

## **Chapter 7**

### **THE INTERSTATE ERA, 1945-1973**

Bound by budget constraints and its attention diverted overseas, Colorado mostly ignored its highways during World War II. Statewide an increased military presence in places like at Camp Hale near Leadville, the military bases around Denver, and the activities of the Manhattan Project on the Western Slope pounded the state's road system. A heavy backlog of maintenance needs piled up due to shortages in manpower, equipment and materials, especially road oil. Highway Department leadership worried that the roads considered "a high type of construction" during the late 1920s and early 1930s had not kept up to "the rapid advance in motor equipment and the ever-increasing volume of heavy and high-speed traffic" (Watrous, 1946: 13). In addition, the state's average highway income per vehicle placed Colorado 43<sup>rd</sup> among the 48 states (Colorado Department of Highways, 1945: 2).

The state's highway system totaled 12,394 miles by the mid-1940s, making it the 11<sup>th</sup> largest among the 48 states, and only 1,500 miles short of California's 13,891 miles. In addition to the mileage in the State Highway System, there were 63,000 miles of county and local roads. The Federal Aid Primary System measured 4,050 miles, comprising only 5.3 percent of all mileage in Colorado. However, those roads carried 60 percent of all rural traffic, primarily heavy truck and bus traffic. (Colorado Department of Highways, 1945: 1,3).

Vail's successor as State Highway Engineer, Mark Watrous, complained in print: "Money, manpower, materials, and time are the essential components of highway building. Colorado is far, far short of having any single one of these essential components" (Watrous, 1946: 13).

Watrous' worries reflected his department's concerns over the increased number of trucks and automobiles on Colorado's roads after 1945. That year, the state registered 600,000 motor vehicles while an additional 800,000 cars and trucks per year drove across its borders. A 1945 Highway Department study predicted that four-lane highways that must be built to provide for heavy traffic volume would cost upwards of \$100,000 per mile. The situation in rural Colorado was also grim. Of 3,500 miles of secondary roads, less than 1,000 miles were judged by the department to be satisfactory for post-war traffic. The estimated cost of improving rural roads

ranged from \$8,000 to \$10,000 a mile and more than \$40,000 per mile in the mountains (Colorado Department of Highways, 1943: 1; 1945: 3).

In 1949, a division of the Department of Highways -- the Highway Planning Commission -- began a four-year odyssey to examine the state's highway system in the years after World War II. Published in 1953, the four-pound report identified and offered solutions regarding the deterioration of Colorado's roads during and after the war. The report recommended a reorganization of the department and went through with making the "Big Switch." Reversing Vail's decision of a decade previous, effective January 1, 1954, the Big Switch reduced the state highway system from 12,400 to 8,000 miles. According to department leadership, during the 1940s, the department had less responsibility since it maintained only 4,000 miles of primary highways. The department would now hold responsibility for over 3,900 miles of federal-aid secondary roads previously maintained by the individual counties (Colorado Department of Highways, 1954:14).

Colorado, along with every state in the union, expressed their highway worries to Congress in Washington. The federal government responded with the last, greatest, and most expensive round of highway construction of the 20<sup>th</sup> century.

## **7.1 Tourism All-Year Long**

Despite the economic hardships brought by the Great Depression, by 1940 tourism was Colorado's third-largest industry after agriculture and manufacturing. As early as 1929, a Denver newspaper noted that Colorado could draw more people during the winter if private interests developed ski runs and other winter facilities (Leonard and Noel, 1990: 437).

Because of World War II and gasoline rationing, summer auto travel was off by a third in the West. Colorado was less affected than other states, but the drop still caused alarm among businessmen. However, as many as 50 inquiries a day reached the State Publicity Bureau from soldiers stationed in the state who wanted to tell their friends and relatives about Colorado (Athearn, 1976: 289). One particular group of soldiers, the 10<sup>th</sup> Mountain Division at Camp

Hale, trained on the west side of Tennessee Pass near Leadville. After the war, some members of the 10<sup>th</sup> Mountain came back to Colorado to establish the state's ski industry at resorts in Aspen, Vail, and Breckenridge (Fay, 2000: 65). By the end of the 20<sup>th</sup> century, Colorado counted 55 ski areas and the number of skier days reached 10 million. Aviation expedited the growth of ski towns like Aspen, Avon, and Telluride. As historians Stephen Leonard and Thomas Noel commented: "Like the mining towns they often replaced, ski towns made Denver their supply hub" (Leonard and Noel, 1990: 438). To keep that new industry growing, during the 1950s and 1960s, the state improved its existing mountain roads and threw its support behind an interstate highway through the Rocky Mountains.

