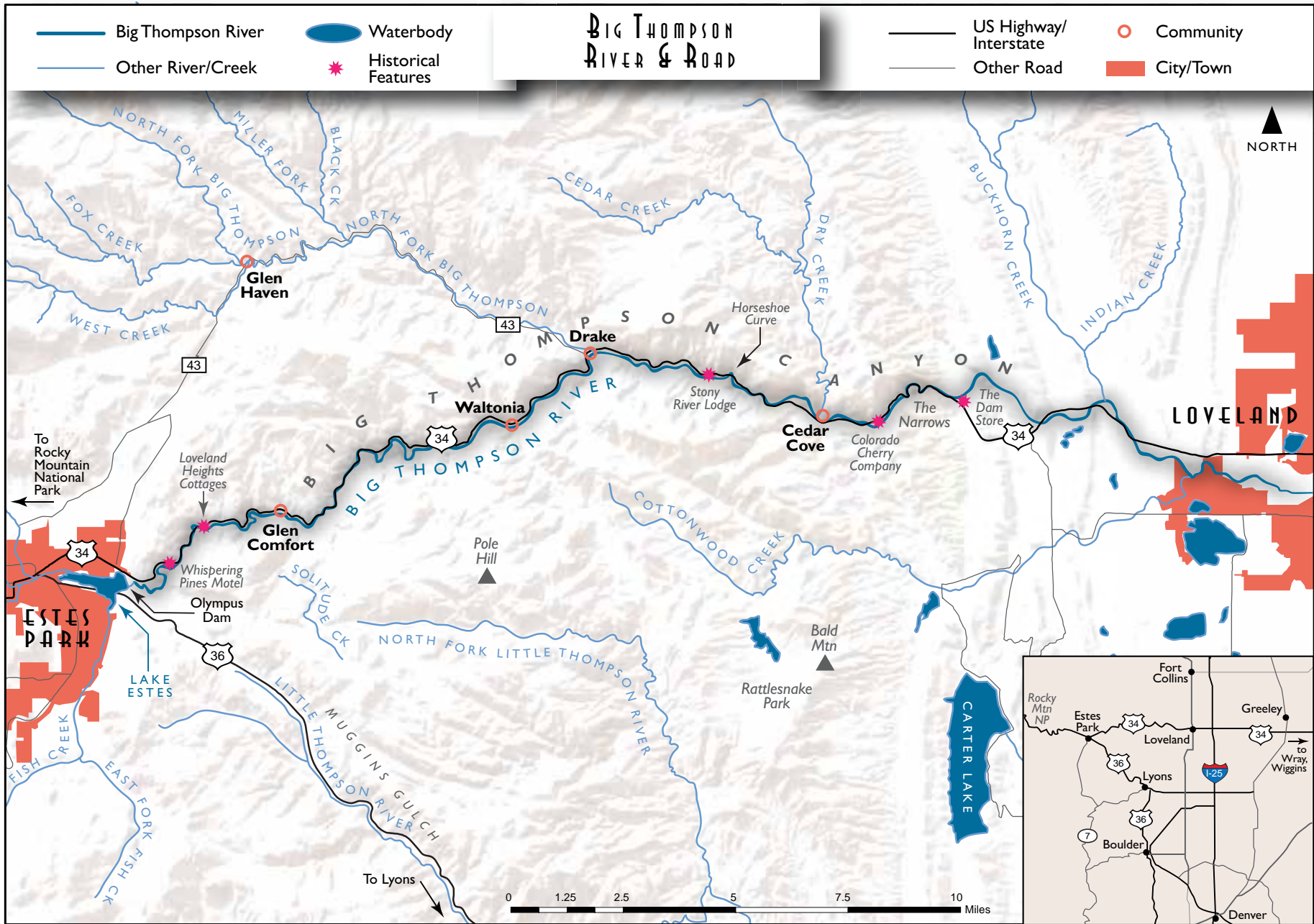




The
River
and the
Road

The compelling story
of the Big Thompson River,
US 34, and human resilience
in the face of tragedy



The Big Thompson River and US 34, Larimer County, Colorado

The
River
and the
Road

This book is dedicated to the people who lost their lives
in the Big Thompson Canyon floods of 1976 and 2013,
and to
Scott Ellis, late CDOT Region 4 Resident Engineer and
first 2013 post-flood Project Manager.

Created by

JACOBS

for the



COLORADO
Department of Transportation

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2019

ii – The *River* and the Road

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Front Cover Image: Colorado Department of Transportation, 2013 flood

Back Cover Image: Colorado State University, 1976 flood

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Image source: CDOT



Foreword

This is the story of the enduring struggle to forge and maintain a transportation connection through the Big Thompson Canyon to Estes Park. Constructed more than 100 years ago, the first road established that connection and paved the way for recreation and settlement in the canyon. Since then, major flooding of the Big Thompson River has claimed lives and caused catastrophic damage to property, infrastructure, and natural habitats. Throughout both the 1976 and 2013 floods, the human spirit was tested, but not broken. Meet the people who barely survived these disasters, those who tragically did not, as well as those who tended to the injured, picked up the pieces, and did the seemingly impossible. As a member of the Colorado Department of Transportation team who has been part of this story, I encourage you to learn more about the river, the road, and most importantly, the power of human persistence.



Image source: CDOT

A handwritten signature in blue ink, reading "Johnny Olson".

Johnny Olson
CDOT Deputy Director
June 28, 2019



Image source: CDOT

Foreword



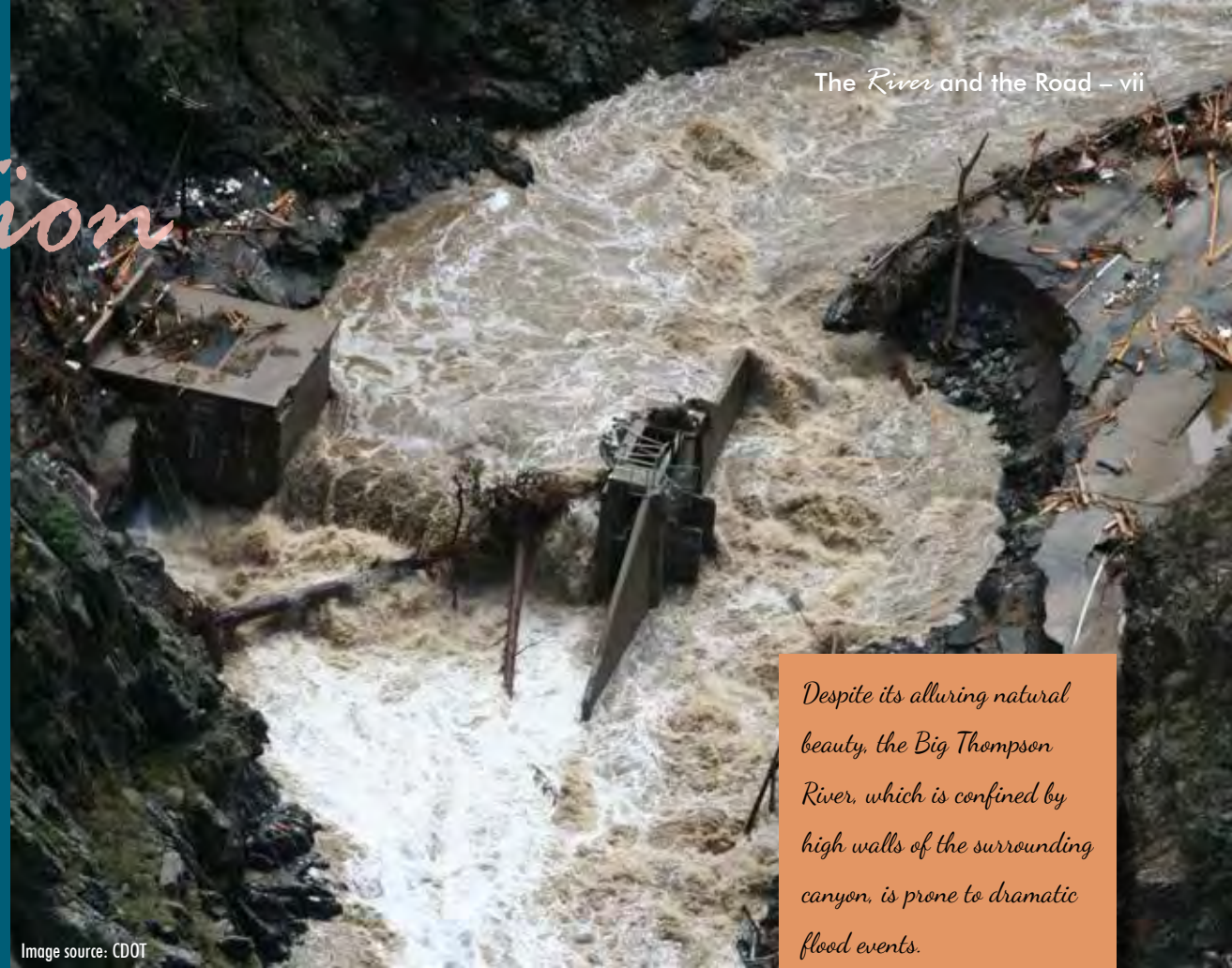
Introduction

This is the story of

the **Big Thompson River,**
its namesake canyon,
and United States Highway (US) 34

...which hugs the river's
meandering curves.
It is the story of the river
and the road.

Image source: CDOT



Despite its alluring natural beauty, the Big Thompson River, which is confined by high walls of the surrounding canyon, is prone to dramatic flood events.

This story speaks of awe-inspiring natural beauty, human determination, exceptional feats of engineering, and tragically, staggering devastation and poignant acts of heroism — all of which coalesce around one thing — the Big Thompson River. The river and the road are inextricably bound together, journeying side-by-side from lofty mountain valleys to expansive, sweeping

plains, each influencing the other ever since travelers began venturing through the canyon.

Lauded as “the very gem of beauty,”¹ the high alpine valley that would become the Town of Estes Park lured explorers and travelers from afar. However, visitors faced a formidable obstacle upon reaching Colorado’s Front Range,

the first mountain range west of the Great Plains. The precipitous roads from the flatlands to Estes Park presented a multi-day trial even for those who came prepared.²

The Big Thompson Canyon beckoned. The river had already cleaved a twisted path through a high-walled chasm



Image source: Collection of P. Steinholtz



Image source: P. Steinholtz

It wasn't just the destination, but the journey through the Big Thompson Canyon that made the drive to Estes Park so extraordinary.

between the mountain town of Estes Park and the City of Loveland, situated prominently at the river's mouth approximately 20 miles downstream. So why not build a road along the river's edge? In 1903, construction of the "rough and bad" Riley's Road through the canyon (the precursor to US 34)

proved it could be done — barely.³ Despite the road's precarious condition, its use exploded, and with it, years of challenging upgrades and modifications. Word soon spread that it wasn't just the destination, but the journey through Big Thompson Canyon that made the drive to Estes Park so extraordinary.

"No motorist can really claim to have seen Colorado scenery at its zenith who has not driven the Big Thompson canon [sic],"⁴ proclaimed a journalist in 1920.

The canyon's natural beauty also lured settlers to put down roots along the river's banks. People built summer cabins and permanent residences, and established businesses catering to an ever-increasing number of visitors and recreationists. Small residential

The canyon's natural beauty lured settlers to put down roots along the river's banks.

communities sprang up, some of which remain in the Big Thompson Canyon today.⁵

Yet few people knew the canyon held

a devastating secret only those keen to its clues could decipher. Stranded trees lodged uncharacteristically high above the stream bank, deeply incised canyon walls soaring up to 3,000 feet high, and sharply curving hairpin turns attest to millennia of violent scouring.⁶ The beckoning beauty of the river and canyon belied their potential peril — flash floods. A 1971 study prepared by the U.S. Army Corps of Engineers determined that the Big Thompson River flooded an average of once every six

years, the worst of which killed seven people in 1951.⁷ But these floods were just a precursor of the devastation that would soon come.

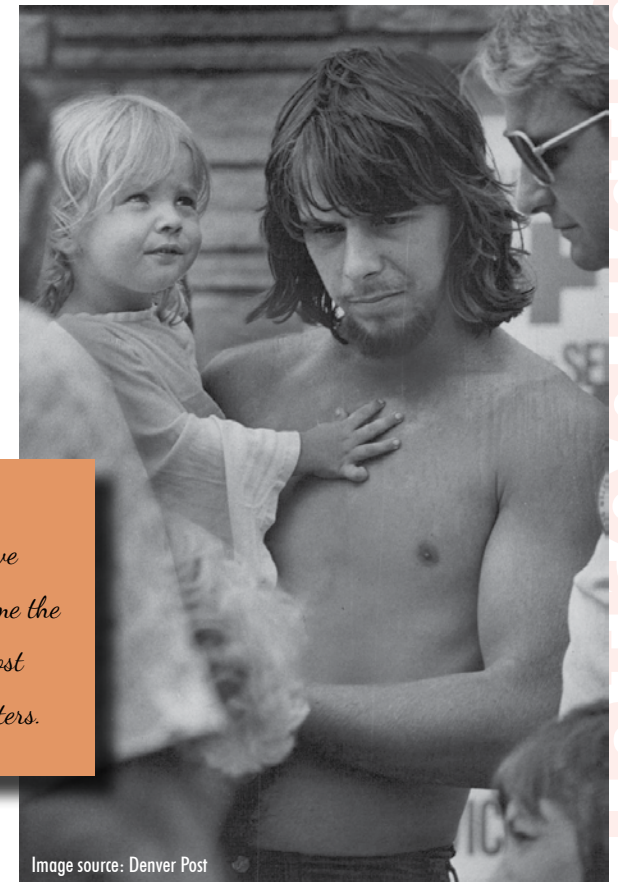
On July 31, 1976, the Big Thompson Canyon was the site of one of the most catastrophic natural disasters in Colorado history. The canyon was alive with activity, as thousands of people celebrated the state's 100-year birthday. Towering thunderheads unleashed a year's worth of rain in just over one hour. The river exploded from an average depth of 18 inches to a 20-foot wall of water. By the time it was finished, Colorado's deadliest recorded flood had killed 144 people and injured 250 more, destroyed 418 houses and 52 businesses, damaged 138 houses, washed away much of US 34, demolished the Big Thompson Siphon, and caused more than \$35 million in damages.⁸

People wanted US 34 to be replaced precisely where it had been.⁹ As a result, the road was reconstructed in "essentially the same location,"¹⁰ and residents returned to the canyon to rebuild their lives. They considered the flood "a freak event which would not occur again for several hundred years."¹¹

Yet just 37 years later, a devastating flood struck Colorado's northern Front Range in September 2013, once again hitting the Big Thompson particularly hard. While the 1976 storm was over within hours, the rain that began September 9, 2013, didn't end until six days later. During that time, "biblical" record-breaking rainfall dropped the equivalent of one year's worth of precipitation yet again.¹² Ten people died in the 2013 flood throughout the state, including two women who lived in Big Thompson Canyon.¹³

The 2013 flood completely washed out or significantly damaged nearly nine miles of US 34.¹⁴ The Colorado Department of Transportation (CDOT) immediately mobilized for emergency repairs, reopening US 34 in November 2013. Permanent repairs were undertaken later, with CDOT officially reopening US 34 on May 24, 2018, after two seasonal closures for construction. The permanent repairs were designed to make the road more resilient to future

Towering thunderheads in July 1976 unleashed a year's worth of rain.



On July 31, 1976, the Big Thompson Canyon was alive with activity, soon to become the site of one of the state's most catastrophic natural disasters.

Image source: Denver Post



In September 2013, “biblical” record-breaking rainfall dropped the equivalent of one year’s worth of precipitation.

storm events by reimagining how it could coexist with the river, sometimes through radical means. Most notably, engineers decided to abandon the road’s historic path along the outside edge of a tight horseshoe bend in the river, instead cutting bridges into the hillside and substantially flattening the curve.¹⁵

And so the story continues: The river and the road, each changing in response to the other — the river claiming its share when it is so inclined. Communities, governments, planners, and engineers, now more aware of the devastation nature can inflict, have learned to reimagine designs to better

accommodate future disasters. The stories of the past have much to teach, inspiring us to come together and adapt to an increasingly uncertain future. *This* is the story of the river and the road.

Permanent repairs in 2013 were designed to make the road more resilient to future storm events, allowing it to coexist with the river.

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Introduction



The River

The Big Thompson River and US 34 inextricably wind together...

forming a twisting path eastward from the mountain town of Estes Park to the flatland City of Loveland, the river resolutely cleaving a path of least resistance to which the road clings.



Image source: P. Steinhilz

The Big Thompson River and its namesake canyon, with its beckoning shores and “sky-scraping granite walls,” are both alluring and deadly.

Gathering momentum and volume from precipitation and tributaries, the river courses downward, pushing through cracks and folds in ancient bedrock. This relentless process of incision and deposition has shaped a distinctive landscape in Colorado’s Front Range Mountains known as the Big Thompson Canyon. It is the Big Thompson River’s tumultuous 20-mile journey through

its namesake canyon, which the water has been carving since the Front Range rose 70 million years ago,¹ that makes the canyon both alluring and deadly. Here, “nature has carved one of its most beautiful works of art” — a “must-see,” “awe-inspiring” chasm comprised of “sky-scraping granite walls.”² The river teems with life, from tiny midges to silvery trout, which draws mammals and

raptors to the water’s bounty. Water-adapted plants thrive along its wider banks, and evergreens cloak the hillsides. A variety of wildlife, from tassel-eared squirrels to bighorn sheep, find food and shelter among the trees. The scent of earth and pines infuse the crisp air, which roils with thunderstorms in late summer afternoons.

1-2 – The *River* and the Road

Like most Colorado rivers, the Big Thompson's headwaters are lofty and cold. High within the peaks of Rocky Mountain National Park — approximately 11,000 feet above sea level — snow blankets the Continental Divide every winter and spring. As rising summer temperatures release this accumulation, the fresh waters tumble west to the Pacific Ocean or east to the Atlantic in creeks and streams that ultimately coalesce into rivers. Much of the eastward flows eventually form the Big Thompson River, which reaches peak levels in the months of May and June.³

Flowing through the Town of Estes Park, the Big Thompson is joined by Fall River, Fish Creek, and Black Canyon Creek before being impounded by the Olympus Dam.⁴ Constructed in 1948, the dam forms Lake Estes, designed



Snowfall in Rocky Mountain National Park melts each summer, with much of the easterly flows forming the Big Thompson River.

Image source: P. Steinholtz

primarily for power generation as part of the Colorado-Big Thompson Water Diversion project.

Because the water level must be kept high for power production, the lake's "modest reservoir capacity was not designed for flood control."⁵ Excess floodwaters are stored or diverted through the Olympus Tunnel.⁶

From Lake Estes, the Big Thompson River plunges downstream through Big Thompson Canyon, "a natural seam in the mountains,"⁷ whose undulating walls

Colorado-Big Thompson Water Diversion Project

The Colorado-Big Thompson Water Diversion project — "one of the most ambitious water diversion projects ever undertaken by the federal government"³⁰ — greatly modified the natural hydrology of the Big Thompson River. Constructed between 1938 and 1948, the "largest trans-mountain diversion project ever built"³¹ diverts water from the western side of the Continental Divide through a 13-mile tunnel beneath Rocky Mountain National Park to Colorado's northeastern slope and plains. The diverted water is stored in Lake Estes, from which it is released not only into the Big Thompson River, but the Olympus Tunnel. The tunnel travels east and slightly south away from the river, transferring water into a pipe that becomes conspicuously visible as the Big Thompson Siphon, which crosses the Big Thompson River and US 34 at the eastern end of the canyon.³²

The Big Thompson River's headwaters are lofty and cold.

June 9, 1864

First documented flood in Big Thompson Canyon;
river spreads one mile wide at Loveland⁵³

conform to the river's meanders almost as far east as the City of Loveland, where the landscape abruptly flattens. Canyon walls frequently rise directly from the river's edge, with slopes of 40 to 80 percent and jagged ridges as high as 3,000 feet above river level.⁸ Within the canyon, the Big Thompson River descends more than 2,100 feet in just under 20 miles, dropping an average of 105 feet per mile through cascades, riffles, and plunge pools as the water rolls across a near-continuous fill of boulders. Heading east from the community of Drake, the approximate mid-point between Lake Estes and

The Big Thompson River descends more than 2,100 feet in just under 20 miles, dropping an average of 105 feet per mile.

Loveland, the river drops more than 800 feet over an eight-mile segment to the canyon's mouth. This pronounced descent of the Big Thompson Canyon gives rise to rapid flows despite the energy dissipation provided by the channel's natural curves.⁹

The Big Thompson River is joined near Drake from the north by the North Fork



Image source: Colorado State University



Image source: Colorado State University

Flowing through the Town of Estes Park, the Big Thompson River (above) is impounded by the Olympus Dam (left), forming Lake Estes, whose "modest" capacity was designed for power generation, not flood control.

May 31-June 1, 1894

Big Thompson River overflows half-mile wide at canyon mouth, destroys Loveland's water supply³⁴

1-4 – The River and the Road

of the Big Thompson, which originates high in the peaks of the Mummy Range, also within Rocky Mountain National Park. The largest tributary within the Big Thompson Canyon, the North Fork is, in turn, fed by Fox Creek and West Creek. Many smaller gulches also join the Big Thompson River within the canyon. Steep gradients characterize major tributary gulches; shorter gulches and gullies have even steeper gradients, where increasing gravitational forces pull the water rapidly downward. Each of these tributaries augments the Big Thompson's volume and energy, becoming ever more powerful the farther it travels. These surface waters and their tributaries, as well as the Little Thompson River to the south,

together comprise the Big Thompson Watershed, totaling approximately 900 square miles that drain to the South Platte River (see Figure 1-1, opposite page).¹⁰

In rare instances, such as at Drake, the river seems to relax. Sharp changes in stream direction and slope, as well as outwash from side streams, have created broad, relatively flat areas up to 500 feet wide within the canyon. Several stretches of the river are also braided and shallow, where dry channels form during low-flow conditions. It is these areas, calm and inviting when the river is placid, that have drawn people to

Several tributaries increase the Big Thompson's volume and energy.

settle over the years, giving rise to small communities with names like Cedar Cove and Glen Comfort.¹¹

Conversely, the canyon constricts and steepens most remarkably near its eastern end in a section known as the Narrows. Here, the canyon is a mere 80 to 100 feet wide and enclosed by hard, nearly vertical rust- and lead-hued metamorphic cliffs soaring to thousand-foot heights.¹² The steepest of the fractured cliffs lack vegetation, with the exception of lichens that stain the rocks a pale lime green. The river tumbles through a convoluted, boulder-strewn path of hairpin turns, a testament to the cliffs' reluctance to yield. The Narrows has been described as "claustrophobic," a place "where human beings are

dwarfed... [with] no quick escape. You are in a partially closed stone hand."¹³

In rare instances, such as at Drake, the river seems to relax at broad, relatively flat areas up to 500 feet wide.



Image source: P. Steinholtz

July 7, 1906

○
Flooding; bridge washes out at Drake³⁵

July 31, 1919

○
10-foot wall of water; 400 people are stranded at Forks Hotel in Drake³⁶

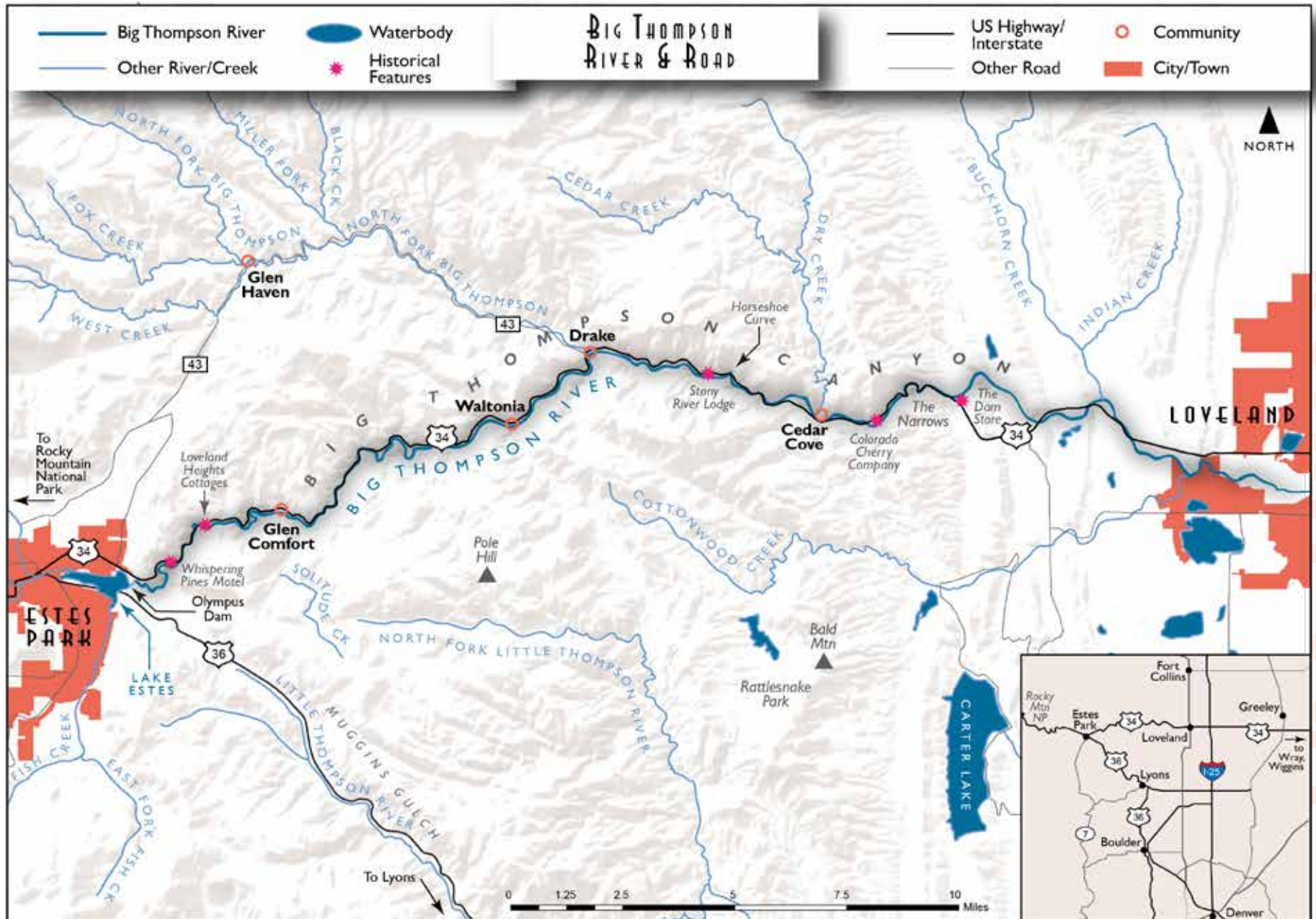


Figure 1-1: The Big Thompson River and US 34

June 4, 1921

Widespread flash flood; river spreads half-mile wide at Loveland³⁷

June 7-10, 1923

Big Thompson floodwaters cover canyon road and parts of Loveland³⁸

Sept 2 and 11-12, 1938

Flooding in Narrows destroys bridges and segments of US 34; road closes³⁹

1-6 – The *River* and the Road

Suddenly and unexpectedly, the Narrows spits the river out of the canyon and onto a broad, flat plain at Loveland’s doorstep. The river, freed from the confines of the canyon’s constricting walls, expands and quiets. After descending more than 6,000 vertical feet and traveling 78 miles from its alpine origins, the Big Thompson eventually merges with the South Platte River near the Town of Greeley.¹⁴

The canyon’s allure is due not only to its soaring cliffs and twisting turns, but the plants and animals that inhabit its confines. Expanses of grassy meadows interspersed with brush thickets, willows, river birch, and cottonwood groves line the banks of the Big



Image source: CDOT

Thompson River. As the elevation increases closer to the mountains, Ponderosa pine and Rocky Mountain juniper become dominant, forming a montane forest that extends to an altitude of about 8,000 feet.

The river’s east-west orientation gives rise to two distinctive microclimates — one on the drier, sun-drenched north side, and one on the cooler, perpetually shaded south side. Plants colonize the slopes in response to their preference for light and shade, drawing animals seeking food and shelter specific to each. The elemental difference between these slopes — the amount and intensity of sunlight they receive — leads to profound ecological differences, such as denser vegetation on north-facing slopes, not always obvious to the untrained eye.¹⁵

Most days, the Big Thompson River courses calmly through its canyon. Birds float on thermals overhead,



deer and bighorn sheep browse the hillsides and cliffs, and anglers coax fish from its clear waters. But this twisting, steep-sided landscape is also a prime setting for floods. The pronounced descent of the Big Thompson Canyon gives rise to rapid flows, which its steep canyon walls cannot absorb. As summer slips into late July and August, intense mountain thunderstorms rise ominously overhead, bringing the greatest risk of flash flooding.¹⁶

In a 1971 study, the U.S. Army Corps of Engineers determined that the Big Thompson River flooded an average of once every six years. That report, which preceded the deadliest flood in Colorado’s history by five years, recorded 12 large floods, starting in 1864 when the Big Thompson spread a mile wide at Loveland following an extraordinary rainstorm.¹⁷ During

Most days, the Big Thompson courses calmly through its canyon.

Summer 1941

Flooding in canyon and Loveland causes sizable bridge and road damage⁴⁰

July 19, 1945

Massive 6- to 7-foot wall of water in Big Thompson Canyon⁴¹

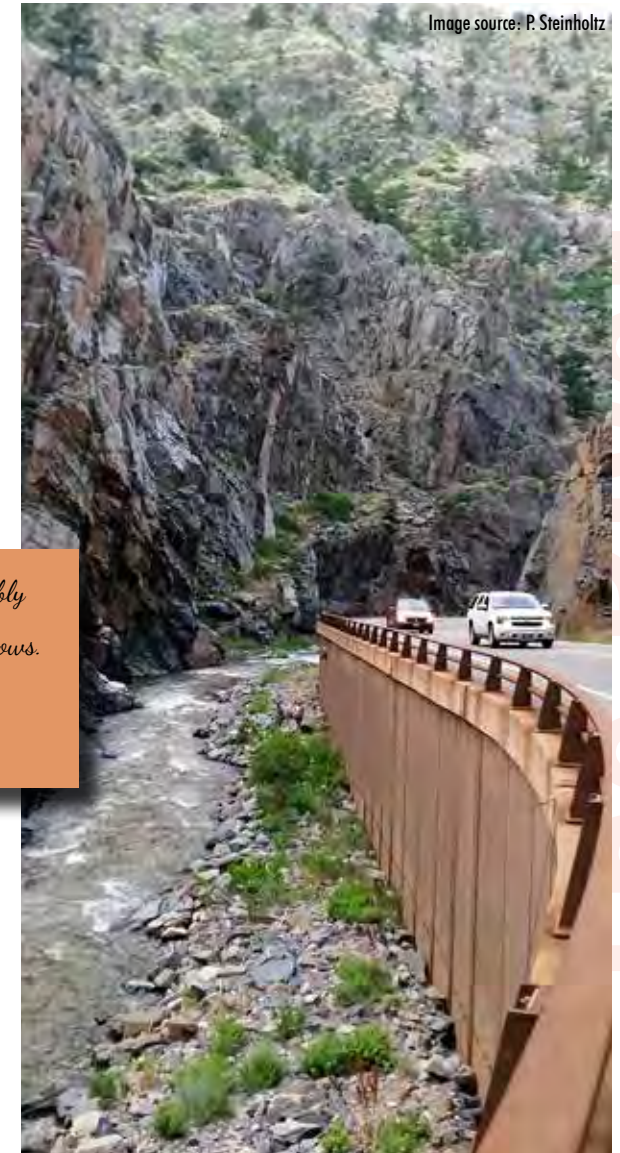
The Narrows spits the river out of the canyon and onto a broad, flat plain at Loveland's doorstep.

that storm, water laden with driftwood rushed down the Cache la Poudre River farther north of the Big Thompson, “plunging like the waves of the sea under the impulse of a gale.”¹⁸ The 1864 flood destroyed Camp Collins, an early military post that was the site of today’s City of Fort Collins, but amazingly, no lives were lost. In the early 1880s, a local newspaper reported that a farmer saw a 25-foot wall of water surge from the mouth of Big Thompson Canyon. Not long afterward, water extended a half-mile wide at the canyon’s mouth in 1894. Drake was hit by high waters in 1906 and again in 1919, washing away bridges, isolating the Forks Hotel, and reportedly unleashing a 10-foot-tall wall of water.¹⁹ The 1919 floodwaters swept “logs, planks and bridges before it in a mad swirl,” covering most of the road in two feet of water and washing out the road bed to bedrock.²⁰ Following the latter event, the Loveland *Daily Herald* proclaimed, “Since then, the road [the precursor to US 34] has been changed and all the low bridges elevated, until now it is almost impossible for any such damage to take place.”²¹ Ironically, five days later, an overnight downpour raised the water 12 to 15 inches over the



The canyon constricts and steepens most remarkably at its eastern end in a section known as the Narrows. Here, the canyon is a mere 80 to 100 feet wide.

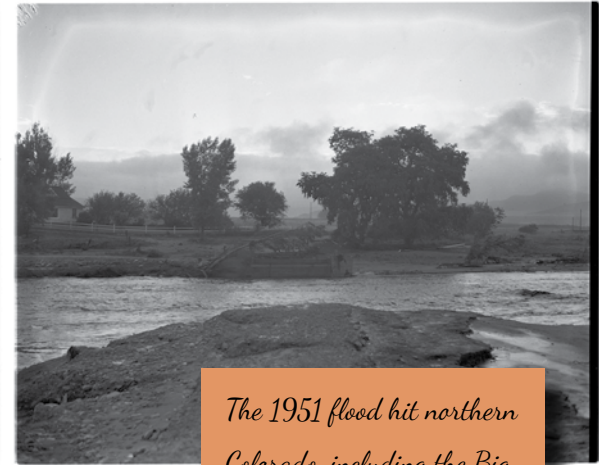
road, causing \$200,000 in damage.²² In June 1921, four days of precipitation “very materially” increased the Big Thompson’s volume, washing away a house, including its occupants, located near the river just outside Loveland and depositing it in a grove of trees a half-mile downstream.²³ Two years



June 4, 1949

Heavy rains at Big Thompson headwaters; US 34 is damaged⁴²

1-8 – The River and the Road



The 1951 flood hit northern Colorado, including the Big Thompson, killing seven people. (The location of these images is unknown.)

later, floodwaters overflowed the Big Thompson's banks in a number of places, covering "the Estes Park road," as well as parts of Loveland in over a foot of water.²⁴ Intense precipitation in September 1938 flooded several of the Big Thompson's tributary streams and the Big Thompson itself. "The chief damage from the flood was to the recently completed highway in the canyon, which was washed out in 10 places."²⁵

The worst of the floods recorded in the 1971 study occurred in August 1951. Four inches of rain fell at Cedar Cove, bursting a reservoir on Buckhorn Creek, which enters the Big Thompson River three miles east of the canyon. An eight-foot wall of water swept a car containing a Denver family off US 34.

The flood killed seven people, destroyed five homes, knocked out telephones, and "deposited mud deep enough to cancel the annual county fair," again resulting in \$200,000 in damage.²⁶ Referring to this event, the 1971 U.S. Army Corps of Engineers report stated, "to the many people who did not experience the 1951 flood, this report should create a respect for the awesome power of the flooding river."²⁷

Twenty-five years would pass before the Big Thompson Canyon would flood again with horrifying consequences — the 1976 flood was the deadliest flash flood in Colorado's recorded history.²⁸

In his 1980 book describing the flood of 1976, author David McComb ends by noting that, since rainstorms "strike at random, the chances are slight that [a flood within the Big Thompson Canyon] will happen again for another 333 years."²⁹ Yet in 2013, another disastrous flood struck again, a mere 37 years later.

The 1971 U.S. Army Corps of Engineers report "should create respect for the awesome power of the flooding river."

August 31, 1951

Worst flood to date; loss of life; damage to bridges, roadways, and homes; one mile of US 34 is washed out⁴³

June 1965

Flooding near Loveland results in loss of life, damage to homes and businesses⁴⁴

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1-10 – The River and the Road

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The Road

The story of US 34 is a story of
two Colorado communities
and the connection between them:

the Town of Estes Park
and the City of Loveland.

