Railroads in Iowa Pt. 1

How did the railroad shape the landscape of Iowa?

Iowa boasts 25 percent of the world’s Grade A farmland. From the hills of northeast Iowa across the flat central prairies to the gently rolling countryside of southern and western Iowa, Native Americans and early pioneers encountered a rich countryside that quickly became a breadbasket of the world.

Rivers were the most important feature for early Iowans. Both Native Americans and early settlers resided in the woodlands along the state’s major waterways, bordered in the east by the Mississippi and in the west the Missouri. River towns along the Mississippi — Dubuque, Clinton, Davenport, Burlington and Keokuk — were the first major settlements in frontier Iowa. Steamboats brought pioneers and goods up the river and connected the state with St. Louis, Missouri, and New Orleans, Louisiana. Across the eastern two-thirds of the state, rivers flow toward the Mississippi. Pioneers used them as early highways and towns sprang up along their banks. As the population moved west, the capital of the state was moved from Iowa City to Des Moines where the Des Moines River and Raccoon Rivers flowed together. In western Iowa, the rivers emptied into the Missouri River. Sioux City and the Council Bluffs-Omaha area became important cities for western Iowans.

Rise of the Railroads

In the 1850s, the first railroads reached the state from the east. Rail transportation was safer, quicker and more reliable than riverboats, and they quickly had a major influence. The federal government gave four railroad companies substantial grants of land to build lines connecting the Mississippi and the Missouri rivers. In consequence, Iowa farm goods flowed into Chicago, not New Orleans, and merchants purchased goods from Chicago warehouses on the return trips. Railroads aggressively encouraged settlement. They printed and distributed brochures in foreign languages extolling the merits of Iowa and giving instruction on how to get there. Railroad companies were also town builders. Towns sprang up where the railroads created depots and refueling stations, often every seven or eight miles along the track. In the 1870s and 1880s, railroad construction was at its peak and soon almost no Iowans lived more than 10 miles from a rail line. The railroads also opened new economic opportunities. Farmers could move their grain to markets much more cheaply. The invention of the refrigerated rail car allowed meatpacking plants to open close to the source of the livestock and to ship fresh meat to eastern cities. Trains also made it easier for people to travel from town to town and out of state.

Investment in Roads

The introduction of the Model-T Ford in 1909 and other car makes brought another major transportation revolution. Farmers could get into town and back home much more quickly. Farm kids could attend town schools and still live at home. While families relied on local stores for most of their purchases, it was easier to take an occasional trip to the larger city to shop in department stores. Trucks allowed farmers to transport their livestock to meatpacking plants where they got the best prices. Responding to the increased travel, the state began to majorly invest in road improvements including creating major highways connecting major cities. Cities began expanding into the suburbs. Workers could commute from their homes in the suburbs to downtown. The federal government in the 1950s began construction of the massive interstate highway system that today carries enormous numbers of cars and trucks. Airports extended the transportation networks to cities around the world.

Agriculture Shapes Iowa’s Landscape

Throughout all of these changes, agriculture remains a central feature of the Iowa scene. When settlers first arrived, the state was 85 percent grassland and 15 percent woodlands. Farmers had to adapt to new farming practices. Today, very few acres of virgin prairie exist and huge expanses of north central Iowa have become fields of either corn or soybeans. Southern and western Iowa, where hills make crop farming more difficult, continue to produce livestock. Northeastern Iowa has a strong dairy industry where the pastures provide hay and winter forage. The land remains one of the most important features of this state, often called “the land between two rivers.”
Supporting Questions

How were the railroads built?

- Geological Picnic in Iowa, April 28, 1984
- Bridge over the Middle Raccoon River in Coon Rapids, Iowa, between 1895 and 1910
- Horse and Buggy Next to Large Boulders, between 1895 and 1910
- Interurban Cut with University of Iowa Buildings, between 1895 and 1910
- Kansan Topography in Coralville, Iowa, between 1895 and 1910
- Limestone Cliff in Durango, Iowa, between 1895 and 1910
- Owl's Head Mountain Capped by Oneota Limestone, between 1895 and 1910
- Railroad Cut Through Maquoketa Shales, between 1895 and 1910
- Crew of the Wabash Railroad Posing on Handcar, 1900
- Crews Laying Planks and Rails for the Wabash Railroad, 1900

Where were the railroad lines located in Iowa?