One of the first post-war highway projects inviting greater numbers of tourists was the widening and paving of the 11,992-foot road over Loveland Pass. Completed in 1950, one construction worker recalled how difficult it was to get a day's work done: "The year round, you can dig into mountain mud and within a few feet strike ice, and when that happens, the work really gets rugged" (Christensen, et. al. 1987: 54).

Each community in Colorado had their own way of luring auto tourists during the 1950s and 1960s. Towns such as Central City "stood out as the classic example of fakery in the world of tourist traps" while the one-time mining metropolis of Victor survived as an example of "a place where one could . . . drive along streets of abandoned buildings without the feeling that these relics had been embalmed for viewing by paying customers" (Athearn, 1976: 324).

By the late 1960s, Colorado's inherent desire to promote the wonders of the state coincided with an increasing sense of limiting development to preserve what made the state special. Much of this controversy between development and preservation was fought on a new battleground – the interstate highway.

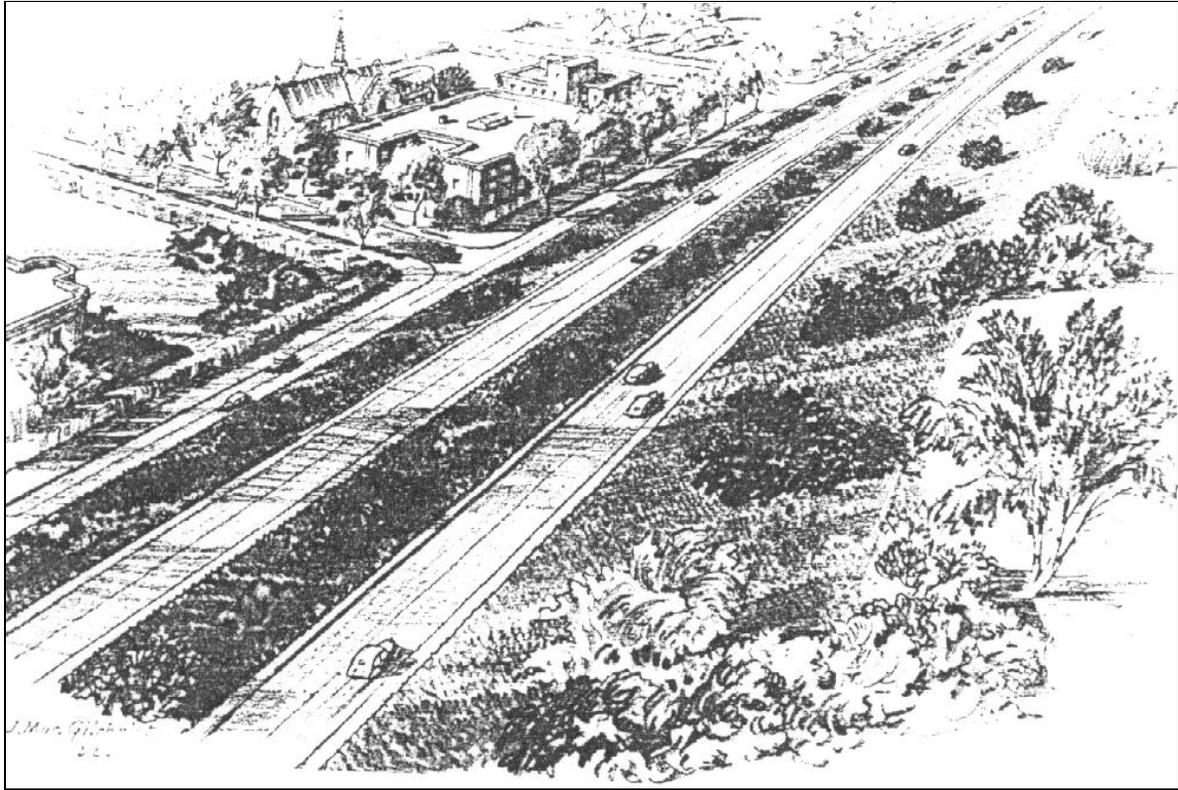
## **7.2 The Freeway Era Begins**

As federal money developed and supported mountain roads during the 1920s and 1930s, post-war highway construction brought the greatest immediate benefits to Denver. Since the 1930s,

the city had proposed a number of expressway projects to federal authorities with little success (Hermsen Consultants, 1999: 15).

In 1941, State Highway Engineer Vail convinced the State Legislature to pass the Freeway Act to provide funding for construction of a multi-lane thoroughfare through Denver. In September 1944, Vail commissioned consulting engineers Herbert S. Crocker and Alfred J. Ryan to study “The Denver Project,” a north-south, limited-access highway through the city. Their report, “The Valley Highway: A North-South Limited-Access Highway” marked the first recorded use of the name “Valley Highway;” a reference that later became part of the local jargon (Crocker and Ryan, 1944: 29). The engineers’ visualized a traffic-way “independent of the cross-flow of city traffic and will serve as an artery of unimpeded transport while at the same time providing fully for distribution and reception of traffic destined to or from Denver. It is clear, also, that a vital facility of this kind must be planned for enduring service. Its function is to carry not merely the traffic of today or of the next few years but that of the future, so far as can be foreseen” (Crocker and Ryan, 1944: 35).

