Iowa Hazard Mitigation Plan

Iowa Comprehensive Emergency Plan

September 2010

Homeland Security and Emergency Management Division
Iowa Department of Public Defense
7105 NW 70th Avenue
Camp Dodge, Building W4
Johnston, Iowa 50131
(515) 725-3231

How to Use This Document

The Iowa Hazard Mitigation Plan is organized into eight sections: Introduction, Prerequisite, Planning Process, Risk Assessment, Mitigation Strategy, Local Coordination, Plan Maintenance, and Enhanced Plan. The eight plan sections are consistent with the multi-hazard mitigation planning guidance issued by the Federal Emergency Management Agency (FEMA). The plan sections, along with primary subsections and annexes, are shown in the plan organization table below.

Each mitigation plan section is represented by a tab in the printed version of the document. If there are annexes associated with a section, those annexes are referenced by section number and annex letter on a tab directly below the section tab. On the first page of each plan section is a table of contents specific only to that section.

Plan Organization Reference Table

Sections	Subsections	Annexes
Plan Organization	• State Plan Update Summary of Revisions • Executive Summary • Community Profile • Iowa Map Book	
Prerequisite Section 1.1	• State Adoption and Assurances	
Planning Process Section 1.2	• Documentation of the Planning Process • Coordination Among Agencies • Program Integration	**1.2-A** Executive Order 62 **1.2-B** Iowa SHMT Members **1.2-C** Iowa's Rural Electric Cooperatives
Risk Assessment Section 1.3	• Identifying Hazards • Profiling Hazards • Assessing Vulnerability • Estimating Potential Losses	**1.3-A** Loss Estimation Model
Mitigation Strategy Section 1.4	• Hazard Mitigation Goals and Objectives • State Capability Assessment • Local Capability Assessment • Mitigation Actions • Funding Sources	**1.4-A** Mitigation Measures (Actions) Initiated/Accomplished 2007-present **1.4-B** Capability Assessment **1.4-C** Local Hazard Mitigation Plan – Data Collection Worksheet **1.4-D** Notice of Interest (NOI)
Local Coordination Section 1.5	• Local Funding and Technical Assistance • Local Plan Integration • Prioritizing Local Assistance	**1.5-A** Administrative Plan **1.5-B** Hazard Mitigation Resources for Subgrantees CD **1.5-C** Hazard Mitigation Grant Finance-Methodology and Resources for Subgrantees **1.5-D** Trip Report
Plan Maintenance Section 1.6	• Monitoring, Evaluating, and Updating the Plan • Monitoring Progress of Mitigation Activities	
Enhanced Plan Section 2.0	• Integration With Other Planning Initiatives • Project Implementation Capability • Project Management Capability • Assessment of Mitigation Actions • Effective Use of Available Mitigation Funding • Commitment to a Comprehensive Mitigation Program	**2-A** Iowa Strategy for Homeland Security and Emergency Management **2-B** Hazard Mitigation Resources for Subgrantees CD **2-C** 2008 Iowa Mitigation Success Story – Avoided Losses through Property Acquisition and Relocation

		for Open Space **2-D** Sample Collected Mitigation Data Collection Worksheet **2-E** 2009 Department of Public Defense Audit Report

Plan Update Revision Table

Standard Plan Section	Update Review and Analysis
1.0 Plan Organization	• Updated section to include a standard and enhanced update/change log
1.0.1 Executive Summary	• Executive summary changed to address the update process
1.0.2 Community Profile	• Updated to reflect changes in development and Statewide trends
1.0.3 Iowa Map Book	• Iowa Map Book updated with best available data and agency ArcGIS overlays
1.1 Prerequisite	• State adoption section and adoption letter updated
1.2.1 Documenting the Planning Process	• Planning process updated to reflect the 2010 update process
1.2.2 Coordination Among Agencies	• Coordination among agencies section changed to reflect the 2010 update processing
1.2.3 Program Integration	• Updated section to reflect the 2010 update and relevant agencies participating in the planning process • Updated section to reflect State and Local plan integration and planning initiatives
1.2-B Iowa Hazard Mitigation Team Members	• Contact information updated and changed to reflect new and existing/changed team members
1.2-C Iowa's Rural Electric Cooperatives (REC) Annex under the Iowa Association of Electric Cooperatives	• Updated with changes provided by the Iowa Association of Rural Electric Cooperatives
1.3.1 Identifying Hazards	• Updated section to reflect the changes in the risk assessment methodology used to rank hazards in the HARA process • Combined hazard profiles with hazard worksheets into one section • Removed references to utilizing cascading event scoring in the risk assessment process
1.3.2 Hazard Profile and Risk Assessment	• Updated the hazards considered to reflect the consolidation of hazards into 16 natural and 7 human caused / combination hazards • Updated the hazard scores to reflect best available data collected on hazards and any changes in hazard data • Consolidated the hazard profile section with the hazard worksheets in an effort to make the plan more efficient • Hazard data was updated with best available current information as of April of 2010
1.3.3 Assessing Vulnerability	• Updated to reflect the changes in the HARA process • Updated to reflect changes in the Critical Asset Protection Program (CAPP)
1.3.4 Estimating Potential Losses	• Updated to reflect changes in the loss estimation that occurred since 2004 including the inclusion of 12 hazards included in the loss estimate (previously 5 hazards) • Maps were updated to reflect the new loss estimate with the addition of a combined loss estimate map by county. • State facilities inventory by county was updated to reflect best available data from State partners
1.3-A Loss Estimation Model	• Updated to reflect changes in the loss estimate process
1.4.1 Hazard Mitigation Goals and Objectives and Measures	• Updated to reflect the consolidation of hazards and input from State partners • Updated process to reflect the consolidation of mitigation measures and criteria for prioritizing measures • Severe Repetitive Loss information updated

1.4.2 State Capability Assessment	• Updated to reflect changes in mitigation laws, regulations, programs, and policies
1.4.3 Local Capability Assessment	• Updated to reflect changes in local planning and local mitigation policies
1.4-A Mitigation Measures (Actions) Initiated / Accomplished	• Updated with mitigation actions from 2007 to present
1.4-B Capability Assessment	• Updated to reflect changes in goals and objectives and program information
1.5.1 Local Funding and Technical Assistance	• Updated with changes to the grant management and technical assistance processes and technical assistance for local planning efforts • Annex added as an example of local notice of interest submission
1.5.2 Local Plan Integration	• Updated to reflect changes in local planning integration • Annex added as an example of local plan data collection
1.5.3 Prioritizing Local Assistance	• Updated to reflect changes in the process of prioritization of local assistance
1.6.1 Monitoring, Evaluating, and Updating the Plan	• Updated process of plan maintenance procedures in an effort to increase the efficiency of the update process
1.6.2 Monitoring Progress of Mitigation Activities	• Updated the monitoring process for mitigation planning and program activities

Enhanced Plan Section	Update Review and Analysis
1.0 Integration with other Planning Initiatives	• Reviewed for currency and updated state legislative mitigation initiatives that provide guidance to state and regional agencies
1.1.3 Comprehensive Planning	• Described state smart planning legislation to provide local comprehensive planning guidelines
1.1.4 Community Builder Plan	• Updated section to meet FEMA requirement to address integration of mitigation in Community Builder Plan at the community/county level
1.3 Local Planning Integration	• Described the Local Hazard Mitigation Plan – Data Collection Sheet for comprehensively collecting and analyzing local mitigation planning data
1.5 Integration with Emergency Management Accreditation Program (EMAP)	• Updated section to show implementation of the HSEMD Strategic Plan EMAP strategy – Assessment May 2009
1.6 Integration with Federal and State Floodplain Management Programs	• Updated section to demonstrate additional mitigation programs addressing Map Modernization, Storm Ready, dam safety, safe rooms, Public Assistance 406 Mitigation
2.2 Eligibility Criteria	• Updated section to address changes with the FY2009 HMA program application cycle
2.3.3 Severe Repetitive Loss	• Updated section to address changes with the Final Rule
2.5 Specific State Project Eligibility Criteria	• Updated section to address the ranking process for DR-1763
2.6 Determining Cost Effectiveness	• Updated section to demonstrate Benefit Cost Analysis through # of staff performing BCA, training, total # of BCA's performed, total amount of BCA's performed, BCA process
3.4 Preparation and Involvement in the Environmental Review Process	• Reviewed section and updated with special process established for DR-1763, Iowa's catastrophic tornado and flood event
3.6 Grant Management – Accurate and Timely Progress and Financial Reporting	• Updated section to include the current process for quarterly progress reports and financial reporting

4. Assessment of Mitigation Actions	• Updated section to meet FEMA requirement to demonstrate capacity to perform cost avoidance with a record of actual cost avoidance, descriptions of methodology, and example of cost avoidance for a mitigated group of structures impacted by 2008 flooding • Described use of the mitigation data collection sheet as a tool for loss avoidance data
5. Effective Use of Available Mitigation Funding	• Updated section to meet FEMA requirement to link state goals and objectives to projects for assessment in achieving goals • Updated section to provide detailed progress specific to the three-year period of performance for the 2010 update

The State of Iowa has been proactive in hazard mitigation planning since the 1990's. The mitigation plan demonstrates the State's commitment to reducing risks from all hazards, natural and human caused, and serves as a guide for State decision makers in committing resources to reduce the effects of these hazards.

To remain eligible for hazard mitigation grant assistance following a Presidential Declaration, the State Plan must be maintained, reviewed, updated and submitted to the Federal Emergency Management Agency (FEMA) for approval every three years. State Mitigation Plan requirements are outlined in Section 44, Code of Federal Regulations (CFR), Part 201. The following document represents the update to the approved Standard and Enhanced State Mitigation Plan that was submitted in 2007.

In addition, the Iowa Hazard Mitigation plan is maintained in accordance to Federal planning requirements for the following funding sources:

- Permanent Work Public Assistance, Categories C through G (Road Systems, Water Control Facilities, Building and Equipment, Public Utility Systems, and Other Public Assistance Projects that do not reasonably fit into the other six categories)
- Pre-Disaster Mitigation Program
- Hazard Mitigation Grant Program
- Flood Mitigation Assistance Program
- Repetitive Flood Claims Program
- Severe Repetitive Loss Program

FEMA regulations establish two types of State Mitigation Plans, Standard and Enhanced. For each Presidential-declared disaster, HMGP funding is allocated using a "sliding scale" formula based on the percentage of the funds spent on Public and Individual Assistance programs. The Enhanced Section increases the funding based up to 20 percent of the total estimated eligible Stafford Act disaster assistance.

The mitigation planning process followed a methodology prescribed by FEMA:

- Describing the planning process – Section 1.2;
- Developing and reviewing risk assessments to analyze natural and manmade hazards statewide – Section 1.3;
- Developing and reviewing the mitigation strategy for reducing the losses identified in the risk assessment – Section 1.4;
- Establishing a process for local coordination of hazard mitigation planning and activities – Section 1.5;
- Establishing a plan maintenance process – Section 1.6;
- Demonstrating a comprehensive mitigation program (Enhanced) – Section 2
- Formal adoption process; and
- Addressing all applicable federal statutes and regulations including changes in state and federal laws.

To establish a clear understanding of the planning requirements outlined in the scope of work for Iowa's plan update, the State Hazard Mitigation Team (SHMT) met

beginning in late 2008 to discuss the process and to review requirements outlined in 44 CFR Part 201 for the update. As a primer, the team was provided material to review the existing hazards and identify any additional hazards. The team reviewed updated hazard analysis and risk assessments, mitigation strategies, mitigation measures, state agency capabilities and identified completed mitigation actions.

The hazard identification portion of the hazard analysis and risk assessment is an inventory of all the hazards that could potentially impact the State of Iowa. Each hazard profile was reviewed for accuracy and updated using the best available data. Hazards were consolidated and verified with the identified hazards from Iowa's 307 FEMA approved Local Hazard Mitigation Plans related to the Disaster Mitigation Act of 2000 (DMA 2000) since August of 2007. After the evaluation of the hazards profiled and scored by the agency experts, the team decided to consolidate several human caused hazards into general categories for the purpose of the risk assessment process. Iowa's all hazards plan identified 16 natural and 7 human caused/combination hazards. Iowa's previous plan identified 40 hazards and with this update the team identified a total of 23 hazards, which is addressed in section 1.3 Risk Assessment.

Further refinement of the hazards was completed to group hazards into priority areas. For purposes of developing mitigation goals and objectives, the individual hazards related to terrorism that was combined in the last update, as well as the hazards related to transportation incidents, hazardous materials, radiological, and infrastructure failure were combined into these general categories.

The Rural Electric Cooperative (REC) under the name of the Iowa Association of Electric Cooperatives participated as a private non-profit organization (PNP) for the purpose of disaster assistance provided by FEMA under the Stafford Act. The REC plan is included in Section 1.2, Annex C.

Iowa Homeland Security and Emergency Management Division (HSEMD) staff reviewed and compiled mitigation measures from county and community DMA 2000 approved plans. The list was compared to the previous measures and refined.

A list of completed mitigation measures was gathered from agencies, council of governments, and local communities for reporting purposes to this update. This report is included in Section 1.4, Annex A.

HSEMD conducted a comprehensive analysis to determine prioritization of effective mitigation measures. These measures are generally measures that are technically feasible and cost-effective while also providing for multiple benefits or risk reduction related to multiple hazards. Measures that are prioritized are associated with mitigation of higher priority hazards from the hazard analysis and risk assessment process.

While this method of comprehensively prioritizing hazard mitigation measures is effective, it is recognized that disaster specific events and associated disaster response and recovery actions can result in the prioritization of specific mitigation measures that contribute to the disaster recovery process. Prioritizing mitigation measures post disaster is also effective, particularly in light of the devastating effects of the flooding

and severe thunderstorm events that occurred in the summer of 2008 and subsequent agricultural and severe weather events occurring after that date.

In Iowa this holds true in particular for flood retrofitting projects for critical facilities and infrastructure as well as the acquisition and/or relocation of flood impacted residential and commercial structures.

Table of Contents

1. Overview

An important step or component to the Iowa SHMT planning process was to develop a community profile for the state of Iowa. This required the planning team to research climate and weather, geography, land use, and other conditions that impact the state or can be influenced by hazards in the state. This information helped identify the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas. For the purpose of the 2010 plan update, and the timeline of the 2010 census not yet completed and approved, all statistics were brought to include the most current and newest information available that could also be verified for accuracy.

