

2004
Crawford County
All Natural Hazard
Pre-Disaster Mitigation
Plan



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INTRODUCTION

The Crawford County Emergency Management Agency, in accordance with the Disaster Mitigation Act of 2000 (Public Law 106-390), has prepared this Multi-Jurisdictional Natural Hazard Mitigation Plan for all of Crawford County. The Plan will demonstrate that all Townships, Cities, and Villages have participated and each community, as a part of the planning process, will identify local problems and mitigation activities to help reduce hazards, damage, and loss of life during a natural hazard event. Each jurisdiction participated in the planning process. Cities, the county, and the Village of New Washington were represented on the Mitigation Committee. The villages of Chatfield, Tiro, and North Robinson participated through involvement in the Regional Planning Commission.

The Crawford County Natural Hazards Mitigation Planning Committee has prepared this Plan based on the analysis, policies, and actions of Crawford County citizens and has shown how they will achieve, grow, and maintain sustainability and disaster resiliency.

The Crawford County Board of Commissioners will be responsible for adopting the Crawford County, Ohio Natural Hazards Mitigation Plan. The County Commissioners will be the public authority to promote and oversee sound mitigation processes and activities.

ORGANIZING RESOURCES

CRAWFORD COUNTY NATURAL HAZARDS MITIGATION PLANNING COMMITTEE

The Crawford County Natural Hazards Mitigation Planning Committee has met monthly since December 2002 to guide in the development of the Crawford County Natural Hazards Mitigation Plan. The Committee consists of representatives from the following public and private sector of Crawford County.

- Crawford County Office of Homeland Security and Emergency Management Agency
- Crawford County Regional Planning Commission
- Crawford County General Health District
- Crawford County Sheriff's Office
- City of Bucyrus
- City of Galion
- City of Crestline
- Village of New Washington
- Crawford County Development Board
- Representative of Crawford County Township Trustee Association

COMMUNITY ASSISTANCE

Information was requested from various individuals and organizations interested in natural hazards planning. These requests were intended to provide insight and additional information helpful to reduce risk from natural mitigation hazards.

Those participating included:

- Citizens of Crawford County
- Local Fire and Rescue Authorities
- Health Department Officials
- Soil & Water Conservation Officials
- Agricultural Department Personnel
- School District Personnel
- Ohio Emergency Management
- Red Cross Representatives
- Crawford County Planning Officials
- Crawford County Emergency Management Agency
- Crawford County Board of Commissioners
- Crawford County Township Trustees Association
- Various City, Village, and Township Officials and Staff
- Various Community Leaders

PUBLIC MEETINGS

There were five public meetings held in Crawford County for the Pre-Disaster Mitigation Plan. Four meetings were held in the four largest communities in the county and one meeting was held during a Crawford Regional Planning Commission meeting. Attendance figures do not include Crawford Regional Planning and Crawford County EMA staff.

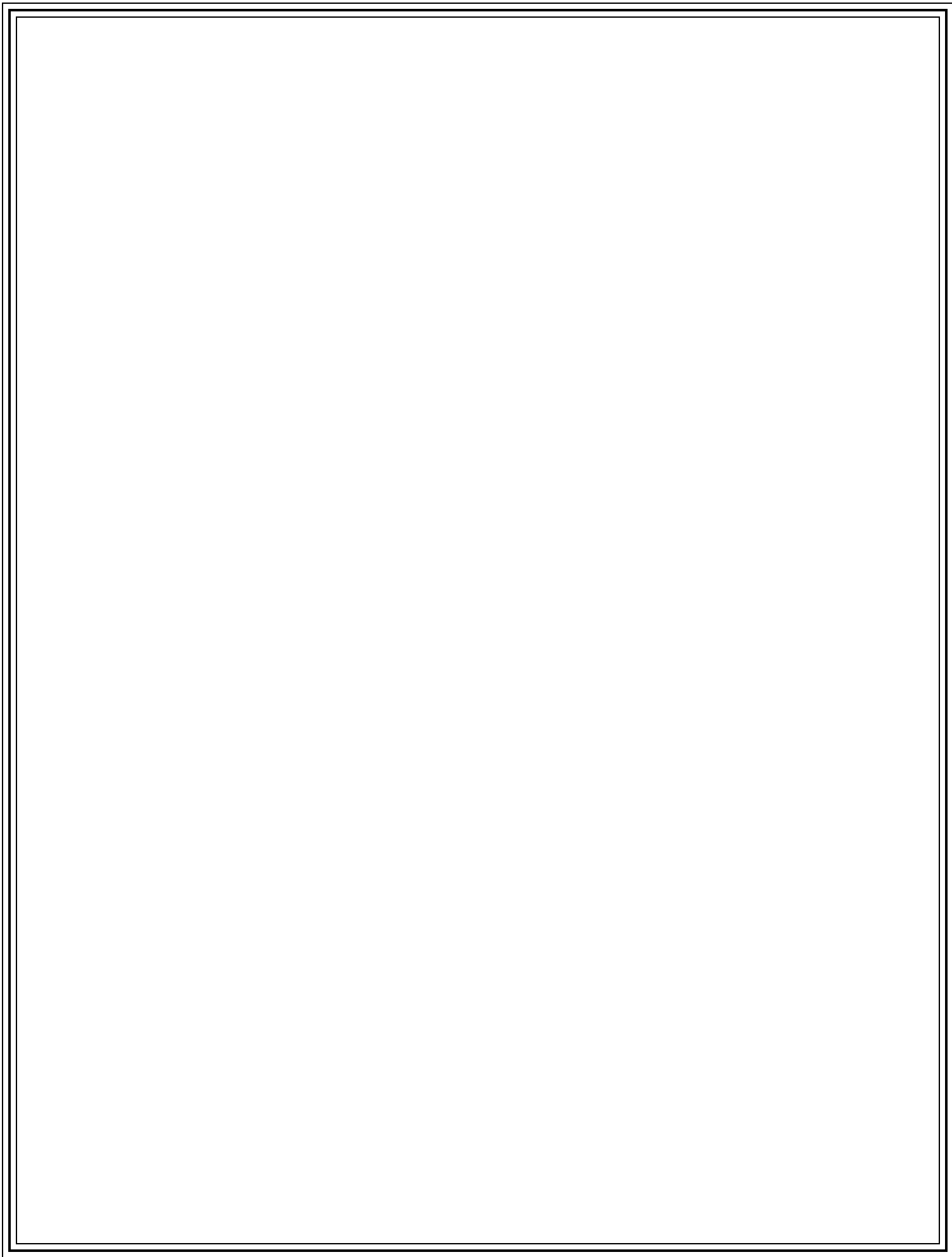
Galion
Galion City Building
August 12, 2004
Attendance: 0

Crawford Regional Planning Commission
Crawford County Engineer's Office
August 25, 2004
Attendance: 16

Bucyrus
August 26, 2004
Bucyrus City Hall
Attendance: 0

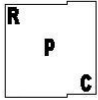
Crestline
Crestline City Hall
September 7, 2004
Attendance: 0

New Washington
Buckeye Central High School
September 14, 2004
Attendance: 1



Sample of News Release

CRAWFORD



CRAWFORD REGIONAL PLANNING COMMISSION

112 EAST MANSFIELD STREET, SUITE 207

BUCYRUS, OH 44820

(419) 562-8566 FAX: (419) 562-3491 E-MAIL: RPC@CRAWFORD-CO.ORG

NOTICE OF PUBLIC MEETING

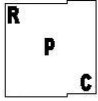
The Crawford Regional Planning Commission and the Crawford County Emergency Management Agency will be holding a public meeting for the Fiscal Year 2004 Crawford County All-Natural Hazard Mitigation Plan on September 7 at 7:00 pm in council chambers at Crestline City Hall, 100 North Seltzer Street, Crestline.

The purpose of the plan is to show how previous natural hazard events have affected the county and also what steps the community can take to minimize the impact from future events. For those unable to attend the meeting, a copy of the plan will be available for review at the Crestline Public Library from September 8 through the 22. Interested individuals will be able to submit written comments.

For more information please contact the Crawford Regional Planning Commission at (419) 562-8566 or rpc@crawford-co.org.

Letter to other counties

CRAWFORD



CRAWFORD REGIONAL PLANNING COMMISSION

112 EAST MANSFIELD STREET, SUITE 207

BUCYRUS, OH 44820

(419) 562-8566 FAX: (419) 562-3491 E-MAIL: RPC@CRAWFORD-CO.ORG

TO: All County Emergency Management Agencies adjoining Crawford County

FROM: Crawford Regional Planning Commission & Crawford County Emergency Management Agency

RE: Crawford County FY 2004 All Natural Hazard Mitigation Plan

DATE: February 12, 2004

Crawford County has received funding to begin the creation of its 2004 All Natural Hazard Pre-Disaster Mitigation Plan. As you may know, the purpose of the plan is to evaluate the history of natural disasters in Crawford County and what can be done to prepare for future natural disasters. If you have any questions, comments, or concerns about this project please call the Crawford Regional Planning Commission at (419) 562-8566 or the Crawford County Emergency Management Agency (419) 562-6009.

Crawford County Pre-Disaster Mitigation Committee
February 9, 2004 9:00 am

Committee Present:

Tim Flock, EMA	Mike McBeth, Regional Planning
Scott Robertson, New Washington	David Bauer, Crestline City
Don Long, CCBBD	Larry Feick, Sheriff Office
Mick Christini, Galion City	

Committee Absent:

City of Bucyrus	Crawford County Soil and Water
Galion Industrial Development	Crawford County General Health District

The meeting was called to order by Tim Flock, Crawford County EMA Director at 9:00 am. A brief description of the grant was given and the introduction of Mike McBeth, Crawford County Regional Planning was given. Regional Planning has contracted with Emergency Management to handle the Pre-Disaster Mitigation Plan. The grant total is for \$31,225 with \$7,806 an in kind match for the county. The county match will be in-kind match and time spent at meetings by each of us will be considered as payment. A sign in sheet must be completed at each meeting.

Mike McBeth gave a presentation on requirements of plan and participants of the Core Committee. The presentation covered the reasons we must complete this plan and how the county must go about doing so. To recap the Pre-Disaster Mitigation Plan must be completed by counties to show a work plan to help prevent and minimize loss of property and life in an event. Without an approved plan Crawford County **WILL NOT** receive any further Pre or Post Disaster Mitigation funds or support from the state or federal government. Each City, Village and Township must show participation in the planning process, and adopt the plan upon final reviews and approvals. A copy of the Presentation is attached.

The Core group believes several other agencies may want to become involved as either a core member or as a subcommittee member for specific hazards. It was recommended that we contact OSU extension, Township Trustees, County Engineer, FSA and Dept. of Natural Resources for additional committee members.

Concerns of Public outreach was discussed and a decision to use civic groups and media to release information on a regular basis throughout the planning process. A press release on the planning process will be sent to all local media outlets before next meeting.

Question about specific hazards to the county and what is covered under the plan were asked. Specific natural hazards the group spoke about and would like included in the plan are: drought, snow emergencies, tornadoes, wind damages, flooding, ice damages, and earthquakes. Other hazards to consider include terrorism, hazardous material release, natural gas pipelines, and energy shortages.

Meeting frequency, time and location was discussed. A monthly meeting schedule is set for the core group and specific subcommittee meetings on specific disasters being scheduled as needed. The next meeting date is March 8, 2004 9:00 am at the Emergency Operations Center (EOC) in the basement of Sheriff's Office.

Although the federal grant deadline is August 5, 2005 the committee set a county timeline to follow. The timeline has a draft plan available for review by June 30, 2004. A public meeting will be set for early July 2004. October 2004 Ohio Emergency Management Agency and FEMA will be sent plans for approval. Final approval expected by November 1, 2004. The early timeline follows FEMA requirements for pre and post disaster mitigation grant funding.

Questions or comments can be directed to Crawford County EMA (419) 562-6009 or Crawford County Regional Planning (419) 562-8566.

Minutes Completed By: Tim Flock, Director Crawford County EMA

Crawford County Pre-Disaster Mitigation Committee
April 5, 2004 9:00 am

Committee Present:

Tim Flock, EMA	Mike McBeth, Regional Planning
Scott Robertson, New Washington	David Bauer, Crestline City
Larry Feick, Sheriff Office	
Mick Christini, Galion City	

Committee Absent:

City of Bucyrus	Crawford County Soil and Water
Galion Industrial Development	Crawford County General Health District
Crawford County Development Board	

The meeting was called to order by Tim Flock, Crawford County EMA Director at 9:00 am.

Mike McBeth updated task force members on the progress of the plan.

-The lost history events were analyzed and presented

Members also discussed a timeline for the plan. It was decided that it would be more effective for the group to rely on EMA and Regional Planning Staff to do the work and provide updates to committee members rather than doing the work as a committee.

The meeting adjourned at 9:30 am

Crawford County Pre-Disaster Mitigation Committee
May 17, 2004 9:00 am

Committee Present:

Tim Flock, EMA

Mike McBeth, Regional Planning

David Bauer, Crestline City

Larry Feick, Sheriff Office

Daniel Ross, City of Bucyrus

Committee Absent:

City of Bucyrus

Crawford County Soil and Water

Galion Industrial Development

Crawford County General Health District

Crawford County Development Board

The meeting was called to order by Tim Flock, Crawford County EMA Director at 9:00 am.

Mike McBeth explained the process for creating an action plan.

Members then discussed mitigation activities that would be specific to Crawford County. The activities were then listed and ranked as having either a high, medium or low ranking. This list was then used to create an action plan.

Mike McBeth stated that the final draft plan would then be put together and public meetings would be held throughout the county. The public input would then be incorporated in to the plan and then local officials would have a final opportunity to review and comment on the plan before it is submitted to the state.

The meeting adjourned at 9:30 am

REVIEW OF EXISTING PLANS, STUDIES, REPORTS, AND TECHNICAL INFORMATION

The Crawford County Natural Hazards Mitigation Planning Committee reviewed the following plans, studies, reports, and technical information and incorporated such appropriate information into the development of this Plan:

- County, City & Village Comprehensive Development Plans
- County, City & Village Planning, Zoning, & Subdivision Regulations
- Current Crawford County FIRM Flood Plain Maps
- Crawford County Emergency Management Operations Plan
- City of Bucyrus Land Use, Transportation, Parks, and Open Space Final Report
- Physical Features for Crawford County
- 2002 Crawford County Comprehensive Annual Financial Report

COMMUNITY PROFILE

Crawford County is located in North Central Ohio. It has a total area of approximately 257,773 acres or just under 403 square miles. It includes 16 townships, 3 cities (Bucyrus – the county seat, Crestline and Galion), and 4 incorporated villages. Crawford County borders Wyandot County Ohio to the west, Marion and Morrow Counties to the south, Richland County to the east and Seneca and Huron Counties to the north.

Although rural in nature, Crawford County is located within a 60 to 90 minute drive of several major Midwest metropolitan areas, such as Cleveland, Columbus and Toledo, Ohio. Crawford County is a part of the Mansfield Metropolitan Statistical Area. U.S. Route 30 is the major arterial route in the county. The route will become a limited access highway across the entire county sometime in 2005. Other State Routes include 4,19,39,61,96,97,98,100,103,294,309,598,and 602.

Crawford County is served by the Port Bucyrus airport. The Galion Municipal Airport lies in Richland County just east of the county line along State Route 309. Rail Service in the county includes Norfolk and Southern, Conrail, and the Wheeling and Lake Erie Railroad.

Crawford County 2000 Census
Population by Jurisdiction

Incorporated Areas

Bucyrus City	13224
Chatfield Village	218
Crestline City	5085
Galion City	11341
New Washington Village	987
North Robinson Village	211
Tiro Village	281

Unincorporated Areas

Auburn Township	616
Bucyrus Township	828
Chatfield Township	558
Cranberry Township	687
Dallas Township	455
Holmes Township	1330
Jackson Township	402
Jefferson Township	1613
Liberty Township	1489
Lykens Township	649
Polk Township	2334
Sandusky Township	475
Texas Township	409
Tod Township	739
Vernon Township	817
Whetstone Township	2218

CRAWFORD COUNTY 46966

Township populations are the
unincorporated areas only

Climate, Geography, and Environment

The climate of Crawford County is classified as continental; which is distinguished by large annual, daily, and day to day ranges in temperature. Summers are moderately warm and humid with occasional days when temperatures exceed 90°F. Winters are reasonably cold and cloudy and on the average contain six days of below zero temperature. The passing of cold or warm fronts and their associated centers of high and low pressure causes weather changes every few days. The mean annual temperature for Crawford County from 1896 to 1966 was 50.0°F.

Precipitation in the Crawford County area is characteristic of continental areas as it varies widely from year to year. It is, however, normally abundant and well distributed throughout the year with fall being the driest season. Mean annual precipitation in Crawford County from 1896 to 1966 was 35.26 inches.

The surface features vary from gently rolling hills in the eastern two thirds of the County to a very flat and even till plain in the remainder of the County. In the western townships the only places of considerable relief are along the stream channels. Because of its location on the divide between north and south flowing rivers, no major streams drain the County. However, the headwater tributaries of such major rivers as the (1) Huron, (2) Muskingum, (3) Sandusky, and (4) Scioto are found here.

The Till Plains, which extend southward from a series of beach ridges marking the shorelines of earlier stages of Lake Erie in Huron and Seneca Counties, are generally smooth-surfaced, glacial deposits composed of silt and clay. The county is also traveled in a general southwest-northeast direction by several ridges (glacial end moraines) which occur as sharply-rolling or hummocky land generally higher than the adjoining land surface.

Physiographically, Crawford County may be divided into three nearly equal belts running north and south. The eastern belt is rolling, with frequent gravel beds and glacial boulders; except in the eastern portions of Vernon and Jackson Townships where the land surface is rather flat. Streams in this belt have increased the relief of the land surface by cutting deeply through the glacial drift and sandstone and shale bedrock, in places (Jefferson Township) to a depth of nearly 70 feet

The central belt is also an upland area, but in contrast, is usually quite flat. The distinction is very marked in the central and southern portion of the County, but in the northern townships its uniformity is disturbed by a series of ridges (end moraines) producing an undulating surface.

The central belt is underlain by hard black shale. The streams in these townships, though deeply cut into the glacial drift, very rarely expose the underlying rock.

The third belt lies along the west side of the County and is underlain by limestones. The surface is lower than the other belts and varies from flat to undulating. Before modern drainage, the southern townships were flat and marshy and extensive prairies prevailed, particularly in Dallas Township.

But the northern portion of this belt is more broken and characterized by broad surfaced swells, or ridges (end moraines), which cross the belt in a southwest-northeast direction.

The features other than the glacial ridges appear to be coincident with, and are probably controlled by, the nature of the underlying bedrock. The several end moraines which traverse the County represent periods when the glacial fronts were stationary for a considerable length of time, allowing thick masses of debris to be formed at the front edge of the ice. End moraines are usually expressed topographically by a very definite ridge or series of low hummocky hills. Between the end moraines are lower flatter areas known as ground moraines which were deposited in thinner layers by moving ice sheets.

Topographically, Crawford County has only moderate relief. The total relief is only about 380 feet, with the lowest point being 854 feet above sea level in the bed of Buckeye Creek (NW Texas Township) and the highest elevation being 1234 feet in the southeastern part of Polk Township. The county's streams contain the headwaters of four major Ohio rivers - Huron, Muskingum, Sandusky, and Scioto. Groundwater supplies are abundant at various depths.

