

# APPENDIX A:

## MITIGATION STRATEGIES

Appendix A contains the locally and regionally identified mitigation strategies for the 2012 RRRC Regional Hazard Mitigation Plan

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**2012 Rappahannock-Rapidan Region Mitigation Strategies**

Rappahannock-Rapidan Regional Commission Strategies (Region-wide)

Project #	Strategy	Year Added	Hazard(s) Addressed	Priority	Estimated Cost	Funding Sources	Lead Agency/Department	Status/Schedule	Comments
1	Coordinate inter-regional meetings (with surrounding PDCs) to ensure linkage with evacuation and other emergency planning of adjoining jurisdictions, as well as EOC interoperability within and outside of region	2005	Multiple	High	None other than staff time	None needed	Rappahannock-Rapidan Regional Commission	Completed	RRRC has participated, with member jurisdictions, in meetings with surrounding localities. RRRC staff should also commit to regular attendance/participation in regional emergency coordinating meetings in the future.
2	Update floodplain maps across the region as means of improving floodplain management and ensure each jurisdiction maintains ordinances in compliance with NFIP requirements.	2005	Flood	Moderate	Dependent on extent of changes needed	FEMA	Local Jurisdictions, Rappahannock-Rapidan Regional Commission	Ongoing	Continue to monitor for additional changes; respond to jurisdiction requests for assistance as needed.
3	Conduct NFIP, CRS and Flood Prevention information sessions around the region to improve awareness of flood insurance and how communities can reduce the effects of the flood hazard.	2005	Flood	Moderate	Dependent on number of workshops and attendees	FEMA; VDEM	Local Jurisdictions, Rappahannock-Rapidan Regional Commission	Ongoing	
4	Broaden Hazard Mitigation Committee to include representation from National Parks Service, Soil and Water Conservation Districts, Red Cross, HOAs, employers, schools	2005	All	Moderate	None other than staff time	None needed	Rappahannock-Rapidan Regional Commission	Completed	2012 Plan update included participation by community colleges, employers, National Parks Service
5	Develop Emergency Preparedness manual and distribute across the region to help prepare for all hazards	2005	Multiple	High	Dependent on size and number of copies to be distributed	FEMA	Rappahannock-Rapidan Regional Commission	Ongoing, as Funding allows	Should also work with other agencies in similar efforts, such as VDEM, Virginia Department of Health
6	Facilitate continued sharing of GIS maps/data, impact studies, ordinances, plans, etc. among member jurisdictions	2005	Multiple	High	None other than staff time	None needed	Rappahannock-Rapidan Regional Commission	Completed	
7	Facilitate further review of earthquake hazard and its impacts on the region in order to develop locally relevant mitigation strategies	2012	Earthquake	High	Staff time; VDEM/FEMA assistance	None needed initially	Rappahannock-Rapidan Regional Commission	Within 1 year	To include additional HAZUS analysis
8	Wildfire prevention and training programs, including support of Firewise training for interested localities, support and publication of Virginia Department of Forestry applications and data sets	2012	Wildfire	Moderate	Staff time; Dependent on training and workshop need	None needed initially	Rappahannock-Rapidan Regional Commission	As funding allows	
9	Regional Water Supply Planning support to those jurisdictions without water supply plans in place	2012	Drought	Moderate	Staff time	VDEM; DEQ	Rappahannock-Rapidan Regional Commission	As funding allows	
10	GIS Data Analysis of Virginia Department of Forestry's Wildland-Urban Interface zones with recent imagery and projected growth areas in region	2012	Wildfire	Moderate	Staff time	DOF grants	Rappahannock-Rapidan Regional Commission	As funding allows	
11	Assist local jurisdictions with development of Continuity of Operations Planning, if not currently in place	2012	Multiple	Low	Staff time	Local, State, Federal funds	Local jurisdictions, RRRC	Ongoing	
12	Identify the four missing addresses for repetitive loss properties in the region.	2012	Flood	Moderate	Staff time	None needed	Local Jurisdictions, RRRC	Within 1 year	
13	Improve water monitoring capabilities along major rivers in the region (including additional monitor stations and improved data tracking capabilities)	2012	Flood	Moderate	Unknown	FEMA: HMGP	Local Jurisdictions, RRRC	As funding allows	