- Routes of Proposed Railroads in Iowa, 1851
- Railroad Map of Iowa, 1881
- Map of Iowa Issued by the Board of Railroad Commissioners, 1915
- Iowa Transportation Map, 1938

How did the weather impact the early railroad?

- Men Removing Snow from Tracks in Forest City, 1936
- Interview with John Grosvenor, November 1938
- Train Wreck Caused by Track Washout, Waterloo, Iowa, Date Unknown

Case Study: Chicago & North Western Railroad Viaduct (Kate Shelley High Bridge) over Des Moines River between Boone and Ogden

- Illustrated Historical Atlas of Boone, Iowa, 1875
- Chicago & North Western Railway Depot in Boone, early 1880s
- St. Louis Limestone East of Harvey, Iowa, between 1895 and 1910
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*Printable Image and Document Guide*
Geological Picnic in Iowa, April 28, 1894

Description
A group of geologists in 1894 are exploring the Iowa landscape. The individuals are seen having a picnic during their exploration.

Text-Dependent Question
• The geologists in this photo were exploring the land. Looking at the landscape in the photo, do you think this would be a good place to build railroad tracks? Why or why not?

Citation Information
“Geological picnic, Iowa, April 28, 1894,” 29 April 1894. Courtesy of University of Iowa Libraries
Description
The still image is of a bridge over the Middle Raccoon River in Coon Rapids, Iowa, sometime between 1895 and 1910. Coon Rapids is a town in Guthrie and Carroll counties, which is on the west side of the state.

Text-Dependent Question
• Notice the landscape in this photo. Describe what needed to happen in order for the railroad to be built in this area.

Citation Information
“Bridge over Coon Rapids, Middle Raccoon River, Coon Rapids, Iowa, late 1890s or early 1900s,” between 1895 and 1910. Courtesy of University of Iowa Libraries
Description
A horse and buggy is parked next to large boulders in Iowa sometime between 1895 and 1910. Behind the buggy, one can see the open and vast landscape of Iowa as railroad surveyors, architects and engineers explored the possibilities of the prairie land.

Text-Dependent Question
• The railroad surveyors, architects and engineers had to consider many different landforms in Iowa. What would be involved with planning and laying a railroad line in this area?

Citation Information
“Horse and buggy next to large boulders, Iowa, late 1890s or early 1900s,” between 1895 and 1910. Courtesy of University of Iowa University Libraries
Interurban Cut with University of Iowa Buildings, between 1895 and 1910

Description
Featured is an interurban cut in Johnson County, Iowa, with University of Iowa buildings visible on the other side of the river. The photo was taken in Iowa City sometime between 1895 and 1910. An interurban is a type of electric railway and was prominently used in the United States between 1900 and 1925.

Text-Dependent Question
• Why do you think surveyors, architects and engineers decided to cut through the land rather than going around the landform?

Citation Information
“Interurban cut with University of Iowa buildings visible on the other side of the river, Iowa City, Iowa, late 1890s or early 1900s,” between 1895 and 1910. Courtesy of University of Iowa Libraries
Kansan Topography in Coralville, Iowa, between 1895 and 1910

Description
The photo features Kansan topography from the late 1890s or early 1900s. The image shows mature topography developed by erosional loess overlying Kansan drift in Coralville, Iowa.

Text-Dependent Question
• The railroad surveyors, architects and engineers had to consider many different landforms in Iowa. What would be involved with planning and laying a railroad line in this area?

Citation Information
Calvin, Samuel, “Kansan topography, showing mature topography developed by erosional loess overlying Kansan drift; Coralville, Iowa, late 1890s or early 1900s,” between 1895 and 1910. Courtesy of University of Iowa Libraries
Limestone Cliff in Durango, Iowa, between 1895 and 1910

Description
The Galena Limestone cliff next to the railroad was photographed between 1985 and 1910 in Durango, Iowa. Durango is located in Dubuque County on the eastern border of the state near the Mississippi River.

Text-Dependent Question
• Notice the geography in this area. What would have been challenging for people to plan and build a railroad line in this particular area?

Citation Information
Calvin, Samuel, “Limestone cliff, Durango, Iowa, late 1890s or 1900s,” between 1895 and 1910.
Courtesy of University of Iowa Libraries
Owl’s Head Mountain Capped by Oneota Limestone, between 1895 and 1910

Description
Owl's Head Mountain, located in Allamakee County, is capped by Oneota Limestone and reaches over 300 ft. high. The photo shows the mountain sometime between 1895 and 1910. Allamakee County is on the very northeastern tip of the state and has a total area of 659 square miles.