This part of the state was originally covered with hardwood forests of oak, beech, maple and hickory with a few open prairies. The region is now predominantly devoted to agriculture. The rolling hills to the east are mainly areas of general farming and dairy cattle raising, whereas the flatter areas to the west belong to the cornbelt region.

Crawford County History

Crawford County Ohio was born out of the Northwest Territory and the westbound movement after the Revolutionary War. Before 1845, this county was largely a part of Delaware County, which encompassed a large amount of North Central Ohio. It was redesignated from Indian Territory and a bit of Western Richland County.

Indians contributed to much of the early history of the county. The Wyandots bitterly fought Colonel Crawford's retreating party (appointed by General Washington) in the battle of the Olentangy (even though the war was officially over months before, it involved Indians aligned with the British against Crawford's men. Crawford lost and he was captured near Leesville and burned at the stake in neighboring Wyandot County.

The first settler with his family came to Auburn Township in 1815. Leesville became the first organized settlement, and in 1828 Reverend Lee platted it as a village. Fine Waverly Sandstone quarries had sprouted and placed it on Ohio's map. Oxcart haulers began forging their way to the town of Sandusky on Lake Erie.

Bucyrus was founded on the banks of the Sandusky River in 1822 near the heart of the county by Samuel Norton. Norton started a tannery here. Later, Bucyrus became the county seat in 1826.

By 1831 Galion was founded near the crossroads of the U.S. Army's War of 1812 East-West Road and the Columbus and Sandusky Pike. Later the town center was established about a mile east on high ground where the current Public Square exists.

Crestline was founded because of railroad activity in 1850. Crestline enjoyed growth as a major railroad town until the 1960's when it's regional roundhouse closed. Crestline and Galion were both major railroad towns in the 1870's and were regional rail hubs. Consequently, much industry sprang up and stabilized this area during the Great Depression.

Tourism and Points of Interest

Bucyrus Historical Society Street, Bucyrus	201 South Walnut
Crestline Historical Society Street, Crestline	211 North Thoman
Galion Historical Society Street, Galion	132 South Union
New Washington Historical Society	106 ½ West Mansfield Street New Washington
D. Picking & Company	119 South Walnut Street Bucyrus
Hosford Mill	Hosford Road, Galion
Pennsylvania Railroad Roundhouse Road, Crestline	Crestline
Crawford Park District Lowe-Volk Nature Center	2401 State Route 598 Crestline
Colonel Crawford Capture Site	Lowe-Volk Nature Park
Crawford County Festivals include: Crawford County Fair Bucyrus Bratwurst Festival Galion Oktober Festival Crestline Harvest Festival Chatfield Fireman's Festival Tiro Fireman's Festival	

Parks and Recreation

City of Bucyrus

Aumiller Park
Harmon Field
Lane Street Field
Lions Field

Bucyrus Area YMCA

City of Bucyrus Reservoirs 1-4

City of Crestline

Hamilton Park
Kelly Park

City of Galion

Heise Park
Peco II Park and Ballfields
Cobey Park
East Park
South Park

Galion Area YMCA

Ammans, Amicks, and Powers Reservoirs

Village of New Washington

Community Park

Crawford Park District

Unger Park
Lowe-Volk Park
Sears Woods

Golf Courses

Bucyrus Golf Club
Cranberry Hills Golf Course
New Winchester Golf Course
Valley View Golf Course
Galion Country Club *Private*

Public Libraries

Bucyrus Public Library
Crestline Public Library
Galion Public Library
New Washington Public Library

Education

Buckeye Central Local Schools

Buckeye Central High School
Buckeye East Elementary School
Buckeye West Elementary School

Bucyrus City Schools

Bucyrus High School
Bucyrus Middle School
Carlisle Intermediate School
Kilbourne Elementary School
Lincoln Elementary School
Norton Elementary School

Colonel Crawford Local Schools

Colonel Crawford High School
Colonel Crawford Intermediate School
Sulphur Springs Elementary School
Whetstone Elementary School

Crestline Exempted Village School District

Crestline High School
Crestline Middle School
North Elementary School
Southeast Elementary School

Galion City Schools

Galion High School
Galion Middle School
Dawsett Elementary School
North Elementary School
Renschville Elementary School
Wilma Crall Elementary School

Parochial and Private Schools

Holy Trinity School (Bucyrus)
Saint Bernard's (New Washington)
Saint Joseph's (Crestline)
Saint Joseph's (Galion)
Wayside Christian Academy (Bucyrus)
Mother of Sorrows (North Auburn)

Wynford Local Schools

Wynford High School
Wynford Intermediate School

Business and Industry

Crawford County can be considered a strong agricultural community. Major farm products include soybeans, wheat, corn, hogs, livestock, beef, and dairy products. Crawford County has more than 78.6% of its land in farms.

In 2000 the total employment for all industries in Crawford County was 19,012 with manufacturing claiming the largest percent at 27.8%.

EMPLOYMENT BY INDUSTRY

	<i><u>No. of Jobs</u></i>
Agriculture, forestry, fishing and hunting	148
Construction	543
Manufacturing	6,681
Wholesale trade	621
Retail trade	1,577
Transportation and warehousing	176
Information	142
Finance and insurance	605
Real estate and rental and leasing	73
Professional and technical services	515
Administrative and waste services	227
Health care and social assistance	1,768
Arts, entertainment, and recreation	93
Accommodation and food services	1,251
Other services, except public administration	540
State and Local Government	2,104
State government	104
Local government	2,000
Federal Government	101

MAJOR EMPLOYERS

The Timken Company
PECO II
Baja Marine Corporation
Swan Hose
General Electric
McClain E-Z Pack
Bucyrus Precision Tech, Inc.
Lifetouch Church Directories
Mansfield Brass and Aluminum
Company
Covert Manufacturing, Inc.

Total Number of Businesses: 1016

Residential Housing

Residential Households	20,178
Average Household Size	2.45 persons
Detached 1 Family Units	14,990
2 Family Units	1,333
3 or 4 Family Units	982
10 to 19 Family Units	245
20 or more Units	272
Mobile Homes	1,287

Residential Housing Construction Data:

<u>Year Structure Built</u>	<u>No. Built</u>	<u>Percent</u>
1999 to March 2000	185	0.9
1995 to 1998	427	2.1
1990 to 1994	495	2.5
1980 to 1989	1,089	5.4
1970 to 1979	2,919	14.5
1960 to 1969	2,958	14.7
1940 to 1959	4,811	23.8
1939 or earlier	7,294	36.1

<u>Value</u>	<u>No.</u>	<u>Percent</u>	
Specified Owner-Occupied Units	11,449	100.0	
Less than \$50,000	1,751	15.3	
\$50,000 to \$99,999	6,721	58.7	
\$100,000 to \$149,999	2,109	18.4	
\$150,000 to \$199,999	628	5.5	
\$200,000 to \$299,999	182	1.6	
\$300,000 to \$499,999	47	0.4	
\$500,000 to \$999,999	5	0.1	
\$1,000,000 or more	6	0.1	
Median (dollars)	79,200		(X)

Taxable Value of County Real Property (2000)

Residential	\$397,454,320
Agricultural	\$76,671,860
Industrial	\$25,738,640
Commercial	\$62,360,700
Other	\$134,200,301
<i>Total</i>	\$696,425,821

Agricultural Data

Land in Farms	203,013 acres
Number of Farms	780
Average Size	173 acres
Total Cash Receipts	\$72,168,000

Land Cover in Acres

Urban (open impervious structures)	13621.45
Agricultural/Open Urban Areas	203013.61
Grass/Pasture	8,156.97
Wooded	31,752.56
Open Water	527.87
Shallow Water	70.91
Gravel Pit	<u>630.20</u>
<i>Total</i>	257,773.57

RISK ASSESSMENT

IDENTIFYING HAZARDS

The Crawford County Natural Hazards Mitigation Planning Committee collected data and compiled research on the following most prevalent hazards:

- Tornadoes
- Flooding
- Thunderstorms, Hail, and High Winds
- Severe Winter Storms
- Droughts
- Earthquakes

Research materials included referencing local newspapers, discussion among residents, township and village officials, Crawford County Emergency Management Agency files, as well as State Agency and online internet website information, such as National Climatic Data Center (NCDC) climate resources.

See following Hazards Table.

The hazard research initiated by the Crawford County Natural Hazards Mitigation Planning Committee identified several hazards that will be addressed in the county's Natural Hazards Mitigation Plan. These hazards were identified through a process that utilized input from the Planning Committee members. In addition, the Planning Committee members researched past disasters; received input from the community; utilized existing Emergency City Operations Plans; County, City, and Village Comprehensive Development Plans; Village Township Zoning and Subdivision Plans; current FIRM Flood Plain Maps; Risk Assessments completed by the Crawford County Emergency Management Agency and internet websites, Ohio Natural Hazard Mitigation Planning Guidebook, and FEMA State and Local Mitigation How-To-Guides.

Hazards Table

<u>Hazard</u>	<u>How Identified</u>	<u>Why Identified</u>
Tornadoes	Review of past tornadoes Published data from newspaper articles and historical records Committee member input Online data	The county has been hit by 11 Tornadoes spotted in Crawford County since 1961. The most recent tornado was in 1992 in Lykens Twp.
Flooding	Researched past flooding events Committee member input Online Data	Crawford County is located in the 250 mph zone IV wind speed map for community design shelter. The county as whole experiences flash flooding events periodically
Thunderstorms, Hail, and High Winds	Review of past storm events Public input Researched past flooding events Committee member input Online Data	Thunderstorms are the most common events that occur in Crawford County.
Severe Winter Storms	Review of past storm events Public input Researched past flooding events Committee member input Online Data	These storms can affect emergency response times countywide.
Droughts	OSU Extension information Public Input Natural Hazards Committee	Agriculture plays a critical role in Crawford County's economy.

RESEARCH FINDINGS - TORNADOES

The following is a summary analysis of the Crawford County Natural Hazards Planning Committee's hazard research findings for tornadoes.

Crawford County receives many of its high winds and tornadoes from weather events crossing through north central Ohio. In the past, on many occasions the residents of Crawford County received little advance warning of an approaching severe storm that could spawn a tornado.

Past history indicates that tornadoes can and have occurred anywhere in the County, including the rural areas and within our cities and townships. Most devastating would be the effects on critical facilities and essential services. These critical facilities are necessary to preserve the welfare and quality of life in the County and is needed to fulfill the important public safety, emergency response, and/or disaster recovery functions. The critical facilities outlined include the hospital, healthcare facilities, and First Responder facilities such as county sheriff's department, police, fire, and rescue. Many of these also serve as storm shelters. Gas, electric, communications, utilities, water, and wastewater treatment plants, schools, township buildings and municipal buildings are also critical facilities.

In addition, the County contains at-risk populations that should be factored into a vulnerability assessment. These include residents with a relatively large population of elderly residents with limited mobility.

The many County communities have large temporary populations during community festivals. These individuals could be affected. Also, large temporary populations are expected each year at the County Fair and during various community festivals. Adequate storm shelters or advance warning systems do not exist in most of these areas.

The County also has mobile home parks with no storm shelters and a large percentage of less mobile elderly residents.

Crawford County has experienced at least 11 tornadoes since 1961 in accordance with the NOAA website, <http://www.outlook.noaa.gov/tornadoes>. At least 3 of these tornadoes were categorized as an F-1 on the Fujita Tornado Scale. This rates as a severe tornado with 158-206 mph winds causing severe damage with roofs and walls torn off of well constructed houses, trains overturned, most trees uprooted, and cars lifted off the ground and thrown*. The most recent devastating F-1 tornado was in Lykens in northern Crawford County on November 22, 1992 with an estimated 10 million dollars in damages.

Other tornadoes have hit various parts of Crawford County as outlined in the Crawford County, Ohio History/Loss Estimate section of this Plan.

On the Design Wind Speed Map for Community Shelters, Crawford County is listed in Zone IV – 250 mph.

RESEARCH FINDINGS - FLOODING

The following is a summary analysis of the Crawford County Natural Hazards Planning Committee's hazard research findings for flooding.

Countywide Flooding

Crawford County is subject to flooding by various annual flooding events. The flooding can affect Crawford County residents in many ways. It affects the unincorporated as well as incorporated areas and causes damage to both the private and public sector. Crawford County is drained by the Sandusky, Scioto, Olentangy, and Huron Rivers and their tributaries.

Crawford County is subject to flash flooding as well as flooding from overflows of rivers and small streams within designated flood plains. Much of the flash flooding and more frequent flooding is due to inadequate city, village, and county storm drainage tiles. The Crawford County Emergency Management Agency and Crawford County Natural Hazards Committee reviewed the county's Flood Insurance Rate Maps (FIRMS) as developed under the National Flood Insurance Program (NFIP). This Flood Insurance Study (FIS) was used to compile the flooding hazard in the county.

In addition, the Natural Hazards Mitigation Committee also utilized research of past flooding events. This study indicated that much of the flooding occurs in areas out of the designated 100-year flood plain. Public infrastructure, agricultural areas, private homes and businesses are all at risk.

Flash Flooding

The county is rural and relatively flat. In many of the rural areas, water runoff is through old county tiles that have been in place for many years. The streams and rivers, in many cases, are capable of accepting the runoff but the tiles are undersized, broken down, and plugged with sediment. Therefore, the water cannot get to the streams. Compounding the issue, in more recent history, is the removal of fence rows and enlargement of the fields. This accelerates the surface water runoff to these lower land areas. This creates significant ponding in depressed or low areas.

In several rural townships during the 1960's and 1970's, prior to zoning and subdivision regulations, ranch style homes built on concrete slabs were constructed adjacent to these low runoff areas. Many of these floor slab elevations are only about 4 – 6" above the surrounding grade. Most farmers do not want to replace the storm tiles as it is very expensive and they do not have the financial resources to do so.

Many of the homes that flood are owned and occupied by lower income residents who cannot afford to replace and upsize long runs of county storm drainage tile.

Flooding along Rivers and Streams

Crawford County has experienced several river and stream floods due to the development within the designated 100-year flood plains per the county FIRM maps. For example the City of Bucyrus' Water and Wastewater Treatment Plants, located within the 100-year flood plain were out of service.

The Cities of Bucyrus, Galion and Crestline, Villages of New Washington, North Robinson, and Tiro have a base flood plain map whereby the base flood plain elevation has been determined. Unfortunately, for the remainder of the county villages and 16 townships, there is only an approximate zone 'A' designation with no base flood elevation. The Crawford County EMA currently has on file copies of all the Crawford County FIRM Maps.

Other Community Flooding Issues

Property loss from flooding occurs on both private and public property. During intense rain, many of the communities receive infiltration into the public wastewater collection systems such as in Bucyrus, Galion and Crestline. Several wastewater treatment plants are located in the 100-year flood plain.

Almost all the county communities, in some form, receive runoff from field flooding at 3 – 5 year intervals. In several areas of the county, due to poor soil types, many existing septic and leach field systems are inundated with standing water. These conditions cause health hazards.

RESEARCH FINDINGS – THUNDERSTORMS, HAIL AND HIGH WINDS

The following is a summary analysis of the Crawford County Natural Hazards Planning Committee's hazard research findings for thunderstorms, hail and high winds:

With Crawford County being a rural agricultural community, many farmers can be exposed to the adverse elements of the weather during farming operations. In accordance with the NOAA website <http://www.outlook.noaa.gov/thunderstormandhighwind>, from 1993 to present, there has been 46 thunderstorm and high wind events reported in Crawford County. These storms have produced 0 deaths, 9 injuries and over \$4.5 million in property damages.

An example of recent thunderstorm activity occurred in the City of Bucyrus. This happened on July 8, 2003. Heavy winds knocked down trees and caused damage to electrical lines. The total damage from this storm caused \$875,000.

RESEARCH FINDINGS – SEVERE WINTER STORMS

The following is a summary analysis of the Crawford County Natural Hazards Planning Committee's hazard research findings for severe winter storms:

Severe winter storms in Crawford County can produce ice, snow, freezing rain, cold temperatures and wind. Severe winter storms impact highway safety and has a destructive impact on trees, power lines, and utility services. Extreme periods of cold can have an adverse effect on water lines and water systems. Power outages and drifting and blowing snow, common to rural Crawford County, can have widespread impacts to the residents of Crawford County. During the winter of January, 1977, there were 21 straight days of below 0° F temperatures

Destructive snow and ice storms occur on an annual basis. Most county schools have five adverse weather days included in their normal school schedule.

Past history indicates Crawford County, and much of Ohio, felt the winter storm effects of the November 25, 1950 blizzard; April 13, 1957 ice storm; January, 1978 blizzard; February 1985 snow storm; and January 2, 1996 snow storm. The 1978 blizzard was the most devastating recent winter storm event. It swept through Crawford County on January 25 and 26, 1978 and virtually shut down the entire county. At least 17" of snow fell. Some residents were left without electricity or heat for five days. Some township roads were impassible for five days. The Ohio National Guard units assisted in clearing snow from the county roads.

Freezing rains across Crawford County is also a very prevalent winter weather hazard event. On February 8, 1994, an ice storm hit Crawford County and much of the Ohio region causing many injuries and at least one death (outside of Crawford County). The ice storms caused widespread power outages, downed utility lines, and damages such as downed tree limbs. Travel was very treacherous.

RESEARCH FINDINGS – DROUGHTS

The following is a summary analysis of the Crawford County Natural Hazards Planning Committee's hazard research findings for droughts:

A drought can have a considerable impact on the agricultural economic stability of the county. The 2002 summer drought indicates that the county is very much affected in several ways. In addition to economic loss of reduced crop yields, droughts lead to problems with irrigation and increase the potential for field and grass fires. The significantly less rainfall also can leave reservoirs, water tables and farm ponds significantly lower. Some farmers use their ponds for livestock.

Damages are not immediately noticed, such as the damages to trees, shrubbery and wildlife. The water processing facilities throughout the county appear to have adequate supplies in time of droughts. For example, The city of Bucyrus has a one year reserve of water contained within its reservoirs. Some damage has also occurred to building foundations as a result of the loss of moisture in the highly expansive clay soils found in Crawford County.

REASEARCH FINDINGS - EARTHQUAKES

Ohio is on the periphery of the new Madrid Seismic Zone. At least 14 moderate sized earthquakes have caused minor to moderate damage in Ohio. There have been no deaths and only a few minor injuries reported. Crawford County has not been the epicenter of any reported earthquakes. However there has been a reported earthquake reported in Richland County in 1996 and it fell into 3.0-3.5 range.

Several of the older downtown districts such as found in Bucyrus, Galion, and Crestline have non-reinforced brick structures and would be considerably more vulnerable to damage.

Other vulnerable facilities would be some of the underground gas, water piping, and sewerage systems.

Some of the older county school buildings are solid reinforced masonry, however, several county school districts will be rebuilding their schools and these facilities will meet the more stringent earthquake design requirements under the current building code.

Most of the industrial buildings in the county are of pre-engineered steel design with braced steel frames.

Crawford County has approximately 223 miles of county roadways and 443 miles of township roadways. Infrastructure can be very vulnerable to earthquake damage.

At risk to the county from an earthquake are the non-reinforced brick masonry structures, the hazardous materials facilities, water, sewer, and natural gas pipelines, public and private property structures, railroads, roadways, bridges, and communication towers.

