



This resource, developed by the Union Pacific Railroad Museum, is a comprehensive guide for telling the story of the first American transcontinental railroad. In addition to bringing to life this important achievement in American history, this kit allows students to examine firsthand historical photographs from the Union Pacific collection. This rare collection provides a glimpse into the world of the 1860s and the construction of the nation's first transcontinental railroad.

Today, nearly everything American families and businesses depend on is still carried on trains – raw materials such as lumber and steel to construct homes and buildings; chemicals to fight fires and improve gas mileage; coal that generates more than half of our country's electricity needs; produce and grain for America's food supply; and even finished goods such as automobiles and TVs. After 150 years, UP now serves a global economy and more than 7,300 communities across 23 states.

### National Standards for History

- **Grades 3-4** 5A.1 & 8.B. 4 & 6  
[www.nchs.ucla.edu/history-standards/standards-for-grades-k-4/standards-for-grades-k-4](http://www.nchs.ucla.edu/history-standards/standards-for-grades-k-4/standards-for-grades-k-4)  
National Center for History in Schools
- **Grades 5-12** Era 4 Expansion and Reform (1801-1861). 4A.2.1-3, 4E.1 & 4  
[www.nchs.ucla.edu/history-standards/us-history-content-standards](http://www.nchs.ucla.edu/history-standards/us-history-content-standards)  
National Center for History in Schools

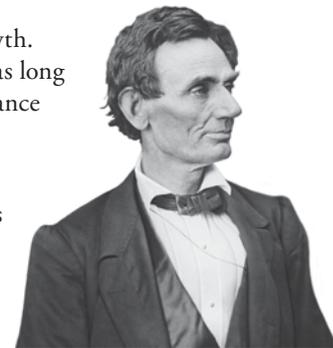
### Additional Resources

- **Bain, David Haward.** *Empire Express: Building the First Transcontinental Railroad.* New York: Penguin, 2000. Print.
- **The Union Pacific Railroad Museum's official website.** [www.uprrmuseum.org](http://www.uprrmuseum.org)
- **Union Pacific's official website.** [www.up.com](http://www.up.com)
- **The Golden Spike National Historic Monument.** [www.nps.gov/gosp](http://www.nps.gov/gosp)
- **U.S. National Archives,** for a printer-friendly version of the 1862 Pacific Railway Act. [www.ourdocuments.gov](http://www.ourdocuments.gov)
- **Railroad map collection.** [www.loc.gov/collections/railroad-maps-1828-to-1900/about-this-collection/](http://www.loc.gov/collections/railroad-maps-1828-to-1900/about-this-collection/)
- **Central Pacific Railroad Museum.** [www.cpr.org](http://www.cpr.org)

## BUILDING AMERICA

The transcontinental railroad's May 10, 1869, completion has had an enduring impact on the U.S.'s growth. Traveling from the East to the Pacific Coast, previously a dangerous trip with many hardships that took as long as six months, was reduced to just seven days. Water stops marked the route every 25-30 miles – the distance a steam locomotive could travel before needing to refill. And each station held the opportunity for a new community to grow, immigrant families to settle and commerce to flourish.

Today, nearly everything American families and businesses depend on is carried on trains – raw materials such as lumber and steel to construct homes and buildings; chemicals to fight fires and improve gas mileage; coal that generates more than half of our country's electricity needs; produce and grain for America's food supply; and even finished goods such as automobiles and TVs. After 150 years, Union Pacific now serves a global economy and more than 7,300 communities across 23 states.



