

## 1.0 INTRODUCTION

### Purpose

The purpose of the mitigation plan is to identify risks and vulnerabilities from hazards that affect Carroll County, Ohio. With these risks and vulnerabilities identified, local officials can reduce losses of life, injuries, and to limit future damages by developing methods to mitigate or eliminate damages.

### Scope

The *Carroll County Hazard Mitigation Plan* follows a planning methodology that includes public involvement, a risk assessment for various identified hazards, an inventory of critical facilities and at-risk areas, a mitigation strategy for high-risk hazards, and a method to maintain and update the plan.

### Plan Authority

The *Carroll County Hazard Mitigation Plan* is “multi-jurisdictional,” meaning that it includes several jurisdictions. Carroll County stakeholders prepared this plan per federal requirements outlined in the Disaster Mitigation Act of 2000 (DMA2K), which requires communities to formulate a hazard mitigation plan to be eligible for mitigation funds made available through the Federal Emergency Management Agency (FEMA). Section 322 of the Robert T. Stafford Act requires that local jurisdictions develop and submit plans meeting the criteria outlined in 44 CFR Parts 201.6.

When the content of this plan corresponds to a requirement of 44 CFR 201.6, it will include a description of the relevant guidance. The following table lists the requirements of 44 CFR 201.6 and identifies the sections of the plan fulfilling the guidance.

44 CFR 201.6 REQUIREMENTS IN THIS PLAN		
<i>Section</i>	<i>Description</i>	<i>Section in Plan</i>
§ 201.6	Local Mitigation Plans. The local mitigation plan is the representation of the jurisdiction's commitment to reduce risks from natural hazards, serving as a guide for decision makers as they commit resources to reducing the effects of natural hazards. Local plans will also serve as the basis for the state to provide technical assistance and to prioritize project funding.	Section 1.0 Introduction
§ 201.6(a)(4)	Multi-jurisdictional plans may be accepted, as appropriate, as long as each jurisdiction has participated in the process and has officially adopted the plan.	Section 1.1 The Planning Process



44 CFR 201.6 REQUIREMENTS IN THIS PLAN		
Section	Description	Section in Plan
§ 201.6(b)(1)	An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval	Section 1.1 The Planning Process Section 4.3 Continued Public Involvement
§ 201.6(b)(2)	An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process	Section 1.1 The Planning Process
§ 201.6(b)(3)	Review and incorporate, if appropriate, existing plans, studies, reports, and technical information	Section 1.3 Capabilities Section 1.4 Trends & Predictions Section 4.2 Implementation through Existing Programs
§ 201.6(c)(1)	Documentation of the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved	Section 1.1 The Planning Process
§ 201.6(c)(2)	A risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.	Section 2.0 Risk Assessment
§ 201.6(c)(2)(i)	The risk assessment shall include a description of the type, location, and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.	Section 2.1 Hazards Identification Section 2.2 Hazard Profiles
§ 201.6(c)(2)(ii)	The risk assessment shall include a description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community. All plans approved after October 1, 2008, must also address NFIP insured structures that have been repetitively damaged by floods.	Section 223 Hazard Profiles Section 234 Hazard Rankings
§ 201.6(c)(2)(ii)(A)	The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas;	Section 2.2 Hazard Profiles
§ 201.6(c)(2)(ii)(B)	The plan should describe vulnerability in terms of an estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate;	Section 2.2 Hazard Profiles
§ 201.6(c)(2)(ii)(c)	The risk assessment shall provide a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.	Section 1.4 Trends and Predictions
§ 201.6(c)(2)(iii)	For multi-jurisdictional plans, the risk assessment section must assess each jurisdiction's risks where they vary from the risks facing the entire planning area.	Section 2.2 Hazard Profiles
§ 201.6(c)(3)	A mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.	Section 3.0 Mitigation Strategy
§ 201.6(c)(3)(i)	This section shall include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.	Section 3.1 Mitigation Goals



44 CFR 201.6 REQUIREMENTS IN THIS PLAN		
Section	Description	Section in Plan
§ 201.6(c)(3)(ii)	This section shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure. All plans approved by FEMA after October 1, 2008, must also address the jurisdiction's participation in the NFIP, and continued compliance with NFIP requirements, as appropriate.	Section 3.2 Mitigation Actions
§ 201.6(c)(3)(iii)	This section shall include an action plan describing how the actions identified in paragraph (c)(3)(ii) of this section will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost-benefit review of the proposed projects and their associated costs.	Section 3.2 Mitigation Actions
§ 201.6(c)(3)(iv)	For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.	Section 3.2 Mitigation Actions
§ 201.6(c)(4)(i)	A plan maintenance process that includes a section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.	Section 4.1 Monitoring, Evaluating and Updating the Plan
§ 201.6(c)(4)(ii)	A plan maintenance process that includes a process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.	Section 4.2 Implementation through Existing Programs
§ 201.6(c)(4)(iii)	A plan maintenance process that includes discussion on how the community will continue public participation in the plan maintenance process.	Section 4.3 Continued Public Involvement
§ 201.6(c)(5)	Documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commission, Tribal Council). For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.	Section 5.0 Appendix 6
§ 201.6(d)(1)	Plans must be submitted to the State Hazard Mitigation Officer (SHMO) for initial review and coordination. The State will then send the plan to the appropriate FEMA Regional Office for formal review and approval. Where the State point of contact for the FMA program is different from the SHMO, the SHMO will be responsible for coordinating the local plan reviews between the FMA point of contact and FEMA.	Section 5.0 Appendix 6
§ 201.6(d)(3)	A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within five years in order to continue to be eligible for mitigation project grant funding.	Section 3.1 Mitigation Goals Section 3.2 Mitigation Actions Section 5.0 Appendix 2



## 1.0 INTRODUCTION

### 1.1 Planning Process

§201.6(c)(1) Documentation of the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

Carroll County, through the direction of the Carroll County Emergency Management Agency (CCEMA) began the process to update this plan; the CCEMA contracted the services of JH Consulting, LLC, of West Virginia, (the consultant) to aid in the process. The consultant met with CCEMA to layout the process and timeline for the update and determine the agency, department, organization, and jurisdictional representatives who would serve as committee members.

#### 1.1.1 Planning Committee

The following table outlines the committee members that actively participated in the update of this plan.

PLANNING COMMITTEE MEMBERS AND AFFILIATIONS	
<i>Agency/Affiliation</i>	<i>Name and Title</i>
Brown Township	Chris Rotondo, Township Trustee
Brown Local Schools	Scott Bowling, Superintendent
Carroll County Emergency Management Agency	Devin Herrington, Deputy Director
Carroll County General Health District	Courtney Grossman
Carroll County Solid Waste District	Barb Walton, Director (former)
Carrollton Village	Mark Wells, Village Administrator

The committee came together five times throughout the process. The first meeting was in person at the CCEMA conference room/emergency operations center (EOC) on June 11, 2019. The second meeting took place online via web conference on July 22, 2019. The third



meeting was again in person at the CCEMA conference room on September 26, 2019. The next committee meeting took place at the CCEMA conference room on October 21, 2019.

Municipal participation was also important. The CCEMA staff and the county's consultant reached out directly to municipal officials to gauge their concerns about the hazards included in the plan, existing project status, and new projects. Several village and township officials completed an online "capability survey." Other stakeholders provided input via meeting participation, or email and phone correspondence with CCEMA or consultants. The CCEMA emailed neighboring county emergency management agencies with notice that the plan had been updated, and invited them to comment on it.

### Committee Meeting 1

The first committee meeting gave members the opportunity to familiarize themselves with each other and with the plan. The consultant explained the requirements of the plan and the steps through which the update would occur. The consultant also laid out the expectations for the committee members for participation in the update.

The focus of the first meeting was on getting reacquainted with the plan and reviewing the projects and goals from the previous update in 2005. The committee members discussed the key items that are important in creating a mitigation strategy; they discussed the problems they face as a county and in their jurisdictions, and they presented ideal solutions that would feed into the overall goals for this updated plan. For further information on the goals and the process by which the committee updated the goals, refer to Section 3.1: Mitigation Goals.

Committee members also discussed the public involvement requirement of the plan; they approved (with minor changes) a survey that the consultant had presented as an example to garner public input.

### Committee Meeting 2

The second committee meeting was online via a web conference. There were two main purposes for this meeting: discussion and approval of the goals and discussion of hazards included in the plan. The consultant presented the three goals formulated during Meeting 1; they were approved with minor changes to wording. Then, the discussion turned to updating the hazard list for the plan. The committee decided to keep all of the hazards they included in the previous plan updates but expand the list. The committee elected to add "oil and gas emergencies" as per discussion from Meeting 1 and to change the title of the "epidemic" profile



(from 2005) to the broader “public health emergencies.” The committee also added severe wind/tornado, severe winter storm, extreme temperature (heat and cold), terrorism, and wildfire to the hazard list. The modifications bring the total number of hazards profiled in the plan to fifteen.

### Committee Meeting 3

The third committee meeting was an in-person meeting. The main object of this meeting was to gather local input about past hazard events. The consultant asked the committee to recall instances or examples of each of the hazards listed in the plan, and members gave personal anecdotes about their experiences with the hazards.

The second purpose of Meeting 3 was to approve a final draft of the public involvement survey. The committee suggested changes to the survey, including consolidating questions 3 and 5, condensing preparedness questions, and removing income demographic.

### Committee Meeting 4

The fourth committee meeting was an in-person meeting. The primary focus of the meeting was to update the committee on the public participation survey information. As of Friday, October 18<sup>th</sup>, 26 community members had participated in the survey. Most respondents were most concerned with flooding, severe winter storms, and oil and gas emergencies. They were least concerned with earthquakes, wildfires, and dam/levee failures. Hazards not included in the plan that respondents mentioned include drinking water safety and electrical infrastructure age.

The final agenda item for Meeting 4 included gathering prospective project ideas. Committee members provided prospective project ideas: watershed debris removal, infrastructure maintenance and improvement, public education regarding hazard mitigation, rabies control, and discharging septic systems.

### Committee Meeting 5

The primary focus of the meeting was to gather status updates for existing mitigation projects. The consultant provided the list of projects from the previous plan, and reviewed the list with the committee. Members provided status updates for each of the projects listed in the previous plan.



### 1.1.2 Jurisdictional Involvement

All of the jurisdictions within Carroll County participated in the update to this plan. All cities, villages, townships, and the county had the opportunity to provide input for the plan in the following ways.

- Attending meetings
- Completing the online capabilities survey
- Updating their mitigation project lists (which could include updating status of existing projects or adding new projects)
- Providing information for the plan to CCEMA or the consultant via phone or email
- Promoted public involvement by sharing the public survey via website and social media

The following table identifies what activities jurisdictions completed.

CARROLL COUNTY HMP JURISDICTIONAL TASKS							
<i>Community</i>	<i>Attended Planning Meetings</i>	<i>Online Capability Survey</i>	<i>Project Updates</i>	<i>Added New Projects</i>	<i>Provided Info to CCEMA or Consultant</i>	<i>Promoted Public Involvement</i>	<i>Overall Participation Assessment</i>
Carroll County	YES		YES		YES <sup>1</sup>	YES	YES
Carrollton Village	YES				YES <sup>1</sup>		YES
Dellroy Village		YES			YES <sup>2</sup>		YES
Leesville Village		YES	YES		YES <sup>2</sup>		YES
Magnolia Village		YES			YES <sup>2</sup>		YES
Malvern Village					YES <sup>2</sup>		YES
Minerva Village				YES	YES <sup>2</sup>		YES
Sherrodsville Village		YES			YES <sup>2</sup>		YES

<sup>1</sup> Information provided on an on-going basis throughout the term of the project (i.e., June 2019 through September 2020).

<sup>2</sup> Information provided via telephone and email during the period of July and August, 2020.



### 1.1.3 Public Involvement

The committee approached the public involvement component in two ways to garner input for the plan: through an online survey and by promoting a draft of the plan for public review. Throughout the process, partners promoted a survey that asked residents about their views on hazards, their support for various mitigation actions, and their level of personal preparedness. Survey respondents indicated which hazards they were most concerned about in their areas. The following table depicts respondents' levels of concern for each of the hazards listed in the plan. Those respondents showing concern answered "somewhat concerned", "concerned", or "very concerned" when asked to indicate how concerned they were about each of the included hazards.