A moderate to severe earthquake in the county would disrupt critical services; which are essential to the lifeline of the community. Disruption of county transportation, industry, and business when stopped could have a tremendous economic impact on the county.

Death and injury could occur from falling equipment, buildings, downed power lines, and impaired natural gas lines. Fire threats and debris costs would also be factors to be considered.

CRAWFORD COUNTY HISTORY/LOSS EVENTS

LOCATION	DATE	TIME	TYPE	MAGNITUDE	DEATH	INJURY	PROP LOSS	CROP LOSS
VERNON TWP	6/6/61	1615	Tornado	F1	0	0	3K	0
JEFFERSON TWP	6/6/71	1225	Tstm Wind	0 kts.	0	0	0	0
CHATFIELD TWP	5/25/73	1720	Tornado	F1	0	0	0K	0
BUCYRUS TWP	6/4/73	1735	Tstm Wind	65 kts.	0	0	0	0
LYKENS TWP	7/3/73	1450	Tstm Wind	0 kts.	0	0	0	0
SANDUSKY TWP	7/3/73	1500	Tornado	F0	0	0	3K	0
HOLMES TWP	8/11/73	1330	Tstm Wind	0 kts.	0	0	0	0
TOD TWP	1/26/74	1945	Tornado	F1	0	2	250K	0
BUCYRUS TWP	4/14/74	1130	Hail	1.00 in.	0	0	0	0
BUCYRUS TWP	4/14/74	1130	Tstm Wind	0 kts.	0	0	0	0
POLK TWP	8/13/75	1725	Tornado	F2	0	0	250K	0
BUCYRUS TWP	3/20/76	2000	Tstm Wind	0 kts.	0	0	0	0
BUCYRUS TWP	6/30/77	1750	Tornado	F1	0	0	250K	0
LYKENS TWP	7/4/77	1840	Hail	1.25 in.	0	0	0	0
LYKENS TWP	7/4/77	1840	Tstm Wind	0 kts.	0	0	0	0
AUBURN TWP	6/7/79	1700	Tornado	F1	0	4	25K	0
BUCYRUS TWP	7/5/80	730	Tstm Wind	61 kts.	0	0	0	0
LIBERTY TWP	7/12/80	1555	Hail	1.50 in.	0	0	0	0
DALLAS TWP	7/12/80	1745	Hail	1.00 in.	0	0	0	0
LIBERTY TWP	3/31/82	1145	Tstm Wind	0 kts.	0	0	0	0
CRANBERRY TWP	5/22/82	2015	Hail	1.00 in.	0	0	0	0
CHATFIELD TWP	5/27/82	1455	Hail	1.00 in.	0	0	0	0
LIBERTY TWP	6/15/82	1725	Tstm Wind	0 kts.	0	0	0	0
HOLMES TWP	6/15/82	1735	Tstm Wind	0 kts.	0	0	0	0
HOLMES TWP	5/2/83	1230	Tstm Wind	0 kts.	0	0	0	0
HOLMES TWP	7/2/83	1430	Tstm Wind	0 kts.	0	0	0	0
BUCYRUS TWP	7/4/83	1410	Tstm Wind	0 kts.	0	0	0	0
POLK TWP	7/4/83	1410	Tstm Wind	0 kts.	0	0	0	0
HOLMES TWP	7/4/83	1515	Tstm Wind	0 kts.	0	0	0	0
POLK TWP	8/11/83	1130	Tstm Wind	0 kts.	0	0	0	0
POLK TWP	8/7/84	2030	Tstm Wind	0 kts.	0	0	0	0
WHETSTONE TWP	8/7/84	2100	Tstm Wind	0 kts.	0	0	0	0
BUCYRUS TWP	3/28/85	2005	Hail	1.00 in.	0	0	0	0
BUCYRUS TWP	4/5/85	1800	Tstm Wind	0 kts.	0	0	0	0
DALLAS TWP	5/27/85	1704	Tornado	F1	0	0	250K	0
BUCYRUS TWP	7/10/85	133	Tstm Wind	0 kts.	0	0	0	0
BUCYRUS TWP	3/10/86	1647	Tornado	F1	0	0	250K	0
GALION	3/10/86	1655	Tstm Wind	0 kts.	0	0	0	0
HOLMES TWP	5/15/86	1727	Tornado	F1	0	0	250K	0
VERNON TWP	6/16/86	1600	Tstm Wind	0 kts.	0	0	0	0
LIBERTY TWP	6/27/86	1500	Tstm Wind	0 kts.	0	0	0	0
GALION	5/18/87	1200	Tstm Wind	0 kts.	0	0	0	0

WHETSTONE TWP	5/30/87	1330	Tstm Wind	0 kts.	0	0	0	0
LIBERTY TWP	6/29/87	1900	Tstm Wind	0 kts.	0	0	0	0
GALION	5/9/88	1415	Tstm Wind	0 kts.	0	0	0	0
LIBERTY TWP	5/25/89	1900	Tstm Wind	0 kts.	0	0	0	0
BUCYRUS	6/1/89	1900	Tstm Wind	0 kts.	0	0	0	0
LIBERTY TWP	8/5/89	1430	Tstm Wind	0 kts.	0	0	0	0
CRESTLINE	7/9/90	1625	Tstm Wind	0 kts.	0	0	0	0
LIBERTY TWP	8/19/90	240	Tstm Wind	0 kts.	0	0	0	0
BUCYRUS	8/19/90	1150	Tstm Wind	0 kts.	0	0	0	0
CRESTLINE	6/15/91	1945	Tstm Wind	0 kts.	0	0	0	0
HOLMES TWP	7/23/91	945	Tstm Wind	0 kts.	0	0	0	0
AUBURN TWP	7/23/91	1005	Tstm Wind	0 kts.	0	0	0	0
LIBERTY TWP	2/15/92	1445	Tstm Wind	0 kts.	0	0	0	0
LYKENS TWP	7/13/92	1600	Tornado	F1	0	0	250K	0
LIBERTY TWP	7/20/92	1415	Tstm Wind	0 kts.	0	0	0	0
TEXAS TWP	8/27/92	1518	Tstm Wind	0 kts.	0	0	0	0
N. CRAWFORD CNTY	8/2/93	300	Tstm Winds	N/A	0	0	500K	5.0M
CRAWFORD COUNTY	8/2/93	320	Hail	1.00 in.	0	0	500K	5.0M
CRAWFORD COUNTY	11/14/93	945	Flash Flood	N/A	0	0	5K	0
CRAWFORD COUNTY	12/26/93	0	Extreme Cold	N/A	0	0	500K	0
CRAWFORD COUNTY	2/8/94	1300	Ice Storm	N/A	0	0	500K	500K
CRAWFORD COUNTY	3/9/94	400	Heavy Snw	N/A	0	0	500K	0
BUCYRUS	3/24/94	53	Hail	0.75 in.	0	0	0	0
CRESTLINE	4/12/94	2238	Hail	0.75 in.	0	0	0	0
GALION	5/24/94	1955	Tstrm Winds	N/A	0	0	5K	0
BUCYRUS	6/20/94	1500	Tstrm Winds	N/A	0	0	500K	0
GALION AND BUCYRUS	6/20/94	1720	Lightning	N/A	0	0	500K	0
GALION AND BUCYRUS	6/20/94	1720	Tstrm Winds	N/A	0	0	500K	0
GALION	6/28/94	2340	Tstrm Winds	N/A	0	0	5K	0
GALION	8/20/94	1720	Tstrm Winds	N/A	0	0	50K	0
CRAWFORD COUNTY	11/1/94	415	Hail	1.00 in.	0	0	0	0
CRAWFORD COUNTY	11/1/94	2000	High Winds	0 kts.	0	0	500K	0
CRAWFORD COUNTY	11/27/94	1400	High Winds	0 kts.	0	0	50K	0
CRAWFORD COUNTY	11/28/94	1000	High Winds	0 kts.	0	0	500K	0
CRAWFORD COUNTY	1/15/95	2300	Ice Storm	N/A	0	0	150K	0
CRAWFORD COUNTY	1/20/95	800	Heavy Snow	N/A	0	8	1.0M	0
STATEWIDE	2/11/95	2000	Extreme Cold	N/A	4	0	100K	0

CRAWFORD COUNTY	4/4/95	2100	Extreme Cold	N/A	0	0	0	0
CRAWFORD COUNTY	4/10/95	600	Glaze	N/A	0	0	150K	0
NEW WASHINGTON	6/14/95	1600	Hail	1.00 in.	0	0	0	0
BUCYRUS	6/28/95	1632	Lightning	N/A	0	1	2K	0
BUCYRUS	6/28/95	1632	Tstrm Winds	N/A	0	1	2K	0
CRAWFORD COUNTY	7/12/95	1200	Heat Wave	N/A	0	12	600K	0
CRAWFORD COUNTY	7/13/95	1845	Tstrm Winds	N/A	1	9	500K	0
CRAWFORD COUNTY	7/13/95	1945	Tstrm Winds	N/A	0	0	40K	20K
NEW WASHINGTON	7/16/95	1539	Hail	0.75 in.	0	0	0	0
CRAWFORD COUNTY	7/16/95	2019	Flash Flood	N/A	0	0	15K	0
CRAWFORD COUNTY	8/4/95	912	Flash Flood	N/A	0	0	30K	0
CRAWFORD COUNTY	8/13/95	2110	Tstrm Winds	N/A	0	0	4K	0
CRAWFORD COUNTY	9/1/95	0	Drought	N/A	0	0	0	0
CRAWFORD COUNTY	9/2/95	1000	Waterspouts	N/A	0	0	0	0
CRAWFORD COUNTY	9/11/95	500	Record Cold/frost	N/A	0	0	0	0
CRAWFORD COUNTY	10/5/95	900	Heavy Rain	N/A	0	0	0	0
CRAWFORD COUNTY	10/5/95	900	Strm Frce Winds	N/A	0	0	200K	0
CRAWFORD COUNTY	10/5/95	900	Strong Winds	N/A	0	0	80K	0
CRAWFORD COUNTY	10/7/95	1910	Waterspouts/ Fun. Cld.	N/A	0	0	0	0
CRAWFORD COUNTY	10/24/95	600	Strong Winds	N/A	0	0	25K	0
CRAWFORD COUNTY	11/11/95	630	High Winds	0 kts.	0	0	260K	0
CRAWFORD COUNTY	12/9/95	800	Extreme Cold	N/A	3	0	210K	0
STATEWIDE	12/9/95	1200	Extreme Cold	N/A	0	1	2K	0
CRAWFORD COUNTY	12/18/95	900	Ice Storm	N/A	0	0	30K	0
CRAWFORD COUNTY	12/19/95	0	Blizzard	N/A	1	0	800K	0
CRAWFORD COUNTY	1/7/96	6:00 AM	Heavy Snow	N/A	0	1	1.1M	0
CRAWFORD COUNTY	2/2/96	8:00 PM	Extreme Cold	N/A	1	0	3.4M	0
CRAWFORD COUNTY	3/19/96	4:00 PM	Heavy Snow	N/A	0	0	352K	0
GALION	3/31/96	7:55 PM	Flash Flood	N/A	0	0	0	0

CRAWFORD COUNTY	4/25/96	2:00 PM	High Wind	52 kts.	0	0	44K	0
BUCYRUS	5/9/96	7:01 AM	Lightning	N/A	0	0	0	0
GALION	5/10/96	6:00 PM	Tstm Wind	60 kts.	0	0	20K	0
CRAWFORD COUNTY	6/22/96	8:45 AM	Tstm Wind	55 kts.	0	0	10K	0
BUCYRUS	6/24/96	11:10 AM	Tstm Wind	55 kts.	0	0	2K	0
CRAWFORD COUNTY	8/1/96	12:00 AM	Drought	N/A	0	0	0	0
BUCYRUS	10/30/96	1:57 AM	Tstm Wind	50 kts.	0	0	2K	0
CRAWFORD COUNTY	10/30/96	12:10 AM	High Wind	69 kts.	1	2	5.3M	2.3M
CRAWFORD COUNTY	11/7/96	5:15 PM	Tstm Wind	0 kts.	0	0	20K	0
CRAWFORD COUNTY	1/10/97	12:00 AM	Extreme Cold	N/A	4	0	195K	0
CRAWFORD COUNTY	2/27/97	12:15 AM	High Wind	57 kts.	0	0	180K	0
CRAWFORD COUNTY	5/1/97	12:00 AM	Crop Damage	N/A	0	0	0	34K
GALION	5/18/97	3:35 PM	Hail	0.88 in.	0	0	0	0
BUCYRUS	5/18/97	3:40 PM	Tstm Wind	0 kts.	0	0	2K	0
CRAWFORD COUNTY	5/19/97	12:00 AM	Tstm Wind	0 kts.	0	0	2K	0
CRAWFORD COUNTY	5/25/97	2:58 PM	Flash Flood	N/A	0	0	0	0
CRAWFORD COUNTY	5/25/97	10:15 AM	Flash Flood	N/A	0	0	0	0
CRAWFORD COUNTY	6/1/97	8:55 AM	Flood	N/A	0	0	60K	20K
NEW WASHINGTON	7/8/97	10:50 PM	Tstm Wind	0 kts.	0	0	1K	0
AUBURN TWP	7/26/97	8:54 AM	Lightning	N/A	0	0	50K	0
CRESTLINE	8/12/97	4:05 PM	Tstm Wind	0 kts.	0	1	4K	0
CRAWFORD COUNTY	3/28/98	9:30 AM	High Wind	0 kts.	0	0	305K	0
CRAWFORD COUNTY	4/9/98	8:44 AM	High Wind	0 kts.	0	0	40K	0
WHETSTONE TWP	5/4/98	6:54 PM	Flood	N/A	0	0	0	0
WHETSTONE TWP	5/4/98	7:05 PM	Hail	0.75 in.	0	0	0	0
LIBERTY TWP	6/12/98	7:10 PM	Tstm Wind	0 kts.	0	0	2K	0
CRAWFORD COUNTY	6/27/98	5:10 PM	Tstm Wind	0 kts.	0	0	5K	0
CRAWFORD COUNTY	6/27/98	8:30 PM	Tstm Wind	0 kts.	0	0	3K	0

CRAWFORD COUNTY	6/28/98	5:46 PM	Tstm Wind	0 kts.	0	0	100K	0
CRAWFORD COUNTY	6/28/98	6:00 PM	Flood	N/A	0	0	50K	0
CRAWFORD COUNTY	6/28/98	6:30 PM	Tstm Wind	0 kts.	0	0	2K	0
CRAWFORD COUNTY	6/28/98	6:55 PM	Flood	N/A	0	0	100K	50K
BUCYRUS	6/29/98	1:00 PM	Tstm Wind	0 kts.	0	0	30K	0
CRAWFORD COUNTY	7/19/98	7:20 PM	Tstm Wind	0 kts.	0	0	30K	0
BUCYRUS	8/24/98	6:45 PM	Tstm Wind	0 kts.	0	0	7K	0
GALION	8/25/98	1:30 PM	Hail	1.50 in.	0	0	0	10K
BUCYRUS	11/10/98	3:30 PM	Tstm Wind	0 kts.	0	0	10K	0
CRAWFORD COUNTY	11/10/98	11:15 AM	High Wind	0 kts.	0	0	535K	0
CRAWFORD COUNTY	1/2/99	4:00 AM	Winter Storm	N/A	0	56	600K	0
CRAWFORD COUNTY	1/8/99	4:00 AM	Winter Storm	N/A	0	0	46K	0
CRAWFORD COUNTY	1/13/99	1:30 AM	Winter Storm	N/A	0	0	58K	0
CRAWFORD COUNTY	3/9/99	12:15 AM	Heavy Snow	N/A	0	0	0	0
CRAWFORD COUNTY	5/6/99	9:00 AM	High Wind	52 kts.	0	0	328K	50K
CRAWFORD COUNTY	6/1/99	12:00 AM	Drought	N/A	0	0	0	0
CRAWFORD COUNTY	6/6/99	12:00 AM	Excessive Heat	N/A	0	0	0	0
CHATFIELD	6/11/99	5:25 PM	Tstm Wind	0 kts.	0	0	25K	0
CRAWFORD COUNTY	6/12/99	3:05 PM	Flood	N/A	0	0	0	0
CRAWFORD COUNTY	7/1/99	12:00 AM	Drought	N/A	0	0	0	0
CRAWFORD COUNTY	7/1/99	12:00 AM	Excessive Heat	N/A	0	0	0	0
BUCYRUS	7/9/99	4:49 PM	Tstm Wind	51 kts.	0	0	90K	0
BUCYRUS	7/23/99	5:04 PM	Hail	0.88 in.	0	0	0	10K
CRAWFORD COUNTY	7/23/99	5:15 PM	Tstm Wind	0 kts.	0	0	10K	0
GALION	7/24/99	8:30 PM	Tstm Wind	0 kts.	0	0	20K	0
BUCYRUS	7/31/99	6:10 PM	Tstm Wind	0 kts.	0	0	5K	0
CRAWFORD COUNTY	8/1/99	12:00 AM	Drought	N/A	0	0	0	0
CRAWFORD COUNTY	9/1/99	12:00 AM	Drought	N/A	0	0	0	200.0M

BUCYRUS	10/13/99	2:30 PM	Hail	1.75 in.	0	0	0	0
BUCYRUS	10/13/99	2:45 PM	Tstm Wind	0 kts.	0	0	50K	0
GALION	10/13/99	2:52 PM	Hail	1.00 in.	0	0	0	0
CRAWFORD COUNTY	4/8/00	12:30 AM	Flash Flood	N/A	0	0	0	0
BUCYRUS	5/23/00	5:20 PM	Funnel Cloud	N/A	0	0	0	0
CRAWFORD COUNTY	6/16/00	2:45 PM	Tstm Wind	0 kts.	0	0	10K	0
BUCYRUS	7/14/00	5:01 PM	Hail	0.75 in.	0	0	0	0
CRESTLINE	7/14/00	5:15 PM	Tstm Wind	0 kts.	0	0	5K	0
CRAWFORD COUNTY	8/6/00	9:20 PM	Tstm Wind	0 kts.	0	0	575K	0
CRAWFORD COUNTY	8/23/00	7:30 PM	Flood	N/A	0	0	0	0
CRESTLINE	8/27/00	1:40 AM	Tstm Wind	0 kts.	0	0	5K	0
CRAWFORD COUNTY	12/11/00	11:30 PM	High Wind	0 kts.	0	0	4.4M	0
CRAWFORD COUNTY	2/9/01	8:00 PM	High Wind	0 kts.	0	0	320K	0
CRAWFORD COUNTY	2/25/01	7:00 AM	High Wind	0 kts.	0	0	460K	0
CRAWFORD COUNTY	4/12/01	9:00 AM	High Wind	0 kts.	1	0	815K	0
CRAWFORD COUNTY	10/25/01	11:00 AM	High Wind	0 kts.	0	4	760K	0
BUCYRUS	11/30/01	6:30 AM	Tstm Wind	0 kts.	0	0	100K	0
CRAWFORD COUNTY	2/1/02	10:00 AM	High Wind	0 kts.	0	0	1.1M	0
CRAWFORD COUNTY	3/9/02	2:30 PM	High Wind	55 kts.	2	8	8.9M	0
CRAWFORD COUNTY	3/24/02	8:00 PM	Winter Storm	N/A	0	0	1.6M	0
CRAWFORD COUNTY	3/26/02	1:00 AM	Winter Storm	N/A	0	0	3.6M	0
GALION	4/19/02	6:15 PM	Hail	0.75 in.	0	0	5K	0
CRESTLINE	4/19/02	6:30 PM	Hail	1.00 in.	0	0	10K	0
BUCYRUS	5/29/02	5:50 PM	Tstm Wind	0 kts.	0	0	15K	0
BUCYRUS	5/29/02	5:55 PM	Tstm Wind	54 kts.	0	0	0	0
CRESTLINE	6/3/02	9:15 PM	Flood	N/A	0	0	50K	0
BUCYRUS	7/19/02	1:30 PM	Tstm Wind	0 kts.	0	0	2K	0
BUCYRUS	7/29/02	5:50 PM	Tstm Wind	0 kts.	0	0	25K	0

