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# WASHINGTON COUNTY PLANNING ELEMENT



## Washington County Planning Subcommittee and General Description

The following entities participated in the DMA planning process through the Washington County Planning Subcommittee (CPS). The majority of local government entities participated through an “authorized representation” that enabled Washington County Emergency Management to participate in meetings on their behalf. These entities are indicated with an ‘\*’ below. CPS membership details are provided in Appendix C.

Participating Jurisdictions	Stakeholders
Washington County	USDA FSA**
Emergency Management (lead)	USDA NRCS**
Road and Bridge	Washington County CERT*
Ambulance	Washington County Senior Citizens
Town of Akron*	Washington County Mental Health
Fire Department**(***)	Y-W Electric Association
Town of Otis*	
Fire Department*	
Woodlin School District**(***)	
Arickaree Public School	
Akron Public Schools	
Southwest Washington County Fire Protection District**(***)	

\* County Emergency Management Participated on their behalf

\*\* Stakeholders that attended planning meeting(s).

\*\*\* New participant in 2009.

Washington County also involved the local CERT team at a planning meeting during the update this plan in 2009. This allowed the public to have a say in the development of new or revised action item recommendations.

## County Profile

Washington County is located in the northeastern region of the State in the high plains and includes the incorporated communities of Akron and Otis. The land area of Washington County is 2,521 square miles. According to the 2000 U.S. Census, the population for Washington County was 4,926. The 2008 population estimate from the Census is 4,630. The estimated housing density for the County is 1.8 people per square mile. Washington County grew at a rate of 2.4% between 1990 and 2000. Between 2000 and 2008, the County declined 6%. There are 2,366 housing units in the County for a housing density of .93 units per square mile. As of the 2000 Census, the median age in the County is 40.2 years. 6.2% of the population is under age 5 and 18.2% of the population is age 65

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or older. The average household size is 2.46 and the average family size is 2.97. 81.7% of the population (above the age of 25) is a high school graduate or higher and 14.3% of the population holds at least a bachelor's degree. 18.7% of the population (over the age of 5) claims some disability status and 5.2% of the population speak a language other than English at home. 8.6% of families live below poverty level, as does 11.4% of the population. The County is predominantly agricultural. The 2007 Agricultural Census notes there are 1,010 farms in the County and 1,375,742 acres of farmland. This accounts for 85% of the County's total area. The average farm size is 1,362 acres. A base map of the County can be referenced in Figure 1.

From 1883-1887, present day Washington County was part of Weld and Arapahoe counties. At that time Weld County covered an area from the front-range to the northern and eastern state lines. In 1887, Washington County was divided off of Weld and Logan Counties, running south along the baseline and eastward to the state line. Arapahoe County encompassed much of the southern parts of Washington County until it was divided in 1903, when the southern borders of Washington and Yuma counties were expanded to their present day locations.

## **Hazard Identification and Summary**

Washington County's planning team identified the hazards that affect the County and summarized their frequency of occurrence, special extent, potential magnitude, and significance specific to Washington County. This information is presented in Table 1. A detailed description of each hazard can be found in Section 4.2 Hazard Profiles.

**Table 1. Washington County Hazard Summary**

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/Severity	Significance
Biological Hazards				
Pestilence	Extensive	Occasional	Limited	Medium
Plague*	Limited	Likely	Limited	Medium
Blizzards & Severe Winter Storms	Extensive	Likely	Critical	High
Dam Failures & Levee Failures	Limited	Likely	Limited	Medium
Drought	Extensive	Likely	Critical	High
Earthquake	Limited	Occasional	Limited	Low
Flooding	Significant	Likely	Critical	High
Fog	Significant	Likely	Negligible	Low
Hailstorms	Extensive	Highly Likely	Limited	Medium
Land Subsidence	Limited	Likely	Negligible	Low
Landslides	Limited	Occasional	Negligible	Low
Lightning	Extensive	Highly Likely	Limited	Medium
Noxious Weeds	Extensive	Highly Likely	Negligible	Low
Straight-Line Winds	Extensive	Highly Likely	Limited	High
Temperature Extremes	Extensive	Highly Likely	Limited	Low
Tornados	Extensive	Likely	Critical	High
Wildland & Grassland Fires	Extensive	Highly Likely	Limited	High

\* Some zoonotic hazards have higher or lower ratings than those reflected here, based on individual datasets.

**Geographic Extent**

Limited: Less than 10% of planning area  
 Significant: 10-50% of planning area  
 Extensive: 50-100% of planning area

**Probability of Future Occurrences**

Highly Likely: Near 100% chance of occurrence in next year, or happens every year.  
 Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.  
 Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.  
 Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

**Magnitude/Severity**

Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths  
 Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability  
 Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability  
 Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

**Significance**

Low: minimal potential impact  
 Medium: moderate potential impact  
 High: widespread potential impact

## Washington County History of Recorded Natural Hazard Losses

The 2008 State Hazard Mitigation Plan notes that the County has primarily been subject to droughts and flooding resulting in disaster declarations.<sup>1</sup> A summary of the past hazard events are captured in Table 2 and in the text that follows.

**Table 2. Historic Hazard Events**

Date	Event	Location	Damages	Other Info	Data Source
Dec.4-6, 1913	Blizzard	County-wide		30" of snow largest in 100 years	FFA Weather Document
8/10/1924	Tornado	Thurman	12 deaths	Most from single tornado in CO history	NCDC
1930's	Drought	Dust Bowl	Farms abandoned		Planning Team
Nov. 4-6, 1949	Blizzard			24-30" of snow	FFA
Jan. 1-4, 1949	Blizzard			RR and highways shut down 4 weeks	FFA
6/26/1952	Tornado		\$250K	F2, 7 miles long, 33 yards wide	NCDC
3/31/1954	Tornado		\$3K		NCDC
4/12/1955	Tornado		\$25K		NCDC
7/20/1958	Tornado		\$3K	F2	NCDC
5/31/1965	Flood		Road out on 34, Bridge out on 63	Akron isolated:	NCDC
6/6/1967	Tornado		\$3K	F1	NCDC
7/5/1969	Tornado		\$3K		NCDC
5/8/1969	Flood	S. Platte		Fed. Dec. 15 counties	
5/10/1975	Tornado		\$25K	F3	NCDC

