The INTERSTATES in the WEST

By Tom Kuennen

Across mountains, plains, jungles, and deserts, the Interstate system delivers for residents of the American West

Flung across mountains and plains, jungles and deserts, and through tunnels and across spans, the Interstate system is serving residents and travelers to America's far Western states. Western states not only have some of the longest Interstate networks in terms of mileage, but they also are leaders in civil and structural engineering technology. Here's how America's far Western states have constructed their Interstates and are building for tomorrow, compiled from American Association of State Highway & Transportation Officials (AASHTO) state DOT questionnaires distributed exclusively for this publication early in 2006.

Colorado DOT photo by Gregg Gargan

The western portals of the Eisenhower/Johnson Memorial Tunnels carrying I-70 across the Continental Divide in Colorado are seen here. The tunnels were constructed between 1968 and 1979. The eastbound bore is named after Edwin C. Johnson, a former Colorado governor and U.S. senator who actively supported the Interstate system in the Centennial State.

ALASKA: Routes Based on World War II Highways

Alaska's Interstate system routes largely are based on facilities that were constructed during World War II – highways A-1, A-2, and A-3, – reports the Alaska Department of Transportation and Public Facilities.

The FHWA's predecessor – the Bureau of Public Roads – designated Interstate routes in Alaska and Puerto Rico. But unlike the mileage in Hawaii and elsewhere, the mileage in Alaska and Puerto Rico is exempt from meeting Interstate design standards. Alaska's Interstate highways are designated A-1, A-2, A-3, and A-4, totaling 1,082 miles, and most of the route mileage remains non-divided, opposed traffic, single lane in each direction.

Of these routes, A-2, the Alaska Highway (from the Canadian border), has the most colorful history. Construction of the Alaska Highway began in March 1942, and was completed eight months later. The Alaska Highway's route was developed by the U.S. War Department, and followed the location of airfields from Edmonton, Alberta, to Fairbanks. The Alaska Highway begins in Dawson Creek, B.C., and heads northwest through the Yukon Territory to Fairbanks.

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Its length is 1,520 miles to Fairbanks, and 1,422 miles to Delta Junction at A-1 from Anchorage to the south. The state's highways largely are located in the more populous southeastern portion of the main part of the state. The George Parks Highway (A-3) from Palmer to Fairbanks – named in July 1975 in honor of George A. Parks (1883-1984), the territorial governor from 1925 to 1933 – was constructed during the 1960s.

Back in the Interstate era, the Alaska Road Commission/Bureau of Public Roads devoted much of its funding to building the George Parks Highway, the Alaska DOT reports.

A-1 and A-3 have sections in the Anchorage Urbanized Area, but no circumferential Interstates exist. Future projects include the Glenn Highway (A-1) to Seward Highway (A-3) connection in Anchorage, and ongoing construction projects that prioritize improving the most hazardous sections of the designated Interstate routes to lower the number of traffic accidents and related fatalities.

Alaska is refining its Road Weather Information System (RWIS) and 511 Travel in the Know systems to improve information access for travelers and snow removal.

ARIZONA: Fast Growth Transforming Interstates

The Arizona Highway Department launched a number of Interstate highway projects at the time of the 1956 Federal-Aid Highway Act. Records and memories indicate the following sections opened close to the same time: I-17 (Black Canyon Freeway) north and south of Thomas Road in Phoenix; I-10 near Ehrenberg (at the Colorado River); and I-40 between Holbrook and Joseph City in northern Arizona.

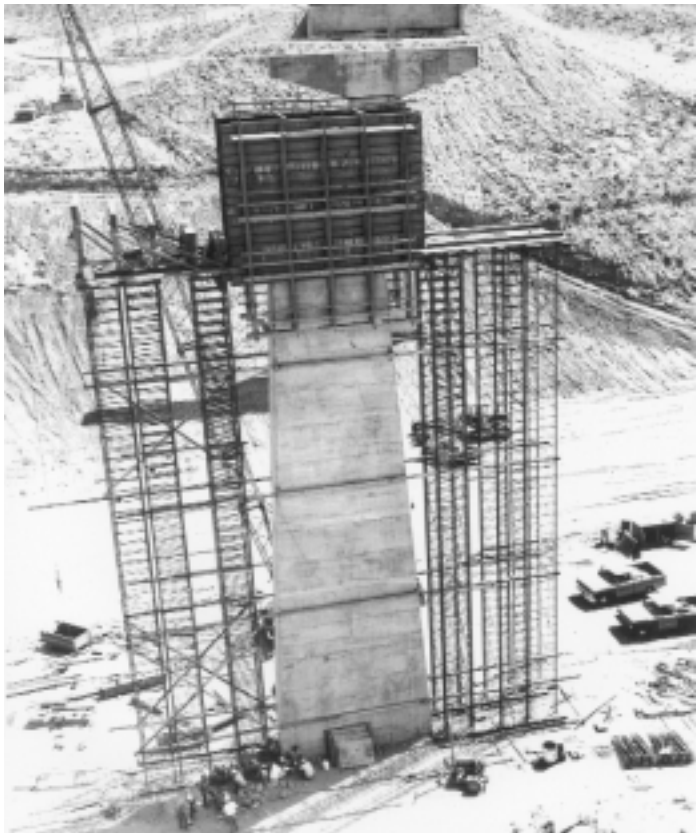
The first Arizona contract under the 1956 Federal-Aid Highway Act appears to have financed the construction of the Veterans' Memorial Overpass in Tucson, an I-10 bridge over the local railroad tracks.

There were no limited-access highways in Arizona prior to 1956, reports the Arizona Department of Transportation. Recognizing that Interstates could ultimately bypass various rural communities, the Arizona Highway Commission in 1957 established a policy providing for the construction of the Interstates between towns, primarily along existing state highways, so that traffic still passed through local communities. That policy provided for the construction of bypass segments in the later years of the program.