Adapting elements from existing freeways like the Davidson in Detroit, and the Arroyo Seco across Los Angeles, the Valley Highway was unlike anything ever attempted in Colorado. At a cost of \$14.5 million, including acquiring right-of-way, the Valley route was the least expensive of four proposed to the State Highway Department (Crocker and Ryan, 1944: 43-4). Every interchange and all intersections where city streets or railroads carried across the freeway required overpasses and underpasses to separate traffic flow. The final design incorporated 62 structures over the highway’s 11-mile course. All interchange ramps were concrete rigid-frame construction built with moment resistant connections between the superstructure and the substructure to produce an elastic finished product. The river bridge, and the bridges carrying the main line railroad tracks over the highway, rested on steel plate-girder structures placed on concrete substructures. The Valley Highway represented the Highway Department’s first use of rigid-frame highway bridge construction. Comprised of a concrete beam superstructure tied rigidly to the abutments with steel reinforcing bars, rigid frame bridges differed materially from conventional support spans. Rigid frames were also well suited to support thousands of cars and were aesthetically pleasing (Hermsen Consultants, 1999: 32, 34).



**Plate 6.** Engineers Herbert Crocker and Alfred J. Ryan emphasized aesthetics when proposing the state’s first freeway (later known as the Valley Highway) in 1944. While modern Interstate 25 bears little resemblance to the illustration, Crocker and Ryan’s original design featured “dual roadways separated by a landscaped median strip and bordered by service roads.” (Herbert Crocker and Alfred J. Ryan, *The Valley Highway: A North-South Limited Access Highway Through Denver*, 1944: 63).

Lack of funding slowed the Valley Highway's progress during the late 1940s and early 1950s. As work crept along Denver's north side, a popular effort grew to build a direct route between Denver and Boulder. For most of the automobile era, right-angled State Highway 7 served as the primary route between Colorado's biggest city and the home of the state university. Roderick Downing, a University of Colorado Professor in the School of Engineering, led the campaign to build the proposed highway.

The citizens of Boulder were much more vocal in their support for a new freeway than their neighbors in Denver. In 1949, following a recommendation from the Highway Advisory Board, the State General Assembly adopted a resolution authorizing the highway department to issue bonds for the construction of a toll turnpike. Reflecting tight state budgets after the war, it was the first time the legislature approved construction of a toll automobile highway. The consulting engineering firm for the project, Howard, Needles, Tammen, and Bergendorf, drew plans and supervised construction under direction of the Highway Departments. After court action legalized clearance of the bonds, the department purchased the right-of-way and construction began October 2, 1950 (Portland Cement Association, 1952: 1).