Text-Dependent Question
• This photo shows Owl's Head Mountain. Would you place a railroad line in this area? Why or why not?

Citation Information
Calvin, Samuel, “Owl's Head Mountain capped by Oneota Limestone (a hill of circumdenudation over 300 feet high), Iowa, late 1900s or early 1900s,” between 1895 and 1910. Courtesy of University of Iowa Libraries
Railroad Cut Through Maquoketa Shales, between 1895 and 1910

Description
This railroad cut through Maquoketa Shales - which is soft and fine sedimentary rock that forms from mud or clay and can be split easily into fragile slabs. The photo was taken by Samuel Calvin in Graf, Iowa, sometime between 1895 and 1910.

Text-Dependent Questions
• What do you notice about the hillside and the railroad tracks in this photo?
• How might the land around railroad tracks impact the trains?

Citation Information
Calvin, Samuel, “Railroad cut through Maquoketa Shales, Graf, Iowa, late 1890s or early 1900s,” between 1895 and 1910. Courtesy of University of Iowa Libraries
Description
A crew of the Wabash Railroad is posing on a handcar in 1900 near Albia or Des Moines, Iowa. The photo originally belonged to Charlie Goens, who was a section foreman for the Wabash Railroad in Albia, Iowa and Ohio.

Text-Dependent Questions
- Notice the tools that this work crew is taking with them. What kind of work might they be doing?
- What do you observe about the people in this photo (age, gender, ethnicity, etc.)? What does this tell you about the people who built the railroads?
Crews Laying Planks and Rails for the Wabash Railroad, 1900

Description
Crews of the Wabash Railroad are laying planks and rails near either Albia, Iowa, or possibly Ohio. The photo belonged to Charlie Goens, who served as foreman for the railroad - which worked primarily in Ohio, Indiana, Illinois, Iowa, Michigan, Missouri and the province of Ontario in Canada.

Text-Dependent Questions
- Notice the number of people in this photo. Why do you think so many people were needed?
- Describe the work that you see happening. How does this photo show teamwork?
- What can we conclude about the process of building the railroad in the 1800s?
Description
The 1851 map highlights the proposed routes for railroads in Iowa that was published by the Cook & Sargent Agency & Exchange Office.

Text-Dependent Questions
- What parts of the state of Iowa did the railroads have plans for in 1851? Why would they have planned these areas?
- Based on this map, what were the railroads trying to connect?

Citation Information
“Iowa: showing routes of proposed rail roads & c, 1851,” Cook & Sargent Land Agency & Exchange Office, 1851. Courtesy of University of Iowa Libraries
Railroad Map of Iowa, 1881

Description
The map shows the many railroads running through the state of Iowa in 1881 and was published at the time by the Western Litho Company. The map was actually created by the Iowa Board of Railroad Commissioners, which served as an independent regulatory railroad agency.

Text-Dependent Question
• How did the railroad change between the plan created in 1851 and the actual lines as mapped here in 1881?

Citation Information
“Railroad map of Iowa, 1881,” Iowa Board of Railroad Commissioners, Western Litho Co., 1881.
Courtesy of University of Iowa Libraries
Description
The transportation map features more than 26 railroads in Iowa in 1915. The map, which was published by Rand McNally and Company, includes the railroad lines of companies such as the Wabash Railroad, the Union Pacific Railroad Company and the Atlantic Northern Railroad.

Text-Dependent Question
• How did the railroad change between 1881 and 1915? Use this 1881 map to make the comparison?

Citation Information
“Map of Iowa, issued by the Board of Railroad Commissioners, 1915,” Rand McNally and Company, Iowa Board of Railroad Commissioners, 1915. Courtesy of University of Iowa Libraries
Iowa Transportation Map, 1938

Description
This map of Iowa features railroads in the state as of 1938. Published by the U.S. Bureau of Public Roads, the map can be seen to show some significant changes made later in the 20th century to the railroads. The map also shows highways, railroads canals, air lanes and dredged channels.

Text-Dependent Question
• How did railroads change between 1915 and 1938? Use this 1915 railroad map of Iowa for the comparison.

Citation Information
“Iowa transportation map: Highways, railroads canals, air lanes, and dredged channels,” United States Bureau of Public Roads, 1938. Courtesy of University of Iowa Libraries
Men Removing Snow from Tracks in Forest City, Iowa, 1936

Description
The St. Louis Railway, located near Leland, Iowa, had its tracks covered with snow after a major storm in February 1936. Coal train service had to stop for three days as crews attempted to remove the snow. Two of the photos show a locomotive that has been completely engulfed by massive snowbanks.

