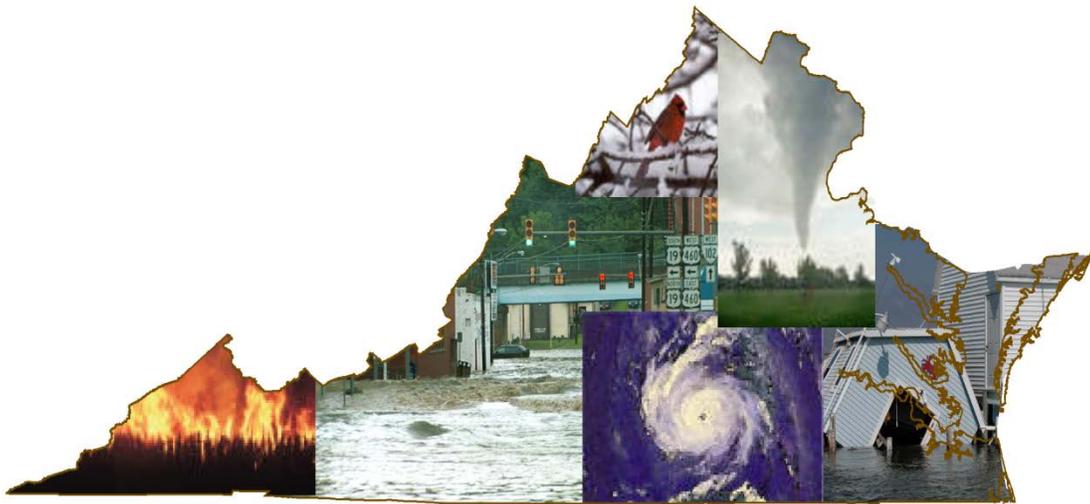


COMMONWEALTH OF VIRGINIA



Hazard Mitigation Plan



Chapter 3 Hazard Identification and Risk Assessment (HIRA)

Appendix 3.6 – Local Plan Incorporation



SECTION 3.6

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Section 3.6: Local Plan Incorporation

Summary of Planning Efforts

Virginia currently has 18 local hazard mitigation plans that have been submitted and approved by VDEM and FEMA Region III. There are 7 plans that have expired and are currently being revised. These plans will be submitted to FEMA for review and approval in 2013. The following section addresses local hazard identification, vulnerability and potential losses based on estimates provided in local risk assessment. In this revision of the plan, these results were not compared in detail to the statewide risk assessment as a result of data inconsistencies.

In addition to FEMA requirements for risk assessments, the Virginia Department of Emergency Management (VDEM) has additional requirements for local plan risk assessments. The local plans must include maps for the flood hazard. This would involve an overlay of the Special Flood Hazard Area (SFHA) over the demographic data to determine what infrastructure and populations lie within the floodplain. The second requirement is for local risk assessments to include maps known high hazard areas. Chapter 6 of this plan discusses the steps VDEM goes through for review and approval of local plans and how the state coordinates with the local efforts.

Local Hazard Identification

The most significant hazards identified in the local hazard mitigation plans were flood, hurricane, and winter weather, the same top three hazards that are identified in this revision of the statewide analysis. Local plans identified a variety of distinct hazards; Table 3.6-1 below classifies these based on the majority of localities that ranked the hazard as High, Med-High, Medium, Medium-Low, Low, and Not Assessed. For example, flooding was given an overall ranking of high for comparison in this plan. Of the 25 plans, 19 plans ranked this as high, 4 as medium-high, 2 as medium, and 0 as low resulting in an overall locality ranking of high. In addition to the hazard summarized in this report, local plans also assessed other hazards of local concern.





Table 3.6-1: Summary of local plan hazard ranking

High	Medium	Low	Not Assessed by Majority
Flood Hurricane Winter	Tornado Drought Wildfire	Earthquake Landslide Karst	Erosion Wind Thunderstorm Lightning Hail Extreme Cold Extreme Heat Tsunami HazMat Terrorism Impoundment Failure

Localities used a variety of approaches, ranging in complexity, to rank the hazards they identified as impacting their regions. Some plans used a blend of various techniques and discussions to arrive at their final ranking. Several of the major ranking/scoring techniques used in the local plans included:

- Quantitative Scoring (based on available historical data, i.e. NCDC)
- Human Judgment/Knowledge of Locality
- Numerical Scoring Worksheets (based on criteria, i.e. FEMA 386-2 worksheets)
- Interactive Activities with Steering Committee Members

FEMA guidance indicates that the jurisdictions at greatest risk to specific hazards should be identified, considering both the characteristics of the hazard and the jurisdictions’ degree of vulnerability. A variety of analysis methods may be sufficient to meet these goals; FEMA does not mandate a specific analysis method. As a result, many local and state plans have developed their own ranking system.