14	Mitigation of flood-prone properties including, but not limited to, acquisition, elevation, relocation, and dry & wet flood proofing of flood prone structures, and mitigation reconstruction for NFIP-defined Severe Repetitive Loss properties only	2012	Flood	Moderate	Unknown	FEMA	Local Jurisdictions, RRRC	As funding allows	
15	Consider participation in the Community Rating System as a means to reduce the flood insurance premiums of citizens in the region and to foster better floodplain management practices	2012	Flood	Moderate	Unknown	FEMA	Local Jurisdictions, RRRC	As funding allows	

**2012 Rappahannock-Rapidan Region Mitigation Strategies**

Culpeper County

Project #	Strategy	Year Added	Hazard(s) Addressed	Priority	Estimated Cost	Funding Sources	Lead Agency/Department	Status/Schedule	Comments
1	Develop a coordinated GIS department and improve GIS usage and capacity across county departments; Improve Emergency Operations Center use of GIS	2005	Multiple	Moderate	Staff Salary, Training	FEMA, Local Funds	Culpeper County Planning; Emergency Management	Ongoing	
2	Enhance current GIS capabilities/data to expand in-house hazard mitigation capabilities	2005	Multiple	Moderate	Staff Salary, Training	FEMA, Local Funds	Culpeper County Planning; Emergency Management	Ongoing	
3	Develop policies for early drought conservation measures	2005	Drought	Moderate	Staff time	None needed initially	Culpeper County Environmental Services	Ongoing	County is currently developing water supply plan in conjunction with Town of Culpeper
4	Develop Public Awareness campaign for flooding, hurricanes and tropical storms	2005	Flood, Hurricane, Tropical Storms	Moderate	\$1,000 annually	FEMA, local funds	Culpeper County Emergency Services	Ongoing	
5	Develop county-wide warning and alert system	2005	All Hazards	Moderate	Dependent upon upgrades needed	FEMA, VDEM, ISP	Culpeper County Emergency Services	Ongoing	Reverse 911 system is in place; need to continue to monitor for upgrades and interoperability
6	Participate in ICS scenario exercises in conjunction with other local jurisdictions	2012	Multiple	Moderate	Staff time	None other than staff time	Culpeper County Emergency Services	Ongoing	
7	Implement Town & County Water & Sewer agreement	2012	Multiple	High	Unknown	Local Funds	Culpeper County Administration	Long-term	
8	Retain thick vegetative cover on public lands flanking river to reduce erosion	2005	Flood	Moderate	Staff time	None needed	Culpeper County Planning	Deleted	
9	Limit the percentage of allowable impervious surface within developed parcels to reduce the impact of erosion and to lessen the impact of flooding	2005	Flood	Moderate	Staff time	None needed	Culpeper County Planning	Completed	In place, reference Culpeper County Code, chapter 11A
10	Design a "natural runoff" or "zero discharge" policy for stormwater subdivision design to reduce the impacts of downstream flooding	2005	Flood	Moderate	Staff time	None needed	Culpeper County Planning	Deleted	
11	Require more trees be preserved/planted in landscape designs to reduce the amount of stormwater runoff	2005	Flood	Moderate	Staff time	None needed	Culpeper County Planning	Completed	In place, reference article 33 of Zoning Ordinance
12	Require clustering for PUDs in the zoning ordinance that reduce or eliminate development in known hazard areas (generally flood zones)	2005	Flood	Moderate	Staff time	None needed	Culpeper County Planning	Completed	Floodplain ordinance in place, reference article 8A or Zoning Ordinance
13	Ensure zoning ordinance encourages higher densities only outside of known hazard areas	2005	Flood	Moderate	Staff time	None needed	Culpeper County Planning	Deleted	
14	Increase minimum lot size for development in known hazard areas	2005	Flood	Moderate	Staff time	None needed	Culpeper County Planning	Deleted	
15	Require setbacks from delineated hazard areas (e.g. wetlands, steep slopes)	2005	Multiple	Moderate	Staff time	None needed	Culpeper County Planning	Deleted	
16	Join the Community Rating System program to reduce the flood insurance premiums of citizens in Culpeper County and to foster better floodplain management practices	2005	Flood	Moderate	Staff time	Local Funds	Culpeper County Emergency Services	Deleted	
17	Buy out or elevate repetitive flood risk homes	2005	Flood	Moderate	Dependent on number of homes	FEMA Funds	Culpeper County Planning	Deleted	
18	Install generators in shelter locations for use in times of displacement/evacuations	2005	Multiple	Moderate	\$30,000 per generator	FEMA Funds	Culpeper County Emergency Services	Completed	
19	Make sure the new EOC is designed and built in such a way as to be resistant to the effects of natural hazards	2005	Multiple	Moderate	Dependent on EOC design	FEMA Funds	Culpeper County Emergency Services	Completed	