The state prepared and sold bonds totaling \$6.3 million, payable over 30 years. Money collected from tolls went to liquidate those bonds. From 1950 to 1952, three private firms did the grading and ballast over three separate portions. (Colorado Department of Highways, 1949(c): 70-4)

Completed in January 1952, the Denver-Boulder Turnpike featured fully controlled access with two 12-foot lanes traveling in each direction. Eight bridges spanned the turnpike to accommodate cross-traffic. Twelve major structures, primarily the tollbooths, lined the turnpike. The turnpike experiment opened on January 1952. Many thought it would be part of the local scene for years to come (Portland Cement Association, 1952: 4-5).

The turnpike exceeded all expectations from the first day of operation. The engineering consultants forecast a daily average for turnpike traffic between 1950 and 1960 at 2,580 vehicles, but the actual count reached 7,000 a day by the mid-1950s before increasing to 13,774 vehicles a

day by 1966. A quarter toll paid for the 17.3-mile ride from Denver to Boulder. An unexpected windfall of spare change paid off \$6.3 million in bonds plus \$2.3 million in interest by 1967; 15-and-a-half years after completion. Honoring a promise future generations of Colorado politicians later regretted, the state removed the last tollbooth on September 14, 1967. The Denver-Boulder Turnpike remains the only toll road located on the U.S. public highway system ever to revert to a free highway. Part of US 36 since 1967, the Denver-Boulder Turnpike represents a good design compounded by a good deed (Colorado Department of Highways, 1950(b): 86; Wiley, 1976: 33).

Elsewhere across the state, other communities across Colorado needed bigger roads to handle more traffic. In 1949, a 10-year project began to build a four-lane highway for travel from Pueblo to Denver. Along with the Monument Valley Freeway, completed by 1960 and transecting Colorado Springs, created the modern Interstate 25 through southern Colorado (Christensen, et. al., 1987: 54).

One other important road project after the war involved completing the Clear Creek Canyon road. The highway tied directly into 48<sup>th</sup> Avenue and provided mountain access for Denverites. Delayed by wartime shortages, this route finally opened as part of US 6 through Clear Creek Canyon in 1952 (Christensen, et. al., 1987: 54).

### **7.3 Colorado Joins the Rest of the Nation – The Interstate System, 1956 to the Present**

Ever since the First World War, a nationwide alliance of politicians, military, engineers and the tourism industry supported an interstate highway system. In Colorado, a national highway would do more than link the state to the rest of the nation; it would bring the eastern and western halves of the state together. As one Coloradoan noted in the years before the interstate, “Colorado was more like two states independent of each other. There were months and months when you didn’t go to Steamboat Springs on the highway; you didn’t go to Grand Junction; you didn’t go any place on the Western Slope”(Lewis, 1997: 254).

Inspired by 19<sup>th</sup> century achievements to link the continent by pony express, telegraph and rail, and 20<sup>th</sup> century examples like the Autobahn; the Federal Highway Act of 1944 authorized a system of interstate highways. The 1944 Act appropriated \$500 million a year for each of the three fiscal years following the war. The money was divided between \$225 million for primary federal aid roads, \$150 million for secondary and \$125 million for intercity streets. Colorado's allotted mileage under the Act included what is now Interstate 25 between Cheyenne, Wyoming and Raton Pass on the New Mexico border, I-80 South (now I-76) from Denver to the Nebraska line at Julesburg and Interstate 70 from Denver east to the Kansas line.