<sup>1</sup> 2008 State Hazard Mitigation Plan

Date	Event	Location	Damages	Other Info	Data Source
3/10/1977	Blizzard		Highline EA (approx 1,000) & Y-W EA Lost 5500 poles	Power out for week, some out for 30 days	REA
1980	Grasshoppers			State Dec	CO-OEM
1981	Grasshoppers			State Dec	CO-OEM
1982	Flood	Otis			
July, 1990	Drought	20 counties	\$1 billion (USDA)		USDA
5/29/1991	Tornado		\$25K		NCDC
6/20/1992	Tornado & Hail	Lone Star, then Platner to Otis	\$50K property damage \$14M in crop damage (FFA)		NCDC
7/1993	Tornado	Thrumman		A tornado wiped out an entire farmstead. There were no injuries.	
5/18/1994	T-storm winds	Otis	\$5K		NCDC
7/23/1995	Flood		\$101,489 road & bridge damage at 36 sites		CWCB
5/30/1996	Tornado	Elba	\$300K	F3	NCDC
10/29/1996	Winds	Akron		78 MPH	NCDC
9/19/1998	T-storm winds	Anton	\$200K	winds blew down grainbins and damaged buildings	NCDC, Newspaper, OEM
8/5/1999	Flood		\$772K		CWCB
5/12/2000	Freeze		50% loss to wheat & beets		NCDC
2000	Drought		(USDA Dec)		USDA
Spring 2001	Disease		78,000 acres of wheat 33% of crop	Strip Rust fungus Exacerbated by humidity	USDA
6/8/2001	Flood/Hail/ Tornado		\$90K to roads and bridges 100% loss of Millet & Sunflowers (1728 acres ea)	(NRCS) (USDA/FSA)	USDA/FSA NRCS
April 2001	Winter Storms Fed #1374		Ice damage HEA lost 16 poles = \$24K	\$0 paid approx \$600K est. (CO)	FEMA CO-OEM

Date	Event	Location	Damages	Other Info	Data Source
08/1 & 13/ 2001	Hail		135,000 acres	125 farms	NCDC
6/1/2002	Wildfire	West central County line		A lightning sparked wildfire burned over 12,000 acres	newspaper, OEM
8/24/2002	Flash Flood		\$150K to roads & bridges	Hwy 63 N. of Akron 2' water on Hwy 61 13 mi N. of Otis	NCDC
2002	Drought		\$1 Billion statewide (USDA)	9.49 annual rainfall, lowest in 95 years	USDA
8/24/2002	Hail	Akron Platner Anton Arickaree		2.75" 2.5" 2.75" 4.5"	
8/24/2002	Flood	Akron	\$50K	Floodwaters along the highway caused several cars, including a sheriff's vehicle, to slide into the ditch.	NCDC
8/28/2002	Flood	SW County	\$50K	Five county roads were washed out during the storm.	NCDC
5/20/2004	Hail	Messex		2"	NCDC
6/20/2004	Lightning	Akron	\$1.8K	Lightning struck several bales of hay near Akron. 60 tons of hay were destroyed.	NCDC
4/20/2005	Hail	Woodrow		4.25"	NCDC
6/2/2005	Lightning	Akron	\$25K	Lightning struck two oil refinery tanks. One of the tanks lost approximately 500 barrels of crude oil.	NCDC
9/7/2005	Hail	Akron	\$300,000 on roofs and Justice Center	3"	NCDC
11/14/2006	Dust Storm	Hwy 36 @ Arickaree hill (Anton)		A four car pileup auto accident with multiple injuries resulting from poor visibility because of blowing dirt on the highway.	SW Fire & Washington County Ambulance
7/11/2007	Hail	Arickaree		2"	NCDC

Date	Event	Location	Damages	Other Info	Data Source
6/4/2008	Flood	Otis		Basements, streets and roadways flooded and trees were blown down	OEM, Otis Fire, Town of Otis
6/4/2008	Flood	Akron	\$10K	A storm spotter near the intersection of County Roads 14 and P measured over 5 inches of rainfall.	NCDC
7/2/2008	Flood	Pinneo	\$15K	High water forced the closure of State Highway 34, between Brush and Akron.	NCDC
8/1/2008	Flood	Countywide		Heavy rains produced flooding which damaged roadways and temporarily closed Hwy 63	OEM, newspaper
8/6/2008	Flood	Messex	\$20K	Heavy rain caused considerable damage to several county roads and culverts south of Akron.	NCDC

(NCDC Filters Applied: Tornadoes ≥ F1; Hail ≥ 2"; Wind ≥ 75 MPH)

## Other Hazards in Washington County:

### Dams: 1

- Class I (High Hazard) Dam
- 0 Class II (Significant Hazard) Dams
- Known Failures: 0
- All Class I Dams in Colorado have emergency action plans in place.
- Levees: 0

**Drought Incidents:** 6 (regional occurrence)

**Dust Storm:** 1

**Earthquake:** No risk according to CGS survey.<sup>2</sup>

**Extreme Temperatures:**

<sup>2</sup> CGS, Earthquake Evaluation Report. See Earthquake Section in Hazard Identification Chapter for further explanation of risk.



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- Highest Recorded Temperature in County: 107°F
  - Lowest Recorded Temperature in County: -32°F
  - Severe Cold Incidents: 4

**Floods and Flash Floods:** 19

**Hailstorms:** 42

**Landslide:** Large area of “Suspected High Risk” in SW portion of County. There are no pipelines indicated in the area.

**Lightning:** Averages 13,100 strikes per year with 0 reported injuries and 0 reported deaths from 1980-2005.

**Severe Windstorms:** 127

**Severe Winter Weather:** 15

**Tornadoes:** (F1 or higher) 24 (Any Size) 102

**Wildfires:** sparked by lightning & railroad sparks. 6/1/2002, 12,000 acres burned – near western County line

**West Nile Virus:** 13 human illnesses, 0 deaths as of 2008

**Total number of injuries:** 23 + 13 West Nile cases

**Total number of deaths:** 4 + 0 West Nile cases

## Washington County Vulnerability Assessment

The intent of this section is to assess Washington County’s vulnerability separate from that of the planning area as a whole, which has already been assessed in Section 4.3 Vulnerability Assessment in the main plan. This vulnerability assessment analyzes the population, property, and other assets at risk to hazards ranked of medium or high significance that may vary from other parts of the planning area. For more information about how hazards affect the Region as a whole, see Chapter 4 Risk Assessment in the main plan.

### Assets at Risk

This section identifies Washington County’s assets at risk, including values at risk, critical facilities and infrastructure, historic assets, economic assets, and growth and development trends. Two data sources are used: assessed valuations, as available, and HAZUS-MR3 databases. The HAZUS building exposure (includes building counts, value of building structure and contents) is shown in Table 5.