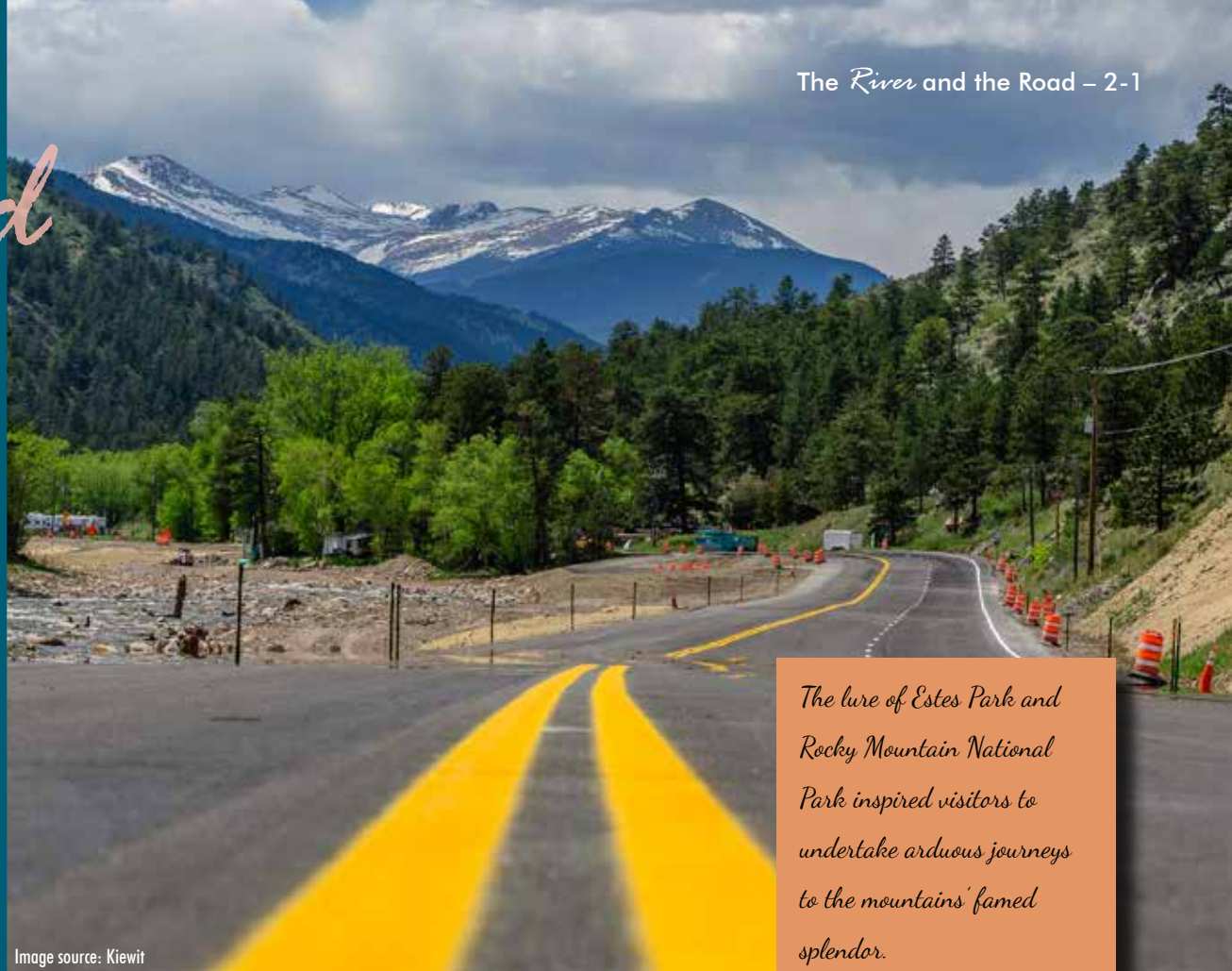


Image source: Kiewit

The lure of Estes Park and Rocky Mountain National Park inspired visitors to undertake arduous journeys to the mountains' famed splendor.

Each town's story and evolution reflect their strikingly disparate geographies, drawing settlers with vastly different aspirations. The stories roughly begin with what Theodore Roosevelt described as the country's "great leap Westward"¹ — the pursuit of new opportunities, adventure and riches, and the urge to tame a vast, unknown land stretching from the Mississippi River to the Rocky Mountains. Explorers, mountain

climbers, hunters, ranchers, health seekers, and tourists were all drawn to the high alpine valley of what would become Estes Park, lured by the outstanding beauty of surrounding peaks and the mythos of the Wild West. Meanwhile, farther east where the plains nose up to the foothills, early pioneers were drawn by the promise of arable land. Farms and ranches began flourishing in the broad Big Thompson

Valley. Soon after, travelers started arriving by stage — and later, rail — in what would become the City of Loveland. However, for visitors seeking the "wild auroras"² of Estes Park, the stage and rail lines to Loveland would get them only so far. What they needed was a route into the mountains, and the narrow canyon just west of Loveland beckoned.

2-2 – The River and the Road

Image source: Library of Congress



"Mountain men" searched for pelts and hides in present-day Rocky Mountain National Park, shown at left, following trails blazed by Native Americans.

Arriving in northern Colorado in the early 1800s, "mountain men" roamed the peaks and valleys of present-day Estes Park in search of pelts and hides, enduring a hardscrabble life that quickly imploded through zealous overharvesting and diminishing demand. These wilderness explorers roved an untamed land, plying existing Native American trails and blazing paths of their own. By the 1820s, they had established camps along waterways throughout the region, living a life that "often invited tragedy."³

The Rocky Mountain fur trade was short-lived, peaking between 1820 and 1840. "This was a time when Americans became more interested in the politics and geography beyond the Mississippi River; it was a time of expansion and experimentation."⁴ Large military expeditions were deployed to survey and study the country's newly purchased territories and their river systems and natural, ethnographic, and geographical resources. David Thompson, an English engineer and astronomer, explored the West in search of sites for trapping camps as an agent for the Northwest Fur Company. In 1810, he magnanimously named the Big Thompson River after himself.⁵ Ten years later, the 1820 Long Expedition, led by Major Stephen H. Long (for whom the City of Longmont and Long's Peak are named), traversed the South Platte River to the Rocky



Image source: Denver Public Library

Trappers endured a hardscrabble lifestyle that quickly imploded.

Early 1800s

Arrival of "mountain men" to Estes Park area

1810

David Thompson names Big Thompson River

Large military expeditions surveyed and studied the country's newly purchased territories.

Mountains as “the first scientific party to explore the West in the name of the United States Government.”⁶

Settlement by Europeans in the area of Estes Park began in 1860 when Joel Estes — cattle rancher, gold seeker, explorer, and father to 13 children — fled the gold rush crowds of Denver for present-day Estes Park, his future namesake. Estes arrived via an existing trail established by fur trappers along the St. Vrain River, traveling from what is now the Town of Lyons. From there, the trail extended over the mountains along the Little Thompson River (known then as Muggins Gulch), essentially following the route of present-day US 36 (see Figure 2-1 next page). At the time, at least three rough trails led to what would become Estes Park, including one that extended over Bald Mountain southwest of Loveland. None of the trails were well developed, and Estes had to transport all of his possessions on horseback — no small task at the time.⁷ He later improved the trail he had followed along the Little Thompson/

Muggins Gulch enough so that it “could be negotiated by a four wheel rig by careful driving and lots of motive power.”⁸ This “improved” road traversed ridges, gulches, and hills where “the least lurch would turn the wagon or cart over.”⁹ Despite these improvements, “it

An account of an expedition from Pittsburgh to the Rocky Mountains in 1819 and 1820 under the command of Major Stephen H. Long (right) includes the image of Native Americans, below.

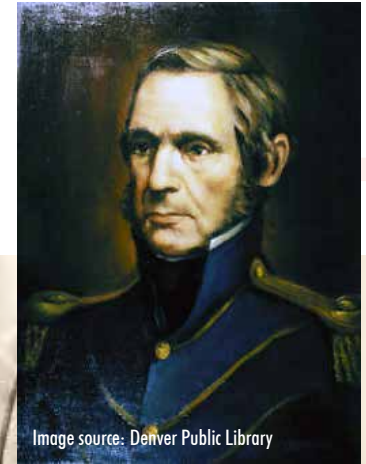


Image source: Denver Public Library



Image source: Wikimedia Commons

1820

Long Expedition explores Rocky Mountains

1820s

Trappers establish camps along region's waterways

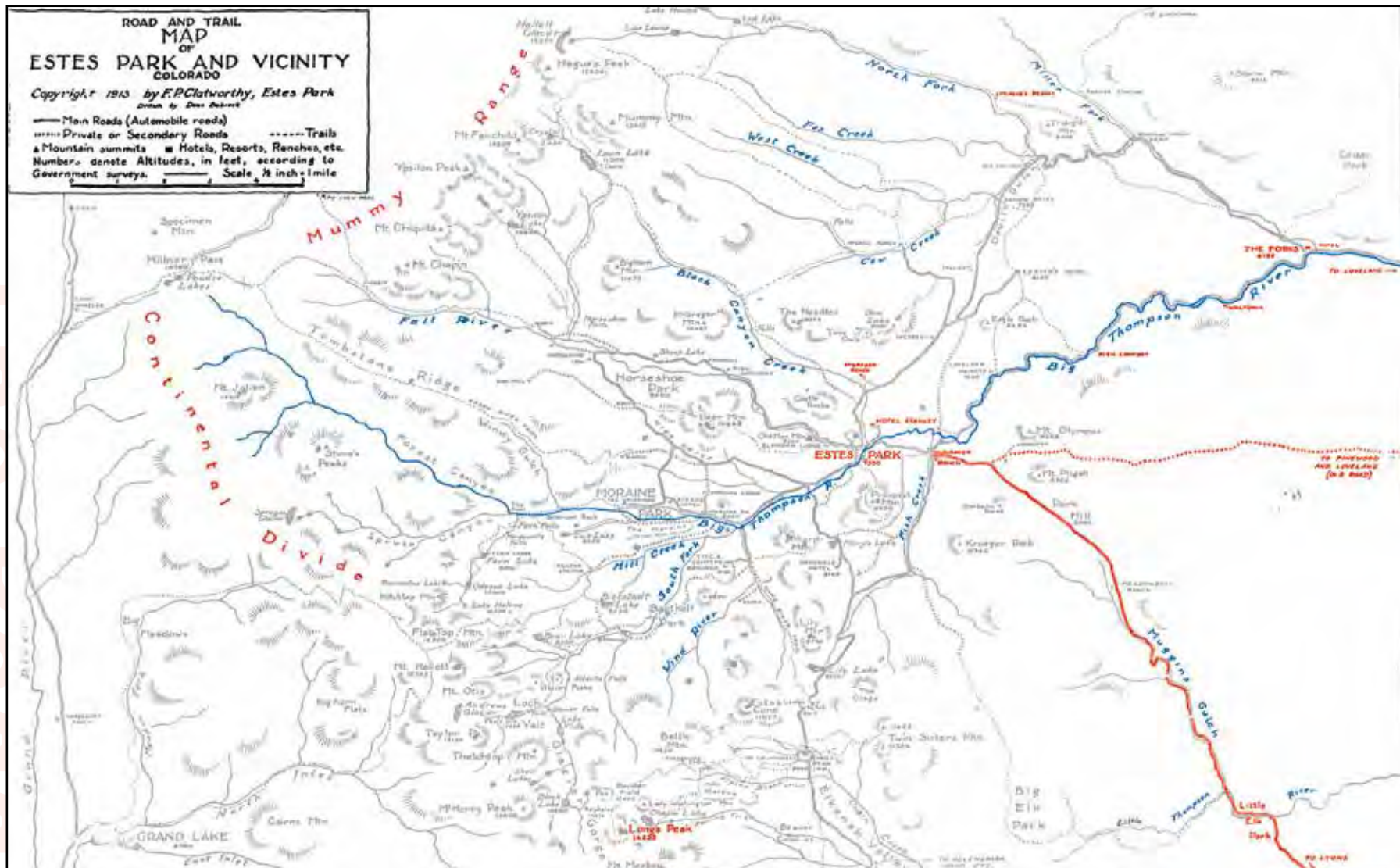


Image source: U.S. Department of Interior, National Park Service, Office of History and Historic Architecture. 1971. Rocky Mountain National Park Historical Background Data. By F. Ross Holland, Jr. March. https://www.nps.gov/parkhistory/online_books/romo2/holland.pdf

Figure 2-1: 1913 Map of Estes Park and Vicinity

1820-1840



Rocky Mountain fur trade peaks

1858



Mariano Medina settles at mouth of Big Thompson River

was years before the trail could be called a road in any sense.”¹⁰

The arduous journey was evidently worth the strife. “We did not know what we had found,”¹¹ Joel’s son Milton wrote of the upland meadow they called a park, which he defined as “a long, irregularly shaped valley surrounded by lofty mountains and dominated by snow-capped Long’s Peak.”¹² He declared, “We were monarchs of all we surveyed, mountains, valleys, and streams. There was absolutely nothing to dispute our sway. We had a little world all to ourselves.”¹³

As word spread of the area’s natural beauty, the Estes family became unofficial hosts to a variety of travelers. One such visitor was William Byers, owner and editor of the Rocky Mountain News, who traveled to the area in 1864 in his first attempt to scale Long’s Peak. Simply arriving was a feat in itself. He wrote of crossing the “beautiful but swift” St. Vrain River seven times, turning back after following the wrong fork, negotiating dense stands of vegetation “higher than the horse’s backs,” and repeatedly ascending “lofty ridgelines” followed by “steep, sliding descents” — the last of which necessitated abandoning his wagon. But

As word spread of the area’s natural beauty, the Estes family became unofficial hosts to a variety of travelers.



Image source: Fort Collins Museum of Discovery, #H01826A

William Byers named the mountain valley in honor of the Estes family in 1864.

the toils of the trip were soon forgotten when, upon seeing the landscape before him, Byers hailed it as “the very gem of beauty.”¹⁴ Although Byers surmounted multiple obstacles just to reach the valley, the summit of Long’s Peak eluded him. Chagrined by his failure, Byers wrote of the peak, “Not a living creature, unless it had wings to fly, was ever upon its summit, and we believe we run no risk in predicting that no man will ever

be.”¹⁵ Imagine his vexation when, finally summiting in 1868, he found evidence that Native Americans had beaten him to the top.¹⁶

Impressed not only by the grandeur of the valley, but the graciousness of the Estes family, Byers named the mountain valley in honor of his hosts in 1864, predicting that “eventually this park will become a favorite pleasure resort.”¹⁷

1860



Joel Estes settles in Estes Park area

1860



Mariano Medina establishes Miraville

Explorers and travelers sensationalized the area's strangeness, unpredictability, and breathtaking scenery.

Despite the honor, Joel Estes and his family would not remain to see that day. The severe winter of 1864/1865 proved enough for the Estes clan, who left their signature park for “a milder climate and a wider range for the cattle.” In 1866, Joel Estes sold the park to Michael Hollinbeck and a man simply named “Buck” for a yoke of oxen.¹⁸

Notwithstanding the departure of the town's founding family and the poor condition of the only known means of access, changes were “sweeping across this mountainous landscape in the decade after Joel Estes and his family sold and moved out...a time that brought official government explorers, more mountain climbers, more hunters, more subsistence ranchers and settlers. It was a time that saw a flurry of health seekers, promoters, and literate tourists.”¹⁹ Explorers and travelers sensationalized the area's strangeness, unpredictability, breathtaking scenery, and wilderness. They romanticized the West as wildly divergent from the known and predictable patterns of life anywhere else. The American West was dangerous, but also very interesting.²⁰



Image source: Colorado State University

During the late 1860s, ever-larger groups of summer vacationists descended upon Estes Park. “Although the existing roads were roads in name only, that did not stop the influx of visitors coming up from the hot and dry towns along Colorado's Front Range and, increasingly, from places farther east and even Europe.”²¹ In 1873, a

The stunning valley that would become Estes Park and its surrounding peaks were hailed as “the very gem of beauty.”

1860s

Agricultural development begins in Loveland area

1860s

Tourism to Estes Park increases dramatically

reporter vacationing in the town noted fellow travelers from Denver, Longmont, and Greeley, as well as the more distant cities of Chicago, Philadelphia, and New York.²² But reaching this mountain haven remained a challenge. Newcomers to Estes Park attempted to further improve the road Joel Estes had traveled, removing rocks and brush along the creeks. However, their efforts appear to have been mere drops in a bucket. A woman traveling by prairie schooner from Iowa to Estes Park in 1874 declared that the route was called a road “only by courtesy.”²³

Isabella Bird, an adventurous Englishwoman and “literate tourist,” visited Estes Park for three months in 1873 and left an indelible linguistic mark in the minds of her readers. “Her romantic imagination and descriptive pen painted vivid portraits of the region’s inhabitants and its natural features.”²⁴ Stirred by such images and tales of a mythologized West, travelers increasingly poured into the region seeking the “peerless sunrises and sunsets, its glorious afterglow, its blazing noons, its hurricanes sharp and furious,

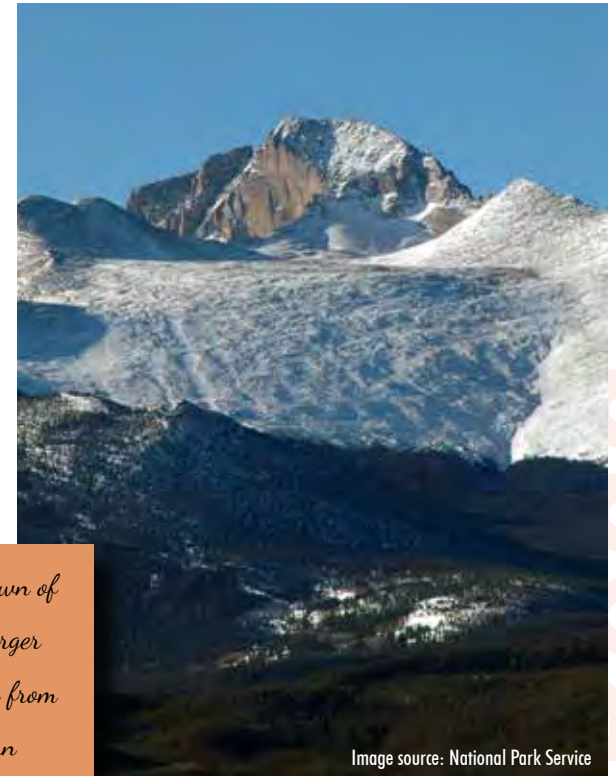


Image source: National Park Service

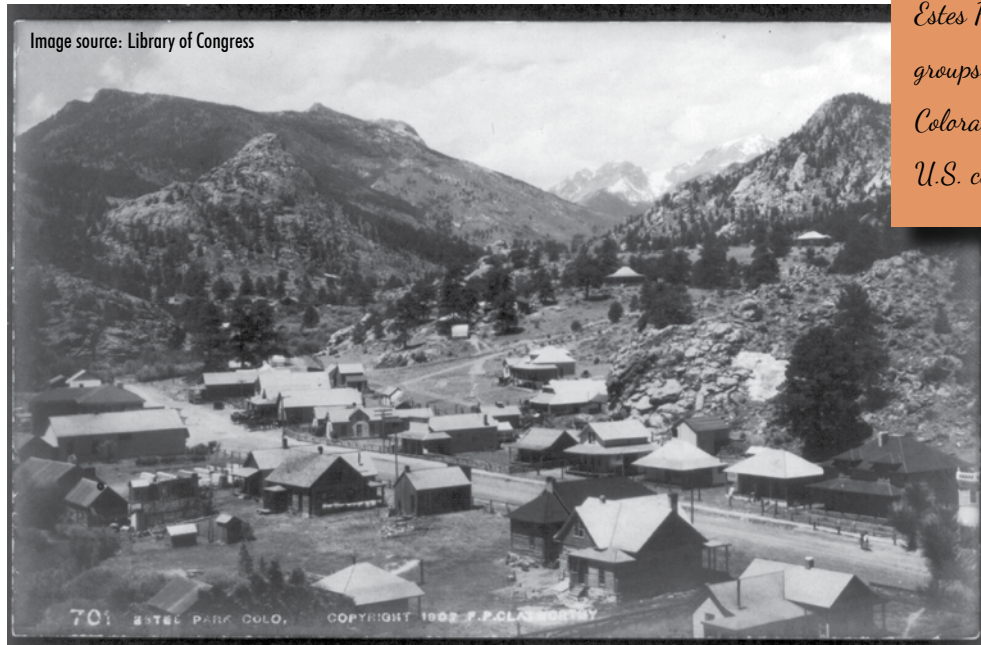


Image source: Library of Congress

Longs Peak (right) and the Town of Estes Park (left) lured ever-larger groups of summer vacationists from Colorado’s Front Range, eastern U.S. cities, and Europe.

Reaching the mountain haven of Estes Park remained a challenge.

1862

Overland Stage Line moves to Colorado

1862

Homestead Act is enacted

The route to Estes Park was called a road “only by courtesy.”

its wild auroras, its glories of mountain and forest, of canyon, lake, and river”²⁵ that Bird (shown at right with horse) so passionately portrayed. Other enthusiastic travelers also whetted the appetite of those seeking the wonders of Colorado’s wilderness. In his 1867 book *Colorado: A Summer Trip*, Bayard Taylor prophesied, “Colorado will soon be recognized as our Switzerland.”²⁶ In the same year, author Ovando Hollister reported that “rambles in the Mountains, riding, hunting, bathing, fishing, berrying, camping out, living on air, puts new cheeks on old bones and paints them the richest brown.”²⁷ With such vociferous praise, rapid change was close at hand.

The Earl of Dunraven (shown lower right), who was perhaps the most significant early contributor and advocator for the development of Estes Park and Big Thompson Canyon as a tourist destination, arrived from England to hunt big game in 1872. Along with Isabella Bird, he represented “a distinctly curious generation of people, investigating regions for adventure or excitement as eagerly as

[Ferdinand] Hayden or [John Wesley] Powell explored for science.”²⁸ However, it appears Dunraven overstepped his bounds. Because he became so charmed with the area, he “tried to take all the park for his own enjoyment and that of his friends,” often through fraudulent means.²⁹ The locals “disliked his heavy-handed ways,”³⁰ and when the Denver newspapers learned of his scheme, they “put the glare of publicity on it.”³¹ Although Dunraven soon packed his things and moved back to England, his legacy persisted. “Perhaps the most important mark he left,” noted an author of the area’s history, “both intentional and inadvertent, was the impetus he gave to the resort industry of the area by his activities and his writings.”³²

As word of Estes Park’s glories spread, more and more people succumbed to

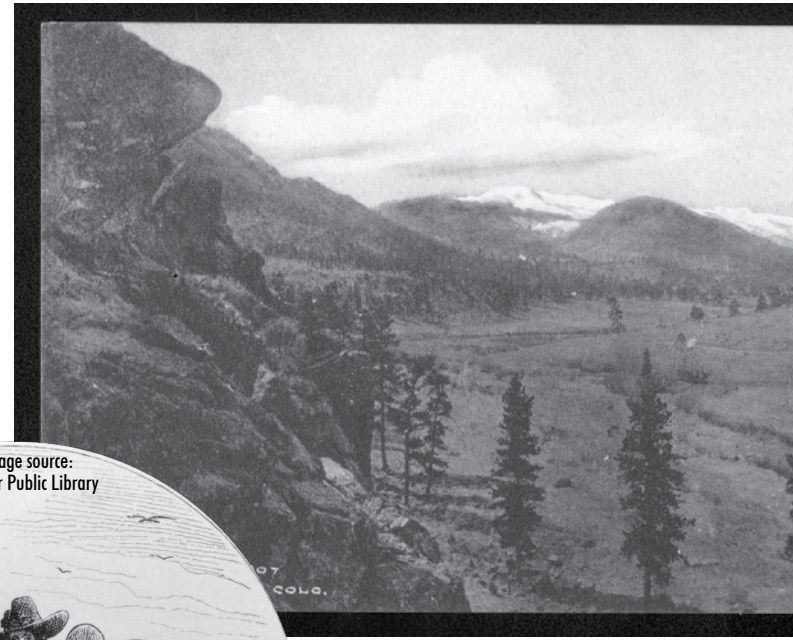


Image source:
Denver Public Library

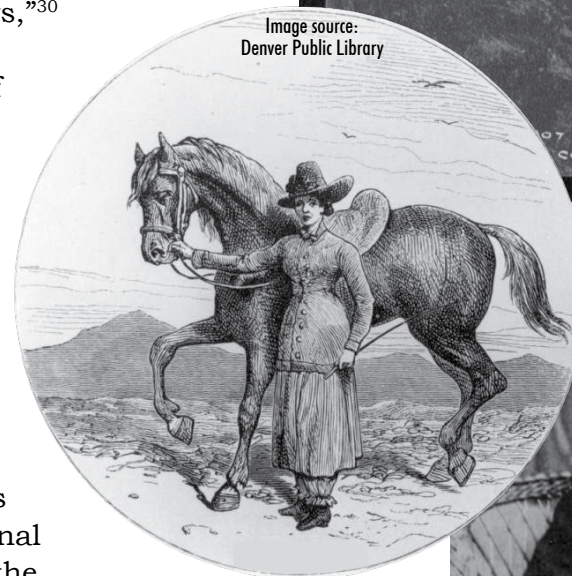


Image source: Fort Collins Museum of Discovery, #H08964

1864

William Byers first visits
Estes Park area

1864

William Byers names Estes
Park after Estes family

Image source: Library of Congress



its allure, including Enos Mills, a sickly Midwestern teenager. The promise of health bestowed by fresh mountain air and clean living was enough to convince him to hitchhike to Estes Park from Kansas in the middle 1880s. Clearly, the move suited him. He made his first of 40 solo ascents of Long's Peak at the age of 15, and an additional 300 ascents as a guide. After a chance encounter with naturalist John Muir, Mills devoted his life to conservation and activism. His tireless efforts to preserve the area around Long's

Peak led to the establishment of Rocky Mountain National Park in 1915.³³ Two years later, the Town of Estes Park was officially formed, and with it, the beginnings of local government.³⁴

Meanwhile, things were stirring on Colorado's plains, 20 miles downstream. While tourism was fast becoming the primary industry in Estes Park, agriculture was the driving force on the east side of Big Thompson Canyon

Early visitors, such as Isabella Bird and the Earl of Dunraven (opposite page), were deeply influenced by the beauty of Estes Park and, in turn, influenced those that followed.

As word of Estes Park's glories spread, more and more people succumbed to its allure.

1864/1865



Severe winter
hits Estes Park

1866



Estes family leaves
Estes Park

Image source: Fort Collins Museum of Discovery, #Modena_Mariana



Mariano Medina (above) was the Big Thompson Valley's first permanent settler (home at right) and entrepreneur, forming the Town of Miraville near present-day Loveland.

The area that would become the City of Loveland began with a small settlement at the crossing of the Big Thompson River.

starting in the late 1860s. Settlers moved into the area between 1867 and 1890, generally in response to the Homestead Act of 1862. Two fledgling settlements would come and go before a third — and lasting — attempt took hold, anchored by construction of a new railroad.³⁵

The area that would become the City of Loveland, located near the mouth of the Big Thompson Canyon roughly 30 miles east of Estes Park, began with a small settlement at the crossing of the Big Thompson River around 1858.

Mariano Medina, formerly a trapper and scout, was the Big Thompson Valley's first permanent settler and entrepreneur. With judicious foresight, he constructed a sturdy toll bridge over the Big Thompson River. The bridge, which rested on pilings driven into the bottom of the river and supported by substantial cribbing on either side, "was well above the level of the river even during flood stage." He charged travelers one dollar to cross his bridge, likely increasing it when the river was flooding.³⁶



Image source: Fort Collins Museum of Discovery, #H01421

Medina established a new town that the *Rocky Mountain News* dubbed "Miraville" in 1860, and recruited Mexican families from Taos to work the land and populate the

1867

Writer likens Colorado to Switzerland

1867-1890

Settlers move into Loveland area

small village. In 1862, the Overland Stage Line moved from the Oregon Trail in Wyoming to the Overland Trail route in Colorado to take advantage of the growing Denver market. This route crossed the Big Thompson River at Medina's small settlement, and essentially turned Miraville into a stage station, known as Fort Namaqua or Marion's Crossing.³⁷ Around this time, homesteaders also established farms and ranches in the Big Thompson Valley and along the Big Thompson River west of modern-day Loveland.³⁸

Although the town continued to grow throughout much of the 1860s, by the time of Medina's death in 1878, most of the settlement had been abandoned for the growing community of St. Louis developing nearby. Andrew Douty had relocated his flour mill from Boulder to this area, spurring growth of a small settlement around the mill. As part of a marketing strategy, he began printing "St. Louis" on his flour bags, inspiring the community to adopt the same name. The community flourished for much of the 1870s.³⁹



The Town of Loveland evolved at the mouth of the Big Thompson Canyon from various earlier settlements, eventually anchored by the Colorado Central Railroad.

In 1873, David Barnes moved to the Big Thompson Valley from Golden to farm 320 acres of wheat immediately north of the Big Thompson River. When his friend William A. H. Loveland, the President of the Colorado Central Railroad, alerted Barnes to news that a railroad line would soon extend from Denver to Fort Collins, he began platting an 80-acre town near the proposed line. By December of 1877, the rail company had completed the Loveland train depot in what was once Barnes' wheat field, bypassing St. Louis and Namaqua.⁴⁰

David Barnes began platting a town near the proposed rail line.

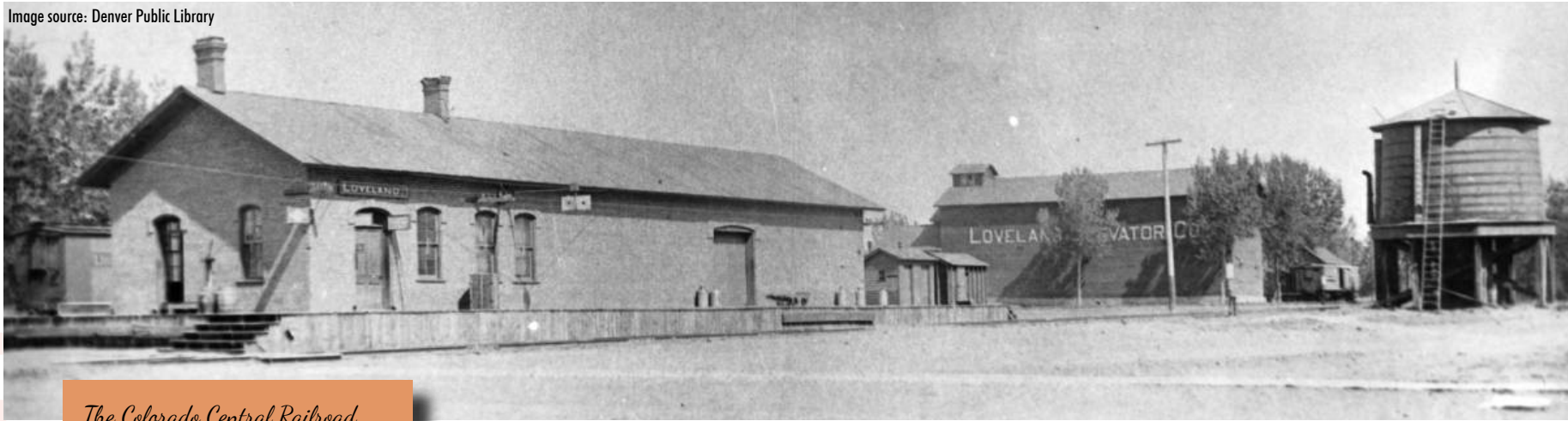
1868

William Byers summits
Long's Peak

1870s

Community of St. Louis
flourishes

Image source: Denver Public Library



The Colorado Central Railroad Depot in Loveland was built in 1877. Smaller, nearby settlements relocated to Loveland due to the presence of the railroad.

On May 11, 1881, the Town of Loveland was formally incorporated.

Construction of Barnes' town began shortly thereafter. Two pioneer merchants "took a gamble on the new town" and purchased lots from Barnes for \$350, immediately erecting the community's first substantial building.⁴¹ Merchants from St. Louis, a mile upstream, began relocating closer to the railroad, realizing their town would not survive without it. Homes were erected soon after, and on May 11, 1881, Barnes' town was formally incorporated.

Although many residents suggested the name "Barnesville" for their new community, David Barnes opted to name the town after his good friend Mr. Loveland, who had so generously tipped him off to the railroad's coming.⁴² As Barnes had likely anticipated, the railroad led to rapid growth. Roughly 250 townspeople called Loveland home in 1882; by the close of 1885, its population exceeded 900⁴³ — a 260 percent increase in the span of just three years.

Some intrepid pioneers ventured beyond Loveland and up the Big Thompson Canyon, also propelled by the Homestead Act.⁴⁴ Although the

canyon was originally used for ranching and homesteading, recreational and leisure activities, such as fishing, camping, and hiking became more commonplace in the 1920s and 1930s as interest in the American West piqued the nation.⁴⁵ As a result, many people flocked to Big Thompson Canyon both permanently and seasonally, attracted by aesthetically pleasing streamside building lots along canyon bottoms and gently sloping areas, particularly the relatively large terraces at stream confluences.⁴⁶ Plat commissioners (who typically make recommendations regarding subdividing plots of land) purchased acreage along the river during the 1920s and 1930s, then

1872

Earl of Dunraven
arrives at Estes Park

1873

Isabella Bird arrives
at Estes Park

People flocked to Big Thompson Canyon.

subdivided large parcels into small acreage plots perfect for single-family cabin retreats and oases. A sprinkling of summer cabins began sprouting in the canyon as visitors sought to return to the wilderness on a regular basis. Early patent owners also began selling portions of their homesteads to developers, who subdivided the plots into small residential communities. Some of these communities, including Drake (whose subdivision dates to July 1910) and Cedar Cove (November 1920), remain in the Big Thompson Canyon today.⁴⁷

Among the earliest canyon residents were D. T. and Lillian B. Pulliam. The couple decided to build a cabin on a flat and inviting meadow within the canyon. The task seemed easy. However, they were perplexed by the presence of a large log that was lodged in the meadow, curiously high above the river. Taking this sign as a warning, they instead built their cabin on the hillside, which has since “survived and endured.”⁴⁸

Development of Rocky Mountain National Park greatly increased national

and regional interest in the area. More than a quarter million people visited “Rocky” in 1920, just five years after it opened in 1915,⁴⁹ perhaps due in part to dubious early marketing efforts. In 1916, the park’s second supervisor decided that it “needed special publicity to attract



Image source: Denver Public Library

Recreational activities became popular in Big Thompson Canyon, where small communities like Loveland Heights (above) sprang up on the river's banks.



Image source: History Colorado

1873

David Barnes arrives at Big Thompson Valley

1874

Writer visiting Estes Park notes road's bad condition

Rocky Mountain National Park lured visitors from afar.



Image source: Lulabeth and Jack Melton Collection

Although Enos Mills was focused on conservation and preservation of Rocky Mountain National Park, he nonetheless bid farewell to “The Eve of Estes” as she prepared to spend a week frolicking in the park.

visitors,” specifically in the form of a “Modern Eve.” In cooperation with a leading Denver newspaper, he employed a pretty girl in a leopard-skin dress to “roam through the park, skipping about and catching fish with her hands and picking berries.” The park ranger would meet her at regular intervals to deliver street clothes so she could retire to a local inn for a few days while the leopard-skin garment was being dry-cleaned. The propriety of this advertising tactic did not sit well with the park



Image source: Colorado State University

ranger, who soon left his position to scale timber in France for the Army instead.⁵⁰

Despite the demise of the Modern Eve, the grandeur of Rocky Mountain National Park was sufficient to lure visitors with or without her. Estes Park catered to an ever-growing tourist population that sought the beauties of Colorado and the American West with new trails, buildings, conservation efforts, and roads, most notably Trail Ridge Road, which snakes through the alpine reaches of Rocky Mountain National Park as part of US 34.⁵¹ Small communities like Estes Park offered visitors a glimpse into the genuineness, charm, and beauty of rural western life, and provided unique activities such as horseback riding, fishing, hiking, camping, specialty shopping, and wildlife viewing.⁵²

However, reaching the town’s famed attractions was no small task. Without a railroad to Rocky Mountain National Park, tourists seeking Estes Park’s promised splendor arrived at Loveland initially via Miraville’s early stagecoach station, which was eventually replaced by Loveland’s railroad, coming tauntingly close to the famed park’s doorstep. The ensuing challenge was

1875

Petition circulates to extend
Bald Mountain Road

1875

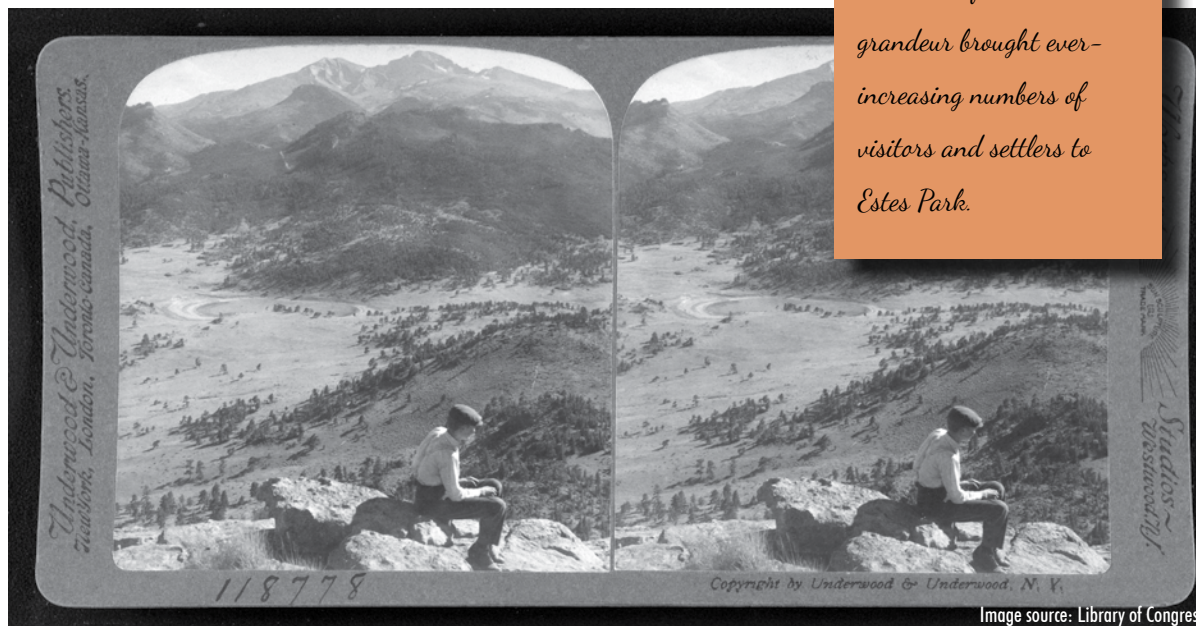
Alex MacGregor completes
toll road to Estes Park

getting from Loveland to the mountains, as “the roads to and from the valley remained a trial even for those who came prepared.”⁵³

Finding himself with a bit of extra investment money, a man named Alex Q. MacGregor — “a shrewd businessman and lawyer”⁵⁴ — recognized opportunity in the troublesome condition of the road to Estes Park that led from present day Lyons, southwest of Loveland — likely the route Joel Estes had originally followed. MacGregor improved the rough

dirt path along the St. Vrain Canyon (generally the current US 36 route) with funds from the Territorial legislature, which also gave him the right to collect tolls on the road for the next 10 years. In 1875, his Estes Park Wagon Road Company completed the MacGregor Toll Road, which traveled east of Little Elk Park and conveniently terminated at his own ranch.⁵⁵ Each horse team traveling the road was charged a dollar per trip,

Views like this one of distant Longs Peak and tales of mountain grandeur brought ever-increasing numbers of visitors and settlers to Estes Park.