I-17, also known as the Black Canyon Freeway in Phoenix, is considered the "Granddaddy" of urban Interstates in Arizona. There are no circumferential Interstates in Arizona, but the state is nearing completion of a network of looped freeways (known as Loop 101 and Loop 202) that connect with Phoenix-area Interstates in strategically planned locations.

Arizona's Interstates take travelers to and through some of the most spectacular scenery in the United States. I-40, stretching more than 355 miles across northern Arizona, is a gateway to destinations such as the Grand Canyon, the Painted Desert, and Meteor Crater.

The I-10 Deck Park Tunnel was completed in August 1990 and represents the "Final Mile" of I-10 across the country. As a result of this project near downtown Phoenix, I-10 was for the first time a continuous highway between Jacksonville, Fla., and Santa Monica, Calif. Some ADOT highway veterans say Arizona also had the first-ever section of I-10 in the country, a segment near Ehrenberg along the Colorado River.



A pier is constructed in 1967 for the I-15 bridge over the Virgin River in Arizona.

Construction of I-15 in the Virgin River Gorge in northwest Arizona was significant. At the time it was built, it was the most expensive highway per mile in the country. There are 300-foot slopes in some areas along the highway. Interestingly, even though I-15 is an Arizona Interstate, there was no access to it in the Grand Canyon State. The entrance and exit ramps were in Nevada and Utah. That situation has since changed with the addition of access points in Arizona.

Population growth is driving future ADOT projects. I-17 will be widened to four lanes, including new carpool lanes, in each direction between the Loop 101 Pima Freeway and Carefree Highway (State Route 74) starting in 2007, at an estimated cost of $200 million.

I-17 in north Phoenix (Peoria Avenue to Bell Road) has just undergone a major facelift with the addition of merge lanes, new sound walls, signage, and other improvements. ADOT is working with local governments to finalize plans to widen I-10 in the

FHWA PHOTO

downtown Tucson area (Prince Road to 29th Street) over the next several years, with an estimated cost of $193 million.

Arizona is a leader in the deployment of intelligent transportation systems, providing drivers with important information about crashes and restrictions. These systems will continue to expand in future years. The Phoenix area's freeway carpool lane system is still growing, providing an incentive for solo drivers to share the ride or board an express bus.

In 2004, Maricopa County voters approved a 20-year funding plan for Phoenix region transportation upgrades, including more lanes on Interstate freeways. Despite funding challenges, there are efforts to accelerate the schedule for certain projects due to concerns about growing traffic demands. Stretches of I-10 west of Phoenix and I-17 as it climbs north out of the Valley of the Sun toward northern Arizona are examples. ADOT is working with the FHWA on plans to add local traffic lanes (collector-distributor lanes) to a busy stretch of I-10 between Phoenix and Tempe, including the busy rush hour location known as the "Broadway Curve." Efforts also continue to secure adequate funding to add a third lane in each direction to I-10 between Phoenix and Tucson.

CALIFORNIA: Leader in Limited-Access Highways

Well before the Interstate system, California was the leader in limited-access freeways.

The California Department of Public Works, Division of Highways had been actively constructing limited-access freeways across the state, including the Lake Tahoe Wagon Road (deeded to California in 1895, the first state highway, now part of U.S. 50); U.S. 40 (later I-80); U.S. 101 (Bayshore Freeway, first unit dedicated June 1, 1951); Calif. 110, the Arroyo Seco Parkway/L.A. 110 (1940, not part of Interstate system, but the first freeway in California); now I-15 in San Diego County, San Diego-Miramar, 1950; now I-80, the Eastshore Freeway, under construction in San Jose, 1953; and the Santa Ana Freeway, portions open in 1949.

The first northern California freeway opened under the Federal Highway Act of 1956 was I-80, opened to traffic on June 24, 1957. I-10 is one of the oldest Interstates, and possibly the first California Interstate project to go to construction with Interstate construction funds under the 1956 act. Prior to the act, units were already being constructed and dedicated, including L.A. 10 units dedicated in 1953 and 1954.

Additionally, I-5, I-8, I-10, I-15, I-40, I-80, I-505, and I-580, were all part of the initial Interstate routes approved for California in 1947, total mileage 1,938 miles. Beltline and circumferential routes were added in 1955, bringing California's total to 2,135 miles.

Of course, California also was a leader in urban expressways, but which were first? This is difficult to answer for California. Possibly the first was the Aliso Street Viaduct (later part of I-5) in 1948. The first freeway in California was the Arroyo Seco Parkway (Route 110) in 1940, but this is not officially part of the Interstate Highway System. California began a proactive, incremental process

Snow-clad Mt. Shasta serves as a backdrop to I-5 northbound near Castella in California's Shasta County in 1963.

throughout the state of developing limited-access highways to full freeway standards, beginning with the 1939 highway law and continuing through 1956. The freeway system began as short segments that upgraded existing highways.

California was first assigned beltline and circumferential routes in 1955 in the San Francisco Bay and Los Angeles areas in 1955. However, construction and freeway adoptions were occurring before then, including I-105, Santa Ana Freeway; I-110 Harbor Freeway, with first section opened in 1952, last in 1970; I-205 North Tracy Bypass, construction of portions nearing completion in 1948; I-210, 280 Urban Loop added to Interstate system in 1955, with first portions completed 1955; and I-305, redesignated in 1980.

The City of Los Angeles and the Division of Highways both took early leadership roles in the development of freeways and development of high-capacity roads with limited access, and was in the vanguard of resolving issues of ramp design, access control, and how to buy right-of-way prior to the 1956 act, Caltrans reports.

With California's Urban Loop, I-280, authorized as part of the Interstate system in 1955, and construction completed in 1964, engineers emphasized aesthetics and cooperation in design.

COLORADO DOT PHOTO

Night work is seen on the "T-REX" I-25 southeast Denver corridor reconstruction program, 2001-2006.