### Total Values at Risk from Hazards:

- **Akron:** \$7,015,650 in Total Assessed Values
- **Otis:** \$1,549,490 in Total Assessed Values

- **Unincorporated County:**
  - Residential Improvements = \$4.842M
  - Commercial Improvements = \$2.393M
  - Industrial Improvements = \$47K
  - Agricultural Residential = \$3.462M
  - Manufactured Housing = \$285K
  - Agricultural Support Buildings = \$3.715M

**Table 3. Building Exposure**

City	Population	Building Count	Building Exposure (\$)	Building Content (\$)	Total Exposure (\$)
Akron	1,720	1,482	120,569,000	78,791,000	199,363,202
Otis	534	427	33,364,000	22,239,000	55,603,000
Unincorporated	2,672	2,630	151,097,000	95,005,000	246,107,302
<b>Total</b>	<b>4,926</b>	<b>4,539</b>	<b>305,030,000</b>	<b>196,035,000</b>	<b>501,065,000</b>

Source: HAZUS MH-MR3

**Table 4. County Building Exposure**

Type	Parcel Count	Value	Improved Parcel Count	Improved Value	Total Value
Residential	149	751,000	2859	131,972,010	132,723,110
Commercial	19	132,207	204	10,197,693	10,330,000
Industrial	0	0	4	186,686	186,686
Agricultural	3,443	87,534,655	1,405	15,055,928	102,590,583
Government	0	0	142	8,850,000	8,850,000
<b>Total Value</b>	<b>3,611</b>	<b>88,417,862</b>	<b>4,614</b>	<b>166,262,317</b>	<b>254,680,379</b>

Source: Washington County Assessor, 2008.

## Critical Facilities and Infrastructure

An inventory of critical facilities in Washington County is provided below in Table 5. The table includes data from available statewide GIS resources (locations are illustrated in Figure 1) supplemented with information from the Washington County CPS. There are no critical facilities in floodplains of Akron or Otis. The County maintains an inventory of critical facilities in the LEOP.

**Table 5. Critical Facilities Inventory**

Facility Type	Number of Sites	Est. Replacement Value	Capacity or Enrollment	Additional Information
<b>Essential Infrastructure</b>				
Airports (paved)	2			
Communications Towers	6	\$2.1 Million		
Correctional Facilities	1 (County jail complex)	\$10.0 Million		
Electrical Generation/Distribution				
Media Outlets	2			
National Guard				
Public Safety Communications Centers				
Public Safety Facilities				
Police Stations	1			
EMS/Ambulance Stations	2			
Fire Stations	5			
EOCs	1			
Town/City Halls/Courthouse	2			
Wastewater Treatment	2			
Water Utilities/Treatment	1			
Childcare Centers				
Schools	5		916 Students 150 Staff	
Shelters				

Facility Type	Number of Sites	Est. Replacement Value	Capacity or Enrollment	Additional Information
Hospitals				
Clinics	2	\$696,000		
Nursing Homes/Assisted Living Centers	3	\$2.6 Million		
<b>Natural, Cultural and Historic Resources</b>				
Community Centers	4			
Historic Properties				
<b>Hazardous Materials</b>				
Extremely Hazardous Substances				
Hazardous Chemicals storage				

## Natural and Historic Assets in Washington County

- Akron Public Library
- Akron Gymnasium
- Washington County Courthouse (Akron)
- Plum Bush Creek Bridge (Last Chance)
- West Plum Creek Bridge (Last Chance)
- Hoopes Drug Store (Otis)
- Otis Commercial District (100 block of S. Washington & 102 N. Washington)
- Otis Municipal Waterworks System
- Schliesfsky's Dime Store (Otis)

## Development Trends

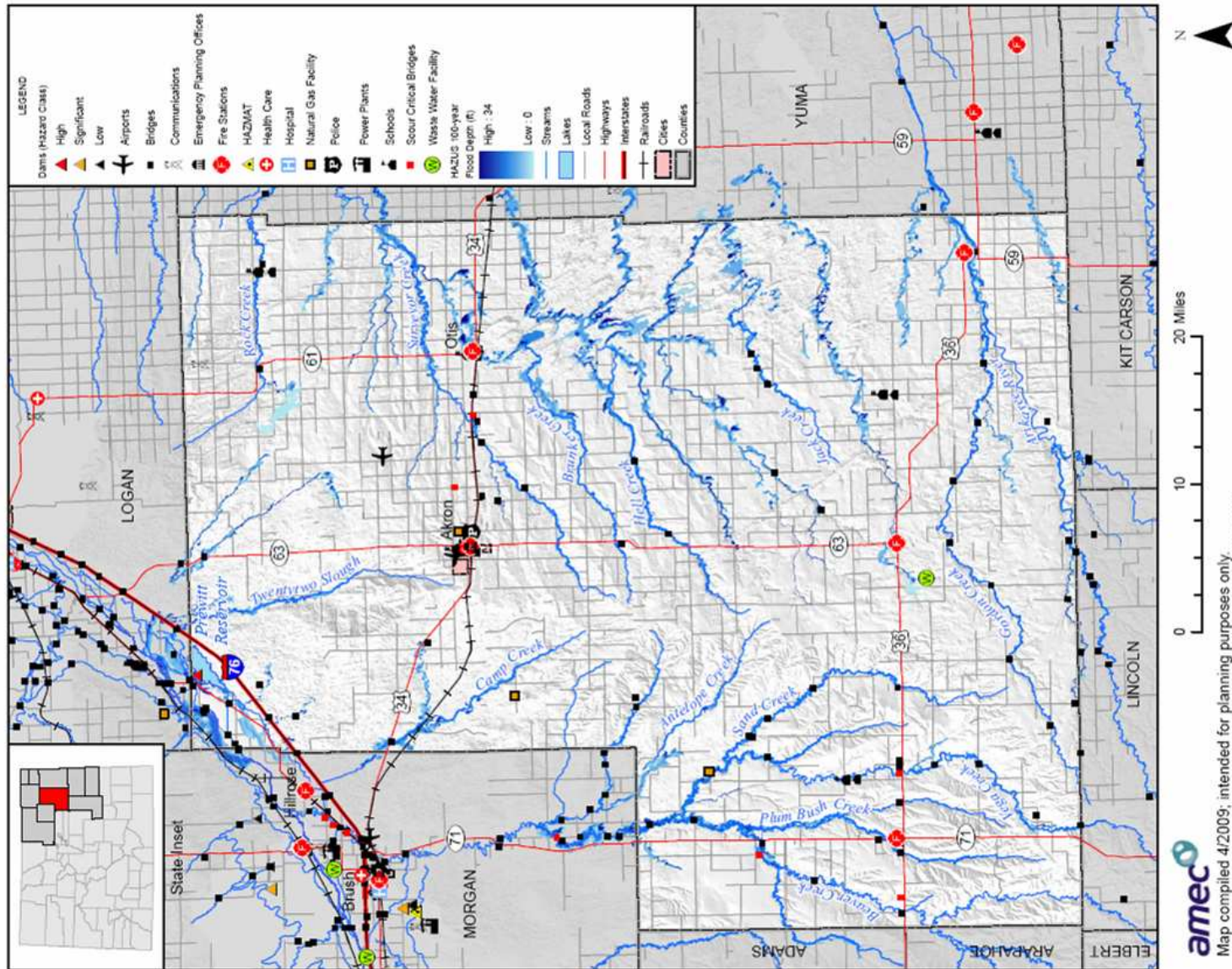
None. While the County has experienced limited growth, there is no distinguishable pattern as to where it occurs.

