintain a safe and healthful work place and safe working equipment. All vehicle and equipment operations are to be conducted as safely and efficiently as possible. Safety on the job is of the utmost importance. Therefore, it is the responsibility of all Authority employees to observe the safety rules established for their position.

**6.2.2 Licensure and Insurance.** Each employee who is required to drive an Authority vehicle or motor equipment, or who must drive personal or rental motor equipment or vehicles on Authority business, must be properly licensed and maintain a driving record acceptable to the Authority and its insurer. As a result, such an employee may be required to provide and authorize the Authority the ability to check the employee's Virginia Division of Motor Vehicles driving record at any time.

**6.2.3 Use of Personal Vehicle for Authority Business.** If an employee will be using personal or rental motor equipment or vehicles for Authority business, the employee must have at least the minimum insurance coverage on the vehicle required by Virginia law.

**6.2.4 Incidents with Vehicles or Drivers.** Each employee shall report all tickets, citations, or accidents involving Authority motor equipment or vehicles, or accidents, tickets or citations received in personal or rental motor equipment or vehicles while being used on Authority business, to the employee's supervisor in writing within 24 hours of the incident, or as soon thereafter as possible if it is impossible to do so within 24 hours. Each employee shall report any restriction or change in the ability to drive (e.g., suspension of license) in writing to the employee's supervisor within 24 hours of the imposition of the restriction or change, or as soon thereafter as possible if it is impossible to do so within 24 hours, if the employee's job requires the employee to drive. In all instances, the Authority will determine if the employee provided proper and timely notice of these incidents.

**6.2.5 Restricted Drivers.** Employees whose driving privileges are revoked, suspended, or otherwise changed shall not to drive Authority vehicles or personal or rental vehicles on Authority business without the prior written permission of the Chief Executive Officer. Employees whose driving privileges are changed as set forth above may be subject to discipline, including demotion or dismissal if the employee's job requires the employee to drive. The Authority will not be responsible for any damage or injury caused by the employee to the employee or others if the employee was driving or performing services without the proper licensure. When an employee who is required to drive as part of their job functions has their license suspended or revoked, the Authority has no obligation on the Authority to place such employee in any other position or to otherwise accommodate such employee.

**6.2.6 Post-Accident Testing.** After any on-the-job accident or injury, including vehicular accidents, an employee may be required to submit to a drug test or an alcohol test, or both. Employees are prohibited from taking any action which would jeopardize such testing.

**6.2.7 Vehicle Rules.** The Authority will not be responsible for liability incurred due to the negligent or illegal actions of an employee driving Authority motor equipment or vehicles or personal or rental motor equipment or vehicles on Authority business. The following vehicle rules shall be observed by all employees operating Authority motor equipment or vehicles:

- A. Commercial driver's licenses shall be required for all licensed vehicles larger than pick-up trucks which operate off Authority premises.
- B. Authority vehicles and personal or rental vehicles being operated for Authority business shall be operated within the legal speed at all times and with good judgment when road, weather, or traffic conditions warrant a reduction in speed below posted speed limits. Drivers and passengers shall use safety belts and harnesses, if available in the vehicle, whenever a vehicle is in motion.
- C. Drivers shall ensure that there is no obstruction before backing a vehicle. If necessary, a spotter should be used to give instructions regarding clearances and distances. If alone, the driver shall stop the vehicle, set brakes, turn on the flashers

and make a walk around of vehicles prior to backing if unable to visually clear the area.

- D. A daily motor vehicle check shall be performed on all vehicles and equipment. Any discovery that will affect safe driving or operating shall be reported immediately and corrective maintenance performed before operating vehicle or equipment.
- E. No passengers shall be permitted in or on vehicular or motor equipment unless they are in the process of performing required employment duties, on official business as agents or potential agents of the Authority, or otherwise authorized by the Authority.
- F. Any person who operates any Authority vehicle or motor equipment under the influence of alcohol or illegal drugs shall be subject to immediate dismissal.
- G. Employees shall not (i) use any external (i.e., not part of the motor equipment) electronic device (e.g., cellular telephones, headsets, pagers, or tablets) while operating Authority motor equipment, (ii) text while driving or operating an Authority vehicle or motor equipment, (iii) use any handheld personal communications device in violation of section 46.2-818.2 of the Code of Virginia.

### **6.3 Severe Weather Policy.**

- A. Employees are responsible for reporting to work on time. When weather conditions cause transportation or reporting to work problems, the employee must contact the employee's supervisor. If the supervisor decides the employee is not required to report to work, the supervisor may let the employee take leave or leave without pay as appropriate. An employee who fails to make a reasonable effort to get authorization for an absence may be subject to disciplinary action. Failure to report to work when the Authority has determined it is not unsafe to do so may result in disciplinary action up to and including dismissal. Management will inform employees who may be required to remain at work or report to work when such weather conditions occur.
- B. In severe weather conditions, the Chief Executive Officer may close Authority offices or any or all Authority facilities. When this occurs, every attempt will be made to notify the affected employees through their supervisors, communication media, or the local media.

### **6.4 No Smoking Policy.** The Authority is concerned about the health and welfare of its employees and is responsible for providing a work environment that does not present a health or safety hazard to employees or citizens. Therefore, smoking is prohibited in Authority-owned buildings, facilities, and heavy equipment. Smoking shall be permitted only in designated areas. Employees who violate this no smoking policy are subject to discipline.

## **6.5 Information Technology Systems.**

**6.5.1 Definition of “Information Technology Systems.”** For purposes of this section 6.5, “information technology systems” includes network systems, hardware, software, and any related systems or devices as well as electronic media including, but not necessarily limited to, electronic mail (“E-mail”), Internet use, Intranet bulletin boards, electronic subscription services, electronic data or documents, voicemail, and any other forms of electronic communication or accounts associated with any of these systems.

**6.5.2 Ownership of Information Technology Systems.** All information technology systems provided for the use of Authority employees are the property of the Authority or of Roanoke County.

**6.5.3 Information Technology Support.** Roanoke County provides information technology maintenance and support for the Authority through a contract. This support includes access to Roanoke County network systems and other County-owned information technology systems. Accordingly, all Authority employees shall comply with all Roanoke County information technology policies and procedures applicable to the Authority’s use of information technology systems that Roanoke County may maintain for the Authority or own.

**6.5.4 Disclaimer of Liability for Use of Internet.** The Authority is not responsible for material viewed or downloaded by users from the Internet. The Internet is a worldwide network of computers that contains millions of pages of information. Users are cautioned that these pages may include offensive, sexually explicit, and inappropriate material. In general, it is difficult to avoid at least some contact with this material while using the Internet. Even innocuous search requests may lead to sites with highly offensive content. In addition, having an E-mail address on the Internet may lead to receipt of unsolicited E-mail containing offensive content. Users accessing the Internet do so at their own risk.

**6.5.5 Duty of Care.** Employees should endeavor to make each electronic communication truthful and accurate. You should use the same care in drafting E-mail and other electronic documents as you would for any other written communication. Please keep in mind that anything created or stored on the computer system may, and likely will, be reviewed by others.

**6.5.6 Duty Not to Waste Computer Resources.** Employees shall not deliberately perform acts that waste computer resources or unfairly monopolize resources to the exclusion of others. These acts include, but are not limited to, sending mass mailings or chain letters, spending excessive amounts of time on the Internet, playing games, engaging in online chat groups, printing multiple copies of documents, or otherwise creating unnecessary network traffic. Because audio, video, and picture files require significant storage space, files of this sort may not be downloaded unless they are business-related.

**6.5.7 No Expectation of Privacy.** The information technology systems provided to employees are to assist them in performance of their jobs. Employees have no expectation of privacy

in anything they create, store, send, or receive on Authority-provided information technology systems. All electronic communication systems and all communications and stored information transmitted, received, or contained in the Authority's information systems are the property of the Authority, may be viewed or inspected by the Authority at any time, and may only be used for job-related purposes. The Authority retains the right and maintains the obligation as the owner of information technology systems to access, review, and use such for Authority business and to gather information as deemed necessary to conduct investigations or to assist in legal investigations of individuals or incidents at any time and without prior notice. Use of Authority telephone, voicemail, computer, and other information technology systems constitutes acceptance of such monitoring.

- 6.5.8 No Privacy in Communications.** Employees should never consider electronic communications to be either private or secure. E-mail may be stored indefinitely on any number of computers, including that of the recipient. Copies of an employee's messages may be forwarded to others either electronically or on paper. In addition, E-mail sent to nonexistent or incorrect user names may be delivered to persons that the sender never intended.
- 6.5.9 Monitoring of Computer Usage.** The Authority has the right, but not the duty, to monitor any and all aspects of its information technology systems, including, but not limited to, monitoring sites visited by employees on the Internet, monitoring chat groups and news groups, reviewing material downloaded or uploaded by users to the Internet, and reviewing E-Mail sent and received by users.
- 6.5.10 Blocking of Inappropriate Content.** The Authority may use software to identify inappropriate or sexually explicit Internet sites and may cause such sites to be blocked from access by Authority-provided networks. In the event an employee encounters inappropriate or sexually explicit material while browsing on the Internet, the employee immediately shall disconnect from the site, regardless of whether the site was subject to Authority blocking software.
- 6.5.11 Prohibited Activities.** Employees shall not sent material that is fraudulent, harassing, embarrassing, sexually explicit, profane, obscene, intimidating, defamatory, or otherwise unlawful or inappropriate by E-mail or other form of electronic communication (e.g., bulletin board systems, news groups, and chat groups), viewed, accessed or downloaded from the Internet, or displayed on or stored in Authority computers. Employees encountering or receiving this kind of material should immediately report the incident to their supervisors.
- 6.5.12 Games and Entertainment Software.** Employees shall not use the Authority's Internet connection to download games or other entertainment software, including screen savers, or to play games over the Internet.
- 6.5.13 Illegal Copying.** Employees may not illegally copy material protected under copyright law or make that material available to others for copying. Each employee is responsible for complying with copyright law and applicable licenses that may apply to software, files,

graphics, documents, messages, and other material that the employee wishes to download or copy. The employee may not agree to a license or download any material for which a registration fee is charged without first obtaining the express written permission of the Chief Executive Officer.

**6.5.14 Virus Detection.** Files obtained from sources outside the Authority, including disks brought from home; files downloaded from the Internet, news groups, bulletin boards, or other online services; files attached to E-mail; and files provided by customers or vendors, may contain dangerous computer viruses that may damage Authority-provided information technology systems. Employees should never download files from the Internet, accept E-mail attachments from outsiders, or use disks not provided by the Authority without first scanning the material with Authority approved virus checking software. If an employee suspects that a virus has been introduced into the Authority's network, the employee shall notify the Chief Executive Officer immediately.

**6.5.15 Use of Encryption Software.** Employees may not install or use encryption software on any of the Authority's computers without first obtaining written permission from their supervisors. Employees may not use passwords or encryption keys that are unknown to their supervisors.

**6.5.16 Export Restrictions.** The federal government has imposed restrictions on export of programs or files containing encryption technology (such as E-mail programs that permit encryption of messages and electronic commerce software that encodes transactions). Employees shall not place on the Internet or transmit in any way outside the United States and software containing encryption technology without prior written authorization from the Chief Executive Officer.

**6.5.17 E-Mail General Guidelines.**

- A. Think before sending a message. It is very important that employees use the same care and discretion in drafting E-mail as you would for any other written communication. Anything created or stored on the computer may, and likely will, be reviewed by others and kept indefinitely. Before sending a message, employees should ask themselves, "Would I want a judge or jury to see this message?"
- B. Avoid inappropriate material. Material that is fraudulent, harassing, embarrassing, sexually explicit, profane, obscene, intimidating, defamatory, or otherwise unlawful or inappropriate may not be sent by E-mail. If an employee encounters this kind of material, the employee shall report it to the employee's supervisor.
- C. Do not forward or initiate chain E-mail. Chain E-Mail is a message sent to a number of people asking each recipient to send copies with the same message to a specified number of others. Do not forward E-mail to any person or entity without the express permission of the sender.

- D. Do not send unsolicited E-mail (i.e., spamming). Employees may not send unsolicited E-mail to persons with whom they do not have a prior relationship without the express permission of their supervisors
- E. Do not alter metadata. Employees may not alter the “From:” line or other attribution-of-origin information in E-Mail, messages, or postings. Anonymous or pseudonymous electronic communications are forbidden. Employees shall identify themselves honestly and accurately when participating in chat groups, making postings to news groups, sending E-Mail, or otherwise communicating online.
- F. Use the Authority’s standard footer for E-mail. The following footer should be appended to all E-mail sent outside the Authority:

This E-mail and any files transmitted with it are confidential and are intended solely for the use of the individual or entity to whom they are addressed. If you are not the intended recipient or the person responsible for delivering the E-mail to the intended recipient, be advised that you have received this E-mail in error and that any use, dissemination, forwarding, printing, or copying of this E-mail is strictly prohibited. If you have received this E-mail in error, please immediately notify the Roanoke Valley Resource Authority by telephone at 540.857.5050. You will be reimbursed for reasonable costs incurred in notifying us.

- G. Identify attorney-client communications. E-mail sent from or to any attorney representing the Authority should include this or a substantially equivalent warning in all capital letters at the beginning of the E-mail: “ATTORNEY-CLIENT COMMUNICATION - PRIVILEGED AND CONFIDENTIAL - DO NOT FORWARD.” It is the policy of the Authority that communications from the Authority’s attorneys may not be forwarded without the sender’s express permission.

**6.5.18 Blogging and Personal Websites.** Personal websites and weblogs (i.e., blogs) have become prevalent methods of self-expression in our culture. The Authority respects the right of employees to use these mediums during their non-working time. Employees should not, however, identify themselves as an Authority employee on a website or weblog. Additionally, employees shall adhere to the following minimum guidelines when using personal websites and weblogs:

- A. Never disclose any confidential or proprietary information of the Authority.
- B. Respect other individuals and do not make derogatory statements about other Authority employees, vendors, and customers.
- C. Never permit blogging to interfere with the employee’s job.

D. Do not do anything which is detrimental to the best interests of the Authority in a web site or blog.

**6.5.19 Social Media.** To address the fast-changing landscape of the Internet and the way residents communicate and obtain information online, the Authority may, in its sole discretion, consider using social media formats to communicate Authority information to the public and to further the goals of the Authority when and where it deems appropriate. The Authority has an overriding interest and expectation in deciding who is authorized to “speak” and what is “spoken” on behalf of the Authority on any social media site. This section 6.5.19 establishes guidelines for any authorized use of social media on behalf of the Authority. The Authority’s Chief Executive Officer shall approve what social media outlets may be suitable for use by and on behalf of the Authority. All official presences on behalf of the Authority on social media sites or services are considered an extension of the Authority’s information networks and are governed by all policies contained in this handbook. The Authority’s Chief Executive Officer will review any recommendations from employees to use social media sites on behalf of the Authority, and no such use shall be permitted without the Chief Executive Officer’s prior written approval. Only employees authorized by the Chief Executive Officer shall use social media officially on behalf of the Authority. Such employees shall comply with applicable federal and state laws, regulations, and policies. This includes adherence to established laws and policies regarding copyright, the Virginia Public Records Act, the Virginia Freedom of Information Act, First Amendment, any applicable privacy laws, and information security policies established by the Authority. Employees acting officially on behalf of the Authority via social media outlets must conduct themselves at all times as representatives of the Authority.

**6.5.20 Questions and Violations.** Employees should address any questions about this section 6.5 or any policies referred to herein to the Administrative Coordinator. Violations of this section 6.5 or any policies referred to herein may result in disciplinary action up to and including dismissal.

**6.6 Conflicts of Interests.** The State and Local Government Conflict of Interests Act, tit. 2.2, ch. 31 of the Code of Virginia, applies to all officers and employees of the Authority. This law sets out generally prohibited behavior, such as accepting bribes or kickbacks or using confidential information acquired as an Authority employee for one’s own economic benefit. This law also prohibits Authority employees and their families from having a financial interest in a contract with the Authority and Authority employees from participating on behalf of the Authority in transactions in which they or their families have a financial interest. The Virginia Public Procurement Act, tit. 2.2, ch. 43 of the Code of Virginia, sets out additional rules for Authority employees involved in public contracting on the Authority’s behalf. Violations of these laws may subject an Authority employee to civil or criminal penalties as well as disciplinary action by the Authority. Employees with questions or concerns related to conflict-of-interests laws should address them to the Administrative Coordinator, who may consult with the Authority’s General Counsel to assist in responding to the questions or concerns.

**6.7 Gifts.** In addition to the laws to which section 6.6 of this handbook refers, Authority employees shall not (i) accept gifts, gratuities, favors, or rewards for any services they perform in connection with Authority employment or (ii) solicit, offer, or accept money or anything of value in exchange for an appointment, promotion or special privileges with the Authority. This policy does not prevent an employee from accepting a gift with a value less than \$20.00.

**6.8 Confidentiality of Authority Information.**

- A. It is the responsibility of all Authority employees to safeguard sensitive information. Generally, any information about Authority gained by an employee, as a result of the employee's employment with Authority and which is not known by the general public, is considered confidential and should be treated as confidential.
- B. During employment with the Authority, and after the termination of that employment, irrespective of whether the termination was voluntary or involuntary, employees should use, access, disclose, copy, or duplicate confidential information only as needed to perform their duties and in no manner which is detrimental to the best interests of the Authority. This forbids, among other things, the discussion or disclosure of confidential information with outsiders, including members of an employee's family and an employee's close friends. Employees are also prohibited from discussing confidential information with other employees unless the employees in question are specifically required to do so in the performance of their duties.
- C. Employees are also prohibited from storing, downloading or removing confidential information (either in written or electronic form) away from Authority premises or in personal systems such as personal computers or external storage drives or for any reason that is detrimental to the interests of Authority or in violation of this policy. It is also important not to leave confidential information in areas which would be visible or accessible to visitors or any other individual who has no need to know concerning the confidential information. Consequently, confidential information should be locked up and computers containing these systems locked or powered off when not in use.
- D. In order to protect confidential information, employees are prohibited from using any device at work which has the ability to photograph, record (audio or visual), transcribe, photocopy, or otherwise duplicate images, documents or things unless it is specifically necessary for the employee to use such a device for job-related functions. Such devices include, but are not limited to, cameras, camcorders, phone cameras, tape recorders, and PDAs. Except as specifically required by the employee's job, employees are also prohibited from copying, photographing, recording (audio or visual), downloading or otherwise duplicating confidential information or images unless the employee is specifically required to do so in the performance of the employee's duties with the Authority.

- E. Employees may be required to have passwords, or may be provided passwords, for use with certain Authority information systems. Employees are prohibited from disclosing such passwords to outsiders or to other employees who have no business need to know about the password, or for any manner which is detrimental to the best interests of the Authority.
- F. If an employee is questioned by anyone (either outside Authority or other employees) about disclosing any information about the Authority, including confidential information, and the employee is concerned about the appropriateness of giving them the information, the employee is not required to answer. Instead, as politely as possible, the employee should refer the request to the Chief Executive Officer.
- G. If an employee believes that the employee is required by law or otherwise to reveal any confidential information of the Authority, such as by court order or subpoena, either during employment with the Authority or after the termination of that employment, the employee should, except as otherwise prohibited by law, promptly contact the Chief Executive Officer prior to any disclosure so that the Authority can take appropriate steps to safeguard the disclosure of the confidential information.
- H. Employees must return all Authority property in the employee's possession, including confidential information, as well as copies of the same, at the time the employee leaves employment with the Authority or at any other time the Authority requests.
- I. The Authority may take appropriate civil or criminal action against anyone who misappropriates or misuses confidential information. The Authority may also notify proper law enforcement authorities where it believes that illegal or improper activities have occurred.

**6.9 Outside Employment.** Although employees are allowed to have employment outside the Authority, Authority employees shall not engage in any employment, activity, or enterprise which has been determined to expose the Authority to legal liability for acts of negligence growing out of such outside employment, or to be inconsistent, incompatible, or in conflict with the duties, functions, or responsibilities of their Authority employment. In addition, in the event that such outside employment activity or enterprise interferes with the employee's performance, attendance, promptness, ability to work overtime hours, the employee may be required to discontinue it. Outside employment is defined as that employment which is outside the normal job for which an individual is employed by the Authority; this includes self-employment. Employees are required to seek written approval of the Chief Executive Officer prior to engaging in any outside employment, activity or enterprise. A copy of such approval will be actively maintained in the employee's personnel file. The absence of this approval from the employee's personnel file creates a presumption that the employee failed to obtain the written approval required in this section.

**6.10 Political Activity.** The Authority and its employees serve all people equally, regardless of their political opinions or affiliations. A person's political opinions or affiliations will not affect the amount or quality of service a person receives from the Authority in or under any circumstances. The Authority complies with section 15.2-1512.2 of the Code of Virginia, which protects the rights of Authority employees to participate in political activities while those Authority employees are off duty, out of uniform, and not on the premises of their employment with the Authority. Consequently, it is the Authority's policy that an applicant's or employee's political affiliation, preference, opinions, or non-work activities will have no effect on the appointment, retention, or promotion of an applicant or employee. However, no Authority employee shall engage in political activities, including, but not limited to, campaigning, displaying or distributing campaign materials, soliciting campaign funds, circulating candidacy petitions, or any other activity meeting the definition of "political activities" in section 15.2-1512.2 of the Code of Virginia while on Authority time or Authority property. Violation of this policy may result in disciplinary action up to and including dismissal.

**6.11 General Conduct and Appearance.** An employee, upon accepting employment, accepts an obligation to conduct himself or herself at all times as a representative of the Authority. The Authority's reputation is determined to a large extent by the impressions made by each and every employee. Consequently, professional attire and image is required of all employees while working or representing the Authority with the public. All employees are also reminded of the following general rules:

- A. Hair, beards and mustaches must be kept trimmed.
- B. Some customers and co-workers are sensitive to strong odors; therefore, employees should use only mild perfumes, colognes, and hair or other body products.
- C. Body piercing, body art, and the nature and amount of jewelry may also be considered inappropriate depending on the particular circumstances.
- D. Those employees required to wear uniforms must do so.

Employees should address questions about what is or is not appropriate under this policy to their supervisor.

**6.12 Comments to News Media and Others.** To ensure that all Authority information is accurate and up to date, all requests for comment by the news media or other sources concerning Authority business are to be referred to the Chief Executive Officer for consideration and response if needed.

**6.13 Use of Authority Time, Care and Use of Equipment, Tools, and Property.**

- A. Authority employees are expected to report to work promptly and make every effort to use time wisely in the completion of assigned duties. Employees shall not use Authority time for personal reasons.

- B. Employees shall attempt in good faith to limit the number and duration of personal telephone calls to communication that is essential and necessary to accomplish the objective. No Authority employee shall use any Authority telephone for a long-distance telephone call for personal purposes where the Authority is to be billed for charges incurred as a result of the telephone call. Use of Authority telephones for excessive numbers of personal calls or for longer periods of time than are necessary, or at times which impede operations, may result in disciplinary action.
- C. Fax machines, personal computers, copiers, and other Authority equipment should be used for Authority business.
- D. Employees are expected to demonstrate proper care when using all Authority equipment and property and such equipment and property should only be used for its intended purpose. Any loss or damage to company property must be reported at once to the employee's supervisor.
- E. Except as needed by the employee to perform that employee's job, no employee is permitted to remove any Authority property, tools or equipment from the Authority's premises without prior approval of their supervisor. Authority property is for business use only and, therefore, not for personal use or for conducting business other than that of the employee's assigned duties.
- F. Scavenging or removal of any discarded item, scrap metal, or any other materials or property from the Authority's transfer station or landfill premises for personal use or gain is strictly prohibited.
- G. Violation of this policy may result in disciplinary action up to and including dismissal.

#### **6.14 Work Routine.**

- A. Because the Authority relies heavily upon its employees, it is important that employees attend work as scheduled. Dependability, attendance, punctuality, and a commitment to do the job right are essential at all times. As such, employees are expected at work on all scheduled workdays and during all scheduled work hours and to report to work on time. Moreover, an employee must notify the employee's supervisor as far in advance as possible (or an amount of time established by the policy of the employee's work unit) if the employee expects to be late or absent, to need to leave early, or to otherwise deviate from the employee's work schedule. In all instances, the Authority will determine whether the employee provided notice as far in advance as possible. The failure to provide timely notice may result in appropriate discipline, up to and including dismissal.
- B. The employee's supervisor will provide the employee with a daily schedule. The supervisor or management may alter work hours during the workday, or may

increase or decrease the normal work hours or work schedule as deemed necessary. Regular employees work a 40-hour week. Depending on the nature of their work, an employee may be allowed to alter the employee's work hours or lunch schedule with approval from the employee's supervisor. However, offices that serve the public must remain open and staffed during normal business hours. While there are no designated times for employee breaks, individuals may need a rest period or brief break during the day. Break periods may not exceed 15 minutes in the morning and 15 minutes in the afternoon. Break periods must not conflict with ongoing work in the office or work area or leave offices that serve the public uncovered. The employee must notify the appropriate supervisor before taking a break. Break periods shall not be used to arrive at work late, leave work early, or extend the lunch period. Employees on break may not disturb employees who are working, and employees, including supervisors, may not disturb employees who are on break.

- C. Depending on the nature of an employee's position, the employee may be required to work overtime or holidays. If overtime or holiday work is required, the Authority will compensate the employee in accordance with this handbook.

**6.15 Solicitation of and Distribution to Employees.** Authority employees are not permitted to sell items for personal gain to other employees or members of the general public during regular office or work hours. The Authority has a policy to provide each employee with a workplace free from solicitation or distribution and "pressure" to support a variety of causes so that the employee may be more productive at work. Accordingly, the following rules apply:

- A. Trespassing, soliciting, or distribution of literature by non-employees on Authority property is prohibited at all times.
- B. Employees may not solicit or distribute to other employees during their own work time, to other employees who are working, or in areas where customers are present.
- C. Employees may also not distribute literature in work areas or areas where customers are present.
- D. Distribution is defined as handing out non-work-related materials, leaflets, literature or printed materials of any kind. Solicitation is defined as approaching another employee for the purpose of influencing that employee to take a specific course of action concerning any cause not directly related to the employee's regular work duties or conditions.
- E. Work time is any time during an employee's shift except for authorized breaks and lunches. Work areas include any area where work is performed except designated break rooms, restrooms or designated employee lounges.

F. Bulletin boards, company mail, electronic mail and other communications channels on company premises are solely for business purposes, including information on employee policies, programs and benefits.

**6.16 Compliance with Law; Reporting Duty.** It is the Authority's goal to be in compliance with all appropriate federal, state, and local laws applicable to it. If you are aware of any action or conduct by another individual which may be in violation of applicable law or of any of the policies of the Authority, including those contained in this handbook, or any other conduct which is inappropriate or detrimental to the Authority, you have a responsibility to report such violation, conduct, or action to your supervisor or the Chief Executive Officer. Failure to do so may result in disciplinary action up to and including dismissal.

**6.17 Weapons.** For purposes of this section, "weapon" means a firearm, stun weapon, knife or other bladed weapon, baton, nunchaku, shuriken, explosives, or any other implement of like kind. The Authority prohibits the possession or use of any weapon by any employee or visitor on Authority premises or by any employee during work time, while conducting Authority business, or on Authority premises. This prohibition does not apply to law enforcement or security personnel that the Authority authorizes or to weapons that remain secured in an employee's or visitor's locked personal vehicle parked in an authorized location on Authority premises throughout the employee's or visitor's presence on Authority premises.

## CHAPTER 7 – SUBSTANCE ABUSE POLICY

### 7. Substance Abuse Policy.

#### 7.1 Policies Applicable to All Employees.

**7.1.1 Purpose.** It is the policy of the Authority to establish and maintain a work environment free from the adverse effects of alcohol and drugs, including marijuana and marijuana products, cannabis oil and cannabis products, and to ensure the fair and equitable application of policy requirements. The effects of alcohol and drugs in the workplace could undermine the productivity of the Authority's workforce and create a serious threat to the welfare and safety of fellow employees and to the residents of the Authority's member jurisdictions.

**7.1.2 Definitions.** As used in this policy:

- A. ***“Alcohol”*** means the intoxicating agent in beverage alcohol, ethyl alcohol or other low molecular weight alcohols, including methyl or isopropyl alcohol.
- B. ***“Driver”*** means any person operates a commercial motor vehicle as defined in 49 C.F.R. Pt. 382.
- C. ***“Drugs”*** means any substance which, when used by a person, has the potential to produce the effects of a behavioral change which may adversely affect the person's ability to safely and efficiently perform the person's job, including, but not limited to, those substances defined as controlled substances by 21 C.F.R. Pt. 1308 and those substances for which section 7.2.1 of this policy requires the testing of employees.
- D. ***“Medical Review Officer”*** means a person who is a licensed physician and who is responsible for receiving and reviewing laboratory results generated by the Authority's drug testing program and evaluating medical explanations for certain drug test results.
- E. ***“Safety-sensitive function”*** means all time from the time a driver begins to work or is required to be in readiness to work until the time the driver is relieved from work and all responsibility for performing work as defined in 49 C.F.R. Pt. 382.
- F. ***“Substance Abuse Professional”*** means a person who evaluates Authority employees who have violated this policy or a United States Department of Transportation drug and alcohol regulation, makes recommendations concerning education, treatment, follow-up testing, and aftercare.

**7.1.3 Cannabis Oil Medicinal Use.** Section 40.1-27.4 of the Code of Virginia prohibits the Authority from discharging, disciplining, or discriminating against an employee for the employee's lawful use of cannabis oil pursuant to a valid written certification issued by a practitioner for the treatment or to eliminate symptoms of the employee's diagnosed condition or disease. The law does not (i) restrict the Authority's ability to take any adverse

action for any impairment caused by the use of cannabis oil or to prohibit possession during the work hours or (ii) require the Authority to commit any act that would cause the Authority to be in violation of federal law. This law does not affect those employees and applicants who are subject to the United States Department of Transportation regulations. It remains unacceptable for employees and applicants subject to those regulations to use alcohol or drugs, including marijuana and cannabis oil.

**7.1.4 Searches.** The Authority retains the right to search, without employee consent, all areas and property in which it maintains either joint control with the employee or full control, including Authority vehicles, property, and equipment. Supervisors shall not physically search employees under any circumstances. If containers or items with beverages containing alcohol or illegal drugs are found in Authority vehicles or equipment, a supervisor shall obtain the items and may contact security or police personnel to conduct further investigation or physical searches.

**7.1.5 Pre-Duty Alcohol Prohibition.** Employees are prohibited from using alcohol within four hours prior to reporting for duty or, if an employee is called to duty to respond to an emergency, within the time period after the employee has been notified to report to duty. If a supervisor has actual knowledge that an employee has used alcohol within four hours prior to performing duties or within the time period after the employee has been notified to report for duty, the employee will not be permitted to perform or continue to perform any duties.

**7.1.6 Employee Responsibilities.** All employees shall abide by the rules of conduct outlined in this policy. Failure to meet these responsibilities shall be the basis for imposing discipline. An employee shall:

- A. Not have their ability to perform job duties impaired by alcohol or any drugs, whether legal or illegal, while on duty or on call, while on Authority premises in an official capacity, while acting in any official capacity representing the Authority, or at any time while operating Authority vehicles or equipment;
- B. Not be under the influence of alcohol or illegal drugs under any of the circumstances described in paragraph (A);
- C. Not use alcohol at all while on duty or report to work under the influence of alcohol;
- D. Not use, possess, sell, distribute, or manufacture illegal drugs at any time, or assist another in such acts, regardless of whether on duty or off duty;
- E. Submit to alcohol and drug substance detection testing when requested to do so by management pursuant to this policy;
- F. Provide to the Medical Review Officer a legally valid prescription or valid written certification issued by a practitioner for the treatment or to eliminate symptoms of

- the employee's diagnosed condition or disease issued by the practitioner when the employee's test returns a positive result;
- G. Provide notification to management of any criminal drug-related conviction within 48 hours of the conviction; and
- H. Provide notification to management of any suspension, revocation, or other loss of commercial driver's license privileges within 24 hours of the event.

**7.1.7 Employee Assistance Program.** The Authority's Employee Assistance Program is available to all employees under this policy to provide appropriate education regarding the use of alcohol and illegal drugs. In addition, the Employee Assistance Program will coordinate training with the Authority to provide supervisors with the necessary training on performance indicators of possible drug and alcohol use for reasonable suspicion drug awareness and testing. The Employee Assistance Program is also available for employees to confidentially seek voluntarily assistance to obtain counseling, rehabilitation, and other assistance for drug and alcohol abuse problems.

**7.1.8 Disciplinary Action for Violations.** Violations of this policy will result in disciplinary action up to and including dismissal.

## **7.2 Testing Requirements.**

**7.2.1 Purpose.** The testing required by this policy will test for the following prohibited substances which could impair an employee's ability to effectively and safely perform the employee's required duties:

- A. Alcohol;
- B. Marijuana;
- C. Cocaine;
- D. Opioids;
- E. Phencyclidine (PCP); and
- F. Amphetamines.

**7.2.2 Applicability.** All drivers are subject to random testing. All employees are subject to reasonable suspicion testing. All drivers and all employees operating certain Authority equipment are subject to post-accident testing. All employees are subject to return-to-duty testing after receiving a positive test.

## **7.2.3 Types of Testing.**

**7.2.3.1 Pre-Employment Testing.** The Authority requires each applicant who accepts an offer of employment with the Authority to undergo alcohol and drug testing. Any applicant who (i) refuses to provide written authorization for the release of information, (ii) refuses to take any alcohol or drug test, (iii) tests positive for alcohol or drugs, or (iv) engages in conduct that obstructs the testing procedure is ineligible for employment for a period of one year after such refusal, positive test, or conduct.

**7.2.3.2 Post-Accident Testing.** A driver who receives a citation for a moving traffic violation arising from a United States Department of Transportation reportable accident defined in the Federal Motor Carrier Safety Regulations, 49 C.F.R. Pt. 390, as an occurrence involving a commercial motor vehicle operating on a public road which results in (i) a fatality, (ii) bodily injury to a person who, as a result of the injury, immediately receives medical treatment away from the scene of the accident, or (iii) one or more motor vehicles incurring disabling damage as a result of the accident, requiring the motor vehicle to be transported away from the scene by a tow truck or other motor vehicle, is required to be tested for alcohol and drugs. The driver is responsible for completing the drug test as soon as possible, but no later than 32 hours after the accident occurs, and the alcohol test no later than two hours after the accident occurs. The driver's supervisor shall maintain on file written documentation indicating why any such test was not conducted within the required time frame. If the driver is disabled and cannot be tested for alcohol or drugs at the time of the accident, the driver's supervisor shall document all conversations held with the law enforcement officer, the hospital staff, and the driver and obtain, to the maximum extent feasible, a medical release form signed by the driver consenting to the release of hospital records to the Authority as a means of determining if the accident was related to the driver's use of alcohol or drugs.

**7.2.3.3 Random Testing.** The Authority conducts random testing for all drivers pursuant to 49 C.F.R. § 382.305. The testing for alcohol and drugs is unannounced, and the selection is made by the Authority's testing contractor via computer through a non-biased means of choice. With random selection, it is possible that some drivers may never be selected while other drivers may be selected more than once. When a driver is notified that the driver has been selected for alcohol testing, drug testing, or both, the driver will not perform a safety-sensitive function until the test is administered, and the driver shall proceed to the testing site immediately. If the driver refuses to complete an alcohol or drug test, the driver will not be allowed to perform safety-sensitive functions for the Authority and will be subject to disciplinary action in accordance with this policy.

**7.2.3.4 Reasonable Suspicion Testing.** Each supervisor shall follow the provisions of this section when the supervisor has a reasonable suspicion that an employee is under the influence of alcohol or drugs. The supervisor's determination that reasonable suspicion exists to require the employee to undergo an alcohol or drug test must be based on specific, contemporaneous, articulable observations concerning the appearance, behavior, speech or body odors of the employee. In the case of drugs, the supervisor's observations may include indications of the chronic and withdrawal effects of drugs. The supervisor shall refer to the Carilion EAP Reasonable Suspicion Form available at [https://www.carilionclinic.org/sites/default/files/2017-08/Reasonable\\_Suspicion\\_Form\\_0.pdf](https://www.carilionclinic.org/sites/default/files/2017-08/Reasonable_Suspicion_Form_0.pdf)

for examples of observations that would support a determination that reasonable suspicion exists to require the employee to undergo an alcohol or drug test and use this form to document the supervisor's observations. Two supervisors, at least one of whom has received at least 120 minutes of Employee Assistance Program training on the specific indicators and symptoms of alcohol and drug misuse or abuse, must make the determination as to whether grounds exist for reasonable suspicion testing. If both supervisors determine that reasonable suspicion exists, both supervisors shall document the observations constituting reasonable suspicion as required by this section and transport or arrange the transportation of the employee to the Authority's testing site for the Authority's testing contractor to conduct the necessary tests. The supervisors shall not allow the employee to drive or report to the testing site alone.

**7.2.3.5 Return-to-Duty Testing.** If an employee receives a positive test result, the employee shall undergo alcohol or drug testing and assessment before returning to duty. If a United States Department of Transportation-certified Substance Abuse Professional determines that evaluation, rehabilitation, training, or treatment is required, the employee must complete that evaluation, rehabilitation, training, or treatment to be considered eligible to return to duty. The employee is responsible for all costs associated with the employee's completion of the evaluation, rehabilitation, training, or treatment. If the employee fails to complete successfully the evaluation, rehabilitation, training, or treatment, the employee will be placed on leave without pay to proceed with the disciplinary process. The Authority may permit the employee to return to the performance of safety-sensitive functions, only after the employee takes a return-to-duty test. This test cannot occur until after the United States Department of Transportation-certified Substance Abuse Professional has determined that the employee has complied successfully with prescribed evaluation, rehabilitation, training, or treatment. The employee must have a negative drug test result or an alcohol test with an alcohol concentration of less than 0.02, or both, before resuming performance of safety-sensitive duties.

### **7.3 Testing Procedures.**

- 7.3.1 Recordkeeping.** The Authority will retain and destroy records of test results in accordance with the Library of Virginia's Records Retention and Disposition Schedule No. GS-03. The Authority will make every effort to keep the results of alcohol and drug tests confidential. However, test results may be used in administrative hearings, arbitration, grievances, and as otherwise required by law or court order. Also, test results will be sent to federal agencies as required by federal regulations. If the employee is referred to a treatment facility, the test results will be made available to the employee's counselor.
- 7.3.2 Alcohol Test Results.** Alcohol testing will determine whether an employee has a prohibited concentration of alcohol in a breath specimen. No employee shall report for or remain on duty while having an alcohol concentration of 0.02 or greater.
- 7.3.3 Legal Drugs.** Each employee using legal drugs prescribed by a practitioner, as defined by section 4.1-1600 of the Code of Virginia, is responsible for (i) being aware of any effects such drugs may have on the performance of the employee's duties, (ii) reporting the use of

such drugs that may affect the performance of the employee's duties to the employee's supervisor, and (iii) obtaining their supervisor's authorization to possess or use such drugs while working or on the Authority's premises. An employee may continue to work even though taking a legal drug if the employee's supervisor has determined, with appropriate medical consultations, that the employee does not pose a threat to the safety of the employee or others and that the employee's job performance will not be affected significantly by the legal drug.

**7.3.4 Positive Test for Drugs.** The Medical Review Officer must verify a confirmed positive test result for marijuana, cocaine, amphetamines, semi-synthetic opioids (i.e., hydrocodone, hydromorphone, oxycodone, and oxymorphone), or phencyclidine (PCP) unless the employee presents a legitimate medical explanation for the presence of the drug in the employee's system. The employee has the burden of proof that a legitimate medical explanation exists, including a valid prescription or valid written certification issued by a practitioner, as defined by section 4.1-1600 of the Code of Virginia, for the treatment or to eliminate the symptoms of the employee's diagnosed condition or disease. The employee must present information meeting this burden at the time of the verification interview. The Medical Review Officer may extend the time available to the employee for this purpose for up to five days before verifying the test result, if the Medical Review Officer determines that there is a reasonable basis to believe that the employee will be able to produce relevant evidence concerning a legitimate medical explanation within that time. If the Medical Review Officer determines that there is a legally valid prescription or valid written certification issued by a practitioner for the treatment or to eliminate the symptoms of the employee's diagnosed condition or disease or that there is otherwise a legitimate medical explanation, the Medical Review Officer must verify the test result as negative. Otherwise, the Medical Review Officer must verify the test result as positive.

**7.3.5 Challenges of Test Results.** For alcohol testing, the second test serves as the confirmation test to determine the alcohol concentration. Accordingly, no applicant or employee will have the ability to challenge alcohol test results. An applicant or employee may challenge a positive test for a drug by notifying the Administrative Coordinator in writing within 72 hours of the employee's receipt of the test results. The Authority's contracted laboratory will retest the applicant or employee's original sample at the applicant or employee's cost. A negative retest result will not result automatically in the applicant being eligible for employment or the employee avoiding disciplinary action, but the Authority will consider the retest in light of all of the circumstances.

## CHAPTER 8 – DISCIPLINARY PROCEDURES

### 8. Disciplinary Procedures.

#### 8.1 Conduct.

##### 8.1.1 Generally.

- A. The Authority has established and encourages high professional, moral and ethical standards for its operation and employees. The Authority will not tolerate unethical, illegal actions, or actions in violation of established laws and standards. Authority employees are expected to apply themselves efficiently to the performance of their assigned job duties, to be timely as well as regular at attendance at work, to provide satisfactory work performance and to adhere to the standards established by the Authority. Failure to follow these standards will normally result in some type of corrective action by supervisors, including the possibility of immediate dismissal.
- B. The conduct standards listed in this chapter are intended to be illustrative. It is not possible to list every conceivable infraction, and therefore those listed are not exclusive. Other forms of misconduct or nonperformance will be treated consistently with these guidelines. Although the Authority attempts to offer corrective counseling whenever possible, immediate dismissal may result from situations where, in the opinion of the Authority, corrective action is not appropriate.
- C. Any action or inaction which is in violation of any Authority policy or is harmful to co-workers, the Authority, or the Authority's reputation may result in disciplinary action up to and including dismissal.

##### 8.1.2 Prohibited Practices. Prohibited practices include, but are not limited to, the following:

1. Violation of the Authority's substance abuse policy.
2. Violation of the Authority's attendance policies.
3. Failing to perform tasks required by the job.
4. Unsatisfactory attendance.
5. Willful or negligent damaging of equipment or property.
6. Willful or negligent violation of safety rules or practices.

7. Physical violence.
8. Failing to remain at one's assigned work station.
9. Violation of work rules.
10. Gambling on Authority time or on Authority property.
11. Use of abusive, threatening or profane language toward fellow employees or the public.
12. Failure to report on-the-job accidents involving vehicles or equipment in which the driver or passengers are Authority employees.
13. Making false statements in regard to application for employment.
14. Cheating or aiding anyone to cheat on any examination for original appointment or promotion with the Authority.
15. Receiving, paying or offering to pay money or render anything of value to any person with the intent of influencing that person to alter or have altered the results of an examination or some other selection process or to alter or have altered the results of any inspection or procurement or any other governmental process.
16. Electioneering on Authority premises during working hours in such a manner as to hinder, delay, disrupt, or otherwise disturb normal work procedures in violation of section 6.10 of this handbook.
17. Commission of any act constituting a crime under federal or state law or under city or county ordinance
  - a. while on Authority property or while on Authority time, or
  - b. of such a nature as to indicate unfitness or unsuitability to continue in the particular position of employment.
18. Knowingly, intentionally, or negligently violating any provision of the Authority's Employee Safety Manual or any other policy, procedure, regulation, or rule of the Authority.
19. Refusal to report to work without justification when ordered to report by the Operations Manager or supervisor.

20. Scavenging of discarded items from the landfill or transfer station.
21. Excessive use of telephones for personal use.
22. Wearing ear phones while operating Authority vehicles or equipment.
23. Any action by an Authority employee that is in violation of any Authority policies or procedures or is detrimental to the Authority.

Engaging in any one or more of these prohibited practices may result in disciplinary action up to and including dismissal.

### **8.1.3 Harassment Policy.**

**8.1.3.1 Purpose.** The Authority is dedicated to a work environment that is free of harassment, discrimination, and inappropriate conduct. The Authority does not and will not tolerate words, jokes, pictures, gestures, or comments to any employee or other person in the workplace related to an individual's protected characteristic as defined in section 8.1.3.3.

**8.1.3.2 Applicability.** This policy applies to all officers and employees of the Authority.

### **8.1.3.3 Definitions.**

- A. **Harassment.** "Harassment" may take many forms, including, but not limited to, the following:
  1. Verbal harassment, including, for example, epithets, derogatory comments, or slurs on the basis of a protected characteristic; sexual remarks or well-intentioned compliments about a person's clothing, body, or sexual activities; jokes targeting a person with a protected characteristic and jokes or comments of a sexual nature;
  2. Physical harassment, including, for example, assault, unwelcome touching, impeding or blocking body movement, or any physical interference with normal work or movement when directed at an individual on the basis of a protected characteristic;
  3. Visual harassment, including, for example, derogatory posters, notices, bulletins, cartoons, drawings, or other advertisements on the basis of a protected characteristic, including, but not limited to posters, magazines, videos, Internet sites, or other electronic media of a sexual nature;

4. Sexual harassment, including, for example, unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature which are implicitly or explicitly a term or condition of an employee's employment, are used as a basis for employment decisions, or affect or interfere with an employee's work performance.
5. Hostile work environment, created by conduct, including the above-referenced behaviors, which has the purpose or effect of creating an intimidating, hostile, or offensive work environment.

B. ***Protected Characteristic.*** "Protected characteristic" means race, color, religion, ethnic or national origin, sex, pregnancy, childbirth or related medical conditions, age, marital status, sexual orientation, gender identity, disability, military status, or any other legally-protected characteristic.

**8.1.3.4 Statement of Policy and Regulation.** The Authority strongly disapproves of and prohibits harassment, discrimination, and inappropriate conduct. The Authority does not and will not tolerate words, jokes, pictures, gestures or comments to any employee or other person in the workplace, e.g., vendors, passengers, or members of the public, related to an individual's protected characteristic. Such conduct is a violation of the Authority's rules of conduct and may result in disciplinary action up to and including dismissal. All employees shall avoid engaging in offensive, harassing, or inappropriate behavior at work and shall be responsible for assuring that the workplace is free from such actions at all times. Examples of prohibited conduct include, but are not limited to, lewd or sexually or racially suggestive comments, off-color language or jokes, slurs and other verbal, graphic, or physical conduct relating to an individual's protected characteristic, including the use of terms such as "honey", "babe", "sugar", or any display of explicit pictures, calendars, greeting cards, articles, books, magazines, photos or cartoons. Any employee who engages in any of the conduct prohibited herein may be subject to disciplinary action up to and including dismissal. Please note that what one person considers to be appropriate behavior may be offensive to others. The Authority will not tolerate any inappropriate conduct, as determined by the Authority, whether or not it rises to the level of harassment or discrimination under applicable law.

**8.1.3.5 Complaint Procedure.** Any employee who has a complaint of harassment, discrimination, or inappropriate conduct at work, by anyone, including supervisors, co-workers, visitors, vendors, outside contractors, service or maintenance personnel, or employees of other businesses, should bring the matter to the attention of the employee's supervisor, an Operations Manager, the Administrative Coordinator, or the Chief Executive Officer immediately so that the matter may be investigated and dealt with properly. Employees who wish to file a complaint may do so in writing which can be submitted or dictated to

their supervisor, an Operations Manager, the Administrative Coordinator, or the Chief Executive Officer, and signed by the employee. A complaint form is attached to this policy.

#### **8.1.3.6 Nature and Scope of Investigation.**

- A. The person receiving the complaint shall present the complaint promptly to the Chief Executive Officer. The Chief Executive Officer shall assign an investigator to investigate the complaint and, where warranted, recommend appropriate disciplinary action. In the event the Chief Executive Officer is the subject of the complaint, the person receiving the complaint shall present the complaint to the Authority Board Chairman for investigation and action with the advice of the Authority's General Counsel.
- B. The investigator shall handle all matters related to allegations of prohibited conduct in a thorough, expeditious, and professional manner so as to protect all employees. In determining whether alleged conduct constitutes harassment, discrimination, or inappropriate behavior, the totality of the circumstances, the nature of the conduct, and the context in which the alleged incidents occurred all will be investigated. The investigator's findings and recommendations should be reduced to writing. To the extent permitted by law, except for disclosure the Authority deems necessary, the written contents and findings of investigations will be treated as confidential.

#### **8.1.3.7 Confidentiality.**

- A. Except as necessary to carry out his or her duties and subject to applicable law and the exceptions contained in this policy, including any disciplinary or grievance procedure, the investigator shall not communicate the fact that an investigation is pending nor the contents or findings of such investigation except to the Chief Executive Officer and legal counsel for the Authority.
- B. Except as necessary to carry out his or her duties and subject to applicable law and the exceptions contained in this policy, including any disciplinary or grievance procedure, persons receiving a complaint of harassment or findings of the investigator shall not communicate the fact or information to any person other than the investigator.
- C. Persons from whom information is being sought within the course and scope of investigation should only be informed that a complaint of harassment has been brought and that the information sought of such persons is a necessary part of the investigation.
- D. The written contents and findings of investigations shall be maintained by the investigator in a place of security and limited access. Such records may be made

available to the Chief Executive Officer as part of any disciplinary action, to any court or federal agency having jurisdiction over such harassment complaints after consultation with the Authority's legal counsel, or to others as required or allowed by law.

#### **8.1.3.8 Rights of Subjects of Complaint.**

- A. Authority officers and employees against whom a complaint is made shall receive written confidential notice from the investigator within five regular business days of the investigator's receipt of a complaint.
- B. Such notice shall inform such party of the right to be heard by the investigator and the right to produce witnesses and present evidence concerning the allegations. Attorneys or representatives of parties other than the Authority shall have no right to be present during the interviews or to otherwise participate in the internal investigation of complaints of prohibited conduct.
- C. The party against whom the complaint is made shall receive written, confidential notice within five regular business days after the conclusion of the investigation. Such notice will, among other things, contain a statement of the results of the investigation and disciplinary action taken, if any.

**8.1.3.9 Retaliation.** The Authority will not take any adverse action against any employee who, based on a good faith belief, makes a complaint under this policy.

#### **8.1.3.10 Disciplinary Action.**

- A. The Authority considers harassment, discrimination, and inappropriate conduct to be major offenses which may result in discipline up to and including dismissal for the offender if the offender is an employee. If the offender is a third party, the Authority may cease doing business with such individual or entity.
- B. Where the results of an investigation reveal that a written complaint of harassment is frivolous or made in bad faith, the employee having made such complaint will be subject to appropriate disciplinary action up to and including dismissal.
- C. An employee who reveals information in violation of section 8.1.3.7 will be subject to disciplinary action up to and including dismissal.
- D. An employee who engages in retaliation prohibited by section 8.1.3.9 will be subject to disciplinary action up to and including dismissal.

**8.1.4 Workplace Violence Policy.** Workplace violence includes any action that may threaten the safety or security of an Authority employee, affect an Authority employee's physical or psychological well-being, or damage Authority property or the property of an Authority employee. No Authority employee shall make any oral or written threat against another person or engage in any act of workplace violence. If an Authority employee observes or experiences threatening behavior or workplace violence by any person on Authority premises, the Authority employee immediately shall report the incident to the Authority employee's supervisor, an Operations Manager, or the Chief Executive Officer.

**8.1.5 Retaliation Policy.** The Authority intends to foster an environment that allows Authority employees to report violations or conditions they reasonably perceive to be violations of laws or Authority policies without fear of retaliation. Any Authority employee who retaliates against another Authority employee for reporting known or suspected violations of law or Authority policies has violated this retaliation policy and is subject to disciplinary action up to and including dismissal. Authority employees who experience or witness retaliation should report such retaliation to their supervisor or the Administrative Coordinator immediately.

## **8.2 Progressive Discipline.**

**8.2.1 Generally.** The Authority will address most violations of the policies set forth in this handbook through progressive discipline comprised of disciplinary steps that progress in degrees of severity. The Authority reserves the right to determine what discipline will be imposed and to combine or skip disciplinary steps depending on the facts of each situation and the nature of the violation. The Authority reserves the right to dismiss probationary employees without cause.

**8.2.2 Step 1 - Counseling and Oral Warning.** Whenever the performance or conduct of an employee becomes unsatisfactory, the employee's supervisor shall inform the employee promptly of the unsatisfactory performance or conduct, discuss with the employee the nature of the problem or the violation of Authority policies and procedures, and describe the expectations and steps the employee must take to improve the employee's performance or conduct to resolve the problem. Within five business days after the oral counseling of an employee, the supervisor shall prepare written documentation of the counseling. The employee will be asked to sign this document to demonstrate the employee's understanding of the issues and the corrective action to be taken.

**8.2.3 Step 2 - Written Warning.** If the employee's unsatisfactory performance or conduct does not improve, recurs, or results from an unsatisfactory performance evaluation, the disciplinary process will advance to the second step. The employee's supervisor, and, if different, Operations Manager shall meet with the employee to review any additional incidents or information about the employee's performance or conduct as well as any prior relevant corrective action plans. The supervisor and, if different, Operations Manager will

outline the consequences for the employee of the employee's continued failure to meet expectations. The employee's supervisor shall provide the employee with a written warning in the form of a corrective action plan describing the employee's immediate and sustained corrective action within five business days of this second step meeting. The written warning will be delivered to the employee, placed in the employee's personnel file, and sent to the Administrative Coordinator and the Chief Executive Officer.

- 8.2.4 Step 3 - Final Written Warning and Penalty.** If an employee fails to successfully complete a corrective action plan, or if the employee's performance, conduct, or safety incidents are serious or harmful, the employee's supervisor shall issue a final written warning to the employee and impose a penalty described in section 8.3. The Chief Executive Officer must approve each imposition of a penalty.
- 8.2.5 Step 1 4 Dismissal.** The last and most serious step in the progressive disciplinary process is a recommendation to dismiss the employee. Generally, the Authority will proceed through the preceding four steps in the progressive disciplinary process before dismissing an employee. However, the Authority reserves the right to combine steps, skip steps, or dismiss employees without prior notice or disciplinary action depending upon the circumstances of each situation and the nature of the offense.
- 8.2.6 Conduct Not Subject to Progressive Discipline.** Behavior that is illegal, constitutes workplace violence under section 8.1.4, or violates the Authority's substance abuse policy is not subject to progressive discipline, may result in immediate dismissal, and may be reported to appropriate law enforcement officers.

### **8.3 Penalties.**

- 8.3.1 Reprimand.** A reprimand is a notice in writing from a supervisor to an employee warning the employee about unsatisfactory work performance or misconduct. Before receiving a written reprimand, the employee will be allowed to provide an explanation for the misconduct or poor job performance. If a written reprimand is still to be issued, the supervisor must then advise the employee that a written reprimand will be issued. The employee will be requested to and should sign the written reprimand as evidence of receipt. A copy of the written reprimand is given to the employee, and a copy is placed in the employee's personnel file.
- 8.3.2 Suspension.** An employee may be suspended for such period of time as the employee's supervisor, with the approval of the Chief Executive Officer, determines to be reasonable and appropriate under the circumstances. All suspensions are disciplinary actions. During a suspension, the employee will not accrue retirement credit or Flexible Leave, the employee will not receive pay for any holidays, and the employee may continue the employee's health insurance coverage by payment of both the employee share and the Authority share of the premium.

**8.3.3 Reduction in Pay.** The pay of an employee may be reduced within the employee's assigned pay grade by a percentage determined by the Chief Executive Officer. A copy of the documentation of the violation or violations that are the basis for the reduction in pay is given to the employee, and a copy is placed in the employee's personnel file.

**8.3.4 Demotion.** A demotion may be based on performance if the employee has displayed an inability to meet essential job functions. The employee may be assigned to a position in a lower pay grade, provided the employee can perform the essential job functions and a position is available. The compensation of a demoted employee will be within the salary range established for the employee's new position. If the demoted employee's current salary is above the maximum rate established for that new position, the salary will be reduced. The demoted employee's salary may be set at any point within the established range for the employee's new pay grade. The new salary will be based upon recommendation by the supervisor and approved by the Chief Executive Officer. A copy of the documentation of the violation or violations that are the basis for the demotion is given to the employee, and a copy is placed in the employee's personnel file.

**8.3.5 Dismissal.** The last and most serious step in the progressive disciplinary process is a recommendation to dismiss the employee. The Chief Executive Officer must approve any decision to dismiss an employee. The employee's supervisor will notify the employee that a dismissal notice is being issued, and a copy of the dismissal notice will be given to the employee. Dismissals also may occur when the employee does not meet performance standards, conduct standards, or the conditions of employment for the employee's position.

## **8.4 Procedural Provisions.**

### **8.4.1 Investigations.**

- A. The Authority may conduct investigations as part of its review of personnel matters. These investigations will follow the applicable laws and the Authority's current policies and procedures. To the extent permitted by law, the Authority will treat any information and records pertaining to the investigation as confidential.
- B. During an investigation, the Chief Executive Officer may place the employee who is the subject of the investigation on paid or unpaid administrative leave as the Chief Executive Officer determines the circumstances warrant. If the employee is placed on unpaid administrative leave, the employee will not accrue retirement credit or Flexible Leave, the employee will not receive pay for any holidays, and the employee may continue the employee's health insurance coverage by payment of both the employee share and the Authority share of the premium. If the investigation absolves the employee, the employee may be reinstated without loss of pay, benefits, or leave and retirement credit.

## **8.4.2 Procedural Guarantees.**

**8.4.2.1 Employee's Right to Notice.** Prior to the imposition on an employee of any penalty pursuant to section 8.3 of this handbook, the employee's supervisor shall give the employee oral or written notice of the offense. The employee shall have the right to offer an explanation or contest the decision, or both.

**8.4.2.2 Employee's Right to Pursue Grievance Procedure.** Non-probationary employees may use the grievance procedure for any matters relating to the application of this chapter of the handbook. Probationary employees may not use the grievance procedure except where discrimination on the basis of race, color, religion, age, sex, political affiliation, handicap or disability, veteran status, or national origin or any other status protected by applicable law is alleged.

**8.4.2.3 Employee's Right to Rebuttal Statement.** The employee may place a statement in the employee's personnel file to explain a situation which led to the commencement of the progressive disciplinary process. This statement does not fulfill any requirement or other part of the grievance procedure and does not constitute notification to the Authority of a grievance.



**CONFIDENTIAL**

## ROANOKE VALLEY RESOURCE AUTHORITY

## **HARASSMENT, DISCRIMINATION, AND INAPPROPRIATE CONDUCT COMPLAINT FORM**

Date: \_\_\_\_\_

Name: \_\_\_\_\_  
(Please Print)

Please describe as clearly as you can exactly what happened to you that leads you to believe that you have been the subject of prohibited conduct. Include dates, if you can, and the names of everyone who was involved in the activity or activities or saw or heard what happened. If there was more than one incident, please describe each incident separately. You may wish to use the back of this form or another piece of paper.

Signature:

Received By: \_\_\_\_\_

Date:

## **NOTICE**

### **ROANOKE VALLEY RESOURCE AUTHORITY PROHIBITS HARASSMENT, DISCRIMINATION AND INAPPROPRIATE CONDUCT IN THE WORKPLACE**

The Roanoke Valley Resource Authority's support of an Equal Employment Opportunity policy includes our commitment to prohibit harassment, discrimination, and inappropriate conduct because of race, color, religion, sex, age, national origin, disability or any other legally protected status. Our employees have the right to be free from, among other things, racial or ethnic slurs, unwelcome sexual advances of any other verbal or physical contact or other conduct that substantially interferes with an employee's work performance or creates an intimidating, hostile, or offensive work environment, or conduct which violates the Authority's policy and regulation prohibiting harassing behavior.

Any employee who feels he or she has been the subject of prohibited conduct as set forth in the policy and regulation providing for a Harassment Free Workplace, should report such incidents to his or her Supervisor, the Operations Manager, or the Chief Executive Officer without fear of reprisal. A complaint may be filed with a representative of management who is not the victim's supervisor.

The Authority also prohibits sexual harassment. Unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature constitute sexual harassment when: (i) submission to the conduct is made either an explicit or implicit condition of employment; (ii) submission or rejection of the conduct is used as the basis for an employment decision affecting the harassed employee; or (iii) the harassment substantially interferes with an employee's work performance or creates an intimidating, hostile, or offensive work environment.

**IF YOU OBSERVE OR ARE SUBJECT TO ANY INAPPROPRIATE CONDUCT, INCLUDING HARASSMENT, DISCRIMINATION, OR SEXUAL HARASSMENT BY ANYONE, REPORT IT!**

**DO NOT ASSUME THAT THE AUTHORITY KNOWS OF SEXUAL OR OTHER HARASSING CONDUCT OR INAPPROPRIATE BEHAVIOR ALLEGEDLY AFFECTING YOU. NOTIFY A MANAGEMENT REPRESENTATIVE SO THAT THE AUTHORITY CAN RESPOND. THE AUTHORITY HAS THE RESPONSIBILITY OF INVESTIGATING AND RESOLVING SUCH COMPLAINTS. THE AUTHORITY WILL TREAT ALL COMPLAINTS AS CONFIDENTIALLY AS POSSIBLE. THE AUTHORITY CONSIDERS HARASSMENT, DISCRIMINATION, AND INAPPROPRIATE CONDUCT TO BE MAJOR OFFENSES WHICH CAN RESULT IN THE SUSPENSION OR DISCHARGE OF THE OFFENDER.**

## CHAPTER 9 – GRIEVANCE PROCEDURE

### 9. Grievance Procedure.

**9.1 Policy.** It is the policy of the Authority to encourage resolution of employee problems and complaints through open and free discussion of employee concerns with immediate supervisors and Authority management personnel. However, to the extent that such concerns cannot be resolved in such an informal manner, this grievance procedure attempts to afford an immediate and fair method for the resolution of disputes that may arise during the course of an employee's employment with the Authority.

**9.2 Purpose.** The purpose of the grievance procedure is to attempt to provide a fair, detailed process whereby eligible employees may voice complaints concerning certain issues related to their employment with the Authority. The objective is to improve employee-management relations through a prompt and fair method of resolving problems.

**9.3 Definition of Grievance.** A grievance shall be a complaint or dispute by an employee relating to his employment, including (i) disciplinary actions, including dismissals, disciplinary demotions, and suspensions, provided that dismissals shall be grievable whenever resulting from formal discipline or unsatisfactory job performance; (ii) the application of personnel policies, procedures, rules, and regulations, including the application of policies involving the contents of ordinances, statutes, or established personnel policies, procedures, rules, and regulations; (iii) discrimination on the basis of race, color, creed, religion, political affiliation, age, disability, national origin, sex, marital status, pregnancy, childbirth or related medical conditions, sexual orientation, gender identity, or military status; and (iv) acts of retaliation as the result of the use of or participation in the grievance procedure or because the employee has complied with any law of the United States or of the Commonwealth, has reported any violation of such law to a governmental authority, has sought any change in law before the Congress of the United States or the General Assembly, or has reported an incidence of fraud, abuse, or gross mismanagement.

**9.4 Management Responsibilities; Nongrievable Complaints.** The Authority shall retain the exclusive right to manage its affairs and operations. Accordingly, the following complaints are nongrievable: (i) establishment and revision of wages or salaries, position classification, or general benefits; (ii) work activity accepted by the employee as a condition of employment or work activity that may reasonably be expected to be a part of the job content; (iii) the contents of ordinances, statutes, or established personnel policies, procedures, rules, and regulations; (iv) failure to promote except where the employee can show that established promotional policies or procedures were not followed or applied fairly; (v) the methods, means, and personnel by which work activities are to be carried on; (vi) except where such action affects an employee who has been reinstated within the previous six months as the result of the final determination of a grievance, termination, layoff, demotion, or suspension from duties because of lack of work, reduction in work force, or job abolition; (vii) the hiring, promotion, transfer, assignment, and retention of

employees within the Authority; and (viii) the relief of employees from duties of the Authority in emergencies.

**9.5 Coverage of Employees.** Regular employees and part-time employees, as defined in section 2.5 of this handbook, are eligible to file grievances. However, the Chief Executive Officer, temporary employees as defined in section 2.5 of this handbook, and probationary employees as defined in section 2.7 of this handbook, are not eligible to file grievances.

**9.6 Grievability.**

- A. The Chief Executive Officer or the designee thereof shall make decisions regarding grievability and access to the grievance procedure at any time prior to the final step meeting upon the Chief Executive Officer's own initiative or at the request of a Director of Operations, the Business Manager, or the grievant within ten calendar days of the request. The Authority's General Counsel may advise upon but shall not decide the issue of grievability. A copy of the decision shall be sent to the grievant and to the appropriate manager or director, and the Authority's Administrative Coordinator.
- B. The grievant must state clearly within the written grievance facts sufficient to show that the complaint is grievable, that the person complaining is covered by this procedure, and that the grievance is timely.
- C. The deadlines and time limits specified herein shall be tolled until the issue of grievability has been finally determined or accepted.

**9.7 Right to Grievance Procedure.**

- A. Any employee to whom this grievance procedure is applicable who believes he or she has a grievance and who desires to utilize this grievance procedure shall, within ten calendar days after the event giving rise to the grievance, or from the date the grievant should have reasonably gained knowledge of the event giving rise to the grievance, request a meeting with the grievant's supervisor for the purpose of an informal discussion of the grievant's complaint.
- B. In the event the basis of the grievance is the result of a direct disciplinary action taken by a Director of Operations, the Business Manager, or the Chief Executive Officer, or some other person who is not the grievant's immediate supervisor, then the grievant's immediate supervisor shall, within two business days after knowledge of such fact, inform the Administrative Coordinator, who will provide the grievant with the proper form for a written grievance to be completed and returned by the grievant within ten calendar days. The Administrative Coordinator shall refer the written grievance to the appropriate management employee who took the disciplinary action.

C. Failure by the grievant to request the meeting or file the required form with the Administrative Coordinator within the time specified in this section shall be a bar to this grievance procedure.

## **9.8 Steps in the Procedure.**

A. Except as hereafter provided in this section 9.8, the grievance procedure shall consist of the processing of a grievant's complaint by the grievant's immediate supervisor through the submission of a verbal request as the first step and the two following management steps:

1. Step 1: Submission of request to grievant's supervisor;
2. Step 2: Director of Operations or Business Manager; and
3. Step 3: Chief Executive Officer—the final step.

B. Employees under the immediate supervision of a Director of Operations or the Business Manager shall follow the first step in the grievance procedure by filing a written grievance and request for a meeting with such Director of Operations or the Business Manager. The remaining step in the grievance procedure consists of the meeting with the Chief Executive Officer.

C. In the event the basis of the grievant's complaint filed is the result of a direct disciplinary action taken by a Director of Operations or the Business Manager, who is not the grievant's immediate supervisor, then the grievant shall follow the first step in the grievance procedure by filing a written grievance and request for a meeting with such Director of Operations or the Business Manager. If the grievant first requests an informal meeting with the grievant's immediate supervisor, who did not take the disciplinary action, then the immediate supervisor and the Administrative Coordinator shall follow the procedure contained in subsection (B) of this section. The supervisor shall schedule a meeting within five business days of this referral and may request further information. The remaining step in the grievance procedure will proceed as described in subsection (A) of this section.

D. In the event the grievant's immediate supervisor is the Chief Executive Officer, if the grievant is dissatisfied with the results of the meeting with the Chief Executive Officer, the grievant may proceed to request a meeting with the Authority Board Chairman, which will be the final step in the grievance procedure. The decision of the Authority Board Chairman shall be final and binding.

## **9.9 Step 1 - Meeting with Immediate Supervisor.**

A. Except as otherwise specified in section 9.8 of this handbook, the first step in the grievance procedure is an initial processing of a complaint by the grievant's immediate supervisor by requesting a meeting with such supervisor, informal

discussion and written reply format. At Step 1, the grievant's complaint is not required to be submitted in writing, and a formal hearing is not required.

- B. During the informal meeting the grievant and supervisor should endeavor to identify and discuss what act or acts are being challenged, the basis for the grievance, and the relief requested. The grievant must request this meeting within ten calendar days after the event giving rise to the grievance, or from the date the grievant should have reasonably gained knowledge of the event giving rise to the grievance. The grievant may ask the Administrative Coordinator for any assistance required in processing the grievance.
- C. Upon timely request by a grievant who believes that the grievant has a grievance and who desires to utilize this grievance procedure, the grievant's immediate supervisor shall hold a meeting with such grievant within five business days from receipt of such request for an informal discussion of the grievant's complaint. Within five business days from the date of such meeting, the immediate supervisor shall communicate in writing to the grievant the immediate supervisor's response to the grievant's complaint. In reviewing the grievant's complaint, the immediate supervisor may conduct whatever investigation is necessary to reach a final decision and write a response to the complaint. A copy of the immediate supervisor's written response to the grievant's complaint shall be forwarded to the Administrative Coordinator.
- D. All employees and their immediate supervisors are encouraged to calmly and fairly discuss their differences at Step 1.
- E. The only persons who may be present at the supervisor step meeting are the grievant and the supervisor.
- F. If the grievant is not satisfied with the results of the Step 1 informal meeting with the immediate supervisor, and the grievant desires to continue to process the complaint through the grievance procedure, the immediate supervisor shall refer the grievant to the Administrative Coordinator for any assistance required in processing the grievance and for the required forms, which the grievant shall complete and submit to the Administrative Coordinator and the Administrative Coordinator shall distribute.

#### **9.10 Step 2 - Director of Operations or Business Manager.**

- A. If the grievant's immediate supervisor is not a Director of Operations or the Business Manager and the grievant is not satisfied with and does not accept the Step 1 response, or if the immediate supervisor fails to respond within the required time frame, and the grievant wishes to proceed to Step 2 of this grievance procedure, the grievant shall reduce the grievance to writing on the form provided for the purpose by the Administrative Coordinator, and the grievant shall file the required form with the Administrative Coordinator within five business days after

receipt of the immediate supervisor's response or the deadline for the immediate supervisor's response, whichever occurs first.

- B. If pursuant to section 9.8(B) of this handbook the first step for such grievant is Step 2, then the grievant shall reduce the grievant's grievance to writing on the form provided for that purpose by the Administrative Coordinator, and the grievant shall file the required form with the Administrative Coordinator within ten calendar days after the event giving rise to the grievance.
- C. On the form for the written grievance provided by the Administrative Coordinator, the grievant shall indicate the date on which the grievant requested the informal meeting with the immediate supervisor in the space provided for such purpose. The grievant shall also specify on the form the specific relief expected to be obtained through use of the Grievance Procedure. The grievant shall specify facts sufficient to show that the complaint is grievable, that the person complaining is covered by the procedure, and that the grievance is timely.
- D. The Administrative Coordinator shall forward a copy of the grievance to the Director of Operations or Business Manager.
- E. The Director of Operations or Business Manager shall meet with the grievant within five business days of receipt of the notice and render a written decision to the grievant within five business days following such meeting.
- F. The only persons who may be present at the Director of Operations or Business Manager step meeting are the grievant, the Director of Operations or Business Manager, a representative from management, and appropriate witnesses for each side. Witnesses shall be present only while actually providing testimony.
- G. The Director of Operations or the Business Manager shall forward a copy of the decision resulting from the meeting to the Administrative Coordinator.

#### **9.11 Step 3 - Chief Executive Officer.**

- A. If the grievant is not satisfied with the decision of the Director of Operations or the Business Manager, or if the Director of Operations or the Business Manager fails to respond within the required time frame, and the grievant wishes to proceed to Step 3 of this Procedure, then within five business days following receipt of the decision of the Director of Operations or the Business Manager, the grievant shall file a written request with the Administrative Coordinator on a form provided by the Administrative Coordinator.
- B. If pursuant to section 9.8(D) of this handbook, the first step for the grievant is with the Chief Executive Officer, then such grievance shall be reduced to writing on the form provided for the purpose by the Administrative Coordinator, and the grievant

shall file the required form with the Administrative Coordinator within ten calendar days after the event giving rise to the grievance.

- C. The Administrative Coordinator shall forward a copy of the request to the Chief Executive Officer.
- D. The Chief Executive Officer shall meet with the grievant within five business days after receipt of the request and render a written decision within five business days following the meeting with the grievant.
- E. The only persons who may be present at the Chief Executive Officer step are the grievant, the Chief Executive Officer, a representative of management, appropriate witnesses for each side (who shall be present only while providing testimony), and, if the meeting with the Chief Executive Officer is the final step, then at the option of the grievant, a representative of grievant's choice. If legal counsel represents the grievant, the Authority likewise shall have the option of being represented by counsel. Each party shall be responsible for its own attorney's fee and costs. If the grievant states on the required form that the grievant is not represented by counsel and thereafter appears with counsel at the final step meeting, then the Authority shall have the right to delay the meeting until such time as counsel for Authority is available to be present for the meeting. The grievant and the Authority may exchange documents, exhibits, and lists of witnesses in advance of the meeting.
- F. The Chief Executive Officer shall forward a copy of the decision to the Administrative Coordinator.
- G. Except as specified in section 9.12 of this handbook, the decision of the Chief Executive Officer shall be final and binding.
- H. Any question of whether relief granted is consistent with written policies and procedures shall be determined by the Chief Executive Officer or the designee thereof unless the Chief Executive Officer has a direct personal involvement with the event or events giving rise to the grievance, in which case the decision shall be made by the Authority Board Chairman pursuant to section 9.12 of this handbook.

## **9.12 Alternative Final Step - Authority Board Chairman.**

- A. If pursuant to section 9.8(D) of this handbook the first step for the grievant is with the Chief Executive Officer, and if the grievant is not satisfied with the decision of the Chief Executive Officer, then within five business days following receipt of the decision of the Chief Executive Officer, the grievant shall file a written request with the Administrative Coordinator on the form provided for a meeting with the Authority Board Chairman.
- B. The Administrative Coordinator shall forward a copy of the request to the Authority Board Chairman.