**2012 Rappahannock-Rapidan Region Mitigation Strategies**

Town of Culpeper

Project #	Strategy	Year Added	Hazard(s) Addressed	Priority	Estimated Cost	Funding Sources	Lead Agency/Department	Status/Status/Schedule	Comments
1	Enhance current GIS capabilities to expand in-house hazard mitigation capacity	2005	Multiple	Moderate	Dependent on level of enhancement	FEMA, Local funds	Town of Culpeper Department of Planning and Community Development	Ongoing	Upgrades included in Capital Improvements Plan
2	Acquire Global Positioning System (GPS) units to locate critical public infrastructure	2005	Multiple	High	\$11,000 - \$15,000	FEMA	Town of Culpeper	Completed	
3	Technology upgrades to allow the Town to more efficiently respond to disasters	2005	Multiple	High	Dependent upon upgrades identified	Grant funds	Town of Culpeper Administration	Ongoing	Installation of AMR systems ongoing through FY 2014 to improve security of public utility systems
4	Improve security and protection measures for Town's water plant and water supply reservoirs	2005	Multiple	High	Dependent upon level of enhancement	Federal funding	Town of Culpeper Department of Public Works	Ongoing	Installation of AMR systems ongoing through FY 2014; Installation of additional well systems to provide increase in MGD in testing phase
5	Improve security and protection measures for Town's electric utility and distribution system	2005	Multiple	High	Dependent upon level of enhancement	Federal funding	Town of Culpeper Director of Light and Power	Ongoing	Installation of AMR systems ongoing through FY 2014 with remote access, dual port system
6	Improve security and protection measures for Town's wastewater utility	2005	Multiple	High	Dependent upon level of enhancement	Federal funding	Town of Culpeper Department of Public Works	Ongoing	Emergency generators installed at multiple points; additional perimeter fencing installed to date
7	Provide vegetative buffers where appropriate to offset effects of potential flooding	2005	Flooding	Moderate	Staff time	None other than staff time	Town of Culpeper Departments of Planning and Community Development, Public Works	Ongoing	Streambank segments identified on Mountain Run to promote soil retention
8	Employ the use of impervious surfaces, only where practical, to counteract the effects of flooding in developed areas of town	2005	Flooding	Moderate	Staff time	None other than staff time	Town of Culpeper Departments of Planning and Community Development, Public Works	Ongoing	
9	Construct Inner Loop road between route 229 and route 522 to provide additional traffic options during flood events	2012	Flooding, Multiple	Moderate	Estimates at VDOT	VDOT, FHWA	Town of Culpeper, VDOT	2016 Completion Date	
10	Utilize old VDOT Residency property to further streamline maintenance efficiency	2012	Winter Weather, multiple	Moderate	Staff time	None other than staff time	Town of Culpeper Department of Public Works	Ongoing	
11	Complete and implement mitigation planning policies for dams at Lake Pelham and Mountain Run Lake	2012	Flooding	High	Staff time	DCR, staff time	Town of Culpeper Departments of Public Works, Planning and Community Development	Ongoing	
12	Participate in ICS scenario exercises in conjunction with other local jurisdictions	2012	Multiple	Moderate	Staff time	None other than staff time	Town of Culpeper Departments of Public Works, Planning and Community Development	Ongoing	