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## **Floodplain Vulnerability Assessment**

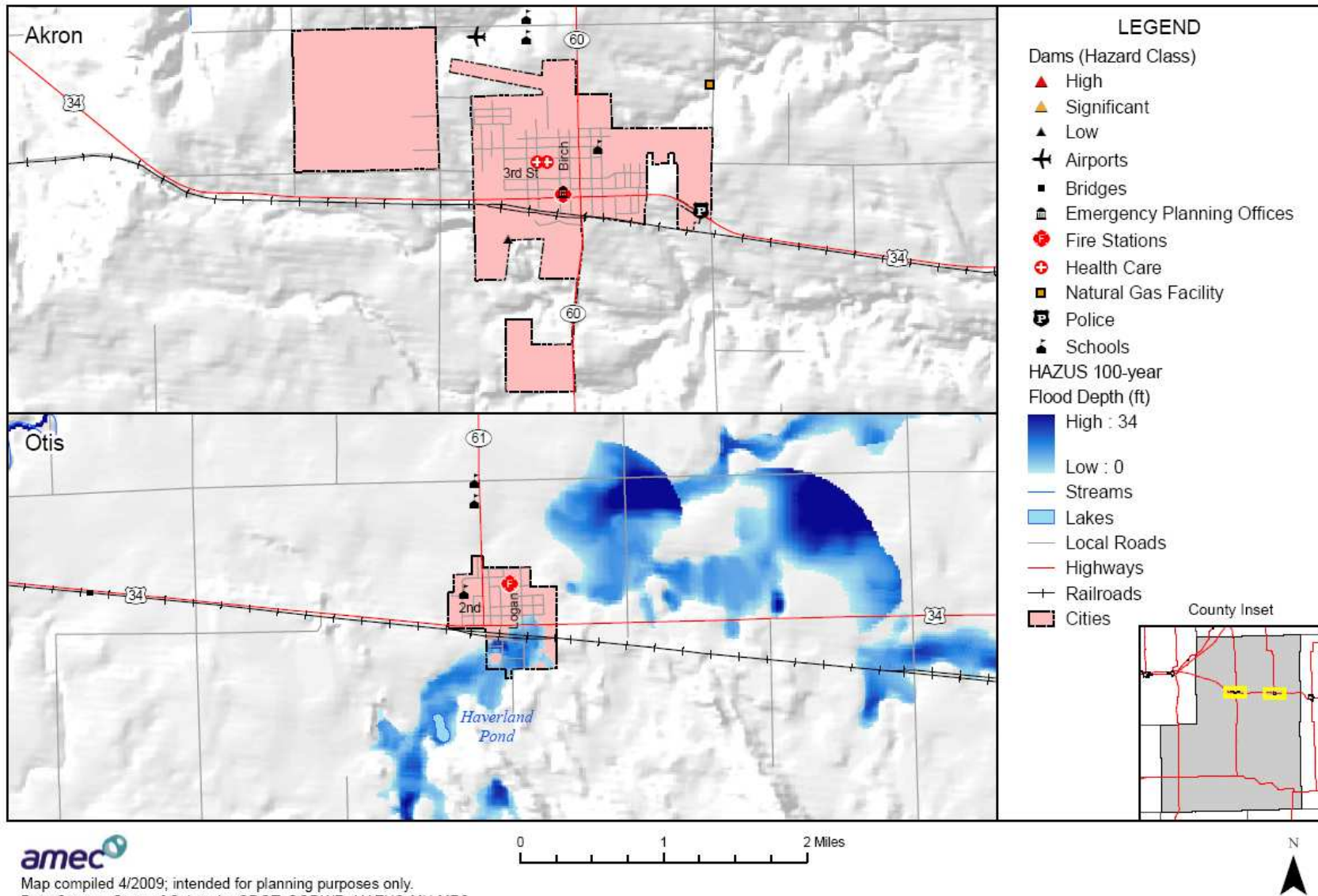
The best available flood data for Washington County was generated by HAZUS-MH MR3, FEMA's software program for estimating potential losses from disasters. See the base plan vulnerability assessment for a description of the HAZUS methodology. The 100-year floodplain generated with HAZUS-MH is shown countywide in Figure 1 and at municipal scales in Figure 2. Both maps indicate the location of critical facilities as well.

Figure 1 Washington County HAZUS 100-year Floodplain and Critical Facilities Map



Map compiled 4/2009; intended for planning purposes only.  
 Data Source: State of Colorado, CDOT, CODWR, HAZUS-MH MR3

**Figure 2 Washington County Cities HAZUS 100-year Floodplain and Critical Facilities Map**



Map compiled 4/2009; intended for planning purposes only.  
Data Source: State of Colorado, CDOT, CODWR, HAZUS-MH MR3

HAZUS-MH estimates the potential for over \$6 million in flood losses from a 100-year flood in the County. To estimate the monetary loss for each city, the flooded Census Blocks were extracted, and the damage costs were totaled using GIS. This was done for each city and unincorporated area to illustrate how the risk varies across the planning area, with the results summarized in Table 6. According to HAZUS-MH, the Town of Otis has the greatest flood risk and majority of the damage with \$1,629,000. The map in Figure 3 displays the distribution of the flood loss by Census Block across the County. According to the map in Figure 1 the majority of flood impacts in the unincorporated County are located on a drainage that feeds into Surveyor Creek which goes through the Town of Otis. According to the current FEMA FIRMs there are not any levees in Washington County.

**Table 6. Estimated Economic Losses from Flooding**

Jurisdiction	Cost Building Damage (\$)	Cost Contents Damage (\$)	Inventory Loss (\$)	Relocation Loss (\$)	Capital Related Loss (\$)	Rental Income Loss (\$)	Wage Loss (\$)	Total Loss (\$)	Percent of Total Loss	Loss Ratio
Akron	-	-	-	-	-	-	-	-	-	-%
Otis	765,000	835,000	20,000	-	3,000	-	6,000	1,629,000	24%	2.3%
Unincorporated	2,482,000	2,513,000	159,000	-	2,000	-	13,000	5,169,000	76%	1.6%
Total	3,247,000	3,348,000	179,000	-	5,000	-	19,000	6,798,000	100%	1.1%

The building damage loss ratio shown in Table 6 is an indication of the community's ability to recover after an event. Building Damage Loss Ratio percent is calculated by taking the Building Structural Damage divided by Building Structural Value and then multiplying by 100. Loss ratio exceeding 10% are considered significant by FEMA. The town with the highest building damage loss ratio is Otis with a loss ratio of 2.3% with a potential building damage loss of \$765,000.

