

Flooding Incident Annex

Coordinating Agency

Emergency Management

Cooperating Agencies

Fire-EMS Department

Police Department

Public Works Department

Sheriff's Department

Emergency Communications Center

Housing and Neighborhood Services

General Services Department

Department of Technology

Parks and Recreation Department

City Schools

Virginia Department of Health – Roanoke Health Department

Council of Community Services

I. Introduction

A. Purpose

Flooding within the City of Roanoke and the Roanoke Valley is a common natural-occurring hazard. Historically, this hazard has contributed to citizen fatalities and major damage to dwellings and infrastructure. The purpose of this annex is to assist the City to protect the public health and safety in the event of flooding utilizing training, equipment, experience, and technology.

B. History

The history of flooding in the Roanoke Valley has been well documented since records were kept. Since 1877 over 17 large floods have occurred in the Roanoke Valley with four of the largest in the past 20 years. Dates of significant floods include the following: 1877, August 1892, October 1893, October 1906, Spring 1913, August 1928, October 1932, January 1935, August 1939, August 1940, July 1947, August 1961, July 1962, June 1972, April 1978, November 1985, April 1992, and June 1995. The flood of record was the November 1985 event.

In the past 20 years, four of the largest floods on record have occurred including June 1972, April 1978, November 1985, and April 1992. Based on rainfall amounts and durations which resulted in these events, the June 1972, April 1978, and November 1985 flood events have recurrence intervals, respectively of approximately 50-, 130-, and 10-years. In this period of flood activity, damages have been estimated exceeding \$200 million with over 12,000 impacted residential structures and over 1,000 businesses.

In November of 1985 rains from Hurricane Juan caused the Roanoke River to rise and crest at a level of 23.4 feet from the bottom of the River, as measured from Walnut Street. The result of that single weather event created floodwaters in downtown Roanoke that rose over five feet inside some businesses. Ten lives

were lost and damage to property cost \$520,000,000 (source: The Roanoke Times, November, 1985). This was the Flood of Record, but is not the only significant flood the Roanoke Valley has experienced over the past 100 years. On August 16th, 1928, the Roanoke River crested at 18.1 feet; twelve years later, on August 14th, 1940, the Valley's river crested at 18.3 feet. On June 21st, 1972, the Roanoke Valley was hit with the effects of Hurricane Agnes, causing the Roanoke River to crest at 19.6 feet. On April 22nd, 1992, the river once again exceeded its banks and spread floodwaters in the Valley when it crested at 18.1 for the second time during the century.

C. Scope

The flood plains around Roanoke are generally narrow, averaging less than 250 feet in most areas and are usually where most of the development occurs. The most severe flooding on the Roanoke River is usually the result of heavy rains associated with tropical storms, while tributary stream flooding is usually the result of local thunderstorms or frontal systems. Flooding along tributaries is compounded when the streams in lower elevations back-up into feeder streams.

Riverine and flash flooding constitutes a major hazard for the City of Roanoke. Flooding exceeding the 10-year and 100-year flood of records per National Flood Insurance Program Rate Map criteria have occurred forty-one times during the 1900s and two times since 2000. Most of the flooding occurs along the following 13 major creeks and rivers: Barnhardt (or Cravens) Creek, Garnand Branch, Glade Creek, Gum Spring, Lick Run, Mudlick Creek, Murdock Creek, Murray Run, Ore Branch, Peters Creek, Tinker Creek, Trout Run, and the Roanoke River (See Tab 1). Most of the creek and drainage system flow into the large Roanoke River, and as such, its waters tend to rise slower and are more easily predicted with help from IFLAWS (Integrated Flood Observing and Warning System).

The scope of this annex is to provide guidance to essential departments to help predict flood hazards and effect safe and timely evacuations with technology, and to protect life and property.

D. Situation

1. Floods have affected the City causing loss of life, damage to infrastructure, and repetitive losses to homes and businesses. The Roanoke River Floodplain extends through a heavily populated area within the City.
2. The "Commonwealth of Virginia Emergency Services and Disaster Laws of 2000" (Code of Virginia, § 44-146.17:2) authorize the Governor to compel evacuation of all or part of the populace from any stricken or threatened area if this action is deemed necessary for the preservation of life.
4. The City Fire-EMS Department has a regional Swiftwater Rescue Team made of members from the City of Roanoke and City of Salem. The team is based out of Station 6, 1333 Jamison Avenue in Roanoke.
5. Floods are hazardous materials events. As such, the Fire-EMS hazardous materials team must be engaged in monitoring and decontamination of citizens and rescuers.

