Central Shenandoah Valley All Hazards Mitigation Plan

"Reducing the impact of natural disasters on citizens of the Central Shenandoah Valley through planning, preparedness, mitigation, and education."

Prepared by:
The Central Shenandoah
Planning District Commission

2013

TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

TABLE OF CONTENTS (continued)

TABLE OF CONTENTS (continued)

I. INTRODUCTION

The Central Shenandoah Valley Regional All Hazards Mitigation Plan (2005) and it's 2013 update were developed in accordance with the Disaster Mitigation Act of 2000 (DMA2K) and requirements of the Federal Emergency Management Agency (FEMA) Section 322 local hazard mitigation planning regulations. DMA2K was enacted on October 10, 2000, when President Clinton signed the Act (Public Law 106-390). The legislation reinforces the importance of mitigation planning and emphasizes planning for disasters before they occur. As such, this Act establishes a pre-disaster hazard mitigation program and requirements for the national Hazard Mitigation Grant Program (HMGP). States and local governments are required to adopt hazard mitigation plans in order to qualify for pre-disaster and post-disaster federal hazard mitigation funding and must update those plans every five years.

The purpose of the Plan is to identify natural hazards that impact the Region and to offer mitigation strategies that will lessen the effects that these hazards have on the citizens, property, and businesses in the Region. The Plan was developed on a multi-regional basis which included the five counties of Augusta, Bath, Highland, Rockbridge, and Rockingham, the five cities of Buena Vista, Harrisonburg, Lexington, Staunton, and Waynesboro, and the eleven incorporated towns Glasgow, Goshen, Craigsville, Grottoes, Bridgewater, Broadway, Dayton, Elkton, Mt. Crawford, Timberville, and Monterey.

The planning process was led by the Mitigation and Planning Work Group of the Shenandoah Valley Project Impact and supported by staff of the Central Shenandoah Planning District Commission (CSPDC) for the original 2005 Plan. The Hazard Identification Risk Assessment (HIRA) was prepared by Virginia Tech's Center for Geospatial Information Technology. *The HIRA was updated for the 2013 edition by staff of the CSPDC.* Funding for the development of the Plan was provided in large part through a grant from the Virginia Department of Emergency Management (VDEM) with matching funds provided by the Central Shenandoah Planning District Commission.

An update of the Plan took place from 2010 through 2013. The update process was led by a Steering Committee made up of local government staff, regional representatives of State agencies, interested citizens, and other organizations and supported by staff of the Central Shenandoah Planning District Commission. Funding for the update of the Plan was provided in large part through a Pre-disaster Mitigation Grant from the Federal Emergency Management Agency (FEMA) with matching funds provided by the Virginia Department of Emergency Management and local jurisdictions within the Central Shenandoah Planning District.

II. PLANNING PROCESS

The planning process actually began in 1995 when local government officials recognized a void in flood planning and prevention after the devastating floods in 1995 and 1996. They called on the Central Shenandoah Planning District Commission (CSPDC) to develop a local mitigation strategy and offer planning and technical assistance to abate future damages.

For the next several years and the next few flood events, the CSPDC assisted many of the localities in identifying at-risk properties, applying for state and federal funds, and administering flood mitigation projects. Since 1995, the CSPDC has secured nearly $10,000,000 in federal, state and local funds to elevate, move, acquire or floodproof *nearly 200* structures and provide a disaster preparedness and mitigation education program in the Region. In 1999, the Region began looking at ways to prevent floods from becoming disasters through a viable planning process with effective public input. A committee comprised of elected officials, local government staff, and private citizens as well as technical experts from various natural resource agencies was created to assess the problem, review possible solutions, and recommend actions for the Region to take.

Led by the Central Shenandoah Planning District Commission, the Committee met over the course of a year and half to produce the Central Shenandoah Valley Regional Flood Mitigation Plan. The Plan addressed the flood hazards that put each of our 21 communities at risk. The Plan identified and illustrated flood risks and recorded the history of flooding. It described the projects and efforts that localities have implemented to reduce flood damage and more importantly it explains what still needs to done. The Plan offered sound and effective mitigation options and guidance with options for dealing with floods, setting priorities, and effectively planning to minimize future damage and protect floodplain resources.

From there, the Region was directed by FEMA and VDEM to look at other natural hazards that impact the Central Shenandoah Valley. The Flood Mitigation Committee that was created back in 1999 to oversee the Central Shenandoah Regional Flood Mitigation Plan was called back into action to address the requirements of the Disaster Mitigation Act of 2000. In the meantime, the Central Shenandoah Region became a Project Impact Community, and named this new program, Shenandoah Valley Project Impact. The purpose of Project Impact was to develop a sustainable long-term program of disaster-resistance education in the Shenandoah Valley. The Central Shenandoah Project Impact structure was made up of a Steering Committee and 4 work groups: 1) Mitigation and Planning; 2) Business Continuity, 3) Public Awareness and 4) Special Populations. Under this structure the former Flood Mitigation Committee was reinstated and reorganized and became Project Impact's Mitigation and Planning Workgroup. The purpose of this committee was to promote mitigation methods that protect homes, public buildings, critical facilities, and natural spaces in the Shenandoah Valley.

The main task of the Mitigation and Planning Workgroup was to develop the All Hazards Plan. The Mitigation and Planning Workgroup was comprised of elected officials, city, county, and town staff, business persons, and interested citizens. All local jurisdictions were involved in the planning process either through direct representation on the committee or through involvement with Shenandoah Valley Project Impact.

Others involved throughout the planning process included representatives of local government, nonprofit organizations, human service agencies, the business community, universities and colleges, local libraries, the Red Cross, and other organizations interested in disaster mitigation. These persons served on the Project Impact/Citizen Corps Council and met on a regular basis throughout the development of the plan.

During the update process to create the 2013 edition of the Plan, a new Steering Committee was formed consisting of former members of the Mitigation and Planning Committee as well as others to help with the task of reviewing the data and information in the original Plan and making revisions and adding additional information where needed.

Mitigation and Planning Committee Members
2005

Name	Title/Organization
Robbie Symons	Chief of Fire & Rescue/Rockingham County
John Lively	Citizen, Highland County
Tom Higgins	County Engineer/ Rockbridge County
Kyle O'Brien	Town Manager/Broadway
Sam Blackburn	Mayor/Glasgow
Gary Critzer	Emergency Operations Director/Waynesboro
Sharon Angle	City Planner/Staunton
Thomas Sliwoski	Director of Public Works/Staunton
Sherry Ryder	Planner/Bath County
Candy Hensley	County Engineer/ Augusta County
Sam Crickenberger	Director of Planning/Rockbridge County
Tracey Shiflett	Director of Community Development/Buena Vista
Tom Bailey	Zoning Technician/Augusta County
Hadley Jenner	County Planner/Rockingham County
Basil Finnegan	Town Engineer/Bridgewater
David Nichols	GIS Manager/Bridgewater
Billy Via	Vice-Mayor/Goshen
Matt Smith	City Engineer/Harrisonburg
Jason Debord	Construction Manager/Engineering Concepts
Drew Havens	Town Manager/Glasgow
Sam Hoddinger	GIS Manager/Harrisonburg

2013 Plan Update Steering Committee Members

Name	Title/Organization
Sharon Angle	Director of Planning/ City of Staunton
Gary Craun	Manager of Operations/ Shenandoah Valley Regional Airport
Gary Critzer	Emergency Services Director/ City of Waynesboro
Jason DeBord	Construction Manager/ Engineering Concepts Inc.
Kenneth Flick	Director of Public Works, Town of Bridgewater
Robert Foresman	Emergency Services Coordinator/ Rockbridge County
Susan Frushour	Interested Citizen/ City of Waynesboro
Austin Garber	Town Manager/ Town of Timberville
Donna Good	Emergency Manager/ Augusta County
Paul Helmuth	EMS, Safety, and Wellness Officer/ City of Harrisonburg
Ashley Jacobs	Town Manager/ Town of Grottoes
Michael Keatts	Emergency Planner/ Cent. Shen. Health District, VDH
Shawn Maddox	Emergency Manager/City of Staunton
Teresa Phillips	911 Administrator/ Bath County
Anthony Ramsey	Assistant Emergency Manager/ Augusta County
Andy Seabolt	Emergency Operations Director/ Bath County
Larry Shifflett	Fire Chief/ City of Harrisonburg
Ryan Spitzer	Town Manager/ Town of Glasgow
Brenda Stearn	Risk Management Coordinator/ Town of Dayton
Robin Sullenberger	Executive Director/ Shenandoah Valley Partnership
Robbie Symons	Director of Fire and Rescue/ Rockingham County
John Temple	Wastewater Treatment Plant Supervisor/ Town of Craigsville
Janice Warner	Mayor/ Town of Monterey
Kevin Whitfield	Chief of Police/ Town of Elkton
Doug Wolfe	County Engineer/ Augusta County

The Mitigation and Planning Committee met over the course of 3 years to develop the plan. Below is a list of the meeting dates, agenda topics, and number of attendees.

Mitigation and Planning Committee Meetings

Date	Topic/Agenda	Attended
9/17/2002	Distributed "Understanding Your Risks" – FEMA guidance document Distributed Hazard Response Survey to Committee Members Presentation on Community Rating System	16
12/3/2002	Project Impact Up-date Multi-Hazard Plan Presentation Citizen Corps	13
1/21/2003	Reviewed Results of Hazard Response Survey Discussed Map Modernization Program	14
3/18/2003	Conducted "brainstorming" exercise to select and prioritize hazards Developed citizen input survey	9
5/20/2003	Presentation on Wildfires/Wildfire Mitigation From Boyd Ritchie, Va. Department of Forestry Distributed citizen input survey	15
7/15/2003	Virginia Corps/Citizen Corps Council Presentation Mitigation Workgroup Status Report Disaster and Mitigation Library Collection	30
9/16/2003	Scheduled/planned Vulnerability Assessment Training for public utility providers	11
11/18/2003	Presentation on Hurricanes and Wind Mitigation from Jon Ayscue, FEMA Region III Presentation and discussion of Hurricane Isabel	17
12/2/2003	Hurricane Isabel Up-date Virginia Corps/Citizen Corps Council/CERT	35
3/16/2004	Presentation on tornadoes, anti-terrorism, and disaster education for persons with disabilities	19
6/15/2004	Presentation on karst topography, sink holes, drought by Terri Brown, Terrane Environmental Co.	19
9/21/2004	Presentation on Hurricane Camille and 2004 hurricane season Presentation on HAZUS	12
11/16/2004	Up-date on CERT Special Needs-Post Hurricane Survey Results Presentation by Institute for Infrastructure and Information Assurance – Homeland Security HIRA Presentation – Dr. Shane Parson, Virginia Tech	22
1/26/2005	Up-date on Tsunami Disaster Identifying Critical Structures Disaster Preparedness for Special Populations	13
3/15/2005	Historical Winter Storms Report All-Hazards Plan Mitigation Strategies JMU Preparedness Guide	22
6/21/2005	Amateur Radio and Disasters Citizen Corps Update HIRA Results Presentation JMU Preparedness Guide	23
7/27/2005	Public Meeting and Review/Adoption Process	7

The Plan Update Steering Committee met over the course of 2 years to update the plan. Below is a list of the meeting dates, agenda topics, and number of attendees. Following this process, CSPDC staff incorporated the newly updated information and Steering Committee recommendations into the original Plan to create the 2013 edition of the Central Shenandoah Valley All Hazard's Mitigation Plan.

Plan Update Steering Committee Meetings

Date	Topic/Agenda	Attended
3/31/10	Discussion of Mitigation and Mitigation Planning Mitigation Planning Process Presentation	19
4/28/10	Natural Hazards Profile: Flooding/Hurricanes, Winter Weather, and Tornadoes Mitigation Methods Presentation	16
5/26/10	Natural Hazards Profile: Drought, Wildfires, and Karst Natural Hazards Survey Discussion Review of Hazards Identification and Risk Assessment (HIRA)	16
7/21/10	Continuation of Review of HIRA Maps Presentation by CSPDC GIS Department	15
9/29/10	Virginia Department of Emergency Management Planning Update Public Participation Report Discussion of Mitigation Strategies: Options and Projects	12
2/9/11	Continuation of Mitigation Strategies Discussion Hazard History Section Review: Floods Critical Facilities Mapping	18
4/6/11	Continuation of Mitigation Strategies Discussion Hazard History Section Review: Winter Storms, Tornadoes Critical Facilities Mapping	12
9/20/11	Final Committee Input Session including a review of the Mitigation Strategies	13

Staff Training - Throughout the course of the planning process, staff and committee members attended workshops, training, and conferences related to the development of the All Hazards Plan as well as sponsored a number of training workshops for the public.

Training Attended By Staff/Committee

Date	Workshop/Conference	Sponsor/Location
7/29 - 8/2/2002	NFIP-CRS Training	FEMA-Emmitsburg, MD
8/19-21/2002	Fire and Life Safety Educators Conference	FLSEC – Staunton, VA
11/19-20/2002	VDEM Emergency Preparedness Outreach Conference	Richmond, VA
11/21-22/2002	Living with Nature: Pre-disaster Mitigation Conference	Roanoke Project Impact -Roanoke, VA
1/23/2003	Virginia Floodplain Management Association Workshop	VFMA – Abington, VA
3/7/2003	All-Hazards Training	VDEM – Radford, VA
3/12-14/2003	Va. Emergency Management Conference	VEMA, VDEM – Williamsburg, VA
3/25-26/2003	Flood Fight Course	VDEM - Waynesboro, VA
4/29 - 5/1/2003	Environment Virginia Conference	DEQ, VMI – Lexington, VA
5/6/2003	Flood Mitigation Workshop	VFMA, DCR – Harrisonburg, VA
5/30 - 31/2003	Shenandoah Valley Watershed Conference	Pure Water 2000 – Harrisonburg, VA
6/22-25/2003	CERT Training	FEMA, VDEM – Emmitsburg, MD
8/1 - 3/2003	Fire & Life Safety Educators Conference	VAFLSE – Alexandria, VA
11/19-21/2003	Va. Public Safety Outreach Conference	VDEM, Virginia Citizen Corps – Richmond, VA
3/30-31/2004	HMGP/BCA Training	VDEM, Staunton, VA
5/16-21/2004	Association of State Floodplain Managers Annual Conference	ASFPM - Biloxi, MS
5/26-27/2004	Managing Hazard Mitigation Grants Workshop	VDEM/FEMA – Richmond, VA
6/16-18/2004	Virginia Mitigation Summit	UVA, VCU, VDEM – Charlottesville, VA
8/18-19/2004	Va. Housing Rehab Conference	DHCD – Charlottesville, VA
9/14-17/2004	HAZUS Training	FEMA – Emmitsburg, MD
9/15/2004	All-Hazard Planning	VDEM, FEMA – Roanoke, VA
9/21/2004	Citizen Corps Council Regional Meeting	Roanoke, VA
11/17 - 18/2004	Public Safety Outreach Conference	VDEM – Richmond, VA
3/26/2005	Medical Reserve Corps Workshop	JMU – Harrisonburg, VA
4/15/2005	Citizen Corps Council Regional Meeting	Roanoke, VA
5/2-4/2005	Emergency Management Course	Rockingham County – Harrisonburg VA
5/9/2005	JMU Research Symposium	JMU – Harrisonburg, VA






Training Sponsored By SVPI Mitigation and Planning Workgroup

Date	Workshop	Location
8/16/2002	SVPI/VAZO Building Disaster Resistant Communities	Harrisonburg, VA
10/8/2002	Disaster Planning for People with Special Needs	Staunton, VA
4/9/2003	NFIP Insurers Workshop	Staunton, VA
5/6/2003	Floodplain Management Workshop	Harrisonburg, VA
11/15/2003	Emergency Operations Planning Workshop	Staunton, VA
5/11/2004	Emergency Operations Planning Workshop	Staunton, VA
1/28/2004	Vulnerability Assessment Training for Utility Providers	Weyers Cave, VA
11/9-11/2004	Emergency Planning for Persons with Special Needs – FEMA Course G197	Staunton, VA
6/21/2005	Amateur Radio Presentation and Workshop	Staunton, VA

III. PUBLIC PARTICIPATION

In 2000, the Central Shenandoah Region, was designated a Project Impact Community by FEMA. Through Shenandoah Valley Project Impact (SVPI) thousands of citizens, businesses, and community organizations were educated regarding disaster preparedness and mitigation. Through SVPI, many opportunities were made available to gather public input into the planning process. Numerous presentations were made to civic groups, human service organizations, and other groups working with citizens (young and old) in the Valley. Educational materials were distributed to thousands of citizens at community events. In January 2003, the Central Shenandoah Region also became a Citizen Corps Council enabling the region to continue the work and programs initiated by Project Impact. Included here are just a few of the events and venues where the general public was given the opportunity to learn more about disaster preparedness, mitigation, and the multi-hazard plan.

Another avenue used to reach the public and gain their input into the planning process was through the Community Emergency Response Team (CERT) program. CERT is a national program offered through FEMA. The goal of CERT is for emergency personnel to train members of neighborhoods, community organizations or workplaces in basic response skills like disaster preparedness, fire safety, emergency first aid and crime prevention. The Central Shenandoah Planning District began offering CERT classes in September 2003. Since then there have been 25 courses held throughout the region resulting in a total of 423 volunteers trained in CERT.

In addition, the Mitigation and Planning Workgroup developed a survey, to gather written responses to gauge the public's knowledge of tools and techniques that assist in reducing risk and loss from natural disasters and to gauge household preparedness for disasters. This survey was distributed to Project Impact members, their contacts, CERT members, and at many of the events listed below. Sixty-two (62) surveys were returned and tabulated. Comments from these surveys have been incorporated into this document as appropriate. See survey instrument and survey results attached.

A public meeting was held on July 27, 2005 to allow the public to comment on the draft All Hazards Plan and to gather input from citizens into the planning process. The meeting was announced through local media.

With the update of the Plan, public participation again played a key role in the revision process of the Plan. The Update Committee decided to use an extensive grassroots approach for receiving public input by creating a new public survey. The survey was widely distributed through an email blast; a press release to a variety of media outlets in the Region, including local newspapers, radio and television stations. The survey and discussion of the All Hazards Mitigation Plan was also incorporated into many public education and awareness events. These events are listed on Sec. III page 5 from May 20, 2010 - September 21, 2010. The survey could be completed using an on-line survey instrument, by requesting a paper copy, or through a phone call with CSPDC staff. Six hundred and forty-four (644) surveys were completed and tabulated. A report of the survey results can be found in the appendices. Input provided by the survey respondents assisted the Update Committee members in their revision process of the Plan. Also, during the update process, a copy of the original plan was kept on the CSPDC website to allow for comment from the public as well.

During the adoption process of the update of the Plan by the jurisdictions located in the Region, the public had another opportunity to provide input during the public comment period held at each Board of Supervisors, City Council, or Town Council meeting where adoption of the Plan was on the agenda. The CSPDC will also have the Plan on their website for public comment as well. The CSPDC will issue a press release regarding the adoption process and the opportunity for additional public comment to the media throughout the Region. Any public comments received during the adoption process will be recorded and included in the Plan.

After the Plan has been approved by the Federal Emergency Management Agency and been adopted by the local jurisdictions, the All Hazards Mitigation Plan will be kept on the CSPDC website for public comment throughout the five year plan update cycle. Over the five years between revisions of the Plan public comment will be allowed and any comments received will be recorded.

Public Involvement Activities 2002 - 2013

Date	Event	Location
September 3, 2002	Presentation to Waynesboro Kiwanis	Waynesboro, VA
September 7, 2002	Display at Children's First Day	Harrisonburg, VA
November 14, 2002	Presentation for Virginia Department of the Deaf and Hard of Hearing	Staunton, VA
November 26, 2002	Presentation to Rockingham Rotary Club	Harrisonburg, VA
February 10, 2003	TV interview – "Reach Out" Program	Harrisonburg, VA
June 18, 2003	Presentation to Craigsville Elementary Summer School	Craigsville, VA
July 2, 2003	Presentation to Riverheads Elementary Summer School	Augusta County, VA
July 8, 2003	Presentation to Cassell Elementary Summer School	Augusta County, VA
July 22, 2003	Presentation to Gypsy Hill House Residents	Staunton, VA
July 24, 2003	Presentation to Rockbridge Area Community Service Board	Lexington, VA
August 5, 2003	Display at National Night Out	Staunton, VA
October 5-10, 2003	Fire Prevention Week Display	Staunton, VA
October 12, 2003	Waynesboro First Aid Crew – Open House	Waynesboro, VA
October 27, 2003	Flood Preparedness Presentation	Bath County, VA
November 12, 2003	"Too Much Weather" presentation to Millboro Group Home	Bath County, VA
December 18, 2003	Presentation to Bath/Highland Disability Serve Board	Highland County, VA
March 2, 2004	"Too Much Weather" presentation to VCSB Day Program	Staunton, VA
March 9, 2004	Presentation to regional VDOT staff	Rockingham County, VA
May 22, 2004	Display at Glasgow EMS Day	Glasgow, VA
July 7, 2004	Spanish language preparedness display at Valley View Trailer Park	Harrisonburg, VA
July 9, 2004	Disaster preparedness activity at Boys and Girls Club	Harrisonburg, VA

Public Involvement Activities 2002 - 2013

Date	Event	Location
July 22, 2004	CERT presentation to Community Watch Group	Glasgow, VA
July 27, 2004	Disaster preparedness presentation to Animal Hospital staff	Waynesboro, VA
July 29, 2004	Flood Mitigation Presentation	Vesuvius, VA
July 31, 2004	Safety Day Disaster Display	Rockingham County Fair Grounds
August 3, 2004	Disaster preparedness display at National Night out	Staunton, VA
September, 4, 2004	Disaster preparedness display at Children First Day	Harrisonburg, VA
September 11, 2004	Disaster preparedness display at Augusta Fire Rescue Appreciation Day	Verona, VA
September 25, 2004	Animal preparedness display at Pets in the Park	Staunton, VA
October 4-8, 2004	Fire prevention kiosk for Fire Prevention Week	Staunton, VA
October 15, 2004	Disaster preparedness workshop for staff at Massanutten Library	Harrisonburg VA
October 16, 2004	Disaster preparedness display for Vesuvius Day	Vesuvius, VA
October 17, 2004	Historic flood lecture at Massanutten Library	Harrisonburg, VA
January 18, 2005	Disaster preparedness presentation to Rotary Club	Staunton, VA
March, 2 2005	Disaster preparedness presentation to Western State Hospital	Staunton, VA
March 10,2005	Disaster preparedness presentation for Mint spring Ruritan Club	Augusta County, VA
April 16, 2005	Disaster preparedness display for Civilian Air Patrol Training	Waynesboro, VA
April 27, 2005	Disaster preparedness presentation Senior Group	Harrisonburg, VA
May 7, 2005	Display at Kid Matters Day	Staunton, VA
May 16 – 20, 2005	Hurricane Preparedness Week display at mall	Staunton, VA
June 6, 2005	Disaster preparedness presentation for Disability Services Board	Waynesboro, VA

Public Involvement Activities 2002 - 2013

Public Involvement Activities Where Public Input Survey Was Distributed

Date	Event	Location
July 7, 2005	Disaster preparedness presentation for Senior Center	Harrisonburg VA
July 18, 2005	Disaster preparedness presentation for Mosby Court Apartment Complex	Harrisonburg, VA
March 26, 2010	*Verona United Methodist Church Daycare Presentation*	*Augusta County, VA*
May 13, 2010	*James Madison University Employees Luncheon*	*Harrisonburg, VA*
May 20, 2010	*Valley Floods Presentation*	*Region-wide*
May 21, 2010	*Valley Floods Presentation*	*Region-wide*
May 25, 2010	*Buena Vista Women's Club Presentation*	*Buena Vista, VA*
June 3, 2010	*VDEM Regional Citizen Corps Meeting*	*Region-wide*
June 9, 2010	*Cosmopolitan Group Presentation*	*Waynesboro*
July 15, 2010	*Price Rotary Club Senior Center Presentation*	*Harrisonburg and Rockingham County*
September 21, 2010	*Shenandoah Valley Project Impact Quarterly Meeting*	*Region-wide*
November 2, 2010	*Rockingham County Public Schools Employee Benefits Community Fair*	*Rockingham County*
November 5, 2010	*Anatomy of a Disaster Workshop*	*Region-wide*
November 9, 2010	*VDEM Regional Citizen Corps Meeting*	*Region-wide*
December 14, 2010	*Staunton Senior Center Winter Preparedness Presentation*	*Staunton*
January 13, 2011	*Staunton Public Library Valley Floods Presentation*	*Staunton*
March 15, 2011	*Shenandoah Valley Project Impact Final Quarterly Meeting*	*Region-wide*
June 22, 2011	*Western State Hospital Preparedness Presentation*	*Staunton*
June 26, 2011	*Tinkling Springs Presbyterian Church Presentation*	*Augusta County*
July 11, 2011	*Pleasant View/Springhill Ruritans Presenation*	*Augusta County*
September 20, 2011	*SVPI 1st Annual Disaster Resistant Forum*	*Region-wide*

Public Involvement Activities 2002 - 2013

Date	Event	Location
December 9, 2011	*Fire Life Safety Educators Meeting*	*Harrisonburg, VA*
December 14, 2011	*S-A-W LEPC Meeting*	*Verona, VA*
February 15, 2012	*CBS Workshop Series*	*Fishersville, VA*
March 14, 2012	*S-A-W LEPC Meeting*	*Verona, VA*
April 11, 2012	*Disaster Preparedness Presentation to AARP*	*Waynesboro, VA*
June 5, 2012	*Riverheads Ruritan Presentation*	*Augusta County, VA*
July 3, 2012	*Hurricane/Tornado Presentation to Senior Center*	*Staunton, VA*
September 18, 2012	*Disaster Resistance Forum Annual Meeting*	*Staunton, VA*
September 27, 2012	*Preparedness Presentation to Gypsy Hill House Residents*	*Staunton, VA*
October 6, 2012	*Augusta County CWPP Public Input Display*	*Waynesboro, VA*
October 10, 2012	*Preparedness Presentation for persons with disabilities*	*Lexington, VA*
October 10, 2012	*S-A-W LEPC Meeting*	*Verona, VA*
October 12, 2012	*Preparedness Presentation to Plaza Apartment Residents*	*Staunton, VA*
December 18, 2012	*Shenandoah Valley Fire and Life Safety Annual Lunch Meeting*	*Weyers Cave, VA*
January 30, 2013	*Preparedness Presentation to Retired Federal Employees Group*	*Waynesboro, VA*
February 7, 2013	*GARCC Leadership Group Presentation*	*Fishersville, VA*
March 21, 2013	*Panel at VEMA Conference*	*Bath County, VA*
April 11, 2013	*Daycare Provider Emergency Planning Training*	*Fishersville, VA*
April 11, 2013	*CAAV Severe Weather Presentation*	*Harrisonburg, VA*
May 10, 2013	*JMU CERT Class*	*Harrisonburg, VA*
May 10, 2013	*Waynesboro Senior Center Preparedness Panel*	*Waynesboro, VA*
May 15, 2013	*Preparedness Presentation Waynesboro AARP Meeting*	*Waynesboro, VA*

IV. HAZARD IDENTIFICATION RISK ASSESSMENT (HIRA)

1. Purpose

In accordance with the requirements of the Disaster Mitigation Act of 2000, communities must conduct a hazard identification risk assessment (HIRA). Having the HIRA in place allows local jurisdictions in the planning district to better understand local hazards and the risks posed by them, begin to develop mitigation activities to lessen the impacts, and to acquire disaster-related grants in the aftermath of a disaster. The HIRA was developed to serve as a guide to all communities in the planning district when assessing potential vulnerabilities to natural hazards. When developing this section, every effort was made to gather input from all aspects of the project area communities to assure that the results of this analysis were as accurate as possible.

The planning area for this study includes the 21 jurisdictions of the Central Shenandoah Planning District (CSPD). All jurisdictions located in this district have been included in this portion of the study, as this analysis has been completed on a regional basis. It should be noted, however that a local jurisdiction's inclusion in the full Mitigation Plan is dependent on the community's participation in the remainder of the planning process.

The purpose of the HIRA is to:

1. Identify what hazards that could affect the Central Shenandoah Planning District.
2. Profile hazard events and determine what areas and community assets are the most vulnerable to damage from these hazards.
3. Estimate losses and prioritize the potential risks to the community.






Methodology for Identifying and Prioritizing Hazards

One of the first steps in the planning process and the hazards identification risk assessment phase was to identify each of the hazards that can occur and impact the Region. This hazard identification began with a review of previous hazard events based on historical data provided through studies and reports, existing plans, and resources. In addition extensive research was conducted by the staff of the Central Shenandoah Planning District Commission (CSPDC) and Virginia Tech on hazards. Also, members of the Mitigation and Planning Workgroup participated in a group exercise to assist with the identification and priorities of hazards. *During the 2013 update of the Plan, Steering Committee members again reviewed the hazards and prioritized them. Survey results collected from the general public, during the initial planning process as well as those from the 2013 update process, were also used to identify and prioritize hazards.*

The hazards were ranked to determine what hazards are most likely to impact the communities of the CSPDC. The hazards that were determined to have significant impact were analyzed in the greatest detail to determine the magnitude of future events and the vulnerability for the community and the critical facilities. Hazards that received a moderate impact ranking were analyzed with available data to determine the risk and vulnerability to the specified hazard. The limited impact hazards were analyzed using the best available data to determine the risk to the community.

The findings from these steps were used to identify and prioritize the hazards in our region and are the focus of the mitigation strategies developed in this plan. The following hazards were identified and are described in detail below:

- Floods
- Winter Storms
- Hurricanes
- Wildfires
- Tornadoes and Windstorms
- Drought
- Land Subsidence, Karst Topography, and Sinkholes
- Earthquakes

Project Study Area and Planning District Description

The Central Shenandoah Valley Region is located in the middle of the historic and scenic Shenandoah Valley in west-central Virginia. With a land area of 3,439 square miles, the Region is home to some *291,339 persons (2012 population estimate).* Geographically, the Region is the largest planning district in the state.

The Region is comprised of five counties (Augusta, Bath, Highland, Rockbridge, and Rockingham) and five independent cities (Buena Vista, Harrisonburg, Lexington, Staunton, and Waynesboro). The Region also has 11 incorporated towns within its borders: Glasgow and Goshen in Rockbridge County, Craigsville and portions of Grottoes in Augusta County, Bridgewater, Broadway, Dayton, Elkton, Mt. Crawford, Timberville and portions of Grottoes in Rockingham County and Monterey in Highland County.

The Region is bounded on the east by the crest of the Blue Ridge Mountains and on the west by the elevations of the Allegheny Mountains and the West Virginia border. Of the Region's 2.2 million acres of land, approximately 1.2 million acres are publicly held and protected. The headwaters of the James, Shenandoah, and Maury Rivers are located in the Region.

Bisected by Interstate 81 on the north-south axis and by Interstate 64 on the east-west axis, the Region is approximately 45 miles north of Roanoke, 100 miles west of Richmond, 125 miles southwest of Washington, D.C., 68 miles south of the Virginia Inland Port, and 200 miles northwest of the Port of Hampton Roads.

According to the 2010 U. S. Census, there were 125,494 housing units in the Region of which 59.7% were owner-occupied. The four top employment sectors in the Region by percent of the workforce are; Services at 33.4%, Government at 18.3%, Manufacturing at 16.7%, and Trade at 15.5%.

The Region is part of the Valley and Ridge Physiographic Province, which is characterized by gently rolling and hilly valleys, as well as gradual mountain slopes. The extreme eastern edge of the Region is within the Blue Ridge Physiographic Province which is distinguished by mountain peaks. The western edge of the Region is characterized by high, narrow, mountain ridges that run northeast to southwest forming relatively narrow river valleys. Elevations range from a high of 4,546 feet above sea level in Highland County, to a low of 720 feet above sea level near Glasgow in Rockbridge County.

Soils in the valley range from carbonate soils to alluvial soils along rivers and streams. Colluvial soils resulting from the weathering of the sandstone and shale mountains are found in the foothills paralleling the valley. The mountain areas are covered with shallow, rocky, excessively drained soils that derive from the weathering of acidic sandstone, shale, quartz, and granite parent material. The predominant geological structure underlying the Region is a complex formation of limestone, calcareous shale, and dolomite, with smaller amounts of sandstone, conglomerate, and chert.

The Region contains a high quality and quantity of natural resources, made evident by large proportions of each county that are held as national forest and park land. Much of the forested area in the Region is within either Shenandoah National Park or the George Washington-Jefferson National Forest. Forest resources are important in maintaining the local forestry industry, watersheds, wildlife habitats, and outdoor recreation. The dominant forest type in the Region is mixed hardwoods, specifically oaks, hickories, and maples.

Surface water in the Region drains into two separate basins; the Shenandoah River basin in the north and the James River Basin in the south. The ridge dividing the two watersheds is located in southern Augusta County. The major waterways in the Region are the North and South Forks of the Shenandoah River, North River, South River, Middle River, Jackson River, Bullpasture River, Cowpasture River, and Maury River. Many of these major waterways are used as public supply sources. Normal water flow in the larger water courses generally provides ample supplies, but impoundments are required to maintain adequate reserves during droughts. Lake Moomaw in Bath County, with a surface area of 2,530 acres, was created in 1979 with the completion of the Gathright Dam on the Jackson River.

Table 1 and Figure 1 illustrates the land area of each of the communities in the Planning District as well as the populations in the community and number of households. Approximately half of the Region's land is publicly owned and protected. This information will prove to be a key component in determining the risk to communities from natural hazards.

Table 1: Central Shenandoah Planning District Commission Demographics

NAME	Area (Sq Mile)	2000 Pop	2000 Pop per Sq Mile	2003 Pop	Median Home Value	Total Housing Units
Augusta County	970	65,615	67.64	67,427	$110,900	24,818
Craigsville, Town of	1.945	979	503.34	1,012	$64,800	474
Bath County	532	5,048	9.49	5,013	$79,700	2,053
Buena Vista City	7	6,349	907	6,320	$72,900	2,547
Harrisonburg City	18	40,468	2,248.22	41,170	$122,700	13,133
Highland County	416	2,536	6.10	2,504	$83,700	1,131
Monterey, Town of	0.304	158	519.74	150	$84,200	141
Lexington City	2	6,867	3,433.50	7,076	$131,900	2,232
Rockbridge County	600	20,808	34.68	20,973	$92,400	8,486
Glasgow, Town of	1.488	1,046	702.96	1,018	$66,400	494
Goshen, Town of	1.711	406	237.29	398	$59,100	214
Rockingham County	851	67,725	79.58	69,365	$107,700	25,355
Bridgewater, Town of	2.361	5,203	2203.73	5,301	$126,300	1,850
Broadway, Town of	1.795	2,192	1221.17	2,429	$101,100	976
Dayton, Town of	0.798	1,344	1684.21	1,345	$120,600	565
Elkton, Town of	1.377	2,042	1482.93	2,038	$94,800	919
Grottoes, Town of	0.037	2,114	57135.14	2,166	$90,500	894
Mt. Crawford, Town of	0.345	254	736.23	284	$96,700	109
Timberville, Town of	0.875	1,739	1987.43	1,703	$82,300	770
Staunton City	20	23,853	1,192.65	23,848	$87,500	9,676
Waynesboro City	15	19,520	1,301.33	20,388	$89,300	8,332

- From The U.S. Census

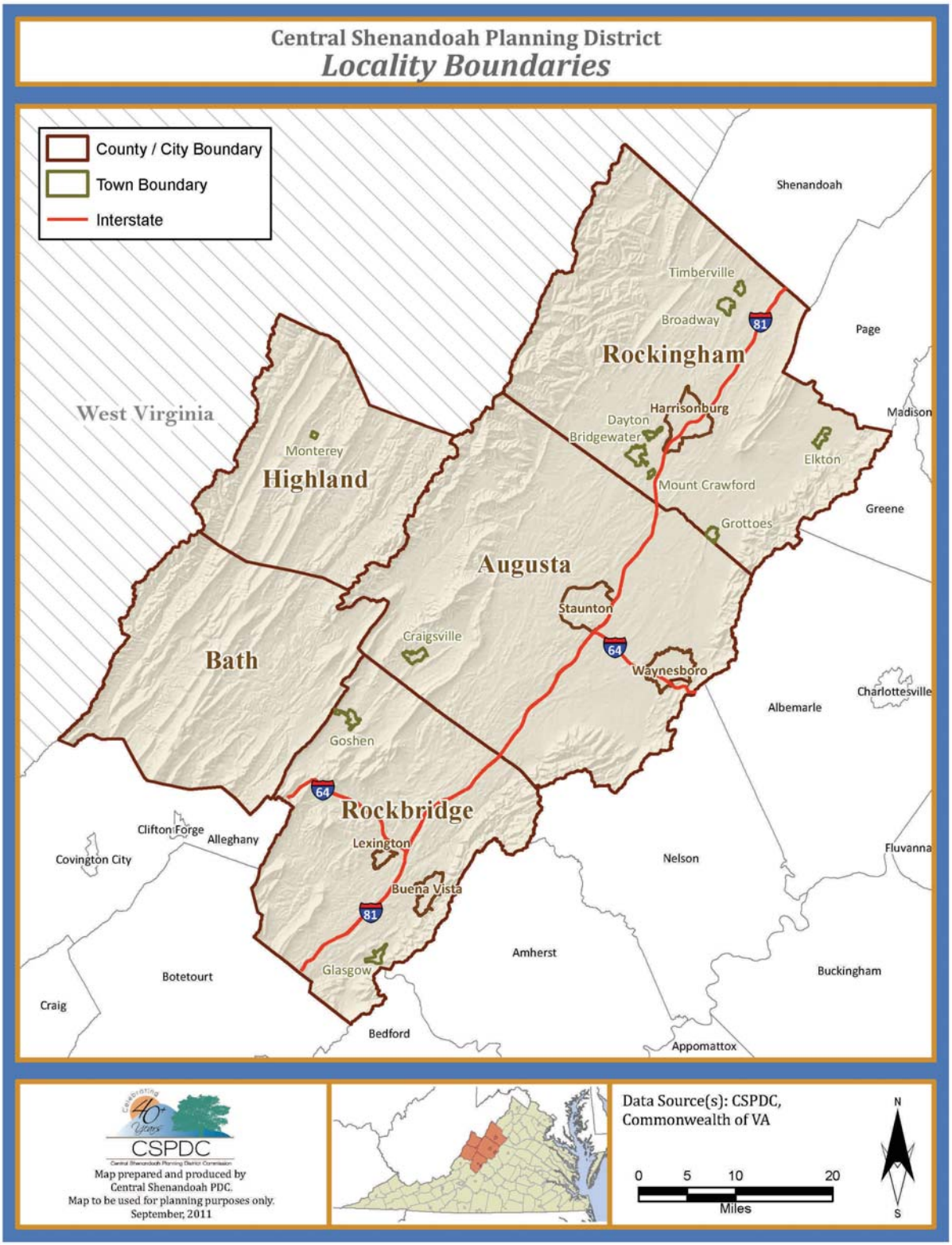

Figure 1 - Central Shenandoah Planning District Boundaries

Watersheds

The major watersheds for the Central Shenandoah PDC include the Potomac River Basin to the northeast and the James River Basin to the southwest. The Rappahannock River Basin boarders the eastern tip of Rockingham County and the Roanoke River Basin is in close proximity to the southern tip of Rockbridge County. The headwaters of the James, Shenandoah, and Maury Rivers are located within the Region. The following Figure 2 illustrates the location of the major watershed boundaries for the Planning District.

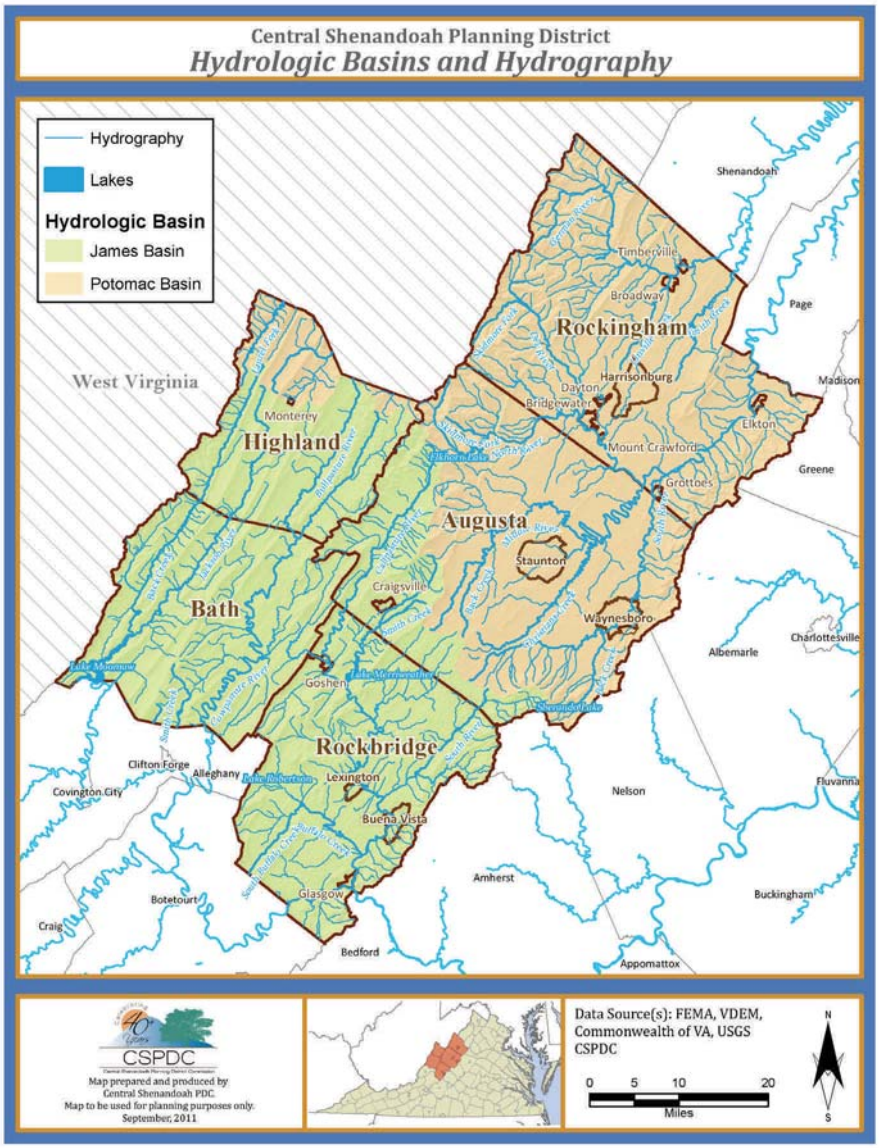

Figure 2 - Central Shenandoah Planning District Watersheds

Critical Facilities

According to the FEMA State and Local Plan Interim Criteria, a critical facility is defined as a facility in either the public or private sector that provides essential products and services to the general public, is otherwise necessary to preserve the welfare and quality of life in the local jurisdiction, or fulfills important public safety, emergency response, and/or disaster recovery functions.

Critical facilities for the CSPD were derived from a variety of sources. Information provided by the CSPDC was supplemented with ESRI data as well as geocoded facilities completed at the Virginia Tech Center for Geospatial Information Technology (CGIT). Analysis for the Region was completed using the best available data. Census blocks were used to assess the areas vulnerability to specific hazards. Flooding analysis was conducted in a slightly different manner. Critical facility points were intersected with the floodplain data for the region. Structure value was established using average house value in the 2000 Census data. The 2000 Census data for average structure value per block was used as a replacement cost in the event of a disaster. This value can serve as a guide in assessing the impacts of various hazards. Figure 3 shows the locations of critical facilities in the region.

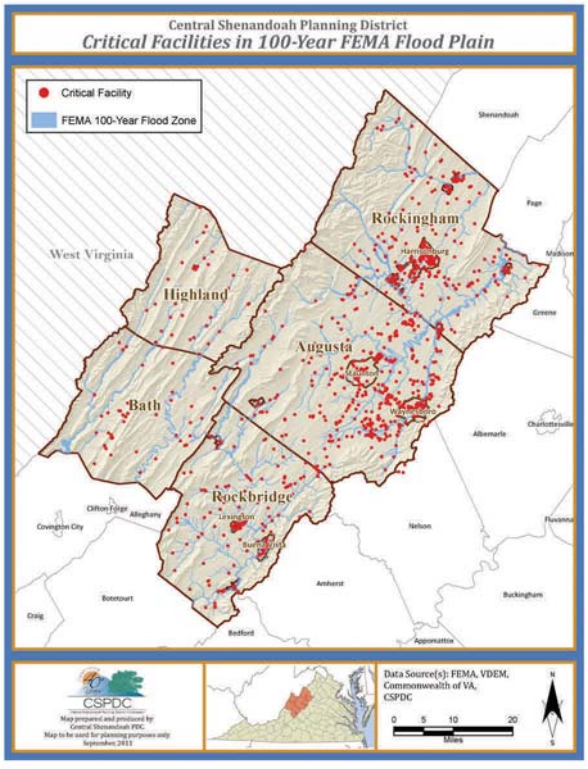

Figure 3 - Central Shenandoah PDC Critical Facilities

Data Limitations

Inadequate information posed a problem for developing loss estimates for most of the identified hazards. The limiting factor for the data was the hazard mapping precision at only the jurisdiction level. Many of the hazards do not have defined damage estimate criteria.

Available data for this plan was very limited. The FEMA guidelines emphasize using "best available" data for this plan. The impact of these data limitations will be shown through the different vulnerability assessment and loss estimation methods used for hazards.

Critical facilities were determined based on best available data. Critical facilities, residential and industrial buildings within the 100 year floodplain were identified for flood analysis (CSPD Flood Mitigation Plan). The HAZUS-MH model was used to estimate damage from hurricanes in the Central Shenandoah region.

Glossary

A-Zone – An area that would be flooded by the Base Flood, and is the same as a Special Flood Hazard Area (SFHA) or a 100-year floodplain. A-Zones are found on all Flood Hazard Boundary Maps and Flood Insurance Rate Maps (FIRMS).

Acquisition – Removal of structures from the floodplain through purchase and demolition with the property to be forever maintained as open space.

Aftershock – An earthquake of similar or lesser intensity that follows the main earthquake.

Alluvium – Sand, mud and other material deposited by a flowing current.

Annual Flood – The flood that is considered the most significant flood event in a one-year cycle of a floodplain.

Backwater – Rise in water caused by downstream obstruction or restriction or by high stage on an intersecting stream. Also referred to as "heading up."

Base Flood – Sometimes referred to as a 100-year flood, it is a flood of the magnitude that has a one percent chance of occurring in any given year.

Base Flood Elevation (BFE) – Elevation of the 100-year flood. This elevation is the basis of the insurance and floodplain management requirements of the National Flood Insurance Program.

Basin – The largest watershed management unit. A basin drains to a major receiving water such as a large river, estuary or lake.

Benefits – Future losses and damages prevented by a project.

Benefit Cost Analysis (BCA) – An assessment of project data to determine whether or not the cost of the project is justified by its benefits.

Berm – Small levees, usually built from fill dirt.

Blizzard Warning – Winds or frequent gusts to 35 miles per hour or greater and considerable falling or blowing snow expected to prevail for a period of three hours or longer.

Buffer – Vegetated strips of land surrounding ecosystems.

Buyout – Commonly used term for property acquisition.

Catchment – The smallest watershed management unit. The area that drains an individual development site to its first intersection with a stream.

Channel – A natural or artificial watercourse with definite bed and banks to confine and conduct flowing water.

Check Dam - A small, low dam constructed in a gully or other watercourse to decrease the velocity of stream flow, for minimizing channel scour.

Community Rating System (CRS) – A system, administered by FEMA, where communities are recognized for their mitigation efforts that exceed the NFIP's minimum standards for floodplain regulation. NFIP policyholders in the community are rewarded with reduced annual flood insurance premiums as part of this project.

Confluence – The section where one stream joins another stream.

Crest – The maximum stage or elevation reached or expected to be reached by the water of a specific flood at a given location.

Critical Facility – Facilities that are critical to the health and welfare of the population and are especially important following hazard events. Critical facilities include, but are not limited to, shelters, police and fire stations, and hospitals.

Debris/Debris Flow – Materials (broken bits and pieces of wood, stone, glass, etc.) carried by wind or floodwaters, including objects of various sizes.

Declaration – Presidential finding that a jurisdiction of the United States may receive Federal aid as a result of damages from a major disaster or emergency.

Design Wind Speed Map – A map of the United States development by the American Civil Engineers that depicts wind zones based on frequency and strength of past tornadoes and hurricanes.

Development – Any man-made change to improved or unimproved real estate, including, but not limited to, buildings or other structures, mining, grading, paving, excavation or drilling or storage of equipment or materials.

Digitize – To convert points, lines and area boundaries shown on maps electronically into coordinates for use in computer applications.

Disaster Resistant Communities – A community based initiative that seeks to reduce vulnerability to natural hazards for the entire designated area through mitigation actions. This approach requires cooperation between individuals and the business sectors of a community to implement effective mitigation strategies.

Drought - a period of abnormally dry weather that persists long enough to produce serious effects like crop damage, water supply shortages, etc.

Dry Floodproofing – Protecting a building by sealing its exterior walls to prevent the entry of flood waters.

Earthquake – A sudden slipping or movement of a portion of the earth's crust accompanied and followed by a series of vibrations

Elevation – The process of raising a house or other building so that it is above the height of a given flood to minimize or prevent flood damage.

Emergency – Any hurricane, tornado, storm, flood, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, drought, fire, explosion, or other catastrophe in any part of the United States which requires Federal emergency assistance to supplement State and local efforts to save lives and protect property, public health and safety, or to avert or lessen the threat of a disaster.

Emergency Operations Plan (EOP) – Sets forth actions to be taken by State or local governments in response to emergencies or major disasters.

Encroachment – Any physical object placed in a floodplain that hinders the passage of water or otherwise affects flood flow, such as landfills or buildings.

Epicenter – The area of the earth's surface directly above the origin of an earthquake.

Erosion – The process of the gradual wearing away of land masses during a flood or storm or over a period of years through the action of wind, water or other geologic processes.

Fault – An area of weakness where two sections of the earths crust have separated.

Federal Emergency Management Agency (FEMA) – An independent agency of the Federal government established in 1979, reporting to the President. FEMA's mission is to reduce loss of life and property and protect our nation's critical infrastructure from all types of hazards through a comprehensive, risk-based emergency management program of mitigation preparedness, response and recovery.

First Floor Elevation – The elevation of the lowest finished floor of a structure.

Flash Flood – A sudden, violent flood that rises quickly and usually is characterized by high flow velocities. Flash floods often result from intense rainfall over a small area, usually in areas of steep terrain with little or no warning where water levels rise at an extremely fast rate.

Flood – A partial or complete inundation of normally dry land areas from 1) the overland flow of a lake, river, stream, ditch, etc.; 2) the unusual and rapid accumulation or runoff of surface waters; or 3) mudflows or the sudden collapse of shoreline land.

Flood Control – Measures taken to keep the flood waters away from specific developments or populated areas by the construction of flood storage reservoirs, channel alterations, dikes and levees, bypass channels, or other engineering works.

Flood Depth – Height of the floodwater surface above the ground surface.

Flood Duration – The length of time a stream is above flood stage or overflowing its banks.

Flood Frequency – A statistical expression referring to how often a flood of a given magnitude can be expected. (Note: the word "frequency" often is omitted to avoid repetition).

Examples:
10-year flood – the flood which can be expected to be equaled or exceeded on average once in 10 years; and which would have a 10 percent chance of being equaled or exceeded in any given year.
50-year flood - …. two percent chance…in any given year.
100-year flood - …. one percent chance…in any given year.
500-year flood - ….two-tenths percent chance…in any given year.

Flood Fringe – The portion of the floodplain that lies beyond the floodway and serves as a temporary storage area for floodwaters during a flood.

Flood Insurance Rate Map (FIRM) – An official map of a community prepared by FEMA on which areas that may or may not require flood insurance are delineated. These maps also provide flood elevations and velocity zones.

Flood Insurance Study (FIS) – A study prepared by FEMA that provides an examination, evaluation, and determination of flood hazards and, if appropriate, corresponding water surface elevations in a community or communities.

Flood Mitigation Assistance Program (FMA) - Provides pre-disaster grants to State and local governments for both planning and implementation of mitigation strategies. Each State is awarded a minimum level of funding which may be increased depending upon the number of NFIP policies in force and repetitive claims paid.

Floodplain – Land adjoining a stream (or other body of water) which has been or may be covered with water.

Floodplain Management – The operation of an overall program of corrective and preventive measure for reducing flood damage, including but not limited to emergency preparedness plans, flood control work and floodplain management regulations such as zoning ordinances, subdivision regulations, building codes and floodplain ordinances.

Floodproofing – Any combination of structural and nonstructural additions, changes or adjustments to properties and structures which reduce or eliminate flood damage to lands, water, and sanitary facilities, structures, and contents of buildings. May include structural elevation, relocation, acquisition, or other measures.

Floodwall – Flood barrier constructed of manmade materials, such as concrete or masonry designed to keep water away from a structure.

Flood Warning – A warning term that means flooding is already occurring or will occur soon in your area.

Flood Watch – A warning term that means that a flood is possible in your area.

Floodway – The channel of a river or other watercourse and the adjacent land areas required to carry and discharge the base flood without cumulatively increasing the water-surface elevation more than one foot at any point.

Floodway Fringe – The area between the floodway and the 100-year floodplain boundaries.

Freeboard – An additional amount of height usually expressed in feet above the Base Flood Elevation used as a factor of safety in determining the level at which a structure's lowest floor must be elevated or floodproofed to be in accordance with State or community floodplain management regulations.

Freezing Rain – Rain that freezes when it hits the ground, creating a coating of ice on roads, walkways, trees, and power lines.

Frost/Freeze Warning – Below freezing temperatures are expected.

Fujita Scale – Rates tornadoes with number value from F0 to F5 based on wind speed and damage sustained.

Geographic Information System (GIS) - A computerized mapping and analysis tool. GIS can be a useful tool in mapping at-risk structures and infrastructure in the floodplain.

Greenways – Greenways are linear parks or corridors of open space that may extend across many communities. They can provide walking and biking links between parks, businesses, and culturally important sites. They embody a strategy for keeping riverside areas largely undeveloped, which provide recreational, cultural and aesthetic resources. Greenways can help to protect stretches of floodplain ecosystems.

Hail – Hail or hailstones are irregular pellets or balls of ice falling from a cumulonimbus clouds.

Hazard – A source of potential danger or adverse condition. Hazards include naturally occurring events such as floods, earthquakes, tornadoes, tsunami, coastal storms, landslides, and wildfires that strike populated areas. A natural event is a hazard when it has the potential to harm people or property.

Hazard Mitigation – A plan to alleviate or make less severe the effects of a major disaster. Hazard mitigation can reduce the severity of the effects of a flood on people and property by reducing the cause or occurrence of the hazard and reducing exposure to the hazard.

Hazard Mitigation Grant Program (HMGP) – Authorized under Section 404 of the Stafford Act; provides funding for cost-effective hazard mitigation projects in conformance with the post-disaster mitigation plan.

Hazard Mitigation Plan – A plan resulting from a systematic evaluation of the nature and extent of vulnerability to the effects of natural hazards present in a community that includes the actions needed to minimize future vulnerability to hazards.

HAZUS – A GIS-based nationally standardized loss estimation tool developed by FEMA.

Headwater – Highest reaches of a stream in a drainage basin.

Hurricane – A severe tropical disturbance in the North Atlantic Ocean, Caribbean Sea, or Gulf of Mexico that achieves a sustained wind force of at least 74 miles per hour.

Hydrology – The science of the behavior of water in the atmosphere, on the earth's surface, and underground.

Hydrostatic Pressure – Forces imposed on an object, such as a structure, by standing water.

Increased Cost of Compliance (ICC) – Coverage under a standard NFIP flood insurance policy. ICC helps pay for the cost of mitigation, including demolition and relocation, up to $15,000 for a flood-insured structure that sustains a flood loss and is declared to be substantially or repetitively damaged.

Infrastructure – Public services that have a direct impact on the quality of life such public water supplies and sewer treatment facilities, and transportation networks such as airports, roads and railways.

Integrated Flood Observing and Warning System (IFLOWS) - A flood warning system developed by the National Weather Service that combines sensors, communication, and computer technology with advanced forecasting to provide timely guidance and advice to local emergency services staff.

Karst – A land area with topographic depressions such as sinkholes, springs, sinking streams and caves caused by underground solution of limestone bedrock.

Landslide - Downward movement of a slope and materials under the force of gravity.

Levee – A man-made flood barrier constructed of compacted soil designed to contain, control, or divert the flow of water.

Lighting – Lightning is an electrical circuit that is generated in cumulonimbus clouds (thunderheads) which have a negative electrical charge at the base and a positive charge at the top.

Lightning - Lightning is an electrical circuit that is generated in cumulonimbus clouds (thunderheads) which have a negative electrical charge at the base and a positive charge at the top.

Lowest Floor – Under the NFIP program, the lowest floor of the lowest enclosed area, including a basement. An unfinished or flood-resistant enclosure such as a garage or storage area is not considered a building's lowest floor.

Magnitude – Measurement of the energy released in an earthquake measured on the Richter Scale.

Mitigation – Sustained action that reduces or eliminates long term risk to people and property from natural hazards and their effects.

Mudflows – Sometimes called debris flows; mudflows are rivers of rock, earth, and debris saturated with water. They develop when water accumulates rapidly in the ground, so that earth becomes a flowing river of mud (called a slurry).

National Flood Insurance Program (NFIP) – Provides the availability of flood insurance in exchange for the adoption and enforcement of a minimum local floodplain management ordinance. The ordinance regulates new and substantially damaged or improved development in identified flood hazard areas. The Federal Emergency Management Agency administers this program.

Open Space – An area of land that is free of development, i.e. houses and other buildings that alter the area's natural appearance and impede the area's ability to covey flood flows. Open space can be used for parks, ball fields, hiking trails, garden spaces and other compatible open space uses.

Palmer Drought Severity Index (PDSI) – A measurement index which tracks moisture conditions and severity of drought conditions ranging from -4.0 (extremely dry) to +4.0 (excessively wet), with the mid-range (-2.0 to +2.0) representing the normal or near normal conditions.

Pre-FIRM/Post-FIRM – Pre-FIRM means that a building was constructed before the date of the initial Flood Insurance Rate Map (FIRM) issued to the community or before December 31, 1974, whichever is later. Post-FIRM means the building was constructed on or after the date of community initial FIRM, or after December 31, 1974, whichever is later.

Preparedness – Activities to ensure that people are ready for a disaster and respond to it effectively. Preparedness requires figuring out what will be done if essential services break down, developing a plan for contingencies, and practicing the plan.

Project Impact – A new project introduced by FEMA as a result of the increasing number and severity of disasters over the last decade to reduce the damage of disasters. It helps communities protect themselves from the effects of natural disasters by taking actions to reduce disruption and loss.

Rain Gardens – A water quality practice in which plants and soils are used to remove pollutants from stormwater. Also known as bio-retention.

Recovery – Activities necessary to rebuild after a disaster. Recovery activities include rebuilding homes, businesses and public facilitates; clearing debris; repairing roads and bridges; and restoring water, sewer and other essential services.

Recurrence Interval – The time between hazard events of similar size in a given location. It is based on the probability that the given event will be equaled or exceeded in any give year.

Relocation – The process of moving a house or other building to a new location outside the flood hazard area.

Repetitive Loss – An insured structure that has sustained flood damage on more than one occasion with claims of at least $1,000 each within any 10-year period since 1978.

Response – Activities to address the immediate and short-term effects of an emergency or disaster. Response activities include immediate actions to save lives, protect property, and meet basic human needs.

Retrofitting – Making changes to an existing house or other building to protect it from flooding or other hazards.

Richter Scale – A numerical scale of earthquake magnitude devised by seismologist C. F. Richter in 1935.

Riparian System – Ecosystem occurring in the interface between aquatic and terrestrial systems, in floodplains and adjacent to rivers and streams. Riparian systems are subject to direct influences of ground and or surface waters, and occasional flooding.

Riprap – Broken stone, cut stone blocks, or rubble that is placed on slopes to protect them from erosion or scouring caused by floodwaters.

Riverine – Relating to, formed by, or resembling a river, including tributaries, streams, brooks, etc. Riverine flooding occurs when a river or stream overflows its banks and causes considerable inundation of nearby land and roads.

Seismic – Describes activity related to earthquakes.

Seismic Waves – Vibrations that travel outward for the center of the earthquake at speeds of several miles per second.

Severe Thunderstorm Watch – A sever thunderstorm is expected in the next six hours within an area approximately 120 to 150 miles wide and 300 to 400 miles wide.

Severe Thunderstorm Warning – Indicates a severe thunderstorm is occurring or is imminent in about 30 minutes to 1 hour.

Sink Holes – Natural depressions in the landscape caused by solution and subsidence of earth materials.

Sleet – Rain that turns to ice pellets before reaching the ground. Sleet also causes roads to freeze and become slippery.

Special Flood Hazard Area (SFHA) - The shaded area on a FIRM map that identifies an area that has 1% chance of being flooding in any given year (100-year floodplain).

Stafford Act – Robert T. Stafford Disaster Relief and Emergency Assistance Act, PL 100-707, signed into law November 23, 1988; amended the Disaster Relief Act of 1974, PL 93-288. The statutory authority for most Federal disaster response activities especially as they pertain to FEMA and FEMA programs.

Stormwater – Water from precipitation that flows across the ground and pavement when it rains, floods, or when snow and ice melt. The water seeps into the ground or drains into what we call storm sewers.

Substantial Damage – Damage of any origin sustained by a structure whereby the cost of restoring the structure to its pre-damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

Topography – The elevations of the land surface.

Tornado – A violently rotating column of air extend form thunderstorm to the ground.

Tornado Warning – A tornado has been sighted or indicated by weather radar. Take shelter immediately.

Tornado Watch – Tornadoes are possible.

Tropical Storm – A tropical cyclone with maximum sustained winds greater than 39 mph and less than 74 mph.

Urban-Wildland Interface Zone – The developed area that occupies the boundary between an urban or settled are and the undeveloped natural forest environment.

Vulnerability – A term used to describe how exposed or susceptible to damage an asset is. Vulnerability depends on an asset's construction, contents and the economic value of its function.

Watershed – The area of land that is drained by a river and its tributaries. Ridges or divides separate watersheds from each other.

Waterspout – A tornado that forms over water.

Wet Floodproofing – Protecting a building by allowing flood waters to enter so that internal and external hydrostatic pressure is equalized. Usually enclosed areas used for parking, storage, or building access are wet floodproofed.

Wetlands – Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas.

Wildfire - An uncontrollable fire spreading through vegetative fuels, exposing and possibly consuming structures.

Wildland Fire – A fire in which development is essentially nonexistent, except for roads, railroads, power lines and similar facilities.

Winter Storm Watch – A winter storm is possible in your area.

Winter Storm Warning – A winter storm is occurring, or will soon occur in your area.

2. Hazard Identification

Types of Hazards

While nearly all disasters are possible for any given area in the United States, the most likely hazards that could potentially affect the communities in the Central Shenandoah Planning District generally include:

- Droughts
- Flooding
- Hurricanes
- Karst Topography
- Landslides
- Land Subsidence
- Terrorism
- Tornadoes
- Wildfires
- Winter Storms

Probability of Hazards

Hazards were ranked by the Steering Committee to determine what hazards they evaluated to have the largest impact on their communities. The results are summarized in Table 2. Certain hazards were not addressed as a result of the infrequency of occurrence and/or limited impact. Earthquake, for example, falls into this category. Analysis level was determined by the type of data available and the scale of data available for the analysis.

Table 2: Central Shenandoah PDC Planning Consideration Levels

Hazard Identification Results		
Hazard Type	**Rank**	***2011 Recommended Changes***
Flooding	Significant	
Drought	High	
Hurricane	High	
Severe Winter Weather	High	
Land Subsidence/Karst	Medium	
Tornado	Medium	
Wildfire	Medium	
Landslide	Low	
Terrorism	Low	
Earthquake	None	***Low***






2011 Plan Update Steering Committee Comments

Between May 26, 2010, and July 21, 2010, the Steering Committee charged with updating the Plan reviewed the Hazard Identification and Risk Assessment Section. At their meeting on July 21, 2010, the Steering Committee discussed the HIRA and concluded that they would like to leave the rankings of the Hazard Identification Results the same, except for Earthquakes which they would like to change from none to low. Additional comments that were made during this discussion include:

- *Drought might be ranked lower with the provision of additional data.*
- *Water shortages could become a factor from either drought or man-made issues such as overuse.*
- *Developing population could keep drought at a higher ranking.*
- *In future plans, including health issues such as an outbreak or a pandemic may be useful.*

Major Disasters

Table 3 lists the major disasters that have occurred in the Planning District including Presidentially declared disasters. Since 1969, the CSPDC has had 88 declared disasters, as of September 13, 2011. Refer to the perspective county for town totals. When town specific information was available, it was included in the description portion of Table 4. Table 4 shows the types of hazards and event descriptions that have impacted the communities in CSPDC.

Table 3: Central Shenandoah PDC Federal Disasters Summary By Community (last updated 9/13/2011)

Communities	Declared Disasters
Augusta County	12
Bath County	11
Buena Vista City	9
Harrisonburg City	5
Highland County	10
Lexington City	6
Rockbridge County	13
Rockingham County	8
Staunton City	7
Waynesboro City	7
Total	**88**

Table 4: Central Shenandoah PDC Federal Disasters

Community	Date Of Declaration	DR#	Description
Augusta, Bath & Rockbridge	8/23/1969 Hurricane Camille	274	This major storm made landfall out of the Gulf as a category 5 and weakened to a tropical depression before reaching the state. Precipitation rained over regions for many hours, dropping more than 27 inches of rain in Nelson County and over ten inches in the area from Lynchburg to Charlottesville. Flooding and landslides, triggered by saturated soils, resulted in catastrophic damage. More than 150 people died and another 100 were injured. At the time, damage was estimated at more than $113 million. In the Central Shenandoah Region, as a result of Camille, significant flooding occurred in Rockbridge County, the cities of Buena Vista and Waynesboro, and the Town of Glasgow. Twenty-three people died in Rockbridge County, with damages exceeding 30 million dollars (1969 dollars).
Bath, Buena Vista, Harrisonburg, Lexington, Rockbridge, Rockingham, Staunton, Waynesboro	6/23/1972 Hurricane Agnes	339	This event produced devastating flooding throughout the Mid-Atlantic States. Some areas of eastern Virginia received over 15 inches of rainfall as the storm moved through. The Potomac and James Rivers experienced major flooding, which created 5 to 8 feet flood waters in many locations along the rivers. Richmond was impacted the most by these high water levels. Water supply and sewage treatment plants were inundated, as were electric and gas plants. Only one of the five bridges across the James River was open, while the downtown area was closed for several days and businesses and industries in the area suffered immense damage. Sixteen people lost their lives in the state and damage was estimated at $222 million. These startling numbers resulted in 63 counties and 23 cities qualifying for disaster relief. In the Central Shenandoah region, the City of Waynesboro was hardest hit. Damage estimates at the time reached hundreds of thousands of dollars. In Rockbridge County, the City of Buena Vista and the Town of Glasgow received funding for the disaster.






Table 4: Central Shenandoah PDC Federal Disasters (Continued)

Community	Date Of Declaration	DR#	Description
Buena Vista	10/7/1972	358	Severe Storms & Flooding
Augusta, Buena Vista, Rockbridge, Rockingham	10/10/1972	359	Severe Storms & Flooding
Augusta, Bath, Buena Vista, Harrisonburg, Highland, Lexington, Rockbridge, Rockingham, Waynesboro	11/9/1985 Hurricane Juan	755	Heavy rainfall from October 31 through November 6, 1985, caused record-breaking floods over a large region, including western and northern Virginia. Most of the rain fell on November 4 and 5 causing flash flooding. Heavy rainfall was indirectly related to Hurricane Juan. The Roanoke River rose 7 feet in one hour and 18 feet in six hours, cresting at 23 feet on November 5. There were 22 deaths in Virginia as a result of the flooding. FEMA declared 50 jurisdictions disaster areas, 1.7 million people were affected by the flooding. Flooding damages were estimated at $800 million. Areas all across the Central Shenandoah Valley Region were affected by the flooding caused by Hurricane Juan. Homes, businesses, bridges, and roads were damaged. The City of Waynesboro had significant damage when the South River broke previous flood records, damaging 140 homes, 32 mobile homes, and 41 businesses.
Augusta, Bath, Buena Vista, Lexington, Rockbridge, Rockingham	5/19/1992	944	Severe Storms & Flooding
Bath, Buena Vista, Rockbridge	3/10/1994	1014	Severe Ice Storms, Flooding

Table 4: Central Shenandoah PDC Federal Disasters (Continued)

Community	Date Of Declaration	DR#	Description
Augusta, Highland	4/11/1994	1021	This winter storm coated portions of Virginia with 1 to 3 inches of ice from freezing rain and sleet. This led to the loss of approximately 10 to 20 percent trees in some counties, which blocked roads and caused many people to be without power for a week. There were numerous automobile accidents and injuries from people falling on ice. Damages were estimates at $61 million.
Augusta, Bath, Buena Vista, Lexington, Rockbridge, Staunton	7/1/1995	1059	Severe Storms & Flooding In the Central Shenandoah Valley Region, a week-long period of ground saturating rains fell. Rain caused flash flooding in Augusta and Rockbridge Counties. In the Town of Glasgow, interior mountain streams, instead of the James and Maury Rivers, caused the flooding in the first floors of 42 homes and the basements and crawl spaces of 64 homes.
Augusta, Bath, Buena Vista, Harrisonburg, Highland, Lexington, Rockbridge, Rockingham, Staunton, Waynesboro	1/13/1996	1086	Also known as the "Great Furlough Storm" due to Congressional impasse over the federal budget, the blizzard paralyzed the Interstate 95 corridor, and reached westward into the Appalachians where snow depths of over 48 inches were recorded. Several local governments and schools were closed for more than a week. The blizzard was followed with another storm, which blanketed the entire state with at least one foot of snow. To compound things, heavy snowfall piled on top of this storm's accumulations in the next week, which kept snow pack on the ground for an extended period of time. This snow was eventually thawed by higher temperatures and heavy rain that fell after this thaw resulted in severe flooding. Total damage between the blizzard and subsequent flooding was over $30 million.
Augusta, Bath, Buena Vista, Harrisonburg, Highland, Rockbridge, Rockingham, Waynesboro	1/27/1996	1098	Flooding -- Snow Melt






Table 4: Central Shenandoah PDC Federal Disasters (Continued)

Community	Date Of Declaration	DR#	Description
Augusta, Bath, Buena Vista, Harrisonburg, Highland, Lexington, Rockbridge, Rockingham, Staunton, Waynesboro	9/6/1996 Hurricane Fran	1135	This hurricane is notable not only for the $350 million in damages, but because of its widespread effects, including a record number of people without power and the closure of 78 primary and 853 secondary roads. Rainfall amounts between 8 and 20 inches fell over the mountains and Shenandoah Valley, leading to record-level flooding in many locations within this region. 100 people had to be rescued from the flood waters and hundreds of homes and buildings were damaged by the flood waters and high winds. In the Central Shenandoah Valley Region, Rockingham County was the hardest hit when the Shenandoah River and its tributaries broke previous records of flooding. The Naked Creek area in Rockingham was particularly hit. In Rockingham County, 16 homes and 18 mobile homes were completely destroyed and 334 structures incurred damages.
Augusta, Bath, Highland, Rockbridge, Rockingham	2/28/2000	1318	Winter Storms
Bath	7/2/2001	1386	A total of six federal disasters, primarily flooding and severe storms, have been declared in Southwest Virginia from 2001-2004 (Disasters 1386, 1406, 1411, 1458, 1502, and 1525). The worse hit counties were Tazewell (all six disasters), Buchanan (five disasters), and Russell (four disasters). Dickenson, Lee, Smyth, and Wise Counties were also declared in half of these six disasters. Many of these disasters have storm tracks along the mountain valleys, producing excessive localized flooding. Catastrophic flooding has been experienced in rural settlements as well as in Bluefield, Hurley, Appalachia, Pennington Gap, Norton, Dante and Wise.
Highland	4/1/2003	1458	2004 NOVA Snowstorm & SW VA Floods

Table 4: Central Shenandoah PDC Federal Disasters (Continued)

Community	Date Of Declaration	DR#	Description
Augusta, Buena Vista, Harrisonburg, Highland, Rockbridge, Rockingham, Staunton, Waynesboro	9/18/2003 Hurricane Isabel	1491	Hurricane Isabel entered Virginia September 18 after making landfall along the North Carolina Outer Banks. The Commonwealth sustained tropical storm winds for 29 hours with some maximum winds approaching 100 mph. The hurricane produced storm surge of 5 to 8 feet along the coast and in the Chesapeake Bay with rainfall totals between 2 to 11 inches along its track. Twenty-one inches of rainfall was measured near Waynesboro Virginia. Damages due to wind, rain, and storm surge resulted in flooding, electrical outages, debris, transportation interruption, and damaged homes and businesses. At the height of the incident, approximately 6,000 residents were housed in 134 shelters and curfews were imposed in many jurisdictions. Further damages occurred when a series of thunderstorms and tornados came through many of the designated areas in the southeast portion of Virginia on September 23. There were a total of 36 confirmed deaths. More than 93,000 registrations were made for assistance. Residential destruction included 1,186 homes reported destroyed and 9,110 with major damage, 107,908 minor damage, with losses estimated over $590 million. Of the 1,470 businesses involved, 77 are reported destroyed, 333 suffered major damage and 1,060 businesses suffered minor or casual damage, with losses exceeding $84 million. Public assistance exceeds $250 million and continues to increase. More than two-thirds of the households and businesses within the Commonwealth were without power. Remote locations did not have power restored for three weeks. In the Central Shenandoah Valley Region, Augusta County received the most rainfall, 20.6 inches, and Rockbridge County received the most damages. Rockbridge County received extensive damage along the South River along Route 608. More than a dozen homes and three bridges were completely destroyed. Rockbridge County had extensive property damages.