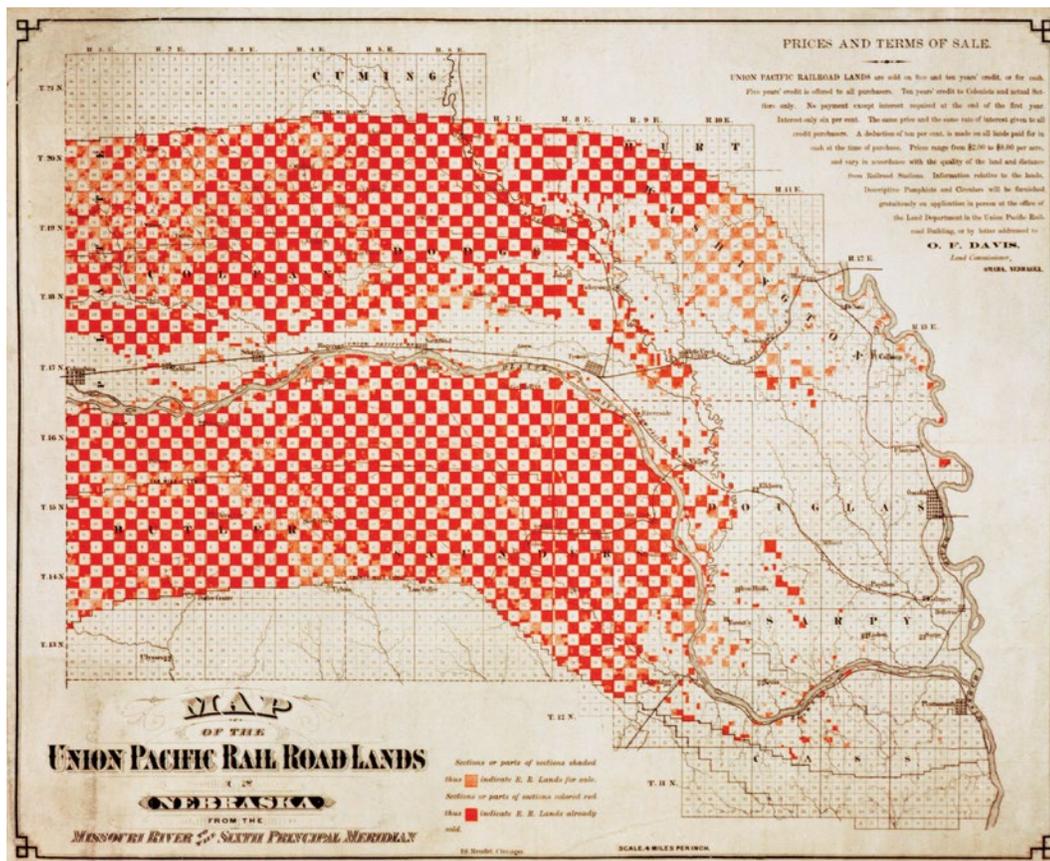
## THE STORY

### Opening the West, Land of Opportunity

Discovery of gold in California created a market for transcontinental traffic and significantly changed the American public's attitude toward the West, making it a desirable opportunity. People began traveling and settling beyond the Mississippi River, in territories stretching to the Pacific Coast.

In 1853, Congress passed an act providing for the survey of possible railroad lines from the Mississippi River to the Pacific Ocean. At least five routes were explored, but an increasing rift between the Northern and Southern states rendered agreement on a route impossible.

In 1859, Abraham Lincoln traveled to Council Bluffs, Iowa, and was introduced to Grenville Dodge, a young railroad engineer completing surveys west of the Missouri River for the M&M Railroad (Rock Island Railroad). As they talked, Lincoln became more and more convinced the route proposed by Dodge, beginning in Council Bluffs and following the Platte River Valley through Nebraska, was the best path west for the transcontinental railroad.



As part of the Pacific Railway Acts of 1862 and 1864, both the Union Pacific and Central Pacific were given alternating sections of land to sell along the transcontinental route to fund part of the construction. The white squares are government land reserved for homesteaders under the Homestead Act (1862). Colored squares designate land that Union Pacific owned or sold.

## Pacific Railway Act Signed, Construction Begins

In 1860, Abraham Lincoln became the 16th president of the United States. Almost immediately, his election caused the long-standing rift between the North and the South to intensify. Very shortly after, the Southern states followed South Carolina into secession. The American Civil War had begun. With the Southern states no longer participating in the discussion, the disagreement over the transcontinental railroad routes ended. Both the Senate and House of Representatives were able to pass the Pacific Railway Act of 1862. President Lincoln signed the act into law July 1, 1862, creating the Union Pacific Railroad Company. Under his direction, construction of the nation's first transcontinental railroad began with UP building west and the already established Central Pacific Railroad building east.

Charters awarded to the railroads gave them territory to build on, the use of available stone and timber, and alternating 10-square miles of land on both sides of the track to sell for construction funds. This land grant was increased by the 1864 Pacific Railway Act to 20-square miles of land. The act also awarded both railroads money for each mile of track completed; however, these funds were loans to be repaid, not grants.

## Recruiting Laborers in the Race to Construct the Railroad

CP broke ground in Sacramento, California, in January 1863. UP began construction at the Missouri River in Omaha, Nebraska, in December 1863. Competition swelled between the railroads' construction crews as they raced to finish first.

In 1865, CP faced a severe labor shortage. Many men hired to build the railroad worked only as far as the gold mines and then went their own way. Continuously looking to grow its forces, CP hired Chinese workers against the wishes of many crews and supervisors. When the first group proved to be efficient and hardworking, they reversed their opinions. In fact, the Chinese crews largely were responsible for CP forging through the Sierra Nevadas.