GALION	8/23/02	6:35 PM	Tstm Wind	0 kts.	0	0	3K	0
GALION	9/20/02	5:08 PM	Tstm Wind	52 kts.	0	0	25K	0
CRESTLINE	9/20/02	5:12 PM	Tstm Wind	52 kts.	0	2	200K	0
BUCYRUS	11/10/02	5:30 PM	Hail	0.75 in.	0	0	5K	0
CRAWFORD COUNTY	11/10/02	5:45 PM	Tstm Wind	0 kts.	0	0	25K	0
CRAWFORD COUNTY	12/24/02	9:00 PM	Heavy Snow	N/A	0	0	3.1M	0
BUCYRUS	4/4/03	9:15 PM	Hail	0.75 in.	0	0	2K	0
BUCYRUS	5/1/03	4:40 PM	Hail	0.75 in.	0	0	0	0
BUCYRUS	5/1/03	6:15 PM	Hail	0.75 in.	0	0	0	0
BUCYRUS	5/7/03	5:00 PM	Tstm Wind	50 kts.	0	0	15K	0
CRESTLINE	5/7/03	5:25 PM	Hail	0.75 in.	0	0	0	0
BUCYRUS	5/7/03	6:10 PM	Flash Flood	N/A	0	0	100K	0
CRAWFORD COUNTY	5/11/03	10:00 AM	Strong Wind	N/A	0	0	1.2M	0
BUCYRUS	6/29/03	5:40 PM	Hail	1.00 in.	0	0	5K	0
BUCYRUS	6/29/03	5:48 PM	Hail	0.75 in.	0	0	0	0
GALION	6/29/03	6:00 PM	Hail	1.00 in.	0	0	5K	0
GALION	7/4/03	2:00 PM	Tstm Wind	50 kts.	0	0	4K	0
GALION	7/4/03	2:00 PM	Tstm Wind	50 kts.	0	0	15K	0
CRAWFORD COUNTY	7/7/03	2:05 PM	Tstm Wind	50 kts.	0	0	40K	0
CRAWFORD COUNTY	7/8/03	3:00 AM	Tstm Wind	50 kts.	0	0	150K	0
BUCYRUS	7/8/03	3:30 PM	Tstm Wind	50 kts.	0	0	15K	0
BUCYRUS	7/8/03	4:00 PM	Flash Flood	N/A	0	0	250K	600K
GALION	7/21/03	8:35 AM	Tstm Wind	50 kts.	0	0	6K	0
CRAWFORD COUNTY	7/27/03	3:15 PM	Tstm Wind	50 kts.	0	0	15K	0
BUCYRUS	8/26/03	6:00 PM	Tstm Wind	50 kts.	0	0	2K	0
GALION	8/27/03	1:50 AM	Tstm Wind	50 kts.	0	0	2K	0
BUCYRUS	9/27/03	12:15 AM	Tstm Wind	50 kts.	0	0	15K	0
BUCYRUS	11/12/03	5:55 PM	Tstm Wind	50 kts.	0	0	5K	0

<u>CRAWFORD</u> <u>COUNTY</u>	11/12/03	8:00 PM	High Wind	52 kts.	0	0	2.3M	0
					19	120	54.471M	213.544M

PROBABILITY OF NATURAL HAZARD EVENTS

In reviewing the past 53 years of natural hazard events in Crawford County, Ohio, the probability of future natural hazard related occurrences are as follows:

NATURAL HAZARD EVENT

Tornadoes

Floods

Thunderstorms, Hail and High Winds

Severe Winter Storms(includes blizzards, ice storms)