<i>Risk</i>	<i>Number of Respondents Showing Concern</i>	<i>Percent of Respondents Showing Concern</i>
Dam/Levee Failure	20	43.5%
Drought	31	67.4%
Earthquake	10	21.7%
Extreme Temperature	32	69.6%
Flooding	38	82.6%
Infestation	29	63.0%
Landslide/Erosion	30	65.2%
Mine Failure	23	50.0%
Oil and Gas Emergencies	39	84.8%
Public Health Emergencies	34	73.9%
Severe Wind and Thunderstorm	42	91.3%
Severe Winter Storms	42	91.3%
Terrorism	31	67.4%
Tornado	41	89.1%
Wildfire	22	47.8%

Another part of the public survey asked participants to chose mitigation projects they would support. The projects most supported by respondents included burying power lines to provide uninterrupted power during severe weather (69.4%), educational campaigns aimed at preparing the population for a variety of hazards (61.1%), planting trees to promote a cooler micro-climate (58.3%), upgrading water and sewer systems (55.5%), and installing generators in critical facilities (52.7%). Projects that received the least amount of support included adopting building codes that go above and beyond the basic requirements of construction (13.89%) and reducing the amount of surface pavement to reduce flooding and the heat island effect (22.2%).



Of the 46 respondents, 16% answered that they had a 72-hour emergency kit in their home, and another 11% had an incomplete 72-hour emergency kit. 72% of respondents did not have an emergency kit in their home.

The committee utilized the survey data in a number of ways throughout the project. First, as it considered the hazards to include in the plan, members reviewed the hazards that posed concerns to residents. When updating project lists, committee members and participating jurisdictions referenced the types of projects the general public might support based on survey responses.

Due to the COVID-19 pandemic, the planning committee used local media sources to garner public input on the completed draft of the plan, as opposed to an in-person town-hall meeting. Once a draft of the plan was completed, Carroll County EMA posted the draft to their website, where residents could review the plan and provide their input.

#### **1.1.4 Previous Versions**

This section contains descriptions of the processes used to update previous versions of the plan (i.e., 2005).

##### Original Plan Development (2005)

The original process in 2005 was led by the Hazard Mitigation Planning Committee (HMC) and supported by the planning and engineering firm R.D. Zande & Associates, INC. This current, updated version was compiled by the CCEMA staff, as well as JH Consulting, LLC of West Virginia.

The Carroll County EMA compiled a HMC, known as project stakeholders, to be responsible for the development and implementation of the original plan. The committee included representatives from local municipalities, as well as emergency service organizations within the county (i.e., fire, police, etc.).

HMC members consistently reported the actions of the project stakeholders back to the participating jurisdictions. As such, participating jurisdictions and the public were continually updated as to the status of the plan's preparations. Further, with respect to the development of an action plan, one special HMC meeting and two public review sessions were scheduled to discuss the formulation of the plan and ways in which the county could lessen its susceptibility to identified hazards.



Feedback received from the HMC proved valuable in the development of the original plan. Several comments were received that resulted in the reevaluation of the risks that should be included in the plan. It was found that in addition to the identified natural hazards, secondary hazards, such as the limited access to the remote areas, and tourist attractions of the county, are a concern to county first responders. Further, all governmental jurisdictions in Carroll County were polled in an effort to gather local opinion on prominent hazards and high-priority mitigative actions. As a result, the plan was tailored to Carroll County's specific needs, and proved to be a document county resident's felt ownership of, and utilized to make educated decisions that reduced their vulnerability to hazards.

The Hazard Risk Assessment (HRA) phase of the original mitigation plan was completed using a variety of research techniques. Federal Emergency Management Agency (FEMA) GeoHazards, National Oceanic and Atmospheric Administration (NOAA), and other Internet sites were searched for historical hazard event records. R.D. Zande & Associates, Inc. conducted searches of local newspaper archives and existing reports and plans that were on file with the Carroll County Emergency Management Agency (CCEMA), and the participating jurisdictions to assist in the determination of hazard-susceptibility areas. Interviews and other discussions were conducted with numerous local officials, including first responders, insurance agents, and other emergency services officials to ascertain the risks associated with particular hazards in specific areas of the county. After identifying the areas in which the hazards were most prominent, they were profiled and positioned into a base map of the county. This Geographic Information System (GIS)-based map contains several themes with information regarding the individual hazards. Assets (i.e., structures, utilities etc.) were inventoried and loss estimates were calculated for each of the inventoried assets with respect to the hazards profiled on the GIS-based maps. The general public of Carroll County was further involved in the planning process as information was gathered from the county's assets to complete loss estimates. The county's contractor contacted representatives from each of these assets, explaining the process and collecting ideas on hazard susceptibility and mitigation actions.

Following the completion of the HRA, the Hazard Mitigation Core Planning Committee (HMC) used information such as hazard profiles and loss estimates to formulate mitigation goals, objectives, and strategies. For this phase of the project, the HMC met separately to discuss baseline strategies. Such an action was reasoned most appropriate, as project stakeholders are individuals that deal with hazard events on a regular basis and will be directly affected by the implementation of the plan. Members of the HMC were notified of the meetings



via memoranda and telephone correspondence from the CCEMA. The stakeholders' ideas were used as the starting point for further planning steps.

The baseline mitigation strategies were presented to the public at the public review sessions to ensure fair participation from all sectors of the county. These meetings were not well attended. The meetings were publicized in the local newspaper and posted on the courthouse bulletin board. In an effort to obtain greater public comment, the EMA's contractor provided HMC members with "Household Hazard Preparedness" questionnaires to distribute to members of the general public and civic and governmental agencies throughout the county.



## 1.0 INTRODUCTION

### 1.2 Description of the Planning Area

The description of the planning area contextualizes the remainder of this document. It provides background information on the areas impacted by various hazards and serves as a foundation for mitigation decisions.

#### 1.2.1 Carroll County Details

This first sub-section provides demographics and other details for Carroll County. It includes unincorporated areas as well as municipal areas.

##### Geography

Carroll County was established in 1833 from parts of Columbiana, Stark, Tuscarawas, Harrison, and Jefferson counties, and was named for Charles Carroll of Carrollton, Maryland, the last surviving signer of the Declaration of Independence. Carroll is one of 88 counties in Ohio, and one of 32 Ohio counties that make up the Appalachian Ohio region. Carroll County is part of the Canton-Massillon, OH Metropolitan Statistical Area, which is also included in the Cleveland-Akron, OH Combined Statistical Area. Adjacent counties include Stark County to the northwest, Columbiana County to the northeast, Jefferson County to the southeast, Harrison County to the south, and Tuscarawas County to the southwest.

According to the U.S. Census Bureau, Carroll County has a total area of 398.93 square miles, with 394.61 square miles of land and 4.32 square miles of water. There are two main watersheds in Carroll County- Atwood Lake Watershed and Leesville Lake Watershed.

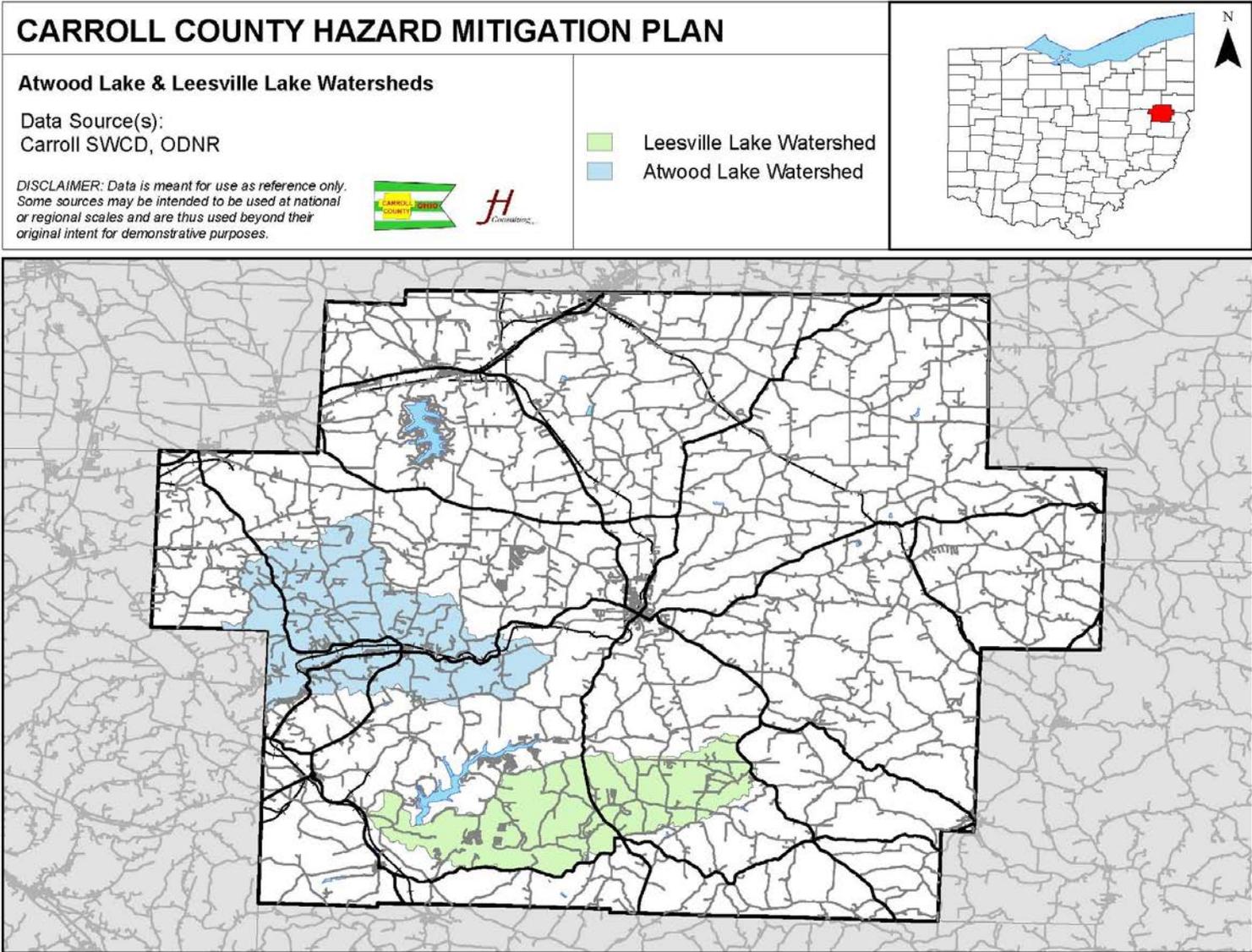
**Atwood Lake Watershed:** Atwood Lake Watershed is 44,976 acres located primarily in Carroll County, with a small portion crossing into Tuscarawas County. The watershed had a population of 7,833 people at the most recent Census. Watershed land is mostly forested, with 26,210 acres of forest, 12,768 acres of agricultural land, and 4,396 acres of urban areas.

**Leesville Lake Watershed:** Leesville Lake Watershed is 31,733 acres located entirely in Carroll County, and had a population of 2,222 at the most recent Census. The majority of the watershed is primarily forested, with 19,674 acres of forest, 8,468 acres of agricultural land, and 1,587 acres of developed areas.



The following maps depict the locations of the Atwood and Leesville Lake Watersheds as well as their drainage areas in Carroll County.





# CARROLL COUNTY HAZARD MITIGATION PLAN

## Carroll County Drainage Areas

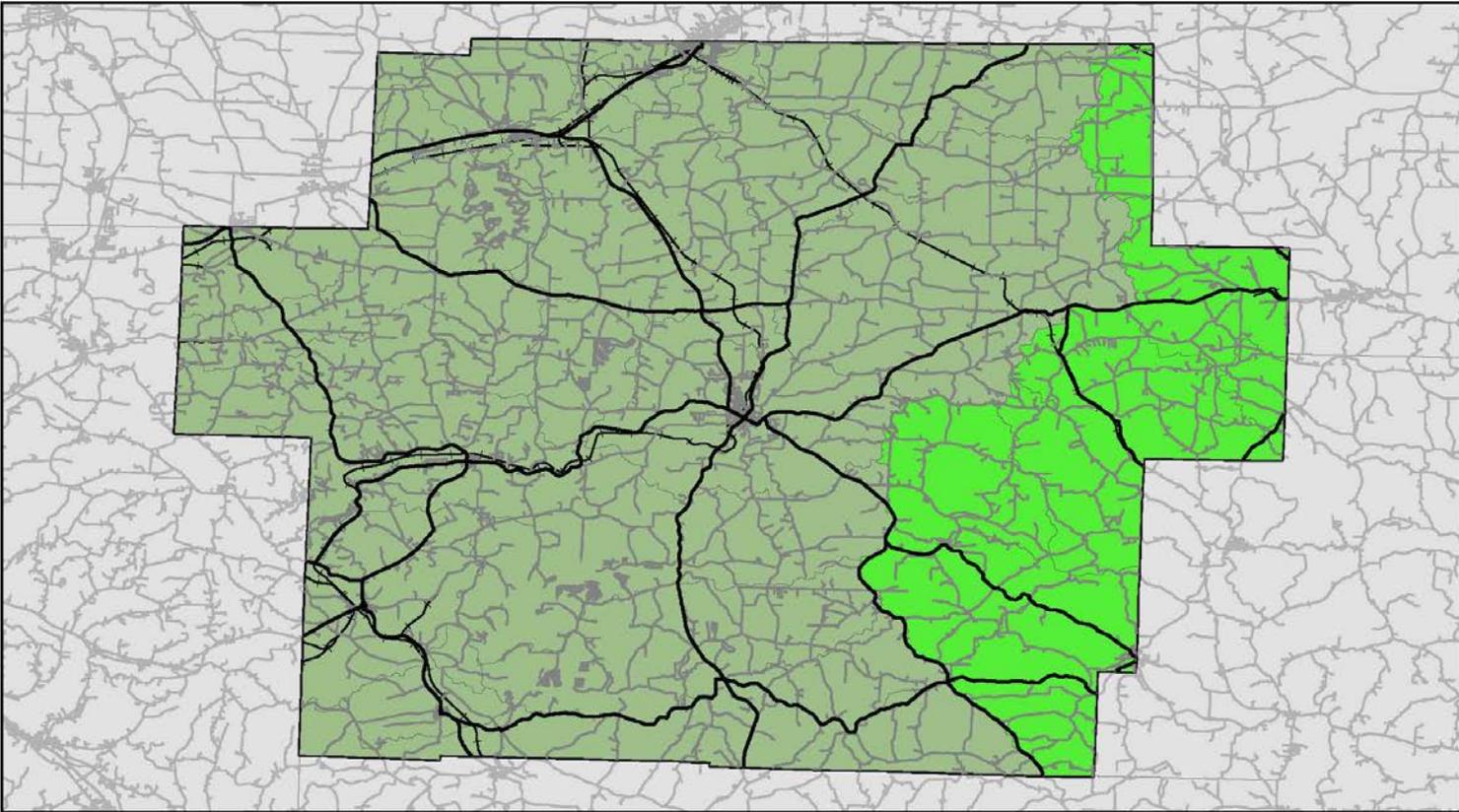
Data Source(s):  
ODNR

*DISCLAIMER: Data is meant for use as reference only. Some sources may be intended to be used at national or regional scales and are thus used beyond their original intent for demonstrative purposes.*