- C. The Authority Board Chairman shall meet with the grievant within ten business days following receipt of such request and render a written decision within ten business days following the meeting with grievant.
- D. The only persons who may be present at the Authority Board Chairman final step meeting are the grievant, the Authority Board Chairman, a representative of management, appropriate witnesses for each side (who shall be present only while providing testimony), and, at the option of the grievant, a representative of grievant's choice. If the grievant is represented by legal counsel, the Authority shall likewise have the option of being represented by counsel. Each party shall be responsible for its own attorney's fees and costs. If grievant shall state on the required form that the grievant is not represented by counsel and thereafter appears with counsel at the final step meeting, then the Authority shall have the right to delay the meeting until such time as counsel for Authority is available to be present for the meeting. The grievant and the Authority may exchange documents, exhibits, and lists of witnesses in advance of the meeting.
- E. The Authority Board Chairman shall be forward a copy of the decision to the Administrative Coordinator.
- F. The decision of the Authority Board Chairman shall be final and binding.

### **9.13 Time Limits.**

- A. Any time limit in the grievance procedure may be waived by mutual agreement at the step in question.
- B. If, at any step in the process a decision is not rendered within the required time limit, the grievant may proceed to the next step unless the time limit has been waived by mutual agreement of the Authority and the grievant. If at any step in the process, the grievant fails to file a timely written request for a meeting at the next step in the procedure, such failure shall constitute a bar to the grievant's proceeding to the next step, and the grievance process shall terminate.
- C. Section 1-210 of the Code of Virginia shall govern all the computation of all time periods under this grievance procedure.
- D. Computation of time, whether in calendar days or business days, shall be without regard to the grievant's personal work schedule or the grievant's use of paid leave or leave without pay.
- E. The term "business day" as used in this chapter 9 means Monday through Friday, not including Authority holidays or any other day on which the Authority's administrative offices are closed.

F. Deadlines may be tolled during the time that the person responsible for conducting the hearing or meeting for the appropriate step of the grievance procedure is on paid leave or on travel for the Authority. In such cases, the Authority will inform the grievant of the number of days that the deadline will be tolled.

**9.14 Compliance.**

A. After the initial filing of a written grievance, failure of either party to comply with all substantial procedural requirements of the grievance procedure without just cause shall result in a decision in favor of the other party on any grievable issue, provided the party not in compliance fails to correct the noncompliance within five business days of receipt of written notification by the other party of the compliance violation. Such written notification by the grievant shall be made to the Chief Executive Officer or the designee thereof.

B. The Chief Executive Officer, or the designee thereof, at his option, may require a clear written explanation of the basis for just cause extensions or exceptions. The Chief Executive Officer or the designee thereof shall determine compliance issues.

**9.15 Recordings and Transcripts.** The use of recording devices or a court reporter is not permitted at any step in the grievance procedure.

**9.16 Judicial Review.** Appeals of compliance determinations, appeals of decisions regarding grievability and access to the grievance procedure, and petitions for orders requiring implementation of the final hearing decision may be made to the Circuit Court of the City of Roanoke, Virginia only to the extent expressly authorized by, and only upon compliance with all deadlines and other requirements for such set forth in, section 15.2-1507 of the Code of Virginia.

# **ROANOKE VALLEY RESOURCE AUTHORITY**

## **EMPLOYEE HANDBOOK**

### **ACKNOWLEDGEMENT FORM**

I acknowledge that I have received, reviewed, and understand the policies outlined in the Roanoke Valley Resource Authority Employee Handbook. I agree to observe and follow all policies, procedures, regulations, and rules of the Authority, including those as described in the handbook. I understand that (i) the Authority has the right to change the handbook without notice, (ii) future changes in policies, procedures, regulations, and rules will supersede or eliminate those found in this handbook, and (iii) the Authority will notify employees of such changes through normal communication channels. I understand that it is my responsibility to be familiar with the contents of this handbook, as well as all other policies, procedures, regulations, and rules of the Authority, and to ask questions on any matters I do not understand.

Furthermore, I understand that I am an “at will” employee and that neither this handbook nor any other policy, procedure, regulation, or rule at the Authority can create a contract for employment for any specific duration.

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Employee Signature

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Date

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Employee Name (please print)

**ITEM NO. II.C  
BUSINESS - ACTION ITEM**

**AT A REGULAR MEETING OF THE ROANOKE VALLEY RESOURCE AUTHORITY:**

**MEETING DATE:** December 3, 2025

**AGENDA ITEM:** RVRA Board Meeting Schedule for CY 2026

**SUBMITTED BY:** Jonathan A. Lanford, Chief Executive Officer

**SUMMARY:**

The Regular Board Meeting Schedule is set during the December meeting each year. Historically, the Board has met at noon on the fourth Wednesday of each month. As discussed during the October Board meeting, staff recommend the following schedule for the Board's consideration. If approved, the Board would meet every other month. Please note the Board can call a special meeting at any time, if necessary.

**February 25, 2026**

(Annual Reorganization Meeting)

**April 1, 2026**

(FY26-27 Annual Operating and Reserves Budget and Notice of Public Hearing)

**June 24, 2026**

(Public Hearing: FY 2026-2027 RVRA Rate Schedule and  
Amendment of FY2025-26 Budget)

**August 26, 2026**

**October 28, 2026**

(Presentation of the Year End Audit Results)

**December 2, 2026**

**RECOMMENDATION:**

It is recommended that the Board approve the FY2026 Board Meeting Schedule, as presented.

**BUSINESS – ACTION ITEM  
ITEM# II.D**

**AT A REGULAR MEETING OF THE ROANOKE VALLEY RESOURCE AUTHORITY (RVRA):**

**MEETING DATE:** December 3, 2025

**AGENDA ITEM:** Consider new RVRA brand logo and adopt RVRA brand guide.

**SUBMITTED BY:** Tiffany Bradbury, Director of Community Engagement

**SUMMARY OF INFORMATION:**

Since its founding in **1993**, the Roanoke Valley Resource Authority (RVRA) has served as the region's environmental steward, responsibly managing waste, protecting natural landscapes, and safeguarding the waterways and communities of the City of Roanoke, Roanoke County, the City of Salem, and the Town of Vinton.

More than 30 years later, the organization continues to evolve, adopting modern technologies, sustainable practices, and regional partnerships that reflect today's environmental challenges and expectations.

The **2025 RVRA logo** represents this next chapter. It is modern, confident, clean, and rooted in the landscapes and values that define the region.

The new RVRA color palette represents the land, water, and environmental stewardship at the core of the organization's mission. More than a graphic, the 2025 RVRA logo:

- Honors the organization's **longstanding commitment** since 1993
- Reflects its **modern operational capabilities**
- Communicates its role as a **regional environmental protector**
- Strengthens connection with partner localities
- Creates a unified visual identity that will serve the next generation of residents

The design tells a story, one of responsibility, stewardship, innovation, and community pride.

**FISCAL IMPACT:**

RVRA's rebrand is intentionally designed as a **gradual, cost-effective rollout**:

**Phase 1 (Year One: 2026)**

- Introduce the new logo on digital platforms:
- Use updated branding for presentations, brochures, and internal materials
- Begin public education about the meaning behind the design
- Transition the logo on uniforms and small-print signage

**Phase 2 (Year Two: 2027)**

- Replace major outdoor or facility signage
- Update directional signage
- Implement new branded educational displays and community outreach materials

This strategic pacing:

- Minimizes budget impact
- Ensures staff and community familiarity
- Allows aging signage and materials to be replaced naturally

\*It's important to note that Jeremy Garrett, Director of Operations/Technical Services for RVRA designed the logo saving the RVRA significantly.

**RECOMMENDATION:**

Staff recommend that the Board adopt the new RVRA logo and brand guide.

# **Roanoke Valley Resource Authority (RVRA)**

Brand Guide (2025 Edition)



**Brand Purpose • Logo Usage • Visual Identity Standards**



## **1. Introduction: A Renewed Identity for a Renewed Mission**

Since its founding in **1993**, the Roanoke Valley Resource Authority (RVRA) has served as the region's environmental steward, responsibly managing waste, protecting natural landscapes, and safeguarding the waterways and communities of **the City of Roanoke, Roanoke County, the City of Salem, and the Town of Vinton**.

More than 30 years later, the organization continues to evolve, adopting modern technologies, sustainable practices, and regional partnerships that reflect today's environmental challenges and expectations.

The **2025 RVRA logo** represents this next chapter. It is modern, confident, clean, and rooted in the landscapes and values that define the region. This brand guide explains the purpose behind the design, outlines how the logo should be used, and provides standards to ensure consistent and professional communication across all RVRA materials.

## **2. The Story Behind the Logo**



### **A. The Wordmark: RVRA**

The bold, streamlined RVRA lettering reflects:

- **Strength and reliability**, echoing decades of trusted service.

- **Modernization**, mirroring the organization's investment in advanced technology and environmental initiatives.
- **Regional unity**, capturing the partnership between all four localities served.

The geometric structure also conveys stability, mirroring a well-managed regional authority committed to long-term environmental stewardship.

## **B. The Blue, Green & Grey Elements: Our Land, Our Water, Our Air, Our Responsibility**

The flowing design beneath the wordmark is the heart of the logo's meaning:

### **Green (Land Stewardship)**

Represents RVRA's responsibility to the region's land, forests, and open spaces.

It symbolizes:

- Proper waste management
- Responsible landfill operations
- Groundwater protection
- Sustainable land practices

### **Blue (Water & Air Stewardship)**

Reflects the rivers, streams, and reservoirs that define the Roanoke Valley.

It conveys:

- Water & Air protection
- Pollution prevention
- Commitment to environmental compliance and best practices

### **Grey (Infrastructure & Reliability)**

The grey swoop in the RVRA logo may be subtle, but it plays an important role. It represents:

- Infrastructure
- Day to day reliability

- Speaks to the human-built systems behind the scenes: our transfer stations, equipment, engineering, and the skilled professionals who keep regional waste operations safe and efficient.

Brings a sense of:

- Balance between nature and essential infrastructure
- Neutrality and professionalism
- A steady foundation beneath the environmental colors
- Long-term stability in RVRA's regional service model

### **Together, all three colors tell a complete story:**

Grey reflects the structure and reliability that supports our mission. Green represents the land we protect. Blue represents the water and air we safeguard. Combined, they visually communicate RVRA's purpose: to responsibly manage waste while preserving the environmental health of the Roanoke Valley and localities we serve for future generations.

## **3. Logo Usage Standards**

To maintain visual clarity and brand consistency, the logo must be used exactly as outlined.

### **A. Primary Logo**

The full RVRA wordmark with green, grey and blue wave graphics should be used for:

- Official documents
- Public-facing marketing
- Signage
- Website and digital platforms
- Educational and Community Engagement materials

### **B. Clear Space Requirements**

Maintain adequate spacing around the logo to ensure legibility:

- Allow clear space equal to at least the height of the letter **R** on all sides.
- Do not crowd with text, imagery, or graphic elements.

## C. Minimum Size

For print:

- Do not use the logo smaller than **1.5 inches** in width.

For digital:

- Minimum width **250 pixels**.

## D. Incorrect Usage

To protect brand integrity, **never**:

- Stretch, distort, or rotate the logo
- Change the colors
- Apply drop shadows or filters (unless part of approved 3D signage design)
- Place the logo on visually busy backgrounds
- Outline the wordmark

Consistency builds recognition, especially throughout a multi-year rollout.



## **4. Color Palette**

The RVRA color palette represents the land, water, and environmental stewardship at the core of the organization's mission. These colors should be used consistently across all print, digital, vehicle, and signage applications to maintain a clear and recognizable brand identity.

### **\*Primary Brand Colors**

#### **RVRA Green – “Land Stewardship”**

A clean, natural green representing landscapes, environmental protection, and sustainability.

##### **Specification Value**

**RGB** 129, 179, 55

**HEX** #81b337

**CMYK** 56%, 9%, 100%, 0%

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#### **RVRA Blue – “Water Stewardship”**

A crisp, flowing blue representing Roanoke's waterways and RVRA's responsibility to protect them.

##### **Specification Value**

**RGB** 62, 150, 209

**HEX** #3e96d1

**CMYK** 71%, 29%, 0%, 0%

### **RVRA Grey – “Reliability & Infrastructure”**

The subtle grey “swoop” is an important visual anchor in the RVRA logo. It represents the infrastructure, and operational reliability that supports RVRA’s mission every day.

#### **Specification Value**

**RGB** 159, 162, 160

**HEX** #9fa2a0

**CMYK** 40%, 31%, 33%, 1%

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### **RVRA Black – “Strength & Stability”**

Used for the RVRA wordmark.

#### **Specification Value**

**RGB** 2, 2, 2

**HEX** #020202

**CMYK** 75%, 68%, 67%, 89%

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#### **\*Primary Neutrals**

RVRA communications may also use white, soft gray, and deep charcoal to maintain clarity and accessibility and to provide single color logos for print.

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## **5. Typography Standards**

Selecting consistent fonts is essential for cohesive communication across RVRA platforms.

### **Primary Brand Font (Headlines & Titles)**

- **Montserrat:** Montserrat is a clean, modern font that feels fresh and approachable. Inspired by simple signage, it has strong lines and balanced shapes that make it easy to read in just about any format. By using Montserrat for our headlines, signage, and key communications, we reinforce RVRA's updated look and maintain a consistent, confident presence across everything we create.
  - Clean, bold, modern
  - Matches the geometric look of the RVRA wordmark
  - Excellent readability
  - Ideal for headers, signage, brochures, and branded materials

### **Secondary Brand Font (Body Text & Long Form)**

- **Times New Roman:** Times New Roman is one of the most widely recognized and trusted serif fonts in professional communication. Its design blends tradition, clarity, and readability, making it a strong complement to the modern, geometric look of RVRA's primary font (Montserrat).
  - Extremely legible
  - Professional
  - Versatile for digital and print materials
  - Easily accessible

### **Accent Font (Optional for Sub-headlines)**

- **Calibri** is a widely available sans-serif font that offers a softer, more rounded look compared to Montserrat's geometric structure. It brings a warm, approachable tone without feeling informal. Its readability is excellent, and because it's a default font in Microsoft Office and many operating systems, staff can use it without installing anything additional.
- **Montserrat Semi-Bold Italic:** Used sparingly for emphasis in marketing or environmental education materials.

### **Waste Watcher Font**

- **Luckiest Guy**
- **Cooper Black**

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## **6. Practical Guidelines for Brand Application**

### **A. Marketing & Communications**

All RVRA printed and digital materials should:

- Use the approved fonts only
- Apply the primary color palette
- Place the logo prominently and consistently
- Incorporate clean, spacious layouts with minimal clutter
- Use photography or illustrations reflecting:
  - Regional landscapes
  - Waste management equipment
  - Community recycling and environmental stewardship
  - Locality pride (City of Roanoke, Salem, Vinton, Roanoke County)

### **B. Vehicle Graphics & Facility Signage**

- Use the primary logo
- Avoid gradients or alternate color treatments
- Maintain high-contrast backgrounds for visibility
- Ensure compliance with state and local sign regulations

### **C. Digital Communications**

For email, social media, and website use:

- Use the full-color logo whenever possible
- Avoid small or overcrowded placements
- Ensure accessibility standards for color contrast

---

## **7. Two-Year Slow Rollout Strategy**

RVRA's rebrand is intentionally designed as a **gradual, cost-effective rollout**:

## **Phase 1 (Year One)**

- Introduce the new logo on digital platforms
- Use updated branding for presentations, brochures, and internal materials
- Begin public education about the meaning behind the design
- Transition the logo on uniforms and small-print signage

## **Phase 2 (Year Two)**

- Replace major outdoor or facility signage
- Update directional signage
- Implement new branded educational displays and community outreach materials

This strategic pacing:

- Minimizes budget impact
- Ensures staff and community familiarity
- Allows aging signage and materials to be replaced naturally

---

## **8. Why This Logo Matters**

More than a graphic, the 2025 RVRA logo:

- Honors the organization's **longstanding commitment** since 1993
- Reflects its **modern operational capabilities**
- Communicates its role as a **regional environmental protector**
- Strengthens connection with partner localities
- Creates a unified visual identity that will serve the next generation of residents

The design tells a story, one of responsibility, stewardship, innovation, and community pride.

## **9. Brand Governance & Administrative Oversight**

To maintain the integrity, recognition, and professionalism of the RVRA brand, **all uses of the RVRA logo must be reviewed and approved by RVRA Administration.**

This includes (but is not limited to):

- Signage
- Uniforms and vehicles
- Printed materials
- Digital graphics
- Promotional or community items
- Partner or locality co-branded materials

### **Why this Matters**

A consistent, recognizable visual identity ensures that every interaction the community has with RVRA:

- Reinforces trust
- Communicates professionalism
- Connects the logo to RVRA's mission
- Builds awareness across all localities
- Supports environmental education campaigns
- Strengthens long-term brand equity

Inconsistent or unapproved usage, such as altered colors, stretched logos, incorrect fonts, or unapproved backgrounds, dilutes the RVRA brand and weakens public recognition.

### **Brand Consistency = Community Recognition**

Because RVRA serves multiple localities and thousands of residents, a unified and consistently applied logo:

- Helps the public instantly identify RVRA vehicles, facilities, and communications

- Supports transparency and trust in waste management operations
- Reinforces RVRA's identity as a regional resource
- Creates a professional and cohesive public-facing presence

**All RVRA staff and partners are expected to follow these standards to preserve the clarity, value, and meaning of the RVRA brand.**



### **Other RVRA Logos:**

#### **Waste Watchers**

The Waste Watchers Brand is used for community engagement programs geared towards children.

#### **Font:**

Luckiest Guy, Cooper Black

#### **Potential Logo Options:**



#### **Internal Hat Logo**

This logo is used INTERNALLY ONLY for RVRA Staff. Any other use needs to be approved by RVRA Administration.



**ITEM NO. II.E  
BUSINESS - INFORMATOIN ITEM**

**AT A REGULAR MEETING OF THE ROANOKE VALLEY RESOURCE AUTHORITY:**

**MEETING DATE:** December 3, 2025

**AGENDA ITEM:** Discuss federal Hazard Mitigation Plan 2025 Update

**SUBMITTED BY:** Jonathan A. Lanford, Chief Executive Officer

**SUMMARY:**

The Hazard Mitigation Plan fulfills the Federal requirements for the Disaster Mitigation Act of 2000. The plan identifies hazards; estimates losses; and establishes community goals, objectives and mitigation activities that are appropriate for the Roanoke Valley-Alleghany region and the various organizations which are represented in the plan. The plan was last updated and adopted in 2019. These plans must be updated every five years. The 2019 plan expired in September 2024.

An adopted Hazard Mitigation Plan allows local governments to apply for disaster mitigation funds which become available following a natural disaster. In September 2024 Hurricane Helene struck Virginia and received a federal disaster declaration. Adoption of this plan update is important for those local governments which are applying for funds associated with the Hurricane Helene disaster.

**RECOMMENDATION:**

This item is for discussion at this time and may be considered for approval during the February 2026 Board meeting.

# 2025 Hazard Mitigation Plan Staff Report and Executive Summary

The Hazard Mitigation Plan fulfills the Federal requirements for the Disaster Mitigation Act of 2000. The plan identifies hazards; estimates losses; and establishes community goals, objectives and mitigation activities that are appropriate for the Roanoke Valley-Alleghany region and the various organizations which are represented in the plan. The plan was last updated and adopted in 2019. These plans must be updated every five years. The 2019 plan expired in September 2024.

An adopted Hazard Mitigation Plan allows local governments to apply for disaster mitigation funds which become available following a natural disaster. In September 2024 Hurricane Helene struck Virginia and received a federal disaster declaration. Quick adoption of this plan update is important for those local governments which are applying for funds associated with the Hurricane Helene disaster.

This plan incorporates the following jurisdictions. All of these jurisdictions have been active participants in the plan.

Alleghany County  
Botetourt County  
Craig County  
Roanoke County  
City of Covington  
City of Roanoke  
City of Salem  
Town of Buchanan

Town of Clifton Forge  
Town of Fincastle  
Town of Vinton  
Roanoke Valley-Alleghany Regional Commission  
Roanoke Valley Resource Authority  
Western Virginia Water Authority

The plan also covers the geographic area of the Towns of New Castle and Iron Gate. While New Castle and Iron Gate did not meet the threshold of participation in this plan, their emergency services efforts operate jointly with Craig County and Alleghany County respectively.

## Required Action

This plan requires adoption through resolution. Resolution text is enclosed.

# Executive Summary

## Chapter 1: The Hazard Mitigation Plan

This chapter provides a summary of the planning process and outlines opportunities for improvement in future iterations of the plan. Planning efforts began in 2024 and were completed in late 2025, with adoption expected in December 2025. One round of public input was held which included a public online survey and direct stakeholder outreach.

The chapter also lays out the adoption and implementation process. Participating governments agree to an annual update of project progress which will be facilitated by the Regional Commission.

## Chapter 2: The Regional Profile

This chapter describes the planning region. Key factors included in the chapter are existing infrastructure, topography, and economic factors as well as a definition of critical and vulnerable facilities.

## Chapter 3: Hazard Identification

Hazards identified in this chapter include:

|                              |              |
|------------------------------|--------------|
| Earthquake                   | Wildfire     |
| Extreme Temperature          | Wind Event   |
| Flooding                     | Winter Storm |
| Hurricane and Tropical Storm |              |
| Geologic Hazards             |              |

While many of these definitions are clear, some are not.

- *Extreme Temperature*: This hazard includes extreme heat and extreme cold.
- *Geologic Hazards*: This includes karst, which gives rise to sinkholes, and landslides.
- *Wind Event*: This includes straight line winds and tornadoes.

Additionally, two hazards are not assessed in the risk assessment but are outlined in this chapter. These are drought, which is addressed through state-mandated water supply plans; and pandemic.

Historical events are surveyed in this chapter. High hazard potential dams are also inventoried in this chapter.

## Chapter 4: Risk Assessment

This chapter contains the risk assessment model for the plan, which guides future recommendations and priorities. Outcomes from the model are included in the table below. More detail regarding each hazard and the logic for the rankings is included in the relevant

subsections of the chapter. Flooding and Wind Events were the two highest ranked hazards across the region.

### All Hazard Ranking Table

*Table 16: All Hazards Ranking Table*

Hazard Ranking Table: All Hazards

| Locality              | Earthquake | Extreme Temperatures | Flooding | Geologic Hazards | Wildfire | Wind Event | Winter Storm |
|-----------------------|------------|----------------------|----------|------------------|----------|------------|--------------|
| Alleghany County      | Medium     | Medium               | High     | Medium           | Medium   | High       | Medium       |
| City of Covington     | Medium     | Low                  | Medium   | Low              | Low      | High       | Medium       |
| Town of Clifton Forge | Medium     | Low                  | High     | Low              | Medium   | High       | Medium       |
| Town of Iron Gate     | Low        | Low                  | High     | Low              | Medium   | High       | Medium       |
| Craig County          | Low        | Low                  | Medium   | Low              | Low      | High       | Medium       |
| Town of New Castle    | Low        | Low                  | Medium   | Low              | Low      | High       | Medium       |
| Botetourt County      | Medium     | Medium               | High     | Low              | Low      | High       | Medium       |
| Town of Buchanan      | Medium     | Medium               | High     | Low              | Low      | High       | Medium       |
| Town of Fincastle     | Medium     | Medium               | High     | Low              | Low      | High       | Medium       |
| Town of Troutville    | Medium     | Medium               | High     | Low              | Low      | High       | Medium       |
| Roanoke County        | Medium     | Medium               | High     | Medium           | High     | Medium     | Medium       |
| Town of Vinton        | Medium     | Medium               | High     | Low              | Low      | Medium     | Medium       |
| City of Roanoke       | Medium     | High                 | High     | Low              | Low      | Medium     | Medium       |
| City of Salem         | Low        | Medium               | High     | Low              | Low      | Medium     | Medium       |
| Regional Score        | Medium     | Medium               | High     | Low              | Low      | High       | Medium       |

## Chapter 5: Capabilities Assessment

This chapter contains individual sections for each participating local government and details of their budgets, their staffing relevant to disaster mitigation and response, and their participation in the National Flood Insurance Program. Mutual aid agreements and other resources are also captured.

## Chapter 6: Mitigation Goals and Strategies

This chapter outlines the goals and strategies for mitigation efforts in the region. In developing mitigation strategies for the region, a wide range of activities were considered in order to achieve the goals and to lessen the vulnerability of the area to the impact of natural hazards.

## Chapter 7: Mitigation Action Plans

This chapter includes individual mitigation action plans for each participating jurisdiction. All identified projects are dependent upon funding availability.

## Appendices

The plan contains supporting documentation in multiple appendices. Supporting documentation includes: outputs from public engagement efforts; flood modeling; critical and vulnerable facilities lists; wildfire incidence reports and modeling; dam inundation mapping and dam safety data; worksheets from steering committee members; and other documentation.

# HAZARD MITIGATION PLAN

2025 UPDATE



Roanoke Valley-Alleghany  
**REGIONAL**  
commission

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Prepared by the  
**REGIONALcommission**

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# Terms and Definitions

## **Code of Federal Regulations (CFR)**

The codification of the general and permanent rules published in the Federal Register by the departments and agencies of the Federal Government.

## **Community Rating System (CRS)**

A voluntary incentive program that recognizes and encourages community floodplain management practices that exceed the minimum requirements of the National Flood Insurance Program (NFIP).

## **Disaster Mitigation Act of 2000 (DMA 2000)**

This act requires state and local governments to develop hazard mitigation plans as a condition for federal grant assistance.

## **Federal Emergency Management Agency (FEMA)**

A United States government agency that helps people before, during, and after disasters. FEMA's mission is to improve the nation's ability to prepare for, respond to, and recover from all hazards.

## **Flood Insurance Rate Map (FIRM)**

Official map of a community on which FEMA has delineated the Special Flood Hazard Areas (SFHAs), the Base Flood Elevations (BFEs) and the risk premium zones applicable to the community.

## **National Center for Environmental Information (NCEI)**

A United States government agency that manages and archives environmental data. NCEI's data includes information about the climate, oceans, coasts, and the Earth's surface.

## **National Oceanic and Atmospheric Administration (NOAA)**

A United States government agency that studies and predicts changes in the weather, climate, oceans, and coasts. A branch of the Department of Commerce.

## **National Weather Service (NWS)**

A United States government agency that provides weather forecasts and warnings. The NWS is part of the National Oceanic and Atmospheric Administration (NOAA), which is a branch of the Department of Commerce.

## **Roanoke Valley – Alleghany Regional Commission (RVARC)**

One of 21 Virginia Planning District Commissions established by the General Assembly to promote regional cooperation between local governments. RVARC members include the counties of Alleghany, Botetourt, Craig, and Franklin, the cities of Covington, Roanoke, and Salem, and the towns of Clifton Forge, Vinton, and Rocky Mount.

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# Chapter 1. The Hazard Mitigation Plan

## 1.1 Overview of the Plan

The purpose of the Roanoke Valley-Alleghany Regional Commission Hazard Mitigation Plan is to fulfill the Federal requirements for the Disaster Mitigation Act of 2000. The plan identifies hazards; estimates losses; and establishes community goals, objectives and mitigation activities that are appropriate for the Roanoke Valley-Alleghany region and the various organizations which are represented in this document.

The Disaster Mitigation Act of 2000 (DMA 2000) requires that local governments, as a condition of receiving federal disaster mitigation funds, have a mitigation plan that: describes the process for identifying hazards, risks and vulnerabilities; identifies and prioritizes mitigation actions; encourages the development of local mitigation; and provides technical support for those efforts.

The Federal Emergency Management Agency (FEMA) defines pre-disaster mitigation as any sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event. Mitigation, also known as prevention, encourages long-term reduction of hazard vulnerability. Mitigation should be cost-effective, appropriate for the community, and environmentally sound. Mitigation activities can protect critical and vulnerable community facilities, reduce exposure to liability, and minimize community disruption resulting from natural disasters. The goal of mitigation is to save lives and reduce property damage, which in turn can reduce the cost and impact of disasters across communities.

This plan incorporates the following jurisdictions. All of these jurisdictions have been active participants in the plan.

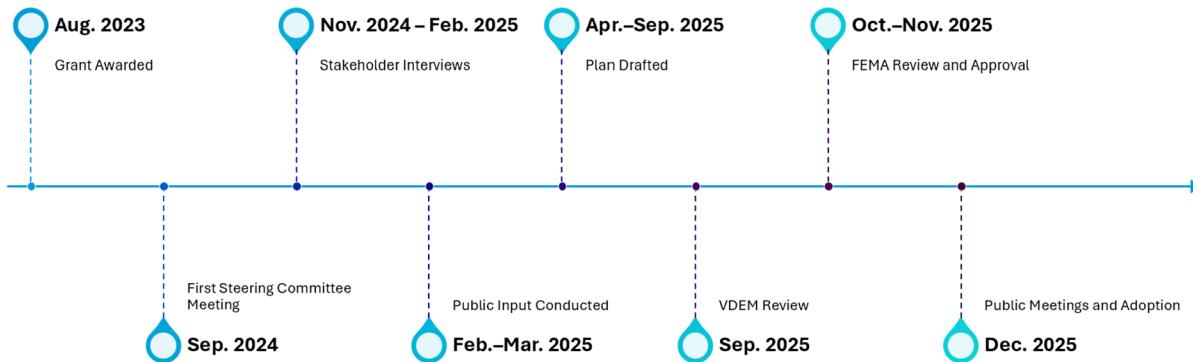
|                   |  |
|-------------------|--|
| Alleghany County  | Town of Clifton Forge                        |
| Botetourt County  | Town of Fincastle                            |
| Craig County      | Town of Vinton                               |
| Roanoke County    | Roanoke Valley-Alleghany Regional Commission |
| City of Covington | Roanoke Valley Resource Authority            |
| City of Roanoke   | Western Virginia Water Authority             |
| City of Salem     |  |
| Town of Buchanan  |  |

The plan also covers the geographic area of the Towns of New Castle and Iron Gate. While New Castle and Iron Gate did not meet the threshold of participation in this plan, their emergency services efforts operate jointly with Craig County and Alleghany County respectively.

## 1.2 Planning Process

The Steering Committee for this effort was made up of jurisdiction representatives and state and federal agency representatives. However, consultation with numerous community stakeholders occurred during planning. Public input was also a key element of the plan. The full details of steering committee meetings, stakeholder engagement, and broader public input efforts are available in [Appendix A: Public Engagement](#) and [Appendix B: Survey Results](#).

### Timeline of the Plan



*Figure 1: Timeline of the Plan*

### Update Priorities

Proposed timelines for this process originally began in August 2023. However, numerous staffing challenges delayed the start of work on this effort until August 2024 – one month before the expiration of the 2019 plan. Additionally, new and more rigorous federal guidelines for document development meant that large sections of this plan were developed from scratch. Additional changes in local and regional staffing continued throughout the planning process.

Additionally, in September 2024, at the same time that the first stakeholder meeting was being convened, Hurricane Helene struck Southwest Virginia. While most of the localities represented by this plan sustained minimal damage, regional stakeholders were heavily involved in disaster response efforts.

As a result of all of these challenges, the primary focus of this update is in right-sizing a new regional vision of pre-disaster hazard mitigation and rebuilding programs and relationships between jurisdictions and stakeholders.

**Table 1: Steering Committee**

| <b>Locality Representatives</b> |  |
|---------------------------------|--|
| <b>Locality</b>                 | <b>Representative</b>  |
| <b>Alleghany County</b>         | Jonathan Fitch<br>Melissa Munsey   |
| <b>City of Covington</b>        | Allen Dressler<br>Christopher Smith  |
| <b>Town of Clifton Forge</b>    | Chuck Unroe<br>Maria Saxton  |
| <b>Town of Iron Gate</b>        | Kawhana Persinger  |
| <b>Botetourt County</b>         | Daniel Murray<br>Jason Ferguson<br>Nicole Pendleton<br>Matt Lewis<br>Nick Baker  |
| <b>Town of Buchanan</b>         | Jon Elistad<br>Angela Lawrence   |
| <b>Town of Fincastle</b>        | Melanie Young McFadyen   |
| <b>Town of Troutville</b>       | Michael Mansfield  |
| <b>Craig County</b>             | Dan Collins<br>Darryl Humphreys  |
| <b>Roanoke County</b>           | Tarek Moneir<br>David Henderson<br>Cindy Linkenhoker<br>Butch Workman<br>Dustin Campbell<br>Nickie Mills<br>Philip Thompson<br>Ross Hammes |

|                        |  |
|------------------------|--|
| <b>City of Roanoke</b> | Dwayne D'Ardenne<br>Ian Shaw<br>Laura Schmidt<br>Leigh Anne Weitzenfeld<br>Mckenzie Brocker<br>Ross Campbell<br>Trevor Shannon |
| <b>City of Salem</b>   | Jeff Ceaser<br>Mary Ellen H Wines<br>Robert Paxton<br>Sam Driscoll<br>William L. Simpson, Jr                                   |
| <b>Town of Vinton</b>  | Anita McMillan<br>Nathan McClung   |

| <b>Special Districts</b>                 |                                   |
|--|-----------------------------------|
| <b>Organization</b>                      | <b>Representative</b>             |
| <b>Western Virginia Water Authority</b>  | Roger Blankenship<br>Tesha Okioga |
| <b>Roanoke Valley Resource Authority</b> | Jon Lanford                       |

| <b>State/Federal Agency Representatives</b> |  |
|---|--|
| <b>Agency</b>                               | <b>Representative</b>                            |
| <b>NOAA</b>                                 | Phil Hysell<br>Nicholas Fillo                    |
| <b>VDOF</b>                                 | Dennis McCarthy<br>Rachel Kim                    |
| <b>VDEM</b>                                 | Cole Taggart<br>Jonathan T. Simmons<br>Mike Guzo |

## Steering Committee

Between September 2024 and September 2025, the steering committee guided development of the Hazard Mitigation Plan through a series of meetings focused on timeline management, plan content, and stakeholder engagement. The process began with a kickoff meeting to discuss the plan framework, timeline, and outreach strategy. Following Hurricane Helene, FEMA and VDEM emphasized the urgency of applying for disaster mitigation funding. This prompted the committee to prioritize eligibility requirements and expand participation requirements. Meetings which occurred early in 2025 focused on public engagement and outreach while spring sessions reviewed stakeholder input, survey results, and drafts of chapters. By May 2025, the committee began to finalize chapter updates, preparing the plan for locality review and submission to VDEM and FEMA ahead of the federal funding deadline in early December. Due to staffing constraints, VDEM regional staff played a critical role in finalizing the plan, conducting final meetings with locality staff which are documented later in this section. The final steering committee meeting was held in September.

## Stakeholder Engagement

In order to maximize stakeholder engagement, staff worked with various stakeholder groups already convening in the region before engaging in some individual outreach. Membership of these groups is included in [Appendix A](#).

### Groups Consulted

- Southwest Virginia Public Works Academy
- Roanoke Valley Collective Response Stakeholder Group
- Roanoke Foodshed Network
- Roanoke Regional Housing Network
- Roanoke Valley Transportation Technical Committee

### Individual Organizations

- Alleghany Highlands Chamber of Commerce and Tourism
- CHIP of Roanoke Valley
- Roanoke Valley Rescue Mission

Many additional stakeholders could have been consulted in this planning process. In future updates to the plan, the following stakeholders are recommended for outreach. Some of these stakeholders may be interested in participating as special districts.

- Area hospitals, especially Roanoke Memorial Hospital
- Alleghany Highlands Economic Development Corporation
- Alleghany Highlands Public Schools
- Craig-Botetourt Electric Co-op
- Local Area Office on Aging
- RVARC Committee on Economic Development Strategies
- Roanoke Regional Airport
- Soil and Water Conservation Districts
- Valley Metro

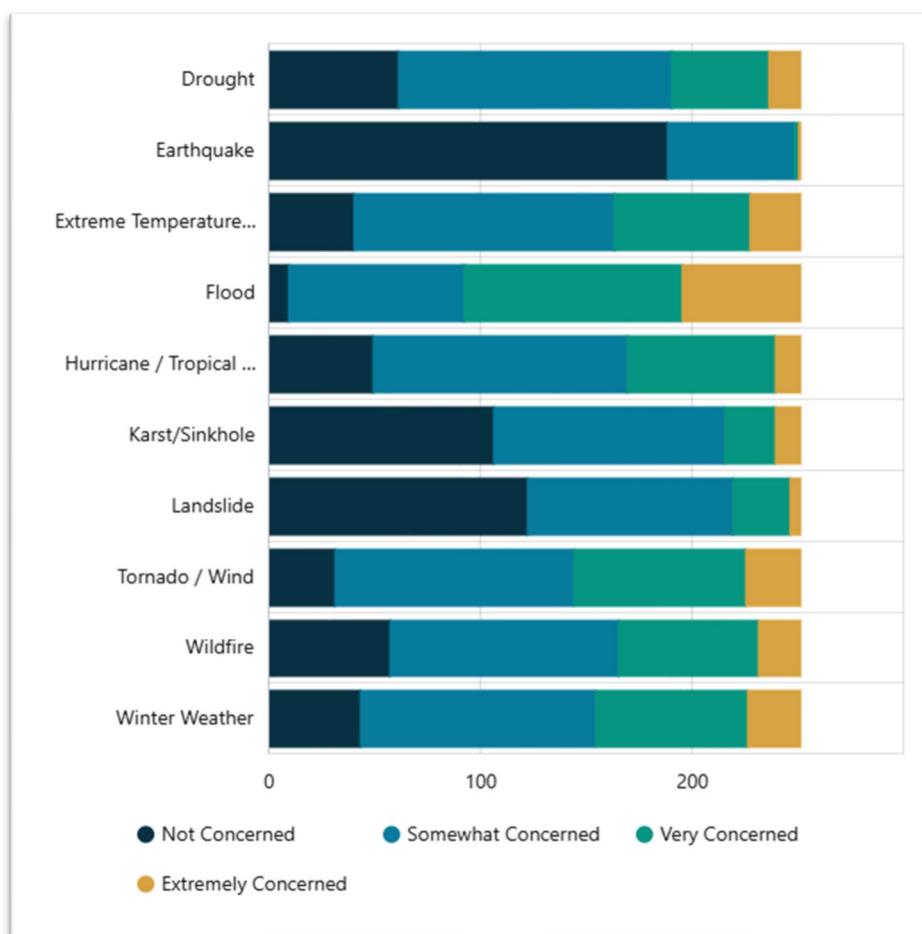
## Public Input

Staff worked with the Steering Committee to design an electronic survey that was open from February through March of 2025. Full details of survey responses are available in **Appendix B**.

The survey received 251 responses, a marked improvement from the 2019 plan. Ninety-five percent of respondents identified as White. Only about 1.5 percent of respondents identified as Hispanic, Latino, or Spanish in origin. Response by household income was more varied, about 13 percent of households reporting an income of less than \$50,000. Responses were spread across zip codes, but the vast majority of responses were seen in the City of Salem (zip code 24153) with 81 responses. Only 5 respondents stated they relied on public transit. Most of the respondents owned their own home, with about 13 percent renting their home.

Flood was the greatest disaster of concern, followed by wind. This echoes results of the vulnerability assessment. Earthquake, Karst and Landslide (the latter two collectively assessed) were marked as of least concern.

Generally, respondents expressed increased concerns about natural disasters in the region compared to five years ago.



**Figure 2: Concern About Future Disaster Events**

## 1.3 Adoption of this Plan

The Virginia Department of Emergency Management (VDEM) was an active participant in development of this plan and a key funding partner. VDEM representatives have reviewed this plan and provided input on compliance with the 2025 Local Mitigation Policy Guide in the hopes of streamlining the federal approval process.

The Policy Guide Checklist with relevant page numbers for each element is included in [Appendix I](#).

The plan was submitted for federal approval on October 10, 2025. Approval documentation is included in [Appendix J](#).

Resolutions by participating jurisdictions are included in [Appendix J](#).

## 1.4 Future Updates

This plan will be reviewed every year for project progress and opportunities for implementation. Immediate opportunities for implementation are described in [Section 1.5](#).

Annual review will be initiated by Regional Commission staff. Project updates will be provided promptly by representatives from the respective jurisdictions incorporated into this plan.

The annual review will result in a project progress document which will be posted on a designated Regional Commission public engagement site and shared with the participating jurisdictions and the Regional Commission board. Public engagement around specific projects that reach implementation stage will be provided by request of the jurisdiction that is primary on the project.

Future five-year updates offer opportunities for planning process improvements. While many of the complications in the planning process for this update were due to staffing issues experienced at the Regional Commission, some other areas for improvement in the next plan update include:

- Expanding outreach to unreachd stakeholders identified in this planning process and considering the creation of a formal stakeholder committee to inform the plan.
- Incorporating new special districts where appropriate and where interest exists.
- Increasing public input around project development and offering more consistent outreach throughout the planning process, including at least two community meetings.
- Targeting broader public engagement efforts to underrepresented populations and census tracts in innovative ways, including direct mailers and pop-ups in community spaces.
- Streamlining the project update process which can be facilitated by annual updates and reviews of this document.

In addition, some potential improvements to the vulnerability assessment have been included as projects in [Chapter 7: Mitigation Action Plans](#).

## 1.5 Implementation Opportunities

Many of the localities within the planning region may have capacity issues which challenge their ability to implement this plan, as discussed in **Chapter 5**. One way to address these challenges is to proactively identify projects which could benefit from technical assistance through the Regional Commission.

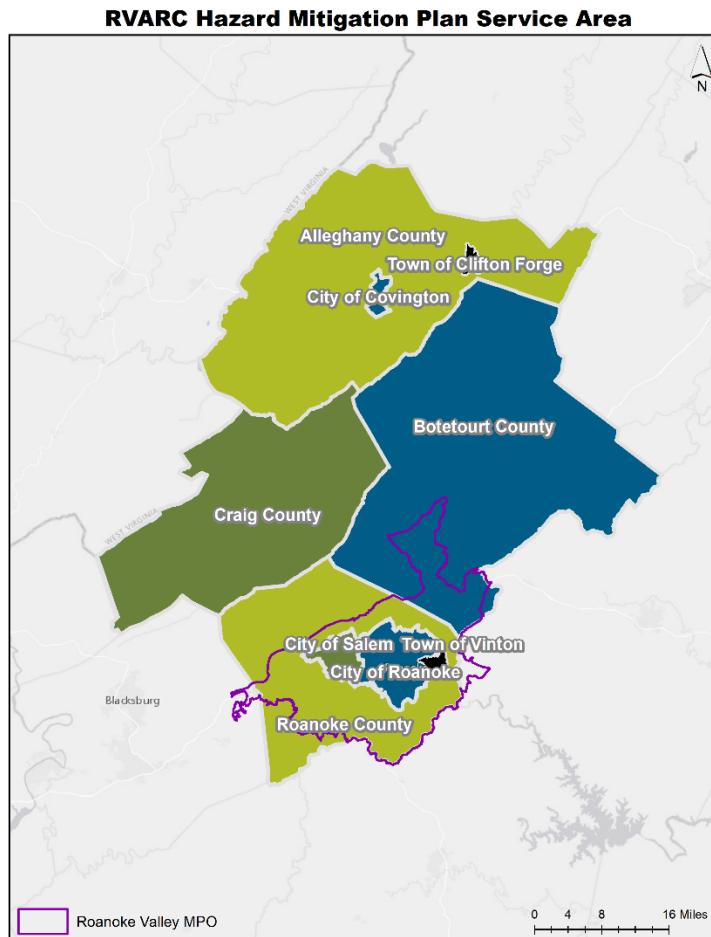
The Regional Commission creates an annual budget and workprogram each year to identify projects of regional significance or which are high priority for local technical assistance. Projects identified in this plan as either of regional significance or as critical to a local government's ability to address hazards should be considered on an annual basis for incorporation into that document. In the first round of project updates, the Regional Commission will work with member localities to identify candidates for the FY2028 workprogram. This review will be conducted annually.

# Chapter 2. The Regional Profile

## 2.1 The Planning Region

The Roanoke Valley-Alleghany Regional Commission service area lies in western Virginia and includes the counties of Alleghany, Botetourt, Craig, Franklin and Roanoke; the cities of Covington, Roanoke and Salem; and the towns of Boones Mill, Buchanan, Clifton Forge, Fincastle, Iron Gate, New Castle, Rocky Mount, Troutville, and Vinton. The localities of Franklin County, Boones Mill and Rocky Mount, are also served by West Piedmont Planning District Commission, and are covered by that district's plan. All other localities within the Roanoke Valley-Alleghany service area will be covered by this document. These are the same localities that participated in the 2006 and 2013 and 2019 iterations of this plan.

Communities within the Roanoke Valley-Alleghany Region may have vastly different capacities and planning ability, which is reflected in this plan. Unincorporated areas within broader jurisdictions may be referenced where appropriate.



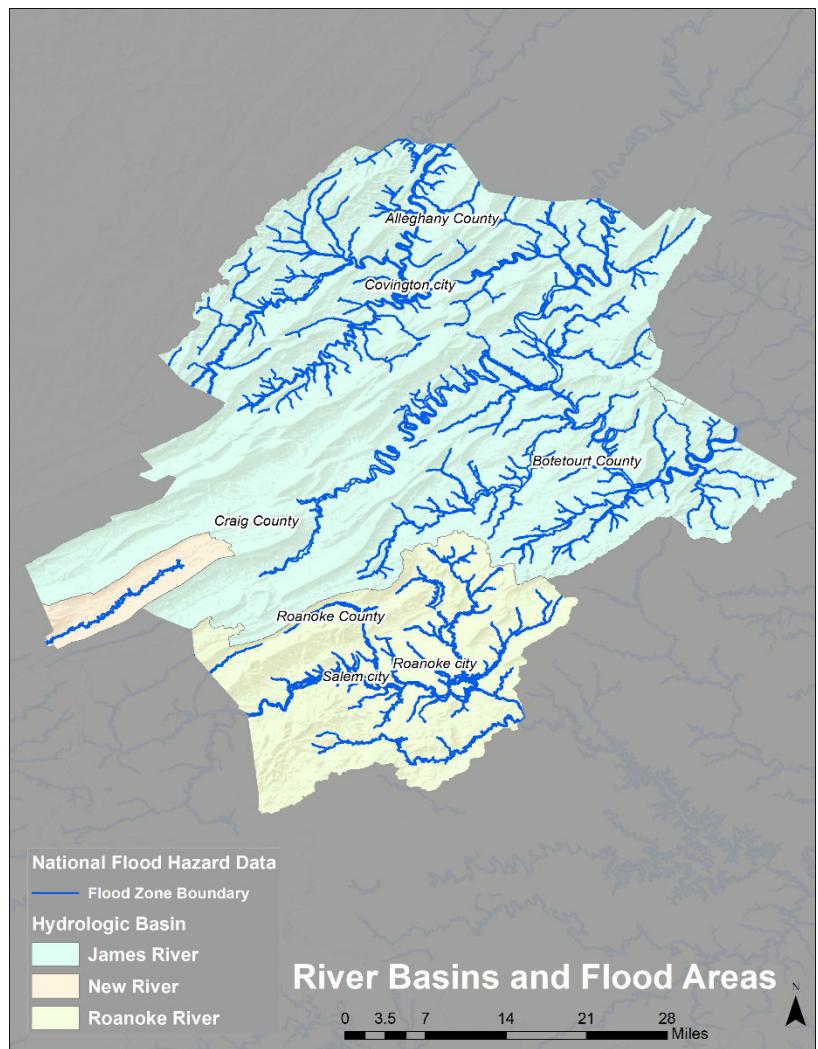
*Figure 3: The Planning Region*

## Location and Topography

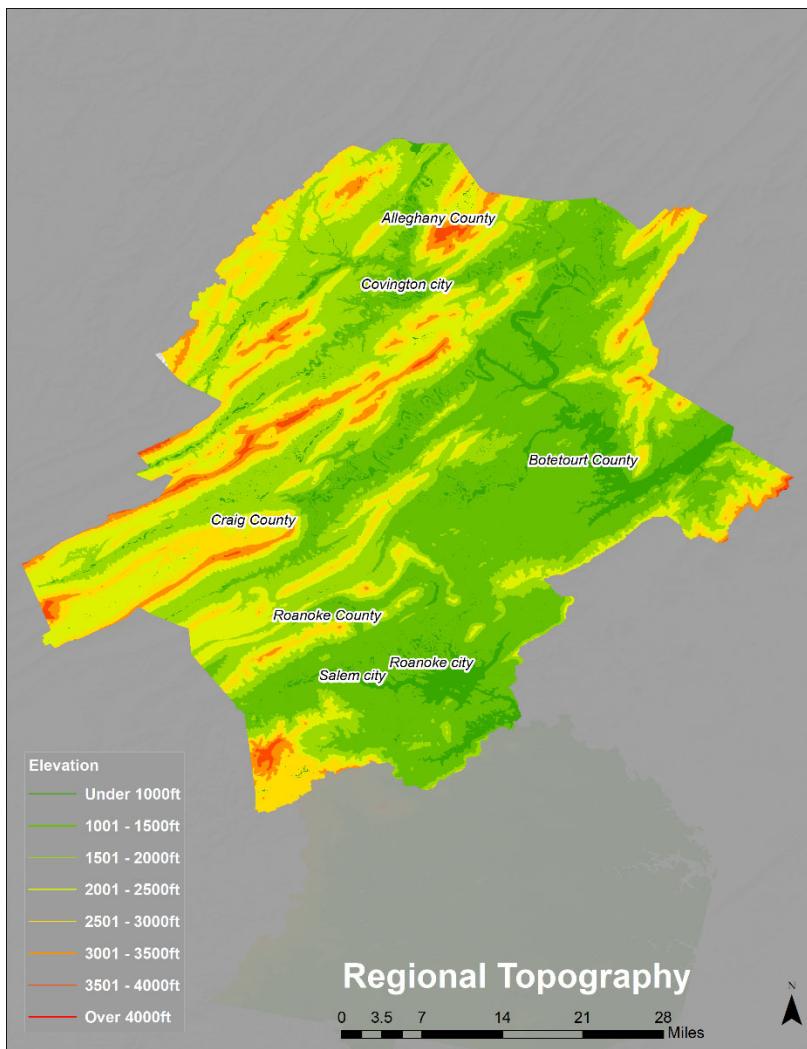
The Roanoke Valley-Alleghany Region (the region) is on the eastern border of the Appalachian Plateau and the western slope of the Blue Ridge Mountains. Two major river basins characterize the region. The James River, flowing east through Botetourt County, ultimately reaches the Chesapeake Bay and the Atlantic Ocean. The Roanoke River flows through the district in a southeasterly direction to North Carolina before reaching the Atlantic. Both river basins serve as development corridors. Although the planning area includes the Roanoke metropolitan area, much of the region is rural. Approximately 212,039 acres of federal land lies within the National Forest and Blue Ridge Parkway system.

The predominant physical characteristic of the region is the mountainous terrain. Forty-eight percent of the land area has slopes of 25 percent or greater. Within the region, mountain ridges run southwest to northeast. There are large concentrations of steep land in northern Botetourt County and Alleghany County. A broken ring of steep lands surrounds the Roanoke metropolitan area. Past development has been influenced greatly by topographic characteristics. The higher elevations have remained in open or forest use while the more moderate foothills and river valleys have been developed.

Floodplains impose considerable restraints on land development activities. In the past, heavy flooding has caused considerable property damage to existing development in floodplains. The region has several major floodplain areas along the Roanoke, James and Jackson Rivers, and the Peters, Mason, Carvin, Tinker, Glade, Mud Lick and Smith Creeks.



**Figure 4: River Basins and Flood Areas**



**Figure 5: Regional Topography**

## Climate

The region is located in agricultural zones 7a and 7b and is characterized by hot, wet summers, cold winters with mild to moderate precipitation, and fluctuating shoulder seasons. Summer high temperatures average around the mid-80s across the region, with higher temperatures in the urbanized areas of the Roanoke Valley. Winter low temperatures average in the 40s in the coldest months of December and January, with colder temperatures felt in the higher elevations of the Alleghany Highlands. The area receives significant annual rainfall, with annual averages in the Roanoke Valley typically around 40 inches per year according to National Weather Service records.

*Table 2: Average High and Low Temperatures*

| Daily average high and low temperatures (°F) |      |     |     |     |     |     |     |     |      |     |     |     |
|--|------|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|-----|
| Month  | High |     |     |     |     |     |     |     |      |     |     |     |
|  | Jan  | Feb | Mar | Apr | May | Jun | Jul | Aug | Sept | Oct | Nov | Dec |
| Roanoke                                      | 46   | 50  | 59  | 69  | 76  | 83  | 86  | 85  | 78   | 68  | 58  | 49  |
| Covington                                    | 43   | 46  | 56  | 66  | 74  | 80  | 84  | 82  | 76   | 66  | 56  | 46  |
| Low  |      |     |     |     |     |     |     |     |      |     |     |     |
| Month  | Jan  | Feb | Mar | Apr | May | Jun | Jul | Aug | Sept | Oct | Nov | Dec |
| Roanoke                                      | 30   | 32  | 40  | 48  | 56  | 64  | 68  | 67  | 60   | 49  | 40  | 34  |
| Covington                                    | 27   | 29  | 37  | 46  | 54  | 62  | 66  | 65  | 58   | 47  | 38  | 31  |

*Data from Weatherspark.com, accessed 5/15/25.*

## Population

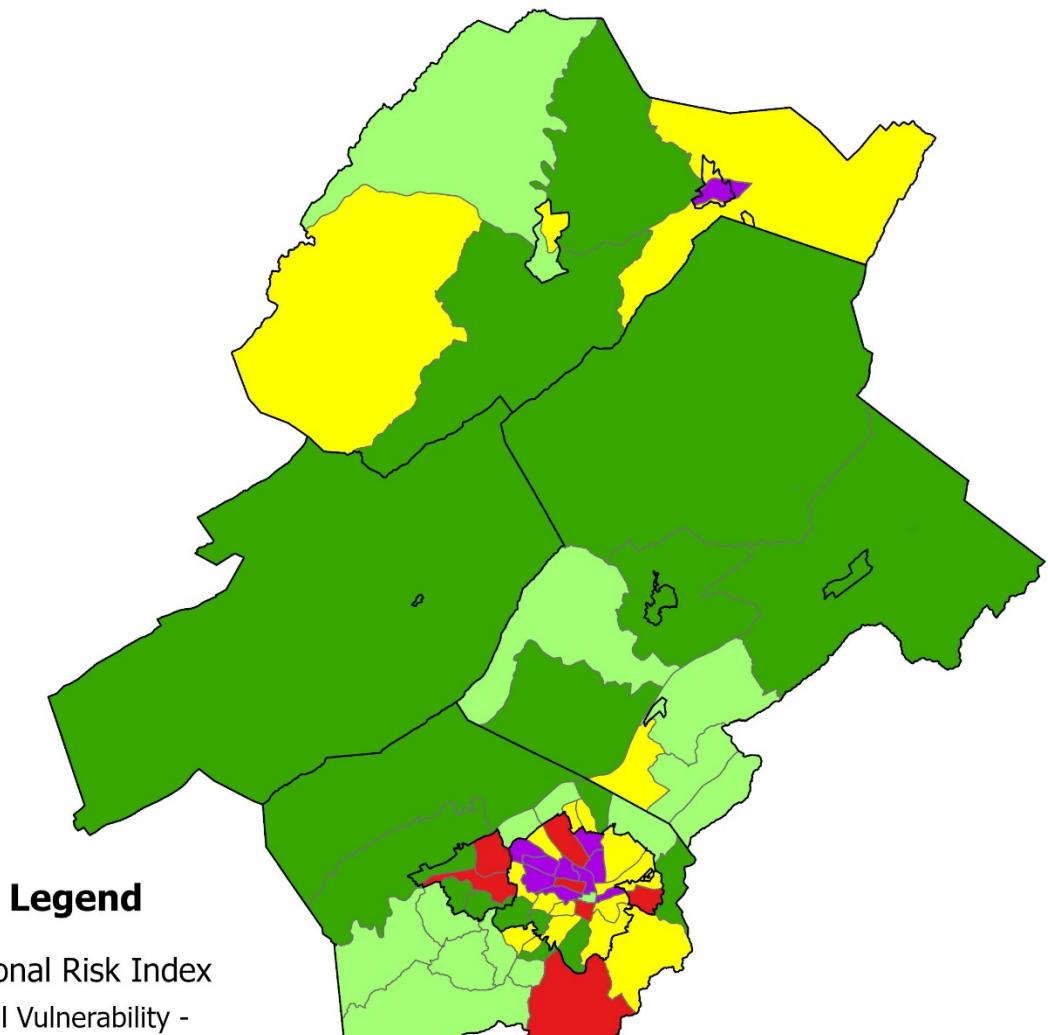
In 2023, the overall population of the region was around 280,000 people, with the majority of residents located in the City of Roanoke and Roanoke County. Key demographic factors to assess in a community's resilience to hazards include age and income. These factors can indicate vulnerability to shocks – for example, a family with children may have a harder time relocating or require more services at a public shelter; the elderly often have special medical needs; and households with low income can face inhibited options post-disaster and require more public assistance. Tables 3 through 5 show basic population data for the region.

Much of the population in Alleghany County, Botetourt County, and the Town of Clifton Forge is aging, with the median age being 48 years or older. This is ten years older than the median age across the Commonwealth. As this trend progresses over the lifetime of this planning document, it will likely have impacts on how hazard mitigation and response are carried out in these localities.

There is a projected increase in population across the region in the next 25 years. However, some localities, including Alleghany and Craig Counties, are projected to see a fall in population, likely due to aging and internal migration.

The National Risk Index displays information about social vulnerability based off the CDC Social Vulnerability Index. Highest levels of social vulnerability occur in the Cities of Roanoke and Covington.

## Roanoke Valley-Alleghany National Risk Index Social Vulnerability Rating



**Figure 6: NRI Social Vulnerability Rating**

**Table 3: Population Projections by Locality, CEDS 2025**

| Locality              | 2023      | 2030      | 2040      | 2050       |
|-----------------------|-----------|-----------|-----------|------------|
| Alleghany County*     | 11,479    | 13,993    | 12,805    | 11,809     |
| Botetourt County      | 33,875    | 33,556    | 34,588    | 36,138     |
| Craig County          | 4,881     | 4,528     | 4,363     | 4,264      |
| Roanoke County*       | 89,755    | 100,027   | 104,046   | 109,621    |
| City of Covington     | 5,671     | 5,434     | 5,075     | 4,792      |
| City of Roanoke       | 98,677    | 101,514   | 102,529   | 105,079    |
| City of Salem         | 25,477    | 25,519    | 25,438    | 25,737     |
| Town of Clifton Forge | 3,483     | -         | -         | -          |
| Town of Vinton        | 8,038     | -         | -         | -          |
| RVARC Region          | 280,336   | 284,571   | 288,844   | 297,440    |
| Virginia              | 8,657,499 | 9,129,002 | 9,759,371 | 10,535,810 |

\*Excludes Town of Clifton Forge. Excludes Town of Vinton population.

**Table 4: Population Distribution by Age, CEDS 2025**

| Locality              | Median Age | Under 5 | 5 to 19   | 20 to 34  | 35 to 54  | 55 to 64  | 65 and over |
|-----------------------|------------|---------|-----------|-----------|-----------|-----------|-------------|
| Alleghany County*     | 48.1       | 603     | 2,268     | 2,420     | 3,211     | 2,338     | 3,801       |
| Botetourt County      | 48.1       | 1,437   | 5,648     | 4,960     | 8,306     | 5,519     | 8,005       |
| Craig County          | 46.1       | 359     | 999       | 551       | 1,112     | 921       | 939         |
| Roanoke County        | 43.7       | 3,891   | 15,682    | 14,649    | 22,772    | 12,188    | 19,573      |
| Covington City        | 41.5       | 332     | 1,238     | 927       | 1,242     | 829       | 1,103       |
| Roanoke City          | 38.0       | 6,353   | 17,891    | 20,304    | 24,421    | 12,481    | 17,227      |
| Salem City            | 40.3       | 1,039   | 4,958     | 5,093     | 6,047     | 3,375     | 4,965       |
| Town of Clifton Forge | 53.5       | 231     | 607       | 589       | 640       | 524       | 892         |
| Town of Vinton        | 39.7       | 431     | 11,478    | 1,570     | 1,833     | 1,165     | 1,531       |
| Virginia              | 38.8       | 495,281 | 1,638,640 | 1,737,462 | 2,255,522 | 1,120,434 | 1,410,160   |

**Table 5: Median Household Income, American Community Survey**

| Locality         | Median Household Income |
|------------------|-------------------------|
| Alleghany County | \$ 52,546.00            |
| Botetourt County | \$ 77,680.00            |
| Craig County     | \$ 66,286.00            |
| Covington City   | \$ 45,737.00            |
| Roanoke City     | \$ 51,523.00            |
| Roanoke County   | \$ 80,872.00            |
| Salem City       | \$ 68,402.00            |

## Development Trends

The region contains a significant portion of the Roanoke, Virginia Metropolitan Statistical Area, which includes the counties of Botetourt, Craig, Roanoke and Franklin, the Cities of Roanoke and Salem. This is the fourth largest MSA in Virginia and the largest in the western half of the state.

Most of the region's largest employers are in the industries of government, healthcare, education, banking and insurance, and retail.

**Table 6: 50 Largest Regional Employers**

| 50 Largest Regional Employers               |  |
|---|--|
| 1. Roanoke Memorial Community Hospital      | 26. City of Salem School Board         |
| 2. HCA Virginia Health System               | 27. Carter Machinery Company           |
| 3. Roanoke County School Board              | 28. Marvin Windows                     |
| 4. U.S. Department of Veterans Affairs      | 29. Yokohama Tire Corp.                |
| 5. Wal Mart                                 | 30. Roanoke College                    |
| 6. Carilion Services                        | 31. YMCA                               |
| 7. City of Roanoke                          | 32. Lake Region Medical                |
| 8. Roanoke City School Board                | 33. County of Franklin                 |
| 9. Kroger                                   | 34. VDOT                               |
| 10. Wells Fargo Bank NA                     | 35. Alleghany Highlands Public Schools |
| 11. County of Roanoke                       | 36. Carilion Healthcare                |
| 12. Cornerstone Building Brands Service     | 37. Dynax America Corporation          |
| 13. U.P.S.                                  | 38. Adams Construction Company         |
| 14. Franklin County School Board            | 39. Davis H. Elliot Company, Inc.      |
| 15. Alliance Group Rock Tenn                | 40. Steel Dynamics Roanoke Bar Div     |
| 16. Altec Industries Inc                    | 41. Coca Cola Bottling Company         |
| 17. Friendship Manor                        | 42. Bimbo Bakeries USA INC             |
| 18. Postal Service                          | 43. Paychecks Plus                     |
| 19. Advance Auto Parts                      | 44. Virginia Western Community College |
| 20. Botetourt County School Board           | 45. Branch Highways                    |
| 21. Virginia Transformer Corporation        | 46. County of Botetourt                |
| 22. Food Lion                               | 47. Franklin Memorial Hospital         |
| 23. Lowes' Home Centers, Inc.               | 48. US Foodservice                     |
| 24. Elbit Systems of America - Night Vision | 49. Metalsa Roanoke                    |
| 25. City of Salem                           | 50. McDonald's                         |

Source: Virginia Employment Commission, Economic Information & Analytics, Quarterly Census of Employment and Wages (QCEW), 3rd Quarter (July, August, September) 2024. Note: Data includes all localities within Roanoke Valley-Alleghany Regional Commission service area.

Of particular interest to this planning effort is the importance of healthcare to the regional economy. Carilion Medical Center (also known as Roanoke Memorial Hospital) is one of only six Level I Trauma Centers in the Commonwealth. It is also one of only three Level I Pediatric Trauma Centers. Disruptions to service at Roanoke Memorial Hospital can have far-reaching effects across the Southwest Virginia region. Nearby LewisGale Medical Center in Salem is a Level II Trauma Center. Both facilities may provide critical services in disaster events to communities outside of the Roanoke Valley – Alleghany Region. Table 7 shows staffed and licensed beds for area hospitals, which can be used to assess capacity in disaster events. Nearby hospitals outside of the service area include Carilion New River Valley Medical Center, LewisGale Montgomery, Carilion Franklin Memorial, and Carilion Rockbridge Community, and, further afield, Centra General Hospital and UVA Medical Center.

**Table 7: Number of Licensed and Staffed Beds in Area Hospitals, 2025**

| Hospital                | Number of Staffed Beds | Number of Licensed Beds |
|-------------------------|------------------------|-------------------------|
| Carilion Medical Center | 694                    | 752                     |
| LewisGale Salem         | 321                    | 506                     |
| LewisGale Alleghany     | 110                    | 205                     |
| <b>Totals</b>           | <b>1,125</b>           | <b>1,463</b>            |

The RVARC produces a Comprehensive Economic Development Strategy document every five years which should be referenced to better understand the economic picture of the region. Key project areas from the 2025 CEDS are included in Table 8. A full list of projects can be found in the CEDS document.

**Table 8: Priority Project Categories, CEDS 2025**

| Priority Project Categories   |
|---|
| 1. Develop regional broadband infrastructure and increased connectivity.  |
| 2. Encourage and develop advanced manufacturing facilities  |
| 3. Focus for workforce development programs to meet needs in target industry sectors.                           |
| 4. Focus on transportation infrastructure: Roanoke-Blacksburg Regional Airport, Amtrak, highways, and commuting |
| 5. Continue success in outdoor tourism with regional and local greenway systems, Explore Park                   |
| 6. Support and encourage industrial site development and upgrades.  |
| 7. Develop a wider range of homeownership and rental housing opportunities.                                     |
| 8. Promote and encourage attraction of biotech and life sciences clusters                                       |
| 9. Support local agriculture, growers, and producers.   |
| 10. Perform a gap analysis to develop regional quality of life amenities.                                       |

Local governments were asked to provide building permit data to help clarify development patterns in the region. The following overview reflects building trends including new construction, demolitions, and improved parcels from 2019 to September 2025.

Internal tracking systems vary widely among jurisdictions, and in some cases, data are incomplete or inconsistent across time periods. Some localities do not distinguish between types of structures when measuring improvements (e.g. homes vs. mobile home hookups vs. storage units). Others provided only parcel data while some reported only structures built before a certain time, current occupied housing units, or buildings which receive refuse collection. Some localities were not able to provide this data. As a result, the dataset may not capture the full extent of building activity and development across years or jurisdictions.

- **Alleghany County**
  - 7,123 buildings recorded in the 2019 refuse collection file; 6,439 in the 2025 refuse collection file.
  - 65 demolitions recorded in this period.
- **Clifton Forge**
  - There has been very little growth since 1990.
  - Residential Historic Overlay District with 730 contributing structures; Commercial Historic Overlay District with 77 contributing structures.
  - Currently 13 churches, 109 commercial buildings, and 140 vacant buildings.
- **Craig County**
  - 232 building permits from 2019-2025 (over 256 sq ft).
  - 34 units were demolished in this period.
- **Roanoke County**
  - 67,425 buildings before 2019.
  - 72,832 buildings in 2025.
  - 203 demolitions recorded in this period.
- **City of Roanoke**
  - 1,018 building permits issued for new residential and commercial structures (including accessory structures and 82 demolitions) since January 1, 2020.
- **City of Salem**
  - 10,582 parcels (9,565 improved) in 2019.
  - 10,650 parcels (9,690 improved) in 2025.
  - 20 demolitions recorded in this period.
- **Town of Vinton**
  - Steady decline in building permits since 2008.
  - As of 2022, there were 3,686 occupied housing units.

## Historic and Cultural Resources

Virginia has a deep cultural history, and this portion of Virginia is no exception. The service area is located within Southwest Virginia and shares cultural ties to the wider Appalachian region. For many communities, historic and cultural resources are a catalyst for economic development and source of pride for residents. Historic properties can be located throughout a locality and the number of structures varies widely. The potentially devastating effects that flooding and other disasters can have on historic properties are not always considered in mitigation planning. More information about specific considerations of hazard mitigation on historic properties is included in [Chapter 4: Risk Assessment](#).

Local governments should work with the Virginia Department of Historic Resources, VDEM, and local preservation groups to identify historic buildings and sites in need of hazard mitigation. These efforts should follow the guidance in [Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning](#) (FEMA 386-6).

## 2.2 Infrastructure and Critical Facilities

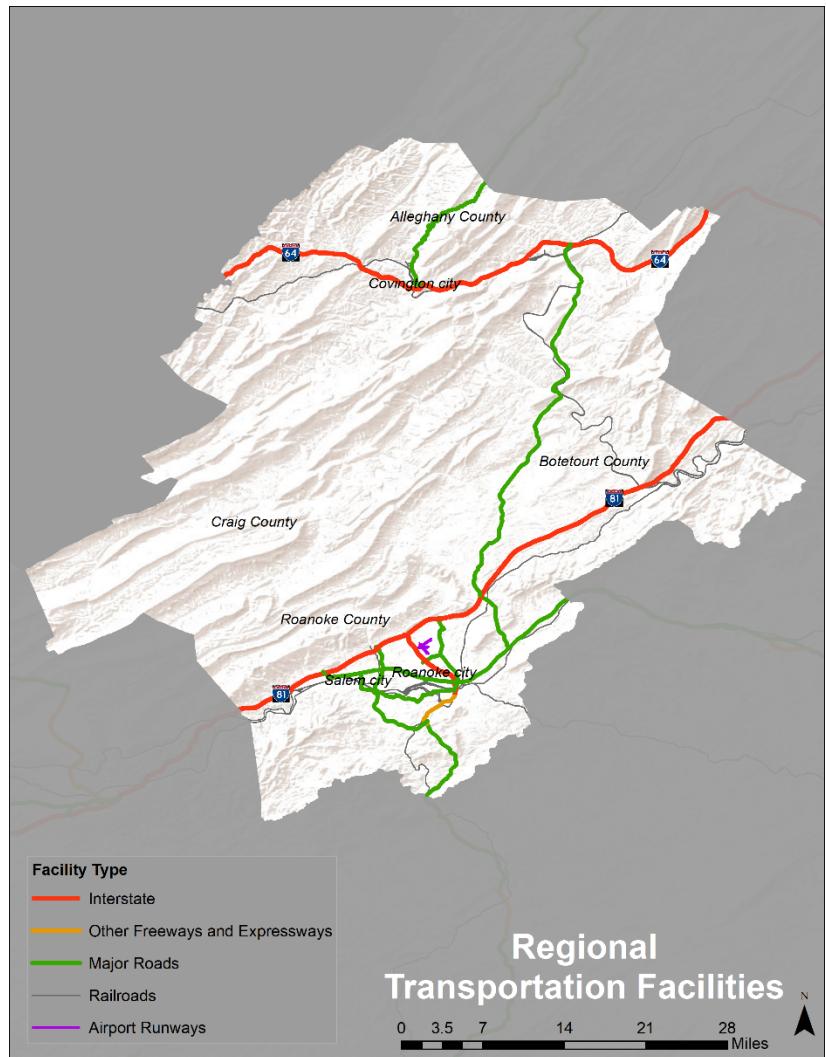
### Infrastructure

Several infrastructure elements contribute to a robust regional socioeconomic space. These elements affect how people get around, how they meet basic needs, and how they access employment.

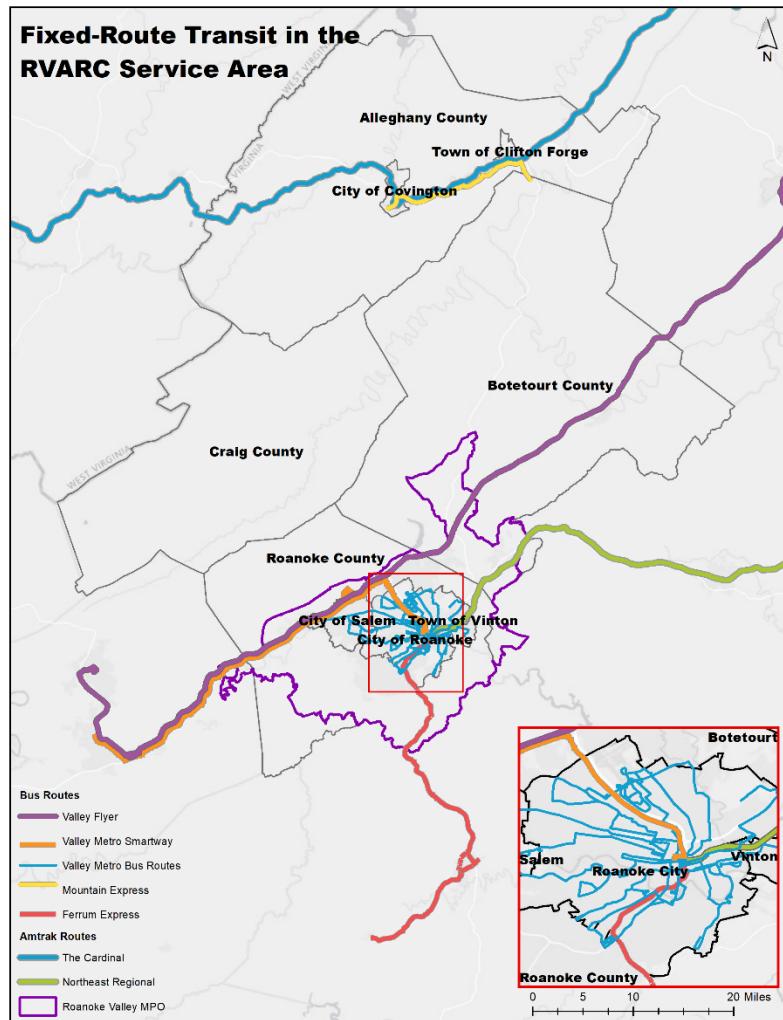
#### Transportation

Interstate 64 bisects Alleghany County in an east-west direction while passing through the City of Covington and Town of Clifton Forge. Interstate 81 crosses Botetourt and Roanoke counties in a northeast-southwest direction and includes an urban connector I-581 that links I-81 to the central business district of the City of Roanoke. Other arterial routes in the area include US 11 in Botetourt and Roanoke counties; US 60 in Alleghany County; US 220 passing through Alleghany, Botetourt, and Roanoke counties; US 221 and 460 in Roanoke County; and State Primary Route 311 in Alleghany and Craig counties.