Additional costs were incurred for split-level design, independent roadways, variable-width medians, broad horizontal curves, maximum grade of 4 percent, and other techniques of aesthetic treatment.

In 1916, District 3 completed work on the Yolo Causeway, which for the first time allowed travel between the state capital and San Francisco during an era when the Sacramento Valley flooded regularly. This causeway, which was part of what was to become I-80, was California's first highway project financed by the sale of highway bonds.

The construction of I-5 in District 3 contains metropolitan areas and small villages, rugged mountains and marshy lowland, regions of extreme cold and regions of subtropical climate, and large rivers and dry washes (that can become raging torrents in a matter of hours). One mile-and-a-half stretch through downtown Sacramento nearly hung up the entire project. Its path followed the nearby Sacramento River, and engineers dubbed it the boat section because it actually sat below the water level. The district found a way to keep the river at bay, so to speak; they sealed it off with pavement 8 feet thick and held tight by pins driven 80 feet into the ground.

In 1953, California built its first four-level direct connector interchange, "The Stack," where the Hollywood, Santa Ana, Pasadena, and Harbor Freeways came together.

Westside Freeway (1963, now I-5) was, at the time, the longest freeway project on entirely new alignment undertaken by the state, at 321 miles. Also, due to coordination with the California Aqueduct Project, it required close collaboration and development of new engineering technologies with the Department of Water Resources and the Federal Bureau of Reclamation.

And in 1965, on I-10, San Bernardino-Riverside County, highway builders used newly-developed machinery to put down four lanes of concrete between Cabazon and Palm Springs in a single operation, a wider swath than had been done before.

The 1971 Sylmar Earthquake held lessons for California and elsewhere, revealing that many design details commonly used by bridge engineers worldwide were inadequate for a force of this magnitude. Findings triggered a seismic retrofit program, and significant changes immediately were made to California bridge-design standards, which also became the basis for a new national code.

In the 21st century, Caltrans is embarking on its "Greening the Fleet" initiative, leading the way to cleaner air by using viable, emerging technologies, and staying ahead of government regulations. I-80 from San Francisco to the Nevada border is undergoing some major renovations and improvements. In the Sacramento area, Caltrans is adding 10 miles of carpool (HOV) and auxiliary lanes to I-80 in the median from the Sacramento River Bridge to the Capital City Freeway split. Construction is scheduled to begin in 2008/2009.

Currently, Caltrans is installing 10 traffic-monitoring sensors, 15 traffic cameras, and 16 ramp meters along I-5 at various locations. These Traffic Operations System elements will ultimately provide congestion relief and give the motoring public much-needed travel information along these highly traveled stretches of freeway. As its current highway system matures, it's clear that adding more lanes just isn't feasible in most locations. To that end, Caltrans and its partners have installed FasTrak, an electronic toll collection system, on all toll bridges. Changeable message signs have been used extensively to apprise motorists of highway conditions, even providing travel times between points in many locations. Its Traffic Management Center (TMC) is state of the art, a place where Caltrans and the California Highway Patrol (CHP) monitor traffic and can respond to incidents by dispatching CHP, tow trucks, or other emergency services to clear accidents, stalls, and other impediments.

COLORADO: Feats of Engineering and Environmental Design

Segments of what later became I-25 were constructed almost simultaneously by the old Colorado Department of Highways in Denver (the Valley Highway) and Pueblo beginning in 1948 and 1949, respectively. The first Interstate section completed was the Valley Highway in Denver in November 1958. The 9-mile Pueblo segment was finished about six months later, in July 1959, reports the Colorado Department of Transportation. A segment in Colorado Springs (Monument Valley Freeway) was completed on July 1, 1960.

Additional segments of I-25 were under construction prior to 1956. No other Interstate segments were started prior to 1956 in Colorado.

Three metro-area freeway construction programs (Denver, Colorado Springs, Pueblo) were under way in 1956; it is likely that one of the phases in these programs would have technically been the

first contract following the 1956 Federal-Aid Highway Act. But because Colorado's historical documents do not contain enough specific data about individual contracts, it is impossible to determine which one was the first.

There are no circumferential Interstates completed in Colorado, the DOT reports. The E-470 beltway around the Denver area is approximately 80 percent complete, but does not include any segments of Interstate highway. It does currently include two segments of privately-owned toll road, as well as another segment of non-Interstate, access-controlled state highway (C-470).

Colorado's spectacular Rocky Mountains challenged Interstate designers both structurally and environmentally. Construction of the Eisenhower-Johnson Memorial Tunnels on I-70 (1968-1980) was one such project, with a combined project cost of $262 million ($665 million in 2005 dollars). At an elevation of 11,000 feet, they are the highest vehicular tunnels in the United States.

Likewise, the construction of the I-70 Glenwood Canyon Final Link, 1980-1992, was an outstanding, award-winning feat of engineering and environmental sensitivity that completed I-70 in Colorado. Glenwood Canyon was hailed as one of the world's greatest civil engineering feats for its innovative use of viaducts and tunnels, and for its environmental sensitivity and stewardship in leaving as much of the fragile canyon ecosystem undisturbed as possible despite the enormous size and scope of the construction project.

Yet another outstanding project is the "T-REX" I-25 southeast Denver corridor reconstruction program, 2001-2006. T-REX (Transportation Expansion) is reconstructing approximately 17 miles of the I-25 and I-225 freeways, with the addition of light rail and related stations and facilities. It is one of the largest multimodal projects in the nation ($1.67 billion), as well as a major design-build project. Its completion in November 2006 will occur two years ahead of initial projections.