Severe Droughts

Earthquakes

OCCURANCE

1 every 4.4 years

1 every 3.3 years

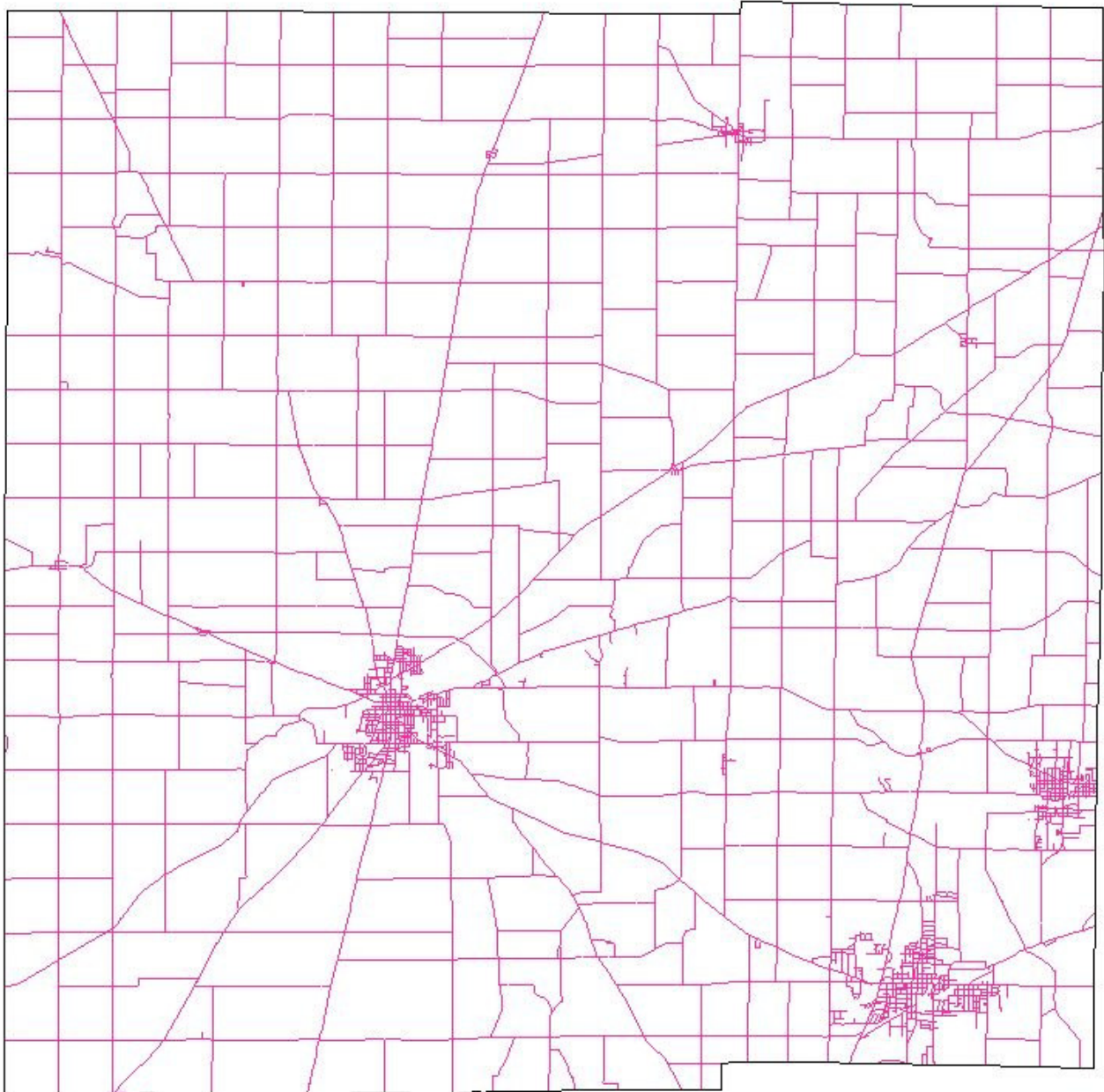
1 every 2.4 years

1 every 8.8 years

1 every 26.5 years

1 every 53 years

CRAWFORD COUNTY BASE MAP

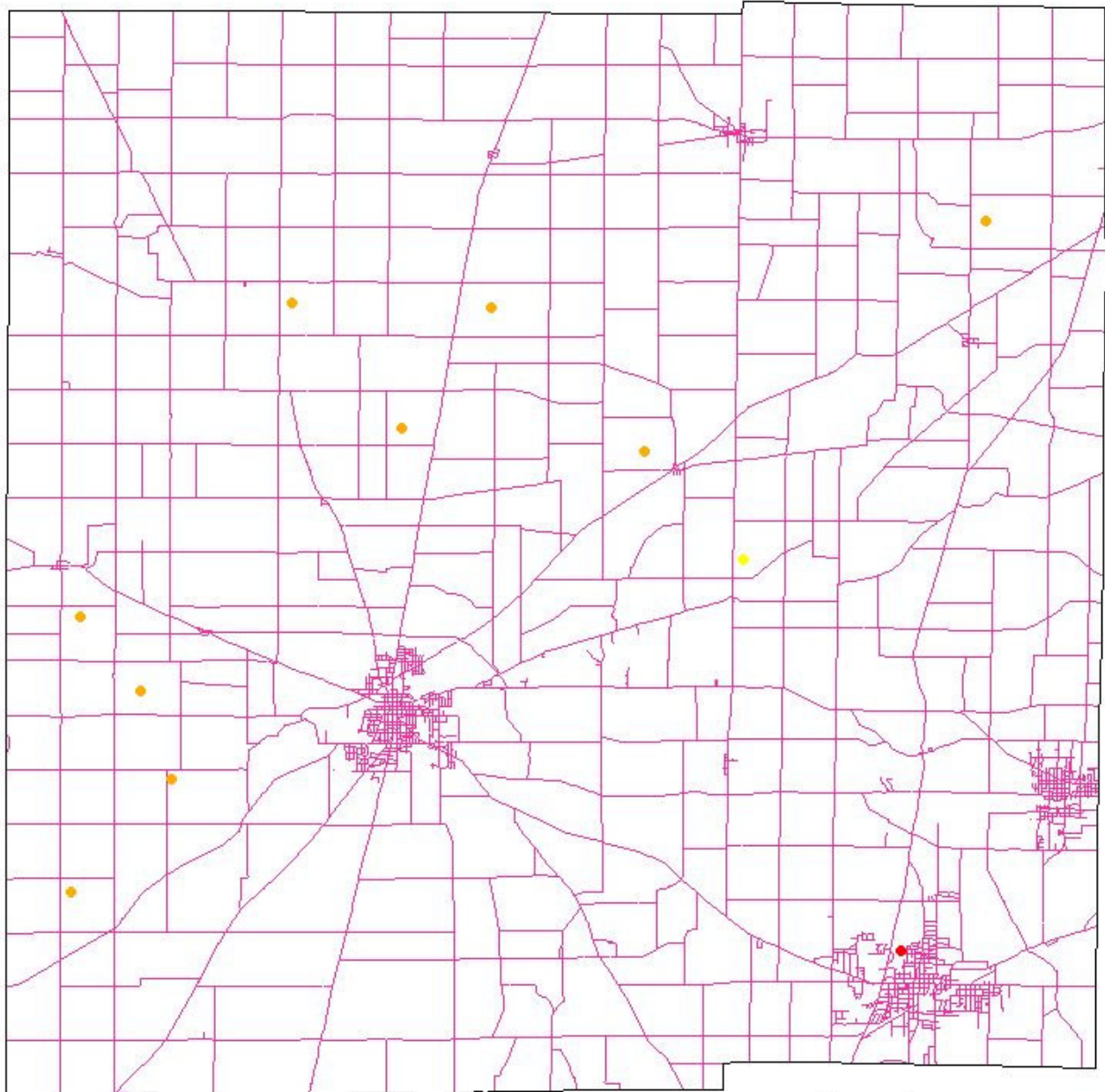


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MILES

CRAWFORD RPC 09/2004

 County Boundary
Streets

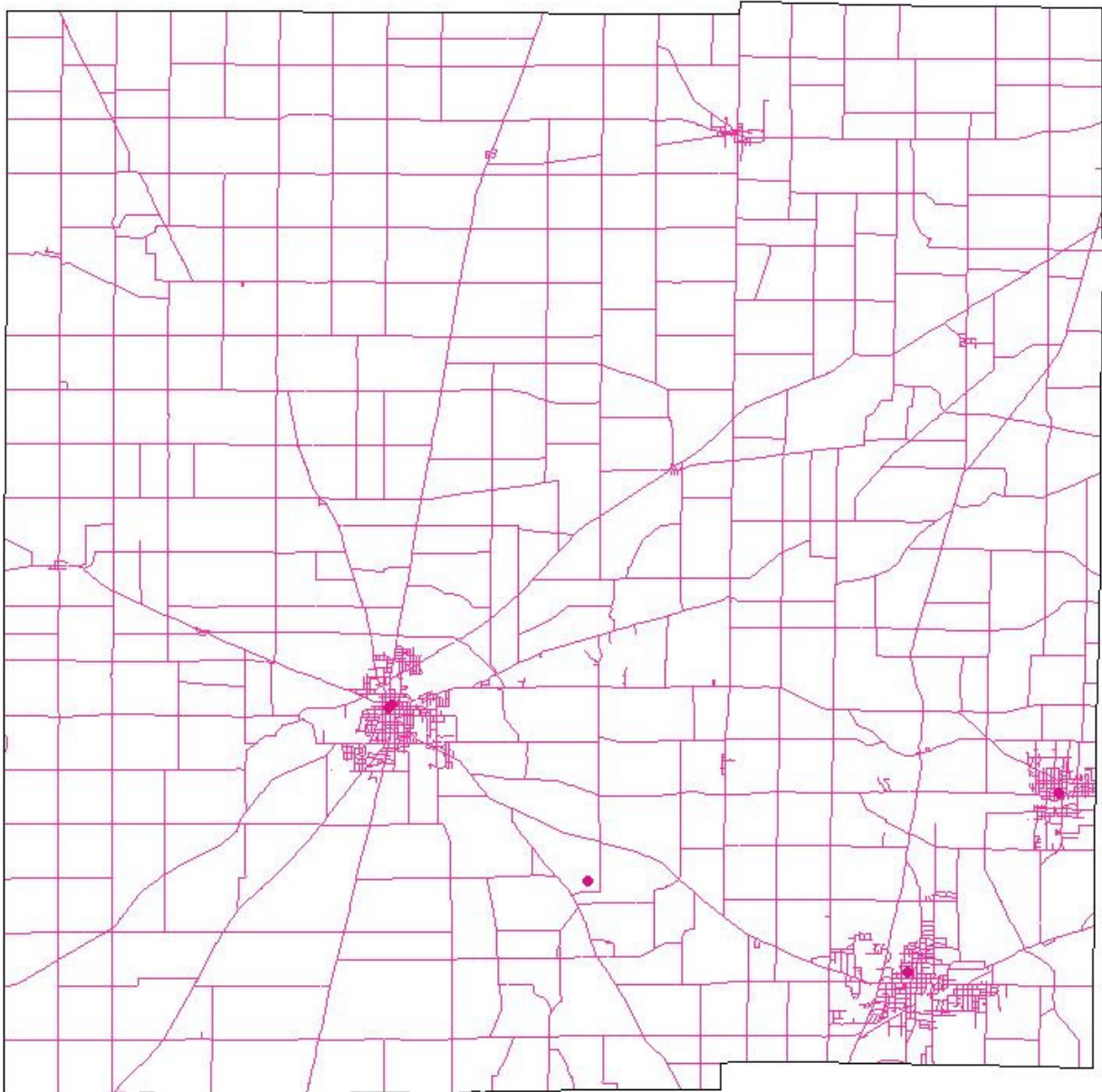
CRAWFORD COUNTY TORNADO MAP



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MILES
CRAWFORD RPC 09/2004

Tornadoes
● F0
● F1
● F2
□ County Boundary
— Streets

CRAWFORD COUNTY FLOOD AND FLASH FLOOD OCCURANCE MAP

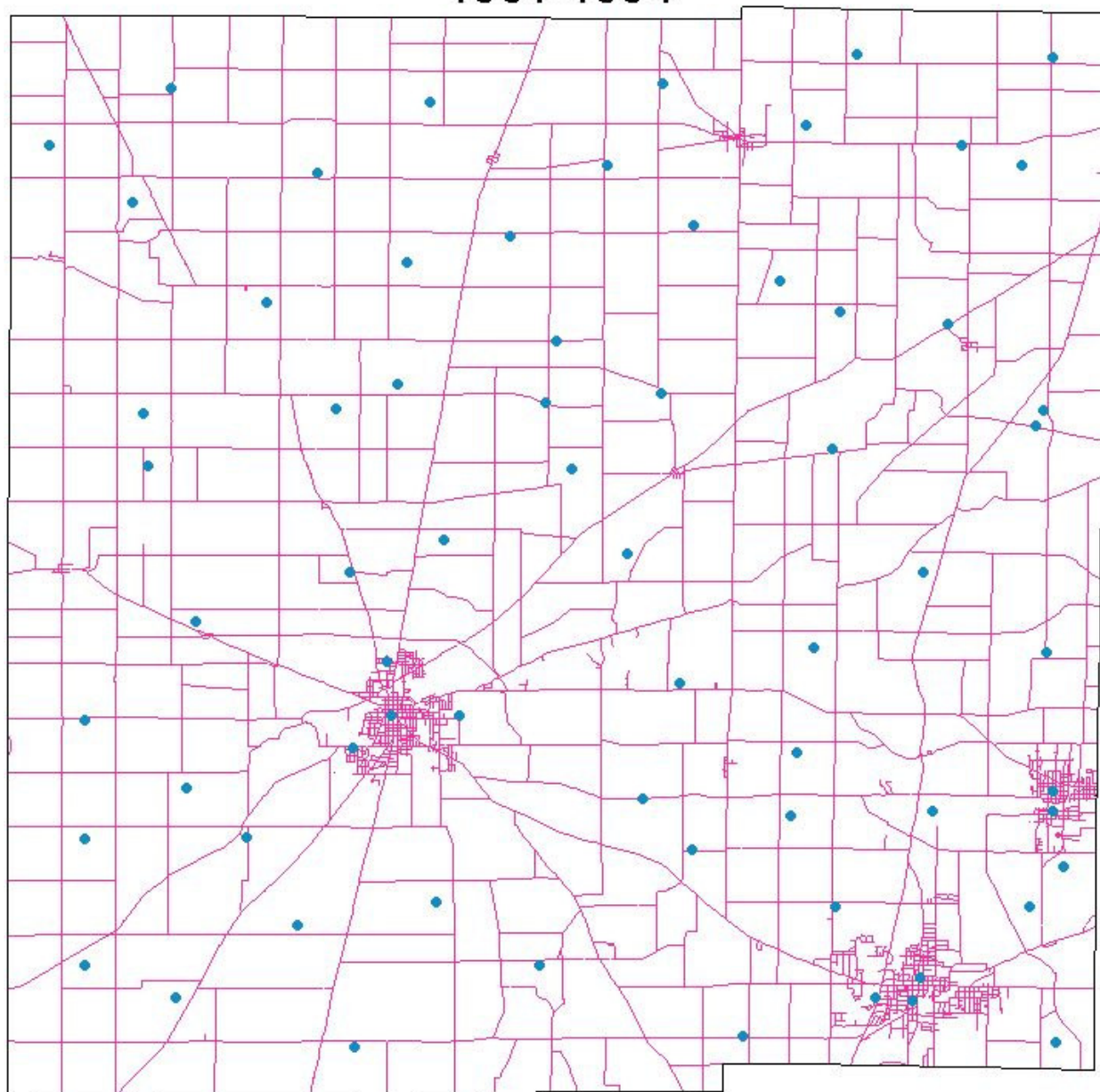


CRAWFORD RPC 09/2004

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MILES

- Flooding Reports
- County Boundary
- ▬ Streets

CRAWFORD COUNTY THUNDERSTORM, WIND, AND HAIL INCIDENTS 1961-1994

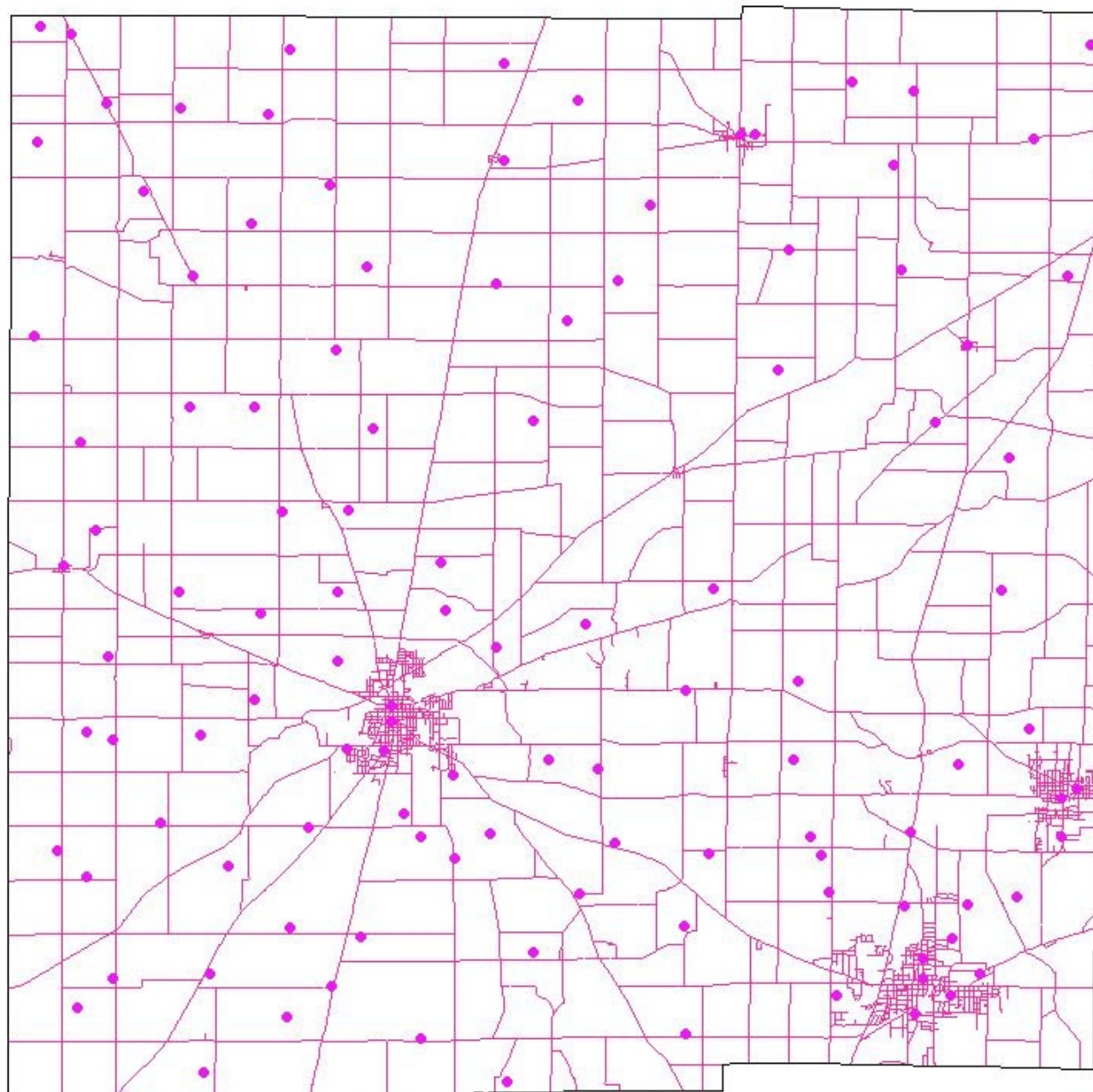


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CRAWFORD RPC 09/2004

- Thunderstorm s, Hail, and Wind
- County Boundary
- Streets

CRAWFORD COUNTY THUNDERSTORM, HAIL, AND HIGH WINDS 1994-2002

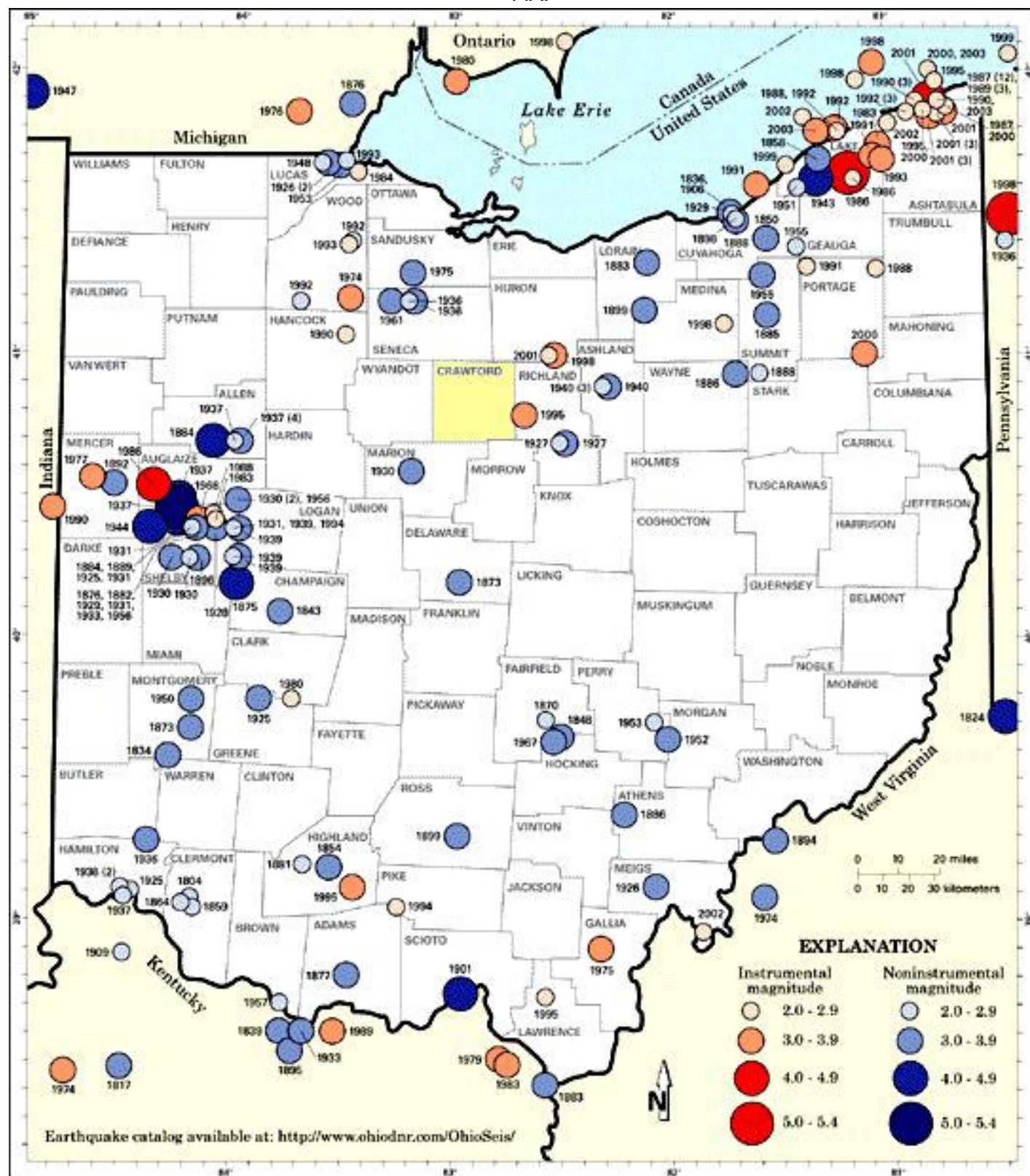


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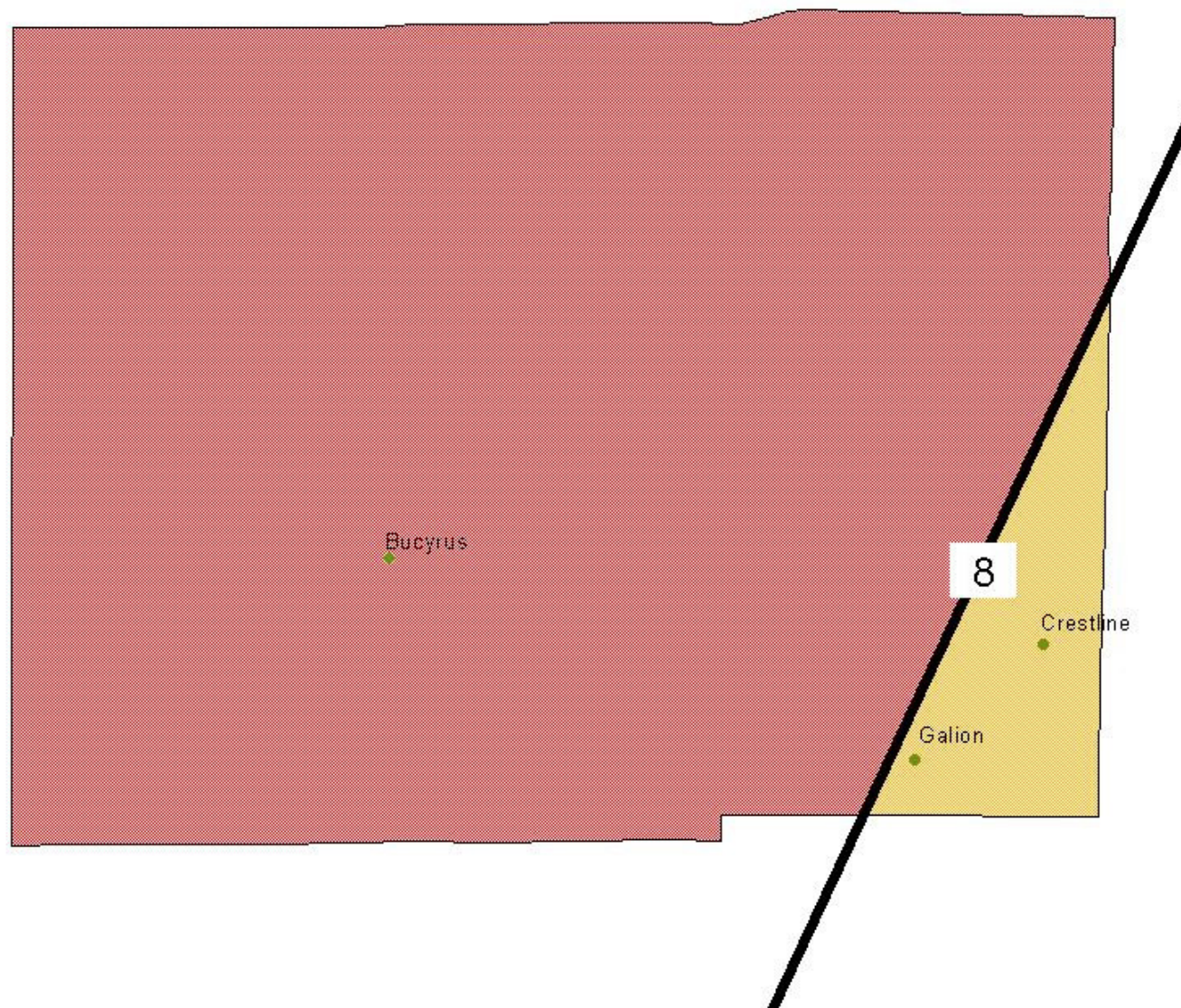
CRAWFORD RPC 09/2004

- Thunderstorms, Wind, and Hail
- County Boundary
- ▬ Streets

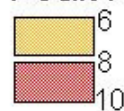
CRAWFORD COUNTY EARTHQUAKE OCCURRENCE AND EPICENTER MAP



CRAWFORD COUNTY PEAK ACCELERATION RATES



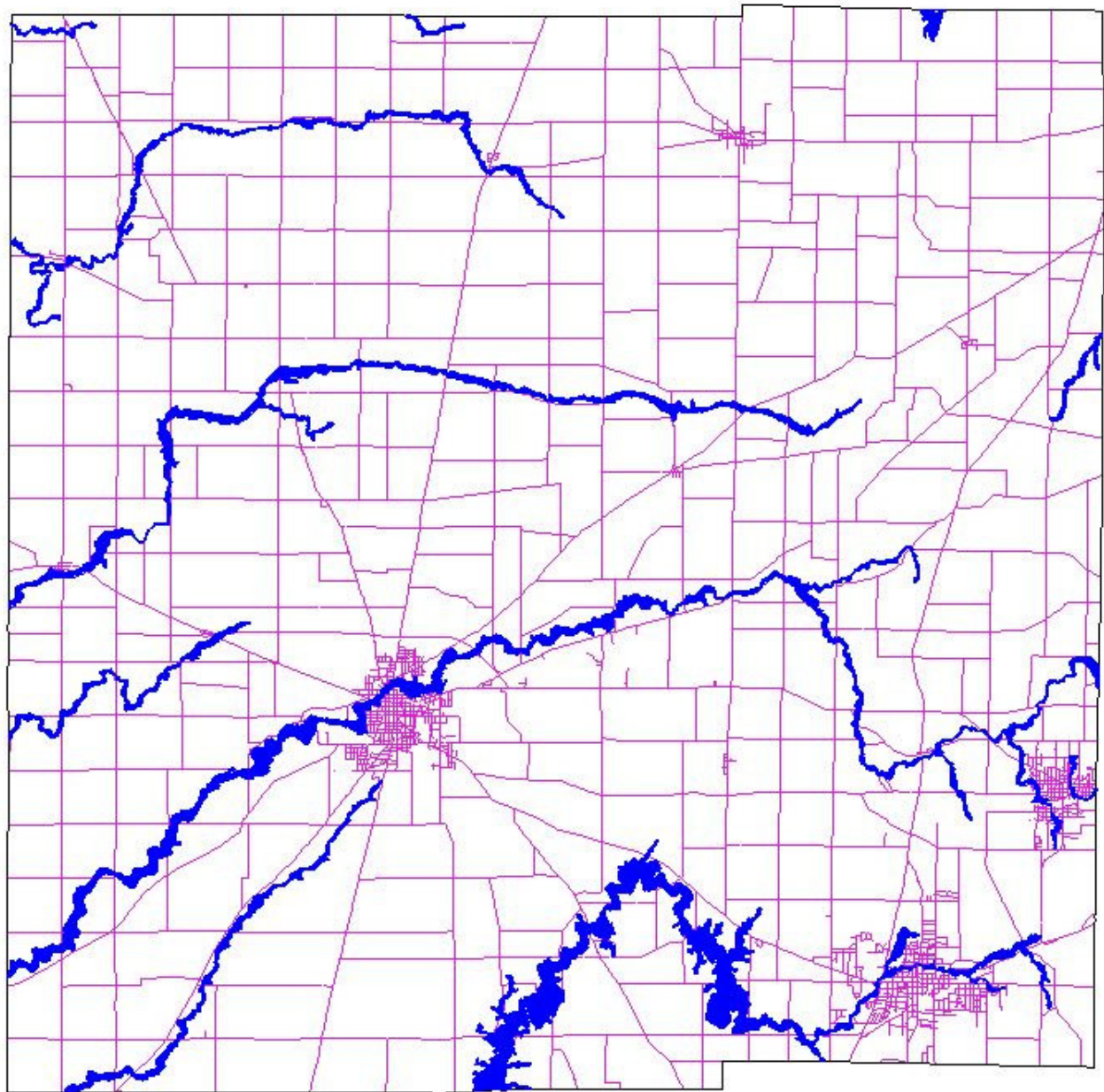
● Crawford cities
Peak Acceleration Rates