E. Policies

1. Fire-EMS will coordinate search, rescue, and evacuation of flooded areas;
2. The Police Department will coordinate and enforce evacuations, as declared by the Director/Coordinator of Emergency Management, when authorized by the Governor;
3. The Emergency Management Coordinator will direct voluntary evacuation notifications via EAS, Reverse 911 alerting through the Emergency Communications Center, public service announcements, and Public Safety vehicle public address systems;
4. Emergency Management will maintain Dam Fact Sheets that list primary and secondary shelters for each dam;
5. Extensive flooding may require evacuation and sheltering of a large number of people, in which case this operation will be in coordination with ESF #6 – Mass Care, Housing, and Human Resources;
6. The Department of Human Services representative to the Emergency Operations Center will close down temporary housing when areas have been declared safe for re-entry; and
7. The Director of Emergency Management or his/her designee will authorize re-entry.

II. Concept of Operations

A. Mitigation

Mitigation is the City's first flood defense. The Engineering Division within Public Works Department is the lead agency in regulating the National Flood Insurance Program (NFIP) guidelines to include regulating home improvements and new construction to property owners within the flood plain and special flood hazard zones.

B. Weather

The National Weather Service (Blacksburg Office) will issue Flood Warnings, Watches, and Statements and has authority to broadcast Emergency Alert System (EAS) messages across area radio and television stations upon request by Coordinator of Emergency Management. The EOC will monitor Weather information via internet, cable, IFLOWS, and The National Weather Service (Blacksburg Office).

C. Public Information

Dissemination of information will occur through EAS, Reverse 911, Public Service Announcements, Press Releases, Roanoke Alert, public address systems, and through the Council of Community Services (#211). ESF #2 will coordinate Public Information through the Director/ Coordinator of Emergency Management. Types of Public Information may include:

1. Advance Notice/Warning- For slow developing situations, warning should be given as soon as it clear that evacuation may be required and should address preparedness actions.
2. Evacuation Warning- Immediate notification should be made to affected areas using all means available.
3. Emergency Public Information- During times of elevated awareness (due to forecasted event or season), the Public Information Officer will ensure essential information be disseminated to the media on a timely basis.

D. Evacuation

Voluntary evacuation may be recommended for repetitive flood and low-lying areas and will be consensually agreed by the Fire-EMS, Police, Public Works and Emergency Management representative. Notice will be made using the above means in consultation with ESF #2.

1. Special Facilities- Special facilities include schools, hospitals, day care facilities, correctional institutions, and nursing home/long-term care facilities. All are required by their respective regulatory agencies to have an emergency plan that addresses emergency evacuation. In order to implement evacuation, timely notification will be made.
 - a. Schools & Day Care Centers: City Schools have identified 'Safe Zones' for each school and, per their plan, may evacuate accordingly. All City Schools have been issued NOAA weather radios and it is imperative that timely evacuation notice be given. Day Care Centers are required to have an evacuation plan but may not have sufficient resources to effect evacuation and may request assistance.
 - b. Hospitals, Nursing/Long-term Care Facilities & Correctional Institutions: Hospitals and long-term care facilities have detailed evacuation plans and will only initiate as a last resort. Each facility is responsible for coordinating transportation and a host/receiving facility for patients. The City will work with and support this action to its fullest ability. All facilities must transport and support evacuation with suitable medical and security support.
 - c. Redevelopment/Housing Authority Facilities: The Roanoke Redevelopment and Housing Authority have an Emergency Action Plan that addresses evacuation. Egress for some units may be blocked due to flooding. The City will assist in evacuation and transportation when requested. Residents will be shuttled to an open emergency shelter or other pre-identified location in coordination with the Housing Authority.
 - d. City Facilities: Any City Department that may be affected by floodwaters shall have an evacuation plan that addresses personnel, vital records, and transportation

E. Shelter

Shelters have been identified across the City and are identified in the Shelter Annex. Sudden/unexpected flooding may result in the need to establish an emergency shelter at an established location. The Red Cross may decide that, if

the number of evacuees is small, they will shelter at an identified hotel, motel, or other pre-arranged temporary housing.