In 2005, Colorado Gov. Bill Owens broke ground on the Colorado Springs Metro Interstate Expansion (COSMIX) – a 2.5-year, $150 million program to increase I-25 capacity through the north side of Colorado Springs – a widening of the freeway to three lanes in each direction from Circle Drive to North Academy Boulevard, and reconstructing the Bijou Street and North Nevada/Rockrimmon Boulevard interchanges. COSMIX is the largest transportation project ever undertaken in the rapidly-growing Colorado Springs area. When I-25 opened in Colorado Springs in 1960, it carried approximately 8,500 vehicles per day. In 2005, as COSMIX was getting under way, the average daily vehicle count in the COSMIX project area was 100,000 vehicles. By 2020, that number is expected to rise to 170,000 vehicles per day.

Major areas of emphasis for future improvement, capacity expansion, and congestion management are projected to be:

- I-25 Denver north to Ft. Collins. Expansion projects in that area are under way; mushrooming population growth in the Northern Front Range requires that this section of I-25 be improved and expanded in order to meet capacity needs.
- I-25 between Denver and Colorado Springs. With approximately 3.5 million residents living along this corridor, future capacity needs must be met. Improvements in place along the north end of the corridor, including climbing lanes southbound out of Denver, and along the descent into Denver from the south, have helped alleviate nagging backups that were occurring in the area. Approximately 55 miles of the corridor remains two lanes in each direction.
- I-70 Denver West. This is the most high-profile corridor currently under study, and it is under the most intense public scrutiny, as well. President Eisenhower expressed frustration at weekend traffic backups on two-lane U.S. 6 and 40 between Denver and Fraser on his frequent fishing trips in the 1950s. Since then, despite the building of I-70 on that same approximate route from Denver to the U.S. 40 exit near Georgetown, the corridor has rapidly become overwhelmed by the population growth of the Front Range and Colorado's growing popularity as a year-round Rocky Mountain recreation paradise.

Marine Term

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All segments of travel on the I-70 West corridor – local travel, commuter travel, business travel, commercial travel, recreational travel – are increasing. At times, particularly on summer/fall and winter weekends when Front Range traffic is flowing to and from the mountains, Interstate traffic is far beyond the design capacity of the roadway. Numerous proposals to alleviate the situation have included additional lanes for I-70 and a fixed guideway monorail or other transit system. No consensus solution has yet been identified as of 2006. Any solution to the problem will be both massive and massively expensive, the DOT reports.

HAWAII: Urbanized Oahu Served by Interstates

Although not linked to the mainland, Hawaii has sections of the Interstate system. They are H-1, H-2, and H-3, all on the Island of Oahu, with a total mileage of just under 54 miles.

H-3 is widely considered to be one of the nation's most beautiful Interstates. The H-3 Freeway, the largest public works project in the history of Hawaii, has also been the most controversial, the most studied, and the most expensive highway in the state's history, the Hawaii DOT reports.

In the meantime, H-1 serves Oahu's built-up urban coast, from near Diamond Head State Monument on the east, through Honolulu, to terminate beyond Pearl Harbor on the west. H-2 connects Pearl City at Pearl Harbor to Wahiawa in the interior. To the astonishment of mainland tourists, these expressways carry heavy rush hour traffic as intense as any found in the lower 48 states.

The newest of the highways, H-3 was authorized as part of the Statehood Act of 1960, one of three Interstate and Defense Highways in Hawaii to be federally funded. Although the Interstate generally connects states, Hawaii was able to receive Interstate funds because of the designation of its routes as defense highways. H-1 connects the Hawaii National Guard at Diamond Head to Barbers Point Naval Air Station, with off ramps to Pearl Harbor and Hickam Air Force Bases. H-2 connects the Hickam/Pearl Harbor area with Schofield Barracks. H-3 provides the final link between Pearl Harbor/Hickam and Marine Base Hawaii at Kaneohe.

During the 37 years since the project began, H-3 has survived corridor changes; legal challenges; lengthy delays due to court injunctions; construction challenges, including a mile-long tunnel through volcanic mountains; proximity to the Coast Guard's Omega Station; and lots of rain. H-3 was the first project in Hawaii to require an Environmental Impact Statement following the passage of the National Environmental Policy Act by Congress. The environmental studies conducted for H-3 spanned 20 years, and reach a height of four feet if stacked one on top of the other.

H-3 was originally envisioned as a six-lane highway through Moanalua Valley at a cost of $250 million. Thirty-seven years later, the highway is through Halawa Valley at a cost of $1.3 billion. H-3 has one of the most spectacular mountainous drives in the nation as it connects leeward and windward Oahu through the mile-long Trans-Koolau Tunnel. The Interstate freeway begins in the North Halawa Valley, climbs to the portal of the Trans-Koolau Tunnel, tunnels through ancient lava rock, emerges into the scenic Haiku Valley, soars on a graceful viaduct, hugs Ho'omaluhia Park, and ends 16.1 miles later at the entrance to Marine Base Hawaii at Kaneohe.

The H-3 was built in 27 separate construction packages by seven different contractors and four joint ventures at a cost of $1.3 billion. It has two sets of tunnels, two long viaducts, and 26 bridges. The roadway width of H-3 is 38 feet in each direction, which consists of two 12-foot lanes, a 10-foot right shoulder, and a 4-foot left shoulder. Due to its sensitive location, a number of innovative construction techniques were used to construct H-3. Instead of pile driving for piers, the DOT chose drilled shafts and cast-in-place concrete piers. This method reduced noise during construction, was suitable in a wide range of soil conditions, and was capable of carrying very large loads. The extensive use of drilled shafts for H-3 bridge foundations has advanced the knowledge and experience of engineers and contractors and has made the use of shafts a common practice in the islands.

IDAHO: Wall Puts Squeeze on I-84 in Narrow Gorge

The first four-lane section of Interstate to be completed by the Idaho Department of Highways was I-86 between Rockland and American Falls, completed in 1958-59. A two-lane segment was completed between Massacre Rocks and the Rockland Junction in 1957-58, the Idaho Transportation Department reports; this was the first contract to be signed under the 1956 Federal-Aid Highway Act.

The Gem State's first urban segment of Interstate was I-84 through Caldwell, completed in 1983.