Air service is available at the Roanoke Regional Airport that provides nonstop service from Roanoke, Virginia to nine major cities. Rail service for freight is provided by the Buckingham Branch Railroad, CSX Transportation and Norfolk Southern Railway. Passenger train service is available from Amtrak at stations in the Town of Clifton Forge and City of Roanoke, and an additional passenger rail station is planned in Christiansburg, with rights-of-way managed by the Virginia Passenger Rail Authority. There are also several fixed-route bus lines in the region.



**Figure 7: Regional Transportation Facilities**



**Figure 8: Regional Transit Connections**

## Housing

The region faces a housing shortage as the Roanoke Valley-Alleghany Regional Housing Market Study Analysis (2021). The biggest challenges to the regional housing market are identified as follows:

- The Region's population has been slowly but consistently growing over the last 50 years, with the percentage of the elderly population increasing.
- One, two, and three-person households comprise the largest share of households in the Region, but over the last five years, more growth has occurred in larger households of four or more people.
- The number of vacant units has been increasing in the Region. This, in part, has been driven by the seasonal home market, which accounts for 30% of all vacant units.
- Nearly 82% of housing units in the Region were constructed before 1980, leaving the Region with a much older housing stock than what is found in many other parts of the Commonwealth.
- Over the last five years, the median gross rent in the Region increased by 14%. The average rent for a single-family home is around \$1,000 per month, while rent in multifamily buildings averaged \$1,200 per month.
- There are significant differences in the percentage of renter of owner households classified as cost burdened across the Region. Approximately 20% of owner households are experiencing some level of cost burden compared to 41% of renters. It is typical to see a broad difference between these two groups, but it also speaks to the need for affordably priced housing for renter households.
- The number of renter households that qualify for affordable rental housing at the 30% of AMI level exceeds the number of units available at that price point. There is a projected deficit of 5,324 units, meaning many extremely low-income households are having to spend more than is recommended on housing costs. This further exacerbates housing affordability and cost burden challenges.

The CEDS offers a more updated overview of housing statistics, including annual home sales and estimated vacancy rates.

## Utilities

The region contains three major electricity providers, Appalachian Power, Dominion Power, and Craig-Botetourt Electric Co-op. The City of Salem also operates a substation. Roanoke Gas and Columbia Gas are other major energy service providers in the region. This form of infrastructure relies on long, linear facilities often bracketed by substations. The location of these facilities can impact development in the region. Major energy production projects such as large-scale wind and solar are a new type of development that continues to expand in the area. Mountain Valley Pipeline is another key infrastructure project which has provided additional natural gas service to the region.

Disruptions to energy can have disproportionate impacts on vulnerable populations. Energy service provision is a key first step in post-disaster response, and future involvement of these stakeholders in hazard mitigation plans is recommended.

Clean water and sanitation are also key concerns following a disaster event. While regional water supply planning is mandated by the state, a high level overview of drought as a hazard is included in **Chapter 3: Hazard Identification**. Key players in the provision of water and sanitation include the Western Virginia Water Authority (WVWA), which provides water and sewer services to much of the service area, including the City of Roanoke, Roanoke County, Botetourt County, the Town of Fincastle, and the Town of Vinton. Additionally, the Craig-New Castle PSA, which provides water and sewer services to Craig County and the Town of New Castle, has recently entered into an administration agreement with WVWA. WVWA is a special district included in this plan. Additional water and sewer provision is provided by Alleghany County, the Cities of Covington and Salem, and the Towns of Buchanan, Clifton Forge, Iron Gate, and Troutville. Small private service providers also exist in the region.

In December of 2023 the Virginia Department of Health published a report on infrastructure needs which focuses on sewer and on-site facilities such as septic. This report estimates that \$288 million of investment are needed to maintain or improve current systems across the RVARC service area. Many sewage processing facilities are located near rivers and streams. Septic systems are also vulnerable to flooding, which can have downstream impacts on water quality and cause ripple effects for the community. These cost estimates are valuable data points in posing future projects and solutions for the region, including hazard mitigation projects.

**Table 9: Regional Sewer and Septic Needs, VDH**

| Locality       | Community Needs         | Onsite Needs             | Total Needs              |
|----------------|-------------------------|--------------------------|--------------------------|
| Alleghany      | \$ 9,344,076.00         | \$ 18,631,769.00         | \$ 27,975,845.00         |
| Botetourt      | \$ 6,857,960.00         | \$ 44,805,866.00         | \$ 51,663,826.00         |
| Covington      | \$ 5,605,860.00         | \$ 207,632.00            | \$ 5,813,492.00          |
| Craig          | \$ -                    | \$ 6,752,172.00          | \$ 6,752,172.00          |
| Roanoke County | \$ -                    | \$ 168,614,006.00        | \$ 168,614,006.00        |
| Roanoke City   | \$ -                    | \$ 9,335,610.00          | \$ 9,335,610.00          |
| Salem          | \$ 17,593,337.00        | \$ 569,056.00            | \$ 18,162,393.00         |
| <b>Total</b>   | <b>\$ 39,401,233.00</b> | <b>\$ 248,916,111.00</b> | <b>\$ 288,317,344.00</b> |

## Outdoor Recreation Facilities

Outdoor recreation is a key part of the regional economy with more than \$42 million in local tax revenue coming from visitors to the region. Greenways and trails are often located in areas particularly vulnerable to disaster events, such as on steep slopes or in floodplains. The Appalachian Trail is a key draw to the region, but other facilities of note include Carvins Cove, the Explore Park, the Roanoke Valley greenway network, the Jackson River Trail, Douthat State Park, the Blue Ridge Parkway, and the George Washington and Jefferson National Forests.

**Table 10: 2023 Tax Revenues from Travel, VTC**

| Locality     | 2023 Tax Revenue |
|--------------|------------------|
| Alleghany    | \$ 1,236,865.00  |
| Botetourt    | \$ 3,104,204.00  |
| Covington    | \$ 719,478.00    |
| Craig        | \$ 145,191.00    |
| Roanoke      | \$ 6,785,403.00  |
| Roanoke City | \$ 24,463,510.00 |
| Salem        | \$ 5,746,444.00  |

While much of the public lands in the area are managed by federal and state partners, local governments maintain numerous parks and trails in the region, including the Explore Park, Carvins Cove, and the greenway network. Managing these facilities is a significant part of local budgets, and even relatively mild storm events can have a disproportionate impact on staff time and materials costs. In some cases, greenway and park networks serve as transportation infrastructure for those who use alternative transportation to commute.

## Critical and Vulnerable Facilities

**Critical Facilities** are those that provide services to the public during an emergency. Examples of this include Public Safety structures, Public Assembly Sites & Shelters, Medical Structures, Utility Structures, and Transportation Structures.

**Vulnerable Facilities** are those that will require special attention during an emergency. Examples of this include Large Scale Housing Complexes of 50 or more total units or those with elderly or sick residents, Child / Day Care Facilities, Manufacturing Sites / Warehouses, and Tier 2 Facilities.

These definitions collectively fulfill the requirement for critical facilities listings for pre-disaster hazard mitigation planning and the community rating system program.

A full listing of Critical and Vulnerable Facilities identified in this plan is included in [Appendix G](#).

High hazard dams are also included in this plan and references to these facilities are located in [Chapter 3, Section 3.4](#); [Chapter 4, Section 4.3](#); and [Appendix H](#).

| Critical Facilities  | Vulnerable Facilities  |
|--|--|
| <ul style="list-style-type: none"><li>• Public Safety: Fire &amp; Rescue, Law Enforcement, etc.</li><li>• Public Assembly &amp; Shelters: Schools, Government Buildings, Community Centers, etc.</li><li>• Medical Structures: Hospitals, Clinics, Pharmacies etc.</li><li>• Utility Structures: Pumps, Wells, Water Treatment, Power Generation, etc.</li><li>• Transportation Structures: Airports, Transit Hubs, Evacuations Routes, etc.</li></ul> | <ul style="list-style-type: none"><li>• Large-Scale Housing Complexes (50 or more total units), Nursing &amp; Assisted Living Homes, Recovery Care, etc.</li><li>• Child / Day Care Facilities</li><li>• Manufacturing Sites / Warehouses: Potential for dangerous Materials</li><li>• Tier 2 Facilities</li></ul> |

# Chapter 3. Hazard Identification

## 3.1 Hazards for Assessment

The region is subject to a variety of hazard events, many of which will be assessed in this document. The following kinds of hazard events have been documented through the NCEI database maintained by NOAA.

- Debris Flow
- Drought
- Extreme Cold/Wind Chill
- Flash Flood
- Flood
- Hail
- Heavy Rain
- Heavy Snow
- High Wind
- Lightning
- Strong Wind
- Thunderstorm Wind
- Tornado
- Winter Storm
- Winter Weather

The locations and number of events for each of these hazard events is visible in [Table 1: Hazard Events and Locations](#).

The Steering Committee identified several hazards for assessment in the plan based off of this data, federal disaster declarations included in [Table 2](#), and historic hazard assessments.

- Extreme Temperature
- Flooding
- Hurricane and Tropical Storm
- Wind Event
- Winter Storm

Additional hazards which will be assessed will include:

- Earthquake
- Karst
- Landslide
- Wildfire

Hazards not assessed in this document include drought and pandemics. High hazard potential dams are assessed under flooding unless otherwise noted, with supplementary materials contained in [Appendix H](#).

The 2019 Plan details all historic disaster declarations and disaster events by hazard. This document will only provide details around disaster events which have occurred since the data collected in the 2019 Plan, or historic events which can provide key learning for hazard mitigation. A comprehensive record of all events since data collection began is not the aim of this chapter.

**Table 11: Hazard Events and Locations**

| Event Types             | Number of Events | Event Types      | Number of Events |
|-------------------------|------------------|------------------|------------------|
| Debris Flow             | 1                | Heavy Snow       | 2                |
| ROANOKE CITY            | 1                | BOTETOURT (ZONE) | 1                |
| Drought                 | 11               | ROANOKE (ZONE)   | 1                |
| ALLEGHANY (ZONE)        | 3                | High Wind        | 33               |
| BOTETOURT (ZONE)        | 3                | ALLEGHANY (ZONE) | 5                |
| CRAIG (ZONE)            | 3                | BOTETOURT (ZONE) | 5                |
| ROANOKE (ZONE)          | 2                | CRAIG (ZONE)     | 3                |
| Extreme Cold/Wind Chill | 3                | ROANOKE (ZONE)   | 20               |
| BOTETOURT (ZONE)        | 1                | Lightning        | 4                |
| CRAIG (ZONE)            | 1                | ALLEGHANY CO.    | 1                |
| ROANOKE (ZONE)          | 1                | BOTETOURT CO.    | 1                |
| Flash Flood             | 21               | ROANOKE CITY     | 1                |
| ALLEGHANY CO.           | 2                | COVINGTON CITY   | 1                |
| BOTETOURT CO.           | 7                | Strong Wind      | 6                |
| CRAIG CO.               | 1                | BOTETOURT (ZONE) | 2                |
| ROANOKE CO.             | 4                | CRAIG (ZONE)     | 1                |
| ROANOKE CITY            | 6                | ROANOKE (ZONE)   | 3                |
| COVINGTON CITY          | 1                |                  |                  |

| Event Types    | Number of Events | Event Types       | Number of Events |
|----------------|------------------|-------------------|------------------|
| Flood          | 37               | Thunderstorm      |                  |
|                |                  | Wind              | 168              |
| ALLEGHANY CO.  | 2                | ALLEGHANY CO.     | 21               |
| BOTETOURT CO.  | 9                | BOTETOURT CO.     | 54               |
| CRAIG CO.      | 2                | CRAIG CO.         | 15               |
| ROANOKE CO.    | 11               | ROANOKE CO.       | 71               |
| ROANOKE CITY   | 10               | ROANOKE CITY      | 1                |
| SALEM CITY     | 3                | SALEM CITY        | 4                |
| Hail           | 27               | COVINGTON CITY    | 2                |
| ALLEGHANY CO.  | 4                | Tornado           | 2                |
| BOTETOURT CO.  | 7                | BOTETOURT CO.     | 1                |
| CRAIG CO.      | 1                | SALEM CITY        | 1                |
| ROANOKE CO.    | 11               | Winter Storm      | 28               |
| ROANOKE CITY   | 2                | ALLEGHANY (ZONE)  | 6                |
| SALEM CITY     | 2                | BOTETOURT (ZONE)  | 7                |
| Heavy Rain     | 17               | CRAIG (ZONE)      | 8                |
| ALLEGHANY CO.  | 1                | ROANOKE (ZONE)    | 7                |
| BOTETOURT CO.  | 3                | Winter Weather    | 3                |
| CRAIG CO.      | 3                | ALLEGHANY (ZONE)  | 2                |
| ROANOKE CO.    | 4                | ROANOKE (ZONE)    | 1                |
| ROANOKE CITY   | 4                | All Hazard Events | 363              |
| SALEM CITY     | 1                |                   |                  |
| COVINGTON CITY | 1                |                   |                  |

**Table 12: FEMA Disaster Declarations since 2018**

| Declaration Date           | Incident Type  | Title or Name                     | Affected Areas  |
|----------------------------|----------------|-----------------------------------|---|
| Friday, April 4, 2025      | Severe Storm   | SEVERE WINTER STORMS AND FLOODING | Craig (County)  |
| Tuesday, October 1, 2024   | Tropical Storm | TROPICAL STORM HELENE             | Botetourt (County)<br>Craig (County)<br>Covington<br>Roanoke<br>Roanoke (County)                                |
| Sunday, September 29, 2024 | Tropical Storm | POST-TROPICAL CYCLONE HELENE      | Craig (County)<br>Covington   |
| Thursday, April 2, 2020    | Biological     | COVID-19 PANDEMIC                 | Alleghany (County)<br>Botetourt (County)<br>Craig (County)<br>Roanoke (County)<br>Covington<br>Roanoke<br>Salem |
| Friday, March 13, 2020     | Biological     | COVID-19                          | Alleghany (County)<br>Botetourt (County)<br>Craig (County)<br>Roanoke (County)<br>Covington<br>Roanoke          |

## 3.2 Earthquake

### Definition of Hazard

An earthquake is a sudden, rapid shaking of the Earth caused by the breaking and shifting of rock beneath the Earth's surface. Ground shaking from earthquakes can collapse buildings and bridges; disrupt gas, electric, and phone service; and sometimes trigger landslides, avalanches, flash floods, and fires. Buildings with foundations resting on unconsolidated landfill and other unstable soil as well as trailers and homes not tied to their foundations are at risk because they can be shaken off their mountings during an earthquake. When an earthquake occurs in a populated area, it may cause deaths and injuries and extensive property damage.

Ground movement during an earthquake is seldom the direct cause of death or injury. Most earthquake-related injuries result from falls, collapsing walls, flying glass, and falling objects. Much of the damage in earthquakes is predictable and preventable. Primary impacts from earthquakes are structural damage and loss of life.

There are two common ways of measuring earthquake intensity. The Modified Mercalli Intensity Scale, composed of 12 increasing levels of intensity that range from imperceptible shaking to catastrophic destruction, is a value assigned to a specific site after an earthquake has occurred, and is assigned based on the severity of the effects of the event. The lower numbers of the intensity scale generally deal with the way the earthquake is felt by people. The higher numbers of the scale are based on observed structural damage. Structural engineers usually contribute information for assigning intensity values of VIII or above. In contrast, the more common Richter scale is used to scientifically measure an earthquake's magnitude, regardless of impact, based on the energy released by the event.

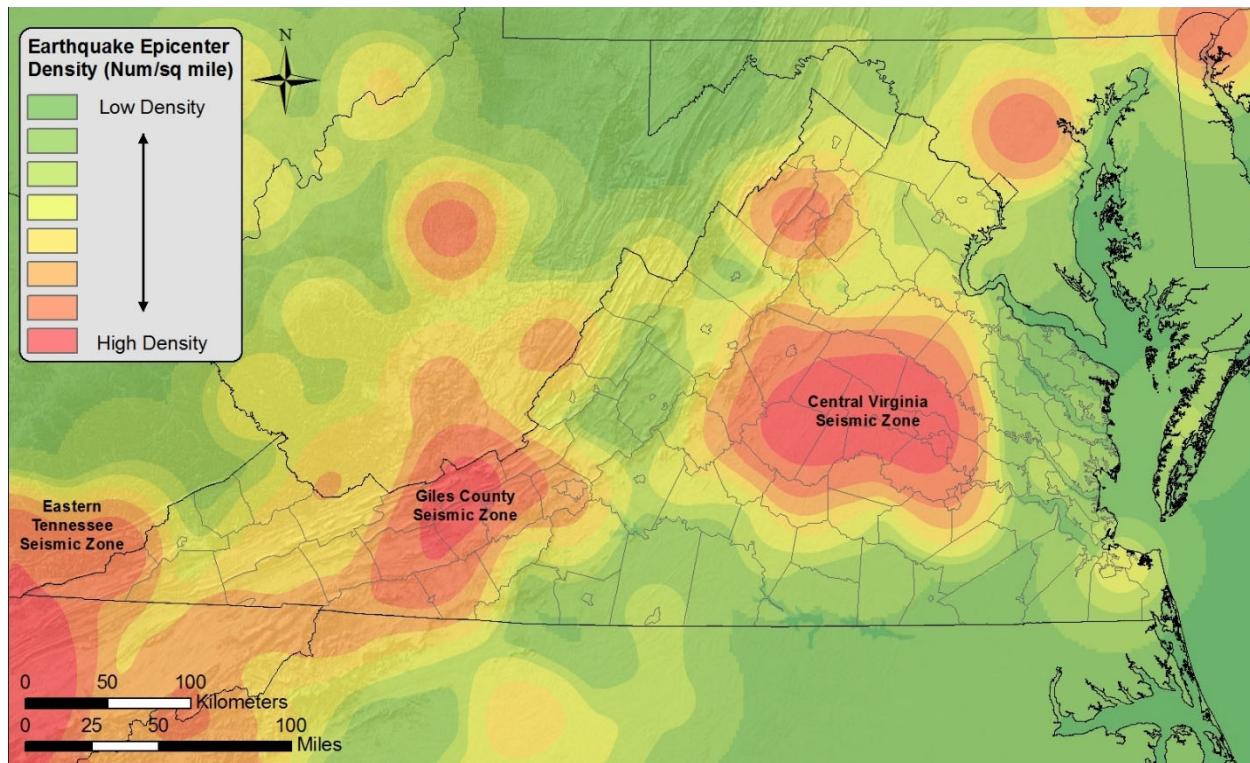
The Virginia Tech Seismological Observatory (VTSO) operates a digital seismic network with stations in Virginia and southern West Virginia. Along with other southeastern regional seismic networks and the U.S. National Seismic Network (USNSN), VTSO contributes to earthquake monitoring, information dissemination and seismic hazard assessment objectives in the southeastern United States. In 1991, Virginia Tech combined with other institutions in North Carolina and Tennessee to form the Southern Appalachian Cooperative Seismic Network to coordinate earthquake monitoring and data exchange.

|  |
|--|
| I. Not felt except by a very few under especially favorable conditions.  |
| II. Felt only by a few persons at rest, especially on upper floors of buildings.   |
| III. Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.                   |
| IV. Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.                                 |
| V. Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.   |
| VI. Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.  |
| VII. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.   |
| VIII. Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. |
| IX. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.   |
| X. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.  |
| XI. Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.   |
| XII. Damage total. Lines of sight and level are distorted. Objects thrown into the air.  |

**Figure 9: Modified Mercalli Intensity Levels**

## Historic Event Descriptions

The southern portion of the Roanoke Valley-Alleghany Region is part of the Giles County Seismic Zone, including the Cities of Roanoke and Salem, the Counties of Craig, Roanoke, and the southern portion of Botetourt, and the Town of Vinton. Map 1 shows data collected by the Virginia Department of Emergency Management, where historical event information was used to approximate the three seismic zones across the Commonwealth.



**Figure 10: Virginia Seismic Zones, Virginia Department of Energy**

Since 1774, the year of the earliest documented Virginia earthquake, there have been over 300 earthquakes in or near the Commonwealth. Of those, 18 earthquakes had reports of intensity VI or higher. The largest earthquake in Virginia was the 1897 Giles County shock which registered an intensity of VIII. It was felt over 11 states (approximately 280,000 square miles). The estimated magnitude for this event was 5.8, making it the third largest earthquake in the eastern United States in the last 200 years (second largest in the southeastern U.S.). On August 23, 2011, a magnitude 5.8 earthquake occurred 5 miles south-southwest of Mineral, Virginia (150 miles northeast of Roanoke). The Mineral event was Virginia's strongest earthquake in over a century. While several small quakes have occurred, no major earthquakes have occurred in Virginia since 2011.

There have only been two earthquakes with epicenters in the planning area since the last update of this plan. One occurred near New Castle at a magnitude of 2.5 in December of 2019. The second occurred near the Roanoke County and Montgomery County border at a magnitude of 2.6 in September of 2021. Neither registered as higher than III or IV on the Mercalli Intensity Scale. One earthquake affected the region with an epicenter outside of the region. On August 9,

2020 a magnitude 5.1 earthquake struck near the Virginia border of North Carolina, with effects felt throughout the study area.

There has not been a Presidential or State Disaster Declaration in the planning region for earthquakes.

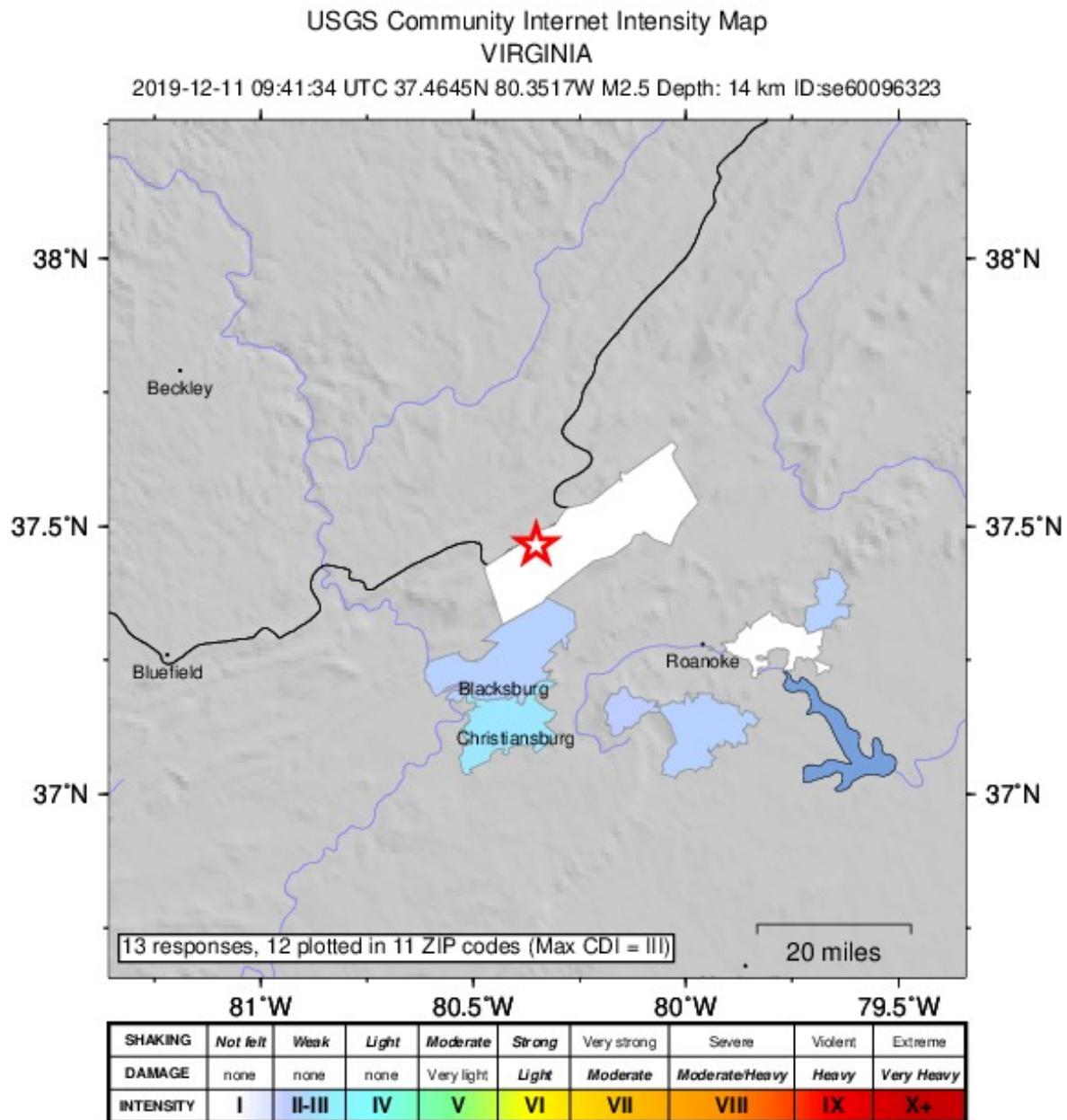


Figure 11: Community Intensity Map, New Castle Earthquake 2019

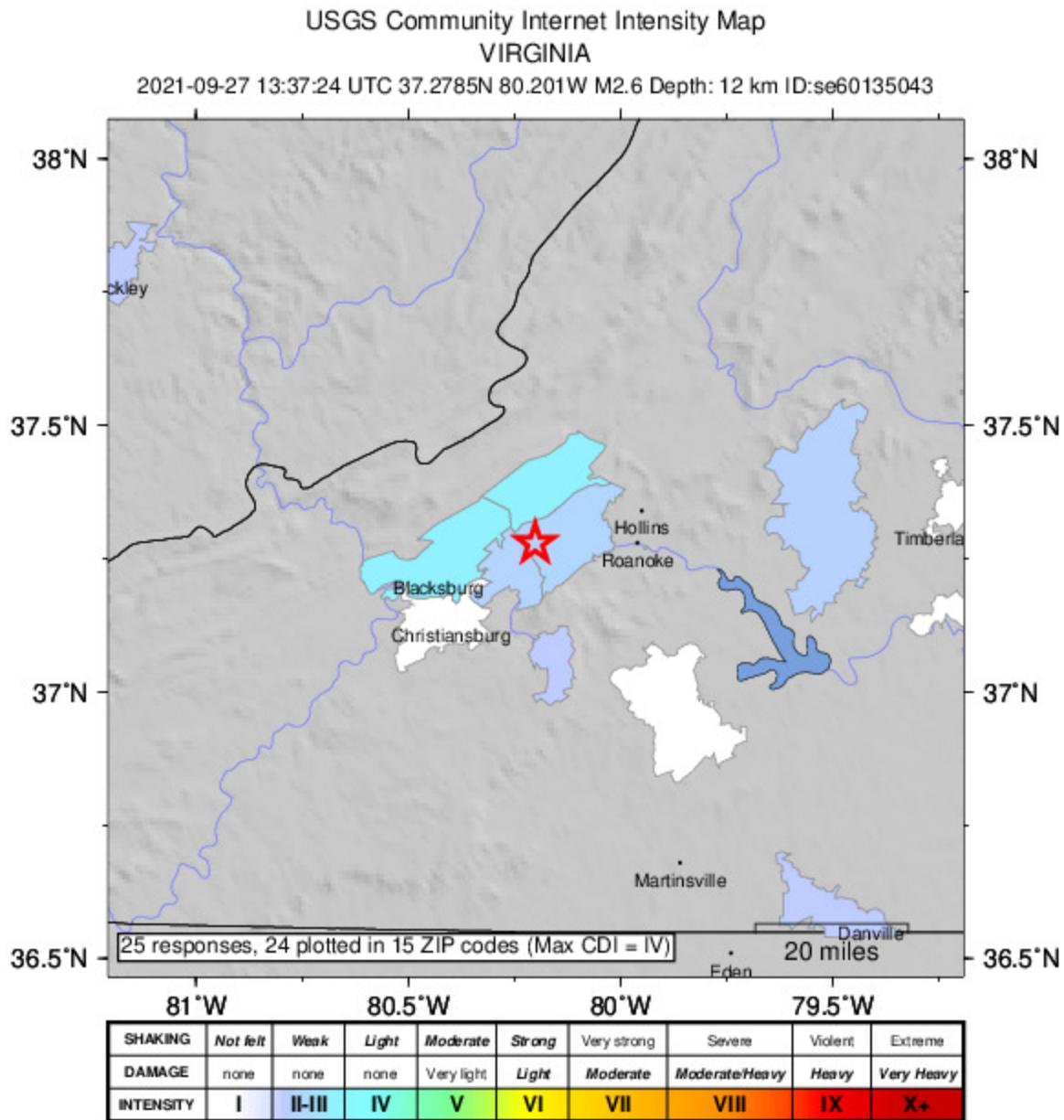
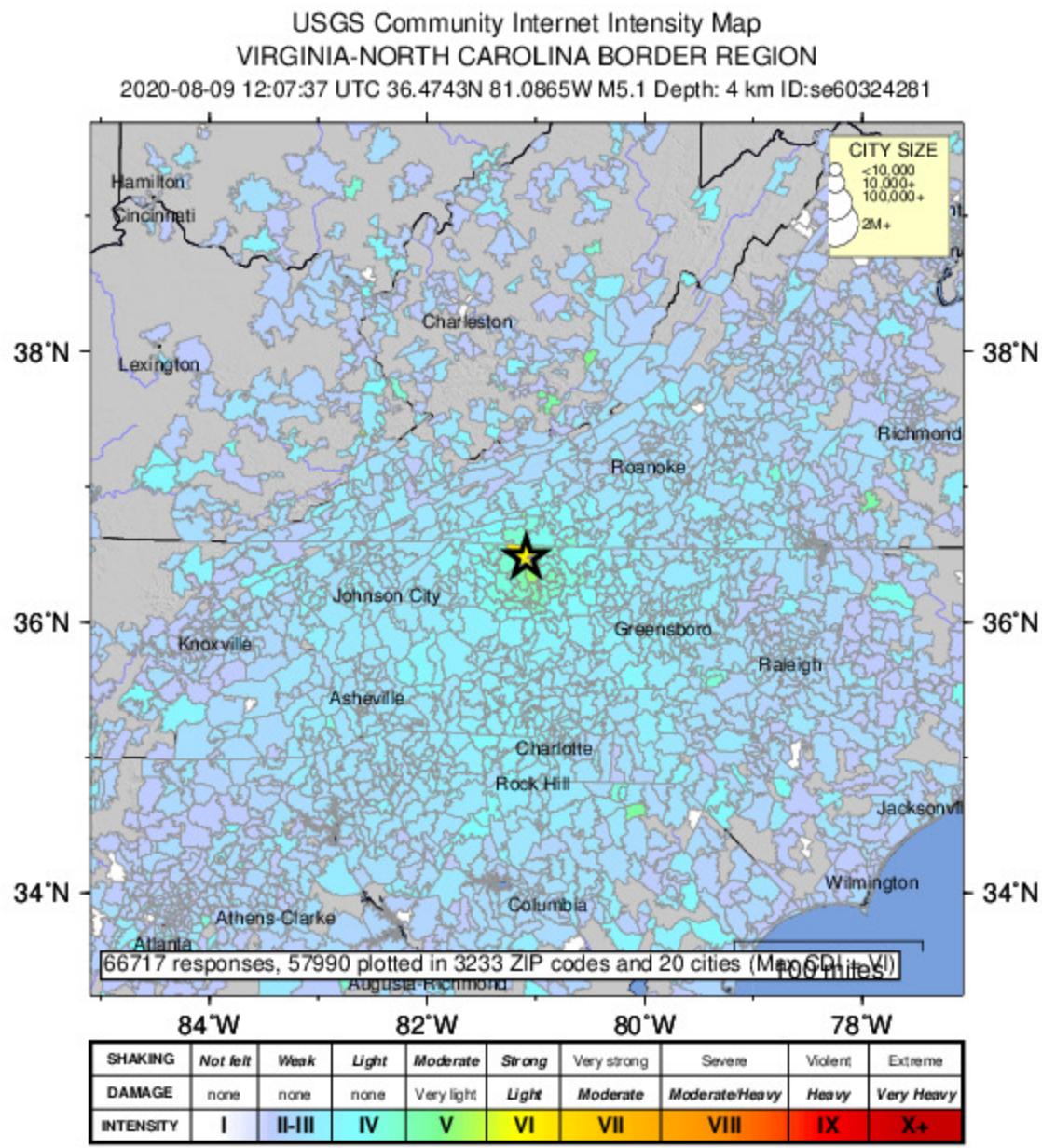


Figure 12: Community Intensity Map, Roanoke County Earthquake 2021



**Figure 13: Community Intensity Map, North Carolina Earthquake 2020**

### 3.3 Extreme Temperature

#### Definition of Hazard

As described in Section 3.1, for the purposes of this plan Extreme Temperature will mean both extreme heat and extreme cold. While some strategies to address extreme heat and extreme cold may differ, the general strategies of weatherization, temperature control in the home, and emergency shelters remain consistent across these disaster events.

There is no unified definition of extreme heat, and there are numerous ways to evaluate potential heat stress. The wet bulb globe temperature (WBGT) is an international standard of measurement that is often utilized by athletic programs and is best suited for those performing strenuous activity outside. This measurement factors in solar radiation, temperature, relative humidity, and wind speed. The heat index, more commonly seen in cell phone applications available to average citizens, does not factor in solar radiation or wind speed, but does factor in relative humidity. This is a more suitable temperature for assessing impacts of heat on indoor, unconditioned spaces.<sup>1</sup> The climate of the Roanoke Valley-Alleghany Region is subject to high levels of humidity, meaning that actual WBGT is likely higher than both the measured temperature and the heat index. Studies of heat impacts do exist in the study area and focus primarily on urban heat island effect.

| Parameter                  | WBGT | Heat Index |   |
|----------------------------|------|------------|---|
| Measured in the sun        | ●    |            |  temperature         |
| Measured in the shade      |      | ●          |  solar radiation    |
| Includes temperature       | ●    | ●          |   |
| Includes relative humidity | ●    | ●          |  relative humidity |
| Includes wind              | ●    |            |   |
| Includes cloud cover       | ●    |            |   |
| Includes sun angle         | ●    |            |  wind speed        |

Figure 14: WBGT vs Heat Index, Weather.gov

Per the EPA, heat is the leading cause of weather-related death in the United States.<sup>2</sup> Further methods of evaluating heat and heat impacts should be assessed. For the purposes of this plan, extreme heat will be defined as daytime high temperatures in excess of 90 degrees Fahrenheit.

Extreme heat most often affects individual health, especially of the elderly, children, homeless populations, and people with underlying health issues, but may also affect worker productivity, infrastructure such as roads and the electric grid, and cause excess energy consumption. Such impacts are further assessed in **Chapter 4**.

<sup>1</sup> (National Weather Service)

<sup>2</sup> (Environmental Protection Agency, 2025)

Wet Bulb Globe Temperature Risk Chart

| WBGT                | Flag Color | Level of Risk        | Comments   |
|---------------------|------------|----------------------|--|
| <18°C (<65°F)       | Green      | Low                  | Risk low but still exists on the basis of risk factors   |
| 18°-23°C (65°-73°F) | Yellow     | Moderate             | Risk level increases as event progresses through the day   |
| 23°-28°C (73°-82°F) | Red        | High                 | Everyone should be aware of injury potential; individuals at risk should not compete   |
| >28°C (>82°F)       | Black      | Extreme or hazardous | Consider rescheduling or delaying the event until safer conditions prevail; if the event must take place, be on high alert. Take steps to reduce risk factors (e.g., more and longer rest breaks, reduced practice time, reduced exercise intensity, access to shade, minimal clothing and equipment, cold tubs at practice site, etc.). |

The WBGT can be measured with a WBGT meter. The calculation for the determination of WBGT is:  $WBGT = .7 \text{ (Wet Bulb temperature)} + .2 \text{ (Black Globe Temperature)} + .1 \text{ (Dry Bulb Temperature)}$ .

This table was originally printed in Roberts WO. Medical management and administration manual for long distance road racing. In: Brown CH, Gudjonsson B, eds. *IAAF Medical Manual for Athletics and Road Racing Competitions: a Practical Guide*. Monaco: International Association of Athletics Federations;1998:39-75.

### Figure 15: WBGT and Safety

Similar to extreme heat, there is no unified definition of extreme cold. The way heat or cold is felt likely depends on a variety of factors, including acclimatization of the individual. Factors such as wind speed and humidity can affect how cold is felt in the body the same way that they can exacerbate high temperatures. Extreme cold can have additional impacts on infrastructure beyond those experienced with extreme heat, including most commonly frozen pipes. Frozen pipes can cause a lack of access to clean, potable water, as seen in Richmond in January of 2025, and extensive property damage if not quickly identified and addressed. More information on impacts of extreme cold is available in **Chapter 4**.

For the purposes of this plan, extreme cold will be defined as daytime high temperatures of 32 degrees or less.

Collectively, extreme temperature will be defined as days when high temperatures are greater than 90 degrees or less than 32 degrees Fahrenheit. As this is the first time this hazard has been assessed in an RVARC plan, all historic instances for which there is existing data are included in this section.

### Historic Event Descriptions

Historical temperature data is available from the National Oceanic and Atmospheric Administration (NOAA) going back to 1948. Since that time, the Roanoke region has experienced 1,855 days of temperatures above 90 degrees Fahrenheit and 510 days of highs at or below 32 degrees Fahrenheit. Extreme heat days average around 24 days per year over this time period. In the last ten years, extreme heat days have averaged 32 days per year. In contrast, the annual average number of extreme cold days has been only 7 days per year, with the number dropping to 5 days a year in the past ten years.

The Commonwealth has declared a state of emergency in the past due to winter weather, but no declarations in the past five years dealt solely with extreme cold. Winter weather is further analyzed later in this chapter.

Average daily lows can better reflect extreme heat in some cases, especially in urban areas. The City of Roanoke undertook a heat island mapping study which provided more insight into the effects of heat on City residents. More details of this mapping can be found on the [Urban Heat Island Effect](#) page of the City's website. Further discussion of the City's work in this area will be included in [Chapter 4: Risk Assessment](#).

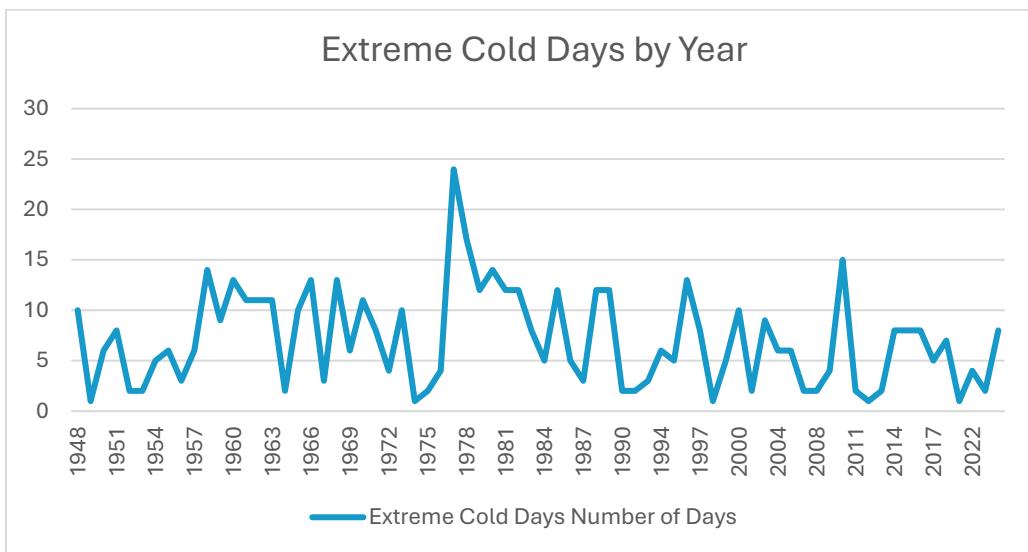


Figure 16: Extreme Cold Days by Year, Roanoke, VA

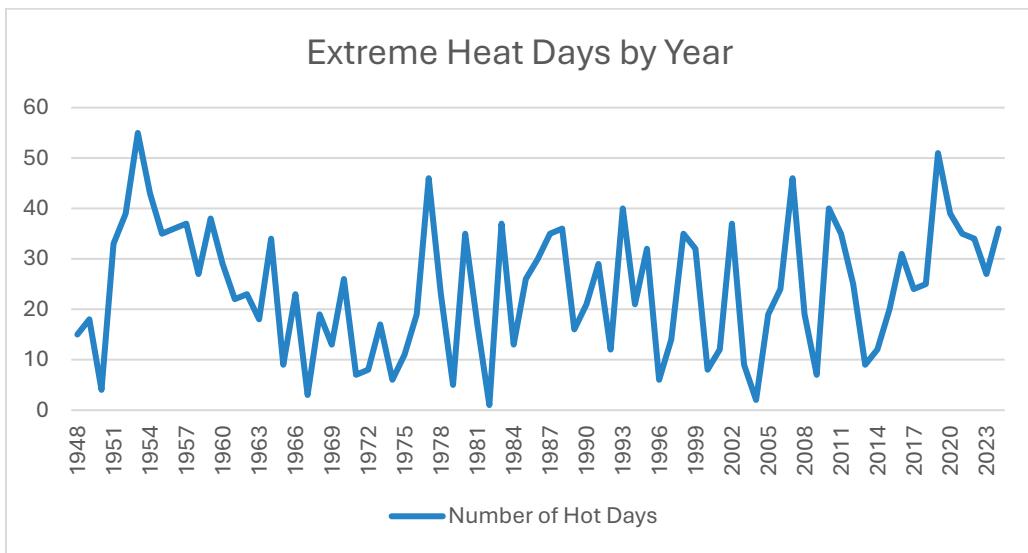


Figure 17: Extreme Heat Days by Year, Roanoke, VA

## 3.4 Flooding

### Definition of Hazard

Widespread flooding or flash flooding impacts a large portion of the region. Watersheds in the Roanoke Valley-Alleghany region are typical of the Blue Ridge region in which smaller streams collect water which then flows through steep terrain, picking up velocity, and into the valleys and flatlands along major rivers where development has occurred. The flood plains throughout these mountainous areas are narrow, averaging less than 250 feet in most areas. These are also the only flat areas where development could take place in this mountainous region. Most flood-producing storms generally occur in the winter and spring. However, flooding due to intense local thunderstorms or tropical disturbances can occur in any season.

Flood hazard areas, along with repetitive loss clusters, dams, flood prone roads, rain gauges and other relevant spatial information for each jurisdiction participating in the plan are mapped in [Appendix D: Flood Hazard Areas](#).

### Historic Event Descriptions

Alleghany County has experienced floods since its original settlement. Large floods occurred in 1877, 1913, 1936, 1969, 1972, 1973 and 1985. Hurricane Jeanne caused severe storms and flooding in October 2004. Flood damage in the area is typically concentrated in and near Covington and Clifton Forge. Because of the rural nature of the county, damages from flooding are widespread. Damage occurs to roads, bridges, and public facilities such as schools.

The Jackson River flows through the City of Covington, towns of Clifton Forge and Iron Gate and the communities of Low Moor and Selma. Gathright Dam, constructed in 1974, partially controls flooding along the Jackson River. Despite this, floods still occur. Covington experienced large floods on November 1877, March 1913, March 1936, March 1967, August 1969 (Hurricane Camille), 1972 (Tropical Storm Agnes), March and December 1973, and November 1985. Tropical Storm Agnes was the most severe of the events with as much as one-third of the city underwater. In all, one church, three public buildings, two industrial plants, 8 commercial buildings, and 490 private residences were damaged. In November 1985, a 100-year frequency rainstorm caused a reported \$17 million in damages in the City of Covington.

The US Army Corps of Engineers, 1986 report titled Flood Control Study, Jackson River, Lower Jackson Street Residential Area, Covington, provides information about the major flood that occurred in November 1985. An approximate 90-year flood event resulted in residential, commercial, and municipal damage in the lower Jackson Street / Rayon Terrace neighborhood. Residential losses included yard, basement, and first-floor damage in sixty-four (64) homes and four (4) businesses. Municipal damage included debris in the city park, a sewage pump station and damage to a storm sewer. Total residential, commercial and municipal damage were estimated at \$544,000. Structural and non-structural alternatives for this section of the city were explored in a cost-benefit analysis and found to be infeasible.

Floods used in the 1978 Federal Insurance Administration study to describe the impact on the town of Clifton Forge include the Flood of 1950 and Flood of 1969 - both of which occurred prior to construction of Gathright Dam. The 1950 flood included the flooding of basements, a lumberyard, and the armory. The town's water supply was cut off when two water mains were washed away.

Smith Creek flows north to south through the residential and commercial center of the Town of Clifton Forge. In Clifton Forge, residential, public, and commercial development are concentrated on both sides of Smith Creek. A number of large commercial buildings in the downtown area have been constructed directly over Smith Creek. Floods have inundated portions of this land in the past, and a substantially greater area is within reach of larger floods in the future. The 1969 Smith Creek flooding caused the evacuation of 40 families and caused over \$200,000 in damage to town owned property.

Numerous flood events have been recorded in the Upper James River Basin in the counties of Alleghany, Botetourt and Craig. The following water bodies in the basin have flooded: Dunlap Creek, Potts Creek, Cowpasture River, Johns Creek, Craig Creek, and Catawba Creek. Records show a history of major and frequent flooding. One of the worst floods to occur in Tinker Creek in Botetourt County was in 1940. Another large flood occurred in 1961 along Buffalo Creek in what is considered to be one of the worst storms of record. The unincorporated communities of Eagle Rock, Glen Wilton, and Gala located in Botetourt County along the James River have all experienced flooding. One of the worst floods for the James River occurred as a result of Tropical Storm Agnes in 1972. Glen Wilton was isolated in 1972 due to floodwaters covering the only road access to the community. The Botetourt Communities of Strom, Lithia, Cloverdale, and Coyner have also been victims of floodwaters. A 1940 event caused severe damage in the Tinker Creek basin. Buffalo Creek was impacted by a flood in 1961.

Historic floods in the community of Eagle Rock occurred in November 1985, November 1877, March 1913, June 1972, April 1978, March 1936, and August 1969. The November 1985 and April 1978 floods were the only two significant flood events to affect the Eagle Rock area since the completion of Gathright Dam. The community of Eagle Rock was severely flooded during the November 1985 storm causing substantial damage to the commercial district and to many residences. The 1985 storm was the storm of record with an exceedance frequency of 460 years. Seventeen commercial properties and about 16 residences were damaged during the November 1985 flood.

The Town of Troutville has been damaged by flooding from Buffalo Creek several times in the past. The flood in August 1961 was one of the worst floods in this basin, when "after two hours of intense downpour, Buffalo Creek overflowed its banks. Several homes and basements were flooded and travel on Highway 11 was hazardous due to excessive water. Also, there was about 2 feet of water around Rader Funeral Chapel in the major commercial area of the town".<sup>3</sup>

Like other communities, the Town of Fincastle experienced extensive flooding as a result of tropical storm Agnes in 1972. Town Branch overflowed its banks and, due largely to insufficient bridge capacity at Highway 606, flooded the area between U.S. Highway 220 and Factory Street. Neither discharges nor frequencies are currently available.

The James River in Botetourt County has experienced large floods in 1877, 1913, 1936, and 1969. The remains of hurricane Camille in 1969 caused flooding that destroyed homes, roads, railroads, and bridges along the James River.

River stages and discharges on the James River at Buchanan have been recorded since 1895 by the USGS. Since 1877, the bank at full stage of 15 feet has been exceeded at least 60 times. The greatest flood known to have occurred in Buchanan was in November 1877 and measured

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<sup>3</sup> (Roanoke Times, 1961).

34.9 feet at the USGS gage. Other large floods occurred in April 1886, March 1889, March 1902, March 1913, January 1935, March 1936, March 1963, and August 1969. Tropical Storm Agnes in 1972 was the second highest storm of record. Few flood related problems have occurred on Purgatory Creek in the Town of Buchanan because of lack of development in its watershed.

The Town of Buchanan has a primary sewage treatment plant on the James River. The plant is subject to flooding and during the November 1985 flood was out of operation for 6 months. The historic flood of record in Buchanan occurred in November 1985 (after completion of Gathright Dam). The Town of Buchanan was devastated during the November 1985 storm which produced the Flood of Record with an exceedance of 600 years. The river caused water damage and structural damage to numerous buildings. Some buildings were completely washed away. The railroad station was washed off its foundation and the historic footbridge was washed downstream. People who expected their basements to be flooded had water up to their ceilings.

The history of flooding in the Roanoke Valley has been well documented since records were kept. The flood of record was the November 1985 event. The most severe flooding on the Roanoke River is usually the result of heavy rains associated with tropical storms, while tributary stream flooding is usually the result of local thunderstorms or frontal systems. Flooding along tributaries is compounded when the streams in lower elevations back-up into feeder streams.

Major floods in the area have occurred in 1940 and 1972 with discharges of 24,400 and 28,800 cfs, respectively, as measured at the USGS gage on the Roanoke River at Niagara Dam. On Tinker Creek at Dale Avenue, the August 1940 storm produced a discharge of 9,000 cfs. The flood damage from the August 1940 event was extensive and resulted in major damage to buildings, roads, bridges, and agricultural crops. The 1972 flood on the Roanoke River, which was the result of Tropical Storm Agnes, was estimated as a 50-year flood. The Roanoke River crested at 19.6 feet as measured at Walnut Avenue. Approximately 400 homes were damaged by flooding from Hurricane Agnes in the Roanoke-Salem area. On April 22, 1992, the river once again exceeded its banks and spread floodwaters in the Valley when it crested at 18.1 for the second time during the century.

The flood of record occurred in November of 1985 when rains from Hurricane Juan caused the Roanoke River to rise and crest at a level of 23.4 feet from the bottom of the River, as measured from Walnut Avenue. A total of 11 inches of rain fell between Thursday October 31 and the following Monday. The last six inches fell during the last 24 hours of that five-day period. The result of that single weather event created floodwaters in downtown Roanoke that rose over five feet inside some businesses. Ten lives were lost and damage to property cost \$520,000,000.<sup>4</sup> This was estimated as a 130-year flood event. The 1985 spurred major work along the corridor, sparking the creation of the greenway system.

Since 2018, 58 flood events have occurred in the region. It should be noted that quantified damages are largely self-reported and may not reflect the full damages that occurred from a given flood event.

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<sup>4</sup> The Roanoke Times, November 1985.

Table 13: Flood Events per the NCEI Database, 2019-2024

| Jurisdiction  | Beginning Date | Cause of Flood         | Reported Damage | Event Description   |
|---------------|----------------|------------------------|-----------------|---|
| BOTETOURT CO. | 2/23/2019      | Heavy Rain / Snow Melt | \$ -            | The James River at Buchanan (BNNV2) reached flood stage of 17 feet on the 24th, cresting at 17.92 feet shortly thereafter. Several roads were closed including Thrasher Road and River Road due to flooding. The peak discharge of 35300 cfs at the gage was very close to a 2.33-year annual recurrence interval (0.43 annual chance of exceedance) according to USGS data. This is also close the bankfull stage.   |
| BOTETOURT CO. | 4/13/2020      | Heavy Rain             | \$ 33,000.00    | Tinker Mill Road was closed due to high water and several other roads in the Buchanan area. Poor Farm Road near Fincastle was also reported to be underwater. There was some damage to roads in the county per VDOT.  |
| CRAIG CO.     | 4/13/2020      | Heavy Rain             | \$ 12,000.00    | Route 614 was flooded by Craig Creek with over six inches of water reported across the bridge. The IFLOWS stream gage at this location was out of service at the time, but the upstream IFLOWS gage on Craig Creek near Abbott (ABBV2) crested at 11.6 feet. This was over the flood stage of 10 feet and the 2nd highest (highest is 11.9 feet in Oct. 2018 with remains from Hurricane Michael) in a fairly short period of record (back to 2010). A water rescue was also preformed in the Abbott area, where a car drove into flood waters. |
| ROANOKE CITY  | 4/13/2020      | Heavy Rain             | \$ -            | The Roanoke River at Roanoke crested at 11.74 feet (10,500 cfs) on the afternoon of the 13th, above the Minor flood stage of 10 feet. Several low water bridges were flooded along with the Roanoke Greenway.   |

| Jurisdiction | Beginning Date | Cause of Flood | Reported Damage | Event Description   |
|--------------|----------------|----------------|-----------------|---|
| ROANOKE CITY | 4/13/2020      | Heavy Rain     | \$ 25,000.00    | There were several reports of flash flooding around Roanoke City including a car that was submerged in flood waters covering the intersection of Walnut Avenue and 4th Street. The intersection was closed. Social media photos showed flooding on Franklin Road at Wonju Street. A mudslide at a car dealership caused two cars to slide into the resulting sinkhole with some damage to the vehicles. |
| ROANOKE CO.  | 4/13/2020      | Heavy Rain     | \$ -            | The Roanoke River at Glenvar (GNVV2) crested at 13.14 feet (11700 cfs) in the early afternoon of the 13th. Flood stage is 9 feet. Several roads were closed near the river including Southwest River Road. Bohon Hollow Road bridge (Route 734) about 1 mile upstream from gage was overtopped.   |
| ROANOKE CO.  | 4/13/2020      | Heavy Rain     | \$ 5,000.00     | Numerous roads were flooded and some damage reported in Roanoke County.   |
| ROANOKE CITY | 5/20/2020      | Heavy Rain     | \$ -            | Wise Avenue was closed due to overflow from Tinker Creek. This is a low-water bridge that is inundated below flood stage on the creek. The gage height on the USGS Tinker Creek above Glade Creek gage was around 7 feet at the time of this report. The stream crested at 14.77 feet on the afternoon of the 21st.   |

| Jurisdiction | Beginning Date | Cause of Flood | Reported Damage | Event Description   |
|--------------|----------------|----------------|-----------------|---|
| ROANOKE CITY | 5/20/2020      | Heavy Rain     | \$ -            | Tinker Creek was reported to be flooding portions of 13th Street from Eastgate Avenue to Mason Mill Road. The gage height on the USGS Tinker Creek Upper near Columbia gage was around 9 feet at the time of this report. The stream crested twice during the event, at 12.58 feet late on the 20th and 13.49 on the afternoon of the 21st. Per USGS data, the peak discharge of 3920 cfs was slightly below a 5-year flood event (0.20 annual chance of occurrence) on upper Tinker Creek.   |
| ROANOKE CITY | 5/20/2020      | Heavy Rain     | \$ -            | A spotter reported water several inches deep on Bennington Street from the Roanoke River around 850 PM EST on May 20th. The stage at the time of the report was around 13 feet on the Roanoke River gage at Walnut Street (RONV2). Several hours later the footbridge to the Carilion Hospital was overrun and inaccessible. Several roads around the hospital were under varying amounts of water, up to a depth of a few feet. The reading on the Roanoke River gage was around 15.7 feet at the time of this report. The river crested at 15.89 feet at 310 PM EST on the 21st. Moderate flood stage is currently 12 feet and Major flood stage is 16 feet. This was the 8th highest stage on record at this gage, with records back to 1899. According to USGS statistics it was slightly under a 10-year event (0.1 annual chance of occurrence). Social media images also showed floodwaters from the Roanoke River covering several feet of the parking lot of the Ramada Inn and water entering the hotel, although this may have been backup along Ore Branch. |

| Jurisdiction  | Beginning Date | Cause of Flood | Reported Damage | Event Description  |
|---------------|----------------|----------------|-----------------|--|
| BOTETOURT CO. | 5/21/2020      | Heavy Rain     | \$ 15,000.00    | The intersection of Craig Creek Road and Roaring Run Road was closed due to high water. The gage on Craig Creek at Parr (CRGV2) was around 13.3 feet at the time of the report. Minor flood stage is 12 feet. The stream crested at a stage of 16.20 feet (16200 cfs), the highest level since September 2004 (19.87 feet) when the remains of Hurricane Jeanne plowed through the area. It was the 7th highest on record at the gage since 1925 and was slightly below a 10-year flood event (0.1 annual chance of occurrence). Moderate flood stage is 15 feet and several roads were flooded. |
| BOTETOURT CO. | 5/21/2020      | Heavy Rain     | \$ 10,000.00    | Tinker Mill Road was flooded and Tinker Creek reported out of its banks.   |
| BOTETOURT CO. | 5/21/2020      | Heavy Rain     | \$ 13,000.00    | Catawba Creek Road was reported to be flooded with water of unknown depth. The USGS gage on Catawba Creek near Catawba (CTWV2) crested at 7.87 feet (3660 cfs) early on the 21st. This was the 8th highest stage on record at this gage with data back to 1954. Only Hurricane Michael in October 2018 has had a higher stage (7.98 feet) in the past 15 years, dating back to September 2004. According to USGS data this was close to a 5-year recurrence interval flood (0.2 annual chance of occurrence).  |
| SALEM CITY    | 5/20/2020      | Heavy Rain     | \$ -            | The Mill Lane low water bridge in Salem was entirely underwater and portions of W. Riverside Drive was flooded and closed along with several other roads in Salem. The nearby Salem Pump Station IFLOWS gage (SPSV2) crested at around 9.1 feet. Minor flood stage is 7 feet.  |

| Jurisdiction  | Beginning Date | Cause of Flood | Reported Damage | Event Description  |
|---------------|----------------|----------------|-----------------|--|
| ROANOKE CO.   | 5/20/2020      | Heavy Rain     | \$ -            | The Roanoke River at Glenvar (GNVV2) crested at 14.14 feet (13400 cfs) in the early afternoon of the 21st. Flood stage is 9 feet. It was the 9th highest stage on record but data only extends back to 1992 at this gage. Several roads were closed near the river including Southwest River Road. Bohon Hollow Road bridge (Route 734) about 1 mile upstream from gage was overtopped. According to USGS statistics it was near a 5-year flood event (0.2 annual chance of occurrence). |
| CRAIG CO.     | 5/20/2020      | Heavy Rain     | \$ 50,000.00    | The Craig Creek at Abbott (ABBV2) IFLOWS gage crested at 10.6 feet around midday on May 21st. This was the 3rd highest crest in the fairly short (since around 2010) and erratic history at this gage site. Some roads were flooded and partially damaged Craig County according to VDOT information.  |
| ROANOKE CITY  | 5/21/2020      | Heavy Rain     | \$ 5,000.00     | Media reports showed water overtopping a portion of Spring Valley Dam in Roanoke leading to the evacuation of 13 homes due to the potential risk of a dam failure.   |
| ROANOKE CO.   | 6/17/2020      | Heavy Rain     | \$ -            | Walnut Avenue near Glade Creek was closed due to water flowing over it. Flooding also occurred along Tinker Creek where the USGS gage near the confluence of Glade Creek crested at 16.96 feet in the afternoon of the 17th. No flood stage has been set at this relatively new gaging station, but Tinker Creek overflows the low-water bridge on Wise Avenue at a stage of around 7 feet.  |
| BOTETOURT CO. | 6/17/2020      | Heavy Rain     | \$ -            | A social media post showed the road completely flooded in front of the Cloverdale Post Office.   |

| Jurisdiction   | Beginning Date | Cause of Flood | Reported Damage | Event Description   |
|----------------|----------------|----------------|-----------------|---|
| BOTETOURT CO.  | 6/17/2020      | Heavy Rain     | \$ -            | Flood waters were reported to have reached some mobile homes in the Wildwood Mobile Home Park. Some evacuations were conducted in the area.   |
| ROANOKE CO.    | 6/17/2020      | Heavy Rain     | \$ -            | Bonsack Road and Glade Creek Road were closed due to flooding, most likely from nearby Glade Creek.   |
| ROANOKE CO.    | 6/17/2020      | Heavy Rain     | \$ -            | A portion of 13th Street in Roanoke was closed due to urban flooding with water flowing over the road.  |
| COVINGTON CITY | 6/17/2020      | Heavy Rain     | \$ -            | Numerous roads were flooded and closed in Covington including South Craig Avenue, South Royal Avenue and and South Highland Avenue.   |
| ALLEGHANY CO.  | 6/17/2020      | Heavy Rain     | \$ -            | Up to a foot of water was observed flowing over Valley Ridge Road at the corner of Woodland Road and Magnolia Street.   |
| ALLEGHANY CO.  | 6/19/2020      | Heavy Rain     | \$ -            | Water over six inches in depth was seen flowing over portions of Highway 159 after 1.5 inches of rain fell in a short duration. The water was not from Dunlap Creek itself which had returned to below flood stage from the previous day. |
| ALLEGHANY CO.  | 6/17/2020      | Heavy Rain     | \$ -            | The USGS gage on Dunlap Creek (DLPV2) rose briefly above minor flood stage of 9 feet early on the 18th, cresting at 9.16 feet. Several roads very close to the creek may have been flooded.   |

| Jurisdiction  | Beginning Date | Cause of Flood | Reported Damage | Event Description  |
|---------------|----------------|----------------|-----------------|--|
| CRAIG CO.     | 6/17/2020      | Heavy Rain     | \$ -            | The USGS gage on Johns Creek at New Castle (JCRV2) crested at 11.03 feet on the afternoon of June 17th after heavy rains the previous two days. This was the highest stage reached at this site since September 28, 2004 when it reached 12.87 feet and the 6th highest since records began in 1927. The 3-day rainfall at the nearby NWS COOP site at New Castle was 4.12 inches. |
| BOTETOURT CO. | 6/17/2020      | Heavy Rain     | \$ -            | The gage on Craig Creek at Parr (CRGV2) crested at a stage of 14.24 feet (12500 cfs) very early on June 18th. It was the 8th highest on record at this gaging station since 1925 and was approximately a 5-year flood event (0.2 annual chance of occurrence) according to USGS studies. A road or two was likely affected.  |
| ROANOKE CITY  | 6/17/2020      | Heavy Rain     | \$ -            | The Roanoke River at Roanoke (RONV2) crested at 11.91 feet, above the Minor flood stage of 10 feet early in the morning of June 18th. Several roads and low water bridges were flooded.  |
| SALEM CITY    | 6/17/2020      | Heavy Rain     | \$ -            | The IFLOWS stream gage at Salem Pump Station (SPSV2) crested above Minor flood stage of 7 feet early on the 18th, cresting at 7.60 feet and closing several roads in Salem, including the Mill Lane Bridge.  |
| ROANOKE CITY  | 11/12/2020     | Heavy Rain     | \$ -            | The Roanoke River at Roanoke, VA (RONV2) was above flood stage (10 feet) on November 12th, and crested at the moderate flood stage of 14.07 feet (14,000 cfs) at 12:35 PM EST on November 12th, the 13th highest crest on record for this gauge. This was between a 5- and 10-year Average Return Interval per the USGS StreamStats website.                                       |

| Jurisdiction  | Beginning Date | Cause of Flood | Reported Damage | Event Description  |
|---------------|----------------|----------------|-----------------|--|
| ROANOKE CITY  | 5/4/2021       | Heavy Rain     | \$ -            | About 1.5 inches of rain from a thunderstorm fell during a 45 minute period. Runoff from the rainfall caused water to pond 12-18 inches deep at the intersection of Campbell Avenue and 10th Street SW, an intersection known to flood during heavy rainfall. The intersection closed by police, but was reopened after the water receded.   |
| ROANOKE CITY  | 5/4/2021       | Heavy Rain     | \$ 2,500.00     | Rain amounts between 1.5 and 1.75 inches fell from a thunderstorm within a 45 minute period across portions of the downtown area in the City of Roanoke. Runoff from this rainfall resulted in about three feet of standing water near the intersection of Salem Avenue and 1 1/2 Street. At least one car became stranded in the flood waters, though it is unknown if the occupant(s) required rescue. The road was reopened to traffic after the flood waters receded.                    |
| ROANOKE CITY  | 8/19/2021      | Heavy Rain     | \$ 25,000.00    | Portions of Salem Avenue and Campbell Avenue were flooded with up to 4 feet of standing water as heavy rain overwhelmed the storm sewer system. Five water rescues were performed as cars drove into the flood waters, causing the vehicles to stall. No injuries were reported. Broadcast media reported that multiple cars parked along Salem Avenue experienced water intrusion into the vehicle passenger compartments and exhaust systems, with some of the vehicle needed to be towed. |
| BOTETOURT CO. | 9/22/2021      | Heavy Rain     | \$ 20,000.00    | Runoff from heavy rain caused Renick Run to flood out of its banks and flow across Indian Rock Road. The bridge crossing Renick Run was damaged and impassible by the flooding, and required repair before being eventually reopened.  |
| BOTETOURT CO. | 9/22/2021      | Heavy Rain     | \$ -            | Runoff from heavy rain caused Purgatory Creek to flood out of its banks around one foot deep across both Greyledge and Frontage Roads. The roads reopened after flooding subsided. No damage was reported.   |

| Jurisdiction  | Beginning Date | Cause of Flood | Reported Damage | Event Description  |
|---------------|----------------|----------------|-----------------|--|
| BOTETOURT CO. | 9/22/2021      | Heavy Rain     | \$ 15,000.00    | Runoff from heavy rain caused Jennings Creek to flood out of its banks and across Jennings Creek Road, both of which are located in the bottom of a valley with steep sides. Occupants from a vehicle caught in the flooding were able to abandon the vehicle to safety, however the vehicle was reportedly washed down the creek. |
| BOTETOURT CO. | 9/22/2021      | Heavy Rain     | \$ -            | Runoff from heavy rain caused Laurel Run to flood out of its banks across Pico Road, causing the road to be impassible until the flooding receded. The road was reopened afterward.  |
| BOTETOURT CO. | 9/22/2021      | Heavy Rain     | \$ -            | Heavy rain caused ponding of water of up to a foot deep along portions of Main Street in the community of Buchanan, making the road impassible. Main Street was passable again once the flooding receded. No damage was reported.  |
| BOTETOURT CO. | 9/22/2021      | Heavy Rain     | \$ -            | Runoff from heavy rain caused Dry Run to flow out of its banks, flooding the railway tunnel on 19th Street and across Highway 11 a few hundred feet further downstream. No damage was reported and the roads were passable again after the flooding receded.   |
| BOTETOURT CO. | 9/22/2021      | Heavy Rain     | \$ -            | Runoff from heavy rain caused a tributary of Ellis Run to flow out of its banks, flooding across portions of Mountain Valley Road. No damage was reported and the road was passable again after the flooding receded.  |

| Jurisdiction  | Beginning Date | Cause of Flood         | Reported Damage | Event Description  |
|---------------|----------------|------------------------|-----------------|--|
| ROANOKE CO.   | 8/25/2022      | Heavy Rain             | \$ -            | The stream gauge at Tinker Creek Upper Above Columbia Street (TKRV2) recorded Tinker Creek rising more than 8 feet within 2 hours to crest at 10.67 feet, before stream levels quickly receded. This was caused by 2 to more than 4 inches of rainfall from a thunderstorm near the Botetourt County border.   |
| ROANOKE CO.   | 8/25/2022      | Heavy Rain             | \$ -            | The stream gauge at Tinker Creek Above Glade Creek recorded Tinker Creek cresting at 7.95 feet. This was caused by 2 to more than 4 inches of rainfall from a thunderstorm near the Botetourt County border.   |
| BOTETOURT CO. | 8/25/2022      | Heavy Rain             | \$ 15,000.00    | Runoff from heavy rainfall overwhelmed an underground storm water pipe, which created a sinkhole in a portion of Highland drive near Sanderson drive.  |
| ALLEGHANY CO. | 2/17/2023      | Heavy Rain / Burn Area | \$ -            | The Cowpasture River near Clifton Forge, VA crested at 10.40 feet (Flood stage is 10 feet). This was a little over a 2-year event (50% AEP) per USGS Streamstats. The flooding was caused by between 1.5 and 2.75 inches of rain over a 24-25 hour period. No snow melt or frozen ground was involved, but the ground was moist from widespread rainfall on the 12th and 13th a few days prior. Minor lowland flooding was the only impact observed.   |
| ROANOKE CITY  | 7/23/2023      | Heavy Rain             | \$ -            | The intersection of Jamison Avenue and 9th Street is flooded and impassible by several inches of flowing water caused by 3 to 4 inches of rainfall, with rates as high as 6 inches per hour. No damage was reported at the intersection, and the road was reopened to traffic after the flooding receded. MRMS FLASH CREST Unit Streamflow was estimated to be between 600 and 800 cfs per mile <sup>2</sup> , while FLASH 1-hour ARIs indicated that rainfall amounts were as high as a 100-year event in spots around the City of Roanoke during this event. |

| Jurisdiction | Beginning Date | Cause of Flood | Reported Damage | Event Description  |
|--------------|----------------|----------------|-----------------|--|
| ROANOKE CITY | 7/23/2023      | Heavy Rain     | \$ -            | Shafer's Crossing between 24th Street and Boulevard Street is flooded and impassible due to 2 to 3 inches of rainfall within a 90-minute period, with rainfall rates ranging from 4 to 5 inches per hour per MRMS estimates. CREST Unit Streamflow was estimated to be between 400 and 600 cfs per mile^2 for this event. No damage was reported to the road, and it was reopened to traffic after the flooding receded. |
| ROANOKE CITY | 7/23/2023      | Heavy Rain     | \$ -            | Glade Creek was observed out of its banks and flowing across Walnut Avenue at least 6 inches deep due to between 3 and locally 5 inches of rainfall within a 2-hour period falling in the basin. Rainfall rates were observed to be as high as 5 inches per hour at times. No damage was reported to the road, and it was reopened to traffic after the flooding receded.  |
| ROANOKE CITY | 6/17/2024      | Heavy Rain     | \$ -            | Poor drainage due to around 1.5 inches of rainfall within an hour caused standing water near within the 4800 block of Valley View Boulevard, making the road impassible for a brief period of time. The road was reopened after the flooding receded, with no damage reported.   |
| ROANOKE CITY | 6/17/2024      | Heavy Rain     | \$ -            | Standing water due to between 1.25 and 1.5 inches of rainfall within an hour was reported at the intersection of Peters Creek Road NW and Melrose Avenue, making the intersection impassible for a brief period of time. Rainfall rates briefly reached up to 3 inches per hour in the area. The intersection was reopened after the flooding receded, with no damage reported.  |

| Jurisdiction | Beginning Date | Cause of Flood               | Reported Damage | Event Description   |
|--------------|----------------|------------------------------|-----------------|---|
| ROANOKE CITY | 6/17/2024      | Heavy Rain                   | \$ -            | Poor drainage due to around 1.5 inches of rainfall within an hour caused standing water near the 900 block of Van Buren Street NW, making the street impassible for a brief period of time. Rainfall rates briefly were estimated to be around 3 inches per hour. |
| ROANOKE CITY | 8/8/2024       | Heavy Rain / Tropical System | \$ -            | Runoff from heavy rain caused the railroad underpass along Wiley Drive to become flooded with about two feet of standing water and impassible until the water drained away. No damage was reported.   |
| ROANOKE CITY | 8/8/2024       | Heavy Rain / Tropical System | \$ -            | A poor drainage issue during heavy rain caused Campbell Avenue to become flooded by several inches of standing water. The road was open to traffic after the drain blockage was cleared.  |
| ROANOKE CITY | 8/8/2024       | Heavy Rain / Tropical System | \$ -            | The low water crossing on Wise Street at Tinker Creek became partially submerged as Tinker Creek rose to a crest of 5.85 feet, which is well within its banks. No damage to the road was reported as it is designed to begin becoming flooded at this stage.      |
| ROANOKE CITY | 8/8/2024       | Heavy Rain / Tropical System | \$ -            | Portions of Boulevard Street and 24th Street were flooded between three and four feet deep in spots by runoff from heavy rain. No damage was reported to the roads, which were reopened to traffic after the flooding receded.                                    |
| ROANOKE CITY | 8/8/2024       | Heavy Rain / Tropical System | \$ -            | Runoff from heavy rainfall was observed pooling several inches deep across the intersection of Walnut Avenue and 8th Street. No damage to the roadways was reported.  |

| Jurisdiction | Beginning Date | Cause of Flood | Reported Damage | Event Description  |
|--------------|----------------|----------------|-----------------|--|
| ROANOKE CITY | 9/19/2024      | Heavy Rain     | \$ 15,000.00    | The Roanoke City Emergency Manager reported that flooding was observed at the intersection of 10th Street and Campbell Street Southwest near downtown Roanoke, an area that frequently floods during periods of heavy rain. Multiple vehicles were stranded in standing water that rose to nearly 3 feet deep as a result of poor drainage. Six individuals had to be assisted from their vehicles in the flood waters by emergency personnel. The damage estimate is the estimated damage to the vehicles due to water intrusion. |
| SALEM CITY   | 9/25/2024      | Heavy Rain     | \$ -            | Heavy rainfall, combined with poor drainage, caused standing water around 2.5 feet deep to pool along Kessler Mill Road. No damage was reported to the road, which was open to traffic after the water receded.  |

Additional flood damage has been recorded from Hurricane Helene which was not included in the NCEI data. As this was a major federal disaster, impacts from this event will be quantified further in section 3.5: Hurricane and Tropical Storm. However, it is worth noting that flooding is so frequent in the region that the NCEI data may not be comprehensive in terms of the impacts of this disaster.

## **CRS Communities: Special Considerations**

Three communities within the region currently have a Community Flood Rating System (CRS) designation. Roanoke County entered the CRS program in October 1991 and has a rating of 8 (10% discount). The Town of Vinton entered the CRS program in October 1, 2016 and has a class 8 rating. The City of Roanoke entered the CRS program in 1996 and maintains a class 6 rating (20% discount on flood insurance premiums for parcel owners within City limits).