Nearly two years after breaking ground, UP track crews had only reached Omaha's outskirts. Not until the end of the Civil War in 1865 were there finally enough laborers to make significant progress. UP's workforce, largely made up of Irish Americans, was supplemented by organized and disciplined veterans from the Civil War, including railroad engineer Grenville Dodge, now a military general, who joined the effort in 1866.

As the two companies approached Utah's Great Salt Lake during the spring of 1869, there was no consensus as to exactly where the railroads should meet. On April 8, 1869, UP's Grenville Dodge and CP's Collis P. Huntington convened in Washington D.C. and agreed the meeting point would be at Promontory Summit, Utah.

## Union Pacific and Central Pacific Meet, Uniting the Nation

At noon on May 10, 1869, the "golden spike" ceremony began with approximately 600 people in attendance. Positioned nose to nose at the end of the last rail were CP's Jupiter locomotive and UP's No. 119. A bottle of champagne was broken over the ceremonial laurel tie, while a telegraph went out across the nation with the simple message: "Done." The transcontinental railroad was complete.

At that instant, in Promontory Summit, Utah, coast-to-coast travel time was reduced from four to six months to only seven days, instrumentally impacting the U.S.'s growth and development. The seven years of physically demanding and dangerous work, to which many laborers lost their lives, united the nation. UP built 1,086 miles of railroad lines from Omaha, Nebraska, over the Rocky Mountains, and CP built 690 miles from Sacramento, California, prevailing through the rugged Sierra Nevadas.

The transcontinental railroad was started in the midst of a war dividing America, but its completion marked a connection between the East and West coasts that defined the U.S. as a single nation.

Blank No. 1. 0177  
**THE WESTERN UNION TELEGRAPH COMPANY.**  
The rules of this Company require that all messages received in this station, shall be written on the message blank of the Company, under and subject to the conditions printed thereon, which conditions have been agreed to by the sender of the following message.  
THOS. T. ECKERT, Gen'l Supt., New York. WILLIAM ORTON, Pres't. New York.  
O. H. PALMER, Sec'y.  
117  
Dated Promontory Utah via Omaha 1869  
Received at May 9  
To Oliver Ames  
Pres't.  
You can make affidavit  
of completion of road to  
Promontory Summit.  
G. M. Dodge  
Chief Eng'r  
11.400 Cou  
Rec'd May 10

Telegram from General Grenville Dodge to Union Pacific President Oliver Ames. Date: May 9, 1869. Union Pacific and Central Pacific reached Promontory Summit on May 9, 1869. General Dodge, chief engineer for Union Pacific, notified his boss, President Oliver Ames via telegraph that the crews were finished. Not coincidentally, The Pacific Railway Act required telegraph wires to be built alongside the transcontinental railroad's track, allowing the historic announcement to be sent from Promontory, Utah, to New York City.

Avoid the Sickness, Dangers and Delays of the Panama Route! Secure Speed, Comfort and Safety by taking the Union and Central Pacific Line, which runs the Miller Platform and the Westinghouse Patent Air Brake, which gives the Engineer instant control of the Train and is the most perfect protection against accident ever invented.



Map of the completed transcontinental route showing the land grants for both railroads. Date: circa 1870



### Photography Key to Railroad

The transcontinental railroad's construction required financial backers, and the finished railroad would need customers. Both UP and CP leaders realized photography could be a vital tool to entice settlers and investors. Scenes from the Great West soon became a favorite fixture in most 19th century parlors. The most popular form of parlor photography were stereocards printed with dual images creating a single 3D image when viewed through a special viewer.

In 1864, CP hired Alfred A. Hart to photograph the building of its railroad over the imposing Sierra Nevadas in California and beyond. UP Vice President Thomas Durant commissioned Andrew J. Russell to photograph UP's 1868 crossing of the Continental Divide. Hart and Russell produced an unprecedented pictorial record of one of the world's most extraordinary construction projects, a work that brought sweeping social change at a pace never before seen in history.

## CENTRAL PACIFIC



*[Original format is a stereocard] Plate number 231 by Alfred A. Hart in California circa June 1865. A train, with men standing on the cars, moves through Bloomer Cut near Auburn, California. The cut is 800 feet long and 63 feet high. Part of the “Scenes in the Sierra Nevada Mountains” stereocard album collection.*

### Bloomer Cut

A grading crew of 30 to 40 men began work on California’s Bloomer Cut in February 1864, using primitive hand tools and blasting powder to remove 40,000 cubic yards of cemented gravel. In July 1864, an accidental black powder explosion severely injured three men; James Strobridge, Central Pacific construction superintendent, lost his right eye in the accident. When finished, Bloomer Cut – named because it was on Bloomer Ranch – was 800 feet long and 65 feet deep at its deepest point. The cut provided a rail link between New Castle and Auburn, and at the time it was considered the most difficult work attempted by CP. It’s virtually unchanged today from the initial construction completed in April 1865.