Round Mountain National Recreation Trail

Development of what is now known as the Foothills Nature Trail, directly across from Cedar Cove, is an example of early enthusiasm for recreation within the Big Thompson Canyon. Constructed around 1905, the trail lured travelers through a landscape of pines and grasses, dotted by granitic boulders and cobbles. The trail was converted to an unimproved dirt road some time prior to 1961, and appears to have transitioned multiple times between a trail and a road, eventually reverting to a trail again some time before 1989. The trail continues west to an old stone shelter built by the Civilian Conservation Corps (CCC) that overlooks the Big Thompson Canyon. Current aerial photographs show the trail eventually becoming Idelwild Lane, intersecting US 34 over one mile west.

Shortly after ascending approximately 480 feet from the trailhead to a ridge, the Foothills Nature Trail is joined by the Summit Nature Trail (also referred to as the Round Mountain Trail). Most of this trail was constructed by the CCC in the 1930s. Portions have been rebuilt by the Loveland Ranger Force, a group of teenagers from Loveland. This trail continues south, contouring around the landscape to the summit of Sheep Mountain and traveling through several granite outcroppings and forests of ponderosa pine and Douglas fir. Views from the trail include the Big Thompson Canyon, the eastern plains of Colorado, and Pinewood and Carter Lake reservoirs.

Currently, these two trails comprise the Round Mountain National Recreation Trail, which was designated in 1981 as a National Recreation Trail for demonstrating its significance to the American Trail System.¹⁵⁷

Reaching Estes Park’s famed attractions was no small task.

1876

Congress creates state of Colorado — Centennial State

1877

Loveland train depot is established

2-16 – The River and the Road

Image source: Collection of P. Steinholtz



The stage line to Estes Park was one of "grandeur."



although regulars were rewarded with discounted rates of 50 or 60 cents.⁵⁶ The road generated \$31 in its first three days of business, of which a profit of \$7 remained after paying the tollkeeper and laborers.⁵⁷ Although MacGregor's road was a significant improvement over the existing route, it was "plagued with difficulties from the very start." In particular, "a toll road was exceedingly unpopular with the people of [Estes] Park."⁵⁸

Visitors travelled MacGregor's road by horse-drawn wagons and stage lines, which operated between Longmont and

Estes Park as early as 1878.⁵⁹ In the intriguingly titled *Fifteen Thousand Miles by Stage*, an early visitor describes riding into Estes Park by stagecoach from Longmont through Lyons in 1878. Following a "newly improved toll road" carved into the hillsides four years earlier (most likely the MacGregor Toll Road) via Alexander MacGregor's Estes Park Wagon Road Company, she recalled, "the stage ride was one of grandeur, from the very first turn of the wheels, up, up, up, along the zigzag trail until the day was nearly spent...."⁶⁰

Improvements to the existing road to Estes Park were needed to help ensure visitors could reach the town and Rocky Mountain National Park.

1878

Mariano Medina dies

1878

Visitors begin using MacGregor's road

Horse-drawn stagecoaches, such as in this postcard of a stage line between Grand Lake and Granby on the west side of Rocky Mountain National park, were likely used to reach Estes Park.



Image source: Fort Collins Museum of Discovery, #H11154

As for many Colorado visitors today, vacation trips to the mountains in the 1800s typically involved camping out, which was “always popular.” However, camping at that time was a major undertaking, and travel to Estes Park required a matter of days rather than hours. In his *Thrilling Echoes from the Wild Frontier* published in 1893, J. S. Flory itemized the plethora of items required for a typical journey to Estes Park by means of horse-drawn wagon. His mélange included “a camp tent, camp stove, buffalo robes, blankets and other necessary bedding, overcoats, rubbers, umbrellas, boxes and sacks of provisions, cooking utensils, table furniture, guns and ammunition, fishing tackle, feed for our team, picket ropes,” and other items “too tedious to mention.”⁶¹

Ten years after it opened, MacGregor sold his toll road around 1885 to a group of Longmont businessmen who “made a serious mistake by immediately raising the toll charges.”⁶² Settlers who never took kindly to a toll road in the first place reacted accordingly, leading the owners to post a man at the gate

Visitors travelled to Estes Park via horse-drawn wagons and stage lines.

1881

Town of Loveland is incorporated

1882

Loveland population reaches 250



Image source: Denver Public Library

Traveling through the Big Thompson Canyon in 1904 by covered wagon required camping out, which was a major undertaking.

with orders to shoot to kill anyone refusing to pay. In response, teamsters who used the road pulled the gate down, leading to a protracted legal case that went all the way to the Colorado Supreme Court. The road owners were ultimately defeated, and this road to Estes Park, which today generally follows US 36, was once again free to the public, although poorly maintained.⁶³

As the 1900s approached and settlement in the region increased, a campaign evolved to develop a more

like Yellowstone, Glacier, and Grand Canyon, a railroad never served Rocky Mountain National Park — Estes Park’s main attraction.⁶⁵ Loveland citizens contributed money and labor to build the 40-mile Bald Mountain Road, which traveled over Bald Mountain, through Rattlesnake Park, up Pole Hill, along Muggins Gulch, and across Solitude Gulch, evidently terminating just short of Estes Park (see Figure 2-2 next page). The “easiest” way into Estes Park from that point was to “drop into Emmons Gulch — drop, in this case, being the

direct road from Loveland to Estes Park.⁶⁴ Unlike other western national parks

right word.”⁶⁶ On the eastern end, the road completely avoided the Narrows of Big Thompson Canyon by several miles. The route followed a series of valleys and ridges, traversing steep and slippery hills, cresting ridgelines, and swinging sharply around corners as it dropped into gulches. Only a light wagon and a sturdy team could handle the ascent, with the driver periodically walking behind the wagon to block the wheels so the team could rest.⁶⁷

The road’s challenges resulted in reroutes and modifications to reduce the grade and connect to the existing

A more direct road from Loveland to Estes Park was needed.

1885

Loveland population reaches 900

1885

MacGregor sells toll road

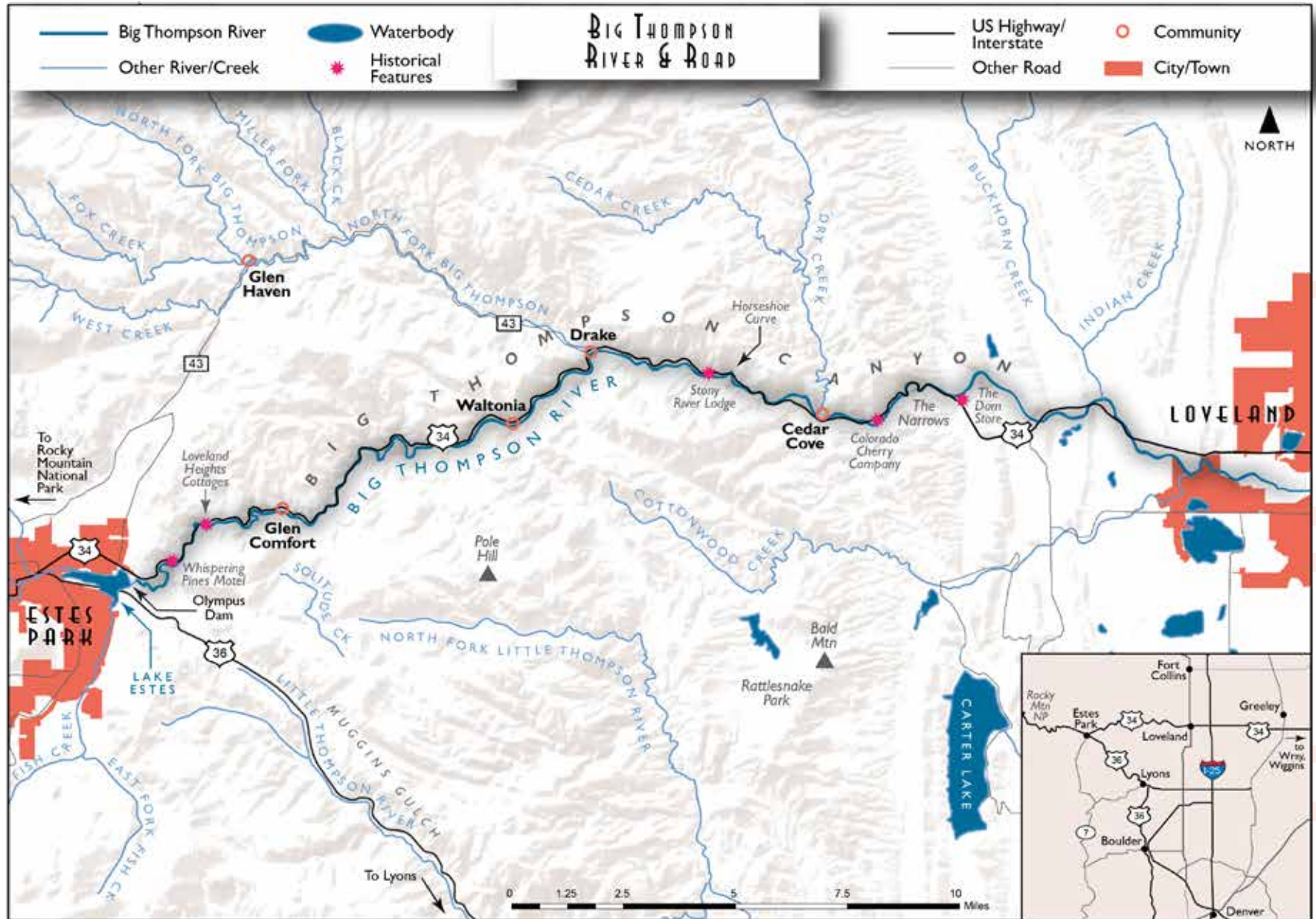


Figure 2-2: Big Thompson River and US 34

Middle 1880s

Enos Mills arrives at
Estes Park

Late 1880s

Bald Mountain Road
is established

People have long enjoyed picnics beside the Big Thompson River, as in this photo taken between 1910 and 1920 with a Ford automobile parked nearby.



Image source: Denver Public Library

toll road just outside Estes Park. When a petition with 25 signatures was presented to area commissioners in 1875 to extend the road all the way to Estes Park, the commission appropriated \$250 — an insufficient amount even by 1875 standards. A subscription was started to solicit donations of money and labor.

Ultimately, most of the labor for the route was donated, and the money gathered was

Building a road through the Narrows was deemed possible.

enough to hire a foreman to oversee the job. Because it was free and open to the public, this improved road saw heavy traffic. One summer, the road carried the mail and all other traffic to Estes Park when the route from Lyons washed out, and a stage line even traveled this road between 1888 and 1890. This “fairly good road” was used to reach Estes Park from Loveland until 1903.⁶⁸

The precursor to US 34 evolved as a feat of engineering through a narrow, high-walled chasm known as “the Narrows.”

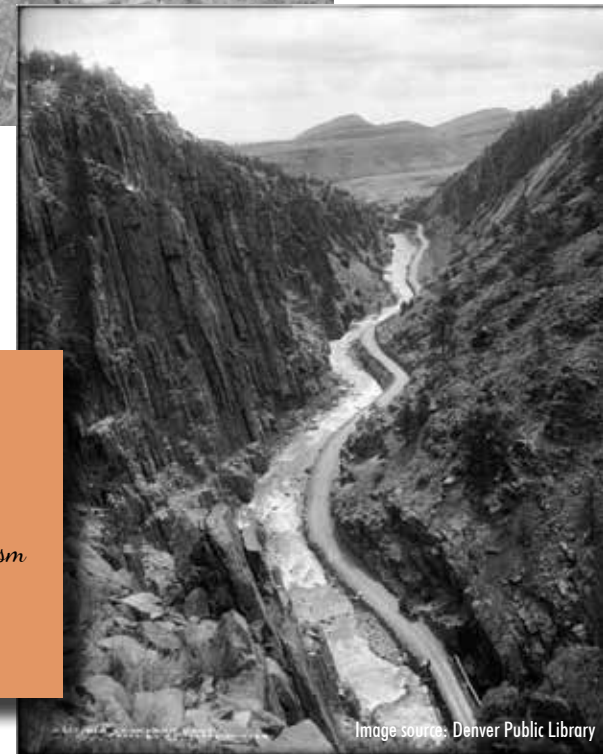


Image source: Denver Public Library

1887



F.O. Stanley invents steam-powered automobile

1888-1890



Stage line uses Bald Mountain Road

Riley's Road to Estes Park from Loveland was "rough and bad."

But "fairly good" wasn't quite good enough, and people began considering another route.

In contrast to the original road from Lyons to Estes Park, the road that would become US 34 emerged not as a slowly-evolving trail — although people did travel up and down the Big Thompson Canyon during the 1800s — but as a feat of engineering. A man named C. H. Cond, who was familiar with the canyon, inspired a petition for a road through it in 1902. The Larimer County Commissioners hired a civil engineer to conduct a survey, who determined that building a road through the Narrows and along the canyon base was possible.⁶⁹ In December of 1902, the county issued a request for proposals to construct a road "up the Big Thompson River by the most practical route to Estes Park...an approximate distance of 20 miles," and a separate bid request to construct several bridges on the new road, ranging in length from three feet to 100 feet.⁷⁰

Larimer County awarded the contract to William A. Riley for \$24,000, giving him leeway to design and build the

The Overland Stage line brought visitors to Loveland, but a route was needed to take them west to Estes Park (see yellow shading in map at right).

road as he chose.⁷¹ This road became known as Riley's Road.⁷² Riley's Road was completed in 1903, and the Bald Mountain route was soon abandoned, fading into a scar on the mountainsides by 1922. Although Riley's Road was "rough and bad," the uphill climb to Estes Park was preferable to the Bald Mountain route, and the return trip to Loveland was all downhill.⁷³

By today's standards, "Riley's Road" would qualify as a primitive four-wheel drive road. The single-lane, shoulderless road required widely-spaced turnouts, which were built to accommodate oncoming traffic. The grade was just a few feet above the Big Thompson River's water level, and outings to Estes Park were "hazardous if not impossible" when the road was inundated during spring runoff.⁷⁴ Corduroy bridges,

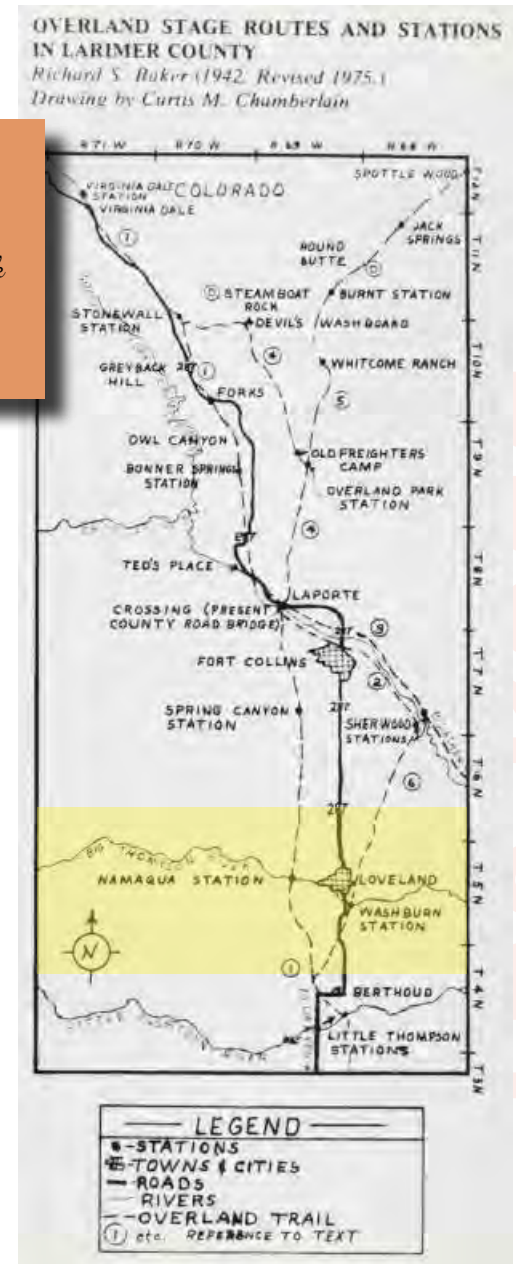


Image source: Fort Collins Museum of Discovery, #H08077

1890s

Cycling craze sweeps country,
spurs Good Roads Movement

1902

Petition circulates for new road
through Big Thompson Canyon

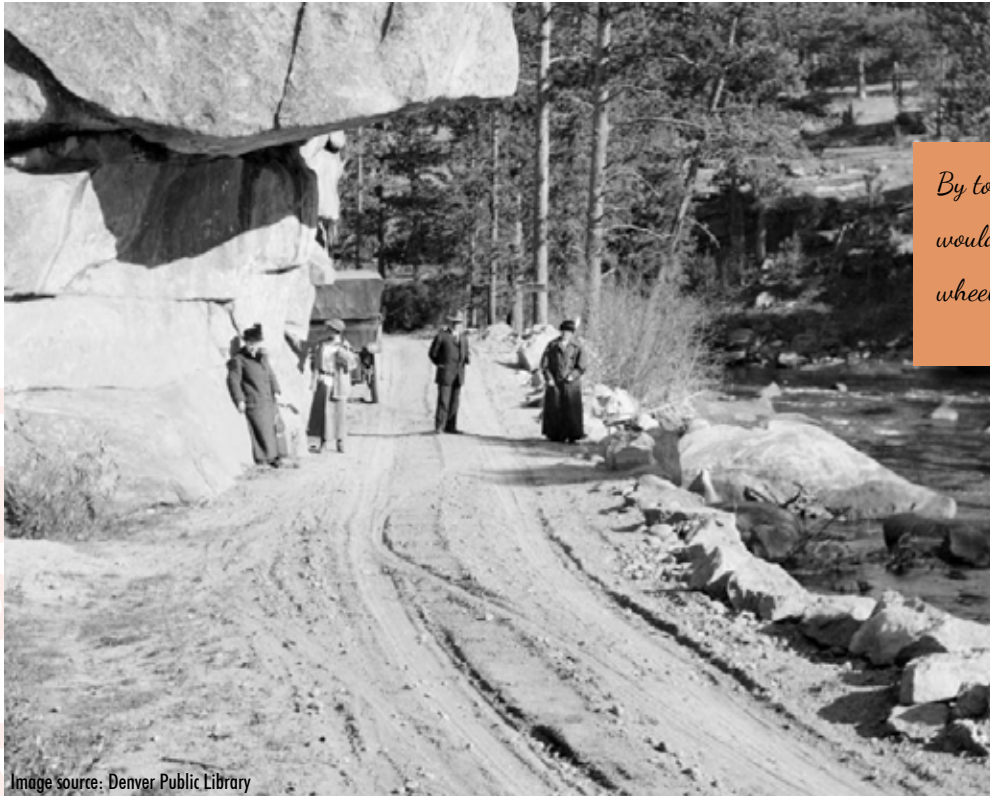


Image source: Denver Public Library

By today's standards, "Riley's Road" would qualify as a primitive four-wheel drive road.

canyon. In one instance later described by Abner Sprague — a passenger on a horse-drawn stagecoach through the canyon who became Riley's chief engineer — the group encountered water rushing from wall to wall. To continue, Sprague had to saddle a horse to find the road bed and lead the coach through the strong currents.⁷⁷

Because he had completed the road at his own expense (with the help of several creditors), Riley claimed ownership of it in 1904, asserting that he was owed several thousand dollars based on the scope and cost estimates provided by the county.⁷⁸ Speaking to Abner Sprague, Riley noted that the county engineer who had conducted the original survey had miscalculated the amount of earth to be removed for the road's construction. While discussing the plans and specifications (which were somehow missing) prepared by the county engineer, Sprague recalls, "I told [Riley] he was crazy, that he should have known he would have to move more material than that to build a bridle path

consisting of tightly-spaced logs, were placed perpendicular across the road in low-lying areas to provide a durable, if jolting, crossing. Horses understandably hated these bridges and had to be led over them.⁷⁵

The questionable condition of Riley's Road did not deter public transportation

enterprises, which began using the road almost as soon as it was finished. A stagecoach line followed the route in 1905 to connect travelers from the Colorado & Southern Railroad in Loveland with Estes Park.⁷⁶ Early stage trips from Loveland to Estes Park could take one to two days, with a night spent at the Forks Hotel halfway up the

Riley claimed ownership of his namesake road in 1904.

1902

Larimer County requests bids for canyon road

1903

William Riley completes road through the canyon

The county engineer had miscalculated the amount of earth to be removed.

20 miles through that canyon, let alone a wagon road.”⁷⁹

At approximately the same time he claimed ownership of the road, Riley, along with two business partners, incorporated the Loveland and Estes Park Electric Railway, with the goal of constructing an electric car line along Riley’s Road connecting Loveland and Estes Park.⁸⁰ This move forced the county commissioners into legal action. In 1904, Larimer County paid Riley a total of \$19,000 of the original road

The road's grade was just a few feet above the Big Thompson River's water level.



Image source: Library of Congress

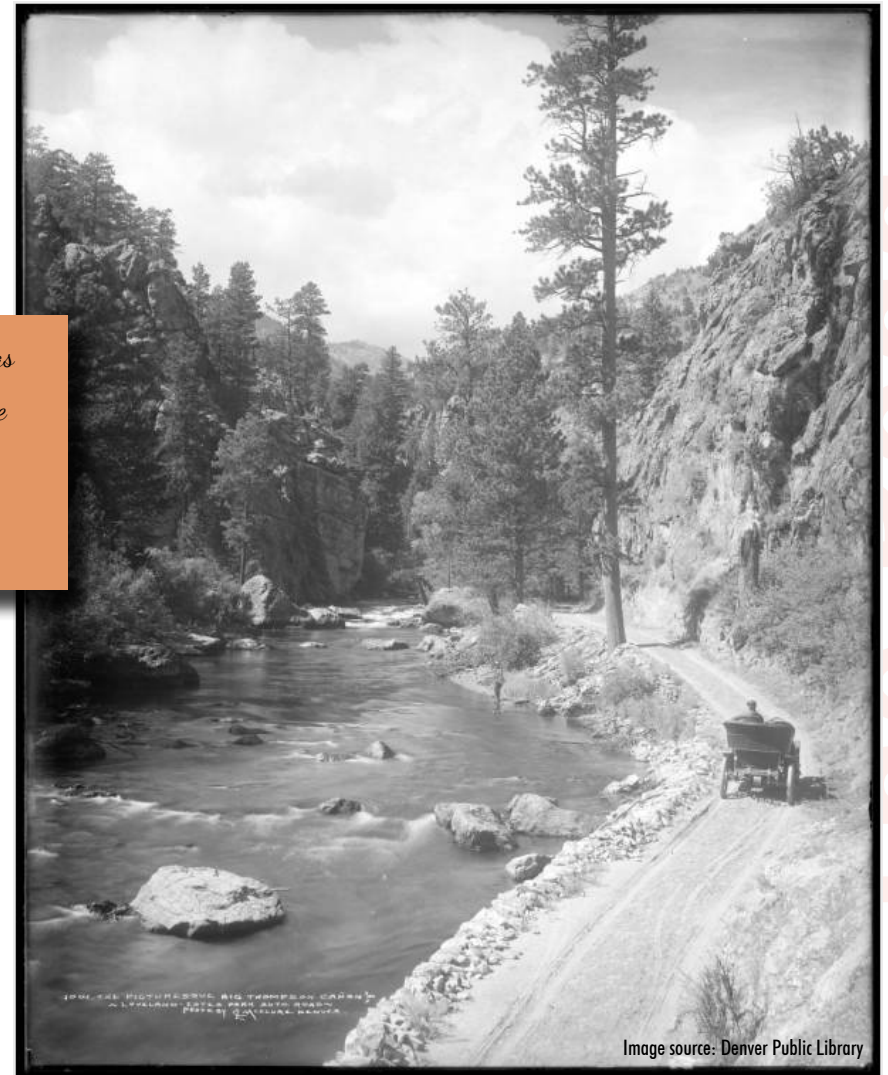


Image source: Denver Public Library

1903

Bald Mountain Road is abandoned

1903

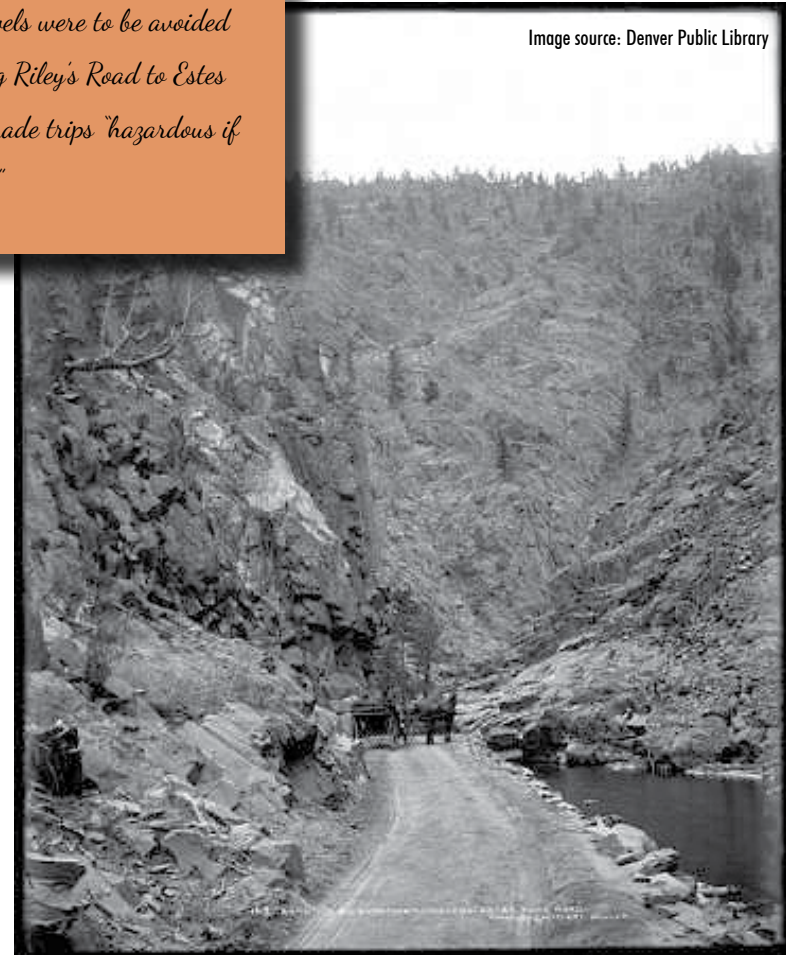
F.O. Stanley arrives at Estes Park



Image source: Library of Congress

High water levels were to be avoided when traveling Riley's Road to Estes Park, which made trips "hazardous if not impossible."

Image source: Denver Public Library



construction contract. However, this final payment was a few thousand shy of the agreed-upon \$24,000, shorting the Bank of Loveland and other businessmen who had furnished goods and materials. The Colorado & Southern Railway, whose line delivered visitors to Loveland, wanted the increased tourist traffic, and therefore kicked in another \$3,000. This sum was divided among Riley's creditors, but represented only a small percentage of what they were due. Writing in 1922, Sprague lamented that "Riley did more work on this road than has been done since for three times twenty thousand dollars." However, speaking of the defrauded creditors, he added, "These men say they never

lost money that did more good."⁸¹ Upon settlement, the roadbed was turned over to the county, thereby killing the future of Riley's electric railway. The route remained a wagon track.⁸²

Perhaps due to the quarrel with Riley over ownership of the road, it appears that Larimer County began referring to Riley's Road as the "Big Thompson Road" after assuming responsibility for it. Yet maintaining the road became a

Riley wanted to construct an electric car line along his road.

1904

Riley claims ownership of the road through the canyon

1904

County partially pays Riley for the canyon road

Maintaining the Big Thompson Road became a headache.

headache. For several years after the settlement, Larimer County performed only enough maintenance work to keep the single-track road passable.⁸³ Sensing a lost opportunity in the neglected road, an enterprising newcomer to Estes Park — Freeland Oscar (F. O.) Stanley — offered the county a deal in 1907. Stanley had money, ambition, and a keen interest in the rising automobile industry. Upon arriving in Estes Park in 1903 at the age of 54 (an occasion Stanley’s friend Enos Mills gushed as “the epoch-making event” in the town’s history⁸⁴), Stanley was already a successful and enterprising inventor and entrepreneur. He brought with him his namesake Stanley Steamer, a steam-powered automobile he invented in 1897 with his twin brother (who ironically died in a car accident in 1918). Relentless automobile promoters,



Image source: Denver Public Library

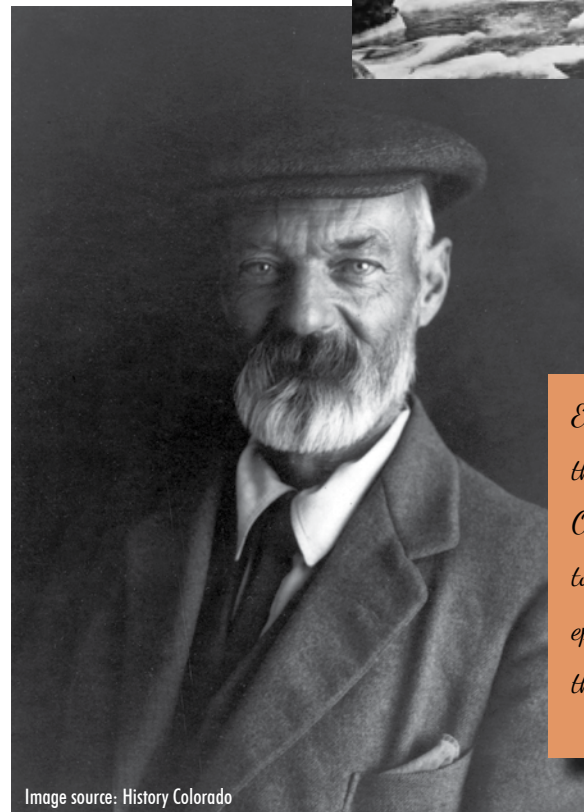


Image source: History Colorado

Enos Mills claimed that the arrival of Freeland Oscar Stanley (at left) to Estes Park was “the epoch-making event” of the town’s history.

1905

Stagecoach line uses
Riley’s Road

1905

Foothills Nature Trail is
established (approx.)

1906

Stanley’s “Rocket” reaches
127 miles per hour

Stanley was already a successful and enterprising inventor and entrepreneur when he arrived at Estes Park.

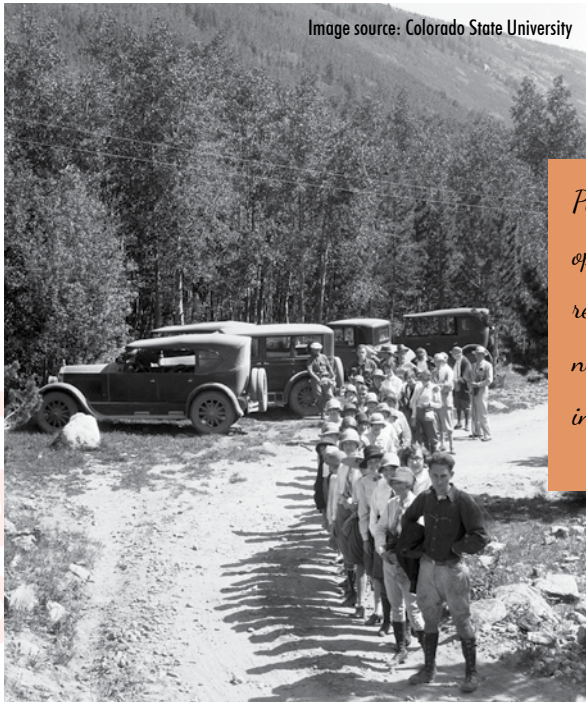


Image source: Colorado State University

People of Estes Park were initially opposed to automobiles, but soon realized that they brought increasing numbers of visitors to the town, including the Stanley Hotel (below).

the “quirky and brilliant” brothers had already shattered existing speed records when their “Rocket” automobile — ingloriously dubbed “the world’s fastest canoe” — reached an astounding 127 miles per hour in 1906.⁸⁵

Stanley made it clear to the people of Estes Park that he was staying for good and would be delivering guests to the grand Stanley Hotel he built in town via his Stanley Steamer Wagon. The hotel, completed in 1909 for \$500,000 “in the wilds 25 miles from a railroad, startled the business world,” thus furthering the town’s publicity and hastening its development.⁸⁶ “This large and adventurous investment required nerve, good business sense, the capacity to see the recreation needs of the future, and showed great confidence in the future of Estes Park,” Enos Mills wrote of the endeavor.⁸⁷

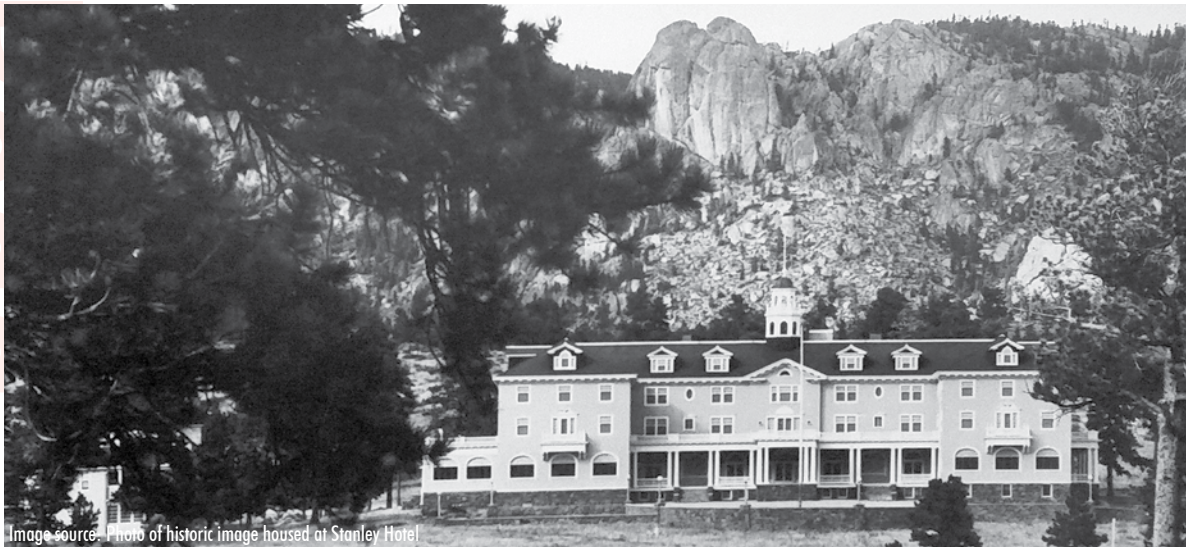


Image source: Photo of historic image housed at Stanley Hotel

According to Mills, “At first, the people of the Park were almost unanimously, and maybe even bitterly, opposed to the automobile. But it was speedy and comfortable, and from the beginning it brought increasing numbers of

1906-1908

Horse-drawn stage lines
transition to auto lines

1907

Stanley offers to maintain
Riley’s Road

Stanley made it clear he would be delivering guests to his hotel via his Stanley Steamer Wagon.

people to the Park and consequently has added to the Park's prosperity and development."⁸⁸ As the automobile became more popular, F. O. Stanley "offered to put the [Big Thompson Canyon] road in good shape."⁸⁹ The only thing he required in return was an exclusive franchise to transport visitors to and from Estes Park. Sensing an impending monopoly, the county and state turned down his offer. Stanley thereupon shifted his focus from the Big Thompson Canyon to the original route from Lyons that would later become US 36.⁹⁰

Less than two years after the establishment of the horse-drawn stage line through the Big Thompson Canyon, a Loveland father-and-son team launched the first "auto stage line" to Estes Park in 1907 under the prosaic but unambiguous name of the Loveland-Estes Park Auto Company, apparently against

Stanley offered to put the road in good shape in return for an exclusive franchise to transport visitors to and from Estes Park.