Lloyd Barron was one of the most influential persons in the history of Idaho transportation. Barron served as chairman of the Idaho House Transportation Committee from 1954-58, and was the chairman of the Idaho Senate Transportation Committee from 1960-68. He was appointed to the Idaho Transportation Board in 1968 and served 20 years before retiring in 1988.

Remarkable Interstate projects by the Idaho Transportation Department include I-15 construction over Malad and Monida passes; I-90 construction over Lookout Pass and around and over Lake Coeur d'Alene; and construction of the Wallace Viaduct to preserve the town of Wallace.

I-86 was constructed with the protection of the Snake River and remnants of the Oregon Trail in mind, and I-84 is noteworthy for construction of a retaining wall at Glenns Ferry to squeeze the Interstate between a mountain gap, railroad tracks, and the Snake River.

Future projects include I-84 expansion in the Treasure Valley (Boise), continued modernization and expansion of U.S. 95 to four lanes where possible, and modernization and expansion of U.S. 30 between Lava and Topaz.

MONTANA: I-15 Construction Restores Damaged Boulder River

In the Treasure State of Montana, I-90 from Drummond to Gold Creek was the first Interstate project completed by the Montana Highway Department, in 1959. The state did not have any limited-access highways prior to the Interstates.

The first contract let under the Interstate act was for I-90 over the Little Big Horn River Bridge in Big Horn County in the south-central part of the state. The first circumferential Interstate was I-15 around Great Falls.

Two segments of Montana Interstates have been recommended for National Register of Historic Places eligibility. I-15, Woodville to Boulder, is located between Butte and Helena. It was one of the last segments of Interstate built in Montana and had some of the most difficult geographic/geologic and environmental obstacles to surmount. It did so in a big way and restored the Boulder River to life in the process, as it had been polluted by nearly a century's worth of mining.

Also, I-15, Sieben Interchange to Hardy Creek Interchange, has been nominated. This route passes through the Wolf Creek and Missouri River canyons between Helena and Great Falls.

The foundation was placed recently for a major National Highway System project in Nevada – the new U.S. 93 bridge over the Colorado River just below the Hoover Dam. The United States' largest concrete arch [bridge] will complement the immense Art Deco concrete dam and take traffic off the structure.

Today, most Interstate projects in Montana involve maintenance of the existing system, reports the Montana Department of Transportation. There are, however, new Interchange projects in the works at Helena (I-15) and at Belgrade (I-90).

NEVADA: New Hoover Dam Bridge Highlight of System

The first section of Interstate constructed by the Nevada Department of Highways was U.S. 40, now I-80, in Reno. But limited-access highways were no stranger to the Silver State, with U.S. Routes 40 (I-80), 91 (I-15), U.S. 50, U.S. 93, U.S. 395, U.S. 6, and U.S. 95 all in operation prior to the 1956 Federal-Aid Highway Act.

The Nevada Department of Transportation reports that U.S. 40 (I-80) from the urban limits of Reno to Sparks constituted the state's first urban expressway.

In 2002 the Nevada Transportation Board approved a Landscape and Aesthetics Plan that earmarked 3 percent of projects to influence the total visual impression of the highway. But they are more than plants and art. They include well-proportioned and visually pleasing bridges, slopes, and drainage swales, views of the highway from adjacent neighborhoods, and carefully preserved scenic vistas viewed by motorists driving through Nevada.

On the engineering side, a dramatic new bridge will span the Colorado River just below the Hoover Dam. When opened in 2008, everything about the U.S. 93 project will be on a grand scale, from its location to its distinction as what will be the country's largest concrete arch. Approaches from Nevada and Arizona are near completion, and construction on the actual bridge structure has begun.

Monitoring and responding to the flow of vehicles on Interstates and arterials will be made easier in Nevada with completion of a new high-tech facility in Las Vegas. Named FAST for the Freeway and Arterial System of Transportation, the new center, which opened in early 2006, brought together the Department of Public Safety's Nevada Highway Patrol, the Intelligent Transportation System of southern Nevada, and a new maintenance facility for NDOT.

The Nevada DOT is also taking advantage of the latest technology for relieving traffic congestion, including ramp metering and HOV lanes. A widening project on the east-west freeway, U.S. 95, is nearing completion, and projects on the north-west freeway, I-15, will include new interchanges and widening of lanes.

NEVADA DOT PHOTO

NEW MEXICO: State Gets GRIP on Interstate Needs

The New Mexico Highway Department's oldest Interstate highway is I-24, Tramway to Bernalillo – actually built in 1954 – and was designated as an Interstate in 1956. However, the first contract under the 1956 Federal-Aid Highway Act was for a 9.8-mile segment east of Clines Corners and let to bid in September 1956, at a

New Mexico DOT photo

An overpass is built over I-40, seen here under construction in New Mexico in 1967.

cost of $1.476 million ($10.2 million in 2005).

The first urban segment of Interstate in the Land of Enchantment was I-40 in Albuquerque. There, the original Big "I" was complete and opened at the junction of I-40 and I-25 in Albuquerque in 1966, making it the first system interchange in New Mexico within a 250-mile radius.

This century, the New Mexico Department of Transportation undertook the reconstruction of the new Big "I" in 2000 at a cost of $293 million. Executed in 23 months, the project was the fastest reconstruction of a full system interchange in the United States to date.

The New Mexico Legislature approved a new $1.2 billion bonding program, Gov. [Bill] Richardson's Investment Partnership (GRIP), in 2003, addressing the state's most critical infrastructure needs over an eight-year period. As part of the program, $500 million is dedicated to reconstruction of critical segments of the Interstate system and $750 million is dedicated to the remaining NHS system.

The New Mexico DOT is integrating multimodal systems (rail and transit), which will complement the Interstate system. More specific to the Interstate system will be the incorporation and development of lane-management strategies, along with urban and rural ITS additions and enhancements.