President Harry Truman approved plans for the first National System of Interstate and Defense Highways on August 2, 1947, but the nation would not see any results until the late 1950s. To concur with the tenets of the Federal Act, the State Legislature made a slight reorganization to the Highway Department in 1952. The Highway Department became the Department of Highways and the fiscal year changed from a calendar year to one ending June 30 to match the timetable used by the U.S. Bureau of Public Roads. Led by a Chief Highway Engineer, an eight-man Highway Commission replaced the existing Advisory Board (Colorado State Highway Commission, Book 1, Feb. 26, 1952: 1-5). The department immediately overturned Charles Vail's 1938 mileage expansion and returned some 4,000 miles of state highways back to the counties. The reduction to 8,000 state highway miles placed full responsibility for maintenance with the department while counties and cities held responsibility for their roads and streets (Colorado Department of Highways, 1954: 14).

#### **7.4 Interstates Cross Colorado**

As the automobile accelerated the pace of life in Colorado at the start of the 20<sup>th</sup> century, the arrival of the interstate highway system propelled the state closer to a long-held dream. In 1956, the U.S. Congress passed the Federal Aid to Interstate Act. The proposed 42,500-mile system would connect important centers of population and areas of national strategic importance by four-lane divided highways with a grade separation at points of crossing and interchanges at points of ingress and egress.

When the federal government first considered the original 40,000-mile interstate system in 1956, I-70 began at Washington, D.C. and terminated in Denver. The Bureau of Public Roads were initially fearful of the amount of manpower and money needed to build a road through the Rockies. Colorado Governor Edwin C. Johnson offered Washington a deal that Colorado would build its own Continental Divide tunnel as long as the interstate went through. Construction of a four-lane highway to the western state line would ensure tourism as the state's primary industry. Johnson crafted a personal campaign toward an occasional visitor to Colorado -- President Dwight Eisenhower. On fishing holidays, Eisenhower -- like many others stuck in traffic -- complained about the traffic jams between Denver and the mountains. Governor Johnson heard and subsequently played on those concerns in letters and personal appeals to the president (Thomas, 1996: 208).

Eventually bowing to concerns from Western congressional delegations, by 1958, the Federal Highway Administration (FHWA) extended I-70 by an additional 547 miles to connect with Interstate 15 near Cove Fort, Utah. Across Colorado, much of I-70 and US Highway 6 follow the same path. After the federal government revised its intentions to complete the interstate through Colorado, the state's Chief Highway Engineer, Mark U. Watrous, remarked that their reassessment was "as important to Colorado as the discovery of gold" (Reef, 1961: 17).