F. Transportation

The majority of emergency transportation will be through personal means. Some individuals may not have sufficient transportation to evacuate and will rely on public transportation. Emergency transportation will be supplemented through Roanoke City Schools, Parks and Recreation Department, Valley Metro, RADAR, and S.T.A.R. (Specialized Transit - Arranged Rides). In the case of large-scale evacuations with advanced warning, pick-up points may be designated and the Council of Community Services #211 phone bank may be opened to receive and process requests for transportation.

G. Traffic Control

Traffic Control and evacuation points will be coordinated by the Police Department. When possible, two-way traffic will be maintained to allow access of emergency vehicles. All detours, when time permits, will be blocked with law enforcement or traffic control devices provided by Public Works. The Police Department will coordinate with wrecker services to remove disabled and abandoned vehicles from evacuation routes.

H. IFLOWS

The City participates in the Integrated Flood Observing and Warning System (IFLOWS) that has been developed through a grant provided by the National Weather Service to provide the earliest possible warning of an impending flash flood. This system is completely automated with radio-reporting rain gauges placed at strategic locations that automatically send reports to the computer in the Communication Center, Emergency Management Office, and Fire-EMS Station 6 (houses Swiftwater Rescue Team), which then interprets the data and provides guidance when appropriate.

III. Responsibilities

A. ESF #4 (Fire-EMS) Including Swiftwater Rescue (ESF #9) & Hazardous Materials (ESF #10)

1. Develop and maintain plans and procedures for flooding;
2. Provide technical specialist to the EOC;
3. Assist with evacuation warnings;
4. Survey and recommend evacuation routes;
5. Coordinate decontamination of rescuers & evacuees;
6. Assist in evacuating trapped and special needs populations;
7. Evaluate the situation and direct protective action as required;
8. Perform fire safety inspections of emergency shelters; and
9. Continue to perform public life safety mission.

B. ESF #5 (Emergency Management)

1. Develop and maintain plans and procedures for flooding;
2. Coordinate evacuation and shelter efforts with neighbor Roanoke Valley governments;
3. Coordinate release of warnings, instructions and other emergency public information with ESF #2;
4. Coordinate ongoing evacuation planning
5. Coordinate mobilization and demobilization of shelters with ESF #6;
6. Activate EOC and request essential staffing when necessary;
7. Coordinate Shelter Operations with ESF #6;
8. Declare a local emergency if/when necessary; and
9. Direct the testing of drinking water for purity in flooded areas.

C. ESF #13 (Public Safety and Security)

1. Develop and maintain plans and procedures for flooding;
2. Provide technical specialist to the EOC;
3. Assist with evacuation warnings;
4. Survey and recommend evacuation routes;
5. Provide security for evacuated areas;
6. Provide access control for evacuated areas;
7. Provide traffic control points as necessary;
8. Declare the area safe for re-entry after danger has passed; and
9. Provide security for shelters and EOC as necessary.

D. ESF #3 (Public Works)

1. Develop and maintain plans and procedures for flooding;
2. Provide technical specialist to the EOC;
3. Assist with evacuation warnings;
4. Survey and recommend evacuation routes;
5. Provide barrier and traffic control devices as needed;
6. Identify evacuation and emergency services access routes;
7. Assist in emergency debris removal to primary transportation routes;

E. Parks and Recreation

1. Develop and maintain plans and procedures for flooding;
2. Assist with evacuation warnings;
3. Survey and recommend evacuation routes; and
4. Provide shelters and transportation, as necessary.

Definitions:

100 Year Flood Event: This type of event is expected to be equaled or exceeded once on the average during any 100 year period (1% chance of being equaled or exceeded during any year).

Flash Flood: A flood which is caused by heavy or excessive rainfall in a short period of time, generally less than 6 hours. Dam, ice or debris jam failures may also cause flash flood conditions.

Flash Flood Watch: Issued by the National Weather Service. Conditions are such that flooding may occur but the occurrence is neither certain or imminent.