Table 4: Central Shenandoah PDC Federal Disasters (Continued)

Community	Date Of Declaration	DR#	Description
Bath, Highland, Rockbridge	*7/13/2006*	*1655*	*Severe storms, tornadoes, and flooding June 23, 2006 - July 6, 2006*
Augusta, Bath, Highland, Rockbridge, Staunton, Waynesboro	*2/16/2010*	*1874*	*Severe winter storm and snowstorm December 18 - 20, 2009*
Augusta, Highland, Waynesboro	*4/27/2010*	*1905*	*Severe winter storm and snowstorms February 5 - 11, 2010*

Level of Hazard

Table 5 provides a breakdown of the natural hazards addressed in the Plan. The level of planning consideration given to each hazard was determined by the committee members. Based on the input of committee members, the hazards were broken into four distinct categories which represent the level of consideration they will receive throughout the planning process.

In order to focus on the most critical hazards that may affect the communities of the Planning District, the hazards assigned a level of *Significant*, *High* and *Medium* will receive the most extensive attention in the remainder of the planning analysis.

As can be seen in Table 2, earthquakes have been designated with a hazard level of None, but after some analysis by the Update Steering Committee, this designation was reassigned as low, as is reflected in Table 5. Information about earthquake risk for the Central Shenandoah Valley is included in the updated version of the All Hazards Mitigation Plan while it wasn't studied in the original Plan.






Table 5: Central Shenandoah PDC Natural Hazards HIRA Overview

Hazard	Type	Detail Level	Analysis Level	Data Reference
Flooding	Riverine	Significant	Covered by HIRA flood analysis	FEMA DFIRM, Q3, and FIRM Mapping
Drought	Including excessive heat	High	Covered by HIRA drought analysis	Drought Monitor Task Force, Water Systems
Wind	Hurricane	High	Covered by HIRA hurricane analysis	FEMA DFIRM, Q3, and FIRM Mapping and ASCE Design Wind Speed Maps, FEMA HAZUS-MH model
Severe Winter Weather	Including winter storms, ice storms, and excessive cold	High	Covered by HIRA blizzards/winter storm analysis	NOAA National Weather Service Records, VirginiaView PRISM, Climate Source
Karst/Land Subsidence	Karst/Land Subsidence	Medium	Covered by HIRA karst analysis	USGS, VT Mines & Minerals
Wind	Tornado	Medium	Description and Regional Maps	NOAA National Weather Service Records
Wildfire	Wildfire	Medium	Covered by HIRA wildfire analysis	Virginia Department of Forestry
Landslide	Landslide	Low	Description and Regional Maps	USGS
Terrorism	Terrorism	Low	Description	Addressed in community Emergency Operation Plans (EOP)
Earthquake	*Earthquake*	*Low*	*Description and Historical Research*	*FEMA HAZUS-MH*

3. Flooding (Significant Ranking)

Hazard History

Listed below are major flooding events that have occurred in the Central Shenandoah Planning District. In Table 4 and Appendix A, some major events have been broken down by the date of occurrence and when available, by individual community descriptions. When no community specific description is available, the general description should be used as representing the entire planning area.

- *July 13, 1842*
- *1846 (month and day unknown)*
- *January 1854*
- *August 4, 1860*
- September 28 - 30, 1870
- *August 28, 1893*
- September 29, 1896
- August 15, 1906
- *November - December 1934*
- March 16 - 17, 1936 "The Great ST. Patrick's Day Flood"
- *April 1937*
- *October 1942*
- June 18, 1949
- September 10, 1950
- *Hurricane Hazel - October 15, 1954*
- *Hurricanes Connie and Diane - August 1955*
- *Hurricane Gracie - September 29, 1959*
- Hurricane Camille - August 19, 1969
- Hurricane Agnes - June 19, 1972
- Hurricane Juan - November 4 - 7, 1985
- *April 1993*
- June 22 - 28, 1995
- Snowmelt Flood of January 1996
- Hurricane Fran - September 6, 1996
- *August 8, 2003*
- Hurricane Isabel – September 2003
- *June 25 - July 5, 2006 "Mid-Atlantic United States Flood"*

Hazard Profile

A flood is a natural event for rivers and streams. Excess water from snowmelt, rainfall, or storm surge accumulates and overflows onto the banks and adjacent floodplains. Floodplains are lowlands, adjacent to rivers, lakes, and oceans that are subject to recurring floods. Under natural conditions, a flood causes little or no damage. Flood problems only exist when the built environment is damaged by nature's water or when property and lives are jeopardized. Floods in the Region are almost always associated with hurricanes, tropical storms, and tropical depressions. However, some of our flooding is caused by sustained heavy rains, severe thunderstorms, and even rapid snowmelts.

While the Central Shenandoah Valley experiences nearly all types of natural disasters, including snow storms, ice storms, wild fires, and tornadoes, flooding is perhaps the most common and devastating type of disaster. It is also the most common hazard in the United States with hundreds of floods occurring every year causing an average of 150 deaths annually. The Central Shenandoah Valley Region has received many federal disaster declarations, nine due to flooding. Floods in 1969, 1972, 1985, 1992, 1994, 1995, 1996, 1998, and 2003 have had severe and long-term effects on property owners, local businesses, industry, and our economy.

Floods typically are characterized by frequency. For example, the "1%-annual chance flood" is commonly referred to as a "100-year" flood. While more frequent floods do occur, as well as larger events that have lower probabilities of occurrence, for most regulatory and hazard identification purposes, the 1%-percent annual chance flood is used.

Homes and business may suffer damage and be susceptible to collapse. Floods pick up chemicals, sewage, and toxins from roads, factories, and farms. Any property affected by the flood may be contaminated with hazardous materials. Debris from vegetation and man-made structures may also be hazardous following the occurrence of a flood. In addition, floods may threaten water supplies and water quality, as well as initiate power outages.

Secondary Effects

Flooding can pose some significant secondary impacts to the area where the event has taken place. Some of the impacts to consider include infrastructure and utility failure and impacts to roadways, water service, and wastewater treatment. These impacts can affect the entire planning district, making the area vulnerable to limited emergency services.

Flood Maps

FEMA DFIRM data was used for all locality flood mapping and analysis. FEMA has replaced the digital Q3 flood data with DFIRM data (Digital FIRM maps) that have links to databases containing the engineering back-up materials used to develop the map.(i.e. hydrologic and hydraulic models, flood profiles, floodway data table, Digital Elevation Models,) Unlike the Q3 data, which lack the engineering back-up materials mentioned before and are to be used as an advisory tool only, DFIRMs will be of the same spatial precision and accuracy of the paper maps and provide a more detailed and accurate flood map.

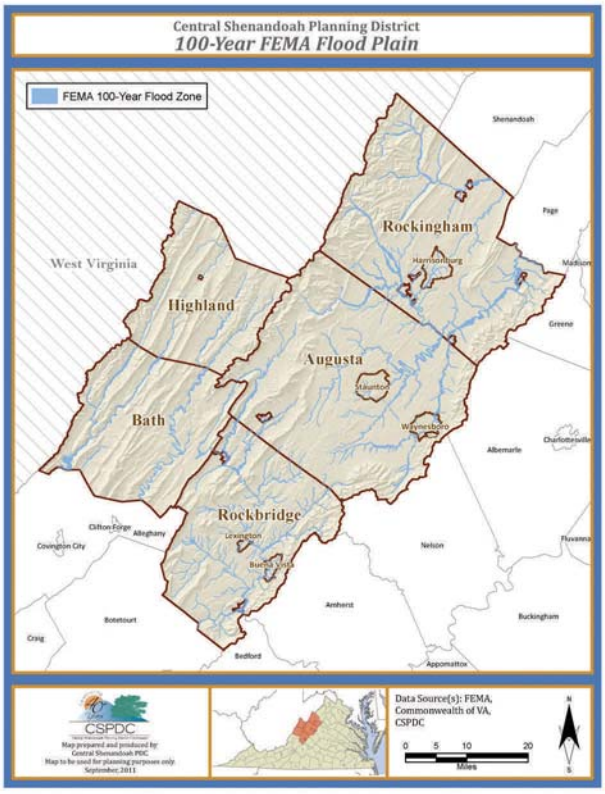

Figure 4 - Central Shenandoah PDC Floodplains

Vulnerability Analysis

Specific areas that are susceptible to flooding were determined by the Central Shenandoah PDC when developing the Central Shenandoah Valley Regional Flood Mitigation Plan (FMA). See Appendix B for the jurisdictional flood maps; these maps provide detailed information on areas susceptible to flooding. These areas were taken into account when completing the hazard identification and risk assessment.

Many factors contribute to the relative vulnerabilities of areas within the floodplain. Some of these factors include development which increases the presence of people and property in the floodplain, flood depth, velocity, elevation, construction type, and flood duration.

FEMA-Designated Repetitive Loss Properties

FEMA provides a Repetitive Loss List of the properties in a community that have received two or more flood insurance claims, greater than $1,000, from the National Flood Insurance Program (NFIP) within a ten year timeframe. The Repetitive Loss list includes pertinent information regarding the property address, dates of claims, amounts received and owner information. Some of this information has been withheld from Table 6; see your local NFIP coordinator for specific information. Please see the Appendix D for Table 6 which has repetitive loss structures in our Region.

There are 6 repetitive loss properties and 29 severe repetitive loss properties in the CSPDC (Appendix D). Note that FEMA designates counties, cities and towns separately in the table.






Structures At Risk-Vulnerability

Structures at risk to flooding were determined by two methods. For many of the counties and cities, the CSPDC Flood Mitigation Plan lists the number of residential and industrial buildings in the floodplain. Table 7 is a summary of these at risk structures.

Table 7: Structures At Risk Due To Flooding From The CSPDC Flood Mitigation Plan

Community	Houses at Risk	Housing Units	% of Housing Units
Augusta County	2,608	24,818	10.51%
Bath County	250	2,053	12.18%
*Bridgewater, Town of	*70*	*1,850*	*3.78%*
*Broadway, Town of	*100*	*976*	*10.25%*
*Glasgow, Town of	*138*	*494*	*28%*
*Goshen, Town of	*64*	*214*	*30%*
*Grottoes, Town of	*40*	*894*	*4.47%*
Rockbridge County	703	8,486	8.28%
Rockingham County	5,017	25,355	19.79%
Staunton City	200	9,676	2.07%
Waynesboro City	958	8,332	11.50%
Total	**9,736**	**78,720**	**12.37%**

*Denotes town values that are also included in totals for the perspective County.

For those communities not covered by the CSPDC Flood Mitigation Assistance Plan, the numbers of structures at risk from flooding were determined based on the percent area of the community in the floodplain and the number of housing units from the 2000 Census. Table 8 shows the number of at risk structures for these communities.

Table 8: Structures At Risk Due To Flooding
Based On Percent Floodplain Area And 2000 Census Housing Units

Community	Housing Units	Total Area (sq mi)	Area in Floodplain (sq mi)	Houses at Risk	% of Housing Units
Buena Vista City	2,547	7	0.8609	313	12.29%
*Craigsville, Town of	*474*	*1.945*	*0.158*	*39*	*8.12%*
*Dayton, Town of	*565*	*0.798*	*0.123*	*87*	*15.41%*
*Elkton, Town of	*919*	*1.377*	*0.227*	*151*	*16.49%*
Harrisonburg City	13,133	18	0.9746	711	5.41%
Highland County	1,131	416	8.0919	22	1.95%
Lexington City	2,232	2	0.1348	150	6.72%
*Monterey, Town of	*141*	*0.304*	*0.011*	*25*	*17.73%*
*Mt. Crawford, Town of	*109*	*0.345*	*0.057*	*18*	*16.52%*
*Timberville, Town of	*770*	*0.875*	*0.11*	*97*	*12.57%*
Total	**19,043**	**443**	**10.06**	**1,196**	**6.28%**

*Denotes town values that are also included in totals for the perspective County.

Estimating Losses

Using the property values from Table 1, an estimation of the potential flood loss for each structure was developed. Losses included structure and contents damage using a method based on FEMA Benefit Cost Analysis. Contents values were estimated as 30% of the structural replacement value. Structural damage percentages for a 100-year event were established as 11%. Contents damages were estimated as 50% greater than the structural damage percentage. These values were used to predict the damage from a 100-yr flood event for the structure. To calculate an annualized flood damage estimate, it was assumed for each structure damages began with a 25-yr event. A percentage of the 100-yr flood damage value was used for events less frequent than the 100-yr event.

For example, a parcel with 25% in the floodplain is estimated to have a structure worth $100,000 based on the community parcel database. The replacement value of the structure would be $110,000 and the contents value $33,000. Damage to the structure (11%) would be estimated at $11,000 with $1,815 in contents damage. Annual damage for the structure and contents would be estimated at $320. In order to take into account the number of structures in the floodplain (method 2), the percent of floodplain area was multiplied by the total number of housing units in the community to give the number of houses in the floodplain. The number of houses in the floodplain (from methods 1 and 2) was then multiplied to the annual damage due to flooding to give the total estimated loss for the region (Table 9). From Table 9, it is shown that a large percentage of the estimated losses are in the counties of Augusta and Rockingham.

Table 9: CSPDC Structure Vulnerability And Estimated Losses Due To Flooding

Community	Flood Policies	Total Housing Units	Medium Home Value	Total Structure Value Vulnerability	Total Loss Estimate
Augusta County	261	24,818	$110,900	$289,227,200	$926,612
*Craigsville, Town of	*28*	*474*	*$64,800*	*$2,495,117*	*$7,994*
Bath County	32	2,053	$79,700	$19,925,000	$63,835
Buena Vista City	91	2,547	$72,900	$22,817,700	$73,159
Harrisonburg City	88	13,133	$122,700	$87,239,700	$279,525
Highland County	12	1,131	$83,700	$1,841,400	$5,899
*Monterey, Town of	*5*	*141*	*$84,200*	*$2,105,000*	*$6,744*
Lexington City	8	2,232	$131,900	$19,785,000	$63,571
Rockbridge County	273	8,486	$92,400	$64,957,200	$208,107
*Glasgow, Town of	*40*	*494*	*$66,400*	*$9,163,200*	*$29,357*
*Goshen, Town of	*13*	*214*	*$59,100*	*$3,782,400*	*$12,118*
Rockingham County	489	25,355	$107,700	$540,330,900	$1,731,085
*Bridgewater, Town of	*57*	*1,850*	*$126,300*	*$8,841,000*	*$28,324*
*Broadway, Town of	*19*	*976*	*$101,100*	*$10,110,000*	*$32,390*
*Dayton, Town of	*10*	*565*	*$120,600*	*$10,502,628*	*$33,648*
*Elkton, Town of	*25*	*919*	*$94,800*	*$14,362,028*	*$46,012*
*Grottoes, Town of	*29*	*894*	*$90,500*	*$3,620,000*	*$11,598*
*Mt. Crawford, Town of	*2*	*109*	*$96,700*	*$1,741,441*	*$5,579*
*Timberville, Town of	*8*	*770*	*$82,300*	*$7,966,640*	*$25,523*
Staunton City	114	9,676	$87,500	$17,500,000	$56,066
Waynesboro City	185	8,332	$89,300	$85,549,400	$274,079
Total	**1,789**	**97,763**		**$1,149,173,500**	**$3,681,938**

*Denotes town values that are also included in totals for the perspective County.






Critical Facilities

The impacts of flooding on critical facilities can significantly increase the overall effect of a flood event on a community. It should be noted that these facilities have been determined to be in the floodplain using Geographic Information Systems (GIS) and should be used only as a planning tool. In order to accurately determine if a structure is actually in the floodplain, site-specific information must be available. Fifty-two critical facilities were determined to be within the FEMA designated floodplain. Table 10 denotes the critical facilities that are located within or in close proximity to the FEMA designated floodplains. Using a GIS, the critical facility points were intersected with the FEMA flood zones. A 30-foot buffer on the facilities provided a radial distance from the center of the building that was used to determine the proximity to the floodplain. While Table 10 shows 52 critical facilities are located near or in the floodplain, there is great diversity in the type of facility located within or in close proximity to the floodplain. See Appendix A for a listing of the critical facilities within the floodplain.

Table 10: CSPDC Critical Facilities Within FEMA Designated Floodplain

Type	Number of Facilities (Historic)
Church	28 (6)
Commercial	4
Government	4
Industrial	6
School	9 (5)
Utilities	1
Total	**52**

4. Drought (High Ranking)

Hazard History

Table 11 includes descriptions of major droughts that have occurred in Virginia and the Central Shenandoah PDC. Events have been broken down by the date of occurrence and when available, by individual community descriptions. When no community specific description is available, the general description should be used as representing the entire planning area.

Table 11: CSPDC Drought Hazard History

Date	Damages
1930-1932	*Considered the worst drought in Virginia history. Piedmont area recorded only 21 inches of rainfall in 1930. The three largest rivers (Potomac, Rappahannock and Rapidan) were reduced to mere puddles.*
1938-1942	*Less severe than the previous 1930 drought. Saw below average levels of rainfall and low stream flow levels in local rivers.*
1962-1971	*Also, less severe than the previous 30'-32' drought, however, the cumulative stream flow deficit was the greatest of all the major droughts because of its lengthy duration.*
1976 - 1977	Ten months of below average precipitation. The drought began in November of 1976 when rainfall totaled to only 50% to 75% of normal. During the rest of the winter, the storms tracked across the Gulf. During the spring and summer the storms tracked across the Great Lakes. These weather patterns created significant drought throughout most of Virginia.
5/1980 - 8/1980	Warm and dry conditions prevailed through the beginning of the summer. June precipitation data show that much of Virginia received record low rainfall. No crop damage reported.
1985 - 1986	Very little rainfall began in December and the trend continued throughout the summer. Total precipitation for January and February was 2 inches. Palmer Index values dropped below -2 by June. High temperatures along with scarce precipitation created a drought that lasted well into the fall.
6/1988 - 7/1988	A heat wave over the southeast produced warm and dry conditions over much of Virginia. Although the news reported stories of a drought in Virginia, the Drought Monitoring Team never stated in a report that these conditions were indicative of a drought. Palmer Drought Index values were above -2.






Table 11: CSPDC Drought Hazard History (Continued)

Date	Damages
5/1993 - 8/1993	Very warm temperatures and little rain were noted beginning June 5, 1993. Precipitation shortages were greater than five inches for southwestern and southeastern Virginia from May through July. Surface soil moisture levels were low enough to result in significant agricultural damage. However groundwater remained at normal levels.
6/1999- 9/1999	Northern Virginia and Shenandoah Valley experienced one of the worst droughts of the 20th Century. Moisture shortages first became apparent in the summer of 1998. Record low stream flows on the Rappahannock. Crops, cattle and fisheries were all suffering. Farm ponds completely dried up and fish died in the tepid backwaters of the Chesapeake Bay. The drought was beginning to move into the Piedmont. The Shenandoah River was drier than it had been since the early 1930s drought. Considered "one of the most profound droughts in Virginia during the 20th century".
2001-2004	Beginning in the winter of 2001, the Mid-Atlantic Region began to show long-term drought conditions. The National Weather Service made reports of moisture starved cold fronts that would continue throughout the winter. Stream levels were below normal with record lows observed at stream gages for the York, James, and Roanoke River Basins. By November of 2002, the U.S Secretary of Agriculture had approved 45 counties for primary disaster designation, while 36 requests remained pending. Governor Warner banned lawn watering, car washing and the filling of swimming pools. Wells dried up in rural areas as the water table dropped drastically.

Hazard Profile

A drought is a period of abnormally dry weather that persists long enough to produce serious effects like crop damage, water supply shortages, etc. The severity of the drought depends upon the degree of moisture deficiency, the duration, and the size of the affected area, as well as, the demands of human activity and agriculture on water supplies. Drought can affect vast regions and large population numbers. A drought is a silent but very damaging phenomenon and unlike other natural disasters can last for years. Drought can ruin local and regional economies that are agricultural and tourism based. Drought increases the risk of other hazards like fire, flash flood, and possible landslide and debris flow. Droughts are a normal and recurrent feature of climate. Statistics indicate that roughly every 22 years, a major drought occurs in the United States, most seriously affecting the Prairie and Midwestern states. The disastrous drought of the 1930s during which a large areas of the Great Plains became known as the Dust Bowl, is one example.

Droughts are measured on the Palmer Drought Severity Index (PDSI) which tracks moisture conditions. The PDSI defines an interval of time, generally in months or years, during which the actual moisture supply at a given place falls short of the climatically appropriate moisture supply. The range on the PDSI is from -4.0 (extremely dry) to +4.0 (excessively wet), with the mid-range (-2.0 to +2.0) representing the normal or near normal conditions.

Table 12 provides a summary of drought categories and impacts. Notice that water restrictions start off as voluntary and then become required. For excessive heat, the National Weather Service utilizes heat index thresholds as criteria for the issuance of heat advisories and excessive heat warnings.






Table 12: Drought Severity Classification

Category	Description	Possible Impacts
D0	Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures; fire risk above average. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered.
D1	Moderate Drought	Some damage to crops, pastures; fire risk high; streams, reservoirs, or wells low, some water shortages developing or imminent, voluntary water use restrictions requested
D2	Severe Drought	Crop or pasture losses likely; fire risk very high; water shortages common; water restrictions imposed
D3	Extreme Drought	Major crop/pasture losses; extreme fire danger; widespread water shortages or restrictions
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses; exceptional fire risk; water emergencies created by shortages of water in reservoirs, streams and wells.

Vulnerability Analysis

The 1990 U.S. Census contained detailed information about source of water per Census block group. For purposes of this analysis, it was assumed that areas with populations having less than 25% of public/ private water systems had a high vulnerability ranking. When a drought occurs, these areas would likely have a larger impact since most homes receive their water from wells, which may dry up during a drought. Table 13 provides a summary of the 1990 population in three categories of drought vulnerability. Note that the Table contains information specific to the towns; this information has also been included with the county totals. As a result of using 1990 U.S. Census data, at the track level, there are some discrepancies with the town boundaries. Boundary adjustments into "high vulnerability" areas are a result of the older census data, which is a data limitation issue. Future updates of this plan will use, if available, the most current census data for water systems. Based on the percentage of the population in the high vulnerability category, Highland County has the highest percentage of people vulnerable to drought (65%) followed by the counties of Rockbridge (53%) and Rockingham (49%). Figure 5 shows these categories for each of the communities.

Table 13: CSPDC Drought Vulnerability (from 1990 Census)

Percent Population with Public/Private Water Systems				
Community	**High (< 25%)**	**Medium (25% - 50%)**	**Low (> 50 %)**	**Total**
Augusta County	18,936	8,105	27,636	54,677
*Craigsville, Town of	0	0	812	812
Bath County	1,333	851	2,615	4,799
Buena Vista City	0	0	6,406	6,406
Harrisonburg City	0	0	30,707	30,707
Highland County	1,722	913	0	2,635
*Monterey, Town of	0	222	0	222
Lexington City	0	0	6,959	6,959
Rockbridge County	9,788	6,409	2,153	18,350
*Glasgow, Town of	0	0	1140	1140
*Goshen, Town of	0	366	0	366
Rockingham County	28,040	11,204	18,238	57,482
*Bridgewater, Town of	0	0	3,918	3918
*Broadway, Town of	0	50	1159	1209
*Dayton, Town of	0	0	921	921
*Elkton, Town of	0	85	1850	1935
*Grottoes, Town of	0	0	1455	1455
*Mt. Crawford, Town of		228	0	228
*Timberville, Town of	0	1596	0	1596
Staunton City	0	0	24,461	24,461
Waynesboro City	0	0	18,549	18,549
Total	59,819	27,482	137,724	225,025

*Denotes town values that are also included in totals for the perspective County.

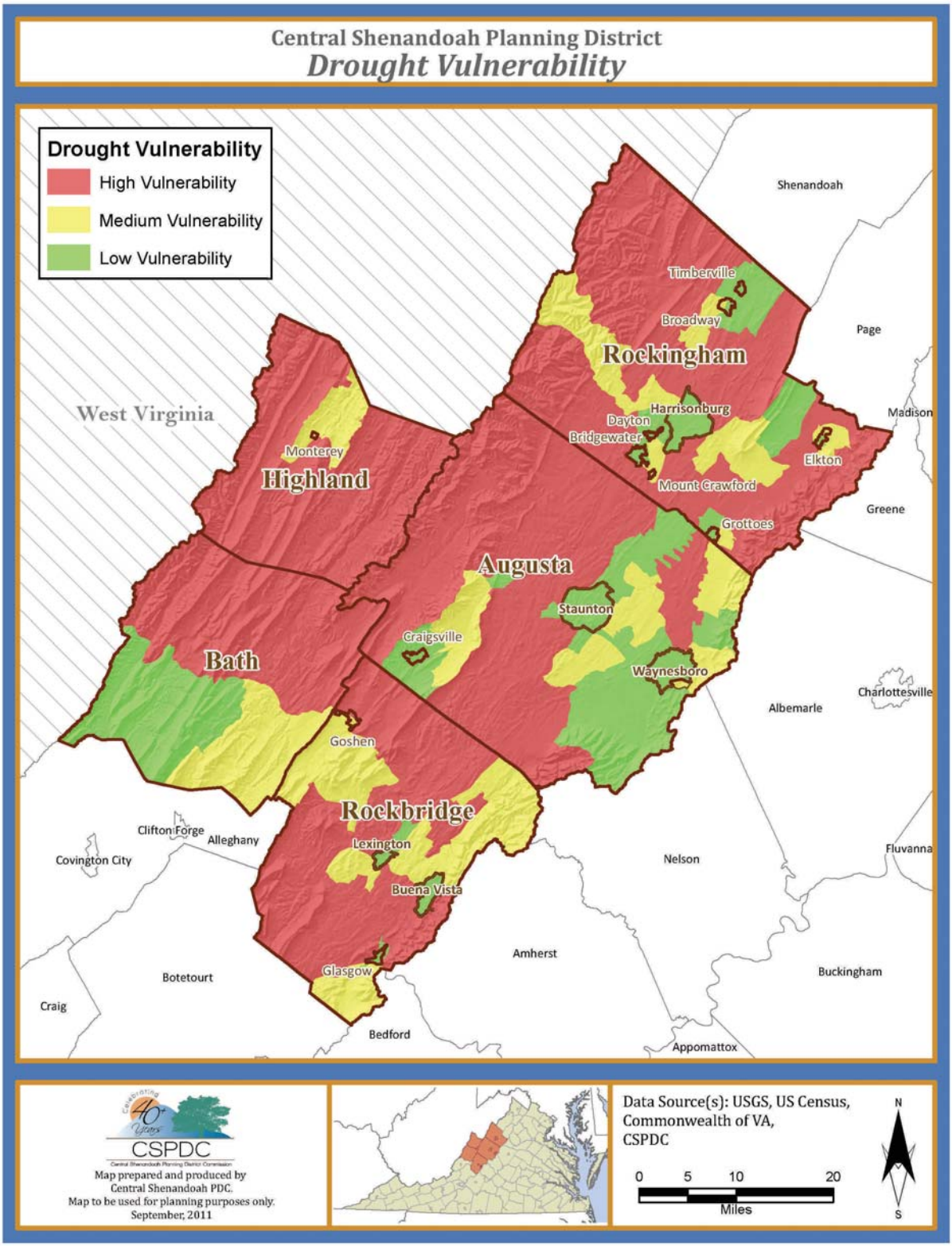

Figure 5 - CSPDC Drought Vulnerability

5. Hurricane (High Ranking) Wind Impacts Only

Hazard History

Listed below are major hurricane and wind events that have occurred in the Central Shenandoah PDC. See Table 4, and Appendix A on flooding for detailed information on the flooding impacts of hurricanes in the Region.

- Hurricane Camille - August 1969
- Hurricane Agnes - June 1972
- Hurricane Juan - November 1985
- Hurricane Fran - September 1996
- Hurricane Isabel – September 2003

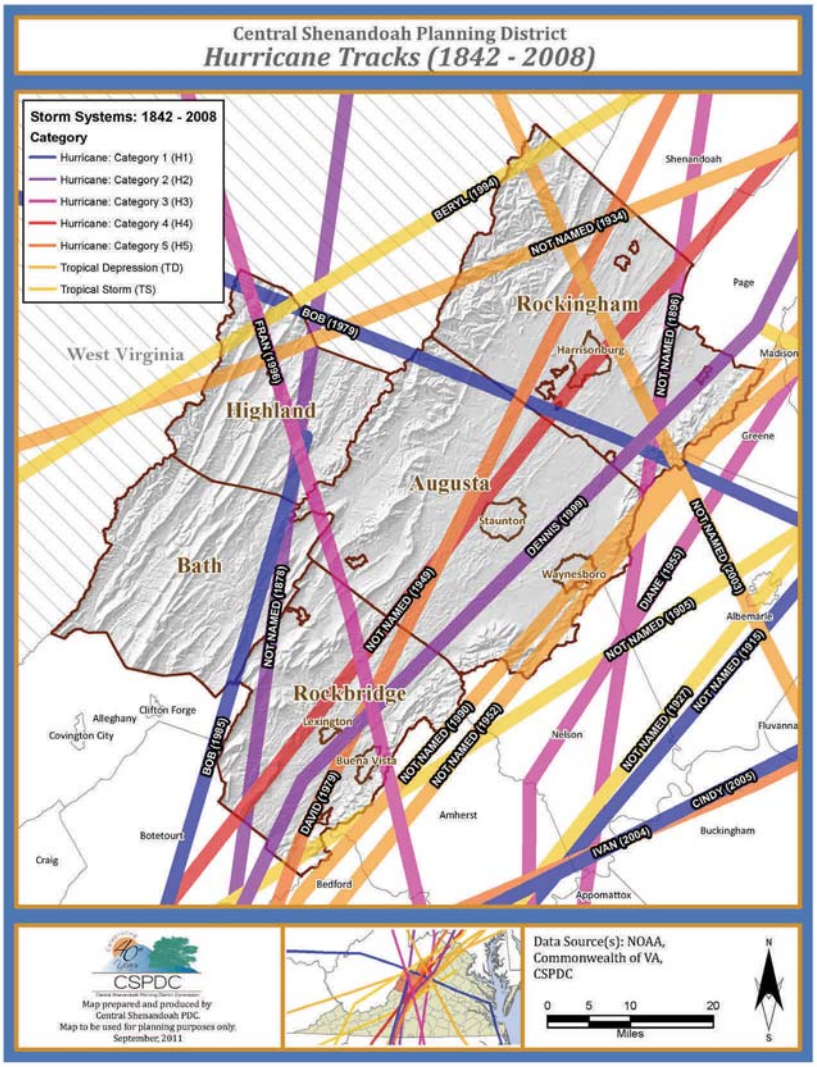

Figure 6 - Central Shenandoah Planning District Hurricane Tracks

The hurricane track map gives an idea of the historical occurrences in the Central Shenandoah PDC Region (Figure 6). The hurricane in 1893, which is "Not Named," tracked through the eastern tip of Rockingham County with a Saffir-Simpson hurricane category of 1. Other hurricanes that have tracked through the Central Shenandoah PDC Region include tropical depression Fran and Hurricane Isabel (category 1 and tropical storm). Hurricanes that have not tracked through the Region still have had a considerable impact on the Region. Notably secondary impacts have caused loss of life, injury, property damage and widespread infrastructure damage (i.e., power and phone disruptions).

Hazard Profile

A tropical cyclone is the generic term for a non-frontal synoptic scale low-pressure system over tropical or sub-tropical waters with organized convection and definite cyclonic surface wind circulation. Depending on strength, they are classified as hurricanes or tropical storms. Tropical cyclones involve both atmospheric and hydrologic characteristics, such as severe windstorms, surge flooding, high waves, coastal erosion, extreme rainfall, thunderstorms, lightning, and, in some cases, tornadoes. Storm surge flooding can push inland, and riverine flooding associated with heavy inland rains can be extensive. High winds are associated with hurricanes, with two significant effects: widespread debris due to damaged and downed trees and damaged buildings; and power outages.

Secondary Hazards

Secondary hazards from a hurricane event could include high winds, flooding, heavy waves, and tornadoes. Once inland, the hurricane's band of thunderstorms produces torrential rains and, sometimes, tornadoes. A foot or more of rain may fall in less than a day causing flash floods and mudslides. The rain eventually drains into the large rivers, which may still be flooding for days after the storm has passed. The storm's driving winds can topple trees, utility poles, and damage buildings. Communication and electricity may be lost for days. Roads may be impassable due to fallen trees and debris.

Hurricane Damage Scale

Hurricanes are categorized by the Safer-Simpson Hurricane Damage Scale listed below (Table 14). Following the Table are detailed descriptions of each category and the potential damage caused by each.

Table 14: Saffir-Simpson Hurricane Damage Scale

Hurricane Category	Sustained Winds (mph)	Description
1	*74 – 95*	***Very dangerous winds will produce some damage:*** *Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.*
2	*96 – 110*	***Extremely dangerous winds will cause extensive damage:*** *Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.*
3	*111 – 129*	***Devastating damage will occur:*** *Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.*
4	*130 – 156*	***Catastrophic damage will occur:*** *Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.*
5	*> 157*	***Catastrophic damage will occur:*** *A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.*

Vulnerability Analysis

HAZUS-MH

HAZUS-MH was used to complete the wind analysis for vulnerability and loss estimates. The HAZUS software has been developed by FEMA and the Nation Institute of Building Sciences. Level 1, with default parameters, was used for the analysis done in this plan. For analysis purposes, the U.S. Census tracks are the smallest extent in which the model runs. The results of this analysis are captured in the vulnerability analysis and loss estimation. HAZUS-MH uses historical hurricane tracks and computer modeling to identify the probable tracks of a range of hurricane events at the U.S. Census Track level. Results from the model are used to develop the annualized damages. The impacts of various events are then combined to create a total annualized loss or the expected value of loss in any given year. The FEMA HAZUS-MH model was used to determine hurricane wind vulnerability and losses. The Hurricane Wind Probabilistic Model with HAZUS-MH predicts hurricane tracks, based on historical hurricane, for different return periods. Wind gust ranges for three return periods are as follows:

- 50-yr wind gust range-56-62 mph
- 100-yr wind gust range-68-71 mph
- 1000-yr wind gust range-94-98 mph

The maximum wind gust for each probabilistic hurricane track is used to predict structure vulnerability and losses using regional statistics for different building stocks and occupancy. The following sections will highlight the specifics for building vulnerability for different building types and occupancies.

Building Types

Table 15 illustrates the probabilistic building stock exposure by building type to hurricanes. For the Central Shenandoah PDC Region, wood-frame buildings account for a large percentage of the building stock. Table 16 illustrates the building stock exposure broken down by the type of occupancy. From the table, 83% of the building stock for the Central Shenandoah PDC region is considered residential, with approximately 14% of the building stock coming from commercial and industrial.

HAZUS-MH hurricane model only conducts analysis at the U.S. Census track level; which is larger than all of the towns in the region. Town exposure has been estimated based on the percentage of the housing units in the County.

Table 15: Building Stock Exposure By Building Type (From HAZUS-MH)

Community	Wood	Masonry	Concrete	Steel	MH	TOTAL
Augusta County	$2,348,057	$934,772	$99,713	$307,691	$117,382	$3,807,615
*Craigsville, Town of	$35,034	$13,947	$1,488	$4,591	$1,751	$56,811
Bath County	$300,188	$121,687	$29,210	$35,166	$8,248	$494,499
Buena Vista City	$237,530	$96,936	$12,134	$23,575	$4,357	$374,532
Harrisonburg City	$1,160,939	$737,195	$264,211	$484,710	$10,683	$2,657,738
Highland County	$151,922	$55,048	$1,947	$8,697	$7,744	$225,358
*Monterey, Town of	$9,465	$3,430	$121	$542	$482	$14,040
Lexington City	$221,457	$144,956	$64,200	$79,922	$764	$511,299
Rockbridge County	$797,923	$307,604	$25,171	$83,094	$45,955	$1,259,747
*Glasgow, Town of	$40,111	$15,463	$1,265	$4,177	$2,310	$63,326
*Goshen, Town of	$15,569	$6,002	$491	$1,621	$897	$24,580
Rockingham County	$2,401,488	$946,000	$86,808	$229,962	$108,452	$3,772,710
*Bridgewater, Town of	$184,495	$72,677	$6,669	$17,667	$8,332	$289,840
*Broadway, Town of	$77,727	$30,618	$2,810	$7,443	$3,510	$122,108
*Dayton, Town of	$47,657	$18,773	$1,723	$4,564	$2,152	$74,869
*Elkton, Town of	$72,408	$28,523	$2,617	$6,934	$3,270	$113,752
*Grottoes, Town of	$74,961	$29,529	$2,710	$7,178	$3,385	$117,763
*Mt. Crawford, Town of	$9,007	$3,548	$326	$862	$407	$14,149
*Timberville, Town of	$61,664	$24,291	$2,229	$5,905	$2,785	$96,873
Staunton City	$943,574	$440,583	$85,584	$156,301	$1,012	$1,627,054
Waynesboro City	$763,567	$324,758	$38,056	$103,054	$6,806	$1,236,241
TOTAL	$9,954,743	$4,356,340	$729,483	$1,573,656	$340,685	$16,954,906
All values are in thousands of dollars						

*Denotes town values that are also included in totals for the perspective County.

Table 16: Building Stock Exposure By General Occupancy (From HAZUS-MH)

Community	Residential	Commercial	Industrial	Agri.	Religion	Gov't	Ed.	Total
Augusta County	$3,217,697	$326,175	$194,572	$20,448	$35,973	$3,908	$8,845	$3,807,618
* Craigsville, Town of	$48,009	$4,867	$2,903	$305	$537	$58	$132	$56,811
Bath County	$452,878	$21,892	$7,852	$907	$4,392	$2,607	$3,971	$494,499
Buena Vista City	$332,182	$25,453	$9,893	$0	$5,015	$1,265	$724	$374,532
Harrisonburg City	$1,820,119	$527,791	$135,296	$14,926	$39,652	$3,703	$116,243	$2,657,730
Highland County	$206,296	$12,188	$2,437	$1,790	$1,335	$1,099	$213	$225,358
* Monterey, Town of	$12,853	$759	$152	$112	$83	$68	$13	$14,040
Lexington City	$384,287	$88,390	$1,165	$259	$8,293	$3,875	$25,032	$511,301
Rockbridge County	$1,098,775	$76,022	$54,564	$7,212	$15,469	$4,433	$3,267	$1,259,742
* Glasgow, Town of	$55,234	$3,822	$2,743	$363	$778	$223	$164	$63,326
* Goshen, Town of	$21,439	$1,483	$1,065	$141	$302	$86	$64	$24,580
Rockingham County	$3,308,546	$242,667	$106,619	$52,367	$47,450	$5,857	$9,211	$3,772,717
* Bridgewater, Town of	$254,180	$18,643	$8,191	$4,023	$3,645	$450	$708	$289,840
* Broadway, Town of	$107,085	$7,854	$3,451	$1,695	$1,536	$190	$298	$122,108
* Dayton, Town of	$65,658	$4,816	$2,116	$1,039	$942	$116	$183	$74,869
* Elkton, Town of	$99,757	$7,317	$3,215	$1,579	$1,431	$177	$278	$113,753
* Grottoes, Town of	$103,275	$7,575	$3,328	$1,635	$1,481	$183	$288	$117,763
* Mt. Crawford, Town of	$12,409	$910	$400	$196	$178	$22	$35	$14,149
* Timberville, Town of	$84,955	$6,231	$2,738	$1,345	$1,218	$150	$237	$96,873
Staunton City	$1,348,576	$213,605	$16,783	$1,884	$22,150	$8,174	$15,886	$1,627,058
Waynesboro City	$1,039,554	$153,293	$23,731	$5,156	$13,249	$57	$1,198	$1,236,238
TOTAL	$14,073,764	$1,751,752	$583,213	$117,381	$205,108	$36,702	$186,988	$16,954,907
All values are in thousands of dollars								

*Denotes town values that are also included in totals for the perspective County.

Critical Facilities

Vulnerability to critical facilities from hurricane winds is fairly low throughout the Region as a result of the low annualized hurricane wind losses.

Loss Estimation

Figure 7 shows that most of the Region's annual probabilistic hurricane losses are less than $20,000 per Census tract. The City of Lexington has a high annual hurricane loss (greater than $40,000). A majority of the areas in the $20,000 to $40,000 loss range are located in the valley region of the PDC, where most of the population is centralized. Annualized losses were estimated using the FEMA MAZUS-MH model. National forests and parks dominant the Central Shenandoah Planning District Commission, as a result the hurricane losses are reduced due to the fact that most people do not live in the national forest areas.

Table 17 provides the loss estimations from HAZUS-MH by building type. As noted earlier, wood structures compose the majority of the structures, and also account for the majority of the losses (63%). Table 18 shows the loss by occupancy type. Note that differences between the totals in the tables are due to rounding in the calculations in HAZUS-MH.

HAZUS-MH hurricane model only conducts analysis at the U.S. Census track level; which is larger than all of the towns in the Region. Town building stock loss has been estimated based on the percentage of the housing units in the County.






Table 17: Building Stock Loss By Building Type (From HAZUS-MH)

Community	Wood	Masonry	Concrete	Steel	MH	TOTAL
Augusta County	$158.19	$61.16	$2.65	$10.57	$9.93	$242.49
* Craigsville, Town of	$2.36	$0.91	$0.04	$0.16	$0.15	$3.62
Bath County	$12.63	$5.06	$0.35	$0.76	$0.51	$19.31
Buena Vista City	$20.29	$8.30	$0.35	$1.14	$0.48	$30.56
Harrisonburg City	$77.48	$53.11	$6.27	$18.85	$1.05	$156.76
Highland County	$7.33	$2.54	$0.03	$0.18	$0.49	$10.58
* Monterey, Town of	$0.46	$0.16	$0.00	$0.01	$0.03	$0.66
Lexington City	$23.43	$12.11	$1.99	$4.48	$0.10	$42.10
Rockbridge County	$54.59	$20.99	$0.70	$3.01	$4.17	$83.45
* Glasgow, Town of	$2.74	$1.06	$0.04	$0.15	$0.21	$4.19
* Goshen, Town of	$1.07	$0.41	$0.01	$0.06	$0.08	$1.63
Rockingham County	$149.86	$58.13	$1.76	$6.93	$8.61	$225.30
* Bridgewater, Town of	$11.51	$4.47	$0.14	$0.53	$0.66	$17.31
* Broadway, Town of	$4.85	$1.88	$0.06	$0.22	$0.28	$7.29
* Dayton, Town of	$2.97	$1.15	$0.03	$0.14	$0.17	$4.47
* Elkton, Town of	$4.52	$1.75	$0.05	$0.21	$0.26	$6.79
* Grottoes, Town of	$4.68	$1.81	$0.05	$0.22	$0.27	$7.03
* Mt. Crawford, Town of	$0.56	$0.22	$0.01	$0.03	$0.03	$0.84
* Timberville, Town of	$3.85	$1.49	$0.05	$0.18	$0.22	$5.79
Staunton City	$75.07	$33.60	$2.02	$6.46	$0.10	$117.25
Waynesboro City	$68.42	$30.56	$1.31	$5.27	$0.75	$106.32
Total	$686.86	$300.87	$17.91	$59.55	$28.55	$1,093.75
*All values are in thousands of dollars						

*Denotes town values that are also included in totals for the perspective County.

Table 18: Building Stock Loss By General Occupancy (From HAZUS-MH)

Community	Residential	Commercial	Industrial	Agriculture	Religion	Government	Education	Total
Augusta County	$219.57	$11.76	$9.75	$0.89	$0.99	$0.16	$0.27	$243.39
*Craigsville, Town of	$3.28	$0.18	$0.15	$0.01	$0.01	$0.00	$0.00	$3.63
Bath County	$18.66	$0.39	$0.14	$0.03	$0.07	$0.05	$0.06	$19.41
Buena Vista City	$28.27	$1.22	$0.84	$0.00	$0.20	$0.06	$0.03	$30.62
Harrisonburg City	$121.09	$20.34	$8.56	$0.81	$1.26	$0.19	$4.66	$156.91
Highland County	$10.19	$0.25	$0.05	$0.05	$0.02	$0.03	$0.00	$10.60
*Monterey, Town of	$0.63	$0.02	$0.00	$0.00	$0.00	$0.00	$0.00	$0.66
Lexington City	$34.69	$5.31	$0.06	$0.02	$0.39	$0.24	$1.47	$42.17
Rockbridge County	$76.78	$2.79	$3.00	$0.34	$0.47	$0.24	$0.11	$83.73
* Glasgow, Town of	$3.86	$0.14	$0.15	$0.02	$0.02	$0.01	$0.01	$4.21
* Goshen, Town of	$1.50	$0.05	$0.06	$0.01	$0.01	$0.00	$0.00	$1.63
Rockingham County	$210.67	$7.35	$3.57	$2.31	$1.27	$0.25	$0.31	$225.72
* Bridgewater, Town of	$16.18	$0.56	$0.27	$0.18	$0.10	$0.02	$0.02	$17.34
* Broadway, Town of	$6.82	$0.24	$0.12	$0.07	$0.04	$0.01	$0.01	$7.31
* Dayton, Town of	$4.18	$0.15	$0.07	$0.05	$0.03	$0.00	$0.01	$4.48
* Elkton, Town of	$6.35	$0.22	$0.11	$0.07	$0.04	$0.01	$0.01	$6.81
* Grottoes, Town of	$6.58	$0.23	$0.11	$0.07	$0.04	$0.01	$0.01	$7.05
* Mt. Crawford, Town of	$0.79	$0.03	$0.01	$0.01	$0.00	$0.00	$0.00	$0.85
* Timberville, Town of	$5.41	$0.19	$0.09	$0.06	$0.03	$0.01	$0.01	$5.80
Staunton City	$105.78	$8.84	$0.82	$0.10	$0.80	$0.46	$0.67	$117.48
Waynesboro City	$95.88	$7.95	$1.45	$0.29	$0.56	$0.00	$0.07	$106.21
Total	$977.16	$68.20	$29.38	$5.39	$6.36	$1.76	$7.73	$1,095.99
All values are in thousands of dollars								

*Denotes town values that are also included in totals for the perspective County.

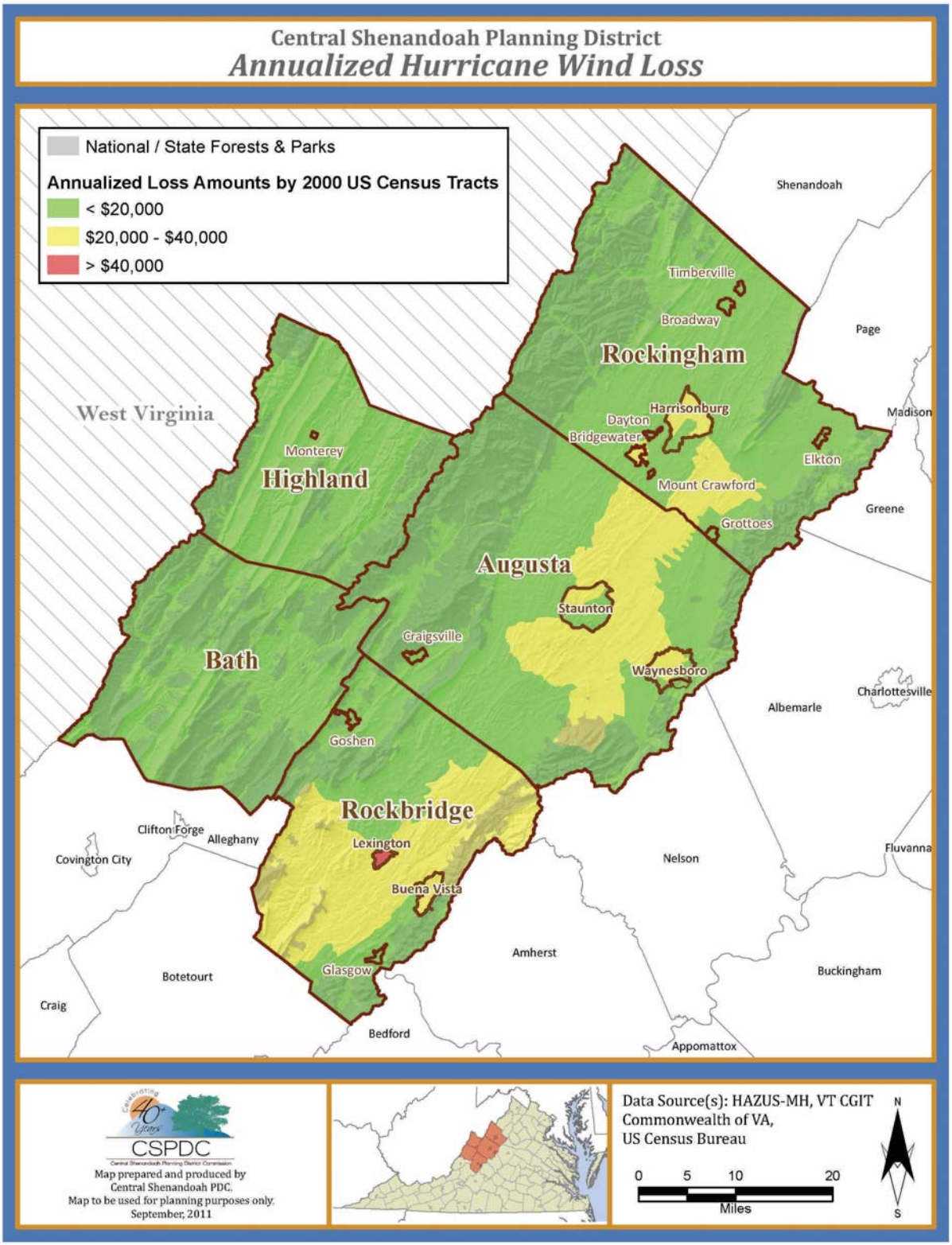

Figure 7 - CSPDC Annualized Total Hurricane Loss Estimate

6. Severe Winter Storm (High Ranking)

Hazard History

Listed below in Table 19 are major winter storm events that have occurred in the Central Shenandoah Planning District. Major events have been broken down by the date of occurrence and when available, by individual community descriptions. When no community specific description is available, the general description should be used as representing the entire planning area.

Table 19: CSPDC Severe Winter Weather Hazard History

Date	Description and Damages
1/28/1772	A severe snowstorm struck the Mid-Atlantic, dropping anywhere from 30-36 inches across the region. The storm became known as the "Washington and Jefferson" snowstorm because they were mentioned in both their diaries.
1/15/1831	Snows of over 13 inches fell on the Shenandoah Valley.
1/19/1857	Extreme cold hampered cleanup from a 12+ inch snowfall. The storm also brought high winds with the snowfall, and a prolonged period of near-zero temperatures froze all rivers in the state. Snowfall was steady for over 24 hours. Train service in the Valley was suspended for ten days. Two buildings belonging to the Central Virginia Railroad caught fire but it was so could the fire hydrants froze and there was no way to put out the fires.
1/18/1881	*Sleet and freezing rain fell all day and everything was coated with ice. Several citizens had injuries from falling. There were several collisions between sleds and horse-drawn coaches. To walk on the icy roads, people wrapped pieces of blanket around their feet.*
2/1899	The Great Arctic Outbreak and Great Eastern Blizzard brought the harshest winter conditions ever experienced to the region. Mail service was postponed, countless pipes burst and railroads were shut down, causing fear that coal supplies would run out. **Harrisonburg:** 14" of snow, temperature of -23°F recorded **Highland County:** temperature of -29°F recorded in Monterey **Lexington:** temperature of -9°F recorded, North River froze completely over **Rockingham County:** 30" of snow in parts of the county, temperature of -36°F recorded in Timberville, temperature of -32°F recorded in Edom, temperature of -40°F recorded in Brock's Gap **Staunton:** 18" of snow, temperature of -18°F recorded

Table 19: CSPDC Severe Winter Weather Hazard History (Continued)

Date	Description and Damages
1/14/1912	An Arctic cold wave struck the region with subzero temperatures. Across the area, water pipes froze, kitchen ranges exploded, trains were delayed, and thousands of birds and small animals died. **Harrisonburg:** temperature of -15°F recorded **Rockingham County:** temperature of -18°F recorded at Bridgewater, temperature of -18°F recorded at Dayton, temperature of -20°F recorded at McGaheysville **Staunton:** temperature of -25°F recorded. One man froze to death.
11/25/1938	An average of 6" of snow fell across the Shenandoah Valley. **Rockingham County:** Between 50 and 75 cars were stranded on Rt. 33. Many people were traveling during this Thanksgiving holiday weekend.
3/5-9/1962	A severe Nor'easter struck the entire east coast, dumping especially heavy snow on western Virginia. **Harrisonburg:** 20" of snow. **Lexington:** 20" of snow fell. **Rockingham County:** 27" of snow fell, stranding travelers overnight on U.S. Rt. 11 near Lacey Springs. **Staunton:** 26" of snow fell.
3/26/1978	An Easter weekend ice storm brought branches and whole trees crashing down onto power lines, with over 1" of ice accumulating in some places. Over 30,000 in the Shenandoah Valley were without power, and over 2,000 were without telephone service. Radio stations were knocked off the air and many basements were flooded.
2/11/1983	The Blizzard of '83 struck Virginia, dropping heavy snow with drifts up to 6 feet high. **Augusta County:** 18-20" of snow fell. **Harrisonburg:** 20" of snow fell. James Madison University and Eastern Mennonite University were closed, several tractor trailers jack-knifed on I-81. **Lexington:** 18" of snow fell. **Rockbridge County:** 15-24" of snow fell.

Table 19: CSPDC Severe Winter Weather Hazard History (Continued)

Date	Description and Damages
3/13/1993	The Storm of the Century struck the east coast, causing 4 feet of snow in some areas and drifts of up to 15 feet. One hundred and fifty (150) Americans lost their lives to the storm. In the Central Shenandoah Valley Region, the storm dropped between 12" and 22" of snow, with near hurricane-force winds creating drifts of 8' to 10' deep. Extremely low wind chills caused problems for farmers trying to feed livestock and drifts prevented farmers trying to move the animals to sheltered places. **Harrisonburg:** Roofs of 2 businesses collapsed under the weight of the 10' snow drifts. **Rockbridge County:** 12"-22" of snow fell and 5,000 people lost power. **Rockingham County:** 13"-22" of snow fell; winds of up to 70 m.p.h. caused drifts of 6'-7'. **Staunton:** 18" of snow fell and 200 people were without power. The National Guard was deployed in Staunton.
2/10 - 11/1994	A severe ice storm struck Virginia, bringing 1"-3" of solid ice, causing $61 million dollars in damage prompting the governor and President Clinton to declare the state a disaster area. Roads were treacherous across the Central Shenandoah Valley Region, where 24 out of the past 54 days had had winter precipitation.
1/6 - 13/1996	The Blizzard of 1996 struck the east coast, killing 40. The Governor declared a State of Emergency in Virginia, with the hardest hit area being the Shenandoah Valley, with over 40" of snow reported in areas of Shenandoah National Park. The Central Shenandoah Valley area reported an average of 28"-30" of snowfall. Local governments also declared states of emergency and all non-essential travel was banned. VDOT needed crawler tractors to plow the snow in higher elevations because the snow was too deep for regular plows. In Virginia, snow removal costs were estimated at 50 million dollars and another 7 million dollars was spent in repairs to damaged infrastructure. Dozens of hikers were stranded in the Shenandoah Valley. Eight hundred (800) persons throughout the State required shelter. **Highland:** 24"-30" of snowfall was reported. **Staunton:** The National Guard's humvees were used by rescue personnel to assist with emergency calls.






Table 19: CSPDC Severe Winter Weather Hazard History (Continued)

Date	Description and Damages
2/14 - 18/2003	*A complex storm system known as the "Presidents' Day Storm" dropped snow and sleet across the State of Virginia. In some places, schools were closed for a week. Across the northern Central Shenandoah Valley, 12 to 20 inches of snow and sleet fell. Across the southern Central Shenandoah Valley, 7 to 12 inches of snow and sleet fell.* ***Augusta County:*** *1.5 million dollars worth of damages reported. Barns and turkey sheds collapsed killing livestock. A 39 year old man died after sledding into the path of a car in Craigsville.* ***Bath County:*** *Received 5 to 8 inches of snow and sleet.* ***Highland County:*** *A turkey house collapsed near McDowell and killed 500 turkeys.* ***Rockingham County:*** *Twelve (12) chicken/turkey houses collapsed killing 37,000 chickens/turkeys. A dairy barn collapsed in Grottoes, killing one cow and injuring 17.*
2/12/2007	*Complex storm of snow and sleet. In Northwestern and Central Virginia, snowfall ranged from 1 - 7 inches with sleet between 1/10 and 3/4 of an inch. There were dozens of automobile accidents, including pileups of dozens of cars on Afton Mountain. The storm caused 22 deaths in the U.S. In the region, as many as 20,000 people lost power at the height of the storm. Ice was followed by gusty winds and bitter cold. Virginia Governor declared a State of Emergency for the State.* ***Augusta County:*** *Was hardest area hit in the Central Shenandoah Region and the County declared a local state of emergency.*

Table 19: CSPDC Severe Winter Weather Hazard History (Continued)

Date	Description and Damages
12/18 - 19/2009	*A strong area of low pressure tracked up the Mid-Atlantic Coast and tapped into moisture from the Gulf of Mexico and the Atlantic Ocean causing copious amounts of precipitation to develop. The severe winter storm that hit the Shenandoah Valley in December 2009 was one of the biggest snow falls in the past 13 years. Snow fall was recorded ranging from 18 inches to 28 inches of snow during the 2 day storm throughout the Valley. The Virginia State Police estimated the storm caused a 42% increase in calls for service. State Troopers responded to more than 4,000 traffic crashes and disabled vehicles. Officials reported only 2 traffic fatalities. Interstates 81 and 77 were hit the heaviest with traffic accidents.* ***Harrisonburg**: 13 inches of snow recorded.* ***Rockingham County**: Received up to 2 feet of snow.* ***Staunton:** Used 96' storm experience in preparation for 09' storm. They had had 20 people in the armory on stand-by to get people out of trouble. Biggest community problem was the amount of disabled vehicles on the road.*
2/5 - 10/2010	*Governor McDonnell declared Virginia in a state of emergency as the second severe storm of the season hit in February, dropping nearly 2 feet of snow throughout the state on February 5 - 6, 2010. This was followed by another system that dropped more snowfall on February 9 - 10, 2010. Gov. McDonnell assisted the state by deploying National Guard soldiers and emergency response teams. VDOT used up all $79 million budgeted for statewide snow removal and nearly exhausted their $25 million reserve. The National Weather Service described the storm as very heavy, wet snow with strong winds. Dominion Virginia power reported half of the 200,000 power outages came from the Charlottesville and Shenandoah Valley region, while Appalachian Power reported an additional 40,000 outages in the Valley. Virginia State Police responded to more than 2,000 traffic crashes and disabled vehicles along with 2 traffic fatalities.* ***Staunton** – accumulated 15 inches of snowfall.* *Augusta County - received 16 inches of snowfall.* ***Waynesboro** – accumulated 13.5 inches of snowfall.* ***Rockingham County** - received between 13 and 17 inches of snowfall. During the second snowfall, parts of Rockingham received an additional 6 inches.* ***Bath County** - totals were between 15 - 18 inches for both storms.*

Hazard Profile

Winter storms may include a variety of cold weather conditions such as heavy snowfall, extreme cold temperatures, freezing rain, sleet, ice, and high winds. Blizzards are a type of winter storm with high winds and considerable blowing snow. Winter storms may last from just a few hours to several days and affect our entire region. The impacts of winter storms include downed power lines and trees, hazardous walking and driving conditions, road closures, and business, government facilities and school closures. Health risks include hypothermia and frostbite if exposed to winter storm conditions and heart attacks due to overexertion. Winter storms are considered deceptive killers because most deaths are not directly related to the actual storm event. The leading cause of death and injury during winter storms is automobile accidents when freezing rain and sleet cause road surfaces to become extremely treacherous and dangerous to motorists. Other dangers related to winter weather and extreme cold include exposure, hypothermia, and asphyxiation due to improper use of heating systems. House fires occur more frequently in the winter months and during winter storms because of the use of alternative heating sources. Frozen water lines and limited access to waterlines poses a significant risk for fighting fires in the winter weather. Injury or death caused by chain-saw accidents and electrocution are also possible in the aftermath of the winter storm as residents try to remove fallen trees and power lines.

Winter storms also impact our economy. Public funds are generally associated with labor and equipment costs for snow removal, road clean -up and repair and utility restoration. Business losses are attributed to closures and the inability of employees and customers to travel. Electrical, communication and utility disruption also impact the private sector. Buildings may be damaged or destroyed when heavy snow loads collapse roofs. The agricultural economy can also suffer as a result of winter storms especially those that occur later in the season affecting crops and livestock.

Predictability and Frequency

Winter storms can be a combination of heavy snowfall, high winds, ice and extreme cold. These are classified as extra-tropical cyclones that originate as mid-latitude depressions. Winter weather impacts the Central Shenandoah between the months of November and April, with varied intensities from east to west. In order to create a winter weather hazard potential map that captures this variability, gridded climate data was obtained from the Climate Source and through the VirginiaView program. This data was developed by the Oregon State University Spatial Climate Analysis Service (SCAS) using **PRISM** (**P**arameter-elevation **R**egressions on **I**ndependent **S**lopes **M**odel). This climate mapping system is an analytical tool that uses point weather station observation data, a digital elevation model, and other spatial data sets to generate gridded estimates of monthly, yearly, and event-based climatic parameters.

PRISM data was selected for this analysis because it is an interpolation system that incorporates elevation fluctuation into the regression equations that are used to predict the gridded variation of each climate parameter. This winter weather risk assessment uses monthly normal precipitation, mean annual days with snowfall greater than 1 inch, and mean monthly snowfall PRISM data to develop snow and ice potential maps for the state. These datasets have been generated to incorporate topographic effects on precipitation, capture orographic rain shadows, and include coastal and lake effect influences on precipitation and snowfall. The monthly precipitation grid provides a 30-year climatological average of total precipitation in inches. The mean monthly snowfall grid provides a 30-year climatological average depth of freshly fallen snow in inches. The mean annual days map reveals the 30-year average of the number of days that a location will receive greater than 1 inch of snowfall in a 24-hour period in a given year.

A criterion of greater than 1 inch was selected for winter snowfall severity assessment because this depth will result in complete road coverage that can create extremely dangerous driving conditions and will require snow removal by the local community. This amount of snowfall in a 24-hour period can also lead to business closure and school delays or cancellation. Figure 8 shows the average number of days with snowfall greater than one inch for the state and Figure 9 shows the same for the Central Shenandoah PDC region. The average number of days with snowfall increases dramatically in the Shenandoah, Allegheny and Blue Ridge Mountain ranges bordering the counties of Highland, Bath, Augusta and a small portion Rockingham.

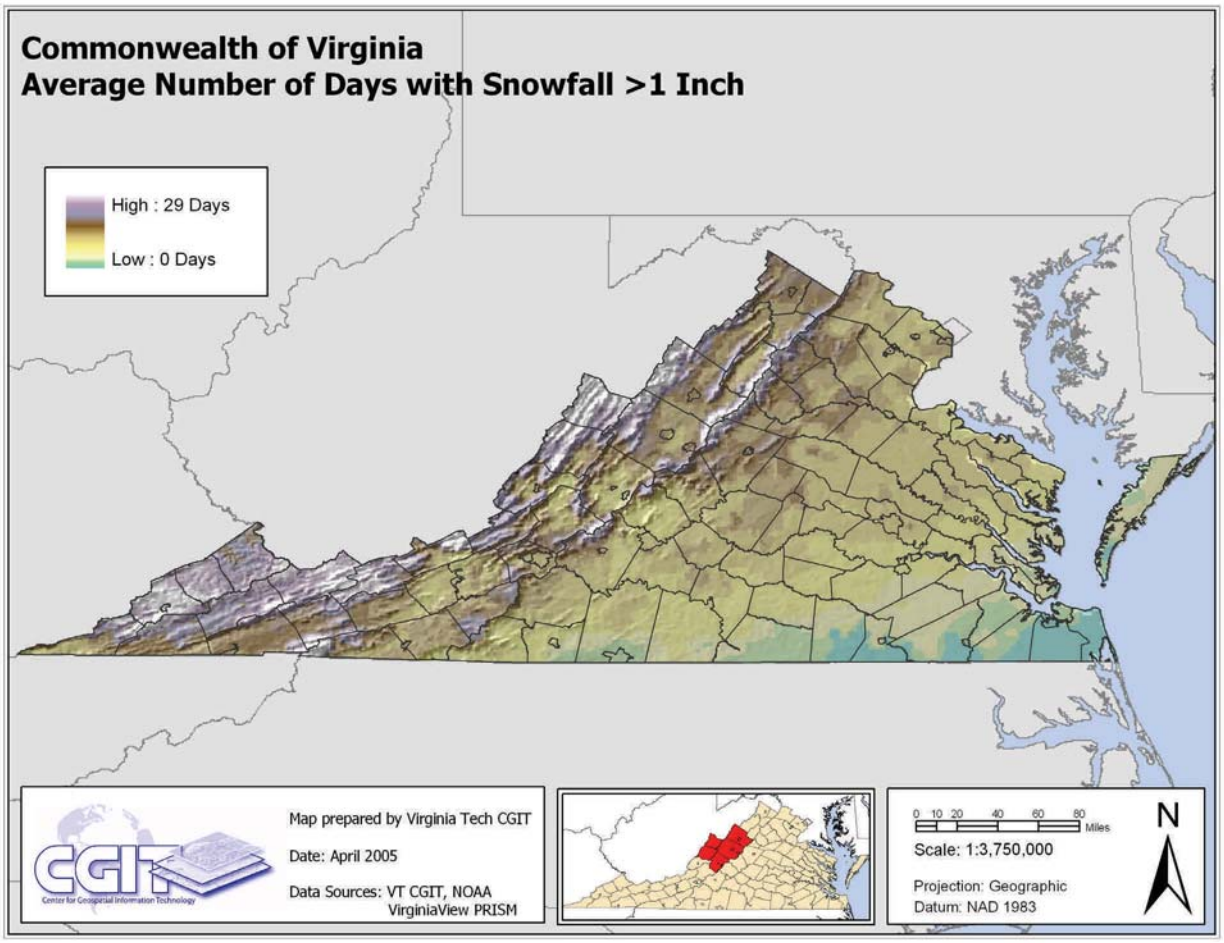

Figure 8 - Virginia Average Number Of Days With Snowfall > 1 Inch

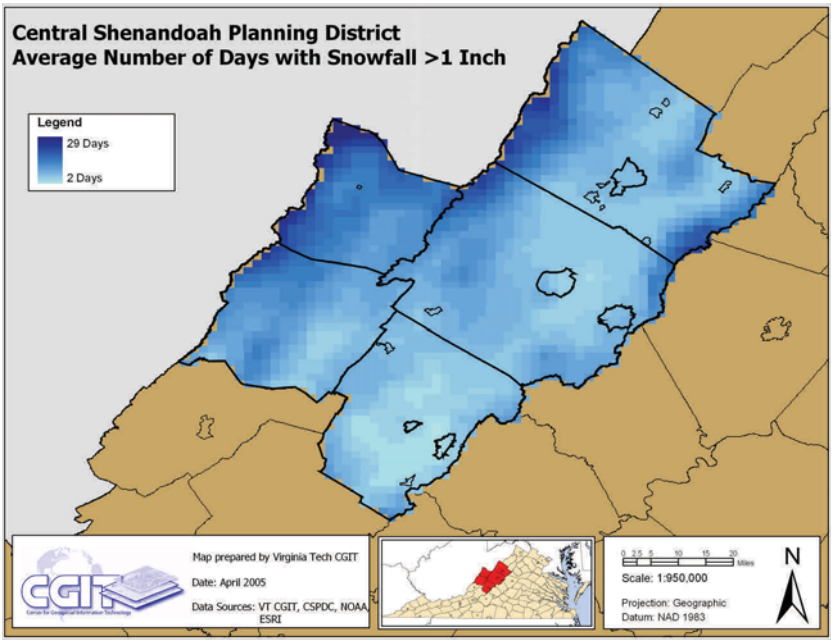

Figure 9 - CSPDC Average Number Of Days With Snowfall > 1 Inch

Ice Potential

Another challenge with winter weather in Virginia and the Central Shenandoah Planning District Region is the amount of ice that often comes as part of winter weather. Snowfall and ice potential are generated based on the percentage difference between the total precipitation from November to April and the corresponding liquid equivalent snowfall depth. Since snowfall is in a frozen state, it does not accumulate on the surface the same way that liquid rainfall would, in order to account for this difference, there are characteristic snow/rain relationships that have been created. For example, a value of 1 would mean that all of the precipitation at the location falls as liquid rainfall, and a value of 0.5 would mean that half of the precipitation falls as liquid rainfall and half falls as frozen precipitation. It is assumed that the lower the percentage, the greater potential that precipitation within these months is falling as snow. The values in the middle of the two extremes would represent regions that favor ice conditions over rain and snow. A five quantile distribution was applied to the output statewide grid to split the percentages into five characteristic climatological winter weather categories (snow, snow/ice, ice, rain/ice, and rain). Figure 10 shows the statewide map and Figure 11 shows the Central Shenandoah PDC Regional Map. Rockbridge County and parts of Bath and Rockingham Counties receive a mixture of the different types of winter weather.

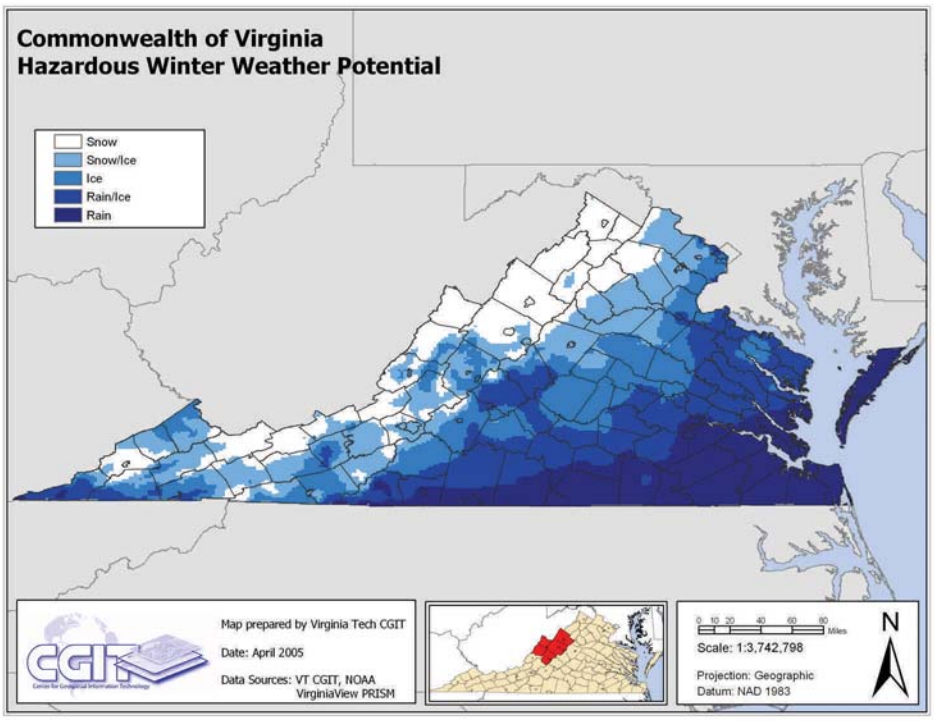

Figure 10 - Virginia Hazardous Winter Weather Potential Based On LEQ Precipitation

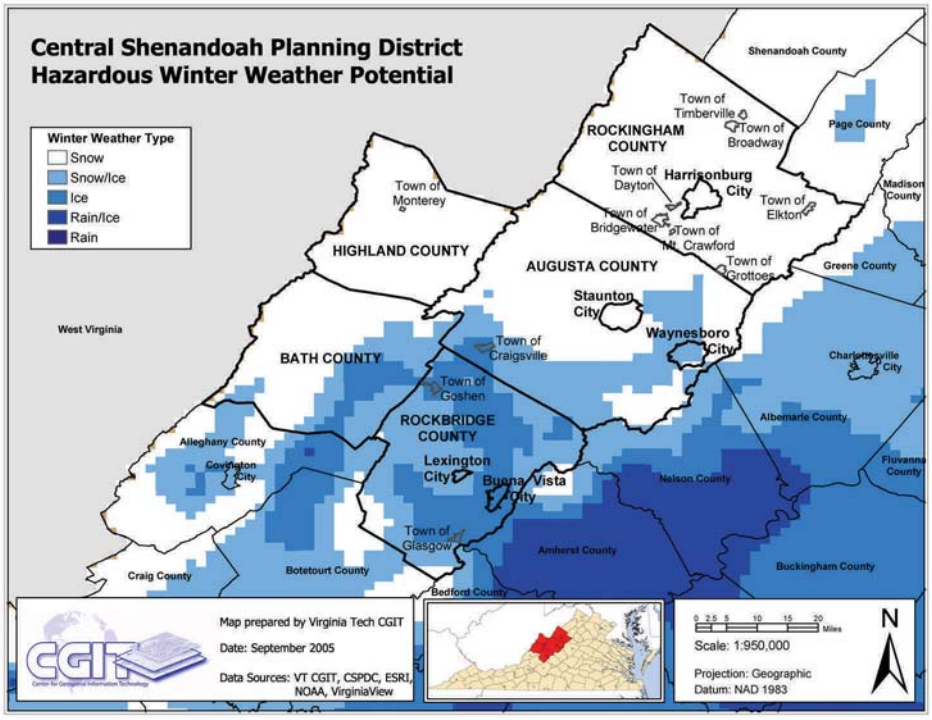

Figure 11 - CSPDC Hazardous Winter Weather Potential Based On LEQ Precipitation

Vulnerability Analysis

Figures 9 and 11 show the relative overall winter weather and ice potential for the Central Shenandoah Region. Figure 12 and 13 show relative risk or vulnerability based these previous maps. These were developed by assigning a high risk to those census blocks within the regions with the greatest potential for snowy days (> 1 in of snow) or ice. Division into high, medium and low were based on the levels predicted from potential maps. Tables 20 and 21 show the population in each county impacted by the overall snowfall and ice risks. Highland County has the highest relative snowfall risk, followed by Rockingham County. Rockbridge County has the highest relative ice potential for the region. Future revision of this plan will need to develop a method to calculate the potential loss from these winter storms. Note Tables 20 and 21 indicate the town populations impacted; the county totals include the populations of the towns. Future revision of this plan will need to develop a method to calculate the potential loss from these winter storms.