2. Geography and Environment

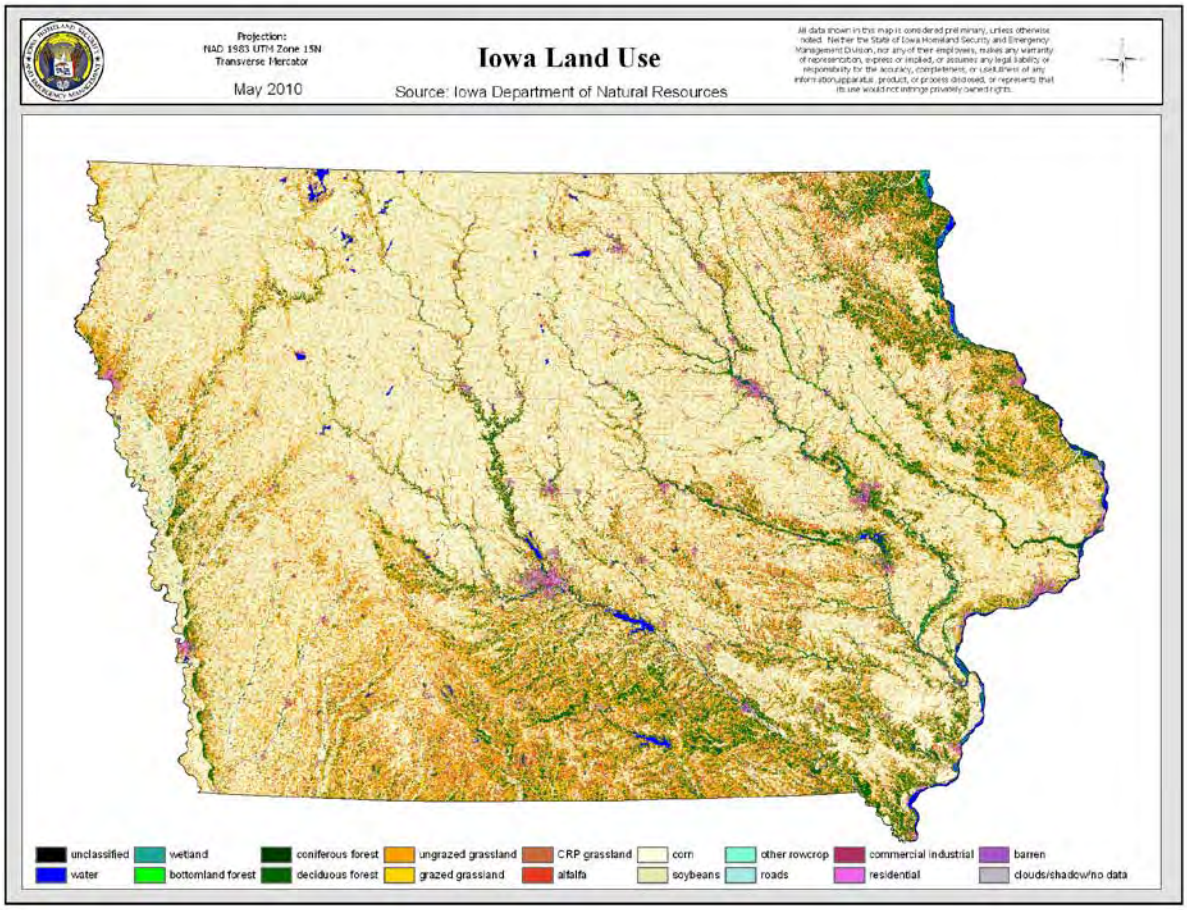
With an area of 56,276 square miles, Iowa ranks 26th in size among U.S. states. The state is roughly rectangular in shape and its extreme dimensions are about 210 miles from north to south and about 320 miles east to west.

2.1 Location

Iowa is generally located in the North Central portion of the United States. It is bound on the north by Minnesota, on the east by Wisconsin and Illinois, on the south by Missouri, and on the west by Nebraska and South Dakota. The Mississippi River forms the entire eastern border and the Missouri River forms much of the western border. Des Moines is Iowa's capital and largest city.

2.2 Land Use

Farms occupy about 91 percent of Iowa's land area representing the influence and importance of agricultural industries in the state. The land cover map below indicates that about 74 percent of the state is covered by cropland; 10 percent by grasslands (e.g., pasture, hay land, prairie, and wetland vegetation), and 4 percent by forest lands. Just less than one percent of the land area is owned by the federal government. Urban areas (e.g., pavement, buildings, and other large structures) account for 1 percent of the land while water bodies cover a little over 1 percent. Too small to see on the map are barren areas (less than 1 percent) that include flooded cropland and sand bars.



Large areas of pasture and hay are located in northeast Iowa, along with a broad, semi-circular swath in south-central Iowa. Rich cropland is particularly noticeable in north-central Iowa. Most of the land originally covered by prairie is now in agricultural production. Along the western border of the state, grass and trees mark the boundary of the Loess Hills with the fertile Missouri River floodplain. Larger tracts of forest lands are found in the northeast and south-central parts of the state. Most forest lands are concentrated in eastern Iowa along river corridors.

2.3 Elevation

Elevations in Iowa range from a low of 480 feet above sea level at the Mississippi River in the southeast to the high point of 1,670 feet in Osceola County in Northwest Iowa. The approximate mean elevation is 1,100 feet.

The Iowa terrain is generally flat or gently rolling, however the extreme northeast has been deeply cut by streams as shown in the map below. In the Northeast, hills frequently rise about 330 feet to 390 feet above the Mississippi River and its tributaries. The western portion of the state contains the Loess Hills, a stretch of hilly terrain reaching hundreds of feet in elevation formed from clay deposits blown eastward from the Missouri River.

Iowa's most level land is found in the North Central region and is the result of ice sheets scraping the land during the glacial periods. When the ice sheets melted, they deposited a mixture of rock and soil; some of the most fertile soil in the United States is found here. Most of the remainder of Iowa consists of rolling lands of the dissected till plains. These plains were formed by glacial deposition of till (a mixture of rock and silt) hundreds of thousands years ago. Streams have had ample time to erode the land, forming rounded hills. A small area of flat till plains is found in the southeastern part of the state. Rich soil has formed on most of the till plains.

2.4 Rivers, Streams, and Lakes

The major types of waters in Iowa include lakes, ponds, streams, rivers, and wetlands. Iowa waters tend to be very productive–they are very rich in plant and animal life. This is due largely to the richness of Iowa soils; however, run-off from agricultural and urban areas also contains nutrients which can increase plant growth, sometimes to the extent that it is undesirable.

Natural lakes formed by glaciation are common in the northwestern and north central parts of the state. Many of the more shallow lakes and prairie "potholes" have been drained and/or filled in for agriculture, but 31 major natural lakes with a combined surface area of almost 29,000 acres and 17

marsh-like lakes with over 3,000 acres of combined surface area are still present in Iowa.

Iowa has nearly 19,000 miles of interior rivers and streams, and approximately 209 square miles of lakes and reservoirs, and 79 square miles of wetlands. There are 87 cold water streams located in northeast Iowa with a combined length of 266 miles. The 25 largest interior rivers in Iowa extend over 3,500 miles and each is fed by numerous smaller creeks and streams (tributaries). All interior rivers in the state are part of either the Mississippi or the Missouri River systems.

Our flowing waters are subject to violent and sudden fluctuations because of the nature of our soils, intensive farming of small grain crops, and drainage. Headwaters of streams usually are quite clear and less subject to water fluctuations. Lower stream reaches tend to be more turbid and subject to greater agricultural and industrial pollution.

Streams and rivers naturally meander, changing their course over time. Pools and riffles between meanders support diverse aquatic life. Channelization (straightening of a stream) and replacement of surrounding natural vegetation with row crops eliminates habitat and, thus , much of the aquatic life disappears from the area.

Water in channelized streams flows faster, increasing erosion and deepening the channel. The chain reaction destroys the natural integrity of stream channels and often results in major damage to bridges. Likewise, floods are more severe.

Most of Iowa's interior rivers and streams have channelized stretches–some 3,000 miles of Iowa rivers have been lost to channelization. Iowa is known as the "land between two rivers." The Mississippi and Missouri Rivers make up most of the east and west borders, respectively. (The Big Sioux and Des Moines Rivers make up small portions of the northwest and southeast borders.)

All of the state's rivers flow into the Mississippi River (on the eastern boarder) or the Missouri River (on the western border). Prominent among the Mississippi's tributaries are the Des Moines River and the Raccoon River, which drain the east central plains; and the Iowa, Cedar, Skunk and Wapsipinicon rivers which drain the eastern plains. All flow south and east into the Mississippi. Major tributaries of the Missouri River include the Big Sioux, Little Sioux, Boyer, and Nishnabotna Rivers, all of which flow southwest.

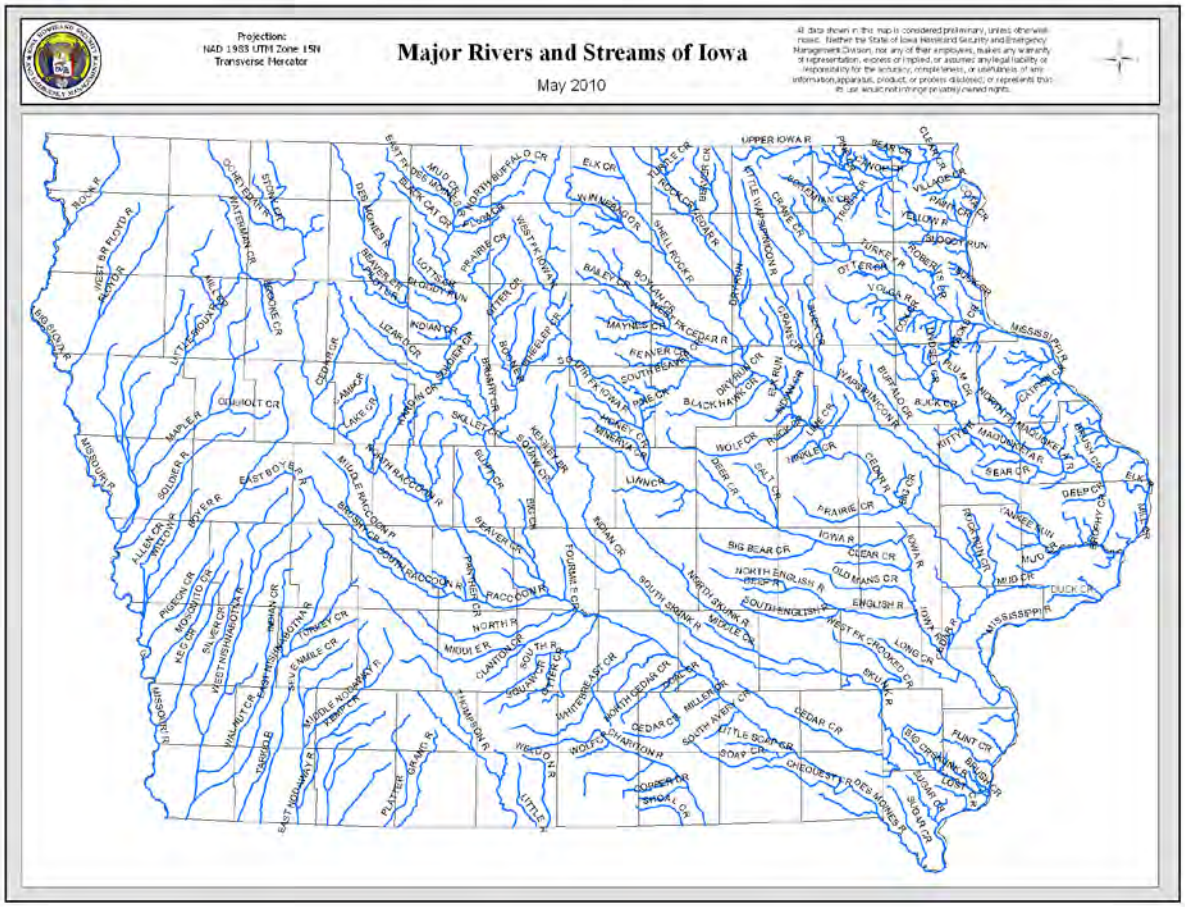
Most of our natural lakes are "middle-aged" and have partially filled with windblown and water-carried sediments, remains of water plants, and soils from eroding shorelines.

Marshes are older lakes that have filled with more sediment and plant remains. These waters generally have good water quality, but this can rapidly decline as a result of shoreline development or loss of soil and nutrients from unprotected land in the lake's watershed.

A second type of natural lake, the oxbow, is formed when river channels change course and sediments block the ends of a meander in the old channel. Larger oxbows are found along the Missouri and Mississippi Rivers and smaller, pond-like oxbows are found along many interior rivers and streams.

Constructed lakes include recreational lakes, municipal water supplies, river impoundments, and surface mine lakes. Over 100 lakes have been constructed in Iowa for recreation. These generally are small; with less than one-fourth over l00 acres.

Iowa streams and rivers have more than 200 dams that provide water for a variety of purposes. Many are used for municipal water storage. Some are used for flood control, others for recreation. These range in size from 15-acre Mitchell Lake to Lake Red Rock, which has a surface area of some 19,000 acres at normal pool level.



Iowa's largest natural lakes are Spirit Lake, Clear Lake, Storm Lake, and the West and East Okoboji Lakes. Major artificial bodies of water include Rathbun, Saylorville, Coralville, and Red Rock Lakes.

2.5 Ponds and Wetlands

There are more than 87,000 ponds statewide. Most are in the southern half of the state because clay soils found there readily form a water-tight basin. (Soils in northern Iowa tend to be more porous.) Ponds generally are less than 10 acres in size. Water quality and habitat in a pond are especially dependent on management of the watershed (land that drains into the pond). Ponds with well-managed watersheds can support excellent fish populations and are very important fisheries. Ponds also provide reliable water sources for livestock and wildlife.

Wetlands are areas where soil is saturated for various lengths of time during the growing season. They are transitions between terrestrial and aquatic systems. All wetlands have three things in common: hydric soils, a hydrology, and the presence of hydrophytes (water plants).

Hydric soils form when soil is saturated and decomposition is slow due to low oxygen. They are characterized by a thick, dark layer of organic soil just below the topsoil, with a gray layer beneath mixed in with splotches of brown, orange, or yellow.

Wetland hydrology is the presence of water on or near the soil surface for most of the growing season. Hydrophytes (water plants) are specially adapted to living with their roots in wet soils.

Marshes are open and unforested. They are dominated by cattails, sedges, and grasses. Iowa marshes include prairie potholes formed during the last ice age, when the Des Moines Lobe of the Wisconsin glacier melted (approximately 10,000 years ago). As the glacier receded, it gouged thousands of shallow depressions. This area of the northern Great Plains in the U.S. and southern Canada, known as the Prairie Pothole region, is ecologically diverse and economically important.