According to a 2004 floodplain inventory there are 4 buildings in the floodplain in Akron: 2 residential buildings valued at \$60,224; one commercial building valued at \$2,313, and one building with no value found. There are 27 buildings in the floodplain in Otis: 20 residential buildings valued at \$555,061; 2 commercial buildings valued at \$312,369; and 5 buildings with no value found (M&M/Cargill storage bins/tanks on RR lease).

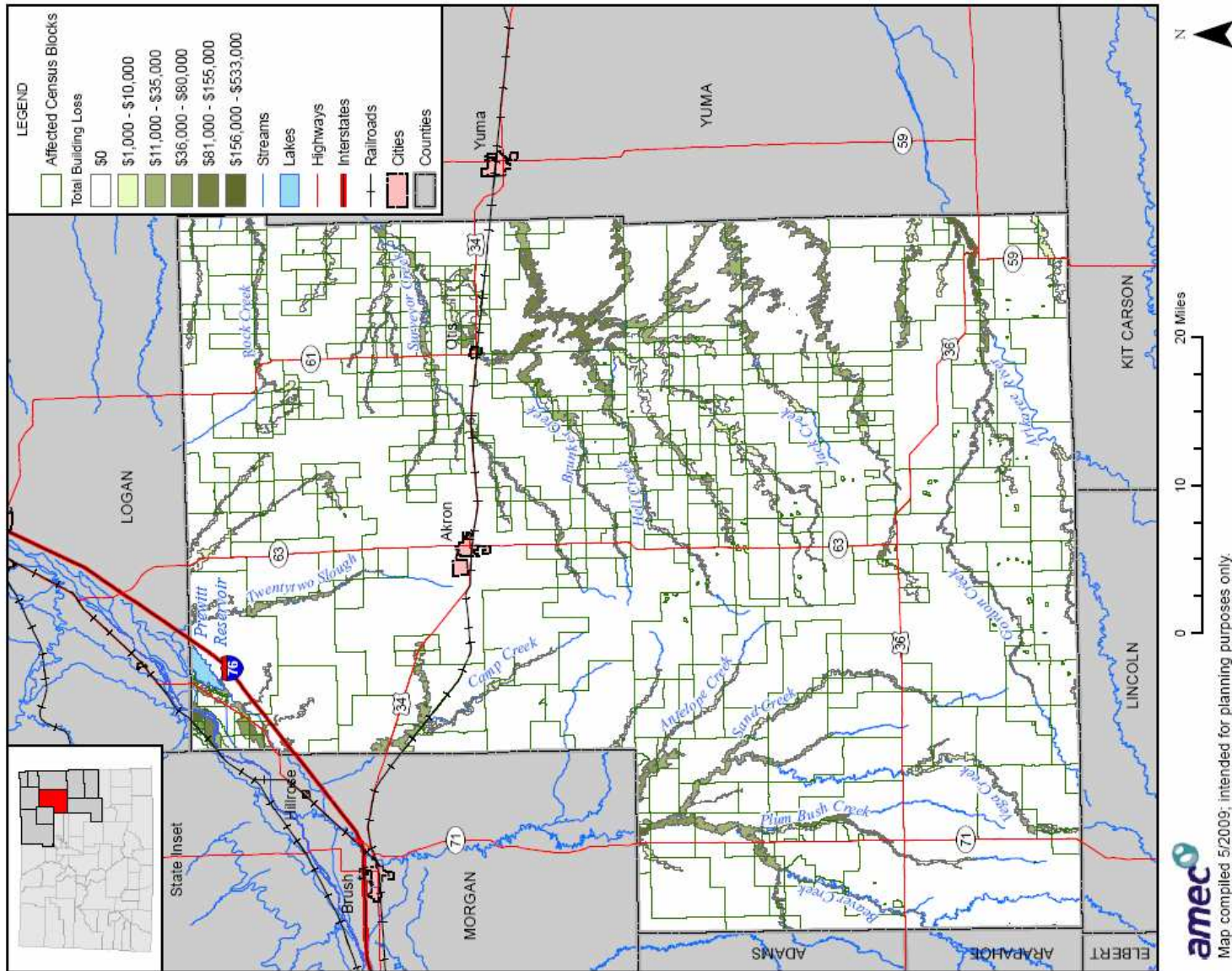
When comparing the HAZUS model results with the current FEMA FIRMs, it was observed that HAZUS does not represent flooding for an un-named tributary in the Town of Akron. The reason this stream was not studied within the model is due to the fact that this stream does not have a 10 square mile drainage area, which is a parameter set within the HAZUS procedure. If the model did account



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for the unnamed tributary there could be damage as it goes straight through town. The unincorporated County can not be compared since there are not any effective flood maps.

**Figure 3 Washington County Building Loss in the 100-year Floodplain**



Map compiled 5/2009; intended for planning purposes only.  
Data Source: State of Colorado, CDOT, CODWR, HAZUS-MH MR3

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### Floodplain Population Information:

The 2008 State Hazard Mitigation Plan estimates there are 38 people, 14 1-4 family structures, and 2 other structures in the County floodplains. Washington County was identified in the State flood risk assessment as Low Risk, based upon the floodplain population, the number of structures at risk, and the number of dams. The displaced population and shelter needs estimated by HAZUS are shown in Table 7.

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**Table 7. Population Displaced by Flooding**

Jurisdiction	Displaced Population	Population Needing Shelter
Akron	-	-
Otis	93	16
Washington County	235	14
Total	328	30

Source: HAZUS MH MR3

### Critical Facilities

Critical facilities in the floodplain were determined using GIS, by selecting all critical facilities that fell within the floodplain. These are listed in Table 8 and shown on the maps in Figures 2 and 3.

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**Table 8. Critical Facilities in the Floodplain**

Flooded Critical Facility	Name	Near City
Natural Gas Facility	Samedan Oil Corporation	Akron

### Washington County Scour Critical Bridges

Included with HAZUS-MH is a database of bridges called the National Bridge Inventory developed by the Federal Highway Administration. One of the database items is a “scour index,” which is used to quantify the vulnerability of a bridge to scour during a

flood. Bridges with scour index between 1 and 3 are considered “scour critical,” or a bridge with a foundation element determined to be unstable for the observed or evaluated scour condition.

There are 5 scour critical bridges in Washington County. They are all located on the highways that travel through Washington County. Two scour critical bridges are located between Akron and Otis, one is on US 34 at Surveyor Creek. The other bridge is located on County Road GG at the intersection of an unnamed tributary to Surveyor Creek. There are 3 scour critical bridges in the southwest portion of Washington County, away from any cities. One is located on County Road F at the intersection of Beaver Creek. Two are on US 36, one at Vega Creek and the other at an unnamed tributary to Beaver Creek.

The location of these bridges is shown in Figure 1, and described in detail in Table 9.