Relative snowfall risk (Figure 12) illustrates Highland County and the Town of Monterey with the highest relative potential for snow, followed by a band of medium snow potential in the counties of Rockingham, Augusta and Bath and in the Town of Craigsville. The southeast portion of the county has a relatively low potential for snow, with the exception being the eastern portion of Rockingham County and the Town of Grottoes.

Relative ice risk (Figure 13) characterizes the region as low and medium potential for receiving ice as the dominant type of winter weather. Areas with medium potential for ice are clustered around Rockbridge and Augusta Counties, including the cities of Lexington, Waynesboro and Buena Vista and the towns of Goshen and Glasgow.

The winter weather mapping resolution does not support town based analysis, since most towns in the CSPD would be represented by one or two pixels at this resolution. As weather data has better spatial resolution in the future, the ability to create practical town based analysis will be improved. While Tables 20 and 21 show town based vulnerability, the analysis method was designed to derive broad regional vulnerability comparisons, not pinpoint location comparisons. Also, the nature of winter storm preparedness and impact cannot be represented with snow or ice potential maps.

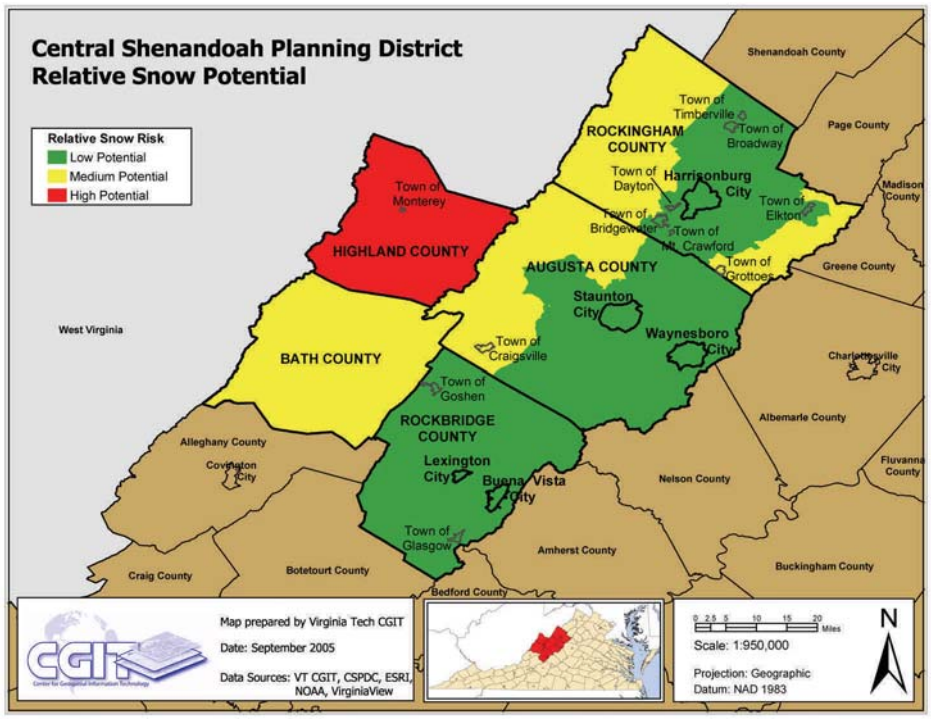

Figure 12 - Central Shenandoah PDC Snowfall Relative Risk

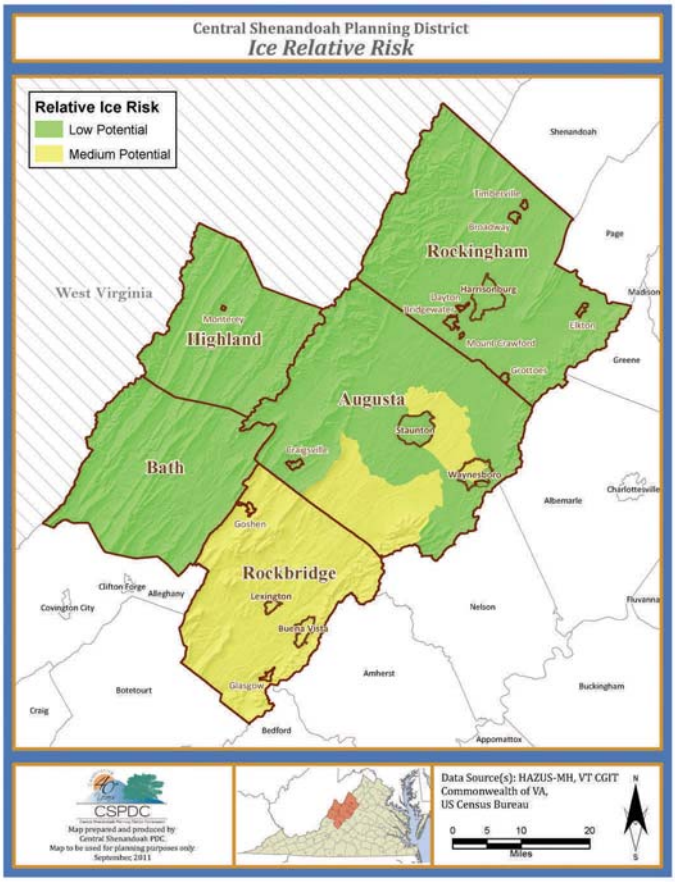

Figure 13 - Central Shenandoah PDC Relative Ice Risk

Table 20: Central Shenandoah PDC Population Snowfall Relative Risk

Community	Low	Medium	High
Augusta County	61,222	7,781	0
*Craigsville, Town of	0	812	0
Bath County	0	5,083	0
Buena Vista City	6,305	0	0
Harrisonburg City	43,104	0	0
Highland County	0	0	2,566
*Monterey, Town of	0	0	222
Lexington City	6,830	0	0
Rockbridge County	21,732	0	0
*Glasgow, Town of	1,140	0	0
*Goshen, Town of	366	0	0
Rockingham County	50,999	18,844	0
*Bridgewater, Town of	3,918	0	0
*Broadway, Town of	1,209	0	0
*Dayton, Town of	921	0	0
*Elkton, Town of	1,935	0	0
*Grottoes, Town of	0	1,455	0
*Mt. Crawford, Town of	228	0	0
*Timberville, Town of	1,596	0	0
Staunton City	23,519	0	0
Waynesboro City	20,120	0	0
Total	233,831	31,708	2,566

*Denotes town values that are also included in totals for the perspective County.






Table 21: Central Shenandoah PDC Population Ice Relative Risk

Community	Low	Medium	High
Augusta County	61,222	7,781	0
*Craigsville, Town of	*812*	*0*	*0*
Bath County	5,083	0	0
Buena Vista City	0	6,305	0
Harrisonburg City	43,104	0	0
Highland County	2,566	0	0
*Monterey, Town of	*222*	*0*	*0*
Lexington City	0	6,830	0
Rockbridge County	0	21,732	0
*Glasgow, Town of	*0*	*1,140*	*0*
*Goshen, Town of	*0*	*366*	*0*
Rockingham County	69,843	0	0
*Bridgewater, Town of	*3,918*	*0*	*0*
*Broadway, Town of	*1,209*	*0*	*0*
*Dayton, Town of	*921*	*0*	*0*
*Elkton, Town of	*1,935*	*0*	*0*
*Grottoes, Town of	*1,455*	*0*	*0*
*Mt. Crawford, Town of	*228*	*0*	*0*
*Timberville, Town of	*1,596*	*0*	*0*
Staunton City	23,519	0	0
Waynesboro City	4,952	15,1680	0
Total	**188,450**	**79,655**	**0**

*Denotes town values that are also included in totals for the perspective County.

7 – Land Subsidence & Karst (Medium Ranking)

Hazard History

Because sinkholes caused by karst are very site-specific and often occur in undeveloped areas, there is no existing long-term record for our region or for Virginia. Although, during the past 30 years, in VDOT's Staunton district that covers the Shenandoah Valley, with Harrisonburg at its center, 350 sinkholes have threatened roads in the district. However, in recent years there have been a number of sinkholes reported on Interstate 81 which runs through our region along a karst line. Over a two-year period, there were six sinkholes on Interstate 81 and secondary roads in our region costing VDOT an average of $15,000 per event to repair. A few other occurrences are included in Table 22.

Table 22: Central Shenandoah PDC Karst And Land Subsidence Hazard Histories

Date	Damages
8/11/1910	**Staunton:** Three sinkholes opened up on Lewis and Baldwin Street and Central Avenue. One of the sinkholes was so large that it swallowed a 35-foot maple tree and a house. Parts of other houses also fell into the sinkhole, and one worker was killed when he fell into one of the chasms caused by the sinkhole as it was being repaired.
4/16 - 8/4/1961 *2/27 - 4/?/1962* *3/2 - 22/1963* *11/21/1972* *4/2/1982* *4/12/1983*	*Incidences of sinkholes opening up in the Town of Timberville.*
Spring, 2000	Thirty-two sinkholes were reported after 7" of rain fell in April after a long dry spell. **Staunton:** Sixteen landslides occurred along Staunton District roads.
3/2001	**Augusta County:** Interstate 81 was closed for a nine-mile stretch due to the sudden appearance of three sinkholes. The largest sinkhole measured 20 feet long, 11 feet wide and 22 feet deep, costing over $100,000 to repair.
10/28/2001	**Staunton:** A 45-feet deep sinkhole opened up in downtown Staunton on Lewis Street.
10/7/2005	*Sinkhole opened up in Town of Timberville.*

Hazard Profile

Karst topography can be described as a landscape formed over limestone, dolomite, or gypsum, and characterized by sinkholes, caves, and underground drainage. Because of our mountainous terrain, much of our Region is karst and characterized by the presence of sinkholes, sinking streams, springs, caves, and solution valleys.

Occasionally the land surface in karst regions may collapse creating sinkholes. Sinkholes are classified as natural depressions of the land surface and caused when the acidic groundwater dissolves the surrounding geology. Most of these events are triggered by man's activities in the karst environment. Excessive pumping of groundwater from karst aquifers may rapidly lower the water table and cause a sudden loss of buoyant forces that stabilize the roofs of cavernous openings. Man-induced changes in surface water flow and infiltration also may cause collapse. Most sinkholes that form suddenly occur where soil that overlies bedrock collapses into the pre-existing void. Sinkholes can cause damage to bridges, roads, railroads, storm drains, sanitary sewers, canals, levees, and private and public buildings. Another problem associated with karst topography is its impact on the aquifers and groundwater contamination. The greatest impact is where polluted surface waters enter karst aquifers. This problem is universal among all karst that underlie populated areas. The groundwater problems associated with karst are accelerated with the advent of (1) expanding urbanization; (2) misuse and improper disposal of environmentally hazardous chemicals; (3) shortage of suitable repositories for toxic waste (both household and industrial); and (4) ineffective public education on waste disposal and the sensitivity of the karstic groundwater system.

Hazard Areas

A majority of the karst regions in Virginia follow Interstate 81, as seen in Figure 14, running northeast to southwest through Augusta County, Harrisonburg City, Rockingham County, Staunton and Waynesboro Cities and Rockbridge County. Figure 14 denotes the locations in the Planning District that are more susceptible to karst hazards. These areas are broadly defined and mapped with a general understanding of karst hazard risks. A more detailed study would be required to determine the actual vulnerable structures at individual sites within these risk areas.

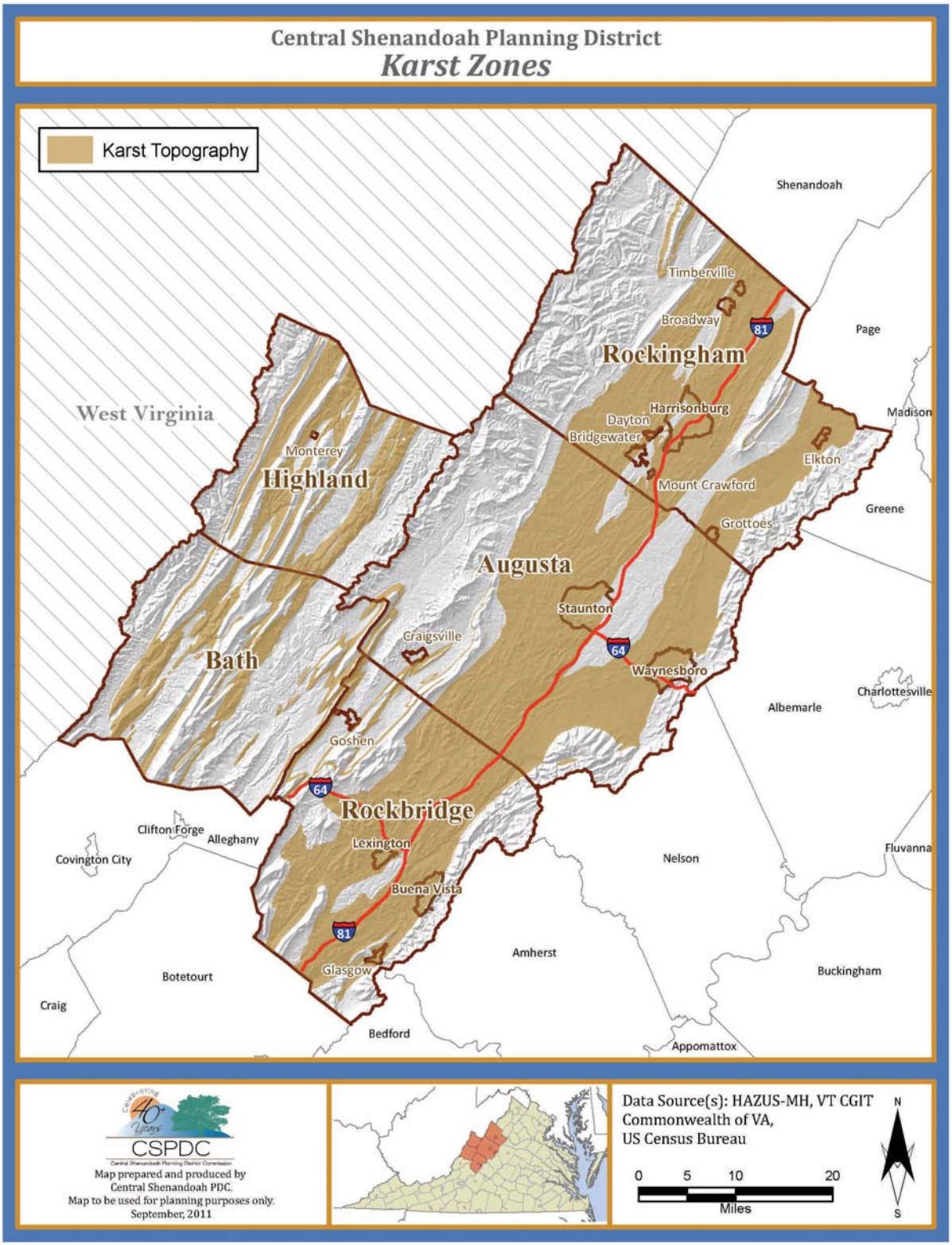

Figure 14 - Central Shenandoah PDC Karst Zones

Vulnerability Analysis

Table 23 illustrates the number of critical facilities and populations in the mapped karst zones. Augusta County (32%) and Staunton City (16%) have the largest amount of critical facilities in karst zones, while Rockingham County (31%), Augusta County (22%) and Harrisonburg City (21%) have the largest amount of the total population in karst zones.

Table 23: CSPDC Population And Critical Facilities Near Mapped Karst Zones

Community	Population In Karst Zones	Critical Facilities Near Karst Zones
Augusta County	39,276	163
Bath County	3,922	9
Buena Vista City	2,873	20
Harrisonburg City	38,582	28
Highland County	956	14
Lexington City	3,496	26
Rockbridge County	11,702	55
Rockingham County	56,031	53
Staunton City	14,996	81
Waynesboro City	10,421	65
Total	182,255	514

8. Tornado (Medium Ranking)

Hazard History

Throughout its history, the Central Shenandoah Region has experienced several tornadoes. While not as common as flooding or winter storms, tornadoes have caused fatalities, personal injuries, and property damage in the Region. Tornadoes that have struck this area range from F0 (Weak, with 40-72 mph winds) to F2 (Strong with 113-157 mph winds) and are usually associated with severe thunderstorms. Table 24 details major tornado events in the CSPDC.

Table 24: Tornado Hazard History

Date	Location	Magnitude	Description and Damages	Interesting Facts
6/14/1834	Rockbridge Co.	N/A	Wind/hail most destructive to residents within their memory. Damage path 18 miles long and 16 miles wide. Trees were flattened and windows broken.	Hail was "hen egg" size, measuring 8 - 9 inches in diameter.
6/4/1911	Staunton and Augusta County (Possibly started in Mt. Solon area, blew s. east to Staunton where it zigzagged north and east also hit Greenville, Fishersville, and Verona from Augusta it crossed into Nelson and Amherst Cos.)	N/A	Damage path was 30 miles long and 7 miles wide – shaped like an hour glass. Hail ranged in size from marbles to goose eggs. Windows broken. People were injured but no fatalities. Water damage to houses. Roofs blown off. Barns destroyed. Crops damaged. Many people caught outdoors on Sunday afternoon outings. Staunton property loss $25,000 - $50,000. County crop loss $1 million. Turkeys/ chickens killed at farms. Boy Scouts helped clean up damaged houses. Four carloads of glass were sold to replace broken windows in Staunton.	"A handsome Persian cat belonging to Miss Florence Parrent was struck by lightning, and its tail hairs singed. Tabby was badly scared but not badly hurt" - Staunton News Leader 6/5/1911 Cover page
9/22/1921	Augusta Co. (1 mi. w. of Mint Springs - moved to Barterbrook)	F2	Damage path 5 miles long and 100 yards wide. Damage amounts not known. No reports of fatalities. Mother and child were severely injured when their home was destroyed and scattered ½ a mile.	

Table 24: Tornado Hazard History (Continued)

Date	Location	Magnitude	Description and Damages	Interesting Facts
5/2/1929 "Virginia's Deadliest Tornado Outbreak"	Bath Co.	N/A	Bath County in Cowpasture Valley. Valley at an elevation of 1500 feet. 10 people were injured but no one was killed. Trees damaged, roof blown off, barns destroyed, 2 people injured in Bath Co. 2 schools damaged here but students had been released. Several homes and a church at Nimrod Hall destroyed. Weather turned cold and snow fell after the storm. "In some places, where a house, a barn, a garage or other building stood, there is only a bare spot to indicate where a structure stood, not even a splinter of the building being left." – Lexington News-Gazette 5/7/1929	Storm swept across 12 states from Florida to Missouri to VA more than 200 injured and approx. 40 killed in U.S. (22 in VA). Five tornadoes in VA that day. 22 people killed and over 150 injured. $1/2 million in damages. 4 schools destroyed including one school at Rye Cove in Scott County where 12 children and 1 teacher were killed and 42 injured.
4/5/1952 (2 tornadoes that day)	Augusta Co. & Rockingham Co.	F2	Augusta Co. tornado tracked 1 mile and had a damage path 150 yards wide. No fatalities and 2 people injured. Rockingham: Damage path 4.9 miles long and 100 yards wide. No damage amounts known.	
4/28/1959	Highland Co.	F1	Damage path not known. Damage to property estimated at $2,500.	
7/1/1959	Augusta Co.	F1	Tracked 11.3 miles with a damage path of 100 yards. No fatalities or injuries. Damage to property was $25,000.	
8/6/1960	Rockingham Co.	F2	Damage path unknown. There were no injuries. Damage amounts to property were $25,000.	
11/29/1963	Augusta Co.	F2	Damage path was one mile long – width not known. No fatalities or injuries. A house under construction was leveled and the roof came off another house. Damage estimated at $50,000.	
4/4/1974 "Super Outbreak"	Augusta Co. Staunton Bath Co. Highland Co.* *Possible touchdown in Big Valley area.	F2 in Augusta	In Augusta Co., tornado struck near Westview, moved n. east to Weyers Cave. Damage path was 18 miles long and 200 yards wide. Blew over 90 barns, destroyed 2 homes, damaged 4 homes, outbuildings and a school. Verona area hit hard. Ft. Defiance High School lost part of the roof. Augusta Co. damage - $2.5 million. Roof damage to Staunton City Hall. In Bath Co., Bacova Junction and Millboro were affected. Millboro – roofs blown off, windows broken, barns damaged.	These tornadoes were the last of the Super Outbreak which totaled 148 tornadoes over 2 days. Most of the tornadoes were recorded in a 24 hour period. Outbreak affected 13 states. The average path length of the tornadoes was 18.7 miles. Six of the tornadoes were F5s. 330 people died in the U.S. 2 deaths in VA. 19 counties in VA were hit with thunderstorms or tornadoes .

Table 24: Tornado Hazard History (Continued)

Date	Location	Magnitude	Description and Damages	Interesting Facts
6/5/1975	Augusta Co. & Rockbridge Co.	F0	Tornado struck near Lyndhurst. The weak tornado tracked .2 miles with a damage path of 30 yards wide. Destroyed a small building and 25-30 trees. Damage estimated at $2,000. No deaths or injuries. Tornado struck near Collierstown – damaged trees and fences. Damage estimated at $1,000.	
8/15/1975	Rockingham Co.	F1	Tornado struck Melrose area which is 6 miles NW of Harrisonburg. Damage path 1 mile long and 27 yards wide. No injuries. Tornado overturned a trailer, ripped off a roof, and carried away outbuildings. Damages $25,000.	
10/2/1979	Town of Dayton	F1	Damage path 1.1 miles long and 37 yards wide. No injuries. Snapped off tree tops and utility poles, broke windows. Flipped an unoccupied trailer. Damages $25,000.	
5/4/1990	Augusta Co.	F2	Damage track was 7 miles long and 27 yards wide. Hit Augusta Springs and Swoope. Tornado tracked a mile through community of Augusta Springs. Lifted 2500 feet over mountains and set back down again on other side. 2 people killed in mobile home in Swoope. 3 injured in Swoope and 7 injured in Augusta Springs. Damages were 2.5 million dollars.	The tornado formed in a thunderstorm along a warm front well out ahead of the expected threat area.
6/10/1995	Waynesboro & Augusta Co.	Strong F2 F1 - F2	Touched down on west side of Waynesboro. Tracked 3.5 miles through the County and southwest portion of the City. Damage path averaged 300 yards wide. No deaths or injuries. Hit industrial area, peeling off roofs and damaging 15-20 homes. Damages = $2 million.	Tornado flipped a 22.5 ton crane and mowed down over 100 pine trees in a park. Quarter sized hail accompanied the storm.
6/24/1996	Town of Broadway	F1	Damage path was .5 miles long and 100 yards wide. No injuries. Tornado tore roofs off 2 homes and 2 poultry houses. Damaged trees. Damage estimates $40,000.	Several chimney's were blown of homes.
7/11/1999	Harrisonburg & Rockingham Co.	F0	Damage path was .1 mile long and 15 yards wide. No injuries. Damage to a store's tin roof and shingles on a home. Damages estimated at more than $2,000.	

Table 24: Tornado Hazard History (Continued)

Date	Location	Magnitude	Description and Damages	Interesting Facts
7/31/1999	Augusta Co.	F1 (Small land spout or tornado)	Struck 5 miles east of Staunton. Damage path .1 mile long and 100 yards wide. Destroyed a barn, damaged a greenhouse, and took down trees. No injuries. Damage estimates: $15,000. Storm produced 3/4 inch in diameter hail.	A 100 pound beam from a barn roof was buried in the ground and the roof rolled into a ball by the force of the wind.
5/9/2003	*Augusta Co.*	*F0*	*A weak tornado touched down in Verona, then moved southeast to Hermitage. Tornado downed a 195-foot radio tower. The path of the tornado was 5 miles long and 100 yards wide. Storm also downed trees in New Hope and produced hail near Mt. Solon.*	
8/2/2008	*Town of Elkton*	*EF0*	*Tornado touched down on the banks of the South Fork of the Shenandoah River along Park Avenue. The tornado's path was 1/4 mile long and 70 yards wide. This series of strong thunderstorms also produced large hail.*	*Witnesses spotted swirling wind and a funnel cloud.*
4/16/2011	*Augusta Co.* *Rockbridge Co.*	*EF1* *EF0*	*Please See Storm Report That Follows*	

April 16, 2011, Storm Report

On April 16, 2011, a devastating storm system made its way across the United States. Originating over the Pacific Ocean, it intensified early morning in Oklahoma, then tracked its way eastward over Arkansas, Mississippi, Alabama, and Georgia, finally settling overtop of North Carolina and Virginia. The storm developed as expected in the Midwest. Overnight, it merged into a fast-moving cold front crossing over Arkansas into the Mississippi River Valley. It drew in warm day-time air, strengthening even more as it drew closer to the East Coast, hitting North Carolina the hardest.

The storm claimed its first 5 lives Thursday night in Oklahoma. Authorities have reported that 7 more died in Arkansas, 7 in Alabama, 2 in Oklahoma, and 1 in Mississippi. It was one of the deadliest storms in recent history. Weather service officials reported more than 240 tornadoes battered 15 states and took at least 44 lives. 62 tornadoes and nearly half of recorded deaths were reported in North Carolina alone. Meteorologist Scott Sharp of Raleigh said, "The conditions that allowed for the storm, occur on the Great Plains maybe twice a year, but they almost never happen on the east coast."

Bertie, North Carolina saw the most devastation, recording 11 deaths during Saturday's storm. Bladen County deaths included a 92-year-old father and his 50-year-old son as they were thrown from their mobile home in the Town of Ammon. In the Northeast portion of Raleigh, 3 children were killed as tornado knocked a tree over, crushing their mobile home. Their six-month old sister is in critical condition. One volunteer helping clean in the aftermath was Iraq veteran, Zee Lamb. Lamb quoted, "I did two tours of duty in Iraq and the scene was worse than I ever saw over there." In Sanford, North Carolina, a Lowe's home improvement store was completely leveled. More than 100 employees and customers crammed shoulder-to-shoulder seeking a safe haven as it ripped through the store. "You could hear all the steel ripping. People screaming in fear for their lives," store manager, Hollowell told the Associate Press. Fortunately, everybody made it out alive.

April 16, 2011 Storm Report (Continued)

Flooding In Elkton As A Result Of The Storm

Hayes Creek
In Rockbridge County

On Tuesday, April 19, 2011, President Obama declared North Carolina a "state of disaster" after being pushed to do so by North Carolina's Governor Purdue. His disaster declaration clears the way for North Carolina to start receiving federal aid money. Federal aid money includes grants for temporary housing and home repairs, low-cost loans to cover uninsured property losses, and programs to help individuals and business owners recover from the effects of the disaster. Statewide, 440 homes and 21 businesses were completely destroyed, and another 92 business were badly damaged. State officials estimated that Saturday's storm produced at least $65 million worth of damage in Wake County alone. Upon further review, State officials estimate that number may increase upwards of $100 million. President Obama's actions make funding available for counties including: Bertie, Bladen, Cumberland, Halifax, Harnett, Johnston, Lee, Onslow, Wake, and Wilson.

Governor Bob McDonnell declared Virginia in a state of emergency on April 17, 2011. This allowed state agencies to aid local efforts in responding to impacts occurred during the severe weather system. Ten tornadoes were confirmed ranging in severity. The National Weather Service confirmed tornadoes landing in Augusta, Dinwiddie, Halifax, Loudoun, Middlesex, Isle of Wight, and Rockbridge counties.

Seven hundred and seventy-three (773) private structures were reported damaged. Eighty-two (82) of those were completely destroyed and 156 of them having major damage. Dominion Virginia Power reported that tens of thousands of households lost electricity that night but by early Sunday, that number was reduced to approximately 5,300, most remaining outages were located in Gloucester County.

Seven Virginian's died as a result of the storm. Officials identified 2 people dead in Gloucester after driving their car into a flooded roadway and 2 more in Waynesboro. The 2 in Waynesboro consisted of an 8 year old girl and a 41 year old woman as they attempted to cross Rockfish Run Creek. A 9 year old boy was also swept away by fast moving water and fortunately was rescued by an unidentified man. A Wythe County resident died when a tree tumbled over his mobile home. The last storm related deaths are being investigated in Page County and one more reported in Gloucester. Thirty-six (36) storm-related injuries were also reported.

The most powerful was the lethal twister that went through Gloucester County. Weather service officials reported this tornado to have winds in excess of 165 mph. The Department of Emergency Management spokesman Bob Spieldenner reported that the Gloucester tornado "ripped across more than 12 miles, uprooting trees, leveling homes and claiming lives." Officials said the tornado also ripped the roof off Page Middle School and destroyed part of the building, as well as overturned school busses and cars. Gloucester County Resident, Christie Matthews, reported her home was at least 50 yards from its original position. Matthews broke two vertebrae in her spine and her boyfriend was flown to Newport News for surgery. Luckily her children escaped with just minor scratches. (Continued)

Fallen Tree On House
In Stuarts Draft As The Result Of
4/16/11 Tornado

April 16, 2011 Storm Report (Continued)

In Rockbridge County, National Weather Service Officials confirmed that a tornado touched down near Vesuvius. It caused minor damage to a barn and house, as well as slightly moving another barn off its original foundation. Multiple trees were snapped down as well. The twister left a path about 100 yards wide and 1.3 miles in length. Wind speeds were estimated at approximately 80 mph. Rockbridge also experienced 3.5 inches of rain and large hail for about three hours around midday. In Glasgow, the Maury River reached near flood stage at 18 feet while the James River crested below flood stage. As many as 33 roads were closed due to high waters and fallen trees, the worst being Va. Route 631, Furrs Mill Road. A swift water rescue was required to retrieve two women and two small children whom were stranded in a van. Mud and silt from the river water caused extremely slick driving conditions. In all, approximately 350 Dominion Power customers lost power following Saturday's storm in Rockbridge County.

A F1 tornado reaching wind speeds in excess of 95 mph ripped through 4 miles in Augusta County Saturday evening. Many trees were snapped down, barns were demolished and trailer was flattened following the storm. The City of Waynesboro closed down nine roads late Sunday afternoon with three inches of rain still toppling over. The South River was pushed to its flood limit between 10 and 10.5 feet in Waynesboro. The City of Staunton recorded 1.6 inches of rain. Stuarts Draft also suffered substantial damage following the April 8th storm. The tornadoes winds reached a max speed of 95 mph, uprooting trees and destroying local structures. All in all, the County estimated $3.1 million dollars in damage.

Hazard Profile

Damaging winds typically are associated with tornadoes or landfalling hurricanes. Isolated "downburst" or "straight-line" winds associated with any common thunderstorm can also cause extensive property damage.

Tornadoes are classified as a rotating column of wind that extends between a thunderstorm cloud and the earth's surface. Winds are typically less than 100 mph, with severe tornado wind speeds exceeding 250 mph. The rotating column of air often resembles a funnel shaped cloud. The widths of tornados are usually several yards across, with infrequent events being over a mile wide. *Tornadoes and their resultant damage can be classified into six categories using the Enhanced Fujita Scale. This scale assigns numerical values for wind speeds inside the tornado according to increasing degrees of damage. The Enhanced Fujita Scale replaced the original Fujita Scale in 2007. It was standardized to add more types of structures to determine the degree of damage as well as accounts for variables such as construction quality. Most tornadoes are EF0 and EF1, resulting in little widespread damage.*

Tornado activity normally spans from April through July but tornadoes can occur at any time throughout the year. In Virginia, peak tornado activity is in July. Hot, humid conditions stimulate the tornadoes growth.

Strong tornadoes may be produced by thunderstorms and often are associated with the passage of hurricanes. On average, about seven tornadoes are reported in Virginia each year. The total number may be higher as incidents may occur over areas with sparse populations, or may not cause any property damage.

Tornadoes also produce hail. Hailstorms are also outgrowths of severe thunderstorms. During summer months, when the difference between ground and upper level temperatures is significant, hail may develop. The size of the hailstones is directly related to the severity and size of the storm. Hail is described as chunks of ice, often in a spherical or oblong shape, that are produced by thunderstorms. The size of the hail greatly affects the magnitude or severity of damage. Storms can produce hail from as small as ¼ inch in diameter to up to 4 ½ inches. Depending on the size of hail determines the potential damage.

Tornado damage is computed using the Enhanced Fujita Scale, as shown in Table 25. Classification is based on the amount of damage caused by the tornado, where the measure of magnitude is based on the impact.

The classification of the tornado gives an approximate depiction of what the corresponding damage of the tornado will be. Because there are so few recorded tornados for the CSPDC, statewide tornado statistics provide some additional information on likely past occurrence breakdown by Fujita Scale/*Enhanced Fujita Scale* and some indication of future occurrence. A majority of Virginia's tornadoes are F0 and F1 on the Fujita Scale/*Enhanced Fujita Scale*, shown in Table 26, which result in minimal extensive damage.

Table 25: Enhanced Fujita Tornado Intensity Scale

Classification	Max. Winds (mph)
EF0	*65 - 85*
EF1	*86 - 110*
EF2	*111 - 135*
EF3	*136 - 165*
EF4	*166 - 200*
EF5	*Over 200*

Table 26: Virginia Tornado Statistics 1950 - 2001

Fujita Scale	Class.	MPH	Damage Description	# in VA	%	Deaths/ Injuries	Damages
F0	Weak	40-72	Light damage. Tree branches snapped; antennas and signs	99	26	0 / 0	7
F1	Moderate	73-112	Moderate damage. Roofs off; trees snapped; trailers moved	186	50	1/85	57
F2	Strong	113-157	Considerable damage. Weak structures and trailers demolished; cars blown off road.	66	18	3/72	75
F3	Severe	158-206	Roofs and some walls torn off well constructed buildings; some rural buildings demolished; cars lifted and	23	6	19 / 102	140
F4	Devastating	207-260	Houses leveled leaving piles of debris; cars thrown some	2	0.1	4 / 248	50
F5	Incredible	261-318	Well built houses lifted off foundation and disintegrated with debris carried some distance.	0	0	n/a	n/a

Figure 15 shows tornado occurrence in the Central Shenandoah PD Region. Since tornadoes are so infrequent for the Region, the Hurricane Wind analysis covers more probable high wind occurrences. Sixteen tornados have been recorded for the CSPDC region during 1950 through 2004. It is also interesting to note that there are no recorded tornados in the national forests and parks. This is a result of tornados only being recorded when impacts affect people or property. Some areas in the Region appear to be slightly more prone to tornadoes than others. It is thought that this is caused by topographical influences on thunderstorms such as the change in low-level wind flow and humidity caused by the orientation of the mountains. One such area is the southern Shenandoah Valley near the cities of Staunton and Harrisonburg. It should be noted that areas with denser population are more likely to report a tornado than less populated areas.

While the tornadoes that have occurred in the Central Shenandoah Region do not compare to the numbers or strength of the tornadoes that have touched down in tornado alley in the Midwestern United States, they have caused large amounts of property damage, many personal injuries, and a few fatalities. The tornadoes that the Region does experience are most frequently spawned from thunderstorms and have little to no warning time. Tornadoes did affect the Central Shenandoah Region in two significant events, Virginia's Deadliest Tornado Outbreak in 1929 and the Super Outbreak of 1974. The potential for similar tornadoes in the future is certain.

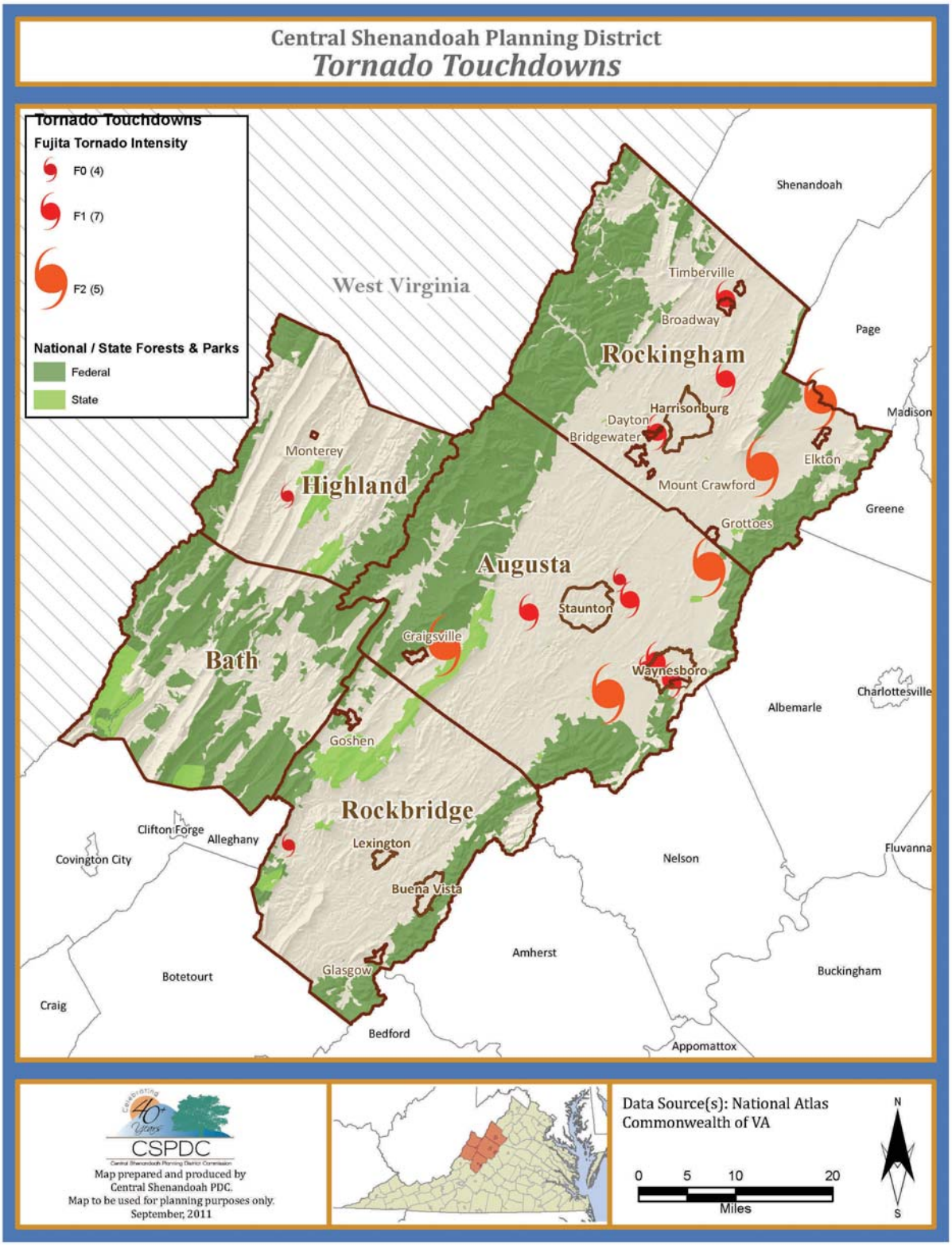

Figure 15 - Central Shenandoah PDC Tornado Touchdowns

9. Wildfire (Medium Ranking)

Hazard History

The Virginia Department of Forestry (VDOF) website provided fire incidence data for fire years 1995-2001. The data provided by VDOF was summarized into the following tables.

Table 27 provides information on the number of wildfires per county. Table 28 is a summary of the number of acres and total damages of wildfires in the Central Shenandoah area. Note that the tables do not include data for towns or cities; this data was not available through VDOF. Table 29 illustrates the cause of fire, broken down by county. The data shows that 27% of fires were caused by debris, followed by 21% caused by incendiary devices and 21% caused under miscellaneous conditions.

Table 27: Wildfire Statistics By Fire Year 1995 - 2001 (from VDOF)

County	1995	1996	1997	1998	1999	2000	2001	Total
Augusta County	17	6	2	20	9	18	24	96
Bath County	5	2		4	6	3	6	26
Highland County	2	1	2	1	4	1	1	12
Rockbridge County	5	3	5	6	5	1	7	32
Rockingham County	36	20	17	18	40	13	76	220
Total	65	32	26	49	64	36	114	386

Table 28: Wildfire Summary 1995 - 2001 (from VDOF)

Fire Year	1995		1996		1997		1998		1999		2000		2001		Acres Total	Damages Total
County	Total Acres	Total Damage	Total Acres	Total Damage	Total Acres	Total Damage	Total Acres	Total Damage	Total Acres	Total Damage	Total Acres	Total Damage	Total Acres	Total Damage	Acres Total	Damages Total
Augusta County	61.3	$1,600	6.2	$2,500	2.5	$1,500	482.3	$206,275	113.2	$10,000	214.5	$35,700	355.8	$31,801	1235.8	$289,376
Bath County	17	$4,100	3	$8,500	0	$0	17.3	$2,825	53	$11,200	23	$23,500	93	$58,800	206.3	$108,925
Highland County	29	$1,700	2	$500	2	$500	35	$7,000	35.3	$4,000	0.3	$0	5	$500	108.6	$14,200
Rockbridge County	4.9	$405	0.3	$20	481.1	$6,360	4.6	$170	100.3	$5,150	2	$1,900	31	$112,950	624.2	$126,955
Rockingham County	166.7	$75,560	8.3	$33,725	16.1	$100	24.4	$2,100	151.6	$5,950	10	$0	147	$728,095	524.1	$845,530
Total	**278.9**	**83365**	**19.8**	**45245**	**501.7**	**8460**	**563.6**	**218370**	453.4	36300	249.8	61100	631.8	$932,146	2699	$1,384,986

Table 29: Wildfire Causes 1995 - 2001 (from VDOF)

County	Lightning	Camp Fire	Smoking	Debris	Incendiary	Equip. Use	R&R	Child	Misc.	Total
Augusta County	2	3	14	25	17	4	5	3	23	96
Bath County	2	4	1	6	2	5		1	5	26
Highland County	5	1		2		1			3	12
Rockbridge County	5		3	10	1	1		2	10	32
Rockingham County	4	4	11	61	61	26	1	12	40	220
Total	18	12	29	104	81	37	6	18	81	386

Hazard Profile

A wildfire is an uncontrollable fire spreading through vegetative fuels, exposing and possibly consuming structures. They often begin unnoticed and spread quickly and are usually signaled by dense smoke that fills the area for miles around. Naturally occurring and non-native species of grasses, brush, and trees fuel wildfires. Wildfire behavior is based on three primary factors:

1. Fuel - The type, and amount of fuel, as well as its burning qualities and level of moisture affect wildfire potential. The continuity of fuels, expressed in both horizontal and vertical components is also a factor.

2. Topography – The topography is important because it affects the movement of air, fueling the fire over the ground surface. The slope and shape of terrain can change the rate of speed at which the fire travels. In general terms, the steeper the slope of the land, the faster a fire can spread up the slope.

3. Weather – The weather affects the probability of wildfires and has a significant effect on its behavior. Temperature, humidity and wind affect the severity and duration of wildfires. Areas that have experienced prolonged droughts or are excessively dry are also at risk for wildfires.

People start more than four out of every five wildfires, usually as debris burns, arson, or carelessness. Lightning strikes are the next leading cause of wildfires.

Hazard Areas

Figure 16 shows the wildfire hazard map developed by Virginia Department of Forestry (VDOF). In 2002 and 2003, VDOF examined which factors influence the occurrence and advancement of wildfires and how these factors could be represented in a GIS model. VDOF determined that historical fire incidents, land cover (fuels surrogate), topographic characteristics, population density, and distance to roads were critical variables in a wildfire risk analysis. The resulting high, medium, and low risk category reflect the results of this analysis. The large percentage of high risk areas are in national forests and parks. These areas of concern are managed and monitored by the Virginia Department of Forestry.






Vulnerability Analysis

Tables 30 and 31 illustrate the number of homes in woodland homes and communities, as designated by the Virginia Department of Forestry. In the Region, 71% of the woodland homes are considered to have high potential for a wildfire, while 63% of woodland communities in the planning area are considered at high risk for wildfire.

Table 30: Woodland Communities Wildfire Risk

County	Low Potential	Medium Potential	High Potential	Total	% High Risk
Augusta	0	21	19	**40**	**48%**
Bath	0	4	4	**8**	**50%**
Highland	N/A	N/A	N/A	**N/A**	**N/A**
Rockbridge	1	6	9	**16**	**56%**
Rockingham		1	25	**26**	**96%**
Total	**1**	**32**	**57**	**90**	**63%**

Table 31: Woodland Homes Wildfire Risk

County	Low Potential	Medium Potential	High Potential	Total	% High Risk
Augusta	0	493	580	**1,073**	**54%**
Bath	0	120	65	**185**	**35%**
Highland	0	20	10	**30**	**33%**
Rockbridge	300	82	458	**840**	**55%**
Rockingham	0	25	1,523	**1,548**	**98%**
Total	**300**	**761**	**2,636**	**3,697**	**71%**

Structures at Risk

Table 32 shows the percentages of critical facilities in fire risk zones. Approximately 9% of the Region's critical facilities are located in a high risk area. Figure 17 shows the locations of critical facilities in relation to fire risk zones.

Table 32: CSPDC Critical Facilities Wildfire Vulnerability

County	Low Potential	Medium Potential	High Potential	Grand Total	% High Risk
Augusta County	44	161	20	225	9%
Bath County	3	23	9	35	26%
Buena Vista City	20	0	0	20	0%
Harrisonburg City	33	5	3	41	7%
Highland County	16	17	4	37	11%
Lexington City	26	0	0	26	0%
Rockbridge County	2	64	8	74	11%
Rockingham County	10	67	15	92	16%
Staunton City	72	9	3	84	4%
Waynesboro City	59	7	1	67	1%
Total	**285**	**353**	**63**	**701**	**9%**

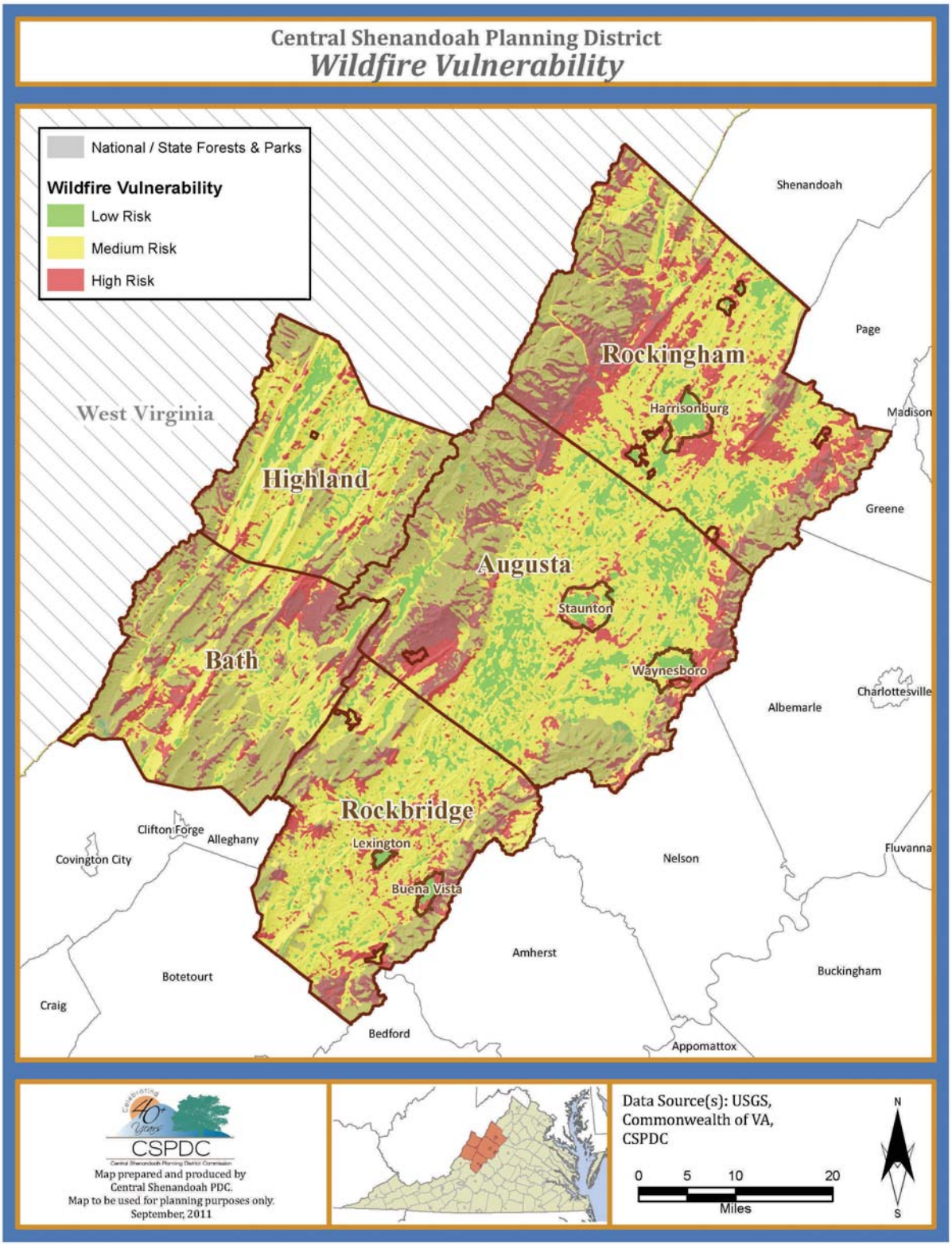

Figure 16 - Wildfire Vulnerability

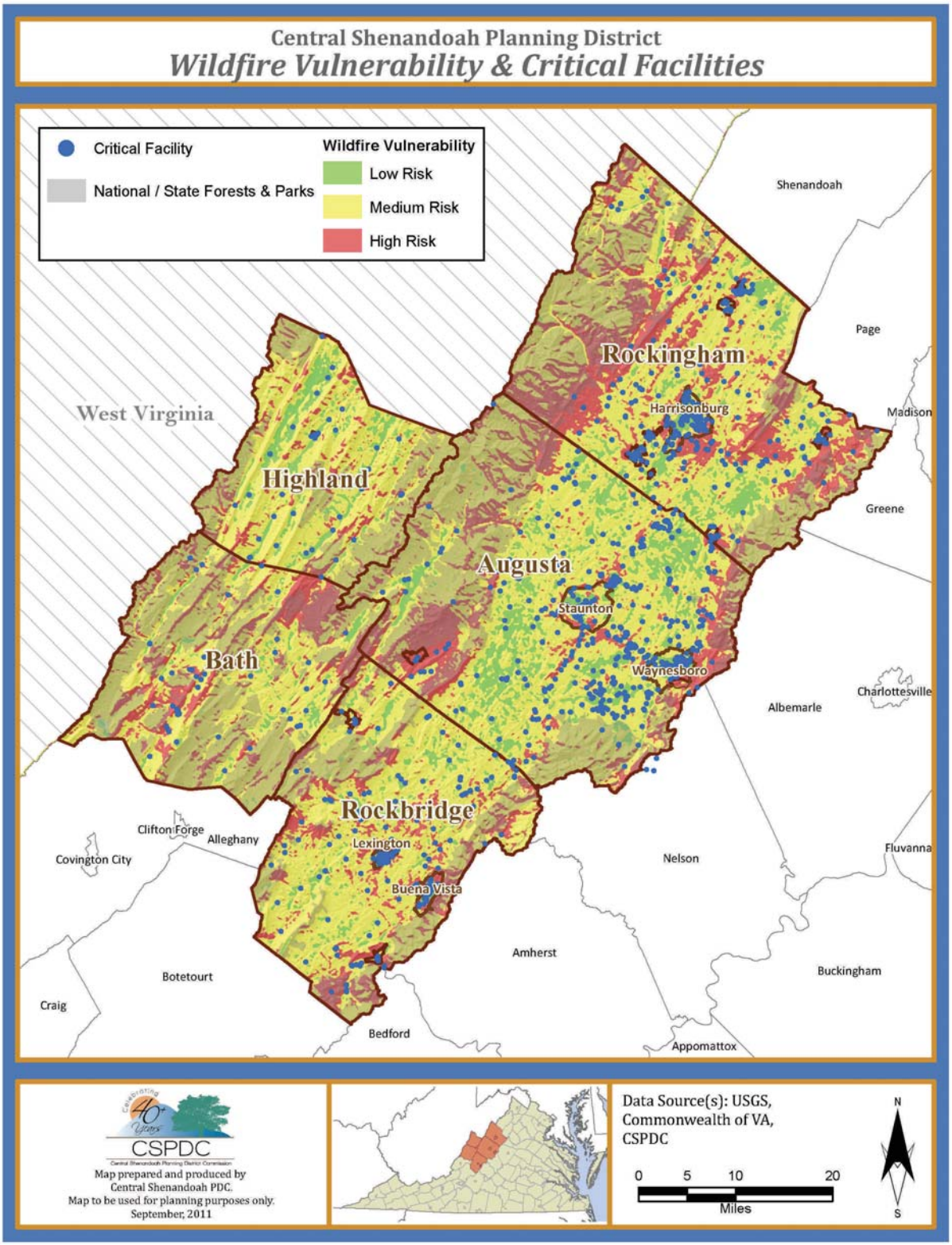

Figure 17 - Wildfire Vulnerability And Critical Facilities






10. Landslide (Low Ranking)

Hazard History

The best predicator of future landslides is past landslides in the same place. Figure 18 illustrates potential risk areas for the Commonwealth of Virginia. Additionally areas with steep slopes, poor drainage, and erosion have a greater probability of landslides. Developed hillsides and slopes denuded by wildfires can also lead to landslides. One area in our region where rock slides are common is Interstate 64 at Afton Mountain, both in Nelson (outside region) and Augusta counties. Many thousands of dollars have been spent removing debris from the highway and installing barriers since the highway was constructed in the late 1960s. The worst landslide in and adjacent to our Region occurred as a result of Hurricane Camille in 1969, where catastrophic debris flows were responsible for the deaths of more than 150 people in the Virginia Blue Ridge.

Hazard Profile

A landslide is a downward movement of a slope and materials under the force of gravity. Landslide occurs when masses of rock, earth or debris move down a slope. Some move slowly causing gradual damage, while others move rapidly destroying property unexpectedly. They are activated by rainstorms, snowmelts, earthquakes, fires, volcanoes and by human modification to the land such as mining and construction. They are common all over the United States and cause up to 2 billion dollars in damages and from 25 to 50 deaths annually. Common types of landslides include rock slides, slumps, mudslides, debris flows, avalanches, and earth flows. Types of landslides vary depending on the amount of water and type of materials that they carry. Landslides usually affect infrastructure such as roads and bridges, but they can also affect individual buildings and businesses, especially those located close to dangerous topographic features such as the top or bases of slopes or in valleys.

Landslides occur in every state and U. S. territory and are common throughout the Appalachian Region, particularly where there are steep slopes, clay-rich soils, periodic heavy rains and vegetation loss caused by wildfires. A debris flow event can be expected to occur somewhere in the southern Appalachian Mountains on the order of once every three years.

Several natural and human factors may contribute to or influence landslides. How these factors interrelate is important in understanding the hazard. The three principal natural factors are topography, geology, and precipitation. The principle human activities are cut-and-fill construction for highways, construction of buildings and railroads, and mining operations.

The USGS recognizes four major impacts caused by land subsidence:

- changes in elevation and slope of streams, canals, and drains
- damage to bridges, roads, railroads, storm drains, sanitary sewers, canals, and levees
- damage to private and public buildings
- failure of well casings from forces generated by compaction of fine-grained materials in aquifer systems

Landslides can cause serious damage to highways, buildings, homes, and other structures that support a wide range of economies and activities. Landslides commonly coincide with other natural disasters. Expansion of urban development contributes to greater risk of damage by landslides.

Hazard Areas

According to the landslide susceptibly and incidence map (Figure 18) Augusta and Rockingham Counties have the highest susceptibility and incidence risk in the region. The remaining areas are characterized as areas of high incidence. These areas are broadly defined and mapped with a general understanding of landslide hazard risks. A more detailed study would be required to determine the actual vulnerable structures at individual sites within these risk areas.

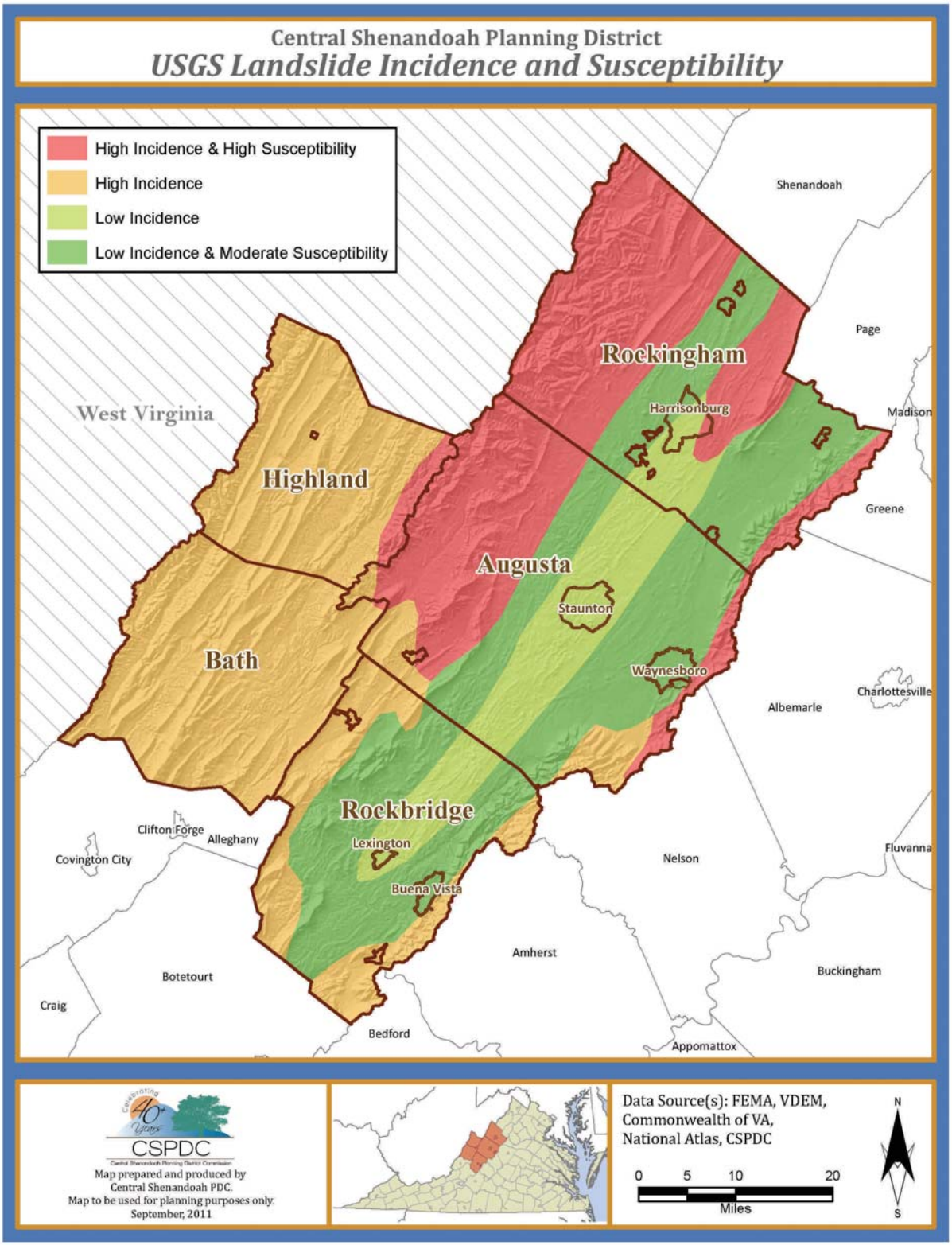

Figure 18 - USGS Landslide Susceptibility

11. Terrorism (Low Ranking)

Hazard History

Terrorism is not required to be included in the CSPDC Hazard Mitigation Plan according to current Interim Final Rule (44 CFR Parts 201 and 206). Currently there is no universal definition for terrorism. Terror can be exhibited through many different forms. The Code of Federal Regulations defines terrorism as "the unlawful use of force and violence against persons or property to intimidate or coerce a government, civilian population, or any segment thereof, in furtherance of political or social objectives." No terrorism history was available for the Region at this time. Emergency Operation Plans (EOP) for this region may contain information on this hazard. These plans are beginning to address terrorism as a concern in operation.

The FEMA risk management series on mitigating potential terrorist attacks against buildings provides information on developing a realistic prioritization of human-caused hazards. The mitigation strategies section on this report should provide projects to address human caused hazard vulnerability. Future concepts to consider include:

- Communities determine the relative importance of various critical and non-critical facilities and the asset of these systems
- Determine the vulnerability to the specified hazard
- Determine what threats are known to exist in the communities

One terrorism concern for this Region relates to possible evacuations of the Northern Virginia/Washington D.C metro area due to possible terrorism threats. Researchers from James Madison University in Harrisonburg at the Institute for Infrastructure and Information Assurance have conducted some preliminary studies to determine the possible number of displaced residents that may need to be temporarily housed in the Region, and the impact as a result of the increased traffic flow on Interstates 64 and 81. In future hazard plans for the Central Shenandoah Region, terrorism issues related to Northern Virginia and other adjacent regions will require more extensive intra-regional planning and cooperation.

Hazard Profile

Currently there is no universal definition for terrorism. Terror can be exhibited through many different forms. The Code of Federal Regulations defines terrorism as "the unlawful use of force and violence against persons or property to intimidate or coerce a government, civilian population, or any segment thereof, in furtherance of political or social objectives."

Hazard Areas

Local Emergency Operation Plans are beginning to address terrorism concerns with special appendices with limited access for only local government staff. Consult these plans for further information.

Vulnerability Analysis

Vulnerability analysis, when available, has been conducted by the different localities. This information has been addressed in local Emergency Operation Plans.

12. Earthquakes (Low Ranking)

Hazard History

In the Central Shenandoah Region, damage has been minor in the Region including shaking objects, broken windows, and toppling of poorly constructed chimneys. Historical research has not shown any earthquakes having epicenters in the Central Shenandoah Region. Below is a list of earthquakes from other areas in Virginia and the eastern U.S. whose affects were felt in the Central Shenandoah Valley:

February 21, 1774 – A strong earthquake was felt over much of Virginia.

December 1811, January and February 1812 – The "New Madrid" earthquakes (M 7.0 - 8.1), the strongest series of earthquakes in the eastern United States struck. These earthquakes were strongly felt over an area of 130,000 sq. km. and moderately felt over an area of 3 million sq. km. Some sections of the Mississippi River appeared to run backward for a short time. Residents as far away as Pittsburgh and Norfolk were awakened by intense shaking. Church bells were reported to ring as far as Boston and Toronto, Canada. Sidewalks were broken and cracked in Washington, D.C. Chimneys toppled in Maine.

March 9, 1828 – An earthquake centered in Southwest Virginia (MM V) was reportedly felt in an area covering 565,000 sq.km. from Pennsylvania to South Carolina, and the Atlantic Coastal Plain to Ohio.

August 27, 1833 – An earthquake covering 135,000 sq.km. (MM V) was felt in Virginia, Maryland, and North Carolina. Documents record that in our region, the earthquake was felt in Lexington.

April 29, 1852 – This earthquake (MM VI) included a "felt area" of 420,000 sq. km. that included Baltimore, Maryland; Philadelphia, Pennsylvania, and North Carolina.

August 31, 1861 – This earthquake (MM VI) had an epicenter in extreme southwestern Virginia or western North Carolina and had a shock affected area of 775,000 sq. km. There were a lack of reports from Virginia because it was during a period in the Civil War when there was intense fighting in Virginia.

August 31, 1886 – A powerful earthquake (6.6 – 7.3 on the Richter Scale) struck Charleston, South Carolina and was one of the most damaging earthquakes to hit the eastern U.S. It was felt as far away as Boston, Chicago, Milwaukee, New Orleans, and Cuba. More than 300 aftershocks continued for 35 years and minor activity that still continues in the area today may be a continuation of aftershocks. The Charleston earthquake was felt in the Central Shenandoah Valley and noted in Bridgewater resident, Henry Smals' diary.

December 23, 1875 – This earthquake (M 4.5) occurred in Central Virginia and was felt throughout Virginia, Maryland, West Virginia, and North Carolina.

May 31, 1897 – This was the largest earthquake in recorded Virginia history. It's epicenter in Giles County had a magnitude on the Richter scale of 5.8 and an MM intensity of VII – VIII. The earthquake extended over an elliptical area from near Lynchburg, west to Bluefield, West Virginia and from Giles County, south to Bristol, Tennessee. In Staunton, downtown buildings began to sway, furniture began sliding around the room, light fixtures swung from the ceiling, and windows twisted and creaked. A low rumble was heard which was described as sounding like the rolling of heavy wagons along a stone road. In Lexington, chimneys were damaged. In Waynesboro the earthquake was felt with an MMI of IV.

April 9, 1918 – The Shenandoah Valley, particularly the Northern Valley region, was shaken strongly by an earthquake (MM VI) that was felt in an area that extended 155,000 sq. km.

September 5, 1919 – An earthquake (MM IV) was strongest in the Blue Ridge Mountains of Virginia and muddied streams and springs in the epicentral area.

December 9, 2003 – This 4.5 magnitude earthquake, with an epicenter 30 miles west of Richmond was felt strongly over almost all of Virginia. The earthquake was also felt in the neighboring states of North Carolina, Maryland, West Virginia, Pennsylvania, and the Delmarva Peninsula. This event was a significant earthquake, the largest recorded in Virginia since the widespread use of modern seismic monitoring equipment in the early 1970s. The earthquake caused little to no structural damage.

August 23, 2011 – A 5.8 magnitude earthquake impacted Virginia at 1:51 p.m. The earthquake's epicenter was located approximately 5 miles south-southwest of Mineral, Virginia. This earthquake centered in the Central Virginia Seismic Zone was the strongest earthquake in that zone yet. The depth of the earthquake was 3.7 miles. The United States Geological Survey reported four aftershocks on August 23 and 24 with magnitudes from 2.2 – 4.2. Reports indicated that the earthquake was felt as far south as Georgia, as far north as Canada, and as far west as Chicago. In Washington D.C., the earthquake caused cracks both in the Washington Monument and the National Cathedral. In Virginia, Louisa County where the epicenter of the earthquake was located received the most damage including significant damage to public buildings and the County airport. Also in Louisa, one residence collapsed and another partially collapsed. Other buildings were damaged in other parts of the State and several natural gas lines and water pipes cracked causing leaks. In the Central Shenandoah Valley shaking was felt and windows rattled. Many in the Valley described the sensation of the quake as feeling if a large truck or train had driven by. Minimal damage occurred in the Region which included cracks in the foundations of structures and pictures falling off the walls.

Hazard Profile

An earthquake is the result of a sudden release of energy in the Earth's crust that creates seismic waves. Earthquakes are caused mostly by rupture of geological faults, but also by volcanic activity, landslides, mine blasts, and nuclear tests. An earthquake's point of initial rupture is called its focus or hypocenter. The term epicenter refers to the point at ground level directly above the hypocenter.

There are around 500,000 earthquakes throughout the world, every year. It is estimated that since 1900, there have been an average of 18 major earthquakes (magnitude 7.0 – 7.9) and one great earthquake (magnitude 8.0 or greater) per year, and this average has been relatively stable. Most of the world's earthquakes (90% and 81% of the largest) take place in the 40,000 km. zone which bounds the Pacific Tectonic Plate, known as the Pacific Ring of Fire. In the United States, minor earthquakes occur nearly constantly in California and Alaska.

The scale currently used to measure the intensity of earthquakes is the Modified Mercalli Intensity Scale (MMI). It replaces the previously used Richter Scale. The MMI Scale quantifies the effects of an earthquake on the Earth's surface, humans, objects of nature, and man-made structures using a scale of 1 – 12.

In the U.S., East of the Mississippi there are much fewer earthquakes than in the West. Western U.S. earthquakes are much stronger but because underlying bedrock is well-connected in the eastern United States like a concrete slab, eastern earthquakes cause more damage away from their origin. The west coast of the U.S is at the edge of the North American Plate.

Hazard Areas

Virginia is in the middle of the North American Plate, which is one of 15 or so major "chunks" of crust that float on top of the hot mantle. The North American Plate includes both continental crust and heavier, oceanic crust. The eastern coast of the United States marks the boundary between the continental and oceanic crust. Because Virginia is in the relatively stable middle of a plate, it does not experience the large-magnitude earthquakes that effect the edges of a tectonic plate where sudden, jerking movements occur regularly.

Two zones in Virginia are more susceptible to earthquakes than others and can be identified by the rivers which follow those faults. The James River follows the Central Virginia Seismic Zone between Charlottesville and Richmond, while the New River follows the other zone from Radford to the West Virginia border. Virginia is classified as a "moderate" seismic risk and has a 10 – 20% chance to experience a 4.75 (Richter Scale) earthquake every century or so. The Central Shenandoah Region is not in either two of the seismic zones which makes the likelihood of an earthquake with an epicenter in the Central Shenandoah Valley remote.

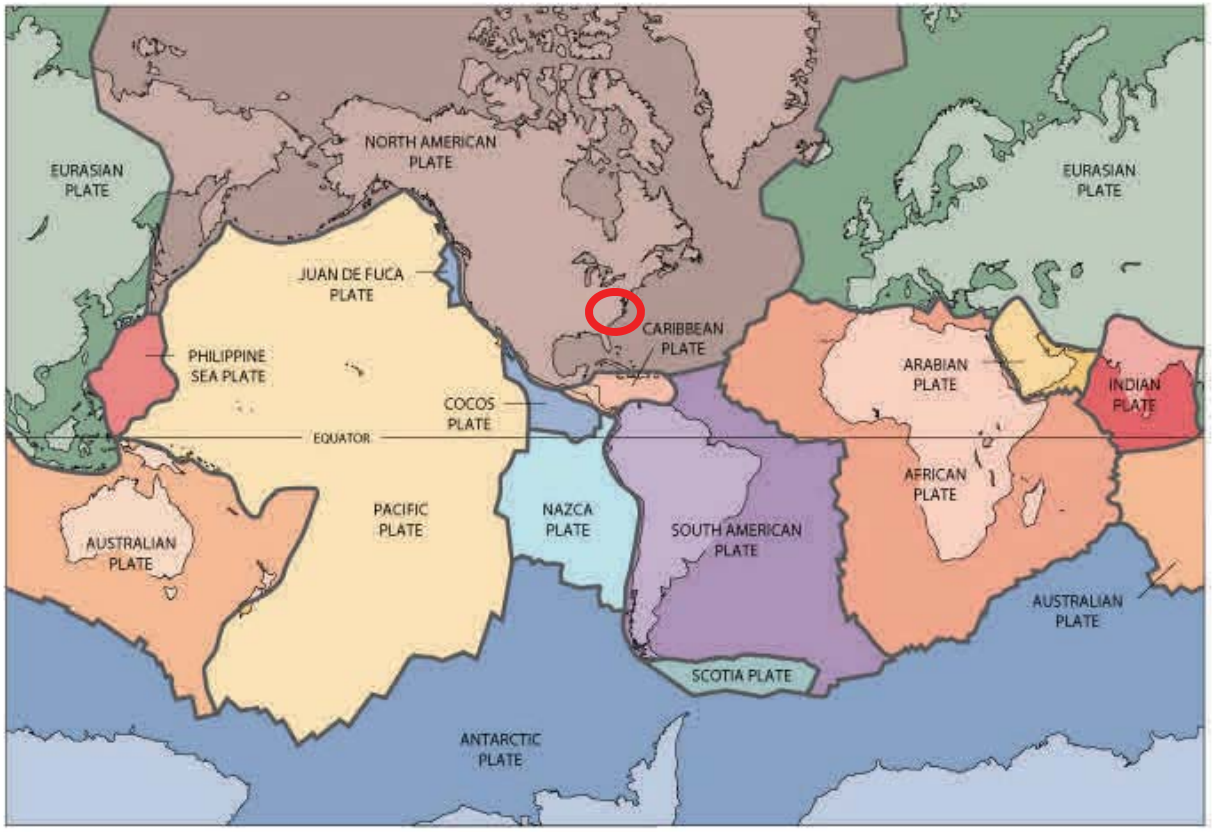

Figure 19. USGS Tectonic Plates Of The World

V. MITIGATION GOALS, STRATEGIES, AND PROJECTS

We know that we cannot prevent disasters from occurring, but through proactive planning and mitigation activities we can reduce the impact of these disasters. The following section describes six broadly effective mitigation categories (prevention, property protection, natural resource protection, emergency services, structural projects, and public information) as well as examples and strategies for each. Using the findings from the risk assessment, numerous meetings, workshops, and exercises the committee developed the following mitigation strategies for each of the hazards identified in the plan. Hazards that ranked low (landslides, earthquake, and terrorism) were not addressed in the mitigation strategy section.

The six categories of mitigation include:

1. **Prevention** - activities that keep problems from getting worse. The use and development of vulnerable areas is limited through planning, land acquisition or regulations. They are usually administered by building, zoning, planning, and/or code enforcement offices. Examples include storm water and floodplain management, planning and zoning, and code enforcement.

2. **Property Protection** - activities intended to mitigate damage primarily on private structures on a building-by-building or parcel basis. Examples include flood proofing, elevation, acquisition, and relocation of structures as well as flood insurance coverage.

3. **Natural Resource Protection** - activities that preserve or restore natural areas or the natural function of disaster-prone areas particularly floodplains and watershed areas. They are usually implemented by parks, recreation or conservation agencies or organizations. Examples include wetlands protection and open space preservation.

4. **Emergency Services** - measures that are taken during a disaster to minimize its impact. These measures are the responsibility of city or county emergency management staff and the owners or operators of major or critical facilities. Examples include flood warning systems and critical facilities protection.

5. Structural Projects – projects that keep disasters away from an area with a structural, mechanical or other control measures. They are usually designed by engineers and managed or maintained by public works staff. Examples include levees and floodwalls and stream remediation.

6. Public Education and Awareness – activities that advise and educate citizens and business owners about hazards, ways to protect people and property from hazards through disaster preparedness, and mitigation education. They are usually implemented by a public information office. Examples include public awareness programs, environmental education, and map modernization projects.

Goal 1: Improve local government planning, zoning, land use regulations and code enforcement to reduce impact of natural disasters.

Hazard: All Hazards
Location: Region-wide
Category: Prevention

Goal Statement: Perhaps the most cost-effective way to reduce damages due to natural hazards is to incorporate mitigation measures into planning, zoning ordinances, land use regulations, and code enforcement as described in the strategies below. Most of the hazards that impact our region can be reduced by addressing them upfront in planning and prevention and through code enforcement and regulatory activities.