### Watersheds

- Ohio River Drainage Areas
- Muskingum River Drainage Areas



Carroll County is situated in two eco-regions. Eastern Carroll County is located in what is known as the Unglaciaded Upper Muskingum Basin, while the western portion of the county is located in the Pittsburgh Lower Plateau. The Unglaciaded Upper Muskingum Basin region is a plateau dissected with streams, which are less degraded than those in the Monongahela Transition Zone and Ohio/Kentucky Carboniferous Plateau.

The Pittsburgh Low Plateau eco-region is characterized by rounded, forested hills and narrow, agricultural valleys. This area is largely unglaciaded in contrast to neighboring eco-regions. Soils in the Pittsburgh Low Plateau are medium textured, and differ from the clayey soils of surrounding eco-regions. Stream acidity from coal mining is present, but less so than in surrounding eco-regions.

### Demographics

The following table presents general demographics for Carroll County and the municipalities therein.



CARROLL COUNTY DEMOGRAPHICS								
	<i>Carroll County (Total)</i>	<i>Carrollton Village</i>	<i>Dellroy Village</i>	<i>Leesville Village</i>	<i>Magnolia Village</i>	<i>Malvern Village</i>	<i>Minerva Village</i>	<i>Sherrodsville Village</i>
Population estimates (2017)	27,825	2,834	421	260	1,040	1,189	3,486	244
White alone	27,103	2,824	404	260	1,036	1,115	3,451	242
Black or African American	257	2	14	0	0	45	0	0
American Indian and Alaska Native	21	0	0	0	4	4	0	2
Asian	105	8	0	0	0	3	0	0
Native Hawaiian and other Pacific Islander	17	0	0	0	0	0	0	0
Two or More Races	252	0	3	0	0	16	35	0
Hispanic or Latino	351	34	18	5	12	26	23	4
Veterans, 2013-2017	2,003	172	22	22	64	54	298	31
Foreign born persons	232	39	0	0	1	0	12	0
Housing units (2017)	13,619	1,405	162	112	419	573	1,762	94
Median household income (in 2017 dollars)	\$51,748	\$51,005	\$52,083	\$53,409	\$62,321	\$50,435	\$43,494	\$45,000
Persons in poverty	14.8%	13.6%	14%	4.2%	12.0%	16.7%	12.2%	6.3%
Population per square mile (2017)	70.5	1,156.7	2,004.7	1,000	4,521.7	1,774.6	1,563.2	762.5
Land area in square miles (2010)	394.61	2.45	0.21	0.26	0.23	0.67	2.23	0.32

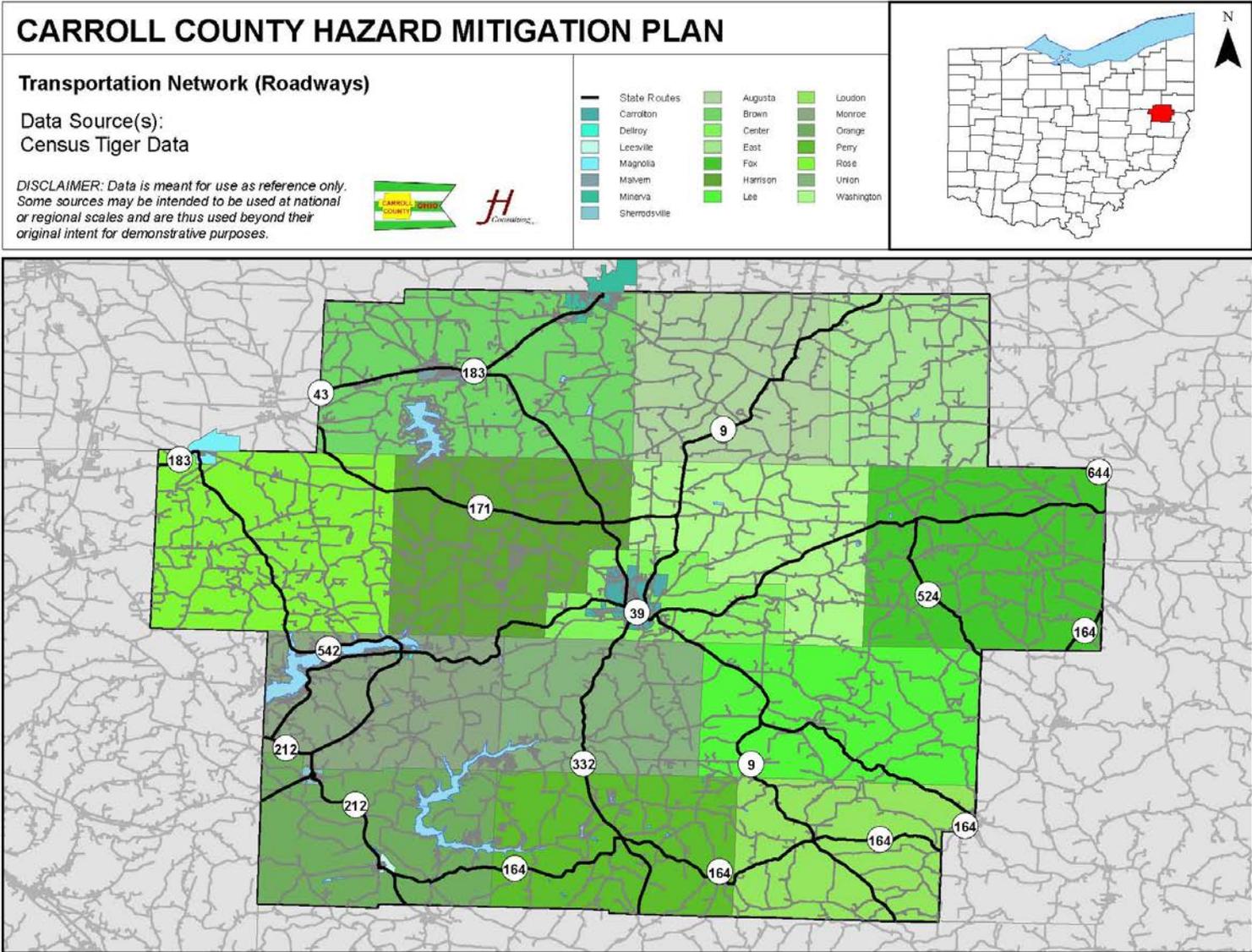


Population density represents the number of people per square mile. Because Carroll County's boundaries are set and the population is decreasing, the population density is also decreasing. As noted in the table above, the population density varies considerably between urban and rural areas of Carroll County. 34% of the county's population located in 6.37 square miles, or 1.6% of the county's total land area. This confirms that the highest concentration of the population is located in the cities and villages. While villages in Carroll County have a high population density, the majority (66%) of residents reside in less dense townships and other rural areas.

### Transportation

Carroll County's transportation infrastructure is composed of highway, rail, and air elements. According to the 2017 Carroll County Engineer Annual Report, there are 307 miles of road in Carroll County, with 141 bridges. State routes coming into Carrollton include 9, 39, 43, and 332. The following image depicts the existing road infrastructure in Carroll County.





The County Engineer and the Ohio Department of Transportation maintain the conditions of the roads throughout the county. ODOT uses the Pavement Condition Rating System (PCR) to classify roads on a 100 point scale. A score of 100 represents a perfect new pavement, and a score of 0 represents a pavement with distress present at the highest or most extensive level of severity. The following table describes the condition of roads in Carroll County.

STATUS OF CARROLL COUNTY ROADS			
<i>Condition Description</i>	<i>PCR</i>	<i>Total Miles</i>	<i>Percentage of Total Miles (%)</i>
Excellent	>90	5.73	1.87
Good	>80	105.97	34.52
Fair	>65	42.27	13.77
Poor	<65	149.67	48.75
Not Rated	-	3.36	1.09

Air comprises a portion of transport in the county. Tolston Field airport, located just outside Carrollton, serves Carroll County. The landing strip at Tolston Field is approximately 5,000 feet in length, and is lighted.

Rail is a small component of Carroll County's transportation infrastructure. Wheeling and Lake Erie operates a line running north-south from Carrollton through Malvern on to Canton, and serves Sherrodsville via their Toledo-Pittsburgh mainline. A local shortline, Ohio Rial Corp. based in Mechanicstown, operates out of the Minerva Yard. This line provides local service between its Norfolk Southern mainline and Minerva, Mechanicstown, and Bergholz/Amsterdam. The following map depicts the railways in Carroll County.



## CARROLL COUNTY HAZARD MITIGATION PLAN

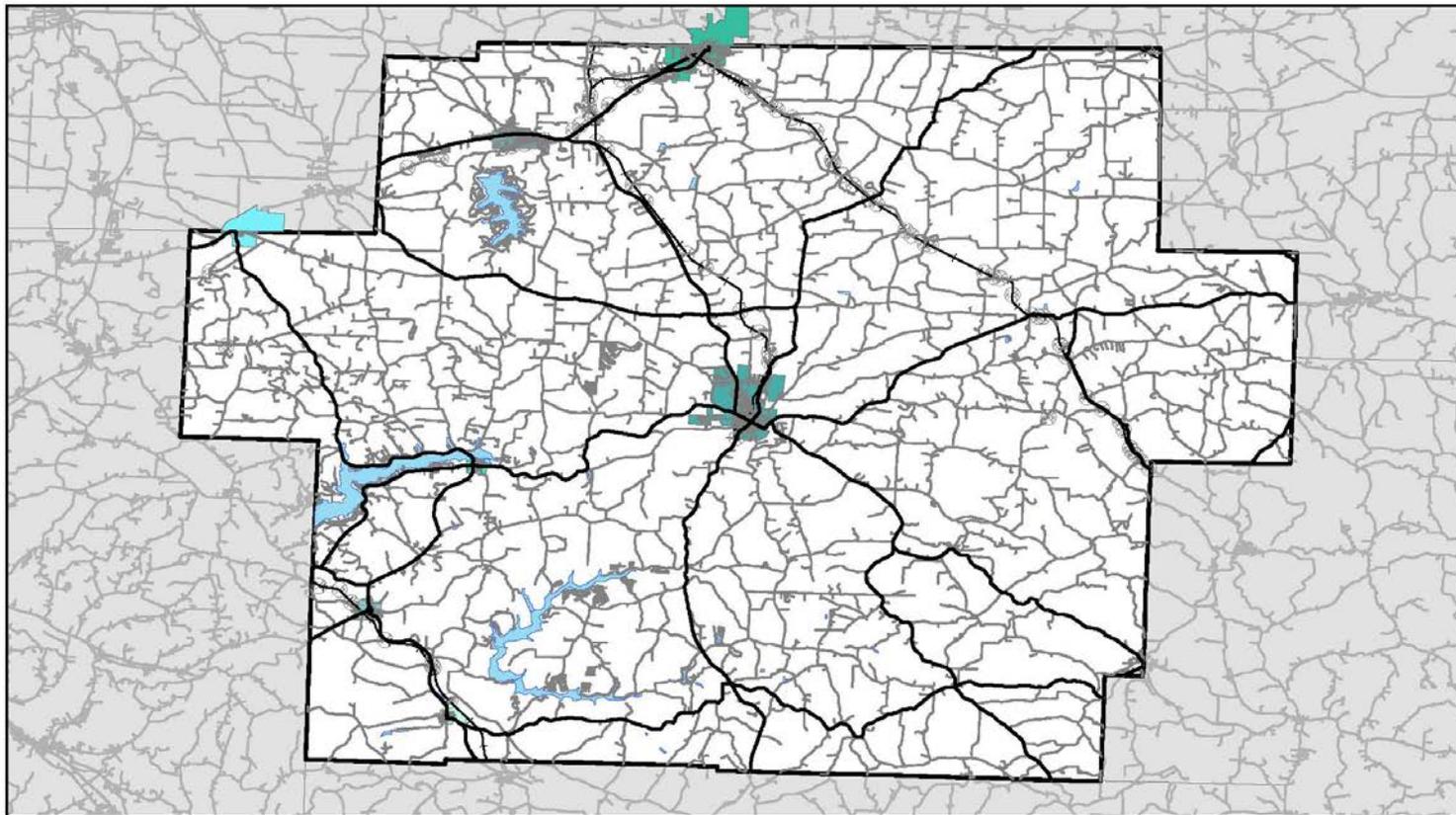
### Transportation Network (Railways)

Data Source(s):  
Census Tiger Data, FRA, ODOT

*DISCLAIMER: Data is meant for use as reference only. Some sources may be intended to be used at national or regional scales and are thus used beyond their original intent for demonstrative purposes.*



- Railroads
- ⊗ Rail Crossings
- Carrollton
- Delroy
- Leesville
- Magnolia
- Malvern
- Minerva
- Sherrodsville



### Economy

Carroll County has a diverse employment sector. According to 2017 information from the Ohio Department of Development, the largest areas of employment are Manufacturing (with an average employment of 1,266 and total wages of \$55,131,546) and Trade, Transportation, and Utilities (with an average employment of 1,261 and total wages of \$46,337,342).