**Table 9. Scour Critical Bridges**

Name	Road Type	Stream	Near City
County Road F	Local Road	Beaver Creek	Southwest portion of Washington County
US 34	Rural Regional Highway	Surveyor Creek	Between Akron and Otis
US 36	Rural Regional Highway	Unnamed tributary to Beaver Creek	Southwest portion of Washington County
County Road GG	Local Road	Unnamed tributary to Surveyor Creek	Between Akron and Otis
US 36	Rural Regional Highway	Vega Creek	Southwest portion of Washington County

### NFIP Claims Analysis

There are 2 policies in force in Washington County. Detail is shown in Table 10.

**Table 10. Policies and Claims Information**

CID	Community Name	Total Premium	V-Zone	A-Zone	No. Policies	Total Coverage	Total Claims since 1978	Total Paid since 1978
80178	Otis, Town of	\$1,739			2	\$49,000	0	\$0
	County Total	\$1,739			2	\$49,000	0	\$0

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### **NFIP Mapping Information:**

- **Akron:** Panel # 080177, 2 panels, (FHBM), 3/5/76 (converted by letter 4/1/88).
- **Otis:** Panel # 080178 001 FIRM, (rescinded by CWCB 5/99, H&H revised in 2002).
- **County:** Never mapped

### **Repetitive Loss Properties:**

There are no repetitive loss properties in the County.

### **Dam and Levee Failure Vulnerability Assessment**

There is one high hazard dam in Washington County on Prewitt Reservoir. Impacts would mainly affect areas outside the County if it failed (Logan County primarily).

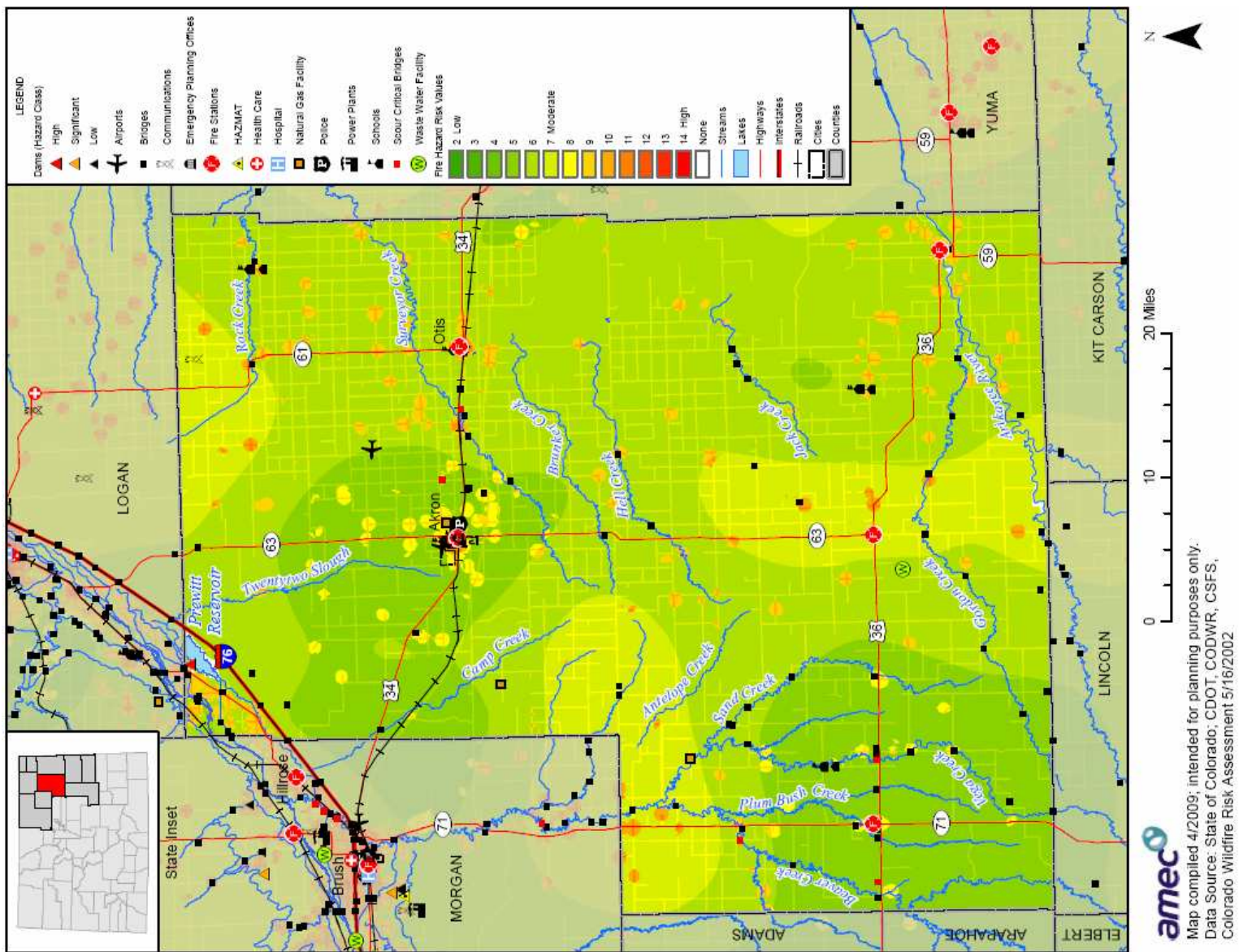
There are no identified levees within the County.

### **Wildfire Vulnerability Assessment**

#### **Washington County Wildland Urban Interface**

The Wildland Urban Interface map in Figure 4 for Washington County shows low to high fire hazard risk values. The majority of the County has low values with the higher values around the communities of Akron and Otis. Otis has the highest fire risk in the County with values between moderate and high with the higher values within the city limits. Akron has a mixture of low to moderate fire values. The middle of the city has a low risk value where the majority of commercial and residential areas are located. The moderate values are out by the city limits and surrounding unincorporated County.

Figure 4 Washington County Wildland Urban Interface



**amec**  
 Map compiled 4/2009; intended for planning purposes only.  
 Data Source: State of Colorado, CDOT, CODWR, CSFS,  
 Colorado Wildfire Risk Assessment 5/16/2002

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## Critical Facilities

A GIS overlay was used to identify certain facilities in the moderate to high fire risk areas. The facilities identified within a moderate to high wildfire risk area are summarized in Table 11. The following narrative describes each community and potentially at risk critical facilities.

There are 81 Critical Facilities in a moderate to high fire hazard in Washington County. Akron has three facilities in the fire hazard: one fire station, one police station and one school. Otis has one fire station and one school in the fire hazard. The unincorporated County has 76 critical facilities in the fire hazard: one airport, 56 bridges, two scour critical bridges, one communication tower, three fire stations, two natural gas facilities, one dam, and ten schools.