Image source: Denver Public Library



Image source: Denver Public Library

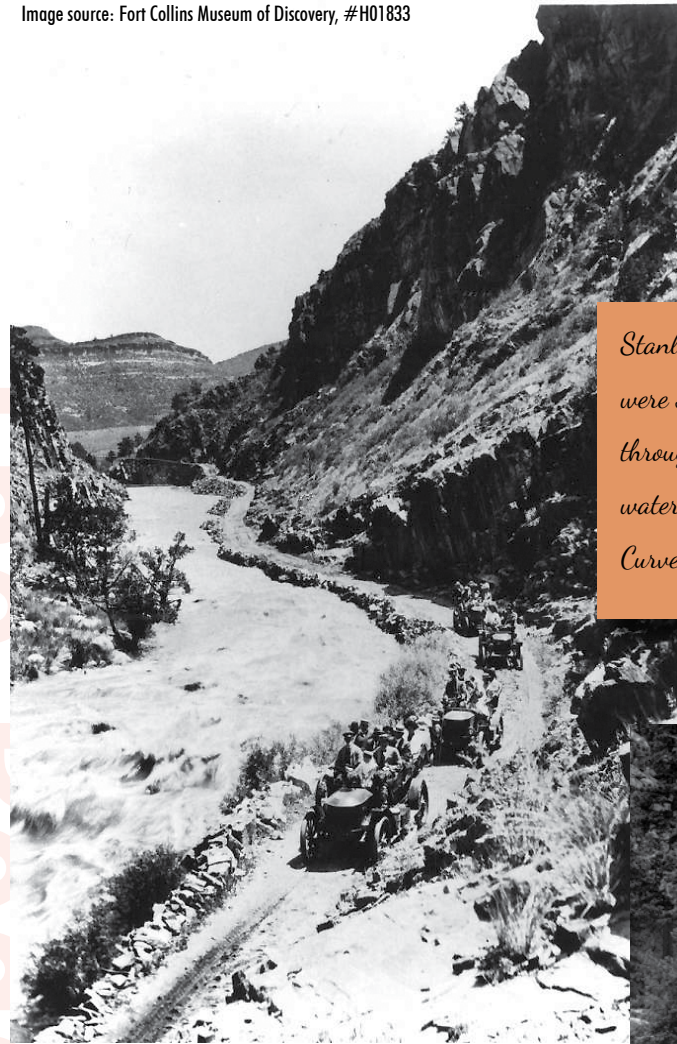
1907

First auto stage line runs through the canyon

1908

Auto company transports 4,000 visitors through the canyon

Image source: Fort Collins Museum of Discovery, #H01833



Stanley Steamer "auto-buses" were soon transporting visitors through the canyon right on the water's edge and around "Devil's Curve," shown below.

Automobiles were speedy and comfortable, reducing the trip to Estes Park from days to hours.

prevailing local wisdom. An Estes Park newspaper noted, "At that time, it was thought that automobiles would never be a success in the mountains..."⁹¹

However, the auto line soon co-opted the stage route, reducing travel time from as much as two days to less than three hours. And F. O. Stanley got a piece of the action after all, as he provided the three five-passenger "touring" Stanley Steamers the company used, showing the naysayers wrong. "The operation of the cars proved all that could be hoped

for...the Stanley Steamer was especially suited to mountain work,"⁹² enthused a journalist. In the span of just two years, the stage line had transitioned from 10 horse-drawn stagecoaches in 1906 to 10 Stanley Steamers by 1908.⁹³ As a result of this outstanding success, the five-passenger vehicles were replaced with nine-



Image source: Library of Congress

1909

Stanley Hotel is built in Estes Park

1909

Colorado State Highway Commission is formed

By 1908, the Loveland-Estes Park Auto Company had transported 4,000 passengers between the two towns.

passenger versions, which in turn were expanded to 12-passenger Steamers — giving birth to what may have been the nation’s first buses and spurring other companies to also begin manufacture of “the bus type of automobile.”⁹⁴ By August of 1908, the Loveland-Estes Park Auto Company had transported 4,000 passengers between Loveland and Estes Park.⁹⁵ Nine years after launching, the owners sold the business to the Rocky Mountain Parks Transportation Company in 1916, at which point they were running 18 Stanley Steamers through the canyon.⁹⁶

As auto traffic along the rickety one-lane Big Thompson Canyon Road increased with the growth of tourism, a new phenomenon rose with it — car accidents. By 1915, reports of head-on collisions, overturned cars, and near-misses throughout Big Thompson

Canyon (as well as other routes to and from Estes Park) were becoming “too frequent to be comfortable.”⁹⁷ Reports were received “almost daily” of accidents in which occupants “barely escaped with their lives.” The canyon walls were reputed to ring with the sound of honking horns blown in warning as drivers rounded blind corners. Luckily, no serious accidents or injuries, aside from minor bruises and totaled cars, had been reported prior to 1915.⁹⁸ This was soon to change. Seven people were injured in 1920 “when their car turned turtle” after it “either skidded or

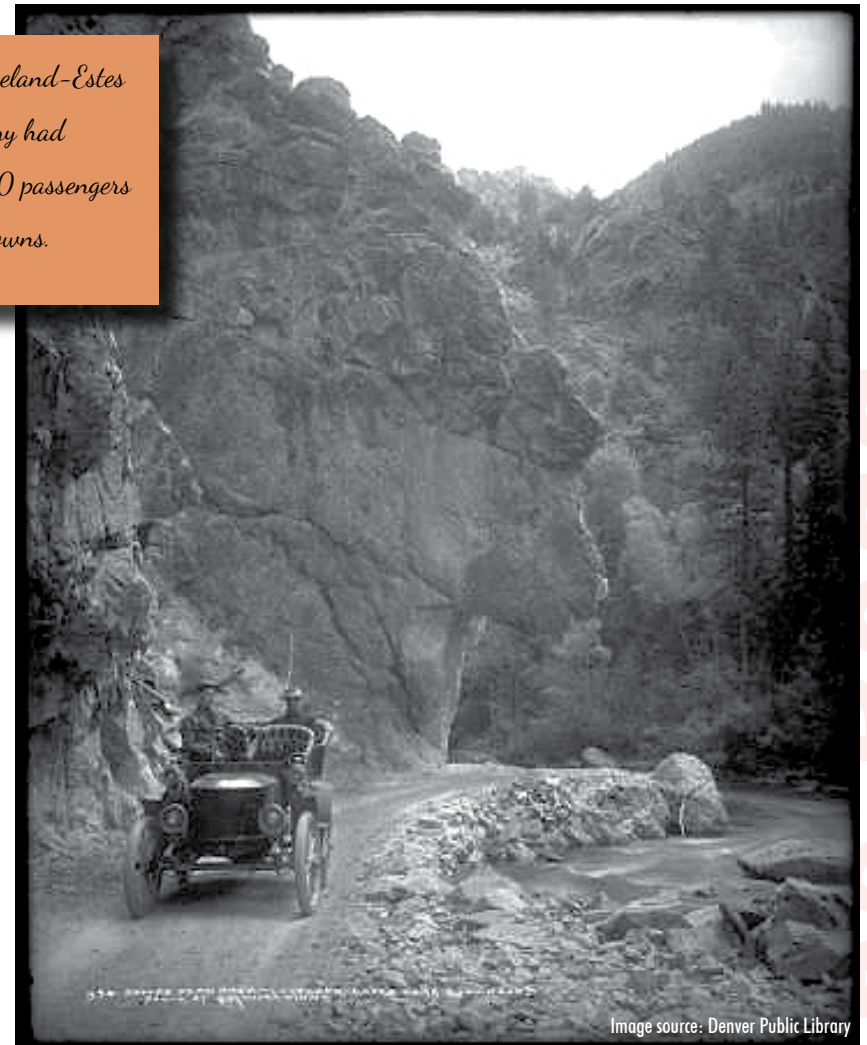


Image source: Denver Public Library

The auto line soon co-opted the stage route.

1910

Community of Drake is established

1912

Canyon road is improved with convict labor

Rocks and logs were thrown into the river to protect retaining walls.

the brakes refused to work, and it was turned up the hill to prevent its falling over the cliff into the Big Thompson River.”⁹⁹ With ominous prescience, a newspaper article published just one month prior noted the increased “dangers to travelers served” in the canyon, including “an open ditch or other danger lurking in the unseen.” The writer exhorted drivers to “Go on the principle that the other [driver] is an idiot.”¹⁰⁰

Although the county began making improvements to the Big Thompson Canyon Road, originally with convict labor in 1912, by 1919 the road remained a one-way track 16 years after its completion.¹⁰¹ In an attempt to address this issue, county commissioners traveled the canyon in 1916 to ascertain the amount of work necessary “to widen and improve the road for the immense amount of travel which the road is being subjected to.”¹⁰² A 1917 newspaper article noted, likely with unintended irony, that the road was “in very bad condition, although safe.” The writer stated that “it was necessary to throw large rocks and logs



Image source: Denver Public Library

into the river to protect the retaining walls” at 20 locations where the water had washed over the roadway.¹⁰³

Meanwhile, the “Good Roads Movement” had begun stirring throughout the country, surprisingly in response to demands of bicyclists led specifically by the League of American Wheelmen, rather than automobile drivers.

County commissioners tried to determine the amount of work necessary to widen and improve the road due to the immense amount of travel occurring.

1915

Rocky Mountain National Park
is established

1915

Car accidents become
frequent in the canyon

The Stanley Steamer, such as this one owned by Enos Mills, was "especially suited to mountain work," enthused a journalist in the early 1900s.

Expansion of the country's road system had launched a cycling craze that swept the nation, reaching its pinnacle by the 1890s with an estimated 2.5 million cyclists. Flexing their political clout, cycling clubs demanded significant road improvements and new roads throughout the country, as well as funding, arguing that good roads were essential for the country's health and economy.¹⁰⁴ The foremost Good Roads

advocate proclaimed, "American roads are among the worst in the civilized world, and always have been. I hope to live to see the time when all over our land, our cities, towns, and villages shall be connected by as good roads as can be found."¹⁰⁵

Since the middle 1800s, America's roads — acknowledged as little more than muddy or dusty trails depending on the prevailing weather — were seen as a state and local responsibility. The Good Roads Movement gained momentum as the rise in automobile use awakened a national passion for travel, resulting in increased pressure by the 1910s for federal funding to improve the country's roads. In 1916, the U.S. House of Representatives passed a roadway federal aid plan described by *Southern Good Roads Magazine* as "horse-high, bull-strong, and pig-tight."¹⁰⁶ However, not everyone agreed, and the Senate balked. After heavy revision and considerable Congressional debate, President Wilson, himself an "ardent motorist," signed the Federal Aid Road Act in 1916, the first large-scale involvement of the federal government



Source: Fort Collins Museum of Discovery, #H01310

**The road remained a one-way track
16 years after its completion.**

1916

"Modern Eve" is hired to roam Rocky Mountain National Park

1916

Transportation company runs 18 Stanley Steamers through the canyon

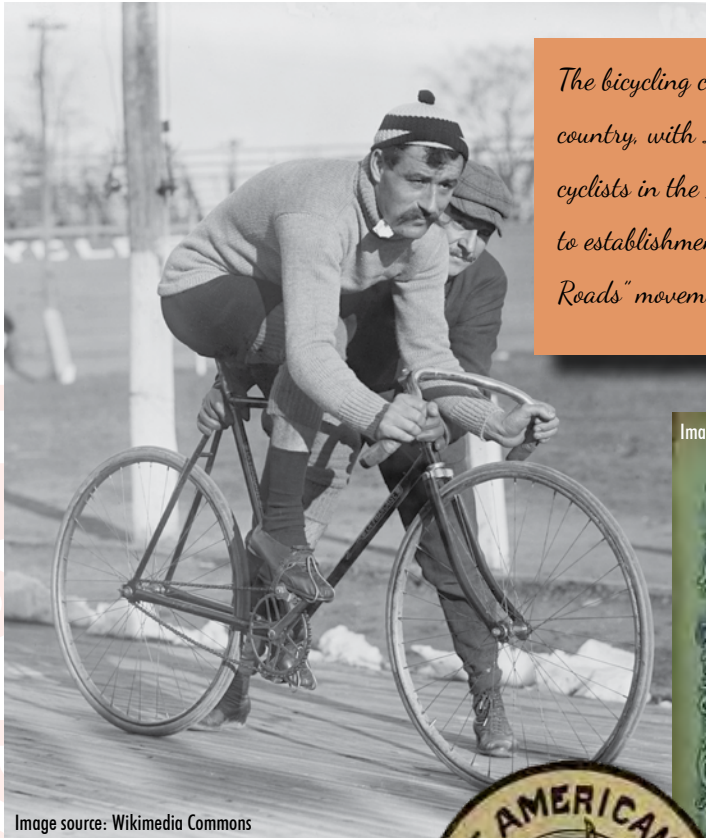


Image source: Wikimedia Commons

The bicycling craze swept the country, with 2.5 million cyclists in the 1890s, leading to establishment of the "Good Roads" movement.



Image source: Boston Public Library



Image source: Wikimedia Commons

in nationwide road building. The act required each state to establish a state highway agency. Furthermore, all improved roads had to be toll-free and maintained by the state.¹⁰⁷ In response, Colorado created the State Highway Department in 1917 and reorganized its State Highway Commission (originally formed in 1909). Under the Federal Aid Road Act, the state received more than \$6 million for roadway projects between 1916 and 1921.¹⁰⁸

The timing of these changes was auspicious. In November of 1917, the Larimer County Board of County Commissioners passed a resolution asking the State Highway Commission to “take over the Big Thompson Road, the main road into Estes Park, and the new main road into Rocky Mountain National Park.”¹⁰⁹ Meanwhile, the need for repairs remained constant, and in November of 1918, Larimer County requested \$8,000 from the State Highway Commission for improving and repairing the Big Thompson Road.¹¹⁰

The county’s appeal proved portentous. One year later, “terrific torrents”

Expansion of the country’s road system launched a cycling craze throughout the nation.

1916

Larimer County evaluates need to improve the canyon road

1916

Federal Aid Road Act is enacted

Since the mid-1800s, America's roads were acknowledged as little more than muddy or dusty trails.

that fell within a very short time on July 31, 1919, washed out Bridge No. 3, stranding nearly 500 people in Big Thompson Canyon between rockslides and the demolished bridge. The bridge had been a simple wood-framed structure supported by cables that snapped in the flood, causing it to collapse into the river. Debris was washed as far away as Loveland. County officials, as well as a crew of around 40 men, worked frantically to complete a temporary structure to free people trapped in the canyon. Many of the stranded tourists volunteered their own labor, and residents from Estes Park worked their way down the canyon to the Forks Hotel in Drake, clearing the road where rockslides had occurred.¹¹¹ Upon liberation the following evening, the trapped tourists "let out a mighty cheer... [that] could be heard for a long distance.... The greatest outburst came when the first car was permitted

Cycling clubs like the League of American Wheelmen demanded significant road improvements and development of new roads.

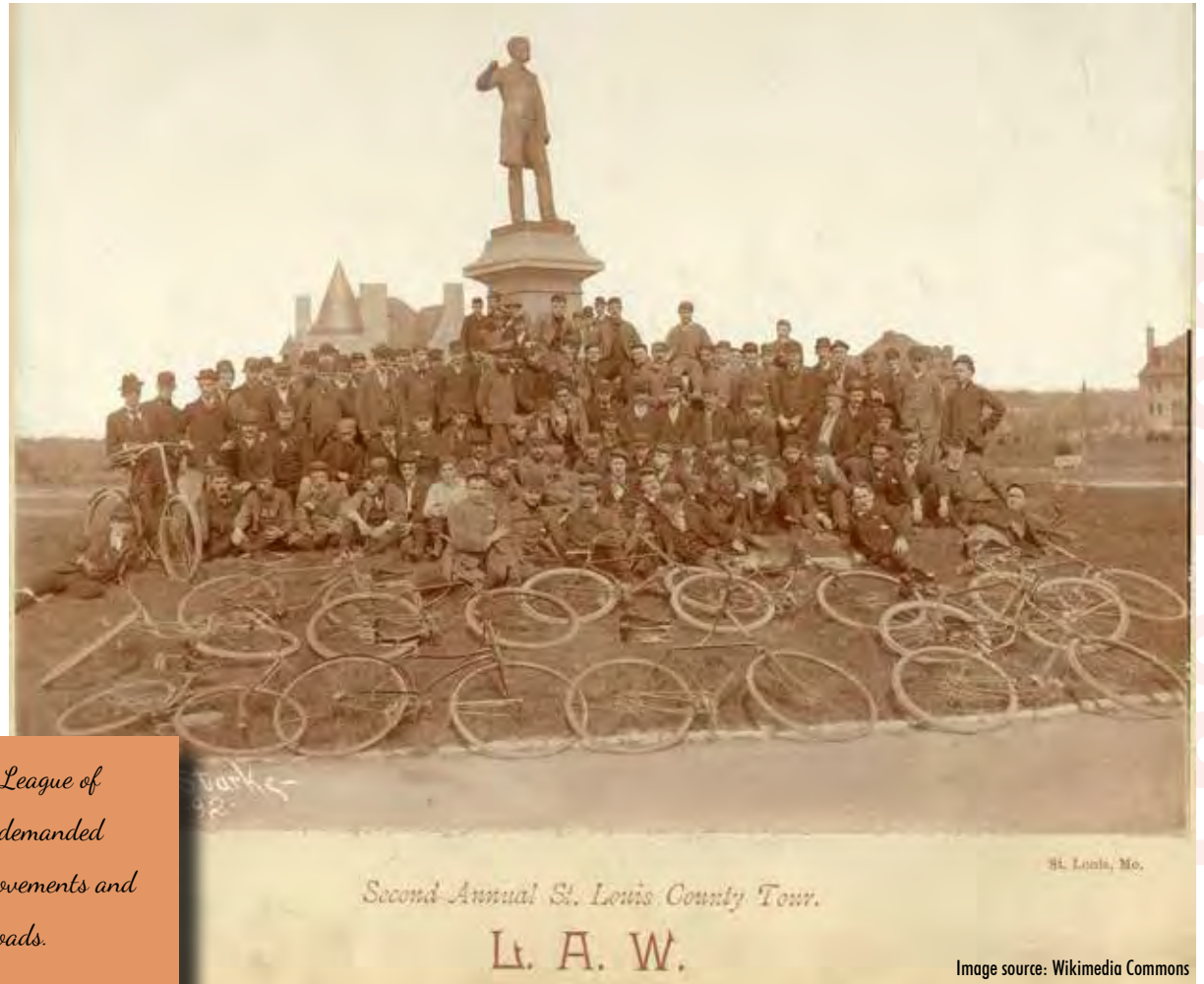


Image source: Wikimedia Commons

1916-1921

Colorado receives \$6 million for road projects

1917

Colorado's State Highway Department is formed

to cross.”¹¹²

A journalist reporting on the flood noted, “more damage has been done by the cloudbursts in the vicinity of Estes Park than at any previous time in more than 25 years.”¹¹³

Shortly thereafter, the road was closed in September of 1919 to begin significant improvements and construction of a “fine concrete bridge” to replace the hastily-constructed temporary structure that was neither a “work of art [nor] built for permanent wear.”¹¹⁴ This

effort marked the start of Colorado’s ninth Federal Aid project.¹¹⁵ The road

was to be 24 feet wide so that motorists could pass at any point. Twice, bids were solicited to improve the road during the winter season to avoid interference with summer tourist travel, but none were received. As a result, the Highway

President Wilson, shown here leaving Denver’s brown Palace Hotel, was an “ardent motorist” and signed the Federal Aid Road Act in 1916.



Image source: Denver Public Library

The Federal Aid Road Act was the first large-scale involvement of the federal government in nationwide road building.

Commission created an “account contract” and awarded the work to Dolling Brothers, Crook & Hoffman. Work began a few miles west of Loveland and extended to within five miles of Estes Park, as sections of road directly

1917

Larimer County requests transfer of the canyon road to the state

1918

County requests road improvement funds from state

Introduction to Architecture in the Big Thompson Canyon

In many ways, a drive through the Big Thompson Canyon is a tour of the architectural history of the Mountain West. Early homesteaders and ranchers, attracted by the beauty of the Big Thompson Canyon and proximity to water, settled in the canyon in the mid to late 1800s and built small, functional properties, often from local materials, such as logs harvested from the canyon itself. As more people flocked to the Rocky Mountains, activities and settlement in the canyon began focusing on recreation and retreating into nature. Completion of the road through the Big Thompson Canyon (originally referred to as "Riley's Road") in the early 1900s, followed by the rapid rise of automobile tourism over ensuing decades, spurred increasing development. Many of the buildings within the canyon today reflect these trends, demonstrated in the use of the "Rustic" architectural style and the emergence of cabin camps, motor courts, and motels.

Key Architectural Styles Rustic Style (1900-1960)

The image of early settlers in the Rocky Mountains coming home after a hard day of work to a cozy log cabin, perhaps with lines of fresh-caught fish slung over their shoulders, is deeply interwoven into the folklore of the Mountain West. While life was harder than this image might suggest, the early cabins of the American West (1850-1890) were rooted in necessity. These buildings were simple and relatively crudely made with readily available local materials, built to suit a specific environment.¹⁵⁹ As the West became more populated, people resonated with images and buildings that reflected the American wilderness, especially where they sought the solitude of nature. These buildings demonstrated that the West was still wild and untamed by the increasing modernity of the 1900s. Rustic Style architecture, which mimicked the structures built by early pioneers, emerged from this desire and sought to evoke the great and unsettled American West.

The Rustic Style embraces simplicity and naturalist design, yet stresses careful craftsmanship. Buildings are usually constructed with local materials, such as river stones and logs, and are

designed to blend into natural settings. Materials varied depending on local surroundings.¹⁵⁹ In the Big Thompson Canyon and the Rocky Mountain Region, Rustic Style buildings are characterized by solid hewn and un-hewn logs that are notched at the ends or fastened with vertical wood posts at the corners; external stone chimneys; twisted logs, branches, and wooden boards to create external and internal ornamentation; stone foundations; exposed rafters; overhanging gable roofs to protect the building from snow; multi-paned windows; as well as wood-framed windows and doors.¹⁶⁰



Rustic Style in the Big Thompson Canyon: Rustic River Cabins



Rustic Style in the Big Thompson Canyon

Roadside Lodging and Architecture (1920-1960)

America has had a long and intense love affair with the automobile and the open road. Once viewed by some as loud, smelly contraptions that were no more than a passing whim, automobiles quickly became an important, and increasingly necessary, facet of American life. In the 1910s, early automobile adventurers took to the country's new roads to see and experience every part of America. By the 1920s, many people either owned, or had the ability to hire, an automobile. Average, middle-class Americans were moving across the landscape, especially for recreational purposes, and were vacationing in a way that previously had been only available to the wealthy.¹⁶¹

Early travelers camped along roadways in free-wheeling caravan style, enjoying the informality and fresh air of traveling by automobile.¹⁶² Recognizing a need to accommodate the ever-growing auto tourism phenomenon, formal camping in free, and later paid, auto camps emerged throughout America in the 1910s. After the close of World War I and well into the 1920s, private auto-camp owners, who traditionally rented tent space, discovered that many auto tourists would pay for accommodations that freed them from the rigors of packing and unpacking camping equipment. Enterprising business owners began building small cabins and bungalows for nightly and weekly stays.¹⁶³ These cabin camps gradually evolved into motor courts in the 1930s and 1940s, and later into roadside motels in the 1950s. Like much of America at the time, roadside lodging in the Big Thompson Canyon is directly traceable to the rise of auto tourism and the emergence of recreational roadside camping.

Cabin Camps (1920-1930)

The first cabin camps that appeared in the 1920s were architecturally primitive. Some camp owners minimally adapted existing small rural outbuildings, like sheds and chicken coops,

continued on next page...

1918

Stanley's brother dies
in car accident

1919

Bridge No. 3 washes out,
strands 500 in the canyon

to house campers. Such cabins were little more than wooden tents with dirt floors.¹⁶⁴ New, purpose-built cabins were usually constructed quickly with a few heavy wooden planks nailed together to form a rough shelter. Some early camps offered small amenities, such as mattresses, community showers, and kitchens. However, it was more common than not for guests to rent a crude, box-like building with no furnishings, and to be given a bucket of water from an outside hydrant for cooking and washing.¹⁶⁵

As the 1930s and the Great Depression wore on, it proved more profitable for camp owners to offer additional services and guest amenities. Cabins became more elaborate and offered small furnishings, such as beds with straw-stuffed mattresses, a couple of benches, a table, a water pitcher and bowl, and possibly a coin-operated cooking plate. Cabins themselves were cleaner and better constructed with sturdier materials. Gradually, camp owners began luring travelers with all the comforts of home — hot showers from the community bathhouse, bedding, electricity, well-groomed landscaping, and home-cooked meals from family-run diners and cafes. Savvy business owners added enticing homey qualities, such as clean paint, charming shutters, window boxes with flowers, and a central lawn complete with playground equipment, ensuring that such amenities could be seen from the road.¹⁶⁶ Cabin units became more structurally unified and demonstrated quaint and nostalgic architecture that played off regional trends and themes like the Rustic Style. Because many of the cabin camps in the Big Thompson Canyon were built nearly 100 years ago (1920s -1930s) and were very basic, many are no longer standing or were converted to motor courts in the 1940s.

See It in the Canyon

The Whispering Pines Motel is the best remaining example of a late cabin camp (bordering on a motor court) in the Big Thompson Canyon. Crisp white paint contrasting with bright blue trim accentuates the office building and quaint, small cabins adorned with wreaths and window boxes. Located at the western end of the canyon approximately three miles east of Estes Park, this complex displays homey qualities, neat exteriors, better construction than the crude camps built before the Great Depression, and units that are structurally unified and display the

nostalgic architecture indicative of regional trends, specifically cabins and cottages in the Rocky Mountains.



Cabin Camp/Motor Court: Whispering Pines Motel

Motor Courts and the Rise of the Motel (1930-1950)

By the close of the 1930s, cabin camps had evolved into more sophisticated, full-serviced motor courts that accentuated the importance of the automobile. Tourists were offered convenient parking next to their individual rooms, under carports, or in garages. Motor courts presented standardized layouts where units were placed closer together, often perpendicular to the road in a U-shape.¹⁶⁷ Motor courts also had semi-circular drives that provided tourists with easy access to their rooms from the central office, and typically highlighted a common area with lush landscaping.¹⁶⁸ Large, elaborate signs advertised the modernity of motor courts, promoting running hot and cold water, in-suite showers and tubs, restaurants, air-conditioning, flush toilets, swimming pools, and other modern amenities.¹⁶⁹ By the end of the 1940s, motor courts had reinvigorated the American public, especially the rising middle class, ready to hit the road after the close of World War II.¹⁷⁰ By the end of the decade, motor courts — perhaps the most common type of tourist-focused architecture in the Big Thompson Canyon — had taken hold of the nation as they peppered national and state highways.

The shift from the 1940s motor courts to the motels (the “motorist’s hotel”) of the 1950s simply continued the trend that motor courts had started. Motels, like their motor court predecessors, offered additional services and amenities, such as

televisions, heated swimming pools, tiled bathrooms, easy chairs, comfortable mattresses, 24-hour diners, and air conditioning. Individual and deluxe cabins were replaced by more economical inline rooms that shared one foundation and singular plumbing and electrical systems. Overall designs became more practical, yet small architectural details, like individual porticos or awnings over each room, created an illusion of separate spaces. The term “motel,” emphasized with elaborate and highly visible neon signs, indicated modernity and a new age of travel.¹⁷¹ Although motels continued evolving in the 1960s, blurring the line between motel and hotel, architecture within the Big Thompson Canyon has remained essentially unchanged from the 1950s.

See It in the Canyon

The Loveland Heights Cottages on the River, Canyon Cottages, and Fireside RV Park and Cabins are the best examples of motor courts in the Big Thompson Canyon. These complexes highlight the importance of the automobile, such as central drives providing easy access to cabins and adjacent parking. Landscaped common areas are featured at Fireside RV Park and Cabins between the main office and US 34, and a large and inviting sign highlights amenities at Loveland Heights Cottages on the River. Buildings at all three motor courts face the roadway, demonstrating curb appeal and convenience, such as in-suite modern amenities. The cabins’ proximity to each other and shared aesthetics create a unified pattern and look.



Motor Court: Loveland Heights

Text and images: Centennial Archaeology

1919

Significant improvements
begin on the canyon road

adjacent to those two towns already existed. The road closure lasted through the winter of 1919/1920 — one of the worst winters the area had experienced in years — to allow workmen to complete 20 miles of improvements by summer.¹¹⁶ During the closure, travelers had to access Estes Park via the North and South St. Vrain Canyons (generally the route now known as US 36).¹¹⁷ Roughly 200 men, who labored through the winter with very few weather-related delays, completed the project after “nine months of the most difficult road building had been accomplished...after it was said the job could not be done.”¹¹⁸

Work crews blasted nearly 20 miles of solid rock to complete the project as surveyed and designed, which included eliminating some of the more dangerous curves. The federal government donated 110 to 125 tons of TNT left over from World War I, which was used to blast 100,000 yards of dirt and rock. Although the TNT was provided for free, project proponents had to pay freight and handling at seven cents per pound. During ceremonies commemorating the official opening of the road in 1920, an orator grandiloquently declared, “I

Many tourists were stranded at the Forks Hotel in Drake, about midway down the canyon, during a flood in 1919.



Image source: Denver Public Library

The road was closed in September 1919 to begin significant improvements and bridge construction.

would rather see roads builded [sic] and cottages springing up by the side of the road with children playing around the doors, the fields turning golden under the kiss of the summer sun and the bees humming prosperity over the alfalfa blossoms than to build the biggest

1920



Improved road opens

Road crews worked over the winter so improvements would be complete by summer.

battleship ever constructed since the stars sang together in the morning.”¹¹⁹

Descending 2,160 feet in approximately 20 miles, the improved road followed the Big Thompson River through the canyon’s entire length, crossing the river six times. The canyon was approximately 100 to 500 feet wide; in several places, there was only room for the river and the road.¹²⁰ Engineering designs resulted in around 27 river realignments to ensure the road could more easily run alongside it. Prior to completion, the road grade was as steep as 12.5 percent. After construction, the steepest grade was roughly 7 percent along the half-mile referred to as “the rapids” (presumably the Narrows). In many cases, the new road had a grade of 4 percent, although in some areas it was as flat as 1 percent.¹²¹ Upon the road’s opening in 1920, a journalist noted, “inasmuch as the greater part of [the road] was cut out of solid rock, it is practically a rock bed.”¹²²

According to newspaper accounts, these improvements cost \$270,000¹²³ — approximately \$2.5 million in 2018

dollars (the year the road was permanently reopened after the 2013 flood). In April of 1920, the State Highway Commission appropriated \$50,000 to rebuild the bridge that was destroyed in 1919, as well as pave two miles of the canyon road where it extended north from Loveland.¹²⁴ These amounts totaled just over the \$311,636 noted for this project by the Colorado Department of Transportation in a historical publication produced in 2002.¹²⁵

The vastly improved Big Thompson Canyon Road opened on May 30, 1920, which marked the official transfer of the road to the State Highway Department.¹²⁶ The opening ceremony featured state and local officials, as well as the contractors and booster delegations from local communities.¹²⁷ The project was touted as a major feat

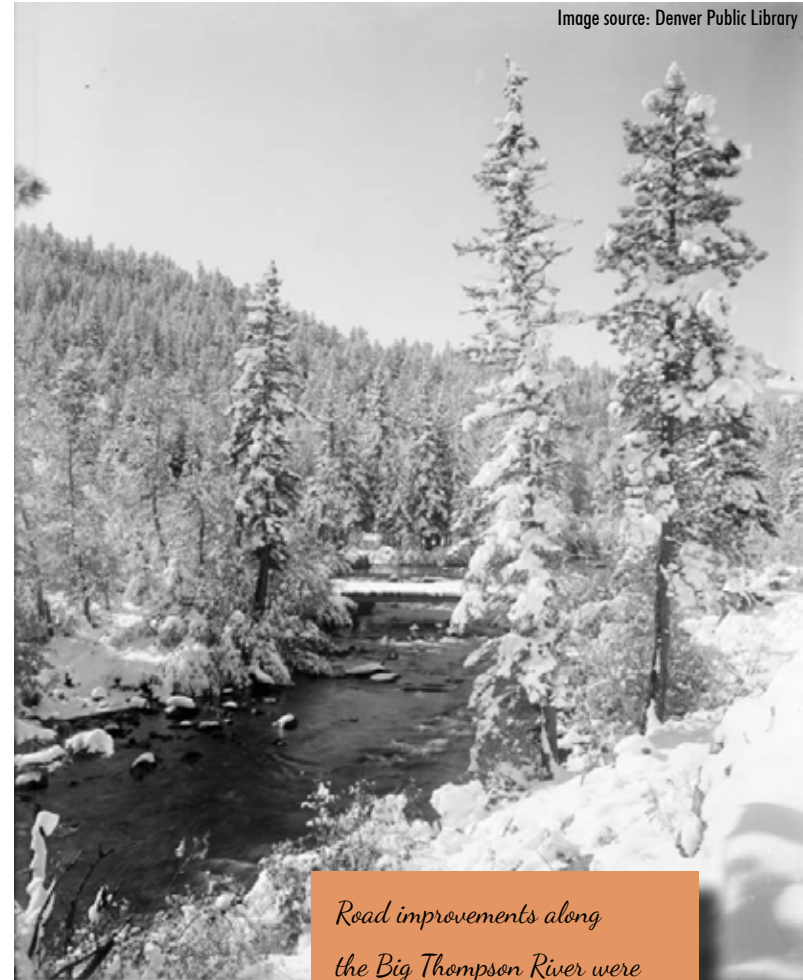


Image source: Denver Public Library

Road improvements along the Big Thompson River were conducted during one of the worst winters the area had experienced in years.

1920

High waters endanger
improved road

Shown here in 1926, road improvements included 27 river realignments to accommodate the road; the steepest grade was 7 percent.