Strategies

1.1 For flood hazards, strengthen current floodplain, zoning and site development ordinances by adopting higher standards that provide additional protection and limit or restrict further development in the floodplain, i.e. additional freeboard, flood protection setbacks, limitation on fill, minimization of hydrostatic pressure, protection for mechanical and utility systems, etc. For drought hazards, utilize growth management tools like zoning and land use regulations to encourage low-impact development and forest preservation. For land subsidence hazards, strengthen enforcement of land use, zoning regulations and building ordinances that regulate construction in areas susceptible to landslides and sinkholes i.e. steep slopes, intermittent stream channels, and karst topography.

1.2 Provide funds for water supply planning and ground water protection projects and seek and research alternative water supplies for communities. Improve forecasting and monitoring of drought conditions.

1.3 Ensure that floodplain ordinances and building codes are clearly understood by staff, property owners, developers, bankers and insurance companies.

1.4 Implement zoning tools that steer development away from hazardous areas or natural areas deserving preservation. Include Department of Forestry personnel in subdivision review for new development in woodland-urban interface areas.

1.5 Provide for tax incentives, donated easements, and other approaches that can assist in preserving land in the floodplain and other environmentally sensitive areas for agricultural, environmental, recreational or educational uses.

1.6 Rezone to open space or acquire undeveloped portions of floodplain to prohibit future residential building.

1.7 Limit government expenditures for public infrastructure such as roads and water and sewer service in hazard-prone areas.

1.8 Provide necessary staff and staff training to enforce floodplain regulations and building codes.

1.9 Provide training and appropriate equipment/tools for local fire fighters to respond to woodland fires.

1.10 Sponsor workshops for Building Officials that focus on floodplain ordinances and FEMA regulations.

Goal 2: Promote the Community Rating System (CRS).

Hazard: Flood/Hurricane
Location: Region-wide
Category: Prevention

Goal Statement: The National Flood Insurance Program (NFIP) administers a program called the Community Rating System (CRS) whereby the cost of flood insurance is reduced in those jurisdictions which carry out floodplain management activities which are more protective than the minimum requirements of the NFIP. Examples include public outreach, mapping and regulations, damage reduction, and preparedness activities. The benefit of CRS participation, other than the reduced cost of flood insurance premiums to policyholders, is the increased overall awareness of flood hazards in the community and decreased flood damages in the future.

Strategy

2.1 Introduce local jurisdictions to the Community Rating System (CRS) and assist them in applying for CRS certification for their communities.

Goal 3: Improve storm water management throughout the region.

Hazard: Flood/Hurricane
Location: Region-wide
Category: Prevention

Goal Statement: Development, whether in or out of the floodplain, has the potential to increase flooding throughout the watershed. Without due consideration of storm water management, development can increase runoff, causing areas previous unaffected by flooding to become flooded and flood depths to increase in other areas.

Strategies

3.1 Consider conducting a Regional Storm Water Management Study which would guide the localities in developing the most cost-effective storm water management system, not only within the political boundaries of each locality, but within the locality's watershed.

3.2 All communities benefiting from a regional storm water management plan could share in the cost of preparing the plan.

3.3 Seek funding to prepare site-specific hydrologic and hydraulic studies that look at areas that have chronic and repetitive flooding problems.

3.4 Consider utilizing special utility assessment districts where property owners who directly benefit from a specific public improvement are charged a fee that is proportional to the benefits received.

Goal 4: Implement watershed planning programs and conduct watershed analysis studies.

Hazard: Flood/Hurricane, Karst/Sinkholes
Location: Region-wide
Category: Prevention

Goal Statement: While it is important for communities to plan and take responsibility for the land uses that occur in their own floodplains, it must be recognized that flooding and water quality can be affected by land use activities that occur elsewhere. In order to address the wide range of water quality, water quantity, and stream stability problems that exist in our Region an integrated approach is needed. Watershed planning allows localities to look holistically at water resource problems beyond jurisdictional lines.

Strategies

4.1 Develop a regional, broad-based watershed plan among localities within a watershed in order to achieve effective and long-term flood protection and a healthy riverine environment.

4.2 Develop a watershed partnership, i.e. watershed roundtable to coordinate planning and program activities among natural resource agencies and stakeholders.

4.3 Conduct a site analysis mapping study to determine and understand the karst topography in our region.

Goal 5: Increase awareness of flood insurance and the National Flood Insurance Program (NFIP).

Hazard: Flood/Hurricane
Location: Region-wide
Category: Prevention

Goal Statement: Insurance does not prevent disaster damage, but it provides financial protection to support recovery, repairs, and reconstruction. All 21 localities in the Region participate and are in good standing with the National Flood Insurance Program (NFIP). This program is designed to provide flood insurance at affordable rates to policyholders. In return, the local jurisdictions agree to adopt and administer local floodplain management measures directed at protecting lives, existing property, and future construction from future flooding. Only about 25% of the structures in our region that are in the floodplain are covered by flood insurance.

Strategies

5.1 Encourage communities to remain active and compliant with the NFIP program.

5.2 Encourage citizens to purchase flood insurance. Partner with insurance companies, lenders, and real-estate agents to market the NFIP program.

5.3 Conduct NFIP training workshops for insurance providers.

Goal 6: Reduce the impact of natural disasters on private residential properties.

Hazard: Flood/Hurricane, Wildfires, Tornado/Wind, Winterstorms
Location: Region-wide
Category: Property Protection

Goal Statement: There are hundreds of residential structures located in hazardous areas, particularly the floodplain, throughout our region. Most of these structures were built in the floodplain or other vulnerable areas before the enactment of zoning ordinances and other regulations that prohibited building in these areas. For these existing as well as new structures, there are numerous measures that can be taken to reduce the impact of disasters.

Strategies

6.1 Develop a program to elevate, relocate, floodproof or acquire flood-prone houses in order to provide protection to these homes and reduce future damages.

6.2 Continue residential buyout and elevation projects of identified structures most at risk of future flooding with priority given to houses that are repetitively flooded.

6.3 For properties where elevation, relocation or acquisition is not feasible, introduce retrofitting measures to protect existing structures from flood damage. Retrofitting is relatively inexpensive and can include dry floodproofing, wet floodproofing, installing sewer backflow valves, berms, and sump pumps.

6.4 Design and landscape structures with wildfire safety in mind by utilizing fire-resistant materials when building especially in the urban-wilderness interface areas. Create safety and defensible space around structures. Provide adequate water resources/dry hydrants nearby woodland communities. Improve access for fire trucks and equipment. Increase knowledge of controlled burns and use of fire-retardant vegetations.

6.5 Include in local building codes a requirement for manufactured home tie downs and hurricane straps in high wind hazard and flood prone areas.

6.6 Offer financial incentives such as tax abatements, conservation easements, and low-interest loans to encourage property owners to elevate, relocate or floodproof buildings.

6.7 Encourage property owners to take advantage of NFIP's Increased Cost of Compliance (ICC). ICC helps pay for the cost of mitigation, including demolition and relocation, up to $15,000 for a flood- insured structure that sustains a flood loss and is declared to be substantially or repetitively damaged.

6.8 Provide guidance and technical assistance to citizens about measures they can take on their own to protect their properties.

6.9 For properties located in known karst and landslide areas, use corrective measures recommended by a professional site analysis (geotechnical or structural engineer) to protect homes.

6.10 Encourage developers to integrate mitigation techniques into new construction and renovation.

Goal 7: Improve disaster education and planning services for persons with special needs.

Hazard: All Hazards
Location: Region-wide
Category: Public Education and Awareness

Goal Statement: Our region is home to many persons with special needs. A number of state-run facilities, assisted living facilities, group homes, retirement communities, nursing homes, and other agencies that serve persons with special needs are also in our region. Persons with special needs are dramatically affected by disasters and include persons with medical issues, physical and mental disabilities, visual and hearing impairments, and the elderly. Non-English speaking citizens and pet owners are also considered to have special needs as well. Education programs and planning are essential to helping persons with special needs minimize the effects of disasters on their lives and homes.

Strategies

7.1 Educate persons with special needs on disaster preparedness and mitigation methods at community events and through public awareness campaigns.

7.2 Provide disaster preparedness and mitigation materials in alternate formats such as large print, audio-cassette, and languages other than English to make materials accessible for a wider audience in the community. Also provide sign language interpreters at community events, workshops, and other educational programs.

7.3 Work with the first responder community to educate them about the special needs that people may have during a disaster.

7.4 Encourage persons with special needs to contact their local emergency management office so their needs can be noted in the 911 system.

7.5 Offer emergency sheltering for persons with disabilities that can provide accommodations that take into account their special needs including the use of medical equipment requiring electrical power, etc.

7.6 Provide training in emergency operations planning and preparedness to organizations that serve persons with special needs to reduce down-time in service provision, to protect lives of staff and clients, and to reduce damage to facilities.

7.7 Work with emergency managers to make sure that weather alerts and warnings are in accessible formats for all citizens to receive essential information during a disaster.

7.8 Ensure that emergency vehicles are accessible for persons with special needs and available to assist in evacuation if needed.

7.9 Educate pet owners and farmers so they will include their pets and livestock in their family's preparedness planning.

7.10 Work with local animal welfare organizations to provide emergency sheltering for pets and livestock.

Goal 8: Reduce the impact of natural disasters on commercial property and businesses.

Hazard: Flood/Hurricane
Location: Region-wide
Category: Property Protection

Goal Statement: Many of the Region's older commercial districts, downtowns, and factories were built near the water. In particular are the Cities of Waynesboro and Buena Vista, in which businesses and industry have been flooded many times costing millions of dollars in property damage, lost revenue, and jobs. Projects that provide funds to floodproof and retrofit commercial buildings would not only provide protection from future flooding but could also preserve the downtown commercial districts.

Strategies

8.1 Identify and seek funding to provide engineering and design services that would determine the most cost-effective mitigation option for each business.

8.2 Seek funding to floodproof and retrofit commercial buildings where acquisition and elevation are not feasible.

8.3 Sponsor workshops that educate local business and industry about mitigation measures they can install to protect their structures and inventory during a disaster.

8.4 Develop a program to assist local business and industry in developing emergency and business continuity plans.






Goal 9: Improve community warning systems in the region.

Hazard: Flood/Hurricane, Wildfire, Winter Storms Tornadoes/ Wind
Location: Region-wide
Category: Emergency Services

Goal Statement: Many of localities participate in a flood warning system developed by the National Weather Service called the Integrated Flood Observing and Warning System (IFLOWS). There are numerous IFLOW stream and rain gauges located throughout our Region. Two of our jurisdictions (Rockingham County and the City of Waynesboro) have "Reverse 911" systems installed. This system allows the locality to alert property owners, businesses, and industry of impending emergencies such as a chemical leak, tornado, flood, etc. through a recorded telephone message. Both the IFLOW and Reverse 911 systems are excellent and effective means to warn citizens of impending disasters. However, not all areas of our Region are covered sufficiently and effectively by this technology.

Strategies

9.1 Identify areas with recurring flood problems and request additional IFLOW stream/rain gauges to ensure that these areas are adequately covered and monitored. Areas that would benefit from an early warning system include the Greenlee Bridge on the James River near Natural Bridge Station in Rockbridge County.

9.2 Develop Emergency Action Plans for specific sites such as mobile home parks, apartment complexes, assisted living facilities, industrial facilities, and essential public facilities within disaster-prone areas and develop specific warning or notification plans for each identified site. These plans should include the designation of a point of contact or resident coordinator, with alternates, to receive warnings, the dispatch of police, sheriff, fire rescue units to these sites to issue warnings and pre-designation of routes. These specific warnings will supplement the general television or radio warnings, which most people receive.

9.3 Seek funding to purchase, install, and maintain Reverse 911 emergency warning systems and other state-of-the-art disaster response and recovery equipment.

9.4 Encourage businesses and public facilities located in high hazard areas to purchase NOAA Weather Radios. By receiving early notification of potential inclement weather, businesses and public facilities can benefit from additional time to prepare for natural disasters. Local governments may be eligible for grants to purchase equipment to be distributed in public facilities, businesses, and industries through out their jurisdictions.

9.5 Utilize emergency preparedness and evacuation plans for people living in high-hazard areas, especially people with special needs and mobility impairments.

Goal 10: Increase protection of public utilities and critical facilities.

Hazard: Flood/Hurricane, Wildfire, Winter Storms, Tornados/ Wind
Location: Region-wide
Category: Structural Protection

Goal Statement: Most communities provide some public utility service such as water, sewer, and stormwater systems. Most of these facilities have been upgraded to meet environmental protection design criteria and to remain operational during a disaster. However, in some instances these facilities have failed or services have been disrupted.

Strategies

10.1 Evaluate and provide retrofit measures to prevent disruption of services. Measures can include elevating electrical controls and equipment and installing watertight doors where practicable at water and wastewater treatment plants.

10.2 Bury underground lines deeper and further away from waterways with stronger encasements in floodprone areas with erodible soils.

10.3 Increase the number of wind-secured critical facilities including schools, daycares, hospitals, and shelters.

10.4 Increase number of functional backup generators at critical facilities.

10.5 Establishing routine schedule for trimming trees/limbs around power lines to prevent power outages during wind events and ice storms.

10.6 Limit government spending on infrastructure in high hazard areas.

10.7 Conduct vulnerability assessments and develop security plans on public utility systems in accordance with the Bioterrorism Act of 2002.

Goal 11: Improve dam safety throughout the region.

Hazard: Flood/Hurricane, Land Subsidence
Location: Region-wide
Category: Structural Protection

Goal Statement: There are 28 flood control dams in the Region built between 1954 and 1980. Many are at or near the end of their planned design life and may pose a threat to public safety. The Soil and Water Conservation Districts have the responsibility for the operation and maintenance of most of these dams. Many of the dams in our Region require significant and costly rehabilitation and maintenance.

Strategies

11.1 Examine the risks posed by dams in watersheds that drain in the Region and consider adopting ordinances to restrict development around these dams because of the potential flooding danger in areas below and behind the dams.

11.2 Consider local government funding to maintain and upgrade these dams. Require regular inspection and maintenance schedules.

Goal 12: Improve storm drainage systems in the region.

Hazard: Flood/Hurricane
Location: Region-wide
Category: Structural Protection

Goal Statement: Much of the flooding problems in our Region are a result of poor drainage and inadequate infrastructure. Drainage systems are designed to provide a certain level of protection when maintained in proper condition. Systems that are not maintained on a regular basis may become clogged with debris caused by either natural events or dumping of lawn debris, appliances, and other materials. To minimize the amount of debris accumulation in the drainage system, a combination of public education, regulation, and maintenance programs are needed.

Strategies

12.1 Support projects that call for improved ditching, replacement of inadequate and undersized culverts, enlargements of bridge openings, and drainage piping needed to minimize flooding.

12.2 Develop regular maintenance programs and standard operation procedures and budget accordingly.

12.3 Encourage routine maintenance of creek beds and culverts to allow more water to be carried with special emphasis placed on culverts where there are repeated problems.

12.4 Notify property owners living along interior streams to keep the creek beds clear of debris, weeds, and high grass.

Goal 13: Implement stream remediation projects where needed.

Hazard: Flood/Hurricane
Location: Region-wide
Category: Structural Protection

Goal Statement: Local communities in the Region recognize the importance of protecting existing bank lines and bridge substructures. This can be accomplished with rip rap or gabion revetments, flood retarding structures, bulkheads and berms, and riparian buffers that have been properly designed or constructed.

Strategies

13.1 When implementing stream remediation projects consideration should be given when designing these structures and take into account stream characteristics that influence the selection of these measures such as channel width, bank height, bend radii, storm event, channel velocities and flood depth, and floodplain configuration.

13.2 Obtain maintenance and access easements from property owners for annual maintenance work.

13.3 Coordinate with and support the Region's Soil and Water Conservation Districts' Emergency Watershed Protection Programs.

Goal 14: Implement a disaster preparedness and mitigation education program.

Hazard: All Hazards
Location: Region-wide
Category: Public Education and Awareness

Goal Statement: There are many ways that citizens and business owners can protect themselves and reduce their losses caused by natural disasters. However, many citizens, even recent victims are unaware of these measures. Listed below are a number of activities that can be implemented in the Region to increase public awareness to the hazard and mitigation actions that can be taken to reduce future damage, injury, and death caused by the natural disasters.

Strategies

14.1 Develop comprehensive public information and education programs on disasters, including preparedness, recovery, mitigation and prevention. This can be accomplished through presentations, workshops and marketing materials for citizens, business, schools, local staff and elected officials in the Region. Much of this has been and can be accomplished through Shenandoah Valley Project Impact.

14.2 Develop a public education program to educate citizens about water conservation, to use of water-conserving appliances, and irrigation practices in agricultural areas. Written materials could be developed to teach developers and home owners about native and/or drought-tolerant grasses, shrubs, and trees to be planted around residential structures.

14.3 Increase public education and awareness regarding the dangers of winter storms including driving/traveling during a winter storm event. (Automobile accidents are the leading cause of death during a winter storm event.). Also, increase public awareness to health risks associated with winter storms including exposure, hypothermia, frostbite, overexertion, and accidents from falling/slipping.

14.4 Encourage communities to become involved with the Department of Forestry's Firewise program. Its goal is to encourage and acknowledge action that minimizes home loss to wildfire by preparing for a fire before it occurs.

14.5 Encourage communities to become involved in the National Weather Service program “Storm Ready”. This program assists communities with local safety, planning, education, and communication programs needed to save lives and property before and during weather- related disasters.

14.6 Provide Community Emergency Response Team (CERT) training to citizens and maintain a CERT organization. Having an active CERT program will not only educate citizens about preparedness and mitigation measures, it will also provide a pool of trained volunteers that can assist during an emergency or disaster.

14.7 Develop a media campaign to educate the general public throughout the year about disasters when they may be likely to occur. For example a Spring campaign on tornado safety, winter storm preparedness in the Fall, and hurricane safety prior to the start of Hurricane Season. This holistic campaign would be designed to reach a multi-generational audience and would include mitigation and preparedness information.

14.8 Increase the number and use of NOAA weather radios or battery-powered radios or TVs. Improve the effectiveness of NOAA weather radios in the valley.

14.9 Utilize the services of amateur radio operators in the region.

14.10 Sponsor Hazard Mitigation Workshops designed to give information to contractors, property owners, and business owners on mitigation strategies such as acquisition, relocation, elevation, and floodproofing.

14.11 Develop Hazard Awareness programs with the local schools, youth programs, and libraries to disseminate information on natural hazards and mitigation actions. Utilize student environmental clubs to volunteer for projects.

14.12 Notify renters of homes, mobile homes, and apartments that they are located in an area that is subject to flooding and should consider purchasing flood insurance for their contents. Notification could be done via lease agreements.

14.13 Establish and maintain Hazard Resource Library/ Self Help Programs on natural hazards, mitigation and safety and related topics in a central location and available to or disseminated to property owners and businesses.

14.14 Strategically place flood elevation reference markers throughout the Region in an effort to educate and remind people of historical floods. The markers could show the elevation of the high water from previous floods as well as the 100-year flood levels in a particular area.

14.15 Notify potential homebuyers of flood hazards and requirements for flood insurance. Programs should be developed with the cooperation of banks, real estate agents, and insurance agents as well as community development staff.

14.16 Implement programs to provide property owners with flood elevation certificates in order to alert them to the fact that they their property is in the floodplain.

14.17 Provide appropriate local government staff with technical expertise and training on flood protection measures, retrofitting, flood insurance, flood warning and response, etc. in order to help citizens meet and understand floodplain requirements and flood hazards.

Goal 15: Improve hazard data collection and GIS for region.

Hazard: All Hazards
Location: Region-wide
Category: Public Information

Goal Statement: Many of the Flood Insurance Rate Maps (FIRM) produced by FEMA are outdated - most over 15 years old - and unreliable. These maps do not always reflect man-made alterations to floodplains caused by development that can change drainage patterns and increase flood hazards. Accurate and dependable maps are critical in helping the Region develop floodplain management strategies aimed at limiting the devastation caused by floods to area businesses and residents. Improved mapping, along with GIS, a computerized mapping and analysis tool, aids in the administration of building codes, land use plans, and efforts to identify risk areas and develop mitigation actions.

Strategies

15.1 Encourage communities to participate in FEMA's Cooperating Technical Partners (CTP) Program. This FEMA initiative establishes partners with local jurisdictions to develop and maintain up-to-date flood maps and other flood hazards. Mapping activities may include hydrologic and hydraulic analysis, floodplain mapping, preparation of digital FIRMs, and refinement of floodplain boundaries.

15.2 Consider creating a consortium of communities to tackle the problem of outdated FIRM maps and how to update the FIRM maps on a regional basis.

15.3 Ensure that all localities have digitized FIRM maps.

15.4 Acquire technology to assist in managing storm water, floodplain, and other land-based resources.

15.5 Utilize GIS technology to inventory at-risk infrastructure and public and private structures within at-risk areas.

15.6 Determine and map landslide/land subsidence, karst, and sinkhole vulnerable areas in the region. Archive events in a database to monitor trends and recurring sites. Coordinate with VDOT on sites impacting transportation infrastructure.

15.7 Identify and map assisted living centers, nursing homes, and facilities that serve people with special needs that require additional services during disasters.

Project Prioritization

Based on recommendations of the Mitigation and Planning Committee, projects were prioritized based on cost, effectiveness, impact on the region's citizens, feasibility of implementation, and agency staff capacity. Using these criteria, projects that fall into the Public Education and Awareness category are ranked highest. This includes all of the projects that relate to Goal 14: *Implement a disaster preparedness and mitigation education program*. The second highest ranked projects are those that relate to Goal 6: *Reduce the impact of natural disasters on private residential properties*. The third highest ranked projects are structural projects involving storm drainage systems, Goal 12: *Improve storm drainage systems in the region*. *This prioritization was maintained upon review of the All Hazards Mitigation Plan Steering Committee for the 2013 edition of the plan. Goals 14, 6, and 12 continue to be the highest ranking priorities in the Central Shenandoah Valley Region.*

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510013	Augusta County	Augusta	CSPDC	14.1 - 14.7	Continue membership and participation in Shenandoah Valley Project Impact, the regional disaster preparedness and mitigation education program that was started in September 2000. By participating in Shenandoah Valley Project Impact, Augusta County educates its citizens about disaster preparedness and mitigation through public awareness campaigns, workshops and trainings, and an extensive resource library.	All Hazards	High	On-going	N/A	CSPDC	On-going
510013	Augusta County	Augusta	CSPDC	11.1, 11.2	Continue study of dam risk assessment. Seek funding to inspect, maintain, and upgrade older dams. *Note: The December 2009 Floodplain Ordinance revision added floodpool areas to the Special Flood Hazard Area. The County continues to work with the HWSWCD, Staunton, and Waynesboro to map inundation zones for all publicly owned, regulated dams in Augusta County.	Flood	Medium	Robinson Hollow Dam #10 - A has been upgraded with reinforced spillways and concrete retaining wall. Inch Branch Dam has been upgraded with increased spillway capacity and a new riser structure. *	On-going	County	On-going
510013	Augusta County	Augusta	CSPDC	1.1	Floodplain Ordinance - Update and revise ordinance; include floodplain overlay district to zoning ordinance. *Note: 2009 revision includes a general prohibition on development on new lots in the floodplain and institutes compensatory storage for any fill in the floodplain.	Flood	Medium	Completed. Floodplain Ordinance revised in December 2009.*.	N/A	County	N/A

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510013	Augusta County	Augusta	CSPDC	15.1, 15.2, 15.3	Update FEMA's flood maps for the following areas in the County that have repetitive flooding problems: North Mountain Estates on East Dry Branch, Deerfield on Hamilton Branch, Crawford Manor at East Dry Branch, Jollette Springs on South River, near Crimora, Stuarts Draft and Sherando on Back Creek, Augusta Springs on Little Calfpasture River.	Flood	Medium	Completed. FEMA is finishing up a Physical Map Revision that should have an effective date of July 18, 2011. The others remain on the list for future updates.	N/A	FEMA and County	N/A
510013	Augusta County	Augusta	CSPDC	14.1 - 14.17	Continue to provide citizens with in-school programs, communication classes, tours, and emergency management seminars.	All Hazards	High	On-going	N/A	County	On-going
510013	Augusta County	Augusta	CSPDC	9.1 - 9.5	Increase emergency communications capability including Reverse 9-1-1, Ind. Map, Emergency Action Plans (EAPs), Dam Protocols, maintain Iflows Rain-Stream Gauges, Mass E-mails, and "Child Is Missing" Hotline.	All Hazards	High	On-going	N/A	County	On-going
510013	Augusta County	Augusta	CSPDC	11.1 - 11.2	Restoration of Dams in Robinson Hollow, Tom Branch, and Mills Creek.	Flood	High	Completed except for Mills Creek which is in progress	N/A	County	On-going
510013	Augusta County	Augusta	CSPDC	13.1 - 13.3	County has been an active participant in stream remediation projects through the Emergency Watershed Protection Program. Maintenance work has been, and will continue to be performed when required on a large scale project on the Saint Mary's River.	Flood	High	On-going	N/A	County	On-going
510013	Augusta County	Augusta	CSPDC	6.1 - 6.8	The Back Creek Physical Map Revision has now identified more properties in the SFHA. County will evaluate the new SFHA to determine what if any resources are available for these newly identified properties.	Flood	High	On-going	Lack of Funding	County	N/A

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510013	Augusta County	Augusta	CSPDC	9.2	Create a regional Emergency Operations Plan (EOP) with the cities of Staunton and Waynesboro to more effectively and efficiently utilize the resources of the three localities.	All Hazards	High	Delayed	Lack of Funding	County and Cities	N/A
510013	Augusta County	Augusta	CSPDC	1.4 6.4	Complete a wildfire protection plan to assess vulnerable woodland areas and propose mitigation techniques and projects to reduce wildfire risk in the County.	Wildfire	High	Project Begun	N/A	County	Should be complete in 2012
510013	Augusta County	Augusta	CSPDC	7.9 - 7.10	Continue development and implementation of planning, preparedness, and response strategies for pets, livestock, and other animals in the County.	All Hazards	High	On-going	N/A	County	On-going
510013	Augusta County	Augusta	CSPDC	8.4	Continue to partner with the Shenandoah Valley Regional Airport in training and implementation of their Airport Emergency Response Plan.	All Hazards	High	On-going	N/A	County and Airport	On-going
510013	Augusta County	Augusta	CSPDC	14.6	Maintain the Staunton-Augusta-Waynesboro Community Emergency Response Team (S-A-W CERT)	All Hazards	High	On-going	N/A	County and Cities	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510013	Augusta County	Augusta	CSPDC	14.1	Maintain a relationship with the Southern Shenandoah Chapter of Virginia Voluntary Organizations Active in Disaster (VOAD), which is a forum where organizations share knowledge and resources throughout the preparation, response, and recovery phases of a disaster.	All Hazards	High	On-going	N/A	County	On-going
510013	Augusta County	Augusta	CSPDC	6.1 - 6.10 8.1 8.2 10.1 - 10.7 12.1	Augusta County will support implementation of structural and non-structural mitigation activities on private or public property to reduce exposure to and provide protection from natural and man-made hazards. Eligible projects include but are not limited to: acquisition, elevation, minor structural flood control projects, relocation of structures, retrofitting of existing structures, infrastructure protection measures, stormwater and wastewater management improvements, advanced warning systems, hazard gauging systems, hazard education, and wildfire mitigation projects.	All Hazards	High	On-going	N/A	County	On-going
510013	Augusta County	Augusta	CSPDC	5.1	Maintain the community's compliance with the National Flood Insurance Program (NFIP) by engaging in various activities included in the three basic components of the NFIP program; 1. floodplain identification and mapping risk, 2. responsible floodplain management, and 3. flood insurance. Sample activities include but are not limited to: maintaining publicly accessible and accurate Flood Insurance Rate Maps (FIRMs), adopting and enforcing a compliant floodplain ordinance, and provide general assistance and education to community members regarding the flood insurance program.	Flood	High	On-going	N/A	County	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510196	Bath County	Bath	CSPDC	14.1 - 14.7	Continue membership and participation in Shenandoah Valley Project Impact, the regional disaster preparedness and mitigation education program that was started in September 2000. By participating in Shenandoah Valley Project Impact, Bath County educates its citizens about disaster preparedness and mitigation through public awareness campaigns, workshops and trainings, and an extensive resource library.	All Hazards	High	On-going	N/A	CSPDC	On-going
510196	Bath County	Bath	CSPDC	6.1	Develop a program to elevate, relocate, floodproof or acquire floodprone structures in order to reduce or eliminate future damages with priority given to structures that are repetitively flooded. Areas of concern where flooding is repetitive include Hot Springs, Jackson River, Mill Creek, Millboro, Millboro Springs, Mountain Grove, and Pads Creek.	Flood	High	Pending - Bath County did not receive funding from NFWF but still has plans to seek funding for this project in the future.	No funding	Local, Federal, State	Unknown
510196	Bath County	Bath	CSPDC	14.1	Maintain a relationship with the Southern Shenandoah Chapter of Virginia Voluntary Organizations Active in Disaster (VOAD), which is a forum where organizations share knowledge and resources throughout the preparation, response, and recovery phases of a disaster.	All Hazards	High	On-going	N/A	County	On-going
510196	Bath County	Bath	CSPDC	15.1	Explore the possibility of revising the County's Flood Insurance Rate Maps (FIRMS) through the Physical Map Revision Process to address changes in the current floodplain delineation.	Flood	High	Pending	No funding	County	Unknown
510196	Bath County	Bath	CSPDC	9.1	Maintain current Iflows rain/stream gauges and consider installing additional gauges in areas of concern if funding is available.	Flood	High	On-going	N/A	County	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510196	Bath County	Bath	CSPDC	9.3	Implement the Code Red Emergency Notification system throughout the County. This system allows for telephone notification for the entire County or targeted areas during emergency situations that require immediate action.	All Hazards	High			County	
510196	Bath County	Bath	CSPDC	9.3	Construct new E-911 Center which will contain an enhanced 911 hardware and software program which will allow dispatches to receive telephone calls from land lines as well as cell phones and create location maps.	All Hazards	High			County	
510196	Bath County	Bath	CSPDC	7.5	Continue to implement and expand Emergency Sheltering Program in the County by partnering with the Red Cross and applying for grant funding for emergency generators for shelters.	All Hazards	High	On-going	N/A	County	On-going
510196	Bath County	Bath	CSPDC	N/A	Continue participation in the Bath County Local Emergency Planning Committee (LEPC)	All Hazards	High	On-going	N/A	County	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510196	Bath County	Bath	CSPDC	6.1 - 6.10 8.1 8.2 10.1 - 10.7 12.1	Bath County will support implementation of structural and non-structural mitigation activities on private or public property to reduce exposure to and provide protection from natural and man-made hazards. Eligible projects include but are not limited to: acquisition, elevation, minor structural flood control projects, relocation of structures, retrofitting of existing structures, infrastructure protection measures, stormwater and wastewater management improvements, advanced warning systems, hazard gauging systems, hazard education, and wildfire mitigation projects.	All Hazards	High	On-going	N/A	Community	On-going
510196	Bath County	Bath	CSPDC	5.1	Maintain the community's compliance with the National Flood Insurance Program (NFIP) by engaging in various activities included in the three basic components of the NFIP program; 1. floodplain identification and mapping risk, 2. responsible floodplain management, and 3. flood insurance. Sample activities include but are not limited to: maintaining publicly accessible and accurate Flood Insurance Rate Maps (FIRMs), adopting and enforcing a compliant floodplain ordinance, and provide general assistance and education to community members regarding the flood insurance program.	Flood	High	On-going	N/A	Community	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510311	Highland County	Highland	CSPDC	14.1 - 14.7	Continue membership and participation in Shenandoah Valley Project Impact, the regional disaster preparedness and mitigation education program that was started in September 2000. By participating in Shenandoah Valley Project Impact, Highland County educates its citizens about disaster preparedness and mitigation through public awareness campaigns, workshops and trainings, and an extensive resource library.	All Hazards	High	On-going	N/A	CSPDC	On-going
510311	Highland County	Highland	CSPDC	14.1	Maintain a relationship with the Southern Shenandoah Chapter of Virginia Voluntary Organizations Active in Disaster (VOAD), which is a forum where organizations share knowledge and resources throughout the preparation, response, and recovery phases of a disaster.	All Hazards	High	On-going	N/A	Community	On-going
510311	Highland County	Highland	CSPDC	6.1 - 6.10 8.1 8.2 10.1 - 10.7 12.1	Highland County will support implementation of structural and non-structural mitigation activities on private or public property to reduce exposure to and provide protection from natural and man-made hazards. Eligible projects include but are not limited to: acquisition, elevation, minor structural flood control projects, relocation of structures, retrofitting of existing structures, infrastructure protection measures, stormwater and wastewater management improvements, advanced warning systems, hazard gauging systems, hazard education, and wildfire mitigation projects.	All Hazards	High	On-going	N/A	Community	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510311	Highland County	Highland	CSPDC	5.1	Maintain the community's compliance with the National Flood Insurance Program (NFIP) by engaging in various activities included in the three basic components of the NFIP program; 1. floodplain identification and mapping risk, 2. responsible floodplain management, and 3. flood insurance. Sample activities include but are not limited to: maintaining publicly accessible and accurate Flood Insurance Rate Maps (FIRMs), adopting and enforcing a compliant floodplain ordinance, and provide general assistance and education to community members regarding the flood insurance program.	Flood	High	On-going	N/A	Community	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510205	Rockbridge County	Rockbridge	CSPDC	14.1 - 14.7	Continue membership and participation in Shenandoah Valley Project Impact, the regional disaster preparedness and mitigation education program that was started in September 2000. By participating in Shenandoah Valley Project Impact, Rockbridge County educates its citizens about disaster preparedness and mitigation through public awareness campaigns, workshops and trainings, and an extensive resource library.	All Hazards	High	On-going	N/A	CSPDC	On-going
510205	Rockbridge County	Rockbridge	CSPDC	6.2	Complete the South River Flood Mitigation Project which calls for the acquisition of up to 35 properties along the South River that were destroyed or damaged in Hurricane Isabel.	Flood	High	Complete	N/A	Local, State, Federal	N/A
510205	Rockbridge County	Rockbridge	CSPDC	4.1	Develop St. Mary's/South River Watershed feasibility study - a joint project with Augusta County and the Army Corps of Engineers to study the flooding along the St. Mary's and South River watersheds.	Flood	Medium	On-hold	N/A	Local and Federal	N/A
510205	Rockbridge County	Rockbridge	CSPDC	13.1, 13.2, 13.3	Continue the stream remediation and bank stabilization work by NRCS on the South River that was affected by Hurricane Isabel and prior flooding events.	Flood	Medium	Complete	N/A	Local and Federal	N/A
510205	Rockbridge County	Rockbridge	CSPDC	14.1	Maintain a relationship with the Southern Shenandoah Chapter of Virginia Voluntary Organizations Active in Disaster (VOAD), which is a forum where organizations share knowledge and resources throughout the preparation, response, and recovery phases of a disaster.	All Hazards	High	On-going	N/A	Community	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510205	Rockbridge County	Rockbridge	CSPDC	6.1 - 6.10 8.1 8.2 10.1 - 10.7 12.1	Rockbridge County will support implementation of structural and non-structural mitigation activities on private or public property to reduce exposure to and provide protection from natural and man-made hazards. Eligible projects include but are not limited to: acquisition, elevation, minor structural flood control projects, relocation of structures, retrofitting of existing structures, infrastructure protection measures, stormwater and wastewater management improvements, advanced warning systems, hazard gauging systems, hazard education, and wildfire mitigation projects.	All Hazards	High	On-going	N/A	Community	On-going
510205	Rockbridge County	Rockbridge	CSPDC	5.1	Maintain the community's compliance with the National Flood Insurance Program (NFIP) by engaging in various activities included in the three basic components of the NFIP program; 1. floodplain identification and mapping risk, 2. responsible floodplain management, and 3. flood insurance. Sample activities include but are not limited to: maintaining publicly accessible and accurate Flood Insurance Rate Maps (FIRMs), adopting and enforcing a compliant floodplain ordinance, and provide general assistance and education to community members regarding the flood insurance program.	Flood	High	On-going	N/A	Community	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510134	Rockingham County	Rockingham	CSPDC	14.1 - 14.7	Continue membership and participation in Shenandoah Valley Project Impact, the regional disaster preparedness and mitigation education program that was started in September 2000. By participating in Shenandoah Valley Project Impact, Rockingham County educates its citizens about disaster preparedness and mitigation through public awareness campaigns, workshops and trainings, and an extensive resource library.	All Hazards	High	On-going	N/A	CSPDC	On-going
510134	Rockingham County	Rockingham	CSPDC	13.1 - 13.3	Begin the stream remediation projects sponsored by NRCS on Germany River, Naked Creek, and Dry Run River that call for streambank restoration, removal of watershed impairments and installation of debris basins to repair damage caused by Hurricane Isabel.	Flood	High	Complete	N/A	Federal, Local	N/A
510134	Rockingham County	Rockingham	CSPDC	14.4	Continue participation in Department of Forestry's Firewise Program, a community awareness and education program that encourages and acknowledges woodland communities to take action that minimizes home loss to wildfires by preparing for a fire before it occurs.	Wildfire	High	On-going	N/A	State, Local	N/A
510134	Rockingham County	Rockingham	CSPDC	6.2	Seek funding to continue county-wide residential flood mitigation project that calls for the acquisition, elevation, floodproofing of properties identified as at-risk of future flooding. Most of these houses are located in the Naked Creek, Rawley Springs, and Bergton/ Criders area of the County.	Flood	High	Delayed	These properties are now mitigated as a result of the Germany River Project.	N/A	N/A
510134	Rockingham County	Rockingham	CSPDC	9.1 12.3 13.1 - 13.2	Rockingham and Page Counties to install an I-Flow gauge on Naked Creek as well as complete stream remediation.	Flood	N/A	Completed	N/A	County	N/A

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510134	Rockingham County	Rockingham	CSPDC	14.1, 14.12, 14.17	Continue support of the Harrisonburg-Rockingham Disaster Recovery Committee, a volunteer group made up of representatives of local churches, the Red Cross, Salvation Army, United Way, VOAD, Social Services, Rockingham County and others that work with residents affected by disasters in providing assistance not covered by federal and state recovery programs.	All Hazards	High	On-going	N/A	County	N/A
510134	Rockingham County	Rockingham	CSPDC	7.9	Continue support of the Harrisonburg and Rockingham SPCA emergency shelter for pets and livestock during a disaster. Volunteers trained to work with animals during disaster situations staff the shelter. Fire Chief also serves on the State animal response committee as well. Currently implementing grant to provide pet emergency supply trailer including supplies and training.	All Hazards	Medium	On-going	N/A	County	On-going
510134	Rockingham County	Rockingham	CSPDC	6.1 - 6.2	Acquire houses located in the floodplain along Naked Creek and have land deeded in Open Space.	Flood	High	Delayed	Property Owners Not Willing To Sell.	Federal, State, and County	N/A
510134	Rockingham County	Rockingham	CSPDC	9.1	Install and maintain I-Flow gauges in two dams: Dry River and Hone Quarry in the middle of each dam.	Flood	High	Completed	N/A	County and Shenandoah SWCD	N/A
510134	Rockingham County	Rockingham	CSPDC	14.1	Maintain a relationship with the Southern Shenandoah Chapter of Virginia Voluntary Organizations Active in Disaster (VOAD), which is a forum where organizations share knowledge and resources throughout the preparation, response, and recovery phases of a disaster.	All Hazards	High	On-going	N/A	County	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510134	Rockingham County	Rockingham	CSPDC	6.1 - 6.10 8.1 8.2 10.1 - 10.7 12.1	Rockingham County will support implementation of structural and non-structural mitigation activities on private or public property to reduce exposure to and provide protection from natural and man-made hazards. Eligible projects include but are not limited to: acquisition, elevation, minor structural flood control projects, relocation of structures, retrofitting of existing structures, infrastructure protection measures, stormwater and wastewater management improvements, advanced warning systems, hazard gauging systems, hazard education, and wildfire mitigation projects.	All Hazards	High	On-going	N/A	County	On-going
510134	Rockingham County	Rockingham	CSPDC	5.1	Maintain the community's compliance with the National Flood Insurance Program (NFIP) by engaging in various activities included in the three basic components of the NFIP program; 1. floodplain identification and mapping risk, 2. responsible floodplain management, and 3. flood insurance. Sample activities include but are not limited to: maintaining publicly accessible and accurate Flood Insurance Rate Maps (FIRMs), adopting and enforcing a compliant floodplain ordinance, and provide general assistance and education to community members regarding the flood insurance program.	Flood	High	On-going	N/A	County	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510134	Rockingham County	Rockingham	CSPDC	N/A	Continue participation in the Harrisonburg-Rockingham Emergency Management Task Force.	All Hazards	High	On-going	N/A	County and City	On-going
510134	Rockingham County	Rockingham	CSPDC	14.5	Rockingham County will strive to attain Storm Ready recognition from the National Weather Service (NWS). Storm Ready is a program designed by the NWS to educate and recognize communities who better prepare for and mitigate effects of extreme weather related events.	All Hazards	High	On-going	N/A	Federal and Local	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510027	City of Buena Vista	Rockbridge	CSPDC	14.1 - 14.7	Continue membership and participation in Shenandoah Valley Project Impact, the regional disaster preparedness and mitigation education program that was started in September 2000. By participating in Shenandoah Valley Project Impact, the City of Buena Vista educates its citizens about disaster preparedness and mitigation through public awareness campaigns, workshops and trainings, and an extensive resource library.	All Hazards	High	On-going	N/A	CSPDC	On-going
510027	City of Buena Vista	Rockbridge	CSPDC	8.1, 8.2	Continue study of acquiring and demolishing the Reeves Brother plant, a major industrial site that was closed in 1985 after Hurricane Juan severely damaged the plant.	Flood	Low	Cancelled, Reeves Brothers Plant has been sold.	N/A	N/A	N/A
510027	City of Buena Vista	Rockbridge	CSPDC	12.1, 13.1, 13.3	Continue the Buena Vista Watershed Project to prevent flooding from four of the interior streams that flow through Buena Vista. The project funded by USDA would protect 240 residences, 70 commercial structures and utilities by constructing debris basins, replacing culverts and bridges and improving stream channels.	Flood	High	On-going	Funding has been cut.	Federal and Local	N/A
510027	City of Buena Vista	Rockbridge	CSPDC	6.1 - 6.2	Seek funding to continue city-wide residential flood mitigation project that calls for the acquisition, elevation, floodproofing of properties identified as at-risk of future flooding.	Flood	High	On-going	Lack of Funding	N/A	N/A
510027	City of Buena Vista	Rockbridge	CSPDC	14.1	Maintain a relationship with the Southern Shenandoah Chapter of Virginia Voluntary Organizations Active in Disaster (VOAD), which is a forum where organizations share knowledge and resources throughout the preparation, response, and recovery phases of a disaster.	All Hazards	High	On-going	N/A	City	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510027	City of Buena Vista	Rockbridge	CSPDC	6.1 - 6.10 8.1 8.2 10.1 - 10.7 12.1	Buena Vista will support implementation of structural and non-structural mitigation activities on private or public property to reduce exposure to and provide protection from natural and man-made hazards. Eligible projects include but are not limited to: acquisition, elevation, minor structural flood control projects, relocation of structures, retrofitting of existing structures, infrastructure protection measures, stormwater and wastewater management improvements, advanced warning systems, hazard gauging systems, hazard education, and wildfire mitigation projects.	All Hazards	High	On-going	N/A	City	On-going
510027	City of Buena Vista	Rockbridge	CSPDC	5.1	Maintain the community's compliance with the National Flood Insurance Program (NFIP) by engaging in various activities included in the three basic components of the NFIP program; 1. floodplain identification and mapping risk, 2. responsible floodplain management, and 3. flood insurance. Sample activities include but are not limited to: maintaining publicly accessible and accurate Flood Insurance Rate Maps (FIRMs), adopting and enforcing a compliant floodplain ordinance, and provide general assistance and education to community members regarding the flood insurance program.	Flood	High	On-going	N/A	City	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510076	City of Harrisonburg	Rockingham	CSPDC	14.1 - 14.7	Continue membership and participation in Shenandoah Valley Project Impact, the regional disaster preparedness and mitigation education program that was started in September 2000. By participating in Shenandoah Valley Project Impact, the City of Harrisonburg educates its citizens about disaster preparedness and mitigation through public awareness campaigns, workshops and trainings, and an extensive resource library.	All Hazards	High	On-going	N/A	CSPDC	On-going
510076	City of Harrisonburg	Rockingham	CSPDC	15.1	Continue participation in FEMA's Cooperating Technical Program (CTP), a technical assistance program sponsored by FEMA that will assist the City in re-mapping the entire floodplain boundary in the City.	Flood	Medium	Complete	N/A	Federal, City	N/A
510076	City of Harrisonburg	Rockingham	CSPDC	1.5, 1.6	Complete the Blacks Run Greenway, a plan to improve Blacks Run, a six-mile creek that runs through the City of Harrisonburg, by limiting development in the floodplain, safeguarding the watershed, and creating open space.	Flood	Medium	Complete	N/A	City, Federal, Aquatic Trust Fund, Nature Conservancy, Private Citizens	N/A
510076	City of Harrisonburg	Rockingham	CSPDC	14.1, 14.12, 14.17	Continue support of the Harrisonburg-Rockingham Disaster Recovery Committee, a volunteer group made up of representatives of local churches, the Red Cross, Salvation Army, United Way, VOAD, Social Services, Rockingham County and others that work with residents affected by disasters in providing assistance not covered by federal and state recovery programs.	All Hazards	High	On-going	N/A	City	On-going
510076	City of Harrisonburg	Rockingham	CSPDC	14.1	Maintain a relationship with the Southern Shenandoah Chapter of Virginia Voluntary Organizations Active in Disaster (VOAD), which is a forum where organizations share knowledge and resources throughout the preparation, response, and recovery phases of a disaster.	All Hazards	High	On-going	N/A	City	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510076	City of Harrisonburg	Rockingham	CSPDC	6.1 - 6.10 8.1 8.2 10.1 - 10.7 12.1	Harrisonburg will support implementation of structural and non-structural mitigation activities on private or public property to reduce exposure to and provide protection from natural and man-made hazards. Eligible projects include but are not limited to: acquisition, elevation, minor structural flood control projects, relocation of structures, retrofitting of existing structures, infrastructure protection measures, stormwater and wastewater management improvements, advanced warning systems, hazard gauging systems, hazard education, and wildfire mitigation projects.	All Hazards	High	On-going	N/A	City	On-going
510076	City of Harrisonburg	Rockingham	CSPDC	5.1	Maintain the community's compliance with the National Flood Insurance Program (NFIP) by engaging in various activities included in the three basic components of the NFIP program; 1. floodplain identification and mapping risk, 2.responsible floodplain management, and 3. flood insurance. Sample activities include but are not limited to: maintaining publicly accessible and accurate Flood Insurance Rate Maps (FIRMs), adopting and enforcing a compliant floodplain ordinance, and provide general assistance and education to community members regarding the flood insurance program.	Flood	High	On-going	N/A	City	On-going
510076	City of Harrisonburg	Rockingham	CSPDC	11.1 - 11.2	Decommission dam at James Madison University	Flood	High	N/A	Lack of Funding	City	N/A

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510076	City of Harrisonburg	Rockingham	CSPDC	7.9 - 7.6	Continue support of the Harrisonburg and Rockingham SPCA emergency shelter for pets and livestock during a disaster. Volunteers trained to work with animals during disaster situations staff the shelter. Currently implementing grant to provide pet emergency supply trailer including supplies and training.	All Hazards	Medium	On-going	N/A	City	On-going
510076	City of Harrisonburg	Rockingham	CSPDC	N/A	Continue participation in the Harrisonburg-Rockingham Emergency Management Task Force.	All Hazards	High	On-going	N/A	City and County	On-going
510076	City of Harrisonburg	Rockingham	CSPDC	14.5	Harrisonburg will strive to attain Storm Ready recognition from the National Weather Service (NWS). Storm Ready is a program designed by the NWS to educate and recognize communities who better prepared for and mitigate effects of extreme weather related events.	All Hazards	High	N/A	N/A	City	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510089	City of Lexington	Rockbridge	CSPDC	14.1 - 14.7	Continue membership and participation in Shenandoah Valley Project Impact, the regional disaster preparedness and mitigation education program that was started in September 2000. By participating in Shenandoah Valley Project Impact, the City of Lexington educates its citizens about disaster preparedness and mitigation through public awareness campaigns, workshops and trainings, and an extensive resource library.	All Hazards	High	On-going	N/A	CSPDC	On-going
510089	City of Lexington	Rockbridge	CSPDC	4.2, 12.3, 12.4, 13.2	Complete the Woods Creek Restoration Project to address water quality/quantity problems along Woods Creek, which runs through the City. The project includes establishing riparian buffers, control storm runoff, modify existing stormwater retention facilities and educate property owners about water quality/quantity issues.	Flood	Medium	On-going	N/A	N/A	N/A
510089	City of Lexington	Rockbridge	CSPDC	14.1	Maintain a relationship with the Southern Shenandoah Chapter of Virginia Voluntary Organizations Active in Disaster (VOAD), which is a forum where organizations share knowledge and resources throughout the preparation, response, and recovery phases of a disaster.	All Hazards	High	On-going	N/A	Community	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510089	City of Lexington	Rockbridge	CSPDC	6.1 - 6.10 8.1 8.2 10.1 - 10.7 12.1	Lexington will support implementation of structural and non-structural mitigation activities on private or public property to reduce exposure to and provide protection from natural and man-made hazards. Eligible projects include but are not limited to: acquisition, elevation, minor structural flood control projects, relocation of structures, retrofitting of existing structures, infrastructure protection measures, stormwater and wastewater management improvements, advanced warning systems, hazard gauging systems, hazard education, and wildfire mitigation projects.	All Hazards	High	On-going	N/A	Community	On-going
510089	City of Lexington	Rockbridge	CSPDC	5.1	Maintain the community's compliance with the National Flood Insurance Program (NFIP) by engaging in various activities included in the three basic components of the NFIP program; 1. floodplain identification and mapping risk, 2. responsible floodplain management, and 3. flood insurance. Sample activities include but are not limited to: maintaining publicly accessible and accurate Flood Insurance Rate Maps (FIRMs), adopting and enforcing a compliant floodplain ordinance, and provide general assistance and education to community members regarding the flood insurance program.	Flood	High	On-going	N/A	Community	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510155	City of Staunton	Augusta	CSPDC	14.1 - 14.7	Continue membership and participation in Shenandoah Valley Project Impact, the regional disaster preparedness and mitigation education program that was started in September 2000. By participating in Shenandoah Valley Project Impact, Staunton educates its citizens about disaster preparedness and mitigation through public awareness campaigns, workshops and trainings, and an extensive resource library.	All Hazards	High	On-going	N/A	CSPDC	On-going
510155	City of Staunton	Augusta	CSPDC	12.1	Complete construction of the Churchville Avenue storm sewer project that is vital to reducing and alleviating downstream flooding in the central business district.	Flood	High	Complete	N/A	City	N/A
510155	City of Staunton	Augusta	CSPDC	3.3	Seek funding to prepare site-specific hydrologic and hydraulic studies that look at the downtown commercial/historic areas that have chronic and repetitive flooding problems.	Flood	Medium	Delayed	Lack Of Funding	N/A	N/A
510155	City of Staunton	Augusta	CSPDC	9.3	Increase expenditures for state-of-the-art equipment, communication systems, and heavy equipment to respond to natural disasters in an effective and efficient manner.	All Hazards	Low	Delayed	Lack Of Funding	N/A	N/A
510155	City of Staunton	Augusta	CSPDC	10.1	Install emergency portable large pumps at the public water supply pump station at Middle River and Gardner Springs located in the floodplain.	All Hazards	Low	Cancelled	N/A	N/A	N/A
510155	City of Staunton	Augusta	CSPDC	14.1	Maintain a relationship with the Southern Shenandoah Chapter of Virginia Voluntary Organizations Active in Disaster (VOAD), which is a forum where organizations share knowledge and resources throughout the preparation, response, and recovery phases of a disaster.	All Hazards	High	On-going	N/A	City	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510155	City of Staunton	Augusta	CSPDC	8.2	Provide floodproofing measures to approximately 12 commercial structures in the downtown area that have been identified as at -risk of flooding. Six additional commercial structures needing floodproofing remain.	Flood	High	Complete	N/A	Community, State, Federal	N/A
510155	City of Staunton	Augusta	CSPDC	8.2 13.1	Demolish structures in floodplain on Central Avenue and complete process of "daylighting" a tributary of Lewis Creek.	Flood	High	Complete	N/A	Community, Private Citizen	N/A
510155	City of Staunton	Augusta	CSPDC	9.3	Install emergency notification system with "Reverse 911" capability and notification by text.	All Hazards	High	Delayed	Lack of Funding	N/A	N/A
510155	City of Staunton	Augusta	CSPDC	6.3	Implement a floodproofing project throughout the City that will strap down above ground storage tanks in the floodplain.	Flood	High	Delayed	Lack of Funding	N/A	N/A
510155	City of Staunton	Augusta	CSPDC	10.1 10.4	Install generators at all of the designated emergency shelters in the City.	All Hazards	High	Delayed	Lack of Funding	N/A	N/A
510155	City of Staunton	Augusta	CSPDC	7.10	Maintain an animal supply trailer and all the supplies needed to stock the mandated animal shelter which will be located at Augusta Expo.	All Hazards	High	Delayed	Lack of Funding	N/A	N/A
510155	City of Staunton	Augusta	CSPDC	12.1	Create a retention pond in the western portion of the City and install other stormwater facilities throughout the City as needed to address stormwater issues.	Flood	High	Delayed	Lack of Funding	N/A	N/A
510155	City of Staunton	Augusta	CSPDC	6.1 - 6.10 8.1 - 8.2 10.1 - 10.7 12.1	The City of Staunton will support implementation of structural and non-structural mitigation activities on private or public property to reduce exposure to and provide protection from natural and man-made hazards. Eligible projects include but are not limited to: acquisition, elevation, minor structural flood control projects, relocation of structures, retrofitting of existing structures, infrastructure protection measures, stormwater and wastewater management improvements, advanced warning systems, hazard gauging systems, hazard education, and wildfire mitigation projects.	All Hazards	High	On-going	N/A	City	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510155	City of Staunton	Augusta	CSPDC	5.1	Maintain the community's compliance with the National Flood Insurance Program (NFIP) by engaging in various activities included in the three basic components of the NFIP program; 1. floodplain identification and mapping risk, 2. responsible floodplain management, and 3. flood insurance. Sample activities include but are not limited to: maintaining publicly accessible and accurate Flood Insurance Rate Maps (FIRMs), adopting and enforcing a compliant floodplain ordinance, and provide general assistance and education to community members regarding the flood insurance program.	Flood	High	On-going	N/A	City	N/A
510155	City of Staunton	Augusta	CSPDC	9.2	City departments will undergo a planning process to evaluate their preparedness.	All Hazards	High	N/A	N/A	City	M/A
510155	City of Staunton	Augusta	CSPDC	9.2	Create a regional Emergency Operations Plan (EOP) with the city of Waynesboro and Augusta County to more effectively and efficiently utilize the resources of the three localities.	All Hazards	High	Delayed	Lack of Funding	County and Cities	N/A
510155	City of Staunton	Augusta	CSPDC	14.6	Maintain the Staunton-Augusta-Waynesboro Community Emergency Response Team (S-A-W CERT)	All Hazards	High	On-going	N/A	County and Cities	On-going
510155	City of Staunton	Augusta	CSPDC	10.1	Move the fire station out of the floodplain.	Flood	High	Delayed	Lack of Funding	City	N/A

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
515532	City of Waynesboro	Augusta	CSPDC	14.1 - 14.7	Continue membership and participation in Shenandoah Valley Project Impact, the regional disaster preparedness and mitigation education program that was started in September 2000. By participating in Shenandoah Valley Project Impact, the City of Waynesboro educates its citizens about disaster preparedness and mitigation through public awareness campaigns, workshops and trainings, and an extensive resource library.	All Hazards	High	On-going	N/A	CSPDC	On-going
515532	City of Waynesboro	Augusta	CSPDC	6.2	Complete the acquisition and relocation of tenants of the Race Ave Trailer Park, a 33 unit trailer park that has been repetitively and seriously damaged in numerous flood events.	Flood	High	Complete	N/A	N/A	Complete
515532	City of Waynesboro	Augusta	CSPDC	6.2	Continue city-wide residential flood mitigation project that calls for the acquisition, elevation, or floodproofing of more than 50 properties identified as at-risk of future flooding. Most of the houses are located in the Club Court, Arch Ave, and Market Street areas of the city. 16 properties have been purchased and kept in “open space”.	Flood	High	On-going	Lack of Funding	N/A	On-going
515532	City of Waynesboro	Augusta	CSPDC	6.1	Complete a project to elevate houses, floodproof utilities, and install flood vents for 12 properties located on Arch and Market Avenues.	Flood	High	On-going	N/A	State and Local	On-going
515532	City of Waynesboro	Augusta	CSPDC	14.1	Maintain a relationship with the Southern Shenandoah Chapter of Virginia Voluntary Organizations Active in Disaster (VOAD), which is a forum where organizations share knowledge and resources throughout the preparation, response, and recovery phases of a disaster.	All Hazards	High	On-going	N/A	City	On-going
515532	City of Waynesboro	Augusta	CSPDC	1.6	Implement greenways project along South River to keep floodplain in “Open Space”.	Flood	High	Complete	N/A	N/A	Complete

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
515532	City of Waynesboro	Augusta	CSPDC	12.1 12.3	Implement stormwater project for Wayne Hills Field in front of the Public Works Building by creating retention pond and connecting drop inlets with piping to travel to retention pond.	Flood	High	On-going	N/A	City	N/A
515532	City of Waynesboro	Augusta	CSPDC	8.1, 8.2	Seek funding to implement a flood mitigation project to provide floodproofing and retrofitting measures to Waynesboro's downtown commercial area.	Flood	Medium	On-going	Lack of Funding	N/A	N/A
515532	City of Waynesboro	Augusta	CSPDC	3.1, 3.3	Up-date a master stormwater study that identifies, analyzes, and prioritizes flooding areas throughout the city. Hire a stormwater manager for the City.	Flood	Medium	On-going	N/A	Local	N/A
515532	City of Waynesboro	Augusta	CSPDC	11.2	Install a flood control dam in Jones Hollow to address problem of ingress and egress of property owners near the mountain whose houses don't get flooded but people get trapped.	Flood	High	Complete	N/A	N/A	N/A
515532	City of Waynesboro	Augusta	CSPDC	9.2	Create a regional Emergency Operations Plan (EOP) with the city of Staunton and Augusta County to more effectively and efficiently utilize the resources of the three localities.	All Hazards	High	Delayed	Lack of Funding	County and Cities	N/A
515532	City of Waynesboro	Augusta	CSPDC	14.6	Maintain the Staunton-Augusta-Waynesboro Community Emergency Response Team (S-A-W CERT)	All Hazards	High	On-going	N/A	County and Cities	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
515532	City of Waynesboro	Augusta	CSPDC	6.1 - 6.10 8.1 8.2 10.1 - 10.7 12.1	Waynesboro will support implementation of structural and non-structural mitigation activities on private or public property to reduce exposure to and provide protection from natural and man-made hazards. Eligible projects include but are not limited to: acquisition, elevation, minor structural flood control projects, relocation of structures, retrofitting of existing structures, infrastructure protection measures, stormwater and wastewater management improvements, advanced warning systems, hazard gauging systems, hazard education, and wildfire mitigation projects.	All Hazards	High	On-going	N/A	City	On-going
515532	City of Waynesboro	Augusta	CSPDC	5.1	Maintain the community's compliance with the National Flood Insurance Program (NFIP) by engaging in various activities included in the three basic components of the NFIP program; 1. floodplain identification and mapping risk, 2. responsible floodplain management, and 3. flood insurance. Sample activities include but are not limited to: maintaining publicly accessible and accurate Flood Insurance Rate Maps (FIRMs), adopting and enforcing a compliant floodplain ordinance, and provide general assistance and education to community members regarding the flood insurance program.	Flood	High	On-going	N/A	City	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
51034	Town of Bridgewater	Rockingham	CSPDC	14.1 - 14.7	Continue membership and participation in Shenandoah Valley Project Impact, the regional disaster preparedness and mitigation education program that was started in September 2000. By participating in Shenandoah Valley Project Impact, the town Of Bridgewater educates its citizens about disaster preparedness and mitigation through public awareness campaigns, workshops and trainings, and an extensive resource library.	All Hazards	High	On-going	N/A	CSPDC	On-going
51034	Town of Bridgewater	Rockingham	CSPDC	6.2	Seek funding to complete the Bridgewater Flood Mitigation Project where structures have been identified as at-risk of flooding and mitigation options such as acquisition, elevation, and/or floodproofing is recommended.	Flood	High	Completed	N/A	Federal, State, Local	N/A
51034	Town of Bridgewater	Rockingham	CSPDC	12.1	Aggressively improve Town's levee system. Maintain levee annually.	Flood	High	On-going	N/A	Federal and Local	N/A
51034	Town of Bridgewater	Rockingham	CSPDC	12.2	Implement plans and regulations at the local level to meet revised storm water management regulations.	Flood	High	On-going	N/A	Local	N/A
51034	Town of Bridgewater	Rockingham	CSPDC	14.1	Maintain a relationship with the Southern Shenandoah Chapter of Virginia Voluntary Organizations Active in Disaster (VOAD), which is a forum where organizations share knowledge and resources throughout the preparation, response, and recovery phases of a disaster.	All Hazards	High	On-going	N/A	Town	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
51034	Town of Bridgewater	Rockingham	CSPDC	6.1 - 6.10 8.1 8.2 10.1 - 10.7 12.1	Bridgewater will support implementation of structural and non-structural mitigation activities on private or public property to reduce exposure to and provide protection from natural and man-made hazards. Eligible projects include but are not limited to: acquisition, elevation, minor structural flood control projects, relocation of structures, retrofitting of existing structures, infrastructure protection measures, stormwater and wastewater management improvements, advanced warning systems, hazard gauging systems, hazard education, and wildfire mitigation projects.	All Hazards	High	On-going	N/A	Town	On-going
51034	Town of Bridgewater	Rockingham	CSPDC	5.1	Maintain the community's compliance with the National Flood Insurance Program (NFIP) by engaging in various activities included in the three basic components of the NFIP program; 1. floodplain identification and mapping risk, 2. responsible floodplain management, and 3. flood insurance. Sample activities include but are not limited to: maintaining publicly accessible and accurate Flood Insurance Rate Maps (FIRMs), adopting and enforcing a compliant floodplain ordinance, and provide general assistance and education to community members regarding the flood insurance program.	Flood	High	On-going	N/A	Town	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510135	Town of Broadway	Rockingham	CSPDC	14.1 - 14.7	Continue membership and participation in Shenandoah Valley Project Impact, the regional disaster preparedness and mitigation education program that was started in September 2000. By participating in Shenandoah Valley Project Impact, the Town of Broadway educates its citizens about disaster preparedness and mitigation through public awareness campaigns, workshops and trainings, and an extensive resource library.	All Hazards	High	On-going	N/A	CSPDC	On-going
510135	Town of Broadway	Rockingham	CSPDC	3.3, 12.1	Seek funding to prepare site-specific hydrologic and hydraulic studies and make recommendations for structural improvements to protect businesses and residences along Linville Creek where chronic and repetitive flooding problems occur.	Flood	High	Delayed	Lack Of Funding	N/A	N/A
510135	Town of Broadway	Rockingham	CSPDC	14.1	Maintain a relationship with the Southern Shenandoah Chapter of Virginia Voluntary Organizations Active in Disaster (VOAD), which is a forum where organizations share knowledge and resources throughout the preparation, response, and recovery phases of a disaster.	All Hazards	High	On-going	N/A	Town	On-going
510135	Town of Broadway	Rockingham	CSPDC	6.1 - 6.10 8.1 8.2 10.1 - 10.7 12.1	Broadway will support implementation of structural and non-structural mitigation activities on private or public property to reduce exposure to and provide protection from natural and man-made hazards. Eligible projects include but are not limited to: acquisition, elevation, minor structural flood control projects, relocation of structures, retrofitting of existing structures, infrastructure protection measures, stormwater and wastewater management improvements, advanced warning systems, hazard gauging systems, hazard education, and wildfire mitigation projects.	All Hazards	High	On-going	N/A	Town	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510135	Town of Broadway	Rockingham	CSPDC	5.1	Maintain the community's compliance with the National Flood Insurance Program (NFIP) by engaging in various activities included in the three basic components of the NFIP program; 1. floodplain identification and mapping risk, 2. responsible floodplain management, and 3. flood insurance. Sample activities include but are not limited to: maintaining publicly accessible and accurate Flood Insurance Rate Maps (FIRMs), adopting and enforcing a compliant floodplain ordinance, and provide general assistance and education to community members regarding the flood insurance program.	Flood	High	On-going	N/A	Town	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510014	Town of Craigsville	Augusta	CSPDC	14.1 - 14.7	Continue membership and participation in Shenandoah Valley Project Impact, the regional disaster preparedness and mitigation education program that was started in September 2000. By participating in Shenandoah Valley Project Impact, the Town of Craigsville educates its citizens about disaster preparedness and mitigation through public awareness campaigns, workshops and trainings, and an extensive resource library.	All Hazards	High	On-going	N/A	CSPDC	On-going
510014	Town of Craigsville	Augusta	CSPDC	12.1	Seek funding to replace and improve infrastructure in key locations throughout the town to reduce flood damage caused by the interior stream water and inadequate culverts and infrastructure. Coordinate project with VDOT.	Flood	High	On-going	Lack of Funding	N/A	N/A
510014	Town of Craigsville	Augusta	CSPDC	14.1	Maintain a relationship with the Southern Shenandoah Chapter of Virginia Voluntary Organizations Active in Disaster (VOAD), which is a forum where organizations share knowledge and resources throughout the preparation, response, and recovery phases of a disaster.	All Hazards	High	On-going	N/A	Town	On-going
510014	Town of Craigsville	Augusta	CSPDC	6.1 - 6.10 8.1 8.2 10.1 - 10.7 12.1	The Town of Craigsville will support implementation of structural and non-structural mitigation activities on private or public property to reduce exposure to and provide protection from natural and man-made hazards. Eligible projects include but are not limited to: acquisition, elevation, minor structural flood control projects, relocation of structures, retrofitting of existing structures, infrastructure protection measures, stormwater and wastewater management improvements, advanced warning systems, hazard gauging systems, hazard education, and wildfire mitigation projects.	All Hazards	High	On-going	N/A	Town	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510014	Town of Craigsville	Augusta	CSPDC	5.1	Maintain the community's compliance with the National Flood Insurance Program (NFIP) by engaging in various activities included in the three basic components of the NFIP program; 1. floodplain identification and mapping risk, 2. responsible floodplain management, and 3. flood insurance. Sample activities include but are not limited to: maintaining publicly accessible and accurate Flood Insurance Rate Maps (FIRMs), adopting and enforcing a compliant floodplain ordinance, and provide general assistance and education to community members regarding the flood insurance program.	Flood	High	On-going	N/A	Town	N/A

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510136	Town of Dayton	Rockingham	CSPDC	14.1 - 14.7	Continue membership and participation in Shenandoah Valley Project Impact, the regional disaster preparedness and mitigation education program that was started in September 2000. By participating in Shenandoah Valley Project Impact, the Town of Dayton educates its citizens about disaster preparedness and mitigation through public awareness campaigns, workshops and trainings, and an extensive resource library.	All Hazards	High	On-going	N/A	CSPDC	On-going
510136	Town of Dayton	Rockingham	CSPDC	10.1	Put fencing around water treatment plant with locked gates and surveillance equipment and alarms for water levels getting too low.	All Hazards	N/A	Completed	N/A	N/A	N/A
510136	Town of Dayton	Rockingham	CSPDC	14.1 14.4	Implement a fire education program to educate citizens on the fire code and burning permits.	Wildfire	N/A	Delayed	Lack of Funding and Staff	N/A	N/A
510136	Town of Dayton	Rockingham	CSPDC	3.3	Conduct a hydrologic study and floodplain analysis to determine vulnerable areas in the Town that receive flooding from Cook's Creek. Implement mitigation measures where needed.	Flood	N/A	Delayed	Lack of Funding	N/A	N/A
510136	Town of Dayton	Rockingham	CSPDC	12.1	Implement a stormwater drainage project to address the stormwater issues on Main Street and College Street.	Flood	N/A	On-going	Submitting application to VDOT.	N/A	N/A
510136	Town of Dayton	Rockingham	CSPDC	14.1	Maintain a relationship with the Southern Shenandoah Chapter of Virginia Voluntary Organizations Active in Disaster (VOAD), which is a forum where organizations share knowledge and resources throughout the preparation, response, and recovery phases of a disaster.	All Hazards	High	On-going	N/A	Town	On-going
510136	Town of Dayton	Rockingham	CSPDC	10.1	Add lightning protection to the Town's Water Plant.	Severe Thunder Storm	High	Delayed	Lack of Funding	Town	N/A

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510136	Town of Dayton	Rockingham	CSPDC	6.1 - 6.10 8.1 8.2 10.1 - 10.7 12.1	Dayton will support implementation of structural and non-structural mitigation activities on private or public property to reduce exposure to and provide protection from natural and man-made hazards. Eligible projects include but are not limited to: acquisition, elevation, minor structural flood control projects, relocation of structures, retrofitting of existing structures, infrastructure protection measures, stormwater and wastewater management improvements, advanced warning systems, hazard gauging systems, hazard education, and wildfire mitigation projects.	All Hazards	High	On-going	N/A	Town	On-going
510136	Town of Dayton	Rockingham	CSPDC	5.1	Maintain the community's compliance with the National Flood Insurance Program (NFIP) by engaging in various activities included in the three basic components of the NFIP program; 1. floodplain identification and mapping risk, 2. responsible floodplain management, and 3. flood insurance. Sample activities include but are not limited to: maintaining publicly accessible and accurate Flood Insurance Rate Maps (FIRMs), adopting and enforcing a compliant floodplain ordinance, and provide general assistance and education to community members regarding the flood insurance program.	Flood	High	On-going	N/A	Town	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510137	Town of Elkton	Rockingham	CSPDC	14.1 - 14.7	Continue membership and participation in Shenandoah Valley Project Impact, the regional disaster preparedness and mitigation education program that was started in September 2000. By participating in Shenandoah Valley Project Impact, the Town of Elkton educates its citizens about disaster preparedness and mitigation through public awareness campaigns, workshops and trainings, and an extensive resource library.	All Hazards	High	On-going	N/A	CSPDC	On-going
510137	Town of Elkton	Rockingham	CSPDC	14.1	Maintain a relationship with the Southern Shenandoah Chapter of Virginia Voluntary Organizations Active in Disaster (VOAD), which is a forum where organizations share knowledge and resources throughout the preparation, response, and recovery phases of a disaster.	All Hazards	High	On-going	N/A	Town	On-going
510137	Town of Elkton	Rockingham	CSPDC	6.1 - 6.10 8.1 8.2 10.1 - 10.7 12.1	Elkton will support implementation of structural and non-structural mitigation activities on private or public property to reduce exposure to and provide protection from natural and man-made hazards. Eligible projects include but are not limited to: acquisition, elevation, minor structural flood control projects, relocation of structures, retrofitting of existing structures, infrastructure protection measures, stormwater and wastewater management improvements, advanced warning systems, hazard gauging systems, hazard education, and wildfire mitigation projects.	All Hazards	High	On-going	N/A	Town	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510137	Town of Elkton	Rockingham	CSPDC	5.1	Maintain the community's compliance with the National Flood Insurance Program (NFIP) by engaging in various activities included in the three basic components of the NFIP program; 1. floodplain identification and mapping risk, 2. responsible floodplain management, and 3. flood insurance. Sample activities include but are not limited to: maintaining publicly accessible and accurate Flood Insurance Rate Maps (FIRMs), adopting and enforcing a compliant floodplain ordinance, and provide general assistance and education to community members regarding the flood insurance program.	Flood	High	On-going	N/A	Town	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
515526	Town of Glasgow	Rockbridge	CSPDC	14.1 - 14.7	Continue membership and participation in Shenandoah Valley Project Impact, the regional disaster preparedness and mitigation education program that was started in September 2000. By participating in Shenandoah Valley Project Impact, the Town of Glasgow educates its citizens about disaster preparedness and mitigation through public awareness campaigns, workshops and trainings, and an extensive resource library.	All Hazards	High	On-going	N/A	CSPDC	On-going
515526	Town of Glasgow	Rockbridge	CSPDC	6.2	Seek funding to complete the Glasgow Residential Flood Mitigation Project that calls for the acquisition, relocation, and elevation of approximately 10 residential properties that have been severely damaged in the past flood events.	Flood	High	Delayed	Lack Of Funding	N/A	N/A
515526	Town of Glasgow	Rockbridge	CSPDC	12.1, 13.1	Seek funding to complete the Glasgow Interior Stream Drainage Project to prevent or reduce flooding along Sallings Mountain and Miller Mountain. The project calls for the construction of a debris basin, flood diversion wall, improved channelization, and replacement of several culverts throughout town. To date ditches have been cleaned out but that is all.	Flood	High	Delayed	Lack of Funding	N/A	N/A
515526	Town of Glasgow	Rockbridge	CSPDC	3.3	Complete a hydrologic, floodplain, and stormwater study to access new and continued vulnerable areas in the town and to provide recommendations for improvements to be made to the Town's stormwater system.	Flood	High	Delayed	Lack Of Funding	N/A	N/A
515526	Town of Glasgow	Rockbridge	CSPDC	14.1	Maintain a relationship with the Southern Shenandoah Chapter of Virginia Voluntary Organizations Active in Disaster (VOAD), which is a forum where organizations share knowledge and resources throughout the preparation, response, and recovery phases of a disaster.	All Hazards	High	On-going	N/A	Town	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
515526	Town of Glasgow	Rockbridge	CSPDC	12.1	Create a stormwater retention pond in north Glasgow - i.e. 1st Street and Pocahontas.	Flood	High	Delayed	Lack Of Funding	N/A	N/A
515526	Town of Glasgow	Rockbridge	CSPDC	10.1, 10.7	Implement a project to safeguard the Town's water system and 2 municipal wells through a wellhead protection project that includes proper abandonment of unused wells, fencing and other security measures, routine inspections of utility lines, and education for property owners, business, industry, and railroad. Also create another well.	All Hazards	Medium	On-going	Lack of Funding	N/A	N/A
515526	Town of Glasgow	Rockbridge	CSPDC	12.1	Implement check-valve system or other floodproofing option to prevent culverts from backing up as they enter the Maury River when rainwater inundates the stormwater drainage system as the the river water simultaneously rises.	Flood	High	Delayed	Lack Of Funding	N/A	N/A
515526	Town of Glasgow	Rockbridge	CSPDC	6.1 - 6.10 8.1 8.2 10.1 - 10.7 12.1	Glasgow will support implementation of structural and non-structural mitigation activities on private or public property to reduce exposure to and provide protection from natural and man-made hazards. Eligible projects include but are not limited to: acquisition, elevation, minor structural flood control projects, relocation of structures, retrofitting of existing structures, infrastructure protection measures, stormwater and wastewater management improvements, advanced warning systems, hazard gauging systems, hazard education, and wildfire mitigation projects.	All Hazards	High	On-going	N/A	Town	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
515526	Town of Glasgow	Rockbridge	CSPDC	5.1	Maintain the community's compliance with the National Flood Insurance Program (NFIP) by engaging in various activities included in the three basic components of the NFIP program; 1. floodplain identification and mapping risk, 2. responsible floodplain management, and 3. flood insurance. Sample activities include but are not limited to: maintaining publicly accessible and accurate Flood Insurance Rate Maps (FIRMs), adopting and enforcing a compliant floodplain ordinance, and provide general assistance and education to community members regarding the flood insurance program.	Flood	High	On-going	N/A	Town	On-going
515526	Town of Glasgow	Rockbridge	CSPDC	10.1	Remove the Glasgow Fire Department from the location of its current building in the floodplain to a less vulnerable location.	Flood	High	Delayed	Lack of Funding	Town	N/A
515526	Town of Glasgow	Rockbridge	CSPDC	6.1	Implement a flood mitigation project to acquire, relocate, or elevate structures on 53 properties located in the floodplain in the Town.	Flood	High	Completed	N/A	Federal, State, and Local	N/A