Several additional localities have listed this as a desired goal in their project listings, though capacity remains an inhibiting factor. Accordingly, this section specifically speaks to additive requirements for CRS planning in the region's jurisdictions.

### Review of Existing Studies and Plans

The following existing studies and plans speak specifically to flooding. They are summarized and recommendations are noted where appropriate. A general overview of existing plans and studies consulted to develop project recommendations and guide planning implementation work is contained in **Chapter 5: Capabilities Assessment**. For the purposes of this section, only local government entities are listed.

#### *Alleghany County*

Flood Insurance Study, Alleghany County, Virginia and Incorporated Areas (2010): This study also includes the incorporated areas of the City of Covington, and Towns of Clifton Forge and Iron Gate.

Emergency Operations Plan (2021): This document details emergency operations procedures, including operations in a flood event.

#### *City of Covington*

City of Covington Drainage Study (2025): This document, funded through the Community Flood Preparedness Fund, includes a condition assessment of the storm sewer system and a hydraulic and hydrologic model which will feed into a forthcoming Resilience Plan.

#### *Botetourt County*

Flood Insurance Study, Botetourt County, Virginia and Incorporated Areas (2010): This study also includes the incorporated areas of Botetourt County which include Buchanan, Fincastle, and Troutville.

Botetourt County Emergency Operations Plan (2017): This document details emergency operations procedures, including operations in a flood event.

#### *Craig County*

Flood Insurance Study, Craig County, Virginia and Incorporated Areas (2009): This study also includes the incorporated area of the Town of New Castle.

### *Roanoke County*

Flood Insurance Study, Roanoke County, Virginia and Incorporated Areas (DATE): This study also includes the incorporated areas of the Town of Vinton, City of Roanoke, City of Salem.

### *City of Roanoke*

City of Roanoke Flood Resilience Plan (2023): This plan deals specifically with flooding and flooding impacts within the City. Several of these recommendations will be incorporated into **Chapter 6** and **Chapter 7**.

NFIP Community Rating System Repetitive Loss Area Analysis (2021): This is an update of the repetitive loss analysis for the City.

Emergency Operations Basic Plan (2020): This plan details emergency operations procedures within the City.

Peters Creek Watershed Master Plan (2019): This plan is part of a series of master plans conducted across the City each watershed. While the primary emphasis is on water quality, there are flooding applications.

Trout Run Watershed Master Plan (2017): This master plan focuses on watershed management of the Lick Run watershed through three implementation goals, which parallel those for the Trout Run Watershed Master Plan.

Lick Run Watershed Master Plan (2017): This master plan focuses on watershed management of the Lick Run watershed through three implementation goals, which parallel those for the Trout Run Watershed Master Plan.

Tinker Creek and Tributaries Watershed Master Plan (2016): This master plan focuses on watershed management of the Lick Run watershed through three implementation goals, which parallel those for the Trout Run Watershed Master Plan.

Flooding Incident Annex (2007): This Annex to the Emergency Operations Basic Plan details specific actions to take in flood situations.

Dam Safety Support Annex (2007): This Annex to the Emergency Operations Basic Plan details specific actions to take in situations where key impoundment infrastructures become a safety risk.

### *City of Salem*

Resilience Plan (2023): This plan was prepared through funding from the Virginia Flood Preparedness Fund and deals directly with flooding impacts in the City of Salem. Several of these recommendations will be incorporated into **Chapter 6** and **Chapter 7**.

This section of the plan and other relevant sections were reviewed and discussed with the Floodplain Program Planner at DCR.

## **High Hazard Potential Dam Inventory and Planning**

Flooding due to dam failure is considered as part of overall flood mitigation assessment and planning within this document. Within the region there are twenty-five known high hazard potential dams per DCR.

Figure 17 shows the Hazard Potential Classification for dams produced by FEMA. It is important to note that even impoundment failure that impacts a lifeline (such as a water treatment plant or key infrastructure element) does not per se result in a high hazard potential dam classification. HHPD classification is focused on the probable loss of life in an impoundment failure.

DCR's Division of Dam Safety and Floodplain Management administers the Virginia Dam Safety Program, under the authority of the Virginia Soil and Water Conservation Board. Virginia's Dam Safety Regulations<sup>5</sup> were last updated in 2016. The owner of each regulated high, significant, or low hazard potential dam is required to apply to the board for an Operation and Maintenance Certificate. The application must include an assessment of the dam by a licensed professional, an Emergency Action Plan and the appropriate fee(s), submitted separately. An executed copy of the Emergency Action Plan or Emergency Preparedness Plan must be filed with the appropriate local emergency official and the Virginia Department of Emergency Management.

| Hazard Potential Classification | Loss of Human Life             | Economic, Environmental, Lifeline Losses        |
|---------------------------------|--------------------------------|---|
| Low                             | None expected                  | Low and generally limited to owner              |
| Significant                     | None expected                  | Yes   |
| High                            | Probable. One or more expected | Yes (but not necessary for this classification) |

**Figure 18: Dam Classifications, FEMA<sup>6</sup>**

The City of Roanoke maintains a Dam Safety Support Annex to their Emergency Operations Plan. The Western Virginia Water Authority also maintains required Emergency Action Plans specific to operation of the dams owned by the Authority, one of which is Spring Hollow Lake Dam listed in Table 2. Inundation maps for Spring Hollow Lake Dam are included in [Appendix H](#).

The VSWCB issues Regular Operation and Maintenance Certificates to a dam owner for a period of six years. If a dam has a deficiency but does not pose imminent danger, the board may issue a Conditional Operation and Maintenance Certificate, during which time the dam owner is to correct the deficiency. After a dam is certified by the board, annual inspections are required either by a professional engineer or the dam owner, and the Annual Inspection Report is submitted to the regional dam safety engineer.

There are no comprehensive databases of historical dam failures or flooding following a dam failure in Virginia. Dam failure can be caused by a variety of scenarios. Thirty-four percent of all dam failures are caused by overtopping, when water spills over the top of a dam. The majority of dam failure incidents are driven by flooding due to excessive precipitation. Proper maintenance of a dam structure is key to mitigating the impacts of flooding. DCR administers the Virginia Dam

<sup>5</sup> (Commonwealth of Virginia, 2016)

<sup>6</sup> (Federal Emergency Management Agency, 2004)

Safety, Flood Prevention, and Protection Assistance Fund. Other funding sources also exist for dam failure mitigation.

The Association of State Dam Safety Officials maintains a voluntary database of dam safety incidents, the ASDSO Dam Incident Database. Only one safety incident is recorded in this database in the region, which references overtopping of Spring Valley Lake dam. However, consultation with DCR clarifies the incident. Spring Valley Lake saw their emergency spillway activated, and a Stage 3 emergency was declared in accordance with their Emergency Action Plan in May 2020. There was no overtopping, and the dam was not in immediate danger of failure.

In the 2019 Plan, several Dam Safety Incidents and remediation efforts were documented. These have been updated with more accurate information from DCR.

**Rainbow Forest Lake Dam:** In May 2011, DCR order the Rainbow Forest Recreation Association (RFRA) in Botetourt County to reduce the pool level of Rainbow Forest Lake in order to provide extra storage capacity behind the dam until the spillway could be improved. The RFRA has been working with the state to address concerns about the structure since 1997.

**Gathright Dam:** In May 2009, the U.S. Army Corps of Engineers (USACE) inspected the Gathright Dam as part of Screening Portfolio Risk Analysis and routine inspections. Later in the year on September 2, the USACE assigned the dam a Safety Action Classification (DSAC) II which is defined as "Urgent (Unsafe or Potentially Unsafe)". The rating is attributed to concerns about possible increased seepage at the toe of the dam, and an undetermined flow rate at the river spring a quarter mile downstream, and potential flow channels through limestone below the spillway during pool events above 1,600 feet. Because of this rating, the USACE has implemented risk reduction measures which include increased monitoring, updating emergency operation plans and reducing the water level in the reservoir. As of early 2010, the USACE has reduced and continues to maintain the reservoir at an elevation of 1,562 ft above sea level compared to the normal level of 1,582 feet. Throughout 2010, the USACE conducted safety exercises with local/state officials, conduct a series of investigations on the dam, update inundation mapping and reevaluate the DSAC status. In November 2010, Lake Moomaw was restored to a level of 1,582 ft. and the DSAC will be reevaluated in the future.

**Clifton Forge Dam:** Clifton Forge Dam impounds a 12.5 square mile drainage area of Smith Creek with an 11.5-acre normal pool. The dam is classified as a High Hazard Dam by DCR and operates under a conditional 2-year, renewable, Operation and Maintenance Certificate. It has been issued an alteration permit by DCR that will be used during upgrades in 2018-19. A Dam Breach Inundation Zone Analysis was done in 2013 that showed a failure would impact 650 residential units, 1,400 people and downtown commercial, retail, public administration and infrastructure. An Emergency Action Plan was completed in 2014 and a preliminary engineering report for proposed improvements was done in 2016. Major improvements proposed include raising crest of non-overflow sections; raise concrete core wall and surrounding earthfill; seal a leaking concrete joint; remove spillway piers to expand spillway capacity; anchor the principal spillway; replace spillway bridge; and repair the deteriorated concrete face. The estimated cost for this work was approximately \$4.3 million. The town worked with its consulting engineers to develop

a funding package from USDA Rural Development in cooperation with Alleghany County. The proposed schedule anticipates construction to be complete by December 2019.

Johns Creek Watershed Dam #1 (McDaniel's Lake): Craig County Board of Supervisors and Mountain Castles Soil and Water Conservation District own and operate the Johns Creek watershed Dam #1. Four floodwater-retarding structures were built in the Johns Creek Watershed between 1966 and 1967.

The dam has a drainage area of 12,241 acres and a normal pool surface area of 28 acres. It was designed to store runoff of 50-year storm. The dam was originally designed as "Significant" hazard and later reclassified to "High" hazard due to downstream development that was allowed to occur. The dam operates under a conditional Operation and Maintenance Certificate from DCR that expired in September 2018.

A breach inundation study for the dam was done in 2009 which concluded the dam is a High Hazard Potential dam. The study found 68 occupied structures and 16 bridges within the inundation zone below the dam. An additional study by URS Group completed in 2010 found the population at risk to be 150 people.

Mountain Castles SWCD has been working jointly with Virginia's DCR and federal partners to facilitate a design to rehabilitate Johns Creek Dam #1 to increase spillway capacity for future flooding. So far, the rehabilitation team has accomplished a wetland delineation survey, riser condition survey, and a geotechnical investigation survey. A complete design is expected by spring of 2026 that involves extending the embankment through the existing auxiliary spillway, installing a new roller-compacted spillway, and installing a new concrete riser to meet the new requirements.

Niagara Dam: Niagara Dam is one of two federally regulated dams in the region. The dam was recently relicensed by the FERC in 2025. On November 4, 1985, high flows recorded at 52,300 cfs resulted in the breach of the right abutment to the dam. Repairs to the right abutment resulted in the Niagara Hydroelectric Project being taken out of service from November 4, 1985 through March 17, 1986. The average flow of the river at this location is 573 cfs. The same event affected Smith Mountain Lake dam downstream, a key infrastructure asset for the region and also federally regulated. The reservoir elevation increased from its normal operating limit of 795 NGVD to 799.5 NGVD. That elevation is 0.5 ft. below the emergency level of 800.0 NGVD allowed under the license for this structure.

Three additional dams of interest may be high hazard dams but have not yet been classified as such. These dams are listed in DSIS as High-Preliminary, which means that there has been a preliminary study that raised concerns, but an inundation study has not been submitted by the dam owner to properly establish the hazard classification yet.

- Orchard Lake Dam – 023002
- Wilburn Dam – 023010
- Stokes Dam – 023013

This section of the plan was reviewed by the Regional Dam Safety Engineer at DCR.

**Table 14: High Hazard Dams**

| Federal ID | Dam Name                   | Alternate Dam Name        | Dam Type | Owner Name   | Location            |
|------------|----------------------------|---------------------------|----------|--|---------------------|
| VA00500 3  | Clifton Forge Dam          |                           | Gravity  | Town of Clifton Forge                                      | Alleghany           |
| VA00500 4  | Landfill No. 2 Dam         | Westvaco #2 Flyash Lagoon | Earth    | Westvaco/WestRock  | Alleghany           |
| VA00500 9  | West Virginia Pulp Dam B   |                           | Earth    | Westvaco/West Rock   | Alleghany           |
| VA00500 1  | Gathright Dam              | Lake Moomaw               | Rockfill | USACE - Norfolk District                                   | Alleghany           |
| VA00501 3  | Westrock #1 Embankment Dam |                           | Earth    | Westvaco/WestRock  | Alleghany/Covington |
| VA02300 4  | Blue Ridge Estates Dam     | Emerald Lake              | Earth    | Lake Forest Homeowners Association                         | Botetourt           |
| VA02300 5  | Botetourt Country Club Dam |                           | Earth    | Botetourt Country Club                                     | Botetourt           |
| VA02301 0  | Wilburn Dam                |                           | Earth    | Vaughn E. & Anne P. Wilburn; Vaughn E. and Anne P. Wilburn | Botetourt           |
| VA02301 3  | Stokes Dam                 |                           | Earth    | Sandra J Stokes  | Botetourt           |
| VA02300 2  | Orchard Lake Dam           |                           | Earth    | Dearl & Julie Fraze  | Botetourt           |
| VA02300 3  | Rainbow Forest Dam         |                           | Earth    | Rainbow Forest Recreational Assoc Inc                      | Botetourt           |
| VA02300 1  | Carvin Cove Dam            |                           | Masonry  | Western Virginia Water Authority                           | Botetourt/Roanoke   |

| Federal ID | Dam Name                       | Alternate Dam Name            | Dam Type | Owner Name  | Location       |
|------------|--------------------------------|-------------------------------|----------|---|----------------|
| VA04500 1  | Johns Creek Dam #2             |                               | Earth    | Mountain Castles Soil and Water Conservation District | Craig          |
| VA04500 2  | Johns Creek Dam #1             | McDaniel's Lake               | Earth    | Mountain Castles Soil and Water Conservation District | Craig          |
| VA04500 3  | Johns Creek Dam #3             |                               | Earth    | Mountain Castles Soil and Water Conservation District | Craig          |
| VA04500 4  | Johns Creek Dam #4             | Dicks Creek Lake              | Earth    | Mountain Castles Soil and Water Conservation District | Craig          |
| VA01901 0  | Falling Creek Reservoir Dam    |                               | Earth    | Western Virginia Water Authority                      | Roanoke County |
| VA16100 1  | Niagara                        |                               | Gravity  | Appalachian Power Company                             | Roanoke County |
| VA16100 2  | Loch Haven Lake Dam            |                               | Gravity  | Bane International Company LLC                        | Roanoke County |
| VA16100 4  | Clifford D. Craig Memorial Dam | Spring Hollow Reservoir Dam   | Concrete | Western Virginia Water Authority                      | Roanoke County |
| VA16100 5  | Woods End Dam                  | Hidden Valley High School Dam | Earth    | Roanoke County  | Roanoke County |
| VA16100 8  | Darr Dam                       | Hudick Dam                    | Earth    | Richard C. & Norma Lee Darr                           | Roanoke County |

| Federal ID | Dam Name               | Alternate Dam Name | Dam Type | Owner Name                                      | Location                     |
|------------|------------------------|--------------------|----------|---|------------------------------|
| VA161013   | Roanoke College Dam    |                    | Earth    | Roanoke College Trustees C/O Roanoke College    | Roanoke County/City of Salem |
| VA770002   | Spring Valley Lake Dam |                    | Earth    | Spring Valley Lake LLC; Spring Valley Lake, LLC | City of Roanoke              |
| VA770001   | Windsor Lake Dam       |                    | Earth    | Windsor Lake Corporation                        | City of Roanoke              |
|            |                        |                    |          |   |                              |

## 3.5 Hurricane and Tropical Storm

### Definition of Hazard

Hurricanes, tropical storms, and tropical depressions occasionally strike the region, causing multiple impacts, most often flooding and wind damage. While damages from these events are referred to in other sections of this document, this section looks at past storm events more holistically.

The National Weather Service offers the following definitions of these storm events:

- *Tropical Depression*: Tropical cyclone with maximum sustained surface winds of 38 mph;
- *Tropical Storm*: Maximum sustained surface winds of 39-74 mph;
- *Hurricane*: Maximum sustained surface winds of 74+ mph.

While this hazard is discussed individually in this chapter, it is important to note that the primary impacts of hurricane and tropical storm in the region are due to wind damage and riverine flooding caused by excess precipitation. In Chapter 4, this hazard is assessed as part of section **4.4 Flooding** and section **4.8 Wind Event**.

### Historic Event Descriptions

Virginia has been struck by 48 hurricanes from 1900 to 2018 according to records from the National Hurricane Center. The Roanoke Valley – Alleghany region has not experienced a direct hurricane in over 100 years. The region is impacted by the remnants of the hurricanes as tropical depressions and subtropical storms bringing heavy rains and winds. The following major events have occurred in the region.

*August 20, 1969, Hurricane Camille*: Camille made landfall as a Category 5 hurricane smashing the Mississippi Coast with 200 mph winds on August 17. Camille was the strongest hurricane to make landfall on the U.S. this century. The hurricane maintained force for 10 hours as it moved 150 miles inland. The storm tracked northward weakening and becoming less defined. It moved toward Virginia on the 19th and was only a tropical depression. Moisture from the warm Gulf Stream waters moved northwest toward the storm and new feeder bands formed. These thunderstorms "trained" (one followed the other), into the Blue Ridge south of Charlottesville. In just 12 hours, up to 31 inches of rain fell with devastating results (153 killed, most in Nelson County). Major flooding followed as the bulge of water moved down the James River into Richmond. Waynesboro on the South River saw eight feet of water in its downtown and Buena Vista had five and one-half feet in its business section. Damage was estimated at 113 million dollars (1969 dollars). The remains of this storm caused flooding that destroyed homes, roads, railroads, and bridges along the James River in Botetourt County.

*June 21, 1972, Hurricane Agnes*. Agnes originated in the Gulf of Mexico and was downgraded to a tropical storm by the time it reached Virginia, yet still caused 13 deaths in the Commonwealth. The storm impacted the entire region. Tropical Storm Agnes was a severe event and resulted in as much as one-third of the City of Covington under water where one church, three public buildings, two industrial plants, 8 commercial buildings, and 490 private residences were damaged. During the event, Glen Wilton was isolated due to floodwaters covering the only road access to the community. The storm impacted communities along the James and Roanoke Rivers. Tropical Storm Agnes was the second highest storm of record along the James River in

Buchanan. The storm caused a 50-year flood. The Roanoke Valley was hit with the effects of Agnes, causing the Roanoke River to crest at 19.6 feet and approximately 400 homes were damaged by flooding in the Roanoke-Salem area.

*Sept. 28, 2004, Hurricane Jeanne.* The remnants of Hurricane Jeanne, in the form of a tropical depression, moved through the vicinities of Greenville, SC, Roanoke, VA and Washington, DC and finally to the New Jersey coast on Tuesday, Sept. 28. Maximum sustained wind speeds ranged from 25 mph to 30 mph near the storm's center. The primary impact on the Commonwealth was flooding, although one F1 tornado touched down in Pittsylvania County. The heaviest rainfall occurred from the New River Valley to the Southern Shenandoah Valley. Rainfall in this region ranged from 3 inches to 7 inches, with the highest amounts falling in Patrick, eastern Floyd, eastern Montgomery, Giles, Roanoke, Botetourt and Rockbridge counties.

*September 14-16, 2018, Hurricane Florence.* Hurricane Florence made landfall along the North Carolina coast on September 14, and after slowly tracking westward through South Carolina, the remnants of Florence did not reach western Virginia until September 16, accelerating again by that time. The track of the remnant circulation through the southern Appalachians resulted in heavy rain and flooding, and at least one landslide, over a large part of the NWS Blacksburg forecast area, with especially heavy rain along portions of the Blue Ridge due to enhanced upslope easterly flow. In addition to the heavy rain and flooding, gusty winds (although below tropical storm force) combined with saturated ground to cause numerous uprooted trees and some scattered power outages. Rainfall amounts across the area varied from less than 1 inch in Eagle Rock, 2.6 inches at the Roanoke Regional Airport to 5.6 inches on Bent Mountain. Winds were from 38 mph at the Roanoke Regional Airport to 13 mph at Springwood in Botetourt County. The Roanoke River crested at 11.14 feet (0.5 feet above flood stage) and the James River in Buchanan crested at 14.7 feet (2.3 feet below flood stage).

*October 10-11, 2018, Hurricane Michael.* Hurricane Michael made landfall along the Florida panhandle as Category 4 hurricane on October 10, 2018, then tracked northeastward with the northern portion of the storm circulation tracking across portions of Southside Virginia, Thursday afternoon, the 11th. As the storm circulation approached on October 11th a cold front moving in from the west and interacted with the storm and enhanced rainfall especially east of Interstate 81. Widespread rainfall amounts of 4 to 8 inches were reported, along with local amounts over 10 inches, mainly from the mountains of North Carolina up through Southside Virginia. This resulted in significant flash flooding with flash flood emergencies issued for the city of Roanoke, as well as Roanoke County. Rainfall amounts ranged from 1.97 inches at Gathright Dam, 3.3 inches at Daleville, 3.15 at the Roanoke Regional Airport to 7.16 inches in the Cave Spring area of Roanoke County. The Roanoke River at Glenvar crested at 17.1 feet (8.1 feet above flood stage) and in Roanoke at 16.4 feet (6.4 feet above flood stage).

*September 27, 2024, Hurricane Helene:* Helene made landfall in Florida as a powerful Category 4 hurricane late Thursday, September 26, and moved quickly northward into the southeastern states, and then turned slightly northwestward towards the southern Appalachian Mountains overnight into Friday morning, weakening as it moved over land. Helene's intensity and fast forward motion led to impacts being felt well inland, from the Florida Big Bend area into the Appalachians only 12 hours after landfall, and there was extensive damage in southwest Virginia. Widespread cellular service and power outages, some lasting for several days, occurred as high winds downed thousands of trees across the region. Winds gusted as high as 55 mph to 65 mph in southwest Virginia. There were three confirmed tornadoes associated with the remnants of

Hurricane Helene in the Piedmont region of Virginia. Flooding impacts from Hurricane Helene were extensive across the area and were exacerbated by a predecessor rainfall event that occurred a day before Helene reached the region, which brought six to eight inches of rain to the mountains prior to the arrival of the remnants of Helene. The three-day rainfall totals associated with the remnants of Hurricane Helene were highest in Grayson and Smyth Counties, where observations of 10 to locally 15 inches of rain were recorded. The Piedmont of Virginia received much less rain, between one and two inches, with a couple areas around three inches. Total economic losses for Virginia, which include Virginia's agriculture, forestry, and other industries, are expected to range between \$416 million and \$630 million per an economic analysis released by Virginia Tech researchers. Within the planning region, at least 20,000 people lost power due to downed trees in Alleghany, Botetourt, Craig, and Roanoke Counties. One woman was killed when struck by a flying chicken coop. Others, including a postal worker and a police officer, were injured by downed trees and flying debris. Total losses from agriculture damages in Craig County were estimated at \$85,000. In Troutville, twenty-one acres of sunflowers at Beaver Dam Farm were flattened by strong winds.

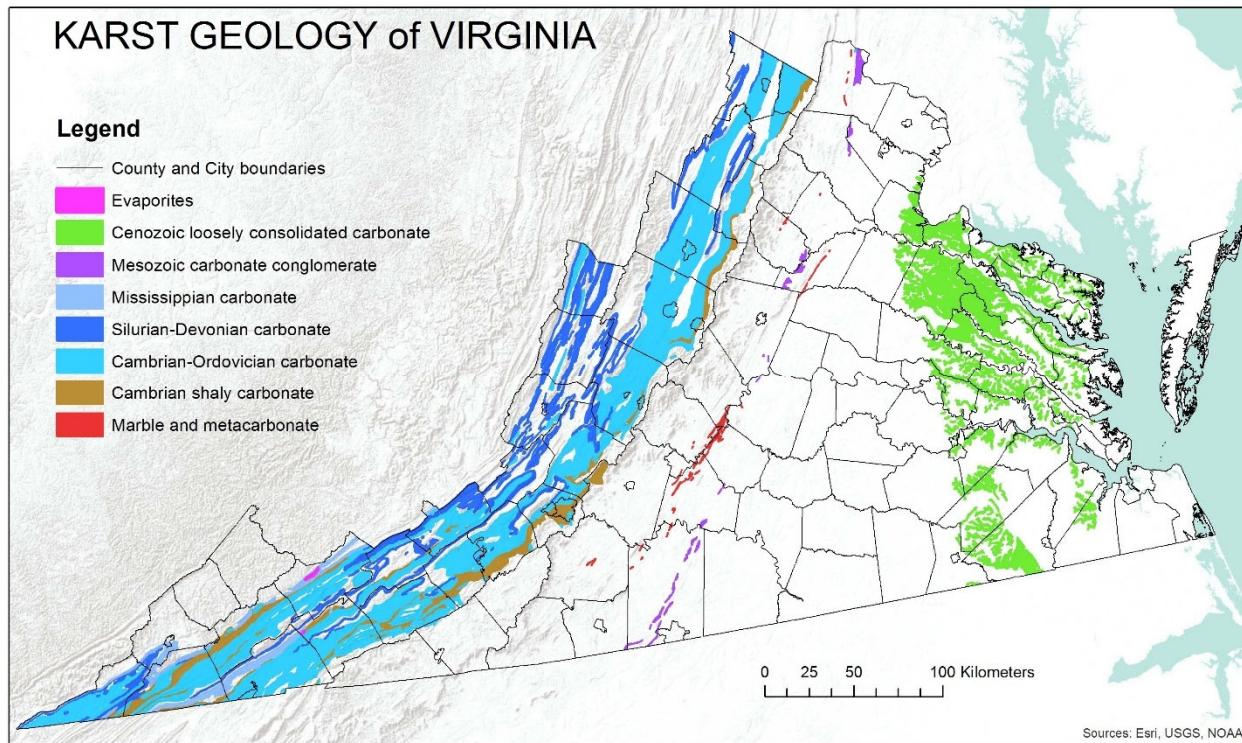
## 3.6 Geologic Hazards

### Definition of Hazard

Karst is defined as a landscape with sinkholes, springs, and streams that sink into subsurface caverns. In karst areas, the fractured limestone rock formations have been dissolved by flowing groundwater to form cavities, pipes, and conduits. Sinkholes, caves, sinking streams, and springs signal the presence of underground drainage systems in karst areas.

Sinkholes are natural depressions on the land surface that are shaped like a bowl or cone. They are common in regions of karst, where mildly acidic groundwater has dissolved rock such as limestone, dolostone, marble, or gypsum. Sinkholes are subsidence or collapse features that form at points of local instability. Their presence indicates that additional sinkholes may develop in the future. The probability for karst hazards cannot be determined as easily as other hazards due to lack of accurate mapping and historical data.

The most notable karst related event in the region was a sinkhole in Botetourt County that occurred on Route 670 in 2005. That hole eventually expanded to 50 feet deep and 75 feet wide. Several smaller sinkholes have damaged Interstate 81 to the north in Augusta, Rockbridge and Shenandoah counties and south in Washington County in the past along with damage to Route 460 in Bedford County to the east. To date, there have been no federal disaster declarations or NCEI recorded events for karst related sinkhole events. Currently, there is no comprehensive long-term record of past events in Virginia.



**Figure 19: Karst Map, VDEQ**

The term landslide describes many types of downhill earth movements, ranging from rapidly moving catastrophic rock avalanches and debris flows in mountainous regions to more slowly moving earth slides and other ground failures.

Though most landslide losses in the United States accrue from many widely distributed events, landslides can be triggered by severe storms and earthquakes, causing spectacular damage in a short time over a wide area. Some landslides move slowly and cause gradual damage, whereas others move so rapidly that they can destroy property and take lives. Debris flows are a common type of fast-moving landslide that generally occurs during intense rainfall on saturated soil. Their consistency ranges from watery mud to thick, rocky mud (like wet cement) which is dense enough to carry boulders, trees, and cars. Debris flows from many different sources can combine in channels, where their destructive power may be greatly increased.<sup>7</sup>

Landslides can be triggered by both natural changes in the environment and human activities. Inherent weaknesses in the rock or soil often combine with one or more triggering events, such as heavy rain, snowmelt, and changes in groundwater level, or seismic activity. Erosion may remove the toe and lateral slope support, triggering potential landslides. Human activities triggering landslides are usually associated with construction and changes in slope and surface water and groundwater levels. Changes in irrigation, runoff and drainage can increase erosion and change groundwater levels and ground saturation.

## Historic Event Descriptions

Historical records tell us that destructive landslides and debris flows in the Appalachian Mountains occur when unusually heavy rain from hurricanes and intense storms soaks the ground, reducing the ability of steep slopes to resist the downslope pull of gravity. For example, during Hurricane Camille in 1969, such conditions generated debris flows in Nelson County, Virginia. The storm caused 150 deaths, mostly attributed to debris flows, and more than \$100 million in property damage. Likewise, 72 hours of storms in Virginia and West Virginia during early November 1985 caused debris flows and flooding in the Potomac and Cheat River basins that were responsible for 70 deaths and \$1.3 billion in damage to homes, businesses, roads, and farmlands.

Most localities of the RVARC region have experienced small, localized landslide events, especially areas in the valleys. The mountain slopes are characterized by the USGS as having a high susceptibility but a low incidence, indicating that few events have occurred on the higher slopes. **Chapter 2: Regional Profile** contains a topographic map of the region.

The only documented concentration of landslides in the planning region has been along Smith Creek in the Town of Clifton Forge. A State Emergency Declaration was issued in November of 1987 for the area. Heavy rain caused landslides along Smith Creek in Clifton Forge, the third occurrence in the past decade. The area is landslide prone and structures are at risk from further landslides. A study is warranted to determine scope of the problem and a method to stabilize the area.

In 2008 a rockslide occurred on Route 220 just north of the City of Covington. No property damage estimates were reported. In 2019, another event on Route 220 closed a section of the road north of Covington for a two-week period. Small landslides just outside of Eagle Rock have closed

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<sup>7</sup> Debris Flow Hazards in the Blue Ridge of Virginia, USGS Fact Sheet 159-96P. L. Gori and W. C. Burton, 1996.

Route 43 multiple times. Landslides on Route 220 south in the Bent Mountain area of Roanoke County have resulted in closures of that road multiple times.

In 2021 a debris flow event triggered by heavy rain was reported in the City of Roanoke with \$25,000 in damages. A car wash sustained severe structural damage when the hillside immediately behind the building gave way and smashed through the rear wall of the building. No deaths or injuries were reported.

## 3.7 Wildfire

### Definition of Hazard

Wildfire is a particularly pernicious natural disaster that can have wide effects across the region, affecting air quality, property, and safety. A significant portion of the region is forested and managed by public entities, including the National Park Service, National Forest Service, Virginia Department of Forestry, Virginia Department of Conservation and Recreation, and the Virginia Department of Wildlife Resources.

Several factors affect wildfires, including meteorological factors such as temperature and wind, and non-meteorological factors such as soil moisture, topography, debris accumulation of dead or dying vegetation, and forest density and age. Wildfires across the state are primarily caused by debris burning. Fire laws proscribe burning until after 4pm from February 15<sup>th</sup> to April 30<sup>th</sup>, the major fire season across the Commonwealth. Other causes include powerlines, lightning, campfires, and arson.

The Virginia Department of Forestry is the primary agency involved in wildfire education and response in Virginia; however, other entities which may engage in wildfire response include local EMS and federal entities. Data in this section comes from the VDOF unless otherwise noted.

### Historic Event Descriptions

Historically, three major fire events have occurred in the region.

In 1999, Fort Lewis Mountain in the western part of Roanoke County burned out of control for a week, endangering multiple homes before it was brought under control.

In April 2012, a series of wildfires burned more than 38,000 acres in western Virginia. One of the largest fires impacting the region was in a remote area in Alleghany County 10 miles west of Covington. The U.S. Forest Service reported the Alleghany Tunnel Fire burned 11,381 acres and resulted in temporary closure of sections of routes 770 and 850. The largest fire originated in Rich Hole Wilderness area of Alleghany County. This fire spread to private lands, grew to 15,454 acres, and closed parts of Interstate 64 in both directions. 7,351 acres burned in the Barbers Creek Fire in Alleghany and Craig counties. All fires posed threats to structures on private lands. Fires also occurred in Page and Shenandoah counties.

On the first weekend of March 2018, VDOF responded to 127 wildfires spread by high winds. Across the Commonwealth. These fires burned a total of 690 acres and impacted Botetourt County and multiple other localities across the state. A month later in Roanoke County, several fires ignited along the shoulder of Virginia Highway 311 on Catawba Mountain, near the highway's intersection with the Appalachian Trail. The fires grew quickly in dry and windy conditions. Several of these fires merged into one fire which grew to 165 acres and threatened the safety of dozens of hikers who were on the trail to McAfee Knob.

Since 2018, approximately 74 fires have occurred in the region, with 38 occurring in Alleghany County, 18 occurring in Botetourt County, five occurring in Craig County, and 13 occurring in Roanoke County. Of these the largest occurred in October of 2023, when 97 acres burned near Penny Hollow and Cumberland Gap Road in Craig County. The threshold for a major fire is 100 acres. A full incident list is contained in [Appendix E: Regional Wildfire Report](#).

## 3.8 Wind Event

### Definition of Hazard

For the purposes of this plan, wind events shall refer to straight line wind events such as derecho or thunderstorm winds as well as other wind events such as tornadoes.

Straight line wind is a term used to define any thunderstorm wind that is not associated with rotation and is used mainly to differentiate from tornadic winds. Most straight-line winds are a result of outflow generated by a thunderstorm downdraft. High winds are also associated with hurricanes, with two significant effects: widespread debris due to damaged and downed trees and building debris; and power outages. Half of all severe weather reports in the lower 48 states are due to damaging winds. Since most thunderstorms produce some straight-line winds as a result of outflow generated by the thunderstorm downdraft, anyone living in thunderstorm-prone areas is at risk for experiencing straight line winds. The majority of the wind events experienced in the region are considered straight line wind events, with the vast majority of these driven by thunderstorms.

Straight line wind events can occur anywhere in the planning region and have the potential to impact all types of buildings, power and telecommunication transmission lines, and transportation services.

*Figure 20: EF Ratings Definitions, Weather.gov*

| EF Rating   | Wind Speeds | Expected Damage   |  |
|-------------|-------------|---|--|
| <b>EF-0</b> | 65-85 mph   | 'Minor' damage: shingles blown off or parts of a roof peeled off, damage to gutters/siding, branches broken off trees, shallow rooted trees toppled.  |   |
| <b>EF-1</b> | 86-110 mph  | 'Moderate' damage: more significant roof damage, windows broken, exterior doors damaged or lost, mobile homes overturned or badly damaged.  |   |
| <b>EF-2</b> | 111-135 mph | 'Considerable' damage: roofs torn off well constructed homes, homes shifted off their foundation, mobile homes completely destroyed, large trees snapped or uprooted, cars can be tossed.   |   |
| <b>EF-3</b> | 136-165 mph | 'Severe' damage: entire stories of well constructed homes destroyed, significant damage done to large buildings, homes with weak foundations can be blown away, trees begin to lose their bark.   |   |
| <b>EF-4</b> | 166-200 mph | 'Extreme' damage: Well constructed homes are leveled, cars are thrown significant distances, top story exterior walls of masonry buildings would likely collapse.   |   |
| <b>EF-5</b> | > 200 mph   | 'Massive/incredible' damage: Well constructed homes are swept away, steel-reinforced concrete structures are critically damaged, high-rise buildings sustain severe structural damage, trees are usually completely debarked, stripped of branches and snapped. |   |

A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud. It is spawned by a thunderstorm (or as a result of a hurricane) and produced when cool air overrides a layer of warm air, forcing the warm air to rise rapidly. The damage from a tornado is a result of the high wind velocity and wind-blown debris. Tornado season is generally April through September, although tornadoes can occur at any time of year.

In February 2007, the National Weather Service adopted the Enhanced Fujita scale to measure tornadoes. The EF scale replaces the original Fujita scale that led to inconsistent tornado ratings due to a lack of damage indicators, no account of construction quality and variability, and no definitive correlation between damage and wind speed. For example, a weak structure combined with a slow-moving storm could lead to a tornado's rating being higher than it should be. The EF scale accounts for these and other variables for a more accurate measurement.

Low-intensity tornadoes appear to occur most frequently in Virginia. Tornadoes rated EF2 or higher are very rare, although EF2, EF3, and a few EF4 storms have occurred.

## Historic Event Descriptions

In total, 242 wind events have occurred in the region since the last update of the plan (see *Table 3-1*). More events were reported in Roanoke County than in any other jurisdiction. Almost all of these events resulted in some level of damages, with a total reported cost across all events of \$2,223,850. Crop damage alone was reported at \$140,000, though this number is likely underreported. The average cost per wind event was \$10,640. Sixteen events with damages estimated at greater than \$20,000 occurred in the region in this time period.

The largest scale event in the region was the derecho on June 29, 2012 that arrived with 80 mph winds and left over a million people without power and caused extensive wind damage throughout Virginia. The event was caused by a series of days with high temperatures in excess of 100 degrees created by a heat dome over the central and eastern US followed by a line of strong thunderstorms that moved quickly from the Chicago area to the east on the afternoon of June 29th. Emergency services personnel dealt with fires caused by downed powerlines, collapsed roofs, and wrecked vehicles. Many businesses in the area remained closed for an extended time and lost revenue due to the power outages while hardware stores experienced a run on generators and propane fueled grills. It took more than two weeks for utility companies to restore power to all residents in the region. Recovery, including the clean-up of hundreds of downed trees, roofs and building repairs lasted throughout July and August. A federal disaster declaration was made for this event.

Significant straight line wind events have occurred since 2019. In February 2019, a strong cold front passed over western and southwestern Virginia. In its wake, high winds intensified in the overnight hours particularly along and west of the Blue Ridge. Impacts were amplified by waterlogged soil, allowing trees to be uprooted or displaced more easily. At the peak of the event, approximately 40,000 homes in Virginia were without power.

Thunderstorms struck in May of 2019 during the afternoon and evening hours. The storms produced hail up to the size of half dollar coins and produced damaging winds that blew down numerous trees and power lines. At least 4,000 people lost power due to trees falling on to power lines, and a few structures also suffered damage. In June of the same year, multiple thunderstorms developed, some of which intensified to severe levels and produced damaging winds that knocked down numerous trees. Numerous trees and tree limbs, as well as power lines,

were blown down by straight line thunderstorm winds in eastern Roanoke and around the community of Vinton. Siding panels from the Roanoke Times Newspaper office were blown down onto the street. One tree fell onto a parked car on Underhill Avenue. Damage was most concentrated along Shelbourne Avenue in Vinton; however, damage was observed from Hardy Road to the Roanoke River, about a 3/4-mile-wide swath. Winds picked up a metal shed on Shelbourne Avenue and blew it into a telephone pole. The damage resulted in a loss of commercial power to about 2,000 customers in eastern Roanoke County.

On Halloween of 2019, a cold front brought strong winds both ahead and behind the frontal passage during the afternoon and evening hours. These winds were not associated with any thunderstorms, but they blew down trees and power lines in southwest Virginia, particularly impacting Botetourt and Alleghany County.

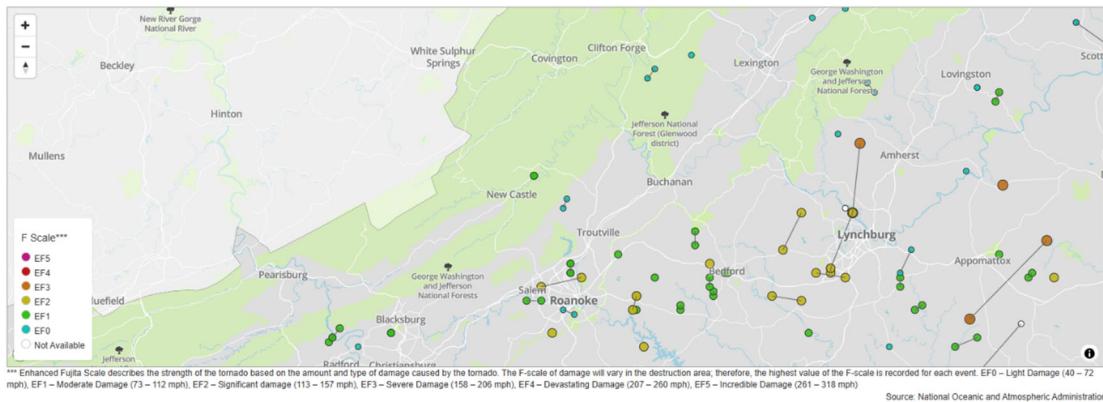
In July of 2020, thunderstorm winds brought two trees down on Catawba Valley Road in Roanoke County. One of the trees fell onto a home in the 3700 block. Damage values are estimated at \$50,000.

A large thunderstorm complex moved east from the Ohio and Tennessee Valleys across southwest Virginia in May of 2021. The system caused dozens of trees to be toppled across the region particularly in Botetourt County. Heavy rainfall from these storms also caused localized flooding in the City of Roanoke, where rainfall rates were in excess of 4 inches per hour at one point, between a 5-year and 10-year rainfall event per NOAA Atlas 14 Point Frequency Estimates, showing that weather events are complex and often create multiple hazards.

In June of 2022, numerous trees and power lines were downed by thunderstorm winds in Botetourt County. Near Iron Gate, one tree fell onto a garage and damaged a vehicle.

April of 2023 saw a \$60,000 estimated damage event when wind gusts resulted in many trees and power lines down in the Cities of Salem and Roanoke and portions of Roanoke County. This resulted in an estimated one to two thousand customers without power. Among the fallen trees, one fell and destroyed a raptor enclosure at the Southwest Virginia Wildlife Center which cost around \$25,000 to replace. Additionally a power pole and a telephone pole were split in two.

In May of 2024, thunderstorm cells produced a tornado (discussed later in this section). In September of 2024, Hurricane Helene caused widespread impacts across the region, with over 3,200 customers reported without power at the peak of the high winds. A peak wind speed of 68 mph was measured. There was one confirmed fatality. A woman was killed when struck by a chicken coop that was lofted by the high winds. A deputy was also injured at the scene. Total losses from agriculture damages were around \$85,000, including losses from crops and structures.



**Figure 21: Tornado Paths, NOAA**

Several tornadoes have touched down in the planning region. On April 24, 1896, around 4:30 pm, a tornado moved northeast from Salem into Roanoke destroying a bowling alley and several other buildings. A framed home near the bowling alley was leveled, killing three of the eight-member family in the house. The five others were injured.

In Bath and Alleghany counties, the Cowpasture Valley is at an elevation of 1,500 feet and lies between two ridges that rise 1,000 feet above the valley. On May 2, 1929, a tornado struck around 6 pm. Property losses in the communities of Coronation and Sitlington were great. At least 10 people were injured, but none were killed. There were five tornadoes reported on that day. More may have struck remote areas. Twenty-two people were killed and over 150 injured with at least half a million dollars in damage in Alleghany and Bath counties.

April 3-4, 1974 is known as the "Super Outbreak" with 148 tornadoes, 315 people killed and 5,484 injured across the United States. It was the most tornadoes ever in recorded in a 24-hour period and it was the worst tornado outbreak since February 19, 1884. In Virginia, eight tornadoes hit. One person was killed and 15 injured, all in mobile homes. Over 200 homes and barns and over 40 mobile homes and trailers were damaged or destroyed. The Saltville area and Roanoke were the hardest hit. An F3 tornado touched down on the west edge of Roanoke, near Salem around 5 a.m., and moved through the north part of Roanoke to Bonsack and into Botetourt County to the Blue Ridge area. The path was initially a mile wide, but it continued to narrow to 75 yards across near the end of its track of damage. It hit four schools (two lost portions of their roof and two had windows broken out) and two apartment complexes, Grandview Village Apartments (18 buildings damaged) and Ferncliff Apartments (lost roof). The Red Cross reported 120 homes damaged or destroyed in the Roanoke area. Trees were down on buildings and cars. Carports, garages, and porches were flattened. Roofs were partly blown off several houses in Botetourt.

A small tornado struck northern Roanoke County on August 5, 2003. The storm had winds of 110-113 miles per hour and caused damage to ITT Industries and Sunnybrook Garage on Plantation Road in addition to damaging roofs, fences and a car in the area. No injuries were reported as a result of the tornado.

A small tornado touched down in the City of Roanoke on June 4, 2008. The tornado was rated EF-0 on the Enhanced Fujita Scale of tornado intensity. The National Weather Service reported that the storm knocked down power lines and trees, including on houses along a 1.4-mile path. Appalachian Power stated that the storm knocked out power to 4,000 customers.

A tornado touched down just east of the Town of New Castle on April 15, 2018. Classified as an EF-1, estimated winds speeds reached 105 mph and had a path length of 0.5 miles. The tornado damaged 6 homes, several outbuildings and garages, and approximately 50 trees in the vicinity. Three cars and a double axel trailer were moved including one truck that was flipped over. The tornado was part of a wide regional outbreak made up of several supercells on April 15th impacting communities in Virginia and North Carolina.

On August 1, 2020 an isolated storm produced an EF0 tornado, resulting in a discontinuous path of damage with uprooted trees and small trees snapped aloft, with damages estimated at \$3,500.

An EF-1 tornado touched down near the intersection of Karen Drive and Joan Circle, on May 26, 2024. Several tree trunks were snapped. Additional trees were snapped and uprooted as the tornado moved east-northeast, with loss of roofing material noted at several homes and apartment buildings just south of the Roanoke River. The tornado lifted just east of Electric Road near the intersection of Midland and Easton Roads. The estimated peak wind speeds were 100 to 105 mph. Damage was estimated to be 1.17 million dollars. The same storm cells spawned straight line winds which resulted in an estimated \$22,000 worth of damages.

## 3.9 Winter Storm

### Definition of Hazard

Winter storms are events which create snow, freezing rain, or sleet. This frozen precipitation can accumulate on powerlines, trees, roofs and roads and cause damage or fatalities through car wrecks, loss of electricity, and, in extreme cases, damage to buildings. The planning region experiences a handful of winter storm events each year.

Winter storms are commonly assessed with the Northeast Snowfall Impact Scale (NESIS). Some Category 1 or 2 storms are recorded in the NESIS database which have a southern extent within the planning region over the past five years. However, the core of these storms was not localized in the planning region.

| Category | NESIS Value | Description |
|----------|-------------|-------------|
| 1        | 1—2.499     | Notable     |
| 2        | 2.5—3.99    | Significant |
| 3        | 4—5.99      | Major       |
| 4        | 6—9.99      | Crippling   |
| 5        | 10.0+       | Extreme     |

*Figure 22: NESIS Scale*

### Historic Event Descriptions

While typical snow and ice events result in low accumulations, several larger winter storms have been documented in the region.

February of 1960 found the area blanketed with 27.6 inches and March delivered 30.3 inches that same year. The March storm registered as a Category 4 storm across the northeast. In January of 1966, the area received a total of 41.2 inches of snow in a Category 3 storm. The second greatest official snow accumulation in a single 24-hour period occurred on February 11th and 12th of 1983 when 18.6 inches covered the region in another Category 3 storm. The storm resulted in snowdrifts of up to three feet in height. This was the third heaviest snowfall in over 100 years.

The "Storm of the Century" hit the valley in March 1993, the first Category 5 since the NESIS scale became commonly used to directly impact the region. With blizzard-like conditions and nearly 30 inches of snow, this was the biggest winter storm in 10 years. Localities in the region received a Presidential Declaration of Emergency and the National Guard was mobilized to help with emergency transportation needs. Shelters were open for those without electricity.

A devastating storm struck the region and surrounding jurisdictions in February 1994, with one to three inches of solid ice from freezing rain and sleet. Roads were blocked, electric and phone lines were damaged, and a large portion of the valley was without electricity.

The "Blizzard of '96," also a Category 5, dropped 22.2 inches officially in 24 hours in early January of 1996 and remains the current record 24-hour snowfall. Many areas of the region received more than 36 inches during the same period.

In March 2009 snowfall reports in the region ranged from 6 to 9 inches and were the largest snow event since 2005. The Winter of 2009-2010 brought three major winter storms to the area. On December 18th, with areas of Craig and Alleghany County reporting up to 23 inches, snow continued to fall for the next 11 days. The first week of February 2010, saw another 8-10 inches fall on top of an event in late January that had already dropped 10-12 inches causing power outages, and dangerous driving conditions. The biggest snowstorm on record for the City was December 18-19, 2009 with 17.8 inches.

The City of Roanoke's snowiest single day in December occurred in 2018 with 15.2 inches.

Since the last iteration of this plan, 31 winter storm or winter weather events have been recorded by NCEI in the planning region. These events are generally widespread and affect multiple localities, meaning that it is more truthful to say that only about 11 individual events have occurred. These events have mostly been characterized by snowfall of less than 10 inches or ice accumulation, with the most widespread impacts being power outages.

In January of 2019, a winter storm event resulted in snow and ice across much of the region, with snow accumulations of up to 4.8 inches in some places followed by slight ice accumulations from sleet and freezing rain. In February, another storm affected the region, with around 4 inches of accumulation.

The 2020-2021 winter storm season began early in December, when snow and ice accumulations of a half inch to 2.5 inches were observed across the region. Another region-wide storm struck at the end of January, with snowfall amounts of 4-7 inches recorded across the region. Two small winter weather events struck Craig and Roanoke Counties respectively in February. These episodes were brief and resulted in less than half inch accumulations of sleet. Another storm event affected the whole region later in the month, with accumulations of less than 1.5 inches.

January of 2022 saw two regional winter storm events. Accumulations in the region ranged from 1.5 to 6.5 inches in the first storm event, and from 1 to 8 inches in the second storm event.

January of 2024 saw a small episode of winter weather in Alleghany, followed by an episode of heavy snow in Botetourt and Roanoke Counties with accumulations of 4.8 and 3.5 inches respectively in higher elevations.

## 3.10 Hazards Not Assessed

### Drought

Drought is defined by four factors: precipitation, groundwater levels, streamflow, and reservoir levels. The Virginia Department of Environmental Quality monitors drought across the state to designate drought events.

Five major droughts affected Virginia in the 20th century, during 1930-32, 1938-42, 1962-71, 1980-82, and from 1998 to 2002. Following the 2002 drought, the Local and Regional Water Supply Planning Regulation was established in Virginia, which required each locality to develop and submit a plan by 2011, either alone or in collaboration with other localities. The Virginia State Water Resources Plan (SWRP) was finalized and released to the public in October 2015. An update of the document was conducted in 2020.

There are three water supply plans which overlap the Roanoke Valley-Alleghany region included in the 2020 SWRP:

- The Upper James Water Supply Plan: this plan covers Alleghany, Bath, and Highland Counties, as well as Lexington, Buena Vista, Covington, Clifton Forge and Iron Gate and was produced in partnership with Central Shenandoah Planning District Commission.
- The Roanoke River Water Supply Plan: this plan covers Roanoke, Bedford, Botetourt, and Franklin Counties as well as the cities of Roanoke and Salem, and the Towns of Boones Mill, Buchanan, Fincastle, Rocky Mount, Troutville and Vinton.
- The Craig County – Town of New Castle Regional Water Supply Plan: this plan covers Craig County and the Town of New Castle.

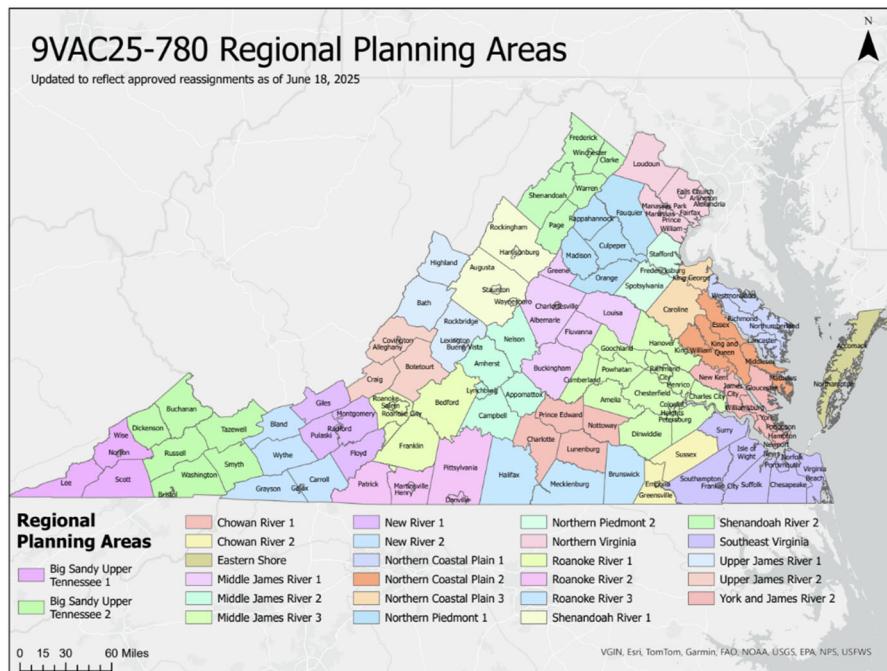


Figure 23: Water Supply Planning Areas, DEQ

The Regional Commission is currently in the process of assisting with updates to regional Water Supply plans following new watershed boundary guidance released in 2024<sup>8</sup>. Two plans will be completed for the Roanoke River basin and Upper James basin respectively. These will supply data and information for a future iteration of the SWRP. Water supply planning includes information concerning community water systems and self-supplied users, existing and potential sources of water supply, existing use, and anticipated future water demand.

## Pandemic

A pandemic is an epidemic that has reached a global level of spread. On January 30, 2020, the World Health Organization declared a Public Health Emergency of Concern following identification of the coronavirus COVID-19, followed by a declaration of pandemic on March 11<sup>th</sup> of that year. The pandemic had harsh economic ripple effects across the Commonwealth and the country. While this document does not assess future pandemic risk, a brief summary of local impacts is included below as a learning opportunity for future disaster events.

In Virginia, a State of Emergency was declared on March 12<sup>th</sup> of 2020. On March 13<sup>th</sup> all K-12 schools in the Commonwealth were ordered closed. On March 23<sup>rd</sup>, businesses such as bowling alleys, gyms, and theaters were also ordered closed. On March 24<sup>th</sup>, restaurants were ordered to close dining rooms. On March 30<sup>th</sup>, a statewide Stay at Home order was issued. The Stay at Home order remained broadly in effect until May 15<sup>th</sup>. During Phase One reopening, people were still encouraged to maintain social distancing and mask fully in public. Social gatherings were capped at 10 people, and outdoor dining was allowed at restaurants. On May 29<sup>th</sup>, Virginians received an official order requiring all people to mask indoors. Phase Two reopening began on June 5<sup>th</sup>, which allowed an increase in social gatherings from 10 to 50 people. Limited indoor dining returned to restaurants and gyms were able to reopen. On June 8<sup>th</sup>, evictions proceedings were suspended. On July 1<sup>st</sup>, Virginia entered Phase Three reopening, which further loosened restrictions. On November 15<sup>th</sup>, new restrictions were placed limiting all indoor and outdoor gatherings to 25 people due to surging case numbers. On December 14<sup>th</sup>, a universal stay-at-home order was issued between 12 am and 5 am, along with a universal mask mandate. Social gatherings were limited to 10 people.

A vaccine was first made available in Virginia in December of 2020, but was restricted to frontline workers due to availability. As of April 2021, the vaccine was officially available to all Virginians aged 16 or older. The universal indoor mask mandate was lifted in May of 2021, along with all social distancing and venue capacity restrictions.

Economic impacts from the pandemic can be seen in a variety of data points, including unemployment rates, spending and tax revenues, and business closures.<sup>9</sup>

Many community stakeholders found their operations directly affected by the pandemic. While a full list of discussions can be found in **Appendix A: Public Engagement Summary**, a major takeaway was that non-governmental organizations and nonprofits serving marginalized communities found themselves quickly adapting in order to meet sharp increases in demand for services which government programs were not able to fully cover. This shows that, while NGO and nonprofit aid programs cannot replace government assistance, they are a pivotal part of the

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<sup>8</sup> (Virginia Department of Environmental Quality, n.d.)

<sup>9</sup> (Roanoke Valley-Alleghany Regional Commission, 2025)

post-disaster response, in many cases providing immediate emergency aid while other, longer-term aid was being processed.

Hospitals were additionally a frontline for disaster response. Hospitalizations and deaths from the pandemic in the years of 2020-2021 are captured in Table 15. Data comes from Virginia's Open Data Portal.

**Table 15: Infections, Hospitalizations, and Deaths due to COVID-19, 2020-2021**

| Locality       | Total Cases | Hospitalizations | Deaths |
|----------------|-------------|------------------|--------|
| Alleghany      | 2,512       | 87               | 87     |
| Botetourt      | 4,825       | 105              | 66     |
| Craig          | 761         | 22               | 11     |
| Roanoke County | 14,245      | 281              | 195    |
| Covington      | 818         | 34               | 19     |
| Salem          | 4,396       | 108              | 83     |
| Roanoke City   | 14,290      | 335              | 272    |
| Total          | 41,847      | 972              | 733    |

The total number of deaths reported per the Virginia Department of Health and Human Services was 5,000 for the year 2020, 614 more than were observed in 2019<sup>10</sup>. The total number of deaths reported due to COVID-19 in 2020 was 560. It is safe to assume that deaths and hospitalizations due to COVID-19 represent an increased burden on hospital and health services staff. Bed capacity at area hospitals is included in **Chapter 2: Regional Profile**.<sup>11</sup>.

In 2025, there are 1,463 licensed beds in three area hospitals within the service area. Hospitals outside of the service area may receive patients in a diversion event. In the case of the COVID-19 pandemic, lockdown and social distancing measures reduced spread sufficiently to allow for the care of all patients. In a more acute disaster, hospital bed capacity may be a limiting factor to disaster response, causing a greater loss of life. In the case of Hurricane Helene, further discussed in **Section 3.5** in this chapter, diverted patients from Asheville, North Carolina reached Roanoke's area hospitals in cases where specific treatments were needed for patients (e.g. in high-risk pregnancies) as reported in stakeholder interviews with CHIP. Further study of hospital capacity in disaster situations is recommended but could not be encompassed fully in this plan.

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<sup>10</sup> (Division of Health Statistics, Virginia Department of Health, n.d.)

<sup>11</sup> (Virginia Health Information, 2021)

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# Chapter 4. Risk Assessment

## 4.1 Disaster Rankings

Hazards assessed in this chapter include all listed hazards from Chapter 3 with the exception of section [3.11 Hazards Not Assessed](#) and [3.5 Hurricane and Tropical Storm](#). While the region experiences the impacts of a few tropical storms or depressions and remnants of hurricanes, these impacts are experienced as flooding and wind events, and assessment of these two events reasonably addresses risk from Hurricane and Tropical Storm.

This section summarizes the contents of the following sections of the chapter. For more information on what data was used for individual hazard assessment, please refer to the relevant section of this chapter. Definitions of ranking methodology are included for reference.

**Projected Scale of Event:** Hazard events may occur on site-specific, community, or regional scales. Estimated scale of event is derived from the impacts of historic events and the projected likelihood of events to remain substantially similar in the future. Scores are defined by the approximate land area affected by a single event.

| <b>Projected Scale of Event</b>                                |   |   |
|--|---|---|
| <b>Local Effects</b>   | <b>Jurisdiction-Wide Effects</b>                                      | <b>Region-Wide Effects</b>  |
| Effects of an event are localized to a parcel or neighborhood. | Effects of an event affect a substantial portion of the jurisdiction. | Effects of an event affect multiple jurisdictions or the region as a whole. |

**Projected Costs per Annum:** Costs are a concrete way to estimate impact from a hazard event. Costs have been derived where possible from NRI and NCEI data, HAZUS modeling, and other sources. Costs are represented as high, medium, and low based off of thresholds defined by the individual jurisdictions. This may mean that costs that are considered high for one jurisdiction are low for another jurisdiction.

### Projected Costs per Annum

|                                   | Low             | Medium                 | High                    |
|-----------------------------------|-----------------|------------------------|-------------------------|
| Alleghany County                  | Under \$25,000  | \$25,000-\$35,000      | \$35,000 or higher      |
| City of Covington                 | Under \$25,000  | \$25,000-\$35,000      | \$35,000 or higher      |
| Town of Clifton Forge             | Under \$25,000  | \$25,000-\$35,000      | \$35,000 or higher      |
| Town of Iron Gate                 | Under \$25,000  | \$25,000-\$35,000      | \$35,000 or higher      |
| Craig County                      | Under \$25,000  | \$25,000-\$35,000      | \$35,000 or higher      |
| Town of New Castle                | Under \$25,000  | \$25,000-\$50,000      | \$50,000 or higher      |
| Botetourt County                  | Under \$50,000  | \$50,000-\$200,000     | \$200,000 or higher     |
| Town of Buchanan                  | Under \$25,000  | \$25,000-\$50,000      | \$50,000 or higher      |
| Town of Fincastle                 | Under \$25,000  | \$25,000-\$50,000      | \$50,000 or higher      |
| Town of Troutville                | Under \$50,000  | \$50,000-\$200,000     | \$200,000 or higher     |
| Roanoke County                    | Under \$200,000 | \$200,00-\$1.5 million | \$1.5 million or higher |
| Town of Vinton                    | Under \$25,000  | \$25,000-\$50,000      | \$50,000 or higher      |
| City of Roanoke                   | Under \$200,000 | \$200,00-\$1.5 million | \$1.5 million or higher |
| City of Salem                     | Under \$200,000 | \$200,00-\$1.5 million | \$1.5 million or higher |
| Roanoke Valley Resource Authority | Under \$25,000  | \$25,000-\$50,000      | \$50,000 or higher      |
| Western Virginia Water Authority  | Under \$25,000  | \$25,000-\$50,000      | \$50,000 or higher      |

**Projected Frequency of Events:** This takes into account the data accumulated in Chapter 3 regarding historical events. Frequent small to medium events can be just as impactful as a single large event, and more costly over the long term for communities.

| Projected Frequency of Event                  |   |   |
|---|---|---|
| Less than Annual                              | Annual                                  | Multiple Times per Year                           |
| An event occurs once every two or more years. | An event occurs on average once a year. | An event occurs on average multiple times a year. |

**Projected Local Vulnerabilities:** This is the most individual of the rankings. Projected local vulnerability to a hazard may be dependent on many factors, including the location of critical and vulnerable facilities, age of population, and other specific vulnerabilities which may be important to modeling impacts of that hazard. For example, certain hazards become more critical in areas with steeper slopes, or with increased impervious surfaces. When possible, NRI data will inform this ranking.

| Projected Local Vulnerability                              |        |      |
|--|--------|------|
| Low  | Medium | High |
| Thresholds for these rankings are defined for each hazard. |        |      |

Rankings are made for each locality, using a variety of data sources as appropriate or available. Rankings have then been consolidated for the region.

Sections of this chapter will specifically cite annual probability and expected annual loss provided by the National Risk Index when available and appropriate. When not available, the closest reasonable estimate will be supplied for comparison purposes.

In the case where HAZUS modeling or other improved local estimates of loss or risk exist, those numbers will be given preference. It is understood that the regional agencies that operate in the region are impacted by the hazards equivalent to the jurisdictions wherein they operate. Further discussion of regional entities included in this plan will occur in **Chapter 6: Regional Mitigation Action Plan** and **Chapter 7: Jurisdiction-Specific Mitigation Action Plans**.

Once values are assigned to each of these elements, the total score is ranked on the following scale:

- Hazard of Low Concern (4 to 6 points)
- Hazard of Medium Concern (7 to 9 points)
- Hazard of High Concern (10 to 12 points)

A regional score and a locality specific score are assigned for each hazard.

## All Hazard Ranking Table

Table 16: All Hazards Ranking Table

Hazard Ranking Table: All Hazards

| Locality              | Earthquake | Extreme Temperatures | Flooding | Geologic Hazards | Wildfire | Wind Event | Winter Storm |
|-----------------------|------------|----------------------|----------|------------------|----------|------------|--------------|
| Alleghany County      | Medium     | Medium               | High     | Medium           | Medium   | High       | Medium       |
| City of Covington     | Medium     | Low                  | Medium   | Low              | Low      | High       | Medium       |
| Town of Clifton Forge | Medium     | Low                  | High     | Low              | Medium   | High       | Medium       |
| Town of Iron Gate     | Low        | Low                  | High     | Low              | Medium   | High       | Medium       |
| Craig County          | Low        | Low                  | Medium   | Low              | Low      | High       | Medium       |
| Town of New Castle    | Low        | Low                  | Medium   | Low              | Low      | High       | Medium       |
| Botetourt County      | Medium     | Medium               | High     | Low              | Low      | High       | Medium       |
| Town of Buchanan      | Medium     | Medium               | High     | Low              | Low      | High       | Medium       |
| Town of Fincastle     | Medium     | Medium               | High     | Low              | Low      | High       | Medium       |
| Town of Troutville    | Medium     | Medium               | High     | Low              | Low      | High       | Medium       |
| Roanoke County        | Medium     | Medium               | High     | Medium           | High     | Medium     | Medium       |
| Town of Vinton        | Medium     | Medium               | High     | Low              | Low      | Medium     | Medium       |
| City of Roanoke       | Medium     | High                 | High     | Low              | Low      | Medium     | Medium       |
| City of Salem         | Low        | Medium               | High     | Low              | Low      | Medium     | Medium       |
| Regional Score        | Medium     | Medium               | High     | Low              | Low      | High       | Medium       |

## High Hazard Potential Dams

High hazard potential dams are a unique structure within the region which may complicate hazard events. Key risks to dam structures include flooding, earthquake, and geologic hazards. Flooding is one of the most commonly occurring hazards in the region, and improving structures to withstand increased flooding frequency and increasingly high flood events is important in reducing risk of dam failure and downstream inundation. Further analysis is needed to assess structural vulnerability to increased rain and flood events and potential downstream impacts; however, efforts have been made to collect emergency action plans, inundation maps, and dam safety fact sheets where available.

Earthquakes may negatively impact dam structures, which can cause the loss of water supply for a community, loss of energy generation, and downstream flooding resulting in loss of life and property damage. Earthquakes may also cause landslides or trigger other geologic hazards which can negatively affect both water quality in the reservoir and impoundment structure access. In 1979, the first Federal Guidelines for Dam Safety. However, further documentation in the form of the Earthquake Analyses and Design of Dams guidance was not completed until May 2005. This indicates that dams within the region, largely built before that time, may be susceptible to earthquakes. Further analysis is needed to determine the compounding risk factors of earthquakes on high hazard potential dams in the region.

A comprehensive list of High Hazard Potential Dams in the region is located in [Chapter 3](#). Dam safety fact sheets and select inundation maps are located in [Appendix H](#).

## 4.2 Earthquake

Earthquake is a rare hazard in the region, but several factors make a potential occurrence concerning. The age of housing stock, social vulnerability factors, steep slopes and the lack of experience with this hazard could make a large earthquake deadly in the planning region.

### Projected Scale of Event

In [Chapter 3](#), historic events were discussed. Generally, earthquakes are considered a wide-ranging event which ignore geographic boundaries. The 2020 earthquake was felt throughout most of the service area, despite originating in North Caroline, and was only measured at a V to VI at its epicenter. It is reasonable to expect that a larger earthquake anywhere across the western portion of Virginia or North Carolina could have effects in the region. A large earthquake with an epicenter in the region would likely be felt across the region even if it were a smaller event. The small 2021 earthquake which occurred on the Montgomery County border was felt through parts of Roanoke County, the City of Salem, and the City of Roanoke.

### Projected Costs of Event

Expected losses for this event are difficult to quantify. No historical loss information was found to support this plan.

*Table 17: Expected Annual Loss and Exposure Values for Earthquake, NRI*

| Locality          | Expected Annual Loss | Exposure Value          |
|-------------------|----------------------|-------------------------|
| Alleghany County  | \$ 27,538.00         | \$ 179,683,942,000.00   |
| City of Covington | \$ 12,797.00         | \$ 67,930,465,000.00    |
| Botetourt County  | \$ 58,140.00         | \$ 395,469,648,000.00   |
| Craig County      | \$ 10,382.00         | \$ 57,657,907,000.00    |
| Roanoke County    | \$ 293,168.00        | \$ 1,141,602,462,000.00 |
| City of Roanoke   | \$ 454,632.00        | \$ 1,181,643,712,000.00 |
| City of Salem     | \$ 116,212.00        | \$ 300,396,037,000.00   |

## Projected Frequency of Event

The USGS Hazard Mapping for earthquakes shows that the region has a 5-25% chance of an earthquake measuring VI or greater on the Mercalli Intensity scale in the next 100 years. This is a relatively low probability consistent with much of Virginia and the east coast. The nearest higher risk center for earthquakes is located on the far side of Kentucky and Tennessee.

NRI data indicates the following annual probability and expected annual loss for earthquakes in the region. Towns are included in counties for the purposes of this analysis.

**Table 18: Annualized Frequency Values for Earthquakes, NRI**

| Locality          | Annualized Frequency Value (%) |
|-------------------|--------------------------------|
| Alleghany County  | 0.03                           |
| City of Covington | 0.03                           |
| Botetourt County  | 0.03                           |
| Craig County      | 0.04                           |
| Roanoke County    | 0.039                          |
| City of Roanoke   | 0.048                          |
| City of Salem     | 0.04                           |

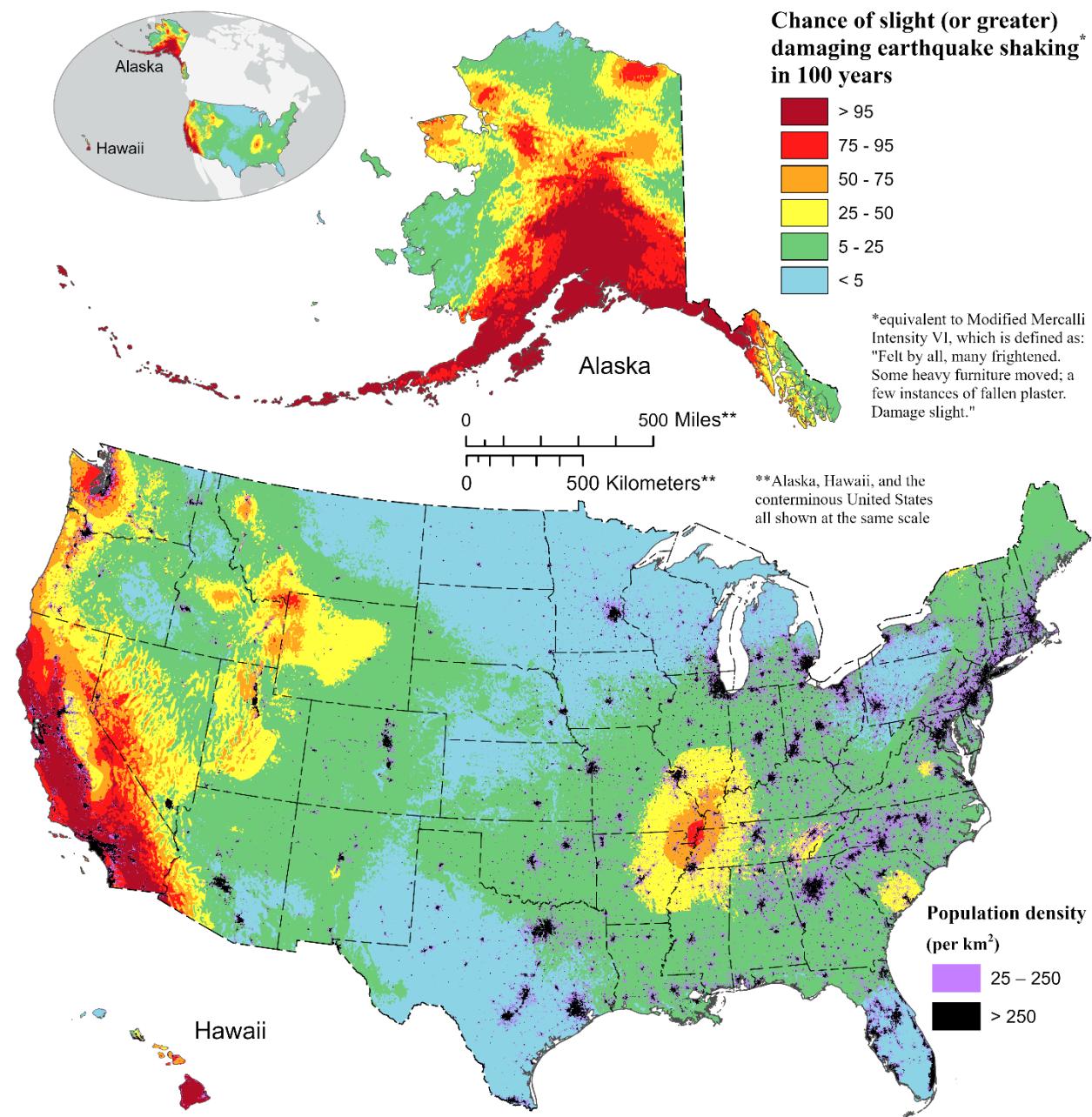


Figure 24: Earthquake Risk Mapping, USGS

## Projected Local Vulnerability

Eighty percent of the housing stock in the region was built prior to 1980. These structures are likely not protected from earthquakes. Per FEMA, existing buildings are the biggest contributor to seismic risk in the United States today. Building codes prior to 1970 may not have included seismic design, which is a key factor in mitigating possible damage from earthquakes. A deeper look at the numbers shows that residences in Alleghany County, the City of Covington, and the City of Roanoke may be uniquely vulnerable to earthquakes. In the City of Covington, three out of four dwelling units are likely at risk from earthquakes.