Other wetlands include: wet meadows (dominated by sedges with very shallow water levels or are just saturated to soil level); bogs and fens (unique wetlands with peat–partially decomposed organic material); and wet prairies (soils almost always organic and saturated). Most Midwestern wet prairies have been drained and now are farmed.

Fens are formed only under very specific conditions. Of the 200 species of plants associated with fens, 20 are endangered or threatened.

From creeks and streams to major rivers, all flowing waters have a riparian zone (floodplain). Riparian zones vegetation traps sediment, agricultural

chemicals, and animal waste. Cottonwood, green ash, silver maple, willow, and many other trees, shrubs, and grasses stabilize stream banks and prevent erosion from storms and snow melt. Streambank vegetation provides shade, moderating temperature, humidity, and light for stream creatures during summer. Forest animals come to drink and find food, shelter, and hiding places. In Iowa, many riparian zones have been cleared and replaced by cultivation, converted to pasture, or developed. Loss of this zone of vegetation has caused serious environmental problems.

It is estimated Iowa had four million acres of wetlands in the mid-1800s (includes oxbows, floodplain wetlands, and natural lakes). As humans realized how rich soils under wetlands and prairies were, these areas soon were drained or filled and converted to cropland, urban areas, housing complexes, industrial areas, railroads, and highways.

Iowa has lost approximately 99 percent of its original wetlands. Wetlands were, and still are, considered by many to be waste areas. Until recently, drainage of wetlands for agriculture was promoted by state and federal programs.

In 1990, approximately 27,000 acres of wetlands remained in Iowa. Since the mid 1980s several programs have emerged to assist in the protection and restoration of wetlands. From 1987-1996, nearly 27,436 acres of land were acquired through the Prairie Pothole Joint Venture in a 35 county area of Central Iowa. Acquisitions included 2,651 acres of existing wetlands and 4,449 acres of restorable wetlands.

2.6 Mississippi and Missouri Rivers

The Mississippi River borders Iowa for more than 300 miles and drains two-thirds of the state. It originates in Lake Itasca, Minnesota, and flows some 2,350 miles to the Gulf of Mexico. Through the ages it has formed chutes, side channels, and sloughs while carving a valley two to six miles wide. It first served as a corridor for settlement by native Americans from the South and later as a major mode of transportation for Euro-American settlers.

The Upper Mississippi River (from the entrance of the Missouri–above St. Louis–to Minneapolis) was a mosaic of braided channels with rapids and shallow areas. Water levels were unpredictable and the river was vulnerable to drought and floods. In 1824, Congress authorized “improvement” of the river for navigation through removal of snags and other obstructions. In 1907, work began to form a six foot navigation channel in the Upper Mississippi. The Mississippi became a major transportation route and the U.S. Army Corps of Engineers (Corps) constructed locks and dams for navigation on the Upper Mississippi between 1930 and 1940. A nine-foot channel now is maintained by the Corps for barge navigation.

The level of the river along the Iowa border is controlled by 11 locks and dams. Damming the Mississippi raised water levels so many chutes between islands, and even islands themselves, were inundated. It also changed the habitat structure from a continuous, flowing body of water to a series of "lake-like" pools (stretch of river between two navigation dams). Each pool is numbered in reference to the dam at its downstream end. Example: Lock & Dam 12 in Bellevue, Iowa creates Pool 12 above it.

The Missouri River was dubbed the "Big Muddy" by early explorers because its shifting sands were swirled by relatively fast-moving currents through a broad series of braided channels. The Missouri River Valley bordering Iowa contained lush hunting grounds used by the Dakota, Iowa, Oto, Winnebago, Sac, Fox, and Pottawattamie. Many fur companies established trading posts along the Missouri. Buffalo, elk, and deer (along with many species of small game and wild fowl) were common in the river valley. A variety of fish were plentiful in the river.

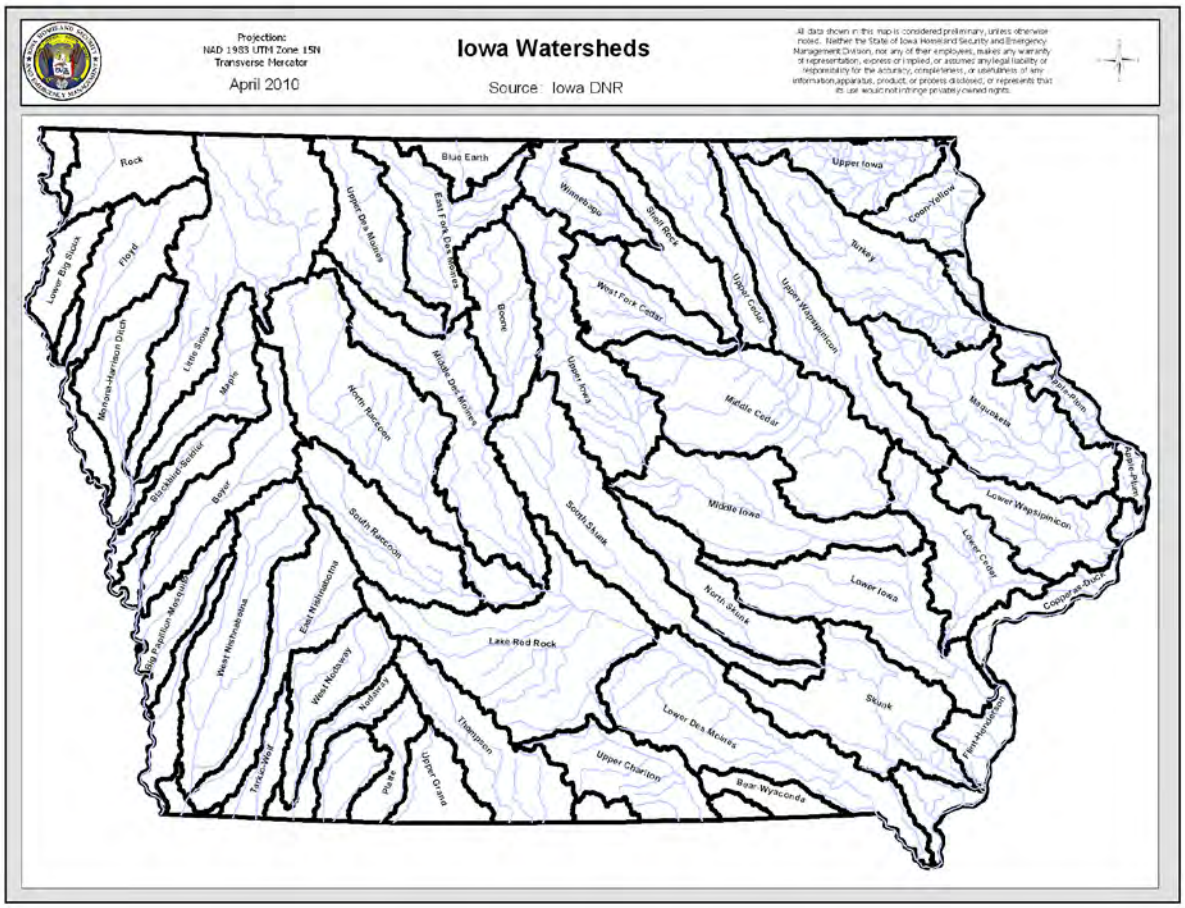
Engineering work for navigation and flood control have had a profound effect on the Missouri. Work began as early as 1876, but accelerated channel stabilization occurred in the late 1920s and early 1930s. Between 1923 and 1976 the river channel was altered from its former braided appearance to a narrow, single channel with a series of gentle bends and well armored shoreline. This reduced the channel area by nearly 35,000 acres along Iowa alone. Dikes and other structures regulate flows instead of locks and dams. The Corps maintains a nine foot channel for commercial river traffic.

Islands, sand bars, brush piles, etc. disappeared after channelization. Habitat diversity is nearly non-existent. Sport and commercial fishing have suffered greatly. Commercial fishing yielded 50,000 to 80,000 pounds of fish each year between 1940 and 1955. Reports in 1996 showed an annual harvest just over 21,500 pounds, compared to almost three million pounds harvested from the Mississippi.

2.7 Watersheds

Combined, all the rivers, streams, and lakes in Iowa represent watershed basins. Iowa has 56 watersheds that range from 390 to 1,954 square miles in size. Within these watersheds are 420 smaller basins ranging from 63 to 391 square miles in size.

Activities in the watershed (land that drains into a lake, marsh, or stream) determine water quality. Water dissolves soil, fertilizers, chemicals, etc. As it moves across the land it picks these up and carries them to the water body. Water also is very heavy and has tremendous power as it falls from the sky and moves across the land. It can move huge amounts of materials during heavy rainfall events or rapid melting of ice and snow, so bare soil is very susceptible to erosion.



Within many of these watersheds, there is a strong history of work to solve problems like upland sheet and rill erosion, gullying, sedimentation of lakes and streams and flooding. More recently, water quality-oriented watershed projects have been organized to address threats to some of Iowans as well as the support of the creation of water quality improvement plans and watershed monitoring groups.

2.8 Climate and Weather

Iowa has a continental climate with hot, moist summers and cold, generally dry winters. The average annual temperatures range from about 46 degrees Fahrenheit in the northwest to about 51.1 degrees Fahrenheit in the southeast. The recorded temperature in the state has ranged from –47 degrees Fahrenheit in 1912 and 1996 to 118 degrees Fahrenheit in 1936.

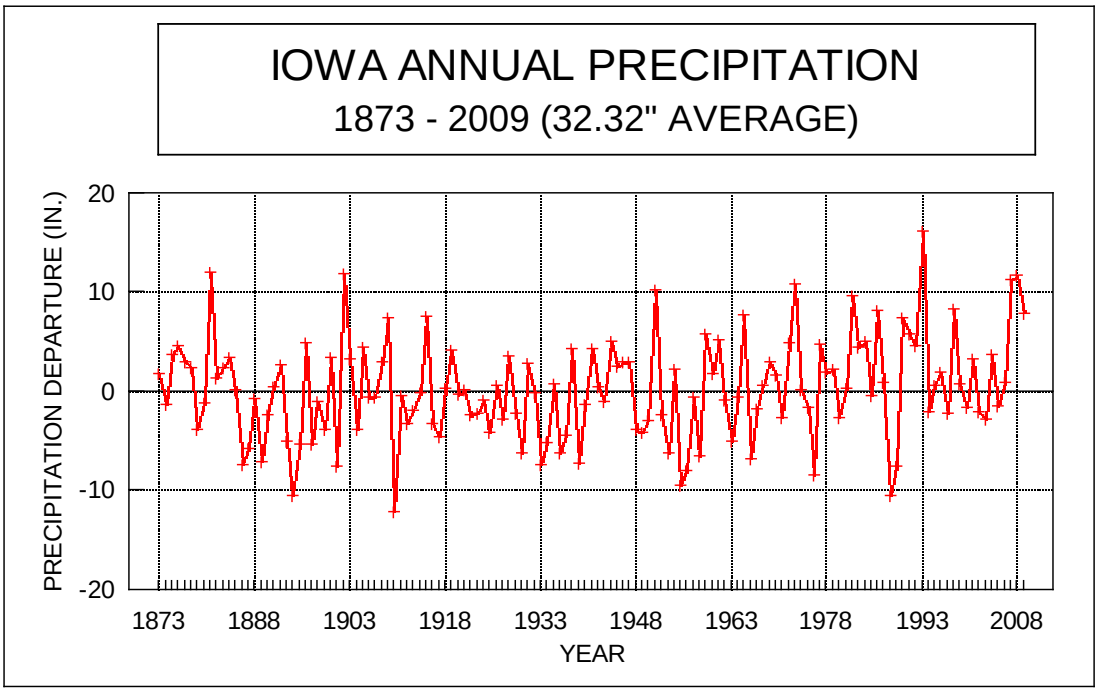
The average annual precipitation is 34 inches for the state, ranging from about 28 inches in the northwest to about 36 inches in the southeast. The Great Flood of 1993 proved to be an extreme exception to historical averages. Although most of the annual precipitation falls in the warm months, snowstorms, ice storms, and occasional blizzards occur during the winter.

Thunderstorms are common in summer. Droughts severe enough to cause widespread crop losses occur about every 20 years. (Source: IDALS State Climatologist)

Iowa Climate Statistics (long term averages 1971-2010)	Numbers
Average Temperature (degrees F) December/January/February	21.4
Average Temperature (degrees F) March/April/May	48.7
Average Temperature (degrees F) June/July/August	72.1
Average Temperature (degrees F) September/October/ November	51.0
Average Annual Temperature (degrees F) Southeast	51.1
Average Annual Temperature (degrees F) Northwest	46.1
Average Precipitation (inches) December/January/February	3.05
Average Precipitation (inches) March/April/May	9.33
Average Precipitation (inches) June/July/August	12.59
Average Precipitation (inches) September/October/ November	8.14
Average Annual Precipitation (inches) Southeast	36.35
Average Annual Precipitation (inches) Northwest	28.33
Average Annual Snowfall (inches) Southeast	27.5
Average Annual Snowfall (inches) Northwest	34.7
Average Temperature as of May 2010*	60.6
Average Temperature Departure as of May 2010*	+0.4
Average Precipitation Since January 1, 2010 to May 2010*	12.06
Average Precipitation Departure Since January 1, 2010 to May 2010*	+0.36
*Departures are computed from 1971-2000 normals based upon information collected by the U.S. Department of Commerce, NOAA National Weather Service.	

Source: NOAA

The chart below shows the variation by decade in Iowa's annual precipitation. Significant wet years are noticeable in the early 1900's, around 1950, and again in 1993. Periodic wet and dry cycles are discernable with the overall trend of annual precipitation increasing over the last 50 years.