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510217	Town of Goshen	Rockbridge	CSPDC	14.1 - 14.7	Continue membership and participation in Shenandoah Valley Project Impact, the regional disaster preparedness and mitigation education program that was started in September 2000. By participating in Shenandoah Valley Project Impact, the Town of Goshen educates its citizens about disaster preparedness and mitigation through public awareness campaigns, workshops and trainings, and an extensive resource library.	All Hazards	High	On-going	N/A	CSPDC	On-going
510217	Town of Goshen	Rockbridge	CSPDC	8.1, 10.1	Seek funding to relocate the Goshen Town Hall and Goshen Fire Department. Both of these critical facilities are located on Main Street in close proximity to Mill Creek in a low lying area that receives repeated flooding and affects the operation of the town and fire department. The town has purchased 40 acreas out of the floodplain that could be used as an alternative site for these critical facilities.	Flood	Medium	Delayed	Lack of Funding	N/A	N/A
510217	Town of Goshen	Rockbridge	CSPDC	12.1	Replace culvert at Baptist Hill Road (State Rt. 1001) to alleviate flooding on Route 39.	Flood	High	Delayed	Lack of Funding	N/A	N/A
510217	Town of Goshen	Rockbridge	CSPDC	14.1	Maintain a relationship with the Southern Shenandoah Chapter of Virginia Voluntary Organizations Active in Disaster (VOAD), which is a forum where organizations share knowledge and resources throughout the preparation, response, and recovery phases of a disaster.	All Hazards	High	On-going	N/A	Town	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510217	Town of Goshen	Rockbridge	CSPDC	6.1 - 6.10 8.1 8.2 10.1 - 10.7 12.1	Goshen will support implementation of structural and non-structural mitigation activities on private or public property to reduce exposure to and provide protection from natural and man-made hazards. Eligible projects include but are not limited to: acquisition, elevation, minor structural flood control projects, relocation of structures, retrofitting of existing structures, infrastructure protection measures, stormwater and wastewater management improvements, advanced warning systems, hazard gauging systems, hazard education, and wildfire mitigation projects.	All Hazards	High	On-going	N/A	Town	On-going
510217	Town of Goshen	Rockbridge	CSPDC	5.1	Maintain the community's compliance with the National Flood Insurance Program (NFIP) by engaging in various activities included in the three basic components of the NFIP program; 1. floodplain identification and mapping risk, 2. responsible floodplain management, and 3. flood insurance. Sample activities include but are not limited to: maintaining publicly accessible and accurate Flood Insurance Rate Maps (FIRMs), adopting and enforcing a compliant floodplain ordinance, and provide general assistance and education to community members regarding the flood insurance program.	Flood	High	On-going	N/A	Town	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510138	Town of Grottoes	Rockingham	CSPDC	14.1 - 14.7	Continue membership and participation in Shenandoah Valley Project Impact, the regional disaster preparedness and mitigation education program that was started in September 2000. By participating in Shenandoah Valley Project Impact, the Town of Grottoes educates its citizens about disaster preparedness and mitigation through public awareness campaigns, workshops and trainings, and an extensive resource library.	All Hazards	High	On-going	N/A	CSPDC	On-going
510138	Town of Grottoes	Rockingham	CSPDC	3.3, 12.1, 12.2, 12.3, 12.4	Complete the Grottoes Stormwater Drainage Improvement Project to address flooding caused by ponding and poor drainage along Miller Run and Dry Run. Project improvements such as ditching, replacement of undersized culverts and drainage piping will protect between 30 and 50 structures and eliminate water on roads, yards and crawl spaces. Clean-up of Miller Run takes place every year.	Flood	High	Initial project complete, maintenance on-going.	N/A	Local	Complete
510138	Town of Grottoes	Rockingham	CSPDC	12.1, 13.1	Extend earthen berm in Grottoes Town Park to provide protection to the park which periodically receives flooding from the South River.	Flood	High	Complete	N/A	N/A	Complete
510138	Town of Grottoes	Rockingham	CSPDC	13.1	Implement bank stabilization project at Grand Caverns to protect area from erosion and flooding.	Flood	High	Complete	N/A	State	Complete
510138	Town of Grottoes	Rockingham	CSPDC	14.1	Maintain a relationship with the Southern Shenandoah Chapter of Virginia Voluntary Organizations Active in Disaster (VOAD), which is a forum where organizations share knowledge and resources throughout the preparation, response, and recovery phases of a disaster.	All Hazards	High	On-going	N/A	Town	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510138	Town of Grottoes	Rockingham	CSPDC	6.1 - 6.10 8.1 8.2 10.1 - 10.7 12.1	Grottoes will support implementation of structural and non-structural mitigation activities on private or public property to reduce exposure to and provide protection from natural and man-made hazards. Eligible projects include but are not limited to: acquisition, elevation, minor structural flood control projects, relocation of structures, retrofitting of existing structures, infrastructure protection measures, stormwater and wastewater management improvements, advanced warning systems, hazard gauging systems, hazard education, and wildfire mitigation projects.	All Hazards	High	On-going	N/A	Town	On-going
510138	Town of Grottoes	Rockingham	CSPDC	5.1	Maintain the community's compliance with the National Flood Insurance Program (NFIP) by engaging in various activities included in the three basic components of the NFIP program; 1. floodplain identification and mapping risk, 2.responsible floodplain management, and 3. flood insurance. Sample activities include but are not limited to: maintaining publicly accessible and accurate Flood Insurance Rate Maps (FIRMs), adopting and enforcing a compliant floodplain ordinance, and provide general assistance and education to community members regarding the flood insurance program.	Flood	High	On-going	N/A	Town	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510379	Town of Monterey	Highland	CSPDC	14.1 - 14.7	Continue membership and participation in Shenandoah Valley Project Impact, the regional disaster preparedness and mitigation education program that was started in September 2000. By participating in Shenandoah Valley Project Impact, the Town of Monterey educates its citizens about disaster preparedness and mitigation through public awareness campaigns, workshops and trainings, and an extensive resource library.	All Hazards	High	On-going	N/A	CSPDC	On-going
510379	Town of Monterey	Highland	CSPDC	14.1	Maintain a relationship with the Southern Shenandoah Chapter of Virginia Voluntary Organizations Active in Disaster (VOAD), which is a forum where organizations share knowledge and resources throughout the preparation, response, and recovery phases of a disaster.	All Hazards	High	On-going	N/A	Town	On-going
510379	Town of Monterey	Highland	CSPDC	6.1 - 6.10 8.1 8.2 10.1 - 10.7 12.1	Monterey will support implementation of structural and non-structural mitigation activities on private or public property to reduce exposure to and provide protection from natural and man-made hazards. Eligible projects include but are not limited to: acquisition, elevation, minor structural flood control projects, relocation of structures, retrofitting of existing structures, infrastructure protection measures, stormwater and wastewater management improvements, advanced warning systems, hazard gauging systems, hazard education, and wildfire mitigation projects.	All Hazards	High	On-going	N/A	Town	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510379	Town of Monterey	Highland	CSPDC	5.1	Maintain the community's compliance with the National Flood Insurance Program (NFIP) by engaging in various activities included in the three basic components of the NFIP program; 1. floodplain identification and mapping risk, 2.responsible floodplain management, and 3. flood insurance. Sample activities include but are not limited to: maintaining publicly accessible and accurate Flood Insurance Rate Maps (FIRMs), adopting and enforcing a compliant floodplain ordinance, and provide general assistance and education to community members regarding the flood insurance program.	Flood	High	On-going	N/A	Town	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510224	Town of Mount Crawford	Rockingham	CSPDC	14.1 - 14.7	Continue membership and participation in Shenandoah Valley Project Impact, the regional disaster preparedness and mitigation education program that was started in September 2000. By participating in Shenandoah Valley Project Impact, the Town of Mount Crawford educates its citizens about disaster preparedness and mitigation through public awareness campaigns, workshops and trainings, and an extensive resource library.	All Hazards	High	On-going	N/A	CSPDC	On-going
510224	Town of Mount Crawford	Rockingham	CSPDC	14.1	Maintain a relationship with the Southern Shenandoah Chapter of Virginia Voluntary Organizations Active in Disaster (VOAD), which is a forum where organizations share knowledge and resources throughout the preparation, response, and recovery phases of a disaster.	All Hazards	High	On-going	N/A	Town	On-going
510224	Town of Mount Crawford	Rockingham	CSPDC	6.1 - 6.10 8.1 8.2 10.1 - 10.7 12.1	Mount Crawford will support implementation of structural and non-structural mitigation activities on private or public property to reduce exposure to and provide protection from natural and man-made hazards. Eligible projects include but are not limited to: acquisition, elevation, minor structural flood control projects, relocation of structures, retrofitting of existing structures, infrastructure protection measures, stormwater and wastewater management improvements, advanced warning systems, hazard gauging systems, hazard education, and wildfire mitigation projects.	All Hazards	High	On-going	N/A	Town	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510224	Town of Mount Crawford	Rockingham	CSPDC	5.1	Maintain the community's compliance with the National Flood Insurance Program (NFIP) by engaging in various activities included in the three basic components of the NFIP program; 1. floodplain identification and mapping risk, 2. responsible floodplain management, and 3. flood insurance. Sample activities include but are not limited to: maintaining publicly accessible and accurate Flood Insurance Rate Maps (FIRMs), adopting and enforcing a compliant floodplain ordinance, and provide general assistance and education to community members regarding the flood insurance program.	Flood	High	On-going	N/A	Town	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510139	Town of Timberville	Rockingham	CSPDC	14.1 - 14.7	Continue membership and participation in Shenandoah Valley Project Impact, the regional disaster preparedness and mitigation education program that was started in September 2000. By participating in Shenandoah Valley Project Impact, the Town of Timberville educates its citizens about disaster preparedness and mitigation through public awareness campaigns, workshops and trainings, and an extensive resource library.	All Hazards	High	On-going	N/A	CSPDC	On-going
510139	Town of Timberville	Rockingham	CSPDC	3.3	Conduct a stormwater management study to determine the effectiveness of the Town's stormwater system, highlight vulnerable areas to flooding, and provide recommendations for ways to improve the system.	Flood		Delayed	Lack of Funding	N/A	N/A
510139	Town of Timberville	Rockingham	CSPDC	9.2	Complete a detailed Emergency Operations Plan written specifically for the Town.	All Hazards		Delayed	Lack of Funding	N/A	N/A
510139	Town of Timberville	Rockingham	CSPDC	14.1	Maintain a relationship with the Southern Shenandoah Chapter of Virginia Voluntary Organizations Active in Disaster (VOAD), which is a forum where organizations share knowledge and resources throughout the preparation, response, and recovery phases of a disaster.	All Hazards	High	On-going	N/A	Town	On-going
510139	Town of Timberville	Rockingham	CSPDC	13.1	Explore options with the Army Corps of Engineers for the feasibility of dredging the river.	Flooding	High	Delayed	Lack of Funding	Federal and Local	N/A

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
510139	Town of Timberville	Rockingham	CSPDC	6.1 - 6.10 8.1 8.2 10.1 - 10.7 12.1	Timberville will support implementation of structural and non-structural mitigation activities on private or public property to reduce exposure to and provide protection from natural and man-made hazards. Eligible projects include but are not limited to: acquisition, elevation, minor structural flood control projects, relocation of structures, retrofitting of existing structures, infrastructure protection measures, stormwater and wastewater management improvements, advanced warning systems, hazard gauging systems, hazard education, and wildfire mitigation projects.	All Hazards	High	On-going	N/A	Town	On-going
510139	Town of Timberville	Rockingham	CSPDC	5.1	Maintain the community's compliance with the National Flood Insurance Program (NFIP) by engaging in various activities included in the three basic components of the NFIP program; 1. floodplain identification and mapping risk, 2. responsible floodplain management, and 3. flood insurance. Sample activities include but are not limited to: maintaining publicly accessible and accurate Flood Insurance Rate Maps (FIRMs), adopting and enforcing a compliant floodplain ordinance, and provide general assistance and education to community members regarding the flood insurance program.	Flood	High	On-going	N/A	Town	On-going
510139	Town of Timberville	Rockingham	CSPDC	10.1	Implement security measures to protect the Town's water source.	All Hazards	High	Delayed	Lack of Funding	Town	N/A

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
N/A	N/A	N/A	CSPDC	14.1 - 14.7	Continue membership and participation in Shenandoah Valley Project Impact, the regional disaster preparedness and mitigation education program that was started in September 2000. By participating in Shenandoah Valley Project Impact, the Shenandoah Valley Regional Airport educates its employees and customers about disaster preparedness and mitigation through public awareness campaigns, workshops and trainings, and an extensive resource library.	All Hazards	High	On-going	N/A	CSPDC	On-going
N/A	N/A	N/A	CSPDC	8.1 8.2 10.1	Install new roofing system on one of the hangars at the airport to prevent collapse from heavy snow. Add slope and structurally enhance roof.	Winter Storm	High	Completed	N/A	Airport	N/A
N/A	N/A	N/A	CSPDC	8.1 8.2	Remodel air terminal and replace with thermal windows and efficient lighting.	All Hazards	High	On-going	N/A	Airport	On-going
N/A	N/A	N/A	CSPDC	12.1	Create dedicated wetlands on airport property with slopes to allow slow drainage through bio-retention facilities.	Flood	High	On-going	N/A	Airport	On-going
N/A	N/A	N/A	CSPDC	13.1	Complete an Army Corps of Engineers project to redesign a creek bed to help stormwater drain to prevent flooding.	Flood	High	Completed	N/A	Federal, Airport	Completed
N/A	N/A	N/A	CSPDC	14.6	Create and maintain an SVRA Community Emergency Response Team (CERT).	All Hazards	High	On-going	N/A	Airport	On-going
N/A	N/A	N/A	CSPDC	1.8 1.9 9.2	Maintain the highest level of emergency preparedness for the airport by ensuring that adequate staff are properly trained as first responders and law enforcement officers, including fire prevention and suppression training and keep adequate emergency supplies stocked and on hand.	All Hazards	High	On-going	N/A	Airport	On-going

FEMA Community ID #	Community	County	PDC	Strategy ID #	Mitigation Strategy	Hazard	Priority	Project Status	If Not Completed Why?	Responsible Party	Time Frame
N/A	N/A	N/A	CSPDC	14.1	Maintain a relationship with the Southern Shenandoah Chapter of Virginia Voluntary Organizations Active in Disaster (VOAD), which is a forum where organizations share knowledge and resources throughout the preparation, response, and recovery phases of a disaster.	All Hazards	High	On-going	N/A	Airport	On-going
N/A	N/A	N/A	CSPDC	6.1 - 6.10 8.1 8.2 10.1 - 10.7 12.1	SVRA will support implementation of structural and non-structural mitigation activities on private or public property to reduce exposure to and provide protection from natural and man-made hazards. Eligible projects include but are not limited to: acquisition, elevation, minor structural flood control projects, relocation of structures, retrofitting of existing structures, infrastructure protection measures, stormwater and wastewater management improvements, advanced warning systems, hazard gauging systems, hazard education, and wildfire mitigation projects.	All Hazards	High	On-going	N/A	Airport	On-going
N/A	N/A	N/A	CSPDC	12.1	Redesign parking lot and implement stormwater drainage improvements to more effectively handle runoff.	Flood	High	Scheduled for mid-2012	N/A	Airport	N/A

VI. CAPABILITIES ASSESSMENT

This portion of the Plan assesses the current capacity of the communities of the Central Shenandoah Valley to mitigate the effects of the natural hazards mentioned in Section IV, Hazard Identification Rick Assessment. Determining the ability of local governments to implement mitigation strategies and where potential opportunities to increase these abilities exist is the purpose of the capabilities assessment. This Capabilities Assessment has two primary components, an inventory of the plans and programs that the local governments in the Central Shenandoah Valley Region possess, and an analysis of the governments abilities to implement mitigation strategies and measures based on this inventory. In order to assess these components; local plans and the expertise of staff. For this review, cities and counties in the Central Shenandoah Planning District were studied. Because towns are considered part of the counties where they are located and have access to county resources, towns are not listed separately.

Local Plans	Hazardous Mitigation Plan	Comprehensive Land Use Plan	Community Wildfire Protection Plan	Emergency Operations Plan	SARA Title III Hazardous Materials Emergency Response Plan
Augusta County	X	X	X	X	X
Bath County	X	X		X	X
Highland County	X	X		X	X
Rockbridge County	X	X		X	X
Rockingham County	X	X		X	X
Buena Vista	X	X		X	X
Harrisonburg	X	X		X	X
Lexington	X	X		X	X
Staunton	X	X		X	X
Waynesboro	X	X		X	X

Administrative and Technical Capabilities of Local Government Staff	Augusta County	Bath County	Highland County	Rockbridge County	Rockingham County	Buena Vista	Harrisonburg	Lexington	Staunton	Waynesboro
Land use planners or planners with knowledge of land development and land management practices	X	X	X	X	X	X	X	X	X	X
Engineers or Professionals trained in construction practices related to buildings or infrastructure	X	X	X	X	X	X	X	X	X	X
Staff with an understanding of natural or human caused hazards	X	X	X	X	X	X	X	X	X	X
Emergency Manager	X	X	X	X	X	X	X	X	X	X
Floodplain Manager	X	X	X	X	X	X	X	X	X	X
Staff with education and/or expertise to assess the communities vulnerability to hazards	X	X	X	X	X	X	X	X	X	X
Resource development and grant writing staff	X	X	X	X	X	X	X	X	X	X
Internet access	X	X	X	X	X	X	X	X	X	X
Fire and Rescue paid or volunteer staff	X	X	X	X	X	X	X	X	X	X

Capabilities Assessment Findings

Existing Local Plans

Planning capability is based on the creation and implementation of plans that demonstrate a jurisdiction's commitment to guiding and managing growth in a responsible manner; encouraging public safety; preserving the local economy; protecting environmental, historic, and cultural resources; and maintaining the general welfare of the community. Planning initiatives present significant opportunity to integrate hazard mitigation principles and practices into the community. The jurisdictions of the Central Shenandoah Region have many planning mechanisms in place that include mitigation information and techniques including:

Hazard Mitigation Plan: A hazard mitigation plan represents a community's blue print for how it intends to reduce the impact of natural and human-caused hazards on people and the built environment. All twenty-one jurisdictions in the CSPDC have adopted the Central Shenandoah Valley All Hazards Mitigation Plan.

Comprehensive Land Use Plan: A comprehensive land use plan establishes the overall vision for what a community wants to be an serves as a guide to future governmental decision making. A comprehensive plan contains sections on demographic conditions, land use, natural resources, economic development, transportation, and community facilities. Community strategies included in these plans can encourage the achievement of risk reduction goals. The five counties and cities in the CSPDC have Comprehensive Land Use Plans.

Community Wildfire Protection Plan (CWPP): The Healthy Forests Restoration Act (HFRA) of 2003 created the opportunities for local governments to prioritize goals and needs for the wildland areas in their communities through community wildfire protection plans. A CWPP addresses issues in a community such as wildfire response, hazard mitigation, community preparedness, and structure protection. Augusta County has adopted a Community Wildfire Protection Plan.

Emergency Operations Plan (EOP): An emergency operations plan outlines responsibilities and the means by which resources are deployed during and following an emergency or disaster. A section that specifically deals with mitigation is included in these plans. The five counties and five cities in the Central Shenandoah Planning District either have their own EOP or participate in regional EOPs.

SARA Title III Emergency Response Plan (ERP): Required by federal low under Title III of the Superfund Amendments and Re-authorization Act (SARA), these plans outline the procedures to be followed in the event of a chemical emergency such as the accidental release of toxic substances. The five counties and cities in the Central Shenandoah Planning District either have their own individual ERP or participate in regional ERPs.

Based on the types of planning initiatives possessed by all of the jurisdictions in the region, the actual and potential opportunities to incorporate mitigation concepts into local planning processes is very high for the Central Shenandoah Region.

Expertise of Local Planning Staff

As described previously, the Central Shenandoah Region consists of 21 jurisdictions (5 counties, 5 cities, and 11 towns). The counties in the Region are led by an elected Board of Supervisors who appoints a County Administrator to manage the day to day operations of the government. In the cities, a City Council are the elected officials and a City Manager, appointed by Council, manages the day to day operations.

Mitigation cuts across many disciplines. For a successful mitigation program, it is necessary to have a broad range of people involved with diverse backgrounds. Across the jurisdictions in the Central Shenandoah Valley Region this expertise can be found in local government staff in the following areas or departments:

- *Community Development and Building Inspection Departments have the abilities to conduct land use planning based on knowledge of land development and land management practices. They may also possess expertise in resource development and grant writing staff. These departments may also house a community's floodplain manager and other staff with the ability to assess the natural*

hazards vulnerability of the community. As all of the communities are in good standing in the National Flood Insurance Program (NFIP), these departments may also enforce NFIP requirements.

- *Engineering and Public Works Departments have the training in construction practices related to buildings and infrastructure. The Engineering Department may oversee the design and construction of infrastructure including roadways and stormwater facilities. The Public Works Department oversees the maintenance of the community's infrastructure, water treatment and sewer facilities.*

- *Emergency Management, Fire and Rescue Staff are involved with natural and man-made hazards and disasters and are closely involved with mitigation as it is one of the four cornerstones of the emergency management cycle. Fire and Rescue departments provide fire suppression and medical aid at the scene of disasters and may be involved with hazardous materials incidents.*

This capability assessment illustrates the variety of staff and departments in local governments in the Central Shenandoah Region that possess the expertise to identify and implement mitigation activities.

The other resource that the 21 jurisdictions of the Central Shenandoah Planning District have is partnerships with private organizations, Non-governmental Organizations (NGOs), and neighboring jurisdictions. The counties and cities have Memorandums of Understanding and Mutual Aid agreements with these organizations and jurisdictions surrounding our region for assistance in the event of emergencies and disasters for supplies, equipment, and manpower. More informal partnerships also exist in non-disaster times between local government staff from all departments to their counterparts in neighboring jurisdictions for technical assistance and the sharing of resources. When applicable, these partners are often included in the mitigation planning process and other hazard mitigation activities to share their expertise. These partnerships only further the depth of capabilities that the local jurisdictions of the Central Shenandoah Region possess.

VII. PLAN MAINTENANCE

According to the Disaster Mitigation Act of 2000, local plans are required to include a method and schedule of monitoring, evaluating, and updating the hazard mitigation plans within a five-year cycle as well as a description of continued public involvement in the hazard mitigation planning process.

The Central Shenandoah Valley Region will use its All Hazards Plan Steering Committee as the body responsible for the review, monitoring, and update of its All Hazards Plan. This group meets annually and includes representatives from local government and other relevant organizations throughout our Region. In the event that the Steering Committee shall dissolve then each local jurisdiction will be responsible for the maintenance and up-date of the Plan. The Plan Steering Committee is staffed by the Central Shenandoah Planning District Commission.

Through our All Hazards Plan Steering Committee, the All Hazards Plan will be reviewed on an annual basis and updated when and where needed. Each local jurisdiction will be asked to review the Plan and submit a report when necessary that outlines any revisions, projects, or activities that impact the Plan. These annual reports will be reviewed by the All Hazards Plan Steering Committee and revisions will be made to the Plan by CSPDC staff. In addition any local, state, or federal regulations that change or impact the Plan will be incorporated into it. Local governments will be apprised of any substantial changes to the Plan.

In addition to an annual review, local governments will asked to reference the All Hazards Plan in their Emergency Operations Plan (EOP). The Virginia Emergency Management and Disaster Law of 2000 require that the State, and each county and city within the State develop and maintain a current Emergency Operation Plan which addresses their planned response to extraordinary emergency situations. As part of the basic EOP, an appendix that addressees hazard mitigation activities is required. We will request that each of our cities and counties refer to the Central Shenandoah All Hazards Mitigation Plan as a resource document as part of their EOP's Hazard Mitigation Annex and request local government review of the All Hazard Plan as part of their annual EOP review. In addition, a request will be made to each local jurisdiction to include the All Hazards Plan in other planning documents such as comprehensive plans and capital improvement plans.

The Plan will undergo a comprehensive review every 5 years. The All Hazards Plan Steering Committee will be the entity responsible for the review, evaluation and up-date of the Plan. The criteria used to evaluate the Plan will be developed in accordance with the requirements of the Federal Emergency Management Agency (FEMA) Section 322 local hazard mitigation planning regulations as well as additional guidance documents provided by FEMA and Virginia Department of Emergency Management. The method used to up-date the Plan will include a request from each jurisdiction for a report that describe the progress of mitigation strategies identified in the Plan and any activities or projects that has been implemented. Other factors that could necessitate a revision to the Plan may include any new local, state, or federal regulations or requirements that impact the Plan; any Presidentially-declared disasters that have impacted the Region, or an increase or decrease in a community's vulnerability to a natural disaster. The 5-year update will be submitted to each of the local governments, the Virginia Department of Emergency Management, and FEMA as required. Significant changes to the Plan will include public input.

Public participation was an integral part of the development of this Plan and will continue through the course of its existence. Activities to involve the public in the maintenance, evaluation and revision of the plan may include a yearly "Disaster Resistance Forum" meeting where the general public is invited, utilizing the websites of the Central Shenandoah Planning District Commission to notify the public of meetings, agendas, and revisions of the Plan, and employing the media to notify the public of any up-coming activities or public input sessions regarding the Plan and the Plan update.

VIII. ADOPTION PROCESS AND DOCUMENTATION

The Central Shenandoah Valley Regional All Hazards Mitigation Plan was developed as a multi-jurisdictional plan; therefore, to meet the requirements of Section 322 of the Disaster Mitigation Act of 2000, the final plan was adopted by each of the 21 municipalities in our Region for the original Plan in 2005 and for the 1st five-year update of the Plan in 2013. Resolutions from these two adoption processes for each of the jurisdictions in the Central Shenandoah Planning District are included in Appendix C.

IX. REFERENCES

1. Other Mitigation Plans

Virginia Department of Emergency Management (VDEM)
Commonwealth of Virginia's Standard Hazard Mitigation Plan (2004)
Cumberland Mitigation Plan
NRV Mitigation Plan
Wyoming County (WV) Mitigation Plan

2. Software

FEMA HAZUS software
ESRI data and software
PRISM Data
Data provided by Whitt Sours (GIS CSPDC)
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A. Websites

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5. Additional Historic Research Resources (continued)

A. Websites (continued)

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Shaken! Earthquake Rocks Central Virginia from: The Geology of Virginia **http://web.wm.edu/geology/virginia**	
VA Climate Advisery - Vol 23, No 2	Summer 1999
VA Earthquakes **http://www.virginiaplaces.org/geology/quake.html**	7/20/2010
"Volcanoes"-VA Dept of Mines, Minerals, and Energy/Division of Geology and Mineral Resources **http://www.dmme.virginia.gov/DMR3/volcanoes.shtml**	7/7/2011
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5. Additional Historic Research Resources (continued)

A. Websites (continued)

USGS Earthquake Hazards Program, Earthquake History of Virginia **http://neic.usgs.gov/neis/states/virginia/virginia_history.html**	11/3/2005
USGS Earthquake Hazards Program, Virginia Earthquake History **http://earthquake.usgs.gov/earthquakes/states/virginia/history.php**	2/2/2011
USGS Earthquake Hazards Program, Magnitude 5.8 - Virginia; 2011 August 23 17:51:03 UTC **http://earthquake.usgs.gov/earthquakes/recentqsww/Quakes/at001qe6x3.php**	8/24/2011
US Geological Survey "Seasonal Stream Flow Conditions and Historic Droughts"	12/5/2011
UVA Climatology "Little Big Drought"	
Wikipedia **http://en.wikipedia.org/wiki/Earthquake**	
http://en.wikipedia.org/wiki/Mercalli_Intensity_Scale	7/21/2010
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http://en.wikipedia.org/wiki/Virginia_Seismic_Zone	2/2/2011
http://en.wikipedia.org/wiki/Mole_Hill_(Virginia)	7/7/2011
http://en.wikipedia.org/wiki/Trimble_Knob	7/7/2011






5. Additional Historic Research Resources (continued)

B. Newspapers

Newspaper	Date	Pages
Augusta Angus	2/14/1899	pg. 3
Augusta Angus	6/8/1897	pg. 4
Buena Vista News	3/27/1936	pg. 1
Buena Vista News	6/30/1972	Special Flood Section
Buena Vista News	12/6/1934	Cover
Harrisonburg Daily News Record	3/16/1936	pg. 5
Harrisonburg Daily News Record	3/18/1936	pg. 1, 6
Harrisonburg Daily News Record	3/19/1936	pg. 1, 7, 8
Harrisonburg Daily News Record	3/20/1936	pg. 1, 6
Harrisonburg Daily News Record	3/21/1936	pg. 1, 6
Harrisonburg Daily News Record	3/23/1936	pg. 1, 5, 7
Harrisonburg Daily News Record	6/18/1949	pg. 1, 2
Harrisonburg Daily News Record	6/20/1949	pg. 1, 2
Harrisonburg Daily News Record	6/21/1949	pg. 1, 9, 12
Harrisonburg Daily News Record	6/22/1949	pg. 1, 2, 4, 9
Harrisonburg Daily News Record	6/23/1949	pg. 1, 2, 12
Harrisonburg Daily News Record	6/24/1949	pg. 1, 16
Harrisonburg Daily News Record	6/27/1949	pg. 1, 2, 8, 10
Harrisonburg Daily News Record	8/21/1969	Cover, pg. 18, 19
Harrisonburg Daily News Record	8/22/1969	Cover, pg. 8
Harrisonburg Daily News Record	8/23/1969	Cover, pg. 8, 9
Harrisonburg Daily News Record	8/25/1969	pg. 2, 6
Harrisonburg Daily News Record	8/26/1969	Cover, pg. 2
Harrisonburg Daily News Record	6/22/1972	Cover, pg. 12
Harrisonburg Daily News Record	6/23/1972	Cover, pg. 2, 15
Harrisonburg Daily News Record	11/5/1985	pg. 14, 18
Harrisonburg Daily News Record	11/6/1985	Cover, pg. 2, 13
Harrisonburg Daily News Record	9/7/1996	pg. 19
Harrisonburg Daily News Record	9/9/1996	Cover, pg. 15, 17
Harrisonburg Daily News Record	9/10/1996	Cover
Harrisonburg Daily News Record	9/16/1996	Flood of 1996 Section
Harrisonburg Daily News Record	10/16/1954	Cover, pg. 13
Harrisonburg Daily News Record	8/13/1955	pg. 2
Harrisonburg Daily News Record	8/19/1955	Cover, pg. 2, 4
Harrisonburg Daily News Record	2/14/2007	Cover, A5
Harrisonburg Daily News Record	2/15/2007	Cover, A3
Harrisonburg Daily News Record	12/19/2009	Cover, A6
Harrisonburg Daily News Record	12/21/2009	Cover, A10
Harrisonburg Daily News Record	12/22/2009	Cover, A10

5. Additional Historic Research Resources (continued)

B. Newspapers (continued)

Newspaper	Date	Pages
Harrisonburg Daily News Record	5/3/2009	Cover, pg. 6
Harrisonburg Daily News Record	5/4/2009	Cover, pg. 5
Harrisonburg Daily News Record	1/15/2010	Cover
Harrisonburg Daily News Record	11/25/1938	Cover
Harrisonburg Daily News Record	3/6/1962	Cover, pg. 2, 7
Harrisonburg Daily News Record	3/7/1962	pg. 12
Harrisonburg Daily News Record	3/8/1962	pg. 13
Harrisonburg Daily News Record	3/9/1962	pg. 8
Harrisonburg Daily News Record	3/27/1978	Cover, pg. 5, 15
Harrisonburg Daily News Record	3/28/1978	pg. 11
Harrisonburg Daily News Record	3/29/1978	pg. 6, 17
Harrisonburg Daily News Record	3/13/1993	pg. 2
Harrisonburg Daily News Record	3/15/1993	Cover, pg. 2, 5
Harrisonburg Daily News Record	2/12/1983	Cover, pg. 3, 11
Harrisonburg Daily News Record	2/13/1983	Cover
Harrisonburg Daily News Record	2/11/1994	Cover, pg. 2, 3
Harrisonburg Daily News Record	2/12/1994	Cover, pg. 2
Harrisonburg Daily News Record	1/8/1996	Cover
Harrisonburg Daily News Record	1/9/1996	Cover, pg. 2, 4
Harrisonburg Daily News Record	8/24/2011	Cover, A5
Lexington News-Gazette	3/20/1936	pg. 1, 8
Lexington News-Gazette	10/20/1954	Cover
Lexington News-Gazette	8/17/1955	pg. 7
Lexington News-Gazette	9/30/1959	Cover
Lexington News-Gazette	7/21/1842	pg. 2
Lexington News-Gazette	8/31/1893	
Lexington News-Gazette	5/16/2001	A12
Lexington News-Gazette	2/21/2007	Cover
Lexington News-Gazette	2/28/2007	C1
Lexington News-Gazette	5/7/1929	Cover
Lexington News-Gazette	1/17/1912	pg. 5
Lexington News-Gazette	3/7/1962	Cover
Lexington News-Gazette	3/29/1978	pg. 13
Lexington News-Gazette	2/16/1983	pg. 12
Lexington News-Gazette	3/17/1993	Cover, pg. 10, 11
News Virginian	6/28/2005	
News Virginian	6/29/2006	
News Virginian	2/13/2007	Cover, A5
News Virginian	2/15/2007	Cover, A5
News Virginian	12/20/2009	Cover, A2, A5
News Virginian	12/21/2009	Cover, A2






5. Additional Historic Research Resources (continued)

B. Newspapers (continued)

Newspaper	Date	Pages
News Virginian	12/22/2009	Cover, A3, A5
News Virginian	8/24/2011	Cover, A2, A3
NOAA Event Records	2/12/2007	Storm
NOAA Event Records	2/14-2/18/2003	Storm
NOAA Event Records	12/19/2009	Storm
NOAA Event Records	1/16/1996	Storm
NOAA Event Records	12/18-	Winter Storm
NOAA Event Records	2/5-2/10/2010	Winter Storm
Richmond Times Dispatch	8/21/1969	Cover, A4, A5, C3, pg. 5
Richmond Times Dispatch	8/22/1969	Cover, A5, B1, pg. 8
Richmond Times Dispatch	8/23/1969	Cover, A4
Richmond Times Dispatch	8/24/1969	Cover, A15, B1, B2
Richmond Times Dispatch	6/20/1972	Cover, pg. 2
Richmond Times Dispatch	6/21/1972	A3
Richmond Times Dispatch	6/22/1972	Cover, pg. 2
Richmond Times Dispatch	6/23/1972	Cover, A4, A16
Richmond Times Dispatch	6/24/1972	Cover, A4, pg. 5, 12
Rockbridge County News	2/16/1899	pg. 3
Rockbridge County News	6/3/1897	pg. 3
Rockingham Register	10/2/1896	pg. 2, 3
Rockingham Register	8/21/1906	Cover, pg. 3
Rockingham Register	2/10/1899	pg. 3
Rockingham Register	2/17/1899	pg. 3
Rockingham Register	2/24/1899	pg. 2, 3
Rockingham Register	6/4/1897	Cover
Staunton Daily News Leader	11/5/1985	Cover, A3
Staunton Daily News Leader	11/6/1985	Cover, A7
Staunton Daily News Leader	11/7/1985	Cover, A5
Staunton Daily News Leader	11/8/1985	Cover
Staunton Daily News Leader	6/23/1995	Cover
Staunton Daily News Leader	6/24/1995	Cover, A5
Staunton Daily News Leader	6/25/1995	Cover
Staunton Daily News Leader	6/29/1995	Cover, A2
Staunton Daily News Leader	6/30/1995	Cover
Staunton Daily News Leader	9/6/1996	Cover, A2
Staunton Daily News Leader	9/7/1996	Cover, A2, A3
Staunton Daily News Leader	9/8/1996	Cover, A2
Staunton Daily News Leader	9/9/1996	Cover, A2
Staunton Daily News Leader	10/18/1954	Cover, pg. 4
Staunton Daily News Leader	8/13/1955	Cover

5. Additional Historic Research Resources (continued)

B. Newspapers (continued)

Newspaper	Date	Pages
Staunton Daily News Leader	8/14/1955	pg. 4
Staunton Daily News Leader	10/1/1959	Cover, pg. 3
Staunton Daily News Leader	8/18/1955	Cover, pg. 2
Staunton Daily News Leader	8/20/1955	pg. 7
Staunton Daily News Leader	6/28/2006	
Staunton Daily News Leader	4/27/1937	Cover
Staunton Daily News Leader	5/12/2007	B8
Staunton Daily News Leader	1/2/2010	A5
Staunton Daily News Leader		(1881 Storm)
Staunton Daily News Leader	2/14/2007	Cover, A Back Page
Staunton Daily News Leader	2/15/2007	Cover, A5
Staunton Daily News Leader	4/16/2005	B6
Staunton Daily News Leader	2/5/2010	A3
Staunton Daily News Leader	2/6/2010	Cover, A3, A6, A10
Staunton Daily News Leader	2/7/2010	Cover, A4, A12
Staunton Daily News Leader	2/8/2010	Cover, A4, A5
Staunton Daily News Leader	2/9/2010	Cover, A8
Staunton Daily News Leader	12/20/2009	Cover, A3, A4, A5, A12
Staunton Daily News Leader	12/21/2009	Cover, A8
Staunton Daily News Leader	12/22/2009	Cover, A3, A8
Staunton Daily News Leader	6/5/1911	Cover
Staunton Daily News Leader	6/7/1911	Cover, pg. 3
Staunton Daily News Leader	5/3/1929	Cover
Staunton Daily News Leader	4/4/1974	Cover, pg. 2
Staunton Daily News Leader	1/5/1912	Cover
Staunton Daily News Leader	3/6/1962	Cover
Staunton Daily News Leader	3/7/1962	Cover
Staunton Daily News Leader	3/27/1978	Cover, pg. 2
Staunton Daily News Leader	3/28/1978	Cover
Staunton Daily News Leader	2/13/1983	Cover, pg. 2
Staunton Daily News Leader	3/14/1993	Cover
Staunton Daily News Leader	3/15/1993	Cover
Staunton Daily News Leader	1/9/1996	Cover, pg. 3
Staunton Daily News Leader	1/13/1996	Cover
Staunton News Leader	8/24/2011	Cover, A3
Staunton Spectator	10/4/1870	Cover
Staunton Spectator	9/30/1896	Cover
Staunton Spectator	8/10/1896	
Staunton Vindicator	9/23/1870	Cover
Staunton Vindicator	10/7/1870	Cover
Staunton Vindicator	2/16/1899	pg. 2
Staunton Vindicator	6/3/1897	pg. 3






5. Additional Historic Research Resources (continued)

B. Newspapers (continued)

Newspaper	Date	Pages
The Recorder	11/?/1985	Cover, pg. 3
The Recorder	1/26/1996	Cover, pg. 2
The Recorder	2/9/2001	pg. 17
The Recorder	4/9/1993	pg. 9
Washington Post	12/24/2009	Cover, A8
Washington Post	12/20/2009	Cover, A8, A10
Yosts Weekly	10/2/1896	Cover

C. Other Resources

Annals of Augusta Co Va from 1726-1871. Waddel. Pg. 441-449

Buena Vista News: Hurricane Camille - A Review

Debris-Flow Hazards In Areas. Morgan and Wieczorek

Henry Smals Diary. 1886

Major Earthquakes in Virginia: Adopted from Seismicity of the United States, 1568-1989. Carl W. Stover and Jerry L. Coffman

VEOC; VDEM; VERT; 2011-8-23 Earthquake Situation Report #1, August 24, 2011

Virginia Hazard Mitigation Plan: Emergency Operations Plan Volume 6
Barbara McNaught Watson

Virginia Tornadoes
Barbara McNaught Watson

Winter Storms
Barbara McNaught Watson

100 Years of Dreams
Lynda Mundy-Norris

Flood	Description and Damages
July 13, 1842	• *Occurred in Rockbridge County and also affected Covington, Buchanan, Lynchburg.* • *Floods in Rockbridge affected Irish Creek, Mill Creek, Jackson Run, North River (now known as the Maury), and James River.* • *Furnaces, forges, mills, and bridges washed away.* • *Caused by a week of heavy rains.* • *Destroyed crops: corn, wheat, oats, and hay.* • *Fences along rivers washed away.* • *Flooding along James River did not reach Scottsville.* • *Canal seriously damaged in Lynchburg.* *"The heavy rains of last week were succeeded by the most disastrous freshet with which our county has ever been visited."* *- Lexington Gazette July 21, 1842*
1846	*"… a stranger walking thru the business portion of Staunton, would not imagine that the place was liable to be devastated by floods, there being no water force visible to the eye. Yet the town had several times suffered severely from the cause. "* *- Annals of Augusta County, Virginia from 1726 to 1871 by Jos. A. Waddel*
January 1854	• *Heavy rains caused the James River to flood Balcony Falls and Glasgow in Rockbridge County.* • *On January 21, 1854, the canal boat Clinton and its passengers became stranded in the raging waters. Frank Padget, a skilled boatman and a slave, led four other men to rescue them. As Padget was trying to save the last passenger, he drowned in the rushing current. Capt. Edward Echol's, who witnessed the rescue, was so moved he commissioned the construction of a granite monument which now stands in Glasgow's Centennial Park.*
August 4, 1860	• *Flashflood in City of Staunton caused by a severe thunderstorm.* • *Sidewalks were pulled up along Augusta Street.* • *Many stores in downtown Staunton received thousands of dollars of damages.* • *A chimney at St. Francis church was blown down.* • *A stable was lifted off it's foundation and destroyed.* *"It is sufficient to arouse our citizens to the absolute necessity of arming themselves against a recurrence of the disastrous results which have followed this freshet."* *- Staunton Spectator, August 10, 1896*

Flood	Description and Damages
September 28 - 30, 1870	The flood of September 28-30, 1870 was one of the earliest floods in the history of the Shenandoah Valley where written accounts are widely available. The flood event occurred throughout the central Valley from the north in Rockingham County and to the south in Rockbridge. The rain was first welcomed after a period of drought and a summer where rivers had been running below normal. As the rain continued, rivers rose to swirling torrents. The Shenandoah River with its expanded and rapid course carried away houses, trees, and bridges in Rockingham County and northward. The Village of Port Republic was reportedly under 15 feet of water at one time during the event. An example of destruction caused by this flood could be seen in Harper's Ferry, West Virginia, the confluence of the Shenandoah and Potomac Rivers where 47 people died. In Augusta and Rockbridge Counties, extensive damage occurred. Some reports measured nine inches of rain with this storm. In Staunton, flooding along Lewis Creek caused damage to its downtown and washed away a railroad bridge and wood and brick houses. The C & O railroad was damaged, including another bridge that washed away in Waynesboro. In Rockbridge County, Lexington was particularly hard hit in The Point area where several houses were swept away. Also in Rockbridge County, farms, crops, and fences, were destroyed by the flood event. Throughout the Shenandoah Valley, communication lines and transportation routes were blocked. With images of the Civil War still fresh in the minds of people, rebuilding from the flood of September 1870, became another challenge in the recovery they were already experiencing. *"… some idea may be obtained of the immense destruction which has spread over many portions of our beloved old State, greater, by far, than the devastations of four years war. Our people however, have exhibited in the past a wonderful recuperative power. They will not be downcast now, but will bow with humble resignation to the will of Heaven, and will still hope and strive for the best." – Staunton Vindicator, October 7, 1870*
August 28, 1893	• *Flood caused by heavy rainfall affected Rockbridge County.* • *Rain started at around 9 a.m. in the morning and continued until midnight.* • *The North River (now known as the Maury River) before the rainfall had been so low there wasn't enough electricity to run the electric plant. As a result of the storm, water was 3 feet over the roadway at The Point.*

Flood	Description and Damages
September 29, 1896  ***City Of Staunton*** 	On the twenty-sixth anniversary to the day of the flood of 1870, the Shenandoah Valley was hit by another significant flood event. This flood most likely occurred as a result of a tropical storm that was tracking through Virginia during this time. The rain, which fell steadily all day on September 30, 1896, increased in volume through the evening and culminated in torrential flooding that night. *"The gentle, soaking rain which gladdened the hearts of Rockingham farmers Tuesday morning, continuing its steady downpour all day long, at night became a raging equinoctial storm which carried death and destruction in its wake."* *– Rockingham Register, October 2, 1896* The City of Staunton was the hardest hit locality in the region. Lewis Creek and its tributaries overflowed their banks, devastating Staunton's downtown. Houses, sheds, and stables were swept away. Thirty - forty horses drowned. This flood caused significant damage to the downtown business district. The archway under Augusta Street and the arch bridge over Middlebrook Road survived but nearby buildings in the vicinity of both were severely undermined and many homes were washed off their foundations. The dam at the Fair Grounds broke. Six lives were lost in Staunton. While the Flood of 1896 was the most dramatic flood in Staunton's history, flooding also occurred in other parts of the region, though not at such a level. In Rockingham County, three lives were lost, crops destroyed, and railroad and telegraph lines were damaged. In Rockingham, flooding hit Bridgewater, Elkton, and Keezletown. It was estimated that damages to public roads and bridges reached $20,000 (1896 dollars) in Rockingham County. In Harrisonburg, houses along Black's Run were flooded. Damage estimates for Harrisonburg were a few hundred dollars (1896 dollars). At the weather station at Dale Enterprise, six and a half inches of rain reportedly fell over an 18-hour period in Rockingham County. The Flood of 1896, believed to be part of a tropical system, was short lived but during its brief period was able to drop much rain in the northern part of the Central Shenandoah Region during its visit. The heavy, localized flooding was swift and its damage was difficult to grasp. The Flood of 1896 is the flood of record for the City of Staunton.

Flood	Description and Damages
August 15, 1906  ***Farm Land in Highland County***	August 1906 was a wet month in the Central Shenandoah Valley. For a period of three to four weeks, rain fell daily in the northwestern part of the Region. The steady rainfall combined with a storm system that stalled against the mountains, caused heavy flooding in Highland County on August 15, 1906. *"The damage to growing crops, public roads, farmland, etc. cannot be given nor even intelligently estimated, but the loss of one human life, reported from, Forks of Water, seven miles north of town, is the saddest feature of the storm"* *- The Recorder, August 17, 1906.* The storm started with a sustained cloudburst that caused small, mountain streams to rage and overflow their banks. Throughout the Valley, residents coped with the dampness brought on by the repetitive rainfall that month. Farmers, building contractors, and other businesses faced losses because of the long period of rainy weather. In Highland County, and in particular the Town of Monterey, they also faced flood damages including a foot and a half of water in the Monterey Hotel Stables. The Flood of 1906 is an excellent example of a flash flood, where intense rainfall from a stalled storm system causes tremendous damage over a geographically concentrated area. A flash flood event, like other types of flooding, may cause just as much damage and can be just as deadly.
November-December 1934	• *Flooding in Rockbridge County, including Long Hollow Road where damage was estimated at $1,500.* • *A week later, water still surrounded many homes and flooded basements.*

Flood	Description and Damages
March 16 - 17, 1936 "The Great Spring Flood" "The Great St. Patrick's Day Flood"	The winter of 1935-1936 was a brutal one in Virginia. Across the State that winter, low temperatures and heavy snowfalls were common. March began with milder temperatures, but in mid-March, storms tracked across the eastern parts of the United States, dumping heavy snowfalls and torrential rains in its path. Up to 200 deaths nationwide were attributed to this storm. Damage estimates for the United States reached millions of dollars. In Virginia, the James, Potomac, Rappahannock, Shenandoah, and York River watersheds were flooded. Much of the Central Shenandoah Valley suffered the effects of this storm. In Rockingham County, 3.10 – 6.25 inches of rain fell over a two-day period. In the Shenandoah Watershed, streams and creeks reached record depths in Bridgewater, Brock's Gap, Rawley Springs, Lynwood, Keezletown, and Port Republic. The Town of Elkton was cut off as roads were blocked and bridges washed out. The City of Harrisonburg lost power as Black's Run flooded areas surrounding Main Street. In Augusta County, Waynesboro's Dupont Plant was forced to close due to flooding by the South River. Torrential rains along with the melting of 18 inches of snow quickly filled Back Creek and the South River beyond their banks. In Waynesboro, many homes were flooded and cars washed away. Staunton reported heavy rainfall, at one point recording 2.5 inches of rain in a twelve-hour period. Craigsville reported flooding six feet in depth at an underpass on the Craigsville Fordwick Highway. *(Continued On Next Page)*

Flood	Description and Damages
(*continued from previous page)* March 16 - 17, 1936 "The Great Spring Flood" "The Great St. Patrick's Day Flood"	Flooding along the James River watershed, hit Rockbridge County, Lexington, Buena Vista, and Glasgow. Lexington escaped heavy damage, but several residents were forced to evacuate their homes and oil company storage plants were flooded. Buena Vista suffered significant damage. In Buena Vista several industries were damaged by the flood including the Columbia Paper Company, the Majestic Silk Mills, the Buena Vista Throwing Company, and the W.V. Darling Manufacturing Company. *"Buena Vista was the scene of a bad flood causing one death and costing the factories, townspeople, it is estimated, about three million dollars in goods and property."* *– Lexington Gazette, March 20, 1936* In Glasgow, its major manufacturer, the Blue Ridge Company, rug makers, remained dry while Locher and Company, brick manufacturers, did get some water but had little damage. The residential area of Glasgow wasn't as lucky; many people had to be rescued by boat from their homes. It was reported that water reached between eight and ten feet on the main road through Town. *"Due in part to the Great Spring Flood, the Flood Control Act of 1936 became law. The Flood Control Act of 1936 was an act of the United States Congress signed into law by President Franklin Delano Roosevelt on 22 June 1936. It authorized civil engineering projects such as dams, levees, dikes, and other flood control measures through the United States Army Corps of Engineers and other Federal agencies."* *- Flood Control Act of 1936 (2009, March 30) In Wikipedia, The Free Encyclopedia. Retrieved 19:20 April 19, 2010.* In March of 1936, flooding, thunderstorms, landslides, and deep snows caused devastation up and down the East Coast of the United States. A harsh winter that was followed by an equally challenging spring wreaked havoc over many states. The Central Shenandoah Region was not exempt from the storms of 1936 that caused what would come to be known as "The Great Spring Flood".

Flood	Description and Damages
April 1937	• *Flooding in six states caused numerous rivers to overflow their banks.* • *There were reports of high water on all roads leading into Staunton. Drainage systems were taxed with the large amounts of rainfall.*
October 1942	• *Prolonged rainfall over several days caused flooding.* • *The rain gauge just below Afton mountain recorded 11.27" of rainfall.* • *City of Waynesboro was hardest hit in the Central Shenandoah Valley. The amount of water was 3.5 inches higher at the Chesnut Avenue gauge that it had ever been recorded, and up to two feet higher in the Rife-Loth Plant and 17 inches higher at the Main Street service than ever before.* • *Damages across Augusta County, including the Cities of Staunton and Waynesboro, were estimated at $2,000,000 (1942 dollars).*
June 18, 1949	In the Summer of 1949, when the rest of the Central Shenandoah Valley was experiencing the post-World War II economic boom, the Town of Bridgewater was forced to focus its energy and resources on re-building itself after flash flooding ravaged the Town. Parts of Rockingham and Augusta Counties were also struck hard by this storm. On June 17th, rain fell steadily throughout the day and into the night. Rising waters turned into floodwaters in the early hours of June 18th. Rising floodwaters filled Mossy Creek, Dry River, and Briery Branch. These rivers passed along their floodwaters to the already swollen North River. The Town of Bridgewater faced the worst flood event in its history. Floodwaters reached the second story in many houses. "A News-Record Reporter covering the story, reported that the roar of the raging river could be heard in the extreme northern end of Bridgewater. 'It sounds like the roar of Niagara Falls,' he said." – Harrisonburg Daily News Record, June 18, 1949. In Bridgewater, three lives were lost, one home was completely washed away, approximately 100 homes and many businesses damaged, and between 25-30 cars were smashed or washed away. Damage estimates were reported to range from $100,000 to $1,000,000 (1949 dollars). *(Continued On Next Page)*

Flood	Description and Damages
(*continued from previous page)* June 18, 1949	One of the saddest events of the Flood of 1949, was the three deaths that occurred in Bridgewater, including Mrs. C.R. Bowman, Margaret Bricker, and her nine-year-old daughter, Frances. The Bricker's were killed when their house was washed off its foundation in a fifteen-foot wave of water. Mrs. Bricker's twelve-year-old daughter, Betty, who had also been in the house, was rescued from a submerged tree. *"This two-story frame house was hit by the flood at midnight, and, at 1:30 Saturday morning, was lifted from its foundations, carried a quarter of a mile, and smashed to bits, it's tin roof being all that [was left] of it against a tree on College Street."* *- Harrisonburg Daily News Record, June 20, 1949.* Ironically, the day the house washed away was also Frances' ninth birthday. It took a week for Frances Bricker's body to be recovered. The lengthy search to recover her body and the senseless death of "little" Frances Bricker, as she was known, personified the loss that the whole Town felt in the aftermath of this horrific flood. To the west, along the North River, parts of Rockingham and Augusta Counties were also hard hit by severe flooding. Up to 15 bridges were removed by flooding. Small roads covering the area were washed out leaving residents stranded. Aerial views of fields revealed that tons of topsoil had been washed away, leaving only red clay to be exposed. Damage to the George Washington National Forest was estimated at $150,000 (1949 dollars). In Augusta County, Stokesville experienced a great deal of flood damage. Fortunately, there was no loss of life in Stokesville but more than 12 homes were completely demolished as a result of the flood and many others were heavily damaged. Because of the loss of topsoil, many small farmers were unable to replant crops. Poultry in the thousands and heads of livestock in the hundreds were destroyed in the Stokesville area. In the immediate aftermath of the flood, Stokesville was unable to rebound as quickly as Bridgewater because they faced a tremendous shortage of resources and an inability to get tools and materials needed to clean and make repairs. The flash flood of June 1949 left the Town of Bridgewater, the community of Stokesville, and parts of Rockingham and Augusta Counties forever changed.

Flood	Description and Damages
September 10, 1950	• Flash flood after 24 hour period of rainfall. • 3.8" of rain at Dale Enterprise and 3.86" of rain at Timberville in Rockingham County. • 5.81" of rainfall near Balcony Falls in Rockbridge County. • 3.9" of rainfall in Augusta Springs in Augusta County. • Black's Run overflowed in Harrisonburg on Main Street. • In Rockbridge County two people drowned; the Town of Glasgow was completely cut off; Buena Vista flooded; Buffalo Creek and Whistle Creek left their banks. Many homes and hundreds of cars were washed away. 35 bridges and 50 bridge approaches were washed away. • Rockbridge County damages were estimated at $2 million (1950 dollars) with $35,000 of that in damage to secondary roads and $40,000 of that in damage to primary roads. *"At Whistle Creek Carl H. 'Doc' Collett… got up at 4:45 a.m. to close a window against the rain and saw his refrigerator float by downstairs. Within 10 minutes water rose downstairs from two feet to five feet downstairs and the Colletts were trapped upstairs."* *- Lexington News-Gazette May 16, 2001 Page A12*
October 15, 1954 " Hurricane Hazel"	• *Hazel struck land as a Category 4 hurricane on October 15, 1954.* • *The storm caused a national total of 95 deaths and $281 million in damages (1954 dollars), and was considered the worst storm of the 1954 hurricane season.* • *Observers in Washington, D.C. reported 78mph wind gusts.* • *Twelve people were killed in Virginia, including four crewmembers of the tugboat Indian, which sank in the James River as a result of the turbulent wind and water.* • *Turkey growers in the Shenandoah Valley lost between 150,000 and 250,000 turkeys when poultry sheds were wrecked.* • *The Staunton/Augusta area received five to six inches of rain, and roofs, roadways, and bridges throughout the area sustained significant damage.*

Flood	Description and Damages
August 1955 "Hurricanes Connie and Diane"	*Hurricanes Connie and Diane teamed up to spin a relentless one-two punch on the eastern portion of the United States, causing widespread flooding in numerous states.* *Hurricane Connie struck South Carolina as a Category 1 hurricane on August 12, 1955, inflicting flooding and high winds that killed 41 people and resulted in $15 million in damages (1955 dollars). Connie caused extensive damage to Virginia tobacco and corn crops, and flooded low-lying areas throughout the state, but caused little to no damage locally.* *Hurricane Diane, also a Category 1 storm, made landfall in North Carolina on August 17, 1955. With the ground already saturated from Connie's rain, Diane caused intense flooding, resulting in 184 to 200 deaths and $3.25 billion (1955 dollars) in damages, making it the sixth most costly U.S. hurricane of the 20th century. Virginia received about three inches of rain from Diane. The storm also caused widespread flooding throughout Augusta County, an automobile accident with $750 in damage, a backup of Harrisonburg's flood and sewer systems into homes and businesses, and a 4 by 200 foot chunk of concrete to be swept away from the Harrisonburg hydroelectric dam.*
September 29, 1959 "Hurricane Gracie"	*Hurricane Gracie struck the coast of South Carolina as a Category 3 on September 29, 1959. With winds of 120 mph, the hurricane moved along the eastern coast of the United States, spawning fierce tornadoes amidst its high winds and rain. It killed ten people in Georgia and South Carolina, and produced a total of seven tornadoes. Virginia received 6.79 inches of rain from the storm. Eleven people died from a tornado in Ivy, Virginia, and the storm caused minor flooding throughout the local area.*

Flood	Description and Damages
August 19, 1969 "Hurricane Camille"	**Camille.** In the western part of Virginia this name is synonymous with unequalled destruction. The remnants of Hurricane Camille caused flooding during the evening hours of August 19, 1969 and the morning hours of August 20, 1969 that broke all flooding records in modern history along the James and Maury Rivers. On August 17, 1969, Hurricane Camille made landfall on the gulf coast of Mississippi as a Category Five Hurricane – the deadliest type of hurricane. Gusts of up to two hundred miles an hour were reported. The storm surge was the highest ever recorded in the United States. One hundred and forty-three people died as a result of this hurricane on the gulf coast of the United States. Hurricane Camille had weakened to a tropical depression by the time it had reached the Mississippi/Tennessee border. Rain was forecast for the western part of Virginia but it was the combination of three factors that caused the rain to turn into torrential downpours of unparalleled amounts. *"As Camille reached Virginia, it ran into three influences—a westerly flow of cold air, an 'orthographic lifting' of air over the mountains, and a stationary cold front over the northern part of the state. The counter clockwise flow of air created by the storm drew moisture, apparently in great amounts, from the Atlantic Ocean into the center of the storm. The 'orthographic lifting' or updrafts of air created by the mountains, forced the moisture up to the westerly flow of cold air, where it was cooled to a 'release point' and then came down in torrents of rain. The cold front acted as a blocking force, causing the storm to move eastward over the mountains where the updrafts of air continued to force the moisture upward."* *– excerpt from the Richmond Times-Dispatch in Hurricane Camille: A Review.* Nelson County was the hardest hit in all of Virginia receiving from between 27 to 31 inches of rain, most of which fell in a five-hour period during the middle of the night while people were sleeping. Homes in Massie's Mill and Lovingston were washed off their foundations and completely destroyed. Whole families died either in their homes or as they tried to escape the floodwaters. As the land became saturated, tons of topsoil streamed down the mountainsides, toppling trees and creating mammoth landslides. An example of this devastation could be seen after the flood where for a five-mile stretch of Davis Creek, logs were piled 30 feet high. One hundred and seventeen people died in Virginia and a majority of those people were in Nelson County. *(Continued On Next Page)*

Glasgow's business district flooded by Hurricane Camille. Photo by Ralph Ogden

Rising water in Waynesboro from Hurricane Camille.

Nelson County in the aftermath of Hurricane Camille.

Flood	Description and Damages
(*continued from previous page)* August 19, 1969 "Hurricane Camille"	In the Central Shenandoah Region, Rockbridge County was severely impacted by Hurricane Camille. For the City of Buena Vista and the Town of Glasgow, Camille would become their flood of record. Up to eight inches of rain fell in the southeastern part of Rockbridge County. Twenty-three people died in Rockbridge County including three members of the Rion family of Glasgow, and eight members of the Clark family in Cornwall. In Buena Vista, 69 year-old Hansford Odell Allen died in Camille also. Both Buena Vista and Glasgow's business districts were flooded with six feet and fourteen feet of water respectively. At least 75 homes were damaged in Buena Vista, and in Glasgow a quarter of the residences were damaged by the floodwaters. In Goshen, the Stillwater plant was inundated with water. Not only were lives lost, homes destroyed, and businesses devastated, but agriculture in Rockbridge County was also affected. One hundred and fifty head of cattle were lost, crops were ravished, and fertile topsoil washed away. Damages in Rockbridge County exceeded thirty million dollars. Hurricane Camille affected both Mississippi and Virginia. Two hundred and sixty lives were lost as the result of the hurricane and the flash flooding it created. Camille caused a half a billion dollars (1969 dollars) in damages throughout the state of Virginia. The year following Hurricane Camille was full of loss and a struggle to recover for thousands of residents in western Virginia. This struggle is best exemplified through the words on a plaque given by the Lion's Club to the citizens of the City of Buena Vista, "To the citizens of Buena Vista and their good friends from far and near, in grateful recognition of their collective efforts and achievements in the rebuilding of Buena Vista following the flood which came in the wake of Hurricane Camille on August 20, 1969. This plaque expresses appreciation for the labors, moneys, services, supplies, equipment, leadership, and the spirit of cooperation which were extended by individuals, organizations, agencies, and companies; both local and throughout the nation; to relieve the flood devastation and to restore order to our city. In unity lies our strength." Camille, its colossal rainfall, and the total destruction it left in its wake have yet to be surpassed and will be imprinted in the memories of many for a lifetime. The stories of Camille will be passed on for generations.

Flood	Description and Damages
June 19, 1972 "Hurricane Agnes"  ***Club Court in Waynesboro during Hurricane Agnes***	On June 19, 1972 Hurricane Agnes, a weak disorganized hurricane, made landfall in Florida. Barely able to reach hurricane status, it quickly disintegrated to a tropical storm, and quickly a depression. Although it was a weak hurricane, it was a large storm with a diameter of 1,000 miles. It made its way up the Appalachians and exited back out to sea off the coast of North Carolina. Sponging up moisture from the Atlantic Ocean, it regained strength. On June 21, 1972, Agnes now back to tropical storm status reached the Virginia coast and made its way up the Eastern seaboard. Several states received record flooding. From Virginia to New York, several places received rainfall totaling 15 inches or more. An example of the devastation was witnessed in Wilkes-Barre, Pennsylvania where they had built a dike, 37 feet high, to protect them from floods similar to the Flood of 1936, their flood of record, where the Susquehanna River crested at 33 feet above its normal levels. As a result of Agnes, the river crested at 40 feet, pouring water over the dike and flooding the Town. In Kingston, Pennsylvania, only 20 of its 6,600 homes were above water." 'Agnes re-wrote the book on inland flooding and the impact a tropical storm can have hundreds of miles from the coast.' – Sol Summer, National Weather Service, from Storms of the Century, www.weather.com". Damage from Hurricane Agnes in the United States was 3.1 billion (1972 dollars), the second costliest hurricane in U.S. history and caused 120 deaths. In Virginia, 13 lives were lost and damages equaled 222 million dollars (1972 dollars). Rivers surpassed their banks throughout the State including the Appomattox, Dan, James, Potomac, and Roanoke Rivers. Like other parts of the State, the Central Shenandoah Region received flooding but not to the levels that had occurred three years earlier with Hurricane Camille.

Flood	Description and Damages
June 19, 1972 "Hurricane Agnes"	Waynesboro was one of the hardest areas hit in the Region. Waynesboro's downtown and Club Court areas were evacuated. At the time, damages to homes and businesses were estimated to be in the hundreds of thousands of dollars. In Rockbridge County, both Buena Vista and Glasgow received flooding. Glasgow, at the confluence of the James and Maury Rivers, received the greatest amount of flooding in Rockbridge County. In Glasgow, damages reached approximately $150,000 (1972 dollars) and 50 families were evacuated in the small town. In Buena Vista, many homeowners and businesses were evacuated. Hurricane Agnes was one of the costliest and damaging tropical storms to hit the Eastern United States. In the Central Shenandoah Region, because of the recent memories of Camille, many residents took steps early to evacuate and remove property from homes and businesses. While Agnes did bring along floodwaters, Valley residents were prepared.
November 4 - 7, 1985 "Hurricane Juan" "Election Day Flood"  ***Glasgow*** ***November 1985***	The Flood of November 1985 will be remembered in Virginia for its flash flooding. Flooding was caused when a slow-moving low pressure system, possibly containing remnants of Hurricane Juan, moved northeasterly through West Virginia and Virginia dumping torrential rains over a four-day period. Known as the "Election Day Flood", because it occurred during election day, the storm caused 22 deaths. Damages across the state reached nearly eight hundred million (1985 dollars). This flood was the worst flood for the City of Roanoke, where the Roanoke River rose seven feet in one hour and eighteen feet in six hours. Areas all across the Central Shenandoah Region were affected by the flooding. In Rockingham County, the western part of the County was hardest hit. A railroad bridge built in 1896 was washed out in Elkton. The Town of Bridgewater experienced limited damage because of a levy built after the disastrous flood of 1949. Bridgewater did receive damage to roads, their hydroelectric plant, and the athletic field at Bridgewater College. In Highland County, at least 50 homes and 300 farms received damages from the flooding. In Highland County, road damage was estimated at a little over two million dollars (1985 dollars). In Bath County, bridges were washed out, and property damage was estimated in the thousands of dollars (1985 dollars). *(Continued On Next Page)*

Flood	Description and Damages
(*continued from previous page)* November 4 - 7, 1985 "Hurricane Juan" "Election Day Flood"	Communities in Augusta County were inundated by floodwater. The swollen Middle River damaged homes, property, and roads in areas like Frank's Mill, Fort Defiance, and Verona. Buffalo Creek washed away bridges and roads in the Buffalo Gap area. Damages to roads in Augusta County were estimated at eight million dollars (1985 dollars) and homes, businesses, and public facilities at seven million dollars (1985 dollars). The rains had minimal affects on the City of Staunton except for the water treatment plant that was damaged and the evacuation of residents of the Beverly Hotel where the flooded basement caused concerns. The City of Waynesboro, on the other hand, experienced significant damages. Waynesboro's South River created record flood levels and caused damages to 140 homes, 32 mobile homes, and 41 businesses. The City's sewage treatment plant was also severely damaged. Damage estimated for the City of Waynesboro directly after the flood exceeded three million dollars (1985 dollars). In Rockbridge County, Goshen, Glasgow, and Buena Vista were the areas most affected by the flooding. Goshen experienced the heaviest damage due to the swiftness of the floodwaters. Damages in Buena Vista and Glasgow equaled or surpassed what they had experienced during Hurricane Camille in 1969. In Buena Vista, three to six feet of water flooded homes and businesses. In Glasgow, almost half of the homes and two-thirds of the businesses were hit by floodwaters. In Lexington, the waste water treatment plant was covered by the waters of the Maury River. Damages in Rockbridge County were estimated at one hundred million dollars (1985 dollars), well exceeding the cost of Hurricane Camille. In the 1985 Flood, 584 homes and 32 businesses were damaged in Rockbridge County. The November 1985 Flood reached its watery fingers throughout the Central Shenandoah Region, grasping homes, public facilities, and businesses. The three-day period of sustained rains caused flash flooding all over the Region. It is no doubt that the Election Day Flood created one of the lowest poll turnouts in history.

Flood	Description and Damages
April 1993	• *Flooding in Bath and Highland Counties caused by heavy, localized rainfall. Between 1 and 6 inches of rain fell.* • *A corridor running north-south from Pendleton County, WVA into Bath County, between the east side of Lantz Mountain and the west sides of Jack and Warm Springs Mountains, sustained the most damage.* • *Streams were inundated along U.S. 220 and Rt. 642 and culverts, small bridges, and fences washed out.* • *Livestock had to escape floodwaters on many farms.* • *Some areas experienced more damage then they did in 1985.* • *Gardens including all their topsoil were washed away.*
June 22 - 28, 1995  ***Town of Goshen Flood of June 1995***	A week-long period of ground saturating rains fell over the western part of Virginia, causing flash floods and landslides. Madison and Greene Counties were the most devastated in the State, when an intense rainfall stalled over the mountains. On June 27, 1995, in a fifty mile area of Madison county, 30 inches of rain fell in a 16-hour period, with as much as 25 inches falling in a five-hour period in some areas. This caused debris flows and mudslides that uprooted trees, removed topsoil, and caused extensive altercations in the landscape. Rainfall had not been seen there in such a concentrated level over such a short duration since pre-historic times. In the Central Shenandoah Region, the week of rains caused flash flooding in Augusta and Rockbridge Counties. In Augusta County, the Town of Craigsville was flooded when 12 inches of rain fell over an 11-hour period. Trees were uprooted in yards, basements caved it, and 40 people were forced to evacuate their homes. Damage estimates exceeded five hundred thousand dollars (1995 dollars) for the Town. *"Craigsville Mayor Herbert Campbell called Thursday's flood much worse than the 1985 flood which caused damage that some residents believed would never be equaled." – Staunton Daily News Leader, June 24, 1995.* In the Town of Glasgow, flooding from interior mountain streams became more of a problem than river flooding with this event. At least 42 homes in Glasgow experienced flooding on the first floor of their homes and 64 homes had flooded basements or crawl spaces. In the City of Staunton, Gypsy Hill Park was flooded when Lewis Creek overflowed its banks. The Park's duck pond also overflowed causing sinkholes and creating other problems.

Flood	Description and Damages
September 6, 1996 "Hurricane Fran"  ***Rockingham County*** 	Hurricane Fran made landfall in North Carolina as a Category Three hurricane on September 6, 1996. In the Central Shenandoah Region, the Counties of Augusta and Rockingham were most affected by Fran. Fran dropped eight inches of rain in parts of the Valley and up to thirteen inches of rain in the Big Meadows area of the Shenandoah National Park. Hurricane Fran broke almost all flood records along the Shenandoah River and its tributaries, including those set in 1972 with Hurricane Agnes and in 1985. Damages in the Shenandoah Valley were estimated at the sixty-million dollar mark (1996 dollars). The Naked Creek area in Rockingham County, north of Elkton, sustained severe damage by the flood. The flood carved new channels and filled yards and homes with debris. Areas in the Town of Bridgewater were flooded when the North River overflowed its banks. Broadway, Mount Crawford, and Dayton were among the other communities in Rockingham County that experienced flooding. The City of Harrisonburg received flooding along Blacks Run but damage was minimal in comparison to other areas in Rockingham. More than 125 roads were closed in Rockingham as a result of the floods. In the County, 16 homes and 18 mobile homes were completely destroyed by Fran, and 334 additional structures received damage. In Augusta County, National Guard troops evacuated people in the Mount Solon and Churchville areas. Buffalo Gap, Augusta Springs, and Sherando were also vulnerable to the high waters caused by the heavy tropical rains. Twenty-nine roads were closed in Augusta County. Two deaths resulted in Augusta County when people tried to cross the flood-swollen Middle River in two separate incidents. In the City of Staunton, much of downtown was closed due to flooding in the Wharf parking lot area and damage was done to roads at the Frontier Culture Museum. The City of Waynesboro also experienced flooding in their downtown business area when the South River reached flood stage. Waynesboro streets became clogged with debris and tree limbs as the storm progressed. In Virginia, damage from Hurricane Fran was estimated at 286 million (1996 dollars) and caused eight deaths. Two hundred and thirty-three homes were destroyed and over seven thousand homes were damaged in Virginia.