3 0 3 6 Miles

DRAWN BY:
CRAWFORD RPC
10/2004

CRAWFORD COUNTY FIRM FLOOD PLAIN MAP

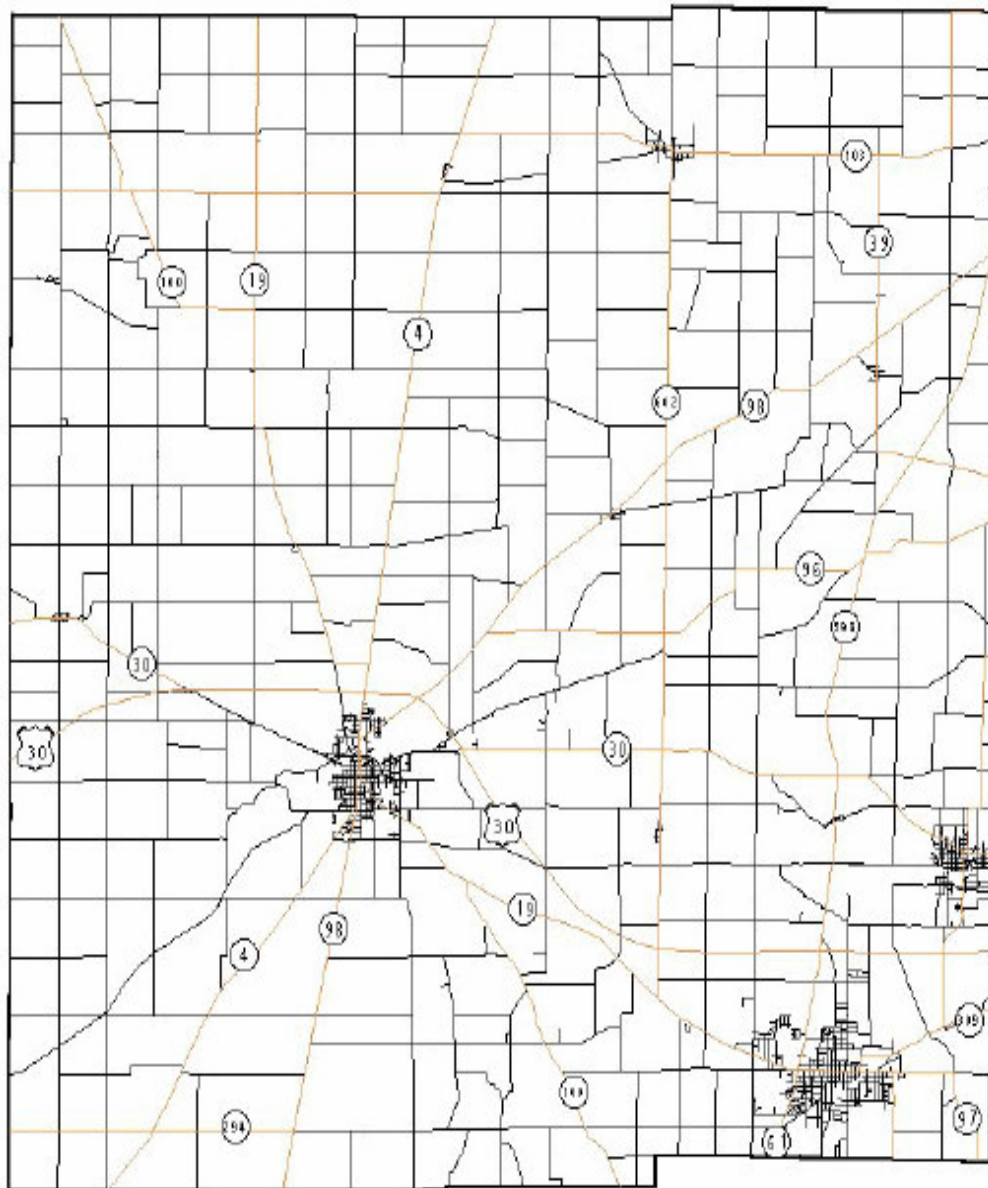


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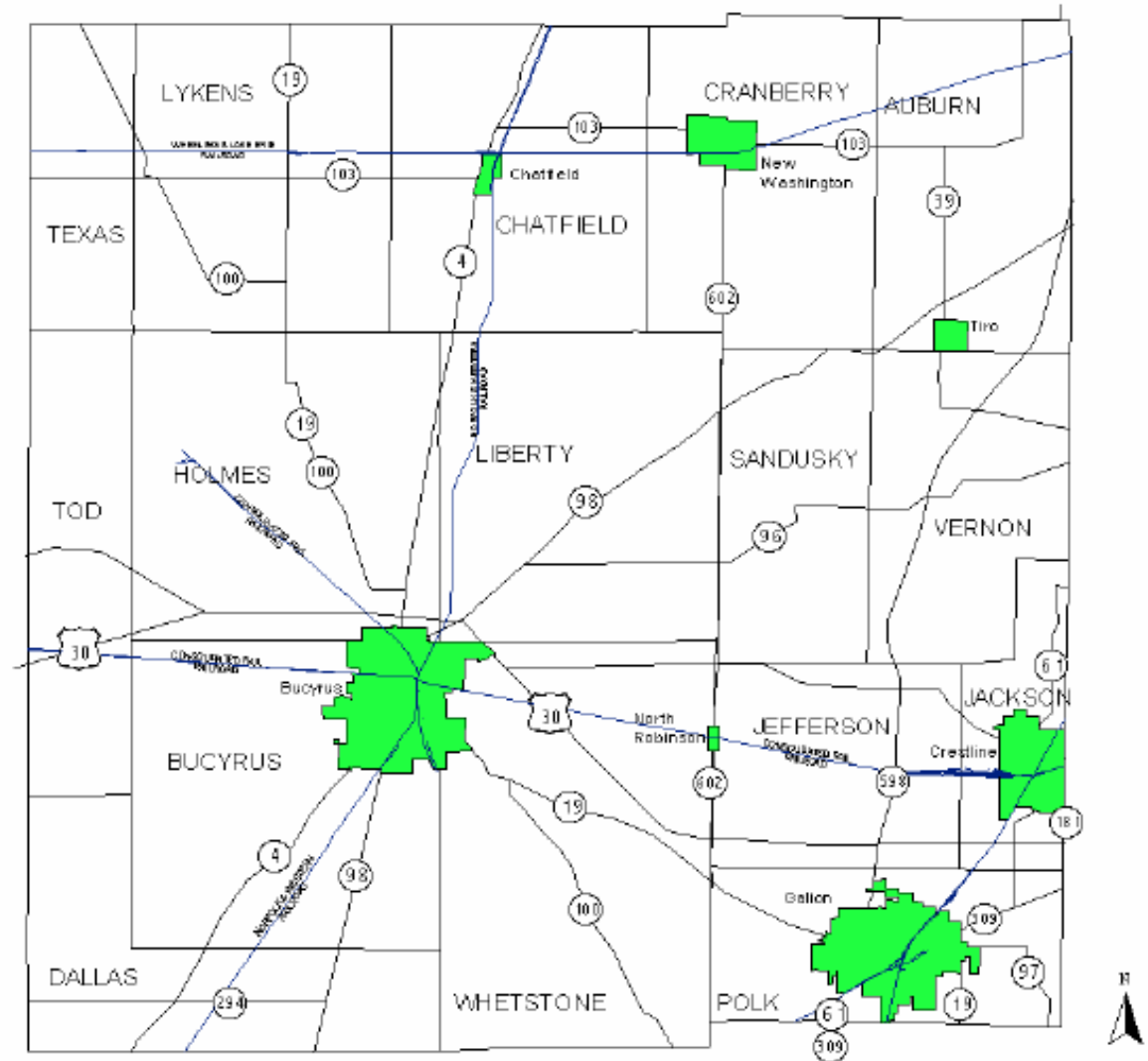
CRAWFORD RPC 06/2004