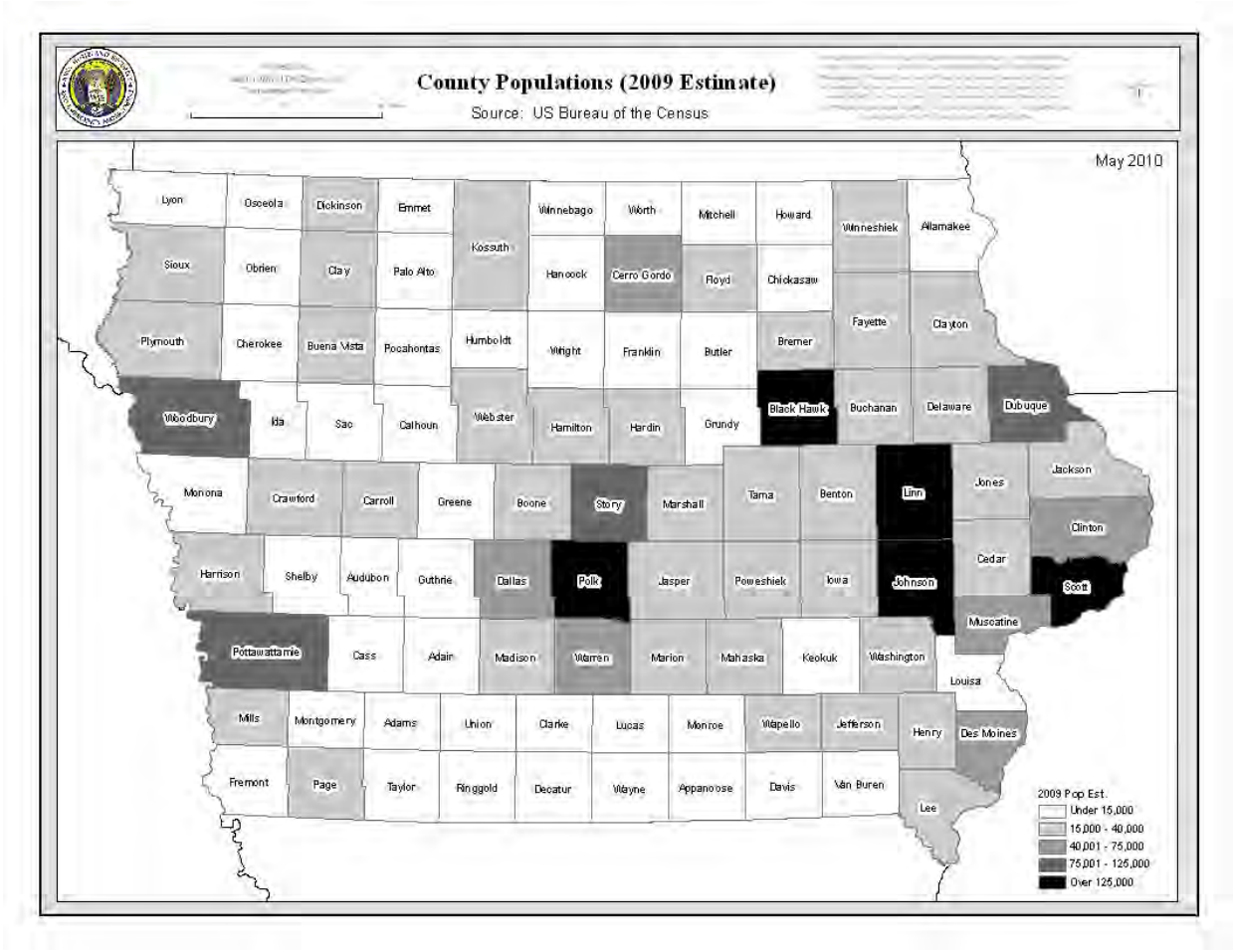


3. Population and Households

In July of 2009, Iowa's estimated population was 3,007,856, retaining the previous ranking of 30th in the nation in total population. Over the last 30 years to the 2009 estimate, the population in Iowa has increased by 92,117 persons, or about a total of three percent. Current projections of the Iowa Data Center, conclude that Iowa is projected to have a population of 3,467,386 in 2040, indicating an increase in population of 459,530. Population density in Iowa is 52.4 people per square mile for a rank of 33 when compared with other states.

As of May of 2010, the United States Census Bureau is in the collection stage of the State's population and demographics data. The Census Bureau is expected to deliver the apportionment counts to the President in December of 2010 with a delivery of redistricting data to the State's in March of 2011. At this time, Iowa will incorporate the changes in development based off of the results of new official census numbers.

Iowa's current population estimate by county is shown in the map below. Although Iowa is known as a rural agriculture state, counties with the largest cities represent the largest population centers in the state. Population distribution within the Iowa can generally be described as highest in the Central and East Central regions of the state and lowest in the Southwest and South Central regions.



Iowa's largest city is Des Moines. The Metropolitan Area spans five counties in central Iowa: Polk, Dallas, Warren, Madison, and Guthrie. With an estimated total metropolitan population of 562,906 (2009) and a city proper population of 197,052. The second largest city is Cedar Rapids with a total population of 128,056. The other communities rounding out the top ten of Iowa's largest cities range in population from 100,827 to 55,426.

Iowa's Largest Cities	Population (2008) estimate	County
Des Moines	197,052	Polk
Cedar Rapids	128,056	Linn
Davenport	100,827	Scott
Sioux City	82,807	Woodbury
Iowa City	67,831	Johnson
Waterloo	66,662	Black Hawk
Council Bluffs	58,268	Pottawattamie
Dubuque	57,250	Dubuque
Ames	56,510	Story
West Des Moines	55,426	Polk/Dallas

Iowa has a median population age of 38.2 years. This age ranks 13th in the country when compared with other states and shows that Iowa's population is older than most other places in the country, including neighboring states.

Overall, Iowa is largely comprised of persons considering themselves White or Caucasian totaling 90.3 percent of the population. This proportion of Whites to other populations is consistent with rural or agriculturally inclined states. As with other states, particularly those with significant agriculture, persons of Hispanic origin continue to represent a higher proportion of the population. In 2008, persons considering themselves Latino accounted for 4.2 percent of the total population which constitutes an increase of 0.5 percent from the last update, as well as Iowa's largest cultural or race related group of persons.

Percent Population by Age	2008	Population by Race/Hispanic	2008
0-19	26	White	90.3
20-44	34	Black	2.5
45-65	26	American Indian, Eskimo, Aleut	0.3
65+	14	Asian or Pacific Islander	1.7
Median age	38.6	Latino (of any race)	4.2
		Reporting two or more races	1.0

There are an estimated total of 1,215,351 households in Iowa as of 2008. Of these households, just over 65.1 percent represent families and 34.9 represent non-family. People in households living alone represent approximately 28 percent of the State's total, with over two thirds of those representing persons age 65 years and older.

The average size of Iowa's households is 2.38 persons with average family size being slightly larger at 2.92. As Iowa's population continues to age, persons age 65 years and older living at home is expected to increase.

Households by Type (2008 Estimate)	Total	Percent
Total Households	1,215,351	100.0
Family households	791,790	65.1
Non-family households	423,561	34.9
Householder living alone	345,655	28.4
Householder 65 years and over	131,579	10.8
Average household size	2.38	
Average family size	2.92	

Iowa's population living in urban areas represents over 60 percent of the state in 1990, increasing slightly to just over 61 percent by year 2000. Of the rural population, significant changes occurred between 1990 and 2000 relative to farm and non-farm households. In 1990, rural non-farm population represented 23.5 percent of rural households and by 2000, this represented only 15 percent. Rural farm households increased from 76.5 to 85 percent during the same period. This

trend suggests that non-farm households are either moving to urban areas or out of the state entirely.

Percent Urban and Rural Households	1990	2000
Total Population: Urban	60.6%	61.1%
Total Population: Rural	39.4%	38.9%
Total Population: Rural: Non-farm	23.5%	15.0%
Total Population: Rural: Farm	76.5%	85.0%

4. Housing

In 2008, housing units in Iowa totaled 1,328,740. This is an increase of 16 percent from 1990, or an annual increase of less than one percent. Mobile homes represent 4 percent of Iowa's total housing stock. The proportion of mobiles homes units has decreased since an influx of mobile housing in the 90's and 2000's.

Total Housing Units in Iowa (1940-2008)			
Year	Total Housing Units	Mobile Homes	Percent
1940	726,654	N/A	N/A
1950	811,912	7,250	0.9%
1960	905,295	11,735	1.3%
1970	964,060	24,285	2.5%
1980	1,131,299	44,172	3.9%
1990	1,143,669	56,857	5.0%
2000	1,232,511	64,719	5.3%
2008	1,328,740	52,740	4%

Source: Iowa Data Center and US Census Bureau

With a growth in housing units has brought a lower percentage of older housing, Iowa's proportion of older homes is showing indications of decreasing. As of 2007 estimates, housing units constructed in 1939 or earlier represent approximately 29 percent of Iowa's total units with less than half of all units in Iowa constructed before 1960. In 2007, housing units in Iowa that were less than ten years old represented 9.7 percent of all units.

Year Structure Built for Iowa (2007 Estimate)		
Year	Number	Percent
2005 or later	36,773	2.8%
2000 to 2004	91,564	6.9%
1990 to 1999	144,486	10.9%
1980 to 1989	97,609	7.3%
1970 to 1979	206,976	15.6%
1960 to 1969	143,414	10.8%
1950 to 1959	144,844	10.9%
1940 to 1949	78,129	5.9%
1939 or earlier	385,593	29.0%

Source: Iowa Data Center and US Census Bureau

Home ownership in Iowa has steadily increased over the past 50 years, while the percent of units rented has decreased proportionately. By 2007, 73.7 percent of Iowa's total housing units were owner occupied.

Home Ownership and Median Rent in Iowa (1900-2007)						
Year	# Occupied	# Owned	% Owned	Rented	% Rented	Median Rent
2007	1,214,353	894,841	73.7%	319,512	26.3%	$567
2000	1,149,276	831,419	72.3%	317,857	27.7%	$470
1990	1,064,325	745,377	70.0%	318,948	30.0%	$336
1980	1,053,033	456,517	71.8%	296,516	28.2%	$226
1970	896,311	642,676	71.7%	253,635	28.3%	$99
1960	841,357	581,352	69.1%	260,005	30.9%	$68
1950	780,167	494,826	63.4%	285,341	36.6%	$43
1940	701,824	361,477	51.5%	340,347	48.5%	N/A
1930	635,704	340,778	54.7%	282,607	44.5%	N/A
1920	559,188	332,567	59.4%	239,880	42.9%	N/A
1910	498,943	292,951	58.7%	208,344	41.8%	N/A
1900	468,682	282,760	60.3%	183,053	39.1%	N/A

Source: Iowa Data Center and US Census Bureau

Source: U.S. Bureau of the Census, Decennial Census

5. Public and Private Infrastructure

5.1 Highway and Roads

Iowa's highway network is the backbone of the state transportation system and accounts for the vast majority of investments. In 2008 the total number of registered vehicles equaled 4,135,870 with 936,006 of these classified as trucks and truck-tractors and approximately 1.1 billion gallons of gas purchased (2004). Motor vehicles on Iowa's public roads traveled an estimated 30.95 billion miles in 2008. The busiest spot on Iowa's roadways is on I-235 in Des Moines near 31st Street, the average daily traffic count in 2008 was 125,100 vehicles per day.

The primary road system, which is managed by the DOT, represents 8.2 percent of the total road mileage in the state. However, in 2008 these roads carry 60.5 percent of all vehicular traffic. The weighted average daily count on Iowa's Interstate Highway System is 20,164 vehicles in rural areas and 43,751 in municipal areas. The weighted average daily traffic on rural county roads is 166 vehicles and the average on municipal streets is 1,335 vehicles.

Trucks transport 80.8 percent of the shipments originating in Iowa, according to the total value of the commodities, this is followed by rail at 6.5 percent and water 1 percent; when measured according to tons shipped, trucks transport 79.6 percent, rail 13 percent and water 1 percent; commodities originating in Iowa travel an average of 141 miles by truck, 822 miles by rail,

618 by water, and 940 by air (2007 Commodity Flow Study). The primary highway system is critical to the passenger, freight and intermodal transportation movements throughout the state. Ensuring safe travel on these routes is crucial.

There were an estimated 2.1 million Iowa driver licenses in force in 2004 with 49.07 percent of licensed drivers in Iowa age 16 and older are females and 50.92 percent male (2005). 91.16 percent of Iowa's total driving population is age 20 and older with individuals age 40 to 49 representing the largest group (404,522) and 22.6 percent or 484,483 aged 60 or older.

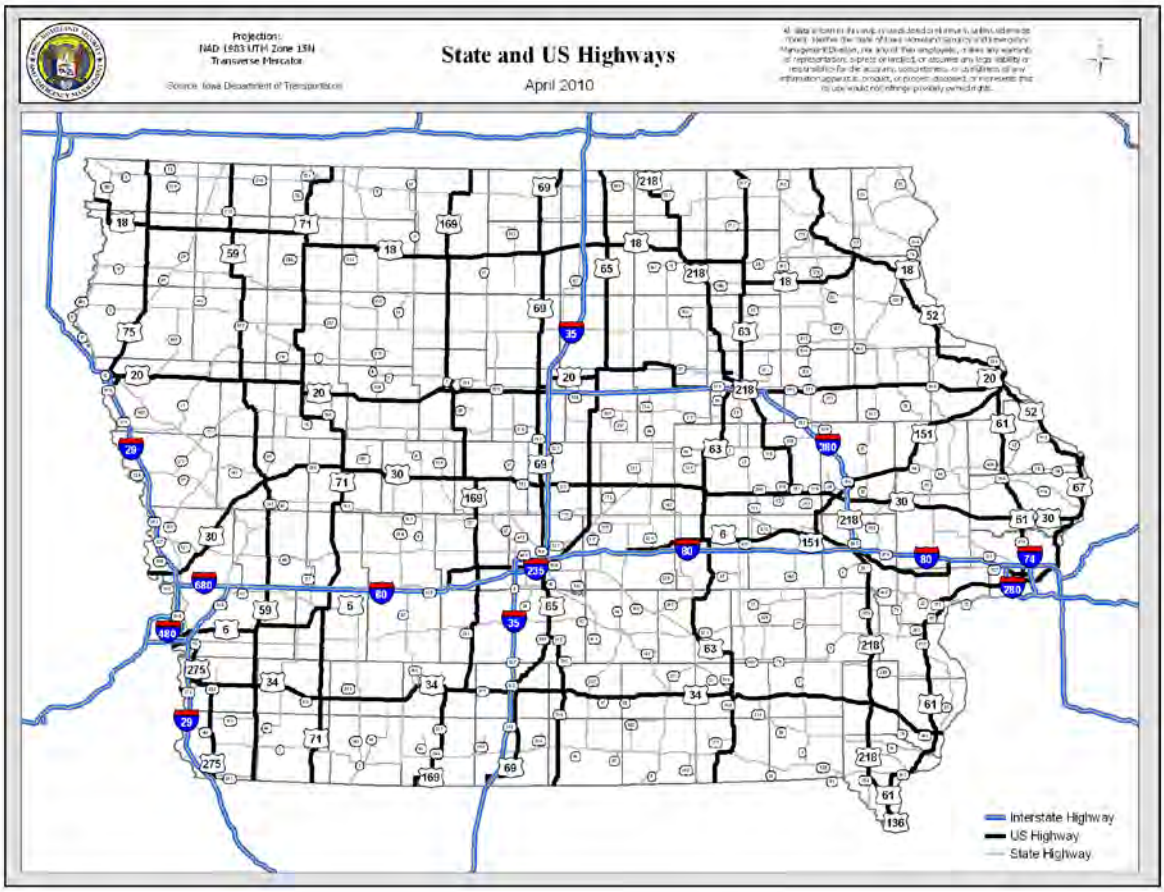
There is an increased emphasis on developing solutions to improve the safety and efficiency of the existing transportation system. Many of the solutions lie in technological advances, such as intelligent transportation systems (ITS). Both rural and urban areas of the state will benefit from implementing ITS technologies.