Flood	Description and Damages
August 8, 2003 	*Flooding occurred in the City of Staunton after a thunderstorm cell stalled out over Staunton's downtown area, dropping between 4-6 inches of rain in an hour. This heavy rainfall caused structures downtown to fill with 2 - 7 feet of water. Floodwaters receded within several hours leaving 1.3 million dollars in damages to 55 businesses and up to 70 homes. Gypsy Hill Park and the City's Johnson Street parking garage also sustained damage.*
September 18, 2003 "Hurricane Isabel"  ***South River in Rockbridge County***	Hurricane Isabel made landfall on September 18, 2003, along the Outer Banks of North Carolina. Isabel made landfall as a Category 2 Hurricane. It moved northwestward through Virginia and Maryland, finally dissipating near Erie, Pennsylvania. In Virginia, as Isabel passed through, some areas had sustained winds of 100 mph. Also, for twenty-nine hours tropical storm winds lasted throughout Virginia. Communities located along either the Chesapeake Bay or the Atlantic Coast felt the effects of a storm surge of 5-8 feet. In the Central Shenandoah Region, Augusta County received the most rainfall and Rockbridge County received the most damage due to severe flooding along the South River. In Augusta County, the heaviest rain occurred in the Sherando area, which is located at the foothills of the Blue Ridge Mountains. The Upper Sherando monitoring station recorded a rainfall total of 20.6 inches. In Augusta County, damage estimates equaled 1.6 million dollars. For the City of Waynesboro, damages equaled 1 million dollars. In Staunton, damages were minimal but one death occurred as a result of carbon monoxide poisoning from the improper use of a generator. In Rockingham County, damage was mainly confined to roads, downed trees, and agricultural lands. Two deaths were caused a few days after the storm, when a man and his daughter tried to cross a swollen stream in a horse and buggy. In Harrisonburg, downed trees were the major problem as a result of rain soaked soil. A JMU student drowned when his canoe overturned in Black's Run the morning after the storm. *(Continued On Next Page)*

Flood	Description and Damages
(*continued from previous page)* September 18, 2003 "Hurricane Isabel" 	The northeastern part of Rockbridge County sustained the most damage when the South River flooded along Rt. 608. The South River is fed by the St. Mary's, Big Mary's, and Little Mary's Creeks which flow down the west side of the Blue Ridge Mountains. During Isabel, the South River began rising by 9 p.m. and the River jumped its bank by 11 p.m. Significant damage to property and infrastructure occurred from the northern Rockbridge County border down stream to the South River's confluence with the Maury River. Rt. 608, which parallels the South River was washed out or undermined in several places. Three permanent bridges over the South River were destroyed. An abandoned C&O railroad bridge, that was part of the Chessie trail system, was washed off its supports as well. In Rockbridge County, property damages were estimated at 6.7 million, damage to South River Road was estimated at 4 million dollars, and agricultural losses were estimated at 5 million dollars (which included the loss of 25-30 head of livestock). Amazingly, there were no serious injuries or fatalities in Rockbridge County as a result of this flood event. In the U.S., forty deaths were attributed to Hurricane Isabel and damages were estimated at over three billion. It was one of the top thirty costliest storms in U.S. history.
June 25 - July 5, 2006 *"Mid-Atlanic United States Flood"*	*The Mid-Atlantic United States Flood of 2006 affected much of the Mid-Atlantic region of the eastern U.S. It is widely considered the worst flooding in the region since Hurricane David in 1979. At least 16 deaths in the U.S. were caused by this flood event. The flooding occurred because of a stalling of the jet stream just west of the Appalachain Mountains, a "Bermuda high" over the Atlantic Ocean, and the influence of a tropical low off the coast of North Carolina. The National Weather Service stated that rain events of this size take place in the region only once every 200 years.* *In Virginia, flooding occurred in the northern regions and mudslides were also witnessed in the mountainous regions. In the Central Shenandoah Valley, flooding occurred in Augusta County in the Brand Flats area along U.S. 250 when Christians Creek spilled over its banks. Residents of 50 trailers in Knox Mobile City were cut off by the flooding. The American Red Cross assisted 1,600 citizens during the week, providing food, clothing, and shelter.*

Appendix A.1
Floodplain Management in the Counties of the Central Shenandoah Region

Augusta, Bath, Highland, Rockbridge, and Rockingham Counties participate in the National Flood Insurance Program and use the Flood Insurance Rate Mapping (FIRM) program to designate that particular' County's Special Flood Hazard Area (SFHA), also known as the 100-year floodplain, and the floodway. All five counties in the Central Shenandoah Region are in good standing in the National Flood Insurance Program (NFIP). This means that each community in the Region adopts and enforces the floodplain management regulations required by the NFIP. Each County incorporates specific requirements through special floodplain management ordinances, building and zoning codes, as well as subdivision ordinances. Each of the five counties meets the requirements by; 1. having a Local Floodplain Manager that serves as the Floodplain Administrator (FPA), 2. requiring NFIP designated requirements for new or substantially improved residential and non-residential structures, each community monitors development to ensure that altered or relocated water courses still contain their allotted flood carrying capacity, and that floodways are not adversely affected, 3. maintaining the appropriate records and files needed to document compliance with the NFIP.

The role of the Local Floodplain Manager in each of the five counties is similar and carries out the following responsibilities:

- Makes permit applications available to prospective developers
- Checks applications for completeness
- Checks development locations on floodplain maps
- Determines if development affects the floodway
- Determines base flood elevation for proposed development sites
- Establishes first floor elevations.
- Completes biennial reports given to FEMA

Through zoning requirements, building codes, and floodplain ordinances, Augusta, Bath, Highland, Rockbridge, and Rockingham Counties ensure that the following NFIP requirements are in place in each county:

Appendix A.1
Floodplain Management in the Counties of the Central Shenandoah Region (con't)

- Elevation of new and substantially improved residential structures occur above the base flood level.
- Elevation or dry floodproofing of new or substantially improved non-residential in the floodplain occur.
- Development in the floodway is regulated to ensure that there are no increases in upstream flood elevations.
- Permits are required on proposed construction and development in the 100-year floodplain. Each county maintains records of these permits.
- Subdivision proposals are reviewed to determine whether the project is safe from flooding and that adequate drainage is provided.
- Manufactured homes must be elevated and anchored in the 100-year floodplain.
- Water systems are designed to eliminate infiltration of floodwaters.
- New and replacement sanitary sewage systems must be designed to at least minimize or eliminate infiltration of flood waters.

Each of the five counties maintains the records required by the National Flood Insurance Program to document the floodplain management. The following are some of the records that the counties maintain:

- An up-to-date copy of the floodplain ordinance
- The Current floodmap (FIRM, Floodway, FIS)
- A copy of NFIP regulations
- Project files for each development permit issued containing the permit application, permit review checklist, pertinent engineering data, correspondence, variance and appeal proceedings (if any), and for subdivision of 5 acres or 50 lots, elevation certificates and Certificates of Occupancy (CO).
- Biennial Reports that are submitted to FEMA.

Appendix A.2
Worst Case Flood Event in the Central Shenandoah Region - Effects

The Central Shenandoah Region of Virginia is susceptible to flooding from numerous causes; heavy rains over long periods of time, torrential downpours of short durations causing flash flooding, tropical systems that stall out (due to the meteorological phenomena of orthographic lifting caused by the Blue Ridge and Allegheny Mountains which surround the region) dumping significant rainfall, and rapid snowmelts after large snowfalls when temperatures increase rapidly. Because of the Central Shenandoah Region encompasses a large geographic area, most storms do not cause dire effects in the entire region at the same time but they can cause a varying scale of problems ranging from severe, moderate, to milder effects throughout the Region simultaneously. This can be seen by examining the most significant flooding events that affected the region in 1969, 1972, 1985, 1996, and most recently 2003. (Please see Flood History Section in Appendix A of this plan).

In looking at the flooding that occurred on September 18, 2003, as a result of Hurricane Isabel, it illustrates the problems that would occur on a wider scale if a future flood event were to occur large enough to affect the entire region. This event caused rainfall in excess of 20 inches to occur overnight in Southern Augusta County which caused flooding along the South River in Rockbridge County. In other areas of the Region, rainfall also caused flooding of streams and creeks. Wind caused power outages and downed trees and power lines. As a result of this event, damages in the Region were estimated at well over 10 million dollars. Many homes and mobile homes in Rockbridge County were damaged significantly including more than a dozen that were destroyed. Throughout the Region, livestock died and other agricultural losses occurred. Bridges were washed away or undermined. Roads were damaged by floodwaters or falling trees and power lines made them impassable. In the Region, four people died from this storm due to trying to cross swollen streams and water bodies, and due to improper use of a generator being used during power outages. These deaths were all caused unfortunately by human error.

In order to look at the effects of a wide-scale flooding event that

occurred in the Region, one would simply need to look at the night that Hurricane Isabel crossed the Region and the aftermath's of that storm to gain insight to the impacts that would be felt Region-wide. A large-scale flood event in the Region would cause the following effects:

- The 52 critical facilities identified in the Plan could experience flood damage making their structures unsafe and limiting or prohibiting their abilities to provide services to the residents of the Central Shenandoah Valley Region.

- Region-wide power outages would impact individuals, local government services, first-responders, the business community and local industries, farms and agricultural industry in the Valley, individuals with special needs including those with medical conditions requiring power-dependent equipment, and the ability of local emergency management officials to communicate with first-responders and the public regarding critical response and recovery information.

- Local water supplies could be contaminated and unavailable for use by the public.

- First responders would be overwhelmed by the number of significant emergency calls that needed response and would be unable to help all those that may be in dire life or death situations.
- Damages caused by flooding and possible downed trees and power lines could trap individuals and families in their homes for days to weeks without the ability to get needed supplies or communicate with the "outside world".

- Hospitals and medical services would be inadequate to treat the number of people injured as the result of the storm or in its aftermath or to treat those whose health conditions became more serious during the storm because of inability to take medication, receive daily nursing care , or because of stress.

- Managing incoming supplies, donations, and emergent volunteers from other communities in the State or across the Country would become burdensome and overwhelming.

- Pets, livestock, and wildlife would need to be dealt with in the

aftermath of a widespread flood that would affect the natural environment in the Region.

The 21 jurisdictions in the Central Shenandoah Region are aware that these are only a few of the scenarios that could occur as the result of a wide-scale event. They participate in a continual cycle of planning based on lessons learned and developing hazards to identify additional potential scenarios, gaps in personnel , equipment, and supplies, how to manage donations and volunteers, and how to educate citizens to be better prepared for disasters and emergencies.

Appendix B2

Central Shenandoah Valley Regional Relative Snow Potential Maps

Augusta County
Craigsville, Town of

Bath County

Buena Vista City

Harrisonburg City

Highland County
Monterey, Town of

Lexington City

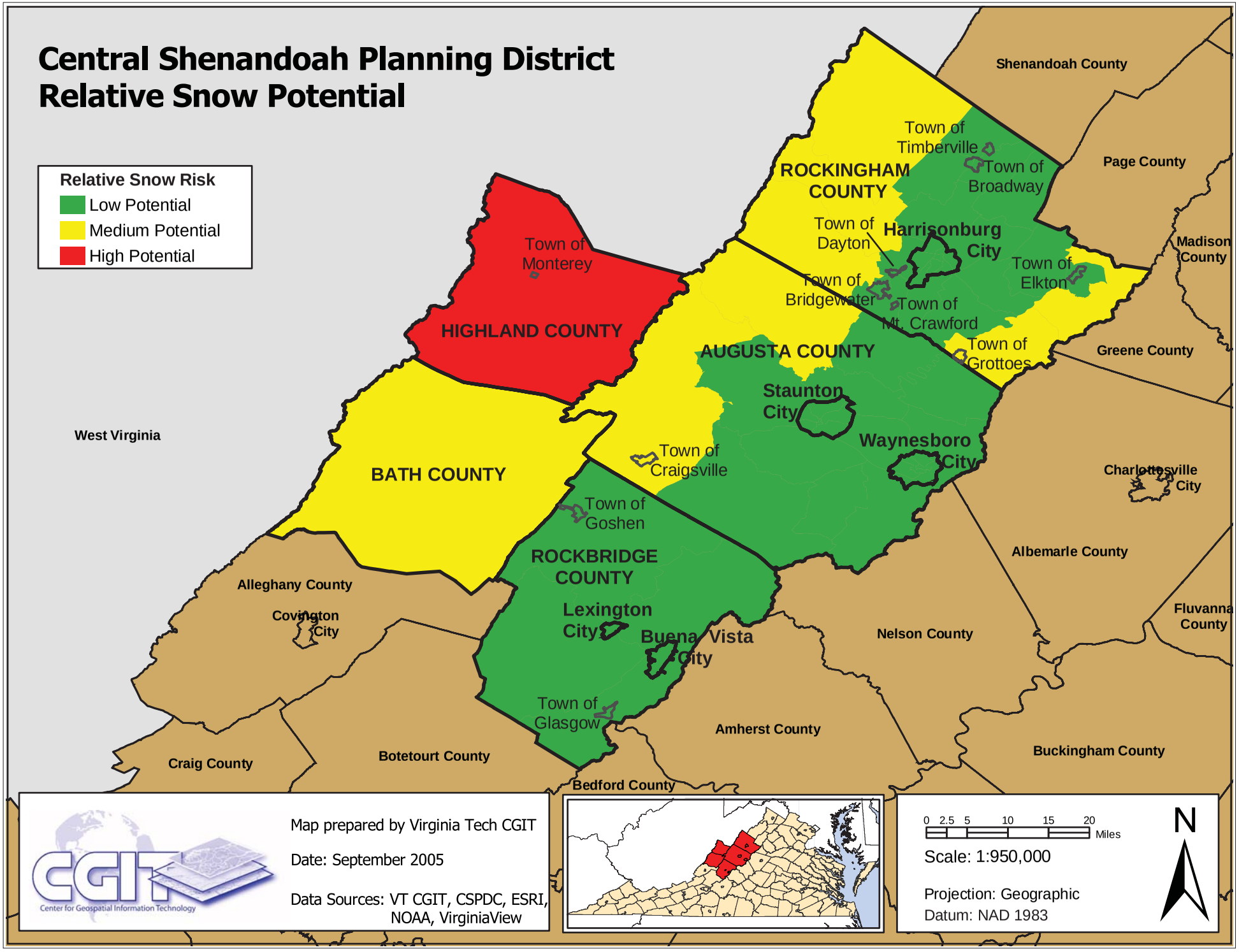
Rockbridge County
Glasgow, Town of
Goshen, Town of

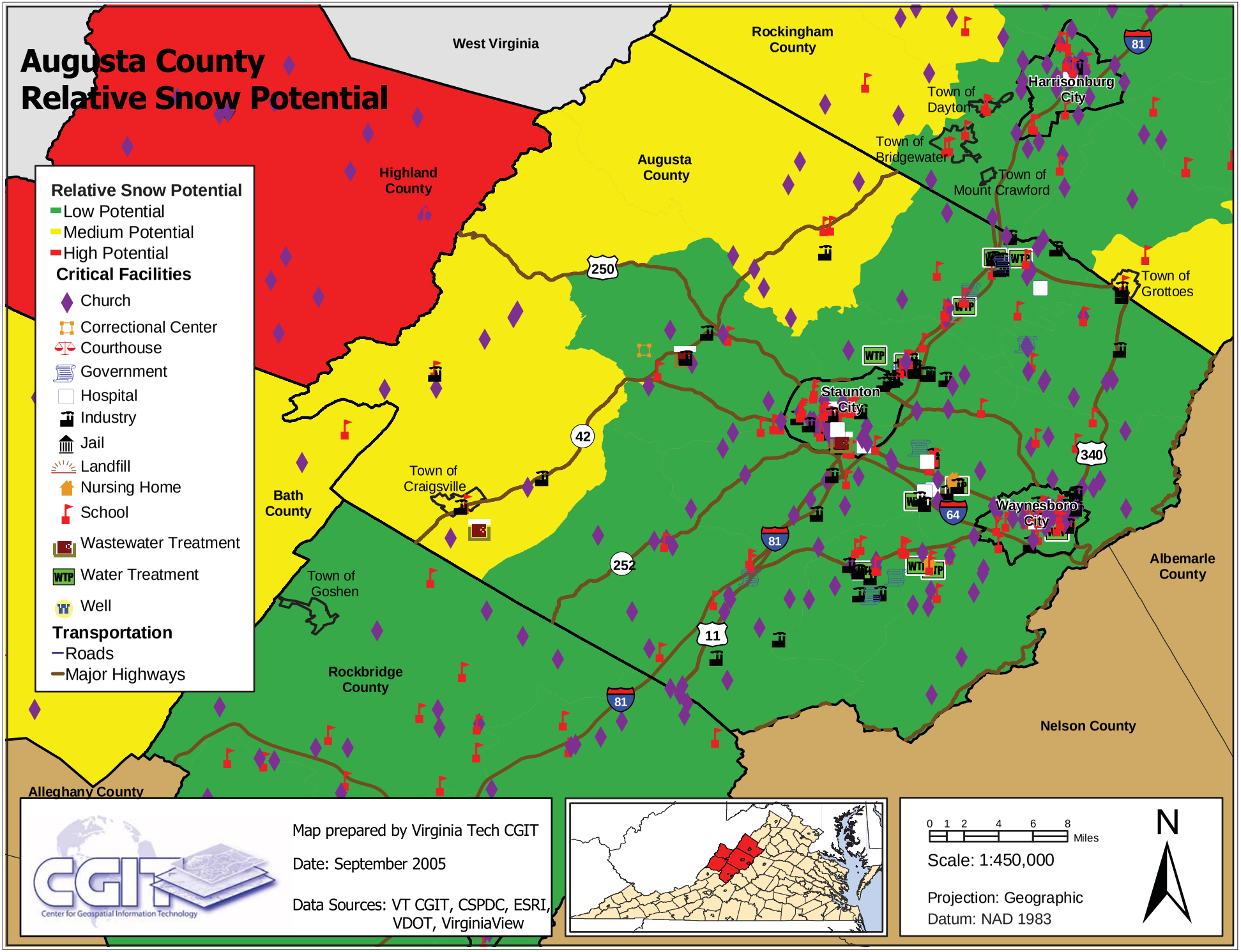
Rockingham County
Bridgewater, Town of
Broadway, Town of
Dayton, Town of
Elkton, Town of
Grottoes, Town of
Mt. Crawford, Town of
Timberville, Town of

Staunton City

Waynesboro City

Central Shenandoah Planning District
Relative Snow Potential



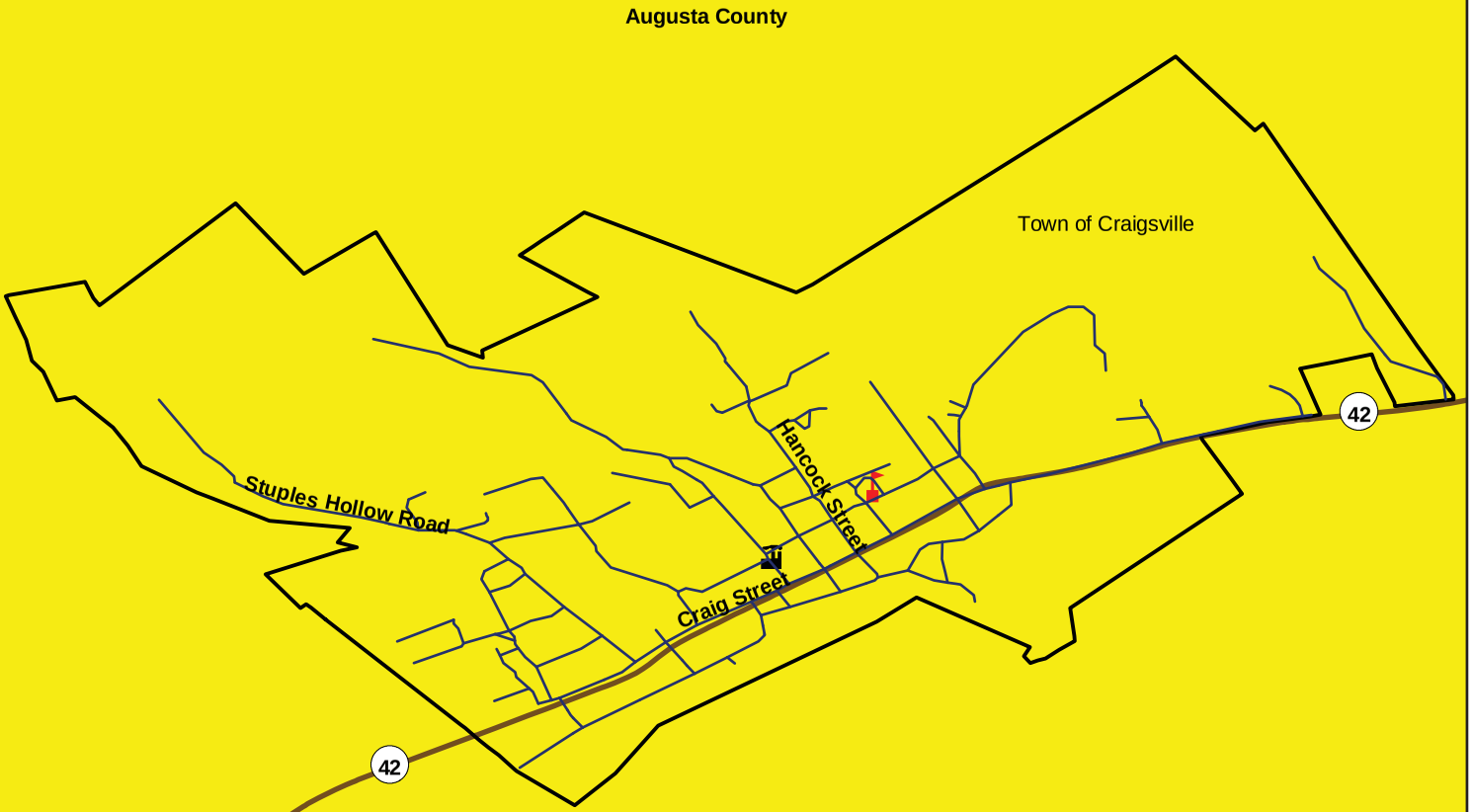

Augusta County
Relative Snow Potential
West Virginia
Rockingham County
Highland County
Augusta County
Town of Dayton
Harrisonburg City
Town of Bridgewater
Town of Mount Crawford
Town of Grottoes
Staunton City
Waynesboro City
Town of Craigsville
Bath County
Town of Goshen
Rockbridge County
Albemarle County
Nelson County
Alleghany County
250
42
340
64
81
252
11
WTP
Relative Snow Potential
Low Potential
Medium Potential
High Potential
Critical Facilities
Church
Correctional Center
Courthouse
Government
Hospital
Industry
Jail
Landfill
Nursing Home
School
Wastewater Treatment
Water Treatment
Well
Transportation
Roads
Major Highways
Map prepared by Virginia Tech CGIT
Date: September 2005
Data Sources: VT CGIT, CSPDC, ESRI, VDOT, VirginiaView
Center for Geospatial Information Technology
0 1 2 4 6 8
Miles
Scale: 1:450,000
Projection: Geographic
Datum: NAD 1983
N

Town of Craigsville
Relative Snow Potential

Relative Snow Potential
- Low Potential
- Medium Potential
- High Potential

Critical Facilities
- Church
- Correctional Center
- Courthouse
- Government
- Hospital
- Industry
- Jail
- Landfill
- Nursing Home
- School
- Wastewater Treatment
- Water Treatment
- Well

Transportation
- Roads
- Major Highways

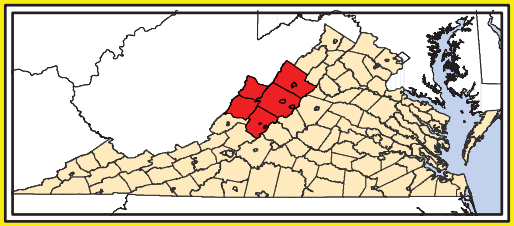


Center for Geospatial Information Technology

Map prepared by Virginia Tech CGIT

Date: September 2005

Data Sources: VT CGIT, CSPDC, ESRI, VDOT, VirginiaView



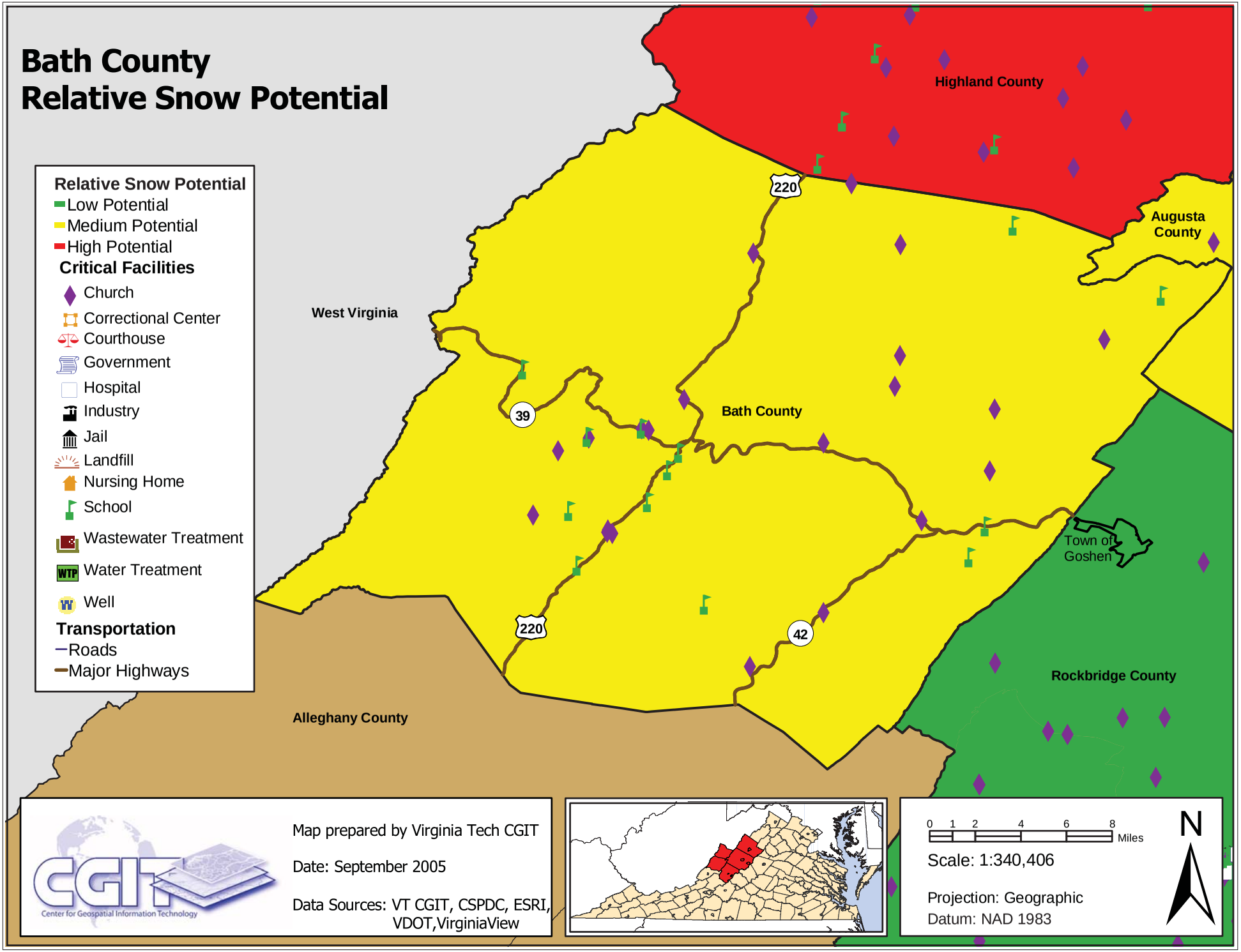
0 0.05 0.1 0.2 0.3 0.4 Miles

Scale: 1:27,000

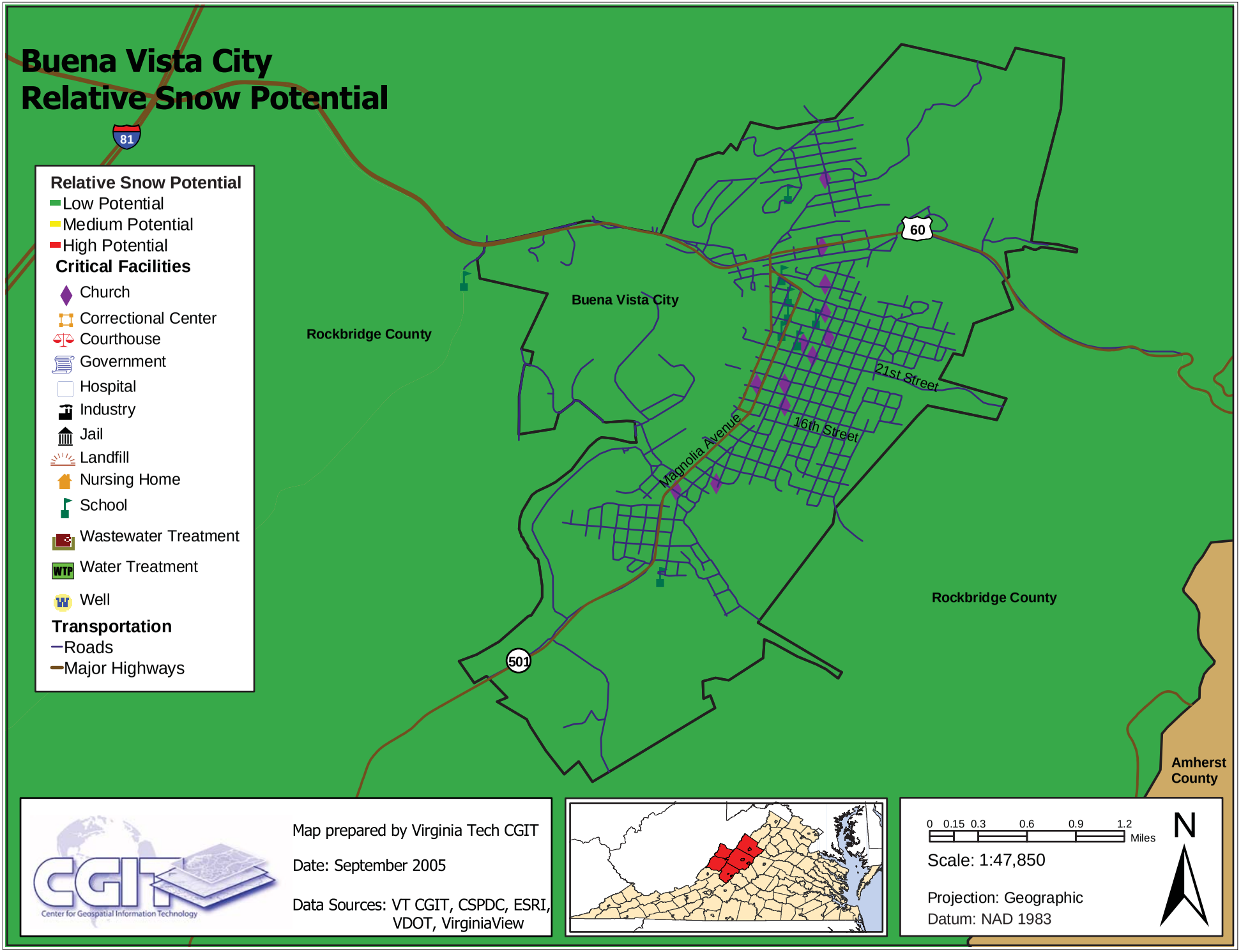
Projection: Geographic
Datum: NAD 1983

N

Bath County
Relative Snow Potential



Buena Vista City
Relative Snow Potential



Center for Geospatial Information Technology

Map prepared by Virginia Tech CGIT

Date: September 2005

Data Sources: VT CGIT, CSPDC, ESRI, VDOT, VirginiaView

0 0.15 0.3 0.6 0.9 1.2 Miles

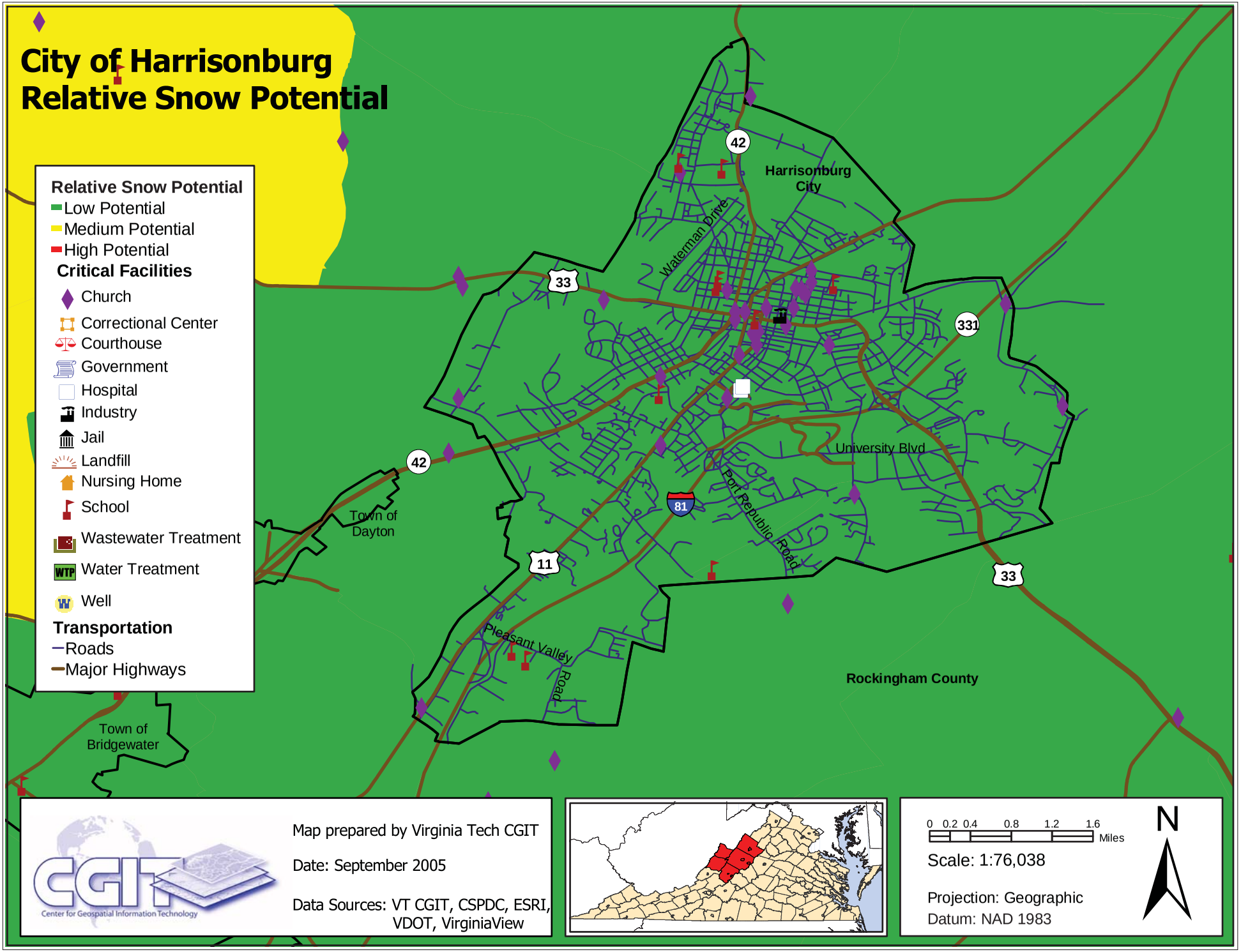
Scale: 1:47,850

Projection: Geographic

Datum: NAD 1983

N

City of Harrisonburg
Relative Snow Potential



Map prepared by Virginia Tech CGIT

Date: September 2005

Data Sources: VT CGIT, CSPDC, ESRI, VDOT, VirginiaView

0 0.2 0.4 0.8 1.2 1.6 Miles

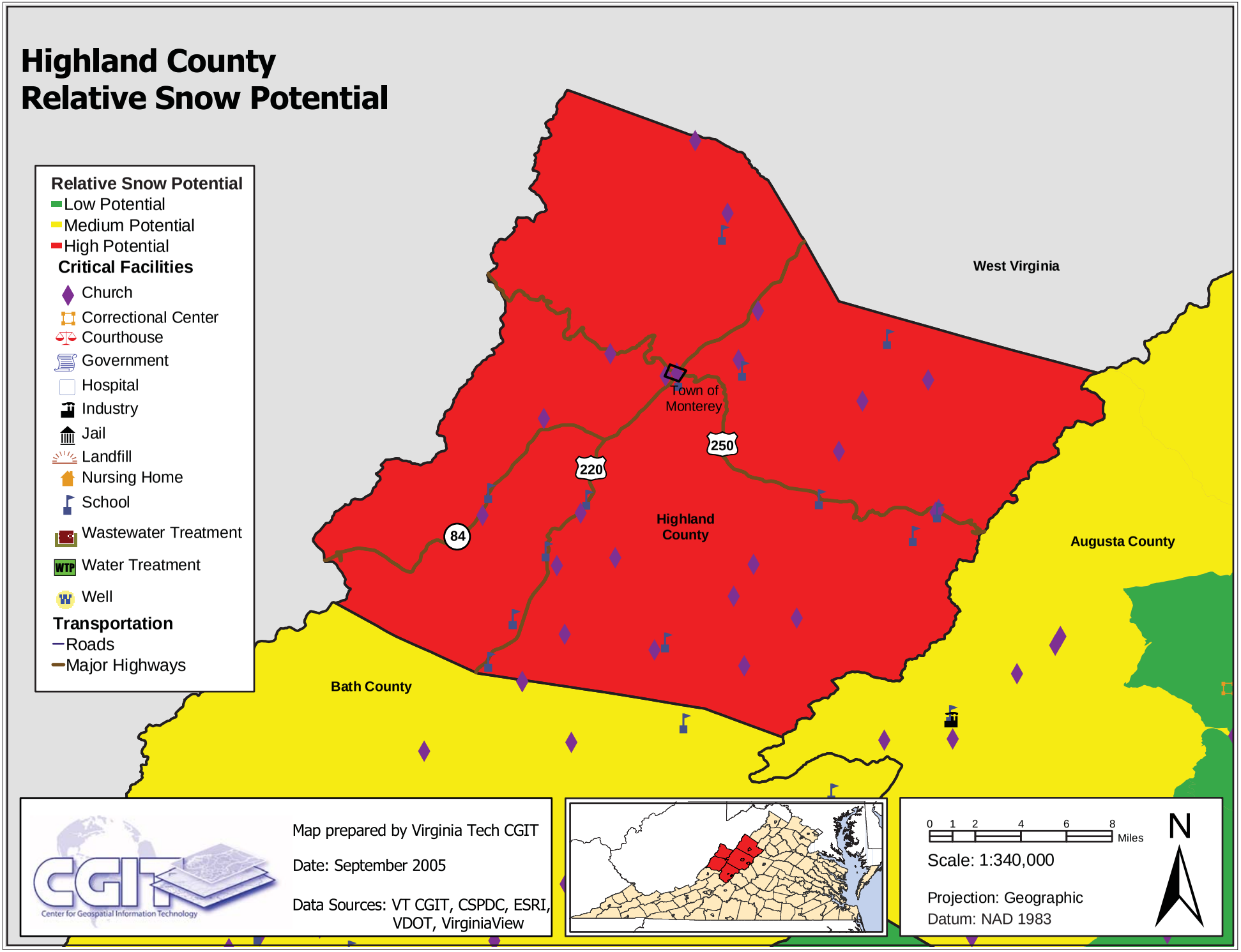
Scale: 1:76,038

Projection: Geographic

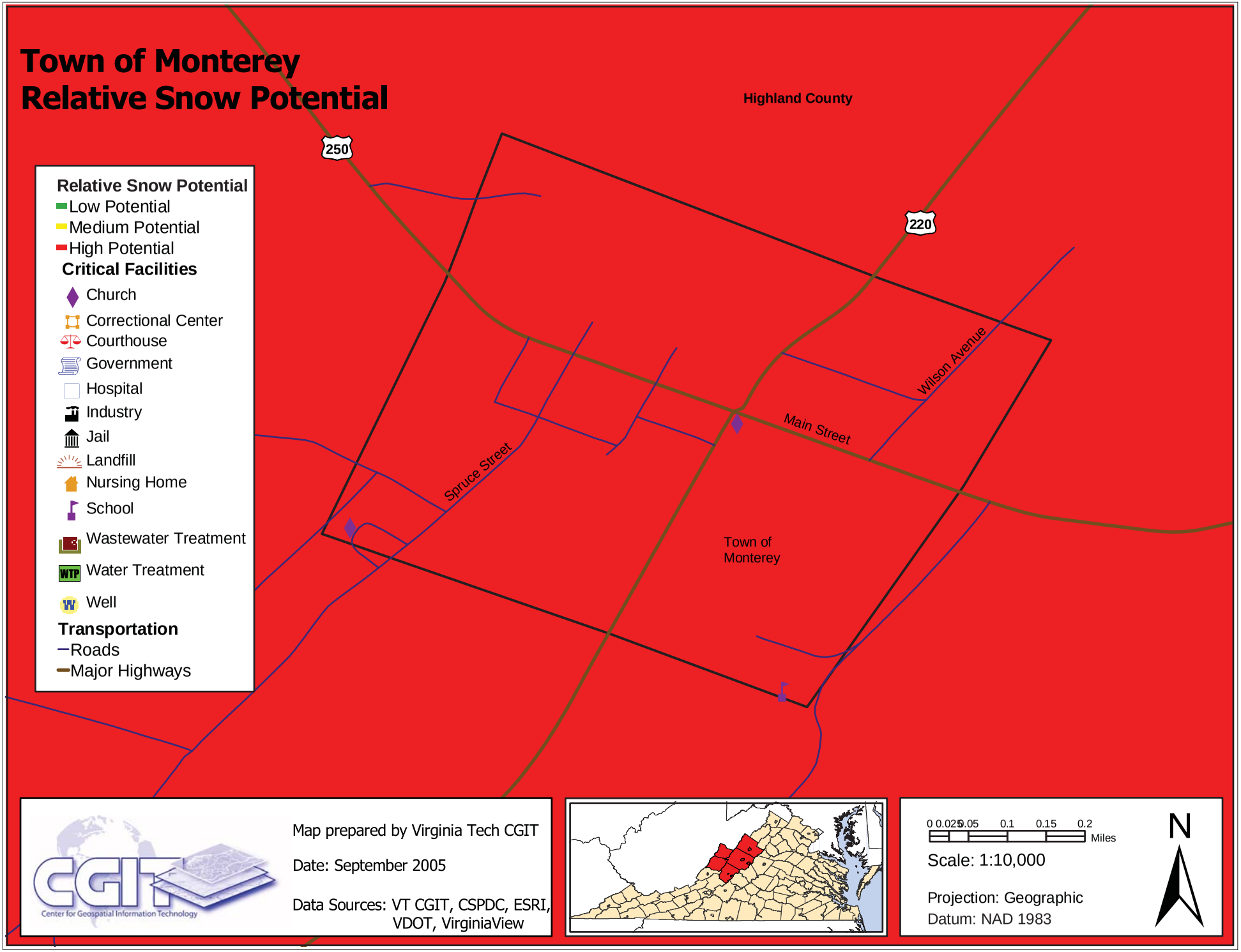
Datum: NAD 1983

N

Highland County
Relative Snow Potential



Town of Monterey
Relative Snow Potential



Center for Geospatial Information Technology

Map prepared by Virginia Tech CGIT

Date: September 2005

Data Sources: VT CGIT, CSPDC, ESRI, VDOT, VirginiaView

0 0.025 0.05 0.1 0.15 0.2 Miles

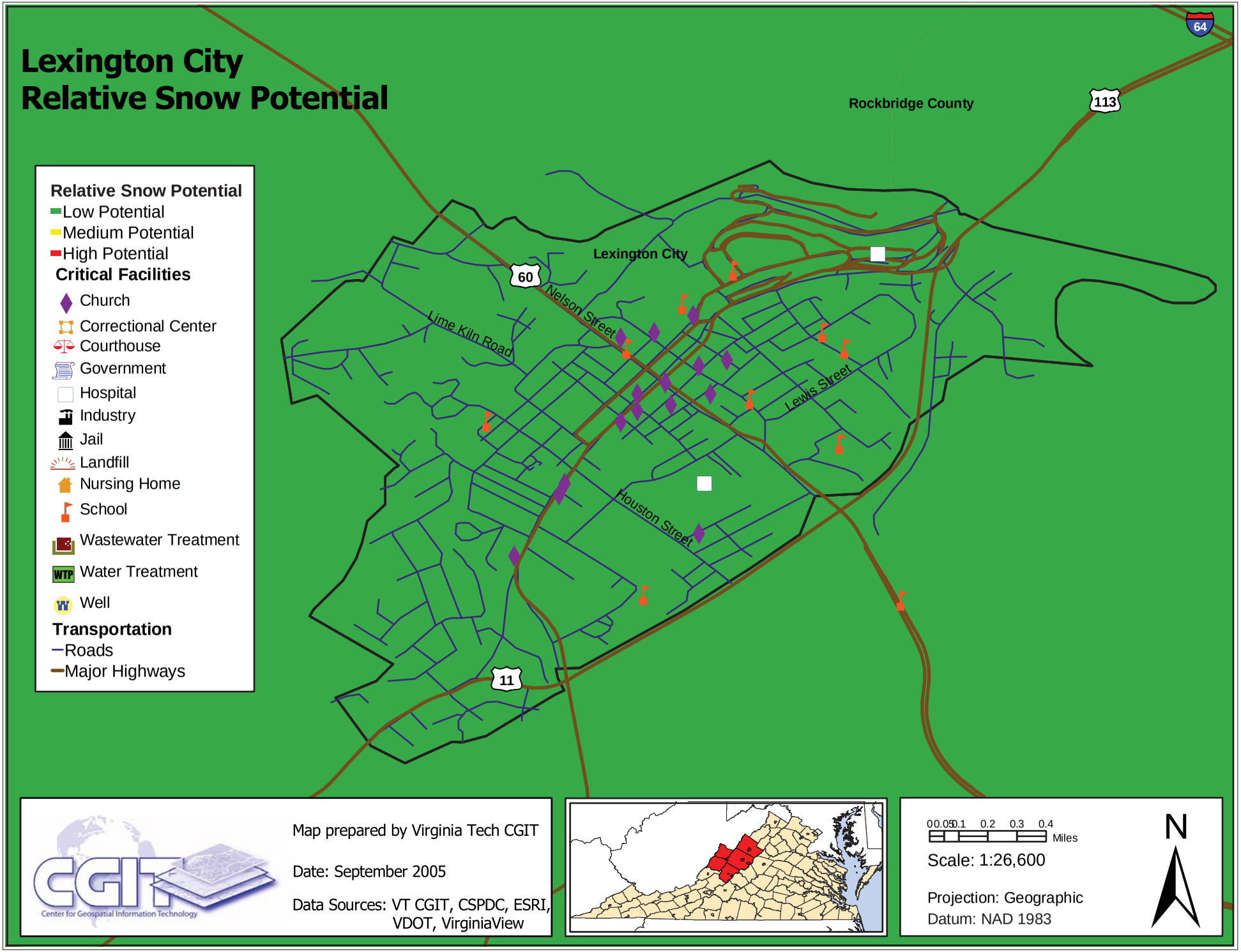
Scale: 1:10,000

Projection: Geographic

Datum: NAD 1983

N

Lexington City
Relative Snow Potential



Center for Geospatial Information Technology

Map prepared by Virginia Tech CGIT

Date: September 2005

Data Sources: VT CGIT, CSPDC, ESRI, VDOT, VirginiaView

0 0.05 0.1 0.2 0.3 0.4 Miles

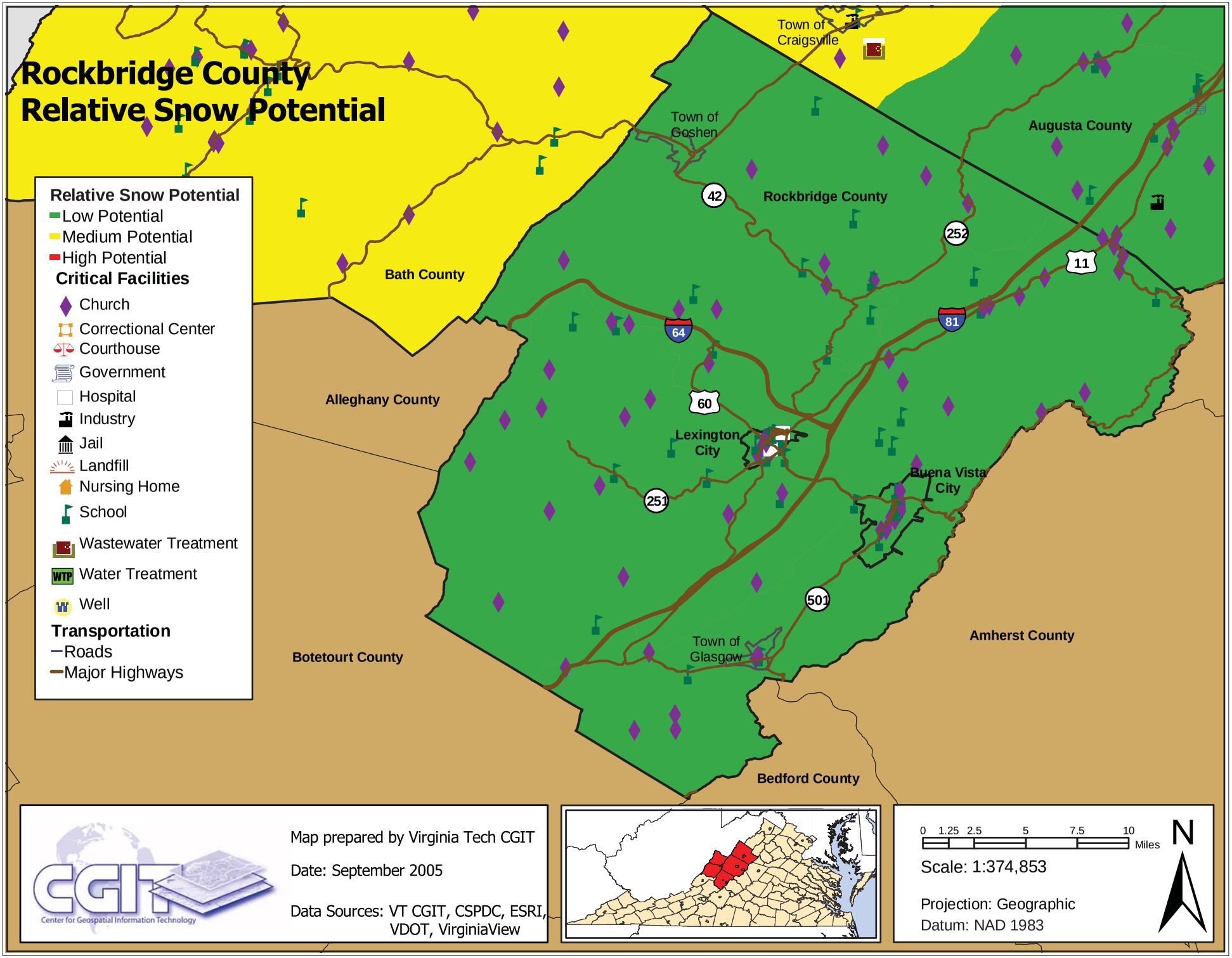
Scale: 1:26,600

Projection: Geographic

Datum: NAD 1983

N

Rockbridge County
Relative Snow Potential



Town of Glasgow
Relative Snow Potential

Relative Snow Potential
- Low Potential
- Medium Potential
- High Potential

Critical Facilities
- Church
- Correctional Center
- Courthouse
- Government
- Hospital
- Industry
- Jail
- Landfill
- Nursing Home
- School
- Wastewater Treatment
- Water Treatment
- Well

Transportation
- Roads
- Major Highways

Rockbridge County

Blue Ridge Road

Catawba Street

501

Fitzlee Street

130

Town of Glasgow

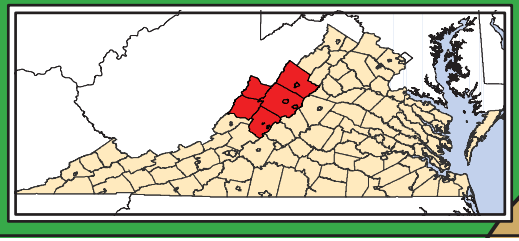
Rockbridge County

Center for Geospatial Information Technology

Map prepared by Virginia Tech CGIT

Date: September 2005

Data Sources: VT CGIT, CSPDC, ESRI, VDOT, VirginiaView



0 0.05 0.1 0.2 0.3 0.4 Miles

Scale: 1:24,100

Projection: Geographic

Datum: NAD 1983

N

Town of Goshen
Relative Snow Potential

Bath County

Rockbridge County

Rockbridge County

Town of Goshen

39

Maury River Road

42

Allegheny Drive

Stillwater Drive

Spring Drive

Relative Snow Potential
- Low Potential
- Medium Potential
- High Potential

Critical Facilities
- Church
- Correctional Center
- Courthouse
- Government
- Hospital
- Industry
- Jail
- Landfill
- Nursing Home
- School
- Wastewater Treatment
- Water Treatment
- Well

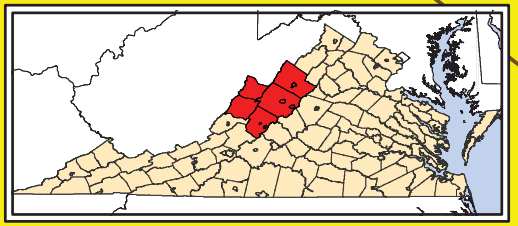
Transportation
- Roads
- Major Highways

Center for Geospatial Information Technology

Map prepared by Virginia Tech CGIT

Date: September 2005

Data Sources: VT CGIT, CSPDC, ESRI, VDOT, VirginiaView



0 0.05 0.1 0.2 0.3 0.4 Miles

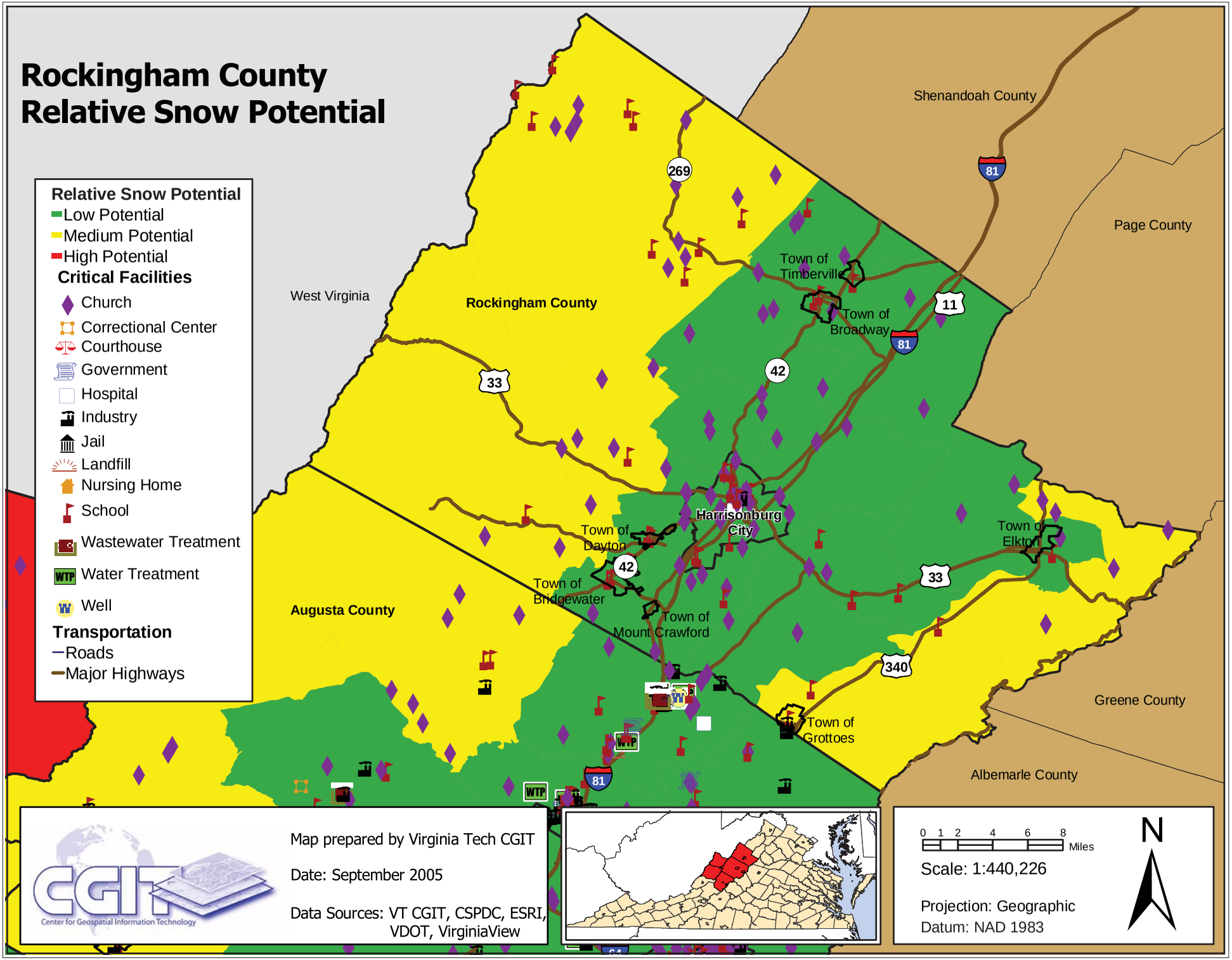
Scale: 1:27,200

Projection: Geographic

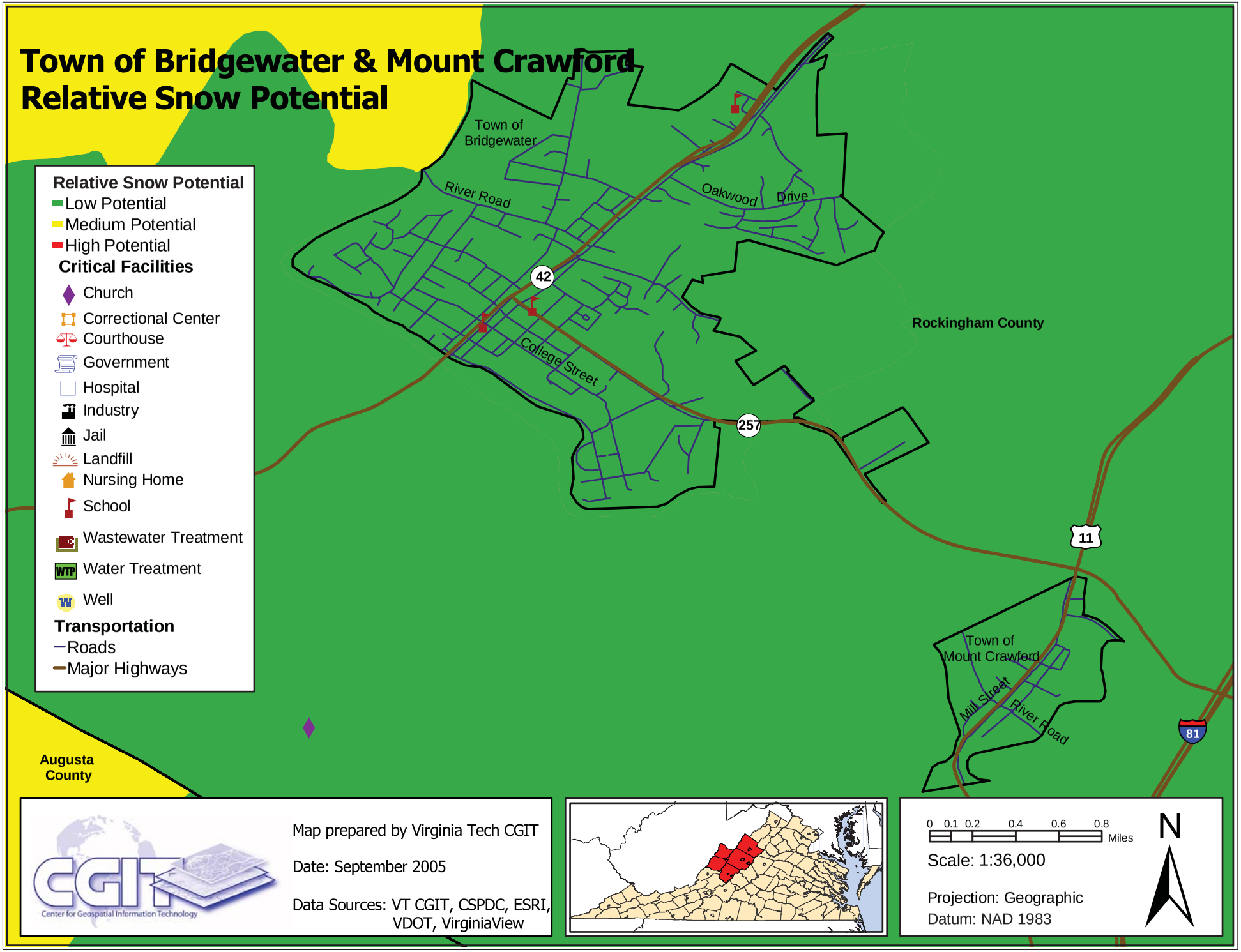
Datum: NAD 1983

N

Rockingham County
Relative Snow Potential



Town of Bridgewater & Mount Crawford
Relative Snow Potential



Map prepared by Virginia Tech CGIT

Date: September 2005

Data Sources: VT CGIT, CSPDC, ESRI, VDOT, VirginiaView

0 0.1 0.2 0.4 0.6 0.8 Miles

Scale: 1:36,000

Projection: Geographic

Datum: NAD 1983

N

Town of Timberville & Broadway
Relative Snow Potential

Relative Snow Potential
- Low Potential
- Medium Potential
- High Potential

Critical Facilities
- Church
- Correctional Center
- Courthouse
- Government
- Hospital
- Industry
- Jail
- Landfill
- Nursing Home
- School
- Wastewater Treatment
- Water Treatment
- Well

Transportation
- Roads
- Major Highways

Rockingham County

Memorial Park Drive

New Market Road

Town of Timberville

Broadway Avenue

Town of Broadway

Springbrook Road

211

42

259

42

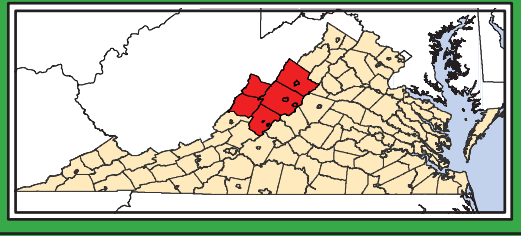
259

Center for Geospatial Information Technology

Map prepared by Virginia Tech CGIT

Date: September 2005

Data Sources: VT CGIT, CSPDC, ESRI, VDOT, VirginiaView



0 0.1 0.2 0.4 0.6 0.8 Miles

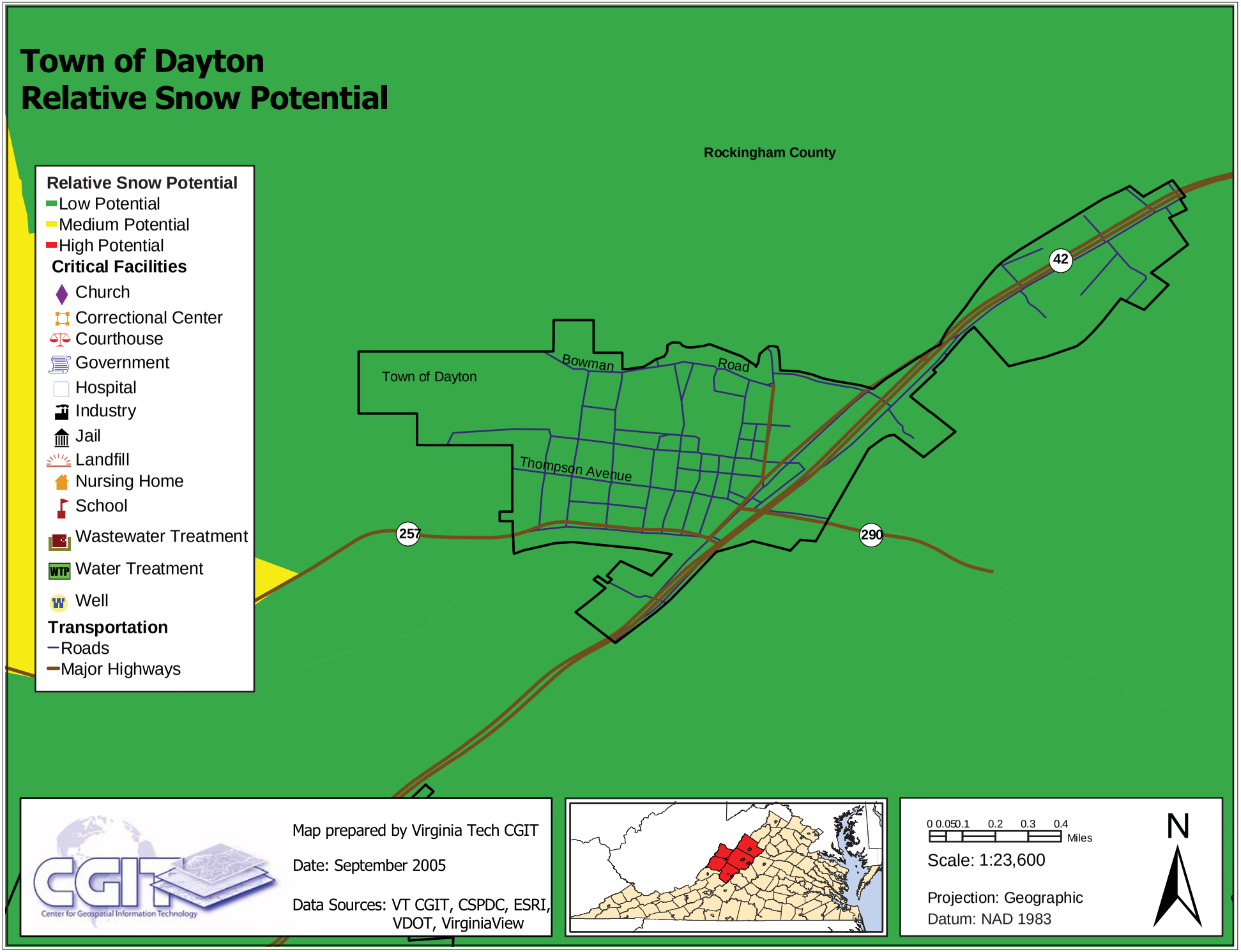
Scale: 1:42,000

Projection: Geographic

Datum: NAD 1983

N

Town of Dayton
Relative Snow Potential



Map prepared by Virginia Tech CGIT

Date: September 2005

Data Sources: VT CGIT, CSPDC, ESRI, VDOT, VirginiaView

0 0.05 0.1 0.2 0.3 0.4 Miles

Scale: 1:23,600

Projection: Geographic

Datum: NAD 1983

N

Town of Elkton
Relative Snow Potential

Relative Snow Potential
- Low Potential
- Medium Potential
- High Potential

Critical Facilities
- Church
- Correctional Center
- Courthouse
- Government
- Hospital
- Industry
- Jail
- Landfill
- Nursing Home
- School
- Wastewater Treatment
- Water Treatment
- Well