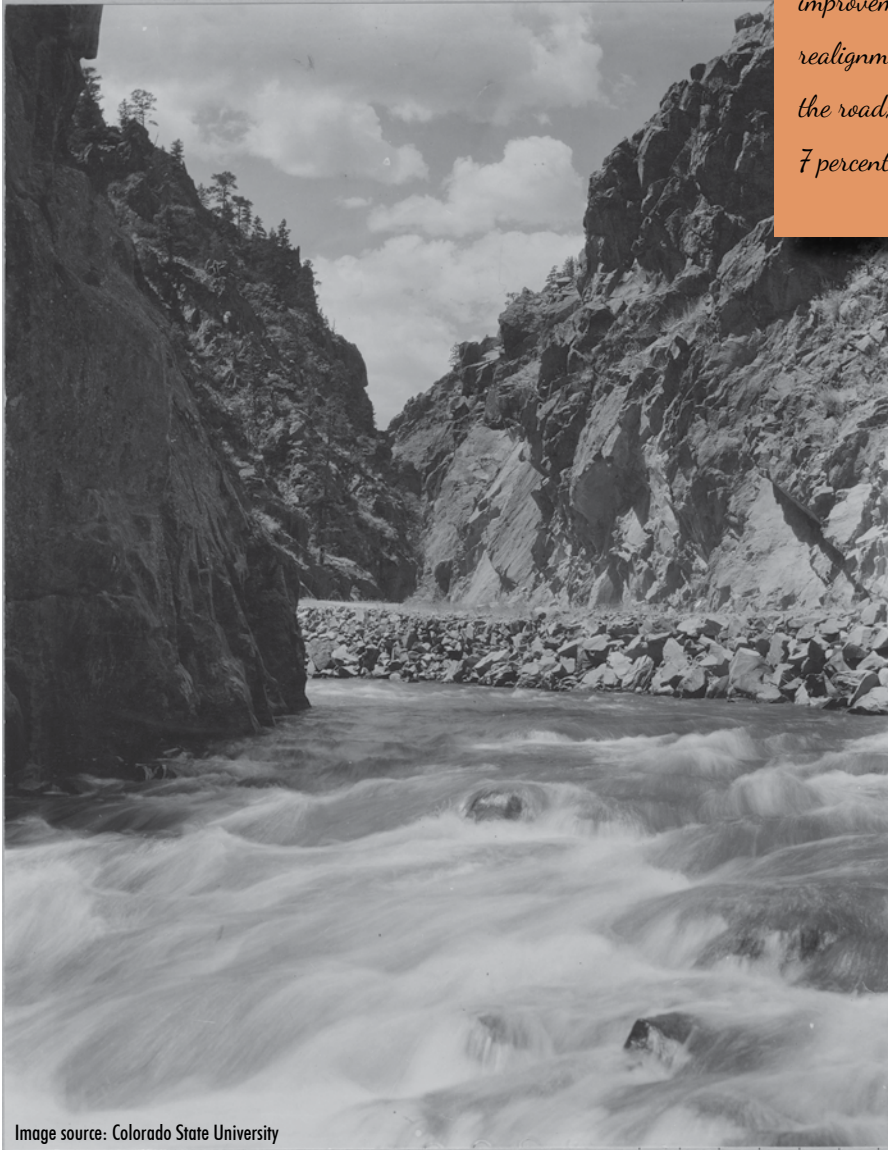


Image source: Colorado State University

of engineering and the dawning of a new epoch in the history of Estes Park. The road was said to be “as safe as the ordinary prairie road and as near fool proof as possible.”¹²⁸ Even a “timid” motorist who “crept along at a snail’s pace for fear of his life” could now drive confidently at speeds of 20 to 25 miles per hour.¹²⁹ The road was “considered to be the best mountain road in the country,” linking Rocky Mountain National Park — “the most popular federal playground in the United States” — with the rest of Colorado.¹³⁰

Despite the fanfare, on June 9, 1920 — just 10 days after the road’s grand opening — high waters caused by rapid snowmelt in the mountains once again threatened the road. Water levels reached the road in two places. At least one bridge was at risk of washing out, and a municipal dam was in danger of being destroyed. Ultimately, the disaster was averted and the road remained open and functional.¹³¹

Ownership of the road was transferred to the State Highway Department in 1920.

1920

Community of Cedar Cove is established

1920

Quarter million people visit Rocky Mountain National Park



Image source: Library of Congress

The national economy flourished in the 20s, and automobiles were “affordable luxuries” that became necessities.

Expansion of highways after World War I enticed tourists to travel with increased ease.

The redesigned Big Thompson Canyon Road opened on the cusp of a remarkable decade, one of dramatic social and political change that would become known as the “Roaring 20s.” The country’s economy boomed, the nation’s wealth doubled, and many Americans had money to spend. The “most important consumer product” of this decade was the automobile. Low prices made cars “affordable luxuries” that

quickly became necessities. By the end of the decade, “there was one car on the road for every five Americans.”¹³² The expansion of state and national highways following the end of World War I enticed tourists to travel with increased ease.¹³³ The Colorado city

dweller could even embark on a quick weekend getaway or a short scenic drive to the mountains on Sunday. Travelers could seek adventure, marvel at the state’s natural beauties, and escape the rapid urbanization of growing cities and towns.¹³⁴

The rise in automobile tourism dramatically increased the development of recreational cabins, motor inns, tourist shops, picnic areas, and campgrounds all along the “Gateway to the Rockies” — the new moniker for the road through the Big Thompson Canyon. By 1920, automobiles had reduced the trip from Loveland to Estes Park to a matter of hours, with thousands of people traveling through the canyon on weekends and holidays, not unlike today’s weekend recreationists.¹³⁵ The improved road was received with unabashed enthusiasm. A 1920 Estes Park newspaper article professed, “Only a few years ago it was a long day’s

1920s

Roaring 20s era begins

1920s

Thousands of visitors travel through the canyon

journey with a wagon and team from the valley towns to Estes Park.” The paper further expounded on the blessings of the automobile, gushing, “Estes Park would not be the popular summer resort the automobile has made it. The importance of the automobile is being recognized today in appropriations for road building. Much has already been done. The opening of the Big Thompson Canyon Road this spring gives autoists a fine double tracked boulevard to Estes Park....Unquestionably, there will be more cars in Estes Park this summer than ever before.”¹³⁶ Similarly, another journalist declared, “No motorist can really claim to have seen Colorado scenery at its zenith who has not driven the Big Thompson canon [sic].... Travelers are rapturous in their praise of the unusual formation of the walls of the gorge and of its splendid coloring. The cliff sides tower over the motorists so high and so sheer that it sometimes seems that they lean nearer each other

The Colorado Cherry Company Stand

When people think of Colorado-grown fruit, they may conjure images of West Slope peaches or cantaloupes from the southeastern plains. But cherries? More than a century ago, Mrs. Newton Johnson planted Loveland’s first cherry orchard in 1904 and launched a local obsession. By 1915, Loveland farmers had planted 70 acres of cherry orchards. This number exploded to 1,200 acres by 1918 when 1.5 million pounds of cherries were harvested at a value of \$85,000 – roughly \$1.4 million in 2018 figures. In 1920, Loveland boasted the largest cherry orchard west of the Mississippi River. The city honored its celebrated fruit with its first Cherry Blossom Festival in 1930, complete with a parade, contests, and dancing in the streets. The city even elected a Cherry Queen. Around the same time, Mrs. A. V. Benson invented cherry cider, selling glassfuls of it at a stand near her farm to thirsty travelers venturing up the Big Thompson Canyon to Estes Park, who spread her fame throughout the country.¹⁷²



Image source: Colorado State University

Fifteen years later, Loveland claimed roughly 10,000 acres of cherry orchards, and the 1948 cherry harvest added over \$50,000 — a little over a half million dollars in 2018 — to the local economy.¹⁷³ That same year, winners of Loveland’s cherry pie baking contest won a trip to Chicago to compete in the national cherry pie event. Tourists allegedly bought an astounding 80 to 100 cherry pies every day from local bakeries and roadside stands along US 34 during the 1940s.¹⁷⁴ By 1950, nearly 155,000 cherry trees graced Loveland’s landscape. Throughout its heyday, Loveland’s cherry industry “seemed to have employed, at one time or another, just about every woman and child in town” as temporary workers during the summer.¹⁷⁵

Despite the city’s love affair with cherries, Loveland’s cherry mania was not to last. By 1970, the industry had gone bust. Blight, frost, out-of-state competition, and rampant land development are said to blame. Cherry Hills Estates, Orchards Shopping Center, and Hewlett-Packard now occupy land once replete with cherry orchards.¹⁷⁶ Not much remains of Colorado’s booming cherry industry – except the Colorado Cherry Company.

Situated just west of the Narrows in the Big Thompson Canyon along US 34, the Colorado Cherry Company’s Cherry Tree Stand has been a tourist landmark for decades, surviving both the 1976 and 2013 floods. The building beckons with red-and-white paint, flower boxes, and cherry juice jugs hanging from the rafters. These cheerful flourishes, along with the large sign positioned to attract customers driving along US 34, summon passersby to stop and browse the array of juices, jellies, and pies. Although the Cherry Tree Stand was built in 1959 toward the end of the industry’s zenith, the colorful store and the Lehnert family who have owned and operated the company for four generations are symbolic of Loveland and its past.¹⁷⁷ The Colorado Cherry Tree Stand remains one of the last vestiges of an industry that was once a pillar of Loveland’s flourishing agricultural economy.

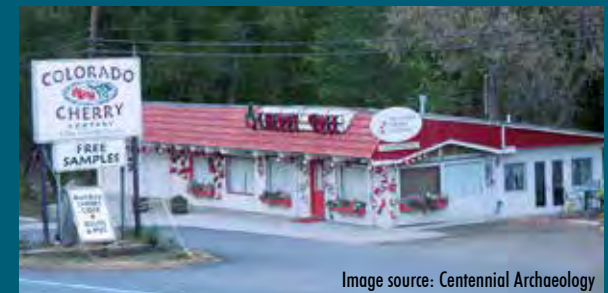


Image source: Centennial Archaeology

1920s-1930s



Plat commissioners subdivide
land within the canyon



Image source: Denver Public Library

The canyon's beauty enhanced the popularity of the drive from Loveland to Estes Park.

The improved road was received with unabashed enthusiasm.

at the top. Many people who have never seen the mountains record sensations of fear lest the great piles tumble down upon them.”¹³⁷

Writing about the road in 1922, Abner Sprague noted, “At this time, 20 years after its inception, the Big Thompson Canyon Road from Loveland to Estes Park is one of the finest mountain

roads in the state.” With a dig at the foibles surrounding the road’s original construction, he added, “We owe its early construction to the mistakes of several men, and the foolishness of the first contractor.”¹³⁸

However, despite the much-lauded improvements and claims made during the road’s opening ceremony, in 1920

the road remained less than perfect, as claimed by a journalist at the time: “The Big Thompson, noted for its spectacular beauty from one end of the country to the other, has never been quite wide enough for two automobiles to pass each other at all points along the road. Cut-outs are necessary, and a cut-out road is never conducive to quite the enjoyable riding as a road which spreads out sufficiently to all for easy passing.”¹³⁹

Yet these drawbacks appear to have been subordinate to the splendors of the scenery. More



Image source: Denver Public Library

1920s-1930s

Recreation becomes popular in the canyon

1930s

Colorado's roads are transformed

prophetically, she continued, “The day is coming, however, and that not very far distant, when the Big Thompson canon [sic] will be threaded with one of the most perfect highways in the West. Especial care and attention are being given to the Big Thompson road because it is this narrow bottle-neck gorge that embraces the greatest scenic splendors of any automobile highway in the land....The Big Thompson road will be one of the most popular scenic one-day trips out of Denver. It will be one of the places that everyone will make an effort to see — and it will be one of the places that those who do make the effort will not regret either the time or effort expended in seeing.”¹⁴⁰

Similarly, a journalist writing in 1924 noted that Colorado had “come into its own as a motorist’s paradise,” enthusing, “The grades that tested the strongest cars are no more....In almost every case, [the motorist] can sail through the mountain passes....There is no drive in America that compares with the Big Thompson Canyon Road to Estes Park. Sweeping along under the



Image source: Wikimedia Commons

Recreational cabins, motor inns, tourist shops, picnic areas, and campgrounds sprang up along the river and the road.

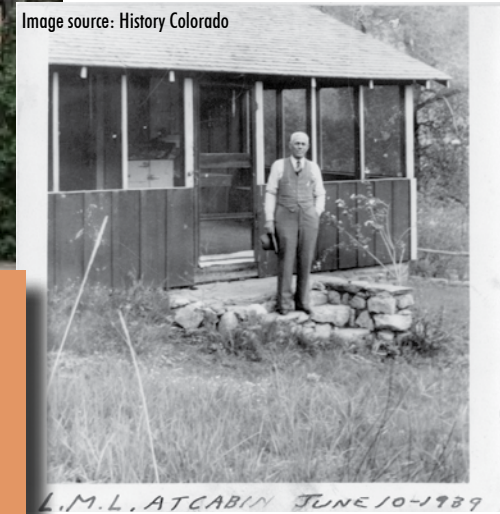


Image source: History Colorado



Image source: Jacobs

Colorado had “come into its own as a motorist’s paradise.”

1930s



Relief program improves the canyon road

1932



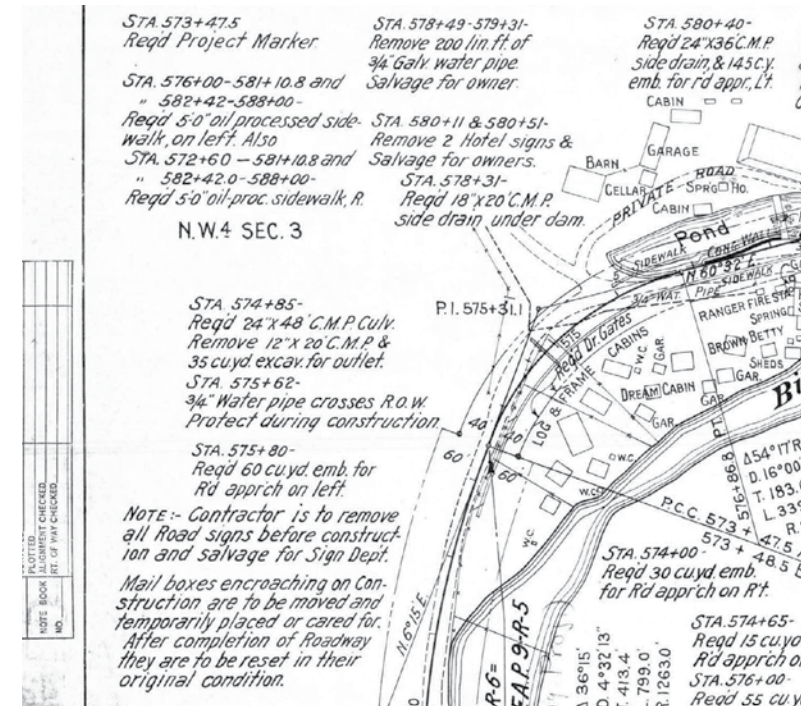
State prepares emergency highway budget

Engineers designing mountain roads in the 1930s, when this photo of the Narrows was taken, focused on safety, with wider roadways and curves.



magnificent canyon walls, around easy curves, on a roadbed as sure and firm and smooth as any pavement....[The motorist] is coming, and he is enjoying it.”¹⁴¹

As the decade wound down, the exuberance and extravagance of the 1920s soon ground to a halt. The ensuing years saw the nation and the state embroiled in the devastating effects of the Great Depression. Yet the downturn had an upside for Colorado. “The 1930s is remembered as a decade of transformation for Colorado’s roads” when the state “went on a road-building binge fueled by federal work programs.”¹⁴² Despite the Depression, tourism continued to support the state’s economy, bringing in an estimated \$1 million per year. Recognizing the importance of mountain routes to Colorado’s economy, the state Highway Department and federal work relief programs undertook several mountain construction projects in the 1930s, including the route through Big Thompson Canyon.¹⁴³ During this time, state highway engineers paid greater



attention to safety, particularly to roads through the Rocky Mountains, where designs featured wider roadways and curves, longer sight distances, and grades rarely exceeding 5 or 6 percent.¹⁴⁴ Yet working in Colorado’s Rocky Mountains was not cheap. Blasting a road through the solid granite of a canyon was estimated to cost between \$25,000 to \$130,000 or more per mile in the 1930s.¹⁴⁵

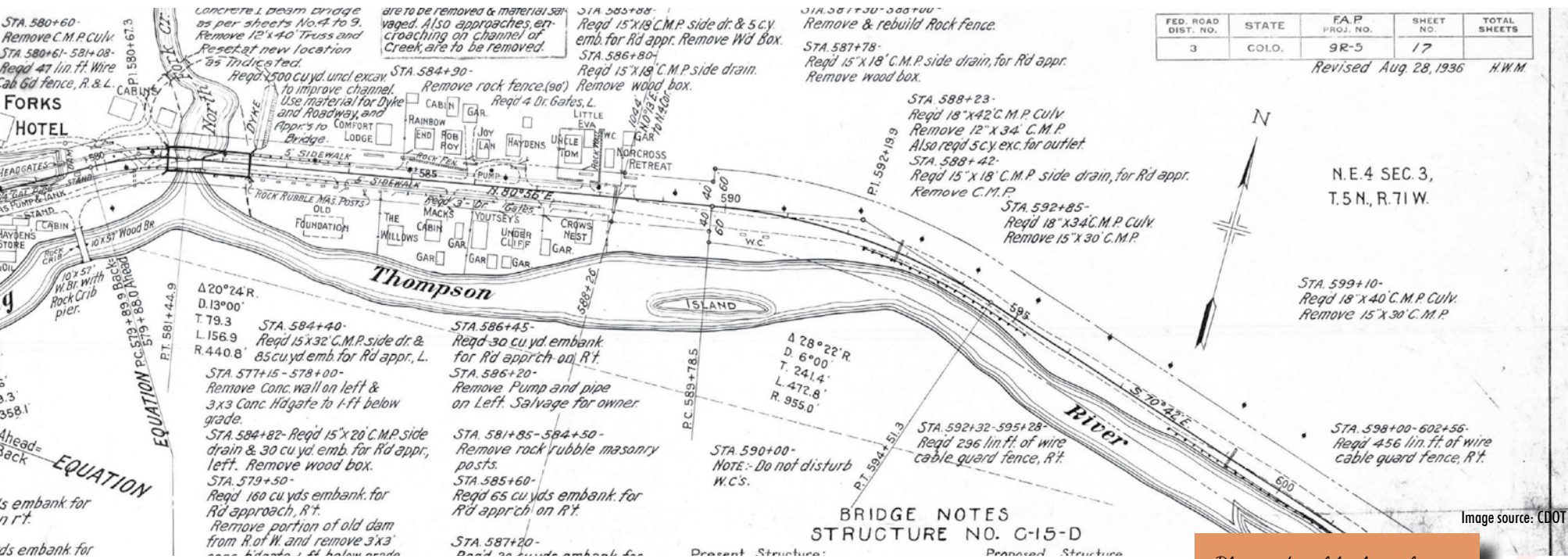
The 1930s was a decade of transformation for Colorado’s roads.

1936

Canyon road closes for new construction

1937

Canyon road is improved



The state prepared an emergency highway budget in 1932 to provide work for the unemployed, particularly those from urban areas where unemployment was concentrated. The budget included \$122,685 for unspecified work on the Big Thompson Road. Additionally, work crews ranging from 15 to 20 men were employed to further widen the road's sharp turns and remove dangerous ledges in the canyon.¹⁴⁶ Workers in this program toiled two five-hour shifts six days a week. Unskilled laborers were paid 55 cents an hour for work within

a 50-mile radius from Denver, and 50 cents an hour for all other areas.¹⁴⁷

Other small construction and maintenance projects occurred on the road throughout the 1930s. The Big Thompson Road was widened during the winter of 1936 to construct one and one-half miles of new road.¹⁴⁸ In 1937, the portion of the road between Estes Park and the Loveland Power Plant (Viestenz-Smith Mountain Park) was oiled, and four bridges were built.¹⁴⁹

Plan and profile sheets from the Colorado State Highway Department in 1936 show designs for Federal Aid Project 9-R-5 for State Highway No. 16 (now US 34) in Larimer County.

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It was during this period that the Big Thompson Canyon Road became US Highway 34. In April of 1938, the Northern Colorado Highway Association requested that State Highway Engineer Charles D. Vail recommend to the American Association of State Highway Officials (the organization that oversaw the numbering of highways at that time) that State Highways 54 and 16 be designated as part of US Highway 34. State Highway 54 entered Colorado from Nebraska east of Wray and passed through Akron to Brush. State Highway 16 began at Wiggins, west of Fort Morgan, and extended through Greeley, Loveland, Estes Park, Rocky Mountain National Park, and Grand Lake to

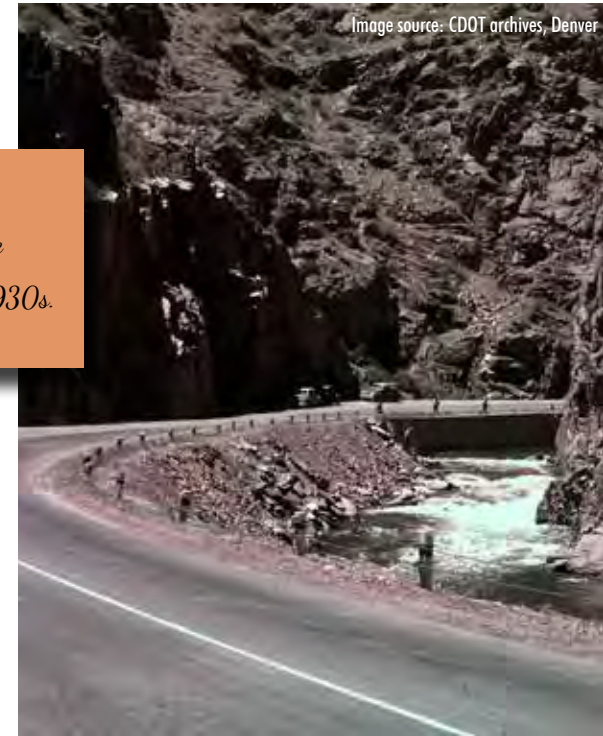


Granby. The change was adopted at a July meeting and announced in August of that year.¹⁵⁰

May 28, 1938, marked the official opening of US 34, which offered drivers “the grandeur of a deep canyon far more spectacular than the route from Lyons.”¹⁵¹ Following a speech at the mouth of the canyon, Governor Teller Ammons inserted a three-foot key into a giant padlock accompanied by an 18-gun salute, thus signaling the renewed flow of traffic through the canyon on the freshly designated highway.¹⁵² Signage indicating the name change was placed along the route as rapidly as it could be manufactured.¹⁵³

The opening of US 34 spurred further growth within the canyon. The canyon’s beauty, coupled with proximity to stores, medical services, and other necessities in nearby Loveland and Estes Park, lured retirees, commuters, and those seeking a second home for weekend retreats to the Big Thompson’s banks. Local entrepreneurs responded by

The Big Thompson Canyon Road became US 34 in the late 1930s.



populating the canyon with gas stations, cider stands, restaurants, and hotels. People began crowding closer to the river.¹⁵⁴

Ensuing decades were uneventful for the highway, with no known major changes to US 34 beyond regular maintenance. As speed limits on the road increased,

Despite the Depression, tourism continued to support the state’s economy.

1938

US 34 is designated and opens

1960-1970

Traffic through the canyon quadruples

The canyon's proclivity for flooding would soon prove catastrophic.

travel time from Loveland to Estes Park decreased from half a day to a couple of hours. Tourism and traffic in the Big Thompson Canyon quadrupled between 1960 and 1970. By 1976, more than 9,000 automobiles traveled US 34 through the canyon on a typical summer day.¹⁵⁵ Easy proximity to Loveland and Estes Park, coupled with serene beauty and a sense of reclusion, lured more people to live along the river's shores. Just prior to the 1976 flood, the canyon was home to 600 full-time residents and approximately 12,000 part-time residents, who occupied around 1,400 houses.¹⁵⁶ The road remained one of the primary access routes to Estes Park, despite the fact that the Big Thompson River flooded easily and often — at least 12 recorded times prior to the 1976 flood. This combination of greatly increased traffic, growing residential development, and the canyon's proclivity for flooding would soon prove catastrophic.

1976

9,000 cars travel through the canyon on typical summer day

The Dam Store

"Location, location, location." That is the answer Les Olmstead provided when asked why the Dam Store, situated at the mouth of the Big Thompson Canyon, has survived for more than 100 years.¹⁷⁸ Although the store's location has changed over time, its success has been steadfastly tied to US 34.

The first Dam Store was located one mile downstream from its current site. It started in 1906 as a small, wooden shop near the dam that provided Loveland's water supply, commonly referred to as the "Big Dam." The Big Dam was allegedly the location of two different Dam Stores, started by two different families.¹⁷⁹ The surviving store was obtained some time between 1909 and 1929 by Ed Shaffer, who likely expanded it, potentially moving it closer to the present-day location and constructing an auto camp for travelers. Rome and Ombra Dietrich then purchased the property in 1930 with the intent of creating a "tourist camp."¹⁸⁰ Not to be deterred when US 34 was rerouted in the early 1930s and bypassed the store, the Dietrichs relocated the store to its current location — the entrance to one of the state's most scenic canyon drives.¹⁸¹



Image source: Jacobs

That auspicious move has kept the store alive through the Great Depression and both major 20th century floods. The Olmstead family has continuously owned and operated the Dam Store since 1969, when Les and Roberta Olmstead bought it from Ray and Dorothy Black. Later that year Les constructed the iconic tower that draws visitors up its 40-foot perch to view the beauty of the Big Thompson and its surroundings. Soon after purchasing the store, Les and Roberta traveled to Estes

Park to order souvenirs from Izzy Miller. Izzy had been selling trinkets since the 1920s for Bloom Brothers, founded in 1906 as one of the country's first wholesale souvenir companies. He told the Olmsteads that the souvenir business had thrived even during the Great Depression. Les and Roberta evidently heeded Izzy's advice, whose insight proved prescient. Although the types of items sold at the Dam Store have changed with the times, up to 1,800 people visit the establishment every summer day to peruse and purchase jewelry, cabin décor, and of course, the store's signature "Dam Shirt" — a best-seller. Children enjoy stopping by to say "Dam" — without the "n," of course — giving rise to a new version of the shirt, which declares "Helping kids cuss (and get away with it)."¹⁸²

In addition to giving kids the thrill of the faux cuss, the store has served the community in more meaningful ways, particularly when it functioned as a command center during the 1976 flood. Although the campground was closed in 1977, the store — said to be the fifth-oldest business in the Loveland area — and its history remain with the Olmstead family, who hope to preserve its legacy for many years to come.¹⁸³

1976

1,400 houses exist in Big Thompson Canyon

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The Road



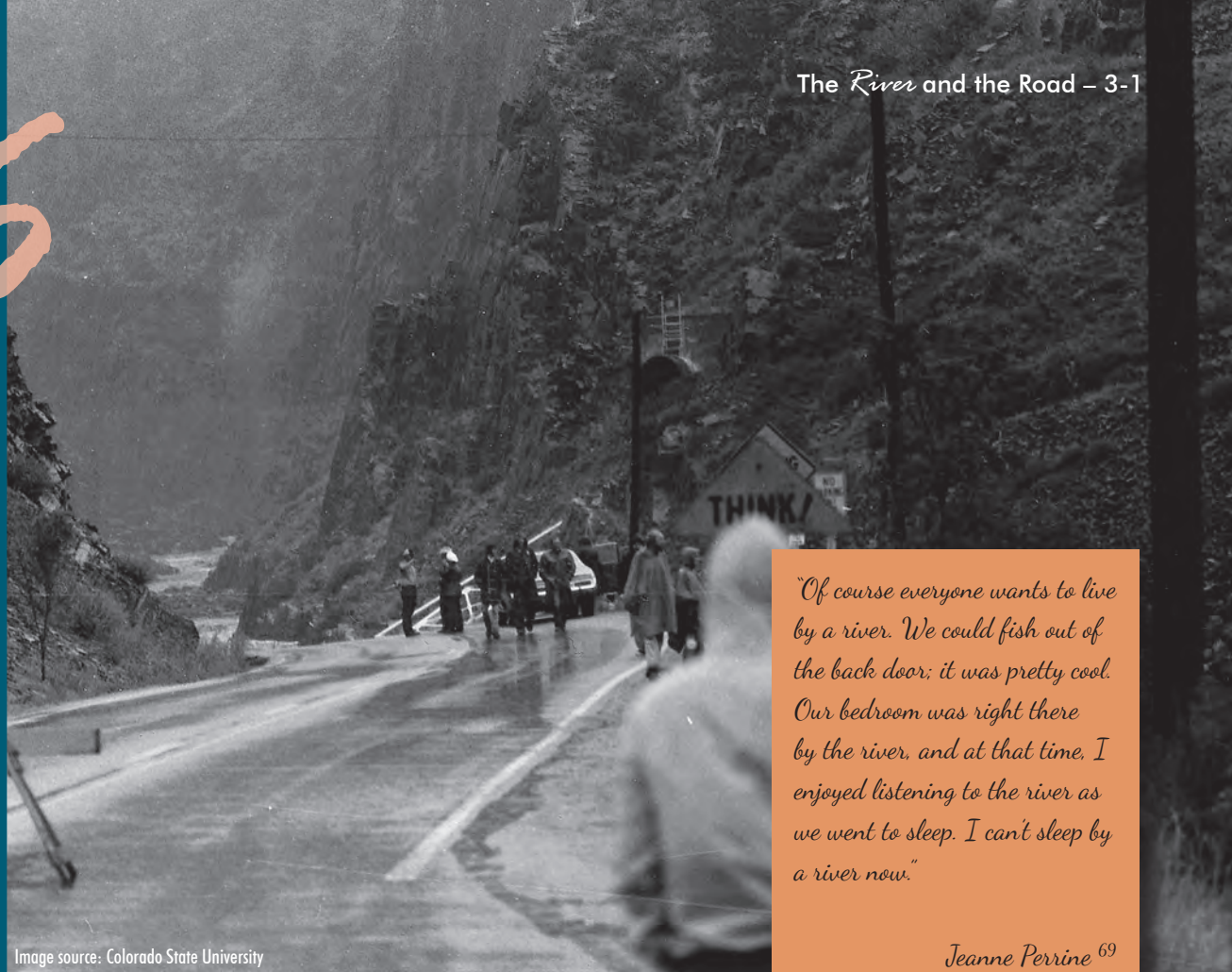
1976

Saturday, July 31: Colorado's Centennial

The rain started at 5:00 p.m.

Within a four-hour period, 14 inches would fall on the mountains surrounding Big Thompson Canyon. By 9:00 p.m., the river would explode from an average depth of 18 inches to a 20-foot wall of water driving 10-foot-wide boulders at its head.

Image source: Colorado State University



"Of course everyone wants to live by a river. We could fish out of the back door; it was pretty cool. Our bedroom was right there by the river, and at that time, I enjoyed listening to the river as we went to sleep. I can't sleep by a river now."

*Jeanne Perrine*⁶⁹

Big Thompson Canyon was alive with activity, as thousands of people celebrated the state's 100-year birthday. It was the height of tourist season, and a weekend evening as well — an inauspicious combination that drew both Colorado residents and visitors to one of the state's most beautiful and accessible natural attractions. Eight inches of rain fell in one hour, turning

the normally placid river into "a raging torrent of water 19 feet high."¹ More than 400 vehicles, "many loaded with tourists or residents trying to outrun the water,"² were carried off US 34 and smashed into rocks and debris. As the death toll passed 100, the severity of the storm became horrendously apparent. Two hours after it started, Colorado's deadliest recorded flood had killed 144

people (including two state patrol officers trying to evacuate people) and injured 250 more, destroyed 418 houses and 52 businesses, damaged 138 houses, washed away much of US 34, demolished the Big Thompson Siphon (filled with water and weighing 989,000 pounds), and caused more than \$35 million in damages.³

3-2 – The River and the Road

Cell phones, home computers, and the internet were futuristic concepts to most people in 1976. The primary mode of communication was the landline telephone. Voicemail was non-existent, and physical answering machines did not become popular until the middle 1980s. The fledgling Apple computer company, a mere two-man startup at the time, released its first personal computer, which was basically just a circuit board. The “cutting-edge” communication technology of the 1970s was exemplified by short-distance, two-way Citizens

Band (CB) radios, embraced primarily by truckers and

aficionados. Meteorology was similarly primitive by today’s standards. Doppler radar, which tracks storm movements, was not available until the 1990s. Instead, weather forecasters relied on crude black-and-white satellite images that downloaded only every 30 minutes. Official weather stations or stream gauges were notably absent in the Big Thompson Canyon.⁴

It was under this scenario that an estimated 3,500 to 4,000 people were in Big Thompson Canyon on July 31, 1976, most of them escaping the heat of



Image source: Colorado State University

“We watched her car being lifted up and carried down the river. We decided at this point we should climb higher. We had never been as cold as we were that night.”

Terry Belair-Hassig⁷²

Clouds that were piled 12 miles into the sky set off the most powerful flood since glaciers retreated.



Image source: Denver Public Library

“Gordon (Kindred) had pulled around to pick up his wife and aunt. When he got the car pulled around, it was gone. They were gone.”

Jeanne Perrine⁷³

July 31, 5:00 p.m.



Massive clouds form,
light rain falls⁷⁰

July 31, 6:30 p.m.



Rains become heavy between
Estes Park and Drake⁷¹

Approximately 4,000 people were in the canyon.



"I'm stuck. I'm right in the middle of it. I can't get out..."

*Colorado State Patrol Sgt.
Willis Hugh Purdy's
last radio transmission⁷⁶*

Image source: Colorado State University

Front Range cities to hike, fish, camp, and relax by the river with family and friends. The forecast was typical

for a Colorado summer day, calling for a 40 to 50 percent chance of showers and thunderstorms. Like any summer weekend in Colorado, the canyon was packed with vacationers and day-trippers enjoying the river's beauty and driving the scenic highway to Rocky Mountain National Park. Hotels and campgrounds were full, and part-time residents were enjoying their summer homes. Some people attended weddings, some met friends for dinner in Estes Park, and some enjoyed company picnics. The mood was particularly festive that day as visitors and residents celebrated the state's centennial.⁵

July 31, 7:00 p.m.



Water levels begin rising in the canyon⁷⁵

Survivor Story

John McMaster and George Woodson Loveland Ambulance Service

McMaster: And we'd started making a U-turn, we could see the stuff slopping over on the highway....and it sounded like a freight train coming. And it hit us.

It's very hard to describe the terror one feels at that point, because I recall myself being in hysterics....You could hear these propane tanks hissing. And it picked us up, a good 15 foot in the air, and it slammed us into the east wall of the Narrows...the thing that was going through my mind, "Make it quick." I didn't want to die, but, "Just make it quick." And at that point I knew I was dead....And I just happened to look over, and I saw George going out the window...and I climbed out the window right behind him.

Woodson: I turned around and I was looking at John, I saw the ambulance hit the canyon wall again, and it just seemed like the tail lights and the headlight both pointed straight up in the air...it just folded the ambulance...it was no doubt a miracle that there just happened to be a rock right there that we could hang onto to pull ourselves out of the ambulance.

Interviewer: It wasn't raining at that time?

Woodson: No. It was very, very dark. It was very cloudy.

McMaster: We kept climbing up, and we were about a good 50 feet above the roadway, and I passed the flashlight to George, because he was above me. And as I tossed it to him, he missed it, and it rolled down, and it was still lit, and it landed on a ledge of rock. And just right after that, the rocks I was [sic] holding on to and were standing on gave way, and I started to fall and I fell a good 30 foot, and I thought that this was going to be it. And extremely panicked, and I was reaching and grabbing for anything my little fingers would hold on to, and about 30 foot down, I happened to catch a rock....I caught that thing, and I held onto that thing....At that time the water was about to the top of my boots, it was about midcalf, and at that time I thought I'd broke my arm because I tried to climb with it, and it wasn't working very well. And it hurt quite a bit....And before the water started to go down, I was hanging onto this rock. I was about waist deep in the water and absolutely berserk.⁷⁷

July 31, 7:00 p.m.



Storm destroys rain gauge at Drake⁷⁴

It was not raining at the lower end of the canyon.
Many people did not believe the possibility of a flood and did not heed officers' warnings.



Image source: Estes Park Trail Gazette

"I remember the great times I had at Cedar Cove...The Thursday after the flood, we drove in over the mountain to Cedar Cove — you never forget the smell or your first look at what was left of the community."

Jerry Reinhart⁷⁸

Meanwhile, a thunderstorm was developing overhead as moist air rose up mountain slopes.⁶ "Suddenly, the rain just came down," recalled Bill Wells, who owned an inn at Glen Haven. "I mean, it was not pouring or anything... it was a sunny, partly cloudy day. That's all it was....When it started to rain, we thought, 'Well, here's our little shower....' We've had heavy rains before, but they last five minutes at the most and go on...so I didn't pay too much attention to it,"⁷ Bill explained, likely summarizing what most people thought

of the weather that day. But this was no ordinary five-minute afternoon storm. Unusually weak winds stalled the storm in the canyon's upper reaches for more than three hours. Clouds that were "piled 12 miles into the mountain sky"⁸ set off the most powerful flood since glaciers retreated 10,000 years ago. The river rose to 19 feet above its normal depth of 18 inches.⁹ Discharges into the Big Thompson from small tributaries were "unequaled in the records of Colorado history."¹⁰ A staggering 31,200 cubic feet of water per second

July 31, 7:30 p.m.

First North Fork peak level is reached at Glen Haven⁷⁹

July 31, 7:30 p.m.