OREGON: Early Funding Paved Way to Early Limited Access

The Oregon State Highway Department's first Interstate was I-5, Myrtle Creek to Canyonville (1959). Nestled between a large cut to the west and the Umpqua River to the east, this section follows a sharply curved route that still requires flashing lights and signed speed reductions. As the road straightens out south of Myrtle Creek toward Canyonville, it follows essentially flat bottomland before sweeping along a bend in the South Umpqua River that was documented as an early postcard view. This also was Oregon's first Interstate contract. The Oregon Department of Transportation regards the Banfield as the state's first urban Interstate segment.

But early on, Oregon laid the foundation for limited-access highways prior to the Interstates. The Banfield, or the westernmost part of I-84 today, from I-5 to I-205 in Portland, was completed in 1955. Work on this congested roadway began

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OREGON DOT PHOTO

Oregon's I-80 was completed in 1964.

after the Oregon Legislature passed S.B. 121 in 1947, creating both the legal framework for the creation of controlled-access highways and, in 1952, the bond-funding mechanisms to help pay for them.

Beginning in 1949, because of OSHD efforts – aided in no small part by local political leaders who saw access to efficient highways as a major component of their own community's potential for postwar growth – the Oregon State Legislature undertook a series of actions to make a significant financial commitment to improving the state's highways. These efforts in the Legislature allowed Oregon to begin building controlled-access, grade-separated highways before the Federal-Aid Highway Act was passed in 1956.

The Stadium Freeway, sometimes called the West Portland Freeway, now called I-405, may be considered "circumferential," as it connects to I-5 north and south of Oregon's major metropolitan area, Portland. The freeway, 4.2 miles long, required the total clearing of a wide swath of densely developed commercial structures near the heart of the downtown. The land acquisition, multiple grade crossings, and depressed construction of this comparatively short route combined to make it, per mile, the single most expensive Interstate project in Oregon's history, with a cost of $121 million (1964-1969). Its final link, the Fremont Bridge, was opened in November 1973, completing Portland's "Inner Loop."

Robert H. "Sam" Baldock, Oregon State Highway Engineer, played an integral role in the development of Oregon's highway system prior to the war, helping to establish the state as a national leader. Baldock began to advocate for large-scale improvements in the primary road system, with the strong support of Thomas H. Banfield and the other members of the Oregon State Highway Commission.

Oregon finished its 308 miles of the north-south Interstate 5, border to border, in October 1966, the first Western state to do so. As of March 1970, nearly 90 percent of the state's 731 miles of Interstate was finished.

In 1961, in concert with the Oregon Federation of Garden Clubs, Oregon established a pilot wildflower seeding program, resulting in wildflowers beautifying many areas near the Interstate. The FHWA adopted a program in December 1973 called "Operation Wildflower" that was largely modeled after Oregon's success in this area.

Two areas on I-84 are of national significance from an engineering standpoint. Toothrock Tunnel at milepost 41 eastbound (completed 1937), and the Historic Columbia River Highway (miles 22 – 82, completed 1922) are both at least 50 years old and meet the National Register criteria for national significance. The Historic Columbia River Highway includes multiple structures and a corridor that winds in and out of the I-84 right of way. Portions are also designated as a National Historic Landmark.

Another significant engineering feat is the I-405 Fremont Bridge at milepost 3. When constructed in 1973, the 902-foot-long main span was floated into place on the river and hydraulically lifted 170 feet into place, making it the largest lift ever made. It also features the longest single span length in the state.

The Columbia River I-5 Northbound Bridge was a major engineering and financial accomplishment, being the first highway bridge across the Columbia River to connect Oregon and Washington. Completed in 1917, the main span is a through truss vertical lift designed by Harrington, Howard, and Ash. The 10 spans of the bridge range from 266 to 531 feet in length, and are all of the Pennsylvania-Petit type.

Also, the Columbia River Bridge at Umatilla on I-82, completed in 1955, has a five-span continuous Warren through truss design. The configuration of the span is unusual in the fact that it takes advantage of a submerged island near the middle of the Columbia River. It is the only bridge in the state having two spans (600 feet each) constructed using the cantilever method.

Future projects include extensive work on I-5 between Kuebler Road and Mission Street in the Salem area, and the I-205 preservation project, repairing and paving the section between the Willamette River and the Columbia River. Planning is under way for the I-5 Delta Park project, which will widen I-5 in north Portland between Victory Boulevard and N. Lombard Avenue Eugene/Springfield's Beltline interchange at I-5 will be a major upgrade for these communities. Construction is scheduled to begin in 2007.

Construction is expected to begin in 2006 for the new South Medford Interchange at exit 27 on I-5. Estimated project cost is $70 million, making it the single most expensive transportation project in southern Oregon. Five new and/or repaired bridges on I-84 between mileposts 64 and 159 will improve the safety and mobility of that major route.

And, started in 2005 and projected for completion in 2008, more than 20 Interstate bridges will be repaired or replaced along

I-84 in eastern Oregon. The projects will result in the removal of freight restrictions on the freeway throughout eastern Oregon.

Oregon has several initiatives under way to ensure the state's Interstates and roads continue to contribute to a healthy economy and high quality of life. The Oregon Transportation Investment Act (OTIA) I, II and III, approved by legislators, is allowing unprecedented investment in Oregon's infrastructure. OTIA I and II provided $500 million for statewide projects; OTIA III allocates $1.34 billion to repair or replace hundreds of aging highway bridges, and an additional $1.2 billion to maintain and modernize local and state roads. Federal funds are also involved, mainly because most of the bridges needing work are on I-5 and I-84. OTIA III projects will keep the state's highway construction crews busy to 2015 and beyond.

The ODOT's Intelligent Transportation Systems enhance safety and mobility throughout the state. From the Green Light Pre-clearance Program – saving valuable time and money for truckers – to the advanced "TripCheck.com" Web site, with up-to-the minute road conditions, alerts, road construction details, and hazard information available to motorists either on the Web or by dialing 511, Oregon is a leader in using ITS.