Text-Dependent Question
• How would the train not being able to get through affect local residents?
Interview with John Grosvenor, November 1938

Description
The transcribed interview is with John Grosvenor, a railroad worker and homesteader, who talks about how he came to work for the railroad. Grosvenor recounts what happens to a railroad track with heavy rain. This interview was conducted as part of the U.S. Work Projects Administration's Federal Writers' Project, which ran from 1936 to 1939.

Full Transcript Grosvenor Interview

Transcribed Excerpts from Grosvenor Interview

Text-Dependent Questions
• Excerpt 1: Why did John Grosvenor work at the railroad for only six months of the year?
• Excerpt 2: According to Grosvenor, what impact did a heavy rain have on the railroad track?

Citation Information
Train Wreck Caused by Track Washout, Waterloo, Iowa, Date Unknown

Description
The train wreck shown was caused by the washout of tracks near Waterloo, Iowa. The rail line is likely running to towns to the east of the state, such as to Burlington and Cedar Rapids. The photographer and date of the photograph are unknown.

Text-Dependent Question
- Washouts happen often as a result of heavy rain. What impact would an accident like this have on the people in the train at the time? On clearing the wreckage? On the future use of the track by other trains? On businesses relying on this train route?
Illustrated Historical Atlas of Boone, Iowa, 1875

Description
The map of Boone County is from the illustrated historical atlas for the state of Iowa from 1875. The atlas shows details of townships, rivers, towns and railroad lines.

Text-Dependent Question
- Describe the railroad route between Boone and Ogden in 1875.

Citation Information
Andreas, Alfred T., “Illustrated historical atlas of the state of Iowa,” 1875. Courtesy of University of Iowa Libraries
Chicago & North Western Railway Depot in Boone, early 1800s

Description
The two-story building is the Chicago & North Western Railroad depot in Boone, Iowa. The photograph was taken in the early 1880s and the depot also included a hotel. The railroad tracks can be seen running in front of the building. The depot and hotel, also known as the Lincoln House, were later destroyed by a fire.

Text-Dependent Questions
• Why would it be beneficial to have a hotel and depot located in the same building?
• Why would this structure be susceptible to fire?

Citation Information
Description
The man in the photo is standing next to limestone that is being quarried from a hillside sometime between 1895 and 1910. The image was taken near Harvey, Iowa, in Marion County near the center of the state.

Text-Dependent Question
- Where and how would limestone like this have been used in the Kate Shelley Memorial Bridge?

Citation Information
“St. Louis Limestone east of Harvey, Iowa, late 1890s or early 1900s,” between 1895 and 1910. 
Courtesy of University of Iowa Libraries
Building of the Boone Viaduct (Kate Shelley High Bridge), December 8, 1900

Description
Also known as the Kate Shelley High Bridge, the Boone Viaduct was completed in 1901 and was one of the highest and longest double-track railroad bridges in the United States. It is located approximately three miles west of Boone, Iowa. According to the Historic American Engineering Record, this viaduct is about 3,000 feet long, 185 feet above the Des Moines River, made of 6,196 tons of steel and has a double track. At that time, there were only three other viaducts similar to this one in the world: Pennsylvania, Texas and Bolivia, and all were smaller than this one. The bridge was designed by George S. Morison for the Chicago & North Western Railway and took about two years to construct.

Text-Dependent Questions
- Where was limestone used?
- How were machines used to assemble the pieces of the viaduct?

Citation Information
Courtesy of James H. Andrew Railroad Museum & History Center, December 8, 1900.
President William McKinley’s Special Crossing, May 28, 1901

Description
On May 28, 1901, President William McKinley’s train made a trip over the Boone Viaduct (Kate Shelley High Bridge) for a special crossing that was immortalized in this photo. McKinley was the 25th president of the United States. He was assassinated in September 1901 when he was shot by an anarchist in New York.

Text-Dependent Question
- Why would the president of the United States make a special point to visit the Kate Shelley Memorial Bridge?

Citation Information
Courtesy of James H. Andrew Railroad Museum & History Center, 28 May 1901.
Republican Atlas of Boone County, Iowa, 1902

Description
The map is entitled the “Republican Atlas of Boone County, Iowa, 1902,” and is showing details of townships, rivers, towns and railroad lines. The atlas was drawn from county records and actual surveys by Hovey & Frame.