US 34 is blocked by rocks and trees deposited by water⁸⁰

1976 Flood

144
Lives Lost

250
Injured

840
Helicopter
Evacuees

418
Homes
Destroyed

52
Businesses
Destroyed

438
Vehicles
Destroyed

(cfs), compared to a typical 165 cfs and the previous maximum of 8,000 cfs discharged during the 1951 flood, disgorged from the canyon’s mouth with ferocious velocity.¹¹ Within four hours, 14 inches of rain would fall.¹²

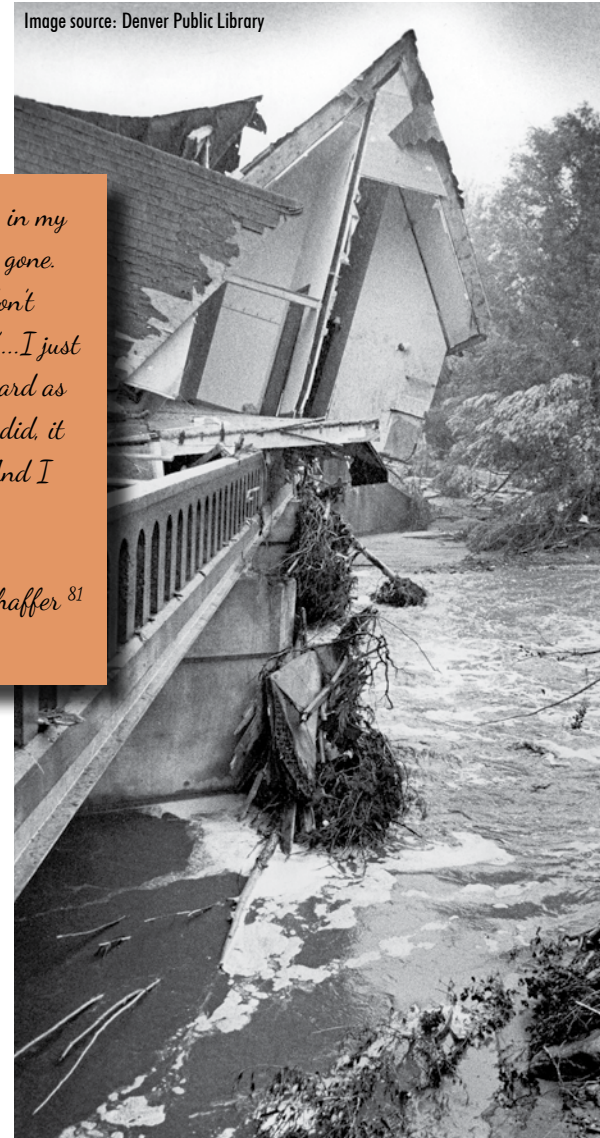
Dorothy Ferguson, a resident who had lived in the canyon since 1956, also recalled the initial normalcy of the weather that day, but with ominous forebodings. “The rain started out, just a nice rain, you know, but it was a strange day,” she said. “The sky was funny and, when we looked up towards Estes Park, it looked like Los Angeles smog. People say that it was very foggy up there. But the storm started — we had hail first, and then the thunder and lightning, and the lightning kept up throughout the night.”¹³

Some say that the first flood warnings came from an amateur radio operator located near the community of Drake,

who reported rockslides and water on US 34. An emergency dispatcher hearing his communication sent two police officers to each end of the canyon to verify the report. Officer William Miller arrived at the west end near the Town of Estes Park. Officer Tim Littlejohn, who was south of Fort Collins at the time, was asked to evaluate the situation to the east.¹⁴ The dispatcher also requested the services of Sergeant Hugh Purdy, a 26-year veteran of the State Patrol, who was off duty and home in Loveland watching the Olympics with his wife.¹⁵

“Then [he] went limp in my arms. I knew he was gone. My thought was, I don’t really want to drown!...I just forced myself up as hard as I could. And when I did, it just swept us away. And I started tumbling.”

Jerry Shaffer⁸¹



The river moved a 275-ton boulder the size of a small house.

July 31, 8:00 p.m.

○
Calls to 911 report rocks on the highway⁸²

July 31, 8:00 p.m.

○
Colorado State Patrol trooper responds to 911 calls⁸³

It was one of the most catastrophic natural disasters in Colorado history.

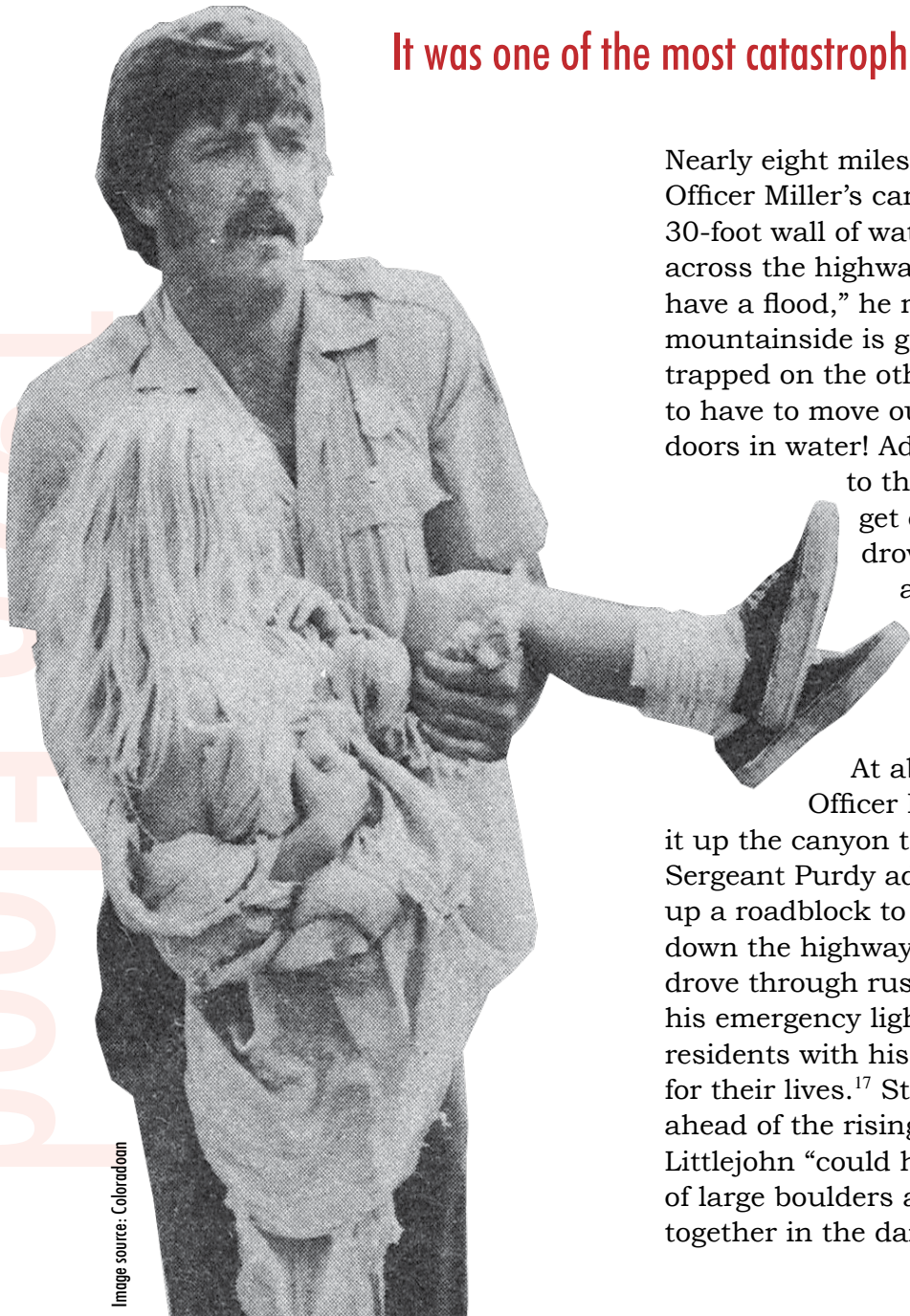


Image source: Coloradoan

Nearly eight miles into the canyon, Officer Miller's car was hit with a 30-foot wall of water that washed across the highway. "Advise, we have a flood," he radioed. "The whole mountainside is gone. We have people trapped on the other side. I'm going to have to move out. I'm up to my doors in water! Advise, we can't get to them. I'm going to get out of here before I drown!" Officer Miller abandoned his vehicle, swam to safety, and moved upslope.¹⁶

At about the same time, Officer Littlejohn had made it up the canyon to the Drake area. Sergeant Purdy advised him to set up a roadblock to turn people back down the highway. Officer Littlejohn drove through rushing water flashing his emergency lights and warning residents with his loudspeaker to flee for their lives.¹⁷ Struggling to stay ahead of the rising water, Officer Littlejohn "could hear the deep rumble of large boulders as they ground together in the dark water, the clatter

of rocks bouncing off cliff sides, and the splintering of wooden houses."¹⁸ He was able to drive to high ground and remained in the Drake area overnight to help wherever he could.

However, Officer Littlejohn had trouble convincing people to leave. "One individual in particular argued that he had reservations at the Waltonia, which we now know is gone," Littlejohn later recalled. Another man insisted on returning to his house. "I had to threaten him with physical arrest, finally to get him to obey the order, and to stay." Littlejohn described the growing devastation he witnessed that night. "I saw a trailer float by, it must have probably been doing 40 miles an hour bobbing along on top of the water, and cars floating away at this time, and there were great big trees just being torn off the side of the



Image source: Denver Public Library

July 31, 8:30 p.m.

Big Thompson reaches peak level at Waltonia¹⁴



"As one of the youngest members of the Evergreen-based Alpine Rescue Team in 1976, little did I know that a routine request for assistance from an official in Estes Park would lead me to the scene of the largest, most destructive and deadly weather event in the history of the state."

*Ted Williams*⁸⁵

banks and you could hear rocks and the boulders in the river. Well, they sounded huge, later some of them appeared to be the size of my patrol car....You could actually feel the ground shake, you know, from the rocks, and they'd bounce off the cliff sides, and houses were just splintered by the force....One thing for sure, if you got caught in that water, you were dead."¹⁹ His patrol car, situated above the inundation, became a beacon for helicopter rescues that were soon to follow.²⁰

Meanwhile, Sergeant Purdy tried to make his way up the canyon, where conditions worsened. Around 9:15 p.m., he made his final radio transmission: "I'm stuck, I'm right in the middle of it, I can't get out...about half mile east of Drake on the highway. Tell them to get out of the low area down below. As soon as the water starts picking up...[static]... high ground...."²¹ Sergeant Purdy did not survive the flood. His patrol car was found about two miles east of Drake, crushed beneath a rock and mudslide.²²

A year's worth of rain fell in 70 minutes.

July 31, 8:45 p.m.

One year's worth of rain falls within one to two hours in many areas⁸⁶

July 31, 9:00 p.m.

Forecasters in Denver warn of "some local flooding"⁸⁷

1976 FLOOD



Image source: Denver Post

"Advise, we have a flood. The whole mountainside is gone. We have people trapped on the other side. I'm going to have to move out. I'm up to my doors in water!"

*Police Officer William Miller*⁸⁸

where debris dams on bridges that build up and then wash through and break the bridges."²⁴ In one location, the river reportedly rose from normal flow to flood stage in less than five minutes.²⁵

840 people were evacuated by helicopter.

Officer Michael Owen Conley of the Estes Park Police Department, who was off duty but happened to be driving up the canyon with his wife, was stopped by a boulder in the middle of the road. Surrounded by rapidly rising flood waters, he contacted the Colorado State Patrol to alert them that the highway was impassable and to keep people out of the canyon. Officer Conley instructed his wife to climb to safety and began warning residents and tourists to get out as fast as possible. As a wall of water shot through the canyon, he attempted

to climb a telephone pole but was swept away and killed in the flood.²³

Erik Nilsson was working as an emergency responder with the Larimer County Emergency Services mountain rescue team in the 1970s. "The '76 flood was so unexpected and came so fast," he said. "Four inches per hour rainfall rates for about three hours. It just, people didn't have a chance. They didn't see it coming, and it came up so fast that we had consecutive so-called 'walls of water,' which are big rushes

"We could see the water as it came up higher and higher, and in fact, it looked like an ocean," recalled Dorothy Ferguson. "And it built up to that volume so quickly, it was almost like one minute it was just rain, and then the next minute it was all this water, and then things started going down the river, like the first one was Ernie Conrad's green bus, brand new, and some other cars, and some of them had their lights on and we didn't know whether the people were in them or not, and all sorts of things started coming down the river."²⁶

Racing down the canyon at an average speed of 15 miles per hour, this cataclysm obliterated everything in its

July 31, 9:00 p.m.

Big Thompson reaches peak level of 30,100 cfs at Drake (50 cfs is normal)⁸⁹

July 31, 9:00 p.m.

Second North Fork peak level is reached at Glen Haven⁹⁰

The human response is, “Let’s go to help.”

path, making death traps of vehicles and buildings. “Huge boulders, trees, houses, propane tanks, cars, mobile homes and everything else in the path of the wall of water were tossed around as if in a giant blender”²⁷ before being sucked under the surface. The river then “twisted, scraped, pounded, and ripped them to pieces in a massive grinder of rock, water, and debris from which there was no escape.”²⁸ The wave of water raced through the canyon so fast that even if US 34 had not been washed out, the only escape was to climb the canyon walls.²⁹

As the “grinding, tearing, ripping” water hurtled downriver, it gouged the canyon’s outside curves. US 34, pummeled by landslides crashing down from above and undercut by the ferocious current below, “fell apart in countless places” while “the river

boomed and rumbled.” Recalling the sound, one resident said, “The noise of the water was deafening. The whole mountain seemed to tremble and you were reminded of the noise of jet engines being tested. After a while, the continuous roaring beats against you and into you, and makes you sick at the stomach.”³⁰

Dorothy Ferguson described how her neighbor, Doug Butow, tried to rescue her by carrying her out of her house to take her to safety. While trying to escape the canyon, she said they “hit a hole in the road and tipped

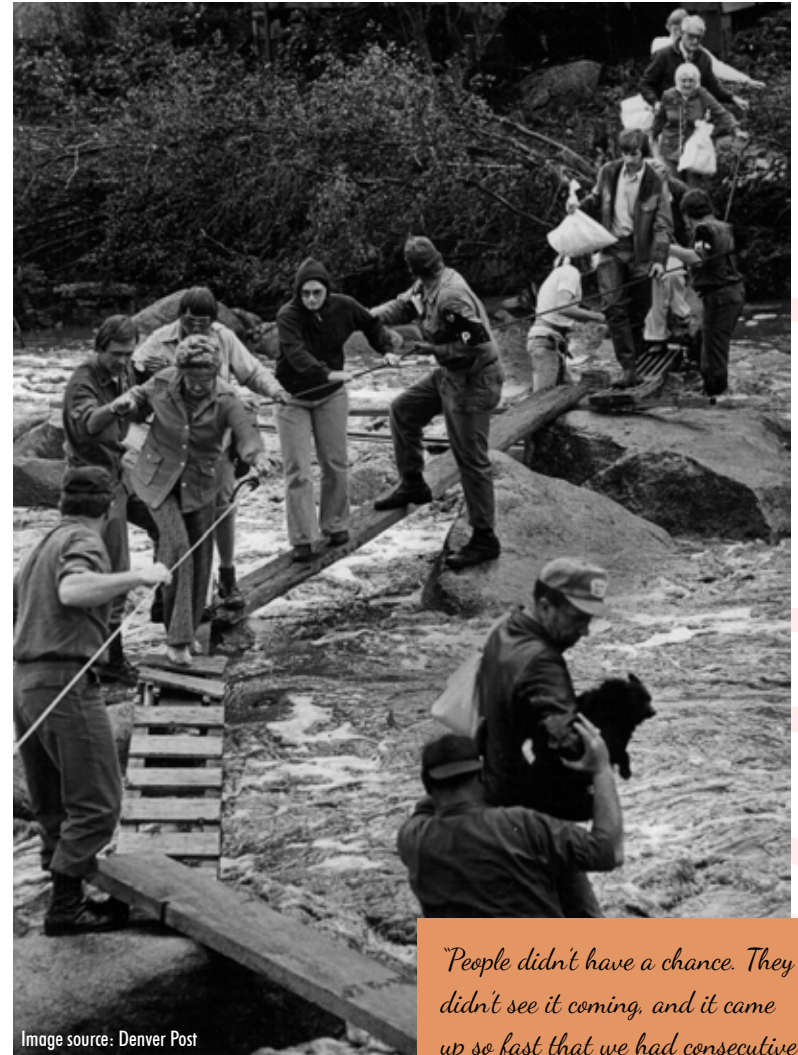


Image source: Denver Post

“People didn’t have a chance. They didn’t see it coming, and it came up so fast that we had consecutive so-called ‘walls of water’...”

*Erik Nilsson
Emergency Responder⁹¹*

July 31, 9:00 p.m.

Fox Creek reaches
peak level⁹²

July 31, 9:15 p.m.

Sgt Purdy radios his
final transmission⁹³

Survivor Story

David Essex, Ron Cotton, and Dwight Hamilton Rocky Mountain National Park

Essex: We had rigged a rope, Tyrolean traverse, across the point where the road was cut out of the Glen Comfort store, but at that time we felt it was too dangerous to take very many people across it, because the velocity of the water was just terrific.

Interviewer: So if that rope broke, or dipped, or something...

Essex: Yes. We'd be in trouble....So we started up out of there in a convoy again....Got back to a point where the road had totally washed out behind us; it was extremely deep, and then we just could not go any further.

Interviewer: So you were trapped.

Essex: At that point we were trapped. The water was rising, coming up onto the road where we were, we rigged ropes up the steep rock slopes, feeling that that would be the only way out. We'd start to take these people up the ropes. We had one lady that was 90 years old, we didn't know whether she could stand that sort of shock, but we sent some of our climbers up high to find ledges, spots that could hold a number of people that we could take up the slope, and the other thing that was dangerous, we were worried about rockslides all the time coming down on you....At this point, a couple tried to cross the point where the road had been washed out and this terrific velocity of water going through. They actually tried to drive through it. It turned their vehicle upside down. One lady inside never got out. She drowned. Her husband did succeed in getting out, was hanging onto the vehicle, which was upside down. We made two tries to get him with a rope, then he was just sloughed away. We weren't able to get him.

Cotton: We were down there for about 21 hours. I came home...and sat down in the chair, and I started bawling like a baby.

Hamilton: I broke down at home three or four days later. I think of it as being my wife, you, or someone very close to you. And it really got to me, and it still does.

Essex: Well, that night, I think a lot of us took it personally that we couldn't get a rope to that guy. You know, you blame yourself for not being able to get to them....⁹⁴

The river carried a boulder as large as 3,200 cubic feet.

over the jeep, [which] threw me in the water. I almost drowned. That was my scariest moment, because I don't know how to swim."³¹

The rising river was just one factor contributing to the unprecedented degree of devastation. Water cascaded down the steep hillsides, dislodging rocks from cliff faces that tumbled and shattered into the water below. Huge falling granite slabs splintered mature Ponderosa pines and Douglas fir trees growing at the base of the slope. The river's astounding velocity carried a boulder as large as 3,200 cubic feet; the largest one moved by the flood weighed 275 tons. A debris slide slammed hundreds of cubic yards of soil and rocks into the river. Deposition of all this material, which was intensified where the flow was impeded by bridges, buildings, and dense vegetation, diverted the river from its pre-flood channel in several locations.³²

Outside the canyon, emergency response efforts by governmental agencies and citizen volunteers quickly formed and strengthened. Police erected roadblocks near the top and base of the canyon to turn motorists away. Around 3:15 a.m. on Sunday morning, the Governor of Colorado, Richard



Image source: Colorado State University

July 31, 9:30 p.m.



Big Thompson reaches peak level at Cedar Cove²⁵

July 31, 9:40 p.m.



Flood crest reaches canyon mouth²⁶

"Anyone caught in the canyon had no chance. There was no way to foresee where the danger zones would be. Nobody really knew until it got there."

Police Officer Tim Littlejohn⁹⁷



A small group of agencies coordinated evacuation and rescue measures.

Douglas Lamm, declared a state of disaster emergency in order to coordinate and authorize state relief measures. The National Guard, along with more Colorado State Troopers, was dispatched at 4:00 a.m. to render aid and begin tactical planning.³³

Throughout the days that followed, a small group of local, state, and federal agencies coordinated evacuation and rescue measures. Ironically, the Fort Collins unit of the National Guard had left Colorado for summer training the



Image source: Colorado State University

July 31, 10:00 p.m.

Fish Creek reaches peak level⁹⁸

July 31, 10:15-10:30 p.m.

Big Thompson siphon, weighing 989,000 pounds, is destroyed⁹⁹

Fifty-five National Park Service personnel responded within 15 minutes to the call for help.



Image source: Denver Post

"Of course, we threw everyone we could get on the county level into this. Everybody just worked, and if they could find time to sleep, they did. But they just kept going."

*Captain John Englebert
Fort Collins Sheriff's Office¹⁰²*

night before. U.S. Army helicopters from Fort Carson and Wyoming arrived near daybreak, and other units of the National Guard, along with the U.S. Forest Service, coordinated ground-to-air communication to focus relief efforts within the canyon. A triage center was organized at the canyon's base. Fifty-five National Park Service personnel responded within 15 minutes of the call for help from the Larimer County Sheriff's Office in Estes Park. Rangers from Rocky Mountain National Park searched for survivors and repaired upper sections of the highway with

heavy equipment. They led roughly 200 to 300 people out of the canyon, many by foot.³⁴

Fred and Edna Woodring, residents of Estes Park, heard a distress call from the canyon on their CB radio and drove down to help as listeners followed their progress. "It's too much, the water's too high," they heard Fred concede. "We've got to turn back." But the raging water plunged their vehicle into the river, headlights up. "My God!," Edna cried. "It's the end of the world!" The

vehicle flipped upside-down, trapping her inside, where she died. Her husband managed to climb outside and cling to the car. One of the rangers tried to throw Fred a rope but was unsuccessful. Moments later, the torrent carried Fred to his death.³⁵

The Covered Wagon Café, approximately one mile west of Cedar Cove, stood on a low terrace on the north side of the river. When water began rising in front

July 31, 10:30 p.m.

Dry Gulch reaches peak level¹⁰⁰

July 31, 10:30 p.m.

20-foot wall of water tears through the canyon¹⁰¹

of the building, the restaurant's 10 customers retreated with the proprietor to his adjacent house. A waitress who had left earlier called to tell her boss she was home safe. While they were talking, a surge of water carried off the house, restaurant, and adjoining motel. No one who had been in the home survived. Only a large gravel bar remained on the site when the flood subsided. Farther west, 16 people died in two separate motels at Waltonia, which had been

built on a large debris fan. Following the flood, virtually all of Waltonia had been obliterated.³⁶

The dawn of "Centennial Sunday" the next day revealed "an almost incomprehensible scene of destruction"³⁷ as evacuations for those still stranded in the canyon began.³⁸ An observer likened the scene to "one to rival

US 34 "fell apart in countless places" while "the river boomed and rumbled."

Image source: Colorado State University



July 31, 11:00 p.m.

National Weather Service issues first flash flood bulletin¹⁰⁴

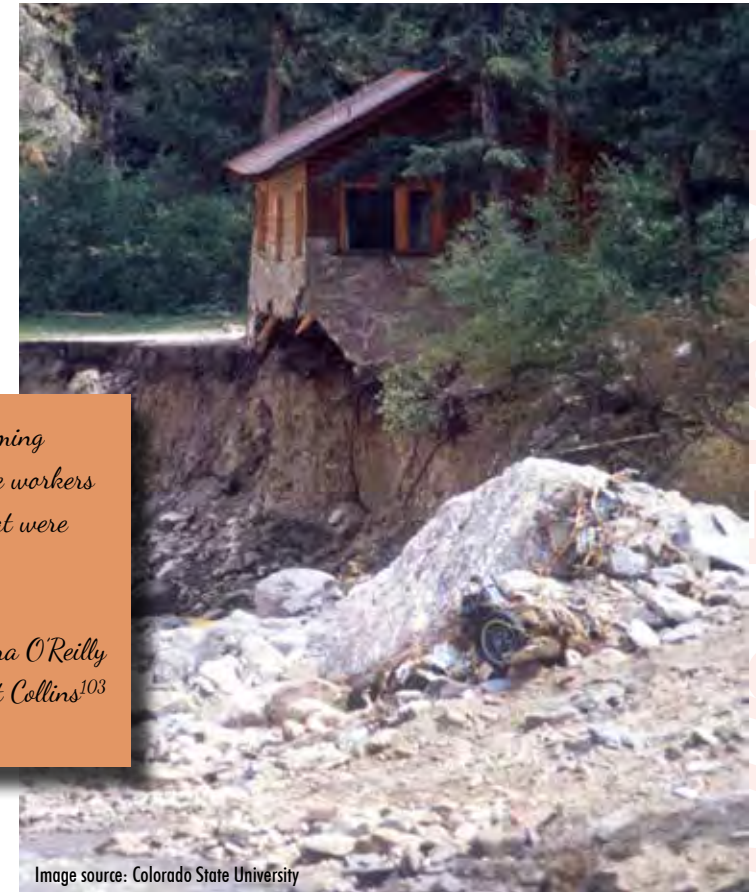


Image source: Colorado State University

"This wall of water was coming down then...they had rescue workers trying to retrieve bodies that were floating down the river..."

*Barbara O'Reilly
Red Cross Officer, Fort Collins¹⁰³*

July 31, 11:00 p.m.

Miller Fork and Black Creek reach peak levels¹⁰⁵



Image source: Loveland Reporter-Herald

"We could see the helicopters all day flying back and forth, and they knew we were there, and we knew they were taking people out, and figured that we'd get out eventually."

*Ervin Deal*¹⁰⁶



Image source: Denver Public Library

"There were people waving frantically..."

a combination tornado, flood, and earthquake."³⁹ The Governor surveyed the destruction by helicopter on Sunday morning. "We were in a reconnaissance helicopter, and there's no way that we could help all of those people that were down there, but there were people waving frantically, there were people clinging to, literally clinging to

hillsides....You see people standing on roofs of houses and the stream on either side of them, then it is a feeling of great frustration....The human response is, 'Let's go to help.'"⁴⁰ He contacted the office of President Gerald Ford, who issued federal disaster funds and additional ground and air support.⁴¹

Infused with state and federal assistance, rescue crews developed a systematic procedure to extricate survivors. The U.S. Forest Service provided an air traffic control network to coordinate the operation, which involved approximately 15 helicopters. Small helicopters were used to rescue people stranded on cliff sides, roof tops, and other high refuges. Evacuees were whisked to designated areas where they were subsequently flown out of the canyon by large Chinook transport helicopters to Loveland.⁴² Hundreds of people were transported out of the canyon; many did not need

July 31, 11:00 p.m.



Big Thompson reaches peak level of 31,200 cfs at canyon mouth (normal is 165 cfs)¹⁰⁷

medical attention and were brought to Loveland High School, where the Red Cross had established a refugee shelter and evacuation center. One evacuated resident found some neighbors and friends, and discovered how many others had perished. “We hugged and cried. What can you say? As we walked away, I passed out.”⁴³ By Tuesday, everyone who wanted to leave the canyon had been evacuated.⁴⁴

The focus then shifted to recovering the dead. Bodies were pulled out of the river, cars, and debris piles. The vast majority of victims were killed by traumatic injury rather than by drowning. Bodies were found stripped of clothing and covered in mud. Slowly the individuals who lost their lives were identified. By the end of September, all but five bodies had been recovered.



Image source: Denver Post

“Monday I called my boy that lives in Berthoud, and I says, ‘How’s Greg?’, and he said Greg was okay. This old dad bawled, tears come into my eyes. I said, ‘I don’t care what happens now,’ as long as I knew that boy was okay.”¹¹⁰

George Morgan

Survivor Story Captain William Thomas Colorado State Patrol, Greeley

Thomas: I just had a feeling that we had something bigger than what I had originally supposed....I’m hearing all this radio traffic out of Estes Park, trying to contact my car down in the canyon, by that time I’d heard that [Officer Purdy’s] car had been washed away, that it was raining extremely hard, and I felt that that officer would probably drown....When Sergeant Purdy started up the canyon — he’s a pretty sagacious old sergeant — he had a feeling that all was not right with the world. So probably along Cedar Cove, while he’s west-bound, he tells Officer George Rahne and Officer Randy Jones to set a roadblock up at the Narrows, not let anybody come west up the canyon....Now there’s no doubt in my mind that that order of Sergeant Purdy saved many, many lives. Because after talking to Officer Rahne and Officer Jones, who set up that roadblock, incidentally, it saved Rahne’s life, in that he was a mile up the canyon in the Narrows. When he got that order from the sergeant, he reluctantly turned around and went back and set up the roadblock. If he’d have stayed in there, he would have died just exactly like Sergeant Purdy died, because they would have been on the highway, warning people.

Interviewer: There was an ambulance that got through.

Thomas: Yes, but he ran our roadblock, and of course they lost their ambulance, and very, very luckily, they both lived.

Interviewer: The officers were waving them down, and [the ambulance driver] thought they were waving them through, and they got through, and of course, they didn’t get very far before they were swamped.¹⁰⁸

By Tuesday, everyone who wanted to leave the canyon had been evacuated.

July 31, 11:00 p.m.



Image source: J. Berna

"When Sergeant Purdy started up the canyon, he had a feeling that all was not right with the world. So...he tells Officer George Rahne and Officer Randy Jones to set a roadblock up at the Narrows, not let anybody come west up the canyon....There's no doubt in my mind that that order of Sergeant Purdy saved many, many lives."

*Captian William Thomas
Colorado State Patrol, Greeley ¹¹¹*

Disaster operation centers were positioned throughout Loveland.

Of the 144 people killed in the disaster, 41 were residents of the canyon. In addition to the devastating loss of life, in a period of roughly two hours the flood had also destroyed and damaged hundreds of homes and businesses, decimated the highway, trampled and overturned cars and trailers, jeopardized Loveland's water supply, deposited massive debris piles, and caused millions of dollars in damages.⁴⁵ The loss of life and extent of the destruction were inconceivable.

As emergency efforts subsided, local, state, and federal agencies evaluated damages and started implementing plans for recovery. Disaster operation centers were positioned throughout Loveland. Various organizations, including the Red Cross, provided lodging, legal help, insurance advice, and mental health counseling. Politicians quickly gathered to release government funding to financially assist survivors, support cleanup, and aid in the quick repair of roadways, culverts, and bridges.⁴⁶



Image source: Colorado State University

By midweek, residents made their way back into the canyon and evaluated the damages. They worked feverishly to remove debris and silt from their properties, and identify salvageable household items and keepsakes. Some tackled the logistics of rebuilding. Two organizations, the Interfaith Task

July 31, 11:00 p.m.

Big Thompson peak stage of 19.7 feet exceeds previous stage by more than 10 feet¹¹²

Force and the Mennonite Disaster Service, offered immediate and direct help to survivors, and spent countless hours cleaning and repairing damaged homes. The magnitude of the effort was exemplified by the contracts awarded by the U.S. Army Corps of Engineers to remove nearly 320,000 cubic yards of debris, 93 propane tanks, and 197 automobiles.⁴⁷

But access to the canyon was significantly limited. Contrary to the belief in 1920 that “the greater part of [the road] is practically a rock bed,”⁴⁸ US 34 had been constructed primarily on artificial fill placed along the canyon walls, which suffered the effects of scour. Highway embankments on the outside of river bends, as well as backfill material around bridge abutments,

were particularly vulnerable to flood damage. The 1976 flood completely destroyed nearly 10 of the road’s 23 miles, and badly damaged another 11 miles. Repairs were estimated at \$16.5 million. A total of 42 bridges were lost — 18 along the Big Thompson River and 24 along the North Fork. The flood had also destroyed small, adjacent roadways, triggered multiple mudslides, and dislodged massive boulders throughout the canyon. The

Slowly, the individuals who lost their lives were identified.

“We felt we probably had 2,500 people, counting campers, in that canyon. And we knew immediately that the death loss was going to be high.”

Captain William Thomas
Colorado State Patrol, Greeley¹¹³



Image source: Colorado State University

August 1, 3:15 a.m.

Governor Lamm declares state of disaster emergency¹¹⁴

3-18 – The River and the Road

road embankment in the Narrows was decimated, with the exception of a few tens of feet inside the curves.⁴⁹ A journalist who flew over the area in a helicopter described the carnage: “The destruction was stunning. At every bend in the canyon, it seemed, the raging river had ripped out the road before making the next straight-away.”⁵⁰



Image source: Denver Public Library

A 1977 report to the Governor about the effects of the flood included an objective that the design of US 34 should “strive to withstand a 100-year flood” and to design bridges “for debris.” The report also recommended considering “alternatives of relocation of all or a portion of the highway outside of the canyon,” noting that “it is important in planning for the redevelopment of the canyon to remember that the river becomes destructive when in the course of pursuing its natural functions, man’s functions are caught in its path.”⁵¹

Destruction of this magnitude cut off the canyon’s residents and the route to Estes Park, which people depended on for business, travel, and communication. “I went to a meeting,”

US 34 was more than just a transportation route.

“The telephone company installed three telephones for us...you could almost see the relief on [evacuees] faces when they talked to someone at home to let them know that they were okay...Finally they had spoken to someone, you know, and they just broke down and cried.”

*Barbara O’Reilly
Red Cross Officer, Fort Collins,¹¹⁵*

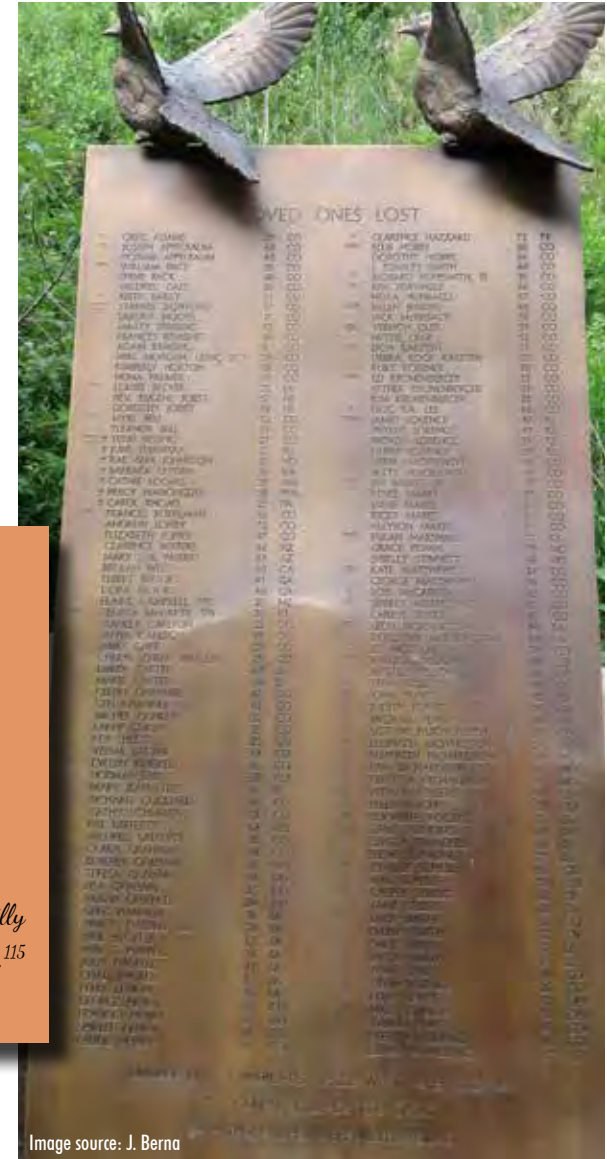


Image source: J. Berna

August 1, 4:00 a.m.

National Guard, Colorado State Troopers are dispatched to the area¹¹⁶

Residents worked feverishly to remove debris and silt from their properties.

"A call was awaiting me when I got [home], notifying us that all the Mental Health Clinic people available, were to report to the evacuation headquarters at Loveland High School..."