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**Table 11. Critical Facilities Subject to Fire Hazard (by type)**

Facility Type	Facility Count
Airports	1
Bridges	56
Communications	1
Dams	1
Fire Stations	5
Natural Gas Facility	2
Police	1
Schools/Childcare Facilities	12
Scour Critical Bridges	2
<b>Total</b>	<b>81</b>

## Agricultural Vulnerability Assessment

Agriculture is an important aspect of the County's economy. The following discussion analyzes the potential losses from floods using HAZUS and multiple hazards from federal crop insurance records.

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## HAZUS Methodology for Agriculture Economic Losses

The agriculture component of the HAZUS Flood Model estimated a range of losses to barley, corn, corn silage, oats and wheat. These crops were the only crops identified by the HAZUS model to have loss within the region of study. The model assumes a short duration and slow rise flood when estimating losses and does not account for high velocity flash floods. Loss estimates are based on United States Army Corp of Engineers (USACE) damage modifiers. The HAZUS-MH impact analysis predicts a loss estimate value by crop for flow time intervals. The first is a loss estimate for the day of the fixed event; the remaining three are for 3, 7 and 14 days following the event.

The agricultural products in Washington County that show economic loss are corn, corn silage, and wheat. Corn's total loss is \$37,690,359, corn silage's total loss is \$108,393,964 and wheat's total loss is \$25,132,060. The total loss of all of these products is \$171,216,383. More detail is given in Table 12

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**Table 12. Washington County Direct Economic Loss for Agriculture Products**

Agriculture Product	Crop Loss Day 0 (\$)	Crop Loss Day 3 (\$)	Crop Loss Day 7 (\$)	Crop Loss Day 14 (\$)	Total Loss (\$)
Corn	0	10,279,189	13,705,585	13,705,585	37,690,359
Corn Silage	0	29,561,990	39,415,987	39,415,987	108,393,964
Wheat	0	6,854,198	9,138,931	9,138,931	25,132,060
Total	0	46,695,377	62,260,503	62,260,503	171,216,383

## Crop Insurance Analysis

Federal Crop Insurance Data represents losses from multiple hazards that could include: biological hazards, flooding, drought, hailstorms, noxious weeds, temperature extremes, tornados, wildfires and straight-line winds. Average annual claims payout amount to \$2.2 million in the County. More details are provided in Table 13 and 14.



**Table 13. Washington County Premium and Loss Data for Federal Crop Insurance from 1980 through 2007**

Liability(Amount of Coverage)	Total Premium	Federal Premium Subsidy	Farmer-paid Premium	Amount Paid in Claims	Average Amt. Paid Annually in Claims
442,046,102	60,728,713	32,384,833	28,343,880	61,645,859	2,201,639

Source: Federal Crop Insurance Services

**Table 14. 2008 Washington County Provisional Data (claim data unavailable as 2008 claims are not fully reported)**

Liability(Amount of Coverage)	Total Premium	Federal Premium Subsidy	Farmer-paid Premium
61,578,736	13,293,766	7,717,981	5,575,785

Source: Federal Crop Insurance Services

## Washington County Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. The capabilities assessment is divided two sections: regulatory mitigation capabilities and additional mitigation projects and capabilities. The regulatory mitigation capabilities for the County and its municipalities are summarized in Table 15. Refer to the Introduction to the County Elements for an explanation of the capability assessment matrix.

**Table 15. Regulatory Mitigation Capabilities**

	Washington	Akron	Otis
Comp Plan	Y		
Land Use Plan	Y		
Subdivision Ord			
Zoning Ord	Y		
NFIP/FPM Ord	N	Y	Y
- Map Date	N/A	04/88(L)-FHBM	8/85(M)-FIRM
- Sub.Damage?			
- Administrator?		Y	Y

	Washington	Akron	Otis
- # of FP Bldgs?		4	27
- # of policies	N/A	0	0
- # of RL's?	N/A	N/A	N/A
CRS Rating	N/A	N/A	N/A
Stormwater Prgrm	N	N	N
Building Code	State P&E	State P&E	State P&E
Building Official.	N	N	N
- Inspections?	State P&E	State P&E	State P&E
BCEGS Rating	N	N	N
LEOP	Y	C	C
HM Plan	In Progress	C	C
Warning	Y	Y	Y
Storm Ready?	Y	C	C
Weather Radio?	Y	C	C
Sirens?	Y-2	Y	Y
Emergency Warning Notification?	Y	C	C
Other?	website	C	C
GIS System	N	N	N
Structural Projects	N	N	N
Property Protection	N	N	N
Crit.Fac.Protection	N	N	N
Natural Res. Inv.	Y	N	N
Cultural Res. Inv.	Y	Y	Y
Erosion Control	N	N	N
Sediment Control	N	N	N
Pub. Info Prgrm	Newspaper, website	Coffee Shop!	Y
Env. Ed Prgrm	N	N	N

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## Other Mitigation Capabilities (Programs/Projects in Place)

- The Y-W Electric Association has an ongoing Hazard Mitigation program – though they don't formally call it that. The program is implemented as an ongoing effort, and affects both new construction & rebuilding. Y-W has increased their heavy loading criterion over the industry design standard. The industry standard is .5 inch of radial ice and 4 pounds of wind per square foot. Y-W's criterion is 1.25 inches of radial ice and 12 pounds of wind per square foot (69.3 miles per hour). The industry standard for pole placement is 18 poles per mile, which equates to between-pole spans of 280-300 feet. The higher loading criterion adopted by Y-W now requires the use of shorter spans (between 223-256 feet), larger poles, and heavier pole top construction.
- The ABC Development day-care center has installed a tornado "Safe-Room."

## Washington County Mitigation Goals & Recommendations

**Action Item #1:** *County should work to become certified as "Storm Ready" by National Weather Service.*

**Issue Statement:** A primary goal of the Northeast Colorado Emergency Managers Association multi-jurisdictional DMA Hazard Mitigation Plan is for each county to become "Storm Ready" certified within the next three years. "Storm Ready" certification is an indication that the community has prepared for adverse weather conditions, trained officials and citizens to recognize and report adverse weather conditions, and has established and regularly tested a system for receiving and disseminating severe weather information and warnings to the public. Warning is critical as tornadoes are the most frequently occurring hazard in the County.

**Implementation Manager and strategy:** Washington County Emergency Manager will contact the National Weather Service to determine what Washington County needs to accomplish, and then seek funding through grants to make the needed improvements.

**Priority:** High

**Cost Estimate:** Up to \$50,000 for 2 NOAA "Weather Radio" "repeaters" throughout the County. Existing coverage is inadequate, particularly near the Town of Cope. The County will also need to purchase "Weather Radios" for all government buildings, and sponsor training and public education.

**Cost-Effectiveness Explanation:** The potential for saving just one life, and providing time for individuals and businesses to take effective actions to protect property, far outweighs the potential cost. This goal and recommended action was selected by the MCPC. It may be the single most effective action the County and the entire Planning Area can undertake to reduce future disaster losses.