There has been a significant change in employment by sector since 2012. Between 2012 and 2017, Information saw a 54.1% decrease in average employment, Natural Resources and Mining saw a 45.7% decrease, and Other Services saw a 25.3% decrease. Conversely, Construction saw a 131.1% increase in average employment, Education and Health Services saw a 61.7% increase, and Professional and Business Services saw a 60% increase. Notable employers in the county include Carroll County Government, Carroll Health Care Center, Carrollton Exempted Village School District, Colfor Manufacturing, GBS Corporation, and St. John's Villa.

### Education

The education system in Carroll County consists of three school districts, which have eight public schools with 2,953 students and 245 teachers. The largest district is Carrollton Exempted Village School District, which has 2,003 students and three schools. Other districts include Brown Local School District with 634 students and three schools and Conotton Valley Union Local School District with 391 students in 2 schools. The current high-school graduation rate in Carroll County is 91.3%, which is higher than both the state and national graduation rates of 84% and 85%, respectively.

There are several options for post-secondary education in commuting distance to Carroll County. Stark State University has a branch in Carrollton where highschool students can earn college credits prior to highschool graduation. Additionally, tow branches of Kent State University are within easy commuting distance. KSU-New Philadelphia is located approximately 30 miles west of Carrollton in Tuscarawas County, and KSU-East Liverpool is located approximately 32 miles east in Columbiana County.

### Healthcare

Communities that are socially connected and have accessible health systems are able to withstand disaster and foster community recovery (US Dept. of Health and Human Services, 2015). There are no registered hospitals located in Carroll County. There are three licensed nursing homes, which have a combined 219 beds, and one residential care facility with 108

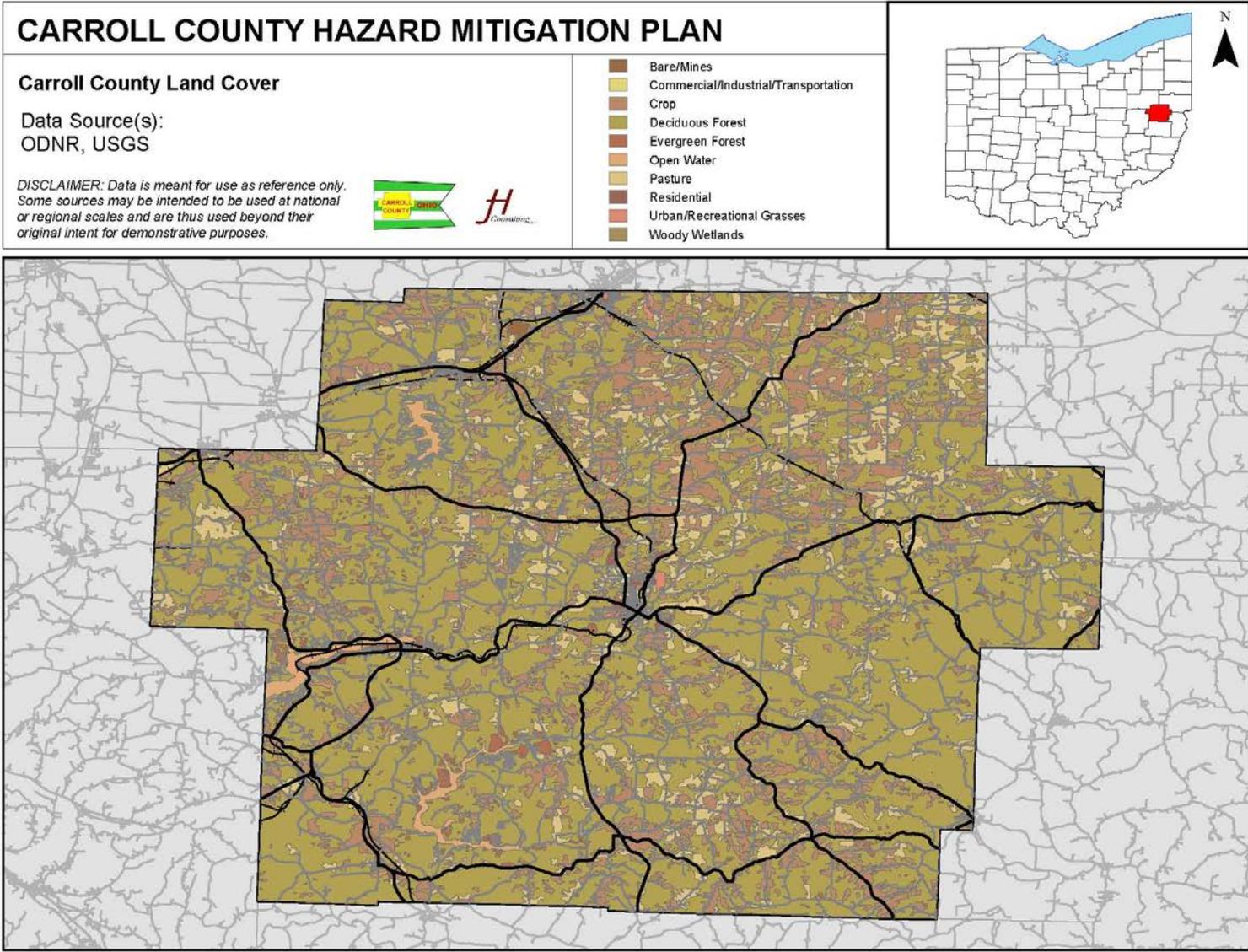


beds. There are also several family practice clinics and one urgent care facility in the county. The Carroll County General Health District is a public health agency that provides immunizations, women's and environmental health services, and assistance for children with medical handicaps.

Land Cover / Climate

The majority of Carroll County's land is undeveloped. Approximately 55% (2,170 square miles) is forested, and 29% (1,144 square miles) is pasture and hay. A small portion is developed land, with 6.65% developed with low intensity and 0.48% developed with higher intensity. Other land cover includes barren land (from strip mines, gravel pits, and the like), shrubs and grassland, cultivated crops, wetlands, and open water. The following map depicts land cover in Carroll County.





### **1.2.2. Municipalities**

This section provides demographic and other general details for each of the participating municipalities.

#### Carrollton Village

The Village of Carrollton was founded in 1815 as “Centerville.” After the village was designated as the county seat of Carroll County in 1834 its name changed to Carrollton for Charles Carroll of Carrollton, the last surviving signer of the Declaration of Independence. According to 2017 Census estimates, Carrollton has a population of 2,834 and a population density of 1,156.7 people per square mile. There are 1,405 housing units in the village, and the median household income for residents is \$51,005.

Transportation routes in the village include state highways and railways. Carrollton is situated at the junction of State Routes 39 and 43, and State Routes 9 and 332 also pass through the village. A branch of the Wheeling and Lake Erie Railway passes through Carrollton and ends at the Carroll County Industrial Park.

Students in Carrollton are served by the Carrollton Exempted Village School District, which operates an elementary, middle, and high school in the village. There is also a branch of the Carroll County District library in Carrollton.

#### Dellroy Village

Dellroy Village was established in 1849 as “Cannonsburg,” and was renamed to Dellroy in 1878. The village is situated along State Route 39 west of Carrollton, and is the smallest village in Carroll County by land area. Dellroy has a population of 421 and a land area of 0.21 square miles. There are 162 housing units in the village. The median household income is \$52,083, which is higher than the county average.

#### Leesville Village

Leesville Village is located in southwestern Carroll County along Conotton Creek. State Route 212 and State Route 164, as well as a portion of the Wheeling and Lake Erie Railway pass through the town. According to the 2017 Census estimates, Leesville has a population of 260 and a land area of 0.26 square miles, thus a population density of 1,000 people per square mile.



There are 112 housing units in the village, and the median household income is \$53,409. Students in Leesville attend schools operated by the Conotton Valley Union Local School District, which serves southwestern Carroll County.

#### Magnolia Village

Magnolia Village is located in both Carroll and Stark counties. It has a population of 1,040 and a land area of 0.23 square miles, for a population density of 4,521 people per square mile. There are 412 housing units in Magnolia, and residents have a median household income of \$62,321, which is the highest in Carroll County.

The Sandy Valley Local School District, based in Stark County, serves Magnolia Village. The three school campuses of the Sandy Valley Local School District are located in Tuscarawas County. Transportation infrastructure in the village consists primarily of local and state roads. State Route 183 traverses the village, and portions of State Routes 542 and County Route 23 (Bachelor Road) serve the area.

#### Malvern Village

Malvern Village is located in northwestern Carroll County along Sandy Creek, and State Route 43 travels east-west through the village. The Brown Local School District serves as the public education system in Malvern. The Carroll County Library operates a branch in Malvern.

According to the 2017 Census estimates, Malvern's population is 1,189, and the land area is 0.67 square miles. It has a population density of 1,774 people per square mile, which is among the highest in Carroll County. There are 573 housing units in the village, and the median household income is \$50,435.

#### Minerva Village

Like Magnolia, Minerva Village is also located in both Carroll and Stark counties. The village's population is 3,486, which is the most of all villages in Carroll County, and its land area is 2.23 square miles. The median household income (of 1,762 housing units) is \$43,494, which is the lowest of the villages in Carroll County. The Minerva Local School District operates an elementary, middle, and high school in the village. State Routes 30 and 183 provide highway access to the area



Sherrodsville Village

Sherrodsville Village was laid out in 1882 and named for the original owner of the site Charles Sherrod. The village is at the intersection of State Routes 39 and 212, and the Wheeling and Lake Erie Railway passes through the area. The Conotton Valley Union Local School District provides local public education via an elementary and high school.

According to the 2017 Census estimates, the population of Sherrodsville is 244, and its land area is 0.32 square miles. The village has a population density of approximately 763 people per square mile, making it the least population-dense village in Carroll County. There are 94 housing units in Sherrodsville, and the median household income is \$45,000.

**1.2.3 Asset Inventory**

§201.6(c)(2)(ii)	[The risk assessment shall include a] description of the jurisdiction's vulnerability of the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.
§201.6(c)(2)(ii)(A)	The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.

This plan identifies potentially-vulnerable community assets such as critical facilities, critical infrastructure, historic properties, commercial/industrial facilities, etc. “Assets” contribute directly to the quality of life in the community as well as ensure its continued operation

Methodology

The assets on the inventory are types of facilities recommended for consideration in the *Local Hazard Mitigation Planning Handbook* (FEMA, 2013). The following list is the most current version of the initial asset inventory included in Carroll County's original hazard mitigation plan. Thus, the methodology used to generate this version was simply via emergency management agency review and comment. This plan categorizes “assets” under the following headings (FEMA, 2013).

- **People:** Areas of greater population density as well as populations with unique vulnerabilities or diminished response and recovery capabilities. Examples include areas of concentrated populations, areas catering to tourist (i.e., visiting) populations, facilities housing or serving functional and access needs individuals, and facilities that provide health or social services.



- **Economy:** Important economic drivers specific to the community. Examples include major employers and commercial centers.
- **Built Environment:** Existing structures, infrastructure systems, critical facilities, and cultural resources. The following table includes examples of built environment categories.