None of the ranking techniques used in the local plans are incorrect as there is no standard way to rank hazards that impact specific jurisdictions. Lack of available data for each hazard is often a driving factor in the ranking method’s degree of subjectivity. The numerical rankings were frequently performed by different contractors, and different data processing methodologies were utilized. The variability in the ranking systems made it difficult to compare local hazard rankings to the state risk assessment.

Table 3.6-2 shows how each of the local plans ranked the hazards identified in their plans. Some modifications have been made to this table to be able to compare between localities and to the state plan. For example, if a regional plan did not have a





hurricane category in their plan, but ranked flood and wind as “High,” then hurricane risk was assigned a ranking of “High.” Also, if a regional plan didn’t have a hurricane ranking, but ranked flood as “High” and wind as “Medium”, then the hurricane risk was assigned “Medium-High.” Also, the Southside plan and the Thomas Jefferson plan both assigned percentage ranks to their hazards but did not give an equivalent categorical ranking. In these two instances, the percentages were used to assign “Low,” “Medium-Low,” “Medium,” “Medium-High,” and “High” rankings. These two modifications are represented by italicized text in the table. Lastly, some of the plans used different categorical rankings such as “Limited,” “Moderate,” and “Significant.” In these instances, the rankings were assigned a “Low,” “Medium,” and “High” ranking respectively.

Table 3.6-2 also compares the average ranking of the local plans to the average ranking based on the analysis completed for this revision. Three of the hazard categories that were addressed in the local plans were not considered in this chapter; these include hazardous materials, terrorism, and biological, radiological and epidemics. VDEM has separate plans that address human caused and hazardous materials. Erosion, extreme heat, extreme cold, thunderstorm, lightning, hail, and tsunami have been included as textual descriptions in the major hazard sections.

Of the hazards considered in this revision the average rankings in local and state analysis are comparable. The rankings for Flood, Hurricane, Drought, Winter Storm, and Wildfire were the same for both the local plans and the state plan. Landslide and Earthquake received a “low” ranking for the local plans and a “medium-low” in the state revision. Tornado received a “medium” ranking for the local plans but was elevated to a “medium-high” risk in the state plan. Impoundment Failure received a ranking of “medium-low” in the local plans but was reduced to a “low” ranking for the state plan.





Table 3.6-2: Local HMP summary of hazard ranking and comparison with 2013 statewide hazard ranking results