2008 Public Road Length – miles by ownership	
Iowa DOT	8,894*
Counties	89,957
Municipalities	14,702
Parks & Institutions	549
Federal agencies	123
Total miles	114,225*
*Totals exclude ramps. The Iowa DOT maintains 9,404 miles of roadway, including 510 miles of ramps.	

2008 Bridge Counts by ownership	
Iowa DOT	4,053
Counties	19,300
Municipalities	1,073
State Parks	3
Local Parks	1
Other State Agencies	19
Private	4
Railroad	80
Local Toll	3
Bureau of Indian Affairs	1
National Park Service	2
Corps of Engineers	2
Unknown	57
Total	24,598

Source: Iowa Department of Transportation

Iowa's interstate system, both north-south and east-west, will continue to play a critical role in national and international trade. Interstate Highways 35 and 29 through Iowa have been designated as key routes on the Canada-to-Mexico corridor as a result of the North American Free Trade Agreement (NAFTA). Iowa's primary highway system, particularly the interstates and the Commercial and Industrial Network (CIN), must meet the challenges of providing safe and efficient travel for international trade.



In 2008, there were 114,225 miles of publicly owned highways and roads in Iowa; this excludes 510 miles of ramps that are maintained by the Iowa Department of Transportation (IDOT). As reported in 2008 Iowa also has 24,598 bridges. The IDOT is responsible for maintaining 9,404 miles of those roadways, including the 510 miles of ramps. They also maintain 4,053 bridges.

5.2 Railway

Iowa's rail transportation system provides both freight and passenger service. Rail serves a variety of trips, including those within Iowa and those to other states as well as to foreign markets. While rail competes with other modes, it

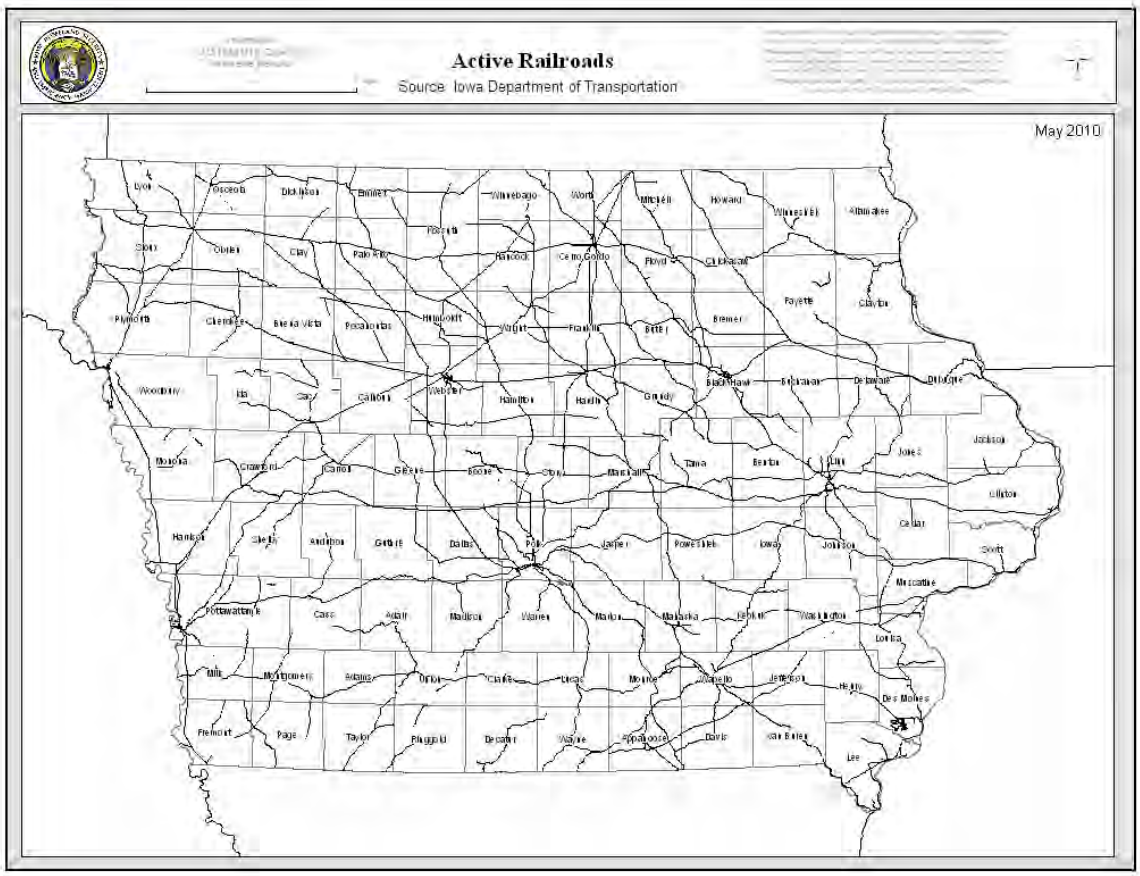
also cooperates with those modes to provide intermodal services to Iowans. In 2008, Iowa's rail transportation system could be described as follows:

- 3,947 miles of track on 19 railroads
- 52.3 million tons shipped
- 43.7 million tons received
- Approximately 64,300 passenger rides

Rail service in Iowa is privately owned and operated by 19 railroad companies. Four of these railroads are major national companies and operate 59 percent of Iowa's total miles and carry 72 percent of Iowa rail shipments. The remaining 15 railroads consist of regional line haul carriers and local switching companies. Of the 15 smaller railroads serving Iowa, 10 operate only within Iowa. These regional and local railroads serve 41 percent of Iowa route miles and transport 28 percent of Iowa rail shipments. Together the rail companies serve 90 out of 99 counties, 407 of 947 cities, 43 out of 60 river terminals, and 444 out of 871 grain elevators (as of 2006). The following map shows Iowa's active railroad lines.

As of 2008, Iowa has 7,310 at-grade highway-rail crossings, 2,865 of these are on private roads and 4,403 on public roads. In 2008 there were 64 highway-rail crashes in at these public crossings with 37 resulting in no significant injuries or fatalities. Since 1985 crashes at highway-rail crossings have decreased by 59 percent despite the increase in rail car miles of 150 percent and motor vehicle miles increasing by 55 percent.

In 2008 there were 53 derailments in Iowa, resulting in no injuries or fatalities, of the derailments 57 percent were caused by a problem with the track, roadbed, or structures and 23 percent were caused by human error. Since 1985, train derailments per million rail car miles have decreased by 73 percent (2008).



5.2.1 Railway Freight

Iowa railroad mileage peaked in 1911 at approximately 10,500 miles. Today, Iowa has 3,947 miles, which is 37.6 percent of the peak mileage. While rail accounts for only 3 percent of the Iowa's 130,000 mile intermodal freight system, it carries 43 percent of Iowa's freight tonnage. A great variety of commodities ranging from fresh fish to textiles to optical products are moved by rail. However, most of the Iowa rail shipments consist of bulk commodities, including grain, grain products, coal and fertilizers. The railroad network performs an important role in moving bulk commodities produced and consumed in the state to local processors, livestock feeders, river terminals and ports for foreign export. The railroad's ability to haul large volumes, long distances at low costs will continue to be a major factor in moving freight and improving the economy of Iowa.

The condition of Iowa's rail network has improved substantially since the 1980s as a result of infrastructure investments and abandonment of inadequate rail lines. Before the 1980s, Iowa was plagued by rail lines that could not handle cars weighing 263,000 pounds, slow operating speeds, and rail weights of less than 90 pounds per yard.

Today's rail network is typified by heavier rail weights that can safely handle larger and heavier cars and locomotives at faster speeds. With today's rail equipment, railroads have placed an increased importance on the condition and clearances associated with their tracks and bridges.

5.2.2 Railway Passenger

Railroad passenger service, once the dominant mode of intercity passenger transportation in the United States, now plays a relatively minor role in moving people between cities. Rail passenger service is provided at six Iowa stops on the two Amtrak routes through southern Iowa consisting of 297 miles. In 2008, the total number of passengers arriving and departing from Iowa Amtrak stations totaled 64,300, an increase of 9,935 (18%) from 2005.

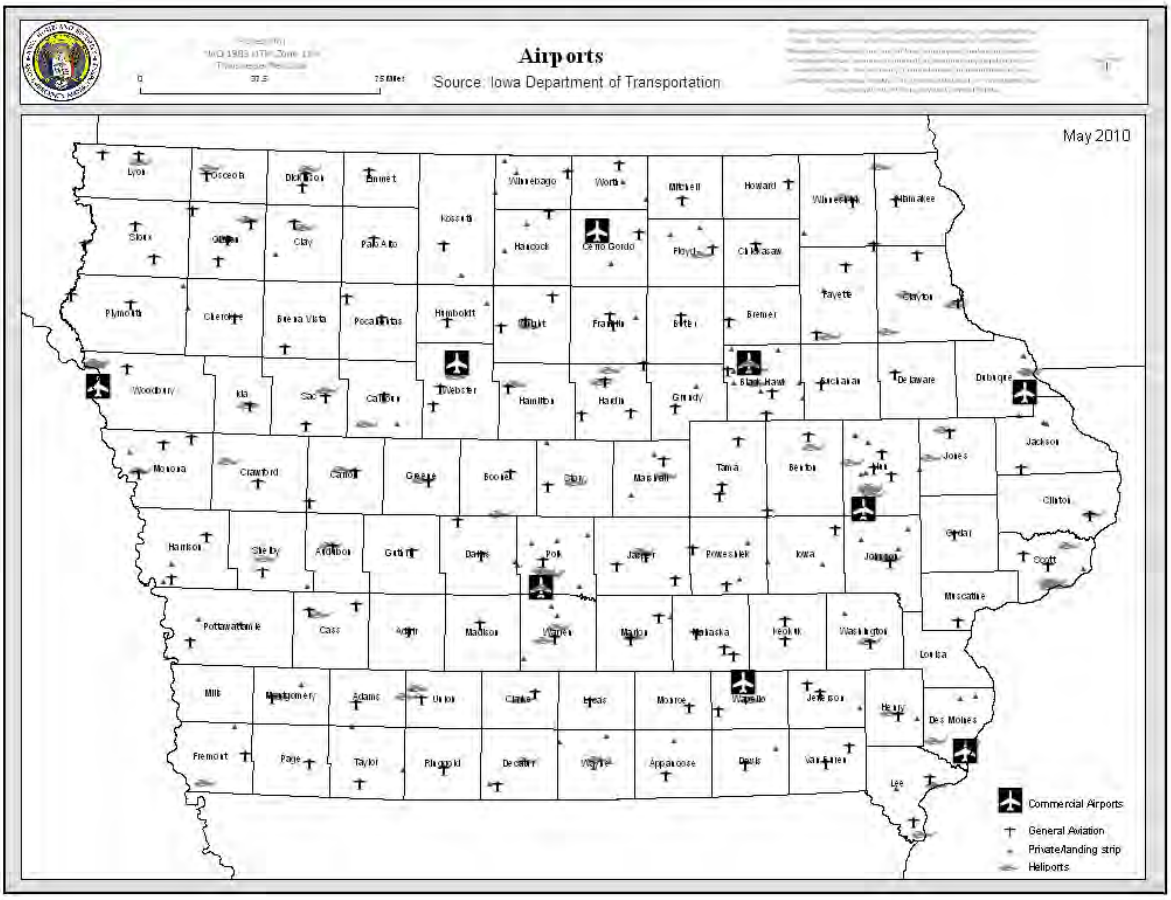
Passenger service in Iowa is currently provided by the California Zephyr from Chicago to Oakland, Calif., and the Southwest Chief from Chicago to Los Angeles, Calif. The California Zephyr operates over the Burlington Northern Santa Fe (BNSF) tracks in southern Iowa providing daily service in both directions. Stations include Burlington, Mount Pleasant, Ottumwa, Osceola and Creston. The Southwest Chief also operates daily in both directions over the BNSF tracks in extreme southeast Iowa with one stop in Fort Madison.

5.3 Airports

Iowa's system of airports provides a variety of services vital to the state's economy and is an integral part of Iowa's overall transportation system. Iowa has 111 publicly owned airports that serve general aviation activity, with eight of those airports offering commercial air service. An additional seven privately owned airports are also open for public use. There are 125 private use heliports and landing zones in Iowa used for helicopter EMS operations. The following map indicates the location of commercial and general aviation airports, as well as private landing strips and heliports.

Scheduled air passenger service allows rapid access to national and international destinations. Iowa generates 2.5 million commercial airline passenger boardings each year, with Des Moines and Cedar Rapids ranking 92nd and 116th (of the 566 commercial service airports) nationally in passenger boardings. There are approximately 1.4 million aircraft operations at publically owned airports in Iowa each year, with nearly 90 percent of those operations from general aviation (non-airline, non-military) activity. Air cargo service, which is the fastest growing mode of freight movement, is critical to many industries in Iowa. General aviation airports support business and recreational flying at communities throughout the state and are important economic assets for those communities. Growth in demand for aviation services, both passenger and air cargo, continues to outpace other

transportation modes. In 2009, there were more than 4,000 Federal Aviation Administration registered aircraft and 5,663 active licensed pilots.



Both the commercial service and general aviation segments of the aviation industry continue to evolve in response to market forces, new technologies and regulatory actions. Within this dynamic environment, the Iowa Aviation System Plan provides direction for the development of Iowa's system of publicly owned airports. It also addresses efforts to maintain and improve commercial air passenger service in the state. The plan identifies the airport infrastructure needs and initiatives the state can take to maintain a safe and efficient operating environment for aviation and respond to economic development opportunities.

5.4 Utilities and Pipelines

Iowa is served by numerous electric and gas providers. These providers range from multi-state firms such as MidAmerican Energy to small municipal utilities and rural/area cooperatives. The other multi-state firm Alliant sold its transmission system to ITC Holdings of Novi, MI. Two other significant gas distribution companies include Black Hills Energy and Atmose Energy. Many

of the rural areas of Iowa rely on delivery of liquid propane to residential and commercial refillable propane tanks.
Collectively, Iowa has 188 electric utilities serving 1,545,050 customers with 70 gas utilities serving 973,451 customers. As well as competitive local exchange carriers and incumbent local exchange carriers providing phone service to 1,560,235 subscribers. The tables below outline the details of Iowa's utility profile.