<b>"BUILT ENVIRONMENT" ASSETS</b>			
<i>Existing Structures</i>	<i>Infrastructure</i>	<i>Critical Facilities</i>	<i>Cultural Resources</i>
<ul style="list-style-type: none"> <li>• Commercial buildings</li> <li>• Industrial buildings</li> <li>• Single &amp; multi-family residential buildings</li> </ul>	<ul style="list-style-type: none"> <li>• Water &amp; wastewater</li> <li>• Power utilities</li> <li>• Transportation (roads, railways, waterways)</li> <li>• Communications systems/centers</li> <li>• Energy pipelines &amp; storage</li> </ul>	<ul style="list-style-type: none"> <li>• Hospitals &amp; medical facilities</li> <li>• Police &amp; fire stations</li> <li>• Emergency operations centers</li> <li>• Evacuation shelters</li> <li>• Schools</li> <li>• Airport/heliports</li> </ul> <p>HIGH POTENTIAL LOSS FACILITIES</p> <ul style="list-style-type: none"> <li>• Nuclear power plants</li> <li>• Dams</li> <li>• Military &amp; civil defense installations</li> <li>• Locations housing hazardous materials</li> </ul>	<ul style="list-style-type: none"> <li>• Historic assets</li> <li>• Museums</li> <li>• Unique geologic sites</li> <li>• Concert halls</li> <li>• Parks</li> <li>• Stadia</li> </ul>

- **Natural Environment:** Resources that are important to community identity and quality of life in the community, as well as those that support the local economy through agriculture, tourism, and recreation. Examples include areas that can provide protective functions that reduce the magnitude of hazard events and critical habitat areas and other environmental features that are important to protect.

Asset Inventory

The following table lists Carroll County’s community assets, and the following map shows their locations graphically. Hazard profiles in 2.0 Risk Assessment reference the facilities from the table located in various hazard susceptibility areas.



<b>ASSET LIST, CARROLL COUNTY OH</b>			
<i>Asset Name</i>	<i>Address</i>	<i>City</i>	<i>ZIP</i>
<i>MUNICIPAL OFFICES</i>			
Augusta Township	3005 Aurora Road NE	Carrollton	44615
Brown Township	200 Grant Street PO Box 378	Malvern	44644
Carroll County Courthouse	119 S Lisbon Street	Carrollton	44615
Carrollton Village	80 Second Street SW	Carrollton	44615
Center Township	419 4th Street SE	Carrollton	44615
Dellroy Village	2 W Main Street	Dellroy	44620
East Township	6177 Bane Road NE	Carrollton	44615
Fox Township	8250 Clover Road NE	Salineville	46945
Harrison Township	2258 Waynesburg Road NW	Carrollton	44615
Lee Township	3154 Apollo Road SE	Carrollton	44615
Loudon Township	7211 Germano Road SE	Carrollton	44615
Magnolia Village	328 North Main Street	Magnolia	44643
Malvern Village	116 West Main Street	Malvern	44644
Minerva Village	209 North Market Street	Minerva	44657
Monroe Township	5073 Roswell Road SW	Dellroy	44620
Orange Township	Mail - 8123 Antigua Road SW	Sherrodsville	44675
Perry Township	158 Amsterdam Road SE	Scio	43988
Rose Township	2044 Magnolia Road	Magnolia	44643
Sherrodsville Village	122 South Sherrod Avenue	Sherrodsville	44675
Union Township	4155 Scio Road SW	Carrollton	44615
Washington Township	3097 Cobbler Road NE	Carrollton	44615
<i>TRANSPORTATION INFRASTRUCTURE</i>			
Furey Runway	LAT/LONG: 40.696802,-81.179185		
Bridges	VARIOUS		
Carroll County- Tolson Runway	LAT/LONG: 40.561656, -81.078126		
Hibbetts Runway	LAT/LONG: 40.63776,-81.11299		
Parsons Runway	LAT/LONG: 40.6481167,-81.0687072		
Railroads	VARIOUS		
Roads	VARIOUS		
McClain Field	LAT/LONG: 40.615824, -80.941508		
Schneider-Mohawk Runway	LAT/LONG: 40.647561, -81.214828		



<b>ASSET LIST, CARROLL COUNTY OH</b>			
<i>Asset Name</i>	<i>Address</i>	<i>City</i>	<i>ZIP</i>
<i>WATER TREATMENT FACILITIES</i>			
Atwood Regional Water and Sewer District	3103 New Cumberland Road NE	Mineral City	44656
Carroll County Environmental Services (Former BTM Sewer)	620 W Canal Street	Malvern	44644
Carrollton Sewer Treatment Plant	Mail - 80 2nd Street SW, Physical - 193 Alamo Road SE	Carrollton	44615
Carrollton Water Treatment Plant	Mail - 80 2nd Street SW, Physical - 2025 Brenner Road NE	Carrollton	44615
Deshea Water Treatment*			
Leesville Sewer Treatment Plant	Mail - PO Box 204, Physical - 8600 Block Cumberland Road SE	Leesville	44639
Malvern Water Treatment Plant	410 N Carrollton Street	Malvern	44644
Minerva Water Treatment Plant	401 E Lincoln Way	Minerva	44657
Minerva Sewer Treatment Plant	805 Valley Street	Minerva	44657
Waynesburg Village Water Treatment Plant	166 Canal Street	Waynesburg	44688
<i>EMS SERVICES</i>			
Maple Cotton Ambulance	28997 SR 30	Kensington	44427
Quad Ambulance	6930 Minerva Road SE	Waynesburg	44688
Regional EMS	110 Mill Street	Sherrodsville	44675
EMT Ambulance - B&M Ambulance District	230 South Reed Street	Malvern	44644
EMT Ambulance - Carrollton	1423 Canton Road	Carrollton	44615
<i>FIRE AND POLICE SERVICES</i>			
Amsterdam Police	103 Springfield St	Amsterdam	43093
Amsterdam Volunteer Fire Dept.	6223 Steubenville Road	Amsterdam	43903
Atwood Rangers	9500 Lakeview Road NE	Mineral City	44656
Augusta Township Volunteer Fire Department	3041 Aurora Road	Augusta	44607



<b>ASSET LIST, CARROLL COUNTY OH</b>			
<i>Asset Name</i>	<i>Address</i>	<i>City</i>	<i>ZIP</i>
Bergholz Fire Dept	724 Monroe Street	Bergholz	43908
Carroll County Sheriff	73 2nd Street SE	Carrollton	44615
Carrollton Police	135 3rd Street SW	Carrollton	44615
Carrollton Village Fire Dept	135 3rd Street SW	Carrollton	44615
Dellroy Community Volunteer Fire Dept	5 North Ohio Street	Dellroy	44620
Fox Township Volunteer Fire Dept	7119 Salineville Road	Mechanicstown	44651
Hanover Township Volunteer Fire Dept	10235 Second Street	Hanoverton	44423
Leesville Fire Dept	150 West Market Street	Leesville	44639
Loudon Township Fire Dept	7177 Germano Road	Carrollton	44615
Magnolia Police	328 North Main Street	Magnolia	44643
Magnolia Volunteer Fire Dept	514 Harrison Street	Magnolia	44643
Mohawk Valley Fire District	8285 Waynesburg Drive SE	Waynesburg	44688
Great Trail Fire District	232 South Bridge Street	Malvern	44644
Minerva Police	209 North Market Street	Minerva	44657
Perry Township Volunteer Fire Dept	178 Amsterdam Road	Scio	43988
Sandy Creek Joint Fire District	505 East Lincoln Way	Minerva	44657
Sherrodsville Volunteer Fire Dept	8183 Stover Road SW	Sherrodsville	44675
<i>SENIOR LIVING FACILITIES</i>			
Carroll Golden Age Retreat	2202 Kensington Road NE	Carrollton	44615
Minerva Eldercare Center	1035 E Lincoln Way	Minerva	44657
Carroll Healthcare Center Inc.	648 Longhorn Street NW	Carrollton	44615
Centerville Village	1082 Kensington Road	Carrollton	44615
Bowerston Pointe	9076 Cumberland Road	Bowerston	44695
Country View Manor	2193 Commerce Drive	Carrollton	44615
Arbor's at Minerva	400 Carolyn Court	Minerva	44657
<i>SCHOOLS</i>			
Carrollton Elementary School	252 Third Street NE	Carrollton	44615
Carrollton High/Middle School	205 Scio Road	Carrollton	44615



<b>ASSET LIST, CARROLL COUNTY OH</b>			
<i>Asset Name</i>	<i>Address</i>	<i>City</i>	<i>ZIP</i>
Carroll County Christian Academy	1211 Lincoln Avenue NW	Carrollton	44615
Conotton Valley High School	7205 Cumberland Road SW	Bowerston	44695
Conotton Valley Elementary School	7205 Cumberland Road SW	Bowerston	44695
Brown Local Schools	3242 Coral Road NW	Malvern	44644
Amish Schools Below*			
Deer Run	6195 Andora Road NE	Mechanicstown	44651
Country Corner	4240 Rush Road NE	Carrollton	44615
Spring Valley	4000-4100 Block Mark Road NE	Carrollton	44615
Saw Mill Run	3110 Steubenville Road SE	Carrollton	44615
Plane Ridge	3400 Plane Road SE	Carrollton	44615
<i>POST OFFICES</i>			
Amsterdam Post Office	116 South Main Street	Amsterdam	43903
Augusta Post Office	8081 Kensington Road NE	Augusta	44607
Bergholz Post Office	254 2nd Street	Bergholz	43908
Carrollton Post Office	246 South Libson Street	Carrollton	44615
Dellroy Post Office	3 East Main Street	Dellroy	44620
Leesville Post Office	95 South Water Street	Leesville	44639
Malvern Post Office	116 East Porter Street	Malvern	44644
Mechanicstown Post Office	7077 Salineville Road	Mechanicstown	44651
Minerva Post Office	112 West High Street	Minerva	44657
Sherrodsville Post Office	27 South Sherrod Avenue	Sherrodsville	44675
Waynesburg Post Office	157 East Lisbon Street	Waynesburg	44688
<i>NATIONAL REGISTER HISTORIC PLACES</i>			
Carroll County Courthouse	119 S Lisbon Street	Carrollton	44615
Kilgore Union Presbyterian Church	7219 Germano Rd. SE	Carrollton	44615
McCook, Daniel, House	Public Sq.	Carrollton	44615
Petersburg Mill	4.3 mi. S of Carrollton on OH 332	Carrollton	44615
Van Horn Building	Public Sq., jct. of W. Main and N. Lisbon Sts.	Carrollton	44615



<b>ASSET LIST, CARROLL COUNTY OH</b>			
<i>Asset Name</i>	<i>Address</i>	<i>City</i>	<i>ZIP</i>
Herrington, John, House	4070 Arbor Rd. NE	Mechanicstown	44651
Herrington Bethel Church	4009 Arbor Rd. NE	Mechanicstown	44651
Pottorf, Henry and Mary, House and Farmstead	4071 Meter Rd.	Mechanicstown	44651
Wheeling and Lake Erie RR Minerva Station	301 Valley St.	Minerva	44657
Hull, Patrick, House	8187 Blade Rd.	Oneida	44644
St. Mary's Of Morges	8012 Bachelor Rd., NW.	Waynesburg	44688

The following map depicts the locations of assets throughout Carroll County. Some assest listed in the table may not appear in the map due to their physical address being outside Carroll County's corporate limits. However, these assets provide essential services to parts of Carroll County.