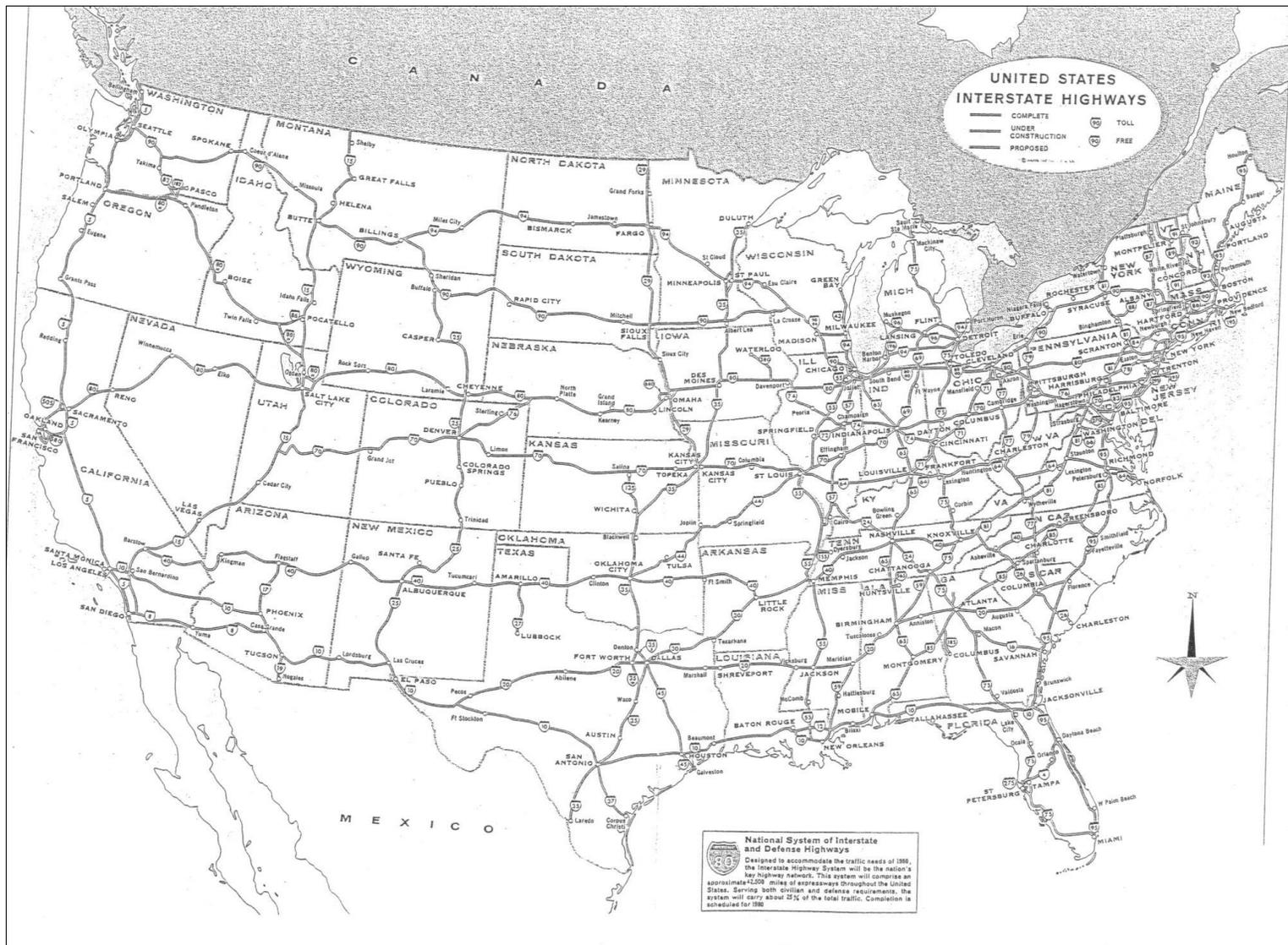
Supported by federal funding, the Highway Department immediately went to work in October 1956 on a six-mile section between known as the Floyd Hill-Idaho Springs complex. Some of the engineering challenges this section presented included drilling twin two-lane, one-way tunnels through a promontory, four-lane the existing road over Clear Creek; and completion of nine concrete bridges. After five years of work from 1956 to 1961, the federal and state government spent \$7.5 million on the first stage of the interstate projects through the Rockies (Reef, 1961: 16).

Another beneficiary was the stalled Valley Highway project. In lean funding years during late 1940s and early 1950s, the state continued to acquire right-of-way and award new contracts when funds became available. Federal money helped the state meet its 10-year construction goal. In November 1958 the \$33-million, 11.2-mile highway opened with the finishing of the

Broadway Viaduct and the completion of the last section between South Emerson Street and West Third Avenue. Use of the road quickly surpassed design, and expansion of the highway was required in less than a decade (Colorado Department of Highways, 1958:1-3).

During the 1960s, the Valley Highway was expanded, I-25 was completed, and work was started on I-70. When the plains segment of I-70 opened to Denver traffic in 1964, it terminated as an elevated highway at 46<sup>th</sup> Avenue. For the next two decades, the Valley Highway interchange at 46<sup>th</sup> Avenue served as the crossroads between I-70 and I-25.

The Interstate program required patience in the city and old-fashioned blasting and building in the high country. From the early 1960s to the late 1970s, the last great combination of highway design and construction would culminate beneath the Continental Divide (Figure 8).



**Figure 8.** As the 1980s dawned, the nation's interstate system was nearly complete. Two of Colorado's three interstate highways -- I-25 and I-76 -- were in place as construction of 12 miles of Interstate 70 through Glenwood Canyon had just begun (Source: Rand McNally Interstate Highway Map, 1980. Courtesy of Rocky Mountain Philatelic Library, Denver).

## 7.5 The Eisenhower Tunnel

When the state highway department opened bids in 1967 to bore through the Rockies, it was the final step toward resolving Colorado's greatest remaining engineering challenge – how to build an interstate highway over the Continental Divide. Construction of one or more tunnels was clearly needed to allow unimpeded highway traffic to cross the rock spine that formed 11,992-foot Loveland Pass.