 Floodplain
 County
 Streets

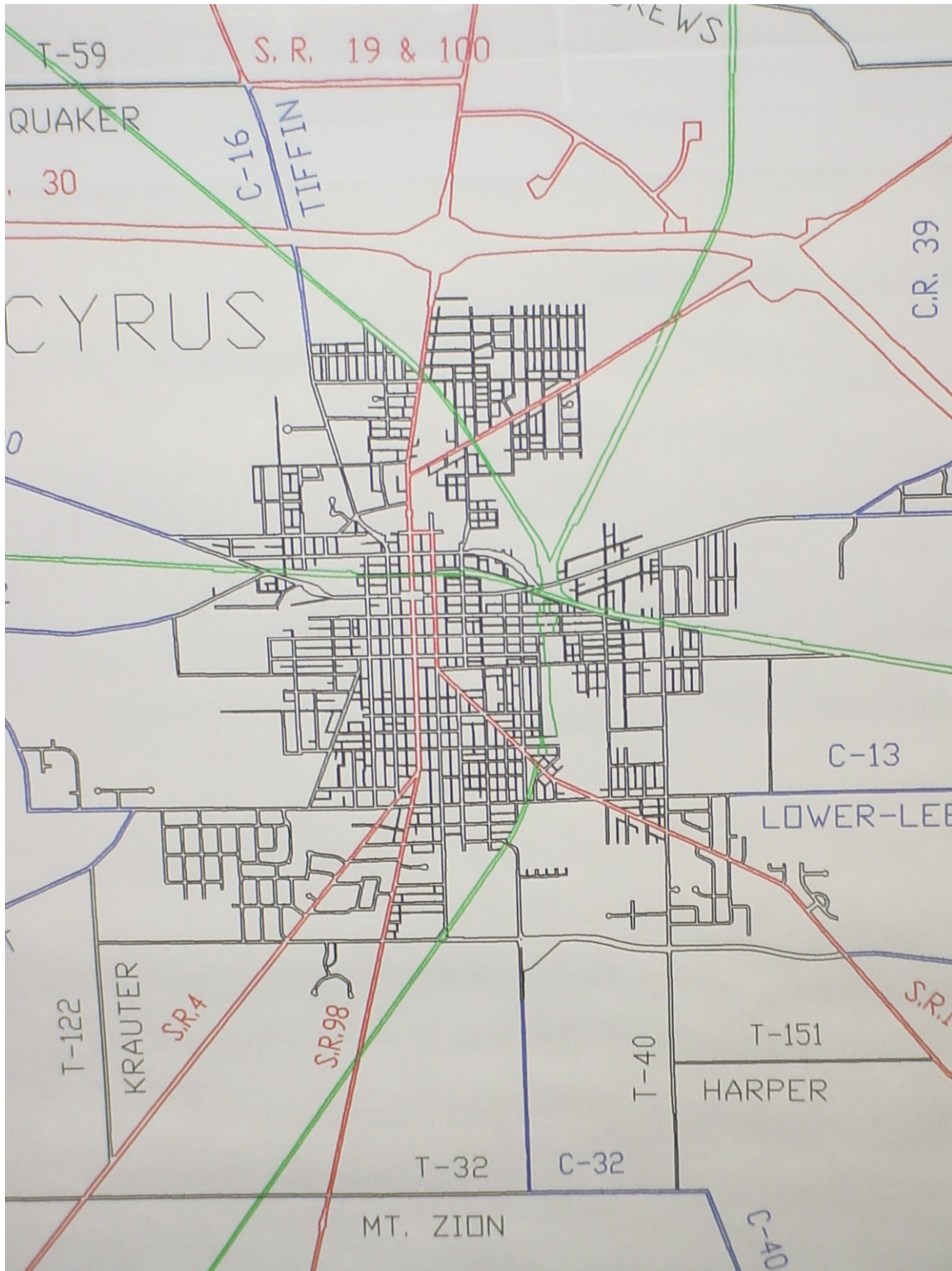
CRAWFORD COUNTY ROADS



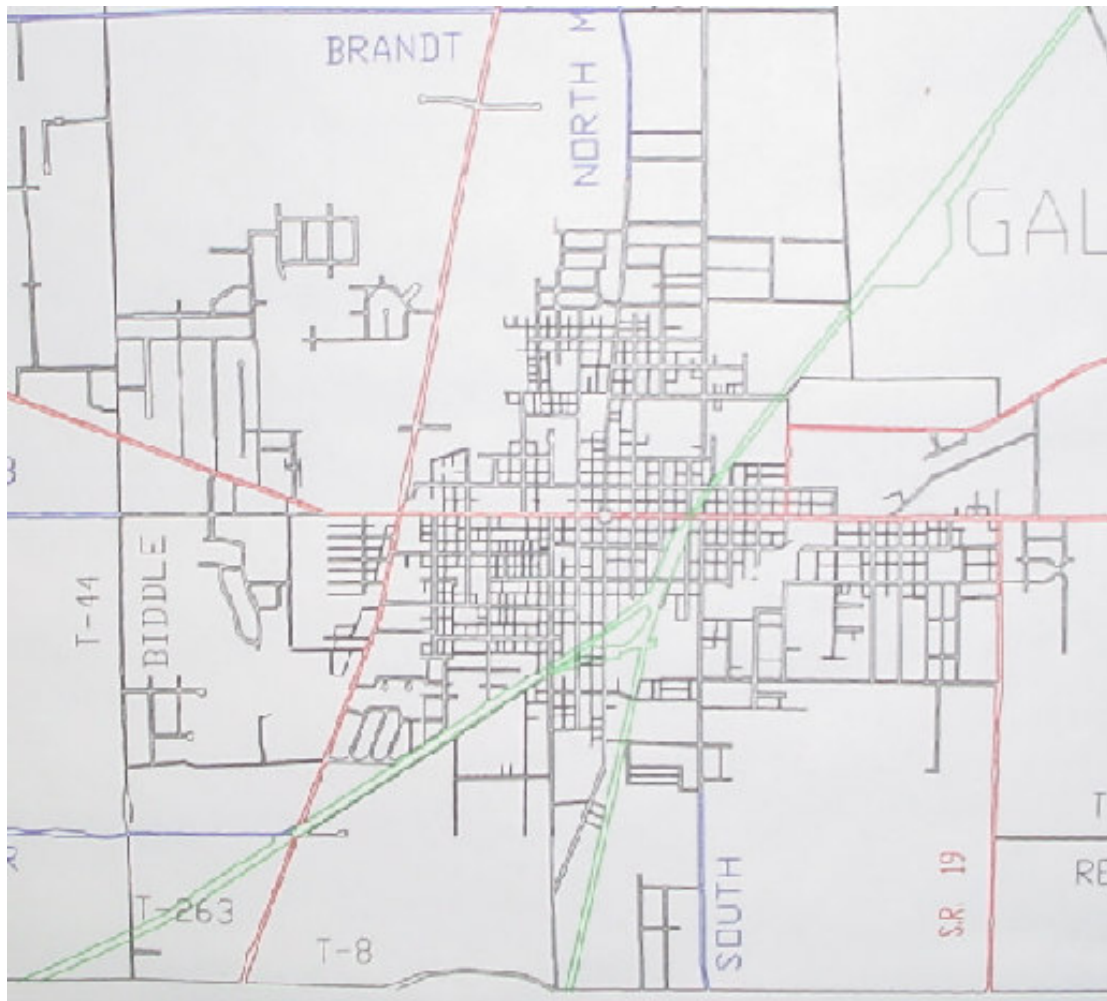
CRAWFORD COUNTY TOWNSHIPS



CRAWFORD COUNTY CITIES



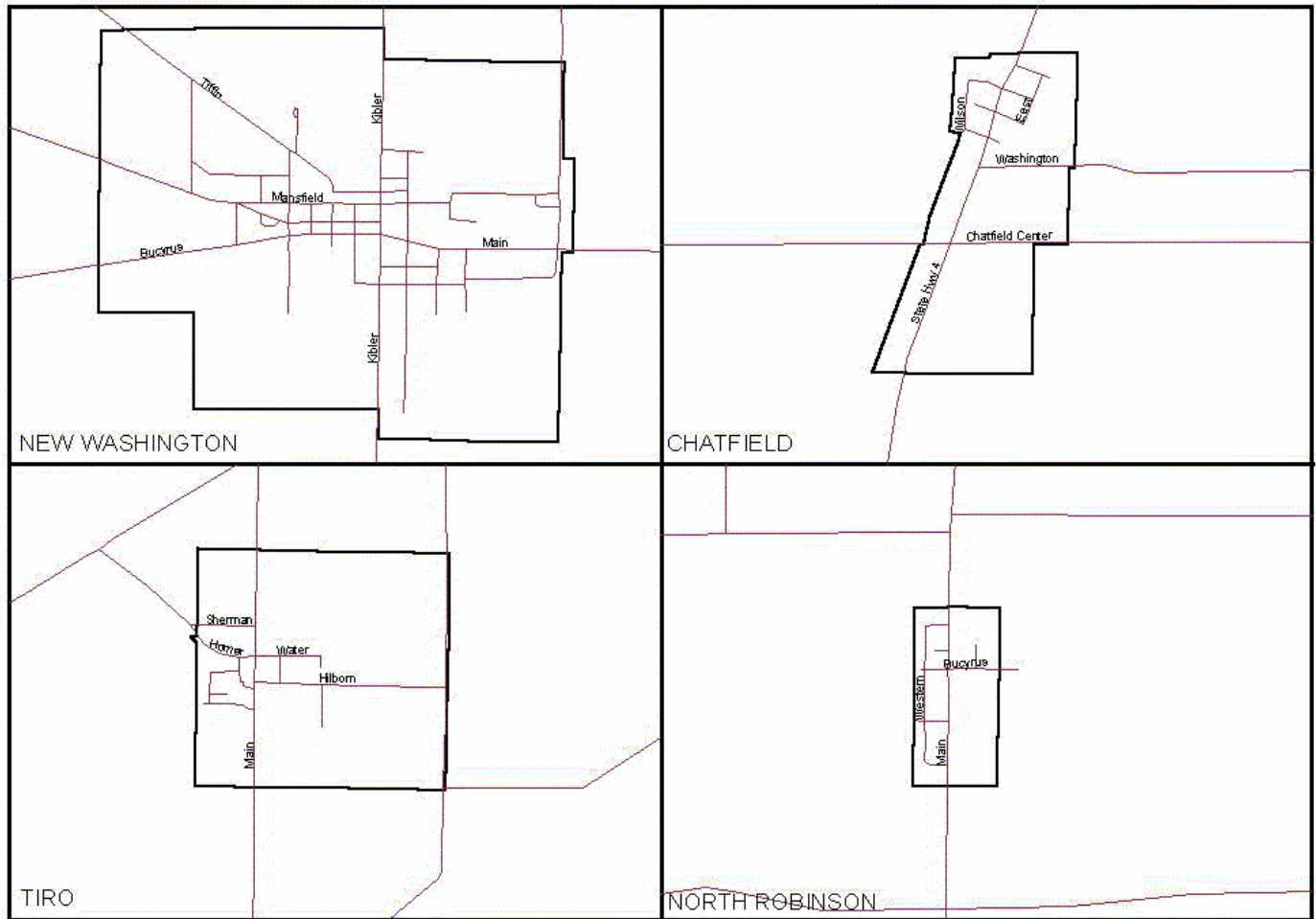
BUCYRUS



GALION



CRESTLINE



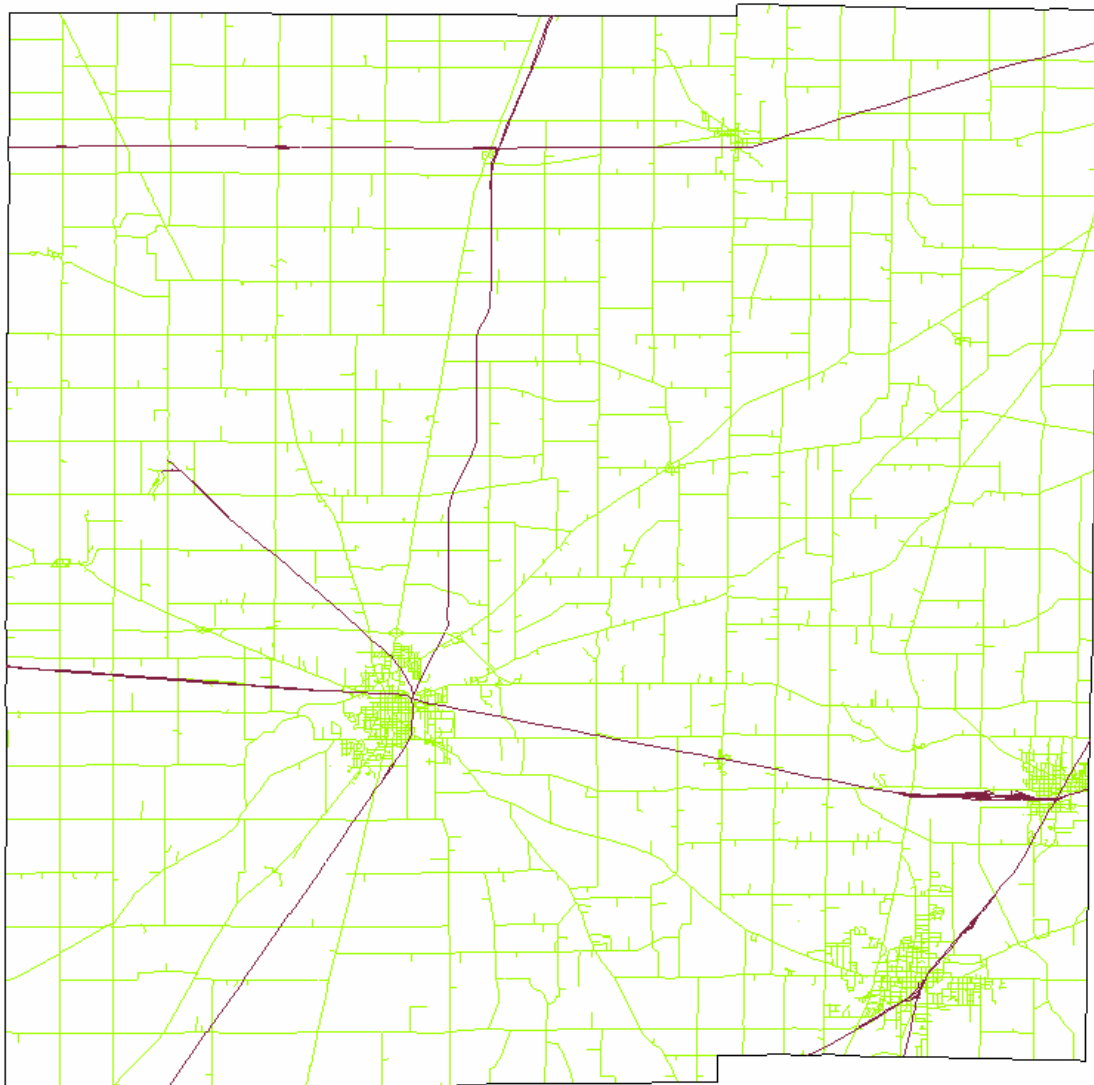
CRAWFORD COUNTY VILLAGES

2000 0 2000 Feet

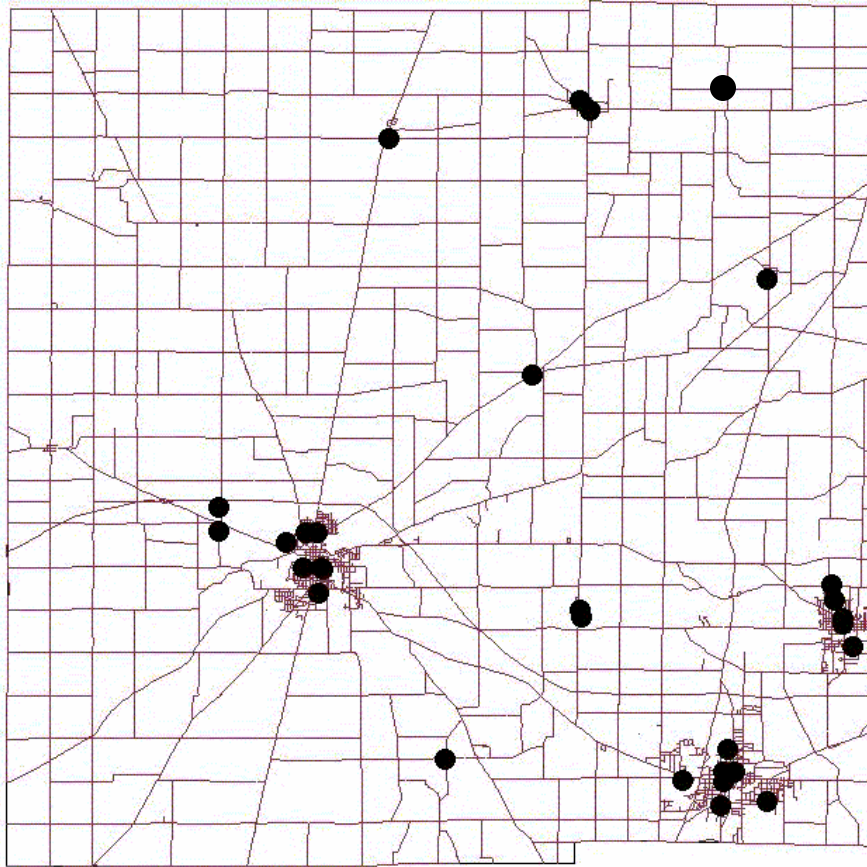


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CRAWFORD RPC
10/2003

RAILROADS



CRAWFORD COUNTY SCHOOLS

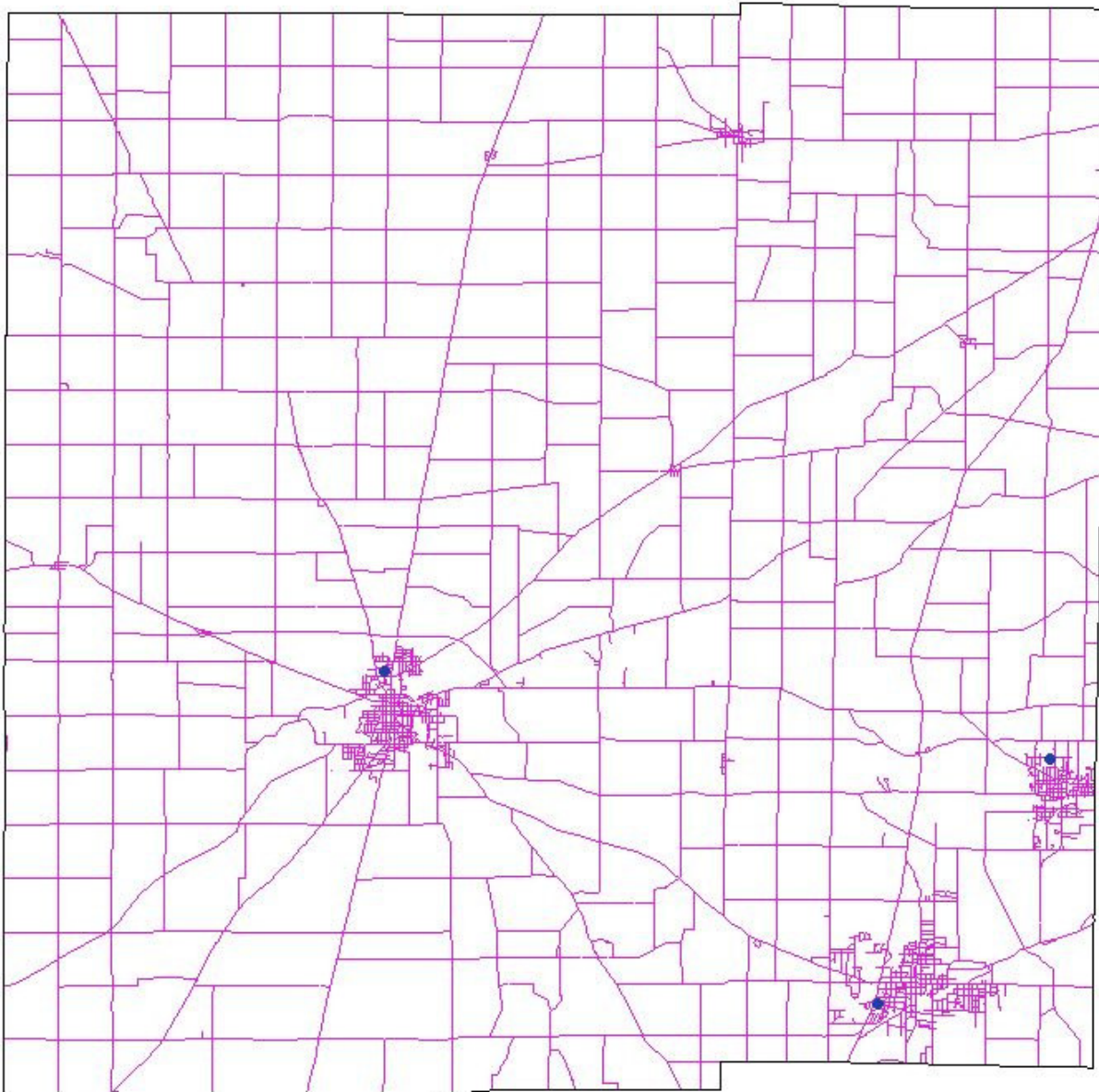


SCHOOL LOCATIONS IN
CRAWFORD COUNTY

2 0 2 4 Miles

DRAWN BY:
CRAWFORD RPC
10/2003

CRAWFORD COUNTY HEALTHCARE FACILITIES

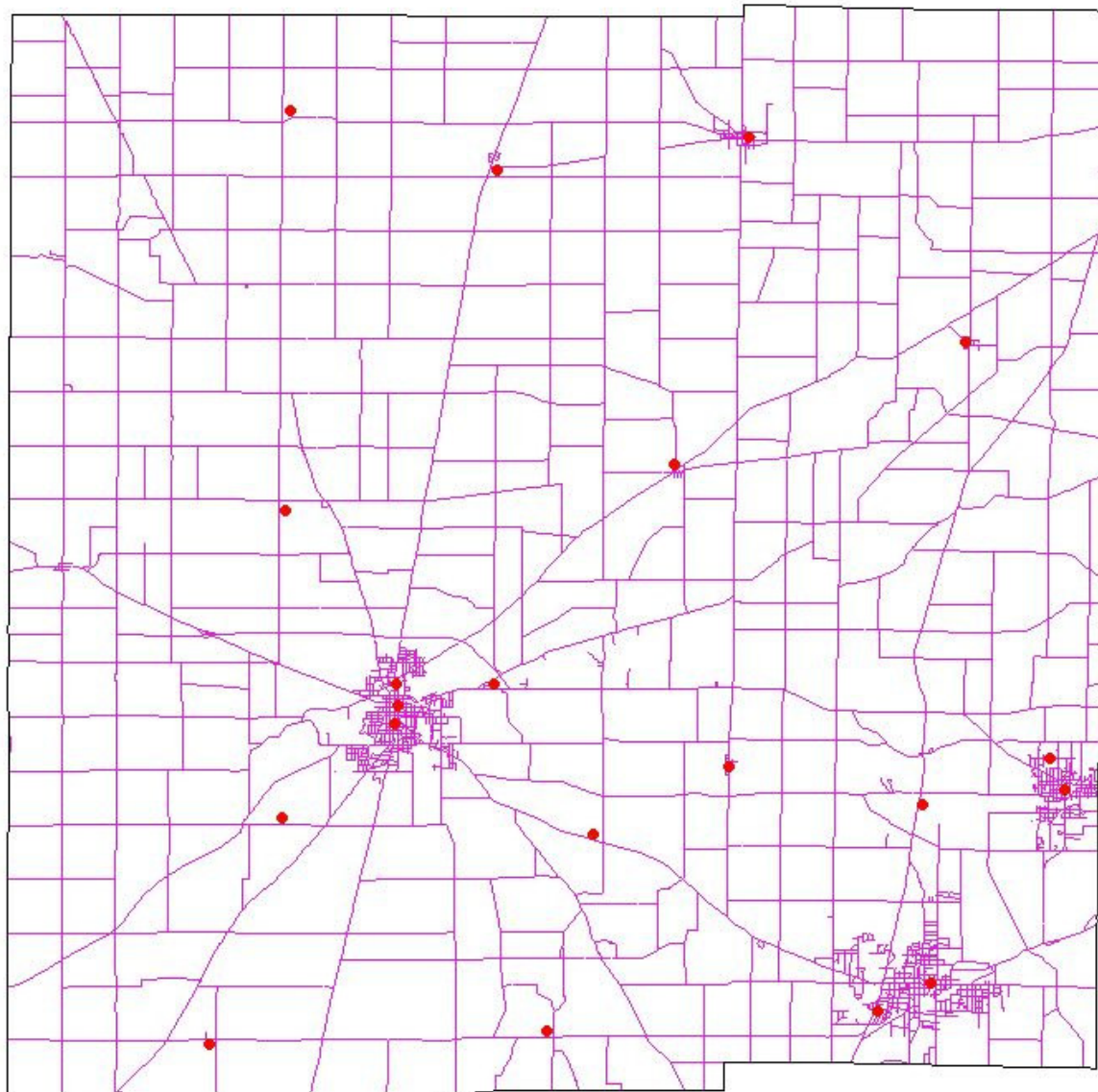


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MILES

CRAWFORD RPC 06/2004

- Healthcare Facilities
- County
- ▬ Streets

CRAWFORD COUNTY EMERGENCY FIRST RESPONDER FACILITIES

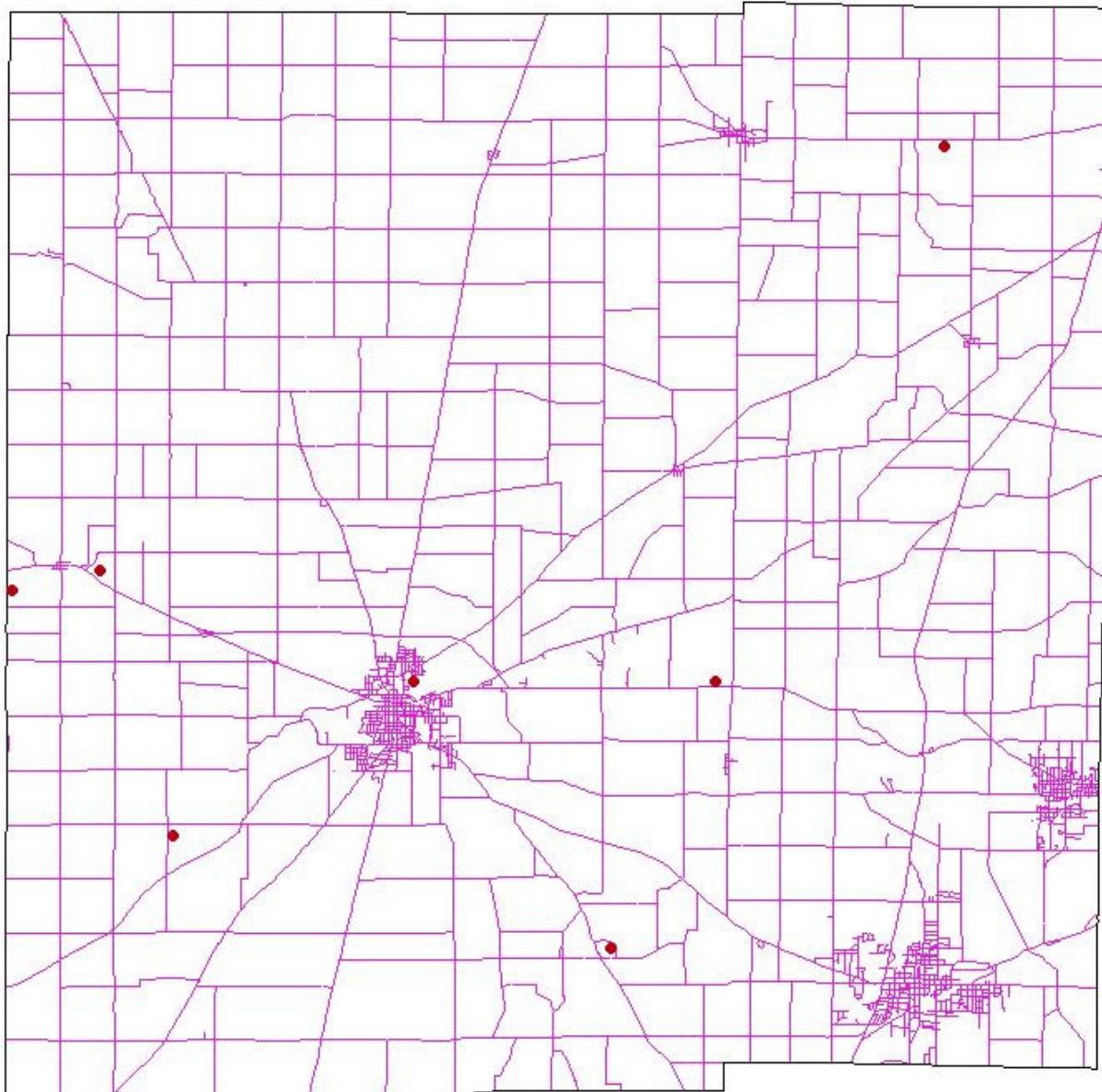


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MILES

CRAWFORD RPC 06/2004

- Emergency First Responders
- County
- Streets

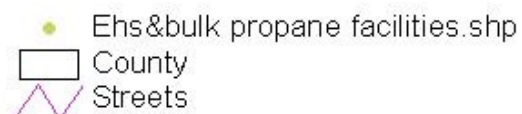
CRAWFORD COUNTY MOBILE HOME PARKS AND CAMPGROUND LOCATIONS



0 2
MILES

CRAWFORD RPC 06/2004

- Mobile Homes and Campgrounds
- County
- ▬ Streets



ASSESSING VULNERABILITY – ESTIMATED POTENTIAL LOSSES - FLOODING

Est. No. of Structures In 100 Yr. FEMA Flood Plain In Hazard Area	Type of Structure	Value of Structures	Persons
<i>Bucyrus.....</i>			120
51	Residential Properties	\$3,760,000	
11	Businesses	1,375,000	
1	Wastewater Treatment Facility	2,000,000	
1	Water Treatment Plant	2,000,000	
<i>Galion</i>			110
20	Residential Properties	\$1,920,000	
3	Business	375,000	
<i>Crestline.....</i>			57
24	Residential Properties	\$1,800,000	
<i>County Unincorporated Areas.....</i>			59
25	Residential Properties	\$ 2,000,000	
<hr/> 136	<i>TOTALS</i>	<i>\$15,230,000</i>	<i>316</i>

Source: Crawford County Auditor GIS Website
2000 Census

ASSESSING VULNERABILITY – ESTIMATED POTENTIAL LOSSES - DROUGHTS

<u>Year</u>	<u>Avg. Yield Bu./Acre</u>	<u>Total Bushels</u>	<u>Estimated Total Average Value</u>
Corn			
2000	162.7	18,890,100	\$41,558,220
2001	157.8	18,194,300	\$40,027,460
2002	73.3	7,825,100	\$17,215,220
Soybeans			
2000	45.5	6,323,000	\$33,385,440
2001	50.0	7,005,000	\$36,986,400
2002	27.8	4,194,900	\$22,149,072
Wheat			
2000	82.3	2,469,300	\$ 6,963,426
2001	72.5	1,775,500	\$ 5,006,910
2002	52.4	1,090,700	\$ 3,075,774
Hay			
2000	28	61,700	\$ 6,170,000
2001	24	64,500	\$ 6,450,000
2002	29	53,100	\$ 5,310,000

Source: U.S. Department of Agriculture Census of Agriculture –
<http://www.nass.usda.gov/census> .

ASSESSING VULNERABILITY – ESTIMATED POTENTIAL LOSSES -EARTHQUAKES

<u>Structure Amount of Type</u>	<u>Value</u>	<u>Percent of Potential Damage</u>	<u>Potential Damage</u>
Residential	\$ 397,454,320*	1.0% *** =	\$ 3,974,453
Commercial	\$ 62,360,700*	4.3% *** =	\$ 22,681,151
Industrial	\$ 25,738,640*	3.0% *** =	\$ 761,359
Agricultural	\$ 76,671,860**	3.1% *** =	\$ 2,376,827

Sources:

* Based on Crawford County Taxable Value less 20% for land costs.