# CARROLL COUNTY HAZARD MITIGATION PLAN

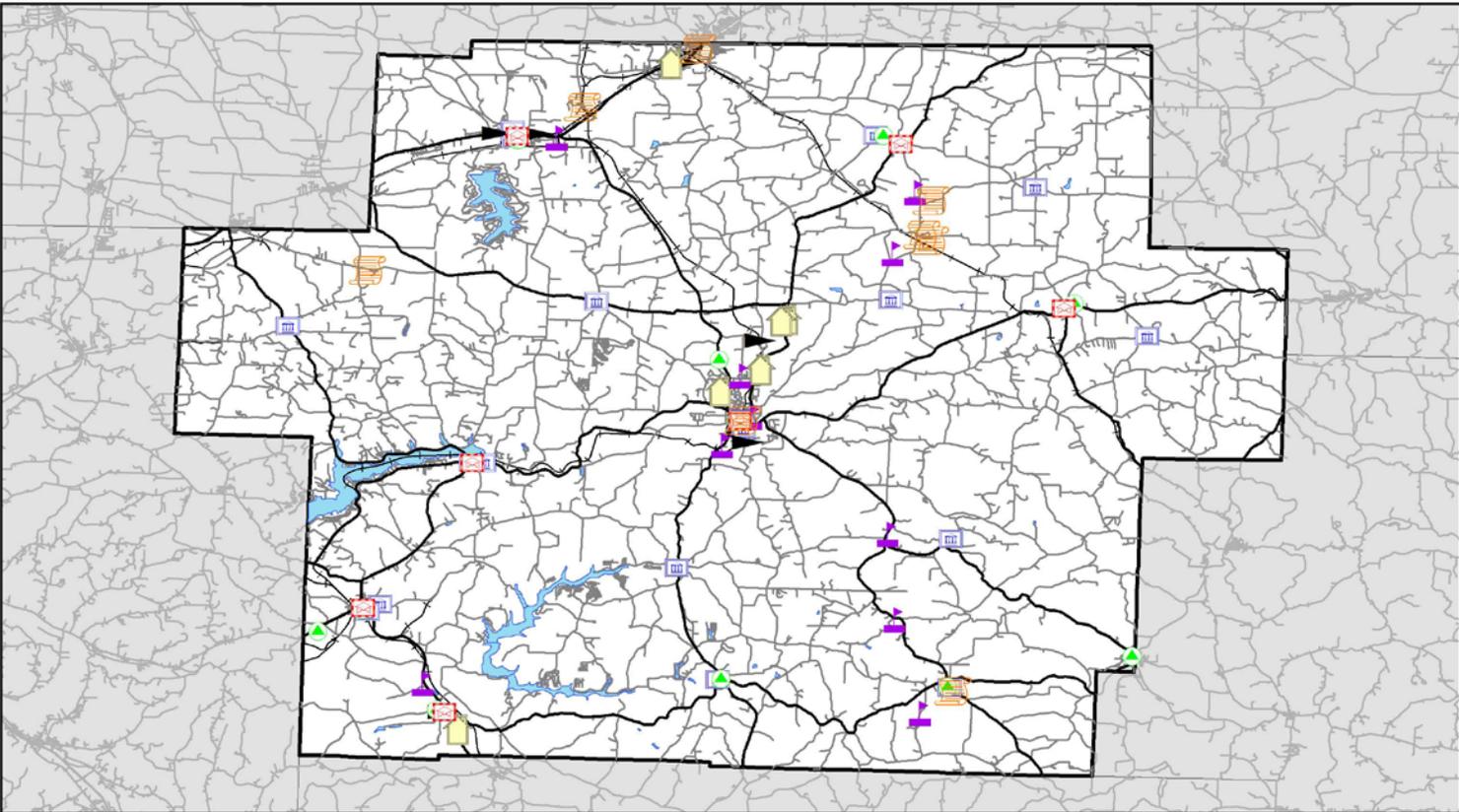
## Carroll County Asset Inventory

Data Source(s):  
Carroll County Planning Committee

*DISCLAIMER: Data is meant for use as reference only. Some sources may be intended to be used at national or regional scales and are thus used beyond their original intent for demonstrative purposes.*



- First Responder
- Government
- Historic Places
- Post Office
- School
- Senior Living
- Water Treatment



## 1.0 INTRODUCTION

### 1.3 Municipal Capabilities

§201.6(b)(3)	Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.
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This section examines the existing capabilities of Carroll County and the participating jurisdictions. Specifically, this section looks at those capabilities that can support the implementation of hazard mitigation efforts. The county’s consultant hosted an online survey of jurisdictional representatives to complete a “capabilities assessment.” Representatives answered questions about various plans, codes, and ordinances from the perspectives of their home jurisdictions. The following table summarizes jurisdictional capabilities.

JURISDICTIONAL CAPABILITIES							
<i>Jurisdiction</i>	<i>Comprehensive Plan</i>	<i>Building Codes*</i>	<i>Subdivision or Land Use Ordinance</i>	<i>Zoning Ordinance</i>	<i>Participates in NFIP</i>	<i>Capital Budget Funds for Mitigation</i>	<i>Public Works Budget for Mitigation</i>
Carroll County	YES	NO	YES	NO	YES	N/A	N/A
Carrollton Village	N/A	NO	N/A	YES	YES	N/A	N/A
Dellroy Village	UNK	NO	YES	NO	YES	NO	NO
Leesville Village	NO	NO	NO	NO	NO	NO	NO
Magnolia Village	UNK	NO	UNK	YES	YES	NO**	NO
Malvern Village	NO	NO	NO	NO	YES	N/A	N/A
Minerva Village	NO	YES	NO	YES	YES	NO	NO
Sherrodsville Village	YES	NO	NO	NO	YES	NO	NO

\*Ohio Administrative Code outlines building codes that all construction in the state must follow  
 \*\*Indicates that the jurisdiction does not have funds in the current budget for mitigation projects, but would be willing to consider it in future budgets  
 UNK – Marked “unknown”  
 N/A - No answer / Skipped question

#### 1.3.1 Existing Plans and Ordinances

Carroll County itself and the municipalities therein have a number of capabilities that can support mitigation efforts, including comprehensive plans, building codes, subdivision and land use ordinances, zoning ordinances, and floodplain regulations. In summary, Carroll County and the municipalities therein appear to have a “limited” planning and regulatory capability.



### Comprehensive Plans

Comprehensive plans promote sound land use and regional cooperation among local governments to address planning issues. These plans serve as the official policy guide for influencing the location, type, and extent of future development by establishing the basic decision-making and review processes on zoning matters, subdivision and land development, land uses, public facilities, and housing needs over time.

Two jurisdictions in Carroll County maintain comprehensive plans: Carroll County and Sherrodsville Village. The Carroll County Sustainable Comprehensive Plan discusses guiding development in Carroll County in a way that preserves its rural features, and balancing economic development while preserving agriculture and social services.

### Building Codes

Building codes regulate construction standards for new construction and substantially renovated buildings. Standards can require resistant or resilient building design practices to address hazard impacts common to a given community. All construction in Ohio is required to abide by Ohio Administrative Code Chapters 4101:1-1 to 4101:1-35. Some jurisdictions formally adopted

Building codes can contribute substantially to hazard mitigation, even if a jurisdiction only adopts codes to the level of the recommended International Building Code (IBC). As the CCEMA manages the next update cycle (i.e., through annual meetings and a formal update), an effort to educate local officials on the connections between minor building regulations and hazard mitigation would be beneficial.

### Subdivision and Land Use Development Ordinances

Subdivision and land development ordinances (SALDOs) regulate the development of housing, commercial, industrial, or other uses, including associated public infrastructure, as land is subdivided into buildable lots for sale or future development. Within these ordinances, guidelines on how to divide land, the placement and size of roads, and the location of infrastructure can reduce exposure of development to hazard events. Carroll County and the Village of Dellroy utilize SALDOs.

### Zoning Ordinances



Zoning ordinances allow for local communities to regulate the use of land in order to protect the interests and safety of the general public. Zoning ordinances can address unique conditions or concerns within a given community. They may be used to create buffers between structures and high-risk areas, limit the type or density of development, or require land development to consider specific hazard vulnerabilities. Currently, three municipalities in Carroll County have zoning ordinances (Carrollton, Magnolia, and Minerva).

### National Flood Insurance Program (NFIP) Participation and Floodplain Management Ordinances

Through administration of floodplain ordinances, local governments can ensure that all new construction or substantial improvements to existing structures located in the floodplain are flood-proofed, dry-floodproofed, or built above anticipated flood elevations. Floodplain ordinances may also prohibit development in certain areas altogether. The NFIP establishes minimum ordinance requirements in order for that community to participate in the program. However, a community is permitted and encouraged to adopt standards which exceed NFIP requirements.

FEMA's *Community Status Book* indicates that the following jurisdictions in Carroll County participate in the NFIP: Carroll County, Carrollton Village, Dellroy Village, Magnolia Village, Malvern Village, Minerva Village, and Sherrodsville Village. Participants manage their participation in the program in similar ways. They maintain access to copies of flood insurance rate maps (FIRMs) by directing residents to websites or to the appropriate local government offices (e.g., village halls, private insurance agents, etc.) for information. Participants support requests for map updates by referring requestors to the appropriate department or agency (e.g., the county engineer's office). In most cases, municipal zoning offices are in charge of issuing permits for development in special flood hazard areas (SFHAs), though in some instances, a village administrator issues permits. Leesville does not currently participate in the NFIP; SFHAs in the village impact roadways, but no structures in the southeast corner of the corporate limits. Currently, no jurisdictions in Carroll County participate in the Community Rating System (CRS).

### **1.3.2 Capability Assessment**

All jurisdictions in the county (i.e., the county, municipalities, and townships) had an opportunity to complete a "capability self-assessment" via an online survey. Representative members of 4 jurisdictions completed a self-assessment for their jurisdiction. In response to the



survey questionnaire, local officials classified each of the capabilities as high, moderate, or limited.

### Administrative and Technical Capability

Administrative capability is an adequacy of departmental and personnel resources for the implementation of mitigation-related activities. Technical capability relates to an adequacy of knowledge and technical expertise of local government employees or the ability to contract outside resources for this expertise to effectively execute mitigation activities.

### Fiscal Capability

The decision and capacity to implement mitigation-related activities is often strongly dependent on the presence of local financial resources. While some mitigation actions are less costly than others, it is important that money is available locally to implement policies and projects. The table above identifies which jurisdictions currently budget funds for mitigation projects. Financial resources are particularly important if communities are trying to take advantage of state or federal mitigation grant funding opportunities that require local-match contributions. Federal programs which may provide financial support for mitigation activities include, but are not limited to:

- Community Development Block Grant (CDBG),
- Disaster Housing Program,
- Emergency Conservation Program,
- Emergency Management Performance Grants (EMPG),
- Emergency Watershed Protection Program,
- Hazard Mitigation Grant Program (HMGP),
- Flood Mitigation Assistance Program,
- Non-Insured Crop Disaster Assistance Program,
- Pre-Disaster Mitigation Program,
- Repetitive Flood Claims Program (RFC),
- Section 108 Loan Guarantee Programs,
- Severe Repetitive Loss (SRL) Program, and
- Weatherization Assistance Program.

State programs that may support mitigation include (but are not limited to):

- Ohio Department of Development (job-ready sites and CDBG funds for economic development),
- Ohio Department of Natural Resources (land and water conservation efforts),



- Ohio Environmental Protection Agency (loans and capital improvements), and
- Ohio Emergency Management Agency (funds to support emergency preparedness, response, and overall resilience).

Political Capability

One of the most difficult capabilities to evaluate involves the political will of a jurisdiction to enact meaningful policies and projects designed to mitigate hazard events. The adoption of hazard mitigation measures may be seen as an impediment to growth and economic development. In many cases, mitigation may not generate interest among local officials when compared with competing priorities. Therefore, the local political climate must be considered when designing mitigation strategies, as it could be the most difficult hurdle to overcome in accomplishing the adoption or implementation of specific actions.

The following table summarizes the results of the self-assessment survey as a percentage of the responses received.

CAPABILITY SELF-ASSESSMENT			
Capability	High	Moderate	Limited
Planning & Regulatory	N/A	N/A	100%
Administrative & Technical	N/A	N/A	100%
Fiscal	N/A	N/A	100%
Political	N/A	25%	75%

The 2020 self-assessment also included four questions to gauge community receptiveness to several types of mitigation strategies. The following table details the results.

SELF-ASSESSMENT: PROJECT CONSIDERATIONS					
Sample Mitigation Strategy	Very Willing	Willing	Neutral	Unwilling	Very Much Unwilling
XYZ community guides development away from known hazard areas.	N/A	50%	50%	N/A	N/A
XYZ community restricts public investments or capital improvements within hazard areas.	N/A	50%	50%	N/A	N/A



SELF-ASSESSMENT: PROJECT CONSIDERATIONS					
<i>Sample Mitigation Strategy</i>	<i>Very Willing</i>	<i>Willing</i>	<i>Neutral</i>	<i>Unwilling</i>	<i>Very Much Unwilling</i>
XYZ community enforces local development standards (e.g., building codes, floodplain management ordinances, etc.) that go beyond minimum state or federal requirements.	N/A	N/A	100%	N/A	N/A
XYZ community offers financial incentives (e.g., through property tax credits) to individuals and businesses that employ resilient construction techniques (e.g., voluntarily elevate structures, employ landscape designs that establish buffers, install green infrastructure elements, etc.).	N/A	50%	75%	N/A	N/A

### 1.3.3 Studies, Reports, and Technical Information

The research conducted for the development of this plan included data from federal, state, and higher education studies, reports, and technical information. Specific sources relative to individual hazards appear in Appendix 5: Citations. Carroll County's consultant reviewed a number of existing plans and reports to (a) identify any obvious inconsistencies between other development and mitigation efforts, (b) as baseline information for such sections as trends and predictions, and (c) to support discussions surrounding mitigation projects. Those documents included the following.

REFERENCED DOCUMENTS		
<i>Document Type</i>	<i>Document Citation</i>	<i>How Incorporated into Plan</i>
Technical Information	USDHS FEMA. (2013) Mitigation Ideas. Federal Government: Washington, DC	Used as general guidance for stakeholders and jurisdictions on mitigation ideas
Technical Information	USDHS FEMA. (2016). National Mitigation Framework. Federal Government: Washington, DC	Used as general guidance on mitigation planning.
Technical Information	USDHS FEMA. (2005). Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning. Federal Government: Washington, D.C.	Used as general guidance for incorporating historical property and cultural protection.