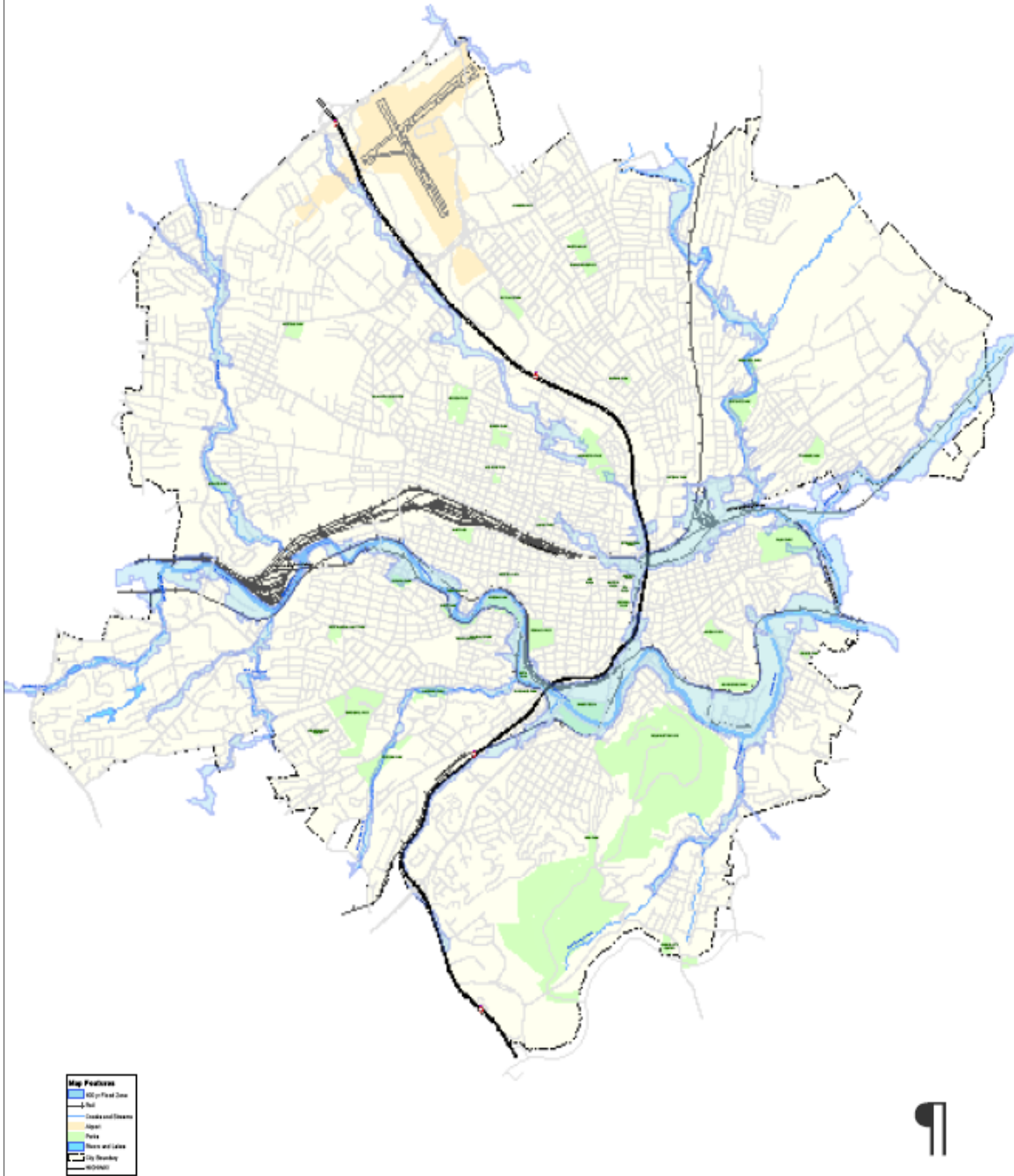
Flash Flood Warning: Issued by the National Weather Service. Conditions are such that flooding is in progress, imminent, or extremely likely.

IFLOWS: Integrated Flood Observation and Warning System- A system provided by the National Weather Service and State Division of Emergency Management to assist local governments in predicting flood events.

Tab 1 to Flood Incident Annex
AREAS SUBJECT TO FLOODING

City of Roanoke

100 Year Flood Zone



Tab 2 to Flood Incident Annex
IFLOWS GAUGE LOCATIONS

Stream Gauge Locations

Tinker Creek/Roanoke River	1118
Roanoke Sewer Plant	1125
Montclair	1129
Lower North Lakes	1131
Salem Power Station	1468
Mason Creek	1498
Tinker Creek	1499

Rain Gauge Locations

Mason Cove	1111
Peters Creek	1112
Sugarloaf Mountain	1114
Witt's Orchard	1115
Fort Lewis Mountain	1117
Crawford's Ridge	1119
Mill Mountain	1120
Tinker Creek South	1121
Mason Creek	1122
Salem Pump Station	1123
Roanoke Sewer Plant	1124
Montclair	1128
Lower North Lakes	1130
Walnut Street	1438

Tab 3 to Flood Incident Annex
IFLOWS GAUGE MAP