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**2009 Update:** This project is complete.

**Action Item #2:** *The towns of Akron and Otis will continue to comply with the National Flood Insurance Program in part by providing “Refresher Training” for local lenders and insurance agents regarding the NFIP, publicizing the NFIP, and promote the purchase of insurance for structures in the floodplain.*

**Issue Statement:** There are 27 buildings in floodplain in Otis and 4 in the floodplain in Akron, but there are zero (in 2004) policies in force in either community. Otis has most at risk. In Otis, approximately \$1 million in damage would occur if all structures were lost. The 100-year flood would average about two feet deep. Statistically, there is a 1% chance in any given year of incurring \$200K in damages. Property owners should be afforded the opportunity to protect against these losses if they so choose.

**Implementation Manager and strategy:** County Emergency Manager, in conjunction with the Otis and Akron Town Managers and Councils, should invite the CWCB to conduct “Refresher Training” for both lenders and insurance agents. CWCB and FEMA can also provide public information brochures describing the benefits of purchasing flood insurance. Each community should annually notify flood prone occupants of their location and of the availability of flood insurance. As part of continued compliance with the NFIP the towns will periodically update their ordinance and continue to enforce the ordinance regarding proposed development in the floodplain.

**Priority:** High

**Cost Estimate:** Can be accomplished within existing budgets or with minimal expense.

**Cost-Effectiveness Explanation:** There is little or no increased cost to the Town. The benefits are to flood prone building owners who choose to insure against flood losses, and to taxpayers who no longer would be faced with subsidizing those potential losses.

**2009 Update:** The town of Otis has 2 policies now.

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**Action Item #3:** *Washington County and the Town of Otis should continue to work with the Colorado Water Conservation Board (CWCB) in their ongoing efforts to reduce future flood losses.*

**Issue Statement:** The Town of Otis is susceptible to flooding. In a recent study, “Flood Mitigation Alternatives Study, Town of Otis” developed by McLaughlin Water Engineers for the Colorado Water Conservation Board (January 2003). The study examines non-100-year channel improvements to a newly delineated floodplain based upon changes and improvements made since the date of the original FHBM. It suggests a variety of mitigation tools in combination with each other.

**Implementation Manager and strategy:** County Emergency Manager, in conjunction with the Otis Town Manager and Council, should continue to work with CWCB to identify flood-prone areas and search for cost-effective solutions, including public information about flooding, flood damage, and flood protection actions that individual property owners can undertake. The least expensive and most effective action the Town can undertake to keep matters from worsening is to stringently regulate new development in the floodplain.

**Priority:** On-going

**Cost Estimate:** Can be accomplished within existing budgets or with minimal expense.

**2009 Update:** This project is still ongoing.

## **New 2009 Objectives**

**Action Item #4:** *Flood Mapping and Flood Mitigation*

**Issue/Background:** There is a need in Washington County to map the unincorporated portions of the County. An accurate map will lead to better flood mitigation plans.

**Other Alternatives:**

- Public Information
- Remove Debris Upstream
- Diversions

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- Acquire and relocate town.

**Responsible Office:** Office of Emergency Management with assistance from County Commissioners and Colorado Water Conservation Board

**Priority (High, Medium, Low):** High

**Cost Estimate:** Unknown, but investigations are ongoing.

**Benefits (Avoided Losses):** More complete and accurate mapping in the county allows for a better discussion of risk and the formulation of more accurate and helpful mitigation plans, actions, and projects.

**Potential Funding:** Unknown, but investigations are ongoing.

**Schedule:** Until a cost estimate and funding sources can be identified, a schedule is impossible to determine. However, in the next 24 months, the communities and county intend to investigate this action item for further development and inclusion in future planning efforts in a more complete form.

#### **Action Item #5: NOAA Repeater**

**Issue/Background:** There is a coverage gap in the north part of the County that makes receipt of NOAA difficult and/or impossible. This area is a major population center of the county, with approximately 2/3 of the County population residing here. It is also where the Woodlin School District, Arickaree Public School, and Akron Public Schools are located. Most businesses and 1/2 of the residents have radios, but the feedback from citizens is that they don't work. The County will contact the National Weather Service about establishing a repeater.

#### **Other Alternatives:**

- Cell phone and alerts
- Public education
- More spotters
- Have reverse 911 but dispatch in Yuma delay.

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**Responsible Office:** OEM/EMD, NWS

**Priority (High, Medium, Low):** High

**Cost Estimate:** \$50,000

**Benefits (Avoided Losses):** Better warning and coverage for prompt and timely notice, in addition to the appropriate level of warning over a siren, especially to the Woodlin School District, Arickaree Public School, and Akron Public Schools, which all house vulnerable populations.

**Potential Funding:** Community Development Block Grants, Energy Impact Grants, USDA Rural Development Grants, fundraisers.

**Schedule:** Under Development

#### **Action Item #6: Multi-Use Community Space and Severe Weather Shelter at Fairgrounds in Akron**

**Issue/Background:** There is no shelter space for public shelter at the fairgrounds. The fairgrounds are a popular and often used central location. In fact, the fair grounds are used at least three times a week year round. As there are no shelter alternatives in the area, a severe weather shelter is needed

**Other Alternatives:**

- Try to use alternate location and staffing
- Classes and public awareness

**Responsible Office:** OEM/SO

**Priority (High, Medium, Low):** High

**Cost Estimate:** Unknown – have plans.

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**Benefits (Avoided Losses):** Population protection combined with event space. Can be used for storage. The fair has a large attendance base that would need protection in case of a weather emergency.

**Potential Funding:** Grants, CDB Grant, Fundraising, Stimulus money (PDM, DHS), Red Cross

**Schedule:** 18 months

### **2009 Wildfire Mitigation actions**

The following actions are wildfire mitigation actions written for the 9 county region that the County and Southwest Washington County Fire Protection District will undertake or participate in (See Appendix C for details). The Woodlin School District, Arickaree Public School, and Akron Public Schools will also participate as they are bordered or surrounded by CRP lands or fields that could put students and buildings at risk of fast moving prairie fires,

- Update wildfire risk assessment
- Develop Countywide CWPPs
- Develop Wildfire pre-attack plans
- Develop County Annual Operating Plans for wildfire
- Host Firewise presentations

### **Other Mitigation actions being considered by Washington County**

The following actions were identified in the CPS Actions Meeting in May 2009 for future consideration by the County.

- Clear areas around oil wells in grassland areas
- Retention Ponds
- Blizzard mitigation actions
- Sidewalks/parks/public areas renovations
- Expand the CERT program targeted to the middle- and high-school students to include a heavier emphasis on preparedness and mitigation activities in order to increase resiliency and readiness among the population.