*[Original format is a stereocard] Plate number 325 by Alfred A. Hart in Nevada circa November 1868. James H. Strobridge, superintendent of construction, family boxcar. Part of the “Scenes on the Humboldt River” stereocard album collection.*

### The Strobridge Family Boxcar

James “Stro” Strobridge was Central Pacific’s burly Irish construction boss and the only man, CP or UP, enjoying the comforts of home during construction. His wife Hannah, second from left, and six children lived in a converted three-bedroom boxcar pulled behind its own locomotive. Mrs. Strobridge, called by some “the heroine of CP,” was the only spouse to travel the line’s entire length. Despite his family’s presence and the charming boxcar outfitted with its own porch, hanging plants and even a canary, Stro’s foul mouth and fierce temper were unmitigated, and he still worked 12 to 14 hour days.



[Original format is a stereocard] Plate number 90 by Alfred A. Hart in Placer County, California, circa December 1866. Horses and carts travel across the surface of the fill at Sailor's Spur. Part of the "Scenes in the Sierra Nevada Mountains" stereocard album collection.

## Chinese Laborers Thrive

When Central Pacific began construction during the Civil War, labor was scarce. Tens of thousands of young Chinese men came to California for gold, and CP General Superintendent J. Crocker suggested the railroad hire them. CP Superintendent Strobidge didn't believe the small Chinese workers could handle the hard labor but agreed to hire 50 men for one month as a trial. The experiment was an enormous success, and by 1865 several thousand Chinese worked on CP and later set a world record, laying 10 miles of track in a single day April 28, 1869.

Though Chinese crews were paid less than Irish crews and not provided room or board, their overall health was much better – attributed mostly to their diet. Irish crews, provided room and board, ate mostly beans, beef and potatoes or bread, while the Chinese hired cooks who procured vegetables and raised pigs and chickens in the camp. Additionally, the Chinese drank tea made with boiled water instead of drinking from possibly contaminated streams and rivers – making them less susceptible to water-borne illnesses like dysentery.



[Originally a stereocard] Plate number 119 by Alfred A. Hart in California circa April 1868. Laborers use tools to chip at the rocks near the opening of the Summit Tunnel. Part of the "Scenes in the Sierra Nevada Mountains" stereocard album collection.

## The Summit Tunnel

Five times more powerful than black powder, nitroglycerin – made on-site by Central Pacific chemist James Howden – was used on the Summit Tunnel but proved too dangerous to use elsewhere on CP.

Work progressed with relatively few accidents and at twice the speed achieved with black powder. CP constructed 15 tunnels through the Sierra Nevada – five on the west slope, one at the summit and nine on the east slope. The Summit Tunnel was the longest, at 1,659 feet through solid granite. Crews worked on both ends, digging toward each other. Since the Summit Tunnel was at the top of the mountain, crews dug an 8-foot by 12-foot shaft from the top to the middle of the tunnel and began digging out toward the ends. This permitted work on four tunnel faces at once. They even stripped a locomotive to its engine and boiler and carted it to the top to haul rock from the tunnel faster. The tunnel was completed in 16 months – considerably less than the three years projected.

Black powder also was used in enormous quantities by CP as it blasted a route through the Sierra Nevada. In a week, CP burned more powder than was ignited at the 1862 Battle of Antietam during the Civil War.



### Donner Summit

During construction, Central Pacific photographer A. Hart captured a photo of a man seated next to a grove of tree stumps cut 8-10 feet above the ground. Photographed in the summer, the stumps were cut in the 1846 winter when the infamous Donner Party struggled for survival on the same pass in the Sierra Nevada. The trees were cut at the snow line which, for them at the time, was 8-10 feet off the ground.

*[Originally a stereocard] Plate number 133 by Alfred A. Hart in California circa 1868. A man sits on a log, surrounded by stumps cut by the Donner Party in 1846. Part of the "Scenes in the Sierra Nevada Mountains" stereocard album collection.*



### Shoshone and Paiute Support

Central Pacific was offered military support and protection from hostile Native American tribes concerned for the incursion into their lands, but CP turned down the support. Instead, the Shoshone and Paiute peoples encountered by CP were offered jobs and free tickets on any CP train. The Shoshone and Paiute worked alongside the Chinese crews.