**Table 19: Homes Built Before 1970, ACS 5-Year Estimate 2023**

| Housing Units     | Built before 1970 | Percentage built before 1970 |
|-------------------|-------------------|------------------------------|
| Virginia          | 1,080,622         | 30%                          |
| Alleghany County  | 4,082             | 52%                          |
| City of Covington | 2,341             | 77%                          |
| Botetourt County  | 4,119             | 27%                          |
| Craig County      | 803               | 34%                          |
| Roanoke County    | 14,370            | 34%                          |
| City of Roanoke   | 31,496            | 64%                          |
| City of Salem     | 5,406             | 49%                          |

The 2024 Edition of FEMA's Seismic Design Category Maps show designations for the International Building Code and the International Residential Code regarding seismic design<sup>12</sup>. The majority of the planning region is located in category B of the International Residential Code. Other factors that are worth assessing in future plans may include soil composition, building height, and number of manufactured homes. Soil composition is directly considered in the applicability the 2024 Edition of FEMA's Seismic Design Category Maps. High risk soils must do site specific assessment.

For the local vulnerability score, designations of low, medium and high were assigned at natural thresholds of under 50 percent of aged dwellings, 50-75 percent of aged dwellings, and 75 percent or more of aged dwellings. Towns share the same score as the county in which they are located. This is not a perfect methodology and should be revisited in future iterations of the plan. Age of housing or building stock in towns may trend significantly higher than that of the enclosing county.

<sup>12</sup> (Federal Emergency Management Agency, 2024)

## Hazard Ranking Table

Table 20: Hazard Ranking for Earthquake

### Hazard Ranking

Table: Earthquake

| Locality              | Scale of Event      | Costs per Annum | Frequency of Event | Local Vulnerability Score | Overall Score |
|-----------------------|---------------------|-----------------|--------------------|---------------------------|---------------|
| Alleghany County      | Region-Wide Effects | Medium          | Less than Annual   | Medium                    | Medium        |
| City of Covington     | Region-Wide Effects | Low             | Less than Annual   | High                      | Medium        |
| Town of Clifton Forge | Region-Wide Effects | Low             | Less than Annual   | Medium                    | Medium        |
| Town of Iron Gate     | Region-Wide Effects | Low             | Less than Annual   | Low                       | Low           |
| Craig County          | Region-Wide Effects | Low             | Less than Annual   | Low                       | Low           |
| Town of New Castle    | Region-Wide Effects | Low             | Less than Annual   | Low                       | Low           |
| Botetourt County      | Region-Wide Effects | Medium          | Less than Annual   | Low                       | Medium        |
| Town of Buchanan      | Region-Wide Effects | Medium          | Less than Annual   | Low                       | Medium        |
| Town of Fincastle     | Region-Wide Effects | Medium          | Less than Annual   | Low                       | Medium        |
| Town of Troutville    | Region-Wide Effects | Medium          | Less than Annual   | Low                       | Medium        |
| Roanoke County        | Region-Wide Effects | Medium          | Less than Annual   | Low                       | Medium        |
| Town of Vinton        | Region-Wide Effects | Medium          | Less than Annual   | Low                       | Medium        |
| City of Roanoke       | Region-Wide Effects | Medium          | Less than Annual   | Medium                    | Medium        |
| City of Salem         | Region-Wide Effects | Low             | Less than Annual   | Low                       | Low           |
| Regional Score        | Region-Wide Effects | Medium          | Less than Annual   | Low                       | Medium        |

## 4.3 Extreme Temperature

Many models project an increase in extreme weather conditions in the coming years, particularly in experiences of heat waves. While the thresholds used to attempt to analyze historical events are detailed in **Chapter 3**, these measurements are not perfect comparisons to the national definitions for a cold wave and a heat wave. NRI uses these terms to describe extreme temperature.

Heat wave: a period of abnormally and uncomfortably hot and unusually humid weather typically lasting two or more days with temperatures outside the historical averages for a given area.

Cold wave: a rapid fall in temperature within 24 hours and extreme low temperatures for an extended period. The temperatures classified as a cold wave are dependent on the location and defined by the local National Weather Service (NWS) weather forecast office.

While having a national standard for temperature is important, localized conditions can create very different experiences of temperature, as discussed in the previous chapter. Additionally, changing norms in the region due to increased impervious surfaces and general trends in weather conditions can mean that heat events in particular are perceived as more critical by a given region's residents even when actual temperatures are less than in neighboring regions.

Generally, more data is needed to fully support this section. However, an initial attempt to assess impacts of extreme temperatures is included below.

### Projected Scale of Event

Generally, weather-based hazards tend to be the most boundary-crossing. However, land use and elevation vary widely throughout the planning area. Temperatures in the rural and higher elevations of Craig County, northern Botetourt County, and the Alleghany Highlands trend slightly lower than temperatures in the Roanoke Valley.

### Case Studies of Extreme Temperature Impacts

Two case studies of extreme heat and extreme cold incidents are worth looking at to guide this assessment: the heat dome in Seattle, Washington, and the cold wave in Richmond, Virginia. These are extreme events which show the scale of potential damage for this hazard should compounding factors occur. Both of these studies highlight impacts on critical infrastructure as being a compounding factor for extreme temperatures as well as other hazards. Specifically, power grids, healthcare facilities, and water utilities may be at risk from these events.

#### *Richmond, Virginia Cold Wave of 2025*

On January 6, 2025, residents across Richmond lost access to water during a cold wave that caused major failures to water infrastructure. Specifically, power was lost to the main water treatment plant. Backup battery power failed, the facility flooded and submerged critical electrical systems. There was a complete water treatment plant power outage for nearly 36 hours.<sup>13</sup> Water production was restored on January 9<sup>th</sup>, but a boil water notification was in place until January 11<sup>th</sup>. Water losses affected area hospitals and other critical facilities.

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<sup>13</sup> (HNTB Corporation, 2025)

Power failure at the water treatment plant occurred during a prolonged cold wave and concurrent winter storm event which caused power loss. An article in The Richmonder on January 1<sup>st</sup> predicted around two weeks of below average temperatures driven by a polar vortex event.<sup>14</sup>

The Interstate Commission on the Potomac River Basin modeled economic and fiscal costs of a water supply disruption in the National Capital Region. Notable economic losses from water disruption begin in as little as two hours from the event, with impacts disproportionately felt by small businesses.<sup>15</sup>

### *Seattle, Washington Heat Wave of 2021*

In the summer of 2021 Seattle, Washington experienced a heat dome event. This area of the country does not have typically hot summers – however, triple digit temperatures were recorded. The Washington Department of Health tracked 136 heat-related deaths across the state from June 26 through July 6, 2021. No planning was done for an event of that scale, because no models predicted it. Many of the care facilities in the region did not have air conditioning, making them particularly vulnerable. Power outages occurred due to the stress on the grid, and critical equipment such as imaging and laboratory equipment overheated.<sup>16</sup>

Impacts from this event were largely felt in healthcare facilities, which were already strained by COVID-19, and in the power grid. Vulnerable populations including the elderly, homeless, and those in healthcare facilities or otherwise lacking mobility to evacuate were especially impacted.

## **Projected Costs of Event**

Costs of opening shelters, mortality costs and crop damage may all be important costs to consider when assessing the costs of extreme temperature events. For example, consistent temperatures over 90 degrees reduce or halt the growth rate of most grasses used for cattle feed in this region, increasing costs of meat production for farmers and reducing their margins. Higher temperatures result in increased energy costs for home owners, and higher demand on the grid can have complicating factors for utility service providers. These costs are hard to quantify in assessing the impacts of this hazard.

**Table 21: Expected Annual Loss for Cold Wave, NRI**

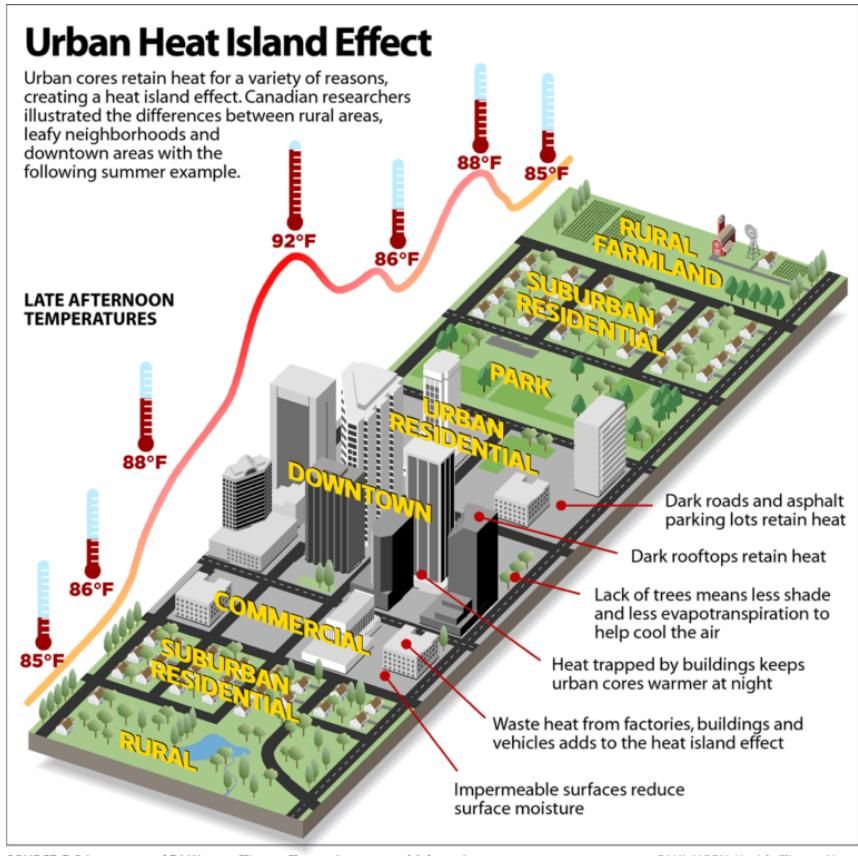
| Locality          | Expected Annual Loss | Exposure Value      |
|-------------------|----------------------|---------------------|
| Alleghany County  | \$42,546             | \$179,478,356,906   |
| City of Covington | \$9,600              | \$67,930,487,195    |
| Botetourt County  | \$36,708             | \$394,929,053,010   |
| Craig County      | \$8,338              | \$57,558,866,073    |
| Roanoke County    | \$65,026             | \$1,141,152,733,759 |
| City of Roanoke   | \$100,139            | \$1,181,121,995,799 |
| City of Salem     | \$25,405             | \$300,396,106,588   |

<sup>14</sup> (Sublette, 2025)

<sup>15</sup> (Tonya E. Thornton, 2024)

<sup>16</sup> (ASPR TRACIE, 2023)

This hazard is one of the main hazards for which shelters are regularly opened in the planning region. Shelters serve as heating and cooling centers when other weather events cause power outages, or simply when temperatures become extreme enough that those without reliable shelter have need. Further plan iterations should seek to quantify the cost of opening shelters for extreme heat and extreme cold to close the gap in national data, as well as the cost of illness and mortality in the housing insecure via coordination with EMS staff, local area hospitals, and local area homeless shelters.



**Figure 25: Urban Heat Island Effect, City of Roanoke**

## Projected Frequency of Event

Annual average of extreme heat and extreme cold historically are discussed in Chapter 3, with 32 extreme heat days and 5 extreme cold days by definitions used in that chapter. Annual frequency by that definition is multiple times per year. NRI data which is based off of different definitions, contests this. The annualized frequency value for cold waves remains low in the region, at between 0.1 and 0.3 events per year.

No annualized frequency data is available for heat wave in the planning region. However, heat waves occur and multiple heat advisories were issued in the region during the writing of this plan.

**Table 22: Annualized Frequency of Cold Waves, NRI**

| Locality          | Annualized Value | Frequency |
|-------------------|------------------|-----------|
| Alleghany County  | 0.3              |           |
| City of Covington | 0.3              |           |
| Botetourt County  | 0.1              |           |
| Craig County      | 0.3              |           |
| Roanoke County    | 0.1              |           |
| City of Roanoke   | 0.1              |           |
| City of Salem     | 0.1              |           |

The City of Roanoke conducted urban heat island mapping to capture the risks of extreme heat within this locality. Mapping from this study recorded a variation in temperature of up to 15 degrees Fahrenheit across the City, with temperatures highest in downtown and low-income neighborhoods. Late evening temperatures of greater than 89 degrees were observed in these areas.

## Projected Local Vulnerability

Factors that can increase vulnerability to extreme temperature include the weatherization rate of buildings, impervious surfaces ratios, and age of residents. For very few other hazards is social vulnerability, including factors of age, health and well-being, and poverty, such a key marker of risk. For this reason, social vulnerability numbers from the NRI are a key indicator of local vulnerability for this hazard.

**Table 23: Social Vulnerability, NRI**

| Locality          | Social Vulnerability |
|-------------------|----------------------|
| Alleghany County  | Relatively Low       |
| City of Covington | Very Low             |
| Botetourt County  | Very Low             |
| Craig County      | Very Low             |
| Roanoke County    | Very Low             |
| City of Roanoke   | Very High            |
| City of Salem     | Relatively Low       |

## Hazard Ranking Table

Table 24: Hazard Ranking for Extreme Temperature

| Hazard Ranking              |                            |                 |                    |                           |               |
|-----------------------------|----------------------------|-----------------|--------------------|---------------------------|---------------|
| Table: Extreme Temperatures |                            |                 |                    |                           |               |
| Locality                    | Scale of Event             | Costs per Annum | Frequency of Event | Local Vulnerability Score | Overall Score |
| Alleghany County            | Region-Wide Effects        | Medium          | Less than Annual   | Medium                    | Medium        |
| City of Covington           | Region-Wide Effects        | Low             | Less than Annual   | Low                       | Low           |
| Town of Clifton Forge       | Region-Wide Effects        | Low             | Less than Annual   | Low                       | Low           |
| Town of Iron Gate           | Region-Wide Effects        | Low             | Less than Annual   | Low                       | Low           |
| Craig County                | Region-Wide Effects        | Low             | Less than Annual   | Low                       | Low           |
| Town of New Castle          | Region-Wide Effects        | Low             | Less than Annual   | Low                       | Low           |
| Botetourt County            | Region-Wide Effects        | Medium          | Less than Annual   | Low                       | Medium        |
| Town of Buchanan            | Region-Wide Effects        | Medium          | Less than Annual   | Low                       | Medium        |
| Town of Fincastle           | Region-Wide Effects        | Medium          | Less than Annual   | Low                       | Medium        |
| Town of Troutville          | Region-Wide Effects        | Medium          | Less than Annual   | Low                       | Medium        |
| Roanoke County              | Region-Wide Effects        | Medium          | Annual             | Low                       | Medium        |
| Town of Vinton              | Region-Wide Effects        | Medium          | Annual             | Low                       | Medium        |
| City of Roanoke             | Region-Wide Effects        | Medium          | Annual             | High                      | High          |
| City of Salem               | Region-Wide Effects        | Low             | Annual             | Medium                    | Medium        |
| <i>Regional Score</i>       | <i>Region-Wide Effects</i> | <i>Medium</i>   | <i>Annual</i>      | <i>Low</i>                | <i>Medium</i> |

## 4.4 Flooding

Flooding is one of the most impacting hazards to the region. All of the jurisdictions and special districts within this plan have to deal directly with flooding on at least an annual basis. The HAZUS model for flooding in the region includes a 100-year and 500-year model. All reports are located in **Appendix D**. Flood Hazard Areas are also mapped in **Appendix D**.

There are two types of flooding of concern in the region. Riverine flooding is most common. Most of the data in this chapter will focus on riverine flooding. Flooding due to failed infrastructure is also an issue across the planning region, specifically failure of culverts and other stormwater detention or diversion infrastructure, and failure of dams.

Stormwater infrastructure failure is an issue in some localities, most commonly in more urbanized areas including in the Cities of Covington, Roanoke, and Salem. Infrastructure typically fails when not designed to transmit the volume of water produced by a given precipitation event. Culverts, which allow stormwater to pass under roads or railways, are designed for 100-year events in most cases, though some may be designed for higher flow where safety impacts are of particular concern.<sup>17</sup> Documenting failed or overwhelmed stormwater infrastructure, especially where it can directly impact critical facilities beyond roadways, is an important potential project for local governments. The City of Covington recently received funding from the Community Flood Preparedness Fund to complete their Drainage Study mentioned in Chapter 3. Resilience Plans from the City of Roanoke and the City of Salem also address this kind of flooding.

A flood prone roadway study was completed by the Regional Commission in 2005. The outcomes of the study were documented in the 2019 Plan. This study has not been updated.

One of the most common drivers of extreme precipitation events which produce flooding in the region is hurricanes. For this reason, hurricane hazards are considered included for assessment in this section. The history of hurricane events and hurricane-derived flooding is included in Chapter 3.

Several localities in the region are CRS communities. Other localities have indicated interest. Where appropriate information in this section will support this designation.

### Projected Scale of Event

The frequency of large-scale flood events is projected via the 100-year and 500-year floodplain for given parcels. The majority of flood events are more likely to be smaller, semi-local events driven by precipitation.

Because riverine flooding specifically is tied to streams which flow through multiple localities, a flood in a specific watershed also usually affects multiple localities in the planning region. For example, a flood of the Roanoke River would affect Roanoke County, the City of Salem, the City of Roanoke, and the Town of Vinton to varying degrees. Similarly, a flood event on the James River could affect Botetourt County and the Town of Buchanan, or, if the entire Upper James watershed is impacted, the Alleghany Highlands localities. Flooding is largely driven by precipitation. Changes in precipitation patterns in the region have resulted in stronger individual precipitation events over the last several years, which increase flooding impacts.

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<sup>17</sup> (Virginia Department of Transportation, 2002)

As discussed in [Chapter 3: Hazard Identification](#), multiple high hazard dams exist in the region. Specific known structural vulnerabilities and safety incidents are documented in that chapter. Although flood inundation maps are a requirement of the current Impounding Structure Regulations, Virginia DCR does not currently have this information available in a digital form. Were these maps available, they would illustrate the probable area of flooding downstream of a dam in the event of failure.

## Projected Costs of Event

For this plan, a HAZUS model was run for riverine flooding at the 100-year and 500-year thresholds. The full reports are contained in [Appendix D: Flooding HAZUS Reports](#).

**Table 25: Estimated Annual Loss for Flooding, NRI**

| Locality          | Expected Annual Loss | Exposure Value   |
|-------------------|----------------------|------------------|
| Alleghany County  | \$1,269,955          | \$16,809,384,028 |
| City of Covington | \$175,909            | \$6,391,387,076  |
| Botetourt County  | \$504,537            | \$16,236,678,289 |
| Craig County      | \$31,287             | \$3,055,738,660  |
| Roanoke County    | \$600,519            | \$26,537,346,445 |
| City of Roanoke   | \$752,345            | \$38,605,696,944 |
| City of Salem     | \$621,251            | \$34,391,371,524 |

While the estimated annual loss for flooding is already high for many localities, a 100-year flood event could have catastrophic impacts to the region. The following include possible outcomes of a 100-year flood event. An event is unlikely to occur across the entire region at the same time, as multiple watersheds are represented. However, as Hurricane Helene showed in western North Carolina, this is not an impossible scenario.

- Damage to Roanoke Memorial hospital resulting in the loss of 703 beds in the region.
- 11,401 people living in the region displaced; 1,632 people requiring temporary shelter.
- Significant damage to transportation systems across the region.
- Damage to water and wastewater systems in Alleghany County and City of Salem, and damage to wastewater systems in Botetourt, Covington, Craig, and Roanoke County and the City of Roanoke.
- Damage to public schools in Covington, Craig, and Salem.
- Damage to two emergency operations centers and two fire stations in Covington.
- Damage to one fire station in the Roanoke area.
- Damage to police stations in Alleghany, Covington, and the Roanoke area.

Mitigation of these facilities for a 100-year or greater flood event is a desirable outcome of this plan.

## Roanoke Valley Resource Authority

The following vulnerabilities were identified by Roanoke Valley Resource Authority staff.

- Smith Gap Landfill: The landfill is outside of the 100-year floodplain but the initial portion of the access road located off the Exit 128 of I-81 would be impacted by the 100-year flood based on current FEMA mapping.
- Tinker Creek Transfer Station: Much of this facility is located in the 100-year floodplain, though the main operations building is located outside the floodplain.
- Salem Transfer Station: This facility is located entirely in the 100-year floodplain.

## Western Virginia Water Authority

Several facilities owned and operated by the Western Virginia Water Authority are within the 100-year floodplain.

*Table 26: WVWA Facilities in the Floodplain*

| Facility                                       | Location      | Address   |
|--|---------------|---|
| Muse Spring Water Treatment Facility           | Roanoke City  | 2135 MOUNT PLEASANT BLVD SE, Roanoke, VA, 24014 |
| Roanoke Regional Wastewater Treatment Facility | Roanoke City  | 1502 Brownlee Ave, Roanoke SE, VA 24014         |
| Eagle Rock Wastewater Treatment Facility       | Botetourt Co. | 14501 Church St. Eagle Rock, VA 24085           |
| Mount Pleasant Water Pump Station              | Roanoke City  | 2135 MOUNT PLEASANT BLVD SE, Roanoke, VA, 24014 |
| 3rd Street Sewer Pump Station                  | Vinton        | Across from 804 3rd St, Vinton                  |

## **Projected Frequency of Event**

Overall frequency of flood events by locality is best assessed through the National Risk Index. A definition for the threshold of riverine flooding captured by the NRI (e.g. 2-year flood, 5-year flood, etc.) was not readily available. However, more frequent flood events do directly impact operations for many localities in the region, specifically outdoor recreation operations and roadways.

*Table 27: Annualized Frequency for Flooding, NRI*

| Locality          | Annualized Frequency Value (Events per Year) |
|-------------------|--|
| Alleghany County  | 1.1  |
| City of Covington | 0.3  |
| Botetourt County  | 1.7  |
| Craig County      | 0.6  |
| Roanoke County    | 2.1  |
| City of Roanoke   | 1.6  |
| City of Salem     | 0.9  |

## **Projected Local Vulnerability**

One way to demonstrate specific local vulnerability is by looking at the number of repetitive loss structures in the locality. Repetitive loss structures are defined as a structure that has had two or more claims within any 10-year period since 1978 of more than \$1,000 paid by the National Flood Insurance Program (NFIP). Identifying repetitive loss structures is one of the ways to receive points in the CRS program.

As a point-to-point comparison the most effective way to assess local vulnerability would be to assess the percentage of structures that are repetitive loss structures within the locality. However, for the purposes of this plan comparison will be made between real count of structures.

**Table 28: Repetitive Loss Structures by Locality, FEMA**

| Locality                               | NFIP<br>Repetitive<br>Loss<br>Structures | NFIP<br>Serious<br>Repetitive<br>Loss<br>Structures | Federal<br>Mitigation<br>Assistance<br>Repetitive<br>Loss | Federal<br>Mitigation<br>Assistance<br>Serious<br>Repetitive<br>Loss | Primary<br>Residences |
|--|--|---|---|--|-----------------------|
| <b>ALLEGHANY COUNTY</b>                | <b>27</b>                                | <b>0</b>  | <b>1</b>  | <b>0</b>   | <b>13</b>             |
| Single Family Dwelling                 | 22                                       | 0   | 1   | 0  | 12                    |
| Single Family Residential Building     | 3  | 0   | 0   | 0  | 1                     |
| Non Residential Building               | 2  | 0   | 0   | 0  | 0                     |
| <b>BOTETOURT COUNTY</b>                | <b>28</b>                                | <b>6</b>  | <b>1</b>  | <b>6</b>   | <b>5</b>              |
| Single Family Dwelling                 | 19                                       | 3   | 1   | 3  | 5                     |
| Non Residential Building               | 8  | 2   | 0   | 2  | 0                     |
| Non Residential Building B             | 1  | 1   | 0   | 1  | 0                     |
| <b>COVINGTON CITY</b>                  | <b>5</b>                                 | <b>0</b>  | <b>0</b>  | <b>1</b>   | <b>1</b>              |
| Single Family Dwelling                 | 4  | 0   | 0   | 1  | 1                     |
| Non Residential Building               | 1  | 0   | 0   | 0  | 0                     |
| <b>CRAIG COUNTY</b>                    | <b>6</b>                                 | <b>0</b>  | <b>0</b>  | <b>1</b>   | <b>3</b>              |
| Single Family Dwelling                 | 4  | 0   | 0   | 1  | 3                     |
| Non Residential Building               | 2  | 0   | 0   | 0  | 0                     |
| <b>ROANOKE CITY</b>                    | <b>85</b>                                | <b>11</b>   | <b>2</b>  | <b>16</b>  | <b>32</b>             |
| Single Family Dwelling                 | 47                                       | 4   | 2   | 5  | 26                    |
| 2-4 Unit Residential Building          | 2  | 0   | 0   | 0  | 0                     |
| Residential Building More than 4 Units | 7  | 0   | 0   | 0  | 0                     |
| Non Residential Business               | 1  | 0   | 0   | 0  | 0                     |
| Single Family Residential Building     | 6  | 0   | 0   | 0  | 6                     |
| Non Residential Building               | 22                                       | 7   | 0   | 11   | 0                     |
| <b>ROANOKE COUNTY</b>                  | <b>41</b>                                | <b>3</b>  | <b>1</b>  | <b>5</b>   | <b>32</b>             |
| Single Family Dwelling                 | 29                                       | 1   | 1   | 3  | 23                    |
| Residential Building More than 4 Units | 1  | 0   | 0   | 0  | 0                     |
| Single Family Residential Building     | 9  | 1   | 0   | 1  | 9                     |
| Non Residential Building               | 1  | 1   | 0   | 1  | 0                     |
| Non Residential Building B             | 1  | 0   | 0   | 0  | 0                     |

| Locality                               | NFIP<br>Repetitive<br>Loss<br>Structures | NFIP<br>Serious<br>Repetitive<br>Loss<br>Structures | Federal<br>Mitigation<br>Assistance<br>Repetitive<br>Loss | Federal<br>Mitigation<br>Assistance<br>Serious<br>Repetitive<br>Loss | Primary<br>Residences |
|--|--|---|---|--|-----------------------|
| <b>SALEM CITY</b>                      | <b>90</b>                                | <b>29</b>   | <b>5</b>  | <b>35</b>  | <b>50</b>             |
| Single Family Dwelling                 | 56                                       | 9   | 4   | 15   | 41                    |
| 2-4 Unit Residential Building          | 5  | 1   | 0   | 1  | 1                     |
| Residential Building More than 4 Units | 12                                       | 12  | 0   | 12   | 0                     |
| Non Residential Business               | 2  | 2   | 0   | 2  | 0                     |
| Single Family Residential Building     | 8  | 4   | 1   | 4  | 7                     |
| Residential Manufactured Home          | 1  | 0   | 0   | 0  | 1                     |
| Non Residential Building               | 6  | 1   | 0   | 1  | 0                     |
| <b>Grand Total</b>                     | <b>282</b>                               | <b>49</b>   | <b>10</b>   | <b>64</b>  | <b>136</b>            |

## Hazard Ranking Table

Table 29: Hazard Ranking Table for Flooding

### Hazard Ranking

#### Table: Flooding

| Locality              | Scale of Event             | Costs per Annum | Frequency of Event             | Local Vulnerability Score | Overall Score |
|-----------------------|----------------------------|-----------------|--------------------------------|---------------------------|---------------|
| Alleghany County      | Region-Wide Effects        | High            | Multiple Times per Year        | Medium                    | High          |
| City of Covington     | Region-Wide Effects        | High            | Less than Annual               | Low                       | Medium        |
| Town of Clifton Forge | Region-Wide Effects        | High            | Multiple Times per Year        | Medium                    | High          |
| Town of Iron Gate     | Region-Wide Effects        | High            | Multiple Times per Year        | Medium                    | High          |
| Craig County          | Region-Wide Effects        | Medium          | Less than Annual               | Low                       | Medium        |
| Town of New Castle    | Region-Wide Effects        | Medium          | Less than Annual               | Low                       | Medium        |
| Botetourt County      | Region-Wide Effects        | High            | Multiple Times per Year        | Medium                    | High          |
| Town of Buchanan      | Region-Wide Effects        | High            | Multiple Times per Year        | Medium                    | High          |
| Town of Fincastle     | Region-Wide Effects        | High            | Multiple Times per Year        | Medium                    | High          |
| Town of Troutville    | Region-Wide Effects        | High            | Multiple Times per Year        | Medium                    | High          |
| Roanoke County        | Region-Wide Effects        | Medium          | Multiple Times per Year        | Medium                    | High          |
| Town of Vinton        | Region-Wide Effects        | Medium          | Multiple Times per Year        | Medium                    | High          |
| City of Roanoke       | Region-Wide Effects        | Medium          | Multiple Times per Year        | High                      | High          |
| City of Salem         | Region-Wide Effects        | Medium          | Annual                         | High                      | High          |
| <i>Regional Score</i> | <i>Region-Wide Effects</i> | <i>High</i>     | <i>Multiple Times per Year</i> | <i>Medium</i>             | <i>High</i>   |

## 4.5 Geologic Hazards

For the purposes of this assessment, landslide and karst have been grouped under geologic hazards. Both of these hazards include often localized sudden ground movement.

Landslide is most common in areas with high slopes, which includes much of the planning region. In Chapter 3, only one historic landslide of note was recorded in the past five years. However, the region has many characteristics which make landslides a hazard of concern.

Karst is a hazard unique to particular geologies. As such it is difficult to find national resources for assessing this hazard. Data in this section comes from the Virginia Department of Energy, Department of Conservation and Recreation, and Department of Emergency Management.

The major risk for karst areas is the development of sinkholes that directly or indirectly affect critical infrastructure. The Virginia Department of Energy began mapping karst via KarstView along the I-81 corridor following several sinkhole events that directly affected this interstate.<sup>18</sup> However, this mapping is somewhat opaque in terms of capturing likelihood of a sinkhole or potential costs.

The second impact from karst is pollution of groundwater. In the planning region, groundwater remains a major source of water supply for several localities, including the Western Virginia Water Authority service area and the Alleghany Highlands. A full list of known wells is included in the Critical Facilities Inventory in [Appendix F](#). This hazard impact is not fully explored in this plan.

Both of these hazards show a relationship with high rain events.

### Projected Scale of Event

Sinkhole events are highly localized events, usually affecting a specific facility or lot. Most landslide events are also localized, some impacting as little as one parcel. In extreme conditions, such as Hurricane Helene in Asheville, multiple landslides may occur. Sometimes landslides can build upon one another as was the case in Nelson and Albemarle Counties.

#### Case Study: Past Landslides in Nelson and Albemarle Counties

Nelson and Albemarle Counties share similar topographic characteristics to the region. In August 1969, an extreme rainfall event instigated by Hurricane Camille caused over 7,800 landslides, which created approximately 2,000 acres worth of impact. One hundred and twenty-five people died in Nelson County alone from impacts of this storm system, which included flooding and landslide impacts.<sup>19</sup> This was a similar event to Hurricane Helene, which struck western North Carolina and Southwest Virginia in September of 2024.

Geology and Mineral Services received funding through VDEM and FEMA in 2017 and 2020 to complete a landslide hazard mapping study for Nelson and Albemarle Counties. This kind of local study can have greater accuracy than national models. The events in 1969 and in 2024 highlight the importance of having good information to plan emergency response to and mitigation efforts for this hazard.

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<sup>18</sup> (Virginia Department of Energy, n.d.)

<sup>19</sup> (Landslide Hazard Mapping, n.d.)

## Projected Costs of Event

Costs of sinkholes can range depending on the location of the sinkhole. A sinkhole directly affecting a major roadway is probably one of the most costly events. Costs come from direct damage to infrastructure at inception and then include stabilization efforts for the sinkholes once established. The largest of the three sinkholes which affected I-81 in Augusta County cost over \$100,000 to repair. It measured 20 feet by 11 feet and 22 feet deep.<sup>20</sup>

Many sinkholes open up in fields and other open spaces, and therefore have limited and localized costs, if any.

Expected annual loss for landslide is available in the National Risk Index. Costs are generally low, but it is important to note that the cost of landslides varies widely depending on location. Because this is such a localized event, impacts can be quite targeted. The landslide recorded in 2021 included \$25,000 in damages from a single building. Widespread events in more populated areas could quickly accrue costs.

**Table 30: Expected Annual Loss, NRI**

| Locality          | Expected Annual Loss | Exposure Value    |
|-------------------|----------------------|-------------------|
| Alleghany County  | \$46,739             | \$140,941,177,976 |
| City of Covington | \$21,900             | \$48,638,641,691  |
| Botetourt County  | \$37,168             | \$226,916,018,449 |
| Craig County      | \$21,900             | \$38,621,453,915  |
| Roanoke County    | \$333,796            | \$653,035,188,326 |
| City of Roanoke   | \$122,400            | \$679,915,744,515 |
| City of Salem     | \$21,900             | \$198,922,958,937 |

## Projected Frequency of Event

There is no good data on the frequency of sinkholes for each separate jurisdiction. The closest comparison may be to the expected annual frequency of landslides in the area, which, despite the increased susceptibility to landslides shown in the topographic data, is relatively low.

The National Risk Index measures projected landslide frequency based off of the number of landslides recorded over a twelve-year period between 2010 and 2021. All of the localities in the region showed a projected frequency of zero landslides per year, despite some localities having events on record during that time period. The landslide noted in Chapter 3 was not captured in this dataset.

<sup>20</sup> (Virginia Department of Emergency Management, 2023)

**Table 31: Events on Record 2010-2021, NRI**

| Locality          | Events on Record (2010-2021) |
|-------------------|------------------------------|
| Alleghany County  | 1                            |
| City of Covington | 0                            |
| Botetourt County  | 1                            |
| Craig County      | 0                            |
| Roanoke County    | 5                            |
| City of Roanoke   | 0                            |
| City of Salem     | 0                            |

Despite the NRI data, the USGS Landslide Susceptibility model shows strong landslide vulnerability in the area. Darker red indicates increased vulnerability to landslides. Steep slopes mean that most of the region is vulnerable to landslides in the right conditions, though notable the more populated areas show less vulnerability.



# Regional Landslide Vulnerability

US Geologic Survey

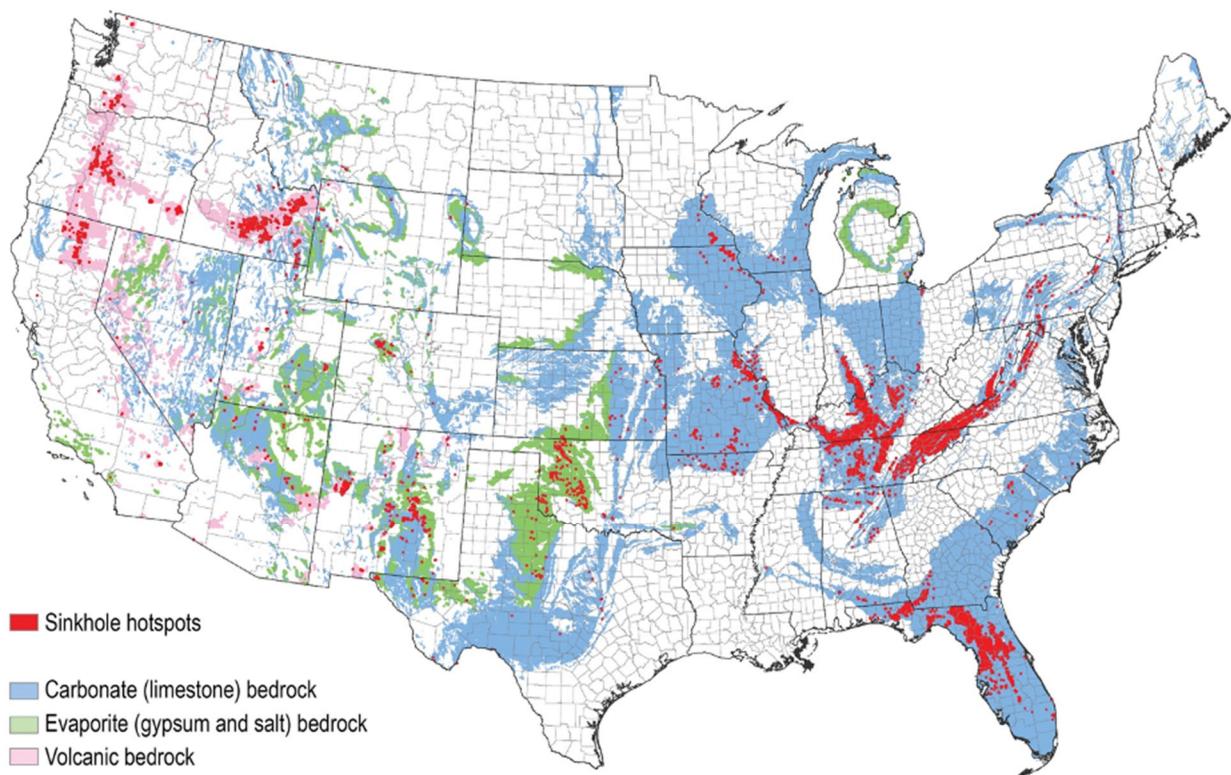


Figure 26: Landslide Susceptibility Model in the Region

## Projected Local Vulnerability

Local vulnerability to karst is poorly understood – it is unknown what factors may make a jurisdiction more or less vulnerable to karst. One potential factor for consideration is the number of households using unmonitored groundwater wells – this could show a locality specific vulnerability to this particular hazard. Alternatively, karst may be more prevalent in climates where long dry spells are followed by periods of intense rain. Further assessment is needed to understand the unique factors that predispose jurisdictions to karst damage.

A small portion of the planning region is located inside of a USGS recognized sinkhole hotspot, mostly in Craig and northern Roanoke Counties. Less populous portions of Alleghany and Botetourt Counties may also be at risk. A full definition of a sinkhole hotspot is not readily available on the USGS website.



**Figure 27: USGS Sinkhole Hotspots, Accessed 2025**

Landslides are also difficult to quantify. During Hurricane Helene, one of the complicating factors experienced by neighboring communities in North Carolina and far Southwest Virginia was landslides caused by extreme rain.

The Virginia Department of Energy recommends identifying areas prone to future landslide hazards in order to target evacuation orders during severe rainstorm events, defined as greater than 5 inches in 24 hours.

The NOAA Atlas shows projected rainfall event frequency. Rainfall data for the City of Covington, Craig County, and the City of Roanoke show that 5 inches in 24 hours is more or less a 25-year storm in Covington and Craig, but closer to a 10-year storm in the City of Roanoke. A framework

based on rainfall frequency could be a valid way to assess potential landslide risk in future updates of this plan.

Projected Local Vulnerability for this hazard is determined by a visual assessment of the landslide and karst vulnerability map. However, future projections around this hazard should take into account more advanced analysis of vulnerability to landslides via GIS manipulation and analysis of rainfall probability as a major determinant of likelihood of landslides.

## Hazard Ranking Table

Table 32: Hazard Ranking for Geologic Hazards

| Hazard Ranking Table: | Geologic Hazards | Locality | Scale of Event   | Costs per Annum | Frequency of Event | Local Vulnerability Score | Overall Score |
|-----------------------|------------------|----------|------------------|-----------------|--------------------|---------------------------|---------------|
| Alleghany County      | Local Effects    | High     | Less than Annual | High            | Medium             |                           |               |
| City of Covington     | Local Effects    | Low      | Less than Annual | Low             | Low                |                           |               |
| Town of Clifton Forge | Local Effects    | Low      | Less than Annual | Low             | Low                |                           |               |
| Town of Iron Gate     | Local Effects    | Low      | Less than Annual | Low             | Low                |                           |               |
| Craig County          | Local Effects    | Low      | Less than Annual | High            | Low                |                           |               |
| Town of New Castle    | Local Effects    | Low      | Less than Annual | Medium          | Low                |                           |               |
| Botetourt County      | Local Effects    | Low      | Less than Annual | Medium          | Low                |                           |               |
| Town of Buchanan      | Local Effects    | Low      | Less than Annual | Low             | Low                |                           |               |
| Town of Fincastle     | Local Effects    | Low      | Less than Annual | Low             | Low                |                           |               |
| Town of Troutville    | Local Effects    | Low      | Less than Annual | Low             | Low                |                           |               |
| Roanoke County        | Local Effects    | Medium   | Less than Annual | High            | Medium             |                           |               |
| Town of Vinton        | Local Effects    | Low      | Less than Annual | Low             | Low                |                           |               |
| City of Roanoke       | Local Effects    | Low      | Less than Annual | Low             | Low                |                           |               |
| City of Salem         | Local Effects    | Low      | Less than Annual | Low             | Low                |                           |               |
| Regional Score        | Local Effects    | Low      | Less than Annual | Low             | Low                |                           |               |

## 4.6 Wildfire

Wildfire risk analysis benefits from some of the most robust data available. Data in this section comes from the National Risk Index to establish easy points of comparison for risk ranking, and from the Southern Wildfire Risk Assessment tool. Assistance was provided by VDOF staff in gathering the data for this section. The entire regional report for wildfire risk is available in [Appendix E: Wildfire Reports](#).

### Projected Scale of Event

The VDOF and the Southern Wildfire Risk Assessment tool provides a Characteristic Fire Intensity Scale, which uses data on significant fuel hazards, wind, and weather conditions in a WildEST framework to provide a standard scale to measure potential wildfire intensity.

|       |   |      |           |
|-------|---|------|-----------|
| Class | 1,  | Very | Low:      |
|       | Very small, discontinuous flames, usually less than 1 foot in length; very low rate of spread; no spotting. Fires are typically easy to suppress by firefighters with basic training and non-specialized equipment.   |      |           |
| Class | 2,  |      | Low:      |
|       | Small flames, usually less than two feet long; small amount of very short range spotting possible. Fires are easy to suppress by trained firefighters with protective equipment and specialized tools.  |      |           |
| Class | 3,  |      | Moderate: |
|       | Flames up to 9 feet in length; short-range spotting is possible. Trained firefighters will find these fires difficult to suppress without support from aircraft or engines, but dozer and plows are generally effective. Increasing potential for harm or damage to life and property.    |      |           |
| Class | 4,  |      | High:     |
|       | Large Flames, up to 40 feet in length; short-range spotting common; medium range spotting possible. Direct attack by trained firefighters, engines, and dozers is generally ineffective, indirect attack may be effective. Significant potential for harm or damage to life and property. |      |           |
| Class | 5,  | Very | High:     |
|       | Flames exceeding 200 feet in length; expect extreme fire behavior   |      |           |

**Figure 28: Characteristic Fire Intensity Scale, VDOF**

This evaluation varies by locality. Data is available for Clifton Forge in this model.

**Table 33: Characteristic Fire Intensity, VDOF**

|                | Alleghany County |            | City of Covington |            | Clifton Forge |            | Botetourt County |            |
|----------------|------------------|------------|-------------------|------------|---------------|------------|------------------|------------|
| Scale Category | Acreage          | Percentage | Acreage           | Percentage | Acreage       | Percentage | Acreage          | Percentage |
| 0              | 12,813           | 4%         | 1,887             | 52%        | 930           | 47%        | 28,661           | 8%         |
| 1              | 8,755            | 3%         | 308               | 8%         | 233           | 12%        | 10,930           | 3%         |
| 1.5            | 19,694           | 7%         | 218               | 6%         | 67            | 3%         | 35,497           | 10%        |
| 2              | 77,686           | 27%        | 422               | 12%        | 277           | 14%        | 84,988           | 24%        |
| 2.5            | 117,072          | 41%        | 480               | 13%        | 368           | 19%        | 102,757          | 29%        |
| 3              | 33,840           | 12%        | 185               | 5%         | 31            | 2%         | 65,435           | 19%        |
| 3.5            | 7,383            | 3%         | 117               | 3%         | 28            | 1%         | 11,030           | 3%         |
| 4              | 6,119            | 2%         | 12                | 0%         | 41            | 2%         | 7,634            | 2%         |
| 4.5            | 1,858            | 1%         | 2                 | 0%         | 8             | 0%         | 2,433            | 1%         |
| 5              | 8                | 0%         | 0                 | 0%         | 0             | 0%         | 37               | 0%         |
| Greater than 5 | -                | 0%         | 0                 | 0%         | 0             | 0%         | 0                | 0%         |
| Total Acreage  | 285,227          |            | 3,630             |            | 1,981         |            | 349,400          |            |

|                | Craig County |            | Roanoke County |            | City of Roanoke |            | City of Salem |            |
|----------------|--------------|------------|----------------|------------|-----------------|------------|---------------|------------|
| Scale Category | Acreage      | Percentage | Acreage        | Percentage | Acreage         | Percentage | Acreage       | Percentage |
| 0              | 8,381        | 4%         | 27,374         | 17%        | 21,475          | 78%        | 7,134         | 76%        |
| 1              | 4,872        | 2%         | 8,320          | 5%         | 2,080           | 8%         | 859           | 9%         |
| 1.5            | 10,334       | 5%         | 10,114         | 6%         | 291             | 1%         | 164           | 2%         |
| 2              | 48,606       | 23%        | 32,438         | 20%        | 1,352           | 5%         | 566           | 6%         |
| 2.5            | 90,580       | 43%        | 52,508         | 33%        | 1,363           | 5%         | 360           | 4%         |
| 3              | 34,794       | 16%        | 19,715         | 12%        | 817             | 3%         | 217           | 2%         |
| 3.5            | 6,349        | 3%         | 4,895          | 3%         | 38              | 0%         | 11            | 0%         |
| 4              | 4,759        | 2%         | 2,066          | 1%         | 33              | 0%         | 23            | 0%         |
| 4.5            | 2,778        | 1%         | 2,884          | 2%         | 15              | 0%         | 2             | 0%         |
| 5              | 144          | 0%         | 355            | 0%         | 0               | 0%         | 0             | 0%         |
| Greater than 5 | 0            | 0%         | 0              | 0%         | 0               | 0%         | 0             | 0%         |
| Total Acreage  | 211,596      |            | 160,668        |            | 27,464          |            | 9,337         |            |

## Projected Costs of Event

Expected Annual Loss and Exposure Value are not particularly high for this hazard. However, some context is missing from the NRI data.

*Table 34: Expected Annual Loss for Wildfire, National Risk Index*

| Locality          | Expected Annual Loss | Exposure Value   |
|-------------------|----------------------|------------------|
| Alleghany County  | \$2,536              | \$3,900,729,935  |
| City of Covington | \$194                | \$1,969,158,111  |
| Botetourt County  | \$8,737              | \$10,057,952,335 |
| Craig County      | \$784                | \$1,237,584,666  |
| Roanoke County    | \$4,347              | \$62,863,692,940 |
| City of Roanoke   | \$3,671              | \$62,717,344,368 |
| City of Salem     | \$1,285              | \$17,697,712,831 |

Roanoke County Fire & Rescue (RCFRD) has demonstrated a substantial financial commitment to wildland fire protection, ensuring the community is safeguarded against the growing risks of brush and wildland-urban interface fires. The County's Wildland Fire Team responds to approximately 80 calls for service annually, deploying 33 specially trained personnel in wildland fire suppression. This capability is supported by a dedicated fleet of eight brush trucks, one Wildland Fire Engine, and one deployable trailer equipped with specialized resources. In addition to serving local needs, Roanoke County maintains a Memorandum of Understanding (MOU) with the Federal Forestry Department, enabling the department to provide mutual aid on federal property within the County and to deploy trained personnel and assets to assist in wildfire suppression efforts in other states. This dual capability reflects both a strong local investment and a regional commitment to public safety, resource protection, and interagency cooperation.

## Projected Frequency of Event

The NRI Annualized Frequency Value for this hazard is low throughout the planning region. It is important to note that while wildfires do occur frequently in the planning region, the majority of fires are small, with negligible risk and impact. The threshold for a major fire cited in **Chapter 3** is 100 acres. One major fire has occurred in Roanoke County in the past five years, which implies a 20 percent chance of a major fire in a given five-year period. More data is needed to assess, but the frequency value for Roanoke County's assessment was adjusted up in the risk assessment.

**Table 35: Annualized Frequency Value for Wildfire, NRI**

| Locality          | Annualized Frequency Value (%) |
|-------------------|--------------------------------|
| Alleghany County  | 0.027                          |
| City of Covington | 0.001                          |
| Botetourt County  | 0.047                          |
| Craig County      | 0.008                          |
| Roanoke County    | 0.002                          |
| City of Roanoke   | 0.001                          |
| City of Salem     | 0.001                          |

## Projected Local Vulnerability

Housing Unit Risk represents the relative potential risk to housing units. This allows for an estimate of how many housing units are at a high risk of wildfire damage. This metric is used to estimate the acreage at a risk of 4 to 6 within each of the available localities for, and that percentage value is ranked as high, medium, or low in the vulnerability table.

Another factor that may affect local vulnerability is the percentage of federal forest land and the topography. Rural areas of Roanoke County, Craig County, and Alleghany County are federally managed. Local vulnerability has been adjusted to account for that factor.

**Table 36: Housing Unit Risk, Virginia Department of Forestry**

| Alleghany County           |                | City of Covington |              | Clifton Forge |             | Botetourt County |                |            |
|----------------------------|----------------|-------------------|--------------|---------------|-------------|------------------|----------------|------------|
| Risk Ranking               | Acreage        | Percentage        | Acreage      | Percentage    | Acreage     | Percentage       | Acreage        | Percentage |
| 1                          | 2              | 0%                | 0            | 0%            | 0           | 0%               | 6              | 0%         |
| 2                          | 180            | 0%                | 21           | 1%            | 4           | 0%               | 312            | 0%         |
| 3                          | 11,411         | 4%                | 430          | 12%           | 149         | 7%               | 30,108         | 9%         |
| 4                          | 33,308         | 12%               | 1,617        | 45%           | 832         | 42%              | 75,424         | 22%        |
| 5                          | 5,820          | 2%                | 761          | 21%           | 683         | 34%              | 7,258          | 2%         |
| 6                          | -              | 0%                | 0            | 0%            | 12          | 1%               | 0              | 0%         |
| Total Acreage              | 285,227        |                   | 3,630        |               | 1,981       |                  | 349,400        |            |
| <b>No Risk</b>             | <b>234,506</b> | <b>82%</b>        | <b>801</b>   | <b>22%</b>    | <b>301</b>  | <b>15%</b>       | <b>236,293</b> | <b>68%</b> |
| <b>Risk Greater than 4</b> | <b>39,128</b>  | <b>14%</b>        | <b>2,378</b> | <b>34%</b>    | <b>1527</b> | <b>77%</b>       | <b>82,682</b>  | <b>24%</b> |

| Craig County               |                | Roanoke County |               | City of Roanoke |               | City of Salem |              |            |
|----------------------------|----------------|----------------|---------------|-----------------|---------------|---------------|--------------|------------|
| Risk Ranking               | Acreage        | Percentage     | Acreage       | Percentage      | Acreage       | Percentage    | Acreage      | Percentage |
| 1                          | 0              | 0%             | 42            | 0%              | 322           | 1%            | 116          | 1%         |
| 2                          | 5              | 0%             | 495           | 0%              | 857           | 3%            | 498          | 5%         |
| 3                          | 16,588         | 8%             | 15,771        | 10%             | 5,165         | 19%           | 2,592        | 28%        |
| 4                          | 23,711         | 11%            | 59,729        | 37%             | 7,527         | 27%           | 4,543        | 49%        |
| 5                          | 686            | 0%             | 9,941         | 6%              | 1,794         | 7%            | 595          | 6%         |
| 6                          | 0              | 0%             | 17            | 0%              | 1             | 0%            | 0            | 0%         |
| Total Acreage              | 211,596        |                | 160,668       |                 | 27,464        |               | 9,337        |            |
| <b>No Risk</b>             | <b>170,607</b> | <b>81%</b>     | <b>74,673</b> | <b>46%</b>      | <b>11,798</b> | <b>43%</b>    | <b>993</b>   | <b>11%</b> |
| <b>Risk Greater than 4</b> | <b>24,397</b>  | <b>12%</b>     | <b>69,687</b> | <b>43%</b>      | <b>9,322</b>  | <b>34%</b>    | <b>5,138</b> | <b>55%</b> |

## Hazard Ranking Table

Table 37: Hazard Ranking Table for Wildfire

| Hazard Ranking Table: | Wildfire                  |                 |                    |                           |               |
|-----------------------|---------------------------|-----------------|--------------------|---------------------------|---------------|
| Locality              | Scale of Event            | Costs per Annum | Frequency of Event | Local Vulnerability Score | Overall Score |
| Alleghany County      | Jurisdiction-Wide Effects | Low             | Less than Annual   | High                      | Medium        |
| City of Covington     | Jurisdiction-Wide Effects | Low             | Less than Annual   | Medium                    | Low           |
| Town of Clifton Forge | Jurisdiction-Wide Effects | Low             | Less than Annual   | High                      | Medium        |
| Town of Iron Gate     | Jurisdiction-Wide Effects | Low             | Less than Annual   | High                      | Medium        |
| Craig County          | Jurisdiction-Wide Effects | Low             | Less than Annual   | Medium                    | Low           |
| Town of New Castle    | Jurisdiction-Wide Effects | Low             | Less than Annual   | Medium                    | Low           |
| Botetourt County      | Jurisdiction-Wide Effects | Low             | Less than Annual   | Medium                    | Low           |
| Town of Buchanan      | Jurisdiction-Wide Effects | Low             | Less than Annual   | Medium                    | Low           |
| Town of Fincastle     | Jurisdiction-Wide Effects | Low             | Less than Annual   | Medium                    | Low           |
| Town of Troutville    | Jurisdiction-Wide Effects | Low             | Less than Annual   | Medium                    | Low           |
| Roanoke County        | Jurisdiction-Wide Effects | High            | Annual             | High                      | High          |
| Town of Vinton        | Jurisdiction-Wide Effects | Low             | Less than Annual   | Medium                    | Low           |
| City of Roanoke       | Local Effects             | Low             | Less than Annual   | Medium                    | Low           |
| City of Salem         | Local Effects             | Low             | Less than Annual   | Medium                    | Low           |
| Regional Score        | Jurisdiction-Wide Effects | Low             | Less than Annual   | Medium                    | Low           |

## 4.7 Wind Event

Wind events are one of the most frequent hazards in the planning region. They can also be costly. This section looks at data from the National Risk Index, National Centers for Environmental Information, and other sources to evaluate risk of wind events including straight line winds and tornados.

One major cause of extreme wind in the region is hurricanes. Effects from hurricanes generally spawn straight line winds, but may occasionally spawn tornado winds.

### Projected Scale of Event

Generally, the majority of events experience in the region are straight line winds. Wind events often spawn from bands of storm cells which cut across the region. Most wind events are multi-jurisdictional within a given 24-hour period, though individual impacts are usually most localized.

### Projected Costs of Event

Costs for wind events can vary greatly. In Chapter 3, one of the most expensive wind events documented, an F1 tornado which damaged a local business, resulted in over a million dollars of damages. However, the majority of wind event records in the past five years do not contain damage estimates. In fact only eight percent of the records in the NCEI database for the planning region contained damage estimates. The average cost across events with recorded damages was \$112,906, but the average across all wind events was only \$10,640. This makes it difficult to estimate the probable economic impact of a given event for the region.

The National Risk Index tracks two wind event categories relevant to this hazard (excluding hurricanes, which also spawn wind damages). The Expected Annual Loss for Strong Wind and Tornado are included in the table below.

*Table 38: Expected Annual Loss for Wind Events, NRI*

| Locality          | Expected Annual Loss - Strong Wind | Expected Annual Loss - Tornado |
|-------------------|------------------------------------|--------------------------------|
| Alleghany County  | \$ 172,445.00                      | \$ 45,378.00                   |
| City of Covington | \$ 110,402.00                      | \$ 20,258.00                   |
| Botetourt County  | \$ 361,702.00                      | \$ 106,201.00                  |
| Craig County      | \$ 84,036.00                       | \$ 14,927.00                   |
| Roanoke County    | \$ 1,018,060.00                    | \$ 352,206.00                  |
| City of Roanoke   | \$ 1,043,952.00                    | \$ 409,594.00                  |
| City of Salem     | \$ 344,362.00                      | \$ 114,772.00                  |

### Projected Frequency of Event

Wind events occur more than annually around the region. The highest number of occurrences are projected in the Roanoke Valley, which includes the City of Roanoke, City of Salem, Roanoke County, and the Town of Vinton.

**Table 39: Annualized Frequency Value for Wind Events, NRI**

| Locality          | Events per Year                          |                                      |
|-------------------|--|--------------------------------------|
|                   | Annualized Frequency Value - Strong Wind | Annualized Frequency Value - Tornado |
| Alleghany County  | 2.3                                      | 0.1                                  |
| City of Covington | 2.5                                      | 0                                    |
| Botetourt County  | 2.7                                      | 0.1                                  |
| Craig County      | 2.6                                      | 0                                    |
| Roanoke County    | 3.4                                      | 0                                    |
| City of Roanoke   | 3.4                                      | 0                                    |
| City of Salem     | 3.4                                      | 0                                    |

## Projected Local Vulnerability

Wind events can compound other hazards, including winter weather and extreme cold. Wind is often a primary factor in power loss following storm events, as strong winds blow down trees and impact powerlines. Power lines are generally privately owned and maintained. Strong winds can also negatively affect RVs and other outdoor recreation users, who can be particularly vulnerable in an event. Further analysis is needed to develop specific nuance in local vulnerability. One potential factor for further development is topography.

## Hazard Ranking Table

Table 40: Hazard Ranking for Wind Events

### Hazard Ranking

Table: Wind Event

| Locality              | Scale of Event                   | Costs per Annum | Frequency of Event             | Local Vulnerability Score | Overall Score |
|-----------------------|----------------------------------|-----------------|--------------------------------|---------------------------|---------------|
| Alleghany County      | Jurisdiction-Wide Effects        | High            | Multiple Times per Year        | To be developed           | High          |
| City of Covington     | Jurisdiction-Wide Effects        | High            | Multiple Times per Year        | To be developed           | High          |
| Town of Clifton Forge | Jurisdiction-Wide Effects        | High            | Multiple Times per Year        | To be developed           | High          |
| Town of Iron Gate     | Jurisdiction-Wide Effects        | High            | Multiple Times per Year        | To be developed           | High          |
| Craig County          | Jurisdiction-Wide Effects        | High            | Multiple Times per Year        | To be developed           | High          |
| Town of New Castle    | Jurisdiction-Wide Effects        | High            | Multiple Times per Year        | To be developed           | High          |
| Botetourt County      | Jurisdiction-Wide Effects        | High            | Multiple Times per Year        | To be developed           | High          |
| Town of Buchanan      | Jurisdiction-Wide Effects        | High            | Multiple Times per Year        | To be developed           | High          |
| Town of Fincastle     | Jurisdiction-Wide Effects        | High            | Multiple Times per Year        | To be developed           | High          |
| Town of Troutville    | Jurisdiction-Wide Effects        | High            | Multiple Times per Year        | To be developed           | High          |
| Roanoke County        | Jurisdiction-Wide Effects        | Medium          | Multiple Times per Year        | To be developed           | High          |
| Town of Vinton        | Jurisdiction-Wide Effects        | Medium          | Multiple Times per Year        | To be developed           | High          |
| City of Roanoke       | Jurisdiction-Wide Effects        | Medium          | Multiple Times per Year        | To be developed           | High          |
| City of Salem         | Jurisdiction-Wide Effects        | Medium          | Multiple Times per Year        | To be developed           | High          |
| <i>Regional Score</i> | <i>Jurisdiction-Wide Effects</i> | <i>High</i>     | <i>Multiple Times per Year</i> | <i>To be developed</i>    | <i>High</i>   |

## 4.8 Winter Storm

Winter storm is another frequent hazard in the area. Localities and the Virginia Department of Transportation spend money every winter preparing the transportation network for winter storm events and ice and snow accumulation. These events also impact powerlines and the electrical grid, similar to wind events and extreme cold. The National Risk Index includes two event types of relevance: ice storm, a freezing rain event with significant ice accumulations of .25 inches or greater; and winter weather, which includes winter storm events in which the main types of precipitation are snow, sleet, or freezing rain.

### Projected Scale of Event

As discussed in Chapter 3, events are generally wide-spread and affect multiple jurisdictions. While effects may vary across the jurisdictions, winter storms are generally a region-wide event.

### Projected Costs of Event

Generally, expected annual loss is higher for winter weather generally than for ice storms specifically, which makes sense given the relative frequency of these events. However, NRI numbers for Craig County are reversed. This may reflect an inaccuracy in the national database. The higher value will be used in ranking this element of the hazard impact.

**Table 41: Costs of a Winter Weather Event**

| Locality          | Expected Annual Loss - Winter Weather | Expected Annual Loss - Ice Storm |
|-------------------|---------------------------------------|----------------------------------|
| Alleghany County  | \$ 11,190.00                          | \$ 1,819.00                      |
| City of Covington | \$ 6,372.00                           | \$ 3,081.00                      |
| Botetourt County  | \$ 19,959.00                          | \$ 6,391.00                      |
| Craig County      | \$ 3,092.00                           | \$ 20,097.00                     |
| Roanoke County    | \$ 103,699.00                         | \$ 2,120.00                      |
| City of Roanoke   | \$ 135,292.00                         | \$ 20,524.00                     |
| City of Salem     | \$ 37,482.00                          | \$ 6,921.00                      |

## Projected Frequency of Event

Winter storms occur frequently, several times a year. Ice storms with greater than .25 inches of accumulation are less frequent but still occur at least every other year across the planning region, more frequently than many other hazards.

| Locality          | Annualized Frequency Value - Winter Weather | Annualized Frequency Value - Ice Storm |
|-------------------|---|--|
| Alleghany County  | 3.8   | 0.5                                    |
| City of Covington | 3.8   | 0.5                                    |
| Botetourt County  | 3.5   | 0.6                                    |
| Craig County      | 3.3   | 0.5                                    |
| Roanoke County    | 3.4   | 0.6                                    |
| City of Roanoke   | 3.4   | 0.6                                    |
| City of Salem     | 2.4   | 0.6                                    |

## Projected Local Vulnerability

Some localities specifically maintain their roads and winter storm response vehicles. Others are dependent on the Virginia Department of Transportation. Extensive roadway mileage in rural areas combined with topography challenges mean that rural localities are much more sensitive to winter storm events. Accumulations are generally higher, and roadways are generally impacted longer, especially non-arterial feeder roads.

For the purposes of this assessment, the factor assessed will be limited to roadway mileage. However, alternative factors for evaluation to include in future plans may include average precipitation accumulation per event, cost of transit interruptions, or cost of roadway maintenance. Data for mileage was taken from the 2024 VDOT Mileage Table Book. Localities with an asterisk maintain their own roads in whole or in part.

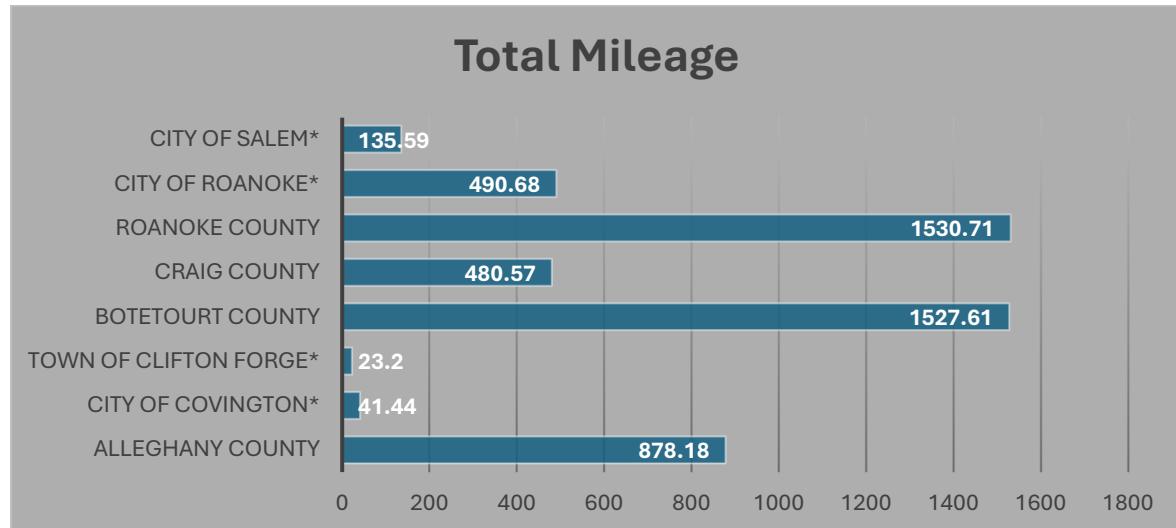


Figure 29: Total Mileage by Locality in 2024, VDOT<sup>21</sup>

<sup>21</sup> (Virginia Department of Transportation, 2024)

## Hazard Ranking Table

Table 42: Hazard Ranking for Winter Storm

### Hazard Ranking

Table: Winter Storm

| Locality              | Scale of Event                   | Costs per Annum | Frequency of Event             | Local Vulnerability Score | Overall Score |
|-----------------------|----------------------------------|-----------------|--------------------------------|---------------------------|---------------|
| Alleghany County      | Jurisdiction-Wide Effects        | Low             | Multiple Times per Year        | High                      | Medium        |
| City of Covington     | Jurisdiction-Wide Effects        | Low             | Multiple Times per Year        | Low                       | Medium        |
| Town of Clifton Forge | Jurisdiction-Wide Effects        | Low             | Multiple Times per Year        | Low                       | Medium        |
| Town of Iron Gate     | Jurisdiction-Wide Effects        | Low             | Multiple Times per Year        | Low                       | Medium        |
| Craig County          | Jurisdiction-Wide Effects        | Low             | Multiple Times per Year        | Medium                    | Medium        |
| Town of New Castle    | Jurisdiction-Wide Effects        | Low             | Multiple Times per Year        | Low                       | Medium        |
| Botetourt County      | Jurisdiction-Wide Effects        | Low             | Multiple Times per Year        | High                      | Medium        |
| Town of Buchanan      | Jurisdiction-Wide Effects        | Low             | Multiple Times per Year        | Low                       | Medium        |
| Town of Fincastle     | Jurisdiction-Wide Effects        | Low             | Multiple Times per Year        | Low                       | Medium        |
| Town of Troutville    | Jurisdiction-Wide Effects        | Low             | Multiple Times per Year        | Low                       | Medium        |
| Roanoke County        | Jurisdiction-Wide Effects        | Low             | Multiple Times per Year        | High                      | Medium        |
| Town of Vinton        | Jurisdiction-Wide Effects        | Low             | Multiple Times per Year        | Low                       | Medium        |
| City of Roanoke       | Jurisdiction-Wide Effects        | Low             | Multiple Times per Year        | Medium                    | Medium        |
| City of Salem         | Jurisdiction-Wide Effects        | Low             | Multiple Times per Year        | Low                       | Medium        |
| <i>Regional Score</i> | <i>Jurisdiction-Wide Effects</i> | <i>Low</i>      | <i>Multiple Times per Year</i> | <i>Low</i>                | <i>Medium</i> |

# Chapter 5. Capabilities Assessment

## 5.1 Capability Assessment Framework

While [Chapter 2: Regional Profile](#) contains a general picture of the region, including of the local jurisdictions served by this document, this chapter will build on that baseline information. The following sections contain a more detailed analysis of the capacity of each of the jurisdictions in this planning effort.

Each section will include the following elements:

- A general assessment of budget and resources, including staffing.
- A list of plans the jurisdiction has or maintains, when they were last updated if that information is available, and which of these plans address hazards.
- A list of ordinances and policy mechanisms which can be used to assist with implementation of the Hazard Mitigation Plan, and any barriers that may exist to their use.
- Additional NFIP compliance documentation.
- Other factors that may help with mitigation efforts.

Plans and documents previously discussed in [Chapter 3: Hazard Identification](#) to meet the goals of the CRS program are marked with an asterisk. Responses to worksheets provided by the localities, which contain more in-depth information about their capabilities and their NFIP programs, are included in [Appendix G: Jurisdiction Capability Assessment Surveys](#).

The table below explores one of the best points of comparison between the localities in the region by showing overall revenues and revenues per capita. This clearly illustrates capacity to operate key government services, including mitigation services and disaster response. Data in this chapter comes from a variety of sources. Where possible, data is provided by the Auditor of Public Accounts to the Commonwealth of Virginia. This data reflects real budgets in the years 2024 if available and 2023 if 2024 data was not available. Where neither dataset is available, 2025 or 2026 adopted budgets have been referenced. These budgets are adopted based off of best available information regarding revenues and expenses.

In [Section 4.3: Extreme Temperature](#), the NRI Social Vulnerability Index for larger localities within the region was examined. The City of Roanoke was the only locality which ranked Very High in terms of social vulnerability. All other localities ranked Relatively Low or Very Low.

Population numbers may vary in this chapter. These were taken from two separate sources, one provided by the Commonwealth's Auditor of Public Accounts, one provided by the CEDS. Sources are noted as appropriate.

**Table 43: Comparison of Revenue Across RVARC Member Local Governments**

| Locality                | Population <sup>a</sup> | Total Revenue    | Total Revenue per Capita |
|-------------------------|-------------------------|------------------|--------------------------|
| Alleghany County*       | 14,898                  | \$81,004,953.00  | \$5,437.30               |
| City of Covington       | 5,567                   | \$32,225,593.00  | \$5,788.68               |
| Town of Clifton Forge** | 3,483                   | \$5,613,161.00   | \$1,611.59               |
| Botetourt County        | 33,466                  | \$139,116,476.00 | \$4,156.95               |
| Craig County            | 4,855                   | \$18,953,496.00  | \$3,903.91               |
| Roanoke County          | 96,519                  | \$441,121,263.00 | \$4,570.30               |
| City of Roanoke*        | 99,634                  | \$603,957,800.00 | \$6,061.76               |
| City of Salem           | 24,985                  | \$164,155,327.00 | \$6,570.16               |
| Town of Vinton**        | 8,038                   | \$15,756,600.00  | \$1,960.26               |

\* Data comes from the 2023 Comparative Report

\*\* Data comes from the website or adopted budget

<sup>a</sup> Data comes from the 2023 and 2024 Comparative Report where available. Where unavailable data comes from the 2025 CEDS.

## 5.2 Alleghany County

Alleghany County is the northernmost county in the service area, characterized by largely rural development patterns. Approximately half of the locality is federal forest land, and state-owned lands are also present. The population of the County was 11,479 in 2023 excluding the Town of Clifton Forge and is projected to be 13,993 in 2030. The median age is high for the region, at 48.1 years. Median household income is low at \$52,546. One small rural hospital provides the majority of medical emergency capacity for the locality.

### Budget and Staffing Characteristics

The Comparative Report of Local Government Revenues and Expenditures shows the following general information about Alleghany County's real budget for the year 2023. Alleghany County staffs a Chief Building Official and an Emergency Manager. The Zoning Administrator serves as a combined Community Planner, Floodplain Manager, and GIS coordinator.

Federal share of revenue in the 2023 budget was over 14 percent. Revenue from the Commonwealth was close to 50 percent, showing a significantly high vulnerability to outside funding sources.

**Table 44: Alleghany County Budget 2023, Commonwealth of Virginia**

| <b>Alleghany County Budget 2023</b> |                         |
|-------------------------------------|-------------------------|
| <b>Population</b>                   | <b>14,898</b>           |
| <b>Local Revenue</b>                | <b>\$ 29,205,904.00</b> |
| <i>Per Capita</i>                   | \$ 1,960.39             |
| <i>Percent of Revenue</i>           | 36.05%                  |
| <b>From the Commonwealth</b>        | <b>\$ 40,281,474.00</b> |
| <i>Per Capita</i>                   | \$ 2,703.82             |
| <i>Percent of Revenue</i>           | 49.73%                  |
| <b>Federal Pass-thru</b>            | <b>\$ 10,729,017.00</b> |
| <i>Per Capita</i>                   | \$ 720.16               |
| <i>Percent of Revenue</i>           | 13.24%                  |
| <b>Direct Federal Aid</b>           | <b>\$ 788,558.00</b>    |
| <i>Per Capita</i>                   | \$ 52.93                |
| <i>Percent of Revenue</i>           | 0.97%                   |
| <b>Total Federal Vulnerability</b>  | <b>\$ 11,517,575.00</b> |
| <i>Percent of Revenue</i>           | 14.22%                  |
| Total Revenue                       | \$ 81,004,953.00        |
| Non-Revenue Receipts                | \$ 77,240.00            |
| Transfers from Other Funds          | -                       |
| <b>Total Sources Available</b>      | <b>\$ 81,082,193.00</b> |

### Plans and Planning Schedules

Alleghany County currently has two plans in place which specifically address hazard mitigation. These are the Comprehensive Plan, currently being updated and last updated in 2019, and the Emergency Operations Plan, the new version of which is expected to be adopted in November

2025. Additional plans in place which could incorporate hazard mitigation in the future include the Capital Improvement Plan.

## Ordinances and Policy Mechanisms

Alleghany County maintains a County code, several sections of which provide some opportunity for hazard mitigation. Large amendments to the code are possible but may be constrained by funding and staff capacity.

Chapter 30 of the County Code contains Erosion and Sediment Control regulations. These provisions mirror Code of Virginia, § 10.1-563(C). Chapter 34 – Fire Prevention and Protection adopts pertinent sections of the Code of Virginia, § 27-1 et seq. to do with fire management, and additionally describes rules around the sale, possession, and use of fireworks. Chapter 47 of the Code addresses Public Safety.

Chapter 52 of the County Code contains the Stormwater Ordinance. This was last adopted in 2014. It integrates the County's stormwater management requirements with its erosion and sediment control, flood insurance, and floodplain management requirements into a unified stormwater program. This facilitates the submission and approval of plans, issuance of permits, payment of fees, and coordination of inspection and enforcement activities in a more convenient and efficient manner.