**2012 Rappahannock-Rapidan Region Mitigation Strategies**

Fauquier County

Project #	Strategy	Year Added	Hazard(s) Addressed	Priority	Estimated Cost	Funding Sources	Lead Agency/Department	Status/Schedule	Comments
1	Build new Emergency Operations Center and Emergency Communications Center	2005	Multiple	High	Undetermined	FEMA HMGP, EMPG Grants	CFREM	Planning ongoing	Lack of funding
2	Relocation of structures out of the floodplain	2005/2012	Flood	Low	Dependent upon number structures identified	FEMA HMGP, FMA	Fauquier County Community Development	No action taken	Requires study of non-conforming homes in updated FIRM maps; Retain strategy as refined in 2012
3	Join the Community Rating System program to reduce the flood insurance premium of citizens in Fauquier County and to foster better floodplain management practices	2005/2012	Flood	Moderate	Staff time	None needed	Fauquier County Community Development	Ongoing	County now has Certified Floodplain Manager on staff; Retain strategy as refined in 2012 in coordination with Emergency Services
4	Improve generator capacity at shelters/schools	2005	Multiple	High	\$35,000 per generator	FEMA HMGP, PDM	CFREM	As funding allows	
5	Develop Code Red System throughout county	2005/2012	Multiple	Moderate	Unknown	Local funds	CFREM	As funding allows	
6	Prohibit or limit floodplain development through regulatory and/or incentive based measures	2005/2012	Flood	Low	Staff time	None needed	Fauquier County Community Development	As necessary	Zoning Ordinance updated in 2007 and 2009 to conform to federal law and updated FIRM maps. Retain strategy as refined in 2012.
7	Establish and manage riparian buffers along rivers and streams to minimize erosion and flooding	2005/2012	Flood	Low	Staff time	None needed	Fauquier County Community Development	As staff time allows	Retain strategy as refined in 2012, given pending stormwater and Chesapeake Bay regulations at state level
8	Incorporate into emergency response plans the procedure for tracking high water marks following a flood	2005/2012	Flood	Low	Staff time	None needed	CFREM	As necessary	
9	Retain thick vegetative cover on public lands flanking river to reduce the potential of erosion	2005/2012	Flood	Low	Staff time	None needed	Fauquier County Community Development	As staff time allows	This is a continuing county coordination effort with special management areas, state and federal agencies. Retain strategy as refined in 2012.
10	Sign a Cooperating Technical Partner (CTP) Agreement with FEMA.	2005/2012	Flood	Moderate	Staff time	FEMA Grants	Fauquier County Community Development	As staff time allows	Requires Floodplain Manager and GIS to work with FEMA to determine county eligibility; and Board of Supervisors authorization to pursue such a designation
11	Determine county's eligibility for Coordinating Cooperative Partner designation	2012	Flood	Moderate	Staff time	Local Funds	Fauquier County Community Development	As staff time allows	
12	Limit the percentage of allowable impervious surface within developed parcels	2005/2012	Flood	Low	Staff time	None needed	Fauquier County Community Development	As necessary	Monitor pending regulations at state and federal level for changes to impervious surface reductions. Retain strategy as refined in 2012.
13	Encourage residents to keep storm drains clear of debris during storms	2005/2012	Flood	Moderate	Staff time	None needed	Fauquier County Community Development	As necessary	Work with HOAs and John Marshall Soil and Water Conservation District to coordinate education and outreach materials
14	Develop Mobile Data Transmission System that is interoperable with Northern Virginia Public Safety agencies	2005/2012	Multiple	High	Unknown	Local, State, Federal funds	CFREM	Ongoing	
15	Require developers to plan for on-site sediment retention.	2005	Flood	High	Staff time	None needed	Fauquier County Community Development	Ongoing	Completed on a regular basis during development review.
16	Develop an open space acquisition, reuse and preservation plan targeting hazard areas.	2005	Flood	Low	\$50,000 to develop plan, additional unknown	FEMA HMGP	Fauquier County Community Development	Ongoing	Part of county planning process as necessary
17	Prohibit any development within the floodplain areas	2005	Flood	Low	Staff time	None needed	Fauquier County Community Development	Completed	Incorporated into County Ordinance
18	Revise and update regulatory floodplain maps	2005	Flood	Moderate	--	FEMA: MMP	Fauquier County Community Development	Completed	Updated floodplain maps adopted and monitored.