Transportation
- Roads
- Major Highways

Rockingham County

Town of Elkton

340

Terrace Avenue

Rockingham Street

33

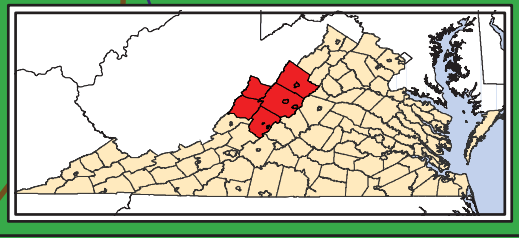
Saplin Ridge Road

Center for Geospatial Information Technology

Map prepared by Virginia Tech CGIT

Date: September 2005

Data Sources: VT CGIT, CSPDC, ESRI, VDOT, VirginiaView



0 0.05 0.1 0.2 0.3 0.4 Miles

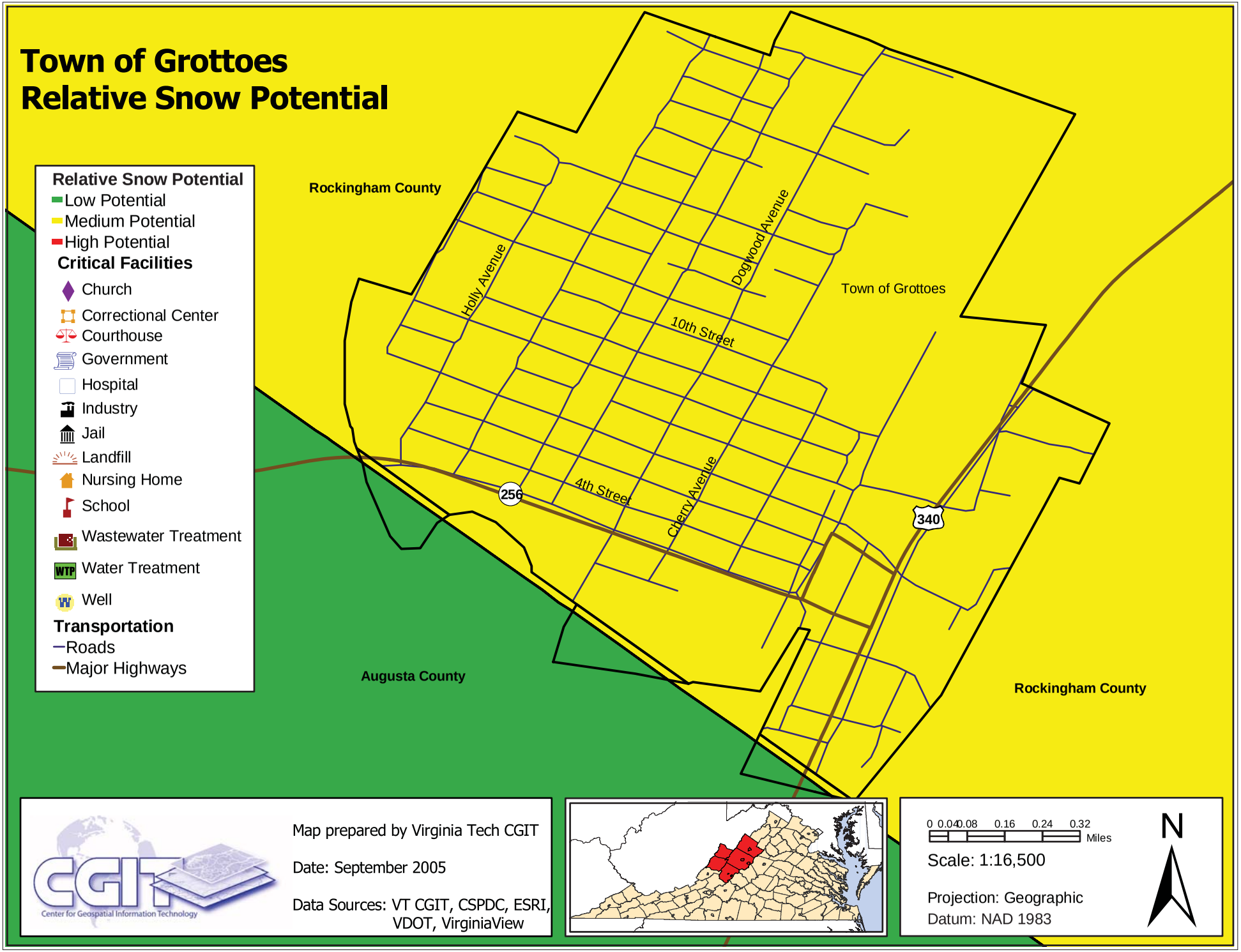
Scale: 1:24,100

Projection: Geographic

Datum: NAD 1983

N

Town of Grottoes
Relative Snow Potential



Map prepared by Virginia Tech CGIT

Date: September 2005

Data Sources: VT CGIT, CSPDC, ESRI, VDOT, VirginiaView

0 0.04 0.08 0.16 0.24 0.32 Miles

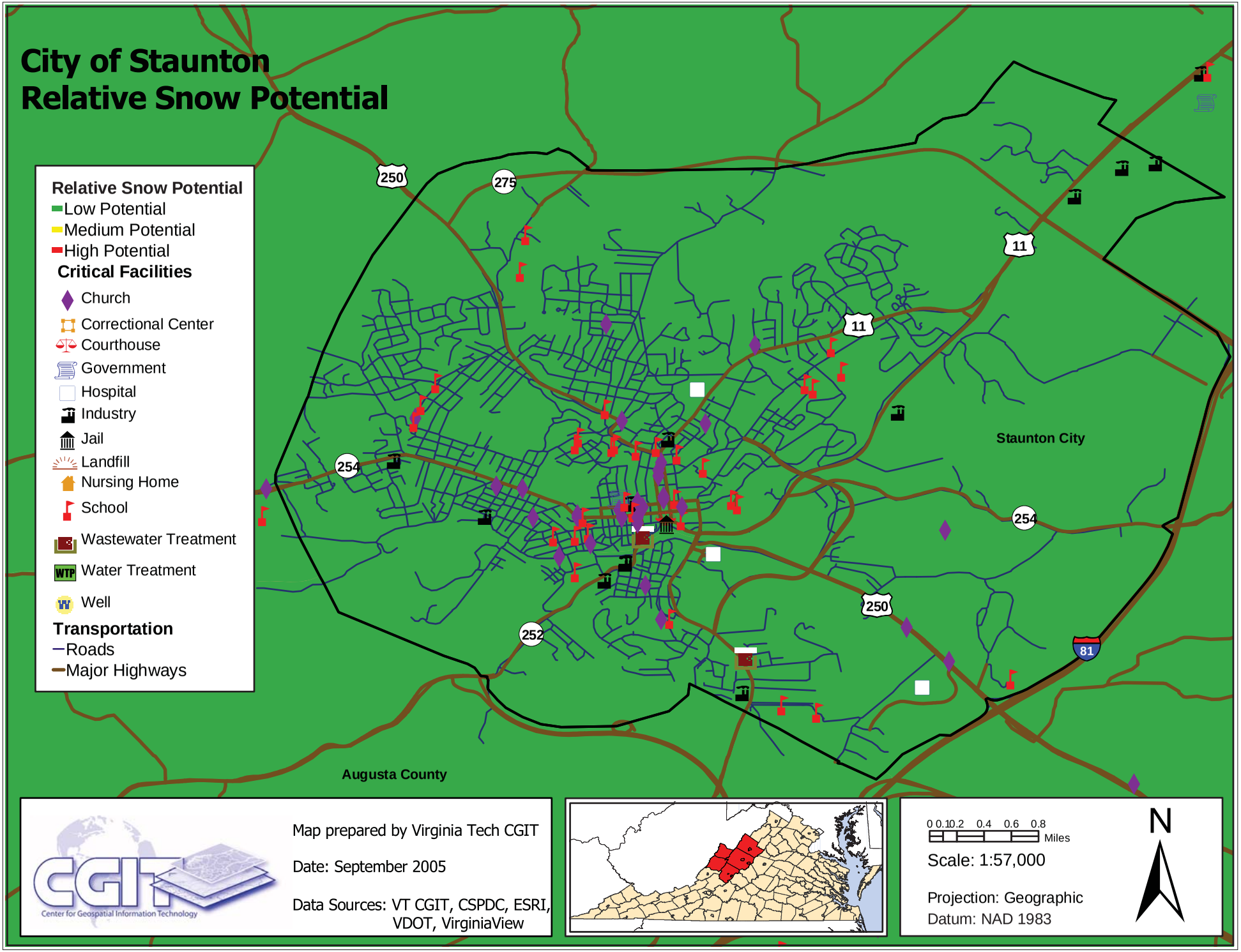
Scale: 1:16,500

Projection: Geographic

Datum: NAD 1983

N

City of Staunton
Relative Snow Potential



Map prepared by Virginia Tech CGIT

Date: September 2005

Data Sources: VT CGIT, CSPDC, ESRI, VDOT, VirginiaView

0 0.1 0.2 0.4 0.6 0.8 Miles

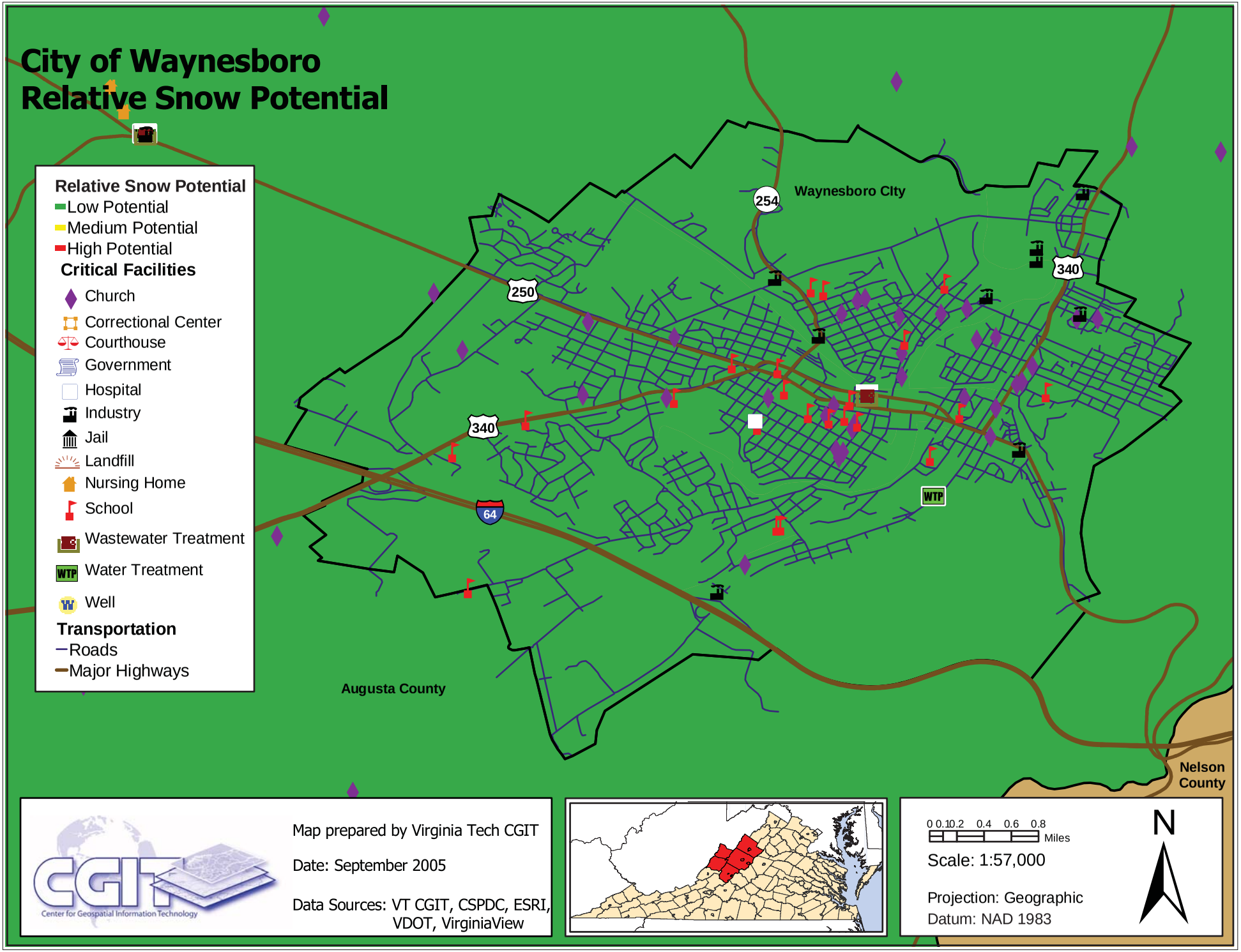
Scale: 1:57,000

Projection: Geographic

Datum: NAD 1983

N

City of Waynesboro
Relative Snow Potential



Map prepared by Virginia Tech CGIT

Date: September 2005

Data Sources: VT CGIT, CSPDC, ESRI, VDOT, VirginiaView

0 0.1 0.2 0.4 0.6 0.8 Miles

Scale: 1:57,000

Projection: Geographic

Datum: NAD 1983

N

Appendix B3

Central Shenandoah Valley Regional Relative Ice Potential Maps

Augusta County
- *Craigsville, Town of*

Bath County

Buena Vista City

Harrisonburg City

Highland County
- *Monterey, Town of*

Lexington City

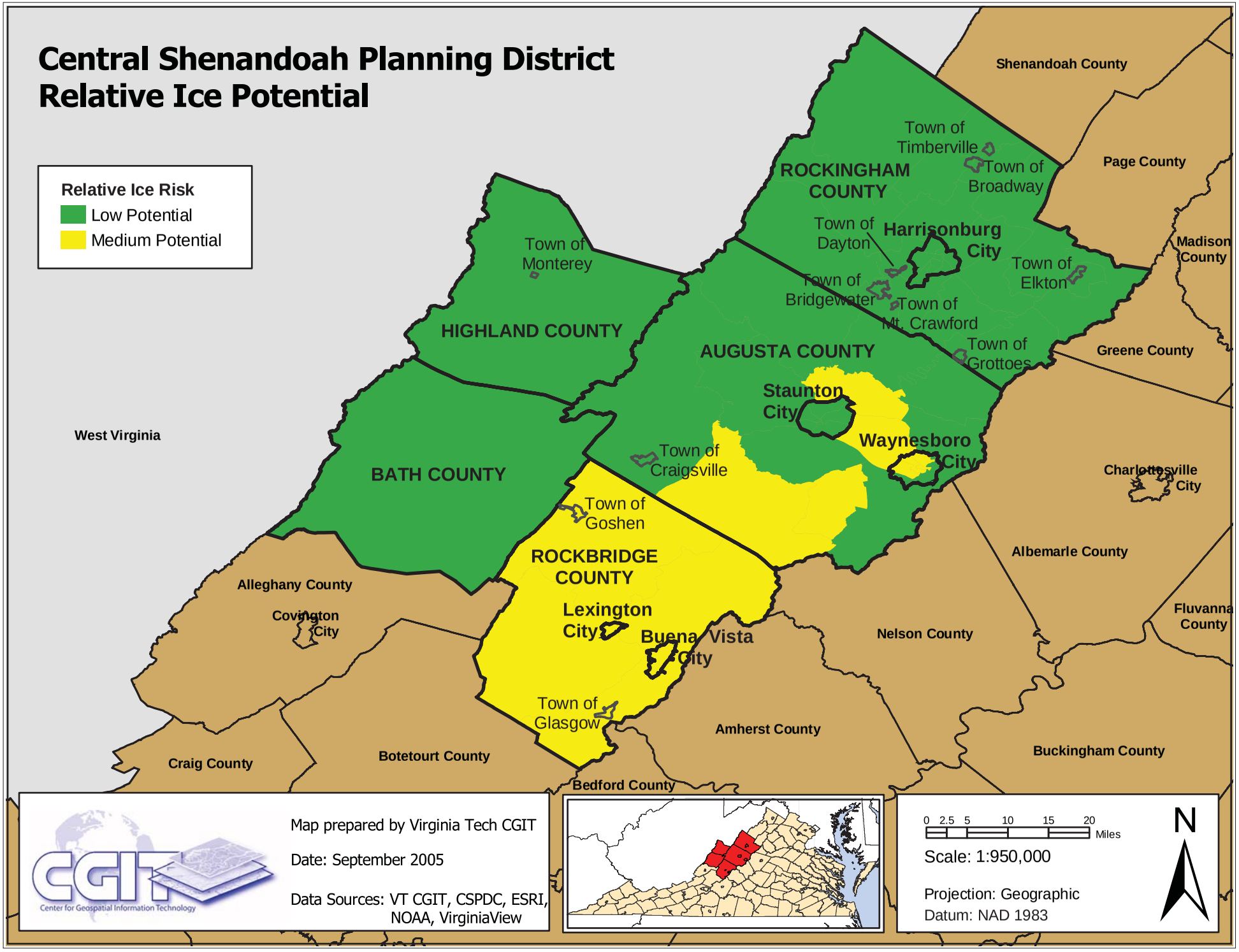
Rockbridge County
- *Glasgow, Town of*
- *Goshen, Town of*

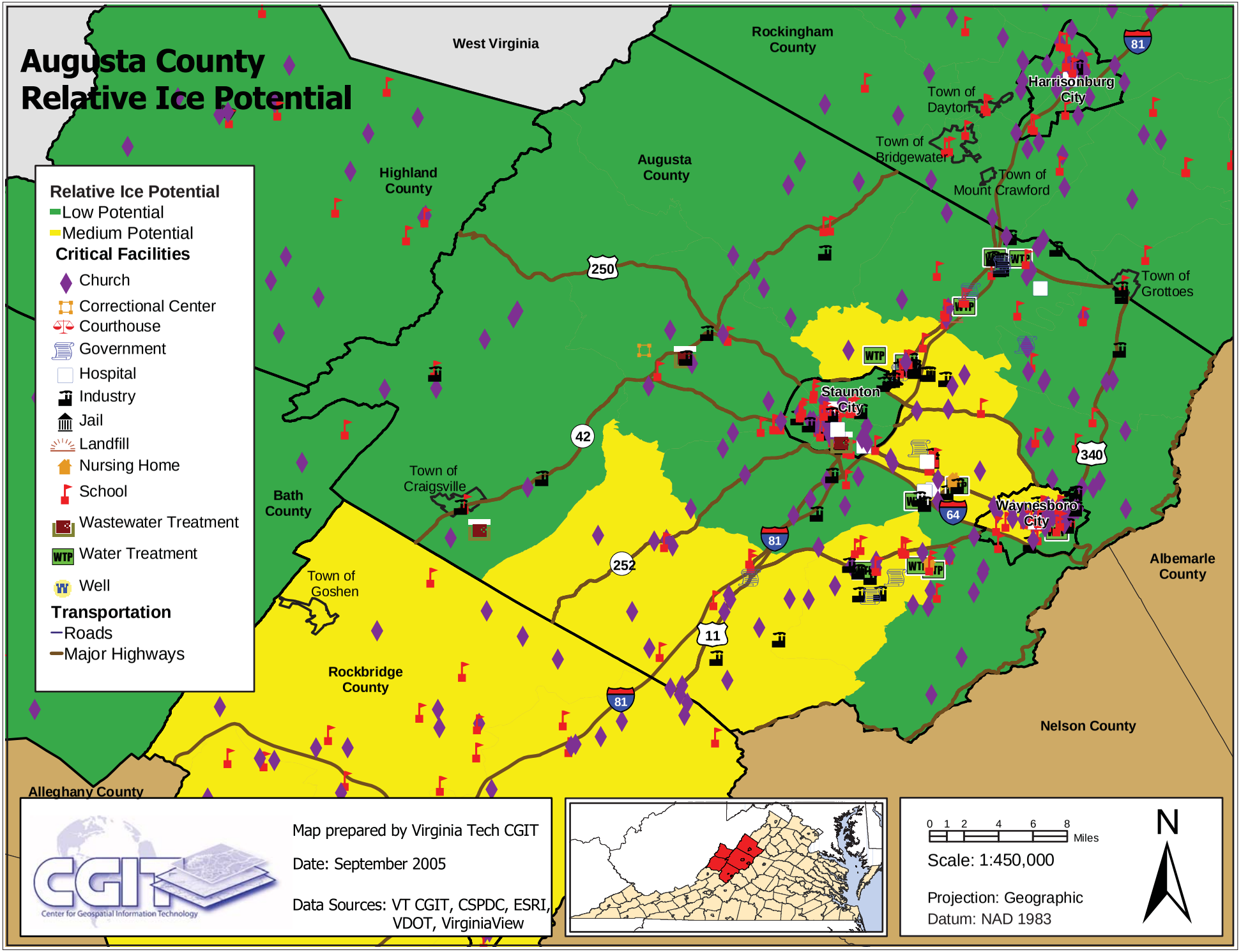
Rockingham County
- *Bridgewater, Town of*
- *Broadway, Town of*
- *Dayton, Town of*
- *Elkton, Town of*
- *Grottoes, Town of*
- *Mt. Crawford, Town of*
- *Timberville, Town of*

Staunton City

Waynesboro City

Central Shenandoah Planning District
Relative Ice Potential




Augusta County
Relative Ice Potential
West Virginia
Rockingham County
Highland County
Augusta County
Bath County
Rockbridge County
Alleghany County
Albemarle County
Nelson County
Town of Dayton
Town of Bridgewater
Town of Mount Crawford
Town of Grottoes
Town of Craigsville
Town of Goshen
Harrisonburg City
Staunton City
Waynesboro City
Relative Ice Potential
Low Potential
Medium Potential
Critical Facilities
Church
Correctional Center
Courthouse
Government
Hospital
Industry
Jail
Landfill
Nursing Home
School
Wastewater Treatment
Water Treatment
Well
Transportation
Roads
Major Highways
250
42
81
64
340
252
11
WTP
Map prepared by Virginia Tech CGIT
Date: September 2005
Data Sources: VT CGIT, CSPDC, ESRI, VDOT, VirginiaView
Center for Geospatial Information Technology
0 1 2 4 6 8 Miles
Scale: 1:450,000
Projection: Geographic
Datum: NAD 1983
N

Town of Craigsville
Relative Ice Potential

Relative Ice Potential
- Low Potential
- Medium Potential

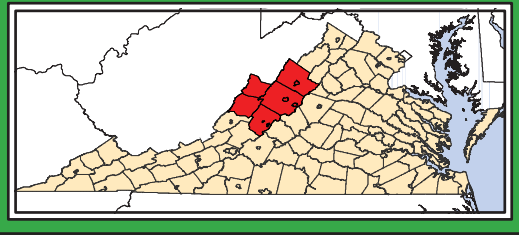
Critical Facilities
- Church
- Correctional Center
- Courthouse
- Government
- Hospital
- Industry
- Jail
- Landfill
- Nursing Home
- School
- Wastewater Treatment
- Water Treatment
- Well

Transportation
- Roads
- Major Highways

Map prepared by Virginia Tech CGIT

Date: September 2005

Data Sources: VT CGIT, CSPDC, ESRI, VDOT, VirginiaView



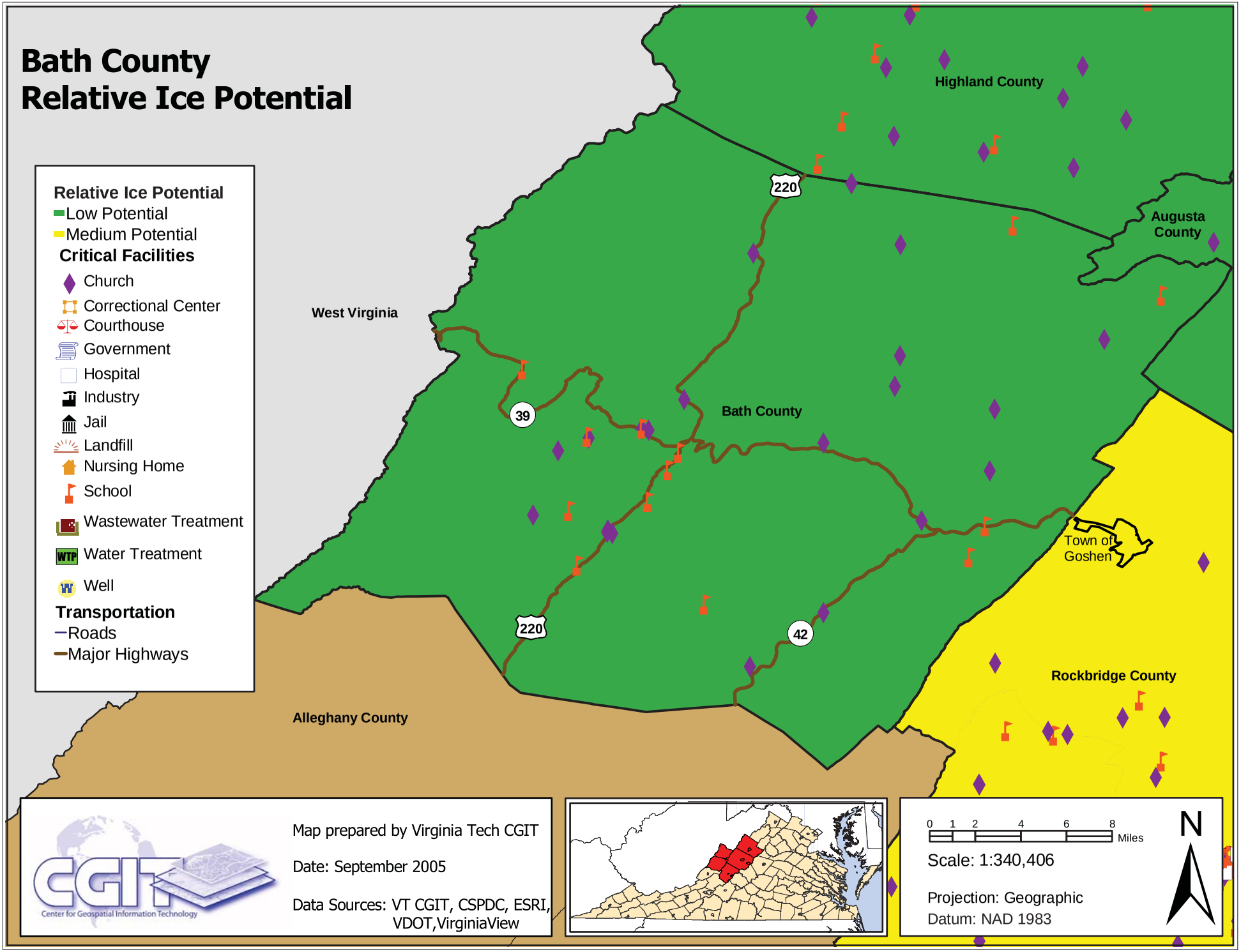
0 0.05 0.1 0.2 0.3 0.4 Miles

Scale: 1:27,000

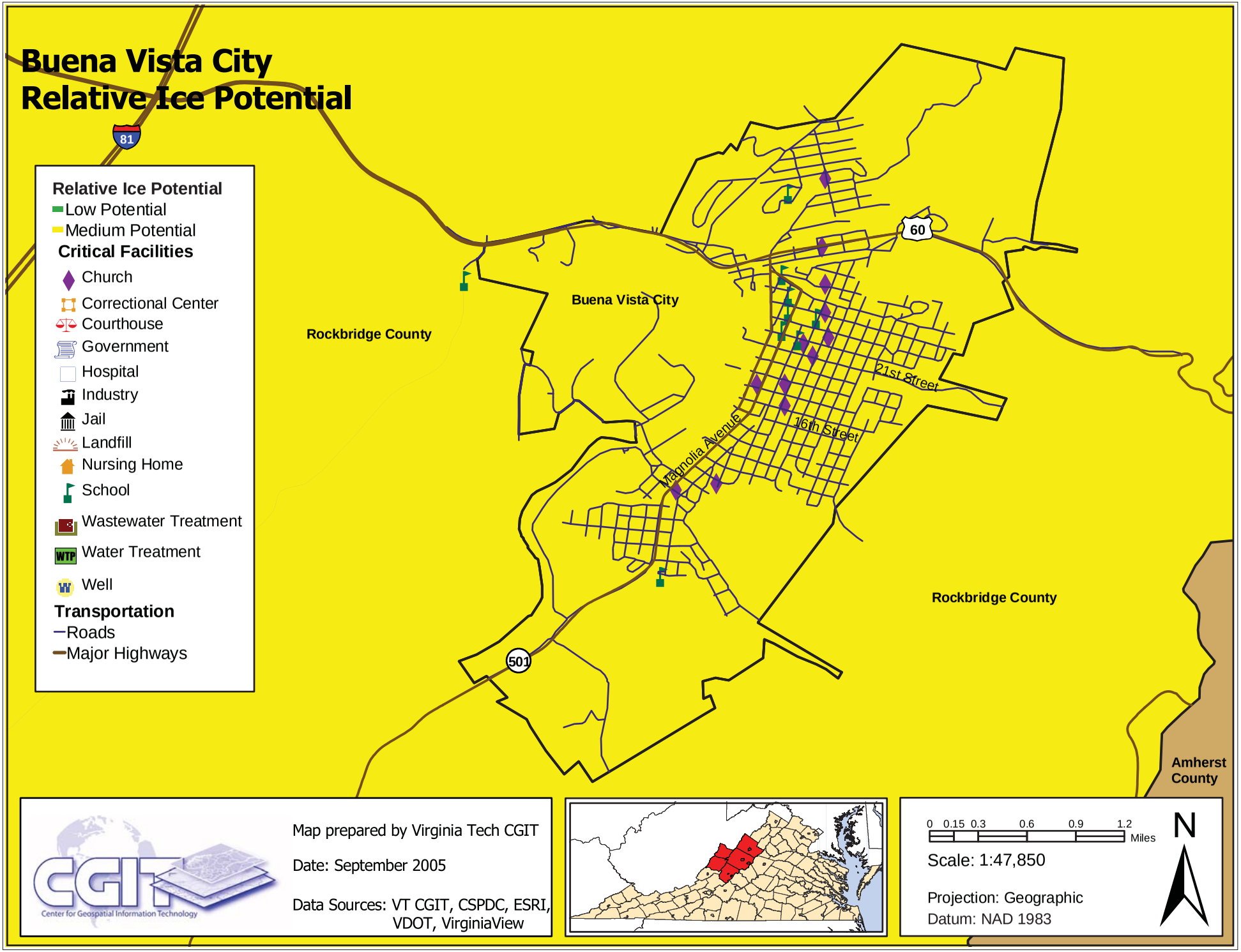
Projection: Geographic
Datum: NAD 1983

N

Bath County
Relative Ice Potential



Buena Vista City
Relative Ice Potential



Map prepared by Virginia Tech CGIT

Date: September 2005

Data Sources: VT CGIT, CSPDC, ESRI, VDOT, VirginiaView

Center for Geospatial Information Technology

0 0.15 0.3 0.6 0.9 1.2 Miles

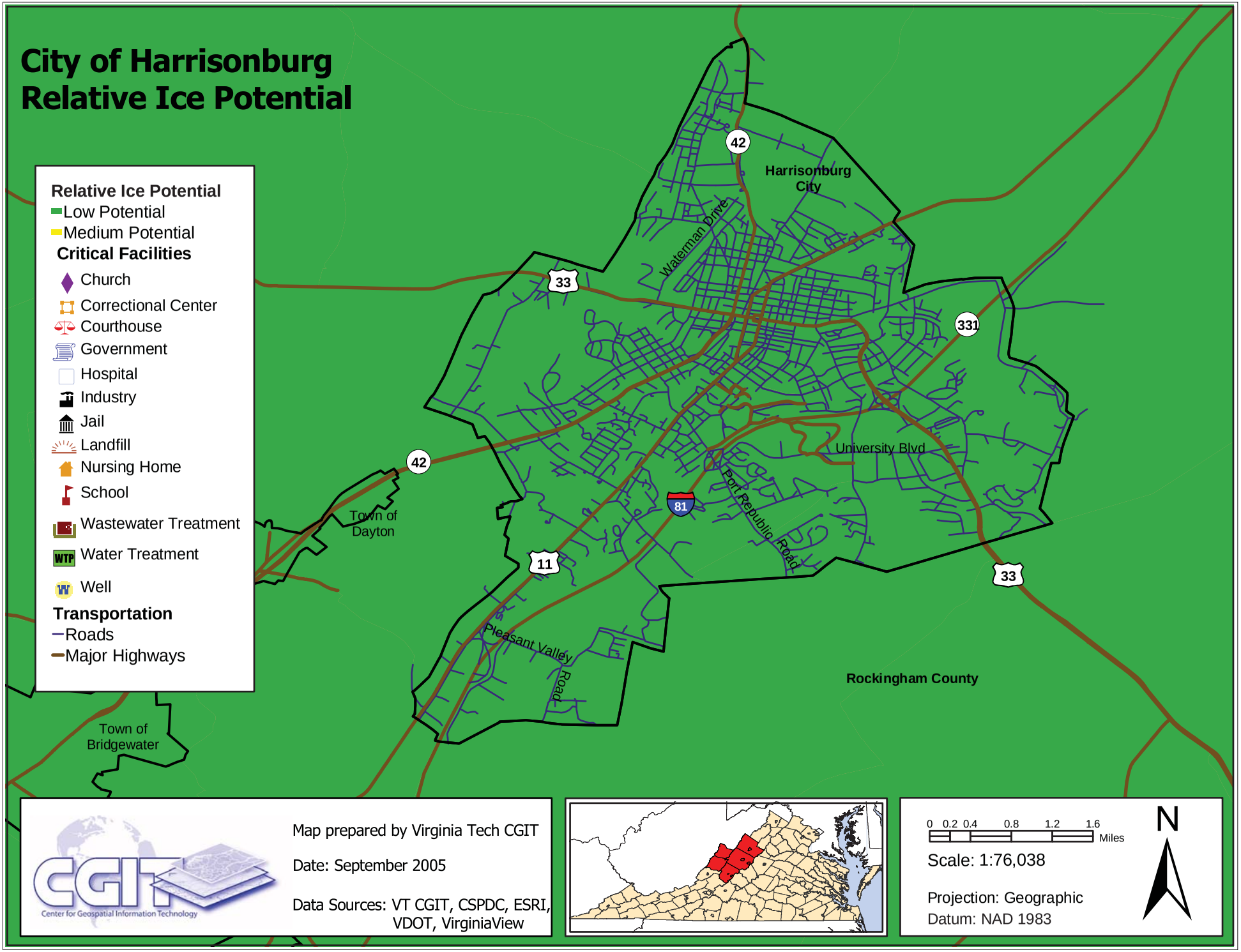
Scale: 1:47,850

Projection: Geographic

Datum: NAD 1983

N

City of Harrisonburg
Relative Ice Potential



Map prepared by Virginia Tech CGIT

Date: September 2005

Data Sources: VT CGIT, CSPDC, ESRI, VDOT, VirginiaView

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0 0.2 0.4 0.8 1.2 1.6 Miles

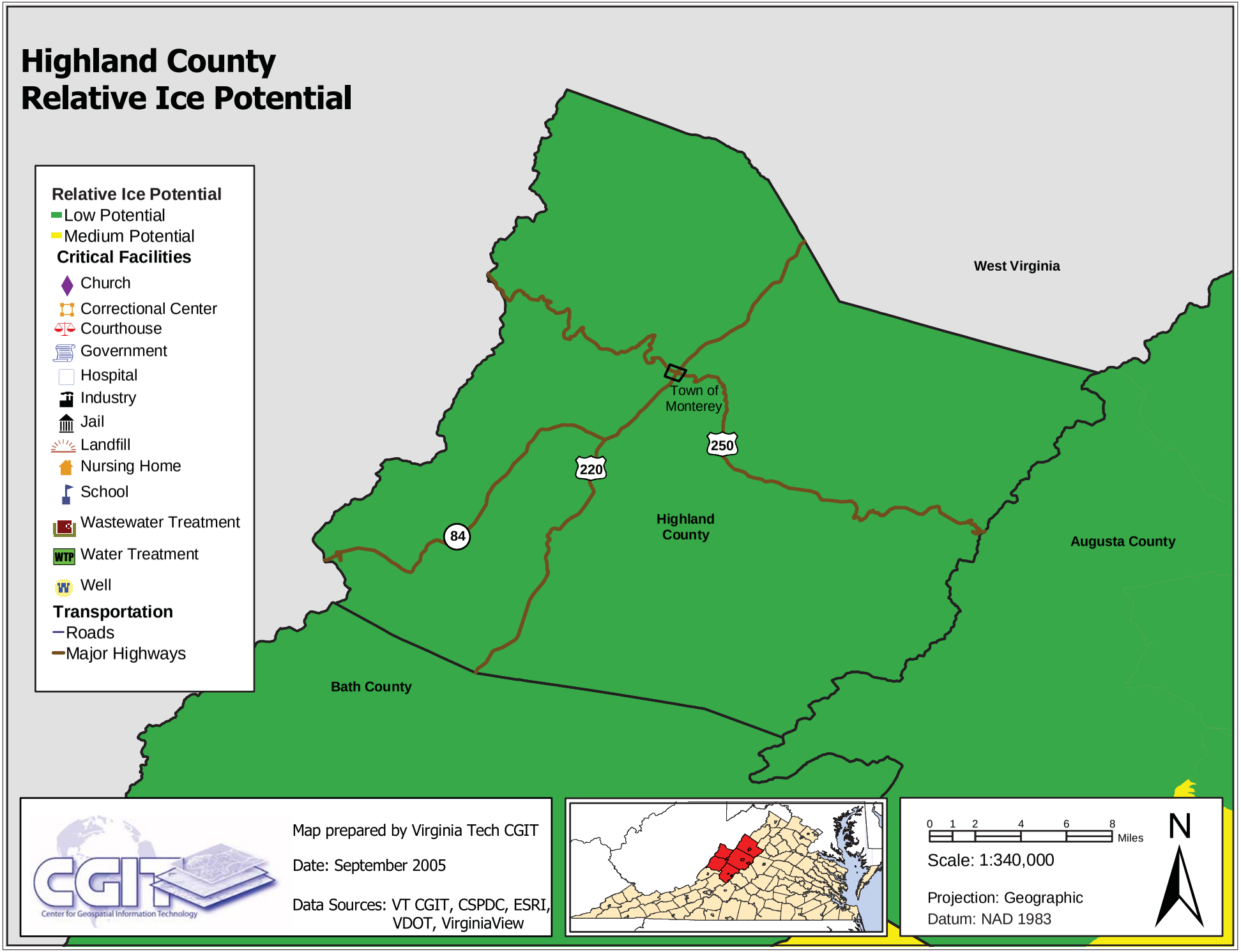
Scale: 1:76,038

Projection: Geographic

Datum: NAD 1983

N

Highland County
Relative Ice Potential



Town of Monterey
Relative Ice Potential

Highland County

250

220

Wilson Avenue

Main Street

Spruce Street

Town of
Monterey

Relative Ice Potential
- Low Potential
- Medium Potential

Critical Facilities
- Church
- Correctional Center
- Courthouse
- Government
- Hospital
- Industry
- Jail
- Landfill
- Nursing Home
- School
- Wastewater Treatment
- Water Treatment
- Well

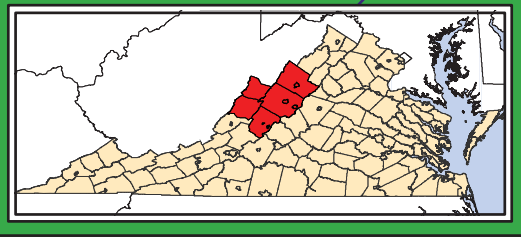
Transportation
- Roads
- Major Highways

Center for Geospatial Information Technology

Map prepared by Virginia Tech CGIT

Date: September 2005

Data Sources: VT CGIT, CSPDC, ESRI, VDOT, VirginiaView



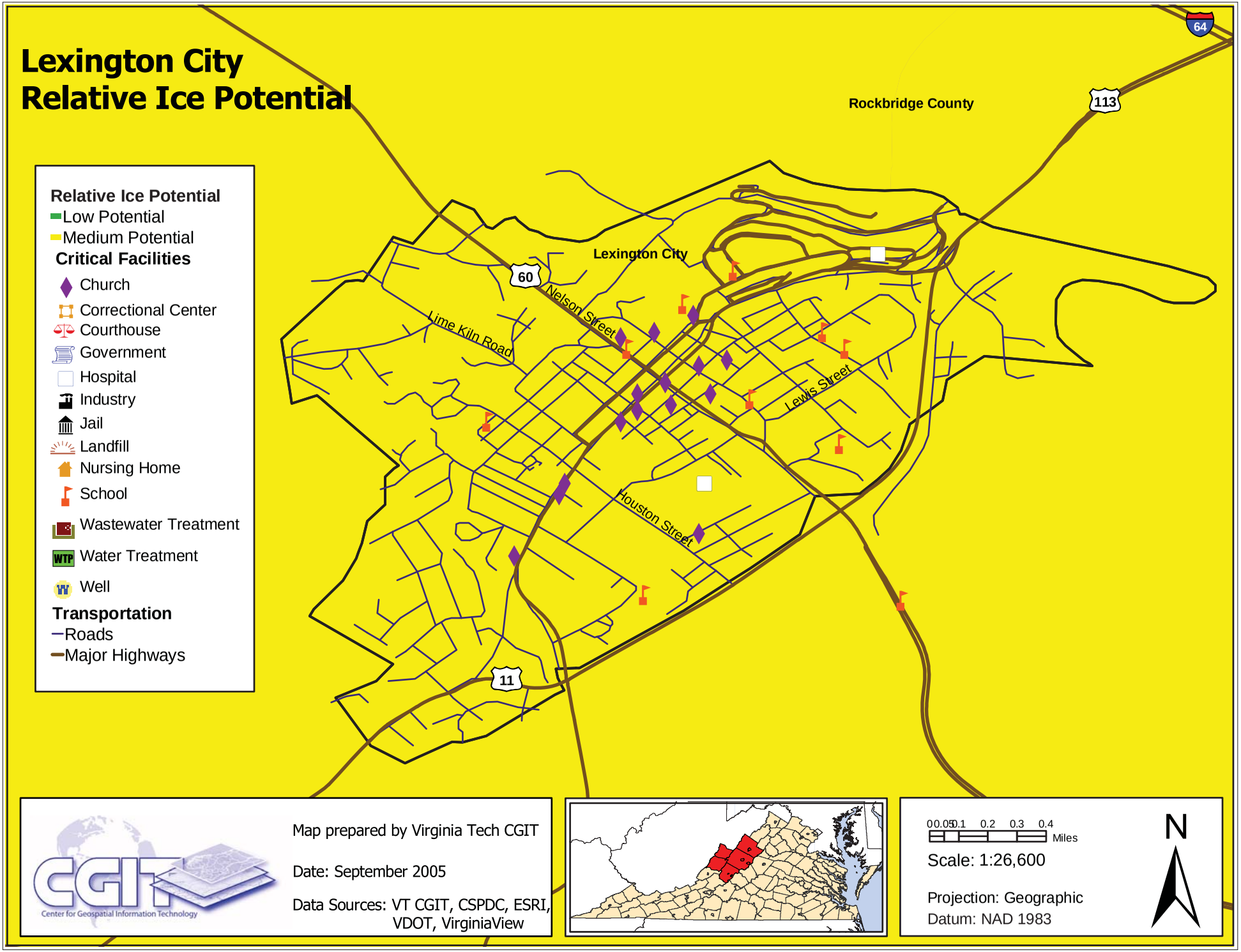
0 0.025 0.05 0.1 0.15 0.2 Miles

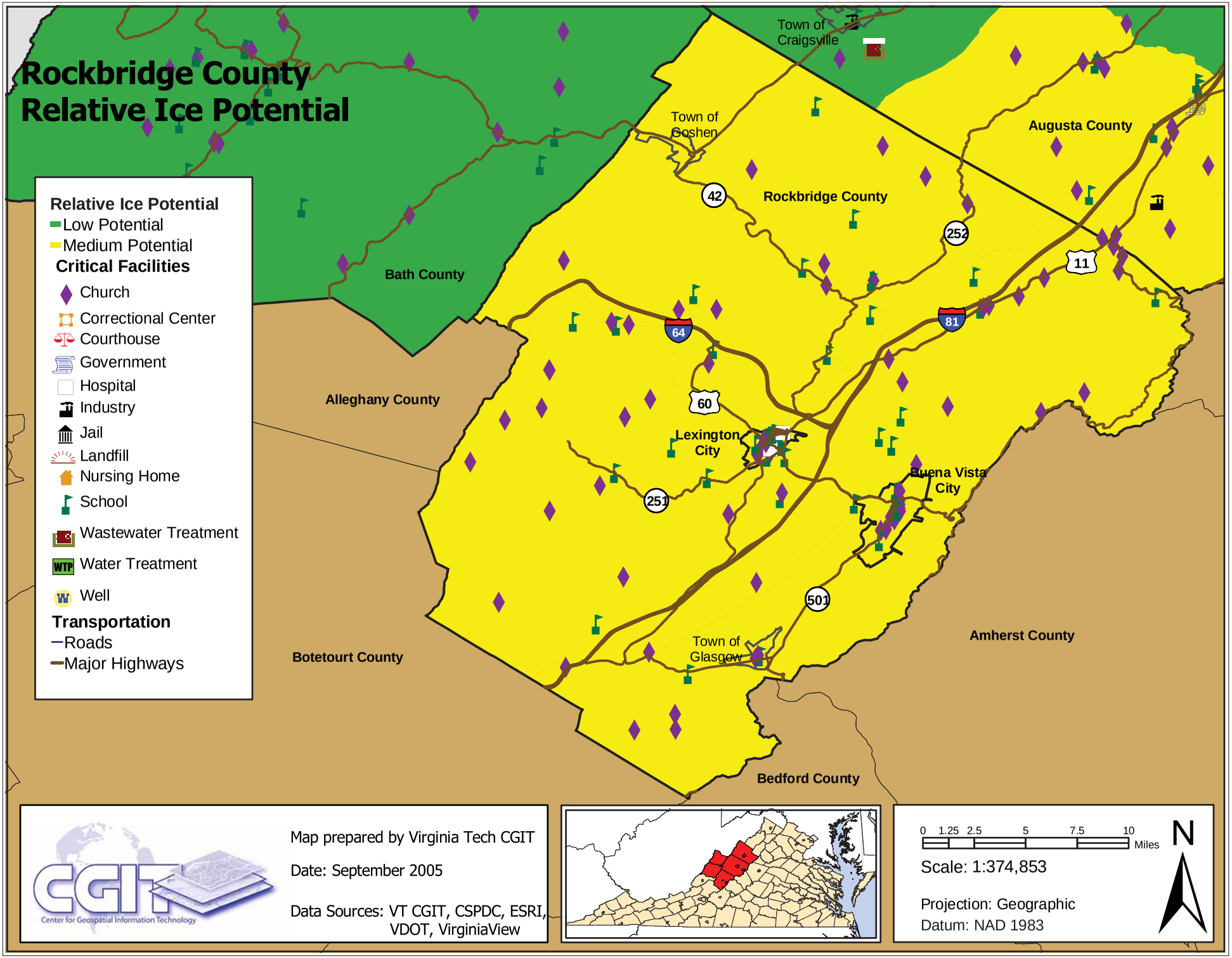
Scale: 1:10,000

Projection: Geographic
Datum: NAD 1983

N

Lexington City
Relative Ice Potential




Rockbridge County
Relative Ice Potential
Relative Ice Potential
Low Potential
Medium Potential
Critical Facilities
Church
Correctional Center
Courthouse
Government
Hospital
Industry
Jail
Landfill
Nursing Home
School
Wastewater Treatment
Water Treatment
Well
Transportation
Roads
Major Highways
Town of Craigsville
Town of Goshen
Augusta County
Rockbridge County
Bath County
Alleghany County
Botetourt County
Amherst County
Bedford County
Lexington City
Buena Vista City
Town of Glasgow
42
252
11
64
81
60
251
501
Map prepared by Virginia Tech CGIT
Date: September 2005
Data Sources: VT CGIT, CSPDC, ESRI, VDOT, VirginiaView
Center for Geospatial Information Technology
0 1.25 2.5 5 7.5 10
Miles
Scale: 1:374,853
Projection: Geographic
Datum: NAD 1983
N

Town of Glasgow
Relative Ice Potential

Relative Ice Potential
- Low Potential
- Medium Potential

Critical Facilities
- Church
- Correctional Center
- Courthouse
- Government
- Hospital
- Industry
- Jail
- Landfill
- Nursing Home
- School
- Wastewater Treatment
- Water Treatment
- Well

Transportation
- Roads
- Major Highways

Rockbridge County

Blue Ridge Road

Catawba Street

501

Fitzlee Street

130

Town of Glasgow

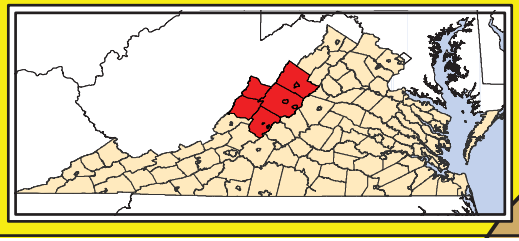
Rockbridge County

Center for Geospatial Information Technology

Map prepared by Virginia Tech CGIT

Date: September 2005

Data Sources: VT CGIT, CSPDC, ESRI, VDOT, VirginiaView



0 0.05 0.1 0.2 0.3 0.4 Miles

Scale: 1:24,100

Projection: Geographic

Datum: NAD 1983

N

Town of Goshen
Relative Ice Potential

Bath County

Rockbridge County

Rockbridge County

Town of Goshen

39

Maury River Road

42

Allegheny Drive

Stillwater Drive

Spring Drive

Relative Ice Potential
- Low Potential
- Medium Potential

Critical Facilities
- Church
- Correctional Center
- Courthouse
- Government
- Hospital
- Industry
- Jail
- Landfill
- Nursing Home
- School
- Wastewater Treatment
- Water Treatment
- Well

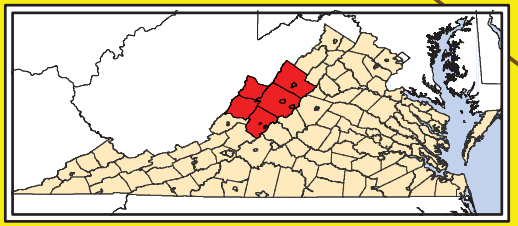
Transportation
- Roads
- Major Highways

Center for Geospatial Information Technology

Map prepared by Virginia Tech CGIT

Date: September 2005

Data Sources: VT CGIT, CSPDC, ESRI, VDOT, VirginiaView



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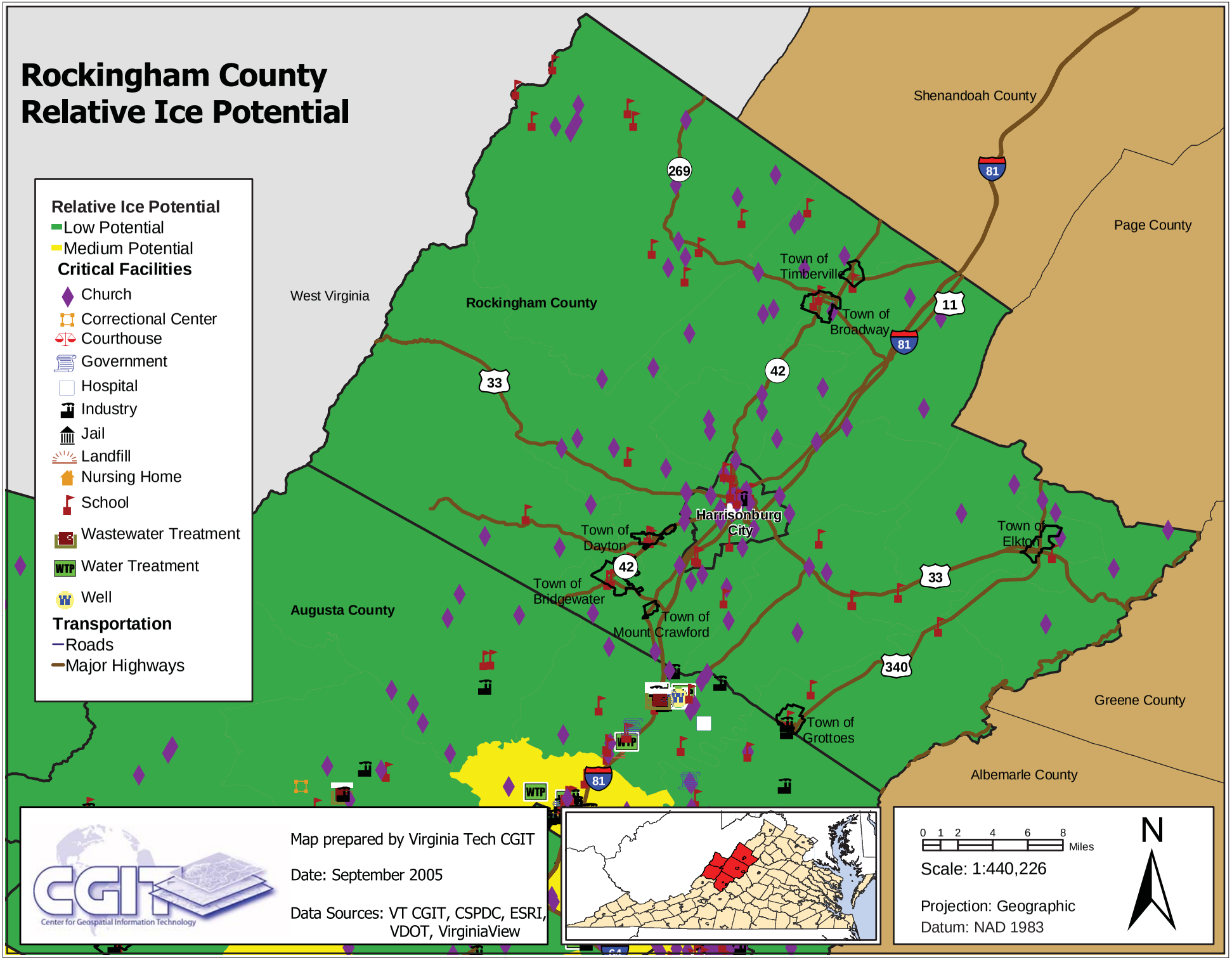
Scale: 1:27,200

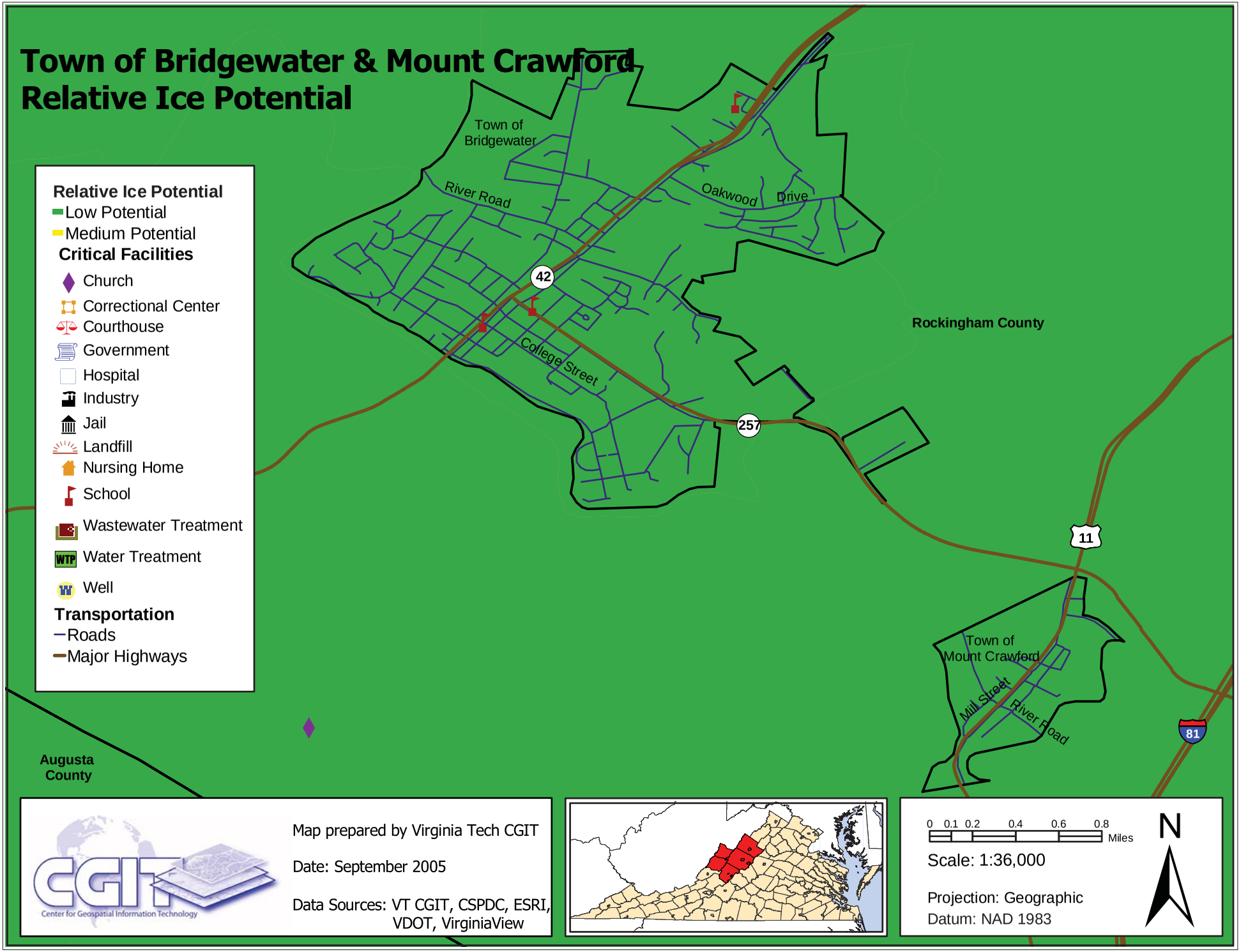
Projection: Geographic

Datum: NAD 1983

N


Rockingham County
Relative Ice Potential
Relative Ice Potential
Low Potential
Medium Potential
Critical Facilities
Church
Correctional Center
Courthouse
Government
Hospital
Industry
Jail
Landfill
Nursing Home
School
Wastewater Treatment
Water Treatment
Well
Transportation
Roads
Major Highways
West Virginia
Rockingham County
Shenandoah County
Page County
Augusta County
Greene County
Albemarle County
Town of Timbervill
Town of Broadway
Harrisonburg City
Town of Dayton
Town of Bridgewater
Town of Mount Crawford
Town of Elkton
Town of Grottoes
269
81
11
42
33
340
WTP
Map prepared by Virginia Tech CGIT
Date: September 2005
Data Sources: VT CGIT, CSPDC, ESRI, VDOT, VirginiaView
Center for Geospatial Information Technology
0 1 2 4 6 8
Miles
Scale: 1:440,226
Projection: Geographic
Datum: NAD 1983
N

Town of Bridgewater & Mount Crawford
Relative Ice Potential



Map prepared by Virginia Tech CGIT

Date: September 2005

Data Sources: VT CGIT, CSPDC, ESRI, VDOT, VirginiaView

0 0.1 0.2 0.4 0.6 0.8 Miles

Scale: 1:36,000

Projection: Geographic

Datum: NAD 1983

N

Town of Timberville & Broadway
Relative Ice Potential

Relative Ice Potential
- Low Potential
- Medium Potential

Critical Facilities
- Church
- Correctional Center
- Courthouse
- Government
- Hospital
- Industry
- Jail
- Landfill
- Nursing Home
- School
- Wastewater Treatment
- Water Treatment
- Well

Transportation
- Roads
- Major Highways

Rockingham County

Memorial Park Drive

New Market Road

211

Town of Timberville

42

259

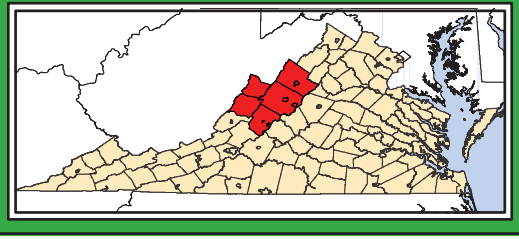
Broadway Avenue

Town of Broadway

Springbrook Road

259

42



0 0.1 0.2 0.4 0.6 0.8 Miles

Scale: 1:42,000

Projection: Geographic
Datum: NAD 1983

N

Map prepared by Virginia Tech CGIT

Date: September 2005

Data Sources: VT CGIT, CSPDC, ESRI, VDOT, VirginiaView

Town of Dayton
Relative Ice Potential

Rockingham County

Relative Ice Potential
- Low Potential
- Medium Potential

Critical Facilities
- Church
- Correctional Center
- Courthouse
- Government
- Hospital
- Industry
- Jail
- Landfill
- Nursing Home
- School
- Wastewater Treatment
- Water Treatment
- Well

Transportation
- Roads
- Major Highways

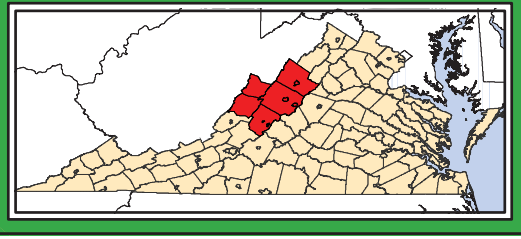
Town of Dayton
Bowman Road
Thompson Avenue
42
257
290

Center for Geospatial Information Technology

Map prepared by Virginia Tech CGIT

Date: September 2005

Data Sources: VT CGIT, CSPDC, ESRI, VDOT, VirginiaView



0 0.05 0.1 0.2 0.3 0.4 Miles

Scale: 1:23,600

Projection: Geographic
Datum: NAD 1983

N

Town of Elkton
Relative Ice Potential

Relative Ice Potential
- Low Potential
- Medium Potential

Critical Facilities
- Church
- Correctional Center
- Courthouse
- Government
- Hospital
- Industry
- Jail
- Landfill
- Nursing Home
- School
- Wastewater Treatment
- Water Treatment
- Well

Transportation
- Roads
- Major Highways

Rockingham County

Town of Elkton

340

Terrace Avenue

Rockingham Street

33

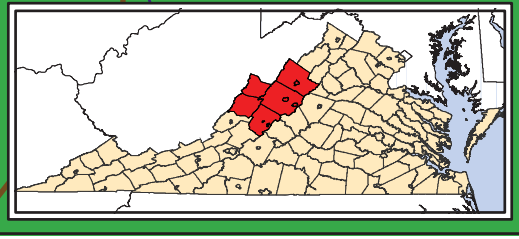
Saplin Ridge Road

Center for Geospatial Information Technology

Map prepared by Virginia Tech CGIT

Date: September 2005

Data Sources: VT CGIT, CSPDC, ESRI, VDOT, VirginiaView



0 0.05 0.1 0.2 0.3 0.4 Miles

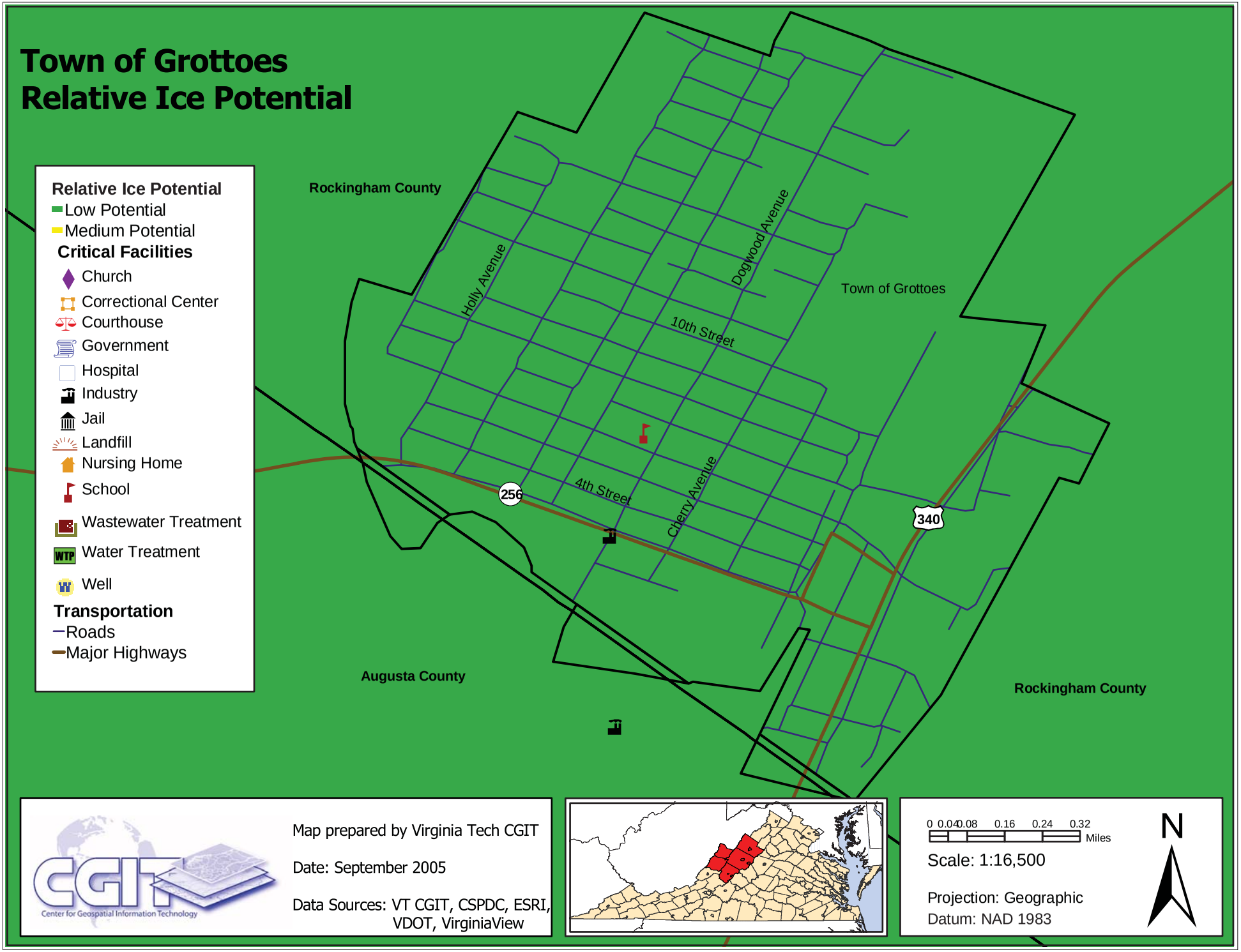
Scale: 1:24,100

Projection: Geographic

Datum: NAD 1983

N

Town of Grottoes
Relative Ice Potential



Map prepared by Virginia Tech CGIT

Date: September 2005

Data Sources: VT CGIT, CSPDC, ESRI, VDOT, VirginiaView

0 0.04 0.08 0.16 0.24 0.32 Miles

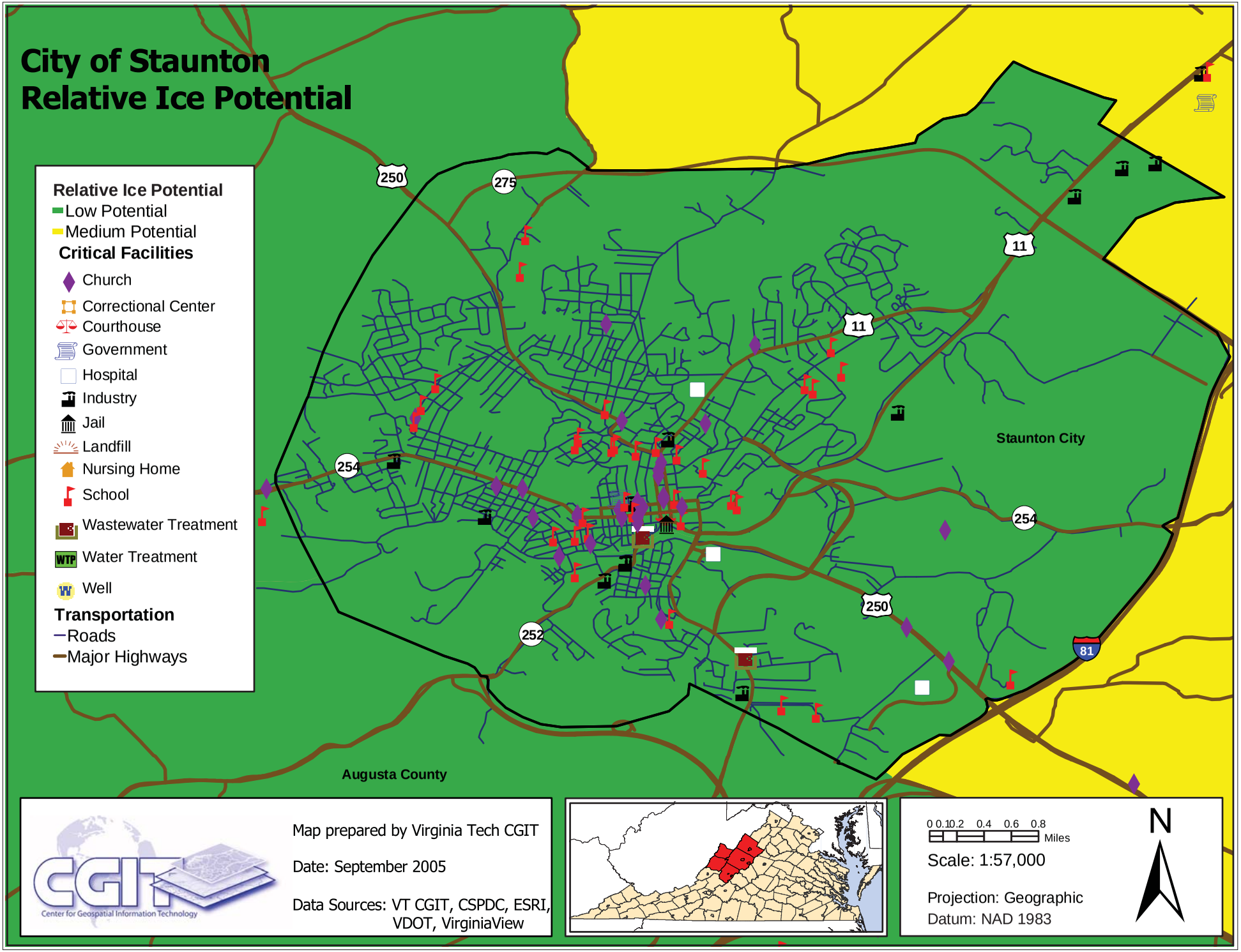
Scale: 1:16,500

Projection: Geographic

Datum: NAD 1983

N

City of Staunton
Relative Ice Potential



Map prepared by Virginia Tech CGIT

Date: September 2005

Data Sources: VT CGIT, CSPDC, ESRI, VDOT, VirginiaView

0 0.1 0.2 0.4 0.6 0.8 Miles

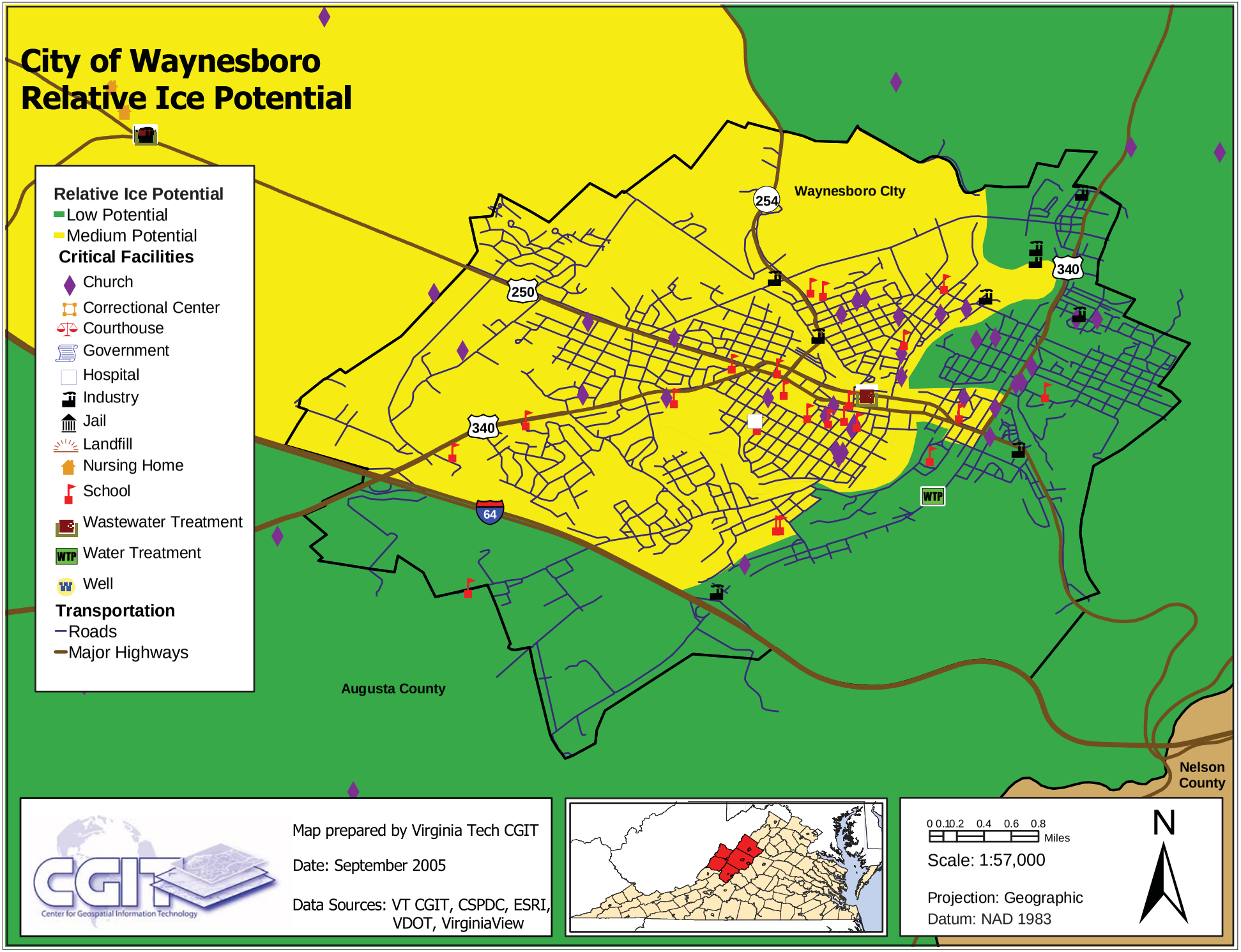
Scale: 1:57,000

Projection: Geographic

Datum: NAD 1983

N

City of Waynesboro
Relative Ice Potential



Map prepared by Virginia Tech CGIT

Date: September 2005

Data Sources: VT CGIT, CSPDC, ESRI, VDOT, VirginiaView

0 0.1 0.2 0.4 0.6 0.8 Miles

Scale: 1:57,000

Projection: Geographic

Datum: NAD 1983

N

Appendix C – Other

Local Jurisdiction Resolutions
Public Meeting Notification
Natural Hazards Survey

Local Jurisdictions Resolutions

Augusta County
Bath County
Highland County
Rockbridge County
Rockingham County
City of Buena Vista
City of Lexington
City of Harrisonburg
City of Staunton
City of Waynesboro
Town of Bridgewater
Town of Broadway
Town of Craigsville
Town of Dayton
Town of Elkton
Town of Glasgow
Town of Goshen
Town of Grottoes
Town of Monterey
Town of Mt. Crawford
Town of Timberville

RESOLUTION

Adoption of the Central Shenandoah Valley
All Hazards Mitigation Plan

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance, and

WHEREAS, the Central Shenandoah Mitigation and Planning Workgroup representing the County of Augusta, as well as the remaining 20 localities of the Central Shenandoah Planning District was convened in order to study the Region's risks from and vulnerability to natural hazards, and to make recommendations on mitigating the effects of such hazards on the Region; and

WHEREAS, the Mitigation and Planning Workgroup was provided staff support by the Central Shenandoah Planning District Commission; and

WHEREAS, the efforts of the Mitigation and Planning Workgroup, the staff of the Central Shenandoah Planning District Commission and Virginia Tech's Center for Geospatial Technology as well as members of the public, private and nonprofit sectors, have resulted in the development of a Natural Hazards Mitigation Plan for the Region.

NOW THEREFORE, BE IT RESOLVED by the Augusta County Board of Supervisors that the Central Shenandoah Valley All Hazards Mitigation Plan dated September 2005 is hereby approved and adopted for the County of Augusta.

BE IT FURTHER RESOLVED that this resolution be spread upon the minutes of the Augusta County Board of Supervisors.

Adopted: October 26, 2005

Chairman, Augusta County Board of Supervisors

H:/Resolution/All Hazards

RESOLUTION

Adoption of the Central Shenandoah Valley All Hazards Mitigation Plan

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance, and

WHEREAS, the Central Shenandoah Mitigation and Planning Workgroup representing the County of Bath, as well as the remaining 20 localities of the Central Shenandoah Planning District was convened in order to study the Region's risks from and vulnerability to natural hazards, and to make recommendations on mitigating the effects of such hazards on the Region; and

WHEREAS, the Mitigation and Planning Workgroup was provided staff support by the Central Shenandoah Planning District Commission; and

WHEREAS, the efforts of the Mitigation and Planning Workgroup, the staff of the Central Shenandoah Planning District Commission and Virginia Tech's Center for Geospatial Technology as well as members of the public, private and nonprofit sectors, have resulted in the development of a Natural Hazards Mitigation Plan for the Region.

NOW THEREFORE, BE IT RESOLVED by the Bath County Board of Supervisors that the Central Shenandoah Valley All Hazards Mitigation Plan dated September 2005 is hereby approved and adopted for the County of Bath.

Adopted by the Bath County Board of Supervisors this 11th day of October, 2005.

APPROVED:

Stuart L. Hall
(Chairman, Board of Supervisors)

ATTEST:

Clerk

RESOLUTION

Adoption of the Central Shenandoah Valley All Hazards Mitigation Plan

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance, and

WHEREAS, the Central Shenandoah Mitigation and Planning Workgroup representing the County of Highland, as well as the remaining 20 localities of the Central Shenandoah Planning District was convened in order to study the Region's risks from and vulnerability to natural hazards, and to make recommendations on mitigating the effects of such hazards on the Region; and

WHEREAS, the Mitigation and Planning Workgroup was provided staff support by the Central Shenandoah Planning District Commission; and

WHEREAS, the efforts of the Mitigation and Planning Workgroup, the staff of the Central Shenandoah Planning District Commission and Virginia Tech's Center for Geospatial Technology as well as members of the public, private and nonprofit sectors, have resulted in the development of a Natural Hazards Mitigation Plan for the Region.

NOW THEREFORE, BE IT RESOLVED by the Highland County Board of Supervisors that the Central Shenandoah Valley All Hazards Mitigation Plan dated September 2005 is hereby approved and adopted for the County of Highland.

Adopted by the Highland County Board of Supervisors this 4th day of October, 2005.

APPROVED:

Jerry A. Rexrode, Chairman
Board of Supervisors

ATTEST:

Roberta A. Lambert, Clerk of the Board

RESOLUTION

Adoption of the Central Shenandoah Valley All Hazards Mitigation Plan

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance, and

WHEREAS, the Central Shenandoah Mitigation and Planning Workgroup representing the County of Rockbridge, as well as the remaining 20 localities of the Central Shenandoah Planning District was convened in order to study the Region's risks from and vulnerability to natural hazards, and to make recommendations on mitigating the effects of such hazards on the Region; and

WHEREAS, the Mitigation and Planning Workgroup was provided staff support by the Central Shenandoah Planning District Commission; and

WHEREAS, the efforts of the Mitigation and Planning Workgroup, the staff of the Central Shenandoah Planning District Commission and Virginia Tech's Center for Geospatial Technology as well as members of the public, private and nonprofit sectors, have resulted in the development of a Natural Hazards Mitigation Plan for the Region.

NOW THEREFORE, BE IT RESOLVED by the Rockbridge County Board of Supervisors that the Central Shenandoah Valley All Hazards Mitigation Plan dated September 2005 is hereby approved and adopted for the County of Rockbridge.

Adopted by the Rockbridge County Board of Supervisors this 24th day of October, 2005.

APPROVED:

(Chairman, Board of Supervisors)

ATTEST:

JOSEPH S. PAXTON
County Administrator

ROCKINGHAM COUNTY

RESOLUTION

Adoption of the Central Shenandoah Valley All Hazards Mitigation Plan

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, the Central Shenandoah Mitigation and Planning Workgroup representing the County of Rockingham, as well as the remaining 20 localities of the Central Shenandoah Planning District was convened in order to study the Region's risks from and vulnerability to natural hazards, and to make recommendations on mitigating the effects of such hazards on the Region; and

WHEREAS, the Mitigation and Planning Workgroup was provided staff support by the Central Shenandoah Planning District Commission; and

WHEREAS, the efforts of the Mitigation and Planning Workgroup, the staff of the Central Shenandoah Planning District Commission and Virginia Tech's Center for Geospatial Technology as well as members of the public, private and nonprofit sectors, have resulted in the development of a Natural Hazards Mitigation Plan for the Region;

NOW THEREFORE, BE IT RESOLVED by the Rockingham County Board of Supervisors that the Central Shenandoah Valley All Hazards Mitigation Plan dated September 2005 is hereby approved and adopted for the County of Rockingham.

Adopted by the Rockingham County Board of Supervisors this 12th day of October 2005.