Electric Utility Data (2008)		
Group	**Number of Customers**	**Number of Companies**
Investor Owned Electric Utilities	1,115,092	2
Municipal Electric Utilities	209,531	136
Rural Electric Cooperatives-Distribution	220,427	46
Rural Electric Cooperatives - G&T	0	4
Electric Utility Totals	1,545,050	188

Source: Iowa Utilities Board

Gas Utility Data (2008)		
Group	**Number of Customers**	**Number of Companies**
Investor Owned Gas Utilities	921,938	4
Municipal Gas Utilities	51,402	51
Certified Natural Gas Providers	111	15
Gas Utility Totals	973,451	70

Source: Iowa Utilities Board

Telephone Utility Data (2008)		
Group	**Number of Customers**	**Number of Companies**
Local Exchange Carriers	1,560,235	278
Interexchange Carriers	N/A	244
Telephone Utility Totals	1,560,235	522

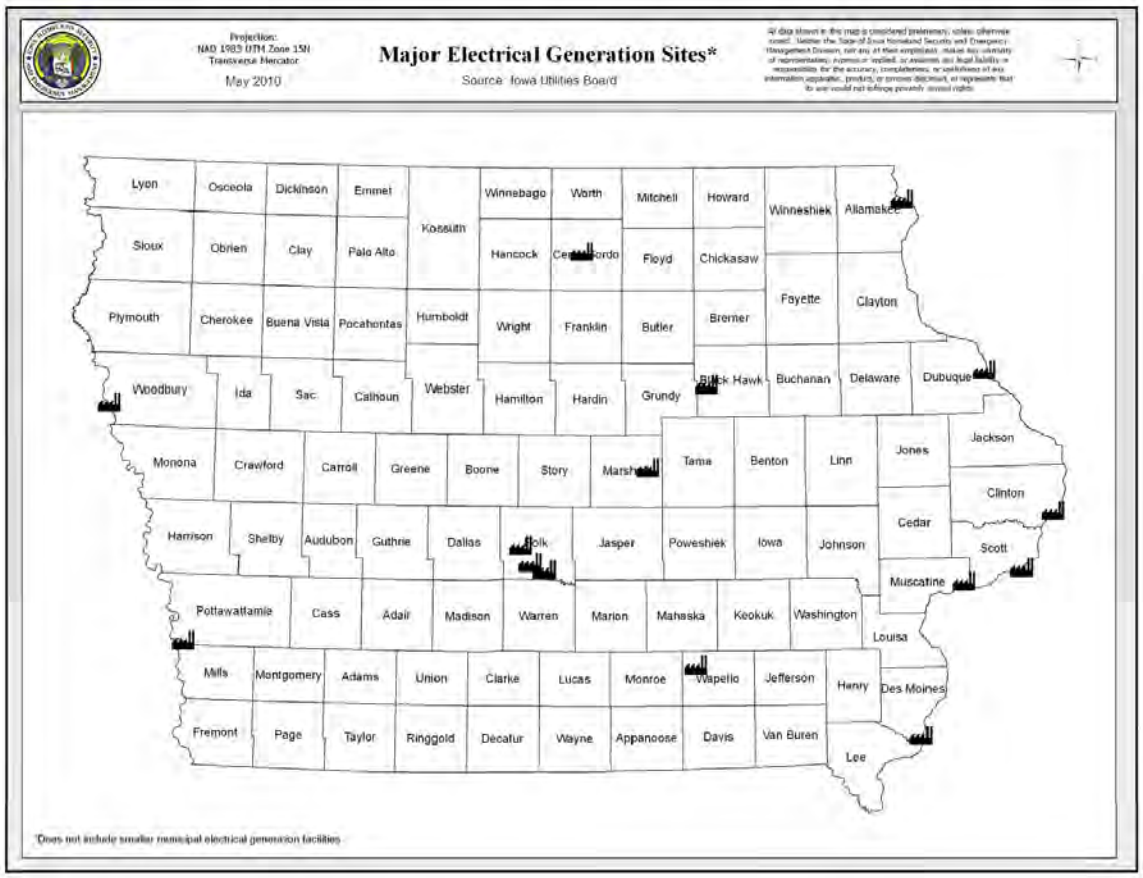
Source: Iowa Utilities Board

Water Utility Data (2008)		
Group	**Number of Customers**	**Number of Companies**
Water Utility	60,569	1

Source: Iowa Utilities Board

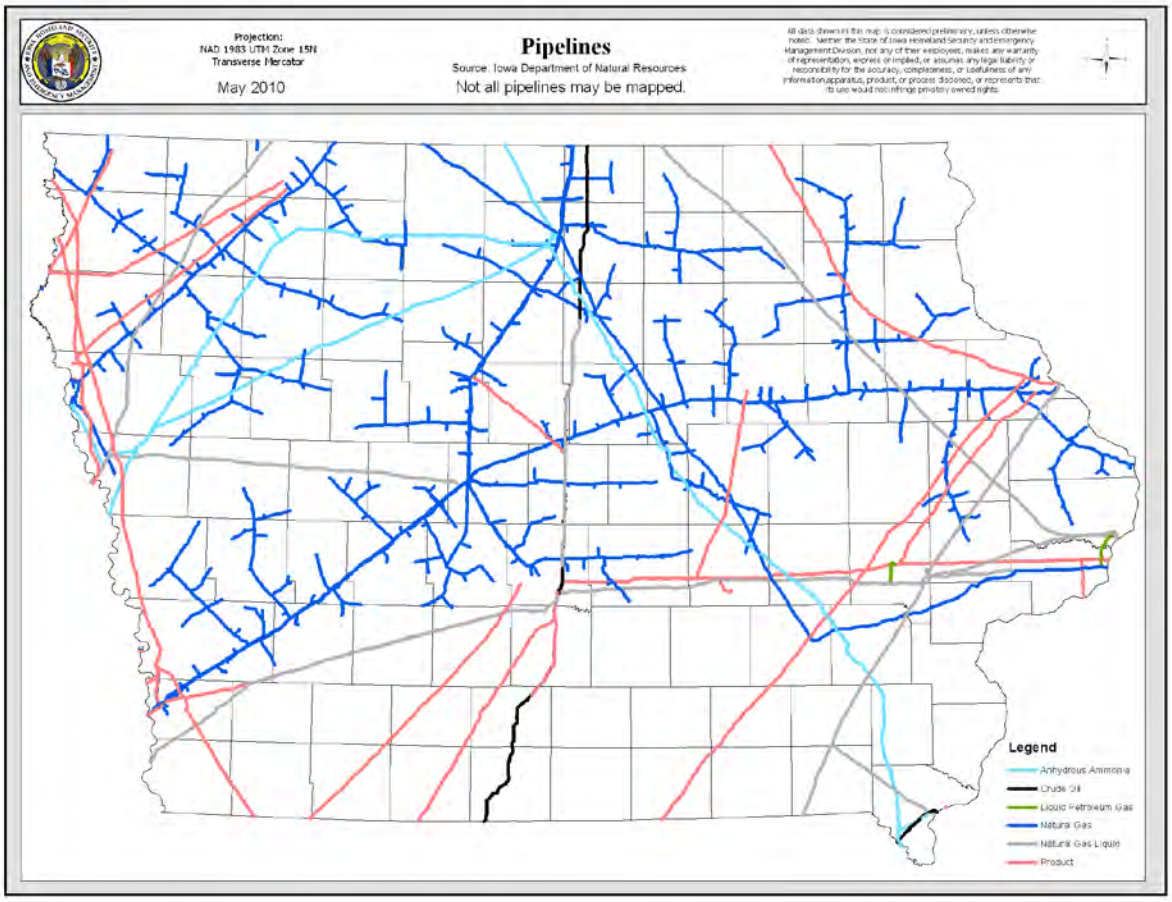
Electric Generation in Iowa by Primary Energy Source (2008)		
Source	**2008 Generation (MWh)**	**Percent**
Coal	40,410,107	76.12%
Natural Gas	2,163,191	4.07%
Wind	4,083,787	7.69%
Fuel Oil / Petroleum	161,127	0.30%
Nuclear	5,282,202	9.95%
Hydro	819,047	1.54%
Other Renewables / Other	167,325	0.32%
Total	53,086,786	100.0%

Source: Iowa Utilities Board



Three of the five interstate natural gas pipelines in Iowa serve MidAmerican Energy with natural gas. They also own five liquefied natural gas and liquefied propane facilities that can provide additional supplies to customers.

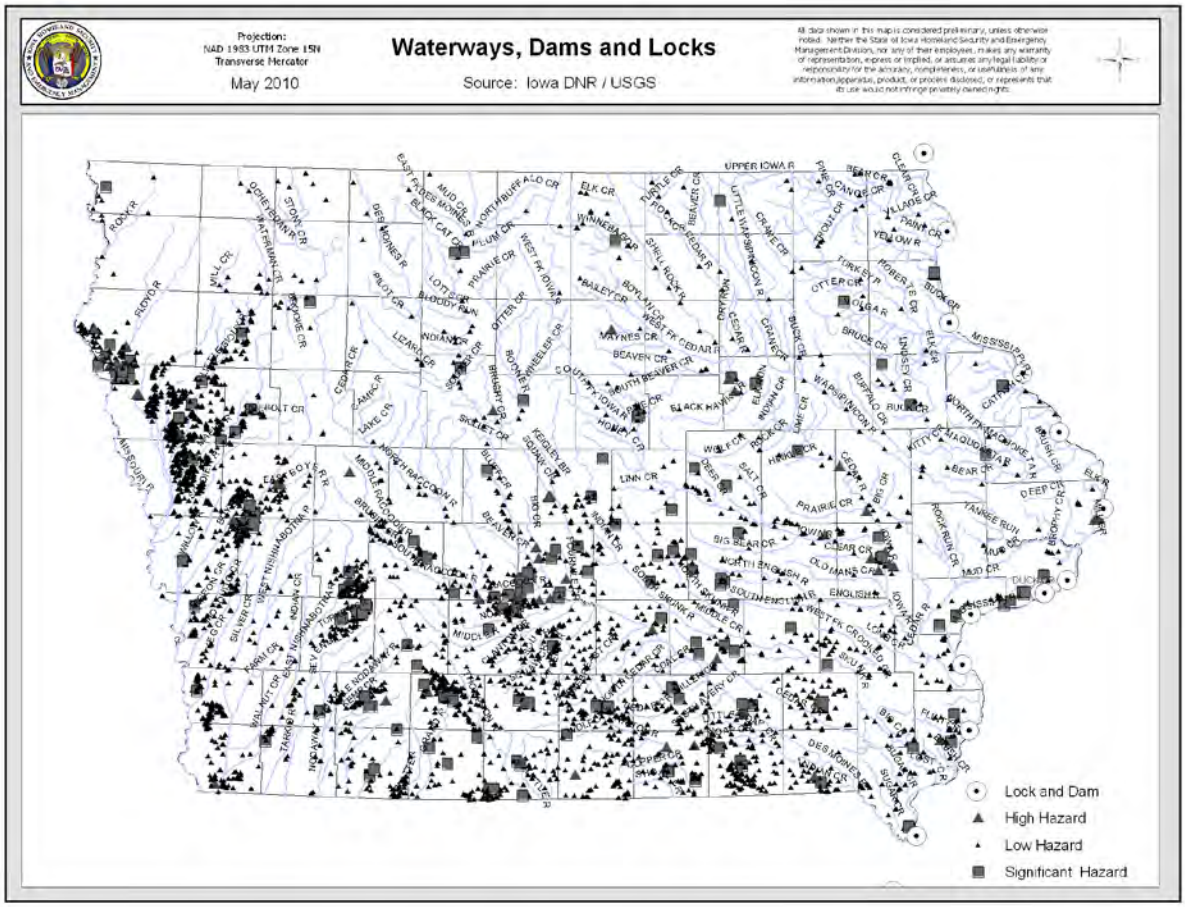
There are some 41,410 miles of hazardous liquid and natural gas pipelines in Iowa. That figure compares with a national average of 51,765 miles. These pipelines continue to provide a safe and efficient vehicle for movement of natural gas, petroleum products and anhydrous ammonia to locations throughout the state. About 5 interstate pipelines operate in the state under federal pipeline jurisdiction.



Modern long-distance pipelines are operated mainly automatically by a computer at the headquarters of the pipeline company. The computer monitors the pressure, flow rates, and other parameters at various locations along the pipe, performs many on-line computations, and sends commands to the field to control the operation of the valves and pumps. Manual intervention is frequently needed to modify the automatic operation, as when different batches of fuels are directed to different temporary storage tanks, or when the system must be shut down or restarted.

5.5 Dams

As of 2009, there are a total of 3,787 dams on Iowa's dam inventory. Of these, 100 dams are classified as having a high hazard potential, 220 dams are classified as having significant hazard potential and the remaining 3,467 dam are classified as low hazard potential dams. There are also 11 lock and dam systems along the Mississippi River. The following map shows the location of Iowa's locks and dams along with their associated hazard potential.



5.6 Source Water

A public water supply is defined in federal law as serving 25 or more people each day for at least 60 days out of the year, or having at least 15 connections. The Water Supply Section of the Iowa Department of Natural Resources regulates public drinking water supplies in Iowa according to the federal Safe Drinking Water Act, under authority from the U.S. Environmental Protection Agency.

By 1990, public or private service represented 81 percent of all source water for Iowans. Another 18.4 percent of Iowans received source water from individually drilled wells. Between 1990 and 2000, there was a shift from individual wells to public or private water systems as shown in the previous table. The percentages of the State residents on a public or private water system increased by about 7 percent while the percentage of people on wells decreased by 7 percent.

Year	Public System or Private Company		Individual Well		Individual Drilled Well		Individual Dug Well		Some Other Source	
	Population	Percent	Population	Percent	Population	Percent	Population	Percent	Population	Percent
1990	927,716	81.1	209,984	18.4	174,323	15.2	35,661	3.1	5,969	0.5
1980	877,037	78.2	236,709	21.1	181,883	16.2	54,826	4.9	7,568	0.7
1970	708,381	74.2	240,365	25.2	N.A.	N.A.	N.A.	N.A.	6,292	0.7

Source: Iowa Historical Census of Source Water, U.S. Census Bureau

5.7 Wastewater

By 1990, 76 percent of Iowa's households were connected to a public sewer system, while over 23 percent remained on a septic tank system. Between 1970 and 1990, there was an increase from 69% to 76% in households on public sewer.