19	Designate a local floodplain manager/CRS coordinator that achieves Certified Floodplain Manager certification	2005	Flood	Moderate	Staff time	None needed	Fauquier County Community Development	Completed	County has certified Floodplain Manager on staff as of 2010
20	Substitute porous surfaces/pavement for impervious pavement when appropriate to reduce flooding caused by runoff	2005	Flood	Low	Staff time	None needed	Fauquier County Community Development	As necessary	Low priority, handled on case-by-case basis
21	Retain natural vegetative bed in stormwater channels to reduce erosion	2005	Flood	Low	Staff time	None needed	Fauquier County Community Development	Completed	

**2012 Rappahannock-Rapidan Region Mitigation Strategies**

Town of Remington

Project #	Strategy	Year Added	Hazard(s) Addressed	Priority	Estimated Cost	Funding Sources	Lead Agency/Department	Status/Schedule	Comments
1	Elevate buildings/buy-out land in floodplain.	2005	Flood	Moderate	Unknown	FEMA, Local Funds	Town of Remington Administration	As needed	
2	The water treatment plant for the Town of Remington on Confederate Boulevard needs a backup generator.	2005	Multiple	High	\$35,000 per generator	FEMA, Local Funds	Town of Remington Superintendent	As funding allows	
3	Ensure plans for new water treatment facility at 5th Street include backup power generation	2012	Multiple	High	Dependent upon identified solution	Local funds	Town of Remington Superintendent	Concurrent with facility development	
4	The sewer plant that serves the Town of Remington needs a backup generator	2005	Multiple	High	\$30,000 per generator	FEMA Funds	Town of Remington Superintendent	Completed	

**2012 Rappahannock-Rapidan Region Mitigation Strategies**

Town of Warrenton

Project #	Strategy	Year Added	Hazard(s) Addressed	Priority	Estimated Cost	Funding Sources	Lead Agency/Department	Status/Schedule	Comments
1	Coordinate all traffic signals in town. Currently the signals are not coordinated and can cause major problems for emergency vehicles trying to enter and exit the police and fire stations	2005	Multiple	Moderate	\$50,000	Local Funds, VDOT	Town of Warrenton Department of Public Works and Utilities	Ongoing	Phase I completed. Town is working to interconnect the signals via wireless during phase II.
2	Verify street addresses and ensure compliance with posting requirements.	2005	All Hazards	High	Staff time	None needed	Town of Warrenton Department of Planning and Community Development	Ongoing	
3	Join the Community Rating System program to reduce the flood insurance premiums of citizens in the Town of Warrenton and to foster better floodplain management.	2005	Flood	Moderate	Staff time	None needed	Town of Warrenton Departments of Public Works and Utilities & Planning and Community Development	Ongoing	Town has identified this as a planned effort across departments.
4	Update floodplain map for the Town of Warrenton	2005	Flood	High	\$85,000	FEMA Funds	Town of Warrenton Department of Public Works and Utilities	Completed	
5	Improve enforcement of erosion and sediment control measures to reduce erosion and flooding problems caused by sedimentation.	2005	Flood	Low	Staff time	None needed	Town of Warrenton Department of Planning and Community Development	Ongoing	
6	Additional staff training for GIS applications.	2005	Multiple	Moderate	\$2,000 to \$4,000; Dependent upon software needs; training needs	Local Funds	Town of Warrenton Departments of Public Works and Utilities & Planning and Community Development	Ongoing	
7	Increase snow removal capabilities	2005	Winter Storms	Moderate	Additional staff time and funding for new equipment	Dependent upon need for new equipment	Town of Warrenton Department of Public Works and Utilities	Ongoing	

Note: The Town of Warrenton opted against identifying new strategies during this Plan Update in order to focus on the number of ongoing efforts currently underway at the Town.