*Jim Dooney
Larimer County Mental Health
Clinic, Fort Collins¹¹⁸*



Image source: Colorado State University

point of orientation.”⁵³ Reconstruction of the highway was “an anxious issue” for affected communities. People wanted assurances that the road would be replaced precisely where it had been, because “to move or change it threatened the community order.”⁵⁴ Acknowledging these concerns, the Director of the Colorado Department of Highways stated that the road would be rebuilt and improved “pretty much where it is now” within nine to 12 months of the 1976 disaster.⁵⁵ As a result, “it would have been impossible to do anything” but reconstruct US 34 in its former location.⁵⁶

Employing “some of the heaviest equipment available,” the U.S. Army Corps of Engineers created a single-lane, gravel “pioneer road” up the canyon to facilitate clean-up operations and provide crude, short-term access for construction equipment and four-wheel drive vehicles.⁵⁷ Engineers removed boulders “as large as elephants” and scraped the river bottom for fill dirt.⁵⁸

recalls George Morgan, “and I said, ‘All right, whatever you do, we’ve got to get that road built back just as quick as possible, because my livelihood depends on that road, and with it gone, I am *sunk*.’”⁵² But US 34 was more than just a transportation route — the highway “was the binding cord of the community, a means of measurement, and a

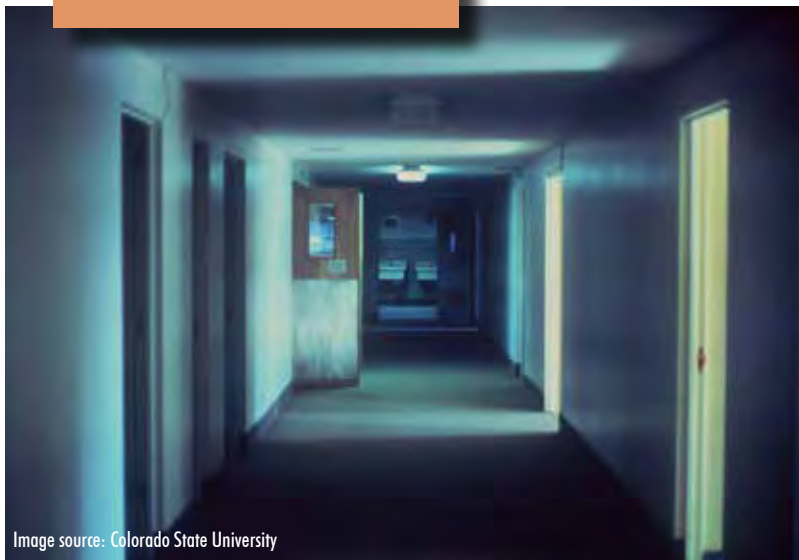


Image source: Colorado State University

August 1, Early Morning

Death reports begin mounting; rescue helicopters are mobilized¹¹⁷

Survivor Story
Captain John Englebert
Sheriff's Office, Fort Collins

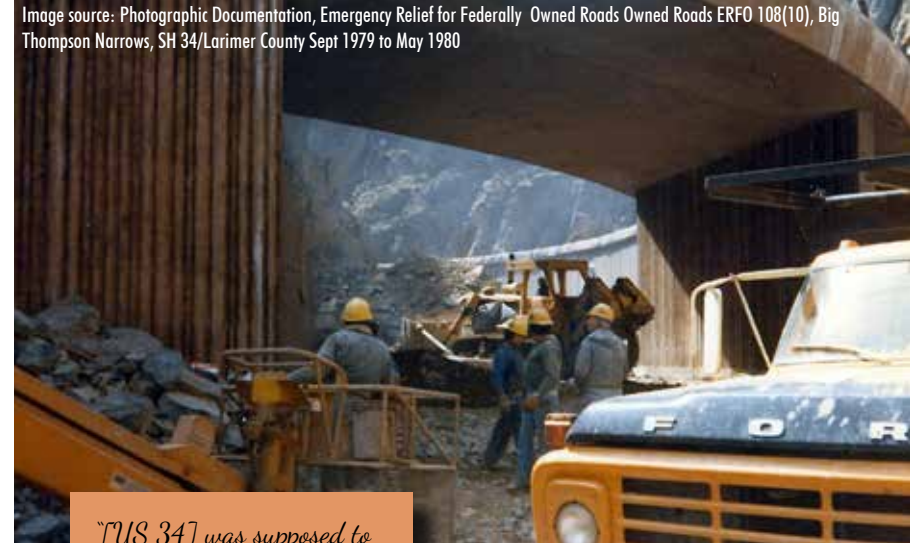
Englebert: Here comes this car down the river; we could see inside this vehicle, and no more than a matter of seconds it was washed by us. We could see the faces of people in this car. They were waving and everything, and of course, it was just the top of this car bobbing in the water, it was just like a cork. And I understand that two or three days later the people who were helping us search the river bottom did find a car with people in it. So I'm sure that was their fate. There was nothing anyone could do without jeopardizing their life either. There was no way we could stop the car. There was nothing that could be done.

I could see we were going into a large air operation. I think that we were all trained for this night. By the next morning we had located enough military helicopters, private helicopters, and St. Anthony's helicopters. We had 19 helicopters in the area. The first day we [brought in] 250 people that were injured....The main problem [was] fuel. The first day, I think we ran through 5,000 or 6,000 gallons of fuel. Nineteen helicopters burn an awful lot of fuel. We were bringing it up in large tank trucks, jet fuel, out of Denver....We landed [the helicopters] and we tried to tell [the evacuees], "Now hold hands, follow us, we'll lead you in." The prop blasts from the double rotors on these helicopters were so immense it knocked me down twice, and of course, knocked down these elderly people many times, just the wind blast. I know they were terrified. You could see it on their faces. They were just immensely terrified of these large helicopters.

Interviewer: Some place you mentioned a night helicopter flight. Where does that...?

Englebert: Wednesday night about 11:30 this individual, Roy Hoffman, called down on the radio on the Emergency Channel, and we couldn't hear him very well because his battery was getting awfully weak...he had three bears around him or something to that effect. We hypothesized that probably the water had wiped out all the garbage dumps in the canyon. The bears, of course, the wildlife, were all stirred up. We called back one of the pilots, and told him the situation....We thought [Roy] was surrounded by three bears, and they were right outside of his camp and, of course, he was petrified. No gun, no light, no nothing. Well, when they got there, the noise of the helicopter or the big spotlights chased the bears off. He had quite a story to tell, that he had three full-grown bears circling him, grunting, and he could see them very plainly. Maybe the bears wouldn't have harmed him, maybe they would have.¹¹⁹

Image source: Photographic Documentation, Emergency Relief for Federally Owned Roads ERFO 108(10), Big Thompson Narrows, SH 34/Larimer County Sept 1979 to May 1980



"[US 34] was supposed to be a lot more bullet-proof."

Neil Grigg
Colorado State University

Although the flood severely scoured the Narrows, enough material remained in the channel to build the pioneer road. Following the temporary repairs, US 34 was opened in November 1976 until more large-scale, permanent repairs could be conducted.⁵⁹

In the aftermath of the devastation, highway engineers redesigned US 34 using "modern engineering and planning standards," with the goal of surviving a 100-year flood.⁶⁰ Neil Grigg, a professor of civil and environmental engineering at Colorado State University, remembers

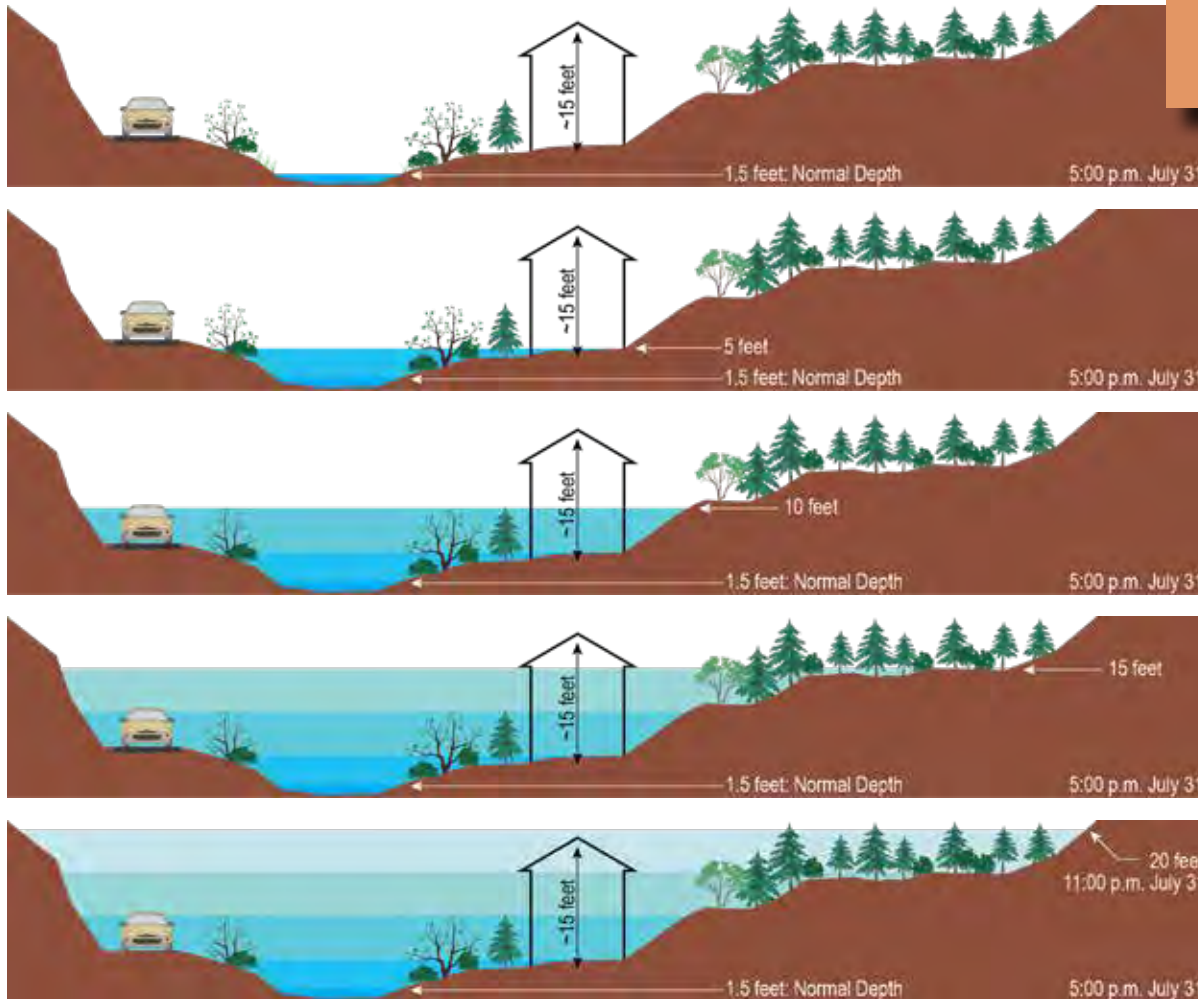
August 1, 9:00 a.m.


National Guard arrives
at Loveland¹²⁰

Prior to the flood, US 34 was no more than 10 feet above the water.

"We could see the water as it came up higher and higher, and in fact, it looked like an ocean. And it built up to that volume so quickly...it was all this water..."

Dorothy Ferguson



discussions and planning about the redesigned road. "It was supposed to be a lot more bullet-proof," he said.⁶¹

The process of rebuilding the highway was "elaborate and expensive."⁶² Prior to the flood, US 34 was no more than 10 feet above the water. Highway engineers decided to raise the road above the river through the Narrows — the most difficult section — with the intent to survive a 100-year flood.⁶³ This section "incorporated novel design concepts which required basically untried construction techniques. Timely solutions to problems encountered in

August 1, 6:00 p.m.

Approximately 200 people remain stranded at Glen Haven¹²¹

3-22 – The River and the Road

the field were of utmost importance if the strict construction schedule were to be maintained.”⁶⁴ The reconstructed section was raised by 16 feet using precast concrete panels, which were anchored by steel soldier piles supported by a footing set into bedrock. Heavy horizontal steel rods tied each panel into the canyon wall.

Image source: Photographic Documentation, Emergency Relief for Federally Owned Roads ERFO 108(10), Big Thompson Narrows, SH 34/ Larimer County Sept 1979 to May 1980



PRINT NOS. 762-763
DATE 2-1-80
SUBJECT Rock cut at Sta. 1533+. Bedrock in this area was highly fractured and continued to spall even after project was completed.

"I said, 'we've got to get that road built back just as quick as possible, because my livelihood depends on that road.'"

George Morgan

US 34 officially reopened nearly four years after the flood.



Image source: CDOT Archives

Upon completion, US 34 was officially reopened on May 17, 1980, nearly four years after the flood. The opening ceremony culminated with “Chainsaw Maggie” razing the last construction sign while crowds watched in a sleet storm (shown at right on facing page).⁶⁵

In addition to rebuilding US 34 to be more flood-resistant, long-term changes were implemented to help ensure a disaster of this magnitude would never strike again. Larimer County purchased

August 2, 9:00 a.m.

President Ford declares Larimer County a major disaster area⁷²

153 parcels of land to remove residents from the path of a future flood. Rain gauges and flood warning signs were installed throughout the canyon. Protocols were established to trigger actions when the river reached a certain level.⁶⁶

Gradually, people returned. Despite the devastation of 1976, many residents wanted to rebuild their homes in the canyon. They considered the flood “a freak event which would not occur again for several hundred years.”⁶⁷ They believed the disaster was an anomaly, and that the lessons learned and changes made would help keep them safe. And they believed, as did an author writing about the flood decades later,

that “the Big Thompson Canyon is better prepared, of course, for the next time.”⁶⁸ Yet just 37 years later, the worst flood in the state’s history struck Colorado’s northern Front Range on September 9, 2013, once again hitting the Big Thompson particularly hard.



Image source: CDOT Archives

“I am concerned about some of the people moving back in their houses, where they one time sat.”¹²³

George Morgan



Image source: Colorado State University



Image source: CDOT Archives

People returned; they considered the flood a “freak event.”

May 17, 1980



US 34 officially reopens

1976 FLOOD



Big Thompson Watershed Forum

Big Thompson Canyon Association

1976 Big Thompson Flood, Colorado

In the early evening of July 31, 1976, a large stationary front system moved as much as 7.5 inches of rainfall in about an hour across 12 inches in a few hours in the upper reaches of the Big Thompson River drainage. The large amount of rainfall in such a short period of time produced a flash flood that caught residents and tourists by surprise. The immense volume of water that churned down the narrow Big Thompson Canyon scoured the river channel and destroyed everything in its path, including 46 houses, 32 businesses, essential bridges, paved and unpaved roads, power and telephone lines, and many other structures. The tragedy claimed the lives of 144 people. Scores of other people narrowly escaped with their lives.

The Big Thompson flood ranks among the deadliest of Colorado's recorded floods. It is one of several destructive floods in the United States that have shown the necessity of conducting research to determine the causes and effects of floods. The U.S. Geological Survey (USGS) conducts research and operates a National Stream Gauging network to help understand and predict the magnitude and likelihood of large streamflow events such as the Big Thompson Flood. Such research and streamgauge installations are part of an ongoing USGS effort to reduce flood hazards and to increase public awareness.



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1976 Flood



2013

Monday, September 9

**The rain
fell
for six straight days.**

Thirty-seven years would pass before storms once again rendered the Big Thompson River a formidable, raging torrent, destroying roads and bridges, ripping houses and businesses from foundations, and most terribly — claiming lives.



Image source: CDOT

"I didn't see it being worse than Big Thompson of '76, not a chance, not a chance..."

*Erik Nilsson
Larimer County
Emergency Manager*

This time, nature spread her wrath unsparingly over 17 northern Front Range counties. Atypical for September, the rain came on the heels of a particularly dry summer, and was “greeted with enthusiasm” by those seeking relief from the drought.¹ While the 1976 storm was over within hours, the rain that began on September 9, 2013, didn't end until six days later.

During that time span, “biblical” record-breaking rainfall dropped the equivalent of one year's worth of precipitation, raising mountain streams and rivers to unprecedented levels, and unleashing widespread destruction and catastrophic loss throughout Colorado's Front Range.² It was “as if a hurricane skipped over Texas and made landfall directly in the Rocky Mountains.”³ On September 16,

21 helicopters launched the biggest civilian airlift operation since Hurricane Katrina, seeking to rescue more than 1,200 people deemed missing or stranded by the devastation.⁴



Image source: CDOT

"I never thought I would ever see cars wrapped around trees again, and certainly not in the Big Thompson Canyon."

*Eve Grunfest
Flood researcher*

Unlike the 1976 flood, which occurred in relative isolation, the rains of 2013 inundated a swath of land from Colorado Springs north to Fort Collins, flooding an area “roughly the size of Connecticut.”⁵ The fast-moving water demolished or severely damaged access roads, bridges, retaining walls, and major highways; swept away homes and businesses;⁶ and caused a staggering \$2.9 billion in damages to public and private lands statewide.⁷ In Larimer

County alone, 1,120 square miles were flooded and approximately 2,000 homes and 4,500 businesses were impacted.

Although peak water volume flowing through the Big Thompson Canyon was “somewhat lower” than in 1976, Big Thompson River levels reached or exceeded the 1976 flood’s peak level for more than 100 hours and qualified as a 1,000-year event.⁸ In a testament to the fury of the 2013 flood, the roiling



Image source: CDOT

River levels reached or exceeded the 1976 flood’s peak level for more than 100 hours.

Sept 9, Afternoon



Temperature drops from 82 degrees to 66 in one hour

Sept 9, Afternoon



Denver area reports heavy rain, hail, street flooding

waters of the Big Thompson demolished a high-water marker placed by the U.S. Geological Survey to commemorate the 1976 event.⁹ Tree limbs and household items like refrigerators became lodged in the river, and riparian areas and riverbanks were decimated.¹⁰ “I never thought I would ever see cars wrapped around trees again, and certainly not in the Big Thompson Canyon,” Eve Gruntfest, a flood researcher, acknowledged.¹¹

A combination of watershed runoff, flows released from the Olympus Dam at approximately 6,000 cubic feet per

second (cfs), and flow surges from debris dam breaches at adjoining tributaries caused massive damage to US 34. Floodwaters overtopped and washed out huge segments of the highway, adjacent retaining walls, and access roads and bridges.¹² Larimer County Sheriff Justin Smith reported that “the devastation being brought on by this floodwater is almost incomprehensible,

Floodwaters washed out huge segments of the highway, retaining walls, access roads, and bridges.



Image source: CDOT



Image source: CDOT

“The devastation being brought on by this floodwater is almost incomprehensible, especially near the Big Thompson River.”

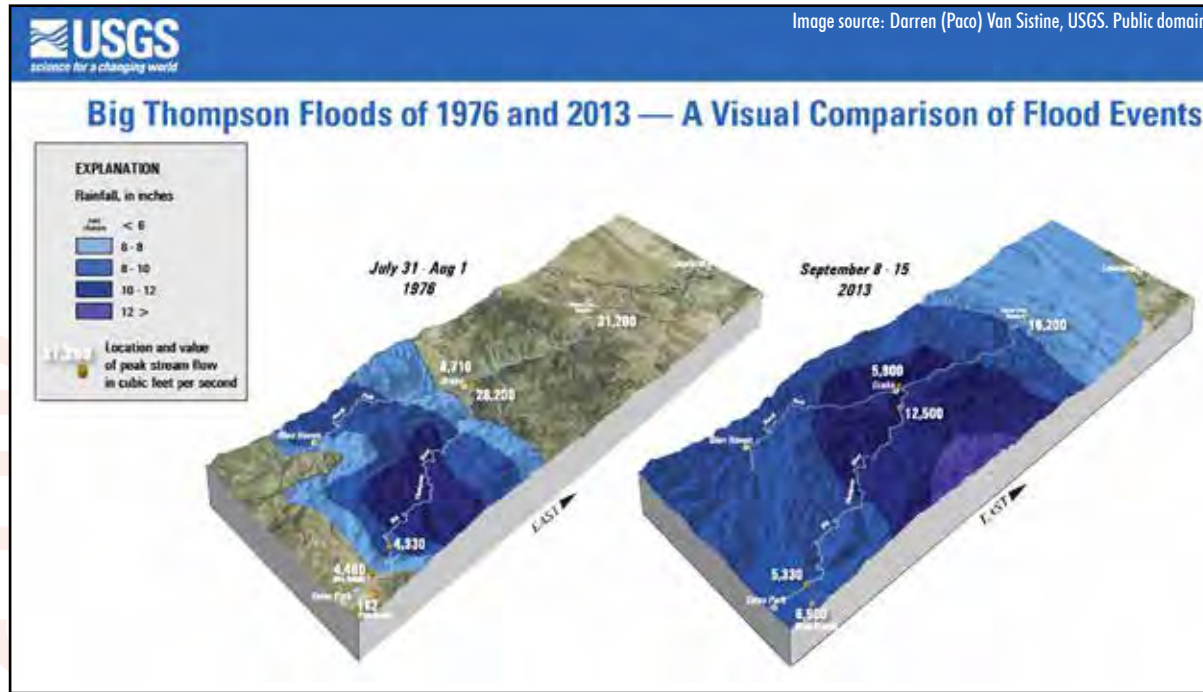
*Justin Smith
Larimer County Sheriff*

Sept 10

Steady rain falls in Loveland

Sept 11, 4:00-7:30 p.m.

Flash flood warnings are issued for most of Boulder County



especially near the Big Thompson River.”¹³ Ten people died in the 2013 floods throughout the state, including two women who lived in Big Thompson Canyon.¹⁴

The extraordinary events of 2013 did not fit Colorado’s usual rainfall pattern. This flood was not the result of spring rains or intense summer thunderstorms that release a ferocity

of water in concentrated areas, such as the 1976 Big Thompson flood. Rather, “This was a totally new type of event: an early fall widespread event during one of the driest months of the year,” said Brad Udall, director of the University of Colorado, Boulder’s Getches-Wilkinson Center for Natural Resources, Energy and the Environment. Part of the blame goes to the 14-year drought that hardened the soil and parched the Front

Range prior to the deluge. And part of the blame is likely the effects of climate change.¹⁵

Erik Nilsson, Larimer County Emergency Manager, experienced both the 1976 and 2013 events. He recalls the first night of the 2013 flood: “I didn’t see it being worse than Big Thompson of ‘76, not a chance, not a chance.... When I got up the next morning...I heard people saying that it was worse than ‘76, and I went, ‘What!?’ You know, it was that bad that night. It reached a tipping point, you know, it can rain and rain and rain and rain and all this, all hell breaks loose....It was a very, very unusual event, and it kept getting worse and it kept getting worse and I didn’t really expect it to blow out Big Thompson Canyon like it did....We were worried that might happen that night,

This flood was not the result of spring rains or intense summer thunderstorms.

Sept 11, 7:30 p.m.

Heavy rain falls in central Larimer County

Sept 11, 10:20 p.m.

Numerous rocks are reported on US 34 in Big Thompson Canyon

Part of the blame goes to the 14-year drought that hardened the soil and parched the Front Range.

that afternoon, ‘cause it was just coming up and coming up and the forecast was that it was just going to keep raining. But, even though I’d been around since ‘76 and even though I’d seen the water disasters in this county from the last 40 years, it still surprised me, the magnitude.”¹⁶

Gilbert Dunning lived with his wife Carolyn in a home adjacent to the Big Thompson River in Drake — their third residence in the canyon. “The flood didn’t come with one big ‘bam’; it kept raising and raising,” he recalled.

Carolyn elaborated, saying “[The] first [house we owned], we watched float down the river the biggest night of the flood. Just went, floated right down at the end of our other neighbor’s driveway farther down.” Their own home narrowly escaped the same fate. “The neighbors urged us to come over to them...on a hill above our current house, and those folks were quite sure — as I was — that this house would never be damaged. Well, I was wrong,” she said. The couple spent several days trapped in the canyon before being airlifted to safety. “We are very, very lucky, really and truly,” Gilbert reflected. “We see the neighbor’s homes, their front yards, their lawns, their utility buildings, all gone....All I do today is look around and say, you know ‘I was, we were really lucky because we got out alive.’”¹⁷

“It kept getting worse and it kept getting worse and I didn’t really expect it to blow out Big Thompson Canyon like it did....”

*Erik Nilsson
Larimer County Emergency
Manager*



Image source: CDOT

Sept 12, 1:00 a.m.

Big Thompson River
flooding undercuts US 34

Sept 12, 1:00 a.m.

US 34 is closed
west of Loveland

4-6 – The River and the Road



"We are very, very lucky, really and truly. We see the neighbor's homes, their front yards, their lawns, their utility buildings, all gone....We were really lucky because we got out alive."

Gilbert Dunning



for the state,¹⁸ evacuation efforts gained significant momentum and hundreds of people were advised to leave the canyon. Jason Gdovicak, the Volunteer Fire Chief for Glen Haven, was living above the Glen Haven Firehouse in September 2013. He spent September 11 and 12 warning residents of the canyon about the impending danger, then assisting with evacuations as the water rose. After 24 hours of working non-stop, he returned to the firehouse to get some sleep. "So I think I finally got to lay down

Evacuation measures in the Big Thompson Canyon began slowly on September 11, 2013.

Sept 12, 5:00 a.m.

Flash flood warning is issued for Big Thompson Canyon

Sept 12, 6:00 a.m.

Bureau of Reclamation warns it will release water from Lake Estes

By the close of September 12, hundreds of people were advised to leave the canyon.

about 11:30 or so at night, and so we had a couple people on watch. We put glow sticks out on the road, as kind of a trigger point. If the water started getting up there, then we had to get people up and possibly look at evacuating the firehouse....So I got all my wet clothes off, laid down, and then...all I heard was screaming and everybody yelling, ‘We need to get out of here! Evacuate now! Did anybody wake Jason up?’ I’m like, ‘What?’...And I’ve never been so scared in my life. Everybody’s scrambling, trying to get stuff. We’re trying to figure out if Clifton’s in the water or if he’s out, and we’re trying to save our lives...and it’s like, ‘We need to get higher.’...That next morning we woke up and walked out, and it was like Armageddon. I can’t even explain it, just walking down the road and...the town was pretty much gone.”¹⁹

By early morning on September 13, flood-waters had swamped the small communities along the river, inviting “comparisons to the horror that visited the same places in 1976.”²⁰ A Presidential Disaster Declaration (DR-4145) was issued on September 14, 2013.²¹ In the end, roughly 1,000 people were safely evacuated by helicopter or escorted out by federal, state, and local agencies. Remarkably, only two individuals, both from Cedar Cove, were reported dead or missing in the Big Thompson Canyon.²²

The dramatic difference in loss of life compared to 1976 can be attributed, in

“Even though I’d been around since 76 and even though I’d seen the water disasters in this county from the last 40 years, it still surprised me, the magnitude.”

*Erik Nilsson
Larimer County Emergency Manager*



Image source: CDOT

Sept 12, 6:00 a.m.

Larimer County Sheriff’s Office calls 598 canyon residents to warn of rising river

Sept 12, 6:00 a.m.

Big Thompson Canyon residents are evacuated

Nearly 9 miles of US 34 were completely destroyed or significantly damaged.



Image source: CDOT

"The neighbors urged us to come over to them...on a hill above our current house, and those folks were quite sure – as I was – that this house would never be damaged. Well, I was wrong."

Carolyn Dunning

Colorado Resiliency and Recovery Office

The 2013 damage was so extensive that Governor Hickenlooper formed the Colorado Resiliency and Recovery Office (CRRO), a state agency whose mission is "to make sure history doesn't repeat itself" in places like Big Thompson Canyon.⁷⁸ Federal, state, and local organizations, non-profits, and various individuals from private sectors came together under the CRRO to direct, guide, and begin restoration. By the close of 2013, people had been able to repair, rebuild, or otherwise mitigate damage to numerous homes, businesses, roads, and bridges. Also, by the end of 2013, watershed recovery efforts helped restore damage to ecosystems and reduce water erosion along hillsides.⁷⁹

part, to nearly 40 years of significantly improved technology. In contrast to the 1976 flood, torrential rains were predicted further in advance through use of radar and satellites, and modern lines of communication allowed for quick road closures and rapid emergency response. In particular, the Wireless Emergency Alert system transmitted flash flood warnings directly to cell phones. Mobile phones, web sites, and social media also helped disperse information rapidly.²³

Nearly nine miles of US 34 were completely destroyed or significantly damaged.²⁴ Much of the US 34 roadway

and grade were undermined in the Narrows, where the river washed out pavement from below, exposing support structures. Commuters and residents of Drake, Cedar Cove, and Glen Haven were stranded on roadways, in their homes, and along hillsides.²⁵ One journalist noted, "Nowhere have the challenges been steeper than Big Thompson Canyon, where floodwaters scoured away not only pavements and guardrails, but roadbeds and subsurface geology, effectively leaving sections of highway unsound and unsafe."²⁶ Dan Alexander, Federal Disaster Recovery Coordinator for the Federal Emergency Management Agency, reiterated these

Sept 12, 6:00 a.m.

Evacuation centers are set up in Loveland, Estes Park, Lyons

Sept 12, 6:00 a.m.

City of Loveland issues voluntary evacuation notices to residents in 100-year floodplain

observations. “This is the largest disaster that Colorado has ever endured. This disaster has changed communities and the landscape. And this is going to take us years to recover from,” he said.²⁷ The scene was uncannily familiar to anyone who had witnessed the tragic events of 1976.



Image source: CDOT

The severe levels of destruction triggered multiple outpourings of private and public aid. The Federal Emergency Management Agency approved roughly \$19.5 million for individual assistance, most of which was used to fund temporary housing or home repairs. An initial \$35 million was allocated for road repairs in Colorado near areas struck the hardest by floodwaters.²⁸ In the days following the flood, Governor Hickenlooper pledged that “Colorado would build back better, stronger, and more resilient.”²⁹



Image source: CDOT

“So I got all my wet clothes off, laid down, and then...all I heard was screaming and everybody yelling. We need to get out of here! Evacuate now!”

*Jason Gdovicak
Glen Haven Volunteer Fire Chief*

With human lives and property at stake, state officials invoked special emergency exemptions to quickly open access to isolated towns like Estes Park. “In a

Much of the US 34 roadway and grade were undermined in the Narrows.

Sept 12, 9:45 a.m.



City of Loveland makes evacuations mandatory

Sept 12, 10:00 a.m.



Flood surpasses 1976 benchmark

4-10 – The River and the Road

rush to rescue mountain residents,” Governor Hickenlooper “set a bold and seemingly impossible timeline,” giving the Colorado Department of Transportation (CDOT) only three months to restore highways obliterated by the flood until more permanent repairs could be made. To temporarily rebuild the flood-ravaged roads, environmental permitting processes were significantly condensed. “Any perceived or real delay by the locals...was unacceptable,” noted Sean Cronin, the head of the St. Vrain and Left Hand Water Conservancy District.³⁰

Jim Eussen, the CDOT Region 4 Planning and Environmental Manager, recalled seeing the destruction for the first time. “We had seen what happened in Loveland, but the damage in the canyon was pretty devastating; I was thinking, ‘Wow, how did anyone survive this?’ We saw debris, propane tanks, propane leaking.” He noted that the scene was similar to pictures he’d seen of the 1976 flood. It was “kind of an eerie feeling” to see the same level of destruction as 1976. “Everything was

The scene was uncannily familiar to anyone who had witnessed the tragic events of 1976.



Image source: Jacobs



Image source: CDOT

"That next morning we woke up and walked out, and it was like Armageddon...the town was pretty much gone."

Jason Gdovicak
Glen Haven Volunteer Fire Chief



Image source: CDOT

Sept 12, 10:30 a.m.



Thompson School District releases students early

Sept 12, All Day



Hundreds of people are advised to leave the canyon

gone. The river channel was where the roadway had been.”³¹

It was against this backdrop that CDOT was feverishly working. “We were given a mandate by the governor to not just build it back, but to build it back better than it was before,” said CDOT spokesman Jared Fiel. “He wanted to make sure the second-largest airlift of people in U.S. history was not going to be revisited.”³² However, recovering from such a punishing blow would not be easy. “We’re focused on building back

stronger, better,” said Molly Urbina, Colorado Resiliency and Recovery Office Executive Director one year after the flood. “But this is not a sprint — it’s a marathon. And we’re just starting the marathon.”³³

The first challenge CDOT faced was implementing temporary emergency

repairs to make US 34 passable by December 1, 2013, as mandated by the governor. CDOT established an Incident Command Center (ICC) in Loveland near US 34 to take control of the situation. The ICC served as a central location for CDOT staff to gather and develop an emergency plan of action for flood-damaged corridors.³⁴

Jim Eussen recalled the herculean effort the emergency repairs required. He and the rest of the emergency response team spent about 10 to 15 straight days assessing the damage, working from first morning light until dusk. “We were putting out fires at the ICC every day, working 12-hour days for six long months. Everyone worked around the clock on deadlines that were seen as unachievable, but we got it done, even with the holidays.”³⁵ Monte Malik, the US 34 Big Thompson Canyon Construction Manager, said, “It was destruction all around. The river was where the road was, and in many segments, there was no evidence of the road at all. Natural debris, vehicles, propane tanks, and other household items were strewn everywhere. We had trouble just trying to determine where to start.”³⁶

“I was thinking, ‘Wow, how did anyone survive this?’ We saw debris, propane tanks, propane leaking.”

*Jim Eussen
CDOT Region 4 Planning and
Environmental Manager*



Image source: CDOT

Recovering from such a punishing blow would not be easy.

Sept 13, 1:00 a.m.

Bureau of Reclamation reduces flow from dam to 5,202 cfs from 6,000 cfs

Sept 13, 1:00 a.m.

River velocity reaches 9,000 cfs west of Loveland



"The damage was devastating. Everything was gone. The river channel was where the roadway had been."

*Jim Eussen
CDOT Region 4 Planning and
Environmental Manager*

With this level of dedication and commitment, the emergency response team surpassed expectations by opening the road early, before Thanksgiving. Jim Eussen noted that quick and unflinching decision-making was an integral part of this success. "Johnny Olson [the CDOT Region 4 Transportation Director at the time] put

the team in place that got it done. We needed someone like him to make the difficult decisions," Eussen explained.³⁷

The flood had widened and degraded the river channel, and deposited a significant amount of sediment and debris throughout the canyon. Extensive repair efforts included removing debris, re-establishing shoulders and embankments, replacing damaged asphalt, filling washed out sections with concrete, repairing local access bridges, and repairing damaged drainage structures. Upon completion of these emergency repairs, US 34 was opened to traffic on November 21, 2013, at a cost of \$30 million. Although the temporary repairs were designed for normal high water events and were safe, they were not designed to flood standards. Therefore, permanent repairs were required in order to minimize the potential for similar future impacts, provide long-term safety of the road, and restore the river itself.³⁸

The first challenge CDOT faced was implementing temporary emergency repairs.

Sept 13, Early Morning

Two individuals are reported dead or missing

Sept 13, 5:45 a.m.

I-25 is closed between US 34 and CO 402

The flood widened and degraded the river channel, and deposited debris.

In addition to the road, the river also suffered from the protracted, multi-day downpour. Erik Nilsson recalled the different effects the 1976 and 2013 floods had on the river. “For days [in 2013] this river was up, and that’s a huge difference. It was a flash flood back then, it was a prolonged rain flood event now,” he said when comparing the two events. “It’s scoured out [in 2013].... There’s some places that look like road graders have gone in to make a big box department store...it was much faster back then [1976], and it didn’t do the erosive damage that this one did. That’s huge because our stream has changed, and we have to re-engineer it now to see where our problems are going to be.”³⁹

Furthermore, “the river became a casualty of an unprecedented emergency” as a result of the rapidly deployed

“The river was where the road was, and in many segments, there was no evidence of the road at all.”

*Monte Malik
US 34 Big Thompson Canyon
Construction Manager*



Survivor Story **Kim Campassi** Blue Mountain Resident, Little Thompson River

Campassi: Our property bordered the Little Thompson River. My husband and I had been out there since we purchased the home in February of 1992. So we’ve been there for some time. It was entirely destroyed. It was washed away. We understand it took about 15 minutes... it’s a complete life change. It’s financially devastating. It’s not something we financially will likely ever recover from. Emotionally it’s a real disaster.

Interviewer: Would you mind taking me through those events as they transpired?

Campassi: It was *big*, I mean there was no question. It was big. It was knocking down trees....From where [the] normal stream was, our place — our home — was about 275 feet away from that, so it was a pretty big distance. It was about 60 feet higher in elevation. So our feeling was that it would take an enormous amount of water, before — ah, I’m trying to think of how to describe this in words....[Our neighbors] were quite welcoming and we thought, “What the heck? Let’s just go up there and get a good night’s sleep....We woke up about 6 o’clock in the morning. It wasn’t raining....Out of the corner of my eye I could see my husband pulling out....He drove down to the bottom of the driveway, and the house was gone. And where the house was, between the house and cliff, which at [that] point now is over 300 feet, was a river, essentially....It didn’t occur to us in any way that anything was at risk. So we did not get anything out. We evacuated on the Saturday morning around lunchtime....”⁸⁰

Sept 13, 8:00 a.m.

Rocky Mountain
National Park closes

Sept 13, 9:30 a.m.