*[Originally a stereocard] Plate number 323 by Alfred A. Hart in Nevada circa November 1868. Members of the Shoshone nation examine a locomotive in the Humboldt Desert. Part of the "Scenes on the Humboldt River" stereocard album collection.*



Andrew J. Russell imperial print, "Snow Sheds, C.P.R.R. and Donner Lake," plate 229, showing the massive wooden snow sheds constructed by the Central Pacific to combat the heavy annual snowfall in the Sierra Nevada.

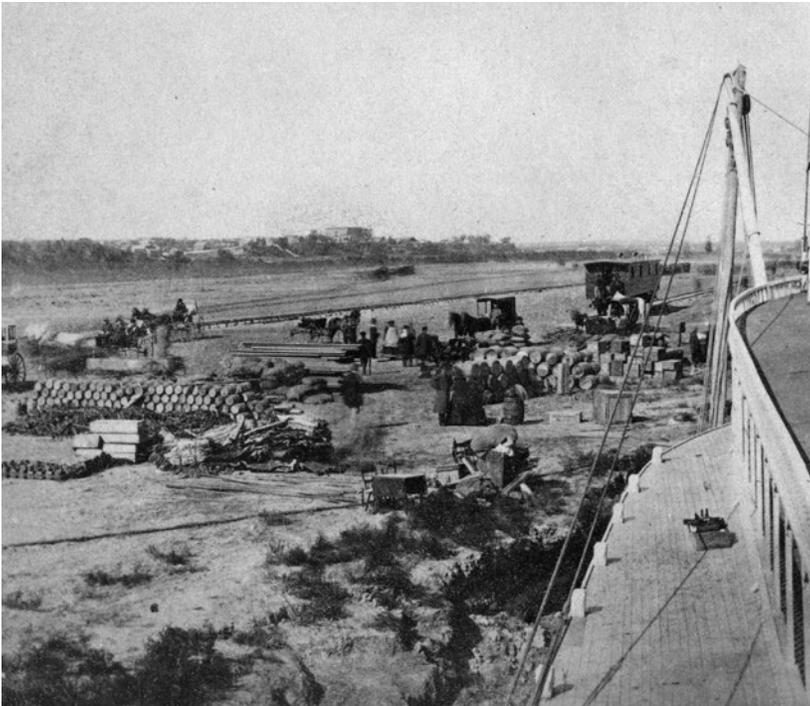
## Snow Sheds

Despite several feet of snow and freezing temperatures, work continued through the winter in the Sierra Nevada. Thousands of men shoveled snow off the line and dug tunnels connecting camps to work sites. Avalanches and snowstorms took lives. Men were found in the spring thaw, standing upright and still gripping the handles of their shovels.

In 1866 and 1867, Central Pacific workers experienced the Sierra Nevada's worst winter in memory, with 44 snowstorms. One four-day storm dropped 6 feet of wet, heavy snow, followed almost immediately by a three-day storm bringing another 4 feet. As late as March, 15 feet of snow remained in the Summit Valley. Supply trains could not get through, and more than half of the workers were occupied just clearing the track.

With no supplies or men for track construction, the CP could not earn money. Even the best snowplows could not clear the tracks. Men essentially lived like moles – traveling through snow tunnels 200 feet long and large enough for a team and wagon. John Gilliss, a CP civil engineer, reported 25-foot tall snow banks still loomed over wagon roads in June. Desperate to move forward, CP General Superintendent J. Crocker and CP President Leland Stanford decided to build a roof over the track to keep the snow off. By 1868, 2,500 men and six trains were dedicated solely to snow shed construction. By 1873, CP had built more than 30 miles of massive snow sheds at a cost of \$2 million. The successful innovation eventually was adopted by Union Pacific, as well as European railroads.

## UNION PACIFIC



[Original format is a stereocard] Plate number 231 by Alfred A. Hart in California circa June 1865. A train, with men standing on the cars, moves through Bloomer Cut near Auburn, California. The cut is 800 feet long and 63 feet high. Part of the "Scenes in the Sierra Nevada Mountains" stereocard album collection.



[Originally a stereocard] Plate 204, by James Carbutt in October 1866. This image shows a company of Pawnee Scouts and Union Pacific excursionists arranged in front of the excursion train. This excursion demonstrated Union Pacific's capacity to build the railroad and terminated at the 100th meridian near Cozad, Nebraska.