Text-Dependent Question
- How did the railroad route between Boone and Ogden change between 1875 and 1902? Use this 1875 map for comparison?

Citation Information
Chicago & North Western Railway Viaduct (Kate Shelley High Bridge) at Boone Data Papers, August 1995

Description
The papers are from the Historical American Engineering Record in a report about the construction of the Chicago & North Western Railroad viaduct (Kate Shelley High Bridge) near Boone, Iowa. The viaduct, a long bridge-like structure, is one of the last projects of noted bridge engineer George Morison, who died two years after the structure was built. The bridge was the longest and heaviest viaduct of its time and may be the longest extant double-track railroad viaduct in the world. It is listed in the National Register of Historic Places. This document was prepared as part of the Iowa Historic Bridges Recording Project performed during the summer of 1995.

Full Transcript of Boone Data Papers

Transcribed Excerpts from the Boone Data Papers

Text-Dependent Questions
• According to the text, what was the purpose of the viaduct? What problem would the viaduct solve?
• Who was Kate Shelley and why was the bridge named after her?

Citation Information
Elevation of Truss, from North, with Train, Date Unknown

Description
The image shows a view of the Chicago & North Western railroad viaduct (Kate Shelley High Bridge) over the Des Moines River from the north. According to the Historic American Engineering Record, this viaduct is about 3,000 feet long, 185 feet above the Des Moines River, made of 6,196 tons of steel and has a double track. At that time, there were only three other viaducts similar to this one in the world: Pennsylvania, Texas and Bolivia, and all were smaller than this one. The Historic American Engineering Record also said that railroad tracks needed to be very solid because any sagging could cause train derailment, but the river valley was unstable because it was sand, shale, mud and silt. The solution was to dig down eight pneumatic caissons, each 10 feet in diameter, so these additions would be deep enough to reach stable sandstone bedrock, anywhere from 42 to 62 feet below. These caissons supported the piers closest to the river, four on each side. The remaining piers were supported by shallower foundations because they supported less weight.

Text-Dependent Questions
- The middle of the bridge, the part spanning the river, looks different than the two sides that do not span the river. Why would bridge engineer George Morison design the viaduct so that no posts or supports were in the water?
- What is the benefit of having a double track across the viaduct instead of a single track?

Citation Information
Replacement Depot in Boone, Date Unknown

Description
The building shown replaced the original depot and hotel that was destroyed by fire. The depot belonged to the Chicago and North Western Railway Company in Boone, Iowa.

Text-Dependent Questions
- Why is this depot less likely to be destroyed by fire?
- What other business(es) are located in this building besides the railroad depot?
- Based on other items in the photo, how do we know that this photo was taken after the photo of the depot in the early 1880s?

Citation Information
Courtesy of James H. Andrew Railroad Museum & History Center
Description
The photograph from the Historic American Engineering Record shows a close-up view of one of the piers of the Chicago & North Western Railway viaduct (Kate Shelley High Bridge) over the Des Moines River. The image focuses specifically on the limestone pier base on the southwest side of the viaduct, which is located in Boone County, Iowa.

Text-Dependent Questions
- How does this photo help you understand how the viaduct works and how it might have been constructed?
- Predict how the construction of this viaduct would have impacted the economy, especially creating jobs and future trade opportunities.

Citation Information
Courtesy of Library of Congress
View from Northwest Boone Viaduct (Kate Shelley High Bridge), Date Unknown

Description
This view shows the Chicago & North West Railway viaduct (Kate Shelley High Bridge) over the Des Moines River from the northwest. According to the Historic American Engineering Record, this viaduct is about 3,000 feet long, 185 feet above the Des Moines River, made of 6,196 tons of steel and has a double track. At that time, there were only three other viaducts similar to this one in the world: Pennsylvania, Texas, and Bolivia, and all were smaller than this one. According to the Historic American Engineering Record, railroad tracks need to be very solid because any sagging can cause train derailment, but the river valley was unstable because it was sand, shale, mud, and silt. The solution was to dig down 8 pneumatic caissons, each 10 feet in diameter, deep enough to reach stable sandstone bedrock, anywhere from 42 to 62 feet deep. These caissons supported the piers closest to the river, four on each side. The remaining piers were supported by shallower foundations because they supported less weight.

Text-Dependent Question
• How does this view of the viaduct help you understand how the viaduct works and how it might have been constructed?

Citation Information