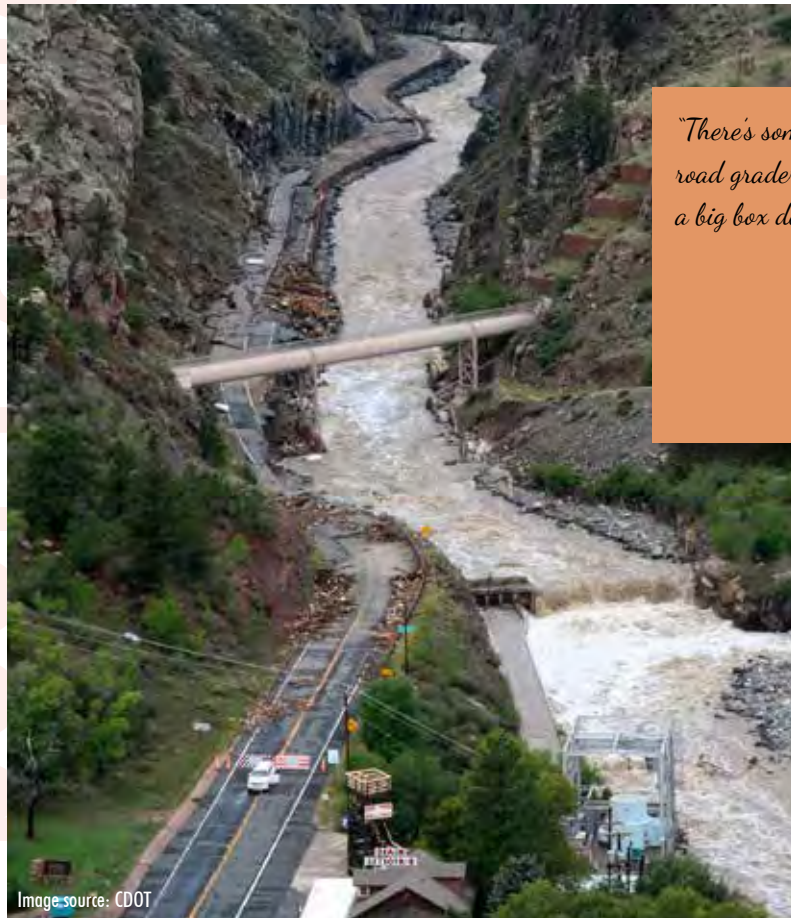
I-25 closes from
Denver to Wyoming

The river suffered in response to the protracted, multi-day downpour.

emergency repairs to US 34 in 2013.⁴⁰ However, restoring the Big Thompson River would have to wait until design and construction of permanent highway repairs. CDOT assured Colorado Parks

and Wildlife that the impacts to the river from the emergency repairs would be reversed.⁴¹

Permanent repairs began in 2015, which included replacing the temporary repairs, revegetating, replacing guardrails, repairing walls and fencing, and restoring the river. The overall goal of the permanent repairs was to provide long-term dependability and safety of US 34.⁴² As part of the permanent repair process, CDOT conducted several analyses to determine how to rebuild the highway to better resist major flood events. In addition, CDOT identified repeat “hot spots” from the 1976 flood, including the Narrows and the “horseshoe curve” east of Drake,



“There’s some places that look like road graders have gone in to make a big box department store....”

*Erik Nilsson
Larimer County
Emergency Manager*

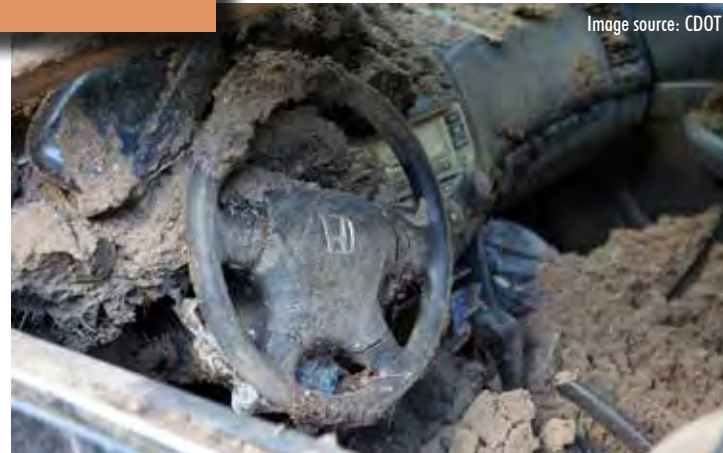


Image source: CDOT

Sept 13, Morning

Larimer County Sheriff
conducts helicopter surveys

Sept 13, 2:00 p.m.

Sheriff estimates 17 miles of
US 34 need to be rebuilt

both of which are characterized by unique natural peculiarities. Cedar Cove, Idylwilde, and Drake were three remaining hotspots that suffered during both floods, all of which are wider, flatter areas where people have settled.⁴³

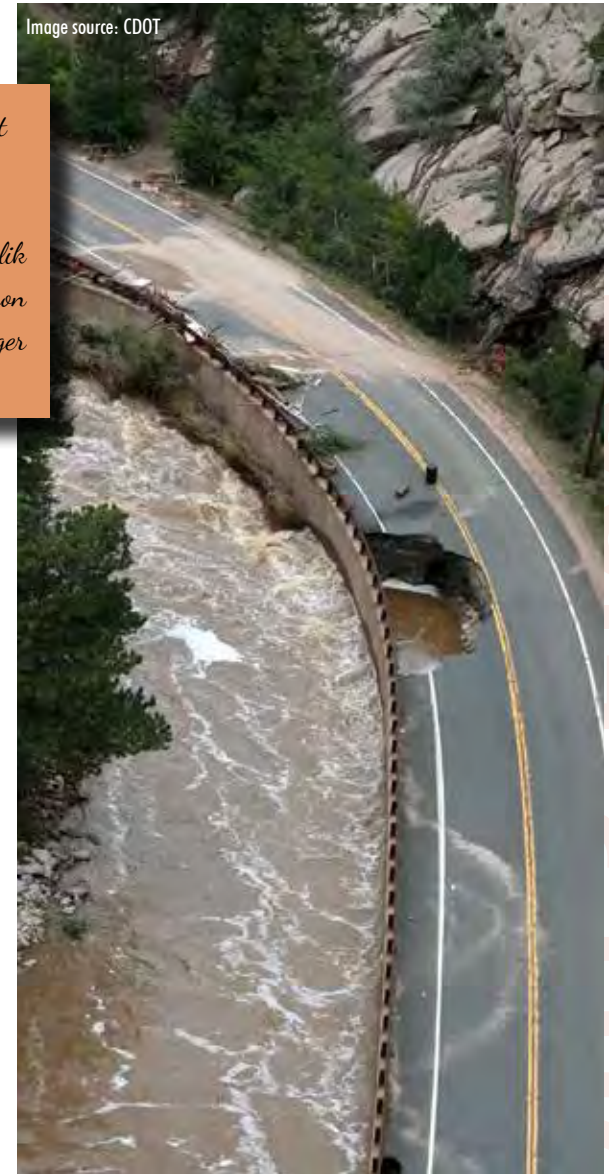
Keeping an open mind and remaining flexible to respond to unexpected situations on the ground was crucial to designing and implementing innovative permanent solutions. Monte Malik attributes the success of this approach to the trust the team members had in each other. “Field staff had to interpret plans, make changes, review issues, and even propose major changes to roadway designers based on what we saw out there. We relied on people working together and knowing when to escalate issues and make changes in the field in order to keep moving forward.”⁴⁴

Morale was high; the majority of the project team was up to the challenge of working long hours, especially when given some autonomy based on what they saw in the field. One crew worked a 10-hour shift during the day, and

another worked a 10-hour shift at night, leaving a few hours each day to maintain the equipment. Managing multiple shifts in the canyon was one of Malik’s biggest challenges, as was keeping the road clear during snow storms. “The mentality was that failure was not an option, we have to make this work,” he explained. “Designers were good at listening to the issues raised in the field, doing site visits, doing test sections in the field for solutions we’d

“The mentality was that failure was not an option, we have to make this work.”

*Monte Malik
US 34 Big Thompson Canyon
Construction Manager*



The overall goal of the permanent repairs was to provide long-term dependability and safety of US 34.

Sept 13, 4:40 p.m.

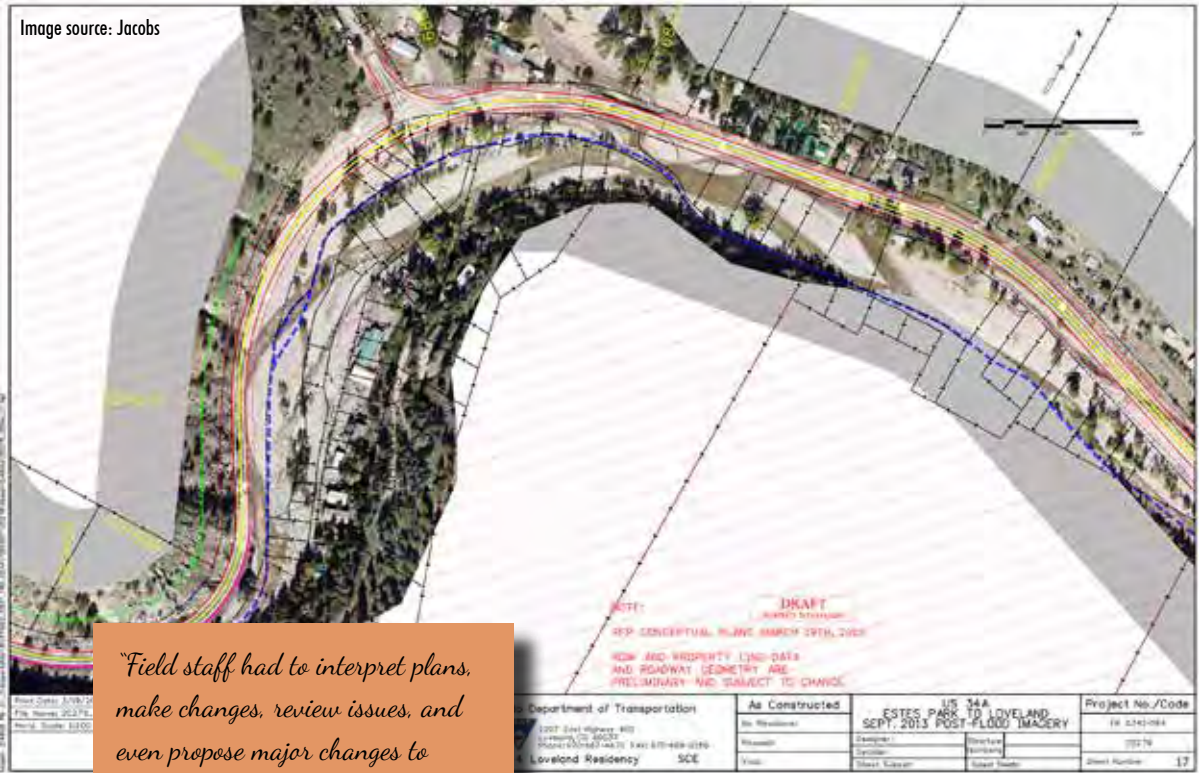


I-25 opens east of
Loveland

Sept 13, 7:00 p.m.



Multiple helicopters evacuate
people stranded by flood



"Field staff had to interpret plans, make changes, review issues, and even propose major changes to roadway designers based on what we saw out there."

Monte Malik
US 34 Big Thompson Canyon
Construction Manager

never tried before. People who couldn't be in the canyon had confidence in those who were, and people in the canyon could communicate up to the field office and designers — this was key. Designers were really willing to look at field issues and make adjustments. It was one big family: design and construction," he said.⁴⁵

Roadway designers strived to make the road more resilient to future storm events, and prevent or lessen the damage caused by significant floods. But what does "resilient" actually mean? "We have to look at the river and the roadway as a system," said Johnny Olson.⁴⁶ James Usher, CDOT US 34 Project Director, echoed this approach, stating that CDOT wanted to make the river and the road "work with each other and not against each other."⁴⁷ Reflecting on the 2013 flood, canyon resident Carolyn Dunning said, "We were always told, 'Well, even if there's a flood, it's not ever gonna get washed out again, especially in the Narrows or anything.' So, one thing I think that they've learned this time is that no matter what they try and do, that river is going to return to its original course..."⁴⁸

Accepting the river's reluctance to be tamed and the funds available for the project, CDOT refined its definition of "resilient." "The definition changed as the project progressed," James Usher

Morale was high; the majority of the project team was up to the challenge of working long hours.

Sept 13, 7:00 p.m.
Larimer County Sheriff requests additional air support

Sept 14, 7:00 a.m.
Search-and-rescue teams enter flooded areas

Managing multiple work crew shifts was a challenge, as was keeping the road clear of snow.

recalled. “At first, we defined it as making sure the road wouldn’t wash out during the next flood event.” When this approach proved to be impractical, CDOT shifted the design focus to preserving the segments of the road most essential for allowing people to get out of the canyon faster and getting emergency responders and construction crews in faster. “Resilient doesn’t necessarily mean making the road bullet-proof, but making it better able to recover next time,” he said.⁴⁹

The US 34 project team endeavored to reimagine the road and how it could coexist with the river. A typical approach in this situation is to rebuild the road on the current alignment and fortify the banks with rocky material (riprap) or walls to withstand the forces of the river. However, these techniques would diminish the natural beauty of the Big Thompson Canyon and could make it difficult for wildlife to traverse the road. In partnership with the U.S. Forest Service, Colorado Parks and Wildlife,

“Designers were really willing to look at field issues and make adjustments. It was one big family: design and construction.”

*Monte Malik
US 34 Big Thompson Canyon
Construction Manager*



Image source: Kiewit

Image source: Kiewit

Sept 14, 3:15 p.m.

Sheriff's Office states Patricia Goodwine of Cedar Cove is presumed dead

Sept 14, 3:55 p.m.

Sheriff's Office reports 475 people have been evacuated

CDOT refined its definition of “resilient.”

and the Big Thompson Watershed Coalition, CDOT decided to take a much different approach to deliver a more resilient connection between Loveland and Estes Park. As a result, most of the permanent repairs that were implemented cannot be seen.⁵⁰

The design team tasked to devise the permanent repairs consisted of a highly

qualified group of engineers with years of experience on roadway projects in Colorado and around the country. But resiliency was not a standard concept implemented on CDOT projects at the time. In addition, the budget was in flux and an innovative design was needed very quickly so the project could meet emergency funding deadlines. The engineers had to reach a common

understanding of what resiliency meant and how it would be applied on the project. Innovative solutions and new concepts evolved from an iterative process to achieve resiliency within the budget.⁵¹

The team evaluated shifting the road onto bedrock by moving it away from the river, allowing the river more room to roam in a flood event. The bedrock would also protect the road from washing away again and stranding residents and visitors. As a result, about three-quarters of a mile of the road was shifted onto bedrock, requiring removal of approximately 387,000 cubic yards of



“We were always told, ‘Well, even if there’s a flood, it’s not ever gonna get washed out again, especially in the Narrows or anything.’...No matter what they try and do, that river is going to return to its original course...”

Carolyn Dunning

Sept 14, Evening

President Obama declares major disaster for Larimer, Boulder, El Paso Counties

Sept 15, 7:45 a.m.

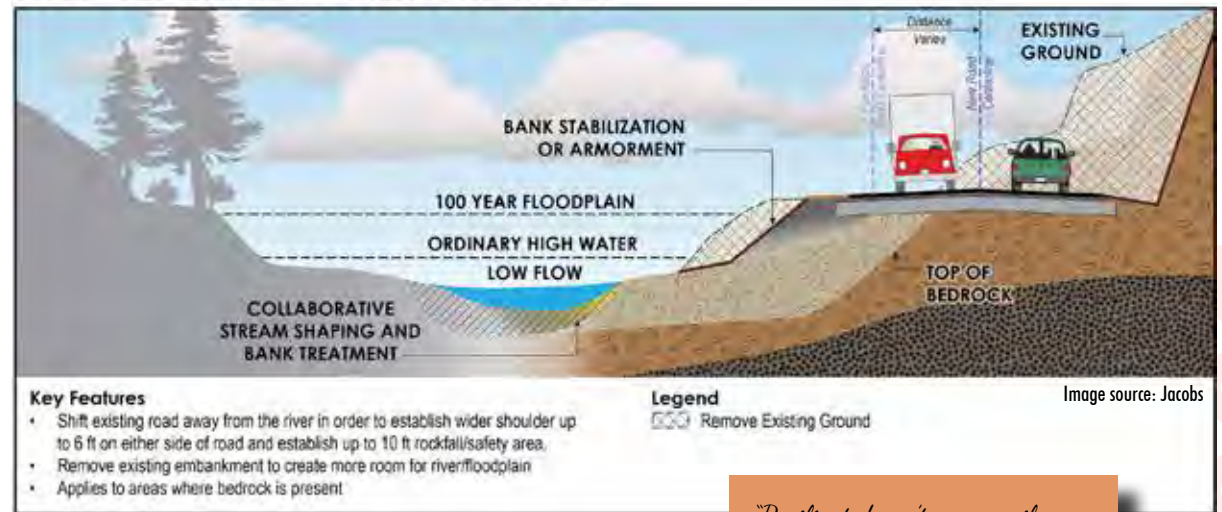
482 people are unaccounted for in Larimer County

rock — a staggering amount. If all this material was piled onto a football field, it would nearly reach the height of a 20-story building.⁵²

However, the road could not be shifted where the river and surrounding walls highly constrained the canyon without extraordinary cost and impacts. In these locations, various fortification techniques were installed below ground level, leaving the natural setting intact. Approximately three and one-half miles of the road were protected this way, and the techniques used were anything but typical. “Many of the solutions had never been applied in this context,” said Velvet Kuesel, Jacobs Engineering Design Project Manager, as she recounted the challenge of exploring unfamiliar technical solutions. For example, crews mixed cement with soil and installed it below the road to create a type of artificial bedrock. “The contractor had used the soil-cement mixing before for a stadium project, but not to build bedrock for a roadway,” Kuesel noted.⁵³

One of the most apparent changes in the canyon that gave the river room to move was abandoning the roadway’s historic

PERMANENT ROADWAY DESIGN CONCEPT #3



path along one of the sharpest bends in the river — the horseshoe curve east of Drake. Millions of years of flooding had eroded the canyon wall at this location, requiring road builders to continually pull the highway away from the river.⁵⁴ When examining photographs from the 1976 and 2013 flood damage, the team realized that the area had been completely destroyed both times. In addition, the largest number of evacuations occurred near this location.⁵⁵ The design team considered several options, such as moving the

“Resilient doesn’t necessarily mean making the road bullet-proof, but making it better able to recover next time.”

James Usher
CDOT US 34 Project Director

The US 34 project team endeavored to reimagine the road and how it could coexist with the river.

Sept 15, 7:45 a.m.

Sheriff’s Office states Evelyn Starner of Cedar Cove is presumed dead

Sept 15, 9:50 a.m.

Bad weather grounds 16 rescue helicopters

Approximately 387,000 cubic yards of rock were removed to shift 0.75 mile of the road onto bedrock.



"Many of the solutions had never been applied in this context."

*Velvet Kuesel
Design Project Manager
Jacobs Engineering*

road onto bedrock, but the bend was too sharp. They also considered installing retaining walls, but they were expensive.

The only option that would withstand a 100-year flood was shifting the road to the other side of the river and spanning it with bridges, but this too, would be extremely expensive and was therefore initially dismissed. However, the team eventually realized that this option made the most sense, even from a cost perspective.⁵⁶ For these

reasons, CDOT surrendered its fight with the river and chose to shift the US 34 alignment through the hillside south of the river, abandoning the road's original alignment. Although this solution involved two new bridges, a huge amount of excavation, and tens of millions of dollars more than the original plan, CDOT spokesman Jared Fiel explained, "In the case of the horseshoe curve, we said, 'Let's let the river have it. She's taken it twice before, so let's pull back and let her have it for good.'"⁵⁷



Sept 15, 9:50 a.m.

Ground crews evacuate 100 people from Cedar Cove

Sept 15, 10:00 a.m.

City of Loveland opens Disaster Assistance Center

Another example of the iterative design process was exemplified at “the slide” area west of Drake. Field crews offered constructability suggestions to the roadway designers, who devised a matrix riprap (partially grouted rocks)

using eight- to nine-foot boulders, which was placed to protect the river and prevent erosion from below, as a great deal of damage to the road happened from underneath. Installing riprap was no small feat. Crews worked 30 to 40

“In the case of the horseshoe curve, we said, ‘Let’s let the river have it. She’s taken it twice before, so let’s pull back and let her have it for good.’”

*Jared Fiel
CDOT Spokesman*



CDOT abandoned the roadway’s historic path along one of the river’s sharpest bends — the horseshoe curve.

Sept 16, 11:45 a.m.



Weather clears, allowing helicopters to fly

Sept 16, 11:45 a.m.



1,000 people in Larimer County require evacuation

2013 Flood

CDOT had to change ideas about how typical river restoration work was done.

feet deep in the canyon where the sun never crested the ridgeline, having to keep the boulders warm when applying concrete grout and working in the wet environment. Although they used big equipment to move large rocks, workers had to manipulate the riprap by hand. “We had a lot of days with no sun,” said Monte Malik. “But staff was still getting work done when it was cold, windy, and miserable.”⁵⁸

While construction crews were busy repairing the road, other specialists were focusing on restoring the river. As with their approach to repairing the road, CDOT had to change ideas about how typical river restoration work was done. A team of professionals with varying types of expertise worked together to form a vision of the river restoration and build the features correctly, with highway workers and river restoration specialists working side-by-side.⁵⁹ Several river restoration techniques, including placement of boulders, plants, and tree trunks, were designed to control the flow of water, create pools for fish habitat, stabilize the river’s banks, and prevent erosion.⁶⁰ The restoration work made use of existing and native

“Given that the river has a lot more room, I think the damage [in a flood] will be a lot less, not just to the road, but to private [properties.] as well.”

*Jason Hagerty
Kiewit Project Manager⁸¹*



Sept 16, 11:45 a.m.

398 people are unaccounted for in Larimer County

Sept 16, 11:45 a.m.

Loveland receives 8.68 inches of rain over seven days

Image source: Kiewit



"Staff was still getting work done when it was cold, windy, and miserable."

*Monte Malik
US 34 Big Thompson Canyon
Construction Manager*

materials, such as rocks supplied by the road reconstruction efforts, to impart a natural appearance. Trees with root balls that had been washed downstream during the flood were installed along the banks, and nearly 3,000 willow stakes cut from trees in the area were planted along the river's edge.⁶¹ Native trees and shrubs were transplanted in clumps to mimic nature, rather than in neat, landscaped rows.⁶² "We didn't want it to look like it was highly designed and highly engineered," said Randy Walsh of Stantec, who designed the restoration

of one stretch of the river. "It is," he continued, "but we didn't want it to look like it."⁶³

The restoration efforts represented the largest stream reconstruction project ever undertaken in the state of Colorado.⁶⁴ "Without remediation by CDOT crews, stream recovery would likely have taken decades," noted one journalist reporting on the restoration.⁶⁵ "The Big Thompson River restoration project was a monumental task which included cooperation between CDOT,

the City of Loveland, the City of Estes Park, the Big Thompson Watershed Coalition, the United States Forest Service, and Colorado Parks and Wildlife," said Jeff Spohn, senior aquatic biologist for Colorado Parks and Wildlife. "The collaborative process that occurred should become the template for future

Another example of the iterative design process was exemplified at "the slide" area west of Drake.

Sept 18, 10:00 a.m.

Rocky Mountain National
Park opens incrementally

Sept 19, 12:25 p.m.

1,183 people are rescued in Larimer
County; 139 are unaccounted for

The design process has been hailed as an outstanding example of collaboration among stakeholders.



Image source: Kiewit

river restoration projects,” he advised.⁶⁶

Today, signs of the 2013 destruction to both the river and the road have essentially vanished. Unbeknownst to travelers now driving through Big Thompson Canyon, the beautiful, post-reconstruction landscape they see was intentionally designed to be more resilient to floods. “People suffered greatly from

the flood and what we wanted to do was give them the river back,” said Walsh. “Restoration isn’t about going back in time,” he explained. “It’s using the past to manage the future.”⁶⁷ Jake Ruthven, an aquatic biologist with Colorado Parks and Wildlife, added, “It’s like a new river, and it’s cool to see how far it’s come.”⁶⁸ Monte Malik reinforced this sentiment, noting there were many naysayers when the restoration first started. “We worked through two tough winters, but people were very happy with the results. In the end, the team [CDOT, Kiewit, Jacobs Engineering] delivered on their promise.”⁶⁹

All of the potential permanent repair solutions identified for US 34 were vetted with organizations and agencies involved in restoring the corridor, and input from residents was critical. The design process has been hailed as an outstanding example of collaboration among stakeholders. Tom Donnelly, Larimer County Commissioner, noted, “One of the great success stories of this project is really the collaboration between at least three different levels of government, our private contractors,

“We used big equipment to move large rocks, but work crews had to manipulate the riprap by hand and keep the rocks warm when applying concrete grout.”

*Monte Malik
US 34 Big Thompson Canyon
Construction Manager*

Sept 20, 9:30 a.m.

Sheriff’s Office announces
Drake man is presumed dead

Sept 20, 10:00 a.m.

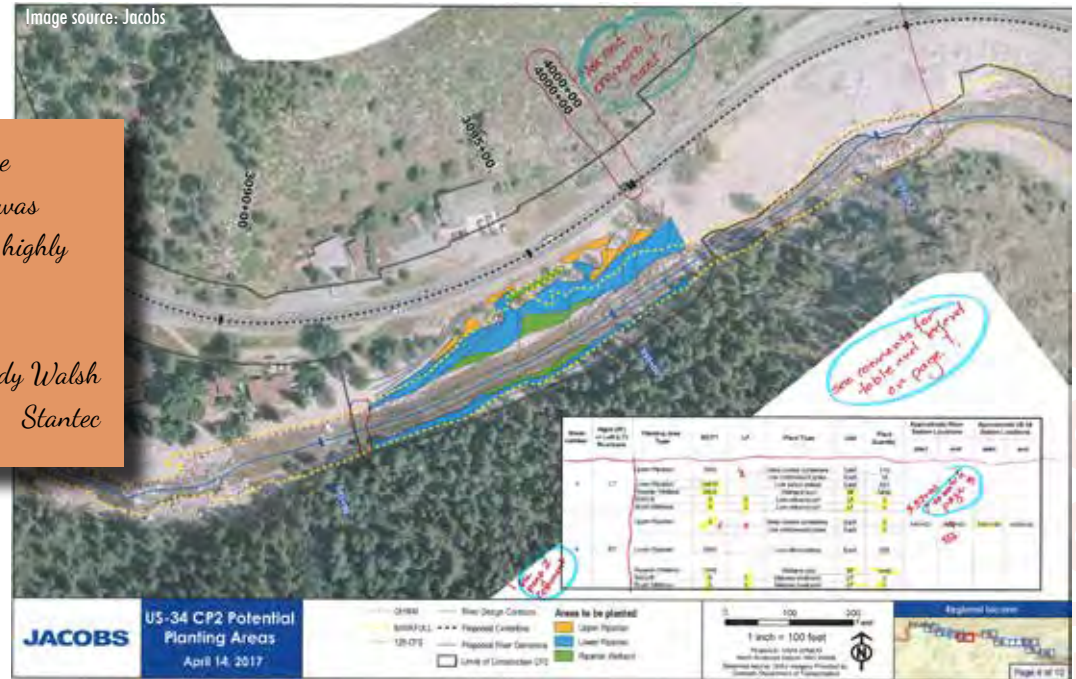
CDOT announces goal to
temporarily open roads by Dec 1



Image source: J. Berna

"We didn't want [the river] to look like it was highly designed and highly engineered."

Randy Walsh
Stantec



and our citizens — really all rallied together to do something that was much greater than any one of those could have done by ourselves.”⁷⁰ Velvet Kuesel recollected how closely the US 34 project team worked with stakeholders and residents in the canyon, noting the team’s acute awareness of how design decisions affected them. Residents also validated the results of the hydraulic model regarding the river’s behavior during flood events. By sharing their concerns and observations, residents contributed to the solutions. Kuesel said of the residents, “They had safety knowledge that could not be gleaned from a traffic or safety study.”⁷¹

The most difficult part of the experience for residents was undoubtedly the

two seasonal closures of US 34 for construction of the permanent repairs. The repairs required two eight-month spans of long-term road closures and limited access for residents. James Usher recalls implementing the second closure as the most challenging part of his job. The team had not planned to close the road a second time, but the steep cost of extending the construction duration to maintain traffic on the road during construction meant they would have to reduce the scope of road

Big Thompson Watershed Coalition

Soon after the flood, a group of property owners, local government officials, and recreational users working with the Natural Resources Conservation Service and the Colorado Water Conservation Board formed the Big Thompson Watershed Coalition.⁸² The coalition’s mission was to “protect and restore the ecological health of the Big Thompson Watershed for the use and enjoyment of our community today and for future generations.”⁸³ In the five years that followed the flood, the coalition would raise over \$10 million and complete 10 river restoration projects focused on the long-term sustainability of the watershed from the Olympus Dam to the Big Thompson’s confluence with the South Platte.⁸⁴

Restoration efforts made use of existing and native materials.

Sept 20, 11:45 a.m.

Rescues taper off; 1,191 rescued, 82 are unaccounted for in Larimer County

Sept 20, 11:45 a.m.

Search-and-rescue teams have searched 7,724 structures



"It's like a new river, and it's cool to see how far it's come."

*Jake Ruthven
Colorado Parks and Wildlife*

improvements to meet the budget. "Initially, I didn't support the idea of the second closure, because the first one was tough on the residents," Usher said. "I could put myself in their shoes. But ultimately it was the right thing for the project. By saving money with the road closure, we were able to put money back into the road."⁷² Monte Malik agreed. "A lot of people were critical of the second closure. But during Construction Phase One, which was the first winter closure with limited residential access,

we saw how much we could get done with big equipment in a safer manner." The team did the best they could to limit residents' difficulties. "Communication with everyone was key," Malik said. "And once residents saw how much work was going on, and saw things being built, they saw the human side of the issues we were facing. The work we do is personal; people were so happy to see us working up there."⁷³

Sept 22, 6:30 p.m.

Six people are officially listed as missing in Larimer County

Sept 23, 2:00 p.m.

Missing Drake man is found alive

Image source: Jacobs



This personal connection was the best part of the recovery process for CDOT staff. “I couldn’t have picked a better career,” said Monte Malik. “I get to brainstorm solutions with all kinds of people and then make them happen; I get to make a positive impact.”⁷⁴ Similarly, James Usher is most proud of the collaboration between all parties

involved. “The best part was everyone coming together and finding middle ground to come up with a great product. There were times when not everyone was happy about what was going on. But at the end of the day, we created a great final product, and I’m confident that the road is more resilient, and we will recover faster after the next flood.”⁷⁵

CDOT officially reopened US 34 on May 24, 2018, just shy of two years after the permanent repairs began in the summer of 2016. A 32-year resident of Drake recalled the effects of the construction efforts. “When they first started it, there was rock crushing going on all night long with big lights, probably for two or three months,” she said. A neighbor

Today, signs of the 2013 destruction to both the river and the road have essentially vanished.

Sept 24, 10:30 a.m.

Last missing person in Larimer County is found alive

Sept 26, 2:45 p.m.

Lake Estes is lowered so bottom fill material can be used to rebuild roads



Image source: Kiewit



Image source: CDOT

"You see a road getting fixed from time to time, but until you live on it and see them constantly going up and down the road, you don't give them credit. They worked morning and night."

Drake Resident

The personal connection was the best part of the recovery process.

added, "You see a road getting fixed from time to time, but until you live on it and see them constantly going up and down the road, you don't give them credit. They worked morning and night."⁷⁶ And one particularly appreciative resident estimates she baked more than 4,000 cookies for construction crews. "Thanks to all," proclaimed a sign next to her baked goods at the highway opening. "You deserve a pat on the back."⁷⁷



Image source: Loveland Reporter-Herald

\$240 Million Estimated Total Repair Cost	3,500 Square Yards Asphalt Removed ⁸⁵	32,000 Cubic Yards Road Base Material Excavated ⁸⁶	8,800 Tons Rock Installed Beneath Road ⁸⁷	475 Cubic Yards Grout Between Rocks ⁸⁸	675 Tons Asphalt Road Base Installed ⁸⁹
587,000 Construction Hours Without an Accident	15,000 Cubic Yards Subbase and Topsoil Crushed ⁹⁰	70,000 Cubic Yards Material Removed from River ⁹¹	95,000 Cubic Yards Rock Installed ⁹²	20,000 Linear Feet River Improvements ⁹³	4,000 Linear Feet New Drainage Pipe ⁹⁴

Sept 27, 9:00 a.m.

County-wide long-term flood recovery group meets in Loveland⁹⁵

May 24, 2018

US 34 officially reopens



2013 Big Thompson Flood, Colorado

Over a one week timeframe in September 2013, flooding in Colorado devastated the northern Front Range. The extensive rainfall resulted in flow surges that caused widespread, massive damage to infrastructure and transportation networks, including the Big Thompson River canyon between Estes Park and Loveland. Major sections of roadway were washed away completely. Much of the roadway was undermined, and many access bridges and retaining walls were destroyed. Two lives were lost, and scores of residents were isolated, with no access out of the canyon.

This was not the first time this had happened, a 1976 flood in the Big Thompson Canyon resulted in similar devastation. After the 2013 event, the Colorado Department of Transportation (CDOT) was challenged by the Governor to "Build Back Better than Before". CDOT quickly committed to completing emergency, temporary repairs followed by a flexible and resilient permanent solution. The permanent repair process involved implementing innovative design solutions to provide a resilient highway in harmony with the river that facilitates emergency ingress and egress in a future event. Some of those solutions involved:

- Shifting the highway up onto bedrock (rock cuts)
- Swapping the highway and the river alignment
- Soil cement mixing to build in situ bedrock
- Shifted re-vestment under the highway prism
- Mix/riprap for embankment slopes
- Floodplain expansion to give the river more space



MILEPOST 82.6 - Upstream view of a significantly damaged road along the Big Thompson River near Dickson Gulch, with a large portion of the road washed out. Reflects undermined/loss of retaining wall backfill, pavement, and riprap embankment; exposure of wall tie backs and bedrock.



MILEPOST 85.43 - Aerial view of damaged eastbound lane but passable westbound lane near Big Thompson Elementary School. Loss of embankment and pavement.



MILEPOST 76.45 - Aerial view of US 34 completely washed out at Rose Hall Way. Loss of access bridges at Rose Hall and Moodle (west of Rose Hall) isolated residents on the south side of the highway. The flooding also caused extensive property damage within this reach.



MILEPOST 83.0 - Aerial view through the "Narrows" portion of the Canyon shows heavy highway damage and frequent instances of overtopping with debris fields.



MILEPOST 68.27 - Aerial view of highway overtopping with sediment and debris accumulation on US 34 near Noels Draw.



MILEPOST 78.4 - Aerial view of the Horseshoe Bend curve. The river completely washed the highway from the mountainside.



MILEPOST 73.52 - Aerial view of complete wash out of US 34 at the Waltonia Rd intersection. Residents along Waltonia Rd were completely cutoff from US 34.



MILEPOST 65.83 - Aerial View of Rock Canyon Rd access bridge. Bridge approaches are undermined with large debris piles at bridge and on US 34.

4-30 – The River and the Road

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2013 Flood



The Future

Although flooding
on the Northern Front Range
is not uncommon,

widespread,
highly destructive floods
such as the 2013 event
are much rarer.

Image source: Kiewit

However, the implication that events of this magnitude occur only once every 500 years (as in the case of the Big Thompson River) may be “very misleading,” according to research geomorphologist Sandra Ryan-Burkett. “Many of the streams in the Front Range have not been gauged for very many years or decades, so we lack information about the long-term historical range

of variation in these streams,”¹ she said. Research economist Patty Champ further warns, “the implication here is that, after having survived one ‘1,000-year event,’ you’re off the hook for the next 1,000 years. This is decidedly not the case: You haven’t reduced the future risk just because you’ve already experienced an event.”²

“You haven’t reduced the future risk just because you’ve already experienced an event.”

Patty Champ
Research Economist



“While the 2013 northern Colorado flooding appears to have been unprecedented, it may only have been unprecedented in the degree of damage that it caused to communities and related infrastructure, not in terms of the underlying rainfall and runoff.”

U.S. Forest Service

In addition, a warming climate may make extreme precipitation and flooding events worse, if not more frequent. Because warmer air holds more moisture, large precipitation events could become even more extensive. However, the latest climate projections do not clearly indicate whether flooding risk on the Front Range will increase. According to the U.S. Forest Service Rocky Mountain Research Station,

“all of this means that, while the 2013 northern Colorado flooding appears to have been unprecedented, it may only have been unprecedented in the degree of damage that it caused to communities and related infrastructure, not in terms of the underlying rainfall and runoff.”³

With this understanding in mind, how will US 34 hold up when the next flood pummels the canyon once again? No

one knows for sure, but the highway is in much better condition to withstand the next beating. “There’s walls built out of stone. There’s walls built out of soil and cement under the road,” explained Scott Cassels, executive vice president of Kiewit, the 2013 construction contractor. “Those are the things you don’t get to see, but the next time the flood comes, we’ll see resilience and access.”⁴ James Usher, CDOT US 34 Project Director, reiterated this perspective. “We created a great final product, and I’m confident that the road is more resilient, and we will recover faster after the next flood.”⁵

A warming climate may make flooding events worse, if not more frequent.

Endnotes

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This book is dedicated to the people who lost their lives in the Big Thompson Canyon floods of 1976 and 2013, and to Scott Ellis, late CDOT Region 4 Resident Engineer and first 2013 post-flood Project Manager.