Another creative use of technology at the ODOT involves its 2006 test of a road-user fee, complete with congestion pricing, in a 280-vehicle pilot project in the Portland metro area. This potentially new way of collecting revenue for highways charges a per-mile fee instead of the current gas tax. Results of the pilot are anticipated in early 2007. The ODOT is also partnering with a private consortium to investigate the feasibility of three large highway-expansion projects, all located in the congested northern portion of the state, surrounding Portland.

UTAH: First Transcontinental Interstate and Railroad Links

On Aug. 20, 1986, the Utah Department of Transportation held a ribbon-cutting ceremony marking the completion of I-80 in both Utah and the United States. The ceremony made I-80 the first fully-completed transcontinental Interstate highway. Coincidentally, the ceremony was held just 60 miles south of Promontory, Utah, where the first transcontinental railroad was completed.

The Utah State Road Commission's first completed section of Interstate was I-15, North Bountiful to Beck Street (1960). This section also was Utah's first section under contract, and Utah's first urban segment. Another early segment was a 15-mile section in northern Washington County between Anderson Junction and the New Harmony interchange. Utah's first circumferential Interstate was I-215 around Salt Lake City. It was first proposed in 1957 but not completed until 1988.

In 2001, in anticipation of the 2002 Winter Olympic games held in Salt Lake City, the UDOT completed a massive reconstruction of I-15 in the Salt Lake Valley. At the time, the project was the largest design-build project ever to be undertaken in the nation. The $1.59 billion project included the reconstruction of 17 miles of highway, 142 bridges, three system-to-system interchanges, and the state's first High Occupancy Vehicle lanes.

Today, the state is preparing to break ground on a $204 million reconstruction project of I-15 in northern Utah. High Occupancy Toll lanes are being considered for I-15 in Salt Lake and Utah Counties. The UDOT is constantly looking for ways to optimize the existing transportation system, the agency reports. Applications currently being examined in Utah include High Occupancy Toll lanes and toll roads. The department also actively encourages car-pooling as a means of managing congestion.

WASHINGTON STATE: Massive Bond Issue Launched Interstates

On April 1, 1957, the State of Washington Department of Highways established a special office charged with property acquisition within the established right-of-way of the Seattle Freeway, now the Seattle portion of I-5. The acquisition was made possible by the sale of $75 million in bonds ($509 million in 2005), authorized by the state legislature, and redeemable from federal highway funds.

On Oct. 1, 1957, the first portion of the future I-5, received federal approval and funding. The first completed project was the Vancouver-Portland Interstate Bridge, part of I-5, completed in 1958 with the help of federal funds.

But Washington State already had limited-access highways prior to 1956, including U.S. 2, U.S. 10, U.S. 97, U.S. 99, U.S. 410, and U.S. 830. The Limited Access Highway Act of 1947 gave a mandate to the State Highway Commission to establish limited-access routes in the state.

Sen. Warren G. Magnuson was instrumental in having the route of I-82 shifted closer to the Tri-Cities of Richland,

A period display lauds construction of the Interstate system in Washington State in 1963.

WASHINGTON STATE DOT PHOTO

Kennewick, and Pasco, and in getting Interstate highway spurs built to the Tri-Cities and to downtown Tacoma.

Samuel Hill vowed that he would build a hard-surfaced highway from the Mexican border to the Canadian border, and all the way up to Vancouver, B.C. In September 1899, he convened a meeting of 100 business leaders for the purpose of forming a group to promote good roads. This organization became the Washington State Good Roads Association and advocated state spending on roads and coordination among the county road systems. Hill died in 1931, but he undoubtedly would have been in support of a national Interstate system.

George F. Kachlein, Jr. was a Seattle lawyer who volunteered tirelessly for many civic organizations. He was active in the Washington Good Roads Association, the Washington division of the American Automobile Association, and served as executive vice president of the national American Automobile Association (AAA), where he conferred with state and federal officials, including President John F. Kennedy, about the development of the American Interstate highway system.

Washington's Lacey V. Murrow Bridge, which is part of I-90, is the world's first floating bridge. The original, completed in 1940, sank during a storm in 1990. A replacement was completed in 1993. And the Mount Baker Ridge Tunnel, which is part of I-90, is the world's largest-diameter soft earth tunnel.

The Washington State Legislature in 2003 and again in 2005 increased the state's gas tax to fund a significant number of new projects, many on the state's Interstate system. The projects of note include additional HOV lanes and general purpose lanes along I-5 in sections starting in Clark County, near the state's southern border, and continuing north to the Canadian border. A series of capacity improvements and safety projects also are under way or planned for I-90, the state's longest stretch of Interstate.

A major project navigating the environmental impact statement process is the Columbia Crossing project, which is being co-developed by the Washington and Oregon departments of transportation. It will construct a new crossing across the Columbia River between Portland, Ore., and Vancouver, Wash., along the I-5 corridor.

WYOMING: Opened Longest Interstate Section at One Time

Cheyenne, Wyoming's largest city, was the site of the earliest Interstate work in that state, reports the Wyoming Department of Transportation. The first segment of Interstate to be opened by the then-Wyoming Highway Department was a segment of I-25 at Cheyenne, on Dec. 17, 1958. The first segment let to contract was a 10.1-mile section of I-25 north of Cheyenne, on Sept. 27, 1956, to Platte Valley Construction Co. And the first urban segment of Interstate in Wyoming was I-25 at Cheyenne, opened on Dec. 17, 1958.

Ross Stapp was superintendent and chief engineer of the Wyoming Highway Department from 1965 to 1971, and president of AASHTO in 1969. On Oct. 3, 1970, Stapp presided over the opening of a 77-mile stretch of I-80 from Walcott Junction to Laramie. This 77-mile stretch of I-80 remains the longest Interstate section in the nation opened to traffic at one time. Stapp also played a key role in winning federal support for building the I-180 spur route from I-80 into downtown Cheyenne.