**2012 Rappahannock-Rapidan Region Mitigation Strategies**

Madison County

Project #	Strategy	Year Added	Hazard(s) Addressed	Priority	Estimated Cost	Funding Sources	Lead Agency/Department	Status/Schedule	Comments
1	Identify the two repetitive loss properties in the county.	2005	Flood	Moderate	Staff time	None needed	Madison County Emergency Management	Ongoing	
2	Develop a HAZMAT team to handle possible spills on Route 29	2005	Hazardous Materials	Moderate	Dependent on number of team members and equipment needed	Hazardous Material Emergency Management grant	Madison County Emergency Management	As funding allows	
3	Expand emergency shelter capabilities for natural disasters and large-scale evacuation	2005	Multiple	Moderate	Dependent upon improvements needed	FEMA	Madison County Emergency Management	Ongoing	

Note: Madison County opted against identifying new strategies during this Plan Update due to staffing limitations and the desire to push resources toward previously identified strategies.

**2012 Rappahannock-Rapidan Region Mitigation Strategies**

Town of Madison

Project #	Strategy	Year Added	Hazard(s) Addressed	Priority	Estimated Cost	Funding Sources	Lead Agency/Department	Status/Schedule	Comments
1	Improve stormwater runoff with the implementation of stormwater management techniques	2005	Flood	High	Town staff has estimates	FEMA, USDA, Soil and Water Conservation	Town of Madison Administration	As funding allows	
2	Protect utilities by placing overhead wires and cables underground	2005	High winds, tornadoes, hurricanes, winter storms	Moderate	Town staff has estimates for existing line burial; future line burial would be taken care of via ordinance amendments	CDBG	Town of Madison Administration	As funding allows, long-term	

Note: The Town of Madison opted against identifying new strategies during this Plan Update due to limited staffing and the desire to push resources toward previously identified strategies.

**2012 Rappahannock-Rapidan Region Mitigation Strategies**

Orange County

Project #	Strategy	Year Added	Hazard(s) Addressed	Priority	Estimated Cost	Funding Sources	Lead Agency/Department	Status/Schedule	Comments
1	Identify and develop additional shelter sites for evacuees from within and outside the region	2005/2012	Multiple	High	Staff time	General fund	Orange County Department of Emergency Management	Ongoing	Modified for 2012 Plan Update.
2	Expand and fully equip Emergency Operations Center	2005	Multiple	High	\$75,000	General fund, North Anna funds and grants	Orange County Administration, Emergency Management	Ongoing	
3	Expand and fully equip E-911 Center	2012	Multiple	High	\$200,000	Local and grant funding	Orange County Administration, Emergency Management and Emergency Communications	As funding allows	
4	Upgrade Reverse 911 system with a modern multi-notification system	2005/2012	Multiple	High	\$40,000	General fund, North Anna funds and grants	Orange County Administration, Emergency Management and Emergency Communications	Ongoing	Modified for 2012 plan.
5	Install a generator at the Orange County Courthouse facility	2012	Multiple	High	\$50,000	General fund, FEMA, grants	Orange County Department of Emergency Management	As funding allows	
6	Install and replace generators in County Fire and Rescue station #21	2012	Multiple	High	\$58,333	General fund, FEMA, grants	Orange County Department of Emergency Management	As funding allows	
7	Install and replace generators in County Fire and Rescue station #24	2012	Multiple	High	\$58,333	General fund, FEMA, grants	Orange County Department of Emergency Management	As funding allows	
8	Install and replace generators in County Fire and Rescue station #29	2012	Multiple	High	\$58,333	General fund, FEMA, grants	Orange County Department of Emergency Management	As funding allows	
9	Conduct a detailed needs assessment for the county's emergency response services	2005	Multiple	Moderate	Unknown	Local, ODP	Orange County Department of Emergency Management	Ongoing	
10	Upgrade or replace generators at communications sites throughout Orange County and add surveillance equipment. Monitoring systems should also be added to provide the following information: fuel status, generator status, temperature status, generator output status	2012	Multiple	High	\$100,000	General fund, grants	Orange County Department of Emergency Management	As funding allows	
11	Retrofit Locust Grove Middle School as an emergency shelter with the addition of a generator	2012	Multiple	Moderate	\$50,000	General fund, grants	Orange County Department of Emergency Management	As funding allows	
12	Retrofit Prospect Heights Middle School as an emergency shelter with the addition of a generator	2012	Multiple	Moderate	\$50,000	General fund, grants	Orange County Department of Emergency Management	As funding allows	
13	Retrofit High School Field House as an emergency shelter with the addition of a generator	2012	Multiple	Moderate	\$50,000	General fund, grants	Orange County Department of Emergency Management	As funding allows	
14	Apply for and obtain funding for hazard mitigation plan implementation	2005	Multiple	High	Staff time	None needed initially	Orange County Administration, Emergency Management and Emergency Communications	Ongoing	Modified for 2012 plan
15	Identify potential terrorism targets (local) and plan for their protection	2005	Terrorism	High	Staff time	State Homeland Security Grant program	Orange County Emergency Operations Center, Local Police	Ongoing	Partially covered by other existing plans
16	Incorporate Hazard Mitigation plan into Comprehensive Plan and Capital Improvements Plan	2005	Multiple	Moderate	Staff time	None needed	Orange County Administration, Department of Planning and Zoning	Ongoing	
17	Complete a stormwater drainage study/plan for known problem areas	2005	Flood	Moderate	Staff time	General Fund, grants	Orange County Department of Planning and Zoning	As funding allows	Town of Orange study reference
18	Develop and implement a multi-hazard public awareness program	2005	Multiple	Moderate	Staff time	General Fund	Orange County Department of Emergency Management and Emergency Communication	Ongoing	
19	Develop an internal GIS that may be used for analysis in times of emergency	2005/2012	Multiple	Moderate	Staff time	FEMA, VGIN, Local Funds	Orange County Department of Planning and Zoning	Ongoing	GIS available for review, not analysis