Year	Public Sewer		Septic Tank		Other Means		No Flush Toilet	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
1990	869,056	76.0	264,889	23.2	9724	0.9	N.A.	N.A.
1980	830,489	74.1	273,536	24.4	17,289	1.5	N.A.	N.A.
1970	662,320	69.4	257,889	27.0	34,829	3.6	N.A.	N.A.
1960	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	112,730	12.5
1950	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	261,591	32.6
1940	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	340,330	47.5

Source: Iowa Historical Census of Sewage Disposal, U.S. Census Bureau

5.8 Communications

The table below lists the number of television, radio, and newspaper resources available to Iowa's citizens. These media resources are available in a variety and combination of formats including visual, audio, and on-line. The 164 commercial broadcast stations, both television and radio, represent the most prevalent systems in Iowa.

The Iowa Newspaper Association reports that Iowa has more newspapers per capita than any other state in the nation. Additionally, according to Newton Marketing and Research (2010) Iowa's newspaper readership of 86 percent is above the national average and 43 percent of Iowans rely on their local newspaper for community news. An emerging trend shows that 42.7 percent of Iowa's adults have accessed a newspaper website for news or information within a period of 30 days.

Iowa Communication Statistics (2010)	Numbers
Commercial broadcast stations, TV and Radio	133
Noncommercial broadcast stations, TV and Radio	48
Broadcast Associates	18
Daily newspapers	38

Weekly newspapers	266
Newspaper websites	181

Source: Iowa Secretary of State's Office & Iowa Broadcasters Association

The following table represents a historic census of hard line telephones. Between 1960 and 1990, the number of housing units without telephones decreased from 10.8 percent to 3.4 percent. Although remaining steady in terms of percentage at 3.4 percent, between 1990 and 2000, the number of housing units in Iowa with telephone service decreased by 3,156. The decrease in the number of units with telephones likely represents the increasing choice of people to use mobile phones rather than both a mobile and land based line in their homes. This illustrates Iowa's focus on E911 and CodeRED warning systems as well as 911 texting initiatives.

Iowa Historical Census of Telephones, U.S. Census Bureau		
Year	**Number of units with no telephone**	**Percent with no telephone**
2000	39,643	3.4%
1990	36,487	3.4%
1980	40,305	3.8%
1970	62,028	6.9%
1960	91,127	10.8%

Source: US Census Bureau

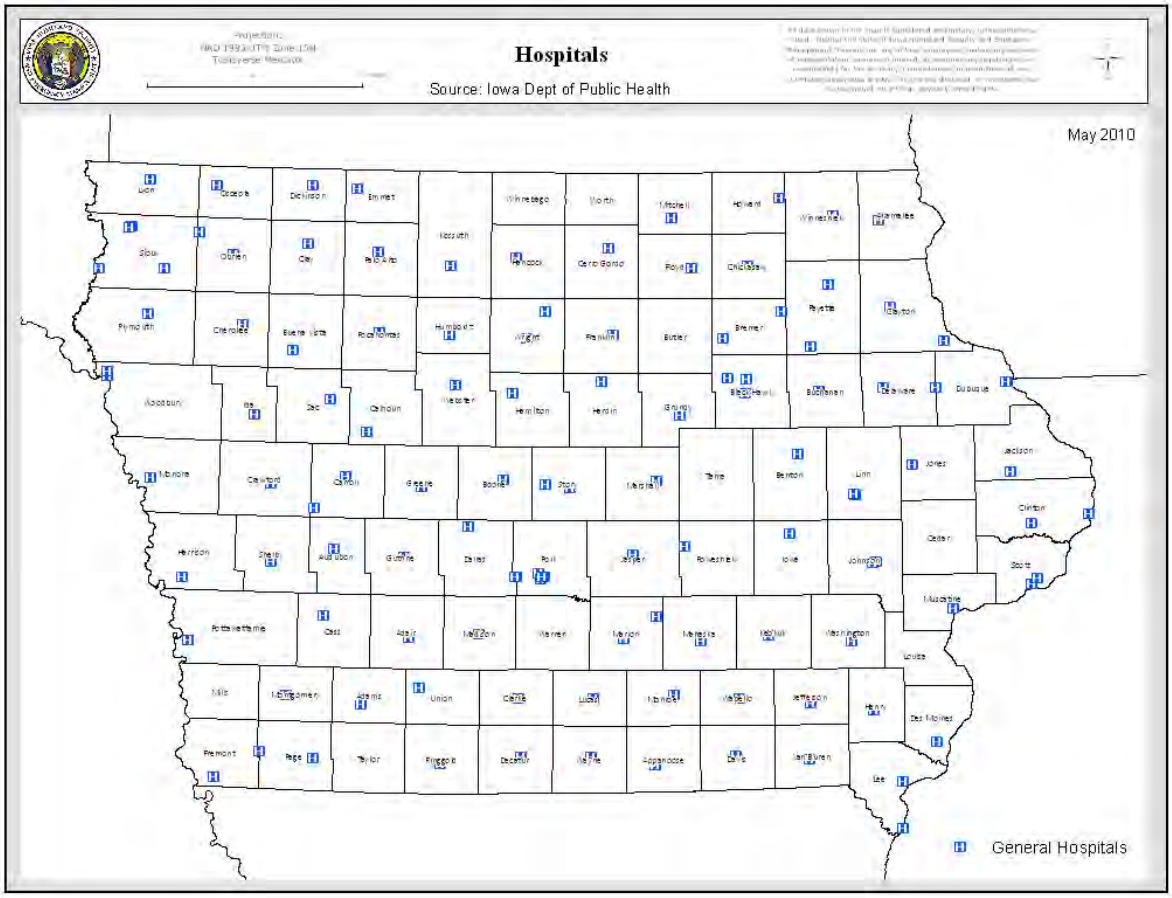
The Iowa Communications Network (ICN) is a state agency that administers a statewide fiber optics network.

The capacity of the Network enables authorized users such as hospitals, state and federal government, public defense armories, libraries, schools, and higher education, to communicate via high quality, full-motion video; high-speed Internet connections; and telephones. Each day across the state, the ICN is being used in a variety of ways by a variety of Iowans. The Iowa Communications Network provides a wide range of services and benefits to its authorized users such as voice, data, video, and Internet.

In addition to the aforementioned communications systems, Iowa has 124 Public Safety Answering Points (PSAP) that are the first line of response to a 911 call. Each county has at least one PSAP and larger communities operate the 25 additional PSAP.

6. Medical and Hospitals

Among those regulated medical and healthcare facilities in Iowa are long-term care facilities, hospitals, hospices, end-stage renal disease units, rural health clinics, and child-placing agencies. 91 of 99 Iowa counties contain at least one community hospital and no Iowan is more than 25 miles from a hospital. The larger urban areas have higher level hospitals that can provide advanced care. According to the Iowa Hospital Association (2008), Iowa has 117 hospitals.



There are numerous other health care facilities across the state as well. These include long-term care facilities, hospices, end-stage renal disease units, rural health clinics, and child-placing agencies. The full inventory of health facilities by county can be found on the Iowa Hospital Association website at http://www.ihaonline.org/memberdir/hospitalsiowa/hospitalsiowa.shtml.

In addition to the community hospitals, eight Federal and/or long-term hospitals are present in Iowa, including three general acute veteran hospitals, four State psychiatric and one alcoholism/other chemical dependency facilities.

The Emergency Medical Service (EMS) system is a continuum encompassing prevention, out-of-hospital, hospital, and rehabilitation phases of care. EMS does not exist in isolation. It is integrated with other services and systems intended to maintain and enhance community health and will remain the public's emergency medical safety net. The EMS system must maintain a high state of readiness in order to fulfill its mission. As a component of the health care delivery system, EMS serves as the safety net for all ages, diseases, and segments of the population. It serves to promote the health status of Iowans through efforts of prevention, acute care, and rehabilitation of the ill and injured.

Iowa has experienced the evolution of emergency medical services since the Advanced Emergency Medical Care act in 1978. New technology and more highly trained EMS providers are becoming state of the art throughout Iowa's EMS system. A reduction of suffering, disability, death, and costs from illness and injury is increasingly possible as EMS systems focus on development through planning, implementation, evaluation, and enhancement to enable more efficient and effective use of resources.

Key facts about the Iowa EMS system:

- Weekday staffing continues to be the most difficult challenge for volunteer ambulance service programs.
- Advancing technology and increasing national standards for training and certification is increasing the standard of patient care.
- Volunteer numbers are decreasing, the population is declining and aging in rural Iowa is on the rise.
- There is an increasing volume of non-emergency and long-distance transfers.
- Volunteerism alone is no longer able to sustain a full-time ambulance service in every community.

7. Economy

7.1 Economy

Iowa is known throughout the world as America's heartland, the source of an abundant supply of top quality agricultural and manufactured goods. The natural wealth of Iowa's soil, our cutting edge technology, world-class educational system and quality workforce has allowed Iowa to yield a diversified economy. While the trend of consolidation has resulted in a diminished farm population, the contribution of agriculture to Gross State Product assures that all Iowans maintain an interest and awareness in that portion of our economy. But it would be a mistake to restrict perception of the state to farm-related goods and services, or to conclude that all Iowans are farmers.

7.2 Labor Force

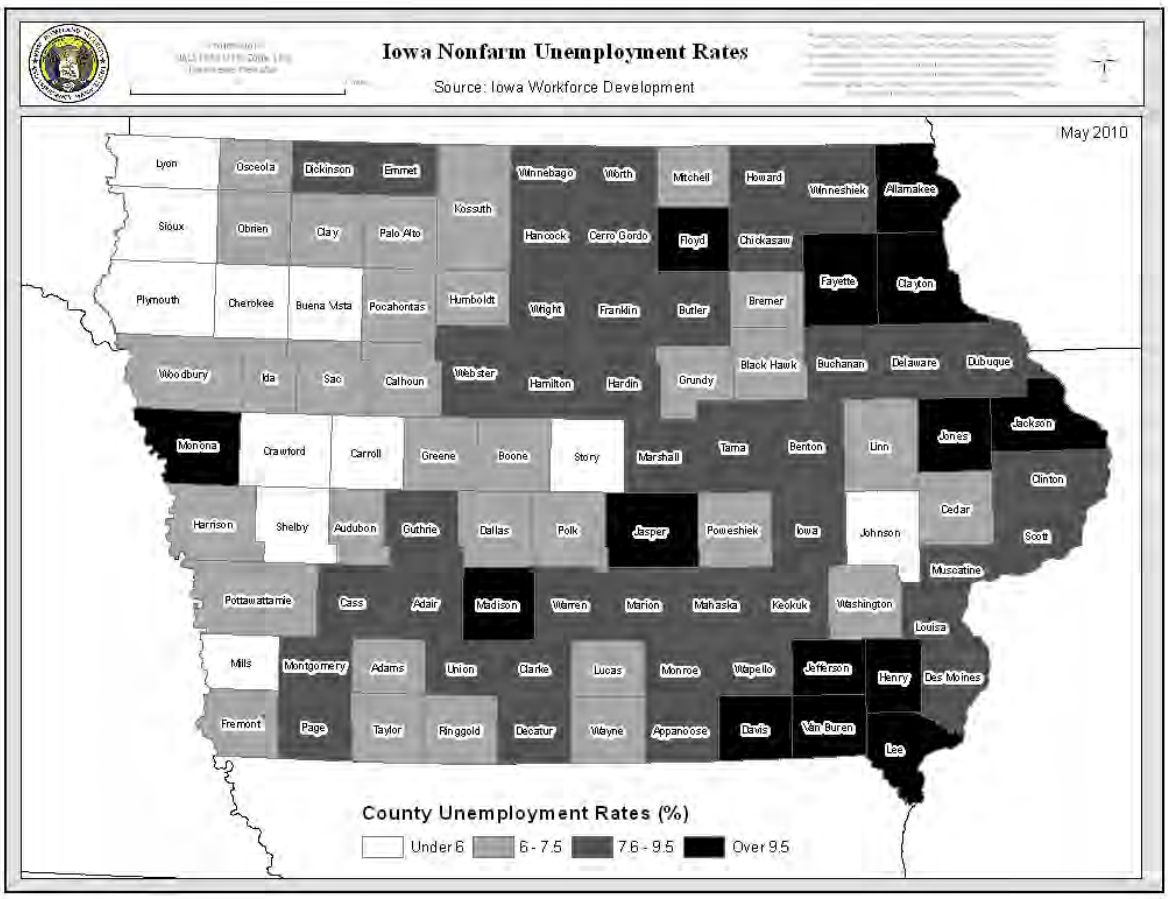
As of March of 2010, Iowa's labor force included 1,570,400 workers with an unemployment rate of 6.7 percent. Farm related employment accounted for 6.7 percent of the labor force with 93.3 percent working in non-farm employment. The Trade and Transportation sector represents the highest employment levels with 19 percent of the non-farm total, followed by Government with 16.1 percent and Education and Health with 13.6 percent.

Iowa Employment Statistics (2010 employment by industry – persons 16 years or older)		
Seasonally Adjusted Labor Force Data		**March 2010**
Labor force		1,570,400
Unemployed		112,500
Rate (%) Unemployed		6.7%
Seasonally Adjusted Non-farm Employment	**Number**	**Percent**
Total Non-farm	1,465,800	93.3%
Mining	2,200	0.1%
Construction	63,500	4.0%
Manufacturing	198,700	12.7%
Trade and Transportation	298,700	19.0%
Information	29,600	1.9%
Finance	100,900	6.4%
Professional and Business Services	117,600	7.5%
Education and Health	213,900	13.6%
Leisure and Hospitality	129,400	8.2%
Other Services	57,800	3.7%
Government	253,500	16.1%
Farm Related Employment	104,600	6.7%

Source: Iowa Workforce Development

In the future, the labor force will see dramatic changes with the retirement of the baby boomers and the influx of immigrants and younger college-educated workers.

The following map shows the distribution of non-farm unemployment rates across Iowa counties. As of February 2007, the highest unemployment rates (over 6 percent) were associated with counties where larger companies downsized or shut down, or where manufacturing continues to represent a smaller portion of employment.



Several counties with the lowest unemployment rates in the state (under 3 percent) are home to the State's larger universities or community colleges, Story and Johnston counties in particular. In addition, the construction of new manufacturing or larger companies has provided employment opportunities to certain areas throughout the state.

7.3 Income

The following table indicates that less than ten percent of Iowa's population derives its personal income directly from agriculture. But indirectly, agriculture-generated dollars have spawned vigorous growth in other sectors. Because our economy is in the early stages of diversification, we are still vulnerable to fluctuations in demand for agricultural products. As new industries mature, a broader consumer base will bring increasing stability.