PDC/Jurisdiction	Flood	Erosion	Wind	Hurricane	Tornado	Thunderstorm	Lightning	Hail	Winter	Extreme Heat	Extreme Cold	Drought	Earthquake	Tsunami	Wildfire	HazMat	Landslide	Karst and Subsidence	Terrorism	Impoundment Failure
Accomack-Northampton	High	High	High	High	NA	NA	NA	NA	Medium	Low	NA	Medium	NA	NA	Medium	Low	NA	NA	NA	NA
Central Shenandoah	High	NA	Medium-High	High	Medium	NA	NA	NA	High	High	High	High	NA	NA	Medium	NA	Low	Medium	Low	NA
City of Chesapeake	High	NA	High	High	High	NA	NA	NA	Medium	NA	NA	Medium-High	NA	NA	Medium	NA	NA	NA	NA	NA
City of Franklin	High	Low	NA	High	Low	High	NA	NA	Medium	Low	NA	Low	Low	NA	Low	High	NA	NA	NA	Low
City of Poquoson	High	NA	High	High	NA	NA	NA	NA	Low	NA	NA	NA	NA	NA	Medium	NA	NA	NA	NA	NA
Commonwealth Regional Council	Medium	Low	NA	High	High	High	NA	NA	High	NA	NA	High	Low	NA	Medium	NA	Low	Low	NA	Low
Cumberland Plateau	High	NA	Medium	Medium-High	Low	Medium	NA	Medium	Medium-High	Low	NA	Medium	Medium	NA	Medium-High	NA	Medium-High	Low	NA	Medium
George Washington	High	NA	High	High	High	High	NA	NA	High	Medium-High	NA	Medium-High	Medium-Low	NA	Medium-High	NA	Medium-Low	Medium-Low	NA	Low
Lenowisco	High	NA	Medium	Medium-High	Low	Medium	NA	NA	Medium-High	Low	NA	Medium	Medium	NA	Medium-High	NA	Medium-High	Low	NA	Medium
Lower Peninsula	Medium-High	NA	NA	High	Medium-High	Medium	NA	NA	Medium-Low	Medium-Low	NA	Medium-Low	Low	NA	Medium-High	NA	Low	NA	NA	Medium-High
Middle Peninsula	Medium-High	NA	Medium	High	Medium	NA	High	NA	Medium	Medium	Low	Medium	Low	Low	Medium	NA	Low	Low	NA	Medium
Mount Rogers	High	NA	Medium	Low	Low	Low	Low	NA	High	NA	NA	Medium	Low	NA	Medium	NA	Low	Low	NA	Medium
New River Valley	High	NA	High	High	Low	NA	NA	NA	Medium	NA	High	Medium	Low	NA	Low	NA	Low	Low	NA	NA
Northern Neck	Medium	Medium	NA	High	Low	NA	NA	NA	Medium	NA	NA	Low	NA	NA	Low	NA	NA	NA	NA	NA
Northern Shenandoah	High	Low	High	High	High	Medium	Medium	Low	High	Low	High	Low	Low	NA	Medium	Medium	Low	Low	NA	Medium
Northern Virginia	High	NA	High	High	High	NA	NA	NA	High	NA	NA	Medium-High	Medium	NA	Medium-Low	NA	Medium	Medium-Low	NA	NA
Rappahannock-Rapidan	High	Low	NA	High	Medium	Medium	NA	NA	High	NA	NA	Medium	Low	NA	Medium	NA	Low	Low	NA	Low
Region 2000	High	NA	NA	Medium-High	Medium	NA	NA	NA	High	NA	NA	High	Low	NA	Medium	NA	Low	NA	Low	NA
Richmond and Crater	High	Low	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	NA	Medium	Low	NA	Low	NA	Low	Low	NA	NA
Roanoke Valley-Alleghany Region	High	NA	Medium-High	Medium-High	Low	NA	NA	NA	High	NA	NA	NA	Low	NA	Medium-High	NA	Low	NA	NA	NA
Southampton County	High	NA	NA	High	Medium	High	NA	NA	Medium	Low	NA	Medium	Low	NA	Medium	Medium	NA	Low	NA	Low
Southside	Medium-High	NA	Medium-Low	High	Medium	Medium-Low	Low	Medium-Low	Medium	Low	Low	Medium	Low	NA	Low	NA	Low	NA	NA	Medium-High
Southside Hampton Roads	High	Low	NA	High	Medium	Medium	Medium	Medium	High	Low	NA	Low	Low	Medium	Low	Medium	NA	NA	Low	Low
Thomas Jefferson	High	NA	Medium	Medium	Medium-Low	NA	Medium-Low	NA	High	Low	Low	Medium-Low	Low	NA	Medium-Low	NA	Low	NA	NA	Medium-Low
West Piedmont	High	NA	Medium	Medium	Low	Medium	NA	NA	High	NA	NA	Medium	Low	NA	Medium	Medium	Low	NA	Low	High
Average Ranking From Local Plans	High	Medium-Low	Medium-High	Medium-High	Medium	Medium	Medium	Medium-Low	Medium-High	Medium-Low	Medium	Medium	Low	Medium-Low	Medium	Medium	Low	Low	Low	Medium-Low
Majority Ranking From Local Plans	High	NA	NA	High	Medium	NA	NA	NA	High	NA	NA	Medium	Low	NA	Medium	NA	Low	Low	NA	NA
2013 Statewide Analysis	High	NA ¹	Medium-High	Medium-High	Medium-High	NA ²	NA ²	NA ²	Medium-High	NA ³	NA ⁴	Medium	Medium-Low	NA ¹	Medium	NA ⁵	Medium-Low	Low	NA ⁵	Low

¹Addressed in flood section 3.7; ²Addressed in wind section 3.8; ³Addressed in drought section 3.10; ⁴Addressed in winter weather section 3.9; ⁵Addressed in the COVEOP: Hazard Specific Annex #5 and #2





Addressing Uncertainty in Hazard Identification

Future revisions of the local plans may help with some of the ambiguity between hazard naming conventions if VDEM outlines what applicable hazard names should be. VDEM will encourage local plan revisions to approach classifying hazards in a similar fashion as done in this revised risk assessment. Table 3.6-3 below provides an outline of what types of events fall within the designated HIRA hazard categories. For this risk assessment the following hazards were evaluated: Flood, Wind, Tornado, Land Subsidence (Karst), Landslide, Winter Weather, Drought, Wildfire, and Earthquake. There were discussions on how to determine what belongs in the hazard category of wind. Hurricanes are one of the Commonwealth’s most costly hazards; however it is a combination of two hazards, wind and flood. Since the impacts of high wind, excluding tornado, are the same whether it be from a tropical system or a severe thunderstorm it was decided they should be grouped together in a non-rotational wind category.