20	Develop and incorporate database information for GIS use	2005	Multiple	Moderate	Staff time	General fund	Orange County Department of Planning and Zoning	Deleted	Revised in 2012 plan, strategy #19
21	Identify flood inundation zones for all dams regulated through the Virginia Department of Conservation and Recreation Dam Safety program	2005	Flood	Moderate	Staff time	General fund, DCR	Orange County Department of Planning and Zoning	As funding allows	
22	Upgrade or replace outdated storage shed at the Orange County Sheriff's office	2012	Multiple	High	Unknown	General fund, FEMA	Orange County Department of Emergency Management, Sheriff's Office	As funding allows	
23	Install and replace generators in county fire and rescue stations	2005	Multiple	High	\$160,650	General fund	Orange County Department of Emergency Communications	Deleted	Revised in 2012 plan, strategies #5 through 8
24	Prepare for loss of electricity at vulnerable facilities	2005	Multiple	High	Staff time	General fund	Orange County EOC	Completed	
25	Create an evacuation plan and clean up scenario in the event of a train derailment resulting in a toxic spill	2005	Hazardous Materials	Moderate	Dependent on location	HMEP grants	Orange County/Town or Orange	Completed	Included in County Emergency Operations Plan
26	Identify/prepare evacuation routes and shelter locations for natural or man-made disasters	2005	Multiple	Moderate	Staff time	General Fund, FEMA grants	Orange County EOC	Completed	Included in County Emergency Operations Plan
27	Develop a terrorism response plan	2005	Terrorism	Moderate	Staff time	General fund	Orange County Administration, EOC, Planning	Completed	Partially covered through other plans
28	Design an early warning system for hazard events	2005	Multiple	Moderate	Staff time	General fund	Orange County EOC, Law enforcement	Completed	
29	In the floodplain ordinance, identify "flooding due to manmade structure" as a concern within the County, also determine ways to regulate development within the flood inundation zones as a function of the floodplain ordinance	2005	Flood	Moderate	Staff time	General fund	Orange County Planning and Zoning	Completed	Floodplain ordinance in place
30	Prepare for radiological problems from North Anna nuclear power station	2005	Hazardous Materials	High	Staff time	HMEP grants	Orange County EOC	Completed	
31	Prevent development between Lake of the Woods Dam and the Rapidan River	2005	Flood	Moderate	Staff time	General fund	Orange County Planning and Zoning	Completed	Addressed through Dam Inundation statute