Alleghany County adopted its most recent Floodplain District in December 2010 that requires new residential buildings to be elevated to or above the base flood elevation. The floodplain district is an overlay that applies to all other zoning districts. Additional requirements prevent the obstruction of the floodway. In addition to Federal Regulations, the County has established guidelines for development within flood hazard areas. They can be found in Chapter 66-Zoning, of the Code of the County of Alleghany, Virginia. No construction or development, including fill, can be done in a designated floodway. Development can occur in the 100-year floodplain, however the first-floor elevation of a structure must be at least one foot above the designated flood elevations shown on the Flood Insurance Rate Maps. Also, structures in the 100-year floodplain must be in compliance with building code requirements for structures in flood hazard areas. Development can occur in the 500-year floodplain with compliance of building code requirements for structures in flood hazard areas.

Chapter 66 - Zoning Ordinance, contains, among other things, the established flood hazard areas and guidelines for development therein. Chapter 66 and Chapter 54 - Subdivision Ordinance both contain key regulatory authority over land use in the county.

One factor in all localities, including Alleghany, is that many structures may have been built prior to the adoption of these ordinances. Pre-existing structures built in flood prone areas are often only mitigated directly if mitigation is triggered by improvements on the property.

## NFIP Compliance

Community Development is the responsible department for NFIP compliance in Alleghany County. The NFIP coordinator is not a Certified Floodplain Manager. NFIP services include permit review, inspections, review of floodplain mapping for zoning and rezoning, and a GIS layer; however, staff capacity is a barrier to running an effective NFIP program. Alleghany County entered the NFIP in

1987. The Indian Draft community within the County is vulnerable to flooding but has limited NFIP policy coverage. The total amount of paid claims in the community is \$2,867,632 for 172 claims.

## **Dam Safety**

There are four dams in Alleghany County. These are the Clifton Forge Dam (owned and maintained by the Town of Clifton Forge), Gathright Dam (owned and maintained by US Army Corps of Engineers), Pond Lick Branch Dam (privately owned) and WestRock #2 Flyash Lagoon Dam (owned and maintained by WestRock). Alleghany County staff review plans annually with Smurfit WestRock, US ACE, and DCR.

## **Town of Iron Gate**

The Town of Iron Gate is a small town on the border of Alleghany and Botetourt Counties, which shares a strong cultural identity with the Alleghany Highlands. The Town engages in water and sewer service provision. They are not an active jurisdiction in this plan but participate through Alleghany County. The Town Code deals mainly with solid waste management and water and sewer service provision.

The Town of Iron Gate has very limited capacity for mitigation, but some utility lines and structures may be vulnerable to hazards. The Town adopted Alleghany County's floodplain ordinance to maintain good standing with NFIP.

## **Other Factors**

The County has also entered into a number of mutual aid agreements in relation to Statewide Aid for Emergency Management, radio communications with neighboring localities and fire and rescue departments, and emergency services. They commonly collaborate with Covington and Clifton Forge, and also with Bath County outside the region. Alleghany County provides support for floodplain management in the Town of Iron Gate.

Alleghany County does maintain a Planning Commission and is a member government of the Roanoke Valley-Alleghany Regional Commission.

## 5.3 City of Covington

The City of Covington is a small city located in the Alleghany Highlands. The City shares strong cultural connections and some infrastructure with Alleghany County and the Town of Clifton Forge. Population in the City of Covington was 5,671 in 2023 and is expected to fall to 5,434 in 2030. The median age is 41.5. Median household income is low at \$45,737. The City provides water and sewer to residents.

### Budget and Staffing Characteristics

The statewide Comparative Report of Local Government Revenues and Expenditures shows the following general information about the City of Covington's real budget for the year 2024. The City of Covington has a small staff. The Director of Development Services serves as a Building Official, Community Planner, and Zoning Administrator. The Director of Public Safety also serves as Chief of Police and primary Emergency Management response. Covington is a small locality, whose employees generally wear many hats.

Funding is a large barrier to the City in expending mitigation efforts. Hazard mitigation grants were uplifted as a main source of funding for mitigation activities. Additional funding sources for mitigation activities include CIP allocations, utility fees, a stormwater utility fee, and other state funding programs. Federal funding, either direct funding or pass-through from the state government, is about 13 percent of the City's revenue.

**Table 45: City of Covington Budget 2024**

| City of Covington Budget 2024      |                  |
|------------------------------------|------------------|
| <b>Population</b>                  | 5,567            |
| <b>Local Revenue</b>               | \$ 21,666,135.00 |
| <i>Per Capita</i>                  | \$ 3,891.89      |
| <i>Percent of Revenue</i>          | 67.23%           |
| <b>From the Commonwealth</b>       | \$ 6,405,092.00  |
| <i>Per Capita</i>                  | \$ 1,150.55      |
| <i>Percent of Revenue</i>          | 19.88%           |
| <b>Federal Pass-thru</b>           | \$ 1,170,444.00  |
| <i>Per Capita</i>                  | \$ 210.25        |
| <i>Percent of Revenue</i>          | 3.63%            |
| <b>Direct Federal Aid</b>          | \$ 2,983,922.00  |
| <i>Per Capita</i>                  | \$ 536.00        |
| <i>Percent of Revenue</i>          | 9.26%            |
| <b>Total Federal Vulnerability</b> | \$ 4,154,366.00  |
| <i>Percent of Revenue</i>          | 12.89%           |
| Total Revenue                      | \$ 32,225,593.00 |
| Non-Revenue Receipts               | \$ 2,233,967.00  |
| Transfers from Other Funds         | -                |
| <b>Total Sources Available</b>     | \$ 34,459,560.00 |

## Plans and Planning Schedules

The City of Covington maintains a Capital Improvements Plan, a Continuity of Operations and Local Emergency Operations Plan, a Stormwater Management Plan and an Economic Development Plan.

The Emergency Operations Plan was updated in November 2023. The Stormwater Management Plan was updated in March 2025. A Resilience Plan is in development which will directly affect flooding and flood response in the City.

## Ordinances and Policy Mechanisms

Chapter 18 – Environment of the City Code addresses Erosion and Sediment Control in compliance with Code of Virginia § 10.1-560 et seq.

Chapter 19 – Stormwater Management, adopted pursuant to Code of Virginia, § 62.1-44.15:24 et seq., addresses specific stormwater management regulations.

Chapter 20 – Fire Prevention and Protection; Emergency Medical Services designates the city fire department and emergency medical services departments as integral to the safety program of the city and additionally establishes open-air fire restrictions and regulations.

Appendix A addresses Subdivision regulations and Appendix B addresses Zoning. Article XIII-A of Appendix B specifically establishes Floodplain Districts for the City, adopting the FIRM provided by FEMA.

## NFIP Compliance

The NFIP program within the City of Covington is maintained by Development Services. The Development Services Director is the primary NFIP administrator. He was formerly certified, but his certification has lapsed. The Development Services Director also serves as the building administrator and zoning administrator, as discussed earlier in this section. Besides staff capacity, one of the barriers to running an effective NFIP program within this jurisdiction is community interest.

The City of Covington entered the NFIP in 1979. Since that time they have paid out 179 claims at \$1,904,162. There are five known repetitive or severe repetitive loss structures in the community.

## Dam Safety

There are three dams in that could impact the City of Covington. These are the Gathwright Dam (owned and maintained by US Army Corps of Engineers), Pond Lick Branch Dam (privately owned) and Mead Westvaco #2 Fly Ash Lagoon Dam (owned and maintained by Mead Westvaco). These dams are not located within the City boundary.

## Other Factors

The City of Covington engages in mutual aid agreements and joint planning and service provision efforts with Alleghany County. The City utilizes open source precipitation and water level gauges through water.gov, as well as a staff gauge posted at the Main St. Park.

The City does maintain a Planning Commission and is a member government of the Roanoke Valley-Alleghany Regional Commission.

## 5.4 Town of Clifton Forge

The Town of Clifton Forge, formerly the City of Clifton Forge, is an incorporated town within the boundaries of Alleghany County. The population of the Town was 3,483 in 2023. Population projections are not available in the data collected for this plan. The median age is the highest in data available for the planning region at 53.5 years. No separate median household income is available. The Town engages in utility service provision of water and sewer.

### Budget and Staffing Characteristics

No budget information was available in the statewide Comparative Report. However, the approved 2025 budget provides some context for Clifton Forge's revenues and resources. Numbers provided may lack some of the nuance available in the state audit document.

Clifton Forge staffs a Community Planner and an Emergency Manager.

**Table 46: Adopted Budget Town of Clifton Forge, 2025**

| Town of Clifton Forge Budget 2025 Projected |                 |
|---|-----------------|
| Population                                  | 3,483           |
| Local Revenue                               | \$ 2,672,548.00 |
| Per Capita                                  | \$ 767.31       |
| Percent of Revenue                          | 47.61%          |
| From the Commonwealth                       | \$ 2,340,613.00 |
| Per Capita                                  | \$ 672.01       |
| Percent of Revenue                          | 41.70%          |
| Direct Federal Aid                          | \$ 600,000.00   |
| Per Capita                                  | \$ 172.27       |
| Percent of Revenue                          | 10.69%          |
| Total Revenue                               | \$ 5,613,161.00 |

### Plans and Planning Schedules

Clifton Forge maintains a Comprehensive Plan, a Land Use Plan, and a Local Emergency Operations Plan. The Emergency Operations Plan is the most relevant to hazard mitigation, and was last updated in 2023.

### Ordinances and Policy Mechanisms

Chapter 50 – Fire Prevention and Protection establishes rules around open burning and the acquisition and use of explosives and fireworks.

Appendix A – Subdivision Ordinance and Appendix B- Zoning contain information guiding new development in the town. Article 5 of Appendix B, Floodplain Overlay District, formally adopts floodplain regulations and the FIRM.

## **NFIP Compliance**

An NFIP worksheet was not developed for the Town, so further details of the NFIP program could not be provided.

## **Dam Safety**

There are three dams in that could impact the Town of Clifton Forge. These are the Smith Creek Dam, Gathright Dam, and Douthat Lake Dam. The Smith Creek dam, along with the associated Smith Creek Reservoir is owned and maintained by the Town of Clifton Forge and serves as the water supply for the Town of Clifton Forge, portions of Alleghany County, and the Town of Iron Gate. The Town of Clifton Forge is responsible for the maintenance of the Smith Creek Dam. After the dam was transferred to the Town, repairs were made and completed in early 2021. The dam and reservoir are routinely maintained and inspected by our water plant staff as well as being inspected annually per dam safety regulations.

## **Other Factors**

The Town of Clifton Forge engages in collective operations with Alleghany County and Covington regarding regional branding, tourism, and economic development. The Town also provides water to portions of Alleghany County.

The Town does maintain a planning commission and is a member government of the Roanoke Valley-Alleghany Regional Commission.

## 5.5 Botetourt County

Botetourt County has been one of the fastest growing localities in the region over the last decade. The southern half of the locality has experienced significant development pressure in this time. The northern half of the locality is still largely rural, with strong cultural ties to the Alleghany Highlands. The population in 2023 was 33,875 and is projected to fall to 33,556 by 2030. Median age is 48.1 and median household income is the second highest in the region at \$77,680. Botetourt County does not maintain an MS4 permit. Utility service provision for water and sewer is handled by the Western Virginia Water Authority or private community providers.

### Budget and Staffing Characteristics

State data is available regarding Botetourt's revenue in 2024. Botetourt is one of the least vulnerable to federal funding fluctuations, with only a little under 11 percent of revenue from federal sources. The majority of Botetourt's revenue is generated locally, at 54.5 percent.

Botetourt staffs a Certified Building Official, Community Planner, Emergency Manager, and Floodplain Administrator. The Community Development Department contains multiple staff positions, including several planners, building inspectors, a code enforcement officer, a combined Erosion and Sediment Control and Stormwater Management Inspector and a separate Administrator, and others. Botetourt's emergency management response is supplemented by a robust volunteer fire and EMS organization.

**Table 47: Botetourt County Budget, 2024**

| Botetourt County Budget 2024   |                          |
|--------------------------------|--------------------------|
| Population                     | 33,466                   |
| Local Revenue                  | \$ 75,818,720.00         |
| Per Capita                     | \$ 2,265.54              |
| Percent of Revenue             | 54.50%                   |
| From the Commonwealth          | \$ 48,166,729.00         |
| Per Capita                     | \$ 1,439.27              |
| Percent of Revenue             | 34.62%                   |
| Federal Pass-thru              | \$ 10,085,282.00         |
| Per Capita                     | \$ 301.36                |
| Percent of Revenue             | 7.25%                    |
| Direct Federal Aid             | \$ 5,045,745.00          |
| Per Capita                     | \$ 150.77                |
| Percent of Revenue             | 3.63%                    |
| Total Federal Vulnerability    | \$ 15,131,027.00         |
| Percent of Revenue             | 10.88%                   |
| Total Revenue                  | \$ 139,116,476.00        |
| Non-Revenue Receipts           |                          |
| Transfers from Other Funds     | -                        |
| <b>Total Sources Available</b> | <b>\$ 139,116,476.00</b> |

## Plans and Planning Schedules

Botetourt maintains a Capital Improvements Plan and a Comprehensive Plan. A Local Emergency Operations Plan directly addresses hazards and was last updated in 2017.

## Ordinances and Policy Mechanisms

Multiple sections of Botetourt's code may affect mitigation activities and disaster response.

Chapter 8.5 – Drainage and Flood Control creates rules for impounding structures that control runoff on a site.

Chapter 10 – Erosion and Sediment Control; Stormwater Management allows for local compliance with the Erosion and Sediment Control Law of the Code of Virginia. The County adopted its most current E&S ordinance in 2024. The towns of Buchanan, Fincastle and Troutville utilize Botetourt County's E&S staff for erosion and sediment control monitoring.

Chapter 11 – Fire Prevention and Protection addresses the coordinated fire and EMS system and brush burning.

Chapter 21 – Subdivisions establishes subdivision regulations.

Chapter 25 – Zoning addresses various zoning rules for the County, including establishing a Flood Hazard Overlay District based on the FIRM to bring the county in compliance with the NFIP.

## NFIP Compliance

The Director of Community Development is the primary administrator of the NFIP in Botetourt County, and is a Certified Floodplain Manager. The county also maintains a retainer contract with an organization to assist in administrative functions. Like all rural, growing communities, the County has difficulty maintaining budget and staff. Their success in NFIP is due to the dedication of existing staff performing multiple auxiliary functions.

Botetourt County entered the NFIP in 1978. Since that time, 182 claims have been paid out in the County, totaling \$3,563,445. There are 1,752 structures exposed to flood risk in the community. Twenty-eight are repetitive loss and six are severe repetitive loss. The community does not participate in CRS. There were 137 NFIP policies in force in the County (including the towns of Buchanan, Fincastle and Troutville) as of July 2025.

## Dam Safety

Botetourt County adopted a Drainage and Flood Control Ordinance in 1987. Division 2 Dam Safety, in Sec. 8.5-31 addresses issues concerning impoundment construction, inspection and maintenance stating "No one shall have a right to build or maintain an impoundment structure which unreasonably threatens the life or property of another. The [county] administrator shall cause safety inspections to be made of impounding structures on such schedule, as he deems appropriate. The time of the initial inspection and the frequency of reinspection shall be established depending on such factors as the condition of the structure and its size, type, location and downstream hazard potential. The owners of impounding structures found to have deficiencies which could threaten life or property if uncorrected, shall take the corrective actions needed to remove such deficiencies within the time limits established by this article, or if no time limit is established, within a reasonable time."

There are five dams of significance in Botetourt County. These are the Blue Ridge Estates Dam on Laymantown Creek, Carvin Cove Dam on Carvin Creek, Orchard Lake Dam on Glade Creek, Rainbow Forest Dam on Laymantown Creek and Greenfield dam on an unnamed creek.

Gathright Dam, located on the Jackson River in Alleghany County, was completed in 1979 and is operated for flood control of the Jackson and James Rivers. The facility is managed by the Army Corps of Engineers. The dam controls the runoff from a 345 square mile drainage area and reduces the effects of flooding along the Jackson and James Rivers. The Corps of Engineers estimates that the project has prevented more than \$70 million in flood damages. The James River passes through the northern part of Botetourt County and impacts the communities of Eagle Rock and Glen Wilton and the Town of Buchanan.

## **Other Factors**

Botetourt contains several Towns, which are further discussed in the following sections, and works collaboratively with them to support their development when possible. Botetourt County is a member government of the Roanoke Valley-Alleghany Regional Commission and the Roanoke Valley Transportation Planning Organization. They are one of only two attainment counties in the Appalachian Regional Commission service area.

Botetourt County has experienced some turnover challenges in the past few years, which is fairly consistent with other governments in the area. The County does maintain a planning commission, as well as a public relations position on staff.

## 5.6 Town of Buchanan

The Town of Buchanan is a small, incorporated town within Botetourt County located on the James River. Buchanan is an important tourist hub for Botetourt County. The Town provides water and sewer service to residents.

### Budget and Staffing Characteristics

The Town maintains four staff positions currently. The Town Manager is the most likely to participate directly in mitigation planning.

The Town is too small to participate in the statewide audit document, but a proposed budget for FY2025 is available on the website<sup>22</sup>. The General Fund shows a balance of \$903,351. \$65,610 comes from the Commonwealth. Total revenues including water and sewer service fees are a little over \$2 million.

### Plans and Planning Schedules

The Town maintains a Comprehensive Plan which is in the process of being updated.

### Ordinances and Policy Mechanisms

Article II of Appendix A of the Code of the Town addresses Zoning, with Sec. 201 establishing a Flood Hazard Overlay District to maintain participation in the NFIP.

Chapter 7 – Erosion & Sediment and Chapter 20 – Subdivisions establish additional restrictions on development.

### NFIP Compliance

Botetourt County has adopted a Flood Hazard Overlay District as part of its Zoning Ordinance (2002). The boundaries of the floodplain district are established as shown on the flood boundary and floodway and/or Flood Insurance Rate Maps. The Town of Buchanan has adopted a Floodplain Management Ordinance that requires new residential buildings to be elevated to or above the base flood elevation.

The Town participates in the NFIP as a consumer of flood insurance for local government infrastructure and is in good standing with the County.

The Town of Buchanan uses Botetourt County's E&S staff for erosion and sediment control monitoring.

### Other Factors

The Town of Buchanan collaborates with Botetourt County on some planning efforts. They are not an official member of the Roanoke Valley-Alleghany Regional Commission due to their size, but RVARC does some support work for the Town at the County's request.

The Town does maintain a planning commission.

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<sup>22</sup> Invalid source specified.

## 5.7 Town of Fincastle

The Town of Fincastle is a small town centrally located within Botetourt County and the county seat. While administrative offices for Botetourt County have largely moved out of the Town, it maintains a central position in Botetourt County's identity. The Town has historically provided water and sewer services; however, those services are now operated by the Western Virginia Water Authority.

### Budget and Staffing Characteristics

The Town of Fincastle maintains a very small staff, including a part-time Town Manager who is charged with the majority of planning activities. While they are too small to be included in the Comparative Report, a budget for FY2024 is available on the town's website which details a General Fund of \$173,000 and total revenues of \$537,700.

### Plans and Planning Schedules

The Town does maintain a Comprehensive Plan, which was last updated in 2021.

### Ordinances and Policy Mechanisms

The Town's Zoning Ordinance is available online, with Sec. 201 establishing a Flood Hazard District to maintain participation in the NFIP.

### NFIP Compliance

Botetourt County has adopted a Flood Hazard Overlay District as part of its Zoning Ordinance (2002). The boundaries of the floodplain district are established as shown on the flood boundary and floodway and/or Flood Insurance Rate Maps. The Town of Fincastle has adopted a Floodplain Management Ordinance that requires new residential buildings to be elevated to or above the base flood elevation.

The Town participates in the NFIP as a consumer of flood insurance for local government infrastructure and is in good standing with the County.

The Town of Fincastle uses Botetourt County's E&S staff for erosion and sediment control monitoring.

### Other Factors

The Town of Fincastle holds several critical facilities for Botetourt County, including the courthouse, Fire/EMS administrative offices, and the jail. They are not an official member of the Roanoke Valley-Alleghany Regional Commission due to their size, but RVARC does some support work for the Town at the County's request.

The Town maintains a planning commission of seven members, including a Zoning Administrator.

## 5.8 Town of Troutville

The Town of Troutville is a small town within Botetourt County. It is located on the southern end of the county, where development pressures are higher, and is an Appalachian Trail community. Town limits are just under one square mile with boundaries including Interstate 81 and the Norfolk Southern Railroad right of way. Troutville provides domestic water via pumped storage system including areas outside of town boundaries. Town population is 468 people.

### Budget and Staffing Characteristics

The Town maintains limited staff, including a volunteer Zoning Administrator, Utility Operator, and Clerk as well as a Facilities and Equipment Manager and Town Attorney.

The FY26 Town budget for general fund is \$187,000.00.

### Plans and Planning Schedules

No plans or planning documents were available on the Town website. The last comprehensive plan was completed in 2010.

### Ordinances and Policy Mechanisms

The Town does maintain a Zoning Code and Erosion and Sediment Control regulations. Article XIV of the Zoning Code details the Floodplain Overlay District.

### NFIP Compliance

Botetourt County has adopted a Flood Hazard Overlay District as part of its Zoning Ordinance (2002). The boundaries of the floodplain district are established as shown on the flood boundary and floodway and/or Flood Insurance Rate Maps. The Town of Troutville has adopted a Floodplain Management Ordinance that requires new residential buildings to be elevated to or above the base flood elevation.

The Town participates in the NFIP as a consumer of flood insurance for local government infrastructure, and is in good standing with the County.

The Town of Troutville uses Botetourt County's E&S staff for erosion and sediment control monitoring.

### Other Factors

The Town does maintain a planning commission. They are not an official member of the Roanoke Valley-Alleghany Regional Commission due to their size, but RVARC does some support work for the Town at the County's request.

## 5.9 Craig County

Craig County is one of the most rural localities in the service area, with a population in 2023 of 4,881 and a projected population of 4,528 by 2030. The median age is 46.1 and the median household income is \$66,286. Nearly two thirds of the county is national forest or state parks.

### Budget and Staffing Characteristics

Craig County budget information is available from the statewide Comparative Report for 2024. About 46 percent of revenues received by the County come from the Commonwealth, and 15 percent is direct federal money or federal pass-thru dollars.

Craig maintains minimal staffing, with a part time County Administrator serving also as the Zoning Administrator, a Building Official, and an Emergency Management Coordinator.

**Table 48: Craig County Budget 2024**

| Craig County Budget 2024           |                         |
|------------------------------------|-------------------------|
| <b>Population</b>                  | 4,855                   |
| <b>Local Revenue</b>               | <b>\$ 7,394,865.00</b>  |
| <i>Per Capita</i>                  | \$ 1,523.14             |
| <i>Percent of Revenue</i>          | 39.02%                  |
| <b>From the Commonwealth</b>       | <b>\$ 8,701,440.00</b>  |
| <i>Per Capita</i>                  | \$ 1,792.26             |
| <i>Percent of Revenue</i>          | 45.91%                  |
| <b>Federal Pass-thru</b>           | <b>\$ 2,410,413.00</b>  |
| <i>Per Capita</i>                  | \$ 496.48               |
| <i>Percent of Revenue</i>          | 12.72%                  |
| <b>Direct Federal Aid</b>          | <b>\$ 446,778.00</b>    |
| <i>Per Capita</i>                  | \$ 92.02                |
| <i>Percent of Revenue</i>          | 2.36%                   |
| <b>Total Federal Vulnerability</b> | <b>\$ 2,857,191.00</b>  |
| <i>Percent of Revenue</i>          | 15.07%                  |
| Total Revenue                      | \$ 18,953,496.00        |
| Non-Revenue Receipts               | \$ -                    |
| Transfers from Other Funds         | \$ -                    |
| <b>Total Sources Available</b>     | <b>\$ 18,953,496.00</b> |

### Plans and Planning Schedules

The County maintains a Capital Improvements Plan, a Comprehensive Plan which addresses land use, an Emergency Operations Plan and Continuity of Operations Plan. The Emergency Operations Plan specifically addresses hazards and was last updated in 2025.

### Ordinances and Policy Mechanisms

Chapter 26 – Fire Prevention and Protection establishes the volunteer fire service and establishes rules for open burning.

Chapter 46 – Erosion and Sediment Control regulates land disturbing activities. The Town of New Castle utilizes the E&S Control services of Craig County.

Chapter 47 – Stormwater Management addresses required stormwater management plans.

Chapter 50 – Floods addresses flood hazard reduction and required elements for the NFIP.

Chapter 54 – Subdivisions and Chapter 58 – Zoning address new development in the County and general land use.

## **NFIP Compliance**

The Building Official is the floodplain administrator in Craig County, and is not certified. Staffing challenges and financial restrictions combined with a low volume of required service are the barriers to running an effective NFIP program. Since 1990, 71 claims have been paid out in the community at \$1,271,108. Two hundred and two structures are at flood risk in the community, with six being repetitive loss structures. The community does not participate in CRS. There were 41 NFIP policies in force in the County and two in the Town of New Castle as of July 2025.

## **Dam Safety**

There are four dams in Craig County. The Mountain Castles Soil and Water Conservation District has responsibility for the operation and maintenance of these dams. The dams are located on Johns Creek, Little Oregon Creek, Mudlick Branch, and Dicks Creek. The dams were constructed during the period of 1966 to 1968 for the purpose of flood control in the Johns Creek watershed. Future work will be occurring to rehabilitate several of these dams. Johns Creek Volunteer Fire Department has observers for each dam when there are high water issues.

## **Town of New Castle**

The Town of New Castle is included in this capabilities assessment despite not having met the criteria for participation in the planning effort. Craig County serves as the planning authority for the Town in hazard mitigation planning. The Town of New Castle is the county seat of Craig County. They are not an active jurisdiction in this plan, but participate through Craig County. The town has one staff person who functions as Town Clerk, Treasurer to the Town Council, and Zoning Administrator. Limited information is available on the Craig County website regarding the Town's government. No budget information is available.

## **Other Factors**

The County has participated in the VDEM Flood Intelligence Unit's flood gauge program. Three water level gauges and two precipitation gauges have been installed in key locations throughout the County. The County receives support from RVARC as a member government and is within the service area for the Appalachian Regional Commission.

## 5.10 Roanoke County

Roanoke County is one of the largest localities by population, with 89,755 residents in 2023 and 100,027 projected in 2030, excluding the population of the Town of Vinton. The development patterns of the County are largely suburban and rural, with some more densely developed areas. The median age is lower than many other localities in the region at 43.7. The median household income is the highest in the region at \$80,872. The County encircles the Cities of Roanoke and Salem. The Town of Vinton is located within the County. The County additionally owns and operates the Explore Park, a major regional outdoor recreation facility which is bifurcated by the Roanoke River, other parks potentially impacted by flooding such as Green Hill Park and Wayside, and several miles of the Roanoke River Greenway which are largely in the floodplain.

### Budget and Staffing Characteristics

Data for the county is available in the statewide Comparative Report. Local revenue is over 56 percent of the revenue for the county in 2024. The percentage of federal revenue is low, at less than 9 percent.

The County maintains numerous staff, including several community planners, stormwater management staff and engineers, GIS staff, and emergency manager. They are a CRS community.

**Table 49: Roanoke County Revenues, 2024**

| <b>Roanoke County Budget 2024</b>  |                          |
|------------------------------------|--------------------------|
| <b>Population</b>                  | <b>96,519</b>            |
| <b>Local Revenue</b>               | <b>\$ 248,040,326.00</b> |
| <i>Per Capita</i>                  | \$ 2,569.86              |
| <i>Percent of Revenue</i>          | 56.23%                   |
| <b>From the Commonwealth</b>       | <b>\$ 154,421,775.00</b> |
| <i>Per Capita</i>                  | \$ 1,599.91              |
| <i>Percent of Revenue</i>          | 35.01%                   |
| <b>Federal Pass-thru</b>           | <b>\$ 30,897,590.00</b>  |
| <i>Per Capita</i>                  | \$ 320.12                |
| <i>Percent of Revenue</i>          | 7.00%                    |
| <b>Direct Federal Aid</b>          | <b>\$ 7,761,572.00</b>   |
| <i>Per Capita</i>                  | \$ 80.41                 |
| <i>Percent of Revenue</i>          | 1.76%                    |
| <b>Total Federal Vulnerability</b> | <b>\$ 38,659,162.00</b>  |
| <i>Percent of Revenue</i>          | 8.76%                    |
| Total Revenue                      | \$ 441,121,263.00        |
| Non-Revenue Receipts               |                          |
| Transfers from Other Funds         | \$ 1,405,682.00          |
| <b>Total Sources Available</b>     | <b>\$ 442,526,945.00</b> |

## Plans and Planning Schedules

The County maintains numerous plans, including a Capital Improvements Plan, a Comprehensive Plan last updated in 2024 which addresses future land use, an Emergency Operations Plan, an Economic Development Plan, an annual update of the Regional Stormwater Management Plan, and other plans and planning documents.

## Ordinances and Policy Mechanisms

The County has engaged in a variety of mechanisms to address hazards, including land acquisition, maintaining an up to date building code, adopting the FIRM and a floodplain overlay, a subdivision ordinance, and a zoning ordinance, all of which are tools that have been used to address hazards.

Roanoke County has adopted an Erosion & Stormwater Management Ordinance (2025) and Design Manual (2008) that require new residential buildings to be elevated two feet and new commercial buildings one foot above the 100-year base flood elevation. The Stormwater Management Design Manual that specifies acceptable methodologies, design events for a wide variety of facilities, and administrative requirements such as submittal checklists. Appendices provide a wide variety of charts and tables to be used in applying the approved methodologies.

The County has a floodplain overlay district, corresponding to areas identified on Flood Insurance Rate Maps (FIRM) prepared by FEMA. Roanoke County also has up to date DFIRMS of all FEMA studied streams. Additionally, the County has adopted regulations for development in areas that contain more than 100 acres of drainage area that require flood studies for elevations of additions or new construction.

Roanoke County has adopted a Roanoke River Corridor Conservation and Overlay District. Although primarily designed to protect water quality, it also helps reduce siltation, which in turn protects the channel that is carrying floodwaters. In this overlay district, smaller sites (2,500 square feet in lieu of standard 10,000 square feet minimum) must meet erosion and sediment controls standards. Roanoke County has completed over one mile of stream restoration. Project goals were aimed at reducing streambank erosion, improving channel stability during high flow events, storing flood waters, and supporting aquatic and other life.

## NFIP Compliance

Roanoke County primarily staffs the NFIP program through the twin roles of a Project Engineer and a Floodplain Administrator. Floodplain management is a primary function for staff. They are also a CRS community. Major barriers to running an effective NFIP program include challenges with staffing following disasters to complete tasks in a timely manner. Limited knowledge beyond primary staff member requires that individual to be present or involved with all mitigation activities and disaster response. More training is sought, however, staff time in the face of additional duties remains a challenge.

Roanoke County entered the NFIP in 1978. To date 797 claims have been paid out in the community with a total amount of \$18,582,734. There were 288 NFIP policies in force in the County as of July 2025.

Participating in the Community Rating System is an important program for Roanoke County. The County maintains an established permit process, requires and tracks elevation certificates, and provides public outreach and education. The County is challenged by the investment of financial and staff resources to improve the class in this plan cycle.

## Dam Safety

There are eight regulated dams that could impact properties in Roanoke County: Privately owned Loch Haven Lake Dam located on a tributary of Deer Branch Creek; Appalachian Electric Power owned Niagara Dam located on the Roanoke River; privately owned Orchard Dam on a tributary of Glade Creek; Carvin Cove Reservoir Dam, located on a tributary of the Carvin Creek and owned by the Western Virginia Water Authority, Spring Hollow Reservoir Dam located on a tributary of the Roanoke River and owned by the Western Virginia Water Authority, Montclair Dam and North lakes Dam in the Peters Creek watershed managed by Roanoke City, and Hidden Valley Dam in southwest county managed by Roanoke County.

The County sees an opportunity for regional collaboration around high hazard potential dams, and a need for dam breach inundation mapping for dams which could impact their community.

## Other Factors and Activities

Roanoke County was first designated as a “StormReady” community in 2019 and has successfully maintained this designation through the National Weather Service. The county’s next recertification is scheduled for 2027.

The County has strategically deployed three (3) Department of Homeland Security (DHS) stream flood sensors and three (3) locally monitored rain gauges to enhance real-time monitoring capabilities. In addition, the County utilizes resources from the National Oceanic and Atmospheric Administration (NOAA), including the Water Prediction Center’s forecasts and mapping tools ([water.noaa.gov/va](http://water.noaa.gov/va)) and the NOAA rainfall monitoring system ([weather.gov/rainfall](http://weather.gov/rainfall)).

Project Impact Roanoke Valley was a partnership of FEMA, Roanoke County, the cities of Roanoke and Salem and the Town of Vinton to reduce destruction to life and property during disasters through planning and mitigation. The Project Impact Roanoke Valley Steering Committee and its work groups evaluated hazard mitigation needs from 1998 to 2001. The four work groups were: Hazard Mitigation, Public Information and Community Education, Stormwater Management and Partnership and Resource group. The Stormwater Management group was responsible for the preparation of over 1,500 floodplain elevation certificates in the participating localities. The Public Information and Community Education and Partnership and Resource groups met with community organizations, civic groups, businesses and the general public to promote hazard mitigation activities. The Land Use group focused on the how local plans and ordinances relate to hazard mitigation and published Hazard Mitigation through Land Use Planning in 2001. The Hazard Mitigation group addressed flooding, wildfire, meteorological events, and hazardous materials incidents in its report Hazard Analysis.

The County provides annual updates on the Roanoke Valley Regional Stormwater Management Plan, which is further discussed in [Section 5.14](#).

Roanoke County provides capacity to the Town of Vinton around stormwater issues. The County is a member government of the Roanoke Valley-Alleghany Regional Commission and the Roanoke Valley Transportation Planning Organization. Water and sewer is provided by the Western Virginia Water Authority. The County is a member of the Roanoke Valley Resource Authority. Valley Metro serves this locality and they are a member of the Greenway Commission. They have a robust public outreach program and are a member of Roanoke Valley Television.

## 5.11 City of Roanoke

The City of Roanoke has the highest population in the region, with a 2023 population of 98,677 and a projected 2030 population of 101,514 per the regional CEDS. The median age is 38, the lowest in the region. The median household income is \$51,523, the second to lowest in the region. The City owns and maintains Carvins Cove, a large park which surrounds a key reservoir for water in the Roanoke Valley. The region's only level 1 trauma center is located within the City. The City is encircled by Roanoke County and adjoined by the City of Salem and Town of Vinton, meaning that many environmental issues are shared between these localities.

### Budget and Staffing Characteristics

Budget information for the City is available most recently in the 2023 publication of the statewide Comparative Report. A little over 46 percent of the City's revenue is local, with slightly less than 17 percent of the revenue being federal or federal pass-thru dollars.

The City maintains a robust stormwater management department, multiple planning staff, and several emergency response professionals, as well as dedicated GIS staff. They are a CRS community in good standing. The City sees an opportunity for increased emergency response training amongst their staff.

*Table 50: City of Roanoke Revenues 2023*

| City of Roanoke Budget 2023        |                   |
|------------------------------------|-------------------|
| <b>Population</b>                  | 99,634            |
| <b>Local Revenue</b>               | \$ 280,458,617.00 |
| <i>Per Capita</i>                  | \$ 2,814.89       |
| <i>Percent of Revenue</i>          | 46.44%            |
| <b>From the Commonwealth</b>       | \$ 221,242,528.00 |
| <i>Per Capita</i>                  | \$ 2,220.55       |
| <i>Percent of Revenue</i>          | 36.63%            |
| <b>Federal Pass-thru</b>           | \$ 86,449,186.00  |
| <i>Per Capita</i>                  | \$ 867.67         |
| <i>Percent of Revenue</i>          | 14.31%            |
| <b>Direct Federal Aid</b>          | \$ 15,807,469.00  |
| <i>Per Capita</i>                  | \$ 158.66         |
| <i>Percent of Revenue</i>          | 2.62%             |
| <b>Total Federal Vulnerability</b> | \$ 102,256,655.00 |
| <i>Percent of Revenue</i>          | 16.93%            |
| Total Revenue                      | \$ 603,957,800.00 |
| Non-Revenue Receipts               | \$ 713,029.00     |
| Transfers from Other Funds         | \$ 1,961,500.00   |
| <b>Total Sources Available</b>     | \$ 606,632,329.00 |

### Plans and Planning Schedules

The City maintains a variety of plans and planning documents. Many of these are listed in Section 3.4: Flooding.

- Comprehensive Plan
- Downtown Roanoke Plan (2017)
- Urban Forestry Plan
- Parks and Recreation Plan
- Climate Action Plan
- CIP
- NFIP Community Rating System Repetitive Loss Area Analysis (2021)\*
- City of Roanoke Flood Resilience Plan (2023)\*
- Emergency Operations Basic Plan (2020)\*
- Peters Creek Watershed Master Plan (2019)\*
- Tinker Creek and Tributaries Watershed Master Plan (2016)\*
- Trout Run Watershed Master Plan (2017)\*

Additionally, they have conducted research into the urban heat island effect, mapping critical hotspots within the City and working with the local Roanoke Memorial Hospital on improving health outcomes for City residents and educating residents on the impacts of heat.

Key amongst these plans, the Flood Resilience Plan could be updated to include additional flood mitigation actions.

The City is working on a collaborative plan to mitigate wildland fire in multiple park areas throughout the City. The current Substantial Damage Management procedures are being consolidated into an effective plan. They are also in the process of revising the Emergency Operations Plan, which will provide opportunities to include mitigation language. The Debris Management Annex will be revised during the next update to our EOP to include a more circular economy framework.

## Ordinances and Policy Mechanisms

The City has a robust ordinance, including most mechanisms allowed in the Commonwealth. The FIRM is adopted in the Floodplain Overlay District (Chapter 36.2 Zoning). Additionally, a River and Creek Corridors Overlay District seeks to manage water quality of the numerous streams running through the City.

The City has adopted the River and Creek Corridors Overlay District (RCC) to recognize the Roanoke River and its tributaries as valuable water resources in the City and to designate certain areas along their banks as being critical to their protection in order to ensure that such streams and adjacent lands will fulfill their natural functions. Streams have the primary natural functions of conveying storm and ground water, storing floodwater, and supporting aquatic and other life. Vegetated lands adjacent to the stream channel in the drainage basin serve as a buffer to protect the stream system's ability to fulfill its' natural functions. Primary natural functions of the buffer include protection of water quality by filtering pollutants, provision of storage for floodwaters, and provision of suitable habitats for wildlife. Within the River and Creek Overlay District, riparian buffers shall be established and shall consist of all land adjacent to, and fifty (50) feet landward from, the top of the banks of the Roanoke River or the applicable tributary. Further, riparian buffers shall be retained and maintained if present, and where it does not exist, shall be established and maintained upon any land disturbing activity. To retain ecological functional value, native vegetation shall be preserved to the maximum extent possible.

Other sections of the ordinance relevant to this effort include Chapter 11.3: Stormwater Discharge Requirements, Chapter 11.5 Stormwater Utility, Chapter 11.6 Stormwater Management, Chapter 11.7 Erosion and Sediment Control, and Chapter 12 Fire Prevention and Protection. Building regulations, subdivision regulations, and general land use are also provided for in the ordinance.

Current zoning standards restrict floodway development to specific permitted uses including agricultural operations, recreational use, botanical gardens, and accessory residential use. Other acceptable floodway uses must be granted by special exception. All floodway development must meet “no-rise” qualifications and all new floodplain development or substantially improved structures must meet the freeboard requirements for elevation or flood-proofing and be within NFIP compliance. After reviewing, the City finds its current zoning and floodplain management ordinance adequate and does not plan to assert stricter permitted uses in the floodway or other flood zones.

Enforcing stricter building codes within flood zones can further reduce flood risk by requiring more strict elevation, or floodproofing requirements in the floodplain. The City currently requires 2 feet of freeboard within the regulatory floodplain but otherwise follows the Virginia Uniform Statewide Building Code. Current City standards are in line with City’s goals and will update alongside any state level changes.

Subdivision ordinance language help to ensure that the threat of flooding is considered and addressed in the planning process. The City’s ordinance language requires that subdivision layouts be consistent with minimizing flood damage and ensuring there are clear and safe evacuation routes during a flood event. It also requires adequate subdivision drainage and locating utilities and facilities in areas subject to minimal flood damage. After review, there are no areas of the subdivision ordinance in regard to floodplains that have been deemed in need of change.

Stormwater management regulations, specifically those addressing water quantity, reduce the severity of flooding when applied across the community. These regulations ensure development impacts on stormwater runoff are offset by solutions such as green infrastructure best management practices. The city code follows the Virginia Stormwater Management Program (VSMP) to address both stormwater quality and quantity, and also employs a stormwater credits program that encourages both residential and commercial properties to employ stormwater best management practices that assists the city in managing stormwater issues. There are no current plans to revise the stormwater management ordinance beyond the state standards.

The City of Roanoke has adopted more stringent regulations, references, guidelines, standards and specifications than promulgated by the Virginia Soil and Water Conservation Board (and any local handbook or publication of the board) for the effective control of soil erosion and sediment deposition to prevent the unreasonable degradation of properties, stream channels, waters and other natural resources.

Notable amongst the other localities, the City has designated a Stormwater Utility Fee in 2014 which is used to fund water quality improvements in the region and encourage alternative

development practices. These activities have co-benefits to reduce flooding in many cases. Project examples include:

- Planning, design, engineering, construction, and debt retirement for new facilities and enlargement or improvement of existing facilities, including the enlargement or improvement of dams, levees, and floodwalls, that serve to control stormwater;
- Water Quality Projects including stream restorations and other green infrastructure to reduce pollutants and erosion and to enhance runoff infiltration;
- Facility operation and maintenance, including the maintenance of publicly owned stormwater and flood mitigation infrastructure;
- Monitoring of stormwater control devices and ambient water quality monitoring; and
- Other activities consistent with the state or federal regulations or permits governing stormwater management, including, but not limited to, public education, watershed planning, inspection and enforcement activities, and pollution prevention planning and implementation.
- Creation of a Stormwater Utility Flood Mitigation Program as a supplement to nationally competitive FEMA grants.
- Outreach and Education on water quality, stream health, floodplain natural functions, flood insurance and substantial damage and substantial improvement requirements.

## NFIP Compliance

The City participates in, and is in good standing with, the National Flood Insurance Program (NFIP) by enforcing floodplain management regulations that meet federal requirements. This program allows property owners to purchase flood insurance from NFIP. As of 2025, there are 385 NFIP policies in force in the City.

The Zoning Administrator is the primary responsible staff person for floodplain management, but is not a certified floodplain manager. The City entered the NFIP in 1981. In that time there have been 797 claims at \$18,852,734 total. There are 85 repetitive loss properties and 11 severe repetitive loss properties in the City.

The City identified land use demands in an urban environment as a primary inhibiting factor for running an effective NFIP program, as well as staff expertise continuity and maintenance.

The City of Roanoke entered the CRS program in 1996 and maintains a class 6 rating (20% discount on flood insurance premiums for parcel owners within City limits).

## Dam Safety

Spring Hollow Reservoir Dam, located on a tributary of the Roanoke River and owned by the Western Virginia Water Authority, could impact properties in the City of Roanoke if it failed. Carvins Cove Reservoir Dam, located on a tributary of the Carvins Creek and owned by the Western Virginia Water Authority, could impact properties in the City if it failed. Two other smaller private lakes in the City are designated high hazard by the DCR; Windsor Lake and Spring Lake, both have conducted significant spillway improvements, and owners closely coordinate with the City. The City works directly with them during storm events and potential flooding impacts that would or could potentially see impacts on dam structures.

Windsor Lake and Spring Valley Lake dams are privately-owned dams located within the City of Roanoke. The emergency communication protocol for both includes notification to City of Roanoke Emergency Management.

Windsor Lake Corporation reaches out to Emergency Management annually for communication tests and every three years for a tabletop exercise and revision of their Emergency Action Plan. They have shared a copy of their 2025 plan with us, as well as GIS shapefiles of inundation extents.

Spring Valley Lake LLC is due for a revision of their Emergency Action Plan. The last revision of the plan is dated 2013. They conducted a joint evaluation with City of Roanoke Emergency Management after a 2020 emergency event.

## **Other Mitigation Implementation Activities**

The City continues to maintain open space as recreational areas as well as seeking to expand the open space in the floodplain through acquisition and demolition of highly flood prone structures, then maintaining them as deed restricted parcels. Acquisition, demolition, and open space preservation has been and will continue to be one of the City's strategies to reduce community flood risk. The City participates in State and Federal grant funding programs to be able to fund these projects.

Stream restorations have been a significantly beneficial strategy for flood loss prevention. Stream restorations allow for channel design and streambank stabilization that protects surrounding infrastructure, with the added benefit of renaturalizing the surrounding floodplain. This not only provides flood storage and property protection benefits, but also improves water quality and local habitat. The City plans to continue to seek high priority stream segments and apply for grant funding for projects in those areas.

Star City Alerts allows for direct alerting to citizen devices which helps save lives and property by shortening warning times and informing the public during flood events. The City has plans to leverage local stream gauge data to trigger automatic communications through this alerting system. Currently the system has a manual communication chain during flood events. Grant funding is being sought to establish the gauges and software necessary to make this connection happen.

The City has a large backlog of Capital Improvement Projects (CIP) to improve stormwater drainage throughout problem areas in the City. The CIP project prioritization system now allows the best use of Stormwater Utility funds and awarded grants to upgrade and repair the stormwater drainage system.

The City has successfully maintained a consistent flooding outreach program that involves a brochure that goes to all floodplain properties, a flood safety website, social media posts, repetitive loss letters, and hosting a Prepareathon (an event focused on emergency preparedness including flooding preparedness). New projects are always being considered to ensure flood hazard and mitigation information is reaching the community. Outreach projects are typically funded through the City general fund and the Stormwater Utility fund.

The City of Roanoke was designated a Storm Ready community in February 2010 by the National Weather Service. The City was certified based on its level of emergency preparedness including: a 24-hour warning point and emergency operations center; development of at least four methods by which weather warnings can be received and disseminated; creation of a system to monitor local weather conditions; conducting community seminars to promote disaster readiness; and development of a formal hazardous weather plan, including spotter training and emergency exercises. An additional benefit of the designation to the residents and business owners in the City is reduced rate for flood insurance.

The Stream Hydrology And Rainfall Knowledge System (SHARKS) is a platform that integrates USGS precipitation gauge data as well as stream sensors across the City of Roanoke to show real time stream height and rain data. This facilitates staff understanding and analysis of flooding in real-time events as well as past flood data. The SHARKS system helps inform flood planning, emergency responders, road closures and stormwater projects.

The City partners with the U.S. Geological Survey (USGS) to monitor and study local waterways to better understand local water quality dynamics and inform management decisions. Monitoring objectives include: continual stream levels, water temperature, pH, conductivity, dissolved oxygen, and turbidity. Statistical relationships between sediment and turbidity have been developed at each station in order to estimate sediment loading with the goal of effective management of suspended sediment. In addition, the monitoring data are being used with aquatic insect data to better understand the relationship between hydrology, water quality and aquatic insect health in the City. These monitoring and science efforts support the City's science-informed watershed management strategy; more information is available at the USGS' Roanoke Project Site.

The City has also partnered with the USGS to install precipitation monitoring gauges in a selected spatial distribution pattern to optimize data capture. This robust precipitation monitoring network can provide many benefits to a variety of stakeholders within the city, including stormwater and other utilities, first responders, educational programs, and others. The monitoring network can provide critical data to aid the management and modeling of the stormwater infrastructure and first responders could utilize the real-time monitoring to better allocate resources during extreme precipitation events. The network could also be used as an outreach tool to educate residents and students about precipitation and potential risks of precipitation and flooding.

Project Impact Roanoke Valley was a partnership of FEMA, Roanoke County, the cities of Roanoke and Salem and the Town of Vinton to reduce destruction to life and property during disasters through planning and mitigation. The Project Impact Roanoke Valley Steering Committee and its work groups evaluated hazard mitigation needs from 1998 to 2001. The four work groups were: Hazard Mitigation, Public Information and Community Education, Stormwater Management and Partnership and Resource group. The Stormwater Management group that originated with the Project Impact Roanoke Valley initiative was responsible for the preparation of over 1,500 floodplain elevation certificates. The Public Information and Community Education and Partnership and Resource groups met with community organization, civic groups, businesses and the general public to promote hazard mitigation activities.

## Other Factors

The City identified several factors as potentially inhibiting mitigation activities. State ordinance and national building codes may offer some limitations. Funding for acquiring land may be limited. The loss of multiple federal funding sources will severely impact mitigation efforts. Potential losses include BRIC grants, funding from the Inflation Reduction Act, Community Bloc Grants, and funding from the Bipartisan Infrastructure Law. These have all been key sources of mitigation funding in the past.

The City is a member of the Roanoke Valley-Alleghany Regional Commission, the Roanoke Valley Resource Authority, the Greenway Commission, the Western Virginia Water Authority, Valley Metro, and the Roanoke Valley Transportation Planning Organization. They maintain a planning commission and a board of zoning appeals. They have a robust public outreach program and are a member of Roanoke Valley Television. Mitigation-related programming is common in their public outreach.

## 5.12 City of Salem

The City of Salem is a small city adjoining the City of Roanoke and encircled by Roanoke County. Route 11, a key transportation corridor, bisects the City and LewisGale hospital, the region's other major hospital, is located within its boundaries. The City had a population of 25,477 in 2023 with a projected population of 25,519 in 2030. The median age is 40.3, and the median household income is \$68,402.

### Budget and Staffing Characteristics

The City staffs several positions, including all relevant positions to mitigation planning. A floodplain administrator, a GIS coordinator, emergency management personnel, building officials and civil engineers, as well as a community planner, are all covered by staff. The Comparative Report shows a low 7 percent federal funding ratio, and local revenue makes up a hearty 61 percent of revenues for the locality.

**Table 51: City of Salem Revenues 2024**

| City of Salem Budget 2024          |                          |
|------------------------------------|--------------------------|
| <b>Population</b>                  | <b>24,985</b>            |
| <b>Local Revenue</b>               | <b>\$ 100,577,836.00</b> |
| <i>Per Capita</i>                  | \$ 4,025.53              |
| <i>Percent of Revenue</i>          | 61.27%                   |
| <b>From the Commonwealth</b>       | <b>\$ 52,065,597.00</b>  |
| <i>Per Capita</i>                  | \$ 2,083.87              |
| <i>Percent of Revenue</i>          | 31.72%                   |
| <b>Federal Pass-thru</b>           | <b>\$ 5,508,189.00</b>   |
| <i>Per Capita</i>                  | \$ 220.46                |
| <i>Percent of Revenue</i>          | 3.36%                    |
| <b>Direct Federal Aid</b>          | <b>\$ 6,003,705.00</b>   |
| <i>Per Capita</i>                  | \$ 240.29                |
| <i>Percent of Revenue</i>          | 3.66%                    |
| <b>Total Federal Vulnerability</b> | <b>\$ 11,511,894.00</b>  |
| <i>Percent of Revenue</i>          | 7.01%                    |
| Total Revenue                      | \$ 164,155,327.00        |
| Non-Revenue Receipts               | \$ 720,018.00            |
| Transfers from Other Funds         | \$ 3,305,679.00          |
| <b>Total Sources Available</b>     | <b>\$ 168,181,024.00</b> |

### Plans and Planning Schedules

The City of Salem maintains numerous plans, many of which are listed in section 3.4: Flooding. The Resilience Plan and the Emergency Operations Plan are perhaps most relevant to this effort. The Comprehensive Plan was recently updated in 2025.

## Ordinances and Policy Mechanisms

Chapter 30. – Environment of the City ordinance contains several sections relevant to mitigation planning and emergency response, including Article III. Erosion and Sediment Control and Article IV. Stormwater Management. Chapter 34 – Fire Prevention and Protection deals with hazardous materials, bonfires, and creates the role of a fire marshal.

The City of Salem has adopted the regulations, references, guidelines, standards and specifications promulgated by the Virginia Soil and Water Conservation Board (and any local handbook or publication of the board) for the effective control of soil erosion and sediment deposition to prevent the unreasonable degradation of properties, stream channels, waters and other natural resources. Salem's ordinance, in addition to referencing the Virginia Erosion and Sediment Control Handbook, states in Section 30-117 that the erosion and sediment control plan must consider “Peak runoff from a ten year or 100-year frequency storm, based on present and future developed conditions …” and “If the watershed is greater than one square mile in area, a peak runoff study of the 100-year frequency storm shall be prepared.”

The City of Salem adopted a Floodplain Management Ordinance in 1993 (revised in 2007) that requires new residential buildings to be elevated to a minimum of one foot (1') above the base flood elevation. The City has a floodplain overlay district corresponding to areas identified on Flood Insurance Rate Maps prepared by FEMA.

The City has a Stormwater Management Ordinance that is part of the City Code. It was developed to bring the City into compliance with state laws on stormwater management and is consistent with the statewide Stormwater Management Model Ordinance.

Chapter 106 establishes the zoning code, which includes the floodplain overlay district in accordance with the NFIP. An urban forest overlay is also designated as a method to combat urban heat island effect.

## NFIP Compliance

The Director of Community Development is the program administrator for the NFIP. He is floodplain manager certified. There were 252 policies in the community in 2025. Since Salem joined the NFIP in 1978, 592 claims have been paid out in the community at \$18,080,710. Flood risk is high in the community, with 2,592 structures at risk. Ninety are repetitive loss structures, with 29 being severe repetitive loss structures. Staff note that the program is understaffed and underfunded – staffing constraints remain a repetitive issue for localities across the region in running an effective NFIP program.

## Dam Safety

Spring Hollow Reservoir Dam, located on a tributary of the Roanoke River and owned by the Western Virginia Water Authority, could impact properties in the City of Salem if it failed. The WVWA is a recognized jurisdiction in this plan. Further information about potential impacts from this dam is available in [Appendix H](#).

## Other Factors

The City stated a desire to improve public awareness around hazards. They stated that their approach to mitigation is proactive and adaptive.

The City maintains many of their own utility systems, including their own water and sewer system and some electrical infrastructure. They are a member of the Roanoke Valley-Alleghany Regional Commission, the Roanoke Valley Transportation Planning Organization, and the Greenway Commission. The locality does maintain a planning commission. Valley Metro serves this locality.

## 5.13 Town of Vinton

The Town of Vinton is one of the largest towns in the Commonwealth with a 2023 population of 8,038 per the CEDS. Located within Roanoke County, the town also borders the City of Roanoke. The median age is 39.7 making this the second youngest locality in the region.

### Budget and Staffing Characteristics

No budget information is available in the statewide Comparative Report for the past two years. However, the adopted FY2025 budget is available on the Town website.<sup>23</sup> The document states FY2023 actual revenues in the General Fund, Capital Fund and Stormwater Fund were \$15,756,600. Combined revenue from non-categorical aid, state sales tax, and categorical aid in that year were about 23 percent of the revenues received.

Vinton uses this money to, among other things, staff several positions, including several community planners, a code enforcement officer, floodplain manager, and a capital projects manager. Some of these may be collected in one position. Vinton has a relatively small staff compared to some other localities in the region.

### Plans and Planning Schedules

The Town maintains a Capital Improvement Plan (updated annually), Comprehensive Plan last updated in 2025 which also serves as a land use plan, and an Emergency Operations Plan and Continuity of Operations Plan updated in 2022. All of these plans include mitigation actions.

They also maintain a transportation plans and an economic development plan.

### Ordinances and Policy Mechanisms

Chapter 79 – Stormwater Management establishes stormwater and erosion and sediment control regulations. Appendix B contains the zoning ordinance, including establishing a Floodplain Overlay District.

The Town of Vinton floodplain management regulations were originally adopted in 1982. These regulations are designed as an overlay district and adopted as part of the 1995 Zoning Ordinance. The regulations have been amended subsequently in 2007 and 2014 and comply with the Federal Emergency Management Agency (FEMA) floodplain regulations. The Floodplain Overlay District applies to properties that have been identified on a Flood Insurance Rate Map (FIRM) as being in a Special Flood Hazard Area (SFHA). The land area covered by the floodwaters of the base flood is the SFHA.

There are two (2) flood zones in the Town:

1. Floodway – The land immediately adjoining the watercourse channel that is the natural conduit for floodwaters; and
2. Special Flood Hazard Area – Any area of land that is susceptible to a one percent (1%) chance of flooding annually. The most recent FIRM for the Town of Vinton was completed in 2007.

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<sup>23</sup> <https://www.vintonva.gov/100/Budgets-Reports>

The Town's floodplain management regulations ordinance requires that new residential structures be at least two (2) feet above base flood elevation, and that new non-residential structures be at least one (1) foot above flood elevation.

The Town follows Roanoke County's Combined Erosion & Stormwater Management Ordinance that is part of the County Code. It was developed to bring the County into compliance with state laws on stormwater management and erosion and sedimentation control. In addition to using the Virginia Erosion and Sediment Control Handbook, Roanoke County publishes a separate Stormwater Management Design Manual that specifies acceptable methodologies, design events for a wide variety of facilities, and administrative requirements such as submittal checklists. Appendices provide a wide variety of charts and tables to be used in applying the approved methodologies.

Roanoke County administers the Town of Vinton Erosion and Sediment Control program under the adopted regulations, references, guidelines, standards and specifications promulgated by the Virginia Soil and Water Conservation Board (and any local handbook or publication of the board) for the effective control of soil erosion and sediment deposition to prevent the unreasonable degradation of properties, stream channels, waters and other natural resources. Such regulations, references, guidelines, standards and specifications for erosion and sediment control are included in, but not limited to, the Virginia Erosion and Sediment Control Regulations and the Virginia Erosion and Sediment Control Handbook, as amended from time to time. In 2025, Erosion and Sediment Control standards, specifications and regulations were adopted under a new ~~joint~~ combined Erosion & Stormwater Management Ordinance

Vinton staff note that a complication of implementation of these ordinances is equity. The enforcement of these ordinances inadvertently impact lower-income populations and neighborhoods

## **NFIP Compliance**

The Town participates in, and is in good standing with, the National Flood Insurance Program (NFIP) by enforcing floodplain management regulations that meet federal requirements. This program allows property owners to purchase flood insurance from NFIP. There are currently 27 NFIP policies in force in the Town.

The Assistant Planning and Zoning Director is responsible for floodplain management in this community and is a Certified Floodplain Manager. One hundred and sixty structures are exposed to flood risk in the community. Three of these are repetitive loss structures. The Midway Community has limited policy coverage but is at risk of flooding.

As of October 1, 2016, the Town is one of the few communities in Virginia that have been accepted into the Community Rating System (CRS) program. Due to the continuing efforts of Town administration, every Town of Vinton property owner – residential or commercial – whose property is located within the Special Hazard Flood Area (SHFA), may be eligible for a 10% discount on their annual flood insurance premium due to the Town's CRS Classification of 8.

Relative to CRS requirements, Vinton undertakes the following CRS specific activities, among many others.

- *Higher Regulatory Standards:* Credit is provided for enforcing regulations that require freeboard for new construction and substantial improvement, and local drainage protection. Credit is also provided for the enforcement of building codes, a Building Code Effectiveness Grading Schedule (BCEGS) Classification of 4/3, and regulations administration.
- *Open Space Preservation:* Credit is provided for preserving approximately 20 percent of the Special Flood Hazard Area (SFHA) as open space and protecting open space land with deed restrictions.

## Dam Safety

Carvins Cove Reservoir Dam, located on a tributary of the Carvin Creek and owned by the Western Virginia Water Authority (WVWA) could impact the western side of the Town of Vinton. Inundation maps for this dam are included in [Appendix H](#).

## Other Mitigation Activities

The Town obtained two FEMA Hazard Mitigation Grant Program (HMGP) grant funding in April 1998 and July 2004. Through these two grant programs, 19 properties that were either developed with residential structures or vacant lots located in the SFHA were acquired. Eleven structures that were located in the floodway were demolished and the occupants and/or tenants were relocated from the SFHA and the properties were rezoned to public/open space district. The Town purchased a mobile home park in 2024 using local funds which involved the relocation or demolition of nine manufactured home units that were in the floodway. Additionally, the Town purchased and demolished a single-family residence located in the floodway in March 2025 using local funds. The Town has an overarching goal of continuing to purchase flood prone properties throughout its jurisdiction using a piecemeal strategy by working with current or future homeowners and vacant landholders.

In January 2010, the Town of Vinton and Roanoke County entered a Memorandum of Understanding (MOU) for Operations, Oversight, and Management of the Merged Emergency Communications Center. By the agreement, the Roanoke County Emergency Communications Center shall provide emergency and non-emergency dispatch services for the Town of Vinton, including the Vinton Police Department and the Vinton Public Works Department. Services delivery procedures will be documented in General Orders (GO) Standard Operating Procedures (SOPs), and Directives, with input provided by the Inter-Agency Operational Team, and the Advisory Board.

In partnership with the City of Roanoke, the Town purchased a flood warning system in 2022.

## Other Factors

Increased assistance with grants administration is an opportunity for regional support to Vinton; especially in regards to hazard mitigation grant programs provided by VDEM and DCR. Additionally, less regulations and requirements on federal grants would be helpful in administering the projects that are awarded. Additional grant assistance (especially from State agencies) is the Town's biggest need in terms of addressing capacity constraints.

The Town receives support on stormwater work and some other services through Roanoke County. The Town of Vinton is a member of the Roanoke Valley – Alleghany Regional Commission and the Roanoke Valley Transportation Planning Organization. Valley Metro serves this locality and they are a member of the Greenway Commission. The Town is a member of the Roanoke Valley Resource Authority and the Western Virginia Water Authority. They have a robust public outreach program and are a member of Roanoke Valley Television.

## 5.14 Roanoke Valley-Alleghany Regional Commission

The Roanoke Valley-Alleghany Regional Commission is the regional planning district commission and the holder of this planning document. The Regional Commission also staffs the Roanoke Valley Transportation Planning Organization, which, while not a direct adopter to this plan, is nonetheless a critical organization in providing transportation planning and funding to the region. The Commission engages in planning across a wide variety of planning areas, including rural transportation, alternative transportation and transportation demand management, public health and opioid abatement, housing, water quality and stormwater management, and general technical assistance including comprehensive plan and zoning assistance.

### Budget and Staffing Characteristics

A breakdown of the Regional Commission budget is included below. The Commission does not own public land or levy taxes upon citizens. All revenue comes from organizational dues, individual contracts with locality or regional partners, state appropriations, state grant programs, or federal grant programs and pass-thru dollars. In fact, more than a quarter of the revenue for the Commission is federal or federal pass-thru.

The annual workprogram and budget of the Commission and TPO guide the work of the Commission from year-to-year. The Strategic Plan guides the work of the Commission over a five-year period.

Table 52: RVARC Budget FY2026

| Roanoke Valley Alleghany Regional Commission<br>Budget Comparison FY2026 |    | Final<br>Budget<br>2026<br>Revenues |
|--|----|-------------------------------------|
| <b>Revenues:</b>   |    |                                     |
| Localities Per Capita Regional Commission                                | \$ | 400,274                             |
| Localities Per Capita TPO  | \$ | 35,882                              |
| Blueway Funding From Localities  | \$ | 11,491                              |
| Franklin County for Micro Transit Study                                  | \$ | 35,000                              |
| Department of Housing & Community Development                            | \$ | 114,971                             |
| Federal Highway Administration - PL                                      | \$ | 726,273                             |
| Virginia Department of Transportation - PL                               | \$ | 90,784                              |
| Federal Highway Administration - SPR                                     | \$ | 58,000                              |
| Federal STBG VDOT Glade Creek Funding                                    | \$ | 268,892                             |
| Virginia Department Rail & Public Transit, FTA Federal                   | \$ | 184,682                             |
| Virginia Department Rail & Public Transit, FTA State                     | \$ | 23,085                              |
| VA Dept. Rail & Public Transit, RideSolutions (Roanoke)                  | \$ | 187,696                             |
| VA Department Rail & Public Transit Franklin County Micro Transit        | \$ | 60,000                              |
| City of Roanoke Better Bus Stops   | \$ | 79,667                              |
| Federal Economic Development Administration                              | \$ | 80,420                              |
| Virginia Department of Forestry  | \$ | 8,000                               |
| Virginia Department of Environmental Quality                             | \$ | 107,754                             |
| Virginia Environmental Endowment   | \$ | 20,798                              |
| Virginia Department of Emergency Management                              | \$ | 38,619                              |
| Appalachian Regional Commission  | \$ | 67,614                              |
| Appalachian Regional Commission Ready LDD Grant                          | \$ | 47,000                              |
| Mountain Castle Water Conservation District                              | \$ | 7,000                               |
| Southeast Crescent   | \$ | 15,000                              |
| City of Roanoke Bike Coordination  | \$ | 12,000                              |
| ARP ACT City of Roanoke Carryover  | \$ | 68,327                              |
| Department of Health & Human Services-Peer Recovery                      | \$ | 495,496                             |
| City of Roanoke Virginia Opioid Abatement Authority Funds                | \$ | 425,000                             |
| Western Virginia Regional Industrial Facility Authority                  | \$ | 25,000                              |
| Virginia Housing   | \$ | 931,569                             |
| SERDI Website Administration Contract                                    | \$ | 1,538                               |
| RVARC Interest Income  | \$ | 40,000                              |
| Miscellaneous Income   | \$ | 2,500                               |
| Sponsorships   | \$ | 2,000                               |
| Blueway Carryover  | \$ | 28,000                              |
| Regional Bike Carryover  | \$ | 7,412                               |
| <b>Total Revenues</b>  | \$ | <b>4,707,744</b>                    |

## Plans and Planning Schedules

The Regional Commission maintains a variety of regional plans mandated by the federal and state governments, as well as several regional studies and documents which have been generated by local interest. The Commission also staffs the TPO, whose documents will be included in this section. Most relevant to the goals of this plan are the Long Range Transportation Plan (LRTP), the Transportation Improvement Plan (TIP), the Rural Long Range Transportation Plan (Rural LRTP), and the Comprehensive Economic Development Strategy document (CEDS). Together these four documents, in conjunction with this plan, guide significant investment across the region.

### Schedule of Updates:

- CEDS: The CEDS receives an annual review and demographics update, with a full update and revision every 5 years. The last 5-year update was conducted in 2024.
- LRTP: The LRTP was last approved in 2023. The next update will begin in 2026.
- Rural LRTP: The Rural LRTP was last updated in 2011, and an update is planned to conclude in 2026.
- TIP: The TIP is approved every four years. The current TIP covers FFY24-27. Updates will begin on the next TIP in 2026.

The Regional Commission has also historically contributed to stormwater collaboration and water quality activities throughout the region which can have direct impact on flood resilience. Specifically, the Regional Commission is currently involved in Chesapeake Bay Watershed Improvement Plan implementation work in partnership with the Virginia Department of Environmental Quality. The Commission also coordinates a regional stormwater advisory group which allows local governments and other entities operating under an MS4 permit to meet and share information and ideas.

### Roanoke Valley Regional Stormwater Management Plan (1997)

All four Roanoke Valley jurisdictions (Roanoke County, Cities of Roanoke and Salem, Town of Vinton) participated in the development of a stormwater management plan that was coordinated through the efforts of the Fifth Planning District Commission (Roanoke Valley-Alleghany Regional Commission). It offers alternative solutions for both flooding and flash flooding problems. These alternatives include clearing stream channels, enlarging drainage openings, constructing regional detention facilities, and flood proofing individual structures. The plan presents a total of 138 individual projects to address flooding in the 16 watersheds. These are ranked in order of priority within each watershed but no overall ranking within the valley is presented. Cost estimates are presented for each project, but neither individual project benefits, nor cumulative benefits are discussed. It would be essential to analyze the benefits of these projects before the plan can be used as a guideline for specific activities. The identified projects would cost a total of \$66 million in 2001 dollars, not including land acquisition or efforts to flood proof or move over 2,200 buildings. A formal quantification of the corresponding benefits would go a long way toward justifying this cost, which can initially seem overwhelming to both citizens and community officials. For example, the 1997 plan reports that between 1972 and 1992, floods caused over \$200 million in damages in the valley, and resulted in 10 deaths. The plan's Financing Options Report recommends creation of a regional stormwater utility as a means of funding the identified work.

## Other Factors

The Regional Commission is the primary holder of this plan and issues with capacity or staffing directly affect the ability to update or maintain the document. Historically, the Commission has also been a key partner for small localities in applying for mitigation grant funding, either by providing assistance with the application process or by administering grants. The Commission also serves as an incubator for regional initiatives.

## 5.15 Roanoke Valley Resource Authority

The Roanoke Valley Resource Authority is a solid waste management organization serving the Roanoke Valley. Member communities include the City of Roanoke, Roanoke County, City of Salem, and Town of Vinton.

### Budget and Staffing Characteristics

The annual revenue for the RVRA totals at \$19,116,734 per the adopted FY2026 budget<sup>24</sup>. They maintain seven administrative staff positions, including a Director of Community Engagement, a Director of Operations, and an Operations Manager.

### Plans and Planning Schedules

The RVRA maintains an annual budget, a Master Plan that functions as the Capital Improvements Plan, a Comprehensive Plan, and a Stormwater Management Plan. The plan was last updated in 2025. Any ordinances that cover solid waste are enacted by localities. RVRA does not have regulatory authority.

### Other Factors

The RVRA is primarily a support agency for response to disasters. They operate critical facilities within the Roanoke Valley. RVRA sees the primary need for mitigation efforts to be better cross-agency engagement.

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<sup>24</sup> <https://www.rvra.net/135/Annual-Budget>

## 5.16 Western Virginia Water Authority

The Western Virginia Water Authority provides critical water and sewer services and maintains and operates infrastructure for many of the communities within this plan, including the counties of Roanoke, Botetourt, and Craig, the City of Roanoke, and the Towns of New Castle, Fincastle, and Vinton.

### Budget and Staffing Characteristics

The WVWA staffs 309 full-time employees across multiple divisions within the organization. All of the divisions might be directly or indirectly impacted by mitigation work or disaster events. Staff members include those with skills in engineering, emergency management, and GIS. The WVWA revenue in FY2025 was projected at \$50.5 million.<sup>25</sup>

### Plans and Planning Schedules

The WVWA maintains a Master Plan, a Capital Improvements Plan, Emergency Response Plans for their various treatment facilities, and Emergency Actions Plans for High Hazard Potential Dams under their ownership. They are all updated annually, and all include mitigation activities. Ordinances which may impact the operations of the WVWA are controlled by the localities in which they operate.

### Dam Safety

The WVWA operates several dams within the region. Inundation mapping for WVWA-owned dams is available in [Appendix H](#).

### Other Factors

The WVWA is primarily a support agency for response to disasters, but the Authority is the primary maintenance agency for two high hazard potential dams in the region. They operate critical facilities within the region.

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<sup>25</sup> <https://www.westernvawater.org/about-us/financial-documents-reports/annual-budget>

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# Chapter 6. Mitigation Goals and Strategies

Goals and strategies are guiding elements which help shape the action plans of the jurisdictions participating in this planning process. Goals and strategies are housed regionally, emphasizing a regional approach highlighting partnership and intentional strategy, representative of all participants.

## 6.1 Identified Goals

Three goals were identified in the planning process. Goals are broad statements allowing for establishment of tailored, focused strategy. These are aspirational, vision statements that guide implementation efforts.

### Goal 1

**Minimize the loss of life, structures and critical infrastructure during a disaster, as well as reduce risk to the built environment and natural resources.**

### Goal 2

**Minimize the economic impact to communities and the region in the wake of disaster**

### Goal 3

**Minimize impacts to social systems and community resources following disaster.**

## 6.2 Regional Strategies

Strategies are conceptual statements wherein projects can be developed, detailed and executed. In applying mitigation strategies to the region and participants, a wide range of activities were considered in order to achieve the goals and to lessen the vulnerability of the area to the impact of natural hazards. Goals are pursued regardless of financial resources. However, advancement of identified strategies is largely contingent upon meaningful, sustainable projects relying on availability and timeliness of non-local funding from a variety of partners and sources.

Strategies are generally organized conceptually around five areas of work, which are:

1. Local Plans and Regulations
2. Structure and Infrastructure Projects
3. Natural Systems Protection and Nature-Based Solutions
4. Education and Awareness Programs
5. Community Safety and Partner Efforts

Strategies were developed by jurisdictions in partnership with VDEM staff.

## 6.3 All Hazards

### Local Plans and Regulations

1. Support local development codes that promote disaster resiliency.
2. Support robust, deliberate emergency operations planning.
3. Pursue opportunities to study, research and plan to build resiliency throughout communities based on hazard data, new research and concepts. This could include risk and vulnerability assessments, operational assessments among others.

### Structure and Infrastructure Projects

4. Equip and maintain critical facilities and resources with redundant power resources, such as generators, hookups/quick connects, and battery/solar backups.
5. Assess and develop where practical, loan, grant, or similar programs to support increased resilience of privately owned facilities, structures and property.
6. Seek opportunities to build resiliency within utilities to reduce impact from all-hazards.
7. Develop redundancy in water sources and water distribution systems.
8. Establish, sustain and develop dam maintenance and replacement programs to ensure dam safety, access to water sources and sustainment of natural recreation areas.

### Natural Systems Protection and Nature-based Solutions

9. Integrate regional environmental and natural resources preservation efforts with hazard mitigation planning.

### Education and Awareness Programs

10. Pursue educational programs and outreach activities that promote individual, family and business safety and resiliency
11. Provide planning resources tailored to business continuity.

12. Make home safety and individual preparedness resources available to community members
13. Participate in special outreach/awareness programs and activities.
14. Seek opportunities to communicate effectively across multiple methods with the public well in advance of disaster to communicate forecast and preliminary action steps, including the use of social media and non-emergency alert systems. Ensure capability to speak with vulnerable communities including non-English speaking community members and individuals with access and function needs.