** Based on Crawford County Taxable Value less 80% for land costs.

*** "Understanding Your Risks" FEMA State and Local Mitigation Planning Guide 386-2 per Loss Estimation Tables.

ASSESSING VULNERABILITY – ESTIMATED POTENTIAL LOSSES TORNADOES

Sample of various types of structures

Est. Value of Structural		No. of		No. of
<u>No. of Structures</u>	<u>Type of Structure/Facility</u>	<u>Losses</u>	<u>Residents</u>	<u>Jobs Lost</u>
90	Buildings	3.0 million	20	520
1	Courthouse	1.5 million	---	150
1	Fairgrounds	2.5 million	---	3
20	Businesses	1.0 million	---	60
1	Hospital	3.0 million	---	250
1	Rescue Facility	1.0 million	---	20
2	Nursing/Retirement Home Complexes	1.9 million	300	150
4	Industrial Complexes	3.5 million	---	400
1	Elementary School	1.5 million	---	30
1	Private School	1.0 million	---	20
1	Junior High School	1.5 million	---	30
50	Residences - Destroyed	3.5 million	125	---
80	Residences - Moderate Damage	3.2 million	200	---
100	Residences – Minor Damage	1.0 million	250	---
2	Apartment Cmplxs – Mod. Damage	.5 million	35	---
1	Wastewater Plant – Mod. Damaged	1.5 million	---	8
1	Mobile Home Park	.75 million	100	2
1	Park – Moderate Damage	.25 million	---	2
---	Infrastructure	1.5 million	---	---
---	Utility Damages	1.8 million	---	---
<u>358</u>		<u>35.4 million</u>	<u>1030</u>	<u>1055</u>

DEVELOPMENT TRENDS

Crawford County is located in north central Ohio. Crawford County residents have the unique opportunity to enjoy small town community life within easy access to major metropolitan areas. While largely rural and agriculture being the county's number one industry, Crawford County is home to a diversified industrial base including the Timken Corporation located near Bucyrus, PECO Industries in Galion, and Carlisle Engineered Products in Crestline

Crawford County also has a strong historical background and has generated an interest in tourism. Bucyrus, near the center of the county, has the Sandusky River passing through. Galion and Crestline are in the eastern part of the county where the Olentangy River and Paramour Creek respectively run.

It is anticipated that the majority of the residential growth will be adjacent to the City of Greenville and villages that have public water and wastewater treatment facilities in the northerly portion of Greenville as the topography and utilities tend to encourage this growth. The municipalities and the Crawford Park District have, in the past, planned for the future to maintain a green space corridor of walking and bike paths along the various bodies of water. The Regional Planning Commission, as well as the individual cities, townships and villages have various measures to prohibit the change of farmland to commercial/residential development in the agricultural areas. Only three of the sixteen townships have adopted zoning regulations. Comprehensive development plans in municipalities reserve greenspace along the creeks and rivers to preserve and keep development out of flood plains. Recent improvements to the Village of New Washington Wastewater Treatment Facilities will allow for development in this village in northern Crawford County.

The 1980, 1990, and 2000 Census Data indicates that Crawford County has maintained about the same or decreased slightly in population throughout the past 20 years. The largest population growth occurred between 1970 and 1980 when the County grew by approximately 6000 people. Because Crawford County is a strong agricultural county, it is anticipated that the population growth will be minimal for the next 10 years.

Upon review of the existing Villages, Townships, and County comprehensive planning documents, it is expected that Crawford County will have only a slight increase in residents over the next 10 – 20 years.

Most of the development has been smaller residential subdivisions within the Cities of Bucyrus, Crestline and Galion; small industrial companies also locating in the three cities; growth of several of the community and the Crawford Park District system parks.

Crawford County currently has a large number of retirement homes and elderly among its residents. In addition, the county, with several mobile home parks, campgrounds, and tourist attractions, has, at times, a temporary influx of population which shall be factored into its vulnerability.

MITIGATION STRATEGY

MITIGATION STRATEGY - GOALS

I. MISSION

It is the intent of the Crawford County Natural Hazard Mitigation Committee to provide hazard reduction goals as reflected in this plan, along with their corresponding objectives to guide the development within Crawford County. The process is necessary to reduce loss of life and risk to the citizens of Crawford County by implementing these goals.

II. PUBLIC PARTICIPATION

The overall goals of the Crawford County Natural Hazard Mitigation Planning Committee have been established from input from the general public from three public workshops, a collaboration of those persons attending the Crawford County Mayor Association Meetings, the Crawford County Trustee Association Meetings, and from recommendations of the Crawford County Natural Hazard Mitigation Planning Committee.

The Crawford County Natural Hazards Mitigation Committee has examined the issues of the general public, public agencies, and their representatives, private organizations, community planning organizations, and private residents.

III. ESTABLISH GOALS

A. Preventative

1. To reduce risk and loss of life by implementing activities to give Crawford County citizens as much advance warning as possible of impending natural hazards.
2. Coordinate existing plans and strategies already in place to put them to more effective use.
3. Strengthen communication between various communities and agencies throughout the county to make them aware of good, sound mitigation activities and practices.

4. Continue to coordinate policies and plans for the protection of critical facilities, services, and infrastructure.

B. Property Protection

To develop practices and implement activities to protect lives and reduce damages to homes, businesses, industries, and agricultural areas of Crawford County.

C. Emergency Services

Continue to support and coordinate emergency services efforts throughout the county and continue to strengthen emergency operation plans at the various Crawford County communities.

D. Structural Projects

Continued maintenance of existing river, stream, and retention dikes and levies.

E. Natural Resource Protection

Continue to rehabilitate, protect, and enhance the natural systems already in place in order to preserve the rich, historical and agricultural environment found in Crawford County.

F. Public Information

Continue to promote public awareness of the risks associated with natural hazard events.

Cost Benefit Analysis

Each project listed underwent a cost-benefit analysis. The amount of people that would be affected played a significant role in determining the overall project ranking. Before projects are implemented a cost benefit analysis will be done to ensure that the project is worthwhile.

IDENTIFYING THE PROBLEMS

In March of 2004, the Crawford County Natural Hazards Mitigation Planning Committee reviewed the vulnerability analysis and estimate of losses, developed problem statements, set goals, identified possible activities, and developed action plans necessary for the multi-jurisdictional plan of Crawford County.

The Crawford County Natural Hazards Mitigation Planning Committee decided to develop goals that would coincide with other goals of the Crawford County community. The Committee, with technical assistance from Regional Planning and Emergency Management staff, focused on the main tools available which included the Crawford County Emergency Operations Plan, Crawford County Subdivision Regulations, Local Township and Village Zoning Regulations, and the Crawford Park District's open space goals and objectives. Also considered was the agricultural influence in the county and watershed studies.

The Crawford County Emergency Management agency is being proactive in pre-disaster mitigation. One example of this is the agency working to purchase homes within the city of Bucyrus that experience repetitive flooding.

All municipalities in the county are working to upgrade their storm sewer capabilities. Also there is an emphasis on separating the storm and sanitary sewer systems.

Crawford County unincorporated areas, the Cities of Bucyrus, Crestline, and Galion. Villages of New Washington, Tiro, and Chatfield are all participating members of the National Flood Insurance Program (NFIP) and have flood plain ordinances.

From evaluation of current regulations, from the Crawford Regional Planning Commission and local township and zoning officials, many of the tools are in place to curb development within the established 100-year flood plains. The Crawford County Park District also takes an active role to help protect our natural resources along the county river and stream corridors.

The Crawford County Emergency Management (EMA) has provided yearly tornado drills and public information for all of the Crawford County schools and continue to do so. The Crawford County EMA also is also working to place NOAA weather radios in the local hospital, schools, nursing homes, day care centers, and industries with a large number of employees. This is an ongoing project and they hope to expand the program to include other locations that will benefit from advance weather warnings. This is an ongoing project with the EMA's goal to successfully complete installation of tornado warning sirens in all of the Crawford County's incorporated city and villages. Placement is dependent on available finances and the villages desire to install these warning devices. Complementary to the siren program will be the distribution of NOAA weather radios to residents in sparsely populated areas of the county.

The Crawford County EMA has a good identification system and emergency procedures for the known hazardous chemical facilities in the county. Crawford County has a very well-trained First Responders group of individuals, many of which are unpaid volunteers dedicated to serving the residents of Crawford County.

While many positive mitigation activities have occurred and are in process, the Crawford County Natural Hazards Mitigation Planning Committee was made aware of several problems that still, or could potentially, exist. Some of the problems mentioned include:

1. Lack of financial resources to fund improvements.
2. Many miles of countywide drainage tiles are old, broken down, and undersized. This leads to field and localized flooding which threatens some homeowners.
3. Some structures built years ago still exist in the 100-year flood plain.
4. Several critical facilities, mainly water or wastewater treatment plants, are located in the 100-year flood plain.
5. With the many different First Responder organizations in the county, the 911 emergency communications could be improved upon.

6. Many of the city and village sewer systems are old, broken down, and undersized. This leads to basement and street flooding during heavy rain events. Some sanitary systems receive storm water infiltration and this causes sanitary sewer backup into basements and lower levels of residences.
7. Crawford County has many festivals, events, and recreation areas which attract many visitors and participants. At most of these locations, there is no safe place for attendees during a severe storm or tornado event.
8. Crawford County has 16 townships and 7 incorporated city and villages. With the many village, city, township officials, and the number of different First Responders, there are many differences in opinions which lead to a wide variety of objectives and goals.
9. With Crawford County being located along the Ohio/Indiana border, most of the violent weather enters Crawford County from the west. It has been the county residents' experiences that many of the storm warnings are not received until the storms are in progress or after they have passed through much of the county.
10. Crawford County has many miles of rural areas. In some cases, Emergency First Responders, during a large emergency, have to travel quite some distance to reinforce and replace essential supplies.
11. Due to the number of public entities (7 city and villages, 16 townships), Crawford County has many different agencies and authorities in regards to implementing and standardizing comprehensive planning, zoning, building code, and economic planning tools.
12. Crawford County is a rural county with many elderly residents. The many miles of state, county, and township roadways create dangerous situations and increased emergency response time for First Responders and their residents in need during periods of severe storms, flooding, ice, snow, and blizzard events.

City Village Township	Natural Hazard	Action Item	Coordinating Organization	Timeline	Priority Level		Preventative	Property Protection	Emergency Service Measures	Structural Projects	Natural Resource Protection	Public Information
							Plan Goals Addressed					
Countywide	Tornadoes	Convert old fire sirens into tornado sirens	Crawford County EMA	Ongoing	High		X		X			X
Countywide	Tornadoes	Continue yearly tornado drill program at all schools.	Crawford County EMA Crawford County Schools	Ongoing	High				X			X
Countywide	Tornadoes	Provide weather radios to homes that are in sparsely populated areas	Crawford County EMA Village Officials	Ongoing	High				X			X
Countywide	Tornadoes	Establish NOAA Weather Radio program for festivals, fairgrounds, campgrounds, parks, and recreation areas.	Crawford County EMA Festival Coordinators	2 Years	Moderate				X			X
Countywide	Flooding	Identify surface water/county tile drainage obstructions for unincorporated areas of Crawford County.	Crawford County Engineer Township Trustees	2 Years	Moderate		X	X			X	
Countywide	Flooding	Investigate and record repetitive flooding areas in City and Villages.	Village Officials City Engineer	5 Years	Low		X	X				
Countywide	Flooding	Encourage development of strategies to preserve scenic waterways and open space in and around flood plains.	Scenic River Association Crawford Park District	Ongoing	Moderate		X	X			X	
Countywide	Flooding	Pursue mitigation activities and funding for existing designated flood prone areas.	Crawford County EMA Village Officials	2 - 3 Years	Moderate		X	X				
Countywide	Winter Storms	Increase public awareness of severe winter storms.	Crawford County EMA	Ongoing	Moderate		X	X				X
Countywide	Droughts	Provide education opportunities to Crawford County farmers on reducing adverse effects of drought.	Crawford County Soil and Water Conservation Crawford County Extension Office	5 Years	Low		X					X

Countywide	Droughts	Local City and Villages to adopt water conservation measures and standards.	City and Village Water Departments	5 years	Low		X					X
Countywide	Earthquakes	Provide public awareness and safety procedures during and following an earthquake event.	Crawford County EMA Crawford County Hazard Mitigation Planning Committee	5 Years	Low		X	X				X
Countywide	Multi-	Develop a Large gathering shelter plan for festivals and other events	Crawford County EMA Community Officials	3 Years	Moderate				X			X
Countywide	Multi-	Implement recommendations of feasibility study for upgrading countywide safety service communications.	Crawford County Fire Chief's Association Crawford County Sheriff Crawford County EMA	4 Years	Moderate		X		X			X
Countywide	Multi-	Identify and pursue funding options and opportunities to develop and implement local and county natural hazard mitigation activities.	City/Village Grant Coordinators Crawford Regional Planning Commission	Ongoing	Moderate			X			X	X
Countywide	Multi-	Encourage underground utility placement and tree maintenance programs in public right of ways.	Local Utility Co. Representatives Crawford County Engineer's Office	5 Years	Low		X					X
Countywide	Multi-	Continuance of a First Responders supply depot.	Crawford County Fire Chief's Association Crawford County EMA	Ongoing	Moderate				X			
Countywide	Multi-	Increase communication, coordination and collaboration between community leaders, property owners, local and county building regulations and zoning authorities to address risk and to provide uniformity and consistency in implementing sound mitigation practices.	Local Village Officials Township Zoning & Planning Officials Crawford County Natural Hazards Mitigation Planning Committee	Ongoing	High		X					X
Countywide	Tornadoes	Safe room for Mobile Home Park.	Mobile Home Park Owner	3 Years	Moderate		X	X				
Cities	Flooding	Analyze and establish floodproofing measures to protect Wastewater Treatment Plant.	City Engineer	2 - 3 Years	Moderate		X	X		X	X	

Cities	Flooding	Pursue funding for purchases of flood plain property/residences along waterways throughout the cities	City Engineer City Park Departments Crawford Park District	5 Years	Moderate		X	X			X	X
Village of North Robinson	Tornadoes	Install warning siren	Crawford County EMA Village Officials	3 Years	Moderate		X	X				X
Cities and Villages	Flooding	Assess and map problem drainage areas.	Village Officials	2 - 3 Years	Moderate		X					
Cities and Villages	Droughts	Ensure municipalities have enough water to ensure	City and Village Water Departments									
Cities and Villages	Flooding	Complete EPA storm/sanitary separation system.	Village Officials	3 - 5 Years	Moderate		X				X	
Townships	Flooding	Evaluate Township roads for frequently flooding areas within each township	Township Trustees County Engineer	3 Years	Moderate		X	X			X	
Townships	Flooding	Identify surface water and drainage tile obstructions.	Township Trustees Crawford County Engineer	5 Years	Low		X	X			X	

PLAN MAINTENANCE PROCEDURES

MONITORING, EVALUATING AND UPDATING

Crawford County has developed a method to ensure that regular review and update of the Crawford County Natural Hazard Mitigation Plan occurs. The County has formed a countywide Hazard Mitigation Plan Review Committee that consists of members of local agencies and other concerned parties, including a Crawford County Emergency Management Representative, Crawford County Board of Commissioners Crawford County Trustees Association Representative, Crawford County City/Village Planning Commission Representative, Crawford County Chamber of Commerce/Economic Development Representative, Crawford County Fire and Rescue Association Representative, Agricultural Representative, Soil and Water Conservation Representative, Planning and Zoning Official Representative, Media Representative, County Engineer Representative, Building Regulations Representative, Red Cross/Insurance Representative and Scenic River/Watershed Authority Representative.

The Crawford County Emergency Management Agency, under the direction of the Crawford County Board of Commissioners, will be responsible for contacting committee members and organizing the annual meeting. The meeting will be held in February of each year and committee members will be responsible for monitoring and evaluating the progress of the mitigation strategies of the plan. In addition to the annual meeting, members are also encouraged to bring forth any concerns or ideas relative to changes in goals or strategies for discussion at municipal council meetings and Crawford County Township Trustees Association meetings for comments and discussion. With these countywide organizations in place, it is an excellent opportunity to address all of the county mayors and township trustees. Crawford County Fire and Rescue Associations also meet quarterly and are generally attended by the Crawford County Emergency Management Agency personnel.

The Crawford County Natural Hazard Mitigation Plan Review Committee will review each goal and objective to determine their relevance to changing situations in the county, as well as changes in state or federal policy, and to ensure that they are addressing current and expected conditions. The committee will also review the risk assessment portion of the plan to determine if this information should be updated or modified. The parties responsible for the various implementation actions will report on the status of their projects and will include which implementation processes worked well, any difficulties encountered, how coordination efforts were proceeding, and which strategies should be revised.

The Crawford County Emergency Management Agency under the direction of the Crawford County Board of Commissioners will then have three months to update and make changes to the plan before submitting it to the committee members and the State Hazard Mitigation Officer. If no changes are necessary, the State Hazard Mitigation Officer will be given a justification for this determination.

IMPLEMENTATION THROUGH EXISTING PROGRAMS

Crawford County currently has the Crawford Regional Planning Commission to guide and control development in the county. Each city and village also has their own individual planning, zoning, and subdivision regulations. Crawford County has three townships: Jefferson, Jackson, and Polk, that have township zoning regulations. The entire county and all municipalities fall under the State of Ohio Building Code Regulations. Permitting for structural, mechanical, and electrical is handled through the State of Ohio Department of Commerce, Division of Industrial Compliance, Bureau of Plans and Specifications. Plumbing work is regulated by the local Crawford County Health Department and municipal building departments. Each public entity has its own existing mechanisms for capital improvements planning. Residential building permitting is processed through the Crawford County Building Regulations Department.

After adoption of this plan, the county will require that local municipalities and townships address natural hazards in their comprehensive plans and land use regulations. Many of these entities currently have such practices already in place. It is one of Crawford County's goals to increase public awareness, communication, coordination, and collaboration between community leaders, agencies, citizens, local and county building regulators, zoning officials, and elected public officials to address risk and to provide uniformity and consistency in implementing sound natural hazard mitigation practices.

The Crawford County Regional Planning Commission along with other municipal planning commissions will conduct periodic reviews of the county and municipal comprehensive plans and land use policies, analyze any plan amendments, and provide technical assistance to smaller local municipalities in implementing these natural hazard mitigation requirements. City, village, and township officials will work with the economic development oriented organizations and those organizations who are knowledgeable about grants to secure potential funding for mitigation projects throughout the county. The Crawford County Board of County Commissioners will be the lead agency and provide the formal adoption of the Mitigation Plan and will incorporate within the plan the approval and adoption by all participating Crawford County townships and municipalities.

Within six months of the formal adoption of the Mitigation Plan, the policies listed above will be incorporated into the process of existing planning mechanisms.

CONTINUED PUBLIC INVOLVEMENT

The Crawford County Emergency Management Agency will make readily available copies of the adopted Natural Hazards Mitigation Plan. The adopted plan will contain the names and the responsible contact person at the Crawford County Emergency Management Agency. This agency will keep track of public contacts of the plan. Posted on the Crawford County Emergency Management Agency website will be e-mail addresses and phone numbers for the contact person regarding the adopted Crawford County Natural Hazards Mitigation Plan. A public meeting will also be held annually by the Crawford County Natural Hazards Mitigation Planning Review Committee. This review forum will be to provide the public with an avenue for which they can express its concerns, opinions, or ideas about the plan or related topics on how to improve the plan. The Crawford County Emergency Management Agency will publicize and host the meeting. In addition, the Crawford County Emergency Management Agency will attend at least yearly, one of the quarterly Crawford County Township Trustee Association meetings, the Crawford County Fire Chief's Association meetings to provide updates and commentary to the plan.