**2012 Rappahannock-Rapidan Region Mitigation Strategies**

Town of Orange

Project #	Strategy	Year Added	Hazard(s) Addressed	Priority	Estimated Cost	Funding Sources	Lead Agency/Department	Status/Schedule	Comments
1	Plan for derailment of freight trains which pass through center of town (4,000 pop) – Large tank cars, chlorine, anhydrous, etc.	2005	Hazardous Materials	Moderate/High	Dependent upon location and event	Hazardous Materials Emergency Preparedness grant	Town of Orange; Railroad	Ongoing	Also consider short-term safety improvements at rail crossings
2	Implement preferred recommendation of the 2006 Baylor Creek Stream Restoration Study	2012	Flood	Moderate	Dependent upon recommendations implemented	Federal/State level grants	Town of Orange Department of Community Development	As funding allows	
3	Perform floodplain mapping of Town to determine base flood elevations.	2012	Flood	Low	Staff time	None needed initially	Town of Orange Department of Community Development	As staffing allows	
4	Purchase residences in area(s) subject to recurrent flooding	2005	Flood, Hurricane, Tropical Storms	Low	Dependent on number to be acquired	FEMA, local funds	FEMA, Insurance	Dependent on several factors	Modified for 2012 plan
5	Prepare for flow of people during an emergency	2005	Multiple	Moderate	Dependent on planning and implementation	HMEP, PDM	Town of Orange	Deleted	
6	Assist in adoption of ordinance in building in known flood zones	2005	Flood	Low	Staff time	None needed	Town of Orange Community Development	Deleted	

**2012 Rappahannock-Rapidan Region Mitigation Strategies**

Rappahannock County

Project #	Strategy	Year Added	Hazard(s) Addressed	Priority	Estimated Cost	Funding Sources	Lead Agency/Department	Status/Schedule	Comments
1	Improve GIS data within the county in order to perform more accurate risk assessments.	2005	Multiple	Low	\$10,000 to \$15,000	Local Funds, Grants	Rappahannock County E-911 Coordination	Ongoing	
2	Develop/revitalize relationship with Red Cross for shelter operations planning.	2005	Multiple	High	None needed initially	None needed initially	Rappahannock County Emergency Coordination	Ongoing	
3	Join the Community Rating System program to reduce the flood insurance premiums of citizens in the Rappahannock County and to foster better floodplain management practices.	2005	Flooding	Low	\$1,000 to \$3,000	Local Funds	Rappahannock County Administration	Ongoing	
4	Coordinate wildfire planning with Shenandoah National Park.	2005	Wildfire	High	None needed initially	None needed initially	Rappahannock County Administration/Emergency Coordination	Ongoing	
5	Promote "Firewise" fire protection by providing literature/brochures with each building permit issued in County for rural area construction.	2005	Wildfire	Moderate	<\$1,000 annually	General Funds	Rappahannock County Administration	Completed	Has been implemented and part of continuing local coordination
6	Design and build a new EOC.	2005	All Hazards	High	Unknown	General Funds, FEMA	Rappahannock County Administration	Deferred	Lack of funding
7	Identify relocation of commercial uses in floodplain	2005	Flooding	Moderate	\$1 to 1.5M	FEMA HMP Grants	Rappahannock County Building Official	Deferred	Lack of funding
8	Install emergency generators at county emergency shelters – Amissville Fire Department, Washington Fire Department	2012	All Hazards	Moderate	Unknown	General Funds, FEMA	Rappahannock County Emergency Coordination	As funding allows	
9	Install emergency generators at primary county emergency shelters at Rappahannock Elementary School and Rappahannock County High School	2012	All Hazards	Moderate	Unknown	General Funds, FEMA	Rappahannock County Emergency Coordination	As funding allows	