Table 3.6-3: Summary of hazard events by HIRA category hazards

Flood	Non-Rotational Wind	Winter Weather	Tornado	Drought	Wildfire
Riverine	Wind	Snow	Tornado	Drought	Wildfire
Coastal	Thunderstorm	Ice		Extreme Heat	Lightning
Tsunami	Hurricane	Extreme Cold			
Erosion		Nor’Easter			
Hurricane					
Nor’Easter					
Sea Level Rise					

Earthquake	Land Subsidence (Karst)	Landslide	Impoundment Failure
Earthquake	Land Subsidence	Landslide	Dam Failure Levee Failure





Assessment of Local Vulnerability and Potential Losses

Local hazard rankings are highly variable; as a result each one has its own set of criteria to develop monetary loss values and is not consistent across the 25 plans. This variability does not lend itself to being able to compare relative loss values for each hazard in the statewide plan. Annualized loss values were pulled out of the local plans and brought into a GIS for comparison. Flood and hurricane were the two dominate hazards that had annualized loss values associated with them.

Table 3.6-4 illustrates the wide range in annualized loss estimates that have been pulled from the local plans. Some plans provided total loss estimates for a specific flood or hurricane event, but did not provide annualized losses. In these instances, N/A was listed in the table. Without proper documentation and data these values cannot be compared in their current form. Some of the local plans used FEMA’s HAZUS software for this analysis, while others may have used a combination of past event damages and years of record. One goal of this revision is to standardize the data analysis process in order for future versions of this plan to be consistent and comparable.





Table 3.6-4: Local Hazard Mitigation plan annualized loss estimates

PDC/Jurisdiction	Hurricane Wind Loss	Total Flood Loss
Accomack-Northampton	N/A	N/A
Central Shenandoah Valley	N/A	\$3,681,938
City of Chesapeake	N/A	N/A
City of Franklin	\$291,000*	\$8,269,000*
City of Poquoson	N/A	N/A
Commonwealth Regional Council	\$274,179*	\$394,942*
Cumberland Plateau	N/A	N/A
George Washington	N/A	N/A
Lenowisco	N/A	N/A
Lower Peninsula	\$9,666,524*	\$94,507,000*
Middle Peninsula	\$959,258	\$41,109,000*
Mount Rogers	N/A	N/A
New River Valley	\$563,000*	\$248,883*
Northern Neck	N/A	\$6,625,524
Northern Shenandoah Valley	N/A	\$6,857,556*
Northern Virginia	\$4,800,000*	\$99,049,000*
Rapahannock-Rapidan	\$139,000*	\$31,250,000*
Region 2000	N/A	\$2,094,999*
Richmond and Crater	\$4,399,829*	\$6,474,812
Roanoke Valley-Alleghany Region	N/A	N/A
Southampton County	\$480,390*	\$361,142*
Southside	\$482,000*	N/A
Southside Hampton Roads	\$30,443,000*	\$2,821,224,000*
Thomas Jefferson	\$385,000*	\$1,400,000*
West Piedmont	\$463,9308*	\$8,628,034*
Total	\$57,522,488	\$3,132,175,830

* HAZUS estimates

Data Collection

In previous revisions of this document, efforts to collect local hazard and critical facility data were made, but ultimately, in most cases, the local data was derived from the same sources that are currently being used for the state plan. In other cases local data was available but was so variable in content that it could not be merged for a statewide analysis. So, the extent of our incorporation of local plans is limited to the summarization of their methods and results.





Future Revisions

Localities have completed or are in the midst of their first round of revisions for the local hazard mitigation plans. Guidelines proposed in this revision will hopefully streamline local efforts and allow for accurate comparisons among jurisdictions based on future revisions of local hazard mitigation plans.

VDEM has provided, and will continue to provide, technical assistance to locals to develop their mitigation plans. VDEM in coordination with local jurisdictions, have held and will continue to hold a series of planning workshops, technical reviews, and financial resources.

There are numerous statewide mitigation actions that can be adapted for local mitigation plans. Local governments updating their plans are urged to review these, as well as the individual hazard sections in this report, and contact VDEM for additional assistance.

Integration of the local plans into the statewide plan is an ongoing process as local plans are reviewed and standardization issues are addressed. See the State and Critical facility Section 3.4 of this chapter for more information on standardization of facility datasets.