Manufacturing provides Iowan's with 14 percent of total personal income, followed by the Government Sector at 12 percent and Wholesale/Retail Trade at 9 percent.

Iowa Total Personal Income by Industry (2007)			
Manufacturing	14%	Agriculture	4%
Government	12%	Professional and Tech. Services	3%
Wholesale/Retail Trade	9%	Transportation and Warehousing	3%
Finance/Insurance/Real Estate	7%	Information	2%
Construction	5%		

Between 1990 and 2008, the median income for Iowa households increased from $26,169 to $49,007. This change in median household income represents an average annual change of 3 percent which indicates Iowan's are slightly matching the 2009 national inflation CPI rate of 3.0 percent.

Iowa Household, and Per Capita Income (1989-2008)		
Year	**Median Household**	**Per Capita**
2008	$49,007	$36,680
2007	$47,324	$34,916
2006	$44,560	$32,741
2005	$43,610	$31,575
2004	$42,865	$30,732
2003	$42,278	$28,608
2002	$41,052	$28,128
2001	$41,216	$27,125
2000	$40,443	$26,558
1995	$33,436	$20,929
1990	$26,169 (data source from 1989)	$17,389

Source: U.S. Department of Commerce, Bureau of Economic Analysis

7.4 Productivity

Iowa's agricultural profile is strong and the States strength in the Industrial sector is often overlooked. Approximately 19 percent of the Iowa workforce is employed in manufacturing holding steady within the non-farm job market. Machinery exports represent the highest dollar value of factory exports, followed by Processed Food Products and Chemicals, as shown in the table below.

Value of Factory Exports by Selected Industries in Iowa, March of 2010 (millions of $)			
Total	$10,179	Computers and Electronics	$463
Machinery	$3,488	Electrical Equipment	$454
Processed Foods	$2,242	Fabricated Metals	$380
Chemicals	$1,142	Plastics and Rubber	$273
Transportation Equipment	$846	Miscellaneous	$247
Primary Metals	$644		

Source: Iowa State Center for Industrial Research and Service

Historically, our manufacturing sector has focused on heavy machinery, food processing, electronics and chemicals. Taking advantage of Iowa's fine reputation for agricultural products, our food processors enjoy ready access to raw materials and an excellent workforce. Manufacturers of rubber and plastic products, machinery, electronics and pharmaceuticals all note the Iowa work ethic as a positive factor in their location here.

The value of Iowa's farm exports by commodity highlights the State's agricultural focus. Overall, feed grains and related products represent the largest commodity group in terms of value for Iowa's farm exports. This commodity represents approximately 1.5 billion dollars in annual value. Soybeans and related products exports are valued at nearly 1.3 billion dollars in 2006 and relates to Iowa's ranking as the number one soybean producing state in the country. The state's meat and poultry commodities also have a high value with regard to exports and as with the other leading commodities in Iowa, the rank first or second in national production levels.

Value of Iowa Farm Exports by Commodity (in millions of dollars)

	2000	2001	2002	2003	2004	2005	2006
Dairy products	23.5	25.7	23.1	23.0	29.8	39.5	41.2
Fats, oil, and greases	23.5	17.1	18.0	23.8	34.9	25.6	19.9
Feed grains and products	1,015.4	999.0	1,294.9	1,108.9	1,433.3	1,213.6	1,533.5
Feeds and fodders	103.0	130.0	110.2	109.4	114.7	127.6	146.5
Hides and skins	40.7	56.7	50.3	53.7	56.4	50.7	59.3
Live animals and meat, exc. Poultry	535.3	573.8	604.2	608.4	731.4	935.5	969.6
Other	10.9	13.5	12.7	14.5	17.3	17.4	19.8
Poultry and products	29.0	32.7	33.8	35.1	43.6	58.1	58.1
Seeds	19.8	18.2	28.5	14.4	16.3	16.5	13.7
Soybeans and products	1,119.9	1,131.9	1,328.0	1,155.6	1,434.5	1,519.7	1,327.2
Vegetables and preps.	3.2	3.6	0.5	0.6	0.5	1.2	1.3
Wheat and products	13.1	13.0	20.1	22.4	18.2	25.2	20.4
Total	2,937.2	3,015.1	3,524.2	3,169.8	3,930.8	4,030.5	4,210.5

Agriculture represents approximately 3.6 percent of Iowa's personal income. As of 2008 approximately 92,600 Iowa farms raise 18.8 percent of the U.S. corn crop and 16.5 percent of the U.S. soybean crop. In addition, Iowa produces 29.6 percent of U.S. pork, 6 percent of our grain-fed beef, and 13.6 percent of the egg production. 2008 statistics show that Iowa is number one in the nation in corn, soybeans, live animals and meat, sixth in feeds and fodders, and 18th in poultry and products, making it the overall second ranking state in the nation in value of agricultural exports.

Top Iowa Counties in agricultural sales (2007)		
County	**Percent of State Total Receipts**	**Thousands ($)**
Sioux County	5.5%	$1,121,144
Kossuth County	2.3%	$467,808
Plymouth County	2.3%	$467,302
Lyon County	2.2%	$453,112
Carroll County	2.2%	$442,654
State Total		$20,418,096

Source: United States Department of Agriculture

7.5 Finance

The Iowa work ethic has resulted in a well-deserved reputation for productivity. While we are proud of this characteristic, high productivity is responsible for economic shifts that continue to challenge our versatility. Productivity on the farm generated development of our manufacturing sector.

Productivity in manufacturing, combined with sophisticated technology, has revealed an emerging financial sector. Iowa has seen employment growth in the home offices of its many insurance and financial service companies in an industry that has experienced cutbacks in other states. Analysts consider the people of Iowa particularly suited to strong performance in this sector. Our well-educated workforce, stable social environment, traditional values and conservative ideology provide a solid base from which to evaluate and satisfy service needs in recreation, medicine, communication and business.

8. History

Source: History of Iowa By Dorothy Schwieder, professor of history, Iowa State University

In the summer of 1673, French explorers Louis Joliet and Father Jacques Marquette traveled down the Mississippi River past the land that was to become the state of Iowa. It is believed that the 1673 voyage marked the first time that white people visited the region of Iowa. Before 1673, however, the region had long been home to many Native Americans. Approximately 17 different Indian tribes had resided here at various times including the Ioway, Sauk, Mesquaki, Sioux, Potawatomi, Oto, and Missouri. Today, Iowa is still home to one Indian group, the Mesquaki, who reside on the Mesquaki Settlement in Tama County. The first official white settlement in Iowa began in June 1833, in the Black Hawk Purchase. Most of Iowa's first white settlers came from Ohio, Pennsylvania, New York, Indiana, Kentucky, and Virginia.

8.1 Hardship on the Prairie

Pioneer families faced many hardships in their early years in Iowa. Constructing a farmstead was hard work in itself. But for the pioneers who remained on the land, and most did, the rewards were substantial. These

early settlers soon discovered that prairie land, although requiring some adjustments, was some of the richest land to be found anywhere in the world. Moreover, by the late 1860s, most of the state had been settled and the isolation and loneliness associated with pioneer living had quickly vanished.

8.2 Railroad Fever

As thousands of settlers poured into Iowa in the mid-1800s, all shared a common concern for the development of adequate transportation. The earliest settlers shipped their agricultural goods down the Mississippi River to New Orleans, but by the 1850s, Iowans had caught the nation's railroad fever. In the early 1850s, city officials in the river communities of Dubuque, Clinton, Davenport, and Burlington began to organize local railroad companies. City officials knew that railroads building west from Chicago would soon reach the Mississippi River opposite the four Iowa cities. With the 1850s, railroad planning took place which eventually resulted in the development of the Illinois Central, the Chicago and North Western, reaching Council Bluffs in 1867. Council Bluffs had been designated as the eastern terminus for the Union Pacific, the railroad that would eventually extend across the western half of the nation and along with the Central Pacific, provide the nation's first transcontinental railroad. The completion of five railroads across Iowa brought major economic changes. Of primary importance, Iowans could travel every month of the year. During the latter ninetieth and early twentieth centuries, even small Iowa towns had six passenger trains a day. Steamboats and stagecoaches had previously provided transportation, but both were highly dependent on the weather, and steam boats could not travel at all once the rivers had frozen over. Railroads also provided year-round transportation for Iowa's farmers. With Chicago's pre-eminence as a railroad center, the corn, wheat, beef, and pork raised by Iowa's farmers could be shipped through Chicago, across the nation to eastern seaports, and from there, anywhere in the world.

8.3 Education

As Iowa's population and economy continued to grow, education and religious institutions also began to take shape. Americans had long considered education important and Iowans did not deviate from that belief. Early in any neighborhood, residents began to organize schools. The first step was to set up township elementary schools, aided financially by the sale or lease of section 16 in each of the state's many townships. The first high school was established in the 1850s, but in general, high schools did not become widespread until after 1900.

In the mid-1800s, state officials organized three state institutions of higher learning, each with a different mission. The University of Iowa, established in 1855, was to provide classical and professional education for Iowa's young people; Iowa State College of Science and Technology (now Iowa State University), established in 1858; was to offer agricultural and technical

training. Iowa State Teachers' College (now University of Northern Iowa), founded in 1876 was to train teachers for the state's public schools.

8.4 Civil War

By 1860, Iowa had achieved statehood (December 28, 1846), and the state continued to attract many settlers, both native and foreign-born. Only the extreme northwestern part of the state remained a frontier area. But after almost 30 years of peaceful development, Iowans found their lives greatly altered with the outbreak of the Civil War in 1861. While Iowans had no battles fought on their soil, the state paid dearly through the contributions of its fighting men. Iowa males responded enthusiastically to the call for Union volunteers and more than 75,000 Iowa men served with distinction in campaigns fought in the East and in the South. Iowa women also served their nation during the war. Hundreds of women knitted sweaters, sewed uniforms, rolled bandages, and collected money for military supplies.

8.5 Political Arena

The Civil War era brought considerable change to Iowa and perhaps one of the most visible changes came in the political arena. During the 1840's, most Iowans voted Democratic although the state also contained some Whigs. Iowa's first two United States Senators were Democrats as were most state officials. During the 1850s, however, the state's Democratic Party developed serious internal problems as well as being unsuccessful in getting the national Democratic Party to respond to their needs. Iowans soon turned to the newly emerging Republican Party

8.6 Iowa: The Home of Immigrants

Following the Civil War, Iowa's population continued to grow dramatically, from 674,913 people in 1860 to 1,194,020 in 1870. Moreover, the ethnic composition of Iowa's population also changed substantially. Before the Civil War, Iowa had attracted some foreign-born settlers, but the number remained small. After the Civil War, the number of immigrants increased. In 1869, the state encouraged immigration by printing a 96-page booklet entitled Iowa: The Home of Immigrants. The publication gave physical, social, educational, and political descriptions of Iowa. The legislature instructed that the booklet be published in English, German, Dutch, Swedish, and Danish. Most immigrants from these countries came in family units. Germans constituted the largest group, settling in every county within the state. The great majority became farmers, but many also became craftsmen and shopkeepers. Moreover, many German-Americans edited newspapers, taught school, and headed banking establishments. In Iowa, Germans exhibited the greatest diversity in occupations, religion, and geographical settlement. Iowa also attracted many other people from Europe, including Swedes, Norwegians, Danes, Hollanders, and many emigrants from the British Isles. After 1900, people also emigrated from southern and eastern Europe.

8.7 Coal Mining

The majority of blacks who migrated to Iowa during the late nineteenth and early twentieth centuries worked as coal miners. Before the Civil War, Iowa had only a small black population, but in the 1880s that number increased considerably. Unfortunately, many of the early blacks were hired as strike breakers by Iowa coal operators. In later decades, however, coal companies hired blacks as regular miners.

8.8 The Family Farm

After the Civil War, Iowa's agriculture also underwent considerable change. By the 1870s, farms and small towns blanketed the entire state. Also in that decade, Iowa farmers established definite production patterns, which led to considerable prosperity. Even though farmers changed their agricultural production, farm work continued to be dictated by the seasons. Wintertime meant butchering, fence mending, ice cutting, and wood chopping. In the spring, farmers prepared and planted their fields. Summertime brought sheep shearing, haying, and threshing. In the fall, farmers picked corn, the most difficult farm task of all. During the late 1800s and early 1900s, social activities for farm families were limited. Most families made few trips to town. Some Iowans remember that even in the 1920s, they went to town only on Saturday night. Family members looked to each other for companionship and socializing. Moreover, the country church and the country school were important social centers.

In 1917, the United States entered World War I and farmers as well as all Iowans experienced a wartime economy. For farmers, the change was significant. Since the beginning of the war in 1914, Iowa farmers had experienced economic prosperity. Along with farmers everywhere, they were urged to be patriotic by increasing their production. The 1920s were a time of hardship for Iowa's farm families and for many families, these hardships carried over into the 1930s. As economic difficulties worsened, Iowa farmers sought to find local solutions. Faced with extremely low farm prices, including corn at 10 cents a bushel and pork at three cents a pound, some Iowa farmers joined the Farm Holiday Association. In 1933, native Iowan Henry A. Wallace went to Washington as secretary of agriculture and served as principle architect for the new farm program. Wallace, former editor of the Midwest's leading farm journal, Wallace's Farmer, believed that prosperity would return to the agricultural sector only if agricultural production was curtailed. Further, he believed that farmers would be monetarily compensated for withholding agricultural land from production. These two principles were incorporated into the Agricultural Adjustment Act passed in 1933. Iowa farmers experienced some recovery as a result of the legislation but like all Iowans, they did not experience total recovery until the 1940s.
In the economic sector, Iowa also has undergone considerable change. Beginning with the first farm-related industries developed in the 1870s, Iowa has experienced a gradual increase in the number of business and

manufacturing operations. The period since World War II has witnessed a particular increase in manufacturing operations. While agriculture continues to be the state's dominant industry, Iowans also produce a wide variety of products including refrigerators, washing machines, fountain pens, farm implements, and food products that are shipped around the world.

8.9 Strong Traditions

At the same time, some traditions remain unchanged. Iowans are still widely known for their strong educational systems, both in secondary as well as in higher education. Today, Iowa State University and the University of Iowa continue to be recognized nationally and internationally as outstanding educational institutions. Iowa remains a state composed mostly of farms and small towns, with a limited number of larger cities. Moreover, Iowa is still a place where most people live stable, comfortable lives, where family relationships are strong and where the quality of life is high. In many peoples' minds, Iowa is "middle America." Throughout the years, Iowans have profited from their environment and the result is a progressive people and a bountiful land.