## Community Safety and Partner Efforts

15. Participate, seek or maintain certification as a "Storm Ready" Community with the National Weather Service.
16. Improve region-wide interoperability across radio systems.
17. Improve citizen access to emergency reporting mechanisms including but not limited to 911 and post disaster recovery tools.
18. Pursue, sustain and develop emergency alerting tools that allow emergency services to alert members of the community through a variety of methods, to impending emergency, particularly mass notifications systems.
19. Develop, resource and sustain locations, physical and virtual, where whole of government and community partners may coordinate to respond to the impacts of hazards.
20. Conduct resiliency assessments of public facilities with an emphasis on critical infrastructure and utilities.
21. Undertake deliberate research, planning and effort to develop comprehensive, compliant and innovative debris management programs following all hazards disasters that generate manageable debris.
22. Support the development of weather reading and monitoring equipment to increase situational awareness, alert and warning.
23. Support the development and sustainment of Community Emergency Response Teams (CERT) within localities.
24. Support the maintenance and expansion of locality sheltering locations and resources.
25. Develop, sustain and support capabilities to shelter pets during disaster.
26. Resource capabilities related to assisting special needs and vulnerable populations.
27. Develop, sustain and support capabilities to conduct family reunification and assistance.
28. Engage partners to share capability and situation information, pre, during and post disaster.
29. Develop capabilities to conduct multi-jurisdiction sheltering when applicable.
30. Regularly train first responders, coordinate with regional partners, and ensure clear post-disaster communication and recovery.

## 6.4 Earthquake

### Education and Awareness Programs

1. Conduct public information activities such as the “Great Shakeout” to provide individuals with tactics to take when earthquakes strike.

### Community Safety and Partner Efforts

2. Engage with subject matter experts to understand the scope and risk to facilities and life as a result of an earthquake.
3. Develop “critical area” maps based on geotechnical information to identify locations where damage potential could be high.
4. Engage partners to share capability information.

## 6.5 Extreme Temperature

### Local Plans and Regulations

1. Plan to develop adaptation features to build individual, community and infrastructure resilience.

### Structure and Infrastructure Projects

2. Identify vulnerable structures and implement infrastructure retrofit projects to include measures that reduce risk to existing utility systems.
3. Consider use of reflective roof coatings, radiant barriers and other tactics to mitigate heat interaction with structures.

### Natural Systems Protection and Nature-based Solutions

4. Increase urban tree cover to mitigate heat island effect.

### Education and Awareness Programs

5. Inform community members of the danger of extreme temperature and provide resources through multiple methods, such as NWS HeatRisk.

### Community Safety and Partner Efforts

6. Identify locations and partnerships that create opportunity for community members to seek reprieve from extreme temperatures.

## 6.6 Flooding

### Local Plans and Regulations

1. Encourage a comprehensive approach to floodplain management
2. Support programs that update FEMA's Flood Insurance Rate Maps (FIRM). Consider participation in FEMA's Cooperating Technical Partners (CTP) program that establishes partners with local jurisdictions to develop and maintain up-to-date flood maps.
3. Participate in FEMA's Digital Flood Insurance Rate Maps (DFIRM) program.
4. Support FIRM remapping projects that address flood prone areas in the region
5. Maintain an accurate database and map of repetitive loss properties
  - a. Localities will work with RVARC, VDEM and FEMA to update list of repetitive loss properties annually.
  - b. Localities will obtain updated list of repetitive loss properties annually from VDEM/FEMA.
  - c. Localities will review property addresses for accuracy and make necessary corrections.
  - d. Localities will determine if and by what means each property has been mitigated.
  - e. Localities will map properties to show general site locations (not parcel specific in order to maintain anonymity of the property owners).
  - f. Localities will determine if properties have been mitigated and inform FEMA/VDEM through submission of an updated list/database and mapping.
6. Participate in, and remain in good standing with the NFIP, in accordance with NFIP regulatory requirements including:
  - a. Adoption of the NFIP minimum floodplain management criteria via local regulation;
  - b. Adoption of the latest effective Flood Insurance Rate Map (FIRM), when applicable;
  - c. Implementation and enforcement of local floodplain management regulations to regulate and permit development in SFHAs;
  - d. Appointment of a designee or organization to implement the commitments and requirements of the NFIP;
  - e. Implementation of the substantial improvement/damage provisions of their floodplain management regulations after an event, as applicable.
7. Strengthen and support the insurance aspects of the NFIP through participation in relevant programs, such as the Community Rating System.
8. Work to reduce flood damage to insurable property.
9. Develop, support and sustain Stormwater Management Plans, such as the Roanoke Valley Regional Stormwater Master Plan.
  - a. Explore the number of watersheds studied in the Roanoke Valley Regional Stormwater Master Plan, consider expanding the number of inclusions as appropriate and develop watershed plans for each.

### Structure and Infrastructure Projects

10. In cooperation with local governments, utilize GIS tools to inventory at risk infrastructure and public and private structures within flood prone areas.

11. Support local and state transportation projects that call for improved ditching, replacement of inadequate and undersized culverts, enlargements of bridge openings, drainage piping and other physical work needed to minimize flooding.
12. Pursue the acquisition of residential and commercial property in floodplains with an emphasis on repetitive loss properties.
13. Support structural elevation projects where buildings can be safely elevated to avoid loss or damage during flood events.
14. Seek opportunities to floodproof structures.
15. Pursue acquisition of elevation certificates for flood prone properties.

## Natural Systems Protection and Nature-based Solutions

16. Consider seeking funding to prepare site-specific hydrologic and hydraulic studies that look at areas that have chronic and repetitive flooding problems.
17. Consider increasing conveyance standard to handle more intense precipitation, while avoiding streambank erosion.
18. Pursue opportunities to utilize pervious hard surfaces when possible.
19. Pursue opportunities to stabilize soil along river, creek and stream banks to prevent undercutting roads and other facilities.
20. Promote green infrastructure to prevent flooding, manage excess runoff and increase filtration.
21. Promote the use of green roofs and rainwater harvesting systems
22. Restore and protect riparian areas.
23. Restore waterways that have been covered or buried due to natural conditions.
24. Protect and restore wetlands, forests, and other natural buffers to reduce storm surge and flooding impacts.

## Education and Awareness Programs

25. Enhance pre-disaster community situational awareness of flood hazards and hazard prone locations, by cooperating with all relevant partners to support a comprehensive public information and education program on all aspects of preparedness related to flooding. Tools such as the FloodView App (2025) provide information and resources supporting this strategy.

## Community Safety and Partner Efforts

26. Provide early flood warning
  - a. Identify target areas for monitoring, including flood prone areas, streams and rivers to provide advance warning for downstream impacts.
  - b. Identify, acquire and maintain equipment that will perform required monitoring for specific locations and needs. Ensure equipment is appropriately supported and networked to enhance data coordination and empower early warning.
  - c. Configure systems and tools that monitor water levels and flooding conditions to support data and early warning interoperability with organizations that have responsibility to provide alerts, store, and monitor data. Ensure sustainment of these systems and data interoperability.

## 6.7 Geologic Hazards

### Local Plans and Regulations

1. Develop, sustain and enforce, as appropriate, steep slope ordinances/guidelines for development in steep slope/marginal soils areas.

### Education and Awareness Programs

2. Develop an education and awareness program for home, land and business owners, to inform life and property safety measures on an individual basis, as well as financial considerations associated with geologic hazards.

### Community Safety and Partner Efforts

3. Encourage the delineation of karst areas and areas susceptible to sinkholes through a cooperative effort with the Virginia Karst Mapping Project, Virginia Speleological Survey, and Virginia Department of Conservation and Recreation (Virginia Cave Board).
4. Encourage the delineation of susceptible areas and different types of landslide hazards at a scale useful for planning and decision-making, led by USGS and State geological surveys.
5. Work with state and Federal agencies to develop data that will assist in reducing and eliminating impacts from landslides.

## 6.8 Wind

### Local Plans and Regulations

1. Promote building codes and retrofitting practices that enhance wind resistance for homes, utilities, and critical facilities.

### Structure and Infrastructure Projects

2. Identify vulnerable structures and implement infrastructure retrofit projects to include measures that reduce risk to existing utility systems.
3. Identify, maintain, and publicize designated tornado shelters, and encourage safe room installation in schools, public buildings, and homes.

### Natural Systems Protection and Nature-based Solutions

4. Research and install landscape mitigation for strategic planting of trees and hedge rows.
5. Conduct pre-storm tree assessments and pruning to help minimize wind born debris and protect infrastructure.

### Education and Awareness Programs

6. In cooperation with Federal and State governments, support a comprehensive public information and education program on wind hazards, including straight line winds, tornados and thunderstorm winds. This can be accomplished through regional workshops and educational materials for citizens, business, local staff, and elected officials.

7. Strengthen community access to NOAA Weather Radio, mobile alerts, and local emergency notifications to ensure residents receive timely tornado warnings.
8. Support school level preparedness activities including tornado drills.

## Community Safety and Partner Efforts

9. Strengthen operational coordination relationships with utility providers to coordinate and collaboratively support the community following disaster related impacts.

## 6.9 Wildfire

### Structure and Infrastructure Projects

1. Encourage residents and developers to use NFPA Firewise USA TM building design, siting, and materials for construction.
2. Continue to support domestic water line infrastructure into communities who currently operate off well water.

### Natural Systems Protection and Nature-based Solutions

3. Create Defensible Space – implement perimeters around homes, structures, and critical facilities through the removal or reduction of flammable vegetation.
4. Continue to utilize the Va. Dept. of Forestry “Dry-Hydrant” program to support access to private water sources

### Community Safety and Partner Efforts

5. Identify buildings or locations vital to the emergency response effort and buildings or locations that, if damaged, would create secondary disasters in forested areas.
6. Encourage VDOF to continue its Community Wildfire Assessments.

## 6.10 Winter Storm

### Structure and Infrastructure Projects

1. Implement pavement temperature sensors to increase real-time planning, execution and public information efforts.

# Chapter 7. Mitigation Action Plans

## 7.1 Project Development and Prioritization

This section contains the mitigation action plans of each participating jurisdiction within the plan. In developing mitigation strategies for the region, a wide range of activities were considered in order to achieve the goals and to lessen the vulnerability of the area to the impact of natural hazards. All goals, strategies, and projects are dependent on the availability and timeliness of nonlocal funding.

Prioritization of projects was based on the benefit-to-cost criteria and the strategy's potential to mitigate the impact from natural hazards in line with long term planning efforts. For example, if a project is already clearly scoped in an existing plan, that project is given higher priority. Consideration was also given to availability of funding, the department or agency responsible for implementation, and the ability of the locality to implement the project. Under each identified project, applicable participant departments will be the lead in making sure that each project or action will be implemented in a timely manner by coordinating with other departments, other participant representatives and/or other regional agencies.

The anticipated level of cost effectiveness of each measure was a primary consideration when developing the list of proposed projects. Projects were categorized as high, medium or low benefit to cost based on the available information for each proposed project. Reduced damages over the lifespan of the projects, the benefits, are likely to be greater than the project cost in all cases. Although detailed cost and benefit analysis was not conducted during the mitigation action development process, these factors were of primary concern when prioritizing and selecting the proposed projects.

For more information about each locality, including active mitigation programs and ordinances, please see [Chapter 5: Capabilities Assessment](#).

## 7.2 Alleghany County

The mitigation actions contained in this section also cover mitigation actions for the Town of Iron Gate.

| Project   | Hazard Mitigated | Benefit   | Cost Estimate        | Benefit-to-Cost | Priority | Funding Partners                                  | Implementation/Lead Agency                           | Status                                 | Proposed Schedule |
|---|------------------|---|----------------------|-----------------|----------|---|--|--|-------------------|
| Acquisition of flood prone properties   | Flooding         | Removal of households from flood hazard areas; reduce repetitive loss; reduce loss of life and property | Unknown              | High            | High     | FEMA, VDEM, Local government                      | Local government, Engineering & Building Inspections | COMPLETE                               | 2018-2023         |
| Communication equipment interoperability  | All hazards      | Improved coordination among jurisdictions; improved response times                                      | \$7,000,000          | High            | High     | FEMA, Local government                            | Local government                                     | COMPLETE                               | Current / Ongoing |
| Identify areas with recurring flood problems and request additional stream/rain gauges  | Flooding         | Improved early warning of flooding; ensure that these areas are adequately covered and monitored        | \$12,500             | High            | Medium   | FEMA, VDEM  | RVARC  | In progress                            | 2025-2026         |
| Identify areas that warrant site-specific hydrologic and hydraulic studies emphasizing chronic and repetitive flooding problems | Flooding         | Possible determination of solutions to repetitive loss properties.                                      | Cost Pending Scoping | Medium          | Medium   | County, Grantor with an appropriate grant program | Community Development                                | Not started; lack of scoping and staff | Unknown           |

| Project  | Hazard Mitigated                                       | Benefit  | Cost Estimate | Benefit-to-Cost | Priority | Funding Partners  | Implementation/Lead Agency                    | Status                       | Proposed Schedule     |
|--|--|--|---------------|-----------------|----------|---|---|------------------------------|-----------------------|
| Identify buildings or locations vital to the emergency response effort and buildings or locations that, if damaged, would create secondary disasters in forested areas | Wildfire   | Available inventory of structures that need additional or unique protection from wildfires.  | \$10,000      | Low             | Medium   | VA Dept. of Forestry, US Forest Service, Local governments                                  | Co Public Safety                              | Not started; lack of funding | Unknown               |
| Evaluate critical facilities and public utilities for flood-proofing   | Flooding   | Evaluation of county owned critical facilities and public utilities for retrofitting or flood-proofing to prevent failure during disasters | \$250,000     | Medium          | Medium   | FEMA, Local government  | Public Works/General Services                 | Not Started pending scoping  | 6MOs from Funding     |
| Hazardous Materials Risk Assessment and Education Program  | All Hazards that result in Hazardous Materials Release | Evaluate risk and community safety information for Hazardous Materials Release   | \$25,000      | Medium          | High     | County, Grantor with an appropriate grant program   | Public Safety                                 | Not started pending scoping  | Pending Scoping       |
| Install Generators at:<br>-CSB<br>-AHS<br>-Pump Stations   | All hazards generating power outage                    | Ensure that emergency facilities can be operational during hazard events   | \$75,000(ea)  | High            | Medium   | County, CSB, Schools, VDEM Shelter Upgrade Grant, Grantor with an appropriate grant program | Public Safety, Public Works, General Services | Pending Grant Award          | 6MOs from grant award |

| Project                        | Hazard Mitigated | Benefit   | Cost Estimate | Benefit-to-Cost | Priority | Funding Partners          | Implementation/Lead Agency | Status                       | Proposed Schedule |
|--------------------------------|------------------|---|---------------|-----------------|----------|---------------------------|----------------------------|------------------------------|-------------------|
| Local codes review             | All hazards      | Review of development codes to evaluate need for changes that would improve disaster mitigation | \$10,000      | Medium          | Medium   | FEMA, Local government    |                            | Not started; lack of funding | Unknown           |
| Community wildfire assessments | Wildfire         | Reduction of loss to wildfire, through collaborative assessments and tailored mitigation action | \$25,000      | Medium          | Medium   | VDOF, USFS, Public Safety | Public Safety              | In progress                  | Ongoing           |

## 7.3 City of Covington

| Project  | Hazard Mitigated  | Benefit  | Cost Estimate | Benefit-to-Cost | Priority | Funding Partners                                | Implementation/Lead Agency                              | Status                                   | Proposed Schedule |
|--|---|--|---------------|-----------------|----------|---|---|--|-------------------|
| Add / Replace Generators at Fire Station City Hall Emergency Shelter Locations | All Hazards generating power outage Extreme Temperature | Evaluate the facilities and install appropriate generating equipment and controls to allow them to be better utilized during disasters and severe events | ~\$220,000+   | High            | High     | City/ Grantor with an appropriate grant program | Development Services/Public Works/ Emergency Management | Not started pending scoping              | 1YR from funding  |
| Add flow monitoring equipment to locality water system                         | Flooding  | Provide better, more timely information to public works to identify system anomalies   | ~\$100,000    | High            | High     | City, I&I Grant                                 | Public Works  | In Progress                              | DEC 2026          |
| Elevation of Structures - City Pool and Playground                             | Flooding  | Reduced damages and repair costs   | \$100,000     | Medium          | Medium   | City & Local Foundation Grant                   | Local Government  | Complete                                 | 2016              |
| Drainage Improvements – Craig Avenue and Royal Avenue                          | Flooding  | Reduced damages and repair costs   | \$500,000     | High            | High     | VDEM / FEMA / LOCAL GOVT                        | Local Government  | Engineering/ design underway<br>COMPLETE | 2020-22           |

| Project  | Hazard Mitigated                    | Benefit   | Cost Estimate | Benefit-to-Cost | Priority | Funding Partners                                      | Implementation/Lead Agency                              | Status                       | Proposed Schedule      |
|--|-------------------------------------|---|---------------|-----------------|----------|---|---|------------------------------|------------------------|
| The upgrading of the present weather terminal at the Covington EOC | All Weather Hazards                 | Better and more timely weather information will allow first responders to make better decision about actions to take, evacuations, and the possibility of flooding and other severe weather | \$10,000      | High            | High     | City, Grantor with an appropriate grant               | Emergency Management                                    | Not started; lack of funding | TBD                    |
| Mobile Generator Acquisition with Quick Connects on Pump Stations  | All Hazards generating power outage | Continue to operate wastewater pump stations during power outage  | \$100,000     | High            | High     | City  | Development Services/Public Works                       | Pending Delivery             | Within 1MO of Delivery |
| Drainage Improvements: Chestnut & Monroe ST                        | Flooding                            | Reduced Damage and repair costs; access and response between areas of the City during moderate or greater rainfall  | \$7,000,000   | High            | High     | City, Post Helene Mitigation                          | Development Services/Public Works/ Emergency Management | Pending Grant Award          | ~1YR from Funding      |
| Study potential of Landslide on 220 at Town Hill                   | Geologic Hazards                    | Prevent impact of landslide into 220  | \$100,000     | Low             | High     | City, VDOT, Grantor with an Appropriate Grant Program | Public Works  | Not Started pending scope    | TBD                    |
| Study former water line work                                       | Geologic Hazards                    | Mitigate flow in the area that could be the cause of sink hole  | \$50,000      | Low             | Low      | City, Grantor with an appropriate grant program       | Public Works  | Not Started pending scope    | TBD                    |

| Project                                       | Hazard Mitigated | Benefit  | Cost Estimate | Benefit-to-Cost | Priority | Funding Partners        | Implementation/Lead Agency                                 | Status  | Proposed Schedule |
|---|------------------|--|---------------|-----------------|----------|-------------------------|--|---|-------------------|
| Joint Communications Center with Alleghany Co | All Hazards      | Improved coordination between responders and response records between both jurisdictions | ~\$10,000,000 | High            | High     | City, County, VDEM(NGS) | City PD/Alleghany Public Safety/Alleghany Sheriff's Office | Multi-phase process, backend technical work underway, Scoping move/construction | 3-5YRS            |

## 7.4 Town of Clifton Forge

| Project  | Hazard Mitigated | Benefit  | Cost              | Benefit-to-Cost | Priority | Funding Partners   | Implementation/Lead Agency           | Status                       | Proposed Schedule |
|--|------------------|--|-------------------|-----------------|----------|--|--------------------------------------|------------------------------|-------------------|
| Update and Develop Town Specific GIS Layer   | All-Hazards      | Create situational awareness related to assets, problem areas and spacial functions of the town. | \$15,000-\$25,000 | High            | High     | Local Government, Virginia Tech                            | Local Government, Community Planning | In Progress                  | 1YR to Completion |
| Identify buildings or locations vital to the emergency response effort and buildings or locations that, if damaged, would create secondary disasters in forested areas | Wildfire         | Available inventory of structures that need additional or unique protection from wildfires.      | \$10,000          | Medium          | Medium   | VA Dept. of Forestry, US Forest Service, Local governments | Local government, VDOF, USFS         | Not started; lack of scoping | 1YR from scoping  |
| Communication equipment interoperability   | All hazards      | Improved coordination among jurisdictions; improved response times                               | \$1,000,000       | High            | High     | FEMA, Local government                                     | Local government, Police Department  | COMPLETE                     | Current / Ongoing |
| Determine the need for generators at public emergency facilities   | All hazards      | Ensure that emergency facilities can be operational during hazard events                         | \$250,000         | High            | Medium   | FEMA, Local government                                     | Local government, Public Works       | COMPLETE                     | 2013              |

| Project  | Hazard Mitigated             | Benefit   | Cost      | Benefit-to-Cost | Priority | Funding Partners        | Implementation/Lead Agency                                 | Status                       | Proposed Schedule    |
|--|------------------------------|---|-----------|-----------------|----------|-------------------------|--|------------------------------|----------------------|
| Local codes review   | All hazards                  | Review of development codes to evaluate need for changes that would improve disaster mitigation | \$10,000  | N/A             | Medium   | Town                    | Local government, Community Development, Building Official | In-Progress                  | Unknown              |
| Local Flood Profile  | Flood                        | Identify Hazards associated with Dam Safety   | \$100,000 | High            | High     | USDA                    | VA Soil and Water Conservation Board                       | COMPLETE                     | 2014-15              |
| Stream Bed Survey  | Flood                        | Identify Repairs Required   | \$25,000  | Medium          | Medium   | RWA, Local Government   | Local Government Public Works                              | Not started; lack of funding | Unknown              |
| Conduct a town-wide study Identify Geologic Hazard Areas, and appropriate mitigation actions | Earthquake, Geologic Hazards | Increased situational awareness and planning capability   | \$75,000  | Medium          | Medium   | Local Government        | FEMA, Local Government, Community Development              | Not started; lack of funding | 1YR from grant award |
| Communications Plan  | All Hazards                  | Improved Communication and Response   | \$5,000   | Medium          | High     | Local Government        | FEMA, Local Government, Police Department                  | COMPLETE                     | Ongoing              |
| Water Reservoir Hazard Plan  | All Hazards                  | Protection of Town Water Supply   | \$125,000 | High            | High     | VA Dept of Health, FEMA | Local Government, VA Department of Health                  | Not started; lack of funding | 12 months            |

| Project                      | Hazard Mitigated                        | Benefit  | Cost              | Benefit-to-Cost | Priority | Funding Partners                                | Implementation/Lead Agency          | Status                               | Proposed Schedule |
|------------------------------|---|--|-------------------|-----------------|----------|---|-------------------------------------|--------------------------------------|-------------------|
| Hazardous Materials Planning | All Hazards resulting in HAZMAT release | Increased awareness and planning capability to decrease loss of life, property and enhance response resources. | \$15,000-\$25,000 | High            | High     | Town, Grantor with an appropriate grant program | Emergency Services, Railroads, VDOT | Not started; Lack of funding/scoping | 2Yrs from funding |

## 7.5 Botetourt County

| Project  | Hazard Mitigated | Benefit  | Cost Estimate | Benefit-to-Cost | Priority | Funding Partners                   | Implementation/Lead Agency           | Status  | Proposed Schedule  |
|--|------------------|--|---------------|-----------------|----------|------------------------------------|--------------------------------------|---|--|
| Participate in the "StormReady" program                              | All Hazards      | Community is better prepared through planning and education  | \$1,000       | High            | Medium   | FEMA, VDEM, NWS, Local governments | Local government                     | COMPLETE  | Accepted to program in 2011. County is a participant in good standing      |
| Obtain more up-to-date and comprehensive GIS system                  | All hazards      | Increased information for better incident response   | \$350,000     | High            | High     | Local Government                   | Local Government                     | COMPLETE  | Complete due to transition to ArcGIS, external funding sources not needed. |
| Community notification system  | All hazards      | Reduced loss through improved warning system   | \$55,000      | High            | Low      | FEMA, VDEM, ODP, Local Government  | Local government, ESC, Sheriff Dept. | COMPLETE  |  |
| Evaluate critical facilities and public utilities for flood-proofing | Flooding         | Evaluation of critical facilities and public utilities for retrofitting or flood-proofing to prevent failure during disasters, particularly emergency services facilities located in flood hazard areas. | \$50,000      | Medium          | Medium   | FEMA, Local government             | Local government                     | In progress: Evaluation ongoing, funding sources are being sought | 2026   |

| Project  | Hazard Mitigated  | Benefit  | Cost Estimate | Benefit-to-Cost | Priority | Funding Partners       | Implementation/Lead Agency           | Status   | Proposed Schedule |
|--|---|--|---------------|-----------------|----------|------------------------|--------------------------------------|--|-------------------|
| Communication equipment interoperability   | All hazards   | Improved coordination among jurisdictions; improved response times   | \$250,000     | High            | High     | FEMA, Local government | Local government, ESC, Sheriff Dept. | In progress: Still on-going, procurement for new radio system underway                     | Fall 2027         |
| Identification and tracking of special needs populations   | All hazards   | Preparation for assisting special needs populations to prevent loss of life and property   | \$25,000      | Medium          | Medium   | Local government       | Local government                     | In progress: GIS efforts underway  | Ongoing           |
| Identification and installation of generator quick-connect locations for critical public service facilities, shelter facilities, and other critical infrastructure | All Hazards resulting in power outage                     | Continuity of critical services during disasters   | \$200,000     | High            | High     | FEMA, VDEM, Local      | Local government                     | In progress: project underway, grant funding is pending FEMA review, expense has increased | 2025              |
| Obtain portable generators to be used on various infrastructure components as needed during incidents  | All Hazards resulting in power outage, including wildfire | Would allow deployment of generator to critical infrastructure when power fails to certain facilities, to include mountain tower sites | \$180,000     | High            | Medium   | Local Government       | Local Government                     | In progress, grant in FEMA review  | 2026              |

| Project  | Hazard Mitigated | Benefit   | Cost Estimate | Benefit-to-Cost | Priority | Funding Partners                                      | Implementation/Lead Agency            | Status  | Proposed Schedule  |
|--|------------------|---|---------------|-----------------|----------|---|---------------------------------------|---|--------------------|
| Construct an Emergency Operations Center for use during disasters to support response and recovery efforts | All hazards      | Allow for central location to coordinate all response and recovery resources during and after an event.         | \$1,000,000   | High            | Medium   | Local Government                                      | Local Government                      | Not Started; Lack of Funding: In progress, Capital Improvement Project for new Fire Station/Dispatch Center                     | 2026               |
| Installation and Maintenance of River and Precipitation Gauges   | Flood            | Development of a water and flooding common operating picture supporting early warning and situational awareness | \$70,000      | High            | High     | Local Government, HMGP: Helene                        | Botetourt County Emergency Management | In progress, Funding has been sourced for initial installation, addition funding is being sourced for maintenance and expansion | 2026               |
| Development of Sheltering Resource Cache   | All-Hazards      | Expand capability to operate shelters within the County   | \$50,000      | High            | High     | SHSP, emergency management grant sources as available | Botetourt County Emergency Management | Not Started, previously submitted grants have not been approved, continuing to seek funding                                     | 6 Mos upon funding |

| Project   | Hazard Mitigated   | Benefit   | Cost Estimate | Benefit-to-Cost | Priority | Funding Partners                                  | Implementation/Lead Agency | Status                           | Proposed Schedule |
|---|--------------------|---|---------------|-----------------|----------|---|----------------------------|----------------------------------|-------------------|
| Landslide and Geologic Hazards Training for land disturbance inspectors | Geological Hazards | Due to increased consequential development in the community and land disturbance, inspectors will have increased perspective and consideration for these types of hazards | \$5,000       | Low             | Low      | County, Grantor with an appropriate grant program | Community Development      | Not Started, Pending development | 2027              |

## 7.6 Town of Buchanan

| Project  | Hazard Mitigated | Benefit  | Cost Estimate | Benefit-to-Cost | Priority | Funding Partners  | Implementation/Lead Agency          | Status                       | Proposed Schedule      |
|--|------------------|--|---------------|-----------------|----------|---|-------------------------------------|------------------------------|------------------------|
| Evaluate public utilities for floodproofing  | Flooding         | Evaluation of public utilities for retrofitting or floodproofing to prevent failure during disasters | \$10,000      | Low             | High     | FEMA, Local government                                  | Local government, Public Works Dept | COMPLETE                     | Ongoing                |
| Aquire and demolish derelict property in the floodplain through local program                    | Flooding         | Reduction of derelict structures within the flood plain  | Unsure        | Medium          | Low      | Town, and Grantor with an appropriate grant program     | Town Manager                        | Not started; lack of funding | TBD                    |
| Elevation of the Water St Pump Station, Pump replacement, movement of sewer line under the river | Flooding         | Continuation of sewer service during disasters   | \$1,800,000   | High            | High     | DEQ, Town   | Town Water System Operator          | In progress                  | 3 Yrs from Engineering |
| Flood Wall to protect Lowe Street and Main Street  | Flooding         | Elimination of street, business and residential flooding downtown                                    | unknown       | High            | High     | FEMA, VDEM, Local                                       | Local government                    | Not started; lack of funding | 2026                   |
| Elevate Parkway Dr from Main St to Quarry  | Flooding         | Elevate Parkway Dr.  | \$1,000,000   | Medium          | Medium   | Town, County, Grantor with an appropriate grant program | Town Manager                        | Not Started, pending scoping | TBD                    |

| Project  | Hazard Mitigated                      | Benefit   | Cost Estimate | Benefit-to-Cost | Priority | Funding Partners                                | Implementation/Lead Agency        | Status   | Proposed Schedule |
|--|---------------------------------------|---|---------------|-----------------|----------|---|-----------------------------------|--|-------------------|
| Study residential and agricultural property existing in steep slope areas to identify mitigation solutions   | Geologic Hazards, Wildfire            | Study landslide, karst and wildfire risk associated with residential and agricultural property existing in steep slope areas to identify mitigation solutions | \$50,000      | Medium          | Medium   | Town, Grantor with an appropriate grant program | Town Manager                      | Not started pending scoping  | 1YR from scoping  |
| Plan Buchanan Library and elementary school as a backup area shelter and POD.  | Extreme Temperature, Wind, Winter     | Development of a redundant location for local emergency sheltering  | \$5,000       | Medium          | Medium   | Town, County                                    | County Emergency Manager          | In Progress  | TBD               |
| Identification and installation of generator quick-connect locations for critical public service facilities, shelter facilities, and other critical infrastructure | All Hazards resulting in power outage | Continuity of critical services during disasters  | \$200,000     | High            | High     | FEMA, VDEM, Local                               | Botetourt Co Emergency Management | In progress: project underway, grant funding is pending FEMA review, expense has increased | 2025              |

## 7.7 Town of Fincastle

| Project  | Hazard Mitigated  | Benefit  | Cost Estimate | Benefit-to-Cost | Priority | Funding Partners  | Implementation/Lead Agency             | Status                             | Proposed Schedule                               |
|--|---|--|---------------|-----------------|----------|---|--|------------------------------------|---|
| Evaluate public utilities for floodproofing                | Flooding  | Study public utilities for retrofitting or floodproofing to prevent failure during disasters   | \$10,000      | Medium          | High     | Town, County, Available Grantors with appropriate grant programs, when scope of work is developed | Town Council                           | Not started; lack of funding       | 4-6 Months from Funding                         |
| Study vulnerability of the Wastewater Treatment plant      | All Hazards generating power outage, Flooding, Geologic Hazards, Wildfire, Earthquake | Study to determine flood risk, power failure and resiliency, slope stability, road access, defensible space and security measures at WWTP  | \$50,000      | Medium          | Medium   | Town, County, Available Grantors with appropriate grant programs, when scope of work is developed | Town Council                           | Not Started pending scope of work  | To be determined by scope                       |
| Procure Trailer Drawn Generator and Install Quick Connects | All Hazards generating Power Outage, i.e. Flood, Wind, Winter, Extreme Temperature    | Have a portable generator to support 2 town wells and the WWTP, upon which quick connects will be installed. Available resource for the Ventilator Dependent Skilled Nursing Facility located within the town, in the event of extreme temperatures. | \$210,000     | High            | High     | Town, County, VDEM Hazard Mitigation, FEMA Post Disaster Mitigation Grant (Helene)                | Town Manager, County Emergency Manager | Not Started pending grant approval | 6 Months from Funding (order time of generator) |

| Project                                     | Hazard Mitigated | Benefit  | Cost Estimate | Benefit-to-Cost | Priority | Funding Partners  | Implementation/Lead Agency | Status                            | Proposed Schedule         |
|---|------------------|--|---------------|-----------------|----------|---|----------------------------|-----------------------------------|---------------------------|
| Study: Stream Bank Restoration- Town Branch | Flooding         | Determine course of action and cost to restore the banks of Town Branch to minimize flooding in the low lying area of Roanoke Rd | \$50,000      | Low             | Low      | Town, County, VDOT, Available Grantors with appropriate grant programs, when scope of work is developed | Town Council               | Not Started pending scope of work | To be determined by scope |

## 7.8 Town of Troutville

| Project  | Hazard Mitigated                         | Benefit   | Cost Estimate | Benefit-to-Cost | Priority | Funding Partners  | Implementation/Lead Agency | Status                       | Proposed Schedule |
|--|--|---|---------------|-----------------|----------|---|----------------------------|------------------------------|-------------------|
| Conduct study for public utilities floodproofing   | Flooding                                 | Evaluation of public utilities for retrofitting or floodproofing to prevent failure during disasters        | \$10,000      | Medium          | Medium   | Town, County, Grantor with an appropriate grant program | Town Water Department      | Not started; lack of scoping | 1YR from scoping  |
| Local Code Review  | All Hazards                              | Review of development codes to evaluate need for changes that would improve disaster mitigation             | \$10,000      | Medium          | High     | Town, County, Grantor with an appropriate grant program | Town Council               | Not started; lack of funding | 1YR from funding  |
| Stream Restoration in the Park   | Flooding                                 | Safe community park area and preservation of stream banks   | \$100,000     | Medium          | Medium   | Town, County, Grantor with an appropriate grant program | Town Council               | Not Started pending scoping  | 2Yrs from scoping |
| Identify Water Distribution Infrastructure vulnerable to hazardous environmental concerns including extreme cold and karst | Extreme temperature and Geologic Hazards | Identify and prioritize vulnerable infrastructure to prevent customer/system outage                         | \$50,000      | High            | High     | Town, County, Grantor with an appropriate grant program | Town Water Department      | Not Started pending scoping  | 1YR from scoping  |
| Transfer Switch and Generator Upgrade for town Buildings   | All Hazards generating power outage      | Redundant power for Town Hall, Fire Department, Water Tower, Pump Station, Training Center (Back-up Co 911) | \$30,000      | High            | High     | Town, County, Grantor with an appropriate grant program | Town Water Department      | Not Started pending funding  | 8MOs from funding |

## 7.9 Craig County

The mitigation actions located in this section also cover mitigation actions for the Town of New Castle.

| Project  | Hazard Mitigated                              | Benefit   | Cost Estimate | Benefit-to-Cost | Priority | Funding Partners                                | Implementation/Lead Agency           | Status      | Proposed Schedule       |
|--|---|---|---------------|-----------------|----------|---|--------------------------------------|-------------|-------------------------|
| Reverse 911 (Mass Notification)                                      | All hazards                                   | Reduced loss through improved warning system  | \$38,000      | High            | High     | FEMA, VDEM, Local Government                    | Local government, ESC, Sheriff Dept. | Complete    | 2020-22                 |
| Develop and maintain an inventory of flood prone critical facilities | Flooding                                      | Available inventory of critical structures that need additional or unique protection from flooding. | \$1,000       | Medium          | Medium   | FEMA, VDEM                                      | Local government                     | Complete    |                         |
| Communication equipment interoperability                             | All hazards, enhanced capability for Wildfire | Improved coordination among jurisdictions; improved response times                                  | \$4,700,000+  | High            | High     | Local Government, US Congress, General Assembly | Local government, ESC, Sheriff Dept. | In Progress | Spring '27              |
| Install generators at communications towers                          | All hazards resulting in power outage         | Redundant power for public safety communications, part of overall radio project.                    | \$100,000     | High            | High     | Local Government, US Congress, General Assembly | ESC                                  | In Progress | Spring '27              |
| Install Generator at Shelter-Simmonsville Fire Dept                  | All Hazards requiring shelter/warming/cooling | Resilient shelter and community location in rural area of the county                                | TBD           | High            | High     | VDEM Shelter Upgrade Grant                      | ESC                                  | In Progress | 6MOs from funding award |

| Project   | Hazard Mitigated | Benefit  | Cost Estimate | Benefit-to-Cost | Priority | Funding Partners                         | Implementation/Lead Agency | Status                       | Proposed Schedule |
|---|------------------|--|---------------|-----------------|----------|--|----------------------------|------------------------------|-------------------|
| Support Virginia Department of Transportation projects that minimize flooding               | Flooding         | Clear debris and repair banks along roads to prevent backup, erosion and flooding of existing drainage systems | \$700,000     | N/A             | Medium   | FEMA, VDEM, VDOT                         | VDOT                       | PER VDOT                     |                   |
| Add additional stream and precipitation gauges  | Flooding         | Provide better, more timely information to allow faster, more accurate warnings to be issued to the public     | TBD           | High            | Medium   | VDEM / FEMA / VDOT                       | Local EM                   | Not started; lack of funding |                   |
| Seek funding and support programs that update FEMA's Flood Insurance Rate Maps              | Flooding         | Updated flood hazard mapping   | TBD           | NA              | High     | FEMA                                     | Building Inspector         | Not started; lack of funding |                   |
| Identify projects that would mitigate repetitive flooding at properties along Craig's Creek | Flooding         | Reduction of property and community impacts from flooding along Craig's Creek                                  | unknown       | Unknown         | High     | Grantors with appropriate grant programs | Local EM                   | Not started; lack of funding |                   |

| Project  | Hazard Mitigated | Benefit   | Cost Estimate | Benefit-to-Cost | Priority | Funding Partners      | Implementation/Lead Agency    | Status   | Proposed Schedule |
|--|------------------|---|---------------|-----------------|----------|-----------------------|-------------------------------|--|-------------------|
| Safety improvements to Johns Creek dams #1, #2, #3, and #4 | Flooding         | Protection of life and property downstream from the dams.       | Unknown       | Unknown         | High     | FEMA, DCR, USDA, SWCD | Mountain Castle SWCD          | Design in progress   | 2030              |
| Downtown New Castle Flooding                               | Flooding         | Work with VDOT to address downtown stormwater drainage problems | \$400,000     | High            | High     | FEMA, VDOT, VA DHCD   | County Administrator and VDOT | Planning and design underway.<br><br>Project paused due to lack of funding |                   |

## 7.10 Roanoke County

| Project  | Hazard Mitigated    | Benefit   | Cost    | Benefit-to-Cost | Priority | Funding Partners | Implementation/Lead Agency  | Status   | Proposed Schedule |
|--|---------------------|---|---------|-----------------|----------|------------------|---|----------|-------------------|
| Publish Public Safety Announcements (PSA) using Multi – Media Outlets with emergency information on earthquakes.   | Earthquake          | Increased level of knowledge and awareness in citizens  | \$2,500 | High            | Low      | FEMA, VDEM       | Local government<br>Roanoke Co Public Information Office & Emergency Management   | Ongoing  |                   |
| Research and consider participating in the National Weather Service "Storm Ready" program  | All Weather Hazards | Community will be better prepared through planning and education about hazards  | \$2,000 | Medium          | Medium   | NWS              | Local government<br>Roanoke Co Emergency Management                               | Complete | Complete          |
| Publish Public Safety Announcements (PSA) using Multi- Media Outlets and utilizing practice drills to increase knowledge and impacts associated with high winds in business and schools. | Wind                | Public informed about how to protect yourself during a tornado in case you are at home, in a car, at the office, or outside | \$5,000 | High            | Medium   | Local government | Local government<br>Roanoke Co Emergency Management and Participating Departments | Ongoing  |                   |

| Project   | Hazard Mitigated | Benefit  | Cost  | Benefit-to-Cost | Priority | Funding Partners                          | Implementation/Lead Agency                          | Status      | Proposed Schedule                              |
|---|------------------|--|---|-----------------|----------|---|---|-------------|--|
| Participate in, and remain in good standing with, the National Flood Insurance Program (NFIP) | Flooding         | Reduction of future flood damage through enforcement of floodplain ordinances and availability of discounted flood insurance for property owners | Unknown                                     | N/a             | High     | FEMA                                      | Local government                                    | Ongoing     | Ongoing  |
| Maintain an accurate database and map of repetitive loss properties. Request Data from FEMA.  | Flooding         | Identification of repetitive loss properties that should be mitigated  | Unknown                                     | N/A             | High     | FEMA, VDEM                                | Local government<br>Roanoke Co Development Services | Ongoing     | Ongoing, continuous effort                     |
| Develop and maintain an inventory of flood prone roadways                                     | Flooding         | Inventory of flood prone roadways for planning purposes (road improvements, limitation of development)   | \$25,000                                    | Medium          | Medium   | FEMA, VDEM, RVARC, VDOT, Local government | RVARC, Roanoke Co Development Services              | In progress | Ongoing, continuous effort                     |
| Support Virginia Department of Transportation projects that minimize flooding                 | Flooding         | Clear debris and repair banks along roads to prevent backup, erosion and flooding of existing drainage systems.                                  | Cost varies annually, due to work performed | N/A             | Medium   | FEMA, VDEM, VDOT                          | Roanoke Co Development Services & VDOT              | Ongoing     | Ongoing, continuous effort throughout the year |

| Project  | Hazard Mitigated | Benefit  | Cost      | Benefit-to-Cost | Priority | Funding Partners         | Implementation/Lead Agency   | Status  | Proposed Schedule                              |
|--|------------------|--|-----------|-----------------|----------|--------------------------|--|---|--|
| Seek funding to prepare site-specific hydrologic and hydraulic studies that look at areas that have chronic and repetitive flooding problems | Flooding         | Possible determination of solutions to repetitive loss properties.   | \$100,000 | High            | Medium   | Local governments        | Roanoke Co Development Services  | Continuous effort based on volume of projects ongoing | Ongoing, continuous effort throughout the year |
| Identify locations for additional rain, river and stream monitoring.   | Flooding         | Provide better, more timely information to allow faster, more accurate warnings to be issued to the public | \$25,000  | High            | Medium   | VDEM / FEMA / LOCAL GOVT | Local Government   | Not started; lack of funding                          | TBD  |
| Develop and maintain an inventory of flood prone critical facilities   | Flooding         | Available inventory of critical structures that need additional or unique protection from flooding.        | \$1,000   | Medium          | Medium   | FEMA, VDEM               | Local government<br><br>Roanoke Co General Services and Development Services | COMPLETE  | Ongoing  |
| Maintain an inventory of flood prone residential properties and repetitive loss properties.  | Flooding         | Available inventory of repetitive loss properties that could be used for planning purposes                 |           | N/A             |          | No external funding      | Roanoke Co Development Services  | Ongoing, continuous effort                            |  |

| Project   | Hazard Mitigated | Benefit   | Cost              | Benefit-to-Cost | Priority | Funding Partners                   | Implementation/Lead Agency                 | Status                        | Proposed Schedule             |
|---|------------------|---|-------------------|-----------------|----------|------------------------------------|--|-------------------------------|-------------------------------|
| Repetitive Loss Property Acquisition and Demolition of a Property located in North County | Flooding         | Mitigation of repetitive loss property  | ~\$1,000,000      | High            | High     | FEMA, VDEM                         | Roanoke Co Development Services            | Pending Funding               | 6MOs from received funding    |
| Revise stormwater management and floodplain management ordinances                         | Flooding         | Up to date hazard related ordinances to provide guidance for planning and development | Unknown           | High            | High     | Local government, DCR              | Local government                           | Complete 2025                 |                               |
| Citizen Warning and Alert   | All hazards      | Reduced loss through improved warning system  | \$20,000 annually | High            | Medium   | FEMA, VDEM, Local Government       | Roanoke Co Emergency Management            | Ongoing annual recurring cost | Annual                        |
| Additional hazard related GIS layers/data   | All hazards      | Increased accuracy of hazard mitigation planning                                      | \$100,000         | High            | High     | USGS, NOAA, FEMA, VDEM, VDOT, VDOF | Roanoke Co Development Services and GIS/IT | Complete                      | Continuous improvement effort |
| Public education  | All hazards      | Inform public about hazards and mitigation options                                    | \$50,000          | High            | High     | FEMA, VDEM, Local government       | Local government, Emergency Management     | In progress                   | Ongoing                       |

| Project  | Hazard Mitigated | Benefit  | Cost                 | Benefit-to-Cost | Priority | Funding Partners   | Implementation/Lead Agency   | Status      | Proposed Schedule |
|--|------------------|--|----------------------|-----------------|----------|--|--|-------------|-------------------|
| Participate in special statewide outreach/awareness activities, such as Winter Weather Awareness Week, Flood Awareness Week, etc   | All Hazards      | Inform public about hazards and mitigation options   | \$10,000             | High            | High     | VDEM, FEMA, NWS  | Roanoke Co Emergency Management                                      | In progress | Ongoing events    |
| Upgrade/repairs to stormwater system   | Flooding         | Reduce frequency and impact of flooding  | \$10,000,000         | High            | High     | FEMA, VDEM, VDOT   | Roanoke Co Development Services                                      | Ongoing     | Continuous effort |
| Drainage system maintenance  | Flooding         | Clear debris and repair banks to prevent backup, erosion and flooding of existing drainage systems   | \$1,000,000 annually | High            | High     | FEMA, VDEM, VDOT   | Roanoke Co Development Services                                      | Ongoing     | Continuous Effort |
| Identify buildings or locations vital to the emergency response effort and buildings or locations that, if damaged, would add complexity to a response. Apply community wildfire assessments as appropriate. | Wildfire         | Available inventory of structures that need additional or unique protection from wildfires. Support property owners in taking mitigation actions such as defensible space, building and siting materials | \$80,000             | Medium          | Medium   | VA Dept. of Forestry, US Forest Service, Local governments | Local government, VDOF, USFS, and Roanoke County Fire & Rescue Dept. | Ongoing     | Perpetual         |

| Project                               | Hazard Mitigated | Benefit                                   | Cost        | Benefit-to-Cost | Priority | Funding Partners   | Implementation/Lead Agency      | Status        | Proposed Schedule |
|---------------------------------------|------------------|---|-------------|-----------------|----------|--|---------------------------------|---------------|-------------------|
| Dixie Cavern Landfill Leachate System | Flooding         | Replace aging system to prevent discharge | \$1,000,000 | Medium          | Medium   | Funding Partners with Mitigation Grants; other relevant development grants | Roanoke Co Development Services | Pending Study |                   |

## 7.11 City of Roanoke

| Project                               | Hazard Mitigated | Benefit  | Cost Estimate      | Benefit to- Cost | Priority | Funding Partners             | Implementation/ Lead Agency            | Status   | Proposed Schedule  | Additional Notes   |
|---------------------------------------|------------------|--|--------------------|------------------|----------|------------------------------|--|--|--|--|
| Star City Alerts (Rave Mobile Safety) | All Hazards      | Reduced loss of life and property through improved warning system.                                       | \$25,000           | High             | High     | Local Government             | Local Government, Emergency Management | Online registration portal available. Text, email, and voice message opt-in available.   | Ongoing. Star City Alerts replaced the previous alert system known as "Reverse 911". | Continuing to utilize hazard response operations.  |
| Structure acquisition                 | Flooding         | Removal of structures from flood hazard areas; reduce repetitive loss; reduce loss of life and property. | \$200,000 per year | High             | High     | FEMA, VDEM, Local Government | Local government, Stormwater Utility   | Ongoing, To date \$13M has been spent to mitigate 139 homes/structures thereby returning 58 acres to natural floodplain open space. Two of the four PDM grants from 2020 have been fully completed. The two remaining grants are currently at 95% completion and 65% design phase. | Ongoing  | Continuing to achieve property protection measures. Created City of Roanoke Flooding Mitigation Program in 2019. |

| Project                               | Hazard Mitigated | Benefit  | Cost Estimate | Benefit to- Cost | Priority | Funding Partners             | Implementation/ Lead Agency                                | Status  | Proposed Schedule | Additional Notes   |
|---------------------------------------|------------------|--|---------------|------------------|----------|------------------------------|--|---|-------------------|--|
| Acquisition of flood prone properties | Flooding         | Removal of households from flood hazard areas; reduce repetitive loss; reduce loss of life and property. | \$50,000      | High             | High     | FEMA, VDEM, Local government | Local government, Stormwater Utility                       | Ongoing, To date \$13M has been spent to mitigate 139 homes/structures thereby returning 58 acres to natural floodplain open space. Two of the four PDM grants from 2020 have been fully completed. The two remaining grants are currently at 95% completion and 65% design phase | Ongoing           | Continuing to achieve property protection measures. Created City of Roanoke Flooding Mitigation Program in 2019. |
| Public Education                      | All Hazards      | Inform public about hazards and mitigation options and NFIP.   | \$50,000      | Medium           | Medium   | FEMA, VDEM, Local Government | Local government, Stormwater Utility, Emergency Management | Ongoing – Direct mailer sent each year and Flooding Brochure inserted in Roanoke Times each year or included with direct mailer. Roanoke Remembers the Flood of 85 Event 2025 for education on local flood history  | Ongoing           | Advise property owners, potential property owners, and visitors about hazards.                                   |

| Project  | Hazard Mitigated | Benefit   | Cost Estimate | Benefit to- Cost | Priority | Funding Partners             | Implementation/ Lead Agency  | Status  | Proposed Schedule                  | Additional Notes   |
|--|------------------|---|---------------|------------------|----------|------------------------------|--|---|------------------------------------|--|
| Flood Hazard mapping update / modernization                          | Flooding         | Increased accuracy of flood maps and more effective regulation and enforcement of regulations.      | \$212,800     | High             | High     | FEMA, VDEM                   | Local government, Stormwater Utility, Planning Division                              | Ongoing; Flood prone roads and critical facilities have been mapped. Roanoke River Flood Reduction Project LOMR approved and adopted in December 2023. FEMA Remapping in progress | Ongoing,                           | Work with organizations to improve flood hazard mapping. Look to develop flood models. |
| Additional Hazard related GIS layers/data                            | All Hazards      | Increased accuracy of hazard mitigation planning  | \$100,000     | High             | Medium   | USGS, NOAA, FEMA, VDEM, VDOT | Local Government, Stormwater Utility, Department of Technology, Emergency Management | Ongoing   | Ongoing                            | Update City of Roanoke Real Estate GIS to reflect flood zones on FEMA Map Center       |
| Participate in CRS   | Flooding         | Reduction in flood insurance rates; reduction in flood loss.  | \$10,000      | High             | High     | VDEM                         | Local government; Stormwater Utility   | Participating Community – Currently Class 6 Working toward Class 5  | Ongoing; Class 5 projected by 2030 | Continue to work with departments in the City of Roanoke to achieve CRS credit.        |
| Develop and maintain an inventory of flood prone critical facilities | Flooding         | Available inventory of critical structures that need additional or unique protection from flooding. | \$10,000      | Medium           | Medium   | FEMA, VDEM                   | Local government, Stormwater Utility, Emergency Management                           | Completed   | Ongoing; updates as needed         | Plan for emergency services. Advise emergency response, citizens, and visitors.        |

| Project   | Hazard Mitigated | Benefit  | Cost Estimate                | Benefit to- Cost | Priority | Funding Partners                | Implementation/ Lead Agency                        | Status      | Proposed Schedule                        | Additional Notes   |
|---|------------------|--|------------------------------|------------------|----------|---------------------------------|--|-------------|--|--|
| Continue participation in FEMA's DFIRM program  | Flooding         | Updated flood hazard mapping.  | \$15,000                     | High             | High     | FEMA, local government          | Local government                                   | In progress | Ongoing                                  | Property protection.   |
| Develop Family Assistance Center Plan, Standard Operating Guidelines for Family Assistance Center deployment, and identify staffing needs | All Hazards      | Supporting government and private employers in Roanoke by developing SOGs to implement Family Assistance Center. | \$0                          | High             | Medium   | City & private partner agencies | City of Roanoke Emergency Management, City Schools | Developed   | Ongoing                                  | Plan for emergency response and protection to public safety. |
| Secure grants to purchase and maintain Volunteer Management and Reception capabilities  | All Hazards      | Supporting spontaneous volunteers in a disaster.   | \$25,000 (100% grant funded) | High             | Medium   | City/FEMA                       | Roanoke Valley governments                         | Implemented | Ongoing                                  | Plan for emergency response and protection to public safety. |
| Standard Operating Guidelines for Volunteer Reception deployment  | All Hazards      | Supporting spontaneous volunteers in a disaster.   | \$0                          | High             | Medium   | City Emergency Management       | City EM, Police Department, Animal Wardens         | Developed   | Ongoing. Activated September 21, 2022.   | Plan for emergency response and protection to public safety. |
| Develop Disaster Pet Sheltering capabilities  | All Hazards      | Supporting Pets in Disaster by developing Community Animal Response Team.  | \$25,000 (100% grant funded) | High             | Medium   | City Emergency Management       | City EM & Police Department                        | Developed   | Ongoing. Exercised and utilized in 2022. | Plan for emergency response and protection to public safety. |

| Project                                 | Hazard Mitigated                    | Benefit  | Cost Estimate                     | Benefit to- Cost | Priority | Funding Partners                                      | Implementation/ Lead Agency          | Status  | Proposed Schedule | Additional Notes            |
|---|-------------------------------------|--|-----------------------------------|------------------|----------|---|--------------------------------------|---|-------------------|-----------------------------|
| Upgrade / repairs to storm water system | Flooding                            | Reduce frequency and impact of flooding.   | \$140,000,000                     | High             | High     | FEMA, VDEM, Local government                          | Local government                     | Ongoing   | Ongoing           | Preventative maintenance.   |
| Drainage System Maintenance             | Flooding                            | Clear debris and repair banks to prevent backup, erosion and flooding of existing drainage systems.                | \$500,000                         | High             | High     | FEMA, VDEM, Local government                          | Local government                     | Ongoing   | Annually          | Preventative maintenance.   |
| Stream Restorations                     | Flooding                            | Improved stream flow and sediment transport, reduction of stream bank erosion, increase in water quality benefits. | Variable \$300,000 to \$2 million | High             | High     | VADEQ, potentially FEMA                               | Local government                     | Ongoing based on Watershed Master Plans. Two restoration projects completed Glade Creek and W. Fork Carvins. Garnand stream restoration is now in design. | Ongoing           | Natural Resource Protection |
| Study on power resiliency               | All hazards generating power outage | Solutioning long term, multi disaster power resiliency   | \$100,000                         | Medium           | Medium   | City, Grantor with an appropriate grant program       | Sustainability, Emergency Management | Not started, pending scoping  | Pending scoping   |                             |
| Pavement Temperature Sensors            | Winter, extreme temperature         | Operational efficiency generating safer travel methods   | \$150,000                         | Medium           | Medium   | City, USGS, Grantor with an appropriate grant program | Transportation Division              | Not started, pending scoping  |                   |                             |

| Project   | Hazard Mitigated    | Benefit   | Cost Estimate | Benefit to- Cost | Priority | Funding Partners                                | Implementation/ Lead Agency             | Status                       | Proposed Schedule                   | Additional Notes                            |
|---|---------------------|---|---------------|------------------|----------|---|---|------------------------------|-------------------------------------|---|
| Develop Heat Resilience Plan  | Extreme Temperature | Develop adaptation features to build resiliency   | \$150,000     | Medium           | High     | City, Grantor with an appropriate grant program | Sustainability                          | Not Started, pending funding | 1YR from funding                    |   |
| Sponsor Community Resilience Hub  | All Hazards         | Support community efforts to develop resilience hub, by supporting funding pursuit  | TBD           | Low              | Medium   | Partner identification underway with USDN       | Sustainability and Emergency Management | Scoping on going             |                                     |   |
| Develop Crisis Communications Plan  | All Hazards         | Increased planning to establish coordinated public information and warning throughout the incident continuum                                      | TBD           | High             | High     | City, Grantor with an appropriate grant program | Emergency Management, Communications    | Ongoing scoping              | 1 Yr from completed project scoping |   |
| Develop Continuity of Government Plan   | All Hazards         | Increased decision making and coordination resiliency   | TBD           | High             | High     | City, Grantor with an appropriate grant program | Emergency Management, City Manager      | Not started, pending scoping |                                     |   |
| Participate in, and remain in good standing with, the National Flood Insurance Program (NFIP) | Flooding            | Reduction of future flood damage through enforcement of floodplain ordinances and availability of discounted flood insurance for property owners. | \$0           | High             | High     | FEMA  | Local government, Stormwater Utility    | Ongoing                      | Ongoing                             | Reflect City Codes to match NFIP Standards. |

| Project   | Hazard Mitigated | Benefit   | Cost Estimate           | Benefit to- Cost | Priority | Funding Partners                  | Implementation/ Lead Agency          | Status   | Proposed Schedule                                   | Additional Notes  |
|---|------------------|---|-------------------------|------------------|----------|-----------------------------------|--------------------------------------|--|---|---|
| Elevation Certificate Updates                                       | Flooding         | Once the LOMR is updated as a result of the Roanoke River Flood Reduction Project, new elevation certificates along the river corridor may be needed. | Unknown                 | Med              | Med      | Silver Jackets, VDEM, FEMA        | Local government, Stormwater Utility | Completed  | Waiting completion of LOMR as part of ESP contract. | Revised Elevation Certificates with updated Base Flood Elevations   |
| Inundation Mapping  | Flooding         | City will be able to understand what flooding depths will be based on RR stream gauge heights.  | Unknown                 | High             | High     | Silver Jackets, local governments | Stormwater Utility                   | Completed  |   | Ability to provide road closures and needed evacuation zones at certain gauges levels of the Roanoke River. |
| Maintain an accurate database and map of repetitive loss properties | Flooding         | Identification of repetitive loss properties that should be mitigated.  | Unknown                 | High             | High     | FEMA, VDEM                        | Stormwater Utility, VDEM             | Ongoing - Obtained ISAA with FEMA to better track Rep. Loss structures and areas | Ongoing: annual updates                             | Continue to update Repetitive Loss list.  |
| Watershed Master Planning   | Flooding         | Assess and plan Stormwater needs on a per watershed basis with comprehensive modeling and identification of priority projects                         | \$700,000 per watershed | High             | High     | Local Government, DCR             | Stormwater Utility                   | In progress  | Funding Stream identified (CFPF)                    |   |

## 7.12 City of Salem

| Project  | Hazard Mitigated      | Benefit  | Cost                     | Benefit-to-Cost | Priority | Funding Partners  | Implementation / Lead Agency                            | Status   | Proposed Schedule |
|--|-----------------------|--|--------------------------|-----------------|----------|---|---|----------|-------------------|
| Communication equipment interoperability   | All hazards           | Improved coordination among jurisdictions; improved response times; citizen alerts                                 | \$1,000,000 to 3,000,000 | N/A             | High     | FEMA, Local government  | Local government, Fire & Emergency Services, Police, IT | COMPLETE | 2018-2019         |
| Mass notification System   | All hazards           | Reduced loss through improved warning system   | N/A                      | N/A             | N/A      | FEMA, VDEM, Local Government                                      | Local government, Fire & Emergency Services, Police, IT | Complete | N/A               |
| Flood hazard mapping update/ modernization / Additional hazard related GIS layers/data | All hazards/ flooding | Increased accuracy of flood maps and increased accuracy of hazard mitigation planning                              | N/A                      | High            | Medium   | FEMA, VDEM  | Community Dev   | Ongoing  | Ongoing           |
| Soil Stabilization   | All hazards/ flooding | Continue headwall and riverbank stabilization to reduce road undercutting in multiple areas as scoping determines. | \$500,000                | High            | Medium   | FEMA, VDEM, Local government CFPF, grantor with app grant program | Community Dev   | Ongoing  | 2025-2030         |

| Project  | Hazard Mitigated | Benefit  | Cost      | Benefit-to-Cost | Priority | Funding Partners  | Implementation / Lead Agency | Status                       | Proposed Schedule |
|--|------------------|--|-----------|-----------------|----------|---|------------------------------|------------------------------|-------------------|
| Public education   | All hazards      | Develop web application(s) for informing public about hazards and mitigation options Utilize ArcGIS to allow real-time citizen input regarding occurring hazards.  | N/A       | High            | Low      | FEMA, VDEM, Local government  | GIS                          | Ongoing                      | Ongoing           |
| Participate in FEMA Hazard Mitigation Programs such as FMA, PDM, and HMGP for acquisition of flood prone properties or flood-proofing projects | Flooding         | Possible sources of funding for acquisition/demolition projects, structure elevation, mitigation reconstruction project, flood-proofing critical facilities, flood-proofing commercial structure, infrastructure upgrades, and technology upgrades | \$500,000 | High            | High     | FEMA, VDEM, Local government, grantor with an appropriate grant program | Community Development        | Not started; pending scoping | n/a               |
| Seek funding to prepare site-specific hydrologic and hydraulic studies that look at areas that have chronic and repetitive flooding problems   | Flooding         | Possible determination of solutions to repetitive loss properties.   | \$15,000  | Medium          | Medium   | FEMA, VDEM, City, grantor with app grant program                        | Community Development        | Not started; lack of scoping | N/A               |

| Project   | Hazard Mitigated | Benefit   | Cost        | Benefit-to-Cost | Priority | Funding Partners                                      | Implementation / Lead Agency             | Status                            | Proposed Schedule          |
|---|------------------|---|-------------|-----------------|----------|---|--|-----------------------------------|----------------------------|
| Open Drainage system maintenance;   | Flooding         | Improved stream flow and mitigation of flooding; Clear debris and repair banks to prevent backup, erosion and flooding of existing drainage systems | \$100,000   | Medium          | Medium   | FEMA, VDEM, City, grantor with app grant program      | Community Development, Street Department | Ongoing, preventative maintenance | Ongoing                    |
| Closed Stormwater system construction, upgrades or repairs  | Flooding         | Reduce frequency and impact of flooding   | \$1,000,000 | Medium          | Medium   | FEMA, VDEM, City, grantor with app grant program      | Community Development.                   | Ongoing, preventative maintenance | N/A                        |
| Additional hazard field data  | Flooding         | Elevation certificates for residential, business and critical facilities; increased accuracy of hazard mitigation planning                          | \$25,000    | Medium          | Medium   | FEMA, VDEM, Local government                          | Local government, Community Development. | As needed per project             | Ongoing                    |
| Use HEC-GeoRAS, HEC-GeoHMS, or HAZUS software to model potential flood scenarios and identify high-hazard areas | Flooding         | Use software to model potential flood areas and identify high risk areas to help mitigate flooding  | \$10,000    | Medium          | Low      | FEMA, VDEM, Local government                          | Community Development                    | Not started; lack of scoping      | Within 6 months of scoping |
| Participate in CRS  | Flooding         | Reduction in flood insurance rates; reduction in flood loss   | \$20,000    | Medium          | Low      | VDEM, City, grantor with an appropriate grant program | Community Development                    | Not started; lack of funding      | N/A                        |

| Project  | Hazard Mitigated                         | Benefit  | Cost           | Benefit-to-Cost | Priority | Funding Partners  | Implementation / Lead Agency  | Status                       | Proposed Schedule |
|--|--|--|----------------|-----------------|----------|---|---|------------------------------|-------------------|
| Revision of floodplain ordinance               | All Hazards                              | Up to date floodplain and zoning ordinance to provide guidance for development   | \$150,000      | N/A             | Medium   | City, grantor with an appropriate grant program             | Local government, Community Development   | Not started; pending scoping | 2025-2029         |
| Defensible Space                               | Wildfire                                 | Partner with the Virginia Department of Forestry to mitigate wildfire risk by focusing on fire prevention and creating defensible space. | TBD by project | High            | Low      | DOF, Local government                                       | Local government, Community Development, Fire & Emergency Services, Streets and General Maintenance | Ongoing                      | 2025-2030         |
| Identify and equip a community resource center | Extreme temps, winds, earthquake, winter | Provide community space for warming/ cooling and power needs in a disaster   | \$200,000      | Medium          | Medium   | FEMA, VDEM, City, grantor with an appropriate grant program | Fire and EMS  | Not started; lack of scoping | 2026-2028         |

## 7.13 Town of Vinton

| Project   | Hazard Mitigated | Benefit   | Cost Estimate | Benefit-to-Cost | Priority | Funding Partners                        | Implementation/Lead Agency                            | Status   | Proposed Schedule |
|---|------------------|---|---------------|-----------------|----------|---|---|----------|-------------------|
| Implement Mass Notification System  | All Hazards      | Public made aware of impending danger. Encourage voluntary use of the National Weather Service or private warning mechanisms, such as The Weather Channel NOTIFY! and the Specific Area Message Encoding (SAME) | \$100,000     | High            | High     | RVARC Localities                        | RVARC and Local government                            | COMPLETE |                   |
| Provide an informational brochure or handout on Flood Safety in Vinton  | All Hazards      | Public better informed about Flood Safety.  | Unknown       | Medium          | Medium   | VDEM<br>FEMA, RVARC Localities          | Town of Vinton  | COMPLETE |                   |
| Determine the need for generators at public infrastructure facilities, emergency shelters, and public buildings | All hazards      | Ensure that water and sewer service can be operational during hazard events. Needed services can be provided during emergency events.   | \$20,000      | High            | High     | FEMA, Local government                  | Town of Vinton<br>Public Works and Police Departments | COMPLETE |                   |
| Local codes review  | All hazards      | Review development codes to evaluate need for changes that would improve disaster mitigation  | \$100,000     | Medium          | High     | FEMA, Roanoke County and Town of Vinton | Town of Vinton<br>Planning and Zoning Department      | COMPLETE |                   |

| Project  | Hazard Mitigated | Benefit   | Cost Estimate | Benefit-to-Cost | Priority | Funding Partners                     | Implementation/Lead Agency                    | Status                       | Proposed Schedule                       |
|--|------------------|---|---------------|-----------------|----------|--------------------------------------|---|------------------------------|---|
| Seek funding to prepare site-specific hydrologic and hydraulic studies that look at areas that have chronic and repetitive flooding problems | Flooding         | Study Gish Mill redevelopment area and Tinker Creek Tributary to determine effective solutions  | Unknown       | High            | Medium   | FEMA, VDEM, and RVARC Localities     | Local governments                             | COMPLETE                     |   |
| Flood hazard mapping update/modernization  | Flooding         | Increased accuracy of flood maps and more effective regulation and enforcement of regulations   | \$50,000      | Medium          | High     | FEMA, VDEM                           | RVARC, County of Roanoke, and Town of Vinton  | COMPLETE                     |   |
| Transportation corridor debris removal and bank stabilization.   | Flooding         | Clear debris and repair banks along roads to prevent backup, erosion and flooding of existing drainage systems. Hardy Rd, Walnut Ave, Virginia Ave, as well as, other roadways as determined by Town, VDOT, Roanoke City staff. | \$2,000,000   | Medium          | Medium   | Town, VDOT, Roanoke City, Roanoke Co | Town Planning and Zoning                      | Not started; lack of funding | As funding becomes available            |
| Maintain an inventory of flood prone residential properties and repetitive loss properties   | Flooding         | Available inventory of repetitive loss properties that could be used for planning purposes  | Unknown       | Unknown         | Unknown  | VDEM, RVARC                          | RVARC, Roanoke County and Town of Vinton      | COMPLETE                     |   |
| Property acquisition – single-family and commercial structures   | Flooding         | Removal of households and other structures from flood hazard areas; reduce repetitive loss; reduce loss of life and property  | \$10,000,000  | Medium          | High     | FEMA, VDEM, Town of Vinton           | Town of Vinton Planning and Zoning Department | Ongoing                      | 2020-2024, as funding becomes available |

| Project  | Hazard Mitigated       | Benefit  | Cost Estimate      | Benefit-to-Cost | Priority | Funding Partners  | Implementation/Lead Agency                    | Status  | Proposed Schedule                                 |
|--|------------------------|--|--------------------|-----------------|----------|---|---|---|---|
| Town-wide Stormwater facilities retrofit               | Flooding               | Reduce frequency and impact of flooding  | \$20,000,000       | Medium          | High     | Town of Vinton, Grantor with Appropriate Grant Program                        | Town of Vinton Planning and Zoning Department | Not Started pending scope of work and funding | 2025-2050   |
| Evaluate public utilities for floodproofing            | Flooding               | Evaluation of public utilities for retrofitting or floodproofing to prevent failure during disasters       | \$50,000           | High            | Medium   | FEMA, VDEM, Town of Vinton  | Town of Vinton Public Works Department        | COMPLETE                                      | Additional projects as funding becomes available. |
| Obtain CRS Classification Rating                       | Flooding               | Reduction in flood insurance rates; reduction in flood loss  | \$10,000, Annually | Medium          | High     | FEMA, RVARC Localities, Town of Vinton  | Town of Vinton Planning and Zoning Department | COMPLETE                                      | 2016  |
| Identify locations for additional stream gauges        | Flooding / Heavy Rains | Provide better, more timely information to allow faster, more accurate warnings to be issued to the public | \$25,000           | Medium          | Medium   | Town, Roanoke City, Roanoke County, Grantor with an appropriate grant program | Town of Vinton Planning and Zoning            | Ongoing                                       | As funding becomes available                      |
| Community Wildfire assessments                         | Wildfire               | Reduction of loss to wildfire  | \$50,000           | Medium          | Medium   | VA DOF, RVARC Localities  | Roanoke County and Town of Vinton             | Ongoing                                       | As funding becomes available                      |
| Retrofit and Floodproof Gish Mill Historical Structure | Flooding               | Protect structure and tenants from flooding, improve economic community value                              | \$400,000          | High            | High     | Town, Private Developers, Helene Post Disaster Mitigation                     | Town Planning and Zoning Department           | Ongoing                                       | 2027  |
| Charles R. Hill Community Center Shelter Retrofit      | All Hazards            | Retrofit building with generator and supplies to serve as shelter while War Memorial is upgraded           | \$200,000          | Medium          | Medium   | Town, Roanoke Co, Grantor with appropriate grant program                      | Town Emergency Management                     | Not Started                                   | N/A   |

## 7.14 Roanoke Valley-Alleghany Regional Commission

| Project  | Hazard Mitigated | Benefit  | Cost Estimate     | Benefit-to-Cost | Priority | Funding Partners | Implementation/Lead Agency | Status      | Proposed Schedule |
|--|------------------|--|-------------------|-----------------|----------|------------------|----------------------------|-------------|-------------------|
| Identify areas with recurring flood problems and prepare funding scope for additional stream/rain gauges | Flooding         | Improved early warning of flooding; ensure that these areas are adequately covered and monitored | \$5,000           | High            | High     | DHCD, Localities | RVARC                      | In progress | 2025-2026         |
| Request additional stream/rain gauges on behalf of interested local governments.                         | Flooding         | Improved early warning of flooding; ensure these areas are adequately covered and monitored.     | \$120,000         | Medium          | Medium   | FEMA, VDEM       | RVARC                      | Not started | 2026-2028         |
| Update the 2005 Flood Prone Roadway Study  | Flooding         | Improved and updated information about roadway flooding in the region                            | \$10,000-\$30,000 | Medium          | High     | TPO              | RVARC                      | Not started | 2026-2027         |
| Critical and Vulnerable Facilities Flood Vulnerability Study and action plan                             | Flooding         | Improved and updated information on the regional impacts to critical facilities                  | \$30,000-\$60,000 | Medium          | Medium   | TPO, other       | RVARC                      | Not started | 2027-2029         |
| Train staff in hazard mitigation, specifically in wind-related hazards                                   | Wind             | Increased staff capacity for 2030 plan update  | \$10,000-\$15,000 | High            | High     |                  | RVARC                      | In progress | 2025-2027         |

| Project  | Hazard Mitigated       | Benefit  | Cost Estimate       | Benefit-to-Cost | Priority | Funding Partners              | Implementation/Lead Agency | Status                 | Proposed Schedule |
|--|------------------------|--|---------------------|-----------------|----------|-------------------------------|----------------------------|------------------------|-------------------|
| Maintain an active regional database of repetitive loss properties   | Flooding               | Improved information around repetitive loss                  | \$5,000-\$10,000    | High            | High     | FEMA, VDEM                    | RVARC                      | Needs to be reinstated | 2025              |
| Develop or update the Regional Stormwater Management Plan  | Flooding               | New and updated action items for stormwater management       | \$100,000-\$150,000 | Medium          | Medium   | To be identified              | RVARC                      | Not started            | TBD               |
| Regional Transit Impact Study  | Flooding, Winter Storm | Improved information around transit impacts in hazard events | \$40,000 - \$80,000 | Medium          | Low      | TPO                           | RVARC                      | Not started            | TBD               |
| Expand assessment of wildfire risk to incorporate new data regarding air quality mortality in partnership with regional health advocates | Wildfire               | Improved data around wildfire risk and public health         | TBD                 | Medium          | Low      | Regional health partners, VDH | RVARC                      | Not started            | TBD               |
| Expand extreme temperature data collection in partnership with interested localities   | Extreme Temperature    | Improved data around extreme temperature impacts             | TBD                 | Low             | Low      | VDOF, VDH, other              | RVARC, local governments   | Not started            | TBD               |
| Annual updates on Regional and Local project progress and plan documentation   | All Hazards            | Improved implementation tracking and public engagement       | \$5,000-\$10,000    | High            | High     | Localities                    | RVARC, localities          | Ongoing                | Annual            |

## 7.15 Roanoke Valley Resource Authority

| Project   | Hazard Mitigated  | Benefit   | Cost Estimate                                   | Benefit-to-Cost | Priority | Funding Partners   | Implementation/Lead Agency                      | Status   | Proposed Schedule          |
|---|---|---|---|-----------------|----------|--|---|--|----------------------------|
| Implement 2 trailer drawn emergency generators to support 2 pump stations primarily, with flexibility to support others | All Hazards that result in power outage: Wind, Winter, Flood, etc | Keep pump stations operational during power outage: protection of illicit discharge to VA waters. Trailer mounted set-up provides flexibility for other internal and external use.  | \$300,000                                       | High            | High     | Sourcing FEMA Post Disaster Mitigation Funds   | RVRA- Dir. Of Operations/ Operations Management | Pending Funding, Applications and plans are finished | 190 Days from Funding      |
| Leachate Bypass Pump Station and Tank Cleaning  | Flooding  | Maximize storage capacity, protection of pumps, improved pump out capacity through efficiency gains. Builds resiliency and prevents system from being overrun in a storm event.   | \$322,400                                       | High            | High     | Sourcing FEMA Post Disaster Mitigation Funds<br><br>Connected to the generator project | RVRA- Dir of Operations/ Operations Management  | Pending Funding, Applications and plans are finished | Less than 1YR from Funding |
| Haul Road Study   | Flooding, Geologic Hazards, Earthquake                            | Authority owns a critical access road, along with several state roads leading to the area. This area experiences routine short term and occasional long term flooding. The area is at risk for karst events and runs alongside a sheer cut hillside. A study could yield meaningful solutions to the issue. | Unknown, pending development of a scope of work | Low             | Medium   | Seeking grant funding that would be applicable. This could be from any source.         | RVRA Executive Director                         | Not Started  | No Available Timeline      |

| Project   | Hazard Mitigated | Benefit  | Cost Estimate | Benefit-to-Cost | Priority | Funding Partners  | Implementation/Lead Agency | Status   | Proposed Schedule |
|---|------------------|--|---------------|-----------------|----------|---|----------------------------|----------|-------------------|
| Increase relationships with service jurisdictions | All-Hazards      | RVRA has significant relationships across the operational region, both contractually and organizationally and seeks to share resource information, capability and contribute to regional public safety efforts | \$0           | High            | Low      | All localities and partners within service district on a case by case basis | RVRA Executive Director    | On-Going | Continuous        |

## 7.16 Western Virginia Water Authority

| Project  | Hazard Mitigated                      | Benefit   | Cost Estimate | Benefit-to-Cost | Priority | Funding Partners   | Implementation/Lead Agency | Status                                       | Proposed Schedule             |
|--|---------------------------------------|---|---------------|-----------------|----------|--|----------------------------|--|-------------------------------|
| Water Pollution Control Plant Flood Protection-Ferrum                  | Flooding                              | Study and execute a solution to prevent flooding within the water pollution control plant.                            | \$4,000,000   | High            | High     | FEMA Post Disaster Mitigation                                    | WVWA Water Quality         | Not Started pending grant award              | Study: 6MOs from grant award  |
| Water Pollution Control Plant Flood Protection-Boones Mill             | Flooding                              | Construction of stormwater conveyance system to prevent flooding within the water pollution control plant.            | \$228,000     | High            | High     | FEMA Post Disaster Mitigation                                    | WVWA Water Quality         | Not Started pending grant award              | ~1YR from grant award         |
| Carvins Cove Forestry Management Study                                 | Wildfire, Geologic Hazards            | Prevent and mitigate wildfire, to create resiliency in water quality from source to tap, including reservoir and WTP. | TBD           | Medium          | High     | WVWA, City of Roanoke, Grantor with an appropriate grant program | WVWA Water Quality         | Phase 1 complete, sourcing funds for phase 2 | 2Yrs from funding development |
| Identify critical facilities within WVWA Network to install generators | All Hazards resulting in power outage | Promote resiliency of water distribution system during power outages  | \$5,000,000   | Medium          | High     | WVWA, Grantor with an appropriate grant program                  | WVWA Water Quality         | Not Started pending funding                  | 2Yrs from funding development |

| Project   | Hazard Mitigated                       | Benefit  | Cost Estimate                   | Benefit-to-Cost | Priority | Funding Partners                                | Implementation/Lead Agency | Status   | Proposed Schedule                   |
|---|--|--|---------------------------------|-----------------|----------|---|----------------------------|--|-------------------------------------|
| Identify distribution infrastructure vulnerable to hazardous environmental concerns including extreme cold and geologic hazards | Extreme Temperature, Geologic Hazards  | Identify and prioritize vulnerable infrastructure to prevent customer/system water outage. | Routine effort. Cost by project | High            | High     | WVWA, Grantor with an appropriate grant program | WVWA Engineering Services  | On-going constant maintenance effort, exacerbated by natural hazards | On-going multiple projects per year |
| Study WVWA Dams and establish a replacement program   | Flooding, Geologic Hazards, Earthquake | Long term planning to evaluate dam lifecycle.  | TBD                             | Medium          | Low-Med  | WVWA, Grantor with an appropriate grant program | WVWA Water Quality         | Not Started pending internal scoping                                 | TBD                                 |
| Distribution System Redundancy  | All-Hazards                            | Promote resiliency of water distribution and collection systems.                           | TBD                             | Medium          | Medium   | WVWA, Grantor with an appropriate grant program | WVWA Engineering Services  | Not Started pending internal scoping                                 | On-Going                            |

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# Appendices

## **Appendix A: Public Engagement Summary and Documentation**

### **Appendix B: Hazard Mitigation Survey Results**

*Public Input Survey Report*

*Stakeholder Form Responses*

### **Appendix C: Flood Hazard Areas**

### **Appendix D: Flooding HAZUS Reports**

*100 Year Flood Model*

*500 Year Flood Model*

## **Appendix E: Wildfire Incident Reports and Regional Wildfire Report**

*Wildfire Incident Reports*

*Regional Wildfire Risk Model Report*

## **Appendix F: Critical and Vulnerable Facilities Inventory**

## **Appendix G: Jurisdiction Capability Assessment Worksheets**

## **Appendix H: High Hazard Dam Supplemental Information**

*Dam Safety Fact Sheets*

*Inundation Maps Beaverdam Creek*

*Inundation Maps Carvin Cove*

*Inundation Maps Falling Creek*

*Inundation Maps Johns Creek 1*

*Inundation Maps Johns Creek 2*

*Inundation Maps Johns Creek 3*

*Inundation Maps Johns Creek 4*

*Inundation Maps Spring Hollow*

## **Appendix I: Policy Guide Checklist**

## **Appendix J: Resolutions and Adoption**

[www.RVARC.ORG](http://www.RVARC.ORG)

ROANOKE VALLEY RESOURCE AUTHORITY  
TINKER CREEK TRANSFER STATION  
1020 HOLLINS ROAD, N.E.  
ROANOKE, VIRGINIA 24012

**MINUTES OF OCTOBER 22, 2025**

The Roanoke Valley Resource Authority Board met on October 22, 2025, at the Tinker Creek Transfer Station, 1020 Hollins Road NE, Roanoke, Virginia 24012.