### Missouri River Transport

The enormous amount of tools, materials and supplies required to create the line all were transported up either the Missouri River for Union Pacific or the Sacramento River for Central Pacific. Each track mile required 100 tons of rail, about 2,500 ties, and 2 or 3 tons of spikes and fish plates (metal pieces joining the rails, preventing climatic expansion and contraction). Tools included wheelbarrows, horse-drawn scrapers, two-wheel dump carts, shovels, axes, crowbars, blasting powder, quarry tools and iron rods. Additionally, locomotives, wheel trucks, switch mechanisms and foundry tools were needed.

UP's biggest difficulty lay in getting railroad ties, as there were few trees in the prairie. Ties were cut principally along the Missouri River north and south of Omaha, and as the track-laying proceeded westward, trees were cut near river valleys and smaller streams. UP Vice President Thomas Durant acquired a river steamboat, the *Metamora*, to transport the ties and materials on the Missouri River to Omaha.

### The Pawnee Scouts

Not all tribes fought against the railroad or area settlers. Early on, the Pawnee allied with the U.S. Army as scouts, working alongside men such as Colonel William Cody and Major Frank North. Friendly to the American government and bitter enemies of the Sioux, the Pawnee welcomed Union Pacific into the Great Plains. Under Major North, a uniformed battalion of 800 Pawnee men patrolled the railroad to protect crews and livestock from Sioux and Cheyenne raiders. Their presence as a deterrent was effective. When raiding parties surprised work crews, shovels were laid down in favor of guns. Despite a lingering issue with small raids, the military's presence generally solved the problem of large war parties. When the transcontinental railroad was complete, more than 5,000 troops were stationed between Omaha and Salt Lake City.

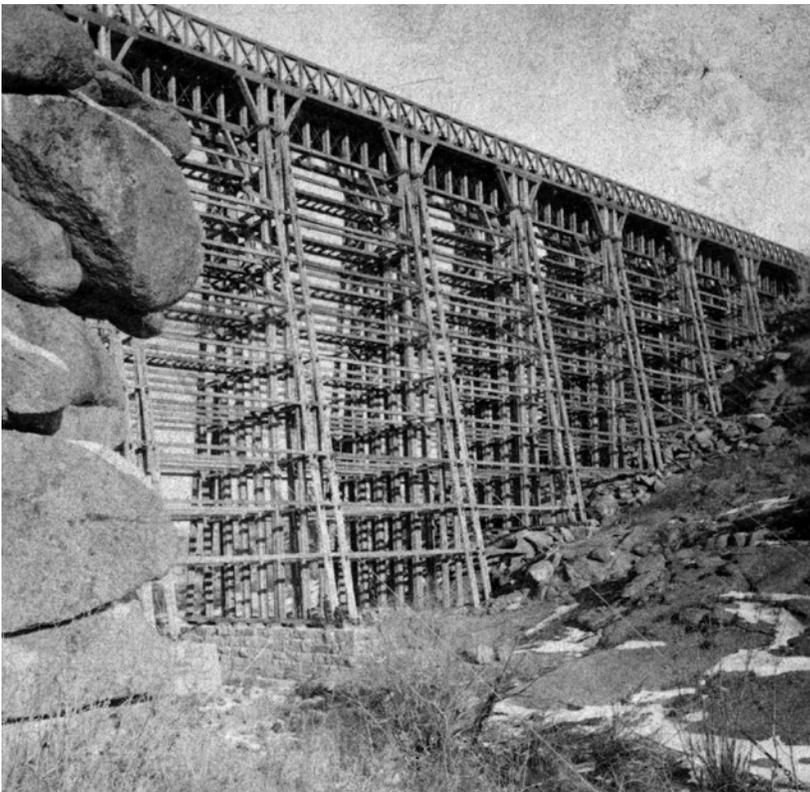


### Casement's City on Wheels

General Jack Casement and his brother Dan were in charge of laying track. Jack served as a Civil War brigadier general, and he carried the same commanding presence into his work for Union Pacific. Dan also was a veteran, and together they commanded thousands of track layers. Though Jack was reportedly 5 feet 4 inches and Dan only 5 feet, they were imposing figures.

To efficiently handle the sheer volume of men, materials and supplies, the Casement brothers created the "City on Wheels." The rail cars were pushed along the tracks by a locomotive, each providing an essential function – sleeping berths, dining cars, kitchens and all needed materials. Men woke up, ate breakfast and stepped off the train to begin work. A *Brown's Gazeteer* reporter estimated the train and attached tent city housed 1,500 to 2,000 men and 2,000 to 3,000 horses and mules. The train alone fed 500 to 600 men, daily consuming seven barrels of flour, 25 bushels of potatoes, a barrel each of coffee and sugar, three cows and two chests of tea.