REFERENCED DOCUMENTS		
<i>Document Type</i>	<i>Document Citation</i>	<i>How Incorporated into Plan</i>
Technical Information	USDHS FEMA. (2013). Local mitigation planning handbook. Federal Government: Washington, D.C.	Used as general guidance on revised mitigation planning process
Technical Information	USDHS FEMA. (2013). Integrating Hazard Mitigation Into Local Planning. Federal Government: Washington, D.C.	Used as general guidance on existing plan integration for hazard mitigation
Technical Information	USEPA. (2018). Storm smart cities: Integrating green infrastructure into local hazard mitigation plans. Federal Government: Philadelphia, PA.	Outlines ways low-impact development and green infrastructure can support mitigation planning.
Plan	State of Ohio (2019). Enhanced Hazard Mitigation Plan. State Government: Columbus, OH	Used as general guidance on existing plan integration for hazard mitigation
Plan	Carroll County Regional Planning Commission. (2015)Carroll County Sustainable Comprehensive Plan. Carrollton, OH	Used as general guidance on existing plan integration for hazard mitigation
Plan	Ohio Mid-Eastern Governments Association. (2020) Regional Transportation Improvement Plan. Cambridge, OH	Used as general guidance on existing plan integration for hazard mitigation



## 1.0 INTRODUCTION

### 1.4 Trends and Predictions

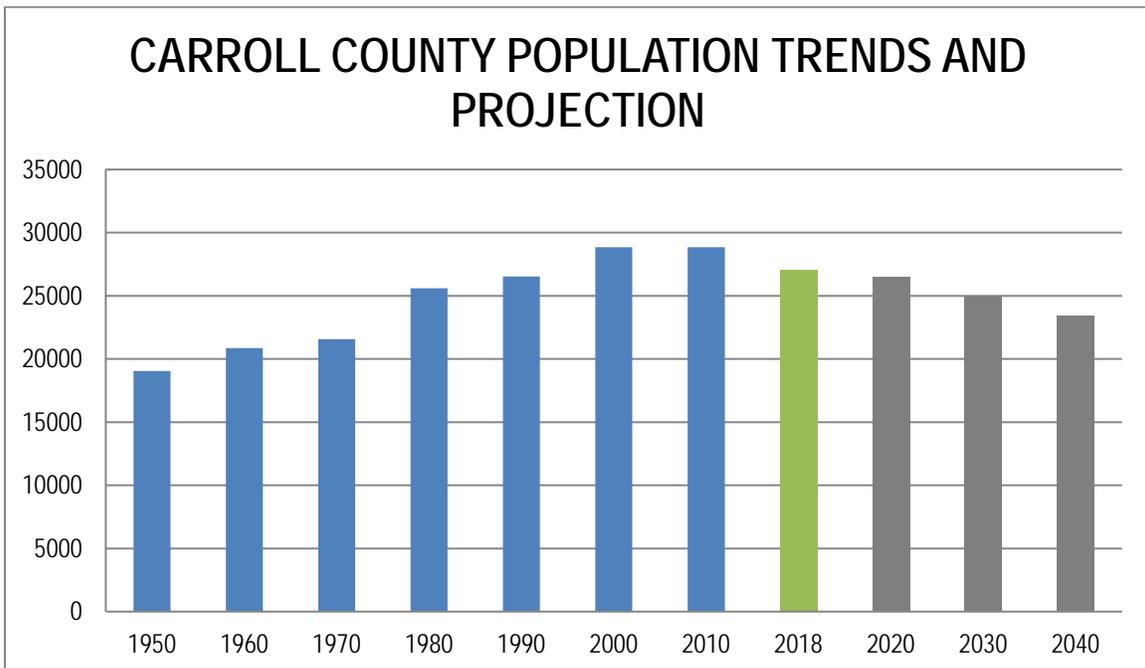
§ 201.6(c)(2)(ii)(c) Providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land-use decisions.

This section examines various demographic and other development trends in Carroll County to contextualize future risk to the hazards identified later in this plan.

#### Population

**Hazard Mitigation Relevance:** People are some of the most important assets in a community. Understanding population trends and concentrations assists in describing current and future vulnerability, as well as in the design of outreach and to target preparedness, response, and mitigation actions. Also, understanding where people reside or visit in a community informs the appropriate locations for mitigation projects (FEMA, 2013).

Carroll County's population has generally increased since the mid-1900s, followed by a sharp decrease in 2018. As the graphic below indicates, the population grew steadily (per decennial Census data) between 1950 and 1960. Since then, the population has oscillated with each census. Projections for 2020, 2030, and 2040 show the population generally decreasing.



Source: Carroll County Profile prepared by the Ohio Development Services Agency, Office of Research, <https://development.ohio.gov/files/research/P6011.pdf>

The following table assigns figures to the bars on the above graph.

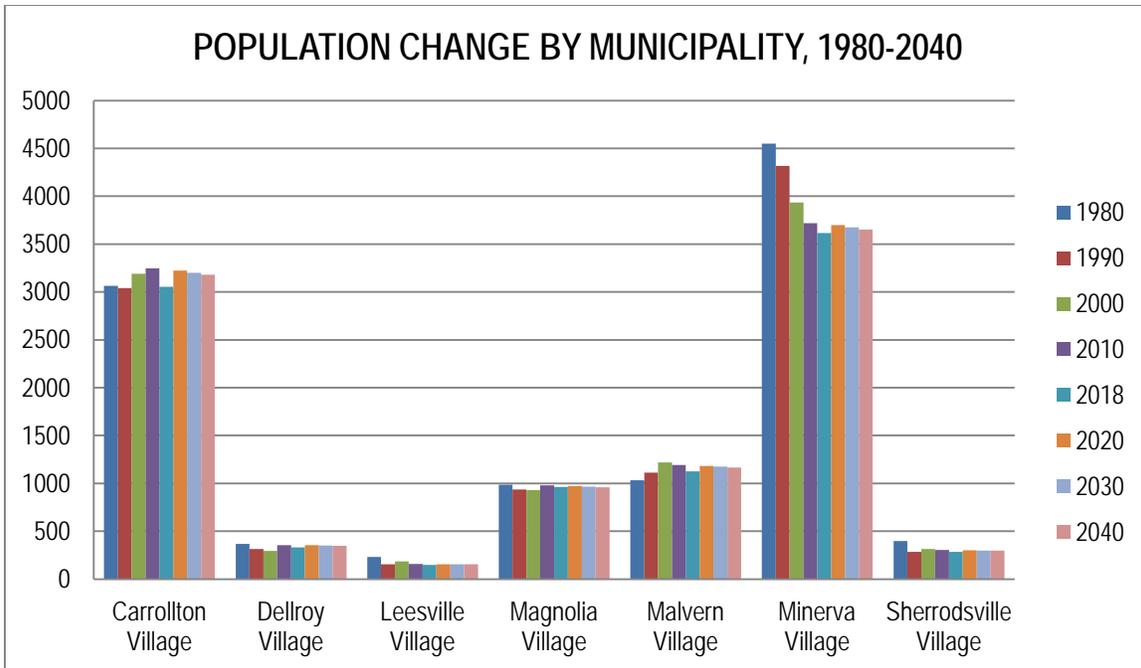
CARROLL COUNTY POPULATION CHANGE, 1950-2040											
Jurisdiction	1950	1960	1970	1980	1990	2000	2010	2018	2020	2030	2040
Carroll County	19,039	20,857	21,579	25,590	26,521	28,836	28,836	27,081	26,530	24,480	23,390

It is also helpful to consider population trends in the population clusters throughout Carroll County. The Ohio Development Services Agency identifies the following as the “largest places” (2018) in Carroll County.

POPULATION CHANGE BY MUNICIPALITY				
Place	2010 Pop.	Est. 2017	Est. 2018	Avg. % Change
Carrollton Village	3,247	3,085	3,055	-0.7%
Dellroy Village	356	334	331	-0.9%
Leesville Village	158	149	147	-0.9%
Magnolia Village	265	254	252	-0.6%
Malvern Village	1,191	1,136	1,125	-0.7%
Minerva Village	1,776	1,709	1,695	-0.6%
Sherrodsville Village	304	387	384	-0.8%
Augusta Township	1,619	1,531	1,517	-0.8%
Brown Township	7,935	7,552	7,484	-0.7%
Center Township	4,664	4,429	4,387	-0.7%
East Township	843	800	795	-0.7%
Fox Township	1,041	982	973	-0.8%
Harrison Township	2,478	2,348	2,326	-0.8%
Lee Township	1,087	1,029	1,017	-0.8%
Loudon Township	1,009	952	943	-0.8%
Monroe Township	2,072	1,956	1,936	-0.8%
Orange Township	1,339	1,264	1,251	-0.8%
Perry Township	996	941	930	-0.8%
Rose Township	1,536	1,455	1,442	-0.8%
Union Township	977	924	915	-0.8%
Washington Township	1,239	1,171	1,678	-0.7%

As shown in the above table, the 2018 estimated populations of all municipalities decrease from the 2010 Census estimate. For the following graphic, the populations of all villages consist of 2010 estimates decreased or increased by the 2020, 2030, and 2040 population estimates shown.



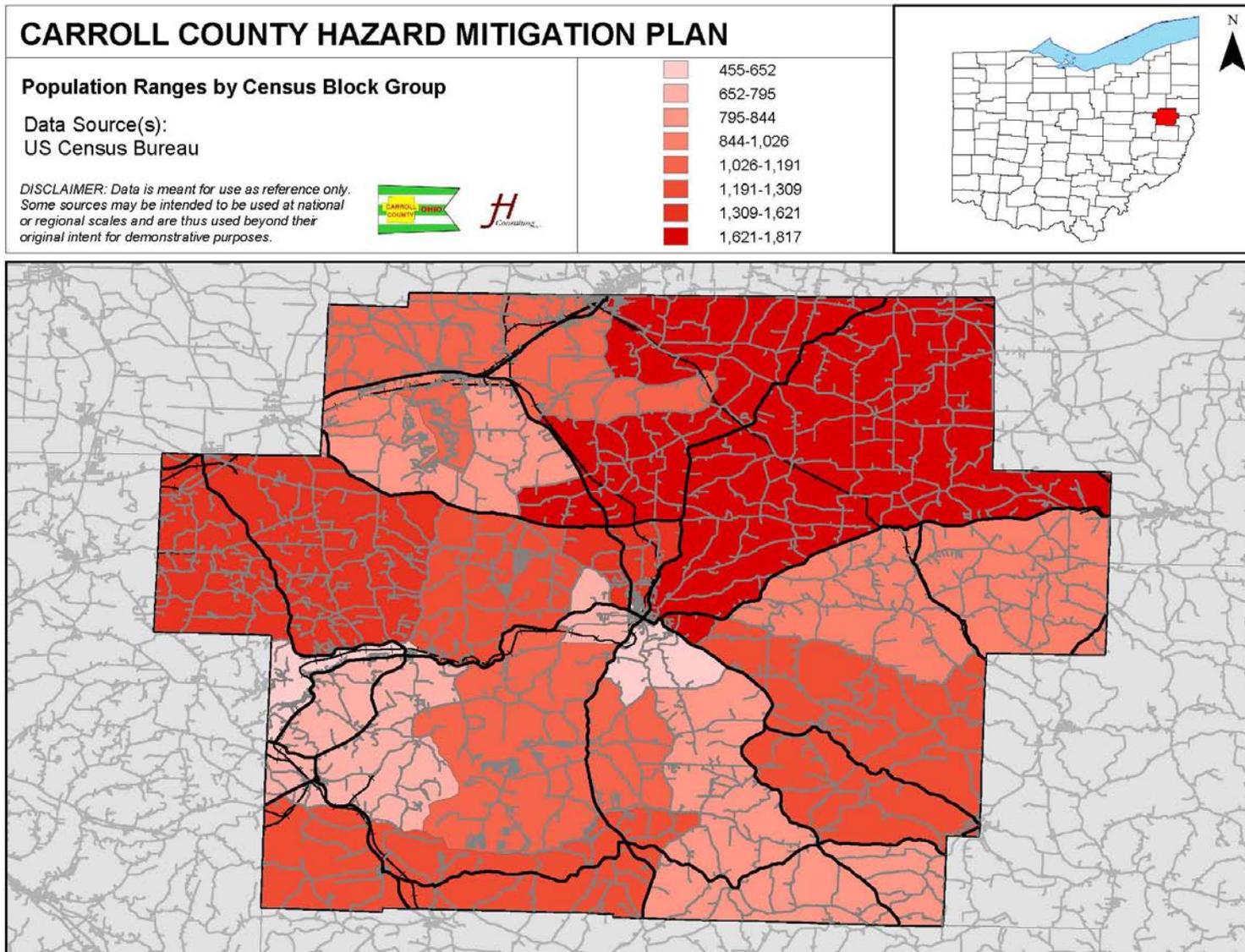


Sources:

- 1980 Census:
- 1990 Census:
- 2000 & 2010 Census:

The following map depicts the population density in Carroll County by Census Block Group.