Based on information gathered during a 1963-65 pilot boring for the Straight Creek Tunnel Project (renamed the Eisenhower Tunnel by the state legislature in 1972), the department planned to drill the first of two tunnels above the town of Bakerville and go under the Continental Divide between Clear and Straight Creek Canyons. A consortium of Al Johnson Construction Co. of Minneapolis, Gibbons and Reed Co. of Salt Lake City, Western Paving Construction Company of Denver, and Kemper Construction Co. of Los Angeles presented the low bid of \$54.1 million on October 3, 1967. Adopting the name Straight Creek Contractors, the builders began tunneling the western portal on March 13, 1968. By October of that year, Straight Creek completed the tunnel's top heading to the midway point. Excavation for the heading on the east portal started on December 11, 1968 (Colorado Division of Highways, 1973: 2).

Charles Shumate, state highway engineer, led the department through a gauntlet of engineering challenges never faced before the Straight Creek Tunnel. Shumate likened the task of building a tunnel at 11,000 feet similar to “putting a five-story building through a mountain” (Lewis, 1997: 254). Shumate and all involved soon found out that the threat of landslides, rock falls and cave-ins were only some of the roadblocks toward completion. During construction, movement in surrounding rock created a squeezing action on a section of tunnel floor, causing it to rise almost 1.4 feet in two months. Employing resourceful corrective measures, crews avoided any cave-in during the tunneling process. Finally, engineers and workers prevented major earth slides before the west approach to the tunnel by controlled runoff drainage (Christensen, et. al., 1987: 55).



**Plate 7.** Perhaps the greatest engineering accomplishment in state history, the Eisenhower Tunnel took 13 years and \$125 million to complete. Vital to the completion of Interstate 70 through the Continental Divide, the tunnel linked for the first time the eastern and western halves of Colorado. Source: Denver Public Library – Western History Department © 1995-2002 Denver Public Library.

The first bore of the Eisenhower Tunnel measures 1.693 miles in length with two 13-foot-wide lanes. Ceiling placement of huge exhaust and fresh air ducts bring the roadway's overhead clearance to 16 feet, four inches. Eight fresh-air fans moved 533,000 cubic feet of air per minute, while eight exhaust fans dispersed 542,000 cubic feet per minute. According to a sign located at the tunnel's west portal, Eisenhower's official elevation is 11,158 feet. While state officials have never made a claim, Eisenhower Tunnel is most likely the highest part of any interstate highway in the United States and the highest vehicular tunnel in the world. Governor John A. Love opened what is now the westbound bore of the tunnel to two-way traffic at noon on March 8, 1973 (Lewis, 1997: 256).

In 1972, the Department of Highways designers planned to build a second tunnel to serve eastbound traffic. Officials opened bids on August 8, 1975 for the mining, lining, drainage, support and approach roads. A joint low bid of \$102,800,000 presented by Peter Kiewit Sons' Co. of Omaha and Brown and Root of Houston won the bid to build the next phase. Preparatory work outside the mountain started on August 18, 1975, and excavation of the tunnel began that November. The eastbound bore opened in 1979 and was named for Colorado Governor and U.S. Senator Edwin C. Johnson. It took 13 years, nine months and \$125 million to complete the Eisenhower Tunnel, about two and half times the original estimate. A few years into retirement, Shumate remarked, "I told many people that one of those (tunnels) in a lifetime is enough" (Lewis, 1997: 256).

Traffic through the first of the twin tunnels increased beyond all projections, as tourists and skiers swarmed to and from the slopes. Approximately 3.4 million cars went through the tunnel during the first full year of operation in 1974, and volume increased 3 to 5 percent annually after 1974. Completion of most four-lane construction in 1978 made I-70 perhaps the most popular mountain vacation route and one of the most important general transportation routes in the nation, with upward of one million cars a month passing through the tunnels during July and August. The Colorado Department of Transportation predicts four times as many cars will travel I-70 by 2008.