Leno Menghini served as superintendent and chief engineer of the Wyoming Highway Department from 1976 to 1991 and as AASHTO president in 1988. During his tenure, the Wyoming Highway Department completed its segments of I-25, I-80, and I-90, and constructed urban Interstate Spur I-180.

The Wyoming Department of Transportation's Green River tunnels, twin 1,135-foot tunnels between mileposts 90 and 91 on I-80, were constructed in 1964-65, and refurbished in 2002-03. The tunnel concept was selected to preserve the scenic beauty of the Green River Shale formation, and thus eliminated the need for a deep cut in the formation.

The new 77-mile I-80 route opened in 1970 shortened the travel distance by almost 20 miles over the existing Lincoln Highway route, but added a new set of challenges for the Wyoming Highway Department. So much snow battered the highway early on that it quickly became known as the "Snow Chi-Minh Trail," and closures because of poor visibility and drifting snow were numerous. As much of the highway is over 7,000 feet above sea level and located in some of the windiest country in Wyoming, it became a prime proving ground for snow control research and implementation of snow control measures. After constructing over 33 miles of snow fence up to 14 feet high, the Wyoming Department of Transportation is now able to cope with most winter snow storms.

The Wyoming DOT is currently advancing a plan known as the Multilane Initiative to add travel and passing lanes to several NHS sections. The first project, on Wyo. 59 south of Gillette, began last year and will be completed by summer 2006. A total of nine passing lanes, averaging a little more than a mile in length, are being built along a 25-mile stretch of roadway. Future projects to add capacity are proposed for U.S. 287 south of Laramie and for Wyo. 200 and U.S. 287 between Casper and Rawlins, as well as for a number of other road sections.

I-80 is a major freight corridor across southern Wyoming and is experiencing exponential growth in truck traffic. This corridor traverses the highest point on the I-80 transcontinental route at 8,640 feet and passes through other stretches of potential severe winter weather driving conditions. Accordingly, the WYDOT has initiated an extensive intelligent transportation system effort – coupled with its blowing snow research project – to help reduce wintertime road closures. In addition, the WYDOT anticipates the need for additional climbing lanes to maintain smooth traffic.

The Interstates: Success Through Innovation

By Bill Dorey

On behalf of Granite Construction Inc., and the tens of thousands of our employees that have worked on building the federal Interstate system over the years, it is an honor and privilege to contribute our thoughts about the Interstate's first 50 years and its future.

Popularly known as the National Interstate and Defense Highways Act of 1956, the authorization of the Interstate highway system not only provided a network of highways for national security, but developed into the primary conduit for commerce providing connectivity to our nation's urban centers.

Planning for our system of new superhighways began in the late 1930s when planners recognized the need for such an interconnected national system to supplement the existing, largely non-freeway U.S. highway system. The federal Interstate system was designed to be faster and safer than the two-lane roads that preceded them. Today, the Interstate comprises less than 1 percent of our nation's roads, but it carries more than 24 percent of its traffic, including 41 percent of total truck miles traveled throughout the country, according to the American Road & Transportation Builders Association.

The Interstate has brought amazing changes to our country's way of life through the safe and efficient movement of goods and passengers, and remains one of the most significant economic engines of the United States economy.

System Taken for Granted

Despite its huge contribution to our way of life, the Interstate highway system is largely taken for granted by most of us, until sections of it are affected by gridlock or disrupted by reconstruction activities. The challenges facing the Interstate system today are similar to our deteriorating local transportation infrastructure. Specifically, much of the Interstate system has reached the end of its lifespan and is operating beyond its design capacity.

The United States has experienced dramatic population growth, and that growth has generated significant traffic congestion affecting commerce and our overall quality of life. As we move forward to ensure our country's ability to compete in a world market over the next 50 years, we must find new ways to finance and deliver the necessary maintenance, reconstruction, and improvement of the Interstate highway system.

Our state and federal governments continue to be challenged to deliver the infrastructure improvements needed, and many transportation budgets have not been fully funded, while other social priorities continue to take precedence over our nation's transportation needs.

Encourage Private-Sector Involvement

To meet today's challenges; federal, state, and local governments must look to innovative delivery systems and encourage private-sector involvement in the redevelopment of our nation's transportation infrastructure. Further, project delivery methods such as design-build must be promoted to expeditiously meet the fast-paced redevelopment needs of the Interstate highway system in the future.

A number of public-sector transportation agencies are using design-build project delivery methods on large highway and bridge projects, as well as on a few smaller projects. Some states are also exploring private-sector involvement through the use of Public Private Partnerships (PPPs) that take the design-build concept that extra step. A PPP is an innovative means of developing and financing major infrastructure projects that has been used successfully around the world for many years, and is increasingly being used to develop and finance highway and other major transportation projects here in the United States. Through a PPP, a government can transfer much of the risk and responsibility for construction, financing, operation, and maintenance of a project to the private sector.

By adopting innovative delivery methods such as design-build and accessing the private-sector capital for infrastructure redevelopment, government can bring more projects to market in a shorter time period, and have the beneficial use of these systems years before the public sector could traditionally deliver a comparable program. It is imperative that the transportation and construction industry be innovative in order to help government agencies meet the redevelopment needs of our Interstate highways and honor the legacy of our great transportation system.

Granite is considered a leader in design-build and privatization projects. Over the past 10 years, Granite, with its joint venture partners, sub-contractors, and material suppliers, has completed more than $4 billion worth of design-build work. Granite is proud to have played a small part in the building of the federal Interstate system and congratulates all the government agencies, designers, contractors, sub-contractors, and material suppliers who have contributed to building America's transportation system.

William G. Dorey is president and CEO, Granite Construction Inc., Watsonville, Calif.