**OPENING CEREMONIES**

**Call to Order:** Chair Owens called the meeting to order at 12:00 p.m., followed by roll call for attendance.

**Members Present:** Steve Bandy, Roanoke County  
Doug Blount, Roanoke County  
Laurie Gearheart, Roanoke County  
Rob Light, City of Salem  
Mike McEvoy, City of Roanoke  
Rebecca Owens, Roanoke County (Chair)  
Pete Peters, Town of Vinton  
Jeffrey Powell, City of Roanoke (Vice-Chair)  
Todd Simmons, Roanoke County

**Members Absent:**

**Staff Present:** Jim Guynn, Attorney  
Jon Lanford, Chief Executive Officer  
Brad Brewer, Finance Manager  
Lorie Bess, Board Secretary

**REQUESTS TO POSTPONE, ADD TO, OR CHANGE THE ORDER OF AGENDA ITEMS**

Mr. Lanford requested to add to the agenda a resolution of appreciation for Rebecca Owens, who would be retiring December 1, 2025. Mr. Light motioned to add the resolution to the agenda; seconded by Mr. Blount. Mr. Lanford read the resolution aloud.

Mr. Powell presented Ms. Owens with tokens of appreciation on behalf of Roanoke City.

Mr. Peters stated it was a pleasure to work with Ms. Owens on the Board and all other interactions on behalf of the town of Vinton.

Mr. Light stated that Ms. Owens hired him in 2018 and he had ever since appreciated her support, leadership, friendship, and that she had been nothing but great to work with.

Mr. Bandy stated he appreciated all her help with Mason Cove especially but also appreciated her as a person.

Mr. McEvoy thanked Ms. Owens for her dedicated service to the entire Roanoke Valley.

Ms. Owens thanked everyone for the resolution and the kind words.

## **BUSINESS – ACTION ITEMS**

### **RVRA Waste and Leachate Hauling Contract Award**

RVRA solicited proposals for Waste and Leachate Hauling this summer, with a total of six (6) proposals received. RVRA staff met to discuss, review and decide upon highest and best offeror. Staff determined Thompson Trucking, our incumbent hauler for both services, was highest and best offeror. On September 8, 2025, Thompson Trucking was issued a Notice of Intent to Award, contingent upon fulfillment of all contractual obligations and completion of all required approvals by RVRA Board of Directors.

Following is a summary of offers submitted in accordance with solicitation:

| RFP - WASTE AND LEACHATE HAULING |                     |                     |          |
|----------------------------------|---------------------|---------------------|----------|
| BIDDERS                          | STS → SG            | TCTS → SG           | SG → STS |
| CASH ENTERPRISES                 | \$370 - \$543       | \$408 - \$576       | \$1056   |
| ILLUMINE                         | \$355 - \$378       | \$397 - \$423       | \$416    |
| MOUNTAIN WASTE                   | \$340 - \$405       | \$385 - \$454       | \$452    |
| MWS LOGISTICS                    | \$350 - \$390       | \$370 - \$410       | \$475    |
| THOMPSON                         | \$265.63 - \$299.46 | \$291.88 - \$325.76 | \$304.24 |
| WEBB'S                           | -----               | -----               | \$441.97 |

\*\*first price listed is RVRA Owns Trailers; second price is Contractor Owned\*\*

As noted in schedule above, Thompson Trucking provided the best value and had the experience to provide quality hauling services for both needs.

Thompson Trucking offered \$1.3MM cash for the purchase of 49 RVRA walking floor trailers. Mr. Lanford noted that Thompson's pricing was the only one that offered a cash option to purchase trailers based off the trade-in value.

In evaluating all costs associated with the potential sale of trailers and utilizing a model where contractor owns all trailers, staff looked at bid pricing in schedule above and also compared current contracted per pull rate versus contractor owned trailer per pull rate in solicitation. Both models yield an overall annual savings to the Authority.

Comparison one, when simply looking at proposed pricing, there is a \$33.83 per pull delta. RVRA averages 12,600 pulls per year equaling \$426,258 more in operational costs. However, we spent \$255,308.22 in Fiscal 25 maintaining our fleet of trailers (this number will only inflate as costs increase and fleet ages). This leaves a true delta of \$170,949.78 or approximately the equivalent of cash needed to fund replacement of a single trailer annually.

Comparison two looked at our current per pull rate (Authority owned) with Thompson Trucking versus proposed per rate (Contractor owned). These per pull rates are different than what is shown in schedule above and base bid rate Thompson Trucking utilized during last solicitation as they include fuel surcharge adjustments based upon DOE weekly published Diesel Fuel costs. Currently, with fuel surcharge adjustment we pay Thompson Trucking \$335.53 per pull. Adjusted proposed price for contractor owned trailer per pull rate is \$355.08 or approximately \$20.00 more than we are currently paying. Multiplying that amount by 12,600 equals \$252,000 more per year in hauling costs but \$3,308.22 less than we spent on trailer maintenance last fiscal year.

It was recommended that the Board authorize staff to formalize two separate contracts with Thompson Trucking, one for leachate and one for waste, to include sale of trailers. The following resolution was read aloud:

**RESOLUTION OF THE ROANOKE VALLEY RESOURCE AUTHORITY**

**Adopted this 22<sup>nd</sup> day of October 2025**

**RA#2025-34**

**A RESOLUTION AUTHORIZING TWO SEPARATE CONTRACTS FOR WASTE AND LEACHATE HAULING SERVICES FROM THOMPSON TRUCKING, UPON CERTAIN TERMS AND CONDITIONS**

**BE IT RESOLVED** by the Roanoke Valley Resource Authority that the Chief Executive Officer is authorized to execute, in a form approved by General Counsel, appropriate documentation necessary for the contracting of **Waste and Leachate Hauling Services** from Thompson Trucking. Such procurement is to be in accordance with the terms of contracts approved by General Counsel and to conform as necessary to the Authority's purchasing requirements, including such additional terms and conditions as the Chief Executive Officer and General Counsel determine to be in the best interest of the Authority, all as more particularly set forth in the RFB bid submission dated August 26, 2025.

MOTION: That the Board authorize staff to formalize two separate contracts, one for Waste Hauling, and one for Leachate Hauling, including the sale of trailers.

MOTION: Mr. Bandy

SECOND: Mr. Powell

AYES: Unanimous

RESOLUTION: RA2025-34

**Presentation of the Year End Audit Results for June 30, 2025**

The audit firm of Robinson, Farmer, Cox Associates completed their independent audit of the Roanoke Valley Resource Authority (RVRA) for the year ended June 30, 2025. The RVRA received a clean and unmodified opinion on the financials. The final "Annual Comprehensive Financial Report" was enclosed in the packet and reviewed at the meeting.

The operating fund ended the year with a net surplus to transfer of \$2,609,861.

Total revenues were approximately \$19.1 million in fiscal year 2025.

- Tipping fees exceeded budget by approximately \$1.2 million, primarily due to a modest rate increase and higher overall tonnage collected.
- Miscellaneous revenue surpassed budget expectations by \$242,441, driven by the new contracted sale of landfill gas and the receipt of FEMA/VDEM reimbursements from Hurricane Helene.
- Total nonoperating revenues amounted to \$452,905, attributable solely to interest income, which exceeded budgeted projections by \$302,905.

Total expenditures and net transfers totaled approximately \$16.4 million.

- Personnel expenditures aligned closely with projected budget, ending with a variance of only 0.3% or \$11,684.
- Operating expenditures exceeded budget by \$695,660 primarily due to:
  - Increased cost of contracted repairs (approx. \$313,000)
  - Increased expense for the purchase of repair parts and tires (approx. \$300,540)
- The fiscal year 2025 budgeted transfer of \$1.7 million to the Future Site Development Reserve was not made prior to June 30, resulting in an addition to the surplus of \$1.7 million.
- VRA debt coverage ratio of 2.39 exceeded the 1.0 minimum requirement

Ms. Gearheart thanked Brad Brewer, Jessica Beemer, and the Roanoke County team for their work with the audit.

Mr. Lanford thanked Mrs. Gearheart and her team, as well as Brad Brewer, for their work on the audit. He noted the \$580,000 would be used to accelerate the purchase of a haul truck at the landfill and it would be a top-rated piece of equipment for 2027. He explained we are currently renting an articulating truck at the landfill.

Staff recommended acceptance of the audit for the fiscal year ended June 30, 2025, and the transfer of net surplus funds in the amounts of \$580,000.00 to the Equipment Reserve Fund and \$2,029,861.49 to the Site Development Reserve Fund in the total amount of \$2,609,861.49.

**RESOLUTION OF THE ROANOKE VALLEY RESOURCE AUTHORITY**

**Adopted this 22<sup>nd</sup> day of October 2025**

**RA#2025-35**

**A RESOLUTION ACCEPTING THE AUTHORITY'S INDEPENDENT "ANNUAL COMPREHENSIVE FINANCIAL REPORT" AUDIT FOR FY2025 AND AUTHORIZING THE TRANSFER OF CERTAIN FUNDS, UPON CERTAIN TERMS AND CONDITIONS**

**BE IT RESOLVED** by the Roanoke Valley Resource Authority that:

1. The Independent Annual Audit for the year ended June 30, 2025, performed by Robinson, Farmer, Cox Associates, and accompanying letters, as presented to the Board and as described in the October 22, 2025 report of the Authority Treasurer, are hereby accepted and the Authority Secretary is authorized and directed to file such document with the Authority's official records; and
2. The following transfer of funds is hereby authorized, as described in the October 22, 2025, report from the Authority Treasurer:
  - i. \$580,000.00 of Surplus to the Equipment Replacement Reserve Fund
  - ii. \$2,029,861.49 Surplus to the Site Development Reserve Fund

**MOTION:** That the Board accept the Year End Audit Results for June 30, 2025, and the transfer of net surplus funds in the amounts discussed and presented.

**MOTION:** Mr. Peters

**SECOND:** Mr. Powell

**AYES:** Unanimous

**RESOLUTION:** RA2025-35

## **BUSINESS – INFORMATION ITEMS**

### **CONSENT AGENDA**

A. Minutes of September 24, 2025 Meeting

MOTION: That the Board approve the consent agenda item, as presented.

MOTION: Ms. Gearheart

SECOND: Mr. Bandy

AYES: Unanimous

RESOLUTION: RA2025-36

### **REPORTS**

#### **FINANCIAL REPORTS**

Mr. Brewer reviewed the following financial reports for month ending September 2025 (attached)

1. Statement of Cash Balances
2. Statement of Operations
3. Reconciliation of Net Income to Cash Provided by Operations (Cash Basis)
4. Summary of Reserve Funds
5. Summary of Cash Reserve Funds Transferred from Roanoke Valley Regional Solid Waste Management Board
6. Cumulative Statement of Operations
7. VRA2021A Bond Issuance

#### **WASTE TONNAGE REPORT**

Mr. Lanford reviewed the Waste Tonnage report noting we are still performing better than budgeted but there was a peak in July that has now leveled out.

The following monthly reports were provided to the Board as information:

- Trailer Report
- Residential Waste Report
- Woodwaste Report
- Recycling Report
- Household Hazardous Waste Report

#### **PROJECT STATUS REPORT** - None

#### **PUBLIC QUESTIONS AND COMMENTS** - None

#### **CHIEF EXECUTIVE OFFICER REPORT**

Mr. Lanford offered the following report:

- During the December 3 meeting Amanda McGhee (VDEM) may attend to discuss the Hazardous Mitigation Plan to be considered for approval by the Board. We do have some grant applications in place now so the adoption of this Plan would be critical for moving forward.
- Hurricane Helene - We have been approved for \$200,000 for repairs. Bids will be due in December and will come to the Board in January.
- I have been discussing with Ms. Duval about the 12-free trips policy for residents and how those policies are outdated. Specifically, policy currently states the maximum vehicle size for residents is a three-quarter ton truck; however, many people are driving ton

trucks now as their daily vehicle, unlike back when the policies were established when only commercial vendors were using the larger trucks. Ms. Duval will work with the localities to refine the policy.

- I met with David Moore with Virginia Tech to discuss options for RVRA to partner with TAP. He reached out to us to discuss options for folks that are reentering the workforce following being released from incarceration. He noted it is a 12-week program, they manage it, and there is no cost to us. While we do not have enough electronic devices for this program, we may look at greenway maintenance, painting of parking lots, and getting project lists from our localities. Let me know if any of you are interested in participating.
- Due to pennies no longer being made, in January we will be rounding up to the nearest nickel, as many businesses have begun to do already. We will post a public notice about it but want to make the Board aware also.
- We will present a revised Employee Handbook in December for the Board's consideration.
- We will present a Transfer Policy in December with a recommendation for the Board's consideration.
- Congratulations to Todd Simmons and Steve Bandy on their reappointments.
- Thank you to Tiffany Bradbury who is doing a lot of good work for us. (Slideshow presentation.)

#### **BOARD MEMBER COMMENTS**

Mr. McEvoy reminded everyone that Saturday would be RX Take Back Day.

Mr. Powell noted the following weekend would be Trick or Treat and to be mindful of children walking around.

Ms. Owens thanked everyone for the beautiful resolution and wished everyone well.

#### **ADJOURNMENT**

Hearing no further questions or comments, Chair Owens adjourned the meeting at 12:43 p.m.

Respectfully submitted,

---

Lorie C. Bess  
RVRA Board Secretary

**Roanoke Valley Resource Authority**  
Statement of Cash Balances  
As of October 31, 2025

|                                       |                      |
|---------------------------------------|----------------------|
| Cash held by Roanoke County           |                      |
| Operating Fund                        | \$ 2,622,234         |
| Contingency                           | 1,483,939            |
| Closure Fund - Smith Gap Landfill     | 1,068,870            |
| Renewal and Replacement Fund          | 1,933,927            |
| Additional Reserves Fund              | 5,267,515 *          |
| Closure Fund - Rutrough Road Landfill | -                    |
|                                       |                      |
| Total                                 | <u>\$ 12,376,485</u> |
|                                       |                      |
| Cash held in Escrow                   |                      |
| VRA 2021A Bond Issuance - interest    | \$ 15,610            |
|                                       |                      |
| Total                                 | <u>\$ 15,610</u>     |

\* \$9,211 of this amount is held by the County for assurance on construction projects

**Roanoke Valley Resource Authority**  
 Statement of Operations  
 As of October 31, 2025  
 ( Cash Basis )

|  | <b>ANNUAL<br/>BUDGET</b>   | <b>ACTUAL<br/>TO DATE</b>  | <b>PERCENTAGE</b> |
|--|----------------------------|----------------------------|-------------------|
| <b>Operating Revenues</b>                      |                            |                            |                   |
| Tipping Fees                                   | \$ 17,950,445              | \$ 7,242,246               | 40%               |
| Sale of Recyclable Material                    | 50,000                     | 19,601                     | 39%               |
| Sale of Mulch                                  | 50,000                     | 15,611                     | 31%               |
| Miscellaneous Revenue                          | 35,000                     | 4,740                      | 14%               |
| Sale of Landfill Gas                           | 831,289                    | 277,096                    | 33%               |
| Beginning balance                              | 69,685                     | -                          | 0%                |
| Total Operating Revenue                        | <u>18,986,419</u>          | <u>7,559,294</u>           | <u>40%</u>        |
| <b>Operating Expenses</b>                      |                            |                            |                   |
| <i>Administration</i>                          |                            |                            |                   |
| Personnel                                      | 1,112,348                  | 395,383                    | 36%               |
| Operating                                      | 1,039,043                  | 348,583                    | 34%               |
| Unappropriated Balance                         | 12,893                     | -                          | 0%                |
| Sub total                                      | <u>2,164,284</u>           | <u>743,966</u>             | <u>34%</u>        |
| <i>Transfer Station</i>                        |                            |                            |                   |
| Personnel                                      | 1,153,961                  | 374,881                    | 32%               |
| Operating                                      | 3,518,740                  | 1,188,824                  | 34%               |
| Unappropriated Balance                         | 43,875                     | -                          | 0%                |
| Sub total                                      | <u>4,716,576</u>           | <u>1,563,705</u>           | <u>33%</u>        |
| <i>Smith Gap</i>                               |                            |                            |                   |
| Personnel                                      | 1,178,968                  | 382,623                    | 32%               |
| Operating                                      | 3,400,292                  | 1,109,829                  | 33%               |
| Unappropriated Balance                         | 41,838                     | -                          | 0%                |
| Sub total                                      | <u>4,621,098</u>           | <u>1,492,452</u>           | <u>32%</u>        |
| <i>Salem Transfer Station</i>                  |                            |                            |                   |
| Personnel                                      | 659,459                    | 250,607                    | 38%               |
| Operating                                      | 2,329,792                  | 844,661                    | 36%               |
| Unappropriated Balance                         | 29,122                     | -                          | 0%                |
| Sub total                                      | <u>3,018,373</u>           | <u>1,095,268</u>           | <u>36%</u>        |
| Total Operating Expenses                       | <u>14,520,331</u>          | <u>4,895,391</u>           | <u>34%</u>        |
| Income from Operations                         | <u>4,466,088</u>           | <u>2,663,903</u>           | <u>60%</u>        |
| <b>Non Operating Revenues ( Expenses )</b>     |                            |                            |                   |
| Investment Income                              | 200,000                    | 141,366                    | 71%               |
| Interest Expense                               | (666,718)                  | (343,096)                  | 51%               |
| Non operating Expenses (net)                   | <u>(466,718)</u>           | <u>(201,730)</u>           | <u>43%</u>        |
| Income (loss) before Operating Transfers       | 3,999,370                  | 2,462,173                  | 62%               |
| <b>Operating Transfers In (Out)</b>            |                            |                            |                   |
| Transfer to Equipment Reserves                 | (695,000)                  | -                          | 0%                |
| Transfer to RVRA Capital                       | (200,000)                  | (66,667)                   | 33%               |
| Transfer to Surplus Revenue Fund               | (45,400)                   | -                          | 0%                |
| Transfer to Future Site Development            | <u>(1,829,913)</u>         | <u>-</u>                   | <u>0%</u>         |
| Net Income Before Transfer of FY25 Net Surplus | 1,229,057                  | 2,395,506                  |                   |
| Transfer of FY25 Net Surplus to:               |                            |                            |                   |
| Equipment Reserve                              | -                          | (580,000)                  |                   |
| Future Site Development                        | <u>-</u>                   | <u>(2,029,861)</u>         |                   |
| <b>Net Income</b>                              | <u><u>\$ 1,229,057</u></u> | <u><u>\$ (214,355)</u></u> |                   |

**Roanoke Valley Resource Authority**

Reconciliation of Net Income to Cash Provided by Operations  
As of October 31, 2025  
( Cash Basis )

|  | <b>ANNUAL<br/>BUDGET</b> | <b>ACTUAL<br/>TO DATE</b> |
|--|--------------------------|---------------------------|
| Net Income   | \$ 1,229,057             | \$ (214,355)              |
| <hr/>  |                          |                           |
| Adjustments to Net Income                          |                          |                           |
| Principal payment on Loans                         | (1,229,057)              | (1,229,057)               |
| <hr/>  |                          |                           |
| Increase (Decrease) in cash provided by operations | <u>\$ -</u>              | <u>\$ (1,443,412)</u>     |

**Roanoke Valley Resource Authority**

Summary of Reserve Funds

As of October 31, 2025

|                                 | <b>Beginning<br/>Balance</b> | Deposits            | Expenditures      | <b>Ending<br/>Balance</b> | Encumbrances      | <b>Remaining<br/>Balance</b> |
|---------------------------------|------------------------------|---------------------|-------------------|---------------------------|-------------------|------------------------------|
| Closure Fund                    | \$ 1,068,870                 | \$ -                | \$ -              | \$ 1,068,870              | \$ -              | \$ 1,068,870                 |
| Contingency Fund                | 1,483,939                    | -                   | -                 | 1,483,939                 | -                 | 1,483,939                    |
| Renewal and Replacement Reserve |                              |                     |                   |                           |                   |                              |
| Equipment Reserves              | 552,939                      | 580,000             | 319,442           | 813,497                   | 346,467           | 467,030                      |
| Environmental Fund              | 500,000                      | -                   | -                 | 500,000                   | -                 | 500,000                      |
| Host Community Improvement      | 250,000                      | -                   | -                 | 250,000                   | -                 | 250,000                      |
| Property Value Protection       | 370,430                      | -                   | -                 | 370,430                   | -                 | 370,430                      |
|                                 | 1,673,369                    | 580,000             | 319,442           | 1,933,927                 | 346,467           | 1,587,460                    |
| Additional Deposits             |                              |                     |                   |                           |                   |                              |
| Further Site Development        | 2,957,271                    | 2,030,511           | 11,528            | 4,976,254                 | 7,452             | 4,968,802 *                  |
| Capital Improvement             | 224,594                      | 66,667              | -                 | 291,261                   | 28,475            | 262,786                      |
|                                 | 3,181,865                    | 2,097,178           | 11,528            | 5,267,515                 | 35,927            | 5,231,588                    |
| Grand Total                     | <u>\$ 7,408,043</u>          | <u>\$ 2,677,178</u> | <u>\$ 330,970</u> | <u>\$ 9,754,251</u>       | <u>\$ 382,394</u> | <u>\$ 9,371,857</u>          |

\* \$9,211 of this amount is held by the County for assurance on construction projects

**Roanoke Valley Resource Authority**  
 Summary of Cash Reserves Transferred from RVRSWMB \*  
 As of October 31, 2025

|  | <b>CLOSURE &amp;<br/>POST CLOSURE</b> |
|--|---------------------------------------|
| Beginning Balance July 1, 2025           | \$ -                                  |
| Revenue                                  |                                       |
| Interest Income                          | -                                     |
| Expenditures                             |                                       |
| Contractual Services                     | -                                     |
| Professional Services                    | -                                     |
| Landfill Gas Monitoring                  | -                                     |
| Lease and Rent                           | -                                     |
| Warrants and Fees                        | -                                     |
| Supplies and Small Equipment             | -                                     |
| Supplies                                 | -                                     |
| Building Maintenance                     | -                                     |
| <br>Cash Balance (less vouchers payable) | <br>-                                 |
| Accrued Landfill Closure Liability       | <u>(3,576,433)</u>                    |
| Unrestricted Balance                     | <u>\$ (3,576,433)</u>                 |

\* Roanoke Valley Regional Solid Waste Management Board

**Roanoke Valley Resource Authority 2025-26**  
Cumulative Statement of Operations  
For the Month Ended October 31, 2025

**Roanoke Valley Resource Authority**

VRA 2021A Bond Issuance  
 As of October 31, 2025  
 ( Cash Basis )

|  | <b>Annual<br/>Budget</b> | <b>Actual<br/>To Date</b> | <b>Outstanding<br/>Encumbrance</b> | <b>Remaining<br/>Balance</b> |
|--|--------------------------|---------------------------|------------------------------------|------------------------------|
| <b><i>Tinker Creek Transfer Station Conversion</i></b> |                          |                           |                                    |                              |
| Building Improvements/Additions                        | \$ -                     | \$ -                      | \$ -                               | \$ -                         |
| Sub total  |                          |                           |                                    |                              |
| <b><i>Smith Gap Rail Spur Conversion</i></b>           |                          |                           |                                    |                              |
| Buildings  |                          |                           |                                    |                              |
| Sub total  |                          |                           |                                    |                              |
| <b><i>Unallocated</i></b>                              |                          |                           |                                    |                              |
| Restricted Interest                                    | 15,242                   | 368                       | -                                  | 15,610                       |
| Sub total  | 15,242                   | 368                       | -                                  | 15,610                       |
| Total  | \$ 15,242                | \$ 368                    | \$ -                               | \$ 15,610                    |

ITEM No. IV.B.

| Month<br>2025-2026 | Actual<br>Received | Budget<br>Projected | Municipal |        | Commercial |        | Wood Waste |        |
|--------------------|--------------------|---------------------|-----------|--------|------------|--------|------------|--------|
|                    |                    |                     | Actual    | Budget | Actual     | Budget | Actual     | Budget |
| JULY               | 37,043             | 25,473              | 10,995    | 9,162  | 25,237     | 15,472 | 811        | 839    |
| AUGUST             | 31,373             | 28,888              | 9,713     | 9,942  | 20,852     | 18,147 | 808        | 799    |
| SEPTEMBER          | 29,853             | 27,728              | 9,685     | 9,054  | 19,335     | 17,937 | 833        | 737    |
| OCTOBER            | 30,085             | 27,493              | 9,349     | 8,900  | 20,055     | 17,937 | 681        | 656    |
| NOVEMBER           |                    |                     |           |        |            |        |            |        |
| DECEMBER           |                    |                     |           |        |            |        |            |        |
| JANUARY            |                    |                     |           |        |            |        |            |        |
| FEBRUARY           |                    |                     |           |        |            |        |            |        |
| MARCH              |                    |                     |           |        |            |        |            |        |
| APRIL              |                    |                     |           |        |            |        |            |        |
| MAY                |                    |                     |           |        |            |        |            |        |
| JUNE               |                    |                     |           |        |            |        |            |        |
| TOTAL              | 128,354            | 109,582             | 39,742    | 37,058 | 85,479     | 69,493 | 3,133      | 3,031  |

## Notes

3 months      18,772 Tons Above Budget      17.13%

Respectfully submitted,



Jonathan A. Lanford  
Chief Executive Officer

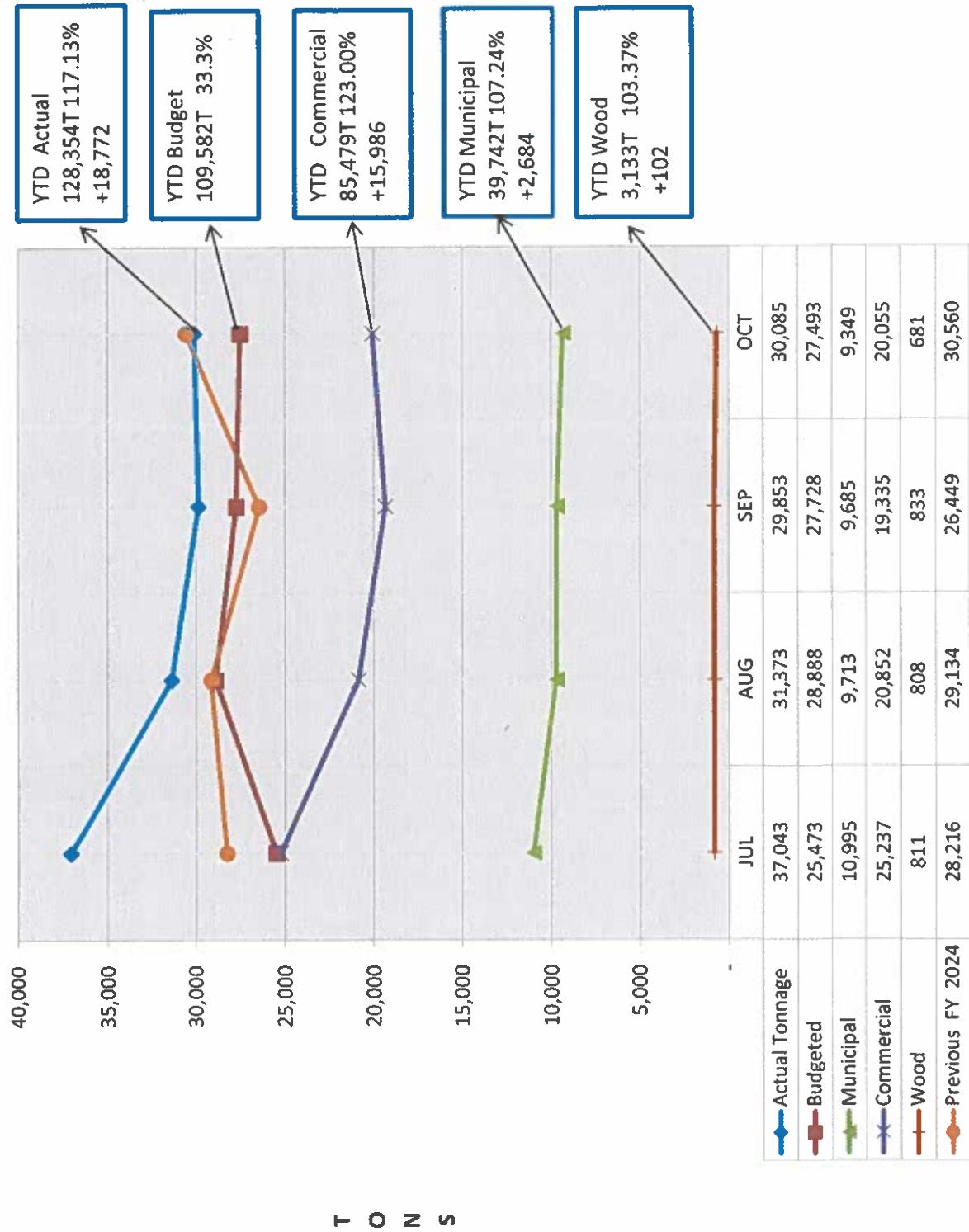
**ROANOKE VALLEY RESOURCE AUTHORITY**  
**WASTE TONNAGE AND TIRES**  
**FISCAL YEAR 2025-2026**

|                      | <u>JUL</u>    | <u>AUG</u>    | <u>SEP</u>    | <u>OCT</u>    | <u>NOV</u> | <u>DEC</u> | <u>JAN</u> | <u>FEB</u> | <u>MAR</u> | <u>APR</u> | <u>MAY</u> | <u>JUNE</u> | <b>YEAR - TO - DATE</b> |                |              |
|----------------------|---------------|---------------|---------------|---------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------------------|----------------|--------------|
|                      |               |               |               |               |            |            |            |            |            |            |            |             | <b>TOTAL</b>            | <b>BUDGET</b>  | <b>%</b>     |
| <b>MUNICIPAL</b>     |               |               |               |               |            |            |            |            |            |            |            |             |                         |                |              |
| CITY OF ROANOKE      | 4,197         | 3,472         | 3,688         | 3,320         | -          | -          | -          | -          | -          | -          | -          | -           | 14,677                  | 41,000         | 35.8%        |
| COUNTY OF ROANOKE    | 3,849         | 3,264         | 3,368         | 3,301         | -          | -          | -          | -          | -          | -          | -          | -           | 13,782                  | 37,000         | 37.2%        |
| CITY OF SALEM        | 1,444         | 1,358         | 1,326         | 1,346         | -          | -          | -          | -          | -          | -          | -          | -           | 5,474                   | 16,000         | 34.2%        |
| TOWN OF VINTON       | 349           | 353           | 311           | 315           | -          | -          | -          | -          | -          | -          | -          | -           | 1,328                   | 3,200          | 41.5%        |
|                      | 9,839         | 8,447         | 8,693         | 8,282         | -          | -          | -          | -          | -          | -          | -          | -           | 35,261                  | 97,200         | 36.3%        |
| RESIDENTIAL          | 1,151         | 1,257         | 989           | 1,060         | -          | -          | -          | -          | -          | -          | -          | -           | 4,457                   | 11,500         | 38.8%        |
|                      | <b>10,990</b> | <b>9,704</b>  | <b>9,682</b>  | <b>9,342</b>  | -          | -          | -          | -          | -          | -          | -          | -           | <b>39,718</b>           | <b>108,700</b> | <b>36.5%</b> |
| <b>COMMERCIAL</b>    |               |               |               |               |            |            |            |            |            |            |            |             |                         |                |              |
| AFFORDABLE CS        | 468           | 347           | 433           | 493           | -          | -          | -          | -          | -          | -          | -          | -           | 1,741                   | 4,500          | 38.7%        |
| REPUBLIC SERVICES    | 2,745         | 2,547         | 2,507         | 2,713         | -          | -          | -          | -          | -          | -          | -          | -           | 10,512                  | 30,000         | 35.0%        |
| JRR LLC              | 129           | 110           | 72            | 121           | -          | -          | -          | -          | -          | -          | -          | -           | 432                     | 1,300          | 33.2%        |
| FIRST PIEDMONT       | 1,459         | 1,391         | 1,383         | 1,406         | -          | -          | -          | -          | -          | -          | -          | -           | 5,639                   | 17,000         | 33.2%        |
| COUNTY WASTE         | -             | -             | -             | -             | -          | -          | -          | -          | -          | -          | -          | -           | -                       | 500            | 0.0%         |
| TIDY SERVICES        | 917           | 1,074         | 955           | 870           | -          | -          | -          | -          | -          | -          | -          | -           | 3,816                   | 11,000         | 34.7%        |
| WASTE MANAGEMENT     | 1,735         | 1,772         | 1,700         | 1,827         | -          | -          | -          | -          | -          | -          | -          | -           | 7,034                   | 23,700         | 29.7%        |
| CONTRACTED WASTE     | 7,523         | 8,130         | 7,888         | 8,043         | -          | -          | -          | -          | -          | -          | -          | -           | 31,584                  | 81,000         | 39.0%        |
| PRIVATE              | 10,232        | 5,435         | 4,361         | 4,547         | -          | -          | -          | -          | -          | -          | -          | -           | 24,575                  | 42,000         | 58.5%        |
|                      | <b>25,208</b> | <b>20,806</b> | <b>19,299</b> | <b>20,020</b> | -          | -          | -          | -          | -          | -          | -          | -           | <b>85,333</b>           | <b>211,000</b> | <b>40.4%</b> |
| <b>WOOD WASTE</b>    |               |               |               |               |            |            |            |            |            |            |            |             |                         |                |              |
| CITY OF ROANOKE      | 217           | 206           | 215           | 205           | -          | -          | -          | -          | -          | -          | -          | -           | 843                     | 2,900          | 29.1%        |
| COUNTY OF ROANOKE    | 10            | 27            | 20            | 17            | -          | -          | -          | -          | -          | -          | -          | -           | 74                      | 1,000          | 7.4%         |
| CITY OF SALEM        | -             | -             | -             | -             | -          | -          | -          | -          | -          | -          | -          | -           | -                       | 0.0%           |              |
| TOWN OF VINTON       | 8             | 6             | 5             | 2             | -          | -          | -          | -          | -          | -          | -          | -           | 21                      | 125            | 16.8%        |
| RESIDENTIAL          | 154           | 62            | 127           | 51            | -          | -          | -          | -          | -          | -          | -          | -           | 394                     | 1,000          | 39.4%        |
| COMMERCIAL           | 37            | 45            | 35            | 40            | -          | -          | -          | -          | -          | -          | -          | -           | 157                     | 400            | 39.3%        |
| PRIVATE              | 385           | 462           | 431           | 366           | -          | -          | -          | -          | -          | -          | -          | -           | 1,644                   | 3,400          | 48.4%        |
|                      | <b>811</b>    | <b>808</b>    | <b>833</b>    | <b>681</b>    | -          | -          | -          | -          | -          | -          | -          | -           | <b>3,133</b>            | <b>8,825</b>   | <b>35.5%</b> |
| <b>TIRES - TON</b>   |               |               |               |               |            |            |            |            |            |            |            |             |                         |                |              |
| CITY OF ROANOKE      | 4             | 5             | 2             | 5             | -          | -          | -          | -          | -          | -          | -          | -           | 16                      | 60             | 26.7%        |
| COUNTY OF ROANOKE    | 1             | 2             | 1             | 2             | -          | -          | -          | -          | -          | -          | -          | -           | 6                       | 20             | 30.0%        |
| CITY OF SALEM        | -             | -             | -             | -             | -          | -          | -          | -          | -          | -          | -          | -           | -                       | 0.0%           |              |
| TOWN OF VINTON       | -             | 2             | -             | -             | -          | -          | -          | -          | -          | -          | -          | -           | 2                       | -              | 0.0%         |
| COMMERCIAL           | 5             | 8             | 12            | 6             | -          | -          | -          | -          | -          | -          | -          | -           | 31                      | 20             | 155.0%       |
| PRIVATE              | 24            | 38            | 24            | 29            | -          | -          | -          | -          | -          | -          | -          | -           | 115                     | 500            | 23.0%        |
|                      | <b>34</b>     | <b>55</b>     | <b>39</b>     | <b>42</b>     | -          | -          | -          | -          | -          | -          | -          | -           | <b>170</b>              | <b>600</b>     | <b>28.3%</b> |
| <b>TOTAL TONNAGE</b> | <b>37,043</b> | <b>31,373</b> | <b>29,853</b> | <b>30,085</b> | -          | -          | -          | -          | -          | -          | -          | -           | <b>128,354</b>          | <b>329,125</b> | <b>39.0%</b> |
| <b>TIRES - EACH</b>  |               |               |               |               |            |            |            |            |            |            |            |             |                         |                |              |
| CITY OF ROANOKE      | 13            | 17            | 27            | 80            | -          | -          | -          | -          | -          | -          | -          | -           | 137                     | 90             | 152.2%       |
| COUNTY OF ROANOKE    | 1             | -             | 4             | 5             | -          | -          | -          | -          | -          | -          | -          | -           | 10                      | 20             | 50.0%        |
| CITY OF SALEM        | -             | -             | -             | 5             | -          | -          | -          | -          | -          | -          | -          | -           | 5                       | -              | 0.0%         |
| TOWN OF VINTON       | -             | -             | -             | -             | -          | -          | -          | -          | -          | -          | -          | -           | -                       | -              | 0.0%         |
| RESIDENTIAL          | 203           | 193           | 157           | 252           | -          | -          | -          | -          | -          | -          | -          | -           | 805                     | 1,500          | 53.7%        |
| COMMERCIAL           | 36            | 62            | 61            | 26            | -          | -          | -          | -          | -          | -          | -          | -           | 185                     | 375            | 49.3%        |
| PRIVATE              | 90            | 129           | 262           | 69            | -          | -          | -          | -          | -          | -          | -          | -           | 550                     | 785            | 70.1%        |
| <b>TOTAL TIRES</b>   | <b>343</b>    | <b>401</b>    | <b>511</b>    | <b>437</b>    | -          | -          | -          | -          | -          | -          | -          | -           | <b>1,692</b>            | <b>2,770</b>   | <b>61.1%</b> |

**ROANOKE VALLEY RESOURCE AUTHORITY**  
**WASTE TONNAGE AND TIRES**  
**FISCAL YEAR 2025-2026**

|                                       | <u>JUL</u>    | <u>AUG</u>    | <u>SEP</u>    | <u>OCT</u>    | <u>NOV</u> | <u>DEC</u> | <u>JAN</u> | <u>FEB</u> | <u>MAR</u> | <u>APR</u> | <u>MAY</u> | <u>JUNE</u> | <b>YEAR - TO - DATE</b> |                |              |
|---------------------------------------|---------------|---------------|---------------|---------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------------------|----------------|--------------|
|                                       |               |               |               |               |            |            |            |            |            |            |            |             | <b>TOTAL</b>            | <b>BUDGET</b>  | <b>%</b>     |
| MUNICIPAL<br>COMMERCIAL<br>WOOD WASTE | 10,995        | 9,713         | 9,685         | 9,349         | -          | -          | -          | -          | -          | -          | -          | -           | 39,742                  | 108,780        | 36.5%        |
|                                       | 25,237        | 20,852        | 19,335        | 20,055        | -          | -          | -          | -          | -          | -          | -          | -           | 85,479                  | 211,520        | 40.4%        |
|                                       | 811           | 808           | 833           | 681           | -          | -          | -          | -          | -          | -          | -          | -           | 3,133                   | 8,825          | 35.5%        |
|                                       | <u>37,043</u> | <u>31,373</u> | <u>29,853</u> | <u>30,085</u> | -          | -          | -          | -          | -          | -          | -          | -           | <u>128,354</u>          | <u>329,125</u> | <u>39.0%</u> |
| MUNICIPAL<br>COMMERCIAL               | 11,384        | 10,014        | 10,052        | 9,624         | -          | -          | -          | -          | -          | -          | -          | -           | 41,074                  | 113,805        | 36.1%        |
|                                       | 25,659        | 21,359        | 19,801        | 20,461        | -          | -          | -          | -          | -          | -          | -          | -           | 87,280                  | 215,320        | 40.5%        |
|                                       | <u>37,043</u> | <u>31,373</u> | <u>29,853</u> | <u>30,085</u> | -          | -          | -          | -          | -          | -          | -          | -           | <u>128,354</u>          | <u>329,125</u> | <u>39.0%</u> |
| RECYCLED ( Residential Area )         | 73            | 89            | 104           | 74            | -          | -          | -          | -          | -          | -          | -          | -           | 340                     | 1,400          | 24.3%        |
| RECYCLED ( Wood and RSA )             | 885           | 896           | 937           | 759           | -          | -          | -          | -          | -          | -          | -          | -           | 3,477                   | 10,225         | 34.0%        |
| Previous FY 2024 - 2025 Waste         | 28,216        | 29,134        | 26,449        | 30,560        | -          | -          | -          | -          | -          | -          | -          | -           | 114,359                 | 296,810        | 38.5%        |
| Monthly Tonnage Projections           | 25,473        | 28,888        | 27,728        | 27,493        | -          | -          | -          | -          | -          | -          | -          | -           | 109,582                 | 329,125        | 33.3%        |
| City of Roanoke                       | 4,418         | 3,683         | 3,905         | 3,530         | -          | -          | -          | -          | -          | -          | -          | -           | 15,536                  | 43,960         | 35.3%        |
| County of Roanoke                     | 3,860         | 3,293         | 3,389         | 3,320         | -          | -          | -          | -          | -          | -          | -          | -           | 13,862                  | 38,020         | 36.5%        |
| Town of Vinton                        | 357           | 361           | 316           | 317           | -          | -          | -          | -          | -          | -          | -          | -           | 1,351                   | 3,325          | 40.6%        |
| City of Salem                         | 1,444         | 1,358         | 1,326         | 1,346         | -          | -          | -          | -          | -          | -          | -          | -           | 5,474                   | 16,000         | 34.2%        |
| Commercial                            | 15,018        | 15,424        | 14,985        | 15,519        | -          | -          | -          | -          | -          | -          | -          | -           | 60,946                  | 169,420        | 36.0%        |
| Private                               | 10,641        | 5,935         | 4,816         | 4,942         | -          | -          | -          | -          | -          | -          | -          | -           | 26,334                  | 45,900         | 57.4%        |
| Residents                             | <u>1,305</u>  | <u>1,319</u>  | <u>1,116</u>  | <u>1,111</u>  | -          | -          | -          | -          | -          | -          | -          | -           | <u>4,851</u>            | <u>12,500</u>  | <u>38.8%</u> |
|                                       | <u>37,043</u> | <u>31,373</u> | <u>29,853</u> | <u>30,085</u> | -          | -          | -          | -          | -          | -          | -          | -           | <u>128,354</u>          | <u>329,125</u> | <u>39.0%</u> |

## WASTE TONNAGE FY 2026



**DAILY TRAILER REPORT** NOVEMBER 2025

| DAY                           | DATE           | ICIS          |               | SIS    |        | GRAND<br>TOTAL |  |
|-------------------------------|----------------|---------------|---------------|--------|--------|----------------|--|
|                               |                | LOADED<br>OUT | LOADED<br>OUT | TO GAP | TO NRV |                |  |
| Sat                           | 11/1/2025      | 3             | 2             | 5      |        | 5              |  |
|                               | Sun 11/2/2025  | 0             | 0             | 0      |        | 0              |  |
|                               | Mon 11/3/2025  | 25            | 28            | 53     |        | 53             |  |
|                               | Tue 11/4/2025  | 15            | 20            | 35     |        | 35             |  |
|                               | Wed 11/5/2025  | 33            | 24            | 57     |        | 57             |  |
|                               | Thu 11/6/2025  | 36            | 16            | 52     |        | 52             |  |
|                               | Fri 11/7/2025  | 19            | 21            | 40     |        | 40             |  |
| WEEKLY TOTAL                  |                | 131           | 111           | 242    | 0      | 242            |  |
| Sat                           | 11/8/2025      | 5             | 2             | 7      |        | 7              |  |
|                               | Sun 11/9/2025  | 0             | 0             | 0      |        | 0              |  |
|                               | Mon 11/10/2025 | 23            | 28            | 51     |        | 51             |  |
|                               | Tue 11/11/2025 | 13            | 11            | 24     |        | 24             |  |
|                               | Wed 11/12/2025 | 25            | 27            | 52     |        | 52             |  |
|                               | Thu 11/13/2025 | 23            | 20            | 43     |        | 43             |  |
|                               | Fri 11/14/2025 | 27            | 19            | 46     |        | 46             |  |
| WEEKLY TOTAL                  |                | 116           | 107           | 223    | 0      | 223            |  |
| Sat                           | 11/15/2025     | 5             | 2             | 7      |        | 7              |  |
|                               | Sun 11/16/2025 | 0             | 0             | 0      |        | 0              |  |
|                               | Mon 11/17/2025 | 25            | 28            | 53     |        | 53             |  |
|                               | Tue 11/18/2025 | 24            | 25            | 49     |        | 49             |  |
|                               | Wed 11/19/2025 | 22            | 22            | 44     |        | 44             |  |
|                               | Thu 11/20/2025 | 27            | 17            | 44     |        | 44             |  |
|                               | Fri 11/21/2025 | 15            | 15            | 30     |        | 30             |  |
| WEEKLY TOTAL                  |                | 118           | 109           | 227    | 0      | 227            |  |
| Sat                           | 11/22/2025     | 5             | 3             | 8      |        | 8              |  |
|                               | Sun 11/23/2025 | 0             | 0             | 0      |        | 0              |  |
|                               | Mon 11/24/2025 | 30            | 33            | 63     |        | 63             |  |
|                               | Tue 11/25/2025 | 25            | 25            | 50     |        | 50             |  |
|                               | Wed 11/26/2025 |               |               |        |        | 0              |  |
|                               | Thu 11/27/2025 |               |               |        |        | 0              |  |
|                               | Fri 11/28/2025 |               |               |        |        | 0              |  |
| WEEKLY TOTAL                  |                | 60            | 61            | 121    | 0      | 121            |  |
| Sat                           | 11/29/2025     |               |               |        |        | 0              |  |
|                               | Sun 11/30/2025 |               |               |        |        | 0              |  |
| WEEKLY TOTAL                  |                | 0             | 0             | 0      | 0      | 0              |  |
| MONTHLY TOTAL                 |                | 425           | 388           | 813    | 0      | 813            |  |
| TOTAL TONS LOADED (Est. Tons) |                |               |               |        |        |                |  |
|                               |                | 0             |               |        |        |                |  |
| PERCENT                       |                |               |               |        |        |                |  |
| TONS                          |                |               |               |        |        |                |  |

**# OF TRAILERS LOADED**

813

SHIPPED TO NRV  
SHIPPED TO GAP

## PERCENT

TONS

#DIV/0!

0.0

**AVG TONS PER TRAILER**

0.00 TCT

AVG TONS PER TRAILER 0.00 TCTS  
AVG TONS PER TRAILER 0.00 STS

**AVG TONS PER TRAILER**

0.00 TCTS/STS

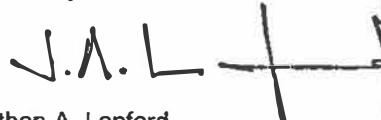
## Roanoke Valley Resource Authority

RESIDENTIAL WASTE REPORT  
ITEM No. IV.D.

| Month<br>2025-2026 | Mixed Waste |        | Wood   |        | Tires  |        | Fees      |            |
|--------------------|-------------|--------|--------|--------|--------|--------|-----------|------------|
|                    | Actual      | Budget | Actual | Budget | Actual | Budget | Actual    | Budget     |
| JULY               | 1,151       | 1,001  | 154    | 101    | 203    | 200    | \$ 59,470 | \$ 59,375  |
| AUGUST             | 1,257       | 897    | 62     | 53     | 160    | 161    | \$ 60,033 | \$ 59,375  |
| SEPTEMBER          | 989         | 1,104  | 127    | 79     | 157    | 170    | \$ 59,622 | \$ 59,375  |
| OCTOBER            | 1,060       | 932    | 51     | 81     | 252    | 168    | \$ 59,649 | \$ 59,375  |
| NOVEMBER           |             |        |        |        |        |        |           |            |
| DECEMBER           |             |        |        |        |        |        |           |            |
| JANUARY            |             |        |        |        |        |        |           |            |
| FEBRUARY           |             |        |        |        |        |        |           |            |
| MARCH              |             |        |        |        |        |        |           |            |
| APRIL              |             |        |        |        |        |        |           |            |
| MAY                |             |        |        |        |        |        |           |            |
| JUNE               |             |        |        |        |        |        |           |            |
| TOTAL              | 4,456       | 3,934  | 394    | 314    | 772    | 699    | 238,774   | \$ 237,500 |

100.5% Fees - Budget to Actual

Respectfully submitted,


Jonathan A. Lanford  
Chief Executive Officer

**ROANOKE VALLEY RESOURCE AUTHORITY  
RESIDENTIAL HOMEOWNER DISPOSAL  
FISCAL YEAR 2025-2026**

|                           | <u>JUL</u> | <u>AUG</u> | <u>SEP</u> | <u>OCT</u> | <u>NOV</u> | <u>DEC</u> | <u>JAN</u> | <u>FEB</u> | <u>MAR</u> | <u>APR</u> | <u>MAY</u> | <u>JUNE</u> | <u>YEAR-TO-DATE</u> | <u>TOTAL</u> | <u>BUDGET</u> | <u>%</u> |
|---------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|---------------------|--------------|---------------|----------|
| <b>CITY OF ROANOKE</b>    |            |            |            |            |            |            |            |            |            |            |            |             |                     |              |               |          |
| RESIDENT WASTE            | 600.88     | 687.62     | 536.05     | 585.07     | -          | -          | -          | -          | -          | -          | -          | -           | -                   | 2,409.62     | 5,003         | 48.2%    |
| WOOD WASTE                | 91.25      | 44.39      | 85.43      | 32.25      | -          | -          | -          | -          | -          | -          | -          | -           | -                   | 253.32       | 435           | 58.2%    |
| TONNAGE                   | 692.13     | 732.01     | 621.48     | 617.32     | -          | -          | -          | -          | -          | -          | -          | -           | -                   | 2,662.94     | 5,438         | 49.0%    |
| TIRES                     | 100        | 102        | 86         | 132        | -          | -          | -          | -          | -          | -          | -          | -           | -                   | 420          | 653           | 64.3%    |
| TRANSACTIONS              | 2,802      | 2,945      | 2,513      | 2,508      | -          | -          | -          | -          | -          | -          | -          | -           | -                   | 10,768       | -             | -        |
| DISPOSAL FEES             | \$ 25,908  | \$ 26,329  | \$ 26,033  | \$ 25,924  | \$ -       | \$ -       | \$ -       | \$ -       | \$ -       | \$ -       | \$ -       | \$ -        | \$ -                | \$ 104,195   | \$ 309,938    | 33.6%    |
| <b>COUNTY OF ROANOKE</b>  |            |            |            |            |            |            |            |            |            |            |            |             |                     |              |               |          |
| RESIDENT WASTE            | 355.75     | 373.56     | 293.96     | 318.50     | -          | -          | -          | -          | -          | -          | -          | -           | -                   | 1,341.77     | 4,796         | 28.0%    |
| WOOD WASTE                | 52.50      | 14.75      | 33.01      | 16.64      | -          | -          | -          | -          | -          | -          | -          | -           | -                   | 116.90       | 417           | 28.0%    |
| TONNAGE                   | 408.25     | 388.31     | 326.97     | 335.14     | -          | -          | -          | -          | -          | -          | -          | -           | -                   | 1,458.67     | 5,213         | 28.0%    |
| TIRES                     | 68         | 28         | 43         | 82         | -          | -          | -          | -          | -          | -          | -          | -           | -                   | 221          | 626           | 35.3%    |
| TRANSACTIONS              | 1,658      | 1,580      | 1,322      | 1,361      | -          | -          | -          | -          | -          | -          | -          | -           | -                   | 5,921        | -             | -        |
| DISPOSAL FEES             | \$ 24,759  | \$ 24,804  | \$ 24,801  | \$ 24,938  | \$ -       | \$ -       | \$ -       | \$ -       | \$ -       | \$ -       | \$ -       | \$ -        | \$ -                | \$ 99,302    | \$ 297,113    | 33.4%    |
| <b>CITY OF SALEM</b>      |            |            |            |            |            |            |            |            |            |            |            |             |                     |              |               |          |
| RESIDENT WASTE            | 145.64     | 143.42     | 115.50     | 106.00     | -          | -          | -          | -          | -          | -          | -          | -           | -                   | 510.56       | 1,288         | 39.6%    |
| WOOD WASTE                | 4.75       | 0.29       | 3.00       | 1.25       | -          | -          | -          | -          | -          | -          | -          | -           | -                   | 9.29         | 112           | 8.3%     |
| TONNAGE                   | 150.39     | 143.71     | 118.50     | 107.25     | -          | -          | -          | -          | -          | -          | -          | -           | -                   | 519.85       | 1,400         | 37.1%    |
| TIRES                     | 33         | 28         | 19.00      | 26         | -          | -          | -          | -          | -          | -          | -          | -           | -                   | 106          | 168           | 63.1%    |
| TRANSACTIONS              | 612        | 581        | 481.00     | 440        | -          | -          | -          | -          | -          | -          | -          | -           | -                   | 2,114        | -             | -        |
| DISPOSAL FEES             | \$ 6,665   | \$ 6,762   | \$ 6,650   | \$ 6,650   | \$ -       | \$ -       | \$ -       | \$ -       | \$ -       | \$ -       | \$ -       | \$ -        | \$ -                | \$ 26,727    | \$ 79,800     | 33.5%    |
| <b>TOWN OF VINTON</b>     |            |            |            |            |            |            |            |            |            |            |            |             |                     |              |               |          |
| RESIDENT WASTE            | 48.25      | 52.50      | 43         | 50         | -          | -          | -          | -          | -          | -          | -          | -           | -                   | 194.09       | 414           | 46.9%    |
| WOOD WASTE                | 5.50       | 2.25       | 5.75       | 1.25       | -          | -          | -          | -          | -          | -          | -          | -           | -                   | 14.75        | 36            | 41.0%    |
| TONNAGE                   | 53.75      | 54.75      | 49.09      | 51.25      | -          | -          | -          | -          | -          | -          | -          | -           | -                   | 208.84       | 450           | 46.4%    |
| TIRES                     | 2          | 2          | 9          | 12         | -          | -          | -          | -          | -          | -          | -          | -           | -                   | 25           | 54            | 46.3%    |
| TRANSACTIONS              | 218        | 221        | 196        | 210        | -          | -          | -          | -          | -          | -          | -          | -           | -                   | 845          | -             | -        |
| DISPOSAL FEES             | \$ 2,138   | \$ 2,138   | \$ 2,138   | \$ 2,138   | \$ -       | \$ -       | \$ -       | \$ -       | \$ -       | \$ -       | \$ -       | \$ -        | \$ -                | \$ 8,550     | \$ 25,650     | 33.3%    |
| <b>RESIDENTIAL TOTALS</b> |            |            |            |            |            |            |            |            |            |            |            |             |                     |              |               |          |
| RESIDENT WASTE            | 1,150.52   | 1,257.10   | 988.85     | 1,059.57   | -          | -          | -          | -          | -          | -          | -          | -           | -                   | 4,456.04     | 11,501        | 38.7%    |
| WOOD WASTE                | 154.00     | 61.68      | 127.19     | 51.39      | -          | -          | -          | -          | -          | -          | -          | -           | -                   | 394.26       | 1,000         | 39.4%    |
| TONNAGE                   | 1,304.52   | 1,318.78   | 1,116.04   | 1,110.96   | -          | -          | -          | -          | -          | -          | -          | -           | -                   | 4,850.30     | 12,501        | 38.8%    |
| TIRES                     | 203        | 160        | 157        | 252        | -          | -          | -          | -          | -          | -          | -          | -           | -                   | 772          | 1,501         | 51.4%    |
| TRANSACTIONS              | 5,290      | 5,327      | 4,512      | 4,519      | -          | -          | -          | -          | -          | -          | -          | -           | -                   | 19,648       | -             | -        |
| DISPOSAL FEES             | \$ 59,470  | \$ 60,033  | \$ 59,622  | \$ 59,649  | \$ -       | \$ -       | \$ -       | \$ -       | \$ -       | \$ -       | \$ -       | \$ -        | \$ -                | \$ 238,774   | \$ 712,500    | 33.5%    |

Roanoke Valley Resource Authority

WOOD WASTE REPORT  
ITEM No. IV.E.

| Month<br>2025-2026 | Wood Received |        | Bulk Mulch |       | Loading Fees |         |
|--------------------|---------------|--------|------------|-------|--------------|---------|
|                    | Actual        | Budget | Loads      | Tons  | Actual       | Budget  |
| JULY               | 811           | 839    | 28         | 462   | \$2,939      | \$5,050 |
| AUGUST             | 808           | 799    | 33         | 607   | \$3,858      | \$4,150 |
| SEPTEMBER          | 833           | 737    | 18         | 331   | \$2,104      | \$3,950 |
| OCTOBER            | 681           | 656    | 5          | 99    | \$631        | \$4,050 |
| NOVEMBER           |               |        |            |       |              |         |
| DECEMBER           |               |        |            |       |              |         |
| JANUARY            |               |        |            |       |              |         |
| FEBRUARY           |               |        |            |       |              |         |
| MARCH              |               |        |            |       |              |         |
| APRIL              |               |        |            |       |              |         |
| MAY                |               |        |            |       |              |         |
| JUNE               |               |        |            |       |              |         |
| TOTAL              | 3,133         | 3,031  | 84         | 1,499 | 9,531        | 17,200  |

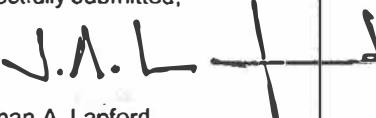
FEE STRUCTURE

55.4%      Budget to Actual

Pick up trucks & small trailers      No Charge

Bulk Mulch Sales      \$ 6.36 per ton

Respectfully submitted,

  
J.A.L.

Jonathan A. Lanford  
Chief Executive Officer

## Roanoke Valley Resource Authority

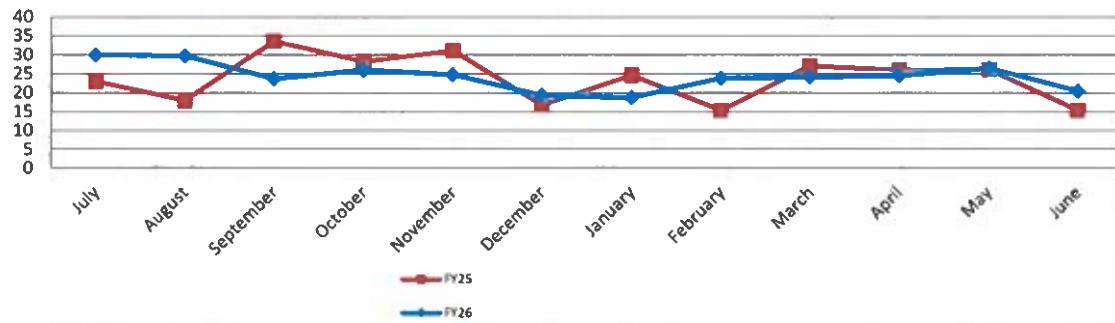
## RECYCLING REPORT

### ITEM No. IV.F.

| Month<br>2025-2026 | Waste<br>Received | Materials Recycled or Diverted |            |            |          | Total<br>Recycled | %           |
|--------------------|-------------------|--------------------------------|------------|------------|----------|-------------------|-------------|
|                    |                   | Wood                           | Metal      | Tires      | Other    |                   |             |
| JULY               | 37,043            | 812                            | 30         | 43         | -        | 885               | 2.4%        |
| AUGUST             | 31,373            | 808                            | 35         | 54         |          | 897               | 2.9%        |
| SEPTEMBER          | 29,853            | 833                            | 27         | 78         |          | 937               | 3.1%        |
| OCTOBER            | 30,085            | 681                            | 24         | 50         |          | 755               | 2.5%        |
| NOVEMBER           |                   |                                |            |            |          |                   |             |
| DECEMBER           |                   |                                |            |            |          |                   |             |
| JANUARY            |                   |                                |            |            |          |                   |             |
| FEBRUARY           |                   |                                |            |            |          |                   |             |
| MARCH              |                   |                                |            |            |          |                   |             |
| APRIL              |                   |                                |            |            |          |                   |             |
| MAY                |                   |                                |            |            |          |                   |             |
| JUNE               |                   |                                |            |            |          |                   |             |
| <b>TOTALS</b>      | <b>128,354</b>    | <b>3,134</b>                   | <b>116</b> | <b>224</b> | <b>-</b> | <b>3,474</b>      | <b>2.7%</b> |

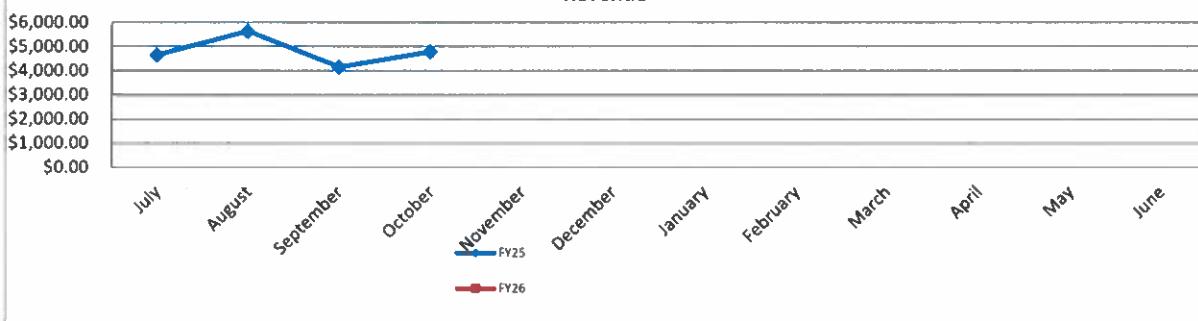
## Scrap Metal Recycled

Tonnage



## Scrap Metal Recycled

Revenue



|                 | **Short          |               |                |               | **Short     |             |                |             |
|-----------------|------------------|---------------|----------------|---------------|-------------|-------------|----------------|-------------|
|                 | Revenue          | *Long Ton     | Rev/Ton        | Ton           | Revenue     | *Long Ton   | Rev/Ton        | Ton         |
|                 | FY25             | FY25          | FY25           | FY25          | FY26        | FY26        | FY26           | FY26        |
| July            | \$4,646.84       | \$26.39       | 176.08         | \$29.09       |             |             |                |             |
| August          | \$5,640.34       | \$32.05       | 175.99         | \$35.90       |             |             |                |             |
| September       | \$4,156.37       | \$23.60       | 176.12         | \$26.43       |             |             |                |             |
| October         | \$4,792.78       | \$28.88       | 165.95         | \$31.83       |             |             |                |             |
| November        |                  |               | #DIV/0!        |               |             |             |                |             |
| December        |                  |               | #DIV/0!        |               |             |             |                |             |
| January         |                  |               | #DIV/0!        |               |             |             |                |             |
| February        |                  |               | #DIV/0!        |               |             |             |                |             |
| March           |                  |               | #DIV/0!        |               |             |             |                |             |
| April           |                  |               | #DIV/0!        |               |             |             |                |             |
| May             |                  |               | #DIV/0!        |               |             |             |                |             |
| June            |                  |               | #DIV/0!        |               |             |             |                |             |
| <u>FY Total</u> | <u>\$ 19,236</u> | <u>110.92</u> | <u>#DIV/0!</u> | <u>123.25</u> | <u>\$ -</u> | <u>0.00</u> | <u>#DIV/0!</u> | <u>0.00</u> |

\* Scrap metal contract payments are based on long ton measurements after receipt at New River Recycling

\*\* Short Ton is reported from Waste Works Scalehouse Program and deviates due to tare weight fluctuations

Roanoke Valley Resource Authority

Household Hazardous Waste

**FY 25**

**ITEM No. III.G.**

**Contracted HHW Expenditures**

| Month                        | Labor Cost         | Disposal Cost      | Total               | Residents Registered | Residents Served | Cost Per Resident |
|------------------------------|--------------------|--------------------|---------------------|----------------------|------------------|-------------------|
| July                         | \$1,000.00         | \$6,010.00         | \$7,010.00          | 99                   | 62               | \$113.06          |
| August                       | \$1,000.00         | \$6,050.00         | \$7,050.00          | 99                   | 69               | \$102.17          |
| September                    | \$1,000.00         | \$5,860.00         | \$6,860.00          | 99                   | 66               | \$103.94          |
| October                      | \$1,000.00         | \$5,915.00         | \$6,915.00          | 100                  | 73               | \$94.73           |
| November                     | \$1,000.00         | \$6,375.00         | \$7,375.00          | 99                   | 74               | \$99.66           |
| December                     |                    |                    |                     |                      |                  | #DIV/0!           |
| January                      |                    |                    |                     |                      |                  | #DIV/0!           |
| February                     |                    |                    |                     |                      |                  | #DIV/0!           |
| March                        |                    |                    |                     |                      |                  | #DIV/0!           |
| April                        |                    |                    |                     |                      |                  | #DIV/0!           |
| May                          |                    |                    |                     |                      |                  | #DIV/0!           |
| June                         |                    |                    |                     |                      |                  | #DIV/0!           |
| <b>Total</b>                 | <b>\$ 5,000.00</b> | <b>\$30,210.00</b> | <b>\$ 35,210.00</b> | <b>496</b>           | <b>344</b>       | <b>\$102.35</b>   |
| YTD Combined Residents Total |                    |                    |                     | 344                  |                  | \$41.62           |

**Daily HHW Quantities**

| *                   | Oil Gallons | Antifreeze Gallons | Batteries Each | Latex Paint Gallons | Total |
|---------------------|-------------|--------------------|----------------|---------------------|-------|
| YTD Total           | 798         |                    |                | 1,225               |       |
| YTD Residents Total | 180         |                    |                | 245                 |       |

**Registration by Municipality**

| Month        | County of Roanoke    |                  | City of Roanoke      |                  | Town of Vinton       |                  | City of Salem        |                  | Total                |                  |
|--------------|----------------------|------------------|----------------------|------------------|----------------------|------------------|----------------------|------------------|----------------------|------------------|
|              | Residents Registered | Residents Served |
| July         | 51                   | 34               | 34                   | 19               | 5                    | 3                | 9                    | 6                | 99                   | 62               |
| August       | 40                   | 28               | 37                   | 23               | 4                    | 4                | 18                   | 14               | 99                   | 69               |
| September    | 56                   | 34               | 31                   | 23               | 0                    | 0                | 12                   | 9                | 99                   | 66               |
| October      | 52                   | 40               | 35                   | 21               | 4                    | 4                | 9                    | 8                | 100                  | 73               |
| November     | 44                   | 32               | 45                   | 35               | 3                    | 2                | 7                    | 5                | 99                   | 74               |
| December     |                      |                  |                      |                  |                      |                  |                      |                  | 0                    | 0                |
| January      |                      |                  |                      |                  |                      |                  |                      |                  | 0                    | 0                |
| February     |                      |                  |                      |                  |                      |                  |                      |                  | 0                    | 0                |
| March        |                      |                  |                      |                  |                      |                  |                      |                  | 0                    | 0                |
| April        |                      |                  |                      |                  |                      |                  |                      |                  | 0                    | 0                |
| May          |                      |                  |                      |                  |                      |                  |                      |                  | 0                    | 0                |
| June         |                      |                  |                      |                  |                      |                  |                      |                  | 0                    | 0                |
| <b>Total</b> | <b>243</b>           | <b>168</b>       | <b>182</b>           | <b>121</b>       | <b>16</b>            | <b>13</b>        | <b>55</b>            | <b>42</b>        | <b>496</b>           | <b>344</b>       |

\*Note: Customers served assumption is 5 gallon limit per customer or 1 battery each