*Andrew J. Russell imperial print, "Supply train on Muddy, Loading," plate 87.*



### The Dale Creek Bridge

Pushing west through Wyoming was exhausting and treacherous, requiring construction of a 650-foot bridge spanning Dale Creek in December 1868. The line's longest trestle, the bridge rose 150 feet from the canyon's bottom and swayed in the wind. The monumental engineering feat consisted entirely of wood and was strong enough to support several hundred tons. Like most UP bridges, it was constructed in pieces by the Boomer Bridge Company of Chicago and shipped to the site for assembly. Once completed, Superintendent Reed confiscated every rope he could find to hold the bridge down in the fierce Wyoming winds. As soon as he could get cables, Reed cabled the entire structure.

*[Originally a stereocard] Plate 112 by Andrew J. Russell showing the Dale Creek Bridge from below, 1868.*

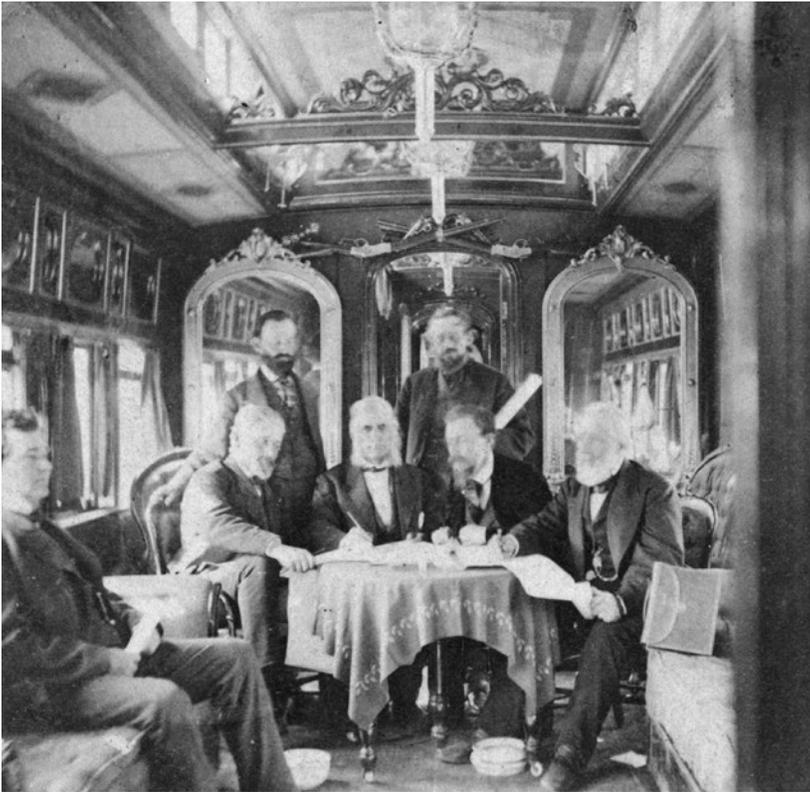


Andrew J. Russell imperial print, "General Grant and Party at Ft. Sanders, [Wyoming]," plate 37, 1868. This image includes General Grant, fifth from left in a white shirt, black tie and straw hat, General Grenville Dodge, far left, and Thomas Durant, sixth from right.

### Fort Sanders Summit

As the line made its way west across Wyoming, tension mounted between General Dodge, Union Pacific's chief engineer, and UP Vice President Thomas Durant. Despite his promise to let Dodge have absolute authority over the route, Durant protected his interests in the field through Silas Seymour, hired by Durant in 1864 as consulting engineer for UP. The disagreement came to a head when Dodge took Ulysses S. Grant, along with Generals