APPROVED:

Pablo Cuevas

(Chairman, Board of Board)

ATTEST:

Dottie L. Bowen
Deputy Clerk

POST OFFICE BOX 1252, HARRISONBURG, VIRGINIA 22803
TELEPHONE (540) 564-3012 • FAX (540) 564-3017
Website: www.co.rockingham.va.us

ADOPTION OF THE CENTRAL SHENANDOAH VALLEY ALL HAZARDS MITIGATION PLAN

RESOLUTION

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance, and

WHEREAS, the Central Shenandoah Mitigation and Planning Workgroup representing the City of Buena Vista, as well as the remaining 20 localities of the Central Shenandoah Planning District was convened in order to study the Region's risks from and vulnerability to natural hazards, and to make recommendations on mitigating the effects of such hazards on the Region; and

WHEREAS, the Mitigation and Planning Workgroup was provided staff support by the Central Shenandoah Planning District Commission; and

WHEREAS, the effects of the Mitigation and Planning Workgroup, the staff of the Central Shenandoah Planning District Commission and Virginia Tech's Center for Geospatial Technology as well as member of the public, private and nonprofit sectors, have resulted in the development of a Natural Hazards Mitigation Plan for the Region.

NOW, THEREFORE, BE IT RESOLVED by the Buena Vista City Council that the Central Shenandoah Valley All Hazards Mitigation Plan dated September, 2005 is hereby approved and adopted for the City of Buena Vista.

J. Todd Jones, Mayor

ATTEST:

Janie G. Caffey
Clerk of Council

November 10, 2005
Date of Adoption

RESOLUTION

Adoption of the Central Shenandoah Valley All Hazards Mitigation Plan

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance, and

WHEREAS, the Central Shenandoah Mitigation and Planning Workgroup representing the City of Lexington, as well as the remaining 20 localities of the Central Shenandoah Planning District was convened in order to study the Region's risks from and vulnerability to natural hazards, and to make recommendations on mitigating the effects of such hazards on the Region; and

WHEREAS, the Mitigation and Planning Workgroup was provided staff support by the Central Shenandoah Planning District Commission; and

WHEREAS, the efforts of the Mitigation and Planning Workgroup, the staff of the Central Shenandoah Planning District Commission and Virginia Tech's Center for Geospatial Technology as well as members of the public, private and nonprofit sectors, have resulted in the development of a Natural Hazards Mitigation Plan for the Region.

NOW THEREFORE, BE IT RESOLVED by the Lexington City Council that the Central Shenandoah Valley All Hazards Mitigation Plan dated September 2005 is hereby approved and adopted for the City of Lexington.

Adopted by the Lexington City Council this 20th day of October, 2005.

APPROVED:

John W. Knapp

(Mayor, City of Lexington)

ATTEST:

Marcia Edwards

RESOLUTION

Adoption of the Central Shenandoah Valley All Hazards Mitigation Plan

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance, and

WHEREAS, the Central Shenandoah Mitigation and Planning Workgroup representing the City of Harrisonburg, as well as the remaining 20 localities of the Central Shenandoah Planning District was convened in order to study the Region's risks from and vulnerability to natural hazards, and to make recommendations on mitigating the effects of such hazards on the Region; and

WHEREAS, the Mitigation and Planning Workgroup was provided staff support by the Central Shenandoah Planning District Commission; and

WHEREAS, the efforts of the Mitigation and Planning Workgroup, the staff of the Central Shenandoah Planning District Commission and Virginia Tech's Center for Geospatial Technology as well as members of the public, private and nonprofit sectors, have resulted in the development of a Natural Hazards Mitigation Plan for the Region.

NOW THEREFORE, BE IT RESOLVED by the Harrisonburg City Council that the Central Shenandoah Valley All Hazards Mitigation Plan dated September 2005 is hereby approved and adopted for the City of Harrisonburg.

Adopted by the Harrisonburg City Council this 11th day of October, 2005.

APPROVED:

Larry M Rogers
(Mayor, City of Harrisonburg)

ATTEST:

Yvonne Ryan CMC

RESOLUTION

Adoption of the Central Shenandoah Valley All Hazards Mitigation Plan

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance, and

WHEREAS, the Central Shenandoah Mitigation and Planning Workgroup representing the City of Staunton, Virginia as well as the remaining 20 localities of the Central Shenandoah Planning District was convened in order to study the Region's risks from and vulnerability to natural hazards, and to make recommendations on mitigating the effects of such hazards on the Region; and

WHEREAS, the Mitigation and Planning Workgroup was provided staff support by the Central Shenandoah Planning District Commission; and

WHEREAS, the efforts of the Mitigation and Planning Workgroup, the staff of the Central Shenandoah Planning District Commission and Virginia Tech's Center for Geospatial Technology as well as members of the public, private and nonprofit sectors, have resulted in the development of a Natural Hazards Mitigation Plan for the Region.

NOW THEREFORE, BE IT RESOLVED by the Staunton City Council that the Central Shenandoah Valley All Hazards Mitigation Plan dated September 2005 is hereby approved and adopted for the City of Staunton.

Adopted by the Staunton City Council this Thirteenth day of October, 2005.

APPROVED:

G. John Avoli
Mayor

ATTEST:

Deborah L. Sutton
Clerk

RESOLUTION

Adoption of the Central Shenandoah Valley All Hazards Mitigation Plan

***WHEREAS**, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and*

***WHEREAS**, the Central Shenandoah Mitigation and Planning Workgroup representing the City of Waynesboro, as well as the remaining 20 localities of the Central Shenandoah Planning District was convened in order to study the Region's risks from and vulnerability to natural hazards, and to make recommendations on mitigating the effects of such hazards on the Region; and*

***WHEREAS**, the Mitigation and Planning Workgroup was provided staff support by the Central Shenandoah Planning District Commission; and*

***WHEREAS**, the efforts of the Mitigation and Planning Workgroup, the staff of the Central Shenandoah Planning District Commission and Virginia Tech's Center for Geospatial Technology as well as members of the public, private and nonprofit sectors, have resulted in the development of a Natural Hazards Mitigation Plan for the Region;*

***NOW, THEREFORE, BE IT RESOLVED** by the Council of the City of Waynesboro, Virginia, that the Central Shenandoah Valley All Hazards Mitigation Plan dated September 2005 is hereby approved and adopted for the City of Waynesboro.*

Seconded by Mrs. Dowdy, the motion carried and the resolution was adopted on the unanimous affirmative votes of Council members Dowdy, Hatfield, Lucente, Reynolds and Williams.

****

I, Bonnie S. Stephenson, Clerk of Council in and for the City of Waynesboro, Virginia, do hereby certify the foregoing to be a true and exact copy as taken from the minutes of a meeting of the Waynesboro City Council as held on Tuesday, October 11, 2005.

/s/ Bonnie S. Stephenson
Bonnie S. Stephenson, Clerk of Council
City of Waynesboro, Virginia

RESOLUTION

Adoption of the Central Shenandoah Valley All Hazards Mitigation Plan

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order receive certain federal assistance, and

WHEREAS, the Central Shenandoah Mitigation and Planning Workgroup representing the Town of Bridgewater, as well as the remaining 20 localities of the Central Shenandoah Planning District was convened in order to study the Region's risks from and vulnerability to natural hazards, and to make recommendations on mitigating the effects of such hazards on the Region; and

WHEREAS, the Mitigation and Planning Workgroup was provided staff support by the Central Shenandoah Planning District Commission; and

WHEREAS, the efforts of the Mitigation and Planning Workgroup, the staff of the Central Shenandoah Planning District Commission and Virginia Tech's Center for Geospatial Technology as well as members of the public, private and nonprofit sectors, have resulted in the development of a Natural Hazards Mitigation Plan for the Region.

NOW THEREFORE, BE IT RESOLVED by the Town Council of Bridgewater, Virginia that the Central Shenandoah Valley All Hazards Mitigation Plan dated September 2005 is hereby approved and adopted for the Town of Bridgewater.

Adopted by the Town Council of the Town of Bridgewater, Virginia this 8th day of November, 2005.

APPROVED:

Mayor, Town of Bridgewater

Carleen A. Loveless, CMC

RESOLUTION

Adoption of the Central Shenandoah Valley All Hazards Mitigation Plan

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order receive certain federal assistance, and

WHEREAS, the Central Shenandoah Mitigation and Planning Workgroup representing the Town of Broadway, as well as the remaining 20 localities of the Central Shenandoah Planning District was convened in order to study the Region's risks from and vulnerability to natural hazards, and to make recommendations on mitigating the effects of such hazards on the Region; and

WHEREAS, the Mitigation and Planning Workgroup was provided staff support by the Central Shenandoah Planning District Commission; and

WHEREAS, the efforts of the Mitigation and Planning Workgroup, the staff of the Central Shenandoah Planning District Commission and Virginia Tech's Center for Geospatial Technology as well as members of the public, private and nonprofit sectors, have resulted in the development of a Natural Hazards Mitigation Plan for the Region.

NOW THEREFORE, BE IT RESOLVED by the Town Council of Broadway, Virginia that the Central Shenandoah Valley All Hazards Mitigation Plan dated September 2005 is hereby approved and adopted for the Town of Broadway.

Adopted by the Town Council of the Town of Broadway, Virginia this 1st day of November, 2005.

APPROVED:

John F. Lay Jr.
(Mayor, Town of Broadway)

ATTEST:

Marla W. Kline

RESOLUTION

Adoption of the Central Shenandoah Valley All Hazards Mitigation Plan

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order receive certain federal assistance, and

WHEREAS, the Central Shenandoah Mitigation and Planning Workgroup representing the Town of Craigsville, as well as the remaining 20 localities of the Central Shenandoah Planning District was convened in order to study the Region's risks from and vulnerability to natural hazards, and to make recommendations on mitigating the effects of such hazards on the Region; and

WHEREAS, the Mitigation and Planning Workgroup was provided staff support by the Central Shenandoah Planning District Commission; and

WHEREAS, the efforts of the Mitigation and Planning Workgroup, the staff of the Central Shenandoah Planning District Commission and Virginia Tech's Center for Geospatial Technology as well as members of the public, private and nonprofit sectors, have resulted in the development of a Natural Hazards Mitigation Plan for the Region.

NOW THEREFORE, BE IT RESOLVED by the Town Council of Craigsville, Virginia that the Central Shenandoah Valley All Hazards Mitigation Plan dated September 2005 is hereby approved and adopted for the Town of Craigsville.

Adopted by the Town Council of the Town of Craigsville, Virginia this 8th day of Dec., 2005.

APPROVED:

Mayor, Town of Craigsville

ATTEST:

Helen N. Cauley Clk, Mem.

RESOLUTION

Adoption of the Central Shenandoah Valley All Hazards Mitigation Plan

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order receive certain federal assistance, and

WHEREAS, the Central Shenandoah Mitigation and Planning Workgroup representing the Town of Dayton, as well as the remaining 20 localities of the Central Shenandoah Planning District was convened in order to study the Region's risks from and vulnerability to natural hazards, and to make recommendations on mitigating the effects of such hazards on the Region; and

WHEREAS, the Mitigation and Planning Workgroup was provided staff support by the Central Shenandoah Planning District Commission; and

WHEREAS, the efforts of the Mitigation and Planning Workgroup, the staff of the Central Shenandoah Planning District Commission and Virginia Tech's Center for Geospatial Technology as well as members of the public, private and nonprofit sectors, have resulted in the development of a Natural Hazards Mitigation Plan for the Region.

NOW THEREFORE, BE IT RESOLVED by the Town Council of Dayton, Virginia that the Central Shenandoah Valley All Hazards Mitigation Plan dated September 2005 is hereby approved and adopted for the Town of Dayton.

Adopted by the Town Council of the Town of Dayton, Virginia this 9th day of JANUARY ~~, 2005.~~ 2006

APPROVED:

Mayor, Town of Dayton

ATTEST:

Brenda P. Stearn

RESOLUTION

Adoption of the Central Shenandoah Valley All Hazards Mitigation Plan

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order receive certain federal assistance, and

WHEREAS, the Central Shenandoah Mitigation and Planning Workgroup representing the Town of Elkton, as well as the remaining 20 localities of the Central Shenandoah Planning District was convened in order to study the Region's risks from and vulnerability to natural hazards, and to make recommendations on mitigating the effects of such hazards on the Region; and

WHEREAS, the Mitigation and Planning Workgroup was provided staff support by the Central Shenandoah Planning District Commission; and

WHEREAS, the efforts of the Mitigation and Planning Workgroup, the staff of the Central Shenandoah Planning District Commission and Virginia Tech's Center for Geospatial Technology as well as members of the public, private and nonprofit sectors, have resulted in the development of a Natural Hazards Mitigation Plan for the Region.

NOW THEREFORE, BE IT RESOLVED by the Town Council of Elkton, Virginia that the Central Shenandoah Valley All Hazards Mitigation Plan dated September 2005 is hereby approved and adopted for the Town of Elkton.

Adopted by the Town Council of the Town of Elkton, Virginia this 21st day of November, 2005.

APPROVED:

Mayor, Town of Elkton

ATTEST:

Richard D. Carey, CMC

RESOLUTION

Adoption of the Central Shenandoah Valley All Hazards Mitigation Plan

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order receive certain federal assistance, and

WHEREAS, the Central Shenandoah Mitigation and Planning Workgroup representing the Town of Glasgow, as well as the remaining 20 localities of the Central Shenandoah Planning District was convened in order to study the Region's risks from and vulnerability to natural hazards, and to make recommendations on mitigating the effects of such hazards on the Region; and

WHEREAS, the Mitigation and Planning Workgroup was provided staff support by the Central Shenandoah Planning District Commission; and

WHEREAS, the efforts of the Mitigation and Planning Workgroup, the staff of the Central Shenandoah Planning District Commission and Virginia Tech's Center for Geospatial Technology as well as members of the public, private and nonprofit sectors, have resulted in the development of a Natural Hazards Mitigation Plan for the Region.

NOW THEREFORE, BE IT RESOLVED by the Town Council of Glasgow, Virginia that the Central Shenandoah Valley All Hazards Mitigation Plan dated September 2005 is hereby approved and adopted for the Town of Glasgow.

Adopted by the Town Council of the Town of Glasgow, Virginia this 3rd day of October, 2005.

APPROVED:

James J. Bloxburn

Mayor, Town of Glasgow, VA

ATTEST:

Sally Gibson

THE TOWN OF GOSHEN

128 MAIN STREET
P. O. BOX 8
GOSHEN, VA 24439

Fax 540-997-9495

Phone 540-997-5545
Email townofgoshen_va@yahoo.com

**

RESOLUTION

ADOPTION OF THE CENTRAL SHENANDOAH VALLEY

ALL HAZARDS MITIGATION PLAN

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance, and

WHEREAS, the Central Shenandoah Mitigation and Planning Workgroup representing the Town of Goshen, as well as the remaining 20 localities of the Central Shenandoah Planning District was convened in order to study the Region's risks from and vulnerability to natural hazards, and to make recommendations on mitigating the effects of such hazards on the Region; and

WHEREAS, the Mitigation and Planning Workgroup was provided staff support by the Central Shenandoah Planning District Commission and Virginia Tech's Center for Geospatial Technology as well as members of the public, private and nonprofit sectors, have resulted in the development of a Natural Hazards Mitigation Plan for the Region.

NOW THEREFORE, BE IT RESOLVED by the Town Council of Goshen, Virginia that the Central Shenandoah Valley All Hazards Mitigation Plan dated September 2005 is hereby approved for the Town of Goshen.

Adopted by the Town Council of the Town of Goshen, Virginia this 6th day of December, 2005.

Darell V. Sprouse

Mayor Darell V. Sprouse

RESOLUTION

Adoption of the Central Shenandoah Valley All Hazards Mitigation Plan

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order receive certain federal assistance, and

WHEREAS, the Central Shenandoah Mitigation and Planning Workgroup representing the Town of Grottoes, as well as the remaining 20 localities of the Central Shenandoah Planning District was convened in order to study the Region's risks from and vulnerability to natural hazards, and to make recommendations on mitigating the effects of such hazards on the Region; and

WHEREAS, the Mitigation and Planning Workgroup was provided staff support by the Central Shenandoah Planning District Commission; and

WHEREAS, the efforts of the Mitigation and Planning Workgroup, the staff of the Central Shenandoah Planning District Commission and Virginia Tech's Center for Geospatial Technology as well as members of the public, private and nonprofit sectors, have resulted in the development of a Natural Hazards Mitigation Plan for the Region.

NOW THEREFORE, BE IT RESOLVED by the Town Council of Grottoes, Virginia that the Central Shenandoah Valley All Hazards Mitigation Plan dated September 2005 is hereby approved and adopted for the Town of Grottoes.

Adopted by the Town Council of the Town of Grottoes, Virginia this 17th day of October, 2005.

APPROVED:

Douglas W. Shifflett

Mayor, Town of Grottoes

ATTEST:

Tara H. Mawyer

RESOLUTION

Adoption of the Central Shenandoah Valley
All Hazards Mitigation Plan

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, the Central Shenandoah Mitigation and Planning Workgroup representing the Town of Monterey, as well as the remaining 20 localities of the Central Shenandoah Planning District was convened in order to study the Region's risks from and vulnerability to natural hazards, and to make recommendations on mitigating the effects of such hazards on the Region; and

WHEREAS, the Mitigation and Planning Workgroup was provided staff support by the Central Shenandoah Planning District Commission; and

WHEREAS, the efforts of the Mitigation and Planning Workgroup, the staff of the Central Shenandoah Planning District Commission and Virginia Tech's Center for Geospatial Technology as well as members of the public, private and nonprofit sectors, have resulted in the development of a Natural Hazards Mitigation Plan for the Region.

NOW, THEREFORE, BE IT RESOLVED by the Town Council of the Town of Monterey that the Central Shenandoah Valley All Hazards Mitigation Plan dated September 2005 is hereby approved and adopted for the Town of Monterey.

Adopted by the Town Council for the Town of Monterey this 2nd day of December, 2005.

APPROVED:

Janice S. Warner, Mayor

Janice S. Warner, Mayor
Town of Monterey

ATTEST:

Nancy H. Hooke

Nancy H. Hooke, Clerk/Treasurer

RESOLUTION

Adoption of the Central Shenandoah Valley All Hazards Mitigation Plan

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order receive certain federal assistance, and

WHEREAS, the Central Shenandoah Mitigation and Planning Workgroup representing the Town of Mt. Crawford, as well as the remaining 20 localities of the Central Shenandoah Planning District was convened in order to study the Region's risks from and vulnerability to natural hazards, and to make recommendations on mitigating the effects of such hazards on the Region; and

WHEREAS, the Mitigation and Planning Workgroup was provided staff support by the Central Shenandoah Planning District Commission; and

WHEREAS, the efforts of the Mitigation and Planning Workgroup, the staff of the Central Shenandoah Planning District Commission and Virginia Tech's Center for Geospatial Technology as well as members of the public, private and nonprofit sectors, have resulted in the development of a Natural Hazards Mitigation Plan for the Region.

NOW THEREFORE, BE IT RESOLVED by the Town Council of Mt. Crawford, Virginia that the Central Shenandoah Valley All Hazards Mitigation Plan dated September 2005 is hereby approved and adopted for the Town of Mt. Crawford.

Adopted by the Town Council of the Town of Mt. Crawford, Virginia this 14 day of Nov., 2005.

APPROVED:

Alfred L. Cook

Mayor, Town of Mt. Crawford

ATTEST:

Clerk - Donna Arbaugh

RESOLUTION

Adoption of the Central Shenandoah Valley All Hazards Mitigation Plan

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order receive certain federal assistance, and

WHEREAS, the Central Shenandoah Mitigation and Planning Workgroup representing the Town of Timberville, as well as the remaining 20 localities of the Central Shenandoah Planning District was convened in order to study the Region's risks from and vulnerability to natural hazards, and to make recommendations on mitigating the effects of such hazards on the Region; and

WHEREAS, the Mitigation and Planning Workgroup was provided staff support by the Central Shenandoah Planning District Commission; and

WHEREAS, the efforts of the Mitigation and Planning Workgroup, the staff of the Central Shenandoah Planning District Commission and Virginia Tech's Center for Geospatial Technology as well as members of the public, private and nonprofit sectors, have resulted in the development of a Natural Hazards Mitigation Plan for the Region.

NOW THEREFORE, BE IT RESOLVED by the Town Council of Timberville, Virginia that the Central Shenandoah Valley All Hazards Mitigation Plan dated September 2005 is hereby approved and adopted for the Town of Timberville.

Adopted by the Town Council of the Town of Timberville, Virginia this 10th day of November, 2005.

APPROVED:

Mayor, Town of Timberville

ATTEST:

Clerk

PUBLIC MEETING NOTIFICATIONS

CENTRAL SHENANDOAH REGIONAL ALL HAZARDS PLAN

PUBLIC MEETING
JULY 27, 2005

AGENDA

1. WELCOME AND INTRODUCTIONS
2. PURPOSE OF THE PLAN
3. PLANNING PROCESS
4. PUBLIC PARTICIPATION
5. HAZARD IDENTIFICATION AND RISK ASSESSMENT (HIRA)
6. MITIGATION ACTIONS AND STRATEGIES
7. REVIEW AND ADOPTION PROCESS
8. OPEN DISCUSSION

GOVERNMENT NOTICES

NOTICE

Citizens may comment on a proposed consent order for a facility in Raphine, Virginia

PUBLIC COMMENT PERIOD: August 8, 2005 to September 7, 2005.

PURPOSE OF NOTICE: To invite the public to comment on a proposed consent order.

A consent order is issued to a business owner or other responsible party to perform specific actions that will bring the entity into compliance with the relevant law and regulations. It is developed cooperatively with the facility and entered into by mutual agreement.

CONSENT ORDER DESCRIPTION: The State Water Control Board proposes to issue a consent order to Raphine Environmental Improvement Company, L.L.C. to address alleged violations of the December 9, 2003 Consent Order, the discharge permit, and Virginia's laws and regulations. The location of the facility where the alleged violations occurred is at the company's sewage treatment plant (STP) in Raphine. The consent order describes a settlement to resolve the failure to submit complete documents needed to reissue the discharge permit, permit effluent limitation violations, violations of the 2003 Consent Order and the unpermitted discharges following the expiration of the permit. It requires the company to connect to Rockbridge County's collection system as soon as available, close out the facility and pay a civil charge.

HOW A DECISION IS MADE: After public comments have been considered, the State Water Control Board will make a final decision.

HOW TO COMMENT: DEQ accepts comments from the public by e-mail, fax or postal mail. All comments must include the name, address and telephone number of the person commenting and be received by DEQ within the comment period.

TO REVIEW THE CONSENT ORDER: The public may review the proposed consent order at the DEQ Valley Regional Office every work day by appointment or on the DEQ web site at www.deq.virginia.gov.

CONTACT FOR PUBLIC COMMENTS, DOCUMENT REQUESTS AND ADDITIONAL INFORMATION:

Name: Steven W. Hetrick

Address: Valley Regional Office, Department of Environmental Quality, Post Office Box 3000, Virginia, 22801-9519

Phone: (540) 574-7833 E-mail: swhetrick@deq.virginia.gov Fax: (540) 574-7844

NOTICE

The Central Shenandoah Planning District Commission will host a public input session on the draft Central Shenandoah Region All-Hazards Mitigation Plan on Wednesday July 27, 2005 at 10 am at the Central Shenandoah Planning District Commission offices located at 112 MacTanly Place, Staunton, Virginia. The Plan identifies and describes natural hazards that impact the region and offers mitigation measures to reduce the impact of these hazards on the region. Citizens will have the opportunity to comment on the draft plan at the meeting. For more information, please contact the Central Shenandoah Planning District Commission by calling 540-885-5174 or by email at cspdc@cspdc.org.

THE NEWS-GAZETTE (USPS 388-060) is published weekly, on Wednesdays, by The News-Gazette Corp., 20 W. Nelson St., Lexington, VA 24450. Subscriptions are available at $38.95 per year to addresses outside Rockbridge County, $22.95 per year within Rockbridge County, (other periods available upon request.) Periodical postage paid at Lexington, VA. POSTMASTER: Send address changes to THE NEWS-GAZETTE, P.O. Box 1153, Lexington, Va 24450-1153.

s to historic town & r. Big View. State road sonal stream. 20 acres ow 1-800-888-1262

AND Bargains, High El- s Pristine State Forest, AC, Sweeping Mountain s www.liveinwv.com

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AND BARGAIN! 27+ al stream, $119,900. h elevation, long ridge minutes to Potomac branch. Near 3 state akes. Only one. must financing. Call 1-800-

E online from home. legal, *Computers. Job tance. Computer & Fi- ualify. 866-858-2121 choline.com

Cool Off in Your Very l Only $744. Complete w/Sundeck, Fence, Filter, Ladder! 100% Financing - w.a.c. Installation Extra. Homeowners! Call for 3-Day Installation! 1-800-316-4104. Limited area

SWIMMING POOLS $688 – New 19'x31' Pools. Includes Sundeck, Fence, Filter, Liner & Ladders! Factory Installation Required & Additional! Financing Available. Call Today 1-800-447-7207. Limited area

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CHANGE YOUR LIFE now. Earn $4-5K part time/month. Let me show you how! 1 Minute Message/24 hours Call 888-577-2682

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SALE OF REPOSSESSED ATV

The following ATV is being offered for sale by First and Citizens Bank

2002 Arctic Cat 300 4x4

This is a sealed bid auction with the ATV going to the highest bidder. A minimum bid has been established by the bank. The ATV will be sold as-is with no warranty. The bank reserves the right to cancel the sale of the ATV unless the minimum bid is received. The ATV can be seen on the bank parking lot located at the corner of Main and Spruce streets in Monterey, Va. Sealed bids can be delivered to the bank in person or mailed to: First and Citizens Bank, P.O. Box 529, Monterey, Va. 24465. All bids must be *received* no later than 5:00 p.m. on Monday, July 25, 2005. You may call 540-468-2430 for additional information.

PUBLIC NOTICE

The Central Shenandoah Planning District Commission will host a public input session on the draft Central Shenandoah Region All-Hazards Mitigation Plan on Wednesday, July 27, 2005 at 10 a.m. at the Central Shenandoah Planning District Commission offices located a 112 MacTanly Place, Staunton, Va. The Plan identifies and describes natural hazards that impact the region and offers mitigation measures to reduce the impact of these hazards on the region. Citizens will have the opportunity to comment on the draft plan at the meeting. For more information, please contact the Central Shenandoah Planning District Commission by calling 540-885-5174 or by email at cspdc@cspdc.org.

COUNTY OF BATH, VIRGINIA SOLICITATION OF BIDS

The County of Bath, Va. is soliciting bids from all interested parties for rehabilitation of the tennis courts located near the Millboro Elementary School.

A pre-bid meeting for all interested parties will be held by the Bath County Parks and Recreation Department on-site at the tennis courts in Millboro on Wednesday, August 3, 2005 at 11:00 a.m.

Sealed bids are due in the office of County Administrator

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PUBLIC NOTICE 300

Auctions 305
Legal 315

Effective September 1, 2003 There will be a $25.00 Charge for Affidavits For Legal Advertisements

Auctions 0305

PUBLIC AUCTION COMMONWEALTH OF VIRGINIA WEDNESDAY * JULY 20, 2005 * 9:00 AM DEPARTMENT OF TRANSPORTATION SALEM DISTRICT SHOP 731 HARRISON AVENUE, SALEM, VIRGINIA 24153 APPROXIMATELY 52-VEHICLES, TRUCKS AND OTHERS * MISCELLANEOUS HIGHWAY EQUIPMENT CUSTODIAN: BEN MCGUIRE - 540-387-5420 WWW.DGS.STATE.VA.US/DPS

Dr. for .6 mi. Turn left on National Ave for .3mi to American Auction Gallery on left: Signs!
Kendall Bennett VA#1152
Betty Bennett VA#2816

Legal 0315

The Central Shenandoah Planning District Commission will host a public input session on the draft Central Shenandoah Region All-Hazards Mitigation Plan on Wednesday July 27, 2005 at 10 am at the Central Shenandoah Planning District Commission offices located at 112 MacTanly Place, Staunton, Virginia. The Plan identifies and describes natural hazards that impact the region and offers mitigation measures to reduce the impact of these hazards on the region. Citizens will have the opportunity to comment on the draft plan at the meeting. For more information, please contact the Central Shenandoah Planning District Commission by calling 540-885-5174 or by email at cspdc@cspdc.org.

EASY SELLS IT!

The News Leader
Career Opportunities

Advertising Sales Representative

Position #2203

The News Leader is seeking an ambitious and organized sales professional to develop and grow advertising revenues for core product and special sections. Candidate should be able to communicate effectively with verbal and written sales presentations to individuals and/or groups, process copy, compute costs and schedule advertising accurately. Ideal candidate will have a four year college degree in marketing or related field and/or equal level of sales experience. Base plus commission gives earning potential up to $40,000.

Receptionist

The News Leader is seeking applicants for a full time receptionist. Previous experience a plus. Duties include answering a busy multi-line phone system, collecting payments and various other office duties. Proper telephone etiquettes a must. Individual must have basic computer skills, be able to multi-task and work in a fast paced environment. Newspaper experience helpful, but not required.

Accounts Payable Clerk - Accounting

Position #5201

Good typing and computer skills a must. Candidate will also act as backup to a variety of accounting functions. Accounts payable experience preferred.

Production Workers

Position #1001

Join us as an Inserter in our mailroom. Starting pay of $6.25 per hour. Approximately 12 hours per week. Advancement to $7.25 per hour. All weekend night shift hours.

Send resume to Human Resources, P.O. Box 59, Staunton, VA, 24402 Attn: Susan Armstrong or e-mail to hr@newsleader.com

Full time hourly and salary positions offer a benefits package that includes medical, dental, vision, pension plan, paid vacation and 401k.

The News Leader has a pre-employment drug screening requirement.

GANNETT EOE

minimal supervision. The candidate will work closely with both inside and outside sales to coordinate and maintain service and delivery schedules. Possession of CDL or ability to obtain is necessary. Please send resume and references to P. O. Box 900, Verona, VA 24482, ATTN: Personnel. Dixie Gas & Oil is an equal opportunity employer offering a competitive salary, incentive plans, 401K, and excellent benefits.

2802

IMPORTANT NOTICE TO VERIZON SOUTH INC. REGIONAL TOLL CUSTOMERS

This notice is to inform you of upcoming changes in the rates for directly dialed and operator-assisted intraLATA Residence Two-Point Service (or regional toll calls). These changes will become effective August 1, 2005 and will be reflected on your August bill.

Current Rates

Mileage Band	Peak Initial Min.	Peak Add'l Min.	Off-Peak Initial Min.	Off-Peak Add'l Min.
0-8 Miles	$0.15	$0.15	$0.075	$0.075
8-13 Miles	$0.15	$0.15	$0.075	$0.075
13-18 Miles	$0.20	$0.20	$0.100	$0.100
18-23 Miles	$0.20	$0.20	$0.100	$0.100
23-28 Miles	$0.20	$0.20	$0.100	$0.100
28-38 Miles	$0.25	$0.25	$0.125	$0.125
38-48 Miles	$0.25	$0.25	$0.125	$0.125
48-58 Miles	$0.25	$0.25	$0.125	$0.125
58-78 Miles	$0.25	$0.25	$0.125	$0.125
78-118 Miles	$0.25	$0.25	$0.125	$0.125
118-194 Miles	$0.25	$0.25	$0.125	$0.125
194-495 Miles	$0.25	$0.25	$0.125	$0.125

Proposed Rates

Mileage Band	Peak Initial Min.	Peak Add'l Min.	Off-Peak Initial Min.	Off-Peak Add'l Min.
0-8 Miles	$0.35	$0.35	$0.20	$0.20
8-13 Miles	$0.35	$0.35	$0.20	$0.20
13-18 Miles	$0.35	$0.35	$0.20	$0.20
18-23 Miles	$0.35	$0.35	$0.20	$0.20
23-28 Miles	$0.35	$0.35	$0.20	$0.20
28-38 Miles	$0.35	$0.35	$0.20	$0.20
38-48 Miles	$0.35	$0.35	$0.20	$0.20
48-58 Miles	$0.35	$0.35	$0.20	$0.20
58-78 Miles	$0.35	$0.35	$0.20	$0.20
78-118 Miles	$0.35	$0.35	$0.20	$0.20
118-194 Miles	$0.35	$0.35	$0.20	$0.20
194-495 Miles	$0.35	$0.35	$0.20	$0.20

Percent Changes

Mileage Band	Peak Initial Min.	Peak Add'l Min.	Off-Peak Initial Min.	Off-Peak Add'l Min.
0-8 Miles	133%	133%	167%	167%
8-13 Miles	133%	133%	167%	167%
13-18 Miles	75%	75%	100%	100%
18-23 Miles	75%	75%	100%	100%
23-28 Miles	75%	75%	100%	100%
28-38 Miles	40%	40%	60%	60%
38-48 Miles	40%	40%	60%	60%
48-58 Miles	40%	40%	60%	60%
58-78 Miles	40%	40%	60%	60%
78-118 Miles	40%	40%	60%	60%
118-194 Miles	40%	40%	60%	60%
194-495 Miles	40%	40%	60%	60%

Note: Verizon Easy Savings Plan[sm] customers will be impacted by these rate changes.

If you have any questions about these changes or would like to discuss optional calling plans, please call your Verizon Business Office. The number can be found on your telephone bill or in the Customer Guide pages of your Verizon White Page directory.

VERIZON SOUTH INC. 0000002172

4-Wheel Drives 808

2001 Toyota 4Runner SR5, 67,000 miles, all power, $14,900. 435-6306

2002 Cadillac Escalade. 17,000 miles, like new, fully equipped, pearlized paint. $35,000. 434-4425 or 540-721-1999.

2002 Jeep Liberty, fully loaded, $15,000. 540-564-2999 or 246-4420

2002 Suzuki XL7 Limited-gold, 4x4, automatic, all power, 36,000 miles, leather, sunroof. Excellent. $12,000. 896-6153.

2002 Toyota Tundra, automatic, 8 cylinder, excellent condition, $17,900/ best offer. 304-897-8122

2003 Chevy K2500HD LS crew cab, 4x4, Duramax/ Allison, Linex, loaded, goose neck, 52,000 miles, $29,500/offer. Call (540) 478-7967 or 828-4946.

2004 Chevrolet K1500. 4-wheel drive work truck-V8, excellent condition, 3 tool boxes, custom racks, 16,000 miles. $17,500 or best offer. 540-432-7900.

2004 Chevrolet Silverado K2500 work truck. V8, 4x4, 4-door cab, 8' bed, toolboxes & custom rack, 40,000 miles, $25,000/best offer. 540-432-7900

2004 Chevy K2500 LS heavy duty, 4x4, 17,000 miles, Duramax/Allison transmission, extendacab, short bed, Linex bedliner, brake control. $31,000. 540-471-9156.

2004 Dodge Dakota. Quad cab, Automatic, CD, 15,000 miles. Excellent condition. $24,000. 540-828-0228, leave message.

2004 Suzuki XL-7, 1-owner, 24,000 miles, leather, heated seats, power sunroof, all power, garage kept. Paid $25,000 Now $17,900. 574-3770

D & M AUTOMOTIVE, INC. Rt. 11 North
Diesels, Crew Cabs, Duallys, Extra Cabs, 4x4's
540-434-3200

WANTED: 1997-2002 Toyota Tacoma Xtra cab 4x4 truck- automatic transmission. 540-298-1248

IE CIRCUIT COURT OF
COUNTY

OF
SERMAN

WILL FILE
No.: 04-430

RDER AGAINST

Vans 810

1987 Ford Hi-Top. 53,000 miles. Family, tow or cargo $5450. 540-867-5680

1995 Dodge Ram 7-passenger. Dependable, clean, 73,000 miles. Air, stereo. $5,000. 438-5970

1995 Nissan Quest XE. Blue, seats 7, air, CD. $2,500. Call 540-833-4706

1996 Chrysler Town & Country. White, all power, CD, new tires/brakes. Good condition. $4,000/ best offer. 757-719-9427 or 540-438-4041

2000 Olds Silhouette GL Extended Minivan-101,100 miles. Clean CARFAX. Automatic, all power, Air front/back, CD/Cassette, cruise, roof rack. Excellent condition inside/outside. Runs great. Only $7195. 540-820-5366 VADLR

Vans 810

2000 Dodge Grand Caravan LE; silver, 7 passenger, air, cruise, privacy glass, 69,700 miles, excellent. $8900. 540-234-9694 or 294-1715.

2000 Toyota Sienna LE; rear air; power door, CD, wheels, windows, locks; nice, 113,000 miles. $12,250. 540-298-9517.

2001 FORD CARGO VAN - Automatic, Air, V6. $9,900. 437-0100. VADLR.

2002 Oldsmobile Bravada-Handicap ready. Bruno wheelchair lift. AWD. $21,902. 437-0100 VADLR

2003 Dodge Grand Caravan Sport- dark green, 30,000 miles, CD, DVD, loaded, clean, great condition. $17,500. 476-0619

MICROSCOPE- World of Science Students. New $140, sell $75. 896-2934

Antique Cars 811

1951 Plymouth Cranbrook, new interior, original drive train, $3900. 540-421-5535

Antique Cars 811

1972 Mercedes 350SL Roadster- 93,000 miles, gray with burgandy leather, 2 tops. Excellent. $11,995. 540-435-3244

VIRGINIA: IN THE CIRCUIT COURT OF ROCKINGHAM COUNTY

IN RE: ESTATE OF HELEN LAM, DECEASED — **WILL FILE No.: 02-202**

SHOW CAUSE ORDER AGAINST DISTRIBUTION

IT IS ORDERED that the creditors of, and all other persons interested in the above estate show cause, if they can, on the 20th day of July, 2005, at 9:00 a.m. before this Court at its courtroom, against payment and delivery of the estate to the distributees without requiring refunding bonds.

IT IS FURTHER ORDERED that the foregoing portion of this order be published once a week for two successive weeks in The Daily News-Record, a newspaper published in Harrisonburg, Virginia, it appearing that a report of the accounts of Roger Ashley, Executor of the Estate, and of the debts and demands against the estate has been filed in the Clerk's Office, and that six months have elapsed since qualification as Executor.

DATE: JUNE 24, 2005
ENTER: James V. Lane, Judge
A TRUE COPY
Atteste: Heather Reardon, Deputy Clerk

I ask for this:

Matthew C. Sunderlin, Counsel for the Executor
Virginia State Bar Number: 38629
Clark & Bradshaw, P.C.
Post Office Box 71
Harrisonburg, VA 22803-0071
Telephone: (540) 433-2601
Facsimile: (540) 433-5528

7/6, 13

The **Central Shenandoah Planning District Commission** will host a public input session on the draft Central Shenandoah Region All-Hazards Mitigation Plan on Wednesday, July 27, 2005 at 10 am at the Central Shenandoah Planning District Commission offices located at 112 MacTanly Place, Staunton, Virginia. The Plan identifies and describes natural hazards that impact the region and offers mitigation measures to reduce the impact of these hazards on the region. Citizens will have the opportunity to comment on the draft plan at the meeting. For more information, please contact the Central Shenandoah Planning District Commission by calling 540-885-5174 or by email at cspdc@cspdc.org.

IMPORTANT NOTICE TO VERIZON VIRGINIA INC. REGIONAL TOLL CUSTOMERS

This notice is to inform you of upcoming changes in the rates for intraLATA Residence Two-Point Service (or regional toll calls). These changes will become effective August 1, 2005 and will be reflected on your August bill.

Current Rates

Customer-Dialed Direct (Night)		Operator-Assisted (Day)			Operator Assisted (Evening)		Operator Assisted (Night/Weekend)	
Initial Min.	Add'l Min.	Mileage Band	Initial Min.	Add'l Min.	Initial Min.	Add'l Min.	Initial Min.	Add'l Min.
$0.09	$0.09	0-8 Miles	$0.21	$0.12	$0.126	$0.072	$0.084	$0.048
$0.09	$0.09	8-13 Miles	$0.25	$0.14	$0.150	$0.084	$0.100	$0.056
$0.09	$0.09	13-18 Miles	$0.30	$0.17	$0.180	$0.102	$0.120	$0.068
$0.09	$0.09	18-23 Miles	$0.32	$0.17	$0.192	$0.102	$0.128	$0.068
$0.09	$0.09	23-28 Miles	$0.32	$0.20	$0.192	$0.120	$0.128	$0.080
$0.09	$0.09	28-38 Miles	$0.33	$0.20	$0.198	$0.120	$0.132	$0.080
$0.09	$0.09	38-48 Miles	$0.33	$0.21	$0.198	$0.126	$0.132	$0.084
$0.09	$0.09	48-58 Miles	$0.34	$0.21	$0.204	$0.126	$0.136	$0.084
$0.09	$0.09	58-78 Miles	$0.35	$0.21	$0.210	$0.126	$0.140	$0.084
$0.09	$0.09	78-118 Miles	$0.35	$0.21	$0.210	$0.126	$0.140	$0.084
$0.09	$0.09	118-194 Miles	$0.37	$0.25	$0.222	$0.150	$0.148	$0.100
$0.09	$0.09	194-495 Miles	$0.40	$0.25	$0.240	$0.150	$0.160	$0.100

Proposed Rates

Customer-Dialed Direct (Night)		Operator-Assisted (Day)			Operator Assisted (Evening)		Operator Assisted (Night/Weekend)	
Initial Min.	Add'l Min.	Mileage Band	Initial Min.	Add'l Min.	Initial Min.	Add'l Min.	Initial Min.	Add'l Min.
$0.15	$0.15	0-8 Miles	$0.35	$0.35	$0.25	$0.25	$0.15	$0.15
$0.15	$0.15	8-13 Miles	$0.35	$0.35	$0.25	$0.25	$0.15	$0.15
$0.15	$0.15	13-18 Miles	$0.35	$0.35	$0.25	$0.25	$0.15	$0.15
$0.15	$0.15	18-23 Miles	$0.35	$0.35	$0.25	$0.25	$0.15	$0.15
$0.15	$0.15	23-28 Miles	$0.35	$0.35	$0.25	$0.25	$0.15	$0.15
$0.15	$0.15	28-38 Miles	$0.35	$0.35	$0.25	$0.25	$0.15	$0.15
$0.15	$0.15	38-48 Miles	$0.35	$0.35	$0.25	$0.25	$0.15	$0.15
$0.15	$0.15	48-58 Miles	$0.35	$0.35	$0.25	$0.25	$0.15	$0.15

NATURAL HAZARD SURVEY

SHENANDOAH VALLEY PROJECT IMPACT
ALL-HAZARDS PLAN SURVEY

NATURAL HAZARDS SURVEY

Thank you for taking the time to answer this survey and participating in the Shenandoah Valley Project Impact All-Hazards Plan. This survey is designed to help us gauge household preparedness for disasters and knowledge of tools and techniques that assist in reducing risk and loss from natural hazards. The information you provide about your needs for disaster preparedness will help improve public/private coordination of preparedness and risk reduction activities within the region. We ask that you please take a few minutes to complete this survey.

NATURAL HAZARD INFORMATION

1. Have you or someone in your household experienced any of the natural disasters listed below? Please check all that apply.

- ☐ Coastal erosion
- ☐ Drought
- ☐ Dust storm
- ☐ Earthquake
- ☐ Flood
- ☐ Landslide/debris flow
- ☐ Wildfire
- ☐ Household Fire
- ☐ Tsunami
- ☐ Volcanic eruption
- ☐ Windstorm
- ☐ Winter storm
- ☐ Other (specify) _____

2. How concerned are you personally about the following natural disasters effecting our area? ***(Circle the corresponding number for each hazard.)***

Natural Disaster	Extremely Concerned	Very Concerned	Concerned	Somewhat Concerned	Not Concerned
Coastal Erosion	1	2	3	4	5
Drought	1	2	3	4	5
Dust Storm	1	2	3	4	5
Earthquake	1	2	3	4	5
Flood	1	2	3	4	5
Landslide/debris flow	1	2	3	4	5
Wildfire	1	2	3	4	5
Household fire	1	2	3	4	5
Tsunami	1	2	3	4	5
Volcanic hazard	1	2	3	4	5
Wind storm	1	2	3	4	5
Winter storm/blizzard	1	2	3	4	5
Ice storm	1	2	3	4	5
Other _____	1	2	3	4	5

3. Have you ever received information about how to make your family and home safer from natural disasters?

- ☐ Yes
- ☐ No

If "Yes", how recently?

- ☐ Within the last 6 months
- ☐ Between 6 and 12 months
- ☐ Between 1 and 2 years
- ☐ Between 2 and 5 years
- ☐ 5 years or more

From whom did you **last** receive information about how to make your family and home safer from natural disasters? ***(Please check only one.)***

- ☐ News media
- ☐ Government agency
- ☐ Insurance agent or company
- ☐ Utility company
- ☐ Other _____
- ☐ American Red Cross
- ☐ Other non-profit organization
- ☐ Shenandoah Valley Project Impact
- ☐ Not sure

4. What is the most effective way for you to receive information about how to make your family and home safer from natural disasters? ***(Please check all that apply.)***

Newspapers:
- ☐ Newspaper stories
- ☐ Newspaper ads

Television:
- ☐ Television news
- ☐ Television ads

Radio:
- ☐ Radio news
- ☐ Radio ads

Other Methods:
- ☐ Schools
- ☐ Outdoor advertisements (billboards, etc.)
- ☐ Books
- ☐ Mail
- ☐ Fire Department/Rescue
- ☐ Internet
- ☐ Fact Sheet/brochure
- ☐ Chamber of Commerce
- ☐ Public workshop/meetings
- ☐ Magazine
- ☐ Academic Institutions
- ☐ Other (please explain) _____

There are many things that you can do to prepare for a natural disaster or emergency event. What you have on hand when a disaster strikes, or are trained to do when a disaster strikes can make a big difference for your comfort and safety in the hours and days following the disaster, whether it is a natural disaster or other emergency. Basic services, such as electricity, gas, water and telephones, may be cut off, or you may have to evacuate at a moment's notice. The following questions focus on your household's preparedness for disaster event.

5. In the following list, please check those activities that you have done in your household, plan to do in the near future, have not done, or are unable to do. **(Please check one answer for each preparedness activity.)**

In your household, have you or someone in your household:

Preparedness Activity	Have Done	Plan To Do	Not Done	Unable To Do
A. Attended meetings or received written information on natural disasters or emergency preparedness?	☐	☐	☐	☐
B. Talked with members in your household about what to do in case of a natural disaster or emergency?	☐	☐	☐	☐
C. Developed a "Household/Family Emergency Plan" in order to decide what everyone would do in the event of a household emergency?	☐	☐	☐	☐
D. Prepared a "Disaster Supply Kit" (stored extra food, water, batteries, or other emergency supplies)?	☐	☐	☐	☐
E. In the last year, has anyone in your household trained in first aid or Cardio-Pulmonary Resuscitation (CPR)?	☐	☐	☐	☐
F. Purchased Flood Insurance	☐	☐	☐	☐
G. Implemented fire-resistant or floodproofing techniques to protect your home or business from floods and fires	☐	☐	☐	☐
H. Instlled smoke detectors/fire extinguishers in your home or business.	☐	☐	☐	☐

6. What steps, if any, have you or someone in your household taken to prepare for a natural disaster? **(Check all that apply.)**

Have stored or stocked up on:

- ☐ Food
- ☐ Water
- ☐ Flashlight(s)
- ☐ Batteries
- ☐ Battery-powered radio
- ☐ Medical supplies (First aid kit)
- ☐ Fire extinguisher
- ☐ Smoke detector on each level of the house
- ☐ Prepared a Disaster Supply Kit
- ☐ Received First Aid/CPR Training
- ☐ Made a fire escape plan
- ☐ Developed a reconnection plan: where to go and who to call
- ☐ Discussed utility shutoffs
- ☐ Other (please explain)

_____

7. Does your household have insurance coverage for flood events?

- ☐ Yes **(If you answered "YES," skip to question 8.)**
- ☐ No

If "NO", what is the main reason your household does not have insurance for flood events? *(Please check only one.)*

- ☐ Not located in the floodplain
- ☐ Too expensive
- ☐ Not necessary
- ☐ Never considered it
- ☐ Deductibles too high/not worth it
- ☐ Not familiar with it/don't know about it
- ☐ Other _____

NATURAL HAZARD RISK REDUCTION

Risk reduction activities are those actions you can take to protect your home from natural hazard events, such as earthquakes, floods or wildfires. Some modifications or retrofits are simple and inexpensive while others may require the services of an expert like a building contractor and may be more costly.

8. Did you consider the possible occurrence of a natural hazard when you bought/moved into your current home?

- ☐ Yes
- ☐ No

9. Would you be willing to spend more money on a home that had features that made it more disaster resistant?

- ☐ Yes
- ☐ No

10. How much more money <u>are you willing to spend</u> to better protect your family and home from natural disasters? *(Check only one.)*

- ☐ $5,000 and above
- ☐ $2,500 - $4,999
- ☐ $1,000 - $2,499
- ☐ $500 - $999
- ☐ $100 - $499
- ☐ Less $100
- ☐ Nothing
- ☐ Don't know
- ☐ Other, please explain _____

11. What nonstructural or structural modifications have you made or would consider making to make your home more resistant to certain natural disasters?

- ☐ Anchor bookcases, cabinets to wall
- ☐ Secure water heater to wall
- ☐ Install latches on drawers/cabinets
- ☐ Fit gas appliances with flexible connections
- ☐ Others (please explain)

_____

- ☐ Purchase flood insurance if your home or business is located in a floodplain
- ☐ Secure home to foundation
- ☐ Brace inside of cripple wall with sheathing
- ☐ Brace unreinforced chimney
- ☐ Brace unreinforced masonry and concrete walls and foundations
- ☐ Others (please explain)

_____

- ☐ Keep culverts, ditches, and gutters free of debris to allow the free flow of potential floodwaters
- ☐ Elevate utilities and move appliances out of basements
- ☐ Seal basement walls and windows with waterproofing compounds to prevent storm water seepage
- ☐ Install check valves to keep sewer lines from backing up

- ☐ Find out if you live in a floodplain
- ☐ Avoid building in the floodplain
- ☐ Elevate your house at least one foot above the 100-year flood elevation
- ☐ Relocate your home outside of the floodplain
- ☐ Select fire-resistant materials to build your home such as flame-retardant roof shingles
- ☐ Landscape your yard with fire-resistant trees, plants and shrubbery
- ☐ Keep gutters clean, remove dead leaves and branches, keep shrubbery trimmed, and lawns mowed to limit combustible material
- ☐ Dispose of stove, grill, and fireplace ashes by placing in a metal bucket, soaking in water for 2 days, and then burying in mineral soil
- ☐ Stack firewood at least 30 feet away and uphill from your home and clear combustible materials around it
- ☐ Place metal screens over structure openings to prevent collection of litter, including roofs, attics, and areas under porches and decks

12. Which of the following incentives, if any, would motivate you to take additional steps to better protect your family and home from a natural disaster? **(Check all that apply.)**

- ☐ Insurance discount
- ☐ Low interest rate loan
- ☐ Lower new home construction costs
- ☐ Mortgage discount
- ☐ Federal or state grant
- ☐ Tax break or incentive
- ☐ None
- ☐ Other (please explain) _____

GENERAL HOUSEHOLD INFORMATION

13. Please indicate your age: _____

14. Gender:

- ☐ Male
- ☐ Female

15. Please indicate your level of education:

- ☐ Grade school/no schooling
- ☐ Some high school
- ☐ High school graduate/GED
- ☐ Some college/trade school
- ☐ College degree
- ☐ Postgraduate degree
- ☐ Other _____

16. Zip code: _____

17. County: _____

18. How long have you lived in the Central Shenandoah Valley Region?

- ☐ Less than one year
- ☐ 1-5 years
- ☐ 5-9 years
- ☐ 10-19 years
- ☐ 20 years or more

19. Do you own or rent your home?

- ☐ Own
- ☐ Rent

20. Do you rent/own a:

- ☐ Single-family home
- ☐ Apartment
- ☐ Manufactured home
- ☐ Other _____
- ☐ Duplex
- ☐ Condominium/townhouse

Other Comments:

_____

_____

_____

_____

_____

_____

_____

THANK YOU VERY MUCH FOR PROVIDING THIS INFORMATION

The Mitigation and Planning Workgroup of the Shenandoah Valley Project Impact prepared this survey for the Central Shenandoah All-Hazards Plan. Information you provide will be kept confidential and only used in cumulative totals. For more information on Shenandoah Valley Project Impact or on this survey, please contact the Central Shenandoah Planning District Commission, 112 MacTanly Place, Staunton, Virginia 24401 or phone: (540) 885-5174, email: cspdc@cspdc.org.

Total Surveys 62

1. Experienced the natural disasters listed below:

		%
Coastal Erosion	0	0.0%
Drought	27	43.5%
DustStorm	3	4.8%
Earthquake	5	8.1%
Flood	28	45.2%
Landslide	2	3.2%
Wildfire	5	8.1%
HouseholdFire	16	25.8%
Tsunami	0	0.0%
VolcanicErupt	0	0.0%
Windstorm	22	35.5%
WinterStorm	43	69.4%
Other	4	Ice waterfunnel plane crashgrease explosion

2. How Concerned about natural disasters effecting our area?

	1	2	3	4	5
Coastal Erosion			6	5	44
Drought	7	18	15	17	2
DustStorm		1	3	12	39
Earthquake	3	3	12	24	16
Flood	13	25	16	5	1
Landslide	3	10	18	16	12
Wildfire	5	13	18	15	8
HouseholdFire	14	24	14	3	1
Tsunami			1	5	48
VolcanicErupt		1		2	54
Windstorm	2	13	21	13	9
WinterStorm	7	32	20	2	1
Ice Storm	11	37	10	3	1
Other					
Terriorism	1				
Tornado		2			
Hurricanes		2			
Chemical Spill		1			

3. Have you received info on how to make your home safer from natural disasters?

Yes:	54 No:	8	Yes	87.10%
If yes, how recently:	last 6 months	42	67.74%	
	6-12 months	4	6.45%	
	1-2 years	2	3.23%	
	2-5 years	3	4.84%	
	5years plus	2	3.23%	

From whom did you receive information:

news media	11	17.74%
Government agency	9	14.52%
insurance	8	12.90%
utility company	2	3.23%
Am Red Cross	2	3.23%
other Non-Profit	4	6.45%
ShenVallProj Impact	22	35.48%
not sure	0	0.00%
other	0	0.00%
church	1	1.61%
Cert	10	16.13%
fire dept	1	1.61%
military	1	1.61%
police dept	1	1.61%
staunton web page	1	1.61%

4. What is the most effective way to receive info on how to make home safer:

newspaper stories	42	67.74%
newspaper ads	8	12.90%
television news	39	62.90%
television ads	12	19.35%
radio news	33	53.23%
radio ads	8	12.90%
schools	23	37.10%
outdor ads	11	17.74%
books	5	8.06%
mail	26	41.94%
fire dept	34	54.84%
internet	23	37.10%
fact sheet/brochure	25	40.32%
chamber of commerce	3	4.84%
public workshops	28	45.16%
magazine	7	11.29%
academic institutions	2	3.23%
other	0	0.00%
church	1	1.61%
cert	4	6.45%
employer	1	1.61%
workplace	1	1.61%
gov web sties	1	1.61%

5. In your household, have you or someone in your household:

	HaveDone	PlantoDo	NotDone	UnabletoDo	HaveDone %
A: Attended meetings	56		5		90.32%
B: Talked with family members	43	14	4		69.35%
C: Develop Plan	26	28	6		41.94%
D: Prepare Disaster Kit	26	27	5		41.94%
E: Trained in First Aid	35	4	22		56.45%
F: Purchased Floor Insurance	1	2	51	5	1.61%

G: Implemented techniques	20	11	25	2	32.26%
H: Installed smoke Det/fire exting	56	4	1		90.32%

6. What steps, have you taken to prepare?

Food	50	80.65%
Water	40	64.52%
Flashlight	58	93.55%
Batteries	55	88.71%
BatteryRadio	40	64.52%
FirstAidKit	46	74.19%
FireExtinguisher	44	70.97%
SmokeDetector	55	88.71%
DistasterSupplyKit	17	27.42%
FirstAid/CPR Training	36	58.06%
MadeFireEscapePlan	27	43.55%
DevReconnectionPlan	22	35.48%
DisUtility Shutoffs	24	38.71%
Other:	3	4.84%

Purchased Generator
CERT Training

7. Insurance coverage for flood events?

Yes	2	3.23%
No	59	95.16%

If no, what is reason for not having flood insurance

not in floodplain	41	66.13%
too expensive	7	11.29%
not necessary	4	6.45%
never considered it	3	4.84%
deductibles too high		0.00%
not familiar	2	3.23%
other		0.00%

8. Consider the possible occurrence of a natural hazard?

Yes	28	45.16%
No	31	50.00%

9. spend more money - disaster resistant?

Yes	47	75.81%
No	13	20.97%

10. How much more willing to spend to protect?

5000 and above	13	20.97%
2500-4999	4	6.45%
1000-2499	6	9.68%
500-999	9	14.52%
100-499	1	1.61%
less than 100		0.00%

nothing	2	3.23%
don't know	20	32.26%
other	4	6.45%

not sure more spending will prevent
depends on what is needed and that I afford
for a backup generator
I rent none

11. modifications made?

anchor bookcases	17	27.42%
secure water heater to wall	17	27.42%
install latches on drawers	12	19.35%
fit gas appliances with flex connections	12	19.35%
purchase flood insurance	11	17.74%
keep culverts ditches,gutters free	47	75.81%
elevate utilities	16	25.81%
seal basement	22	35.48%
install check valves	17	27.42%
secure home to foundation	11	17.74%
brace cripple wall	2	3.23%
brace chimney	6	9.68%
brace masonry	5	8.06%
others	4	6.45%

floor drainage, sump pump
basement drains repaired
storm doors
fire retardant roof

find out if you live in floodplain	17	27.42%
avoid building in floodplain	28	45.16%
elevate your house	7	11.29%
relocate your home	2	3.23%
select fire-resistant materials	21	33.87%
landscape with fire-resistant trees	22	35.48%
keep gutters clean	44	70.97%
dispose of ashes properly	21	33.87%
stack firewood 30ft away	26	41.94%
placement of metal screens	21	33.87%

12. Which of these incentives would motivate you to take additional steps

Insurance discount	41	66.13%
low interest loan	17	27.42%
lower new home costs	13	20.97%
mortgage discount	20	32.26%
federal or state grant	22	35.48%
tax break	40	64.52%
none	4	6.45%
other	2	3.23%

if I have funds
education campaign

13..Age

20's	3	4.84%
30's	12	19.35%
40's	12	19.35%
50's	17	27.42%
60's	15	24.19%

Thank you for taking the time to answer this survey! This survey is designed to help us gauge household preparedness for disasters and emergencies as well as knowledge of tools and techniques that assist in reducing risk and loss from natural hazards. The information you provide about your needs for disaster preparedness will help improve public/private coordination of preparedness and risk reduction activities within the region. We ask that you take a few minutes to complete this survey.

1. Have you or someone in your household experienced any of the natural disasters below? *(Please check all that apply)*

- ☐ Coastal Erosion
- ☐ Drought
- ☐ Dust Storm
- ☐ Earthquake
- ☐ Flood
- ☐ Household Fire
- ☐ Hurricane/Tropical Storm
- ☐ Landslide/Debris Flow
- ☐ Tsunami
- ☐ Volcanic Eruption
- ☐ Wildfire
- ☐ Windstorm
- ☐ Winter Storm/Blizzard

2. How concerned are you personally about the following natural hazards affecting our area? *(Please check only one box for each hazard)*

Natural Disaster	Extremely Concerned	Very Concerned	Concerned	Somewhat Concerned	Not Concerned
Coastal Erosion	☐	☐	☐	☐	☐
Drought	☐	☐	☐	☐	☐
Dust Storm	☐	☐	☐	☐	☐
Earthquake	☐	☐	☐	☐	☐
Flood	☐	☐	☐	☐	☐
Household Fire	☐	☐	☐	☐	☐
Hurricane	☐	☐	☐	☐	☐
Ice Storm	☐	☐	☐	☐	☐
Landslide/Debris Flow	☐	☐	☐	☐	☐
Tsunami	☐	☐	☐	☐	☐
Volcanic Hazard	☐	☐	☐	☐	☐
Wildfire	☐	☐	☐	☐	☐
Wind Storm	☐	☐	☐	☐	☐
Winter Storm/Blizzard	☐	☐	☐	☐	☐
Other:	☐	☐	☐	☐	☐

3. Have you ever received information about how to make your family and home safer from natural disasters within the last year?

   ☐ Yes

   ☐ No

4. In the following list, please check those activities that you have done in your household, plan to do in the near future, have not done, or are unable to do. (*Please check one answer for each preparedness activity)*

Preparedness Activity	**Have Done**	**Plan To Do**	**Not Done**	**Unable To Do**
Attended meetings or received written information on natural disasters or emergency preparedness?	☐	☐	☐	☐
Talked with members in your household about what to do in case of a natural disaster or emergency?	☐	☐	☐	☐
Developed a "Household/Family Emergency Plan" in order to decide what everyone would do in the event of a household emergency?	☐	☐	☐	☐
Prepared a "Disaster Supply Kit" (stored extra food, water, batteries, or other emergency supplies)?	☐	☐	☐	☐
In the last year, has anyone in your household trained in first aid or Cardio-Pulmonary Resuscitation (CPR)?	☐	☐	☐	☐
Purchased Flood Insurance?	☐	☐	☐	☐
Implemented fire-resistant or floodproofing techniques to protect your home or business from floods and fires?	☐	☐	☐	☐
Installed smoke detectors and fire extinguishers in your home or business.	☐	☐	☐	☐

5. Does your household have insurance coverage for flood events?

   ☐ Yes

   ☐ No

6. Did you consider the possible occurrence of a natural hazard when you bought/moved into your current home?

   ☐ Yes

   ☐ No

7. Would you be willing to spend more money on a home that had features that made it more disaster resistant?

   ☐ Yes

   ☐ No

8. How much money are you willing to spend to better protect your family and home from natural disasters? *(Please check only one)*

   ☐ $100 - $999

   ☐ $1,000 - $4,999

   ☐ $5,000 and above

9. What modifications have you made or would you consider making to protect your home from natural disasters? *(Please check all that apply)*

   ☐ Anchor bookcases, cabinets to wall
   ☐ Secure water heater to wall
   ☐ Install latches on drawers/cabinets
   ☐ Fit gas appliances with flexible connections
   ☐ Purchase flood insurance
   ☐ Keep culverts, ditches, and gutters free of debris to allow the free flow of potential floodwaters
   ☐ Elevate utilities and move appliances out of basements
   ☐ Seal basement walls and windows with waterproofing compounds to prevent storm water seepage
   ☐ Install check valves to keep sewer lines from backing up
   ☐ Secure home to its foundation
   ☐ Brace unreinforced chimney
   ☐ Brace unreinforced masonry and concrete walls and foundations
   ☐ Find out if you live in a floodplain
   ☐ Avoid building in the floodplain

- ☐ Elevate your house at least one foot above the 100-year flood elevation
- ☐ Relocate your home outside of the floodplain
- ☐ Select fire-resistant materials to build your home such as flame-retardant roof shingles
- ☐ Landscape your yard with fire-resistant trees, plants, and shrubbery
- ☐ Keep gutters clean, remove dead leaves and branches, keep shrubbery trimmed, and lawns mowed to limit combustible material
- ☐ Dispose of stove, grill, and fireplace ashes by placing in a metal bucket, soaking in water for 2 days, and then burying in mineral soil
- ☐ Stack firewood at least 30 feet away and uphill from your home and clear combustible materials around it
- ☐ Place metal screens over structure openings to prevent collection of litter, including roofs, attics, and areas under porches and decks

10. Which of the following incentives, if any, would motivate you to take additional steps to better protect your family and home from a natural disaster? *(Please check all that apply)*

- ☐ Insurance discount
- ☐ Low interest rate loan
- ☐ Lower new home construction costs
- ☐ Mortgage discount
- ☐ Federal or state grant
- ☐ Tax break or incentive
- ☐ None
- ☐ Other: _____

11. General Household Information:

Please indicate your age: _____

Gender: ☐ Male ☐ Female

Please indicate your level of education:

☐ Grade school/no schooling ☐ Some high school

☐ High school graduate/GED ☐ Some college/trade school

☐ College degree ☐ Postgraduate degree

Zip Code: _____

City or County Where You Resides: _____

How long have you lived in the Central Shenandoah Valley Region?

☐ Less than one year ☐ 1 – 5 years

☐ 6 – 10 years ☐ 11 – 20 years

☐ 21 years or more

Do you own or rent your home?

☐ Own ☐ Rent

Do you rent/own a:

☐ Single-family home ☐ Duplex

☐ Apartment ☐ Condominium/townhouse

☐ Manufactured home ☐ Other: _____

Other Comments:

_____

_____

_____

_____

_____

_____

_____

_____

_____

Thank You Very Much For Providing This Information!

The Central Shenandoah Planning District Commission prepared this survey for the Central Shenandoah Valley All Hazards Mitigation Plan. Information you provide will be kept confidential and only used in cumulative totals. For more information about this survey, please contact Rebecca Joyce, Senior Planner at the Central Shenandoah Planning District Commission, 112 MacTanly Place, Staunton, Virginia 24401, by phone: (540) 885-5174, or e-mail: rebecca@cspdc.org.

Public Input Needed About Natural Hazards and Severe Weather

For Immediate Release: Staunton, Virginia, June 2, 2010: The Central Shenandoah Planning District Commission (CSPDC) is asking for the public's help with the update of the Central Shenandoah Valley Regional All Hazards Mitigation Plan. The plan was adopted in 2005 by the 21 local governments in the Central Shenandoah Region and approved by the Federal Emergency Management Agency (FEMA) in February 2006. The Plan identifies the natural hazards that impact the Region and makes recommendations on ways to reduce Valley communities' vulnerabilities in a variety of ways ranging from public education to structural mitigation projects. Every local government is required by FEMA to have an adopted and approved All Hazards Mitigation Plan in order to be eligible for mitigation grant funds.

The CSPDC is asking Central Shenandoah Valley residents to take an on-line survey about their knowledge and experiences with natural hazards and severe weather. The survey is ten questions and takes less than ten minutes to complete. No personal information is requested on this confidential survey. Survey results will be tallied and incorporated into the All Hazards Mitigation Plan. The survey can be found on the internet at http://www.surveymonkey.com/s/J7FCVYV. Paper copies of the survey are available to anyone without computer access. For additional information, contact Rebecca Joyce at the CSPDC by phone at 540-885-5174 or by e-mail at rebecca@cspdc.org.

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Contact:
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540-885-5174
rebecca@cspdc.org

Central Shenandoah Valley All Hazards Mitigation Plan – 2011 Update
Natural Hazards Survey Report

Summary

Between June and August 2010, the Central Shenandoah Planning District Commission conducted a survey of the citizens of the twenty-one jurisdictions in the region. The purpose of this survey was to receive public input regarding perceptions about natural hazards experienced by individuals in the Central Shenandoah region, their knowledge regarding mitigation techniques, and their willingness to implement mitigation measures.

Distribution of the survey was purposely widespread throughout the region. Individuals had the option to complete the survey on-line, as a paper copy, or by telephone interview. A press release explaining the survey and how citizens could obtain a copy was distributed in a mass e-mail to contacts throughout the region and to various media outlets such as newspapers and local television stations.

Six hundred and forty-four (644) people completed the survey. Examining the demographics of those who completed the survey, the majority of the respondents were females who were college-educated, owned their own homes, lived in the Staunton-Augusta-Waynesboro Sub-region, and had lived in the Shenandoah Valley for more than ten years. This demographic is stated merely for informational purposes only. Each individual's responses were calculated with equal weight and considered just as valuable regardless of the demographic category where they were placed.

Results

- The survey asked respondents which natural disasters had they experienced. The top three natural disasters were; winter storms (82%), hurricanes/tropical storms (50%), and floods (48%).

- Respondents were asked to state their concerns about natural hazards affecting the Shenandoah Valley. Respondents were *very concerned* about winter storms/ blizzards (35%) and ice storms (33%). Hurricanes (31%), drought (32%), and floods (30%) had respondents *concerned*.

- More than half (63%) of the survey respondents reported that they had received mitigation and preparedness information within the last year.

- The survey listed several mitigation activities and asked respondents which of these they had completed. Completed activities included:

    - Installed smoke detectors. (88%)
    - Talked with family members about what to do in an emergency or natural disaster. (55%)
    - Attended meetings or received information about natural disasters or emergency preparedness. (54%)
    - Trained in First Aid or CPR in the last year. (53%)
    - Prepared a disaster supply kit. (37%)
    - Developed a household emergency plan. (34%)
    - Implemented fire-resistance or floodproofing techniques. (19%)
    - Purchased flood insurance. (8%)

- Half of the respondents (50%) considered the possible occurrence of a natural hazard when moving into their current home.

- Seventy-six percent (76%) would be willing to spend more money for a home if it had features that made it more disaster resistant.

- When asked how much money would respondents be willing to spend to better protect their family and homes from natural disasters; forty-three percent (43%) said they would spend up to one thousand dollars ($1,000), thirty-six percent (36%) said they would spend up to five thousand dollars ($5,000), and seventeen percent (17%) would spend five thousand dollars ($5,000) or above.

- The survey listed several types of modifications people have made or would make to protect their home from natural disasters. The three most popular modifications were:

    - Eighty-three percent (83%) of respondents would keep gutters clean, remove dead leaves and branches, keep shrubbery trimmed and lawns mowed to limit combustible material.
    - Sixty-nine percent (69%) of respondents would keep culverts, ditches, and gutters free of debris to allow the free flow of potential floodwaters.
    - Fifty-seven percent (57%) of respondents would avoid building in the floodplain.

- Respondents were asked what incentives would motivate them to take additional steps to better protect their family and homes from a natural disaster. The three incentives that received the most responses were:

    - Seventy-seven percent (77%) of respondents said a tax break or incentive would be a motivating factor.

    - Seventy-six percent (76%) of respondents said an insurance discount would be a motivating factor.

    - Fifty-seven percent (57%) of respondents said a federal or state grant would be a motivating factor.

Conclusions

What conclusions can be drawn by examining the responses of the six hundred and forty-four (644) individuals that completed the survey?

- The most common natural disasters that respondents have experienced are the ones that have happened most frequently.

- The disasters respondents expressed the most concern about are the ones that occur the most frequently. It should also be stated that winter storms may have been of the most concern to respondents due to the fact that the survey was completed following the winter of 2009-10 when record breaking winter storms occurred in December 2009 and February 2010.

- Mitigation and preparedness information is being distributed and received by citizens throughout the Central Shenandoah Region.

- Not only are citizens receiving mitigation and preparedness information but a little over half of the respondents are discussing these topics with family members.

- Only a third of the respondents are doing the two most essential tasks needed to prepare for emergencies and disasters; creating a family plan and assembling a disaster supply kit.

- Fire safety education in the Central Shenandoah Valley has been quite effective as illustrated by almost 90% of respondents having installed smoke detectors.

- Yard work and home maintenance activities that reduce combustible debris and assist with the proper drainage of stormwater are simple mitigation methods a majority of respondents are willing to undertake to prevent damage to their property.

- Not more than one thousand dollars ($1,000.00) is the amount of financial resources that the majority of respondents are willing to spend to protect their families and properties from natural hazards.

- Financial incentives whether through tax breaks, insurance discounts, or grants are the most motivating factors to respondents in order to implement steps to protect their homes and families.

In conclusion, while the Central Shenandoah Valley has been making some strides in its progress towards disaster-resistance, individuals need to be encouraged to use the knowledge that they have acquired about disaster mitigation and preparedness and implement the practical steps needed to protect their families and property.

Table 6 - Repetitive Losses In The Central Shenandoah Valley Region

Community Name	Community Number	Number of Residential Repetitive Losses	Number of Commercial Repetitive Losses
AUGUSTA COUNTY	510013	0	0
BATH COUNTY	510196	0	0
BRIDGEWATER, TOWN OF	510134	0	0
BROADWAY, TOWN OF	510135	0	0
BUENA VISTA, CITY OF	510027	0	0
CRAIGSVILLE, TOWN OF	510014	0	0
DAYTON, TOWN OF	510136	0	0
ELKTON, TOWN OF	510137	0	0
GLASGOW, TOWN OF	515526	0	0
GOSHEN, TOWN OF	510217	0	0
GROTTOES, TOWN OF	510138	0	0
HARRISONBURG, CITY OF	510076	0	0
HIGHLAND COUNTY	510311	0	0
LEXINGTON, CITY OF	510089	0	0
MONTEREY, TOWN OF	510379	0	0
MT. CRAWFORD, TOWN OF	510224	0	0
ROCKBRIDGE COUNTY	510205	1	0
ROCKINGHAM COUNTY	510133	0	0
STAUNTON, CITY OF	510155	0	0
TIMBERVILLE, TOWN OF	510139	0	0
WAYNESBORO, CITY OF	515532	4	1
TOTAL FOR CSVR		**5**	**1**

Severe Repetitive Losses In The Central Shenandoah Valley Region

Community Name	Community Number	Number of Residential SEVERE Repetitive Losses	Number of Commercial SEVERE Repetitive Losses
AUGUSTA COUNTY	510013	2	0
BATH COUNTY	510196	0	0
BRIDGEWATER, TOWN OF	510134	0	0
BROADWAY, TOWN OF	510135	0	0
BUENA VISTA, CITY OF	510027	2	2
CRAIGSVILLE, TOWN OF	510014	0	0
DAYTON, TOWN OF	510136	0	0
ELKTON, TOWN OF	510137	0	0
GLASGOW, TOWN OF	515526	1	0
GOSHEN, TOWN OF	510217	0	1
GROTTOES, TOWN OF	510138	0	0
HARRISONBURG, CITY OF	510076	0	1
HIGHLAND COUNTY	510311	0	0
LEXINGTON, CITY OF	510089	0	2
MONTEREY, TOWN OF	510379	0	0
MT. CRAWFORD, TOWN OF	510224	0	0
ROCKBRIDGE COUNTY	510205	4	0
ROCKINGHAM COUNTY	510133	0	0
STAUNTON, CITY OF	510155	0	0
TIMBERVILLE, TOWN OF	510139	0	0
WAYNESBORO, CITY OF	515532	13	1
TOTAL FOR CSVR		**22**	**7**