Residential construction in Carroll County is. According to the Ohio Development Services Agency, residential construction averaged 1 unit annually between 2014 and 2018. The following table presents the residential construction data.

RESIDENTIAL CONSTRUCTION 2013-2017					
Criterion	2014	2015	2016	2017	2018
Total Units	1	0	1	0	1
Total Valuation	\$80,000	\$0	\$1,000,000	\$0	\$190,000
Single-Unit Buildings	1	0	1	0	1
Avg. Cost per Single Unit Building	\$80,000	\$0	\$1,000,000	\$0	\$190,000
Multi-Unit Buildings	0	0	0	0	0
Avg. Cost per Multi-Unit Bldg.	\$0	\$0	\$0	\$0	\$0

Understanding trends associated with populations corresponding with various social vulnerability indicators can inform hazard mitigation decision-making. For instance, in areas with a low median household income, households may not be able to afford mitigation measures on their own. Populations living under the poverty line may have difficulty recovering; thus, a community can lessen the indirect losses those families incur by strengthening capabilities to support those populations (e.g., assisting with access to FEMA and other governmental agencies accepting requests for disaster assistance, considering all options for structural mitigation projects to protect areas where clusters of those populations live, etc.). Phillips, Thomas, Fothergill, and Blinn-Pike (2010) provide a series of social vulnerability indicators. The following indicators<sup>1</sup> correspond to data that are available to the Carroll County planning committee.

- **Age:** Senior citizens are reluctant to secure aid after a disaster out of concern they may lose their independence. (Proxy Data per Census: Under 18, 65+)
- **Class:** Lower income families and households tend to live in housing that suffers disproportionately during disasters. (Proxy Data per Census: Median household income, Poverty %)
- **Gender:** Women tend to be the ones most likely to secure relief aid for the family, yet they are under-represented and under-used in recovery efforts. (Proxy Data per Census: Female population)
- **Literacy:** Few options exist to inform and prepare people with low reading levels. (Proxy Data per Census: No diploma)

<sup>1</sup> Definitions are quotes from the Phillips et al. text. See p. 3 of the first edition.



- **Race & Ethnicity:** Warning messages tend to be issued in the dominant language with an expectation that people will take the recommended action immediately. Research indicates that culture influences how people may receive and interpret warnings and how they may respond. (Proxy Data per Census: White, Black/African American, Two or more races, Language other than English spoken in home)

The following table presents these indicators and the corresponding demographics.



SOCIAL VULNERABILITY INDICATORS																									
Jurisdiction	AGE										INCOME VARIABLES										GENDER				
	Under 18					65+					Median Household Income					Poverty%					Female Population				
	2000	%	2010	%	2017	2000	%	2010	%	2017	2000	%	2010	%	2017	2000	%	2010	%	2017	2000	%	2010	%	2017
Carroll County	7,252	-8.48%	6,637	-11.83%	5,852	4,084	17.61%	4,803	13.05%	5,430	\$35,509.00	21.51%	\$43,148.00	19.93%	\$51,748.00	11.40%	10.53%	12.60%	17.46%	14.80%	14,562	-0.84%	14,440	-3.04%	14,001
Carrollton	683	5.86%	723	-37.34%	453	734	-1.77%	721	-5.55%	681	\$25,694.00	56.46%	\$40,201.00	26.87%	\$51,005.00	17%	-2.94%	16.50%	-17.58%	13.60%	1,751	3.31%	1,809	-17.80%	1,487
Dellroy	77	18.18%	91	54.95%	141	53	15.09%	61	-52.46%	29	\$27,344.00	64.57%	\$45,000.00	15.74%	\$52,083.00	9.10%	-26.37%	6.70%	108.96%	14%	154	18.83%	183	9.29%	200
Leesville	47	-34.04%	31	-19.35%	25	27	51.85%	41	39.02%	57	\$33,750.00	-24.07%	\$25,625.00	108.43%	\$53,409.00	0.50%	1220.00%	6.60%	-36.36%	4.20%	95	-13.68%	82	53.66%	126
Magnolia	240	5.83%	254	12.20%	285	151	-3.31%	146	15.07%	168	\$39,688.00	15.83%	\$45,972.00	35.56%	\$62,321.00	4.30%	39.53%	6.00%	100.00%	12.00%	464	4.31%	484	10.33%	534
Malvern	276	-11.23%	245	8.16%	265	217	-2.30%	212	-11.32%	188	\$29,063.00	13.13%	\$32,879.00	97.27%	\$64,861.00	12.80%	-28.91%	9.10%	83.52%	16.70%	641	-4.21%	614	6.68%	655
Minerva	927	-5.39%	877	-9.35%	795	727	1.65%	739	-11.10%	657	\$33,468.00	7.25%	\$35,893.00	21.18%	\$43,494.00	9.80%	33.67%	13.10%	-6.87%	12.20%	2,077	-5.78%	1,957	-10.37%	1,754
Sherrodsville	83	-2.41%	81	-28.40%	58	46	-28.26%	33	27.27%	42	\$28,036.00	21.12%	\$33,958.00	32.52%	\$45,000.00	19.10%	-48.43%	9.85%	-36.04%	6.30%	167	-12.57%	146	-22.60%	113
Jurisdiction	LITERACY					RACE & ETHNICITY										LANGUAGE									
	No Diploma					White					Black/African American					Two or More Races					Other than English				
	2000	%	2010	%	2017	2000	%	2010	%	2017	2000	%	2010	%	2017	2000	%	2010	%	2017	2010	%	2010	%	2017
Carroll County	4,308	-12.00%	3,791	-22.92%	2,922	28,316	-0.40%	28,202	-3.90%	27,103	155	-10.32%	139	84.89%	257	206	52.43%	314	-19.75%	252	779	19.34%	930	5.85%	984
Carrollton	529	20.19%	636	-58.48%	264	3,145	1.18%	3,182	-11.25%	2,824	8	50.00%	12	-83.33%	2	27	3.70%	28	-100.00%	-	77	-61.04%	30	53.33%	46
Dellroy	41	4.65%	43	-46.39%	23	292	18.49%	346	16.76%	404	-	200%	2	600.00%	14	-	300%	3	0.00%	3	3	-100.00%	-	0.00%	-
Leesville	35	-5.71%	33	-63.64%	12	183	-15.85%	154	68.83%	260	1	-100.00%	-	0.00%	-	-	400.00%	4	-100.00%	-	3	-100.00%	-	300.00%	3
Magnolia	89	-45.02%	49	-30.52%	34	922	3.69%	956	8.37%	1,036	5	-60.00%	2	-100.00%	-	2	550.00%	13	-100.00%	-	21	-14.76%	18	-32.96%	12
Malvern	252	-39.52%	152	-37.66%	95	1,124	-0.80%	1,115	1.79%	1,135	88	-48.86%	45	-53.33%	21	14	14.29%	16	156.25%	41	19	-3.19%	18	14.17%	21
Minerva	401	-4.15%	384	-38.60%	236	3,896	-6.70%	3,635	-5.06%	3,451	5	100.00%	10	-100.00%	-	26	88.46%	49	-28.57%	35	141	-62.87%	52	26.05%	66
Sherrodsville	29	48.31%	43	-18.63%	35	307	-2.61%	299	-19.06%	242	1	-100.00%	-	0.00%	-	6	-83.33%	1	-100.00%	-	6	-100.00%	-	300.00%	3



Economic and Business Development

**Hazard Mitigation Relevance:** Describing economic and business development trends helps to assess dependencies between economic sectors and the infrastructure needed to support them (FEMA, 2013).

The Office of Research within Ohio’s Development Services Agency noted changes in the number of establishments and employment between 2012 and 2017. The following table presents the data.

ESTABLISHMENTS, EMPLOYMENT, AND WAGES BY SECTOR, 2012 AND 2017 COMPARISON								
Sector	Number of Establishments		Average Employment		Total Wages		Average Weekly Wage	
	Since 2012 (%)	2017	Since 2012 (%)	2017	Since 2012 (%)	2017 (\$)	Since 2012 (%)	2017 (\$)
Private Sector	7.4%	496	13.7%	5,654	45.6%	\$230,799,751	28.1%	\$785
Goods-Producing	12.7%	133	25.7%	2,283	62.8%	\$131,675,622	29.4%	\$1,109
Natural Resources & Mining	-40.0%	21	-45.7%	94	-49.7%	\$5,280,512	-7.6%	\$1,077
Construction	10.6%	72	131.1%	922	263.4%	\$71,263,564	57.1%	\$1,486
Manufacturing	5.3%	40	1.8%	1,266	8.5%	\$55,131,546	6.6%	\$837
Service-Producing	5.5%	363	6.8%	3,371	27.7%	\$99,124,129	19.5%	\$565
Trade, Transportation & Utilities	6.0%	123	3.4%	1,261	19.6%	\$44,337,342	15.7%	\$707
Information	0.0%	6	-54.1%	17	-27.7%	\$1,222,213	55.3%	\$1,356
Financial Services	13.3%	34	61.0%	198	167.8%	\$8,686,589	67.2%	\$846
Professional & Business Services	17.0%	62	61.7%	317	87.7%	\$10,624,456	16.0%	\$644
Education & Health Services	15.4%	45	3.6%	719	15.0%	\$19,385,772	10.9%	\$518
Leisure & Hospitality	0.0%	51	4.8%	680	27.7%	\$8,922,291	21.7%	\$252
Other Services	-14.0%	43	-25.3%	177	-11.6%	\$3,905,290	18.4%	\$425
Federal Government			4.5%	46	11.3%	\$2,144,052	7.7%	\$898
State Government			12.9%	35	34.2%	\$1,969,959	17.1%	\$1,075
Local Government			4.7%	945	11.6%	\$31,570,898	6.8%	\$643

Source: <https://development.ohio.gov/files/research/C1011.pdf>

As shown in the table above, most industries showed modest growth from 2012 to 2017. The average employment for the Natural Resources and Mining, Information, and Other Services industries decreased significantly (more than 10%), while Construction grew 131%, and the Financial Services and Professional and Business Services industries grew 61% each. All industries, except Natural Resources and Mining, saw average weekly wage increases. Construction saw the highest weekly wage growth, with 57%.

Transportation

**Hazard Mitigation Relevance:** The transportation infrastructure is a key community asset, particularly in the response and recovery phases. Ensuring open arterial routes helps with emergency response, the movement of life saving (or sustaining) supplies, etc. Identifying key transportation assets and understanding their potential vulnerabilities can inform projects designed to support their continuity in emergency situations.



Information regarding future transportation projects comes from the Ohio Mid-Eastern Governments Association's (OMEGA's) long-range transportation plan as well as the Ohio Department of Transportation's (ODOT's) Access Ohio 2045 statewide transportation plan.

OMEGA's long-range transportation plan lists 8 projects for Carroll County.

- Intersection improvements at SR 43 at SR 39
- Intersection improvements at SR 171 at CR 20
- Intersection improvements at SR 164 at CR 59
- Intersection improvements at SR 164 and CR 58
- Intersction improvements at SR 164 and SR 9
- Intersection improvements at SR 9 at SR 39 and SR 43
- Intersection improvements at SR 164 at TR 316
- Rehabilitation from oil and gas trucks on Ivory Road North in Harrison Township without a Road Use and Maintenance Agreement (RUMA).

ODOT's Access Ohio 2045 plan includes one project in Carroll County: the resurfacing of State Routes 9, 39, 43, and 332 in and near Carrollton.

### Land Use

**Hazard Mitigation Relevance:** Land use descriptions inform discussions of risk and vulnerability. For example, flooding may exist as a high risk, but may not correlate with high vulnerability in open or unpopulated forested areas. Further, understanding land use may identify valuable areas where natural features can provide protective functions that reduce the magnitude of hazard events (FEMA, 2013). Looking forward, *proposed* land uses can inform discussions about the types of assets that future hazard occurrences could impact.

The Carroll County Comprehensive Plan supports the grouping together of residential, business, and industrial uses into planning areas, with a focus on directing future development towards villages and subdivisions with central water and sanitary sewer systems. The Comprehensive Plan established four planning areas based on the current land use (forested land, agricultural land, lakes and wetlands, and urban expansion pressures). Many townships fall into multiple planning areas.

- Urban Expansion Pressures
  - Townships: Brown, Rose, Harrison, Washington, Augusta, Monroe
- Agricultural Use
  - Townships: East, Augusta, Washington, Center, Harrison, Loudon

- Forested Land
  - Townships: Fox, Lee, Union, Monroe, Orange
- Lakes and Wetlands
  - Townships: Monroe, Orange, Union, Perry, Brown, Rose