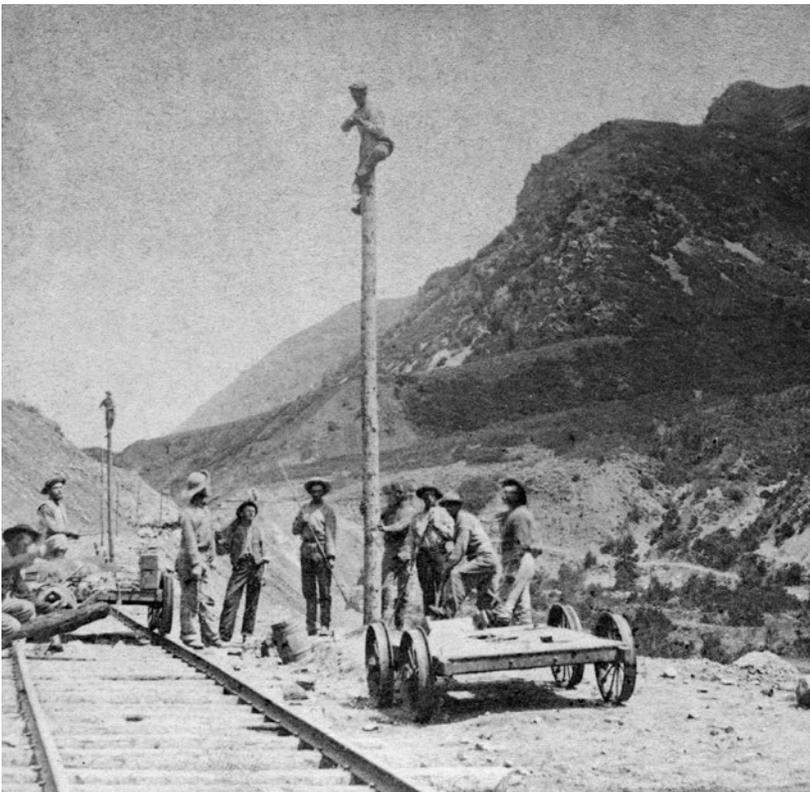
Sherman and Sheridan, to see the construction while en route to Fort Sanders in 1868. Dodge described the progress at length and threatened that if Durant changed the route, Dodge would quit. Durant lashed back, but Dodge's comrades Grant, Sherman and Sheridan stood behind him and vowed not to let him leave the project. Recognizing Grant would almost certainly be the next U.S. president, Durant backed down.



### The First UP Business Car

This 1869 A.J. Russell photograph provides a rare peek into the business operations of the railroad's construction inside Union Pacific's first business car. Thomas Durant, then vice president of the railroad, purchased this car from the federal government in 1866. Previously constructed as Abraham Lincoln's private rail car, it was heavily armored and beautifully appointed. Unfortunately, President Lincoln never used the car alive; its first use transported his and his son's remains to Springfield, Illinois, for burial. Seated left is Edward Creighton of the Pacific Telegraph Company, charged with aligning the transcontinental telegraph system with the railroad. Durant is seated second from left, and UP general superintendent Samuel Reed is standing with UP officer Sidney Dillon to his left.

*[Originally a stereocard] Plate 353 by Andrew J. Russell showing Union Pacific officers in a rail car at Echo City, Utah, 1869. Included in the photograph, from left to right, are Edward Creighton, Silas Seymour, Sidney Dillon, Samuel Reed and Thomas Durant.*



### Telegraph Corps

Telegraph lines were as much an icon of the revolutionary new era as the railroads they paralleled. Edward Creighton extended the first telegraph line from Omaha to Salt Lake City in 1861, replacing the short-lived but colorful Pony Express. The Pacific Railway Act of 1862 creating Union Pacific also stipulated: "An Act to aid in the Construction of a Railroad and Telegraph line from the Missouri River to the Pacific Ocean, and to secure Government use of the same for Postal, Military and other purposes."

The telegraph line was to consist of cedar poles, 35 to the mile, with a cross arm and two wires. During construction, much of the original Creighton line was moved to the railroad right-of-way. It was the telegraph that flashed the message "Done!" to the world upon the connection of UP and Central Pacific at Promontory Summit, Utah, May 10, 1869. Telegrams quickly became part of American life and a crucial railroad communication tool. Telegraph operators were nicknamed "lightning slingers." All UP train dispatching was done by telegraph until 1912, when telephones began to replace Morse code.

*[Originally a stereocard] Plate No. 398 by Andrew J. Russell, "Telegraphic Corps, Weber Canyon," May 1869, [Utah].*



Plate 227 by Andrew Russell, "East and West shaking hands at laying of the last rail," Promontory Summit, Utah, May 10, 1869.

## PROMONTORY SUMMIT

The entire nation listened May 10, 1869, as the Central Pacific and Union Pacific met in Utah, completing what many called an impossible task. The 46-month project cost between \$110 and \$120 million – today, including labor, it would cost billions.

Western Union offered on-site coverage via telegraph – the first major news event carried “live” coast to coast. Telegraph wires were attached to one ceremonial spike, and as it was gently tapped with a silver maul, the strokes were heard across the country.

Three ceremonial spikes were given that day: one gold-plated spike by the State of California to Leland Stanford, CP’s president; a silver spike to both railroads by the State of Nevada; and a gold and silver spike by the Arizona Territory to UP. The ceremony spotlighted UP locomotive No. 119 meeting CP locomotive Jupiter. From left, shaking hands, are CP engineer S. Montague and UP chief engineer General Dodge.